
Special Crash Investigations

Overview of NHTSA's Special Crash Investigations Program

July, 1999

National Highway Traffic Safety Administration



Organizational Chart



Objectives of the SCI Program



→ **Examine safety impact of rapidly changing technology (airbags, alternative fuel vehicles, school buses)**

- Document crash circumstances
- Identify injury mechanisms
- Evaluate safety countermeasure effectiveness

→ **Provide early detection of alleged or potential vehicle defects.**



Other Crashes of Interest



- **Air bag non-deployment & inadvertent deployment**
- **Alternative fuel and electric vehicles**
- **School bus pedestrian fatalities**
- **Potential safety defects**
- **School bus crashworthiness crashes**
- **Physically challenged technology**
- **Other vehicle safety issues**

SCI Demographics - 3 In-depth Team Locations



EAST: Veridian Corporation (Formerly Calspan)

- **NHTSA Regions I, II, III, and IV; and the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Kentucky, Virginia, North Carolina, Tennessee, Mississippi, Alabama, Georgia, South Carolina, Florida and Puerto Rico.**

CENTRAL: Indiana University

- **NHTSA Regions V, VI, and VII; and the states of Minnesota, Wisconsin, Michigan, Ohio, Indiana, Illinois, Iowa, Nebraska, Kansas, Missouri, Arkansas, Oklahoma, New Mexico, Texas, and Louisiana.**

WEST: Dynamic Science

- **NHTSA Regions VIII, IX, and X; and the states of North Dakota, South Dakota, Wyoming, Montana, Idaho, Washington, Oregon, California, Nevada, Arizona, Utah, Colorado, Hawaii, and Alaska.**

SCI Data Collection Projection



- **Caseload Projection**

- **Estimated Case Yield approximately 300 investigations:**

- 100 SCI Primary Focus Cases
 - 200 Redesigned Air Bag Deployments

Focus of Investigations



- **Primary focus**

- **Crashes involving air bag deployment related fatal and seriously injured occupants.**

- **New and/or emerging occupant protection system technology**

- **Crashes involving Redesigned or Advanced Air Bag Deployments**

- **Side Air Bags**

- **Etc.**

Primary Focus Criteria

- NHTSA will investigate all air bag crashes that meet the following criteria:



- **Not a High Speed Crash**

- The travel speed is generally less than 35 mph;
and/or the delta V is less than 25 mph

- **A Life Threatening or Fatal Injury**

- Related to the Air Bag Deployment.



Low Vehicle Damage Severity with a High Injury Severity

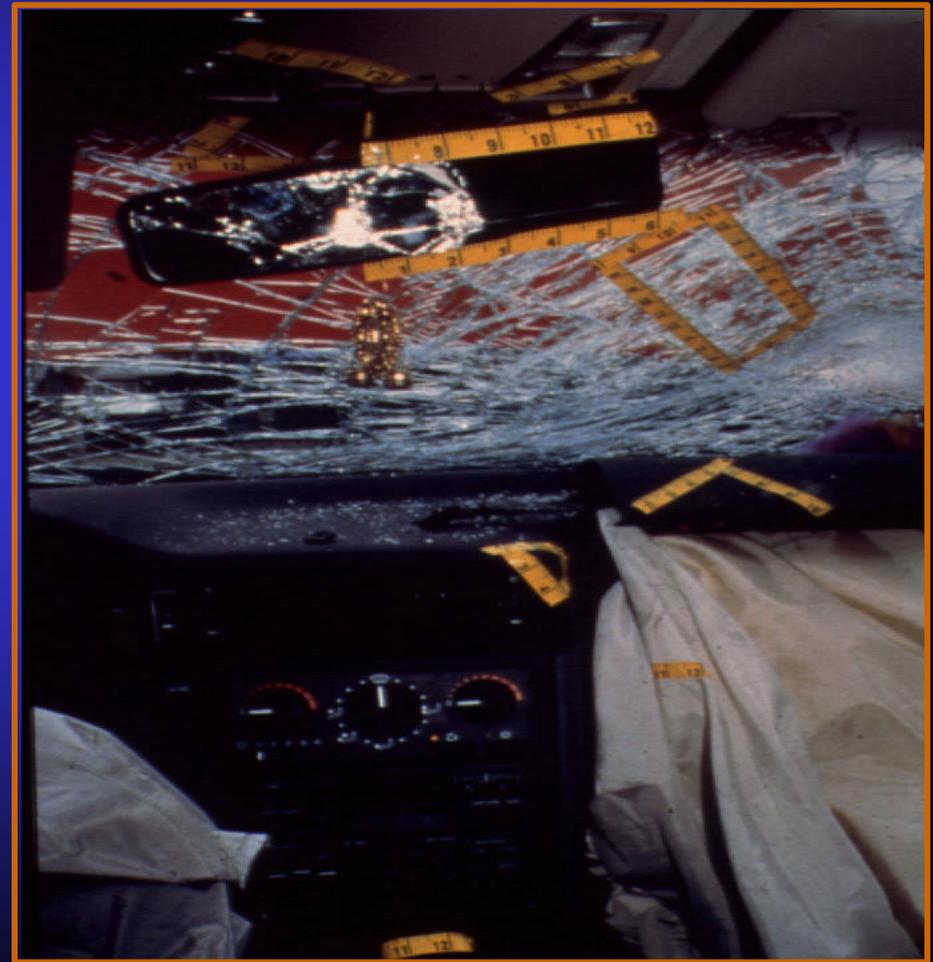
- Low Speed Crash

- The travel speed is generally less than 35 mph;
and/or the delta V is less than 25 mph



Low Vehicle Damage Severity with a High Injury Severity

- **High Injury Severity**
 - **The air bag contacted this unbelted, out-of-position, occupant under the neck. The occupant was lifted vertically resulting in fatal cervical-spine and brain stem injuries.**



***New and/or Emerging
Occupant Protection
System Technology***

Redesigned Air Bags

Redesigned Air Bags



- In March of 1997 NHTSA modified the Federal Motor Vehicle Safety Standard (FMVSS 208) for occupant protection that allowed automobile manufacturers to reduce the force at which their air bags deployed.
 - **Redesigned Air Bags may be installed in 1998 and newer vehicle.**

Redesigned Air Bag Criteria



- A **Child** is seated in a position with a deployed redesigned air bag
- An **occupant seated in a deployed** redesigned air bag position and $V > 24$ mph
- **Driver and front right occupant** are both located in deployed redesigned air bag positions and **both are transported** to a medical facility for treatment of injuries

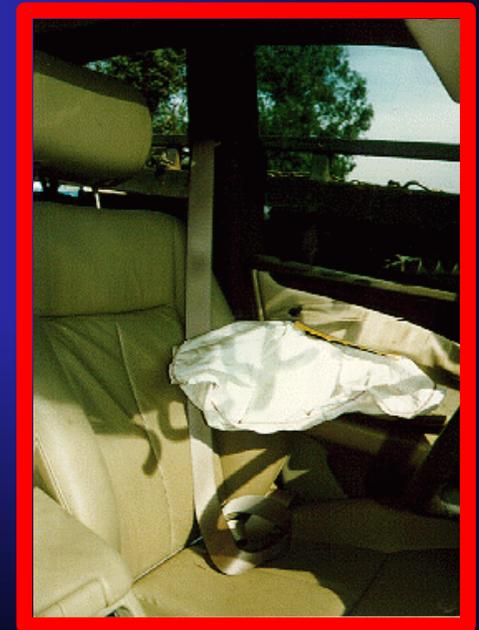
Side Air Bags

Various Types of Side Air Bags



Side Impact Inflatable Thorax Protection System

- **Currently Two Types of Thorax**
 - **Seat Mounted**
 - **Door Mounted**



Side Impact Inflatable Head Protection System

- **Currently Three Types**
 - **Thorax and Head Seat Mounted**
 - **Inflatable Tubular Structure**
 - **Inflatable Curtain**



Air Bag Off-On Switches

Air Bag On-Off Switches

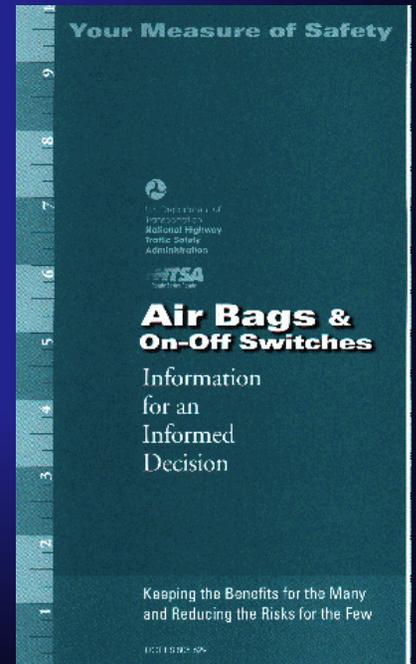


- **Beginning January 19, 1998, motor vehicle dealers and repair businesses may install retrofit air bag on-off switches**
 - **For air bags in vehicles owned by or used by persons whose requests for switches have been approved by the agency.**

Air Bag On-Off Switches

- Information on On-Off switches maybe obtained from contacting the NHTSA web site

→ <http://www.nhtsa.dot.gov/airbags/>

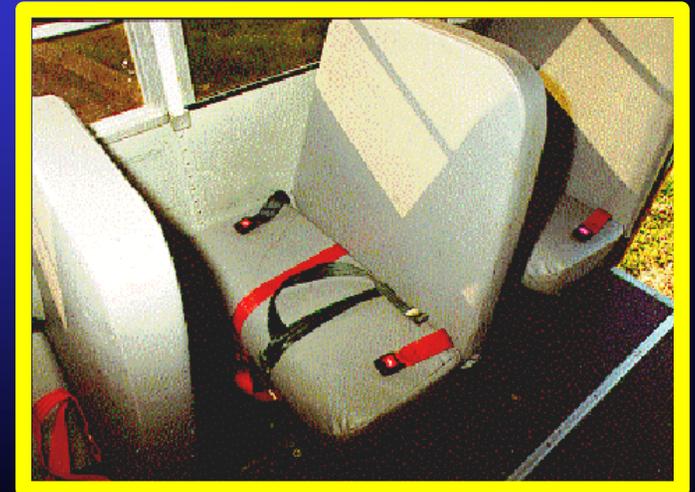


School Bus

School Bus Safety

→ Examine the effectiveness of occupant protection restraint systems in school bus crashes

- Document crash circumstances
- Identify injury mechanisms
- Evaluate safety countermeasure effectiveness



Alternative Fuel Vehicles

Alternative Fuel Vehicles

→ Examine safety impact of alternative fuel vehicles

- Vehicle crashworthiness
- Fuel retention
- Occupant protection systems



***Special Crash
Investigations
Notification***

SCI Notifications



- **24 Hour Voice Mail Telephone Number**

- **Nation Wide Toll Free**

- (877) 201-3172

- **Washington D.C. Area**

- (202) 366-2545 or (202)493-0400

- **FAX Number**

- **202-366-5374**

- **E-mail Address**

- **airbag.crash@nhtsa.dot.gov**