Side Impact Child Program

Objective: To Develop a test procedure that simulates side impact crashes for the evaluation of all child restraint types

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Crash Simulation

1. Intrusion
2. Energy transfer
3. Load path
Occupant Protection
### Q3s RESPONSES

<table>
<thead>
<tr>
<th></th>
<th>Head</th>
<th>Chest</th>
<th>Pelvis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IIHS</strong></td>
<td>79.1</td>
<td>61.1</td>
<td>-126.4</td>
</tr>
<tr>
<td><strong>SUV</strong></td>
<td>61.5</td>
<td>130.8</td>
<td>-150</td>
</tr>
</tbody>
</table>
Kinematics as a Function of Impactor

RIGID WALL

Relative velocity between pelvis & spine  -1.5 m/s
Kinematics as a Function of Impactor

CHAMFERED WALL

Relative velocity between pelvis & spine  +2.9 m/s
**Kinematics as a Function of Impactor**

**SMALL CAR**

<table>
<thead>
<tr>
<th>time [m/s]</th>
<th>Velocities [m/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>-14</td>
<td>-12</td>
</tr>
<tr>
<td>-10</td>
<td>-8</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Relative velocity between pelvis & spine  +2.8 m/s
PELVIS
Crash Simulation Method

1. Reproducible on different sleds;
2. Interface between the child seat and door;
3. Energy transfer
4. Load path
5. Validate to car-to-car results