

Informal document No. GRSP-45-29/Rev.1  
(45th GRSP, 25-29 May 2009  
agenda item 15(a))

# 45th GRSP Session

## Status report of Informal Group on CRS

Pierre CASTAING  
Chairman

# Terms of Reference - Approved ToR

- 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 No. 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, 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.

# Meetings

1. 30<sup>th</sup> January 2008 – OICA – PARIS
2. 1<sup>st</sup> April 2008 – CLEPA – BRUSSELS
3. 13<sup>th</sup> May 2008 – SMMT – LONDON
4. 18<sup>th</sup> June 2008 – CCFA – PARIS
5. 2<sup>nd</sup> September 2008 – BMVIT – VIENNA
6. 7<sup>th</sup> October 2008 – ACEA – BRUSSELS
7. 25<sup>th</sup> November – BNA – PARIS
8. 21<sup>st</sup> January – BAST – KOLN
9. 11<sup>th</sup> March 2009 – OICA – PARIS
10. 22<sup>nd</sup> April 2009 – Test Achat – BRUXELLES

# List of issues & Priorities

- Test bench – **Priority 1**
- Classification of CRS – **Priority 1**
- Dummies – **Priority 1**
- Dynamic tests – **Priority 1**
- Components tests – **Priority 2**
- Labelling – **Priority 2**
- Ease of Use / Misuse – **Priority 2**
- Control Of Production – **Priority 2**
- Interoperability with vehicle – **Priority 1**
- Child comfort and health harmlessness – **Priority 2**
- Other

## Present status

Develop definitions, performance criteria  
and test methods for ISOFIX Integral  
“Universal” CRS

- Test bench
- Classification
- Dummies
- Dynamic tests
- Interoperability with vehicle

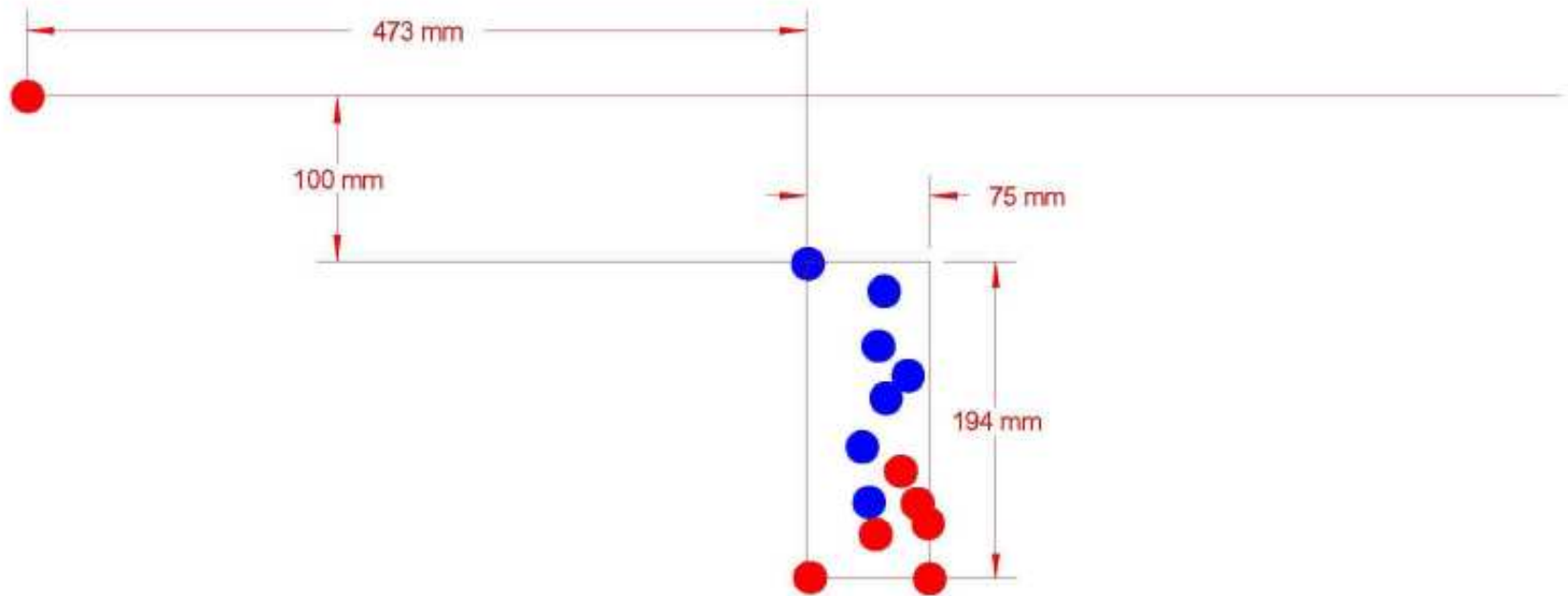
# Test bench

- The test bench will be based on NPACS bench with Isofix and belt anchorages having same the centreline
- There is no need for a dashboard
- Seat cushion technical characteristics to be defined based on NPACS bench
- Test bench orientation:
  - 0°
  - 90°
  - 180°

# Test bench – Open questions

- Head Restraint on the bench?
  - Not defined up to now for phase 1
- Relative positions of adult seat belt anchorages versus Isofix anchorages positions.  
*(Interoperability with vehicles)*
  - To be validated in phase 2 for non integral ISOFIX CRS
- Isofix anchorages - location of 3rd alternative point? *(Interoperability with vehicles)*
  - Not defined up to now for phase 1
  - No solution short term (EEVC WG18 and Swedish research in progress) link with ECE R14

# Heel kick and floor



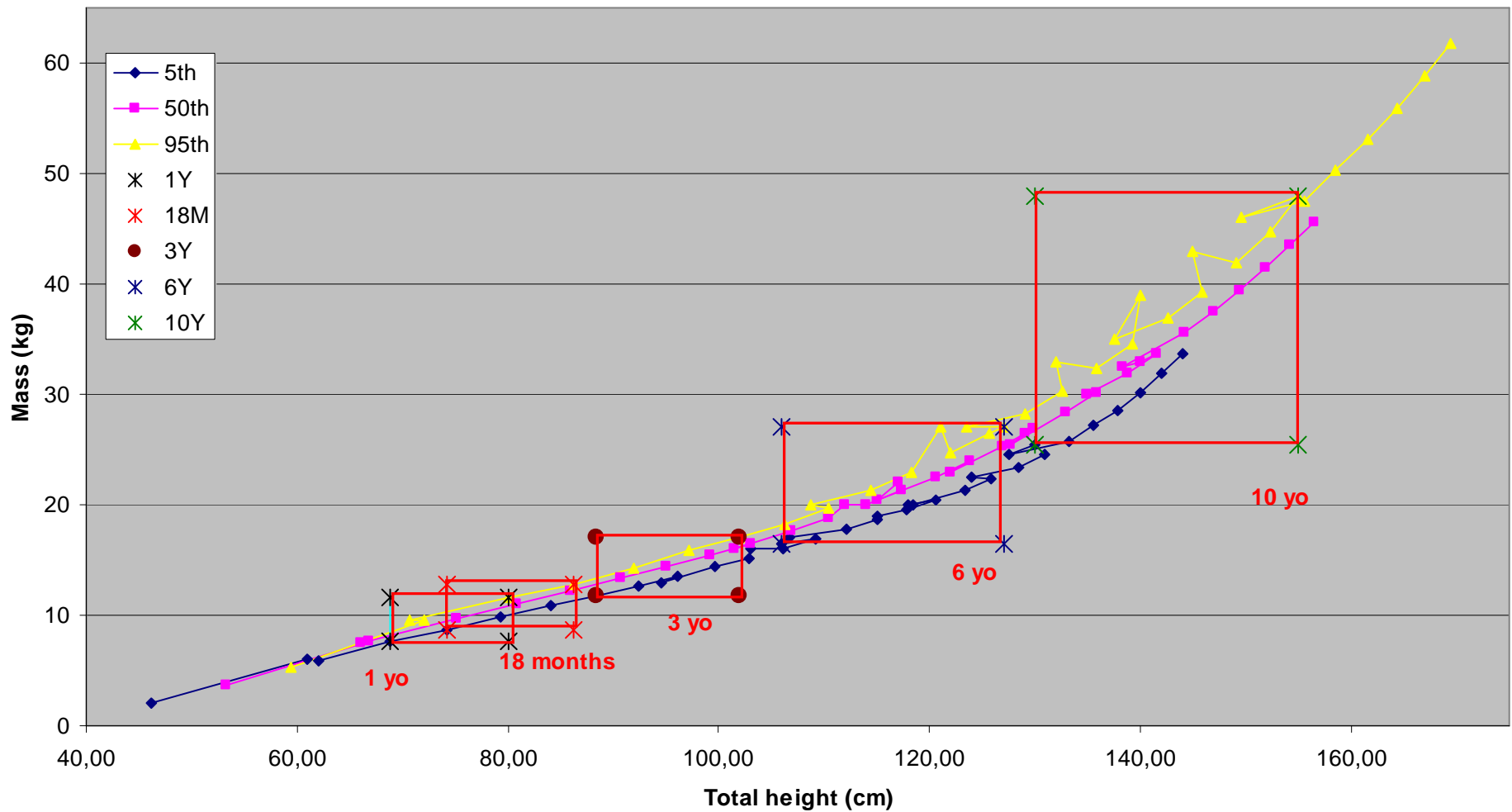


# Classification

- Based on stature and maximum weight
- Not based on availability of dummies
- For Isofix Integral “Universal” CRS limited by *(Interoperability with vehicles)*:
  - Maximum dynamic load sustainable by vehicles anchorages
  - Maximum space offered by Isofix fixtures

# Classification

Total height as a function of body mass



# Draft matrix of classification

Size in Cm	Isofix Integral Universal	Orientation	Maximum Weight Child + CRS	Side protection
40-80	Yes	RF		Yes
75-90	Yes	RF		Yes
85-105(8)	Yes	RF or FF	22 + 10?	Yes
100-130	Tbd	Tbd		Yes
130-150	Tbd	Tbd		Tbd

# Classification

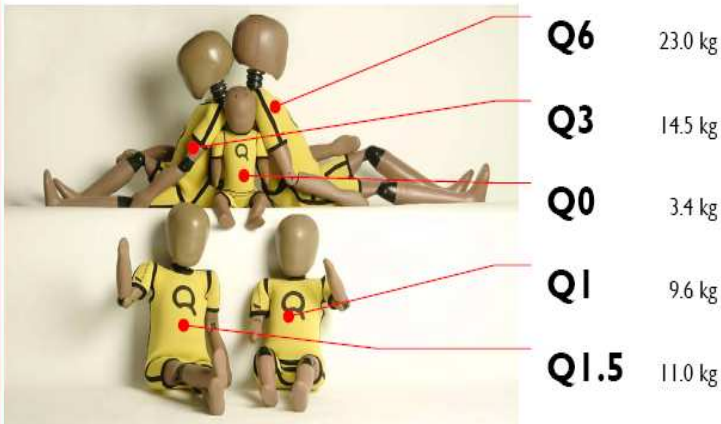
- Rearward Facing CRS with support leg to be included in “universal”
- Needs standard interface between vehicle floor and support leg contact surface
- Interfacing vehicle floor & support leg
  - ISO/TC22/SC12 works on this issue (proposal in July)

# Dummies

- Q series not Qs for dynamic tests
- Use of geometric dummies for size classification



Q-dummy family well equipped ...



<b>Q6</b>	23.0 kg
<b>Q3</b>	14.5 kg
<b>Q0</b>	3.4 kg
<b>Q1</b>	9.6 kg
<b>Q1.5</b>	11.0 kg

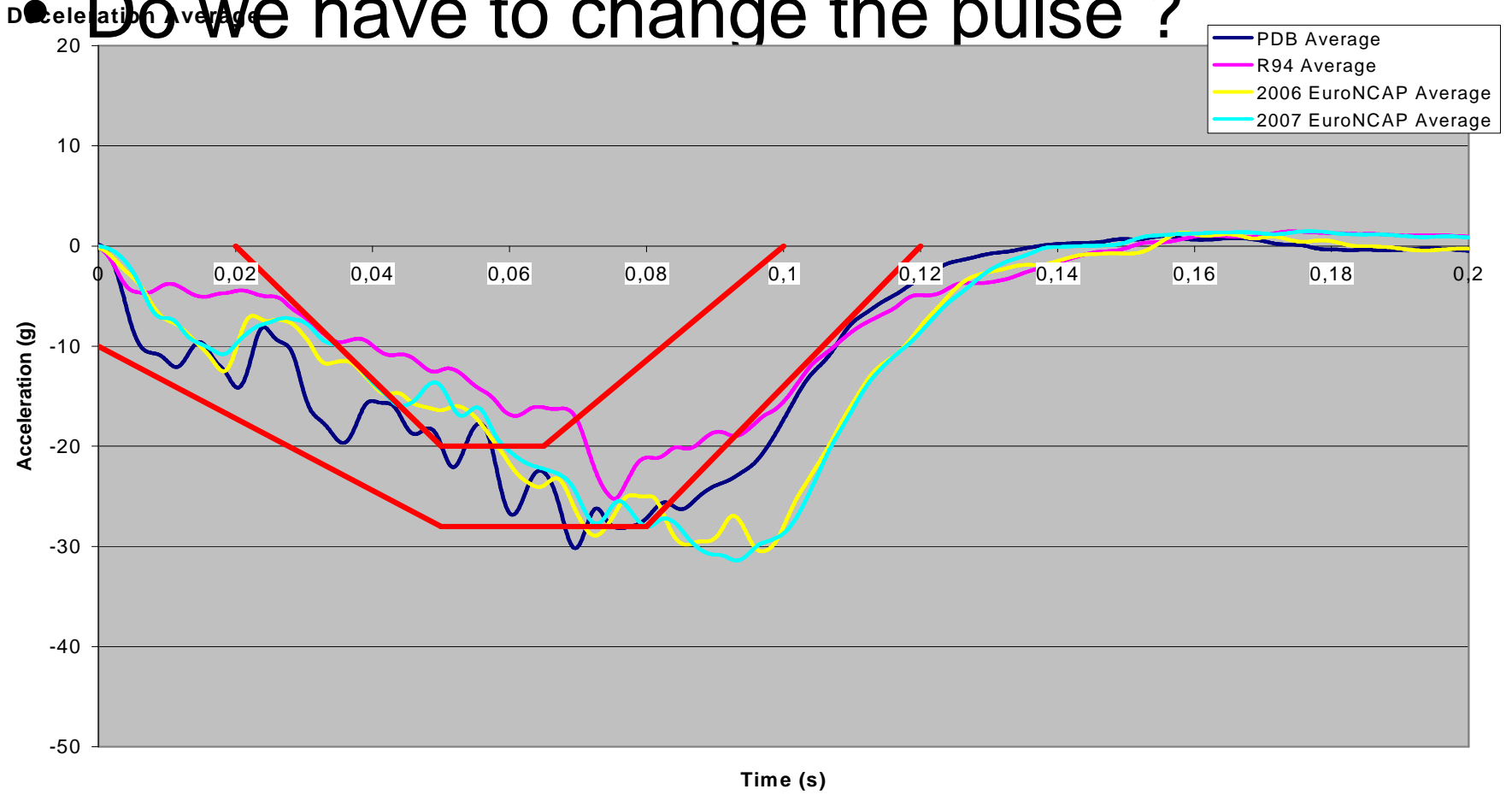
... to contribute to child safety

# Dynamic tests

- Frontal impact
  - Do we have to change the pulse ?
    - Final decision to be done on pulse
- Lateral impact
  - Simple approach in a first step.
    - Decision taken
- Rear impact
  - Keep as it is
    - Decision taken

# Frontal impact

Do we have to change the pulse ?



# Lateral impact

- Informal Group has review all existing methods to determine the one to be retained

Australian Standard AS/NZ 1754 & 3629.1 - 2004

ISO - 2008



Fixed Door; P3 Dummy

$\Delta V$  32 km/h ; Pulse 14 – 20 G



Moving Door; Q3 Dummy

$\Delta V$  24-26 km/h ; , Door angular velocity corridors for RF and FF seats



## NHTSA Research

### Takata linear side impact test device



Moving sled into fixed impactor; Hybrid III 3y & Qs3  
 $\Delta V$  32 km/h ; Door Velocity 25 km/h.

### ADAC Procedure within EU Consumer tests



Opel Astra Body 80°; Fixed Door; Q0 – Q6 and P10  
 $\Delta V$  28 km/h ; Pulse 18 G

### BRITAX – ADAC



Fixed Door 80°; Q3 Dummy  
 $\Delta V$  29 km/h ; Pulse 15 G

# Lateral impact

- Informal Group has consider first methods delivering required energy level and:
  - Promoting energy absorption in the seat
  - Including measurable performance criteria
- Supported by ISO/TC22/SC12 (Alternative1)
  - To provide essential input parameters only of a CRS side impact test method

# Lateral impact configuration

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



# Input parameters

- 90° rotation of the test bench on ECE R44 sled
- Fixed door panel on the stopping block
- Moving Isofix anchorages
- ECE R44 rear impact pulse
- Management of intrusion distance

# Interoperability with vehicle

- Load level in Isofix anchorages
  - Definition of a maximum permissible load level on current ECE R14 Isofix anchorages
    - Maximum weight / g level
- A proposal to reach more flexibility in the application of ISOFIX child restraint could be (*Classification*):
  - A definition of a total weight for the couple [Child + CRS]
  - A permissible weight of the child is then depending on child restraint system weight.

# Decisions

- Scope: Isofix “universal” integral CRS
- Classification based on standing height and maximum permissible weight (Child + CRS)
- Q series dummies + special dummies for sizing
- NPACS test bench with common centreline
- Simple front, side and rear impact test methodology
- CRS with support leg qualified as “universal” if interface between floor and support leg defined by ISO
- No double “type approval” on the same product (*under this new regulation and under ECE R44*)

# Draft Regulation

01 April 09

AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS  
FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED  
AND/OR BE USED ON WHEELED VEHICLES AND THE CONDITIONS FOR RECIPROCAL RECOGNITION OF APPROVALS GRANTED ON  
THE BASIS OF THESE PRESCRIPTIONS./

Regulation No. XXX

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF CHILD RESTRAINT SYSTEM USED ONBOARD OF MOTOR VEHICLES.

UNITED NATIONS

## **SCOPE**

This Regulation applies to **ISOFIX Universal Integral** child restraint systems for child occupants of power driven vehicles.