On-Site 15-Passenger Van Investigation
Dynamic Science, Inc. (DSI), Case Number DS08037
1982 Dodge B350 Maxi Van
Arizona
October 2008

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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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16. Abstract

This on-site investigation focused on a 1982 Dodge B350 15-passenger van that was involved in a rollover. The single vehicle crash occurred in October 2008 at 1430 hours. The Dodge was occupied by a male driver and 17 additional passengers. The driver and passengers were members of a church group and were returning from a church service in a nearby town. The van was traveling eastbound when the right rear tire experienced a tread separation. The driver lost control of the vehicle, traveled off the right side of the roadway, returned to the roadway and traveled off the left side of the roadway, returned to the roadway once again and initiated a left side leading rollover. The Dodge rolled two quarter turns and came to rest on its roof. Prior to the arrival of emergency personnel, all of the van's occupants exited the vehicle either on their own or with the assistance of other passengers. A total of six ambulances and one helicopter responded to the crash.

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Dynamic Science, Inc.
Crash Investigation
Case Number: DS08033

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BACKGROUND

This on-site investigation focused on a 1982 Dodge B350 15-passenger van that was involved in a rollover **(Figure 1**). The single vehicle crash occurred in October 2008 at 1430 hours. The Dodge was occupied by a male driver and 17 additional passengers. The driver and passengers were members of a church group and were returning from a church service in a nearby town. The van was traveling eastbound when the right rear tire blew out. The driver lost control of the vehicle, traveled off the right side of the roadway, returned to the roadway and traveled off the left side of the roadway, returned to the roadway once again and initiated a left side leading rollover. The Dodge rolled two quarter turns and came to rest on its roof. Prior to the arrival of emergency personnel, all of the van's occupants exited the vehicle either on their own or with the assistance of other passengers. A total of six ambulances and one helicopter responded to the crash.

Figure 1. Subject vehicle, 1982 Dodge B350 Maxi Van

This investigation was initiated by the National Highway Traffic Safety Administration (NHTSA) Office of Defects Investigation (ODI) in response to an internet news article that reported a tire blowout and subsequent vehicle rollover. On October 21, 2008 DSI was notified of the case with instructions to determine if any information about the tires was available. The investigating police agency was contacted and the police report was requested. The police agency did not do an in-depth investigation and no tire information was collected. The subject vehicle was located at a private tow yard. The tow yard was contacted and permission to inspect the vehicle was obtained. This information was forwarded to NHTSA and DSI was assigned the case on October 23, 2008. The vehicle inspection was completed on October 24, 2008. The scene inspection was conducted on November 4, 2008.

SUMMARY

Crash Site

This single vehicle crash occurred on an east/west, two-lane, undivided state highway. The roadway was level and the asphalt surface was dry. The travel lanes were separated by a dashed yellow line and the road edges were bordered by white fog lines. There were gravel shoulders on the north and south sides of the roadway. The south shoulder measured 2.7 m (9 ft) and the north shoulder measured 3.1 m (10 ft). The temperature was 36.2 degrees C (97.2 degrees F), the humidity was 13%, and the winds were calm. The speed limit was 89 km/h (55 mph).

Pre-Crash

In addition to the 47-year-old male driver, there were 17 passengers on board the Dodge. The van was traveling eastbound at a right front passenger reported speed of 89-97 km/h (55-60 mph). The

driver and passengers were members of a church group and were returning from a church service in a nearby town. The van belonged to the church. The police report did not list all of the passengers involved the crash and the police injury severity was unknown for all of the occupants except the driver. A copy of the fire department's report of the crash was obtained but it did not list all the patient's names or their contact information. The positioning of the occupants was based on interview information from the right front passenger, third row right passenger, and EMS personnel.

As the Dodge traveled eastbound, the right rear tire lost air and began marking the roadway (**Figure 2**). There were no indications that it contacted any foreign objects. The vehicle traveled 36.2 m (119 ft) before there was a change in the tread pattern (**Figure 3**). The marking indicated that a portion of the tread had separated from the tire at that point. The vehicle traveled a total of 83.5 m (274 ft) from the point where the tire initially began marking as the vehicle partially departed the south side of the roadway. The driver steered to the left and the vehicle returned to the roadway. The vehicle crossed the center line and the driver steered to the right. As the vehicle reentered the eastbound travel lane the drive steered back to the left. The vehicle departed the north side of the roadway and the driver steered back the right. The distance from the south side road departure to the north side departure was 101.1 m (331 ft).

Figure 2. Eastbound approach to area of tread separation

Figure 3. Area of tread pattern change

Figure 4. North side road departure and rollover

Crash

The Dodge began a clockwise rotation and traveled 21.6 m (71 ft) before the left side tires engaged the shoulder surface and road edge (**Figure 4**). The vehicle tripped and initiated a left side leading rollover. The vehicle rolled two quarter turns and came to rest on its roof facing southeast (**Figure 5**). The total distance from the point where the right rear tire began marking to final rest measured 234.3 m (769 ft).

Post-Crash

Prior to the arrival of emergency personnel, all of the vehicle's occupants exited the vehicle either on their own or with the assistance of other passengers. A total of six ambulances and one helicopter responded to the crash. The first ambulance was dispatched at 1445 hours and arrived on scene at 1453 hours, 23 minutes post-crash. The helicopter was dispatched at 1503 hours and arrived on scene at 1511 hours, 41 minutes post-crash. Twelve passengers were transported from the scene by ground, one by air. The distance from the crash scene to the trauma center was approximately 58 km/h (36 miles). The first ground ambulance arrived at the trauma center at 1555 hours; the helicopter arrived at 1544 hours. Several passengers refused to be transported.

The vehicle was towed from the scene due to damage and was later sold to a private party.

Vehicle Data - 1982 Dodge B350 Maxi van

The 1982 Dodge B350 Maxi van was identified by the Vehicle Identification Number (VIN): 2B5WB31R6CKxxxxxx. The Dodge was equipped with an 8-cylinder 5.2-liter engine, 3-speed automatic transmission, and rear-wheel drive. The odometer was recorded as 2,230 km (1386 miles) and had presumably reset to 0 at least one time.

The Dodge was equipped with Goodyear Workhorse 9.50-16.5LT tires on the front. The tire manufacturer's maximum tire pressure was 517 kPa (75 psi). The left rear was equipped with a Denman Express 9.50-16.5LT tire with a maximum pressure of 414 kPA (60 psi). The tire was debeaded and flat. There was a 51 cm (20 in) scuff along the sidewall.

The right rear was equipped with a BF Goodrich

Figure 5. Look back view from final rest (west)

Figure 6. Right rear tire (outboard aspect)

Figure 7. Right rear tire (inboard aspect)

Phantom A/T 9.50R16.5 tire[1] with a maximum pressure of 448 kPA (65 psi). The tire was made for Discount Tires but has been discontinued. The Tire Identification Number (TIN) for the tire was BFXL AEDD 3100, indicating that it was manufactured during the 31st week of 2000. The tire was located in the rear seat of the vehicle and was badly damaged. Approximately 92 cm (36.2 in) of the tread had separated and was missing. The tire specifications indicated a circumference of 233 cm (91.7 in), so the missing section represented approximately 39% of the total tread. On the outboard aspect of the tire, within the area of the missing tread, there were four 22 cm (8.7 in) long tears that ran from the tread to the rim (**Figure 6**). On the inboard aspect of the tire, there was chunking and abrading along the entire sidewall (**Figure 7**). The shoulder of the tread was damaged along the entire circumference. There were at least 16 tears from tread to bead. The interior surface of the tire was examined and there no indications of punctures or tears other than those related to the tread separation and air-out. All the tires were mounted on steel rims. The valve stems for each tire were examined and there were no indications of damage. The driver reported that the front tires had been recently replaced, but the rears were not. He did not know when the rear tires had last been replaced. The driver's door was jammed so the tire label was not visible. According to a 1982 Dodge B350 shop manual, the vehicle manufacturer's recommended tire pressure was 552 kPa (80 psi).

The specific tire information was as follows:

Position	Measured Pressure	Measured Tread Depth	Restricted	Damage
LF	310 kPa (45 psi)	10 mm (12/32 in)	No	None
LR	Tire flat	9 mm (11/32 in)	No	Debeaded.
RR	Tire flat	9 mm (11/32 in)	No	Debeaded, cut, abraded.
RF	345 kPa (50 psi)	10 mm (12/32 in)	No	None

The Dodge was configured to accommodate 15 passengers, including the driver, with a 2-3-3-3-4 seating configuration. The front seats were box type van seats with after-market seat covers. The remaining seats were bench seats.

[1]Rim size 16.5" was phased out

Vehicle Damage

Exterior Damage

The Dodge van sustained moderate left side and roof damage due to the rollover (**Figure 8**). The direct damage began along the top of the windshield and extended rearward along the entire roof. The damage width measured 150 cm (59) laterally. The maximum crush sustained during the rollover was measured at the left B-pillar and measured 10 cm (3.9 in) laterally and 9 cm (3.5 in) vertically. The Collision Deformation Classification (CDC) for the rollover was 00TZDO2.

Figure 8. Rollover damage, subject vehicle

The roof was deformed at some point after the crash, probably in an attempt to move the vehicle with a fork lift. The right roof was separated from the roof rail. There was a 397 cm (156.2 in) long gap that extended from the A-pillar to the E-pillar. The maximum gap was located at the C-pillar and measured 23 cm (9 in). The left roof was separated from the roof rail. There was a 163 cm (64.1 in) long gap that extended from the A-pillar to the C-pillar. The maximum gap was located at the A-pillar and measured 24 cm (9.4 in).

Figure 9. Tire-related right rear damage

The Dodge also sustained damage as a result of the tire blowout (**Figure 9**). There was 156 cm (61.4 in) of direct contact to the rear fender area that began 63 cm (24.8 in) rearward of the right rear axle. The wheel well was bowed outward 9 cm (3.5 in). At the top of the wheel well there were tears in the metal that measured 40 cm (15.7 in) long by 29 cm (11.4 in) wide. The interior of the vehicle was visible through the tears. The damage was located to the right of row 4 (**Figure 10**).

Figure 10. Torn area of wheel well (right of row 4)

Interior Damage

The Dodge van sustained moderate interior damage as a result of passenger compartment intrusion. The left roof side rail, window frame, B-pillar and left door sustained lateral intrusion (**Figure 11**). There was vertical intrusion to the left B-pillar and left side rail. There was probably roof intrusion, but damage was masked by the post-crash deformation of the roof (forklift).

Figure 11. Left side intrusion

The driver's door and rear doors were jammed shut. The windshield glazing was cracked and out of place. The left side glazing was disintegrated, while the right side glazing remained intact.

The left lower instrument panel was cracked, probably due to occupant contact. The window crank knobs for both front doors were missing. The left B-pillar cover was cracked. There were scuffs located along the back of rows 2 and 3. The headliner was missing. The interior of the vehicle was covered with a variety of food items that were in a state of decay at the time of the vehicle inspection.

The specific passenger compartment intrusions were documented as follows:

Position	Intruded Components	Magnitude of Intrusion	Direction
Front row left	Roof side rail	15 cm (5.9 in)	Lateral
Front row left	Window frame	14 cm (5.5 in)	Lateral
Front row left	B-pillar	14 cm (5.5 in)	Lateral
Front row left	Door/rear upper quadrant	2 cm (0.8 in)	Lateral
Front row left	Roof	Unknown	Vertical
Second row left	Roof	Unknown	Vertical

Manual Restraints

The 1982 Dodge van was equipped with 3-point manual lap and shoulder belts for the front two seating positions. The remaining seats were configured with manual lap belts. All the belts exhibited evidence of historical usage and were stiff with age. The driver's belt was restricted in the used position by the door side panel. The plastic fascia surrounding the buckle was cracked and broken away. The front right passenger belt did not show any signs of loading, but the plastic fascia surrounding the buckle was cracked and broken away. The second row left belt was missing the plastic cover for the latch. The second row right belt was missing the plastic cover for the latch. The third row right seat was covered in a dark fluid deposit that might have been blood. The fifth row middle (l) belt was buckled at the time of the inspection. The fifth row middle (2) belt was missing the plastic cover for the latch. There were no indications of loading to any of the lap belts.

Rollover Dynamics

The Dodge was equipped with a 3-speed automatic transmission and rear-wheel drive. The Static Stability Factor and Rollover Resistance Rating for this was not available. There were a total 18 occupants on board. NHTSA research has shown that 15-passenger vans have a rollover risk that increases dramatically as the number of occupants increases from fewer than 5 to more than 10[2]. The rollover rate for vans loaded with more than 10 passengers is three times greater than that for a van loaded with fewer than 10 passengers.

As the right rear tire lost air and the tread separated, the Dodge traveled to the right and partially departed the right side of the roadway. The driver steered to the left and the vehicle returned to the roadway. The vehicle crossed the center line and the driver steered to the right. As the vehicle reentered the eastbound travel lane the drive steered back to the left. The vehicle departed the north side of the roadway and the driver steered back the right. The distance from the south side road departure to the north side departure was 101.1 m (331 ft). The vehicle initiated a clockwise rotation and traveled 21.6 m (71 ft) before the left side tires engaged the shoulder surface and road edge. The vehicle tripped and initiated a left side leading rollover. The vehicle rolled two quarter turns and came to rest on its roof heading southeast. The total distance from the point where the right rear tire began marking to final rest measured 234.3 m (769 ft). The estimated distance from the trip point to final rest was 8 m (26 ft).

[2]NHTSA (2002). NHTSA Repeats Rollover Warning to Users of 15-passenger Vans. NHTSA 27-02.

OCCUPANT DEMOGRAPHICS

	Driver	Front Row Middle (02)	Front Row Right (03)
Age/Sex:	47/Male	7/Female	78/Female
Seated Position:	Front left	Between front seats	Front row right
Seat Type:	Box mounted	None	Box mounted
Seat Track Position:	Between middle and full forward	N/A	Full rearward
Height:	Unknown	Unknown	163 cm (64 in)
Weight:	Unknown	Unknown	84 kg (185 lbs)
Alcohol/Drug Involvement:	None	N/A	N/A
Body Posture:	Upright	Unknown	Upright
Hand Position:	Both hands on steering wheel.	Unknown	Unknown
Foot Position:		Unknown	Unknown
Restraint Usage:	Lap and shoulder belt	None	Lap and shoulder belt

	Second Row Left (04)	Second Row Left (05)	Second Row Middle (06)	Second Row Right (07)
Age/Sex:	Unknown age/ Adult Female	14/Male	13/Female	47/Female
Seated Position:	Second row left	Second row left	Second row middle	Second row right
Seat Type:	Bench	Bench	Bench	Bench
Height:	Unknown	Unknown	Unknown	Unknown
Weight:	Unknown	Unknown	Unknown	109 kg (240 lbs)
Body Posture:	Unknown	Unknown	Unknown	Unknown
Hand Position:	Unknown	Unknown	Unknown	Unknown
Foot Position:	Unknown	Unknown	Unknown	Unknown
Restraint Usage:	None	None	None	None

	Third Row Left (08)	Third Row Middle (09)	Third Row Right (10)
Age/Sex:	15/Female	14/Female	60/Male
Seated Position:	Third row left	Third row middle	Third row right
Seat Type:	Bench	Bench	Bench
Height:	Unknown	Unknown	178 cm (70 in)
Weight:	Unknown	Unknown	140 kg (307 lbs)
Body Posture:	Unknown	Unknown	Unknown
Hand Position:	Unknown	Unknown	Unknown
Foot Position:	Unknown	Unknown	Unknown
Restraint Usage:	None	None	None

	Fourth Row (11)	Fourth Row (12)	Fourth Row (13)	Fourth Row (14)
Age/Sex:	14/Female	16/Female	12/Female	10/Female
Seated Position:	Fourth Row	Fourth Row	Fourth Row	Fourth Row
Seat Type:	Bench	Bench	Bench	Bench
Height:	Unknown	Unknown	Unknown	Unknown
Weight:	Unknown	Unknown	Unknown	59 kg (130 lbs)
Body Posture:	Unknown	Unknown	Unknown	Unknown
Hand Position:	Unknown	Unknown	Unknown	Unknown
Foot Position:	Unknown	Unknown	Unknown	Unknown
Restraint Usage:	None	None	None	None

	Fifth Row (15)	Fifth Row (16)	Fifth Row (17)	Fifth Row (18)
Age/Sex:	9/Male	9/Male	7/Male	Unknown/Male
Seated Position:	Unknown	Unknown	Unknown	Unknown
Seat Type:	Bench	Bench	Bench	Bench
Height:	Unknown	Unknown	Unknown	Unknown
Weight:	Unknown	Unknown	Unknown	Unknown
Body Posture:	Unknown	Unknown	Unknown	Unknown
Hand Position:	Unknown	Unknown	Unknown	Unknown
Foot Position:	Unknown	Unknown	Unknown	Unknown
Restraint Usage:	None	None	None	None

OCCUPANT KINEMATICS

Driver Kinematics

The 47-year-old driver of the Dodge was seated in an unknown posture and was wearing the 3-point manual lap and shoulder belt. The Dodge was traveling eastbound when the tire separation began. The vehicle departed the roadway on the south side. The driver steered to the left to bring the vehicle back onto the roadway. The vehicle crossed the center line and the driver steered to the right. As the vehicle re-entered the eastbound travel lane the drive steered back to the left. The vehicle departed the north side of the roadway and the driver steered back the right. As the vehicle was being steering left and right, the driver responded laterally to the steering inputs. As the vehicle began a clockwise rotation, the driver was displaced to the left. The vehicle tripped and initiated a left side leading rollover. The vehicle rolled two quarter turns and came to rest on its roof. The driver probably contacted the left door panel during the rollover. The driver was able to exit the vehicle under his own power and did not report any injuries. Treatment was recommended by EMS personnel because of the nature of the crash, but the driver refused.

Front Middle Passenger Kinematics (02)

The 7-year-old female was seated on a 4-leg plastic chair that had been placed between the two front seats. She probably came out of the seat during the left and right steering maneuvers and ended up on the roof after the rollover. It was reported that she complained of bilateral knee pain. It was not known how she got out of the vehicle. She was transported from the scene to a local hospital for treatment.

Front right passenger kinematics (03)

The 78-year-old female front right passenger was seated in an unknown posture and was wearing the 3-point manual lap and shoulder belt. As the vehicle began steering from side to side, this

occupant was displaced laterally but remained in her seated position. As the vehicle began a clockwise rotation and the vehicle rolled to the left, she was displaced to the left. This occupant was able to exit the vehicle through the windshield with some assistance. She sustained an abdominal injury from the seat belt webbing and a foot injury from an unknown source. She also stated that she burned her scalp after coming into contact with battery acid. She was transported to a local trauma center where she was treated and released.

Second Row Left Passenger Kinematics (04)

The unknown age adult female was seated in the second row middle seat position in an unknown posture and was unbelted. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. It was unknown she exited the vehicle or if she was injured. Based on ambulance transport records, she was not transported from the scene.

Second Row Middle Passenger Kinematics (05)

The 14-year-old male passenger was seated in the second row left seat position in an unknown posture and was unbelted. As the vehicle was steered from side to side, he moved laterally in response to the steering maneuvers. As the vehicle rolled, he likely came out of his seat and came to rest on the roof. It was unknown if he was injured or how he exited the vehicle. He was transported to a local trauma center for examination and treatment.

Second Row Middle Passenger Kinematics (06)

The 13-year-old female passenger was seated in an unknown posture and was not wearing the manual lap belt. As the vehicle was steered from side to side, she moved laterally in response to the steering maneuvers. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. It is not known how she exited the vehicle. She complained of back pain and was transported to a local trauma center for treatment.

Second Row Right Passenger Kinematics (07)

The 47-year-female second row right passenger was seated in an unknown posture and was not wearing the available lap belt. As the vehicle began steering from side to side, this occupant was displaced laterally. It was not known if she came out of her seat at this time. As the vehicle began a clockwise rotation, she was displaced to her left. She came out of her seat and contacted the roof with her head during the rollover. She was able to exit the vehicle with some assistance. She sustained a small abrasion to her left scalp. She was examined at the scene and denied any loss of consciousness, headache, dizziness, or nausea. The fire department reported a Glasgow Coma Score (GCS) of 13-15. She indicated that she would seek her own medical attention later and was not transported.

Third Row Left Passenger Kinematics (08)

The 15-year-old female third row left passenger was seated in an unknown posture and was not wearing the available lap belt. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. Her means of extrication and injury status were not known.

Third Row Middle Passenger Kinematics (09)

The 14-year-old female passenger was seated in an unknown posture and was not wearing the manual lap belt. As the vehicle was steered from side to side, she moved laterally in response to the steering maneuvers. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. This occupant remembered the entire incident and had exited the vehicle under her own power prior to EMS arrival. She complained of head and neck pain and was transported to a local trauma center for treatment.

Third Row Right Passenger Kinematics (10)

The 60-year-old male third row right passenger was seated in an unknown posture and was not wearing the available lap belt. As the vehicle began steering from side to side, this occupant was displaced laterally. As the vehicle began a clockwise rotation, he was displaced to his left. During the rollover, he probably came out of his seat and came to rest on the roof. He exited the vehicle through a left side window with the assistance of other occupants. He sustained bilateral shoulder strains and a scalp contusion. He was transported from the scene to a local trauma center where he was treated and released.

Fourth Row Passenger Kinematics (11)

The 14-year-old female passenger was seated in the fourth row in an unknown posture and was unbelted. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. Her means of extrication and injury status were not known.

Fourth Row Passenger Kinematics (12)

The 16-year-old female passenger was seated in the fourth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, she moved laterally in response to the steering maneuvers. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. The EMS report reported that there was a loss of consciousness. It is not known how she exited the vehicle. She was transported to a local trauma center for treatment.

Fourth Row Passenger Kinematics (13)

The 12-year-old female passenger was seated in the fourth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, she moved laterally in response to the steering maneuvers. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. She complained of head pain and was transported to a local trauma center for treatment.

Fourth Row Passenger Kinematics (14)

The 10-year-old female passenger was seated in the fourth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, she moved laterally in response to the steering maneuvers. As the vehicle rolled, she likely came out of her seat and came to rest on the roof. She reported a loss off consciousness immediately after the crash and sustained an abrasion

to the back of her neck. She woke up on her own, exited the vehicle under her own power, and was transported to a local trauma center where she was treated and released.

Fifth Row Passenger Kinematics (15)

The 9-year-old male passenger was seated in the fifth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, he moved laterally in response to the steering maneuvers. As the vehicle rolled, he likely came out of his seat and came to rest on the roof. He sustained a finger injury and was transported to a local trauma center where he was examined and released.

Fifth Row Passenger Kinematics (16)

The 9-year-old male passenger was seated in the fifth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, he moved laterally in response to the steering maneuvers. As the vehicle rolled, he likely came out of his seat and came to rest on the roof. It was unknown if he was injured or how he exited the vehicle. He was transported to a local trauma center for examination and treatment.

Fifth Row Passenger Kinematics (17)

The 7-year-old male passenger was seated in the fifth row in an unknown posture and was unbelted. As the vehicle was steered from side to side, he moved laterally in response to the steering maneuvers. As the vehicle rolled, he likely came out of his seat and came to rest on the roof. It was unknown if he was injured or how he exited the vehicle. He was transported to a local trauma center for examination and treatment.

Fifth Row Passenger Kinematics (18)

The unknown age male passenger was seated in the fifth row in an unknown posture and was unbelted. His injury status and means of extrication were not known.

OCCUPANT INJURIES

Driver: No reported injuries.

Occupants 02, 06, 09, 13: Complained of pain.

Occupants 04, 05, 08, 11, 16, 17, 18: Unknown if injured.

Occupant 03: Injuries obtained from interviewee.

Injury	AIS Code	Injury Mechanism	Confidence Level
Abdominal injury	515099.7,0	Seat belt webbing	Probable
Foot injury	890099.1,9	Unknown	Unknown
Scalp burn	192000.1,9	Battery acid	Possible

Occupant 07: Injury obtained from fire department transport report.

Injury	AIS Code	Injury Mechanism	Confidence Level
Scalp abrasion, left	190202.1,2	Roof	Possible

Occupant 10: Injury obtained from emergency room records, radiology reports, and interviewee.

Injury	AIS Code	Injury Mechanism	Confidence Level
Neck strain	640278.1,8	Roof	Possible
Bilateral shoulder strain	751020.1,1 751020.1,2	Unknown	Unknown
Scalp contusion	190402.1,9	Roof	Possible

Occupant 12: Injury obtained from fire department transport report.

Injury	AIS Code	Injury Mechanism	Confidence Level
Loss of consciousness, awake on initial observation at scene	160499.1,0	Roof	Possible

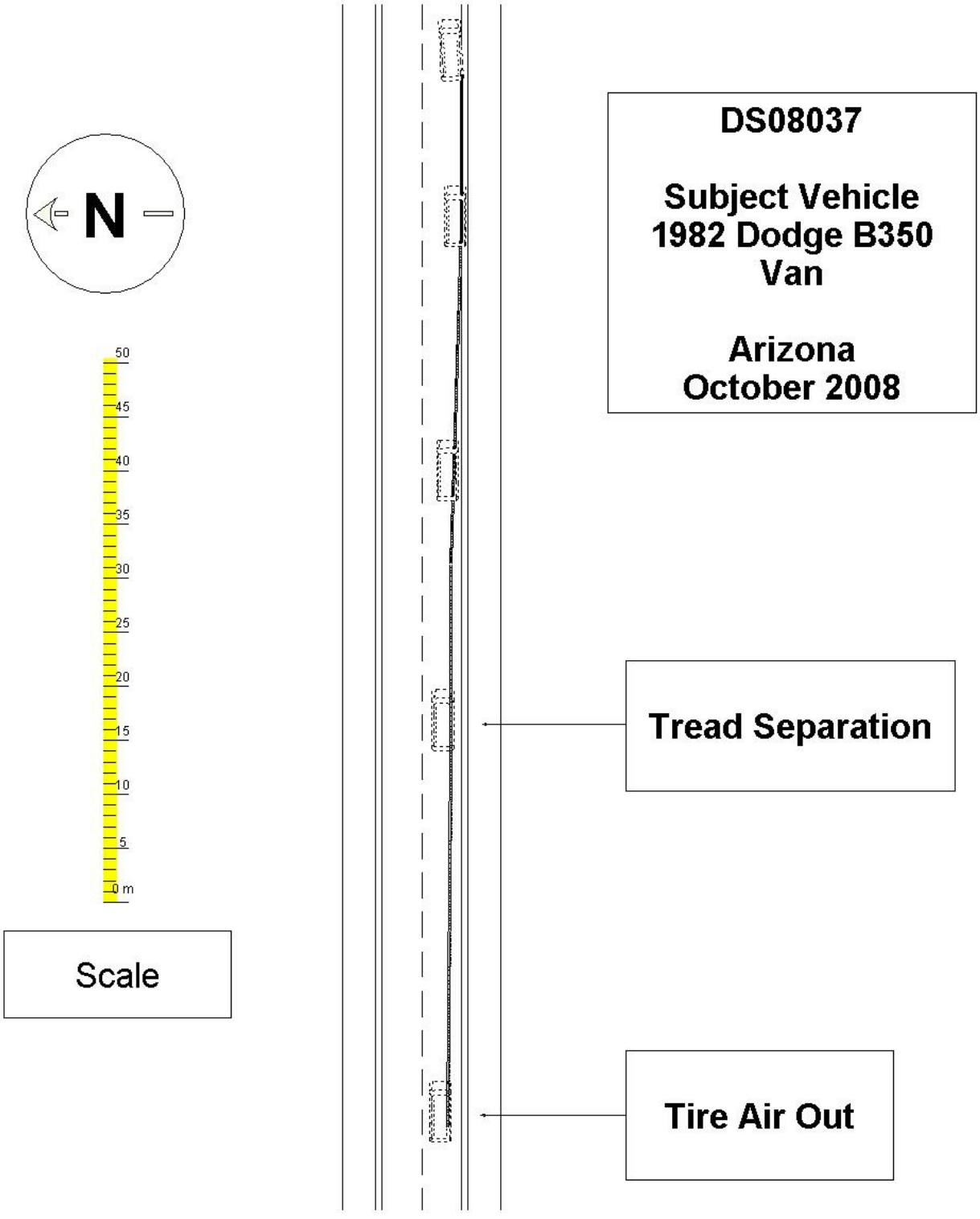
Occupant 14: Injury obtained from emergency room records.

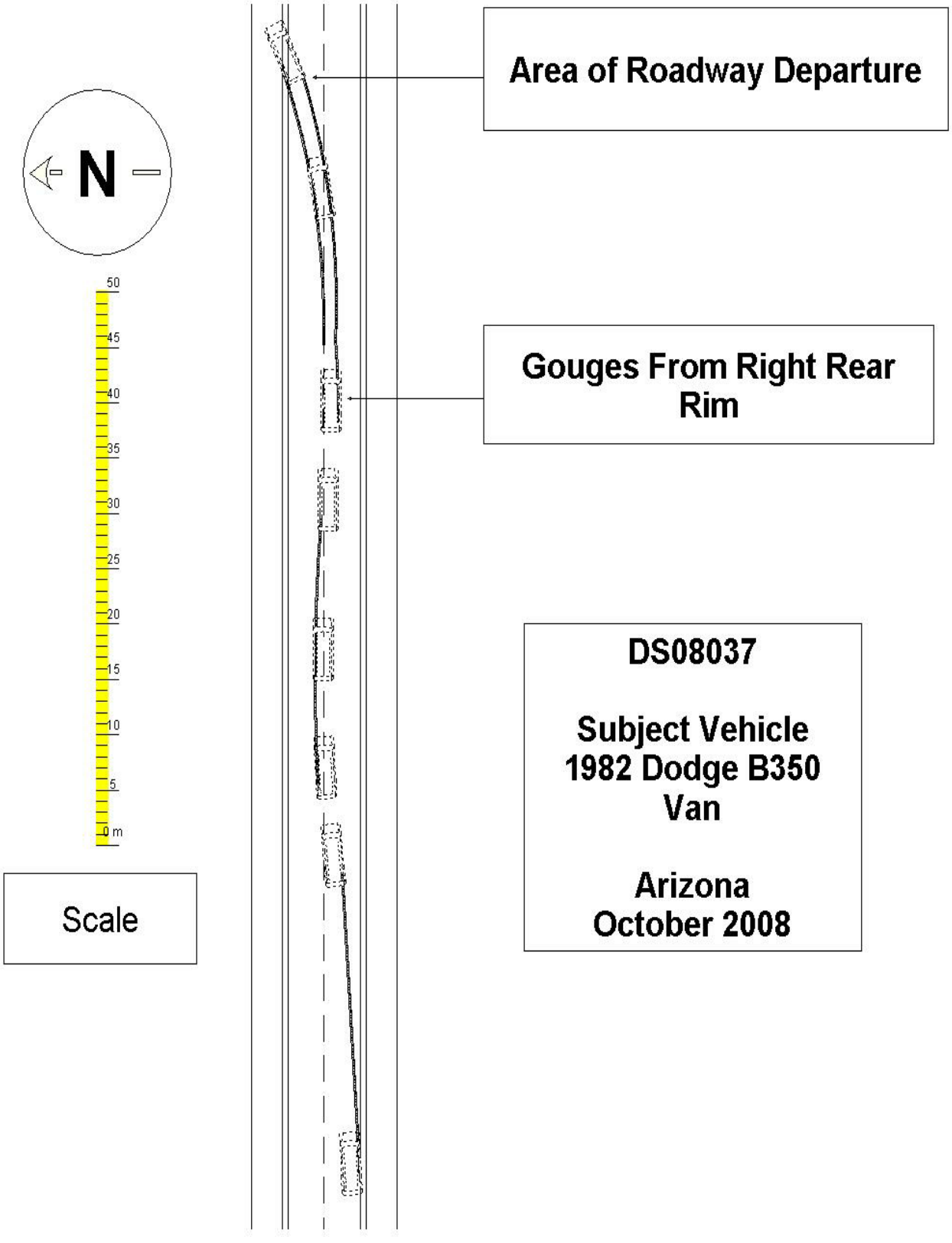
Injury	AIS Code	Injury Mechanism	Confidence Level
Abrasion, posterior neck	390202.1,6	Roof	Possible

Occupant 15: Injury obtained from emergency room records

Injury	AIS Code	Injury Mechanism	Confidence Level
Finger injury, unknown aspect	715099.7,9	Roof	Possible

Attachment 1. Scene Diagram




Area of Roadway Departure
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Subject Vehicle
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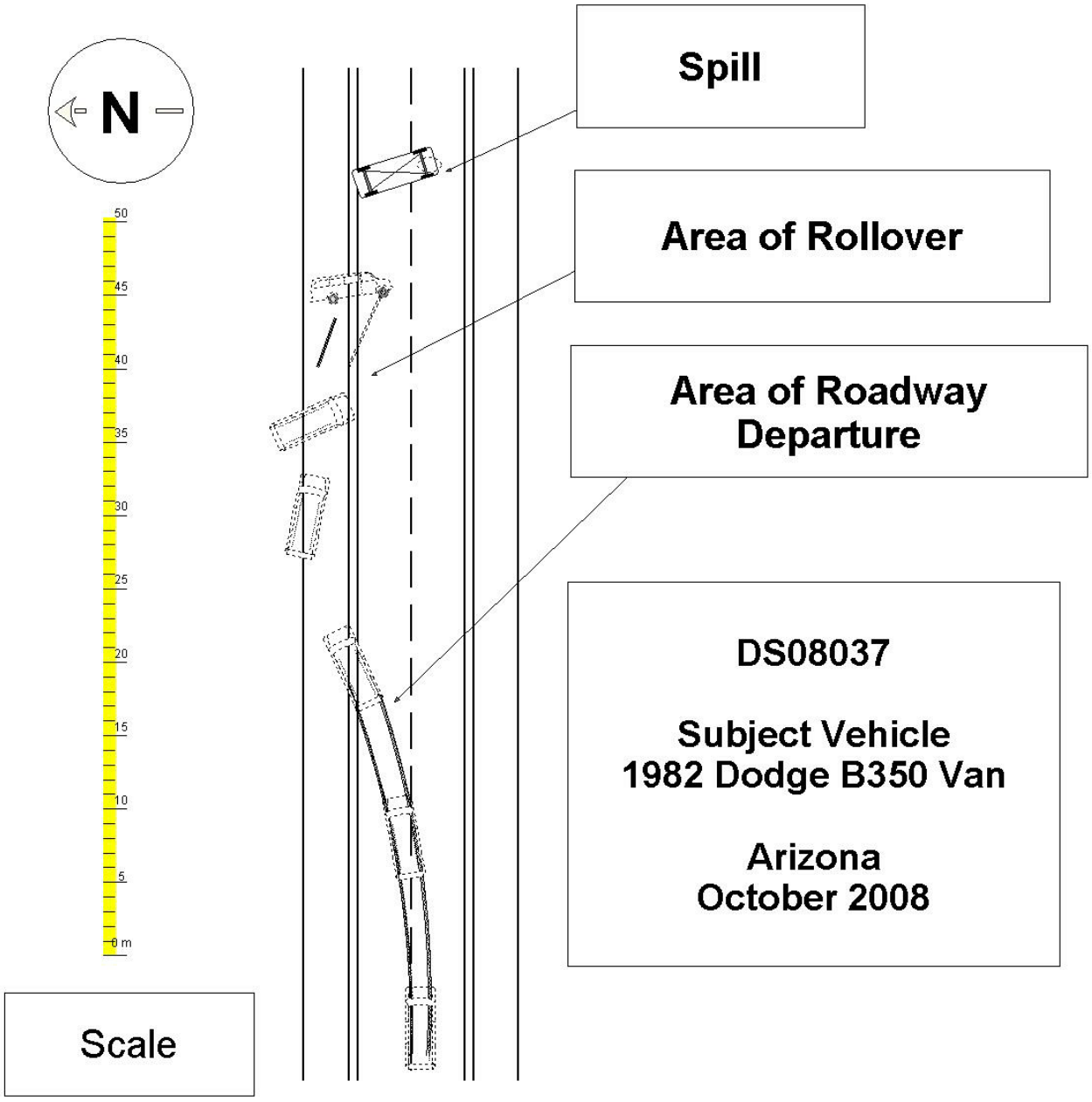
Arizona
October 2008


N
50
45
40
35
30
25
20
15
10
5
0 m
Scale
Spill
Area of Rollover
Area of Roadway Departure
DS08037
Subject Vehicle
1982 Dodge B350 Van
Arizona
October 2008