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DEPOWERED AIR BAG REPORT

CASE NUMBER - IN98-005
LOCATION - Texas
VEHICLE - 1998 FORD RANGER SUPERCAB
CRASH DATE - November, 1997

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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.

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15. <i>Supplementary Notes</i> On-site depowered/second generation air bag deployment investigation involving a 1998 Ford Ranger XL Supercab that impacted a metal overhead door on a parking structure.			
16. <i>Abstract</i> This report covers an on-site investigation of an air bag deployment crash. This case is of special interest because the case vehicle (1998 Ford Ranger XL Supercab) was equipped with depowered/second generation air bags that deployed as a result of the crash events. The case vehicle was traveling east on the access ramp to a parking structure. The parking structure was closed, with a metal overhead door drawn down across the entrance. The case vehicle's driver drove straight into the closed door. The front of the case vehicle impacted the door, causing the case vehicle's driver and front right passenger air bags to deploy. It is not known if the driver attempted any avoidance maneuver. The case vehicle broke through the door and came to rest inside the parking facility. The case vehicle was towed due to damage. The case vehicle's driver (35-year-old male) was not restrained by his available manual three-point lap-and-shoulder safety belt. There was no other occupant in the case vehicle. He did not sustain any police reported injuries. The driver told the investigating police officer that he was on medication and the officer called an ambulance to the scene. The driver was transported to a detoxification center.			
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Background

This on-site investigation was brought to the NHTSA's attention on January 2, 1998 by NASS/CDS sampling activities. The crash involved a 1998 Ford Ranger pickup truck (case vehicle) that ran into a fixed object. 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. The case vehicle's driver (sole occupant) did not sustain any police reported injury. The investigating police agency was contacted on January 8, 1998. The case vehicle was inspected on January 13, 1998, and the scene was inspected on March 17, 1998. The air bags had been cut out of the case vehicle and were not inspected. The investigation revealed that this crash was an attempted suicide. The case vehicle's driver subsequently committed suicide successfully (drug overdose) several days after the crash. The SCI investigator interviewed the driver's mother and a counselor who was familiar with the case.

Crash Circumstances

The crash occurred in November, 1997, at 12:00 p.m., in Texas and was investigated by the applicable municipal police agency. The case vehicle was traveling east on the two-lane access ramp to a parking structure. The parking structure was closed, with a metal overhead door drawn down across the entrance. The case vehicle's driver drove straight into the closed door. The front of the case vehicle impacted the door, causing the case vehicle's driver and front right passenger air bags to deploy. It is not known if the driver attempted any avoidance maneuver. The case vehicle broke through the door and come to rest inside the parking facility. The case vehicle was towed due to damage.

Case Vehicle

The case vehicle was a 1998 Ford Ranger XL, 4x2, extended Supercab pickup truck (VIN: 1FTYR14U5WP-----). When the case vehicle was inspected, the front bumper, grille, and headlight assemblies had been removed and both air bags had been cut out. Both doors remained closed and operational, and there was no crash-induced damage to any of the glazing. The backlight consisted of three glazing panels with the middle panel sliding horizontally to open it. The left fixed glazing panel of the backlight was broken out at the time of the inspection, but this damage was not due to the crash events. There was direct contact damage, consisting of light abrading and minor deformation, along the entire width of the leading edge of the hood and on the leading edges of both fenders, with minor induced buckling of the fenders. Crush measurements were obtained from the exposed frame rail ends, with a maximum crush of 14 centimeters (5.5 inches) on the left. The CDC was determined to be **12-FDEW-1**. Because the parking garage door yielded upon impact, the SMASH reconstruction program was used to calculate barrier equivalent speed. The computations indicate barrier equivalent speed 22 km.p.h. (14 m.p.h.). This was a crash of minor severity.

The case vehicle was fitted with a split bench seat with folding backs. The seat track was adjusted at the rearmost position. The seat back was slightly reclined and retained its precrash adjustment. There was no evidence of seat or track failure. The steering column was not adjustable, and there was no evidence that the steering column had moved. In addition, this extended cab pickup had inward-facing jump seats behind the front seat row.

The driver's air bag was located in the steering wheel hub, with cover flaps in the H-configuration. The module cover flaps opened along the seams and there was no evidence of damage to the cover flaps. The front right passenger air bag was located in the middle of the instrument panel. The single flap opened along the seams with no evidence of damage to the cover flap. Both air bags were cut off and removed. The vehicle was fitted with manual three-point lap-and-shoulder safety belts in the two front seat outboard positions, neither of which showed any signs of use in this nearly-new vehicle. There was no evidence of occupant contact anywhere in the vehicle.

Case Vehicle Occupant

The case vehicle's driver [35-year-old male, 180 centimeters, 77 kilograms (71 inches, 170 pounds)] and was not restrained by his available manual three-point lap-and-shoulder safety belt. There was no other occupant in the case vehicle. He did not sustain any police reported injuries. The driver told the investigating police officer that he was on medication, and the officer called an ambulance to the scene. The driver was transported to a detoxification center. The driver was not interviewed, but two persons who were familiar with the driver's circumstances indicated that he did not sustain any injuries as a result of the crash.

The following discussion of the driver's response to the impact is based on the limited information obtained during the investigation and the principles of occupant kinematics. It is assumed that the driver was in a normal driving posture (i.e., with his back against the seat back, both hands on the steering wheel, his left foot on the floor, and his right foot on the accelerator pedal) and that he did not attempt any avoidance action. The driver steered straight into the closed garage door. The impact caused the driver and front right passenger air bags to deploy and caused the unrestrained driver to move forward. He encountered the deployed air bag with his chest and face, which cushioned his forward motion such that he did not impact the steering wheel. As the vehicle came to rest in the interior of the parking structure, the driver rebounded away from the air bag and came to rest in the driver's seat.

Object Contacted

The overhead garage door was approximately 9 meters (30 feet) wide and 3.5 meters (12 feet) high. The damaged door had been replaced with an identical new installation. The door was made of longitudinal steel panels approximately 7.5 centimeters (3 inches) tall that were hinged along the top and bottom and traveled in a track on the sides. There was no sill or latch to engage the bottom edge of the door where it rested on the driveway. The evidence suggests that the case vehicle impacted the door with the front right corner of the vehicle aligned approximately at the center of the door. In this configuration, the left side of the pickup was close to the left edge of

the door. As the case vehicle impacted the door, the unsupported center of the door yielded more easily than the left side, resulting in greater crush on the left of the case vehicle. The impact caused the door panel to separate from the track on the left and the forward motion of the vehicle pushed the door structure aside as the vehicle traveled into the interior of the parking structure.

Selected Photographs



Figure 1: Case vehicle's eastbound approach toward impact with an overhead door that is raised in this view (case photo #1)



Figure 2: Object contacted--replacement door identical to original door (case photo #2)

Selected Photographs (continued)



Figure 3: Front and left side of case vehicle (case photo #5)



Figure 4: Front and right side of case vehicle (case photo #12)

Selected Photographs (continued)



Figure 5: Case vehicle's steering wheel and cover flaps; note: driver air bag removed (case photo #13)



Figure 6: Case vehicle's front right cover flap; note: air bag removed (case photo #16)