



Informal Document No. GRSP-46-38  
(46th session, 8 - 11 December 2009,  
agenda item 18)

# 46th GRSP Session Status report of Informal Group on CRS

Pierre CASTAING  
Chairman

# Terms of reference of the informal group



- ⚡ The informal group shall consider the development of a new regulation for “Restraining devices for child occupants of power-driven vehicles” for consideration by GRSP.
- ⚡ The basis of the discussion will be informal documents N°. GRSP-42-2 and GRSP-42-27.
- ⚡ A step by step approach shall be implemented
  - Phase1: Develop definitions, performance criteria and test methods for ISOFIX Integral “Universal” CRS
- ⚡ In its work, the informal group will take into consideration amongst others the technical expertise of EEVC WG18, EEVC WG12, ISO TC22/SC12, and NPACS as well as the results of the discussions held in the informal group and at GRSP.
- ⚡ If necessary, the informal group shall develop complementary test methods and propose alternative judgement criteria.
- ⚡ The target completion date for the informal group shall be the forty-sixth session of GRSP (December 2009) for this first phase.

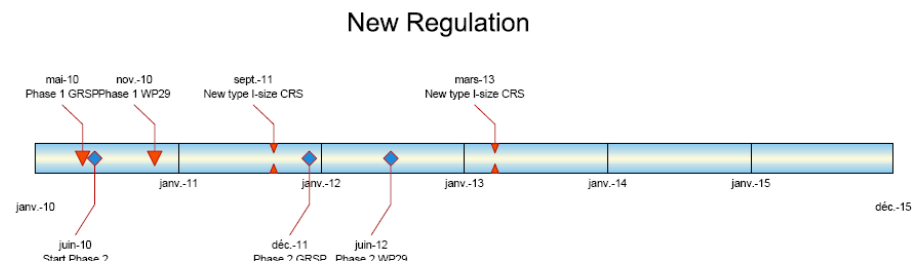
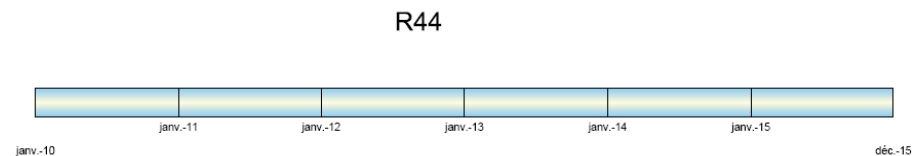
- ⦿ 14 meetings from January 2008 till November 2009
  
- ⦿ First draft regulation covering phase 1 presented as informal document:
  - GRSP-46-28 (Still an incomplete working document)

# Principles of this new regulation



- ⦿ Independent regulation. The ECE R44 remains valid
  - Multi steps approach
  
- ⦿ The scope of this new regulation cover only “ISOFIX – Universal – Integral” CRS in first step
  
- ⦿ New philosophy of classification
  - No groups
  - Classification based on standing height, maximum permissible weight (Child + CRS) and age limit for forward facing use.
  
- ⦿ Use of measurement device for CRS size control
  
- ⦿ Use of the Q dummies for frontal, rear and lateral dynamic impact on a new test bench
  
- ⦿ Use support leg as well as top tether as universal anti rotation device

- ⚡ ECE R44 remains valid
- ⚡ Multi steps approach
  - Integral CRS + ISOFIX
  - Non integral CRS + ISOFIX
  - Adult safety belt dependent CRS
- ⚡ Transitional provisions for “soft landing” between ECE R44 and the different phases of this new regulation



## ⦿ ISOFIX “universal” integral CRS

### – ISOFIX

- 2 lower anchorages + 1 anti rotation device
- No use of the adult safety belt for the restraint of the child seat

### – Universal

- <F3 ISO fixture for FF & <R2 ISO fixture for RF
- With top tether or support leg (to be confirmed)

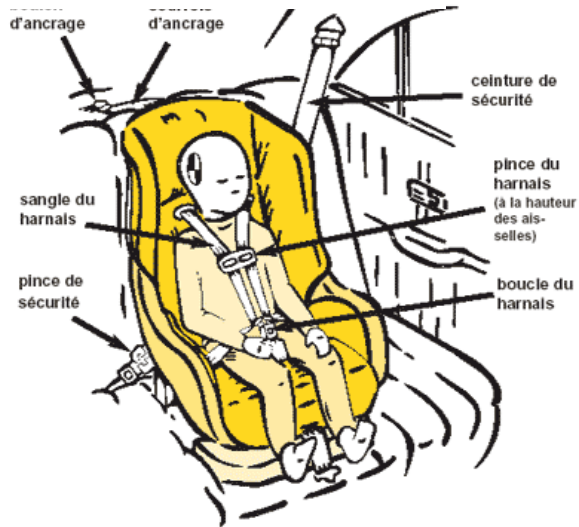
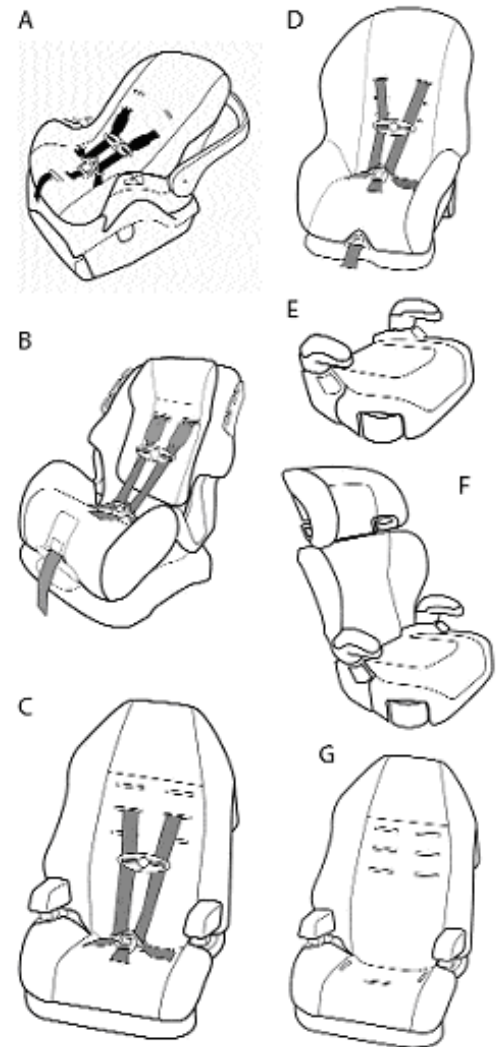
### – Integral

- Child is restraint only by the CRS restraint system (harness)
- No use of the adult safety belt for the restraint of the child

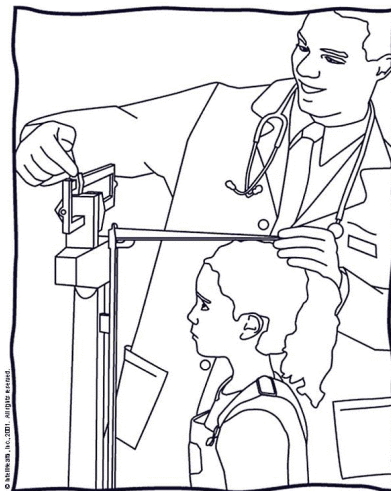
# New philosophy of classification



## ⚡ No group approach

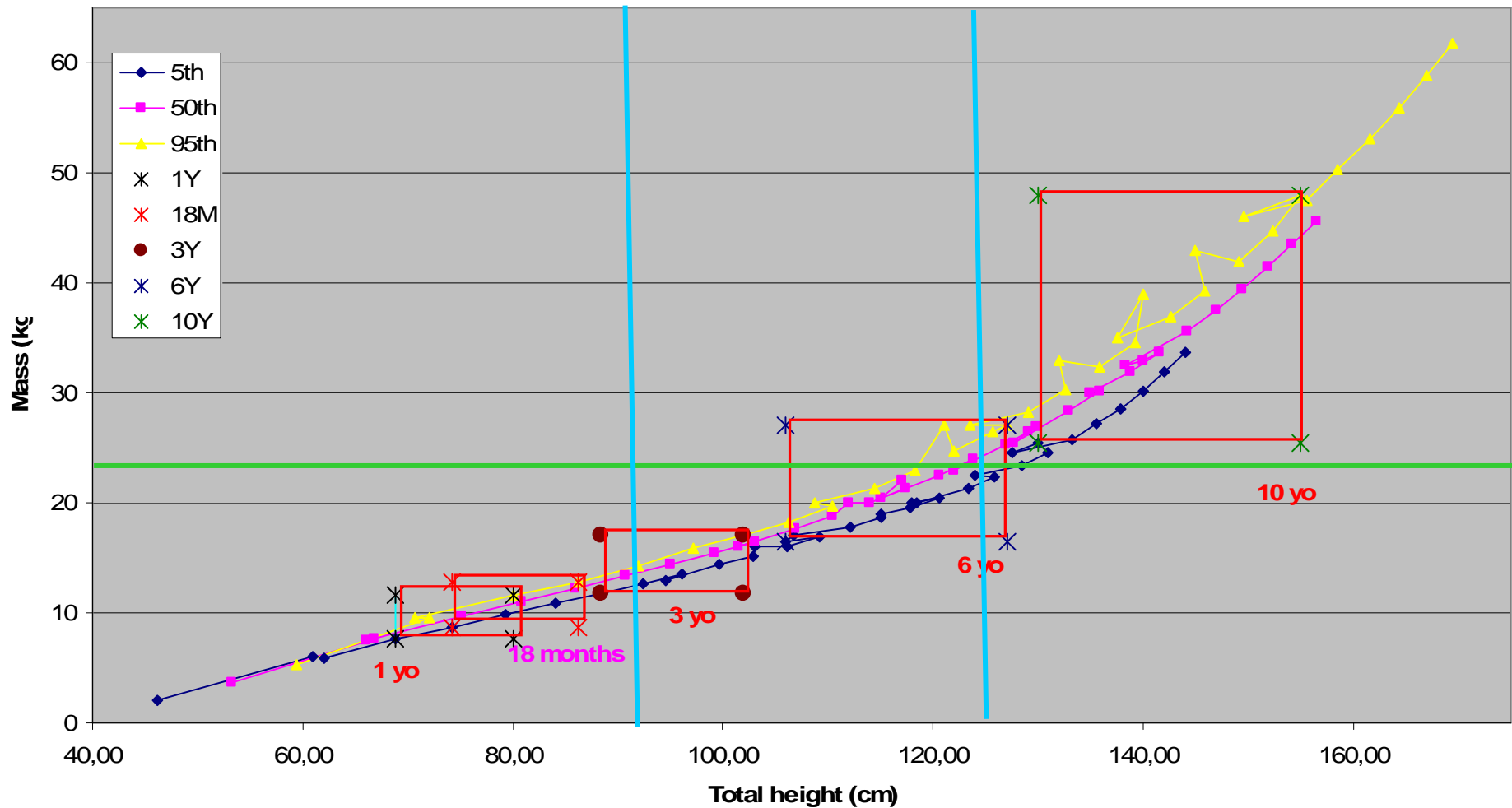


Siège d'enfant/de bébé utilisé face à l'avant



# Classification on standing height

Total height as a function of body mass





- ⚡ Maximum weight of acceptable children  
= [32] kg – CRS weight. *(info to consumer)*
- ⚡ Maximum stature of acceptable children  
= declared by EM and controlled by TAA.  
*(info to consumer)*
- ⚡ Minimum age of acceptable children  
[12/15/18 months ] for FF. *(Mandatory marking)*

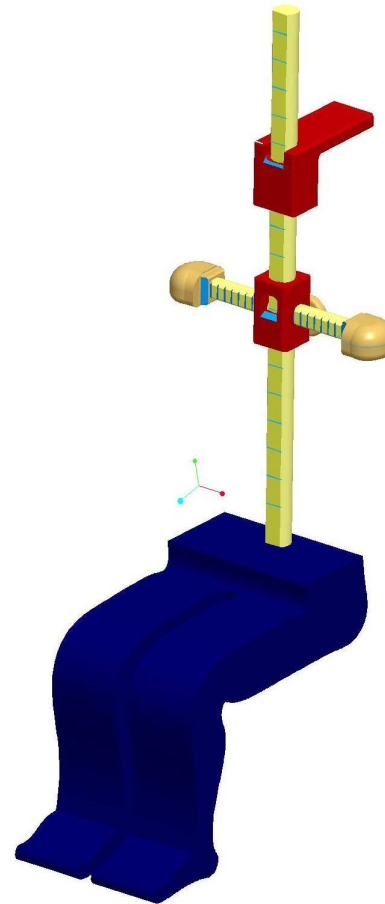
- ⚡ This FF CRS is suitable for a child **older than [18th]** with a mass **not exceeding [22]kg** and a stature comprised **between 75 and 125 cms**
- ⚡ This RF CRS is suitable for a child with a mass **not exceeding [18]kg** and a stature comprised **between 40 cms and 95 cms**

- ⚡ Age limit 
- ⚡ Weight limit 
- ⚡ Size limits 

# Use of measurement device



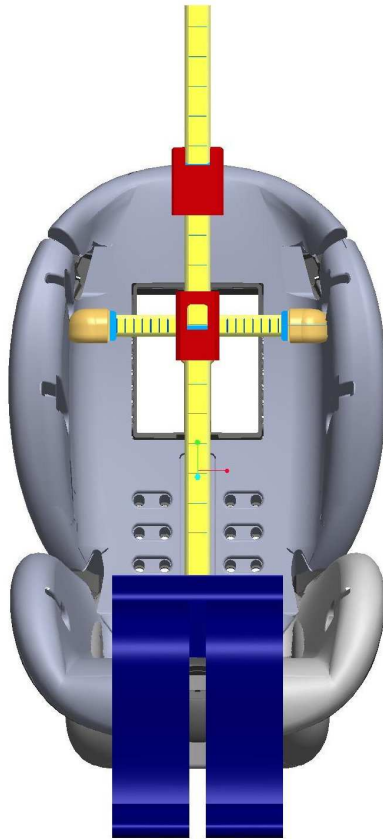
- ⦿ The blue part – lower body segment from P3
- ⦿ The yellow part – rod including scale
- ⦿ The red part – reading of measurement



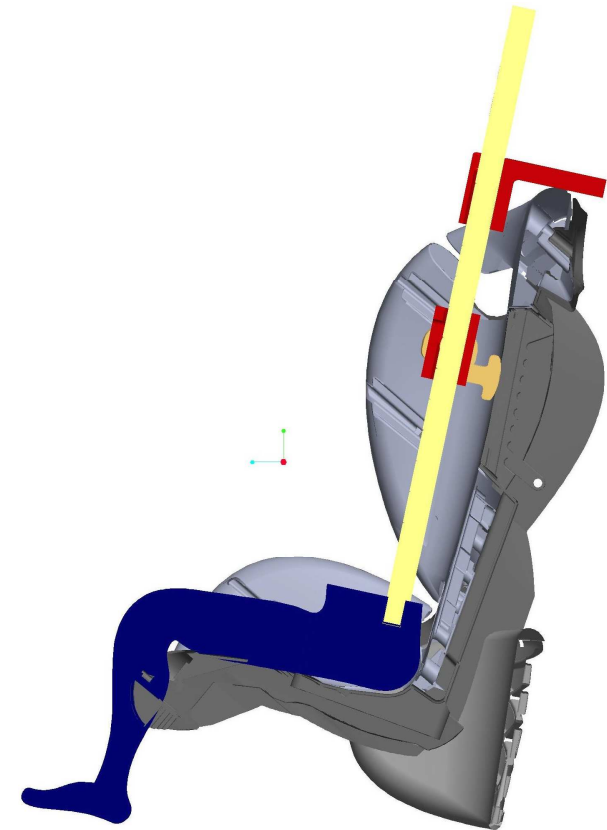
# The measurement device inside a CRS

Based on the range of size declared by the CRS manufacturer

Front



Section



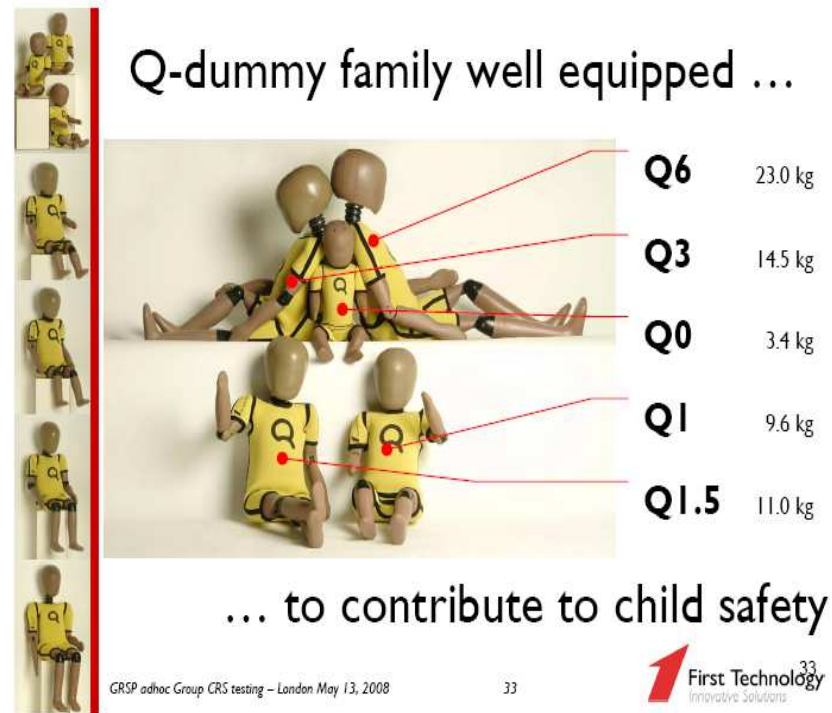
For dynamic behaviour in:

⚡ Frontal impact

⚡ Rear impact

⚡ Lateral impact

Q-dummy family well equipped ...




Q6	23.0 kg
Q3	14.5 kg
Q0	3.4 kg
Q1	9.6 kg
Q1.5	11.0 kg

... to contribute to child safety

GRSP adhoc Group CRS testing – London May 13, 2008

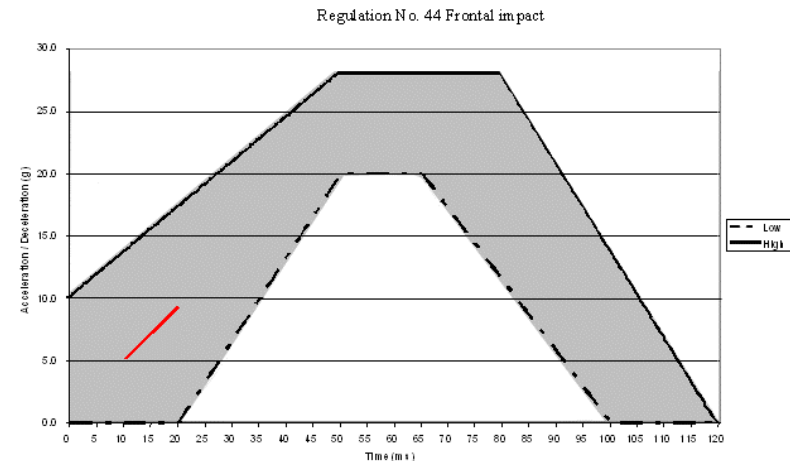
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 First Technology<sup>33</sup>  
Innovative Solutions

# Frontal Impact configuration



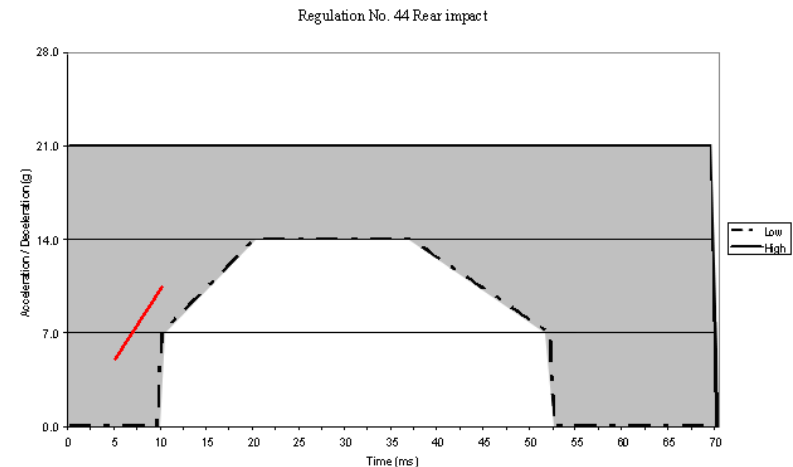
- ☉ Same as ECE R44 for input pulse.
- ☉ New criteria and requirements for dummies readings
- ☉ Same as ECE R44 for head displacement requirement



## Injury assessment criteria per dummy

Criterion	Abbreviation
Head Impact Criterion (only in case of hard contact during in-vehicle testing)	HIC
Head Acceleration 3ms	A head 3ms
[ Upper Neck Tension Force	Fz
[ Upper Neck Flexion Moment	My
Thorax Chest Deflection	D chest
Chest Acceleration 3 ms	A chest 3ms

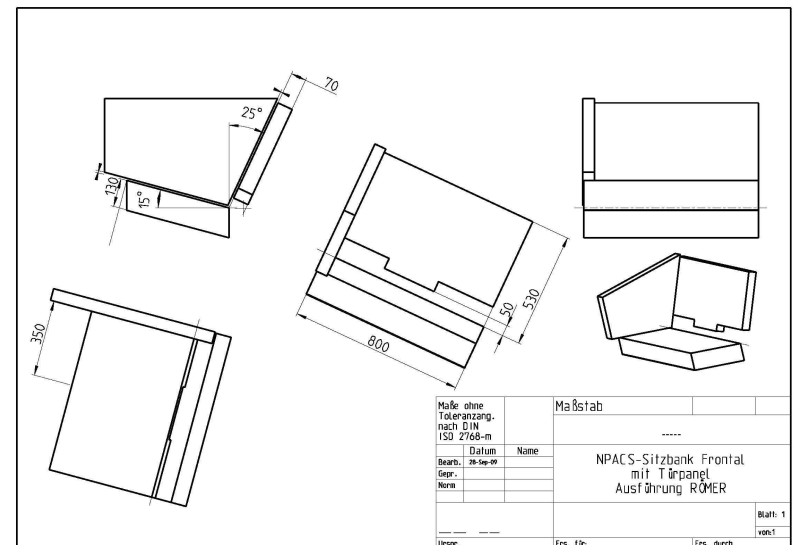
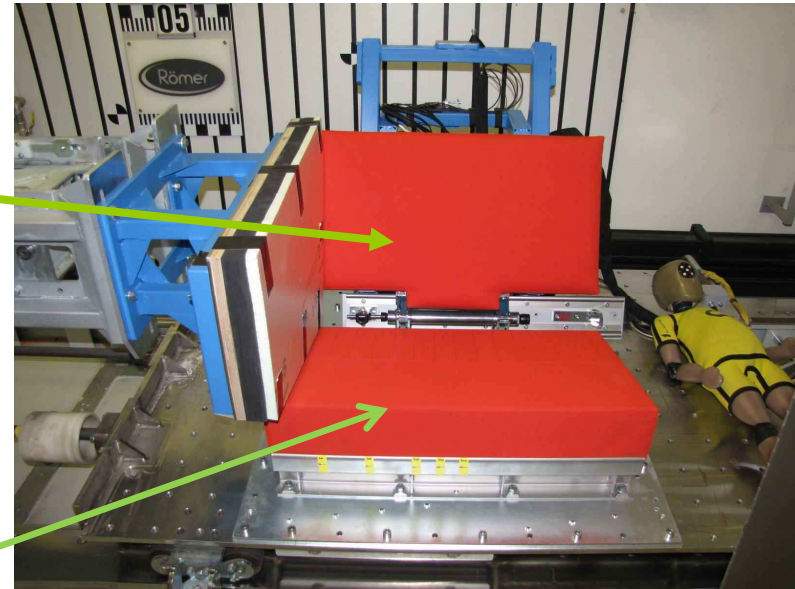
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- ⚡ Test bench according NPACS proposal
- ⚡ Backrest cushion NPACS proposal with a 50 mm cut
- ⚡ Seat cushion NPACS proposal but without gaps
- ⚡ 90° rotation of the test bench for lateral impact

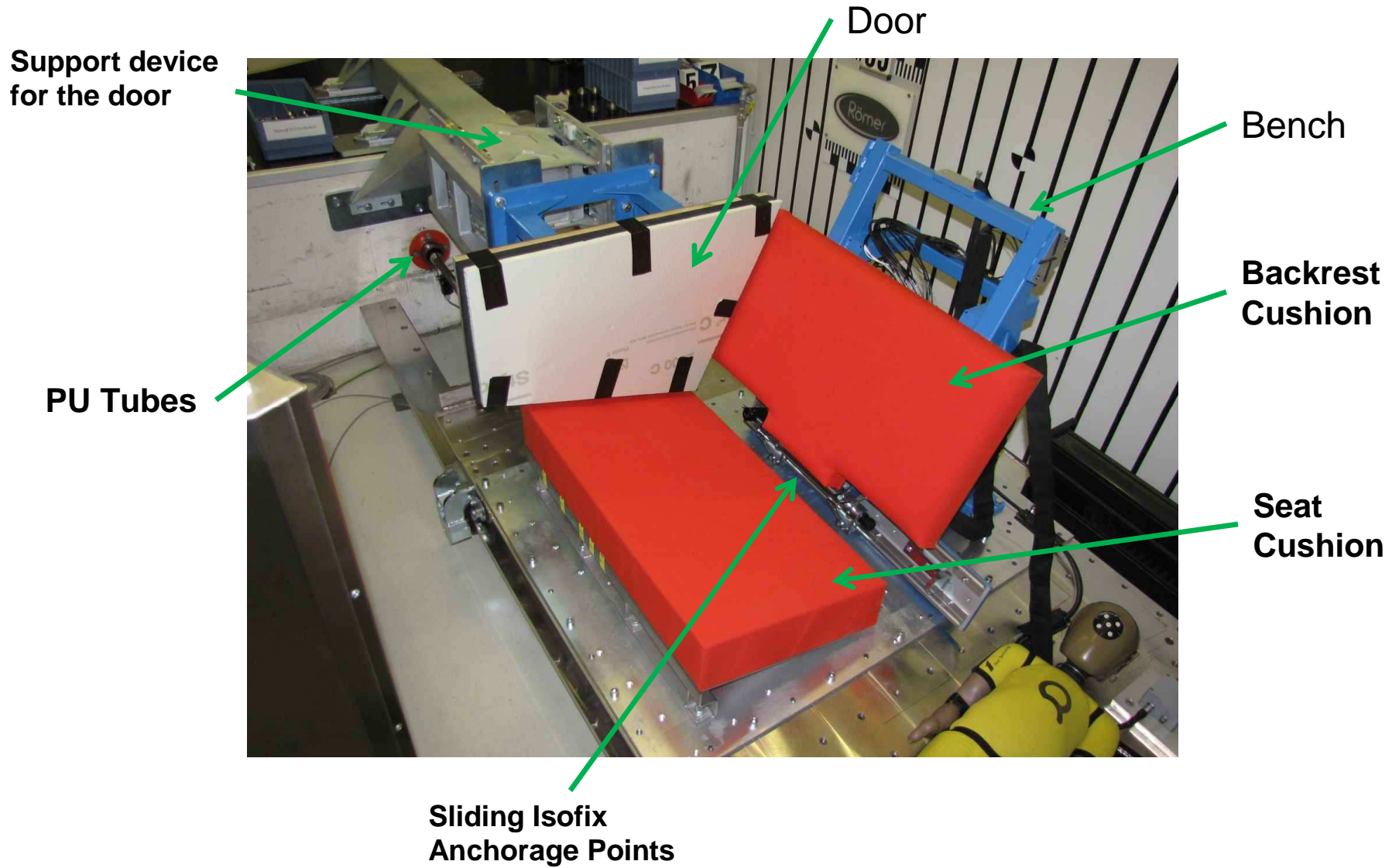




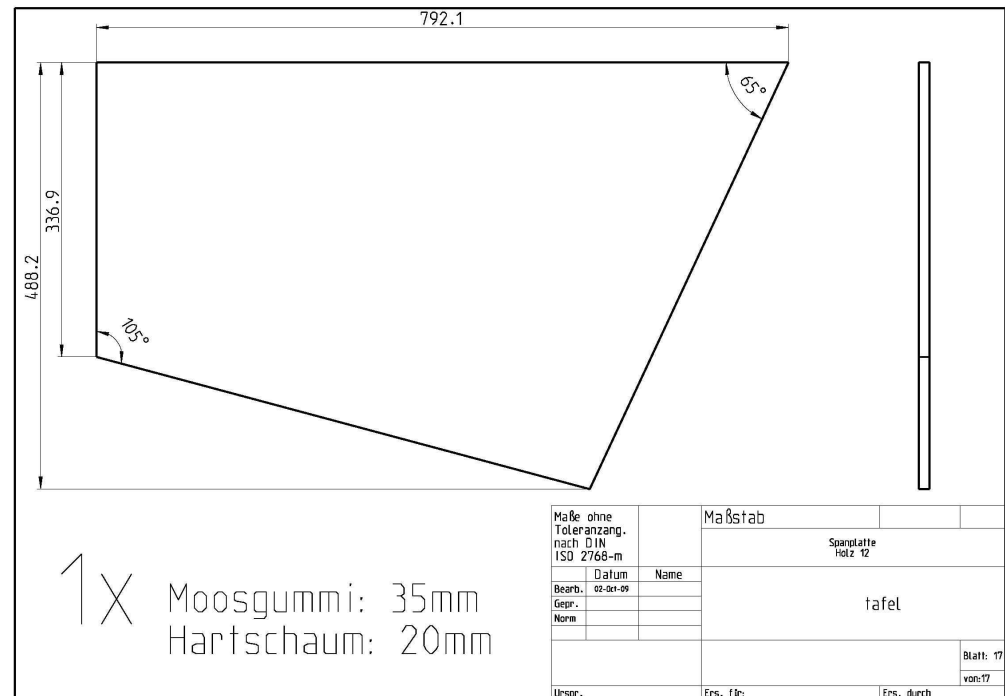
# Lateral Impact configuration

This impactor is fixed on the reaction mass, and the R44 bench is on the sled

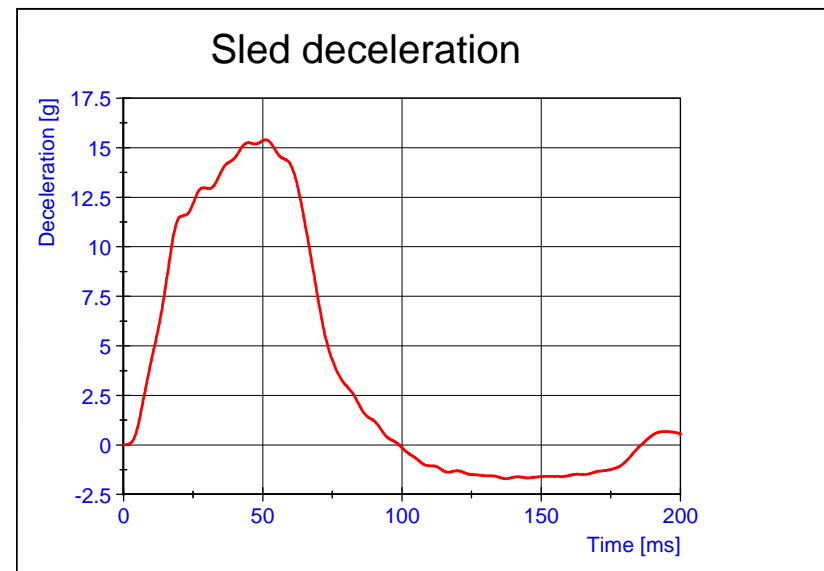
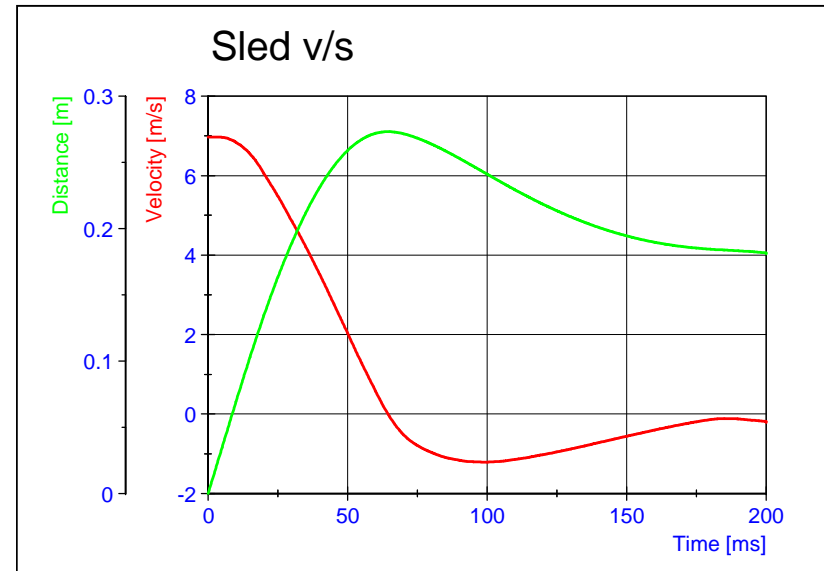




- ⚡ NPACS Door dimension
- ⚡ 35 mm rubber foam  
Polychloropren CR4271
- ⚡ 20 mm Styrodur C2500



	ISO/PDPAS N623E	
Intrusion velocity	7-10 m/s	
Intrusion depth	200-300 mm	
Sled deceleration	10-14 g	
Intrusion surface height	500 mm	



# Forward Facing with TT - Dummy Q3



- How to qualify “universal” CRS with support leg
  - ISO group on floor /support leg interface
  - ECE R14 & R16 modification ?
  - Support leg definition
- How to encourage use of RF CRS for older children
  - Age limit [18, 15 or 12 month]
  - Available space in car

- ⚡ Next meetings
  - 19th January 2010 (Paris)
  - February before Dead Line for GRSP ?
  
- ⚡ Upgrade informal document GRSP 46-28 until February dead line for GRSP May session formal document.
  
- ⚡ Propose to GRSP in May a proposal to start implementation of Phase 1 and new ToR to continue with Phase 2