

# Child Restraint Systems in Frontal Barrier Test

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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

# Frontal Dummies in NCAP



mga  
mga research corporation  
**PRE-TEST**  
NCAP 35 MPH FRONTAL  
2001 NISSAN SENTRA  
M15206 01021201

# 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

# Test Matrix for CRS in NCAP

Test Matrix for Evaluating CRS Performance in Frontal NCAP

Vehicle Size	Model	Latch	Type of Child Seat		Test Date
			Left Rear	Right Rear	
Light	Sentra	Yes	No CRS	Triad-LAT	12-Feb
	Sentra	Yes	No CRS	Emb II-LAT	13-Mar
	Civic 4 dr	No	No CRS	Horizon V-NOLAT	12-Mar
Compact	Echo	Yes	No CRS	Triad-LAT	25-Jan
	Echo	Yes	No CRS	Freeway-LAT	15-Mar
	Elantra	Yes	No CRS	Emb II-LAT	06-Feb
Medium	Stratus 4dr	Yes	Triad-LAT	Triad-LAT	18-Jan
	Volvo S60	No	STE	Horizon V	02-Feb
	Maxima	Yes	Freeway-NOLAT	Freeway-LAT	19-Mar
	Accord	Yes	Freeway-LAT	Emb II-LAT	20-Mar
	Impala	No	STE	Horizon V	22-Mar
Heavy	Lincoln LS	Yes	Triad-NOLAT	Triad-LAT	22-Jan
SUV	Escape	Yes	Emb II-LAT	Emb II-LAT	16-Jan
	Escape	Yes	Triad-NOLAT	Triad-LAT	26-Mar
	Durango	No	STE	Horizon V	27-Mar
	Suburban	No	Emb II-NOLAT	Freeway-NOLAT	05-Feb
Minivan	Grand Caravan	Yes	STE	Horizon V	06-Mar
	Grand Caravan	Yes	Emb II-LAT	Freeway-LAT	29-Mar
	Windstar	Yes	Emb II-NOLAT	Emb II-LAT	05-Mar
	Windstar	Yes	Triad-NOLAT	Triad-LAT	02-Apr
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



# 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