

# THE RECONSTRUCTIONIST

## AN ACCIDENT RECONSTRUCTION NEWSLETTER

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### Who Was Driving? – Crashed, Overturned and Burned!!

Woodrow M. Poplin, P.E.

*When there are multiple occupants, insurance coverage and litigation require the determination of the driver. Accidents involving excessive damage and/or burning can make the determination difficult.*

Approximately 15 minutes after midnight on a cold December morning, a Jeep Cherokee SUV drifted off a two lane roadway. The driver corrected back to the left and lost control. The Jeep Cherokee crossed the roadway to the left shoulder where it collided with a tree. It was redirected back across the roadway to the right shoulder/ditch area where it overturned onto its roof and burned. Both occupants were fatally injured. The vehicle owner remained inside near the driver seat. His friend was partially ejected out of the rear hatch. **The police concluded that the owner was driving. The owner's family insisted that the friend frequently drove the Jeep. The task was to determine who was driving.**



The Jeep Cherokee engine compartment and most of the interior were largely consumed by fire. During the examination, the following was noted:

- The initial collision produced a lateral force at the passenger front of the vehicle. It was followed by rotation, overturn and a final collision at the rear with the ditch bank.
- The driver seatbelt receiver was empty.
- The driver seat was further rearward than the passenger seat.
- The driver seat was adjusted for a large individual.
- The driver seat back was forced rearward and twisted toward the rear.
- Torn khaki material was laying on the driver seat.
- The passenger seat was undamaged.

- The passenger seat belt receiver had the latch plate affixed into the receiver. The seatbelt webbing was burned away.
- Burned black pants and a blue/white striped shirt were melted/adhered to the passenger side of the transmission shift lever.



- A burned passport was removed from the black pants pocket. Blue/white striped shirt material was adhered to the passenger side of the overhead console.
- The rear seat was found folded down. The rear cargo compartment was a large open area behind the front seats.
- The floorboard insulation on the driver side sustained fire damage.
- The floorboard insulation on the passenger side was largely intact.

The final position of the owner in the front indicates he was most probably the restrained right front passenger and not the driver.



The autopsy report for the owner indicates he was wearing black pants and a blue and white striped shirt. His body was extensively burned with the exception of his socks and shoes. The autopsy report for the friend indicates he was wearing khaki pants and a plaid shirt.

The collision damage includes an impact to the passenger front, an impact to the passenger rear and rollover damage along the passenger roofline. The collisions at the front and the rear produced forces which were directed forward and toward the driver side

of the vehicle. **Occupant motion relative to the vehicle is opposite the direction of the collision forces.** Therefore, free motion of the occupants would be toward the right side and toward the rear of the vehicle. Additionally, under the same collision forces, the heavier individual would produce a larger loading on the vehicle's interior components. Restriction of occupant motion would come from contact with the seats, the sides of the vehicle, the rear of the vehicle and the restraint systems.



The condition of the seat belt at the driver's seated position indicates that it was most probably not in use. In addition, the seat is partially twisted and forced to the rear consistent with movement of the driver toward the rear of the vehicle.

The passenger seat is comparatively intact and there are indications that the restraint system was in use. The passenger would therefore have been restrained to the passenger seat. Movement of the passenger from the front of the vehicle would not be expected.

The vehicle came to rest upside down. It is likely that the passenger remained belted in position until the fire had consumed the seat belt thereby releasing him. The burn patterns suggest that the passenger side was elevated somewhat over the driver side because of the ditch bank. As the fire consumed the passenger side restraint, the passenger was released. At that point, the passenger would have fallen in the vehicle to a position against the roof toward the driver side. This is the reported position of the owner.

The dynamic motion of the vehicle suggests that the



unrestrained driver would have been propelled toward the rear of the vehicle. Evidence of the rearward movement is found in the damage pattern of the driver seat. With the rear seat folded down, an empty cargo compartment and the vehicle upside down, the driver could readily move rearward to the rear hatch. The final positions of the occupants are therefore consistent with the owner as the passenger and the friend as the driver of the Jeep Cherokee.

## CONCLUSIONS

1. The accident was initiated when the Jeep Cherokee traveled off the roadway to the right. The driver apparently lost control as the vehicle overcorrected to the left. The Jeep Cherokee sustained a lateral collision at the passenger front with a tree on the south side of the roadway. A second collision at the passenger rear occurred as it traveled to rest. The Jeep Cherokee overturned and came to rest upside down. Both occupants were fatally injured by the accident and the resulting fire.
2. The collision forces would have caused an unrestrained occupant to travel toward the right and toward the rear of the vehicle. The condition of the driver's seat belt indicates that the driver was most probably unrestrained. Rearward movement is evidenced by damage to the back of the driver front seat.
3. The condition of the restraint system and the seat back indicates that the passenger was most probably restrained by the safety system. The restrained passenger would have been released as the seat belt was consumed by the fire.
4. The final position of the owner in the front indicates he was most probably the restrained right front passenger.
5. The final position of the friend at the rear hatch indicates that he was most probably the unrestrained driver of the vehicle.
6. Further evidence of the initial positions are found from the khaki pants material left on the driver seat, the black pants and striped shirt material found on the passenger side of the consoles, the burn patterns of the occupants relative to the burn patterns of the vehicle and the relative size of the occupants when compared to the seat damage and the seat positions.

# SERVICES

## Vehicle Accident Analysis and Reconstruction Vehicle/Motorcycle/Bicycle/Pedestrian/Maritime/Boating

- ▲ Commercial Vehicle Accident Reconstruction
- ▲ Commercial Vehicle/Truck ECM Downloads
- ▲ Motor Vehicle Accident Reconstruction
- ▲ Event Data Retrieval
- ▲ Visibility Issues
- ▲ Animations
- ▲ Skidmark Analysis
- ▲ Occupant Dynamics
- ▲ Pedestrian Dynamics
- ▲ Headlamp Analysis
- ▲ Photogrammetry
- ▲ Timing Issues
- ▲ Failure Analysis
- ▲ Speed Evaluation
- ▲ Cargo Securement

### Online Tools and References

Adjusters Get There "First" - 10 Easy Steps to [Capturing Accident Data](#) While it is "Fresh" - Powerpoint Presentation

Crash Data Group - [CDR Retrieval Listing](#) of Supported Vehicles

[Passenger Vehicle Crash Data Retrieval](#) - Summary "Updated"

[Event Data Retrieval Commercial Vehicle](#) - Summary "Updated"

[Commercial ECM Specifics](#) (Listing of Downloadable Truck Systems by Year) - Spreadsheet "Updated"



W Poplin Engineering, LLC  
Post Office Box 210  
Wadmalaw Island, SC 29487

W POPLIN ENGINEERING

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W POPLIN ENGINEERING

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Direct all inquiries to:

Woodrow M. Poplin, P.E. - [wp@wpoplin.com](mailto:wp@wpoplin.com)

W Poplin Engineering, LLC

Post Office Box 210

Wadmalaw Island, SC 29487

843.559.8801

[www.wpoplin.com](http://www.wpoplin.com)

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