Current Booster Fixture – N1083
Findings from BASt Workshop

1 - C-Pillar interaction with top of CRF
   - Mitsubishi Space star (ISOFIX only)
   - Opel Adam (ISOFIX only)
   - Audi A1

Areas of interaction identified during workshop

2 - Door interaction with side wing of CRF
   - Opel Zafira

3 – Vehicle seat interaction with rear of CRF
   - Audi A1
   - Porsche Panamera
Areas of Interaction

1 - C-Pillar-roof interaction
Is this critical?

2 - Door-side wing interaction
Is this critical?

3 – Seat-rear interaction
May prevent ISOFIX latching
Additional Changes Requested by OICA

Additional areas requested by OICA

Evidence yet to be provided

Areas of interaction identified during workshop

C-Pillar-roof interaction - 3 examples

Door-side-wing interaction - 1 example

Seat-rear interaction – 2 examples

Additional area requested by OICA to allow buckling

2 Examples of difficulties
Investigation of Interactions

1. Verify Fixture in selection of problematic vehicles
   - C-pillar-roof interaction
   - Door-side wing interaction
   - Seat-rear interaction
   - Buckle difficulties

2. Quantify/measure contact – mm/cm
List of Interactions

10 **worst-case** vehicles selected by OICA (assessed during BASt workshop)  
3 vehicles no interaction issues found

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Attachment</th>
<th>Position</th>
<th>Issue</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audi A1</td>
<td>ISO Belt</td>
<td>Outer</td>
<td>No Latch C-Pillar</td>
<td></td>
</tr>
<tr>
<td>Ford Fiesta</td>
<td>Belt</td>
<td>Middle</td>
<td>Buckling</td>
<td></td>
</tr>
<tr>
<td>Mitsubishi Space Star</td>
<td>ISO</td>
<td>Outer</td>
<td>C-Pillar</td>
<td>1 of 2 Fixtures</td>
</tr>
<tr>
<td>Suzuki SX4</td>
<td>Belt</td>
<td>Middle</td>
<td>Buckling</td>
<td>Waiting on vehicle availability (rare car)</td>
</tr>
<tr>
<td>Vauxhall Adam</td>
<td>ISO</td>
<td>Outer</td>
<td>C-Pillar</td>
<td>1 of 2 Fixtures</td>
</tr>
<tr>
<td>Vauxhall Zafira</td>
<td>Belt/ISO</td>
<td>Outer</td>
<td>Door</td>
<td></td>
</tr>
<tr>
<td>Porsche Panamera</td>
<td>ISO</td>
<td>Front</td>
<td>No Latch</td>
<td>Waiting on vehicle availability (rare car)</td>
</tr>
</tbody>
</table>
## Investigation of Interactions

<table>
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<tbody>
<tr>
<td>Audi A1</td>
<td>Belt</td>
<td>Outer</td>
<td>C-Pillar</td>
<td>Significance – Minor&lt;br&gt;No angle change (1.5°)&lt;br&gt;Amount to remove ≈ 5mm</td>
</tr>
</tbody>
</table>

### Areas requiring modification

- ![Front view](image1)
- ![Rear view](image2)

2 interactions with C-pillar / roof

![Diagram with areas A and B](image3)
### Investigation of Interactions

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<tr>
<td>Ford Fiesta</td>
<td>Belt</td>
<td>Middle</td>
<td>Buckling</td>
<td>Significance – Critical for centre seat only</td>
</tr>
</tbody>
</table>

- Fixture does not fit in rear centre position
- Not possible to buckle
- Width between buckles less than 280mm (ISOFIX centre width)
- Therefore impossible to fit if fixture has ISOFIX connectors
## Investigation of Interactions

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| Mitsubishi Space Star / Mirage | ISO       | Outer    | C-Pillar | Significance – Minor No angle change (1°) Amount to remove ≈ 5mm

*Contact with C-Pillar (ISOFIX only)*

- Straighten edge would remove contact

*Area requiring modification*
Investigation of Interactions

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<tr>
<td>Vauxhall Adam</td>
<td>ISO</td>
<td>Outer</td>
<td>C-Pillar</td>
<td>No interaction Action – None</td>
</tr>
</tbody>
</table>

- No interaction found
- Gap between C-Pillar and fixture using ISOFIX
- Conclusion: Fixture fits
### Investigation of Interactions

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<tr>
<td>Vauxhall Zafira Tourer</td>
<td>Belt/ISO</td>
<td>Outer</td>
<td>Door</td>
<td>Significance – Minor No angle change (1°)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Amount to remove ≈ 5mm</td>
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</tbody>
</table>

Very small contact with door

Remove material ≈ 5mm

Area requiring modification
Summary of Interaction Investigation

5 vehicles assessed further
- 1 vehicle: the fixture fitted with no interactions – no action required
- 1 vehicle: the fixture did not fit in middle position – position not suitable
- 3 vehicles: had minor interaction – modifications proposed

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<td>Propose modification</td>
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<tr>
<td>Ford Fiesta</td>
<td>Belt</td>
<td>Middle</td>
<td>Buckling</td>
<td>Position not suitable</td>
</tr>
<tr>
<td>Mitsubishi Space Star</td>
<td>ISO</td>
<td>Outer</td>
<td>C-Pillar</td>
<td>Propose modification</td>
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<td>Vauxhall Adam</td>
<td>ISO</td>
<td>Outer C-Pillar</td>
<td>C-Pillar</td>
<td>Fixture fits</td>
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<td>Vauxhall Zafira</td>
<td>Belt/ISO</td>
<td>Outer</td>
<td>Door</td>
<td>Propose modification</td>
</tr>
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</table>
Summary of Modification Areas

Proposed modification areas

- A1 C-Pillar interaction
- Space Star C-Pillar interaction
- Zafira door interaction
1st Draft Proposition for CAD modifications

Proposed modification areas
1st Draft Proposition for CAD modifications

A1 C-Pillar/roof interaction

Existing intersect

Overhead view

80mm
1st Draft Proposition for CAD modifications

A1 C-Pillar/roof interaction

Existing intersect
1\textsuperscript{st} Draft Proposition for CAD modifications

Space Star C-Pillar interaction

Front view

Rear view
11° was chosen because when fixture is in 110° position this line is parallel to the seat.
1st Draft Proposition for Modified Booster Fixture

Note 2: MAX. ISOFIX ENVELOPE DESIGN DEFINED IN REGULATION 129, PARAGRAPH 6.3.3.2. FIGURE 0(b).
CRF - NEXT STEPS

• Confirm proposed changes to CRF with in-car installation trials
• Finalise discussion with OICA and agree on final modifications of the CRF
• Final CRF definition to be submitted to ISO SC12 WG1 for confirmation