CRASH DATA RESEARCH CENTER

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CALSPAN ON-SITE CERTIFIED ADVANCED 208-COMPLIANT VEHICLE CRASH INVESTIGATION

SCI CASE NO.: CA06-013

VEHICLE: 2004 FORD F-150 SUPERCAB PICKUP TRUCK

LOCATION: OHIO

CRASH DATE: MAY 2006

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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BACKGROUND

This on-site investigation focused on the severity of the crash and the non-deployment of the driver's air bag in a redesigned 2004 Ford F-150 pickup truck. This vehicle was equipped with a Certified Advanced 208-Compliant (CAC) frontal air bag system that consisted of dual stage frontal air bags for the driver and front right passenger positions, seat track positioning sensors, a front right occupant presence system, safety belt buckle switches, and buckle pretensioners. The manufacturer of this vehicle has certified that this model meets the requirements for advanced air bag systems under Federal Motor Vehicle Safety Standard No. 208. The Ford was involved in a run-off-road crash with multiple objects that resulted in severe frontal damage **(Figure 1)**. The 63-year old male driver of the Ford was restrained by the integrated 3-point lap and shoulder belt system. He loaded the safety belt system and the steering wheel rim which resulted in multiple bilateral rib fractures. As a result of belt and wheel loading, his head jackknifed forward and impacted the upper instrument panel. This contact resulted in a frontal bone fracture, fractures of the orbital plates, subdural and subarachnoid hemorrhages, and multiple soft tissue injuries of the face. He expired at the scene due to the closed head injuries.

Figure 1. Severe frontal damage to the Ford F-150 pickup truck.

This crash was identified by the Calspan Special Crash Investigations (SCI) team on Friday, May 19 through an Internet search for potential cases of interest to the SCI program. The notification was forwarded to NHTSA's Crash Investigation Division and the case was assigned for on-site investigation on Tuesday, May 23. Cooperation was established with the Police Chief of the investigating police agency and the on-site SCI investigation was conducted on Thursday, May 25. The investigation involved the detailed documentation of the Ford F-150 pickup truck and the documentation of the crash site and physical evidence.

SUMMARY

Crash Site

The crash occurred off-road of a two lane roadway in a residential area during daylight hours. At the time of the crash, the weather conditions were police reported as overcast and dry. The two lane roadway curved to the left and transitioned to a straight segment at the point of road departure. The east/westbound travel lanes were 3.5 m (11.5') in width and were delineated by double yellow centerlines. Narrow paved shoulders paralleled the travel lanes. The north road edge was bordered by a residential driveway and a lawn area

that sloped downward from the roadway. The slope began 2.7 m (8.9') outboard of the travel lane and varied to a maximum slope of 35 degrees. Roadside objects within the vehicles trajectory included a wooden utility pole, a culvert pipe, a small diameter tree, and a large diameter tree cluster. The utility pole was approximately 20 cm (8") in diameter and was located approximately1.3 m (4.3') outboard of the north edge line. The pole was fractured by the crash and replaced prior to the SCI inspection of the crash site. The replacement pole measured 20 cm (8") in diameter and was positioned 1.4 m (4.6') outboard of the edge line **(Figure 2)**. The culvert pipe was 76 cm (30") in diameter and was exposed to the vehicle at the bottom of the referenced slope. The pipe was nearly perpendicular to the roadway. The Ford impacted and minimally crushed the top surface of the corrugated pipe. The culvert was located 26 m (85.3') west of the struck pole. An 8 cm (3") diameter tree was located 3.5 m (11.5') west of the culvert and 4.2 m (13.8') outboard of the north edge line. This 8 cm (3") diameter tree was struck and fractured by the F-150. The Ford continued forward and struck a large diameter tree cluster **(Figure 3)** that was located 36.3 m (119.1') west of the struck pole and 4.6 m (15.1') west of the road edge. A spilt rail fence was located at the bottom of the slope and was located 6.4 m (21') north of the edge line. The posted speed limit for the area was 64 km/h (40 mph). The Crash Schematic is included as **Figure 17** on Page No. 13 of this report.

Figure 2. Trajectory of the F-150 and the location of the struck utility pole.

Figure 3. Struck tree cluster.

Vehicle Data – 2004 Ford F-150

The Ford F-150 SuperCab pickup truck was redesigned and introduced as a model year 2004. During this 2004 model year, two light duty pickup trucks were sold by Ford; the Heritage model and this redesigned model. This redesigned model was equipped with the Certified Advanced 208-Compliant (CAC) frontal air bag system. The vehicle was also equipped with an Event Data Recorder (EDR); however, this recorder was not supported by the Vetronix Crash Data Retrieval tool software.

The F-150 pickup truck was manufactured in November 2003 and was identified by Vehicle Identification Number (VIN) 1FTRX12W94N (production number deleted). The vehicle was a four-door extended cab with C-pillar hinged rear doors. This door design did not utilize a fixed B-pillar. The truck was powered a 4.6 liter, V-8 engine linked to a four-speed automatic transmission with overdrive and was configured with two-wheel drive. The service brakes consisted of four-wheel disc brakes with anti-lock (ABS).

Steel tube step bars were mounted to the frame of the vehicle and extended from the A- to the C-pillars. A rear mounted 5 cm (2") receiver frame hitch was installed on the F-150. The vehicle was equipped with OEM five-spoke alloy wheels and Michelin LXT A/S radial tires; size P255/65R17 with a load range of 108 and a speed rating of S. The tire data at the time of the SCI inspection is identified in the following table:

Position	Measure Pressure	Measure Tread Depth	Damage
Left Front	228 kPa (33.0 PSI)	8 mm (10/32")	Dirt/stone embedded into outer bead
Left Rear	221 kPa (32.0 PSI)	7 mm (9/32")	None
Right Front	0 kPa	7 mm (9/32")	Inner bead fracture
Right Rear	Unknown	Unknown	None

The interior of the Ford F-150 was equipped with a split bench seat front seat with a fold-down center armrest. The 60/40 passenger side wide seat was equipped with separate track adjustors with a power-adjusted driver's track and adjustable head restraints. Both head restraints were in the full-down position at the time of the SCI inspection. The center seat back/fold-down armrest was in the down position, utilized as an armrest at the time of the crash. The rear seat was a three-passenger bench with split cushions (60/40 left side wide) and a one-piece seatback. The seatback was equipped with adjustable head restraints for the outboard positions.

Additional interior features included cloth covered seats, tilt steering wheel, power windows and door locks, power adjusted outside mirrors, and an in-dash CD player.

Crash Sequence

Pre-Crash

The 63-year old male driver of the Ford F-150 SuperCab pickup truck was returning to his residence and was traveling in a westerly direction on the two-lane roadway. He was police reported as legally intoxicated with a BAC of .086. As the driver was exiting the left curve, he allowed the vehicle to drift right and depart the right road edge into the tall grass and weeds that bordered the shoulder. A rotating right side tire print marked the departure point of the front right tire. This mark began 32.1 m (105.5') east of the struck utility pole. The F-150 continued forward in a tracking mode and traversed a driveway that intersected the roadway east of the referenced utility pole. As the F-150 crossed the driveway, the vehicle entered a mowed lawn area to a residence. Both front tires marked on the lawn which yielded a departure angle of 5 degrees. The F-150 traveled 5.9 m (19.4') across the lawn in a tracking mode to impact with the utility pole.

Crash

The front left and center area of the F-150 impacted the small diameter utility pole that was located approximately 1.3 m (4.3') north of the north road edge and 7.7 m (25.3') west of the referenced driveway. The 12 o'clock direction of force impact sheared the pole approximately 20 cm (8") above ground level. This impact did not alter the westbound trajectory of the Ford F-150.

As the Ford continued forward, the tires continued to mark as rotating tire prints on the mowed lawn. The F-150 traversed the slope of the lawn which induced a slight counterclockwise yaw. The lawn area transitioned to a down slope with sparse grass coverage. In this area, the tire marks faded. The right front tire and right step bar impacted the top surface of the culvert pipe. This impact fractured the inner bead of the right front wheel, aired out the tire and separated the step bar that was mounted to the frame from the A- to the C-pillar. This undercarriage impact also redirected the F-150 to a near tracking attitude as it continued on its westerly trajectory. It should be noted that the physical evidence at the scene did not support driver avoidance maneuvers (i.e., steering or braking).

The frontal area of the pickup truck impacted and fractured an 8 cm (3") diameter tree that was located 3.5 m (11.4') west of the struck culvert. This impact did not alter the vehicle's trajectory or result in a measurable velocity change.

Figure 4. On-scene image of the Ford F-150 at final rest.

The Ford F-150 continued tracking for an additional 6.8 m (22.3') across the dirt area that leveled out below the grade of the road. The center frontal area of the F-150 impacted a 30 cm (12") diameter branch of a large diameter tree cluster. The 12'o'clock direction of force impact crushed the frontal structure to a depth of 82 cm (32.25"), located 29 cm (11.25") right of the vehicle's centerline. The damage and trajectory algorithm of the WIMSMASH program computed an impact speed of 42 km/h (26 mph) for the tree impact. The F-150 rebounded 1 m (3') from the tree impact and rotated approximately 26 degrees counterclockwise before coming to rest **(Figure 4)**. The WINSMASH program computed a total velocity change of 49 km/h (30.4 mph) for the F-150 with a longitudinal component of -49 km/h (-30.4 mph) and a lateral component of 0 km/h. As the vehicle rotated to rest, the back right corner area impacted and fractured two rail sections of the split rail fence. Although the tree impact was severe, the driver's air bag failed to deploy and the driver's pretensioner did not fire. The driver loaded the integrated belt system, the steering assembly, and the upper instrument panel which resulted in fatal injuries.

Post-Crash

At rest, the vehicle was facing in a southwesterly direction, angled approximately 26 degrees CCW to the roadway. The tire positions were marked by the investigating officer and these marks remained visible at the scene at the time of the SCI investigation.

The driver came to rest in an upright attitude within the driver's seat. This was evidenced by body fluid that transferred onto the lap and shoulder belt webbing of the integrated safety belt system. The body fluid was located left of the latch plate. The emergency responders found the driver unresponsive. They immediately placed a call for air transport to a regional trauma center based on the condition of the driver. He was

removed from the vehicle and placed in a ground ambulance and transported to a designated helicopter landing site. As the helicopter arrived at the landing site, a flight physician examined the driver and determined that he was deceased. County protocol requires that all accidental deaths are to be observed by the Coroner at the scene of the occurrence. The driver's body was transported back to the scene of the crash where the Deputy Coroner pronounced the driver deceased. The body was transported to the morgue for autopsy.

Vehicle Damage – Exterior

Primary - The frontal area of the Ford F-150 sustained severe damage as a result of the impact with the large diameter tree cluster **(Figure 5)**. This, the fourth of five impact events, masked the damage from the utility pole and the small diameter tree. Maximum crush was measured at 82 cm (32.25"), located on the bumper 29 cm (11.25") right of the vehicle's centerline **(Figure 6)**. The direct contact damage from the tree cluster impact began on the centerline and extended 36 cm (14") to the right. The chrome bumper fractured inboard of the right frame rail; however, the crush profile was not altered by this separation. The position of the right corner was estimated resulting in a Field L measurement of 95 cm (37.5"). A reference line was established to reflect the original length of the F-150. The crush profile was documented using six equidistant crush values across the deformed width of the vehicle. These values were as follows: C1 = 0 cm, C2 = 11 cm (4.4"), C3 = 40 cm (15.7"), C4 = 80 cm (31.3"), C5 = 77 cm (30.4"), C6 = 30 cm (12"). This C6 value was estimated due to the separated front bumper. The Collision Deformation Classification (CDC) for this event was 12-FYEN-4.

Figure 5. Tree impact damage to the Ford F-150.

Figure 6. Overhead view documenting the depth of frontal crush at bumper level.

Secondary – The initial impact damage from the 20 cm (8") diameter utility pole was masked by the primary damage from the tree impact. A shallow dent from the pole was present on the deformed hood and was located 45-57 cm (17.9- 22.4") inboard of the left hood edge. Based on this damage and the unaltered trajectory of the vehicle, this damage yielded a projected CDC of 12-FYEN-1.

The undercarriage of the F-150 engaged the top surface of the culvert pipe as the Ford continued on its westbound trajectory. This impact deformed the corrugated steel culvert pipe and fractured the inner bead of the right front alloy wheel resulting in an air out of

the tire. The right step bar that was mounted to the frame rail of the F-150 was torn from the vehicle by the culvert. This undercarriage impact CDC was 00-UDRN-1.

The frontal area of the F-150 impacted, fractured, and overrode a small 8 cm (3") diameter tree following the culvert impact. This damage was entirely masked by the primary impact damage. Based on the location of the tree and the known trajectory of the vehicle, the CDC was 12-FCEN-1.

The right back corner area of the F-150 impacted and fractured two rail sections of the spilt rail fence as the vehicle came to rest. Although no damage resulted from this event, the CDC was 03-RBEU-1.

The primary impact damage resulted in induced deformation of the frontal structure that fractured the laminated windshield at both lower corners adjacent to the A-pillars. The left front door was skewed out of alignment; however, the door remained operational post-crash. The right front and both rear doors were not damaged and remained operational. No side or backlight glazing was damaged by the crash. Although the crush was severe, there was no isolated buckling of the roof.

Interior

The interior of the Ford F-150 sustained moderate severity damage as a result of passenger compartment intrusion and driver contact. The left toe pan intruded 9 cm (3.5") rearward as a result of drive train displacement from the tree impact. The transmission was compressed into the center tunnel which intruded 5 cm (2") into the center front position. This displacement resulted in the left toe pan intrusion and rearward displacement of the accelerator pedal.

The belted driver loaded the integrated belt system which was evidenced by a frictional abrasion on the latch plate and a seat belt guide transfer on the shoulder belt webbing. These are addressed in further detail in the *Manual Safety Belt Systems* section of this report.

The driver loaded the steering assembly as evidenced by three distinct areas of contact. A vertically oriented scuff/abrasion was noted to the lower right aspect of the air bag module cover flap. The witness mark was 3 cm (1") in height and 1 cm (0.4") in width. It consisted of two vertical lines that resulted from clothing worn by the driver.

His torso loaded the upper steering wheel rim which displaced the upper rim 6 cm (2.25") forward and 5 cm (2.1") downward **(Figure 7)**. This loading of the steering wheel compressed the energy absorbing steering column. This redesigned steering column did not have conventional shear capsules. Interior measurements indicated that the column was compressed approximately 3 cm (1").

Figure 7. Deformation to the steering wheel rim.

Figure 8. Knee contacts to the rigid bolster panel.

The driver's head jackknifed over the integrated belt and the top of the steering wheel rim. His forehead region impacted the top aspect of the upper instrument panel, fracturing the top plastic panel. Body fluids were present around the fracture site. The combination of this fracture and the compression of the steering column fractured the instrument panel lens for the gauge cluster.

The driver's knees contacted the knee bolster and the locking lever for the tilt steering wheel **(Figure 8)**. His left knee impacted and scuffed the bolster 52-59 cm (20.5-23.25") left of center and 32-48 cm (12.5-19") below the top instrument panel. Located to the right of this contact point and left of the steering column was the locking lever for the tilt wheel. This knee contact fractured the lever arm at the attachment point to the column.

The driver's right knee loaded and deformed the rigid bolster panel; however, the contact did not deform the steel backer panel. The contact scuffed and deformed the panel 23-36 cm (9.25-14") left of center and 28-48 cm (11-19") below the upper instrument panel. The panel was deformed 5 cm (2") forward.

The mid instrument panel exhibited a fracture at the HVAC controls. This fracture was possibly related to the right hand of the driver or from an object that was positioned on the fold-down center armrest. Several beverage containers were found in the vehicle during the police investigation and removed prior to the SCI inspection.

Certified Advanced 208-Compliant Safety System

This 2004 Ford F-150 SuperCab pickup truck was equipped with a Certified Advanced 208-Complaint frontal air bag system for the driver and front right passenger positions. The manufacturer of this vehicle has certified that this F-150 meets the advanced air bag requirements for Federal Motor Vehicle Safety Standard No. 208**.** The system consisted of dual stage frontal air bags for both front outboard positions, seat track positioning sensors, a front right occupant presence system, and buckle pretensioners. During the crash, this CAC system did not command a deployment of the driver's air bag **(Figure 9)** or the firing of the driver's buckle pretensioner **(Figure 10)**.

Figure 9. Non-deployed driver's air bag module.

Figure 10. Non-fired driver's buckle pretensioner.

The air bag system utilized a passenger compartment mounted Restraints Control Module (RCM) that provided crash sensing, system diagnostics, and Event Data Recording (EDR). This EDR was not supported by the current Vetronix software version (Version 2.8) that is available to the SCI program. In addition to the RCM, the F-150 was equipped with an external electronic crash sensor that was mounted to the hood latch bracket **(Figure 11)**, forward of the air conditioning condenser. This vertically mounted sensor was designed to assist in the electronic sensing of narrow object impacts that occur between the front frame rails. This sensor was rotated by the exterior deformation; however, it was not damaged by the tree impact.

Figure 11. Center front external crash sensor.

Figure 12. Passenger air bag on/off status lamp.

The driver's air bag was concealed by a single top hinged cover flap that was located within the four-spoke steering wheel rim. The lower aspect of the cover flap was abraded from driver loading against the steering assembly. The vertically oriented abrasion was 3 cm in height and 1 cm (0.4") in width. This abrasion did not affect the deployment status of the driver's air bag.

The front right air bag was incorporated into the right instrument panel and concealed by a vinyl cover flap. There was no occupant present in this position at the time of the crash; therefore the front right air bag would have been suppressed. The front right air bag activation lamp **(Figure 12)** was located in the upper mid instrument panel, above the CD player.

Manual Safety Belt Systems

The Ford F-150 was equipped with integrated 3-point lap and shoulder belt systems for the driver and front right passenger positions. The belt systems consisted of continuous loop webbings, sliding latch plates, and buckle pretensioners. The driver's belt retracted onto an Emergency Locking Retractor (ELR) while the front right position was equipped with a switchable ELR/Automatic Locking Retractor (ALR). Both shoulder belts extended from the upper outboard aspect of the front seat backs with a plastic guide incorporated into the seat back. The outboard aspect of the lap belt webbing was affixed to the seat frame. The buckle pretensioners were mounted to the inboard aspect of the seat frames. The pretensioners did not fire during the crash. The center front position was equipped with a cinching latch plate that was stowed on the center front seat cushion.

The driver was the sole occupant of the vehicle at the time of the crash. The driver's latch plate yielded subtle historical wear marks that were consistent with occasional use or low mileage. The driver was wearing this belt system at the time of the crash. The inboard aspect of the latch plate (side against driver) contained a full-width frictional abrasion from webbing loading. There was no matching transfer on the webbing. The shoulder belt webbing contained a frictional plastic transfer **(Figure 13)** from driver loading during the crash. The transfer resulted from loading against the seat back mounted belt guide and measured 9 cm (3.5") in length. The transfer was full width across the 4 cm (1.75") wide webbing. This transfer was located 155-164 cm (61-64.5") above the seat frame anchor point. Blood pooling was noted to the lap and shoulder belt webbing located outboard of the latch plate **(Figure 14)**. There was no damage or failures of the driver's integrated belt system.

The rear seat of this vehicle was equipped with 3-point lap and shoulder belt systems for the three designated seated positions. All systems utilized continuous loop webbings, sliding latch plates, and switchable ELR/ALR retractors. None of the rear belt systems exhibited routine wear indicators.

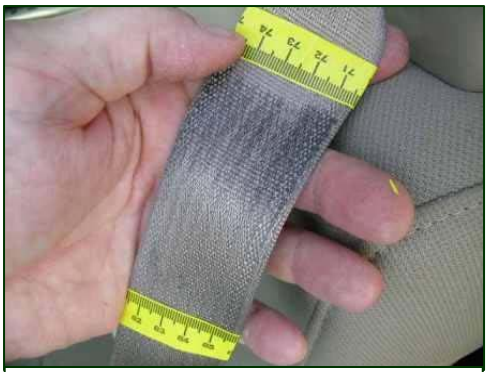

Figure 13. Belt guide abrasion on the shoulder belt webbing.

Figure 14. Body fluid transfers on the lap and shoulder belt webbing.

Occupant Demographics/Data– Driver

Age/Sex:	63-year old/Male
Height:	165 cm (65”)
Weight:	61 kg (134 lb)
Eyewear:	Unknown, although eyeglasses were probably worn
Seat Track Position:	Forward track (adjusted 4 cm aft of full forward and 17 cm forward of full rear)
Manual Restraint Usage:	Integrated 3-point lap and shoulder belt system
Usage Source:	Vehicle inspection, belt loading evidence
Egress from Vehicle:	Rescue personnel
Mode of Transport From Scene:	Transported by ambulance to a helicopter landing site
Type of Medical Treatment:	Pronounced deceased at landing site

Driver Injuries

Injury	Injury Severity (AIS 90/Update 98	Injury Source
Bilateral rib fractures (right 1-10; left 1,5,8-10)	Severe (450240.4,3)	Steering wheel/non-deployed air bag module
Subarachnoid hemorrhage	Serious (140684.3,9)	Upper left instrument panel
Subdural hemorrhage, NFS	Serious (140650.4,9)	Upper left instrument panel
Fractures of the orbital plates with bilateral periorbital ecchymosis	Serious (150200.3,8)	Upper left instrument panel
Fracture of the frontal bone	Moderate (150402.2,5)	Upper left instrument panel
Multiple lacerations of the face, 2-3 cm in length	Minor (290602.1,0)	Upper left instrument panel
5 cm irregular lacerations on both sides of the nose	Minor (290602.1,4)	Upper left instrument panel/eyeglasses
Multiple abrasions of the right cheek	Minor (290202.1,1)	Upper left instrument panel
Multiple abrasions of the right side of the chin	Minor (290202.1,1)	Upper steering wheel rim
Multiple abrasions of the upper chest	Minor (490202.1,4)	Steering wheel/non-deployed air bag module
Multiple abrasions of the forearms bilaterally, 13 cm abrasion of the left upper arm	Minor (790202.1,3)	Steering wheel rim
Multiple abrasions of the anterior aspects of the lower legs, bilaterally	Minor (890202.1,1; 890202.1,2)	Knee bolster
9 cm laceration of the anterior aspect of the left lower leg	Minor (890602.1,2)	Tilt column lever

Source - Autopsy

Driver Kinematics

The 63-year old male driver of the Ford F-150 SuperCab pickup truck was seated in a forward track position and was restrained by the integrated 3-point lap and shoulder belt system. Rescue personnel reclined the seat back during the evaluation and removal of the driver from the vehicle. During the SCI investigation, the seat back was repositioned to a recline angle of 20 degrees. In this position, the horizontal distance between the center of the driver's air bag module cover flap and the seat back measured at 53 cm (21"), located 38 cm (15") above the seat bight. The driver was operating the vehicle at a reported BAC of .086.

Although restrained, the driver was possibly displaced out of position forward during the multiple event crash. He initiated a forward trajectory and loaded the integrated safety belt system in response to the utility pole impact and the subsequent impacts with the culvert and the small diameter tree. These impacts were of minor severity and were not considered to be injury producing events.

At impact with the tree cluster, the driver responded to the 12 o'clock frontal impact force by initiating a forward trajectory and loading the integrated safety belt system. This was evidenced by a frictional abrasion of the inside surface (side against the driver) of the plastic coated latch plate and a full width, 9 cm (3.5") long black plastic transfer on the shoulder belt webbing from loading against the seat back guide of the integrated belt system. Due to the driver's forward seat track position, he loaded the safety belt and the upper steering wheel rim, contacting the non-deployed air bag module. His loading of the upper steering wheel rim deformed the steering wheel rim 6 cm (2.25") forward and 5 cm (2.1") downward and compressed the energy absorbing column. The loading of the steering wheel rim and the air bag module resulted in multiple bilateral rib fractures and an abrasion to the upper chest. The driver's arms contacted the steering wheel rim which resulted in bilateral forearm abrasions and a large abrasion of the left upper arm.

Figure 15. Driver's trajectory and contact points.

Figure 16. Head/facial contact to the top of the instrument panel.

The driver's knees engaged the rigid knee bolster on each side of the steering column. His left knee scuffed the bolster panel while his right knee scuffed and deformed the panel to a depth of 5 cm (2"). The driver sustained multiple abrasions of the anterior aspects of the lower legs from the bolster engagement. His left leg contacted and fractured the tilt wheel adjustment lever. This protruding lever lacerated the anterior aspect of his left leg. **Figure 15** is an overall view of the driver's trajectory and the resulting contact points.

The driver's head hyper flexed over the belt system and the steering wheel rim. His chin contacted the top surface of the wheel rim which resulted in an abrasion. The driver's head and face impacted the top surface of the upper instrument panel and fractured the plastic panel **(Figure 16)**. Body fluid was present within and surrounding the fracture site. As a result of this contact, the driver sustained a frontal skull fracture, bilateral fractures of the orbital plates, subdural and subarachnioid hemorrhages, and facial lacerations. The driver sustained lacerations to the sides of his nose that were suspected to be related to eyeglasses as they were displaced by the head/facial contact to the top surface of the instrument panel.

The driver rebounded from his forward trajectory and came to rest in an upright attitude in his seated position. He bled onto the lap and shoulder belt webbing left (outboard) of the latch plate.

Medical Treatment

The first responders to the crash site consisted of police and fire department personnel that included an ambulance and Emergency Medical Technicians (EMTs). The EMTs assessed the driver's condition in the vehicle and called for helicopter transport to a regional trauma center. The driver was removed from the Ford F-150 and placed in the ambulance and driven to a designated landing site for the helicopter. A physician was a member of the flight team. The physician evaluated the driver at the landing site and determined that the driver was deceased. By County protocol, the Coroner's office must respond to the site of the death and officially pronounce the victim deceased. The driver's body was returned to the crash scene for this practice. Following the Coroner's assessment, the body was transferred to the morgue for autopsy.

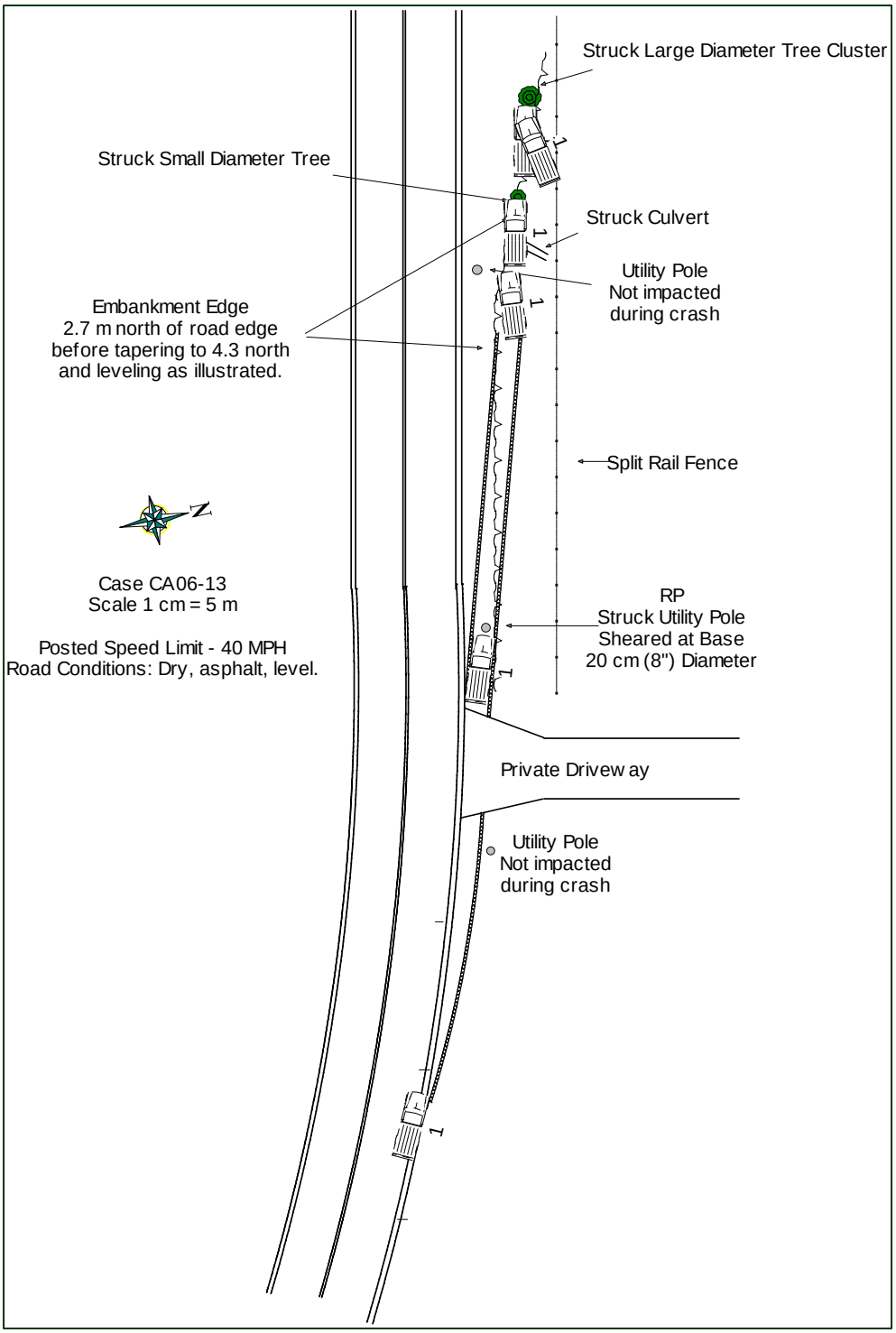

Figure 17 – Scene Schematic