



**Economic and Social
Council**

Distr.
GENERAL

TRANS/WP.29/GRSP/2004/24
28 September 2004

Original: ENGLISH
ENGLISH AND FRENCH ONLY

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Passive Safety (GRSP)
(Thirty-sixth session, 7-10 December 2004,
agenda item B.2.)

PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 44
(Child restraints)

Transmitted by the expert from the Netherlands

Note: The text reproduced below was prepared by the expert from the Netherlands in order to apply the dynamic test of both acceleration sleds as well as deceleration sleds proposed in Regulation No.16 on total velocity change ΔV to Regulation No. 44. The text proposed to be added is underlined, and the existing text proposed to be deleted is crossed out.

Note: This document is distributed to the Experts on Passive Safety only.

A. PROPOSAL

The contents, the list of annexes, amend to read:

"

Annex 7 – Appendix 1 Curves of the trolley's acceleration or deceleration as a function of time (Curve for calibrating an accelerating or stopping device) – Frontal impact

Annex 7 – Appendix 2 Curves of the trolley's acceleration or deceleration as a function of time (Curve for calibrating an accelerating or stopping device) – Rear impact

..... "

Paragraph 8.1.3.1.1.2., amend to read:

"8.1.3.1.1.2. The trolley shall remain horizontal throughout acceleration or deceleration."

Paragraph 8.1.3.1.1.3., amend to read:

"8.1.3.1.1.3. ~~The deceleration of the trolley shall be achieved by using the apparatus prescribed in annex 6 to this Regulation or any other device giving equivalent results. This apparatus shall be capable of the performance specified in paragraph 8.1.3.4. and annex 7 of this Regulation.~~

The acceleration or deceleration shall be achieved in such a way that the total velocity change ΔV , the accelerating or stopping distance and other performances are as specified in paragraph 8.1.3.4. and annex 7 of this Regulation. At the moment that counts as the start of the impact the manikin shall be stable. The apparatus being the origin for the deceleration to be achieved is described in annex 6 to this Regulation however, any other device giving equivalent results may be used."

Paragraph 8.1.3.1.1.4.1., amend to read:

"8.1.3.1.1.4.1. the trolley speed immediately before impact (only for deceleration sleds, needed for the calculation of the distance in which the first 50 km/h ΔV is achieved;)"

Paragraph 8.1.3.1.1.4.2., amend to read:

"8.1.3.1.1.4.2. the ~~stopping distance~~ trolley acceleration or deceleration (also needed for the calculation of the distance in which the first 50 km/h ΔV is achieved);"

Paragraph 8.1.3.1.2.3., amend to read:

"8.1.3.1.2.3. The acceleration or deceleration conditions shall satisfy the requirements of paragraph 8.1.3.4. below."

Paragraph 8.1.3.2.1.5., amend to read:

"8.1.3.2.1.5. The acceleration or deceleration conditions shall satisfy the requirements of paragraph 8.1.3.4. below. The test seat will be the seat of the actual vehicle."

Paragraph 8.1.3.2.1.6.1., amend to read:

"8.1.3.2.1.6.1. the trolley speed immediately before impact (only for deceleration sleds, needed for the calculation of the distance in which the first 50 km/h ΔV is achieved);"

Paragraph 8.1.3.2.1.6.2., amend to read:

"8.1.3.2.1.6.2. the ~~stopping distance~~ trolley acceleration or deceleration (also needed for the calculation of the distance in which the first 50 km/h ΔV is achieved);"

Paragraph 8.1.3.2.2.2., amend to read:

"8.1.3.2.2.2. ~~Same requirements as for frontal impact~~ The acceleration or deceleration conditions shall satisfy the requirements of paragraph 8.1.3.4. below."

Paragraph 8.1.3.3.1., amend to read:

"8.1.3.3.1. The acceleration or deceleration conditions shall satisfy the requirements of paragraph 8.1.3.4. below."

Paragraph 8.1.3.4., amend to read:

"8.1.3.4. The conditions for dynamic tests are summarized in the table below:

Test	Restraint	FRONTAL IMPACT			REAR IMPACT		
		Test pulse	ΔV (km/h)	Distance to achieve the first 50 km/h ΔV	Test pulse	ΔV (km/h)	Distance to achieve the first 30 km/h ΔV
Trolley with test seat	Forward facing front and rear seats universal, semi-universal or restricted (1)	1	[53 \pm 1]	650 \pm 50	-	-	-
	Rearward facing front and rear seats universal, semi-universal or restricted (2)	1	[53 \pm 1]	650 \pm 50	2	[32 \pm 1]	275 \pm 25
Vehicle body on trolley	Forward facing	1	[53 \pm 1]	650 \pm 50	-	-	-
	Forward facing	3	based on vehicle impact at 50 +0/-2	not specified	-	-	-
	Rearward facing	1	[53 \pm 1]	650 \pm 50	2	[32 \pm 1]	275 \pm 25
	Rearward facing	3	based on vehicle impact at 50 +0/-2	not specified	4	based on vehicle impact at 30 +2/-0	275 \pm 25
Whole vehicle barrier test	Forward facing	3	based on vehicle impact at 50 +0/-2	not specified	-	-	-
	Rearward facing	3	based on vehicle impact at 50 +0/-2	not specified	4	based on vehicle impact at 30 +2/-0	not specified

NOTE: All restraint systems for groups 0 and 0+ shall be tested according to "Rearward-facing" conditions in frontal and rearward impact

LEGEND:

Test Pulse No.1 - As prescribed in annex 7 - frontal impact

Test Pulse No.2 - As prescribed in annex 7 - rear impact

Test Pulse No.3 - Deceleration pulse of vehicle subjected to frontal impact.

Test Pulse No.4 - Deceleration pulse of vehicle subjected to rear impact.

(1) During calibration, the stopping distance should be 650 \pm 30 mm

(2) During calibration, the stopping distance should be 275 \pm 20 mm"

Paragraph 9.1., amend to read:

- "9.1. The test report shall record the results of all tests and measurements and ~~the trolley speeds~~, the place occupied by the buckle during the test, if it can be varied, and any failure or breakage, and the following test data:
- (a) velocity change;
 - (b) the trolley speed on the moment that counts as start of the impact(t=0), which is defined as the moment that the acceleration or deceleration vs time filtered CFC 60 passes a level of 0.5 G;
 - (c) legible diagrams showing the acceleration or deceleration curve;
 - (d) which kind of sled is used (accelerating or decelerating sled, and its braking mechanism e.g. polyurethane tubes according annex 6, hydraulic, , crumple tubes, deforming metal strips,.....)
 - (e) how the prescription of annex 7 of the trolley's curve are fulfilled, that is to say: the sled is calibrated with inert mass according to annex 7 part B, or the curve of the actual dynamic type approval tests fulfils all requirements); "

Annex 7, amend to read:

"Annex 7

CURVE OF THE TROLLEY'S ACCELERATION OR DECELERATION
AS FUNCTION OF TIME

There are two ways for fulfilling the conditions of paragraph 8.1.3.4. and remaining in the hatched areas of the appendices to this annex:

[PART A:

Each curve of the actual dynamic type approval tests must remain:

- (a) in the case of frontal impact, in the hatched area shown in appendix 1 to this annex, and
- (b) in the case of rear impact, within the hatched area shown in appendix 2 to this annex.]

PART B: Calibration procedure for sleds that use inert mass during calibration:

1. The acceleration or deceleration curve of the trolley weighted with inert masses to produce a total mass of 455 ± 20 kg in the case of child restraint tests performed in accordance with paragraph 8.1.3.1. of this Regulation, and of 910 ± 40 kg in the case of child restraint tests performed in accordance with paragraph 8.1.3.2. of this Regulation, where the nominal mass of the trolley and vehicle structure is 800 kg, must remain, in the case of frontal impact, within the hatched area shown in

appendix 1 to this annex, and, in the case of rear impact, within the hatched area shown in appendix 2 to this annex.

2. If necessary, the nominal mass of the trolley and attached vehicle structure may be increased for each increment of 200 kg by an additional inert mass of 28 kg. In no case shall the total mass of the trolley and the vehicle structure and inert masses differ from the nominal value for calibration tests by more than ± 40 kg. During calibration of the acceleration or stopping device, the acceleration or stopping distance shall be 650 ± 30 mm for frontal impact, and 275 ± 20 mm for rear impact.

Both for method A as well as for method B, the gradient of the beginning of the curve of the acceleration or deceleration has to be such that the rise of the value of the G-level from the start of the impact up to 10 ms afterwards shall be at least [5] G, and up to 20 ms after the start of the impact at least [9] G.

- ~~3.~~ The All measuring and calibration procedures shall correspond to those defined in the international standard ISO 6487 (1980), the measuring equipment shall correspond to the specification of a data channel, with a channel frequency class (CFC) 60."

Annex 7 – Appendix 1,

The text above the figure, amend to read:

"Curves of the trolley's acceleration or deceleration as a function of time
(curve for calibrating accelerating or stopping device)
Frontal impact"

Annex 7 – Appendix 2,

The text above the figure, amend to read:

"Curves of the trolley's acceleration or deceleration as a function of time
(curve for calibrating accelerating or stopping device)
Rear impact"

* * *

B. JUSTIFICATION

The apparatus, being the origin for the deceleration as described in annex 6, achieves a stopping distance of the trolley from 50 to 0 km/h in 65 ± 3 cm and a rebound velocity of 3 km/h. Therefore, when making use of velocity change, a ΔV of 53 km/h should be the value which provides an equivalent level of kinetic energy between other sleds and the original sled in annex 6.