

**TRANSPORTATION SCIENCES
CRASH RESEARCH SECTION**

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**CALSPAN REMOTE DEPOWERED AIR BAG DEPLOYMENT INVESTIGATION
CALSPAN CASE NO. CA97-34
SUBJECT VEHICLE - 1998 PONTIAC GRAND AM GT
VEHICLE #2 - 1994 OLDSMOBILE CUTLASS SUPREME S**

**LOCATION: STATE OF MICHIGAN
CRASH DATE: SEPTEMBER, 1997**

Contract No. DTNH22094-D-07058

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

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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.

TECHNICAL REPORT STANDARD TITLE PAGE

<p>1. <i>Report No.</i> CA97-34</p>	<p>2. <i>Government Accession No.</i></p>	<p>3. <i>Recipient's Catalog No.</i></p>	
<p>4. <i>Title and Subtitle</i> Calspan Remote Depowered Air Bag Deployment Investigation Subject Vehicle - 1998 Pontiac Grand Am GT Vehicle #2 - 1994 Oldsmobile Cutlass supreme S Location - State of Michigan</p>		<p>5. <i>Report Date:</i> August, 1998</p>	
		<p>6. <i>Performing Organization Code</i></p>	
<p>7. <i>Author(s)</i> Accident Research Group</p>		<p>8. <i>Performing Organization Report No.</i></p>	
<p>9. <i>Performing Organization Name and Address</i> Transportation Sciences Center Accident Research Group Calspan Corporation P.O. Box 400 Buffalo, New York 14225</p>		<p>10. <i>Work Unit No.</i> 1115 (8020 - 8029)</p>	
		<p>11. <i>Contract or Grant No.</i> DTNH22-94-D-07058</p>	
<p>12. <i>Sponsoring Agency Name and Address</i> U.S. Department of Transportation National Highway Traffic Safety Administration Washington, D.C. 20590</p>		<p>13. <i>Type of Report and Period Covered</i> Technical Report Crash Date: September, 1997</p>	
		<p>14. <i>Sponsoring Agency Code</i></p>	
<p>15. <i>Supplementary Notes</i> A remote investigation of a two vehicle front-to-rear type crash between the front of a 1998 Pontiac Grand Am GT and the back of a 1994 Oldsmobile Cutlass Supreme S. The 22 year old restrained male driver of the Grand Am did not sustain injury as a result of the crash.</p>			
<p>16. <i>Abstract</i> A remote investigation was conducted into a two vehicle front-to-rear type crash between the front of a 1998 Pontiac Grand Am GT, 2-door sedan, and the back plane of a 1994 Oldsmobile Cutlass Supreme S, 2-door sedan. The full frontal area of the Grand Am contacted and underrode the back plane of the Oldsmobile which initiated the deployment sequence of the Grand Am's depowered front left and front right air bag system. Total delta V's were estimated at 16-21 km/h (10-13 mph) and 8-13 km/h (5-8 mph) for the Grand Am and Oldsmobile respectively. The Grand Am was occupied by a 22 year old male driver who was reportedly (PAR and interview) restrained by the 3-point manual lap and shoulder belt system. He did not sustain injury resulting from this crash.</p>			
<p>17. <i>Key Words</i> 1998 Pontiac Grand Am, Driver side air bag deployment, Depowered Air Bag, Next Generation Air Bag</p>		<p>18. <i>Distribution Statement</i> General Public</p>	
<p>19. <i>Security Classif. (of this report)</i> Unclassified</p>	<p>20. <i>Security Classif. (of this page)</i> Unclassified</p>	<p>21. <i>No. of Pages</i> 3</p>	<p>22. <i>Price</i></p>

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CALSPAN REMOTE DEPOWERED AIR BAG DEPLOYMENT INVESTIGATION
CALSPAN CASE NO. CA 97-34
LOCATION: STATE OF MICHIGAN
CRASH DATE: SEPTEMBER, 1997

Background

This remote investigation focused on the deployment of the depowered front left and front right air bags of a 1998 Pontiac Grand Am GT, 2-door sedan. The front of the Grand Am was involved in a front-to-rear type impact with the back of a 1994 Oldsmobile Cutlass Supreme S, 2-door sedan. This impact initiated the deployment sequence of the Grand Am's front left and front right air bag system. The Grand Am was occupied by a 22 year old male driver who was reportedly (PAR and interview) restrained by the 3-point manual lap and shoulder belt system. He did not sustain injury resulting from this crash.



Figure 1. View of the damaged frontal plane of the 1998 Grand Am.

The Police Accident Report (PAR) for this crash was located during routine NASS sampling and subsequently reported to the NHTSA by Primary Sampling Unit (PSU) 11. Notification was provided to Calspan's Special Crash Investigation team on Monday, October 6, 1997, and a remote investigation was subsequently initiated due to the repaired state of the vehicle.

Summary

This crash occurred during the daylight hours on a three-lane undivided asphalt roadway which facilitated two lanes of west bound travel and two lanes of east bound travel. The weather was clear and the roadway was dry for this crash. The posted speed limit was 72 km/h (45 mph).

The 1998 Pontiac Grand Am GT, 2-door sedan was equipped with a Supplemental Restraint System (SRS) that consisted of a depowered front left and front right air bag system. In addition to the SRS, the vehicle was equipped with manual 3-point lap and shoulder belt systems in the four outboard seated

Summary (cont'd.)

positions and an Anti-lock Braking System (ABS). The vehicle was identified by vehicle identification number (V.I.N.) 1G2NW12T6WC (production number omitted) and had a reported odometer reading of 66 km (41 miles) at the time of the crash. 1998 Pontiac model vehicles do not have a V.I.N. character identifying the vehicle as equipped with a depowered air bag system. The owner/driver, who purchased the vehicle five days prior to the crash date, did not recall a label affixed to the driver side window glazing noting “NEXT GENERATION AIR BAGS”.

The 1994 Oldsmobile Cutlass Supreme S , 2-door sedan, was equipped with 3-point door mounted automatic lap and shoulder belt systems in the front outboard seated positions and a Supplemental Inflatable Restraint (SIR) system that consisted of a front left air bag. The vehicle identification number was 1G3WH15XXRD (production number omitted).

Crash Events

The Grand Am was stopped in a standing line of traffic in the inboard lane during the red phase of a traffic control signal. The Oldsmobile was stopped in the adjacent outboard lane also in a line of standing traffic. Both vehicles were headed westbound. The traffic control signaled green for east and westbound lanes to proceed through the intersection at which time the westbound lanes were required to merge into one lane. The Oldsmobile merged in front of the Grand Am. An unknown vehicle, approximately five vehicles ahead, stopped suddenly in an attempt to turn left into a private driveway. The vehicles proceeding the Grand Am stopped to avoid an impact. The driver of the Grand Am applied the brakes in an attempt to avoid a collision which compressed the vehicle’s front suspension. The frontal plane of the Grand Am subsequently impacted and underrode the back bumper of the Oldsmobile. This initiated the deployment of the front left and front right air bag system. The Grand Am and the Oldsmobile were driven from the scene of the crash to a residential complex approximately 152.4 meters (500.0 feet) for anticipated arrival of police personnel. Following police assistance, the driver of the Grand Am drove his vehicle approximately 3.2 km (2 miles) to his residence.

The Grand Am sustained moderate frontal damage which resulted from its impact with the back plane of the Oldsmobile. The insurance photograph of the Grand Am indicated that the vehicle sustained a direction of force within the 12 o’clock sector and yielded an estimated Collision Deformation Classification (CDC) of 12-FDEW-1. Total delta V was estimated at 16-21 km/h (10-13 mph). The Grand Am’s damaged components included the front bumper and bumper cover, grille assembly, headlights, hood, radiator support, and front fenders. The SRS was also repaired to include the SDM (GM part no.: 16203119), and the front left and front right air bag modules (GM part nos.: 22653826 and 16759782, respectively). Total cost of the repaired damage was \$6,636.50.



Figure 2. View of the damaged frontal plane of the 1998 Grand Am.

Crash Events (cont'd.)

The Oldsmobile Cutlass Supreme sustained minor damage which resulted from its impact with the frontal plane of the Grand Am. The quality of an insurance photograph depicting the damaged back plane of the Oldsmobile did not allow for an accurate appraisal of sustained damage. However, based on the damage sustained by the Grand Am, the direction of force for the Oldsmobile was estimated within the 6 o'clock sector with a resulting CDC of 06-BDLW-1. Total delta V was estimated at 8-13 km/h (5-8 mph). Damaged components included the back bumper and bumper cover, the taillamp assembly, and the muffler and tail pipe. Total cost of the repaired damage was \$1112.00.

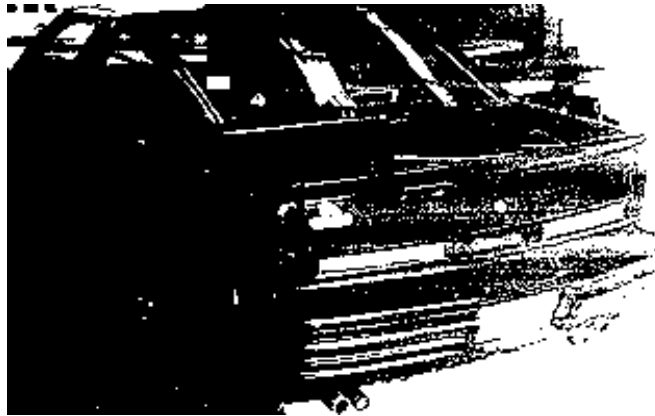


Figure 3. View of the damaged back plane of the 1994 Oldsmobile Cutlass Supreme.

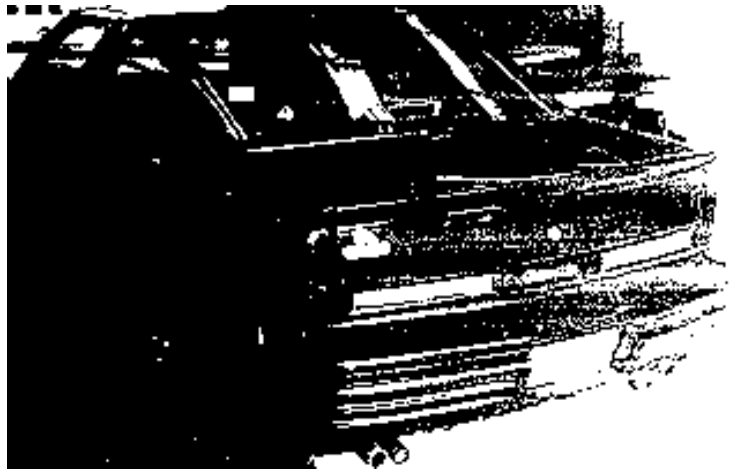
The driver of the Grand Am was a 22 year old male with a stated height of 178 cm (70 in) and weight of 70 kg (155 lbs). He was reportedly (PAR and interview) restrained by the manual lap and shoulder belt system which was equipped with adjustable D-rings that were adjusted to the full down position. The left front seat track was adjusted between the mid and forward most positions and the seat back was upright. The driver initiated as forward trajectory in response to pre-impact braking maneuvers and the 12 o'clock direction of force impact and loaded the 3-point manual lap and shoulder belt system. Due to his forward seated position, the driver probably contacted the deployed front left air bag. The driver did not report sustained injury resulting from this crash.

The Oldsmobile was occupied by a 27 year old male driver. The police reported him as restrained in a lap and shoulder belt. He did not sustain injury as a result of this crash.

APPENDIX A
INSURANCE PHOTOGRAPHS



1. View of the damaged frontal plane of the 1998 Grand Am.



2. View of the damaged back plane of the 1994 Oldsmobile Cutlass Supreme.