

Remote, Redesigned Air Bag Special Study

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Dynamic Science, Inc., Case Number (1998-049-153C)

1998 Chrysler Town And Country

Texas

September/1998

Technical Report Documentation Page

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16. Abstract This remote investigation focused on the redesigned air bag system deployment of a 1998 Chrysler Town and Country minivan. This moderate injury crash occurred in September, 1998 in the evening. The weather was clear and the concrete roadway was dry. The crash occurred in a three legged, "T" shaped intersection of two, two-lane residential streets. The speed limit for the northbound leg is 48 kmph (30 mph). It is controlled by a stop sign at the point where the street dead ends into the east/west street. The road is level at this location. Vehicle 1, a 1998 Chrysler Town and Country minivan (case vehicle) driven by a 60 year old female (163 cm/64 in, 77 kg/170 lb), was traveling north approaching the intersection at a driver estimated speed of 48 kmph (30 mph). The driver was restrained by the available manual lap/shoulder restraint. The front right seat was occupied by a 72 year old male (unknown ht/wt) who was restrained by the available manual lap/shoulder restraint. The driver reported that as they were approaching the stop sign, she believes that the accelerator pedal got stuck and she was unable to stop the vehicle at the intersection. Vehicle 1 traveled through the intersection and struck a curb, damaging the right front wheel (12FRWN3) and deflating the tire (event 1). Vehicle 1 then crossed a residential lawn where the front plane (12FREE5) struck a tree (event 2). The damage extended partially down the right side of the vehicle. Vehicle 1 then continued across the lawn where the front plane (12FREN2) struck a brick wall (event 3) and the vehicle came to final rest. A Delta V could not be computed due to the overlapping damage of events 2 and 3. A barrier speed was calculated, utilizing WinSMASH, to be 28.3 kmph (17.6 mph). As a result of one of the impacts, the supplemental restraint system (driver and passenger side redesigned air bags) of the case vehicle deployed. It is not known which event triggered the air bag deployment. Vehicle 1 came to rest engaged with the damaged brick wall facing northwest. Both occupants sustained incapacitating injuries in the crash and were transported by land to a trauma center where they were treated and released. Vehicle 1 became disabled due to damage sustained in the crash and was towed from the scene.			
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Summary

This remote investigation focused on the redesigned air bag system deployment of a 1998 Chrysler Town and Country minivan. This moderate injury crash occurred in September, 1998 in the evening. The weather was clear and the concrete roadway was dry. The crash occurred in a three legged, "T" shaped intersection of two, two-lane residential streets. The speed limit for the northbound leg is 48 kmph (30 mph). It is controlled by a stop sign at the point where the street dead ends into the east/west street. The road is level at this location.

Vehicle 1, a 1998 Chrysler Town and Country minivan (case vehicle) driven by a 60 year old female (163 cm/64 in, 77 kg/170 lb), was traveling north approaching the intersection at a driver estimated speed of 48 kmph (30 mph). The driver was restrained by the available manual lap/shoulder restraint. The front right seat was occupied by a 72 year old male (unknown ht/wt) who was restrained by the available manual lap/shoulder restraint.



Figure 1. Exterior, Vehicle 1 (Chrysler Town And Country)

Crash Events

The driver reported that as they were approaching the stop sign, she believes that the accelerator pedal got stuck and she was unable to stop the vehicle at the intersection. Vehicle 1 traveled through the intersection and struck a curb, damaging the right front wheel (12FRWN3) and deflating the tire (event 1). Vehicle 1 then crossed a residential lawn where the front plane (12FREE5) struck a tree (event 2). The damage extended partially down the right side of the vehicle. Vehicle 1 then continued across the lawn where the front plane (12FREN2) struck a brick wall (event 3) and the vehicle came to final rest.



Figure 2. Approach to tree impact (event 2)

A Delta V could not be computed due to the overlapping damage of events 2 and 3. A barrier speed

was calculated, utilizing WinSMASH, to be 28.3 kmph (17.6 mph).

As a result of one of the impacts, the supplemental restraint system (driver and passenger side redesigned air bags) of the case vehicle deployed. It is not known which event triggered the air bag deployment.

Vehicle 1 came to rest engaged with the damaged brick wall facing northwest.

Both occupants sustained incapacitating injuries in the crash and were transported by land to a trauma center where they were treated and released.



Figure 3. Approach to wall impact (event 3)

Vehicle 1 became disabled due to damage sustained in the crash and was towed from the scene.

Table 1. Delta V

	Case Vehicle	
	km/h	mph
Total	unknown	unknown
Longitudinal	unknown	unknown
Lateral	unknown	unknown
Barrier speed	28.3	17.6

Exterior of Case Vehicle

Table 2. Vehicle Information

Model year, make and model	1998 Chrysler Town And Country
VIN	1C4GP64L2WB
CDC	12FREE5 (event 2), 12FREN2 (event 3)



Figure 4. Exterior, Vehicle 1 (1998 Chrysler Town & Country)



Figure 5. Exterior, Vehicle 1 (1998 Chrysler Town & Country)

Table 3. Crush Measurements

Plane of Impact	Field L cm/in.	C1 cm/in.	C2 cm/in.	C3 cm/in.	C4 cm/in.	C5 cm/in.	C6 cm/in.
Bumper	134	6	5	13	29	37	31
	52.8	2.4	2	5.1	11.4	14.6	12.2

Interior of Case Vehicle

The interior of the Chrysler Town and Country sustained minor damage from occupant contact. There were no areas of intrusion into the passenger compartment. There was occupant contact evidence to the steering wheel rim, seat belts and air bags.

The case vehicle was equipped with box mounted van type seats in all four seating positions. The front left seat was adjusted between the forward most and middle track positions. The front right seat was adjusted to the rear most track position. Both front seats were equipped with adjustable head restraints which were not damaged. The back seats were not adjustable and were equipped with integral head restraints which were not damaged.

Case Vehicle Occupant Protection Systems

The Chrysler Town and Country minivan was equipped with a redesigned air bag system which consisted of front left and front right air bag modules which housed air bags and depowered inflator units.

The front left air bag was housed in the steering wheel hub and was concealed by asymmetrical H-configuration cover flaps which were not damaged. The circular air bag was equipped with two tether straps and no vent ports. Contact evidence consisting of blood was found primarily on the lower-right quarter of the front of the bag. The bag was not damaged.



Figure 6. Interior, case vehicle. Driver's side air bag.

The front right air bag was housed in the mid-instrument panel position. The H-configuration rectangular cover flaps were not damaged. The rectangular air bag was not equipped with tether straps or vent ports. Contact evidence consisting of blood spots was found on the lower half of the front of the bag. Two large holes and several small holes were found on various locations of the bag. There was no air bag shut off switch present in the vehicle.



Figure 7. Passenger's side air bag



Figure 8. Passenger's side air bag damage

Case Vehicle Occupant Demographics

Table 4. Case Vehicle Occupant(s) Demographics

	Occupant 1	Occupant 2
Age/Sex:	60/Female	72/Male
Seated Position:	Front left	Front right
Seat Type:	Box mounted van type seat, leather covered	Box mounted van type seat, leather covered
Height (cm/in.):	163 64	Unknown
Weight (kg/lbs):	77 170	Unknown
Pre-existing Medical Condition:	Driver requires a walker to enter or exit the vehicle, or to walk alone	None noted
Body Posture:	Normal, upright in seat facing forward	Normal, upright in seat facing forward
Hand Position:	Both on steering wheel	Unknown
Foot Position:	On floor or foot controls	Unknown
Restraint Usage:	Manual lap & shoulder restraint	Manual lap & shoulder restraint
Air bag:	Deployed redesigned air bag system	Deployed redesigned air bag system

Occupant Injuries**Table 5. Case Vehicle Occupant(s) Injuries**

Occupant #	Injury	Injury Severity (AIS)	Injury Mechanism
1	Facial abrasions	1	Air bag
1	Facial contusion	1	Air bag
1	Abrasions inside lips	1	Air bag
1	Left shoulder abrasion	1	Shoulder belt
1	Right knee laceration	1	Knee bolster
1	Bilateral knee abrasions	1	Knee bolster
1	Bilateral knee contusions	1	Knee bolster
1	Right arm contusion	1	Air bag
1	Chest contusion	1	Shoulder belt
1	Abdominal contusion	1	Lap belt
2	Facial abrasion	1	Air bag
2	Chest contusion	1	Air bag
2	Right thumb & finger contusion	1	Air bag
2	Right knee contusion	1	Instrument panel

Occupant Kinematics

The driver (case occupant 01) of the Chrysler Town and Country was seated in a normal upright posture in the front left position of the vehicle. She was wearing the manual lap/shoulder restraint. The front right passenger (case occupant 02) was also seated in a normal upright posture and was wearing the manual lap/shoulder restraint. Seat belt usage evidence was determined through inspection by the investigating police officer at the scene, the presence of blood on the webbing of both front seat belts, and the lack of prominent frontal contact evidence in the vehicle.

The occupants reacted to the impacts by moving forward in response to the 360 degree principle direction of force. As the restraints locked, further forward movement of the occupants was prevented. The driver had moved far enough forward to engage the deploying driver's side air bag-causing the facial and right arm injuries. The occupant's knees came into contact with the knee bolster-causing the knee contusions, abrasions and lacerations. Impact with the locked seat belt caused the left shoulder abrasion, chest contusion and abdominal contusion. The right front passenger also had moved far enough forward to engage the deploying passenger's side air bag-causing the facial abrasion, chest contusion, and finger/thumb contusions. Impact with the right instrument panel caused the right knee contusion.



Figure 9. Interior, case vehicle



Figure 10. Interior, case vehicle

Scene Diagram

