Child Restraint Systems in Frontal Barrier Test

2001 SAE Government and Industry Meeting

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Outline

- Background
- Description of frontal NCAP
- Test setup
- Video Presentation of CRS in NCAP
- Observations
Background

• In November 2000, under “Transportation Recall Enhancement, Accountability and documentation (TREAD)” ACT, Congress mandated that NHTSA to propose a CRS safety Rating by Nov 2001.

• A year later, the agency must establish a CRS safety rating.
What is NCAP?

• New Car Assessment Program (NCAP) has been assessed the performance of passenger cars in frontal impact test since 1979. NCAP began testing light trucks, vans, and sport utility vehicles in model year 1983. Since 1997, side NCAP has been initiated.

• In frontal test, a vehicle is crash tested at 35 mph onto flat barrier. Two belted mid-size dummies are placed in driver and right frontal passenger seats.

• Annually, the agency crash test about 45 vehicles in frontal barrier test to provide safety information for consumers.
Testing of CRS in NCAP

- 3YO H-III dummies in forward-facing child seat (five point harness with top tether) were used
- Various child seats were tested in 20 frontal barrier tests
  - Three CRS with LATCH: Safe Embrace II, Triad, Horizon V-LATCH (pre-production model)
  - Three CRS with Belt: STE, Horizon V, Roundabout,
- Installation of CRS in vehicle
<table>
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<tr>
<th>Vehicle Size</th>
<th>Model</th>
<th>Latch</th>
<th>Left Rear</th>
<th>Right Rear</th>
<th>Test Date</th>
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<tr>
<td>Light</td>
<td>Sentra</td>
<td>Yes</td>
<td>No CRS</td>
<td>Triad-LAT</td>
<td>12-Feb</td>
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<td></td>
<td>Sentra</td>
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<td>No CRS</td>
<td>Emb II-LAT</td>
<td>13-Mar</td>
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<td>Niss. ZC</td>
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Note:
- Frontal NCAP test
- NRD test with small stature dummies
- Triad-LAT Cosco Triad with LATCH configuration
- Emb II-LAT Safe Embrace II with LATCH configuration
- Triad-NOLAT Cosco Triad with no LATCH setup
- Emb II-NOLAT Safe Embrace II with no LATCH setup
- Freeway-LAT Britax Freeway with LATCH
- Freeway-NOLAT Britax Freeway with no LATCH
- Horizon V Even Flo Horizon V with no LATCH configuration
- STE Century STE with no LATCH
- No CRS No child seat
CRS in Nissan Sentra
CRS Setup in Gr. Caravan

PRE-TEST

PRE-CRASH SYSTEMS CORPORATION

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P.O. Box 10865
Santa Clarita, CA 91390-10865
Phone: 661-288-2886
Fax: 661-288-2888

www.pre-crash.com
Video Presentation
Dodge Stratus
35 mph Frontal Crash
Dodge Stratus

Cosco Triad (LATCH/tether) LRP
Cosco Triad (LATCH/tether) RRP
Ford Lincoln LS

Cosco Triad (No LATCH-tether) LRP
Cosco Triad (LATCH-tether) RRP
Ford Windstar
FP Safe Embrace II (No LATCH/tether) LRP
FP Safe Embrace II (LATCH/tether) RRP
Dodge Gr Caravan

Century STE (No LATCH-tether) LRP
Horizon V (LATCH-tether) RRP
GM Suburban
Roundabout (No LATCH-tether) RRP
Nissan Sentra
Cosco Triad (LATCH-tether)-RRP
Honda Accord

FP Safe Emb II (LATCH-tether)-RRP
Evenflo Horizon V (LATCH-tether)-LRP
Observations

- CRS result from vehicle testing depend on a design of vehicle (vehicle pulse, seat, belt geometry, etc)
- Result from left and right outboard rear outboard seats are nearly same
- In matched pair CRS comparisons, a CRS with LATCH-tether performed consistently better than the same CRS with belt-tether
- On average, for HIC and CH g criteria, CRS LATCH-tether performed better than the CRS belt-tether.
Near Term Tasks

- We will docket the CRS in NCAP report in June
- Dynamic sled testing is scheduled in June and early July
- Notice for comments on CRS safety rating will be out in Nov 2001