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DEPOWERED AIR BAG REPORT

CASE NUMBER - IN97-057
LOCATION - Texas
VEHICLE - 1998 DODGE NEON
CRASH DATE - November, 1997

Submitted:

June 18, 1998

Contract Number: DTNH22-94-D-17058

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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

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15. <i>Supplementary Notes</i> On-site depowered air bag deployment investigation involving a 1998 Dodge Neon, four-door sedan, with manual safety belts and dual front air bags, and a 1995 Jeep Grand Cherokee, four-door sport utility					
16. <i>Abstract</i> This report covers an on-site investigation of an air bag deployment crash that involved a 1998 Dodge Neon (case vehicle) and a 1995 Jeep Grand Cherokee (vehicle #2). This crash is of special interest because the case vehicle was equipped with a depowered (second generation) air bag system that deployed as a result of the collision events. The case vehicle was northbound on a city street and was approaching an intersection, intending to pass through the intersection and then turn left immediately beyond to enter a driveway. Vehicle #2 was westbound on an intersecting city street, intending to continue west. The case vehicle's driver was traveling approximately 24 km.p.h. (15 m.p.h.) in anticipation of the intended left turn. The crash occurred within the intersection when the front of the case vehicle impacted the left side of vehicle #2, causing the case vehicle's driver and front right passenger supplemental restraints (air bags) to deploy. The case vehicle's driver (18-year-old female) was seated with her seat track located between its middle and rearmost positions. It is unknown if the case vehicle was equipped with a tilt steering wheel. She was restrained by her available, active, three-point, lap-and-shoulder belt. No person sustained any police-reported injury, and no ambulance came to the scene. According to her interview, the case vehicle's driver sustained the following self-reported, minor injuries: a lumbar strain, a sprained left wrist; and contusions on her right lower leg, knee, and thigh.					
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TABLE OF CONTENTS

	<u>Page No.</u>
BACKGROUND	1
CRASH CIRCUMSTANCES	1
CASE VEHICLE	1
CASE VEHICLE OCCUPANT	2
DRIVER'S INJURIES	2
VEHICLE #2	2
SELECTED PHOTOGRAPHS	3
Figure 1: Case vehicle's northbound approach	3
Figure 2: Case vehicle's front and right side (under repair)	3
Figure 3: Case vehicle's front bumper cover (removed)	4
Figure 4: Case vehicle's engine hood (removed)	4
Figure 5: Case vehicle's steering wheel and driver's air bag module	5
Figure 6: Case vehicle's driver side air bag	5
Figure 7: Case vehicle's instrument panel and center console	6

BACKGROUND

This on-site investigation was brought to the NHTSA's attention by NASS/GES sampling activities on December 16, 1997. The crash involved a 1998 Dodge Neon (case vehicle) and a 1995 Jeep Grand Cherokee (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. The investigating police agency was contacted on December 16, 1997. The case vehicle was inspected on December 19, 1997. The scene was inspected on March 3, 1998, and the driver's father was interviewed on March 30, 1998. The case vehicle's driver was taken to a hospital by her family several hours after the crash. The family would not permit release of the medical records, and no official medical data are available.

CRASH CIRCUMSTANCES

The crash occurred in November, 1997, in Texas, at 4:20 p.m., and was investigated by the applicable city police agency. The case vehicle was northbound in the northbound lane of a two-lane, undivided, city street and was approaching an intersection, intending to pass through the intersection and then turn left immediately beyond to enter a driveway (see **Figure 1**). Vehicle #2 was westbound in the westbound lane of an intersecting, two-lane, undivided, city street and intended to continue west. The case vehicle's driver (18-year-old female) was traveling approximately 24 km.p.h. (15 m.p.h.) in anticipation of the intended left turn. The crash occurred within the intersection when the front of the case vehicle impacted the left side of vehicle #2, causing the case vehicle's driver and front right passenger supplemental restraints (air bags) to deploy. The case vehicle's driver did not attempt any avoidance action. The case vehicle rotated counterclockwise and vehicle #2 rotated clockwise, with both vehicles coming to rest in the intersection a short distance from the point of impact. The case vehicle was towed due to disabling damage, but vehicle #2 was driven from the scene. No person sustained any police-reported injury, and no ambulance came to the scene. The family of the case vehicle's driver took her to a hospital several hours after the crash, where she was treated for minor injuries and released. This contractor's request for official medical data was refused.

CASE VEHICLE

The case vehicle was a front-wheel-drive 1998 Dodge Neon, four-door sedan (VIN: 1B3ES47CKTD-----). Anti-lock brakes were an option for this vehicle, but it is not known if this vehicle was so equipped. Direct contact was limited to the right half of the front, including the bumper, grille, the leading edge of the right fender, and the front right corner of the engine hood, with induced damage across the entire front (see **Figures 2, 3 and 4**). The CDC was determined to be **01-FZEW-1**. The ROLDMIS reconstruction program was used on the case vehicle's highest severity impact because vehicle #2 was not inspected. The Total, Longitudinal, and Lateral Delta Vs are, respectively: 17 km.p.h. (11 m.p.h.), -16 km.p.h. (-10 m.p.h.) and -6 km.p.h. (-4 m.p.h.). The steering wheel was not deformed, and there was no evidence that the nonadjustable steering column had moved (see **Figure 5**). The driver's air bag was located in the steering wheel hub with a single flap. The flap opened along the seams, and there was no evidence of damage to the flap or the air bag. The deployed driver's air bag was round with diameter 58 centimeters (23 inches). There was an area of dark-colored scuffs on the front of the air bag in the lower left quadrant (see **Figure 6**). There were no other marks on the air bag, nor any other evidence of occupant contact anywhere in the vehicle.

CASE VEHICLE OCCUPANT

The case vehicle's driver [18-year-old female, not pregnant, 173 centimeters and 82 kilograms (68 inches, 180 pounds)] was restrained by her available, manual, three-point, lap-and-shoulder safety belt. The safety belt's upper anchorage adjustment was in the down-most position. There was no other occupant in the case vehicle. The driver's pre-crash posture is unknown. The driver's seat track was adjusted between its middle and rear-most positions, and the seat back was slightly reclined. There was no evidence of any seat or track failure. Although the driver did not sustain any police reported injuries and declined treatment at the scene, her family took her to a hospital emergency room later, where she was treated and released. Her self-reported injuries consist of a lumbar strain, a sprain of the left wrist, and an area of contusion along her right lower leg, knee, and thigh.

CASE VEHICLE DRIVER INJURIES

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
1	Strain lower back, not further specified	640678.1 minor	Noncontact, impact force	Possible	Interviewee (relative)
2	Sprain left wrist	751420.1 minor	Air bag, driver's side	Possible	Interviewee (relative)
3	Contusion {bruise} right thigh, location not specified	890402.1 minor	Center floor-mounted console	Possible	Interviewee (relative)
4	Contusion {bruise} right knee and lower leg	890402.1 minor	Center instrument panel and below	Probable	Interviewee (relative)

The case vehicle's driver did not attempt any avoidance maneuvers. The impact deployed the air bags and caused her to move forward and to the right, toward the center of the instrument panel. Because she was wearing her lap-and-shoulder safety belt, her motion was restricted, and she encountered the deployed air bag in an upright posture. Because the air bag cushioned her, she did not load the safety belt webbing with the full force of her inertial motion. Her right leg impacted the rigid plastic knee bolster on the lower edge of the center instrument panel and the side of the center console in the driver's foot well, causing the contusions in her right knee area. The driver's air bag impacted her left wrist, causing the sprain. The combined effects of the impact and subsequent counterclockwise rotation could have caused the alleged lumbar strain.

VEHICLE #2

Vehicle #2 was a four wheel drive, 1995 Jeep Grand Cherokee, four-door sport utility vehicle (VIN: 1J4GZ78Y8SC-----). Vehicle #2 was equipped with four wheel anti-lock brakes. This vehicle could not be located and was not inspected. Based on the police diagram and the damage to the case vehicle, vehicle #2 was hit in the left front fender area. The ROLDMIS reconstruction program was used on vehicle #2's highest severity impact. The Total, Longitudinal, and Lateral Delta Vs are, respectively: 12 km.p.h. (8 m.p.h.), -11 km.p.h. (-7 m.p.h.), and +4 km.p.h. (+3 m.p.h.).

SELECTED PHOTOGRAPHS



Figure 1: Case vehicle’s northbound approach toward impact within the intersection (case photo #1)



Figure 2: Case vehicle’s front and right side with bumper cover, grille, hood, and right fender removed (case photo #16)

SELECTED PHOTOGRAPHS (Continued)



Figure 3: Closeup of direct contact on front right corner of case vehicle's bumper cover (case photo #19)

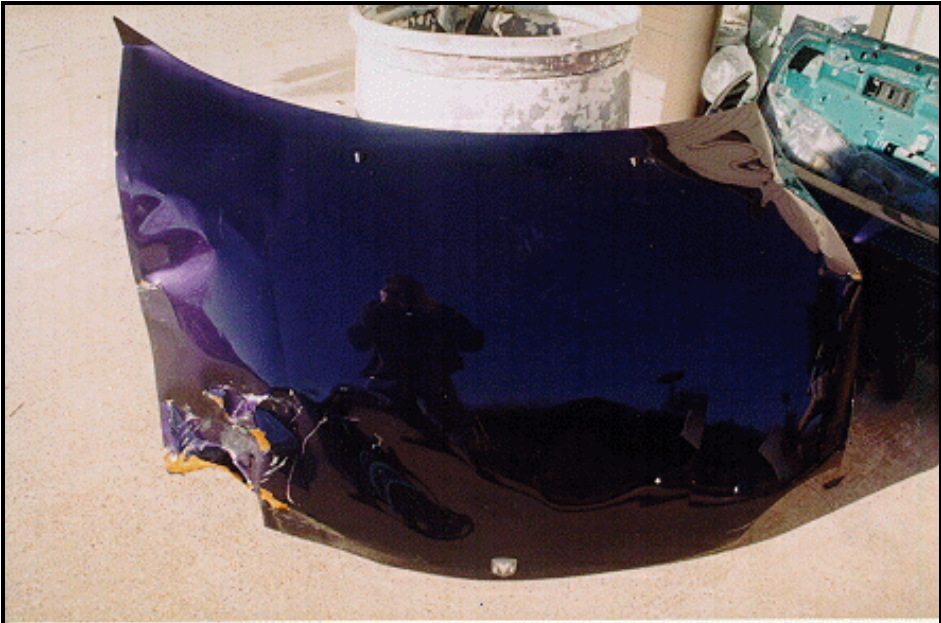


Figure 4: Case vehicle's engine hood; note: damage to front right corner area (case photo #20)

SELECTED PHOTOGRAPHS (Continued)



Figure 5: Case vehicle's steering wheel and driver's air bag module (case photo #23)

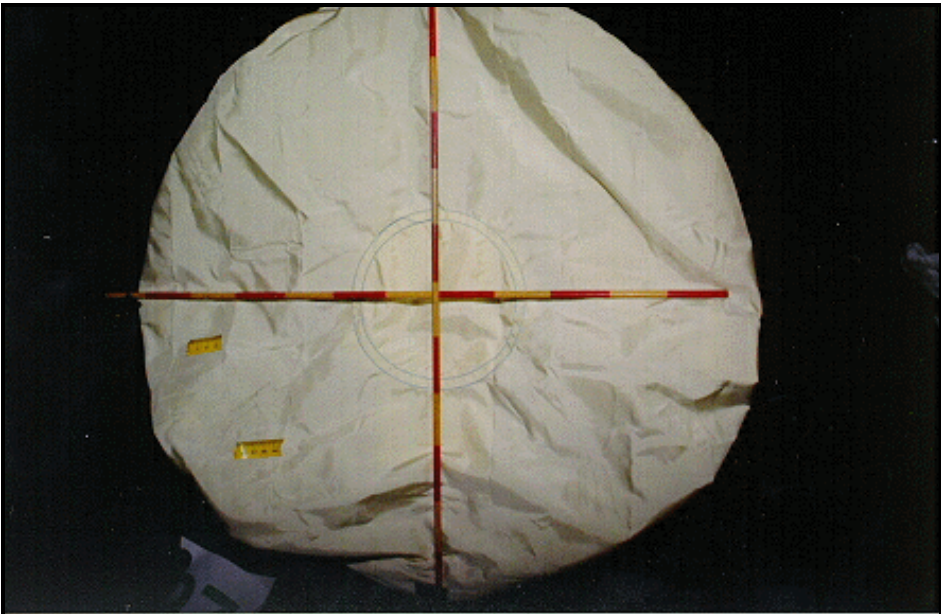


Figure 6: Case vehicle's driver side air bag; note: contact evidence in left lower quadrant (case photo #27)

SELECTED PHOTOGRAPHS (Continued)



Figure 7: Case vehicle's instrument panel, center console, and deployed air bags (case photo #22)