TRANSPORTATION SCIENCES
CRASH RESEARCH SECTION

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CALSPAN ON-SITE AIR BAG/INFANT FATALITY INVESTIGATION
CALSPAN CASE NO. CA98-028
VEHICLE: 1995 SATURN SC1
LOCATION: FLORIDA
CRASH DATE: APRIL, 1998

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

1. *Report No.* CA98-028	2. *Government Accession No.*	3. *Recipient's Catalog No.*	
4. *Title and Subtitle* Calspan On-Site Air Bag/Infant Fatality Investigation Vehicle: 1995 Saturn SC1 Location: Florida		5. *Report Date*: October, 1998 6. *Performing Organization Code*	
7. *Author(s)* Crash Research Section		8. *Performing Organization Report No.*	
9. *Performing Organization Name and Address* Transportation Sciences Crash Research Section Calspan Operations P.O. Box 400 Buffalo, New York 14225		10. *Work Unit No.* 1115 (8530-8539) 11. *Contract or Grant No.* DTNH22-94-D-07058	
12. *Sponsoring Agency Name and Address* U.S. Department of Transportation National Highway Traffic Safety Administration Washington, D.C. 20590		13. *Type of Report and Period Covered* Technical Report Crash Date: April, 1998 14. *Sponsoring Agency Code*	
15. *Supplementary Notes* On-site investigation of an air bag deployment death that involved a 3 week old infant positioned in a rear-facing child safety seat in a 1995 Saturn SC1.			
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17. *Key Words* Frontal air bags, air bag deployment, rear-facing child safety seat, mid mount front right air bag, air bag expansion		18. *Distribution Statement* General Public	
19. *Security Classif. (of this report)* Unclassified	20. *Security Classif. (of this page)* Unclassified	21. *No. of Pages* 13	22. *Price*

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BACKGROUND

This on-site air bag deployment investigation focused on the death of a 3 week old female infant who was positioned in a rear-facing child safety seat in a 1995 Saturn SC1 **(Figures 1 and 2)**. The Saturn was equipped with frontal air bags for the driver and right front passenger positions which deployed as a result of an intersection-type crash with a 1986 Chevrolet pickup truck. The front right passenger air bag expanded against the shell of the child safety seat and accelerated the restraint in a rearward direction. Although no damage occurred to the child restraint, the infant sustained multiple skull fractures and closed head injuries. She was transported to a local trauma center where she was admitted for treatment. The infant expired approximately 28 hours following the crash.

Figure 1. Frontal damage to the 1995 Saturn SC1.

Figure 2. Rear-facing child safety seat and the deployed front right air bag.

NHTSA initially received notification of the crash from General Motors and assigned this on-site investigation to the Calspan Special Crash Investigation Team on April 22, 1998. An on-site investigation was conducted on April 29-30, 1998 and was coordinated with representatives of General Motors and ESIS (General Motors Claims Division) to download the air bag sensing and diagnostic module (SDM).

SUMMARY

Crash Site

This crash occurred at a signalized four-leg intersection of a state route and a local road in a rural area during daylight hours. The local road was a two lane asphalt surfaced road with a right turn lane channel that formed near the mouth of the intersection for both the north and southbound directions of travel. A painted and curbed gore area separated the turn channels from the through lanes at the mouth of the intersection. The state route was a five lane divided roadway with designated left turn lanes for the east and westbound directions of travel. The asphalt road surfaces were straight, level, and dry. The posted

speed limits were 56 km/h (35 mph) for the local road and 72 km/h (45 mph) for the state route. At the time of the crash, there were no adverse weather conditions.

Pre-Crash

The driver was transporting her 6 and 8 year old sons to elementary school. Prior to departing her residence, she placed her 3 week old infant daughter in an Evenflo JoyRide child safety seat. The safety seat was equipped with an integral 3-point harness and a head stabilizer collar that provided lateral stability to the infant's head. The driver stated that she did not secure the infant into the child restraint with the integral harness. She subsequently positioned the child safety seat in a rear-facing position on the right front seat cushion and routed the lap belt webbing through the molded loops on the sides on the restraint shell and secured the safety seat with the vehicle's manual belt system. The driver stated that the shoulder belt webbing was positioned to the rear of the child safety seat and was not routed through the slots. In addition, the locking clip that was provided with the child safety seat was not in use.

The driver of the Saturn departed her residence and was traveling in a northerly direction on the local road. She stated that she was traveling at a speed of approximately 48 km/h (30 mph) as she traversed an at-grade railroad crossing on an approach to the four-leg intersection. As she approached the intersection, the driver stated that the overhead traffic signal changed from a red to a green phase for north/southbound traffic flow. Her travel required her to pass straight through the intersection en route to the elementary school **(Figure 3)**.

Figure 3. Pre-crash trajectory of the Saturn SC1.

The driver of the 1986 Chevrolet S-10 pickup truck was traveling in a southerly direction on the local road **(Figure 4)**. The driver was stopped behind two non-contact vehicles at the red signal phase waiting to initiate a left turn (eastbound) onto the state route. As the signal phase changed to green, the lead vehicle and the second vehicle accelerated and completed the left turn. The driver of the 1986 Chevrolet pickup truck accelerated and initiated the left turn.

Figure 4. Trajectory of the 1986 Chevrolet pickup truck.

As the driver of the Saturn approached the mouth of the intersection on the green signal phase, she noted the two non-contact southbound vehicles initiate left turns at the intersection. These vehicles were not a threat to her path of travel. As she continued into the intersection, the driver of the 1986 Chevrolet pickup truck initiated his left turn across the travel path of the Saturn. The driver of the Saturn steered in a counterclockwise direction and braked in an attempt to avoid the crash.

Crash

The front center and right areas of the bumper fascia impacted the right passenger compartment area of the Chevrolet pickup truck. Resultant directions of force were within the 11 o'clock sector for the Saturn

and 2 o'clock for the struck pickup truck. Although no residual crush resulted to the Saturn, the impact fractured the upper segment of the right third of the bumper fascia and fractured the styrofoam energy absorbing material that was positioned between the bumper fascia and the reinforcement bar. The impact produced sufficient deceleration to deployed the Saturn's frontal air bag system. The longitudinal component of the velocity change for the Saturn was estimated at 16 km/h (10 mph). There was no residual crush to the Saturn and the pickup truck was not inspected during the SCI investigation, therefore damage inputs into the WinSMASH program were limited to CDCs which would have resulted in questionable results for this low speed crash. The SDM data provided by General Motors yielded a total velocity change of 17.65 km/h (10.97 mph) for the Saturn.

The Saturn was rotated in a clockwise direction and came to rest near the point of impact within the intersection. The pickup truck was rotated slightly in a clockwise direction, however, the driver brought the vehicle to a controlled stop on the median of the state route at the east leg of the intersection.

Post-Crash

The driver of the Saturn stated that the child safety seat came to rest on the right front seat cushion, in an altered position from its pre-crash attitude. She further noted that the infant was lying in the restraint on her back in the pre-crash position. Immediately following the crash, the driver checked the condition of her children in the rear seat of the vehicle. The two boys were crying, but not injured. She immediately checked the condition of the infant in the right front and found the child in a sleep-like state. The driver stated that she tickled the feet of the infant in an attempt to get a response from her. The infant attempted to cry as the driver covered the infant with a blanket. The driver (mother) noted that the infant had a loud cry, however, at the scene of the crash, the child could not cry in a similar manner.

The driver detected a smoke-like substance within the vehicle and unbuckled the manual belt system from the child safety seat. She exited the left front door and assisted the children from the rear seat. The driver proceeded over to the right front door of the Saturn and removed the child safety seat from the vehicle. She never removed the infant from the child safety seat at the scene of the crash. The child was transported by ambulance to a local trauma center where she was admitted for treatment. The infant expired approximately 28 hours following the crash.

VEHICLE DATA/HISTORY

The subject vehicle was a 1995 Saturn SC1, 2-door, coupe. The vehicle was manufactured on 10/94 and was identified by vehicle identification number 1G8ZF128XSZ (production number deleted). At the time of inspection, the Saturn was impounded by the investigating officer and was stored at a local tow yard. The odometer reading was 93,597 km (58,160 miles).

The Saturn coupe was a four passenger vehicle with no center front or rear seated positions. All four seated positions were equipped with manual 3-point lap and shoulder belt systems. The front belt systems were equipped with adjustable upper anchorages (D-rings) The front bucket seats were manually operable with reclining back rests and integral head restraints.

The Saturn was purchased by the driver as a used vehicle in January, 1997. She stated that the vehicle was involved in a previous crash on January 8, 1998. The driver lost control of the vehicle on a rural segment of an expressway and departed the right side of the road. The left and center frontal area of the Saturn impacted a tree which required replacement of the bumper system, left front fender, and the windshield. The driver noted that the resulting damage from the tree impact appeared more severe than the damage that resulted from this crash, however, the frontal air bag system did not deploy in the previous crash. The vehicle was repaired by a local repair shop at a cost of $1,600. Over-spray was visible on all areas of the Saturn which indicated that the entire vehicle had been repainted.

VEHICLE DAMAGE

Exterior - 1995 Saturn SC1

The 1995 Saturn sustained moderate frontal damage as a result of the crash **(Figure 5)**. The direct contact damage on the bumper fascia began 2.8 cm (1.1") left of center and extended approximately 59.7 cm (23.5") to the right corner. The fascia was fractured in the area below the right headlamp assembly. The contact damage consisted of black paint transfers from the side surface of the pickup truck. As previously noted, there was no residual crash at the bumper reinforcement bar. The styrofoam energy absorbing filler material positioned between the fascia and the aluminum bumper reinforcement bar was fragmented at the impact site.

Figure 5. Frontal damage to the Saturn SC1.

Compression of the fascia and the styrofoam filler resulted in engagement of the leading edge of the right hood edge against the side surface of the pickup truck. Contact damage on the hood edge consisted of laterally oriented abrasions over the area of the right headlamp assembly. There was no residual crush to the hood. The leading edge of the composite right front fender was fractured due to the engagement against the pickup truck. There was no deformation observed to the sub-structure for the right front fender. The Collision Deformation Classification (CDC) for this impact sequence was 11-FZEW-1.

Exterior - 1986 Chevrolet S-10 Pickup Truck

The Chevrolet pickup truck was not available for inspection at the time of the SCI on-site investigation. The vehicle was subsequently inspected by the ESIS representative who provided photographs of the damage profile. Based on these photographs, the direct contact damage began on the forward aspect of the lower right door panel and extended rearward onto the lower right B-pillar and quarter panel. The depth of crush was estimated at 12.7 cm (5.0") located at the leading edge of the right quarter panel. The CDC was estimated at 02-RZEW-2 **(Figure 6)** .

Figure 6. Right side damage to the Chevrolet S-10 pickup truck.

AUTOMATIC RESTRAINT SYSTEM

The 1995 Saturn SC1 was equipped with a supplemental frontal air bag system for the driver and right passenger positions. The system deployed as a result of the Saturn's frontal impact sequence with the right side of the 1986 Chevrolet pickup truck. There were no defects or damage noted to the air bag system.

The air bag system consisted of a driver module that was located within the four-spoke steering wheel rim. A clockspring assembly provided electrical current to the module assembly. The front passenger air bag module was mounted into the right mid aspect of the instrument panel. A single point sensing and diagnostic module (SDM) monitored the air bag system and recorded data pertinent to the crash.

The driver air bag deployed from an I-configuration module cover. The flaps consisted of a vertical tear seam and vertical hinge points which opened in an outward direction toward the 3 and 9 o'clock positions. The common vertical tear seam was 13.7 cm (5.375") in height. The left cover flap had a horizontal width of 10.2 cm (4.0") while the right cover flap was 11.4 cm (4.5") in width. The word AIRBAG was molded into the lower right corner of the right cover flap.

The air bag membrane was tethered by four internal tether straps that were sewn to the face of the bag with a 17.8 cm (7.0") diameter reinforcement. The driver air bag was vented by two 1.9 cm (0.75") diameter vent ports that were located at the 11 and 1 o'clock sectors on the back side of the bag. The vent ports were centered 8.9 cm (3.5") inboard of the peripheral seam. The diameter of the bag was measured at 53.3 cm cm (21.0") in its deflated state. There was no contact evidence (i.e., make-up transfers, tissue, scuff marks) on the driver air bag membrane.

The front right passenger air bag deployed from a mid mount module that was vertically oriented in the right instrument panel **(Figure 7)**. The padded instrument panel above the mid mount module was curved in a brow configuration to direct the deployment path of the bag membrane. The brow protruded 3.2 cm (1.25") rearward of the module cover flap. The single cover flap was oval in shape with an overall height of 12.7 cm (5.0") and width of 30.5 cm (12.0"). The cover flap was hinged at the top horizontal surface and the word AIRBAG was molded into the lower right corner area of the flap. There was no damage or contact evidence to the black vinyl flap.

Figure 7. Overall view of the deployed mid mount front right air bag and the child safety seat.

The passenger air bag membrane was attached to the gas generator which was 21.6 cm (8.5") in width. The top panel of the bag extended rearward 21.6 cm (8.5") and was tapered to the maximum width of the bag at 81.3 cm (32.0"). The face of the front right air bag was 81.3 cm (32.0") in width x 34.3 cm (13.5") in height. The bag fabric was not damaged and no visible contact evidence (i.e., fabric and shell transfers from the child safety seat) was noted to the fabric. The front right

air bag was tethered by a single wide-band tether that limited the rearward excursion of the bag at the location of the tether to approximately 22.2 cm (8.75").

SDM DATA

A representative of General Motors was on-site during this investigation to download the data from the SDM. His preliminary data list from the Tech 1 diagnostic tool indicated that the driver belt system was not in use at the time of the crash, although the driver stated to this investigator that she was belted during the crash. (There was no loading evidence on the belt system to confirm usage.) The SDM summary was received from General Motors which identified the following data points:

- < The SIR warning light was OFF at the time of deployment (no malfunctions).
- < The SIR warning light was not ON prior to the crash (no malfunctions).
- < The air bag system deployed 130 milliseconds after the collision was first detected by the SDM.
- < The maximum change in velocity (Delta V) the SDM recorded was 17.65 km/h (10.97 mph).
- < Normal criteria were met which caused the SDM to command the deployment of the air bags.
- < The crash occurred on ignition cycle number 8063. Five additional ignition cycles had occurred prior to when the SDM was read on 04/29/98.
- < The driver's seat belt system was unlatched at the time the deployment occurred.
- < The SDM recorded a near-deployment event that occurred on ignition cycle number 7977. The maximum Delta V for this event was o.836 km/h (0.329 mph). The driver's seat belt system was unlatched during this event.

CHILD SAFETY SEAT

The child safety seat involved in this crash was an Evenflo JoyRide Car Seat/carrier **(Figure 8)**. The restraint was manufactured on October 21, 1997, and was identified by number 2031D1P2102197 and Model No. 2031D1P2. The driver stated that she received the safety seat as a baby shower gift on March 21, 1998, therefore the restraint had no prior usage. The restraint was designed specifically as a rear-facing restraint for infants up to 9 kg (20 lb).

Figure 8. Overall view of the Evenflo child safety seat.

The child restraint was constructed of a one-piece ABS-type plastic shell with a carrying handle affixed to the mid point of the shell. The handle pivoted in both directions and locked into several detent positions. The driver noted that at the time of the crash, the handle was positioned forward, toward the front of the vehicle. There was no damage and/or contact evidence to the shell or carrying handle of the restraint.

A foam pad provided cushioning to the infant. The padding was covered by a fitted padded fabric cover that wrapped around the edges of the restraint. A warning label was affixed to the fabric cover in the area of the infants head which advised the following **(Figure 9)**:

WARNING

- **DO NOT** place rear-facing child restraint on front seat with air bag.
- **DEATH OR SERIOUS INJURY** can occur.
- The back seat is the safest place for children 12 and under.

Figure 9. Warning labels on the fabric of the child safety seat.

This warning label was 12.7 cm (5.0") in length and 5.4 cm (2.125") in height. A second label that contained the identical language was affixed to a head stabilizer collar that was used by the mother to provide lateral stability to the infant's head. The collar fabric matched the fabric of the liner, however, it was unknown if the collar was supplied with the restraint, or was a separately purchased item. The edge of the fabric liner at the top of the shell (area above the infant's head) contained a blackish abrasion. The abrasion was consistent with contact by the front right air bag module cover flap.

The child safety seat was equipped with a 3-point harness to secure the infant into the restraint. The shoulder belts extended from the shell of the restraint and contained a plastic clip to position the belts together across the chest of a small infant. The belts buckled with a common latchplate into a buckle unit that was affixed to the shell of the restraint. The driver stated during the interview that she failed to buckle the infant into the rear-facing child safety seat, but secured the restraint with the vehicle's manual belt system.

The shell of the restraint was equipped with two molded loops to accept the vehicle's belt system. Although not witnessed at the scene of the crash, the driver stated that she properly routed the lap belt webbing of the manual belt system through the guide loops of the restraint and buckled the belt system into the center mounted buckle assembly. There was no evidence to support restraint usage during the crash. The locking clip that was supplied with the child restraint was not used by the driver in this installation.

MANUAL RESTRAINT SYSTEMS

The Saturn was equipped with manual 3-point lap and shoulder belts at the four outboard seated positions. The front seat belt systems consisted of independent lap and shoulder belt webbings affixed to a common latchplate. The shoulder belt webbing was routed through an adjustable upper anchorage (D-ring). Both D-rings were adjusted to the full up-position at the time of vehicle inspection. The investigating officer noted that although the seat track positions had been moved from the at-crash positions, the D-rings remained in the original positions.

The driver stated that she was properly restrained by the manual belt system. The latchplate did yield evidence of frequent usage and the belt system did not yield evidence of loading during the crash. The SDM data identified the driver's belt system was not buckled at the time of the crash. Therefore, it was concluded that the driver was unrestrained.

The right front belt system was used to restrain the rear-facing child safety seat. The driver stated that the lap belt segment of the webbing was routed through the loops of the restraint and the shoulder belt webbing was positioned to the rear of the restraint, parallel to the seat back. The right front latchplate and lap belt webbing yielded signs of frequent usage, however, there was no loading evidence to confirm usage during this crash. A faint abrasion was visible on the right front D-ring, however, based on the use of the rear-facing child safety seat and the deployment of the front right air bag system, it was doubtful that loading evidence would occur at the D-ring location.

The 6 year old child passenger was seated in the left rear position of the Saturn. He stated to his mother that he was restrained by the manual 3-point lap and shoulder belt system. The exact height and weight of this passenger was unknown, however, he appeared small for his age. It was recommended to the mother that he should sit in a booster seat to provide a "better fit" for the manual belt system. There was no evidence of loading on the belt system.

The 8 year old male passenger was seated in the right rear position of the vehicle. The driver thought he was restrained, however, following the crash, he stated to her that he was not wearing the manual belt system.

DRIVER AWARENESS OF AIR BAG SYSTEM

The driver stated that at the time of purchase, she had two children and did not plan on having an additional child, therefore the four passenger vehicle was sufficient for her driving requirements. During the first year of ownership, she became pregnant and delivered her third child approximately 3 weeks prior to the crash. At the time of vehicle purchase, the driver stated that she was aware that the Saturn was equipped with a frontal air bag system for the driver position, however, over the period of ownership, she became aware of the passenger side air bag system.

The driver stated that as a working mother with two active elementary aged children, she doesn't routinely have time to read the newspapers or watch the news to stay abreast of all current events. She did note that she heard of brief details regarding the risks associated with children and passenger side air bags. She appeared reluctant to discuss her awareness, but did note that she heard something regarding children under 12 should ride in the rear seat and that children must wear their seat belts.

During the interview, the driver stated that the rear-facing child safety seat would not fit in the rear seat area of the vehicle due to the sports car size of the Saturn. She further noted that a newborn should not be out of sight of the mother, therefore the right front seat was a convenient location for the mother (driver) to maintain eye contact with the infant to ensure the well being of the child. The driver further noted that she thought the child safety seat was positioned a safe distance rearward of the front right passenger air bag module. She estimated that a longitudinal distance of 10-15 cm (4-6") was between the position of the child restraint and the air bag module cover.

HUMAN DATA/OCCUPANT DEMOGRAPHICS

Air Bag Vehicle

Driver:	24 year old female
Height*:*	152.4 cm (60.0")
Weight:	74.0 kg (163 lb.)
Manual Restraint Usage:	None
Usage Source:	SDM readout
Eyeware:	None
Trip Plan:	Transporting children to elementary school
Vehicle Familiarity:	14 months
Route Familiarity:	Daily
Mode of Transport From Scene:	Escorted infant in ambulance to the local trauma center
Type of Medical Treatment:	None

Driver Injuries

Injury	Injury Severity (AIS 90)	Injury Mechanism
Soreness over chest	N/A, not AIS codeable	Front left air bag

Driver Kinematics

The driver of the 1995 Saturn was seated in an upright driving posture with the seat track adjusted to a forward track position. Although, the investigating officer noted that both front seat tracks had been moved during post-crash inspection of the vehicle, the track position was based on driver statements and her stature. The driver further stated that she was restrained by the vehicle's manual belt system. The belt system did not yield evidence of loading from the minor severity crash, however, the SDM readout identified no belt usage for the driver's position.

At impact, the driver initiated a forward trajectory and contacted the deploying driver air bag membrane with her thoracic area. No direct injury occurred (i.e., abrasion and/or contusion). The driver did complain of soreness over the chest region that resulted form contact with the deployed air bag.

Right Front Passenger

Age/Sex:	3 week old infant female
Length:	48.3 cm (19.0")
Weight:	4.1 kg (9 .0 lb)
Restraint Type:	Positioned in a rear-facing Evenflo JoyRide child safety seat. Infant was not restrained by the integral harness, however, the restrained was secured by the manual lap belt.

Mode of Transport
From Scene: Ambulance
Medical Treatment: Admitted to a local trauma center for treatment. The infant expired approximately 28 hours following the crash.

Right Front Passenger Injuries

Injury	Injury Severity (AIS 90)	Injury Mechanism
Macerated brain	Severe (140688.4,9)	Expanding front right air bag
Depressed skull fractures of the right occipital/parietal areas	Serious (150404.3,1)	Expanding front right air bag
Subdural hemorrhage, diffuse	Severe (140438.4,6)	Expanding front right air bag
Intraventricular hemorrhage within the third ventricles	Severe (140678.4,9)	Expanding right front air bag
Diffuse subarachnoid hemorrhage of the basilar cisterns	Serious (140466.3,6)	Expanding right front air bag
Skull fractures of the fronto-temporal areas, bilaterally	Moderate (150402.2,2)	Right front seat back support
Scalpular hemorrhage of the right fronto-parietal, right parietal, and right occipital areas	Minor (190402.1,1)	Right front seat back support
1.5 x 1.5 cm contusion over the right temporo-frontal scalp area	Minor (190402.1,1)	Right front seat back support
Bilateral orbital ecchymosis	Minor (297402.1,1, 297402.1,2)	Right front seat back support
Blue discoloration of the right side of the head and face	Minor (190402.1,1, 290402.1,1)	Right front seat back support

Right Front Passenger Kinematics

The infant passenger was positioned in a rear-facing Evenflo JoyRide child safety seat in the right front of the Saturn. The driver stated that the infant was not secured by the integral 3-point harness of the child safety seat, however, she secured the restraint to the vehicle with the lap belt segment of the manual belt system. There was no loading evidence on the belt system to confirm belt usage and no one witnessed the position of the restraint in the vehicle immediately following the crash, therefore, the restraint usage was based solely on driver statements. The right front seat track had been moved prior to SCI inspection. The driver stated that the seat track was adjusted to a rear position. She further noted that a gap of approximately 10-15 cm (4-6") was between the leading edge of the restraint and the mid mount air bag module. This was consistent with the lack of damage to the shell of the restraint. The driver noted that the infant was sleeping on the approach to the intersection with her head positioned in a straight-up attitude.

Figure 10. Profile view of the deployed front right air bag and the rear-facing child safety seat. (Seat track adjusted to the full rear position).

At impact, the supplemental frontal air bag system deployed. The leading edge of the module cover flap contacted the top surface of the child safety seat. A blackish-type transfer was located on the wrap-around aspect of the fabric at the leading edge of the shell of the restraint. There was no evidence of contact on the module cover flap, therefore the contact with the restraint was minimal. The front right passenger air bag membrane expanded from the mid mount module assembly against the upper aspect of the shell of the rear-facing child safety seat **(Figure 10)**. As a result of the contact, the infant sustained depressed skull fractures of the right occipital/parietal areas, a macerated brain, and diffuse subdural and subarachnoid hemorrhage.

The air bag expansion rotated the rear-facing restraint rearward against the seat back support. The infant was not properly restrained within the child safety seat and probably moved rearward as the shell of the restraint contacted the seat back support. The right aspect of the infant's face and scalp impacted the seat back support which resulted in a 1.5 x 1.5 cm contusion over the right temporo-frontal scalp area, bilateral orbital ecchymosis, blue discoloration of the right side of the head and face, skull fractures of the fronto-temporal areas, bilaterally, scalpular hemorrhage of the right fronto-parietal, right parietal, and right occipital areas. The location of theses injuries suggest that the infant's head was turned to her left exposing the right facial area to the seat back support.

Medical Treatment

At the scene of the crash, the driver suspected the infant was seriously injured based on the lack of response and the swelling that began over the right frontal scalp. The child was transported by ambulance to a local trauma center where she was admitted for evaluation and treatment of her injuries. The child was maintained on a respirator and subsequently expired approximately 28 hours following the crash. An invasive autopsy was performed on the day following the death. The injuries identified in this summary were listed in the autopsy report.

Left Rear Passenger

Age/Sex:	6 year old male
Height:	Unknown
Weight:	Unknown
Manual Restraint	
Usage:	3-point lap and shoulder belt
Usage Source:	Driver interview
Mode of Transport	
From Scene:	Private vehicle
Medical Treatment:	Not injured

Left Rear Passenger Injuries

Injury	Injury Severity (AIS 90)	Injury Mechanism
Not injured	N/A	N/A

Left Rear Passenger Kinematics

The left rear child passenger was seated in a normal posture and restrained by the 3-point lap and shoulder belt system as stated by the driver. At impact, the child passenger was probably displaced in a forward direction. Although not supported by loading evidence, the passenger probably loaded the manual belt system which prevented him from contact with interior components and possible injury.

Following the crash, he exited the vehicle unassisted as was transported from the scene by a private vehicle. He was not injured and was not medically treated.

Right Rear Passenger

Age/Sex:	8 year old male
Height:	Unknown
Weight:	Unknown
Manual Restraint	
Usage:	None
Usage Source:	Passenger statement
Mode of Transport	
From Scene:	Private vehicle
Medical Treatment:	Not injured

Right rear Passenger Injuries

Injury	Injury Severity (AIS 90)	Injury Severity
Not injured	N/A	N/A

Right Rear Passenger Kinematics

The right rear child passenger was not wearing the manual 3-point lap and shoulder belt system. The driver assumed the child was restrained, however, he stated to the investigating officer and to this SCI investigator that he was not restrained by the belt system. There was no evidence of contact to the right rear occupant space. The child passenger probably contacted the right front seat back support and rebounded into the rear seat position.

The right rear child passenger exited the vehicle unassisted from the left front door of the vehicle and was transported from the scene by private vehicle. He did not complain of injury and was not medically treated.