CRS Test Results under UN R80 Frontal Impact Test

JASIC
Background

- No CRS test data under UN R80 dynamic test conditions.
- Two UN R80 dynamic tests were conducted with seatbelt fixed CRSs under below conditions.
  1) 2-point seat belts seat
  2) 3-point seat belts seat
- Dummy: Hybrid III 3YO
Test Condition

UN R80 test condition

Tested CRS

3pt Seatbelt Seat belt fixed CRS,
Usable both FF and RF

UN R44-approved
The tests were conducted in two ways, one with the CRS fixed with the 3-point seat belt and the other with the 2-point seat belt. Belt route: not the correct route! (Because CRS was fixed by only 3pt seat belt type)
Test Video

3-point seat belt

2-point seat belt

- CRS fixed with 3-point seat belt: the dummy’s head did not contact the back of the front seat.
- CRS fixed with 2-point seat belt: the CRS rotated and moved forward more than CRS fixed with 3-point seat belt, and the dummy’s head contacted the back of the front seat.
Test Condition

3-point seat belt

- CRS fixed with 3-point seat belt: the dummy’s head did not contact the back of the front seat.

2-point seat belt

- CRS fixed with 2-point seat belt: the CRS rotated and moved forward more than CRS fixed with 3-point seat belt, and the dummy’s head contacted the back of the front seat.
• CRS fixed with 3-point seat belt: the dummy’s head did not contact the back of the front seat.
• CRS fixed with 2-point seat belt: the CRS rotated and moved forward more than CRS fixed with 3-point seat belt, and the dummy’s head contacted the back of the front seat.
3-point seat belt

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Test Condition

3-point seat belt

- CRS fixed with 3-point seat belt: the dummy’s head did not contact the back of the front seat.

2-point seat belt

- CRS fixed with 2-point seat belt: the CRS rotated and moved forward more than CRS fixed with 3-point seat belt, and the dummy’s head contacted the back of the front seat.
Post-Test Status

3-point seat belt

No contact with the head

2-point seat belt

Contact with the head
<table>
<thead>
<tr>
<th></th>
<th>3pt seatbelt</th>
<th>2pt seatbelt</th>
<th>NHTSA IARV</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIC15</td>
<td>89</td>
<td>185</td>
<td>570</td>
</tr>
<tr>
<td>Head max. Acc.(3ms) (G)</td>
<td>33</td>
<td>46</td>
<td>–</td>
</tr>
<tr>
<td>Chest max. Acc.(3ms) (G)</td>
<td>24</td>
<td>20</td>
<td>55</td>
</tr>
<tr>
<td>Chest Def. (mm)</td>
<td>4</td>
<td>4</td>
<td>34</td>
</tr>
</tbody>
</table>

✓ For both the head and the chest, the injury measures were small enough.
Conclusion

- CRS fixed with a 3-point seat belt: CRS’s forward moving distance was small and the dummy’s head did not contact the back of the front seat.

- CRS fixed with 2-point seat belt: CRS rotated and moved forward more than CRS fixed with 3-point seat belt, and the dummy’s head contacted the back of the front seat. However, the HIC15 was enough low. The forward moving distance of the CRS’s cushion part was small due to the lap belt restraint.