

TRANSPORTATION RESEARCH CENTER

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**REMOTE DEPOWERED AIR BAG REPORT**

CASE NUMBER - IN97-043  
LOCATION - TEXAS  
VEHICLE - 1998 CHEVROLET MALIBU LS  
CRASH DATE - November, 1997

Submitted:

November 4, 1998

Revised Submission:

December 11, 1998

November 19, 2002

Contract Number: DTNH22-94-D-17058

Prepared for:

U.S. Department of Transportation  
National Highway Traffic Safety Administration  
National Center for Statistics and Analysis  
Washington, D.C. 20590-0003

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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 be 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.

**Technical Report Documentation Page**

1. <i>Report No.</i> IN97-043		2. <i>Government Accession No.</i>		3. <i>Recipient's Catalog No.</i>	
4. <i>Title and Subtitle</i> Remote Depowered Air Bag Report Vehicle - 1998 Chevrolet Malibu LS Location - Texas			5. <i>Report Date:</i> November 4, 1998; December 11, 1998		
			6. <i>Performing Organization Code</i>		
7. <i>Author(s)</i> Special Crash Investigations Team #2			8. <i>Performing Organization Report No.</i> Task # 0124		
9. <i>Performing Organization Name and Address</i> Transportation Research Center Indiana University 222 West Second Street Bloomington, Indiana 47403-1599			10. <i>Work Unit No. (TRAIS)</i>		
			11. <i>Contract or Grant No.</i> DTNH22-94-D-17058		
12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation (NRD-32) National Highway Traffic Safety Administration National Center for Statistics and Analysis Washington, D.C. 20590-0003			13. <i>Type of Report and Period Covered</i> Technical Report Crash Date: November, 1997		
			14. <i>Sponsoring Agency Code</i>		
15. <i>Supplementary Notes</i> Remote air bag deployment investigation involving a 1998 Chevrolet Malibu LS, 4-door sedan, with manual safety belts and dual front air bags, and a 1997 Chevrolet Tahoe, 4-door MPV, with dual front air bags					
16. <i>Abstract</i> This report covers a remote investigation of an air bag deployment crash that involved a 1998 Chevrolet Malibu LS (case vehicle) and a 1997 Chevrolet Tahoe (vehicle #2). This crash is of special interest because the case vehicle was equipped with depowered (second generation) air bags that deployed as a result of the crash events, and its restrained driver (25-year-old female) sustained self-reported blunt head trauma and minor integumentary injuries as a result of impacting her deploying air bag. The case vehicle had been traveling west in the westbound, left-hand turn lane of an eight-lane, divided, city trafficway and was turning left at a controlled four-leg intersection, intending to travel southward (i.e., both the east and westbound roadways had three through lanes and a left-hand turn lane). Vehicle #2 had been traveling east in the inside through lane of the trafficway's eastbound roadway and was changing lanes into the center through lane as it approached the intersection. The center of the case vehicle's right side was impacted by the front of vehicle #2, causing the case vehicle's driver and front right passenger supplemental restraints (air bags) to deploy. The case vehicle's driver was seated upright with her seat track located in its middle position. The case vehicle was equipped with a tilt steering wheel but its position is unknown. She was restrained by her available, active, three-point, lap and shoulder belt and sustained, according to her interview, minor injuries which included: blunt head trauma; an abrasion to the left side of her face, with swelling to her whole face; contusions to her left breast, right wrist, bilateral knees, and bilateral lower legs; and small lacerations to her bilateral knees and lower legs. Vehicle #2 was equipped with both driver and front right passenger supplemental restraints (air bags) which, according to vehicle #2's driver, did not deploy. Vehicle #2's driver (46-year-old male) indicated that he did not sustain any injuries as a result of this crash.					
17. <i>Key Words</i> Depowered Air Bag Deployment			18. <i>Distribution Statement</i> General Public		
19. <i>Security Classif. (of this report)</i> Unclassified		20. <i>Security Classif. (of this page)</i> Unclassified		21. <i>No. of Pages</i> 3	22. <i>Price</i> \$5,200

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ANNOTATION

Neither of the two vehicles nor the scene for this case was inspected. Photographs were obtained from the insurance company of the case vehicle, and these photographs permitted only limited information (e.g., the CDC has been assigned).

This remote report was brought to NHTSA's attention on November 18, 1997, through the NASS CDS sampling activities. This crash involved a 1998 Chevrolet Malibu LS (case vehicle) and a 1997 Chevrolet Tahoe MPV (vehicle #2). The crash occurred in November, 1997, at 3:00 p.m., in Texas, and was investigated by the applicable municipal police department. This crash is of special interest because the case vehicle was equipped with depowered (second generation) air bags and its driver (25-year-old female) sustained self-reported blunt head trauma and minor soft tissue injuries from contacting her deploying air bag. This contractor's subcontractor was unable to inspect the scene or the vehicles. The case vehicle driver was interviewed on April 28, 1998, and vehicle #2's driver was interviewed on October 13, 1998. This report is based on the Police Crash Report, interviews with both drivers, occupant kinematic principles, self-reported injury information from the case vehicle's driver, and this contractor's evaluation of the evidence.

### CRASH CIRCUMSTANCES

The case vehicle had been traveling west in the westbound, left-hand turn lane of an eight-lane, divided, city trafficway and was making a left turn at a controlled, four-leg intersection, intending to travel southward (i.e., both the east and westbound roadways had three through lanes and a left-hand turn lane). Vehicle #2 had been traveling east in the inside through lane of the trafficway's eastbound roadway and was changing lanes into the center through lane, intending to continued in its easterly travel path. The case vehicle's driver saw vehicle #2 when it was no more than 4.6 meters (15 feet) from impact. She tried to brake, immediately before the crash, but she was unsure if her vehicle responded to the brakes application before the collision. The crash occurred in the four-leg intersection of the two trafficways and halfway between the inside and center through lanes of the eastbound roadway.

The center of the case vehicle's right side (Figure 1 and Figures 2 and 3 below) was impacted by the front of vehicle #2, causing the case vehicle's driver and front right passenger supplemental restraints (air bags) to deploy. The crash severity to the case vehicle is moderate [24-40 km.p.h. (15 to 25 m.p.h.)]. Vehicle #2 was also equipped with driver and front right passenger supplemental restraints (air bags) but, reportedly, they did not deploy.



**Figure 1:** Case vehicle's right side damage viewed from approximately 20 degrees right of back

### CASE VEHICLE

The case vehicle was a front wheel drive 1998 Chevrolet Malibu LS, four-door sedan (VIN: 1G1NE52M8W6-----). The case vehicle was equipped with anti-lock brakes. The case vehicle was towed due to disabling damage. Based only on the available photographs (i.e., no vehicle inspection), the CDC for the case vehicle was estimated as: **02-RPEW-3**. No reconstruction program was used on this crash because this contractor judges that the results would be unreliable due to the limited information available for input.

From a Chevrolet Division brochure, the case vehicle's driver air bag is located in the steering wheel hub and the front right passenger's air bag is located at the top of the instrument panel. Because no case vehicle inspection was conducted, it is not known if there was damage to or contact by the driver to either of the air bag module's cover flaps or if there was present any driver contact evidence on either module's air bag fabric. Also, it is not known if either of the deployed air bag module's cover flaps opened at their designated tear points. In addition, the shapes and dimensions of the driver and front right passenger air bags are unknown, as well as the existence of tethers and/or vent ports. Finally, it is unknown if there was other evidence of occupant contact on the interior surfaces of the case vehicle.

#### **CASE VEHICLE DRIVER**

The case vehicle's driver [170 centimeters and 68 kilograms (67 inches, 150 pounds)] was restrained by her available, active, three-point, lap and shoulder belt. Since there was no vehicle inspection, no inspection was conducted of the seat belt webbings, "D"-rings, or latch plates. There was, however, self-reported evidence of belt pattern bruising to the driver's body (i.e., a contused left breast).

Immediately prior to the crash, the case vehicle's driver was seated upright, with her back against the seat back, her left foot on the floor, her right foot on or near the brake pedal, and both hands on the steering wheel. Her seat track was located in its middle position with the seat back completely upright. The case vehicle was equipped with a tilt steering wheel, but its position is unknown (i.e., she never adjusted it and was unsure of its position).

The case vehicle's driver tried to apply her brakes prior to the crash. She is unsure if her vehicle responded before the collision to her brake application. Thus, the use of her available safety belts and the slight centrifugal force generated by her left-hand turn may have caused her to move slightly right and forward just prior to impact. The case vehicle's impact with vehicle #2, not only deployed its driver and front right passenger air bags, but thrust the driver to the right and forward. The case vehicle's driver indicated that she lost consciousness for a short time post-crash and did not recall her vehicle's post-crash movement or her final rest position.

The case vehicle's driver was transported by ambulance to a medical facility. She was treated and released from the hospital but underwent two months of physical therapy and lost 40 days of work. She sustained the following self-reported injuries: blunt head trauma; an abrasion to the left side of the face, with her whole face swollen; contusions to her left breast, right wrist, bilateral knees, and bilateral lower legs; and small lacerations to her bilateral knees and lower legs.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
1	Blunt head trauma	115099.7 unknown	Air bag, driver's	Possible	Interviewee (same person)
2	Abrasion left side of face with swelling to whole face	290202.1 minor	Air bag, driver's	Probable	Interviewee (same person)
3	Contusion left breast area	490402.1 minor	Safety belt, torso portion	Probable	Interviewee (same person)
4	Contusion right wrist, specific location not identified	790402.1 minor	Air bag, driver's	Possible	Interviewee (same person)
5	Contusions, bilateral knees and both lower legs	890402.1 minor	Left instrument panel and below	Probable	Interviewee (same person)
6	Lacerations {cuts}, bilateral knees and both lower legs	890600.1 minor	flying glass	Possible	Interviewee (same person)

**VEHICLE #2**

Vehicle #2 was a four wheel drive 1997 Chevrolet Tahoe, four-door, multi-purpose vehicle (VIN: 1GNEK1?R8VJ-----). Vehicle #2 was towed due to disabling damage. With no vehicle inspection or available photographs, vehicle #2's CDC was not estimable.

Vehicle #2's driver (46-year-old male; unknown height and weight) was reportedly restrained by his available, active, three-point, lap and shoulder belt. Vehicle #2 was equipped with both driver and front right passenger supplemental restraints (air bags), which did not deploy. The location of the two air bag modules is not known. The driver was reported to have been uninjured and, thus, was not transported to a medical facility.



**Figure 2:** Close-up of case vehicle's right passenger compartment damage viewed from rear



**Figure 3:** Close-up of case vehicle's right passenger compartment damage viewed from front