



U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

Dear Crash Data Researchers/Users:

Thank you for choosing crash data from the National Highway Traffic Safety Administration (NHTSA) for your research or other use. The information contained in this motor vehicle crash report is collected, maintained and distributed in accordance with Public Law 89-564. In accordance with this Public Law, NHTSA is required not to release any case information until completion of quality control procedures. These procedures include a review of the case material to extract all names, licenses and registration numbers, non-coded interview material, non-research related researcher comments in the margins, non-factual data, and the production number portion of the vehicle identification number (VIN).

If you requested NHTSA to query its database files in order to identify a specific crash, then that query was made using non-personal descriptors you provided for use in our search. This motor vehicle crash may have been identified from a data search and matches the general, non-personal descriptors you provided, but we cannot confirm that this is the specific crash report you requested.

If you have any questions with regard to the above procedures, please contact the Field Operations Branch, Crash Investigation Division, National Center for Statistics and Analysis at 202-366-4820. Again, please be advised that we cannot confirm that this is the case that you have specifically requested nor can we certify the information to be correct.

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## **DISCLAIMERS**

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points are coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.



**ARVIN**

CALSPAN CORPORATION  
ADVANCED TECHNOLOGY CENTER

[REDACTED] 1993

COTR [REDACTED] NRD-32  
National Highway Traffic Safety Administration

Re: Air bag related thumb injury,  
Calspan Case No. 93-2

Dear Mr. [REDACTED]

This letter will serve as our report of a remote investigation of an air bag deployment crash that resulted in a near amputation of the driver's right thumb. The crash was presented by a senior emergency room physician of a [REDACTED] hospital at a meeting of the [REDACTED]. Inputs for this remote investigation were obtained from the physician who provided limited information via the telephone. He failed to provide photographs and information regarding the driver and the crash.

The physician stated that the crash occurred in [REDACTED], 1991 and involved a Ford Taurus that was equipped with a driver's side air bag Supplemental Restraint System (SRS). The vehicle was driven by a 25 year old female. The attached photograph illustrates the position of the driver's right hand on the steering wheel at impact. She had her right hand at the 3 o'clock position with her palm resting against the right side of the hub area of the wheel and her fingers split around the steering wheel rim at the upper right spoke. The driver's right index and middle fingers were positioned on the inboard side of the steering wheel rim on top of the upper spoke. Her right ring and fifth fingers were outboard of the rim. In this position, the anterior aspect of the driver's right thumb was extended across the right side of the upper air bag module cover flap. The base of the driver's right thumb was positioned at the vertical parting seam of the upper air bag module cover flap.

[REDACTED]

The Ford Taurus was equipped with a TRW air bag module that was concealed by two cover flaps. The upper module cover flap involves approximately 75 percent of the entire face of the assembly with measurements of 12.4cm (4 7/8") vertically and 20.3cm (8") horizontally. The lower flap has respective measurements of 3.8cm (1.5") and 20.3cm (8"). The flaps open in an H-configuration and are hinged at the 12 and 6 o'clock positions. At deployment, the flaps open outward and upward as the air bag inflates.

The specific details of the crash were unknown, however, it is believed that the Ford Taurus experienced a sufficient longitudinal deceleration which deployed the vehicle's SRS. As the system deployed, the upper air bag module cover flap contacted the anterior aspect of the driver's right thumb near the base. The physician stated that as a result of the contact, the driver sustained a clean laceration of the soft tissue of the thumb and lacerated and severed muscles and nerves within the thumb (AIS-2).

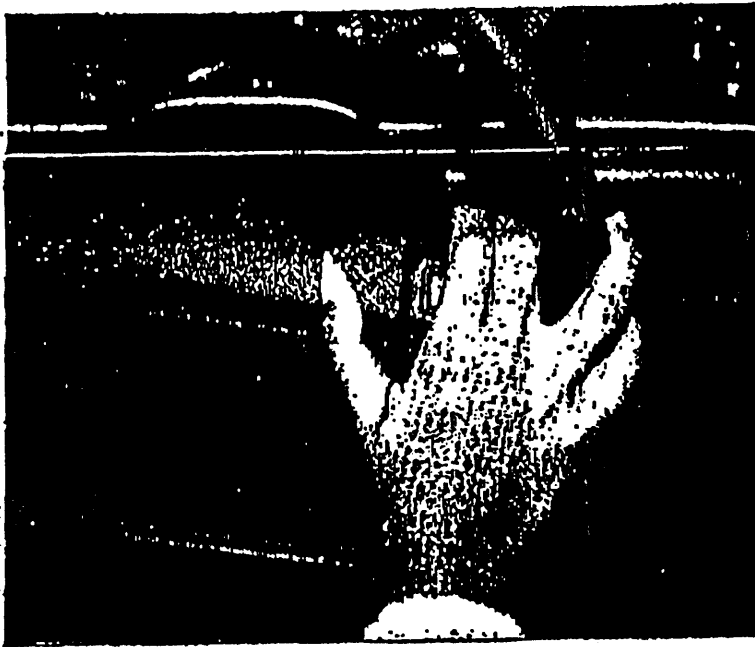
A hand specialist performed micro-surgery to reattach the severed muscles and nerves. The physician reported the surgery was very successful and that the driver has regained 90 percent use of the thumb.

If you have any questions or comments, please call me at your convenience.

Sincerely,

A large, dark, rectangular redaction mark covering the signature area.

TS:eav  
Enclosure



This photo provided by [redacted] shows how not to place your hand on the steering wheel of a car with an air bag. The thumb extends across the air-bag cover. The dark line between thumb and hand shows where the woman's thumb was almost amputated when the cover opened to release the air bag. When driving a car with an air bag, keep your hands on the rim of the steering wheel, away from the air-bag cover.

## Keep those hands on the rim

As you drive down the highway in your air-bag-equipped car, be careful where you place your hands on the steering wheel: Confine your grip to the rim.

That's the advice of [redacted], a senior resident in emergency medicine at [redacted] of [redacted].

[redacted] has found that collision victims risk hand injuries if they allow their fingers or thumbs to extend over the steering wheel hub — which usually holds the horn and engages the air bag.

A 25-year-old [redacted] woman nearly lost her right thumb when she was in an accident last year because it extended over the steering wheel hub of her Ford Taurus. Her case is among four incidents of air-bag-related hand injuries that have come to [redacted] attention.

When the air-bag cover flipped open to release the bag, her thumb was nearly amputated.

"There was severe muscular and neurovascular injury," [redacted] said. The woman, who is a pianist, has since regained 90 percent use of her thumb.

"Air bags are going to save a lot of lives and prevent a lot of injuries," [redacted] said, "but there is the potential for injuries when they are deployed. The forces are just tremendous."

[redacted] said serious and potentially fatal head or chest injuries also can occur if a driver or passen-

ger sits too close to a deploying bag. Potential victims could be "little old ladies who sit right up at the steering wheel," he said.

He recommends sitting no closer than 8 inches and farther back if possible. "I'm certainly not anti-air bag if you wear a seatbelt and sit as far back as possible," he said.

[redacted], who is an assistant state medical examiner, has been looking at air bags as a possible cause of injuries for about two years. The investigation was an outgrowth of automotive safety research he began in 1984 for a master's thesis.

He recently spoke at a meeting of the [redacted] where he shared his "thumb study" with engineers representing automotive manufacturers. He also has reported his findings to the National Highway Traffic Safety Administration.