

# Trends in NCAP's Side Airbag Out-of-Position Testing Program

Lauren A. Collins  
*Alpha Technology Associate, Inc.*



## Presentation Outline

- Background of TWG Procedures
- NCAP Testing Methodology
- NCAP Testing Trends
- 2007 & Future Testing Plans



## Background



## Side Airbags (SABs)

- Inflatable devices designed to protect an occupant's head and/or chest in a side impact collision
- Normally mounted in one of three locations:
  - Seat back
    - Torso or Combination Head/Torso Protection
  - Roof rail
    - Curtain or Tubular Head Protection
  - Door trim
    - Torso Protection



## SAB OOP Technical Working Group

- In 1999, NHTSA encouraged development of procedures to assess SAB injury risk
  - Rapid market introduction without regulation
    - From 20-30% of new vehicle sales in 2001 to 65-75% in 2007
  - Limited agency tests at that time had indicated some potential for door-mounted SABs to pose injury risk to out-of-position (OOP) children
- Technical working group (TWG) was a joint project between the Alliance, AIAM, AORC, & IIHS



## TWG SAB OOP Procedures

- Created positioning guidelines for child & small female dummies to assess injury risks
- NHTSA conducted research using the procedures
  - Concluded they were generally sufficient, but did not represent all worst case conditions
  - Deemed capable of finding aggressive and potentially dangerous SAB systems
- Manufacturers stated they would begin designing and testing new SABs according to the procedures



## Current NHTSA SAB OOP Work

- Ongoing R&D testing
  - ESV presentation slated for June 2007
- Efforts through Consumer Information
  - Information:
    - Manufacturers indicate annually to the agency which vehicles meet the procedures by providing data
    - Those that meet TWG requirements receive an “M” on [www.safercar.gov](http://www.safercar.gov) and in *Buying a Safer Car*
  - NCAP Testing:
    - Verify manufacturer submissions by limited “spot checking”



## NCAP Testing Methodology



## Test Methodology (2004 -Present)

- Previously crashed NCAP vehicles
  - Represent 80%+ of new and newly designed vehicle fleet for that model year
  - Started testing in 2004 with MY 2003 & 2004 vehicles
- Deploy airbags as in a crash
  - i.e., both curtain & torso if present
  - No re-installation
  - No duplicate tests in vehicle



## Current Test Selection Process

- From all NCAP vehicles in that MY,
  - Only vehicles with SABs qualify
    - These are usually vehicles with standard SABs
      - NCAP policy is to test with minimum level of safety equipment
  - Vehicle must also meet the following:
    - Received an "M"
    - Does not employ a suppression system to meet requirements
      - Or, it may be tested with a dummy size or TWG position that will not be affected by the system
    - Identical SAB has not been tested in previous year



## Dummy Selection

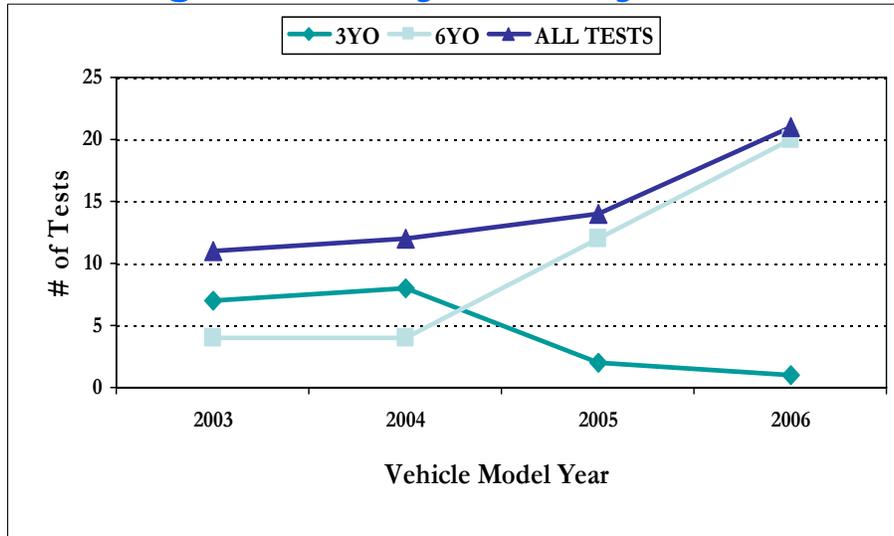
- Test with child dummies first – highest injury values seen
  - HIII-3YO gets priority with seat- and door-mounted SABs
    - Highest traditional injury values seen
    - Largest variety of TWG positions available
  - However, HIII-6YO must be tested with curtain SABs
    - No 3YO test procedure



## NCAP SAB OOP Testing Trends



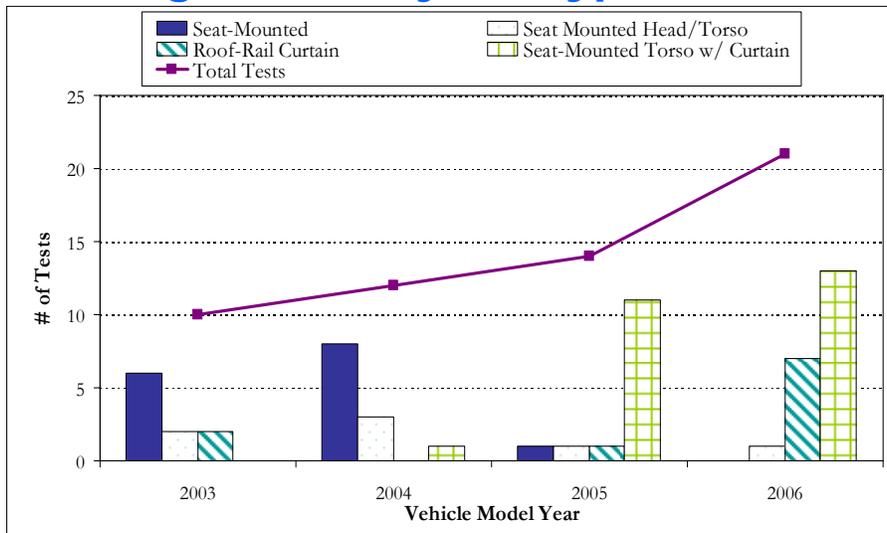
## Testing Trends by Dummy\*



\* Among "M" assigned vehicles.



## Testing Trends by AB Type\*



\* Among "M" assigned vehicles, door-mounted excluded for clarity.



## Overview of Testing from 2004-06

- Overall decrease in 3YO tests
  - Decrease in number of standalone seat-mounted SABs
  - Increase in suppression systems being used for seat-mounted SABs
    - Manufacturers use a variety of proprietary systems
    - ~20% of models submitting data in 2007 suppressed for 3YO in positions most likely to produce high injury numbers
    - Systems that suppress for all occupants up to 10YO are also increasing



## Overview of Testing 2004-06 (cont'd.)

- Number of roof-rail curtains in fleet has been increasing
  - When paired with seat-mounted torso, must be tested with 6YO
  - 6YO used in all tests except one during 2006 MY
- Spot-checking has proved reliable
  - Only 2 instances of disagreement between NCAP and the manufacturer claims to date
    - Vehicles had "M" removed from website as a result



## 2007 Testing Plans



### 2007 MY Testing

- Continue selecting only "M" vehicles
- Current SAB availability trends continue
  - No 3YO tests available
    - Increased numbers of suppression systems for standalone seat-mounted SABs
  - Continue with 6YO & begin SID-IIs testing
    - Increasing numbers of curtain airbags
    - Can test seat-mounted SABs with suppression systems in conjunction with SID-IIs



## 2007 Tentative Testing Matrix

	Seat-Mounted Torso w/ Roof-Rail Curtain	Seat-Mounted Head/Torso*	Roof-Rail Curtain		All
			Alone	Suppressed SM-Torso	
6YO	8	0	4	4	16
SID-IIs	8	1	3	0	12
<b>All</b>	<b>16</b>	<b>1</b>	<b>7</b>	<b>4</b>	<b>28</b>

\*Employs suppression system for 3YO/6YO.



## Questions?

*Thank you for your attention.*

