400 Seventh Street, S.W.
Washington, D.C. 20590

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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*** *** ***

TRANSPORTATION SCIENCES CENTER
ACCIDENT RESEARCH GROUP

Calspan Corporation
[redacted] New York [redacted]

CALSPAN REMOTE AIR BAG DEPLOYMENT INVESTIGATION

CALSPAN CASE NO. 95-15

VEHICLE #1 - 1993 LEXUS LS 400
VEHICLE #2 - 1991 LINCOLN TOWN CAR

LOCATION - [redacted] TEXAS

CRASH DATE - [redacted] 1994

Contract No. DTNH22-94-D-07058

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

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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.

TECHNICAL REPORT STANDARD TITLE PAGE

1. *Report No.*	2. *Government Accession No.*	3. *Recipient's Catalog No.*
4. *Title and Subtitle* Calspan On-site Head-on Crash Investigation Vehicle #1 - 1993 Lexus LS 400 Vehicle #2 - 1991 Lincoln Town Car Location - [redacted] Texas		5. *Report Date*: [redacted], 1995 6. *Performing Organization Code*
7. *Author(s)* Accident Research Group		8. *Performing Organization Report No.*
9. *Performing Organization Name and Address* Transportation Sciences Center Accident Research Group Calspan Corporation SRL [redacted] [redacted] New York [redacted]		10. *Work Unit No.* 1115 (5330-5339) 11. *Contract or Grant No.* DTNH22-94-D-07058
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15. *Supplementary Notes*
Remote investigation of an air bag deployment crash that resulted in fatal injuries of an unrestrained 7 year old female passenger.

16. *Abstract*

A front to rear two vehicle crash involving a 1993 Lexus LS 400 (Vehicle #1) and a 1991 Lincoln Town Car (Vehicle #2) occurred in [redacted] Texas o[redacted]1994 at 1904 hrs. The crash occurred on a six lane, divided, dry, asphalt roadway surface just west of a four leg intersection. The ambient condition was clear with the sky backlighted with the setting sun. The police report indicated the roadway was illuminated with street lighting.

Vehicle #1 was equipped with a driver and passenger side air bag system which deployed during the impact sequence. The driver, a 41 year old male, was proceeding east in the center lane (lane #2 counting from the right roadway edge) when he became distracted by his seven year old daughter seated in the right front seat. He was reportedly looking toward his daughter and did not immediately see Vehicle #2 which was stopping for the traffic signal.

When the driver of Vehicle #1 returned his attention back to the roadway, he saw Vehicle #2 stopping. He applied the brakes which resulted in the front end of his vehicle pitching downward. The top of the front bumper and grille area struck the rear bumper of Vehicle #2.

The right front occupant, who was not restrained by the manual lap and shoulder belt, slid off the seat during the braking evasive maneuver and contacted the passenger side air bag module cover as the air bag began to deploy. The air bag module cover flap contacted her upper chest, neck, and the under side of her chin which resulted in lesions of the soft tissue, muscles, esophagus, cervical vertebrae, spinal cord, left mandible and teeth. The expanding air bag then contacted her face and chest resulting in lesions of the face, mediastinum, heart, and lungs. She was propelled upward and struck her head on the windshield which resulted in a contusion to the top of her head.

17. *Key Words*	18. *Distribution Statement*		
Front to rear impact Dual air bag deployment AIS-3 injury (Serious) Fatality, seven year old female	General Public		
19. *Security Classif. (of this report)* Unclassified	20. *Security Classif. (of this page)* Unclassified	21. *No. of Pages*	22. *Price*

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CALSPAN REMOTE AIR BAG DEPLOYMENT INVESTIGATION

CALSPAN CASE NO. 95-15

VEHICLE #1 - 1993 LEXUS LS 400
VEHICLE #2 - 1991 LINCOLN TOWN CAR

LOCATION - [redacted], TEXAS

CRASH DATE - [redacted] 1994

SUMMARY

A front to rear two vehicle crash involving a 1993 Lexus LS 400 (Vehicle #1) and a 1991 Lincoln Town Car (Vehicle #2) occurred in [redacted] Texas on [redacted], 1994 at [redacted] hrs. The crash occurred on a six lane, divided, dry, asphalt roadway surface just west of a four leg intersection. The ambient condition was clear with the sky backlighted with the setting sun. The police report indicated the roadway was illuminated with street lighting.

Vehicle #1 was equipped with a driver and passenger side air bag system which deployed during the impact sequence. The driver, a 41 year old male, was proceeding east in the center lane (lane #2 counting from the right roadway edge) when he became distracted by his seven year old daughter seated in the right front seat. He was reportedly looking toward his daughter and did not immediately see Vehicle #2 which was stopping for the traffic signal.

When the driver of Vehicle #1 returned his attention back to the roadway, he saw Vehicle #2 stopping. He applied the brakes which resulted in the front end of his vehicle pitching downward. The top of the front bumper and grille area struck the rear bumper of Vehicle #2.

The right front occupant, who was not restrained by the manual lap and shoulder belt, slid off the seat during the braking evasive maneuver and contacted the passenger side air bag module cover as the air bag began to deploy. The air bag module cover flap contacted her upper chest, neck, and the under side of her chin which resulted in lesions of the soft tissue, muscles, esophagus, cervical vertebrae, spinal cord, left mandible, and teeth. The expanding air bag then contacted her face and chest resulting in lesions of the face, mediastinum, heart, and lungs. She was propelled upward and struck her head on the windshield which resulted in a contusion to the top of her head.

Vehicle #1 came to the final rest position (FRP) west of the intersection while Vehicle #2 reportedly came to the FRP across the intersection. Vehicle #1 was towed from the scene while Vehicle #2 was driven from the scene.

The local police department responded on-scene within one minute of the crash. Rescue arrived within three minutes and transported the girl to a local trauma center via ambulance where she expired five hours later.

PRIVATE INVESTIGATION REPORT

The day after the crash, the driver of Vehicle #1 employed a local investigative company to conduct an investigation into the causes and outcome of this crash. The investigative company reviewed pre-impact events, developed travel speeds, assessed exterior and interior damage of Vehicle #1 including interior contact points by the right front passenger, documented exterior damage of Vehicle #2, interviewed both drivers, conducted a drive-by with the driver of Vehicle #1, and provided an analysis of the crash. A report was published and is contained under Appendix C.

VEHICLE DATA

Vehicle #1 (1993 Lexus LS 400 four door which was manufactured [redacted] 1993) was equipped with dual air bags which deployed as the result of the crash. The VIN was JT8UF11E8P0 ([redacted]. The vehicle was powered by a 4.0 iter V8 engine with a four speed automatic transmission.

The damage pattern to Vehicle #1 according to the private investigative report (PIR) suggested the vehicle was pitching downward due to heavy braking prior to impact. The damage pattern included direct contact across the frontal plane of the vehicle with contact to the top portion of the front bumper and grille/hood area. Contact height on the front bumper began at 47.2 cm (18.6") and extended upward. The post crash bumper height measured to the top was 58.4 cm (23.0").

The crush values extrapolated from the report were as follows:

C_1 = 38.1 cm (15.0")	C_4 = 33.0 cm (13.0")
C_2 = 30.5 cm (12.0")	C_5 = 20.3 cm (8.0")
C_3 = 30.5 cm (12.0")	C_6 = 0 cm (0")

An imprint in the hood face of Vehicle #1 appeared to resemble the trunk key lock cover of Vehicle #2. This imprint was located 21.3 cm (8.4") right of Vehicle #1's centerline which indicated Vehicle #1 was slightly to the left of Vehicle #2's at the point of impact (POI).

The damage pattern to the rear of Vehicle #2 began at the left rear bumper corner and ended 30.5 cm (12.0") left of the right bumper corner. Direct contact to the underside of the bumper and truck extended forward 45.7 cm (18.0"). The left and right bumper energy absorbing devices (EAD) were displaced 2.5 cm to 5.0 cm (1.0" to 2.0"). The post crash bumper height measured 36.6 cm (14.4") at the bottom and 57.9 cm (22.8") at the top. The rear tail light filaments were not damaged.

Given this damage description, two speed calculation runs were completed using the damage routine of the CRASH3 PC program. The first run used the crush values as reported in the PIR for Vehicle #1 and EAD stroke values of 5.0 cm (2.0") for C_1 and 2.5 cm (1.0") for C_2 for Vehicle #2 which yielded the following results:

	Vehicle #1	Vehicle #2
Total delta V	20 km/h (13.0 mph)	19.0 km/h (12.0 mph)
Longitudinal delta V	-20 km/h (-13.0 mph)	19.0 km/h (12.0 mph)
Lateral delta V	0 km/h (0 mph)	0 km/h (0 mph)
Energy dissipation	48,686 joules (35,906 ft-lb)	9,387 joules (6,923 ft-lb)

The second run used an averaging technique of the crush values for Vehicle #1 in order to better understand the delta V range limits for a frontal underride crash where the front bumper may not have been displaced rearward in the crash. The results of this run are shown in the following table:

	Vehicle #1	Vehicle #2
Total delta V	16 km/h (10.0 mph)	15.0 km/h (9.0 mph)
Longitudinal delta V	-16 km/h (-10.0 mph)	15.0 km/h (9.0 mph)
Lateral delta V	0 km/h (0 mph)	0 km/h (0 mph)
Energy dissipation	26,980 joules (19,897 ft-lb)	9,387 joules (6,923 ft-lb)

The computation for these runs are contained in Appendix C.

The PIR noted damage to the interior of Vehicle #1 as the result of the crash. Damage included: the separation of the rearview mirror from its mounting on the windshield; contact on the windshield in front of the right front seat; contact on the air bag module cover consisting of a white clothing material; and clothing transfer on the glove box door.

AIR BAG SYSTEM

Vehicle #1 was equipped a driver side and passenger side air bags which deployed during the crash. Delta V estimates derived from the CRASH3 PC program indicated the system deployed as designed (i.e., CRASH delta V output ranged between 16 km/h and 20 km/h (10.0 mph - 13.0 mph).

The PIR noted a white cloth transfer across the passenger side air bag module cover and leading edge of the cover. The right front passenger was wearing a T-shirt at the time as noted by the medical examiner's report. Although, the color of the shirt was not discussed in any of the reports, it was presumed the T-shirt was predominately white. The composition of the module cover was described as a plastic coated metallic air bag door.

The abrasion/contusion injury pattern documented by the medical examiner on the right front occupant's upper chest, neck, and underside of the chin appeared consistent with contact by the air bag module cover during the deployment cycle. The medical examiner described a strap like abrasion that measured 15.2 cm x 2.5 cm (6.0" x 1.0") located on the left under surface and focal hemorrhage of the strap muscles of the neck (refer to photograph #1 on page D-1). The mid portion of the left mandible was fractured and several teeth were traumatically avulsed. These lesions were attributed to contact with the air bag module cover.

The air bag contacted the girl's face and chest resulting in abrasions and contusions. As the bag continued to deploy, it applied a blunt force to the neck which resulted in the hemorrhage of the esophagus, separation of the atlanto-occipital, fracture of C_2-C_3, and contusion of the spinal cord. The air bag contacted the chest which resulted in a hemorrhage of the atria of the heart and contusions of the lungs.

DRIVER DATA

Vehicle #1

The driver was a 41 year old male who may have been transporting his daughter (right front occupant) to an entertainment event. The police accident report indicated the driver was wearing the available lap and torso restraint belt. According to the PIR, the driver indicated it was a family rule to always wear their restraint belts.

The driver reportedly was distracted prior to the crash by the right front occupant. His attention was focused on his daughter as he approached the intersection which reportedly prevented him from observing the stopping action of the lead vehicle (Vehicle #2). As he returned his attention to the roadway, he noticed that Vehicle #2 was stopping. He applied the brakes in a panic stop maneuver, but was unable to avoid the crash.

The crash actuated the air bag system deployment cycle. The driver side air bag deployed. The driver sustained a police reported "C" injury (possible injury).

The driver was initially charged with involuntary manslaughter which was later dropped by the grand jury.

OCCUPANT DATA

Vehicle #1

The right front occupant was a 134.5 cm (53.0") tall, 35.4 kg (78.0 lb), seven year old female who was not wearing the lap and torso belt at the time of the crash. According to the interview in the PIR, the driver stated the restraint belt was generally worn by his daughter where the torso belt was placed behind her back. He was under the assumption prior to the crash that she was wearing the belt in this fashion. The PIR noted that the girl was wearing a blousey T-shirt and speculated the driver's view of whether she had the belt latched or not may have been obscured. The PIR noted the girl was excited about attending an entertainment event which was interpreted as the destination of the trip.

The injury pattern sustained by the right front occupant and the interior component contact evidence identified in the PIR confirmed the police report's assessment that the right front occupant was not wearing the restraint belt at the time of the crash.

Kinematic Pattern, Right Front Occupant Of Vehicle #1

The right front occupant was sitting facing forward in the seat prior to the crash. The seat back rest (as listed in the PIR) was located 79.2 cm (31.2") from the instrument panel. As the driver applied the brakes, the occupant moved forward and contacted the glove box door with her knees.

The vehicle damage pattern (described in the PIR) suggested a bumper override type impact. Although air bag sensor locations were not discussed in the PIR, it was possible this impact configuration may have slowed the air bag system sensor closure time interval, thus delaying the deployment of the air bags. This may have exacerbated the situation and allowed the girl to reach the instrument panel prior to full air bag deployment.

A contusion on the left knee was located along the anterior medial aspect which suggested the leg was positioned slightly to the left just prior to the impact. The contusion on the right knee was located on the anterior aspect indicating the leg was positioned straight forward (refer to photograph #2 on page D-2).

The occupant arrived at the instrument panel at the same time as the passenger side air bag began the deployment cycle. The white cloth transfers on the air bag module cover appeared to correlate with the T-shirt worn by the right front occupant. As the air bag module cover opened, it contacted her upper chest, neck, and underside of the chin. She sustained an abrasion of the chin, a fracture of the mid portion of the left mandible, several traumatically avulsed teeth, and contusions of the neck. the mandible fracture suggested the position of her head may have been slightly rotated to the right and pitched downward when contacted by the air bag module cover.

The air bag contacted her chest, neck, and face which resulted in a hemorrhage of the heart, contusions of the lungs, lesions of the neck, and contusions/abrasion of the face. She was then propelled upward 18.3 cm (7.2") and contacted the windshield which was noted by a piece of long hair on the windshield. She also sustained a faint contusion of the top portion of the head in the midline parietal region.

The PIR did not list any details as to the final rest position of the right front occupant. It was assumed she remained in the right front seat area.

INJURY DATA

Right Front Occupant Of Vehicle #1

The right front occupant was transported from the scene via ambulance to a local trauma center where she expired at 0025 hrs of the next day (i.e., five hours after the crash). An autopsy was performed later that day at 0750 hrs by the medical examiner's office. The following table summarizes the injuries noted in the autopsy report and lists corresponding OIC/AIS severity codes [Abbreviated Injury Scale - 1990 Revision (AIS-90) used by the National Accident Sampling System].

RIGHT FRONT OCCUPANT INJURIES	**SEVERITY (OIC/AIS)**	**SOURCE***
Several traumatically avulsed teeth	251406.18	Passenger side air bag module cover and air bag
Abrasion of the chin *Strap like abrasion that measured 15.2 cm x 2.5 cm (6.0" x 1.0") located on the left under surface of the chin* *Abrasions of the mandibular region, anteriorly*	290202.18	Passenger side air bag module cover and air bag

RIGHT FRONT OCCUPANT INJURIES	SEVERITY (OIC/AIS)	SOURCE*
Contusion of the right and left temporalis muscle Contusion of the left mandible *Purple color located mid to left portion of mandible which measured 3.2 cm x 1.3 cm (1.25" x 0.5")*	290402.11 290402.12	Passenger side air bag
Fracture of the left mandible *Fracture located at the mid portion of the mandible*	250612.22	Passenger side air bag module cover and air bag
Faint contusion of the top portion of the head in the midline parietal region	190402.19	Windshield,
Separation of the atlanto-occipital	650208.26	Passenger side air bag module cover and air bag
Soft tissue hemorrhage surrounding the vertebral column in the neck	390402.15	Passenger side air bag module cover and air bag
Focal hemorrhage around the esophagus	440802.24	Passenger side air bag module cover and air bag
Focal hemorrhage of the strap muscles of the neck	Not a codeable injury	Passenger side air bag module cover and air bag
Contusion of the spinal cord in the region of C_2-C_3 *Apparent necrosis* Fracture at the level of C_2-C_3	640204.36	Passenger side air bag module cover and air bag
Contusions of the knees *Two small contusions were noted of the knee*	890402.13	Glove compartment door

RIGHT FRONT OCCUPANT INJURIES	SEVERITY (OIC/AIS)	SOURCE*
Hemorrhage of the anterior mediastinum in the region of the thymus	Not a codeable injury	Passenger side air bag
Small amount of hemorrhage of the atria of the heart	441002.34	Passenger side air bag
Focal small amounts of hemorrhage are noted of the lungs	441402.33	Passenger side air bag

*The injury source assignment should be considered provisional as the assignment was based on a kinematic pattern developed from review and analysis of documents available prior to the preparation of this report. Photographs of Vehicle #1 were not available.

DRIVER DATA

Vehicle #2

The driver of Vehicle #2 was a 43 year old male. The police accident report indicated that he was wearing the available lap and torso restraint belt at the time of the crash.

The driver was in the process of stopping for the traffic signal which was cycling from green to amber when he was struck from behind by Vehicle #1. The driver sustained a police reported "C" injury (possible injury), but was not transported from the scene to a medical facility.

OCCUPANT DATA

Vehicle #2

A 23 year old male was seated in the right front seat. The police accident report indicated he was wearing the lap and torso belt. The occupant was not injured.

CRASH DATA

Pre-crash

Vehicle #1 was traveling east on a six lane, divided, dry, asphalt urban arterial roadway which was posted at 64 km/h (40 mph). The south side of the roadway (i.e., right side of the vehicle's travel path) was abutted by commercial establishments with numerous driveway egress points adjoining the roadway.

The driver indicated he was traveling at a speed of 56 km/h to 64 km/h (35 mph - 40 mph) when he took his attention off the traffic ahead and looked at his daughter seated in the right front seat. Travel speed calculations contained in the PIR suggested that a travel speed of 64 km/h (40 mph) was the best fit for the mathematical modeling used by the private investigator (refer to Appendix B, page B-6).

As Vehicle #1 approached a four leg intersection, the traffic signal cycled from green to amber. The lead vehicle (Vehicle #2) responded to this change of colors by initiating a stopping action. The driver of Vehicle #1 returned his attention back to the roadway and observed Vehicle #2 braking.

The driver of Vehicle #1 responded to Vehicle #2's stopping action by applying the brakes. The right front occupant was unrestrained and moved forward toward the instrument panel as the vehicle decelerated.

Crash

The front of Vehicle #1 struck the rear of Vehicle #2 in a full end plane engagement configuration. From the data provided in the PIR, two delta V computation runs were completed using the CRASH3 PC program. The results indicated the delta V for Vehicle #1 ranged from 16 km/h (10 mph) in run #2 (averaged "C" values) to 20 km/h (13 mph) in run #1 (full "C" values). Vehicle #2 sustained a delta V of 15 km/h (9 mph) in run #2 and 19 km/h (12 mph) in run #1.

The right front occupant was in contact with the passenger side air bag module cover as the air bag system initiated the deployment cycle. She sustained lesions of the chest, neck, and face as the cover opened and the air bag deployed. The girl was propelled upward and struck her head on the windshield resulting in a contusion to the top of the her head.

Vehicle #2 was pushed forward and came to the final rest position (FRP) on the east side of the intersection. Vehicle #1 came to the FRP 3.6 m (14.0') west of the stop bar located west of the intersection.

Post crash

The local police department responded and was on-scene one minute after the crash. The local fire department dispatched an ambulance which arrive three minutes after the crash. The

right front occupant of Vehicle #1 was transported to a local trauma center where she expired five hours later.

Vehicle #1 was towed from the scene due to damage. Vehicle #2 was driven from the scene by the driver.

Appendix A

Police Accident Report

[redacted] PEACE OFFICER'S ACCIDENT REPORT ST-3 (Eff. [redacted] 93) MAIL TO: STATISTICAL SERVICES, TEXAS [redacted] ORIGINAL

PLACE WHERE ACCIDENT OCCURRED
COUNTY [redacted] CITY OR TOWN [redacted] (SHOW ONLY IF INSIDE CITY LIMITS)
IF ACCIDENT WAS OUTSIDE CITY LIMITS, INDICATE DISTANCE FROM NEAREST TOWN ____ MILES ☐ NORTH ☐ S ☐ E ☐ W OF ____ (CITY OR TOWN)

LOC. NO. [redacted]

DO NOT WRITE IN THIS SPACE
OPS NO. ____
LOC. ____
CODE ____ SEVERITY ____
TYPE ____
FAT. REC. ____ DR. REC. ____

ROAD ON WHICH ACCIDENT OCCURRED [redacted] (BLOCK NUMBER / STREET OR ROAD NAME / ROUTE NUMBER OR STREET CODE)
CONSTR. ZONE ☐ YES ☒ NO SPEED LIMIT 40
INTERSECTING STREET OR RR X'ING NUMBER ____ (BLOCK NUMBER / STREET OR ROAD NAME / ROUTE NUMBER OR STREET CODE)
CONSTR. ZONE ☐ YES ☐ NO SPEED LIMIT ____
NOT AT INTERSECTION APPROX 25 ☒ FT. ☐ ☐ ☐ ☒ OF ☐ MI. N S E W [redacted] (SHOW MILEPOST OR NEAREST INTERSECTING NUMBERED HIGHWAY. IF NONE, SHOW NEAREST INTERSECTING STREET OR REFERENCE POINT.)

DATE OF ACCIDENT [redacted] 19 94 DAY OF WEEK [redacted] HOUR [redacted] ☐ A.M. IF EXACTLY NOON ☐ P.M. OR MIDNIGHT, SO STATE

UNIT NO. 1 - MOTOR VEHICLE
VEH IDENT NO 1FBUF11E8RD[redacted] IF BODY STYLE = VAN OR BUS, INDICATE SEATING CAPACITY N/A
YEAR MODEL 93 COLOR & MAKE BLK LEXUS MODEL NAME LS 400 BODY STYLE 4DR LICENSE PLATE [redacted]
DRIVER'S NAME [redacted] (LAST / FIRST / MIDDLE) [redacted] TX PHONE NUMBER [redacted]
DRIVER'S LICENSE TEXAS [redacted] (STATE / NUMBER / CLASS/TYPE) DOB [redacted] (MO / DAY / YEAR) RACE W SEX M OCCUPATION HOME BUILDER
SPECIMEN TAKEN (ALCOHOL/DRUG ANALYSIS) 1-BREATH 2-BLOOD 3-OTHER 4-NONE 5-REFUSED 4 ALCOHOL/DRUG ANALYSIS RESULT N/A PEACE OFFICER, EMS DRIVER, FIRE FIGHTER ON EMERGENCY? ☐ YES ☐ NO
LESSEE ☐ OWNER ☒ SAME AS OPERATOR (NAME (ALWAYS SHOW LESSEE IF LEASED, OTHERWISE SHOW OWNER))
LIABILITY INSURANCE ☒ YES ☐ NO [redacted] (INSURANCE COMPANY NAME / ADDRESS / CITY / STATE / POLICY NUMBER) VEHICLE DAMAGE RATING FD3

UNIT NO. 2 MOTOR VEHICLE ☒ - TRAIN ☐ PEDALCYCLIST ☐ TOWED ☐ PEDESTRIAN ☐ OTHER ☐
VEH IDENT NO 1LNCM81W0MY[redacted] IF BODY STYLE = VAN OR BUS, INDICATE SEATING CAPACITY N/A
YEAR MODEL 91 COLOR & MAKE BLUE LINCOLN MODEL NAME TOWN CAR BODY STYLE 4DR LICENSE PLATE [redacted]
DRIVER'S NAME [redacted] (LAST / FIRST / MIDDLE) [redacted] TX PHONE NUMBER [redacted]
DRIVER'S LICENSE TEXAS [redacted] (STATE / NUMBER / CLASS/TYPE) DOB [redacted] (DAY / YEAR) RACE W SEX M OCCUPATION ELECTRONE
SPECIMEN TAKEN (ALCOHOL/DRUG ANALYSIS) 1-BREATH 2-BLOOD 3-OTHER 4-NONE 5-REFUSED 4 ALCOHOL/DRUG ANALYSIS RESULT N/A PEACE OFFICER, EMS DRIVER, FIRE FIGHTER ON EMERGENCY? ☐ YES ☐ NO
LESSEE ☐ OWNER ☒ SAME AS OPERATOR (NAME (ALWAYS SHOW LESSEE IF LEASED, OTHERWISE SHOW OWNER))
LIABILITY INSURANCE ☒ YES ☐ NO [redacted] (INSURANCE COMPANY NAME / ADDRESS / CITY / STATE / POLICY NUMBER) VEHICLE DAMAGE RATING BD2

DAMAGE TO PROPERTY OTHER THAN VEHICLES
OBJECT N/A NAME AND ADDRESS OF OWNER ____ FEET FROM CURB ____ S ____ DAMAGE ESTIMATE

LIGHT CONDITION 4 (1-DAYLIGHT 2-DAWN 3-DARK-NOT LIGHTED 4-DARK-LIGHTED 5-DUSK)
WEATHER 1 (1-CLEAR/CLOUDY 2-RAINING 3-SNOWING 4-FOG 5-BLOWING DUST 6-SMOKE 7-SLEETING 8-HIGH WINDS 9-OTHER ____)
SURFACE CONDITION 1 (1-DRY 2-WET 3-MUDDY 4-SNOWY/ICY 5-OTHER ____)
TYPE ROAD SURFACE 2 (1-BLACKTOP 2-CONCRETE 3-GRAVEL 4-SHELL 5-DIRT 6-OTHER ____)
DESCRIBE ROAD CONDITIONS (INVESTIGATOR'S OPINION)

IN YOUR OPINION, DID THIS ACCIDENT RESULT IN AT LEAST $600.00 DAMAGE TO ANY ONE PERSON'S PROPERTY? ☒ YES ☐ NO

CHARGES FILED
NAME [redacted] CHARGE INTOXICATION MANSLAUGHTER CITATION NUMBER Grand Jury Pend
NAME ____ CHARGE ____ CITATION NUMBER ____

TIME NOTIFIED OF ACCIDENT [redacted] 1904 M HOW RADIO DISPATCHER TIME ARRIVED AT SCENE OF ACCIDENT [redacted] 1905 M
TYPED OR PRINTED NAME OF INVESTIGATOR [redacted] DATE REPORT MAILED [redacted] IS REPORT COMPLETE ☒ YES ☐ NO
SIGNATURE OF INVESTIGATOR [redacted] NO. [redacted] DEPARTMENT [redacted] DIST./AREA [redacted]

BEST AVAILABLE COPY

EJECTED	CODE FOR TYPE RESTRAINT USED	AIRBAG CODE	HELMET USE	CODE FOR INJURY SEVERITY	ALCOHOL/DRUG ANALYSIS (COMPLETE IF CASUALTIES NOT INDICATED IN VEHICLE)
A - NOT APPLICABLE Y - YES N - NO P - PARTIALLY U - UNK	A - SEATBELT & SHOULDER STRAP B - SEATBELT & NO SHOULDER STRAP C - CHILD RESTRAINT E - SHOULDER STRAP ONLY N - NONE	Y - DEPLOYED N - NO DEPLOYMENT U - UNK IF DEPLOYED	1 - WORN-DAMAGED 2 - WORN-NOT DAMAGED 3 - WORN-UNK IF DAMAGED 4 - NOT WORN 9 - UNK IF WORN	K - KILLED A - INCAPACITATING INJURY B - NON INCAPACITATING C - POSSIBLE INJURY N - NOT INJURED	1 - BREATH 2 - BLOOD 3 - OTHER 4 - NONE 5 - REFUSED

UNIT NO. 1 — DAMAGE RATING: FO3 — TOWED DUE TO DAMAGE: X YES | | NO — VEHICLE REMOVED TO: [redacted] — BY: [redacted]

Item No	OCCUPANT'S POSITION	COMPLETE ALL DATA ON ALL OCCUPANTS' NAMES, POSITIONS, RESTRAINTS USED, ETC.; HOWEVER, IT IS NOT NECESSARY TO SHOW ADDRESSES UNLESS KILLED OR INJURED. NAME (LAST NAME FIRST)	ADDRESS	EJECTED	TYPE RESTRAINT USED	AIRBAG	HELMET	AGE	SEX	INJURY CODE
1	DRIVER	SEE FRONT		N	A	Y	4	41	M	C
2	FR	[redacted]	[redacted]	N	N	Y	4	17	F	K
3										
4										
5										

UNIT NO. 2 (COMPLETE ONLY IF UNIT WAS A MOTOR VEHICLE) — DAMAGE RATING: BO2 — TOWED DUE TO DAMAGE: | | YES X NO — VEHICLE REMOVED TO: DRIVEN AWAY OVERLAND — BY:

Item No	OCCUPANT'S POSITION	COMPLETE ALL DATA ON ALL OCCUPANTS' NAMES, POSITIONS, RESTRAINTS USED, ETC.; HOWEVER, IT IS NOT NECESSARY TO SHOW ADDRESSES UNLESS KILLED OR INJURED. NAME (LAST NAME FIRST)	ADDRESS	EJECTED	TYPE RESTRAINT USED	AIRBAG	HELMET	AGE	SEX	INJURY CODE
6	DRIVER	SEE FRONT		N	A	N	4	43	M	C
7	FR	[redacted]	[redacted]	N	A	N	4	45	M	N
8										
9										
10										

COMPLETE IF CASUALTIES NOT IN MOTOR VEHICLE

PEDESTRIAN, PEDALCYCLIST, ETC.	CASUALTY NAME (LAST NAME FIRST)	CASUALTY ADDRESS	TYPE SPECIMEN TAKEN	RESULT	HELMET	AGE	SEX	INJURY CODE
	— N/A —							

DISPOSITION OF KILLED AND INJURED

ITEM NUMBERS	TAKEN TO	BY	IF AMBULANCE USED, SHOW TIME NOTIFIED	TIME ARRIVED AT SCENE	NO. ATTENDANTS INC. DRIVER
2	[redacted]	PFD	1904	1907	2

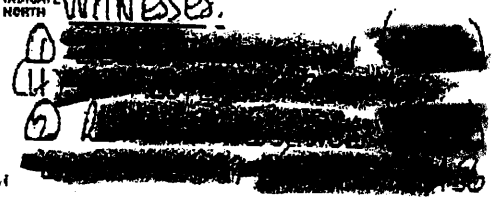
COMPLETE THIS SECTION IF PERSON KILLED

ITEM NUMBER	DATE OF DEATH	TIME OF DEATH	ITEM NUMBER	DATE OF DEATH	TIME OF DEATH	ITEM NUMBER	DATE OF DEATH	TIME OF DEATH
2	[redacted]	0025 HRS						

INVESTIGATOR'S NARRATIVE OPINION OF WHAT HAPPENED (ATTACH ADDITIONAL SHEETS IF NECESSARY)

UNIT #1 AND #2 WERE EB [redacted] UNIT #1 BEHIND #2. THE TRAFFIC SIGNAL WENT FROM GREEN TO YELLOW SO UNIT #2 STARTED TO SLOW TO A STOP FOR RED LIGHT. UNIT #2 WAS NOT QUITE STOPPED WHEN UNIT #1 STRUCK #2 FROM BEHIND. UNIT #1 STATED THAT HE WAS DISTRACTED INSIDE THE VEHICLE BY LOOKING AT PASSENGER IN THE VEHICLE. WITNESS STATED NO BRAKES APPLIED UNTIL IMPACT. UNIT #2 STATED HE NEVER HEARD BRAKES PRIOR TO IMPACT. UNIT #1 PUSHED #2 INTO THE INTERSECTION AFTER IMPACT.

DIAGRAM ☐ ONE WAY ☐ TWO WAY ☐ DIVIDED — INDICATE NORTH — WITNESSES:



FACTORS AND CONDITIONS LISTED ARE THE INVESTIGATOR'S OPINION

FACTORS/CONDITIONS CONTRIBUTING

	1	2	3
UNIT X	19	20	—
UNIT 2	—	—	—

OTHER FACTORS/CONDITIONS MAY OR MAY NOT HAVE CONTRIBUTED

	1	2
UNIT 1	—	—
UNIT 2	—	—

TRAFFIC CONTROL: 0-NO CONTROL OR INOPERATIVE; 1-OFFICER OR FLAGMAN; 2-STOP AND GO SIGNAL; 3-STOP SIGN; 4-FLASHING RED LIGHT; 5-TURN MARKS; 6-WARNING SIGN; 7-RR GATES OR SIGNALS; 8-YIELD SIGN; 9-CENTER STRIPE OR DIVIDER; 10-NO PASSING ZONE; 11-OTHER CONTROL — 2/9

1. ANIMAL ON ROAD — DOMESTIC
2. ANIMAL ON ROAD — WILD
3. BACKED WITHOUT SAFETY
4. CHANGED LANE WHEN UNSAFE
5. DEFECTIVE OR NO HEADLAMPS
6. DEFECTIVE OR NO STOP LAMPS
7. DEFECTIVE OR NO TAIL LAMPS
8. DEFECTIVE OR NO TURN SIGNAL LAMPS
9. DEFECTIVE OR NO TRAILER BRAKES
10. DEFECTIVE OR NO VEHICLE BRAKES
11. DEFECTIVE STEERING MECHANISM
12. DEFECTIVE OR SLICK TIRES
13. DEFECTIVE TRAILER HITCH
14. DISABLED IN TRAFFIC LANE
15. DISREGARD STOP AND GO SIGNAL
16. DISREGARD STOP SIGN OR LIGHT
17. DISREGARD TURN MARKS AT INTERSECTION
18. DISREGARD WARNING SIGN AT CONSTRUCTION
19. DISTRACTION IN VEHICLE
20. DRIVER INATTENTION
21. DROVE WITHOUT HEADLIGHTS
22. FAILED TO CONTROL SPEED
23. FAILED TO DRIVE IN SINGLE LANE
24. FAILED TO GIVE HALF OF ROADWAY
25. FAILED TO HEED WARNING SIGN
26. FAILED TO PASS TO LEFT SAFELY
27. FAILED TO PASS TO RIGHT SAFELY
28. FAILED TO SIGNAL OR GAVE WRONG SIGNAL
29. FAILED TO STOP AT PROPER PLACE
30. FAILED TO STOP FOR SCHOOL BUS
31. FAILED TO STOP FOR TRAIN
32. FAILED TO YIELD ROW — EMERGENCY VEHICLE
33. FAILED TO YIELD ROW — OPEN INTERSECTION
34. FAILED TO YIELD ROW — PRIVATE DRIVE
35. FAILED TO YIELD ROW — STOP SIGN
36. FAILED TO YIELD ROW — TO PEDESTRIAN
37. FAILED TO TO YIELD ROW — TURNING LEFT
38. FAILED TO YIELD ROW — TURN ON RED
39. FAILED TO YIELD ROW — YIELD SIGN
40. FATIGUED OR ASLEEP
41. FAULTY EVASIVE ACTION
42. FIRE IN VEHICLE
43. FLEEING OR EVADING POLICE
44. FOLLOWED TOO CLOSELY
45. HAD BEEN DRINKING
46. HANDICAPPED DRIVER (EXPLAIN IN NARRATIVE)
47. ILL (EXPLAIN IN NARRATIVE)
48. IMPAIRED VISIBILITY (EXPLAIN IN NARRATIVE)
49. IMPROPER START FROM PARKED POSITION
50. LOAD NOT SECURED
51. OPENED DOOR INTO TRAFFIC LANE
52. OVERSIZE VEHICLE OR LOAD
53. OVERTAKE AND PASS INSUFFICIENT CLEARANCE
54. PARKED AND FAILED TO SET BRAKES
55. PARKED IN TRAFFIC LANE
56. PARKED WITHOUT LIGHTS
57. PASSED IN NO PASSING ZONE
58. PASSED ON RIGHT SHOULDER
59. PEDESTRIAN FAILED TO YIELD ROW TO VEHICLE
60. SPEEDING — UNSAFE (UNDER LIMIT)
61. SPEEDING — OVER LIMIT
62. TAKING MEDICATION (EXPLAIN IN NARRATIVE)
63. TURNED IMPROPERLY — CUT CORNER ON LEFT
64. TURNED IMPROPERLY — WIDE RIGHT
65. TURNED IMPROPERLY — WRONG LANE
66. TURNED WHEN UNSAFE
67. UNDER INFLUENCE — ALCOHOL
68. UNDER INFLUENCE — DRUG
69. WRONG SIDE — APPROACH OR IN INTERSECTION
70. WRONG SIDE — NOT PASSING
71. WRONG WAY — ONE WAY ROAD
72. OTHER FACTOR (WRITE IN OR LINE BELOW)

[redacted]

[redacted] POLICE DEPARTMENT

ACCIDENT DIAGRAM SUPPLEMENT

ORIGINAL

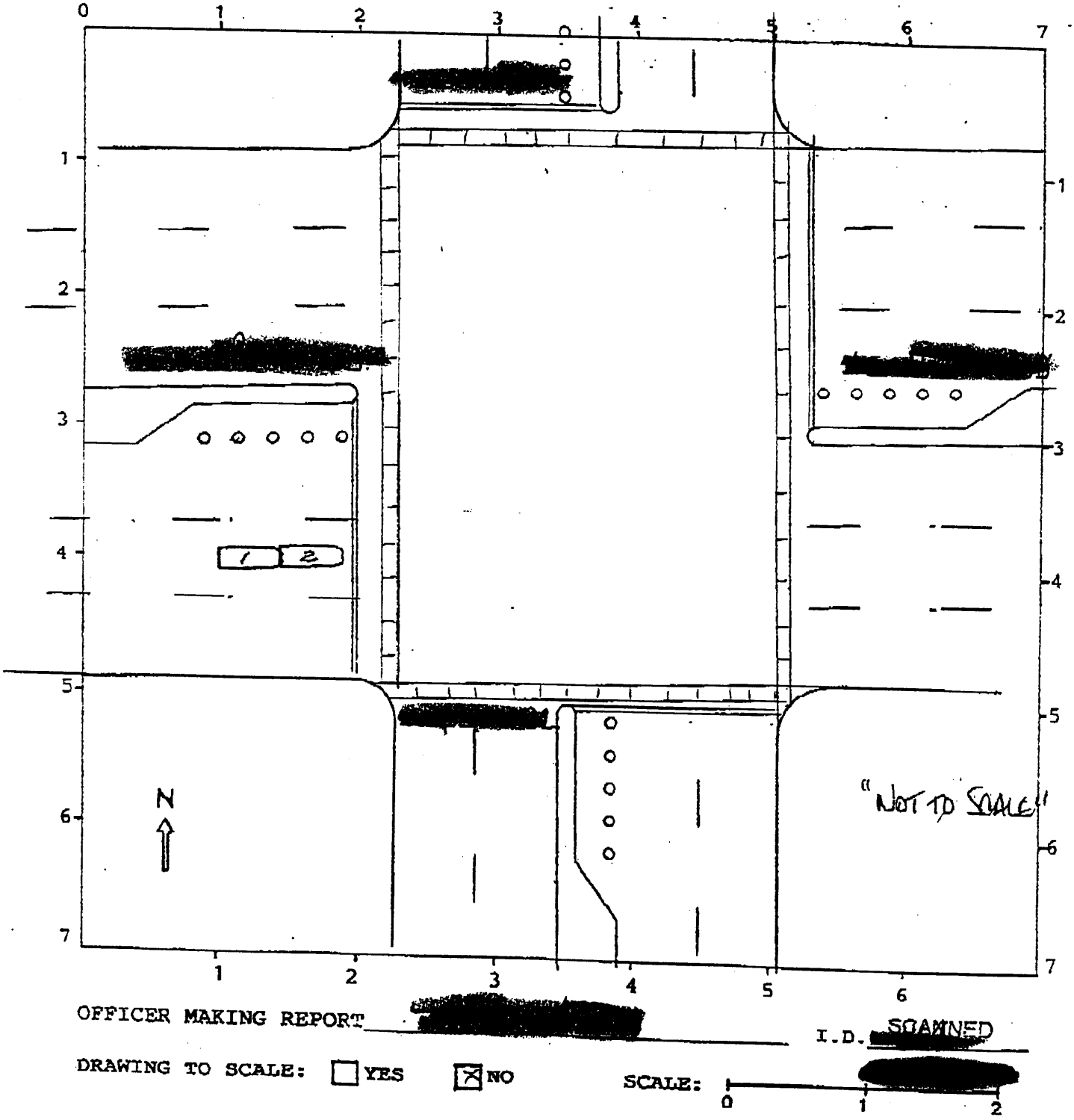
FILE NR. [redacted]

DRIVER UNIT NR. 1 [redacted]

LIC. NR. [redacted]

LOCATION [redacted]

DATE [redacted]



OFFICER MAKING REPORT [redacted]

I.D. [redacted]

SCANNED

DRAWING TO SCALE: ☐ YES ☒ NO

SCALE: 0 1 2

Appendix B

Private Investigation Report

[redacted]

1.0 INTRODUCTION

On [redacted], 1994, [redacted] was requested to investigate a collision between two passenger cars.

2.0 BACKGROUND

On [redacted] 1994, a 1993 Lexus ES 400, owned and operated by [redacted] struck a 1991 Lincoln Town Car. Both vehicles were east bound in the [redacted] approaching the intersection with [redacted] the Lincoln was leading the Lexus. The passenger riding in the front right seat of the Lexus, [redacted] daughter [redacted], was fatally injured.

As the vehicles approached the intersection the light changed from green to amber, the Lincoln stopped before entering the intersection and was struck by the Lexus. Both airbags on the Lexus deployed. [redacted] was killed by the force associated with the deploying airbag, when the airbag forced her head and upper body into the vehicle's windshield.

3.0 INVESTIGATION

The following tasks have been completed:

1. Review of the accident scene;
2. Review of the damaged Lexus;
3. Review of the damaged Lincoln;
4. Personal interview with [redacted] at the accident scene;
5. Calculations for impact speeds and time distance relationships;
6. Review of [redacted] statement;
7. Personal interview with [redacted] of the National Transportation Safety Board;
8. Review of the [redacted] Police accident report.

3.1 REVIEW OF THE ACCIDENT SCENE

[redacted] is a 40 mile per hour, six (6) lane two way urban arterial, serving residential subdivisions and commercial developments. The intersection with [redacted] is a land use division for [redacted]. The west side of the intersection is lined with commercial developments, including fuel stations, restaurants and shopping areas. This leg of the intersection has several intersections with commercial driveways. The east side is lined with privacy fences for abutting residential areas.

The roadway is essentially straight divided by a raised median. Immediately at the intersection, a left turn lane develops to full lane width for intended north and south bound movements from [redacted]. Vertically, [redacted] is situated at a hill crest in [redacted]. A drainage inlet is situated on the south curb line of the west leg, approximately 225 feet from the stop bar.

The intersection is controlled by traffic signals actuated by the presence of vehicles. That is, as a vehicle approaches the intersection from any leg, a switch alerts the signal system of the approaching vehicle and a green light illuminates as soon as practicality allows. From east bound [redacted], the first switch is approximately 200 feet from the stop bar. That is, the Lincoln would have crossed that switch 200 feet before entering the intersection. The length of green and red indicators will vary depending on traffic demand; however, the amber time is a constant four (4) seconds, with an additional one (1) second of "all red".

The investigating officer painted the rest position of the Lexus on the pavement. The marks were found in the center lane on the west side of the intersection, fourteen (14) feet from the stop bar. No marks were found for the Lincoln. Although, witnesses indicate the vehicle drove through the intersection, stopping adjacent to the south curb on east bound [redacted], several hundred feet from the point of impact.

3.2 REVIEW OF THE DAMAGED LEXUS

The Lexus showed front to rear damage across the front of the vehicle. The damage was confined to an area above the bumper. That is, the bumper and frame of the vehicle were not damaged.

The vehicle was inspected, the notes from the inspection follow.

The car has an inspection sticker dated [redacted] of '94 and a [redacted] admittance pass number [redacted]. Tread depth at tire L1 is 4/32", not quite to the wear indicators yet. R1 is 4/32", R2 is at the wear indicators taking it at 2/32". L2 is the same. There are scrape marks on L2, indicative of sliding, the condition has been photographed.

Measuring the front of the car. With 3.3 feet at the hood ornament, which is the previous center of the car. In this configuration, the right side of the car is at 0.20. The right front headlight,

extreme most right front is at 1.2. The hood ornament is at 3.3. The right side of the car is at 6.2. At 2.35 to 2.6 is a square imprint, which measures approximately 38" to 39" off the ground in this damage configuration. It's a square imprint similar to the rear key hole covers on Lincoln Town Cars.

There's damage to the front bumper, along the top edge. This bumper went underneath the bumper of the Lincoln.

The following are crush measurements across the front of the vehicle referenced to the leading edge of the front bumper. The headlight on the left front side, taking the measurement at 1.2 feet, would have about 15" of crush at 2.0 feet is 12" of crush to the front bumper. At 3.0 feet, 12" of crush, at 4.0 feet is 13" at 5 feet, approximately 8" of crush and 0" of crush at 6 feet.

The frame of the car was not involved in the accident. A plastic cover on the underside of the vehicle connected to the bumper shows no signs of defamation whatsoever. Further, it shows no signs of pulling away from the bolts that tack it to the bumper.

The contact across the front of the bumper shows a scraping action where the vehicle nosed down at impact due to braking. The front turn indicators are situated in the bumper of the vehicle. The covers have specifications of Toyota [redacted] Japan, made [redacted] Further specifications, [redacted] labeled E13. The covers show contact from a blue vehicle. Despite the contact, they are not cracked.

The front overhang on this vehicle is 3' 2". The bottom of the A pillar 61". Top of the A pillar, 84", B pillar 102", middle of the C pillar in door seam 141. L2 is at 145. And the car measures 16' 5" in total length.

The bumper measures 1.92' to the top. The lowest contact visible on the front of the bumper is at 1.55'.

The vehicle was manufactured by Toyota Motor Corporation on [redacted] The gross vehicle weight rating is 4940 pounds with a front axle weight rating of 2910 pounds and 2700 pounds on the rear. The Vehicle identification number is JT8UF11E8P0[redacted]. This is designated as Model [redacted] Made in Japan, [redacted]

The air bags on both sides of the car have deployed. The car is in park. The rearview mirror has been torn from its moorings and is broken.

There is a receipt here [redacted] $65.00.

A piece of fairly long hair, hanging on the windshield was located in the car. It obviously came from the young girl involved in the accident. Additionally, several teeth were found in the front of seat area of the vehicle. Each piece of evidence has been secured.

Measuring up from the floorboard, the base of the seat is one (1) foot off the floorboard. The contact to the windshield is 2.8 feet from the floorboard. The contact on the air bag door is 2.2 feet from the floorboard.

From the seat back to the point of contact on the windshield is 3 feet, and to the point of contact on the dashboard or air bag door is 2.6 feet.

The glove box door is just below the air bag door, clothing transfer was located on the glove box door.

The top of the air bag door is plastic coated, the air bag door itself is metal. There is raised lettering on the air bag door. Everything across this air bag door is covered with white clothing type material. The white material is along this whole leading edge of the air bag door

The photographs will depict an in line contact between the passenger and the contact point on the windshield. That is, the passenger struck the windshield immediately in front of the passenger seat with little to no left or right motion. This is indicative of an in line, straight ahead type collision.

Contact with the mirror appears to be from the driver, and would indicate some movement towards the passenger side of the driver. And that appears to be some voluntary motion on the part of the driver to go left to right, possibly in an effort to avoid injury to the child.

At 6:50 p.m., the accident scene was visited to review lighting conditions. A majority of the cars had headlights illuminated. The sun is beyond the horizon at this point, but the sky is still lit.

3.3 REVIEW OF THE DAMAGED LINCOLN

The damaged Lincoln Town Car was inspected for damage. The vehicle showed signs of contact across the rear. The damage was confined to the rear bumper with some induced or non-contact damage to the rear quarter panels. Further, the underside of the car showed signs of contact. The damage under the vehicle extended 1.5 feet in from the rear edge of the rear bumper.

The vehicle identification number is 1LNCM81WOMY[redacted] The gross vehicle weight rating is 5478 pounds with the front axle rated for 2657 pounds and the rear rated for 2875 pounds. The vehicle is light blue, with a light blue plastic vanity cover on the rear bumper.

The bottom of the rear bumper is 1.2 feet high, with the top at approximately 1.9 feet.

Signs of contact can be seen across the vehicle's left rear side, extending from the left rear corner to approximately one (1) foot short of the right rear corner.

None of the rear tail or brake light filaments are distorted.

The energy absorbers on the rear bumper show signs of being pushed in approximately one (1) to two (2) inches.

The brake lights were operative on both sides of the vehicle.

3.4 INTERVIEW WITH [redacted]

1. The [redacted] family rule is to wear safety belts at all times.

2. [redacted] always wore her safety belt. It was [redacted] assumption at all times, that she had her seat belt on. However, she was too short to wear the shoulder belt. That belt was always routed behind her back.

3. [redacted] was very excited about the upcoming [redacted] events.

4. Route to the eventual point of impact was [redacted], and [redacted]

5. Traffic was heavier than usual. Cars all around. Approaching the green light at [redacted], he saw the back of the Lincoln raise up quickly. Enough room in front of him to possibly stop, or to have a fender bender. Clearly remembers hitting his brakes, remembers feeling his car nose down.

6. Drivers side airbag hit him in the chest.

7. From the front of his car to the Lincoln was approximately 80 - 100'.

8. He was traveling 30-40 mph. Doesn't remember phase of lights traveling along [redacted]. That is, red/green [redacted] or shopping center.

9. He looked/talked to [redacted] for 2 seconds maximum.

10. Lots of traffic going through [redacted], he assumed every car would clear intersection.

11. Some witness said the Lincoln stopped on a green light.

12. [redacted] was wearing a big loose shirt, [redacted] could not readily see whether or not [redacted] was wearing a her seat belt. He may or may not have checked to see if she was wearing her belt.

The interview was continued in an automobile. The route immediately preceding the point of impact was traveled.

1. His vehicle was approximately 3 to 4 expansion joints east of the stop bar for east bound [redacted] when he looked up from [redacted]

2. He definitely saw brake lights on the Lincoln.

3. Last saw green light at inlet on south side of east bound [redacted]

4. Confirmed speed of approach of 35 miles per hour.

5. Visually confirmed following distance.

3.5 CALCULATIONS FOR IMPACT SPEED AND TIME/DISTANCE RELATIONSHIPS

The following calculations seek to mathematically review the accident sequence. The calculations are based on the damage to the vehicles, the evidence at the scene, and accident reconstruction doctrine.

1. [redacted] was checking his passenger beginning at a point near the storm sewer inlet located [redacted] from the intersection. At 35 miles per hour, a vehicle is traveling 51.3 feet per second. Therefore, he was approximately 4.4 seconds from impact, and the intersection at that point.

2. The amber phase for east bound [redacted] is four (4) seconds in duration. [redacted] reports seeing a green light at the inlet.

3. [redacted] looked forward, and up from [redacted], at approximately the third or fourth expansion joint prior to the stop bar for the east bound leg of [redacted]. The third joint is 78 feet from the stop bar, and the fourth is 108 feet from the stop bar. Therefore, the distance traveled while looking a[redacted] is:

   a. 225 feet - 78 feet = 147 feet, to
   b. 225 feet - 108 feet = 117 feet.

4. The time associated with traveling 117 to 147 feet, at 51.3 feet per second is:

   a. 117 feet / 51.3 fps = 2.3 seconds
   b. 147 feet / 51.3 fps = 2.8 seconds.

[redacted] estimates he looked t[redacted] for two (2) seconds.

5. The following distance from [redacted] to the Lincoln was reported to be 80 to 100 feet. If the distance was 100 feet, when [redacted] was 225 feet from the intersection, and looking at [redacted], the Lincoln was 125 feet from the intersection traveling at 51.3 feet per second. The Lincoln would have reached the intersection in,

   125 feet / 51.3 fps = 2.4 seconds.

6. Assuming [redacted] would have reached the intersection at the end of the amber phase, then the green light turned to amber 0.4 seconds after [redacted] looked at [redacted]. The following distance is reported as 100 feet, which is 2.0 seconds. Therefore, the Lincoln would be 2.0 seconds from the intersection when it changed from green to amber.

7. The distance from the Lincoln to the intersection would be:

   51.3 feet per second x 2 seconds = 102.6 feet

   when the light turned amber.

8. Assume the driver of the Lincoln reacted to the amber light in a very quick 0.5 seconds, the vehicle would be,

   102.6 feet - (0.5 secs) x (51.3 fps) = 76.9 feet

   from the intersection when the driver's foot began depressing the brake pedal.

9. In order for the vehicle to stop prior to entering the intersection, the vehicle would have to slow at a rate of;

   Deceleration rate = $Speed^2 / 2 \times (Stop\ Dist.)$

   Deceleration rate = $51.3\ fps^2 / 2 \times 76.9$

   Deceleration rate = $17.1\ fps^2$

   This rate is equivalent to 0.53g, near an emergency brake application.

The above analysis assumes all of the conditions described by [redacted] were precise and accurate. However, the conditions would not lead to proper vehicle speeds at impact. Specifically, the Lincoln would have stopped by the time the Lexus arrived. Therefore, the conditions were slightly altered and tested through iterative mathematical modeling.

The calculations are repetitive and would not be appropriate in this format. If [redacted] actual speed was 45 miles per hour, his following distance would have been approximately 80 feet. This

is within the range estimated. If [redacted]'s actual speed was 40 miles per hour, his following distance would have been approximately 70 feet, within ten (10) feet of his estimated range.

If the Lexus was traveling the speed limit, 40 miles per hour, the accident would occur as described, and match the exhibited damage patterns. Alternatively, if the following distance was shortened to a distance of 61 feet, and the 35 miles per hour estimate maintained, the damage patterns would be achieved.

Each of the following distances listed above assume the Lincoln slowed at approximately 0.4g to 0.5g. This matches human factors testing in that slowing from 35 miles per hour to near zero (0) miles per hour at the intersection would require three (3) seconds. Since the amber phase is four (4) seconds in duration, the Lincoln operator would have reacted to the amber light in one (1) second, an average reaction time.

3.6 REVIEW OF [redacted] STATEMENT

1. The light was changing from amber to red as he approached.

2. Was traveling very slow as he approached the intersection.

3. While they were investigating, the [redacted] Police spent a good deal of time with the passenger side airbag.

4. Impact was fairly hard, it drove him across the intersection.

5. Police were doing C.P.R. on [redacted], she had some blood on her face.

6. Drove his car from the scene.

3.7 PERSONAL INTERVIEW WITH [redacted] OF THE [redacted]

1. The [redacted] is in the process of investigating these types of accidents, in which children and passengers are injured by airbags. The [redacted] may recommend that an additional switch be installed in vehicles equipped with airbags which will disable the airbag if the passenger is not wearing a safety belt.

2. Believes most airbags deploy at twelve (12) to fourteen (14) miles per hour change in velocity, although the number varies slightly by manufacturer.

3. Airbags deploy at approximately 200 miles per hour.

3.8 REVIEW OF THE [redacted] POLICE ACCIDENT REPORT

1. Accident occurred on [redacted] 1994 at 7:04 p.m., in the [redacted]

2. Conditions were, daylight - lighted, clear, dry, dry blacktop pavement.

3. The Lexus was towed, and the Lincoln was driven from the scene.

4.0 ANALYSIS

This accident occurred when the operator of the Lincoln unexpectedly stopped at an intersection. Calculations indicate the Lincoln could have easily cleared the intersection during the amber phase. As [redacted] approached the intersection, he would have been subconsciously aware the Lincoln was at a point where it would clear the intersection. Hence, he would have felt safe in checking the condition of his passenger.

The Lincoln's slowing would have initiated while [redacted] was checking his passenger, robbing [redacted] of the opportunity to react to the unexpected slowing. Calculations indicate [redacted] reacted immediately upon becoming aware of the impending danger, and nearly avoided impact.

In fact, the damage to the vehicles indicates the closing speed at impact was sufficiently small as to pose no apparent significant danger to the occupants of either vehicle, and relatively minor danger to the vehicle structures.

Unfortunately, both vehicles would be "nosing down" during the hard slowing. When impact occurred, the rear bumper of the Lincoln was above the front bumper of the Lexus. This configuration exaggerated the damage to the front of the Lexus, and resulted in airbag deployment. Had the bumpers been involved, the entire vehicle structures would have contributed to energy dissipation, resulting in less penetration on the front of the Lexus, changing the timing of airbag deployment. If the airbag could have deployed sooner, or some time later, no death would have occurred.

As a result of the actual impact configuration, the Lexus passenger, "caught up" with the slowing Lexus dashboard, and was over the dash when the airbag deployed. The force of the deployment, forced her upper body and head into the windshield of the Lexus, causing her death.

The damage to this vehicle does not indicate a death would have occurred had the airbag not deployed, or not been on the vehicle.. That is, it appears that if the vehicle was not equipped with an airbag, the passenger would not have been fatally injured.

In fact, a recent study by the [redacted] written in 1988, "Performance of Lap/Shoulder Belts in 167 Motor Vehicle Accidents", no significant injuries were discovered in impacts of this low severity.

Most of the occupants in the study were wearing properly routed lap and shoulder belts, but the association between impact severity and expected injury is clearly established. Typically, the lower the speed, the lower the chance for injury.

The report focuses on the importance of proper use of lap and shoulder belts, and ultimately recommends their use even with children. However, the report references three groups, [redacted] and The [redacted] which all recommend routing shoulder belts behind children. Obviously, confusing and contradictory opinions have been published regarding the safest method of using safety belts with children.

[redacted] understanding of the proper method for strapping a child in a front passenger seat was to have the child route the shoulder portion behind the child's back. The [redacted] has found this position may not illuminate the potential for injury. It will relocate the injury, but the injury may still occur. Further, this position makes it more difficult for the driver to discern whether or not the passenger is wearing a seat belt. [redacted] blousey shirt would obscure the lap portion, and her body would obscure the shoulder portion.

5.0 CONCLUSIONS

1. The closing speeds of the front of the Lexus to the rear of the Lincoln was in a range of ten (10) to fifteen (15) miles per hour.

2. The Lincoln slowed and intended to stop for an amber light which [redacted] correctly surmised could be cleared.

3. There is no evidence to suggest that either vehicle was speeding prior to impact.

4. The speed of each vehicle at impact indicates the driver of the Lexus reacted in a timely manner, and nearly averted impact. Further, the speeds at impact are not associated with a fatality accident.

5. The deployment of the airbag caused the fatal injuries to the passenger. If the airbag did not deploy, or was not a part of the vehicle, the death would not have occurred.

6. The passenger "went straight ahead" after impact. The driver should have followed the same straight ahead path. Therefore, in order for the mirror to be stuck by an object other than an airbag, the driver would have to voluntarily go from left to right, possibly in an attempt to save [redacted] from harm.

Appendix C

CRASH3 PC

SUMMARY OF CRASHPC RESULTS USING DAMAGE

SCI Case 95-15

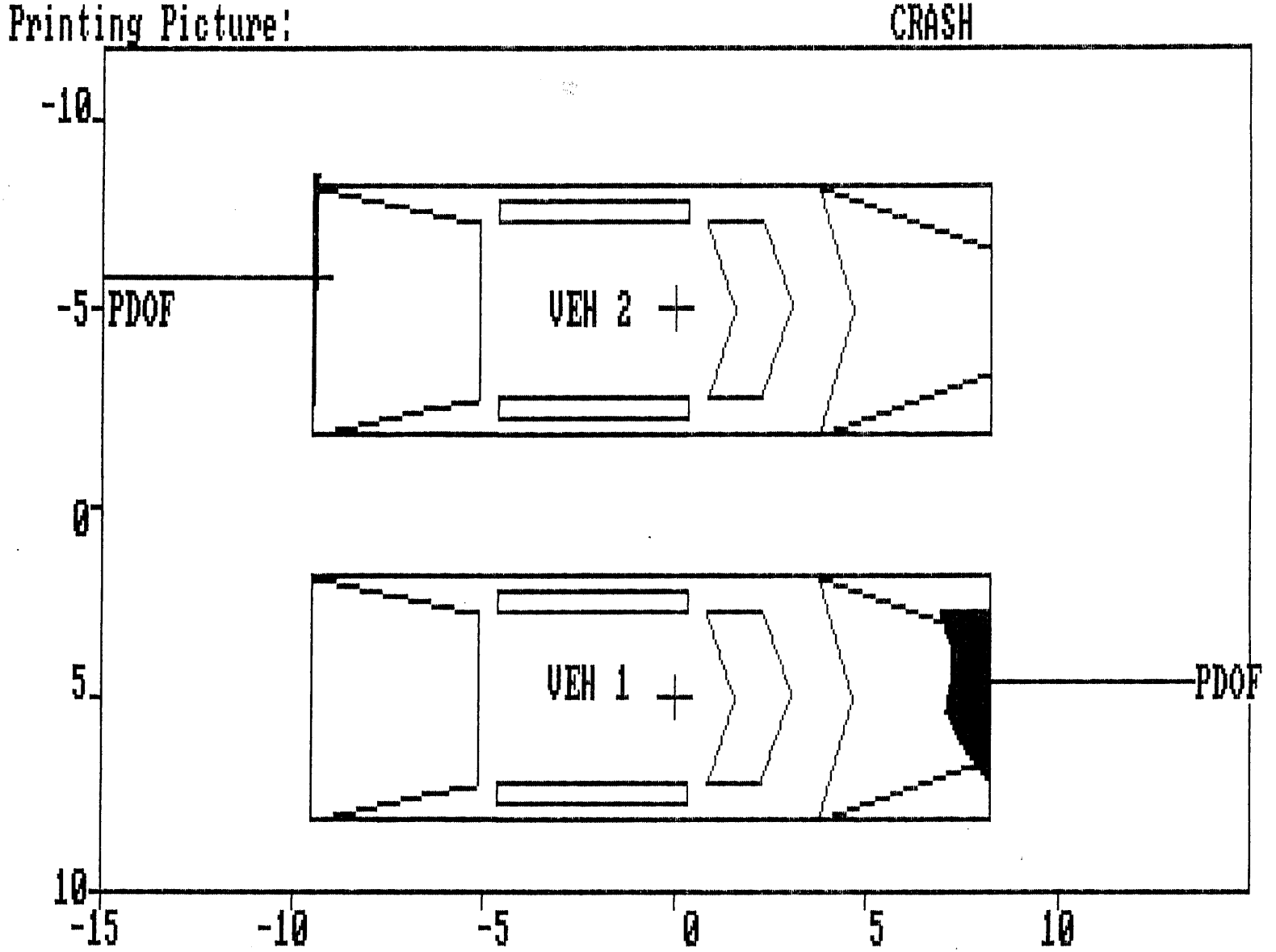
	SPEED CHANGE (DAMAGE)
VEHICLE #1	
TOTAL	20 KPH (13 MPH)
LONGITUDINAL	-20 KPH (-13 MPH)
LATITUDINAL	0 KPH (0 MPH)
PDOF ANGLE	0 DEGREES
ENERGY DISSIPATED =	48689 JOULES (35906 FT-LB)
VEHICLE #2	
TOTAL	19 KPH (12 MPH)
LONGITUDINAL	19 KPH (12 MPH)
LATITUDINAL	0 KPH (0 MPH)
PDOF ANGLE	-180 DEGREES
ENERGY DISSIPATED =	9387 JOULES (6923 FT-LB)

DAMAGE DATA

	VEHICLE #1	VEHICLE #2
SIZE CATEGORY	4	4
STIFFNESS CATEGORY	4	5
VEHICLE WEIGHT	1864 KGS (4110 LBS)	1981 KGS (4368 LBS)
CDC	12FDEW2	06BDEW1
PDOF ANGLE	0 DEGREES *	180 DEGREES *
CRUSH LENGTH	142 CM. (56 IN.)	183 CM. (72 IN.)
C1	38 CM. (15 IN.)	5 CM. (2 IN.)
C2	31 CM. (12 IN.)	2 CM. (1 IN.)
C3	31 CM. (12 IN.)	0 CM. (0 IN.)
C4	33 CM. (13 IN.)	0 CM. (0 IN.)
C5	20 CM. (8 IN.)	0 CM. (0 IN.)
C6	0 CM. (0 IN.)	0 CM. (0 IN.)
D	0 CM. (0 IN.)	-15 CM. (-6 IN.)
D'	-12 CM. (-5 IN.)	-26 CM. (-10 IN.)

DIMENSIONS AND INERTIAL PROPERTIES

	VEHICLE #1	VEHICLE #2
CG TO FRONT AXLE	139 CM. (55 IN.)	139 CM. (55 IN.)
CG TO REAR AXLE	150 CM. (59 IN.)	150 CM. (59 IN.)
TRACK	157 CM. (62 IN.)	157 CM. (62 IN.)
CG TO FRONT OF VEH	251 CM. (99 IN.)	251 CM. (99 IN.)
CG TO REAR OF VEH	-290 CM. (-114 IN.)	-290 CM. (-114 IN.)
CG TO SIDE OF VEH	98 CM. (39 IN.)	98 CM. (39 IN.)
MOMENT OF INERTIA	18135 KGS (39980 LBS)	19271 KGS (42485 LBS)
VEHICLE MASS	5 KGS (11 LBS)	5 KGS (11 LBS)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CRASH
-10
-5
0
5
10
PDOF
VEH 2
VEH 1
PDOF
-15
-10
-5
0
5
10
DAMAGE DESCRIPTION

Run #2 - Averaged "C" Values

: INPUT CALCULATE TRAJECTORY OUTPUT GRAPHICS EXIT :
HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<

SUMMARY OF CRASHPC RESULTS USING DAMAGE

SCI Case 95-15

	SPEED CHANGE (DAMAGE)
VEHICLE #1	
TOTAL	16 KPH (10 MPH)
LONGITUDINAL	-16 KPH (-10 MPH)
LATITUDINAL	0 KPH (0 MPH)
PDOF ANGLE	0 DEGREES
ENERGY DISSIPATED =	26980 JOULES (19897 FT-LB)
VEHICLE #2	
TOTAL	15 KPH (9 MPH)
LONGITUDINAL	15 KPH (9 MPH)
LATITUDINAL	0 KPH (0 MPH)
PDOF ANGLE	-180 DEGREES
ENERGY DISSIPATED =	9387 JOULES (6923 FT-LB)

PRESS ANY KEY TO CONTINUE

: INPUT CALCULATE TRAJECTORY OUTPUT GRAPHICS EXIT :
HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<

DAMAGE DATA

	VEHICLE #1	VEHICLE #2
SIZE CATEGORY	4	4
STIFFNESS CATEGORY	4	5
VEHICLE WEIGHT	1864 KGS (4110 LBS)	1981 KGS (4368 LBS)
CDC	12FDEW2	06BDEW1
PDOF ANGLE	0 DEGREES *	180 DEGREES *
CRUSH LENGTH	142 CM. (56 IN.)	183 CM. (72 IN.)
C1	19 CM. (8 IN.)	5 CM. (2 IN.)
C2	15 CM. (6 IN.)	2 CM. (1 IN.)
C3	15 CM. (6 IN.)	0 CM. (0 IN.)
C4	17 CM. (6 IN.)	0 CM. (0 IN.)
C5	10 CM. (4 IN.)	0 CM. (0 IN.)
C6	0 CM. (0 IN.)	0 CM. (0 IN.)
D	0 CM. (0 IN.)	-15 CM. (-6 IN.)
D'	-12 CM. (-5 IN.)	-26 CM. (-10 IN.)

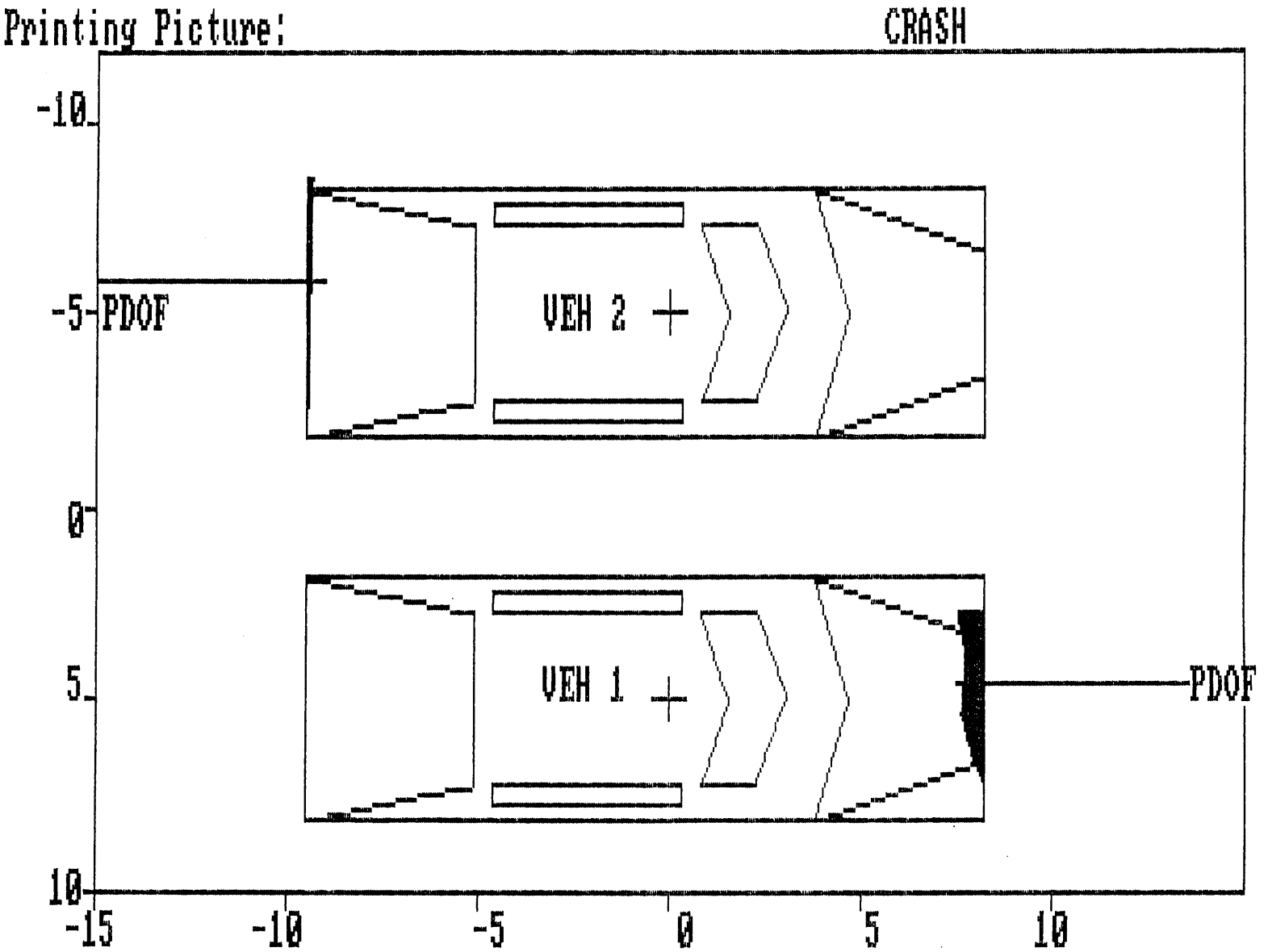
(* INDICATES DEFAULT VALUE)
PRESS ANY KEY TO CONTINUE

: INPUT CALCULATE TRAJECTORY OUTPUT GRAPHICS EXIT :

DIMENSIONS AND INERTIAL PROPERTIES

	VEHICLE #1	VEHICLE #2
CG TO FRONT AXLE	139 CM. (55 IN.)	139 CM. (55 IN.)
CG TO REAR AXLE	150 CM. (59 IN.)	150 CM. (59 IN.)
TRACK	157 CM. (62 IN.)	157 CM. (62 IN.)
CG TO FRONT OF VEH	251 CM. (99 IN.)	251 CM. (99 IN.)
CG TO REAR OF VEH	-290 CM. (-114 IN.)	-290 CM. (-114 IN.)
CG TO SIDE OF VEH	98 CM. (39 IN.)	98 CM. (39 IN.)
MOMENT OF INERTIA	18135 KGS (39980 LBS)	19271 KGS (42485 LBS)
VEHICLE MASS	5 KGS (11 LBS)	5 KGS (11 LBS)

PRESS ANY KEY TO CONTINUE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CRASH
-10
-5
PDOF
VEH 2
0
VEH 1
5
PDOF
10
-15
-10
-5
0
5
10
DAMAGE DESCRIPTION

Appendix D

Autopsy Photographs

CAUTION!

THE FOLLOWING PHOTOGRAPHS CONTAIN GRAPHIC VIEWS OF THE RIGHT FRONT PASSENGER TAKEN AT THE MEDICAL EXAMINER'S OFFICE

"GRAPHIC"
PHOTOGRAPHS AND IMAGES

The following "GRAPHIC" Photographs and Images have been removed from this case.

Photo # 1, 2

If you would like a copy of these photographs and/or images please write to:

MARJORIE SACCOCCIO
VOLPE NATIONAL TRANSPORTATION SYSTEMS CENTER
55 BROADWAY
CAMBRIDGE, MA 02142

In the body of your request please include the case, photograph and image number(s).

Appendix E

NASS Injury Form

Right Front Occupant

Vehicle #1

U.S. Department of Transportation
National Highway Traffic Safety Administration

OCCUPANT INJURY FORM

Form Approved
O.M.B. No. 2127-0021
NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number		3. Vehicle Number	01
2. Case Number - Stratum	95-15	4. Occupant Number	02

INJURY DATA

Record below the actual injuries sustained by this occupant that were identified from the official and unofficial data sources. Remember not to double count an injury just because it was identified from two different sources. If greater than ten injuries have been documented, encode the balance on the Occupant Injury Supplement.

	Source of Injury Data	A.I.S. - 90 Body Region	Type of Anatomic Structure	Specific Anatomic Structure	Level of Injury	A.I.S. Severity	Aspect	Injury Source	Injury Source Confidence Level	Direct/ Indirect Injury	Occupant Area Intrusion Number
FIVS-1 Avulsed teeth	1st	1	2	5	14	06	1	8	185 (180)	1	2	00
FIAI-1 Abrasion of chin	2nd	1	2	9	02	02	1	8	185 (180)	1	1	00
HRCM-1 contusion ® temporalis muscle	3rd	1	2	9	04	02	1	1	180	1	1	00
HLCM-1 contusion © temporalis muscle	4th	1	2	9	04	02	1	2	180	1	1	00
FLFS-2 fx © Mandible	5th	1	2	5	06	12	2	2	185 (180)	1	1	00
HSCI-1 contusion of the head	6th	1	1	9	04	02	1	9	001	2	1	00
NPZV-2 Separation of the Atlanto-occipital	7th	1	6	5	02	08	2	6	185 (180)	1	1	00
NACI-1 Contusion of the Neck	8th	1	3	9	04	02	1	5	185 (180)	1	1	00
CCCD-3 Contusion of the esophagus	9th	1	4	4	08	02	2	4	185 (180)	1	1	00
NPCC-3 Contusion of the spinal cord	10th	1	6	4	02	04	3	6	185 (180)	1	1	00

HS Form 433B (1/95)

This report is authorized by P.L. 89-563, Title 1, Section 106, 108, and 112. While you are not required to respond, your cooperation is needed to make the results of this data collection effort comprehensive, accurate, and timely.

OCCUPANT INJURY DATA

	Source of Injury Data	A.I.S. - 90 Body Region	Type of Anatomic Structure	Specific Anatomic Structure	Level of Injury	A.I.S. Severity	Aspect	Injury Source	Injury Source Confidence Level	Direct/ Indirect Injury	Occupant Area Intrusion Number
KRCI-1 KLCI-1	Contusion of both knees										
11th	1	8	9	04	02	1	3	013	1	1	00
CCH-3	Hemorrhage of the heart										
12th	1	4	4	10	02	3	4	180	1	1	00
CRCP-3 CLCP-3	Hemorrhage of both lungs										
13th	1	4	4	14	02	3	3	180	1	1	00
14th	—	—	—	— —	— —	—	—	— — —	—	—	— —
15th	—	—	—	— —	— —	—	—	— — —	—	—	— —
16th	—	—	—	— —	— —	—	—	— — —	—	—	— —
17th	—	—	—	— —	— —	—	—	— — —	—	—	— —
18th	—	—	—	— —	— —	—	—	— — —	—	—	— —
19th	—	—	—	— —	— —	—	—	— — —	—	—	— —
20th	—	—	—	— —	— —	—	—	— — —	—	—	— —
21st	—	—	—	— —	— —	—	—	— — —	—	—	— —
22nd	—	—	—	— —	— —	—	—	— — —	—	—	— —
23rd	—	—	—	— —	— —	—	—	— — —	—	—	— —
24th	—	—	—	— —	— —	—	—	— — —	—	—	— —
25th	—	—	—	— —	— —	—	—	— — —	—	—	— —

OCCUPANT INJURY CLASSIFICATION

Body Region

(1) Head
(2) Face
(3) Neck
(4) Thorax
(5) Abdomen
(6) Spine
(7) Upper Extremity
(8) Lower Extremity
(9) Unspecified

Type of Anatomic Structure

(1) Whole Area
(2) Vessels
(3) Nerves
(4) Organs (includes Muscles/ligaments)
(5) Skeletal (includes joints)
(6) Head - LOC
(9) Skin

Specific Anatomic Structure

Vessels, Nerves, Organs, Bones, Joints are assigned consecutive two digit numbers beginning with 02.

The exceptions to this rule apply to:

Whole Area
(02) Skin - Abrasion
(04) Skin - Contusion
(06) Skin - Laceration
(08) Skin - Avulsion
(10) Amputation
(20) Burn
(30) Crush
(40) Degloving
(50) Injury - NFS
(90) Trauma, other than mechanical

Head - LOC
(02) Length of LOC

(04) Level
(06) of
(08) Consciousness

(10) Concussion

Spine
(02) Cervical
(04) Thoracic
(06) Lumbar

Level of Injury

Specific injuries are assigned consecutive two-digit numbers beginning with 02.

To the extent possible, within the organizational framework of the AIS, 00 is assigned to an injury NFS as to severity or where only one injury is given in the dictionary for that anatomic structure. 99 is assigned to any injury NFS as to lesion or severity.

Abbreviated Injury Scale

(1) Minor Injury
(2) Moderate Injury
(3) Serious Injury
(4) Severe Injury
(5) Critical Injury
(6) Maximum (untreatable)
(7) Injured, unknown severity

Aspect

(1) Right
(2) Left
(3) Bilateral
(4) Central
(5) Anterior
(6) Posterior
(7) Superior
(8) Inferior
(9) Unknown
(0) Whole region

SOURCE OF INJURY DATA

OFFICIAL RECORDS
(1) Autopsy records with or without hospital/medical records
(2) Hospital/medical records other than emergency room (e.g., discharge summary)
(3) Emergency room records only (including associated X-rays or other lab reports)
(4) Private physician, walk-in or emergency clinic

UNOFFICIAL RECORDS
(5) Lay coroner report
(6) E.M.S. personnel
(7) Interviewee
(8) Other source (specify): _____
(9) Police

INJURY SOURCE CONFIDENCE LEVEL

(1) Certain
(2) Probable
(3) Possible
(9) Unknown

DIRECT/INDIRECT INJURY

(1) Direct contact injury
(2) Indirect contact injury
(3) Noncontact injury
(7) Injured, unknown source

INJURY SOURCES

FRONT
(001) Windshield
(002) Mirror
(003) Sunvisor
(004) Steering wheel rim
(005) Steering wheel hub/spoke
(006) Steering wheel (combination of codes 004 and 005)
(007) Steering column, transmission selector lever, other attachment
(008) Cellular telephone or CB radio
(009) Add on equipment (e.g., tape deck, air conditioner)
(010) Left instrument panel and below
(011) Center instrument panel and below
(012) Right instrument panel and below
(013) Glove compartment door
(014) Knee bolster
(015) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, mirror, or steering assembly (driver side only)
(016) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, or mirror (passenger side only)
(017) Windshield reinforced by exterior object (specify)

_____

(019) Other front object (specify):

_____

LEFT SIDE
(051) Left side interior surface, excluding hardware or armrests
(052) Left side hardware or armrest
(053) Left A (A1/A2)-pillar
(054) Left B-pillar
(055) Other left pillar (specify):

_____

(056) Left side window glass
(057) Left side window frame
(058) Left side window sill
(059) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(060) Other left side object (specify):

_____

RIGHT SIDE
(101) Right side interior surface, excluding hardware or armrests
(102) Right side hardware or armrest
(103) Right A (A1/A2)-pillar
(104) Right B-pillar
(105) Other right pillar (specify):

_____

(106) Right side window glass
(107) Right side window frame
(108) Right side window sill
(109) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(110) Other right side object (specify):

_____

INTERIOR
(151) Seat, back support
(152) Belt restraint webbing/buckle
(153) Belt restraint B-pillar or door frame attachment point
(154) Other restraint system component (specify):

_____

(155) Head restraint system
(160) Other occupants (specify):

_____

(161) Interior loose objects
(162) Child safety seat (specify):

_____

(163) Other interior object (specify):

_____

AIR BAG
(170) Air bag-driver side
(171) Air bag-driver side and eyewear
(172) Air bag-driver side and jewelry
(173) Air bag-driver side and object held
(174) Air bag-driver side and object in mouth
(175) Air bag compartment cover-driver side
(176) Air bag compartment cover-driver side and eyewear
(177) Air bag compartment cover-driver side and jewelry
(178) Air bag compartment cover-driver side and object held
(179) Air bag compartment cover-driver side and object in mouth
(180) Air bag-passenger side
(181) Air bag-passenger side and eyewear
(182) Air bag-passenger side and jewelry
(183) Air bag-passenger side and object held
(184) Air bag-passenger side and object in mouth
(185) Air bag compartment cover-passenger side
(186) Air bag compartment cover-passenger side and eyewear
(187) Air bag compartment cover-passenger side and jewelry
(188) Air bag compartment cover-passenger side and object held
(189) Air bag compartment cover-passenger side and object in mouth
(190) Other air bag (specify)

_____

(195) Other air bag compartment cover (specify)

_____

ROOF
(201) Front header
(202) Rear header
(203) Roof left side rail
(204) Roof right side rail
(205) Roof or convertible top

FLOOR
(251) Floor (including toe pan)
(252) Floor or console mounted transmission lever, including console
(253) Parking brake handle
(254) Foot controls including parking brake

REAR
(301) Backlight (rear window)
(302) Backlight storage rack, door, etc.
(303) Other rear object (specify):

_____

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT
(401) Hand controls for braking/acceleration
(402) Steering control devices (attached to OEM steering wheel)
(403) Steering knob attached to steering wheel
(405) Replacement steering wheel (i.e., reduced diameter)
(406) Joy stick steering controls
(407) Wheelchair tie-downs
(408) Modification to seat belts, (specify): _____
(409) Additional or relocated switches, (specify):

_____

(410) Raised roof
(411) Wall mounted head rest (used behind wheel chair)
(412) Other adaptive device (specify):_____

_____

EXTERIOR of OCCUPANT'S VEHICLE
(451) Hood
(452) Outside hardware (e.g., outside mirror, antenna)
(453) Other exterior surface or tires (specify):

_____

_____

(454) Unknown exterior objects

EXTERIOR OF OTHER MOTOR VEHICLE
(501) Front bumper
(502) Hood edge
(503) Other front of vehicle (specify):

_____

(504) Hood
(505) Hood ornament
(506) Windshield, roof rail, A-pillar
(507) Side surface
(508) Side mirrors
(509) Other side protrusions (specify):

_____

(510) Rear surface
(511) Undercarriage
(512) Tires and wheels
(513) Other exterior of other motor vehicle (specify):

_____

_____

(514) Unknown exterior of other motor vehicle

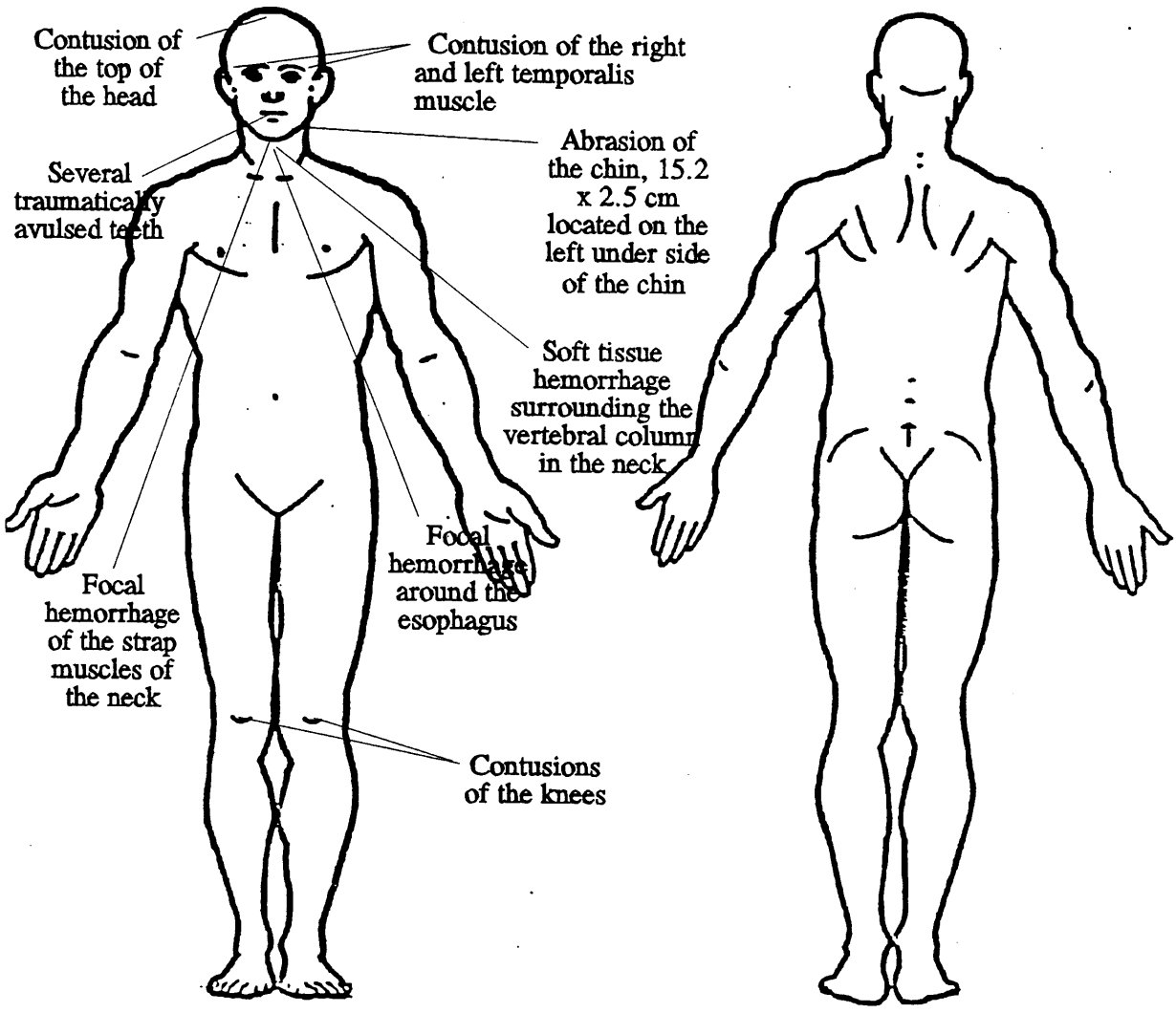
OTHER VEHICLE OR OBJECT IN THE ENVIRONMENT
(551) Ground
(598) Other vehicle or object (specify):

_____

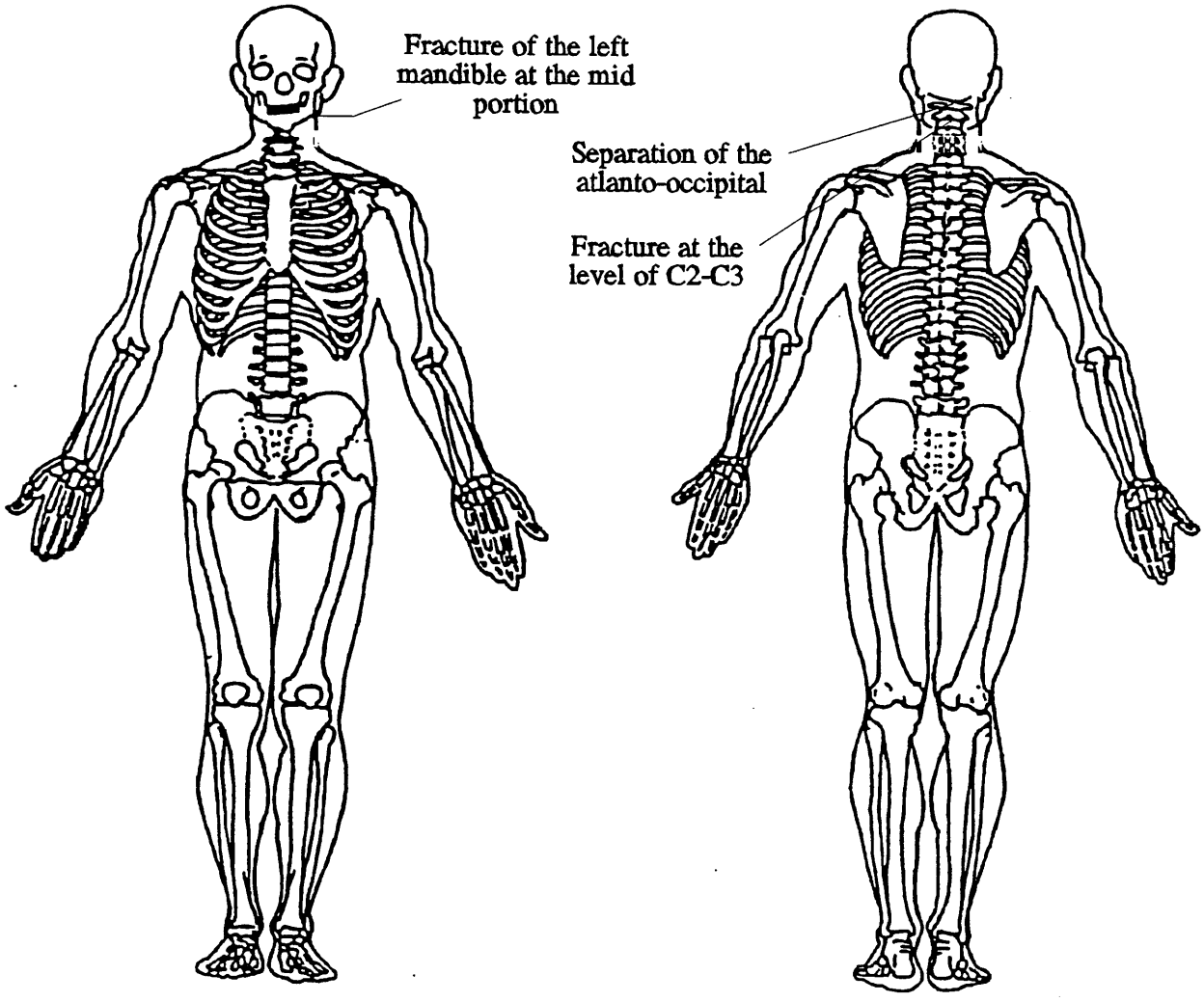
(599) Unknown vehicle or object

NONCONTACT INJURY
(601) Fire in vehicle
(602) Flying glass
(603) Other noncontact injury source (specify): _____
(604) Air bag exhaust gases
(697) Injured, unknown source

OFFICIAL INJURY DATA - SOFT TISSUE INJURIES



OFFICIAL INJURY DATA - SKELETAL INJURIES



OFFICIAL INJURY DATA - INTERNAL INJURIES