

**CRASH DATA RESEARCH CENTER**

Calspan Corporation  
Buffalo, NY 14225

**CALSPAN REMOTE FIFTEEN-PASSENGER VAN ROLLOVER  
INVESTIGATION**

**CASE NO: CA05-040**

**VEHICLE: 1994 DODGE B3500 RAM WAGON**

**LOCATION: ARKANSAS**

**CRASH DATE: JUNE 2005**

Contract No. DTNH22-01-C-17002

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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.

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<p>16. <i>Abstract</i> This remote investigative effort focused on the crash dynamics, occupant kinematics, and injury sources of a 15-passenger Dodge 3500 Ram Wagon that was involved in a rollover crash. At the time of the crash, the Dodge van was occupied by three adults and 12 youths and was towing a loaded enclosed two-axle trailer. Reportedly the van's left rear tire suffered a tread separation precipitating a loss of control and the subsequent rollover-crash. The 48 year old driver and the 36 year old front right adult passenger were restrained at the time of the crash. None of the 12 remaining passengers were restrained. None of the 15 passengers were ejected or suffered serious injuries.</p>			
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**CALSPAN REMOTE FIFTEEN-PASSENGER VAN ROLLOVER INVESTIGATION**  
**SCI CASE NO.: CA05-040**  
**VEHICLE: 1994 DODGE 3500 RAM WAGON**  
**LOCATION: ARKANSAS**  
**CRASH DATE: JUNE 2005**

***BACKGROUND***

This remote investigative effort focused on the crash dynamics, occupant kinematics, and injury sources of a 15-passenger Dodge 3500 Ram Wagon that was involved in a rollover crash. At the time of the crash, the Dodge van was occupied by three adults and 12 youths and was towing a loaded enclosed two-axle trailer. Reportedly the van's left rear tire suffered a tread separation precipitating a loss of control and the subsequent rollover-crash. The 48 year old driver and the 36 year old front right adult passenger were restrained at the time of the crash. None of the 12 remaining passengers were restrained. None of the 15 passengers were ejected or suffered serious injuries.

This crash was identified via an internet news search conducted by the Crash Investigation Division of the National Highway Traffic Safety Administration (NHTSA) on June 13, 2005. An investigation of the crash was assigned to the Calspan Special Crash Investigations team that same day due to the agency's focus on rollover and safety belt use as a means to mitigate injury. It was initially reported that all 15 passengers of the van were restrained by the vehicle's manual restraint system. However, it was determined that only the driver and front right passenger were restrained in this crash. The summary of the crash was based on a conversation with the investigating Arkansas State Trooper, the Police Accident Report and the news article identifying the crash. There were no photographs taken of the crash by the State Police investigator.

***SUMMARY***

This single-vehicle crash occurred during the daylight hours of June 2005. The weather was clear and not a crash factor. The crash occurred in the eastbound lanes of a two-lane divided limited access interstate highway. A 1994 Dodge Ram Wagon was eastbound in the outboard lane of the interstate. The 15-passenger van was towing a loaded 1.8 m x 4.3 m (6 ft x 14 ft) enclosed two-axle trailer. The van was occupied by 15 passengers (3 adults and 12 youths). The adult occupants included a 48 year old male driver, 36 year old male front right passenger and a 27 year old male seated in the second row. The 12 youth passengers were all 14 to 15 year old males. These individuals were traveling on a church sponsored mission trip to assist another group in a construction project. At the time of the crash, the occupants of the van had traveled approximately 568 km (353 miles) of a scheduled 624 km (388 mile) trip.

The crash was initiated when the tread of the left rear tire separated. The tread separation altered the dynamics of the heavily loaded vehicle resulting in a probable driver over-reaction that resulted in the loss of control. After the tread separation, the driver steered right and overcorrected back to the left. The police report indicated the vehicle departed the right side of the travel lane and then initiated a large radius counterclockwise yaw. The van and trailer yawed

90.7 m (297.5 ft) through the eastbound lanes of the highway, departed the left side of the travel lanes and entered the center median. Reportedly, the van and trailer had rotated nearly 180 degrees at this time. The vehicle then tripped and rolled two quarter turns in a right side leading roll. The van came to rest on its roof facing westward in a tree line located 10 m (33 ft) north of the fog line. The trailer separated from the van during the roll event and also overturned. The roll event appeared to be “soft” with minimal vehicle deformation. The reported distance from the end of the yaw mark to the final rest position of the van was 5.4 m (17.5 ft). **Figure 1** is a photograph taken from a news article that depicted the final rest position of the van. The police scene schematic is attached to the end of this narrative, **Figure 2**.



**Figure 1: Final rest position of the van.**

The police report indicated the left rear tire was a Courser Radial LT 225/75 R16. Reference materials indicated that this was the proper size tire for the vehicle. The tread of the tire was found wedged within the vehicle’s left rear wheel well. Post-crash, the left rear tire was still inflated. The driver of the vehicle reported to the police investigator that the van’s right rear tire had “blown out” in a similar manner earlier that morning.

None of the 15 passengers sustained life-threatening injuries; there were no ejections. Six of the 15 passengers were transported to a local hospital by ambulance. Eleven passengers were transported by private vehicles. By evening, twelve passengers of the van had been released from the hospital.

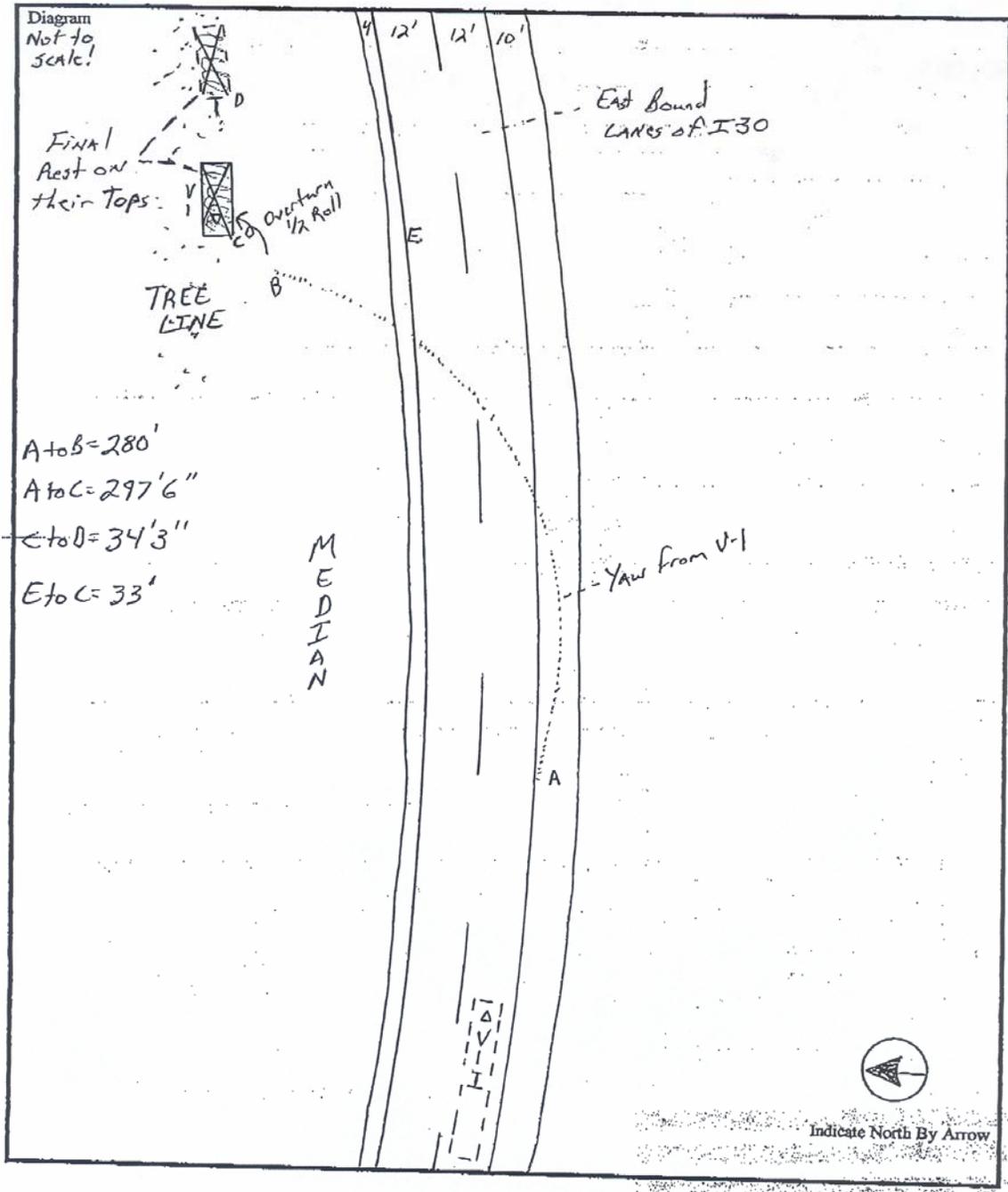


Figure 2 – Police Scene Schematic