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

- 5th
- 50th
- 95th
- 1Y
- 18M
- 3Y
- 6Y
- 10Y

Mass (kg)

Total height (cm)

- 1 yo
- 18 months
- 3 yo
- 6 yo
- 10 yo
<table>
<thead>
<tr>
<th>Size in Cm</th>
<th>Isofix Integral Universal</th>
<th>Orientation</th>
<th>Maximum Weight Child + CRS</th>
<th>Side protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-80</td>
<td>Yes</td>
<td>RF</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>75-90</td>
<td>Yes</td>
<td>RF</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>85-105(8)</td>
<td>Yes</td>
<td>RF or FF</td>
<td>22 + 10?</td>
<td>Yes</td>
</tr>
<tr>
<td>100-130</td>
<td>Tbd</td>
<td>Tbd</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>130-150</td>
<td>Tbd</td>
<td>Tbd</td>
<td></td>
<td>Tbd</td>
</tr>
</tbody>
</table>
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 ...

<table>
<thead>
<tr>
<th>Q</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>Q0</td>
<td>3.4 kg</td>
</tr>
<tr>
<td>Q1</td>
<td>9.6 kg</td>
</tr>
<tr>
<td>Q1.5</td>
<td>11.0 kg</td>
</tr>
<tr>
<td>Q3</td>
<td>14.5 kg</td>
</tr>
<tr>
<td>Q6</td>
<td>23.0 kg</td>
</tr>
</tbody>
</table>

... 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**

- **Fixed Door; P3 Dummy**
  - $\Delta V$ 32 km/h ; Pulse 14 – 20 G

**ISO - 2008**

- **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
ΔV 32 km/h ; Door Velocity 25 km/h.

ADAC Procedure within EU Consumer tests

BRITAX – ADAC

Fixed Door 80°; Q3 Dummy
ΔV 29 km/h ; Pulse 15 G

Opel Astra Body 80°; Fixed Door; Q0 – Q6 and P10
ΔV 28 km/h ; Pulse 18 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)*
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.