Transmitted by the expert from Netherlands

Informal document No. **GRSP-37-23**
(37th GRSP, 23 – 27 May 2005,
agenda item B.1.7.)

**UNITED NATIONS** **E**

**Economic and Social Council**

Distr.
GENERAL

~~TRANS/WP.29/GRSP/2005/6~~
~~9 March 2005~~

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 General Safety Provisions (GRSP)
(Thirty-seventh session, 23-27 May 2005,
agenda item B.1.7.)

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

Transmitted by the expert from France on behalf of the ad hoc group

Note: The text reproduced below was prepared by an ad hoc group in order to authorize the use of an acceleration test device for validation of the dynamic behaviour of a child restraint system.

New text is **bolded and underlined**, and existing text to be deleted is ~~crossed through.~~

---

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

## A. PROPOSAL

CONTENTS, Annex 7, amend to read.

"Annex 7 - Curve of trolley's deceleration **or acceleration** as a function of time
Annex 7 – Appendix 1 - Curve of trolley's deceleration **or acceleration** as a function of time. Frontal Impact
Annex 7 – Appendix 2 - Curve of trolley's deceleration **or acceleration** as a function of time. Rear Impact"

THE TEXT OF THE REGULATION,

Paragraph 8.1.3.1.1.2., amend to read:

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

Paragraph 8.1.3.1.1.3., amend to read:

"8.1.3.1.1.3. **Deceleration or acceleration devices**

**The applicant shall choose to use one of the two following devices:**

**8.1.3.1.1.3.1. Deceleration test device**

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 **hereafter specified:**
**Calibration procedure** :
The 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 **of the graph in annex 7** appendix 1 **of this regulation** ~~to this annex~~, and, in the case of rear impact, within the hatched area **of the graph in annex 7** appendix 2 **of this regulation** ~~to this annex~~.

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 stopping device, the stopping distance shall be 650 ± 30 mm for frontal impact, and 275 ± 20 mm for rear impact.

**The trolley shall be so propelled that at the moment of impact its free running speed and its stopping distance are according to paragraph 8.1.3.4 of this Regulation and the manikin remains stable.**

**8.1.3.1.1.3.2. Acceleration test device**

**Dynamic testing conditions :**

**For frontal impact, the trolley shall be so propelled that, during the test, its total velocity change ΔV is 52 km/h $^{+0}_{-2}$ km/h and its acceleration curve is within the hatched area of the graph in annex 7 appendix 1 and stay above the segment defined by the coordinates [5g, 10ms] and [9g, 20ms]. The start of the impact (T0) is defined, according to ISO DIS 17 373 for a level of acceleration of 0.5 g.**

**For rear impact, the trolley shall be so propelled that, during the test, its total velocity change ΔV is [32 km/h $^{+2}_{-0}$ km/h] and its acceleration curve is within the hatched area of the graph in annex 7 appendix 2 and stay above the segment defined by the coordinates [5g, 5ms] and [10g, 10ms].. The start of the impact (T0) is defined, according to ISO DIS 17 373 for a level of acceleration of 0.5 g.**

**Despite the fulfilment of the above requirements, the technical service shall use a mass of trolley (equipped with its seat), as specified in paragraph 1 of annex 6, superior to 380 kg."**

**However, if the tests above were performed at a higher speed and/or the acceleration curve has exceeded the upper level of the hatched area and the child restraint meets the requirements, the test shall be considered satisfactory.**

Paragraph 8.1.3.1.1.4., amend to read:

8. 1. 3. 1. 1. 4. The following measurements shall be made:

8. 1. 3. 1. 1. 4. 1. the trolley speed immediately before impact**(only for deceleration sleds, needed for stopping distance calculation).**

8. 1. 3. 1. 1. 4. 2. the stopping distance **(only for deceleration sleds), wich may be calculated by double integration of the recorded sled deceleration.**

8. 1. 3. 1. 1. 4. 3. the displacement of the manikin' s head in the vertical and horizontal planes for groups I, II and III and for group 0 and 0+ the displacement of the manikin without considering its limb.

8. 1. 3. 1. 1. 4. 4. the chest **de**celeration in three mutually perpendicular directions; except for new-born manikin.

8. 1. 3. 1. 1. 4. 5. any visible signs of penetration of the modelling clay in the abdomen (see paragraph 7. 1. 4. 3. 1. ); except for new-born manikin.

**8. 1. 3. 1. 1. 4. 6. the trolley acceleration or deceleration for at least the first 300ms.**"

Paragraph 8.1.3.1.2.3., amend to read:

"8. 1. 3. 1. 2. 3. The deceleration conditions shall satisfy the requirements of paragraph ~~8. 1. 3. 4. below.~~ **8.1.3.1.1.3.1.**
**The acceleration conditions shall satisfy the requirements of paragraph 8.1.3.1.1.3.2.**"

Paragraph 8.1.3.1.2.4., amend to read:

"8. 1. 3. 1. 2. 4. The measurements to be made shall be similar to those listed in paragraphs 8. 1. 3. 1. 1. 4. to 8. 1. 3. 1. 1. 4. **6**. above."

Paragraph 8.1.3.2.1.5., amend to read:

"8. 1. 3. 2. 1. 5. The deceleration conditions shall satisfy the requirements of paragraph ~~8. 1. 3. 4. below.~~ **8.1.3.1.1.3.1.**
**The acceleration conditions shall satisfy the requirements of paragraph 8.1.3.1.1.3.2.**"

Paragraph 8.1.3.2.1.6., amend to read:

"8. 1. 3. 2. 1. 6. The following measurements shall be made:
8. 1. 3. 2. 1. 6. 1. the trolley speed immediately before impact **(only for deceleration sleds, needed for stopping distance calculation).**"

8. 1. 3. 2. 1. 6. 2. the stopping distance **(only for deceleration sleds), wich may be calculated by double integration of the recorded sled deceleration.**

8. 1. 3. 2. 1. 6. 3. any contact of the manikin' s head with the interior of the vehicle body shell;

8. 1. 3. 2. 1. 6. 4. the chest deceleration in three mutually perpendicular directions; except for new-born manikin

8. 1. 3. 2. 1. 6. 5. any visible signs of penetration of the modelling clay in the abdomen (see paragraph 7. 1. 4. 3. 1.) except for new-born manikin.

**8. 1. 3. 2. 1. 6. 6. the trolley and vehicle body shell acceleration or deceleration for at least the first 300ms.**"

Paragraph 9.1., amend to read:

"9.1. The test report shall record the results of all tests and measurements including the **following test data:**

**a)** **the type of device used for the test (acceleration or deceleration device),**
**b)** **the total velocity change,**
**c)** the trolley speed **immediately before impact only for deceleration sleds,**
**d)** **the acceleration or deceleration curve during all the velocity change of the trolley and at least 300ms,**
**e)** the time (in msec) when the head of the manikin reaches its maximum displacement during the performance of the dynamic test,
**f)** the place occupied by the buckle during the tests, if it can be varied,
**g)** and any failure or breakage."

Annex 1, insert a new item 9. to read:

**"9. Type of device: deceleration/acceleration**

Items 9. to 16. (former), renumber as **10. to 17.**"

Annex 7, amend to read:

"Annex 7

CURVE OF TROLLEY' S, DECELERATION **OR ACCELERATION**,
AS FUNCTION OF TIME
~~(Curve for testing stopping devices)~~

In **all** cases the calibration and measuring 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.

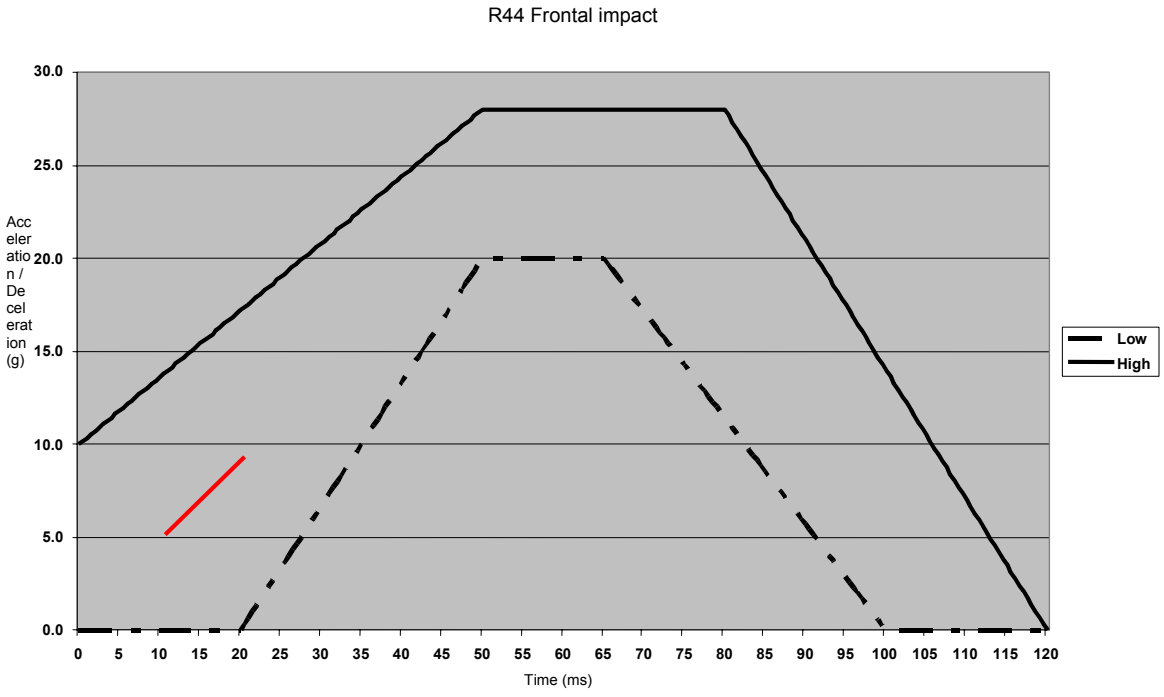
Annex 7 – Appendix 1

CURVE OF TROLLEY' S, DECELERATION **OR ACCELERATION**,
AS FUNCTION OF TIME
~~(Curve for testing stopping devices)~~
FRONTAL IMPACT

~~Test Speed: 50 (+0 ; -2) km/ h~~
~~Stopping distance: 650 ± 30mm~~

**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 (see paragraph 8.1.3.1.1.3.2.) applies only for acceleration sled**

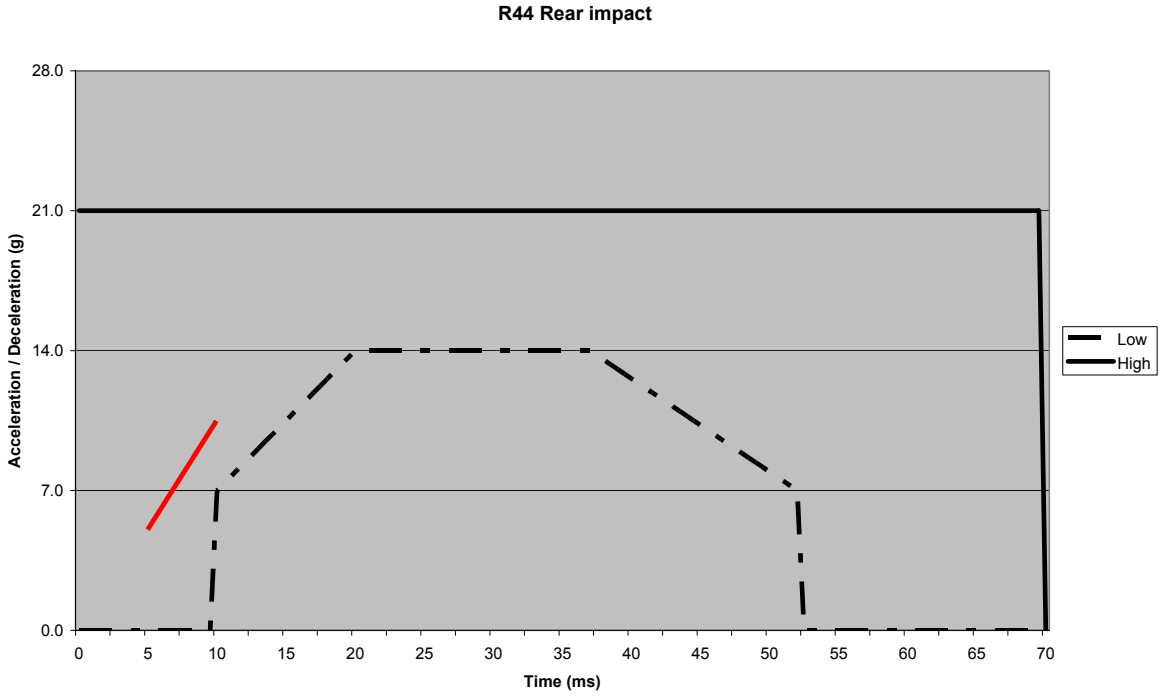
Annex 7 – Appendix 2

CURVES OF TROLLEY' S, DECELERATION **OR ACCELERATION**,
AS FUNCTION OF TIME
~~(Curve for testing stopping devices)~~
REAR IMPACT

~~Test Speed: 30 (+2 ; 0) km/ h~~
~~Stopping distance: 275 ± 20mm~~

**Definition of the different curves**

| Time (ms) | Acceleration (g) Low corridor | Acceleration (g) High corridor |
|---|---|---|
| **0** | **-** | **21** |
| **10** | **0** | |
| **10** | **7** | **-** |
| **20** | **14** | **-** |
| **37** | **14** | **-** |
| **52** | **7** | **-** |
| **52** | **0** | |
| **70** | **-** | **21** |
| **70** | **-** | **0** |




**The additional segment (see paragraph 8.1.3.1.1.3.2.) applies only for acceleration sled.**

* * *