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

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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If you requested NHTSA to query its database files in order to identify a specific crash, then that query was made using non-personal descriptors you provided for use in our search. This motor vehicle crash may have been identified from a data search and matches the general, non-personal descriptors you provided, but we cannot confirm that this is the specific crash report you requested.

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Zimm.
SAN T.

TRANSPORTATION SCIENCES CENTER
ACCIDENT RESEARCH GROUP

Division of Calspan Corporation
[redacted]

CALSPAN REMOTE AIR BAG DEPLOYMENT INVESTIGATION
CALSPAN CASE NO. 94-34
VEHICLE: 1991 FORD CROWN VICTORIA
LOCATION: [redacted] S.C.
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

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4. *Title and Subtitle* Calspan Remote Air Bag Deployment Investigation Vehicle - 1991 Ford Crown Victoria Location [redacted]S.C.		5. *Report Date:* [redacted]1995 6. *Performing Organization Code*
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15. *Supplementary Notes*
Remote investigation of an air bag deployment crash that resulted in forearm fractures to the belted 67 year old female driver of a Ford Crown Victoria.

16. *Abstract*
This remote air bag deployment investigation focused on the injury mechanism of the forearm fractures that were sustained by the belted driver of a 1991 Ford Crown Victoria. The Crown Victoria was involved in a off-set head-on crash with a 1991 Nissan Sentra at a four-leg intersection in [redacted]S.C. The driver of the Ford initiated a left turn at the intersection and into the path of the Nissan. As a result of the crash, the Ford's driver's side supplemental air bag system deployed.

At impact with the Nissan, the driver of the Ford was in a forward driving position with her right forearm extended across the air bag module cover with her right hand positioned on the steering at the 11 o'clock position. The larger upper air bag module cover flap contacted the anterior aspect of her right forearm resulting in a displaced, comminuted fracture of the right radius, a fracture of the tip of the ulnar styloid process, and a dislocation of the 1st metacarpal. The deploying air bag contacted the chest and face of the driver resulting in superficial contusions and abrasions. She was subsequently admitted to a local hospital for surgical repair of the radial fracture.

17. *Key Words* Remote Investigation Supplemental Restraint System (SRS) Off-set head-on configuration AIS-3 forearm fracture Large upper air bag module cover flap	18. *Distribution Statement* General Public

19. *Security Classif. (of this report)* Unclassified	20. *Security Classif. (of this page)* Unclassified	21. *No. of Pages* 9	22. *Price*

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CALSPAN REMOTE AIR BAG DEPLOYMENT INVESTIGATION
CALSPAN CASE NO. 94-34
VEHICLE: 1991 FORD CROWN VICTORIA
LOCATION [redacted] S.C.

TECHNICAL SUMMARY

This remote air bag deployment investigation focused on the injury mechanism of the forearm fractures sustained by the 67 year old female driver of a 1991 Ford Crown Victoria. The vehicle was involved in a moderate off-set head-on crash with a 1991 Nissan Sentra at a four-leg intersection in [redacted], S.C. The crash occurred during daylight hours on [redacted] 1994. The driver sustained multiple AIS-1 through 3 level injuries from her involvement with the deploying air bag and module cover flap of the Crown Victoria.

The driver of the Crown Victoria was traveling on a two-lane state route on an approach to a four-leg intersection with a green signal phase. She failed to detect the Nissan that was traveling in the opposite direction and initiated a left turn across the Nissan's path of travel. The center frontal area of the Nissan impacted the right front corner of the Crown Victoria. Impact forces were within the 12 o'clock sector for the Nissan and within the 01 o'clock sector for the Crown Victoria. Velocity changes were estimated at 14-18 km/h (9-11 mph) for the Ford and 16-19 km/h (10-12 mph) for the Nissan Sentra. As a result of the crash, the Ford Crown Victoria's driver's side air bag deployed.

The 67 year old female driver of the Ford Crown Victoria had a stated height of 162.6 cm (64.0") and weight of 68.9 kg (152.0 lbs.) She was restrained by the manual 3-point lap and shoulder belt system. At impact, the driver was in a normal posture with the seat adjusted to a forward track position. She had both hands positioned on the steering wheel at the 3 and 9 o'clock positions, however, due to the left turn maneuver, her right forearm crossed over the air bag module as her hand turned the wheel to the 11 o'clock position. The large upper air bag module cover contacted the anterior aspect of her right forearm resulting in a displaced, comminuted fracture of the right distal radius (AIS-3 Galeazzi fracture), a fracture of the tip of the ulnar styloid process (AIS-2), and a dislocation of the right 1st metacarpal from the trapezium (AIS-1). The deploying tethered air bag contacted the face and chest of the driver resulting in a contusion and abrasion of the left anterior breast (AIS-1) and multiple facial contusions (AIS-1).

The driver was transported to a local hospital by ambulance where she was admitted for open reduction fixation with a bone graft of the radial fracture. She was discharged three days following the crash.

CALSPAN REMOTE AIR BAG DEPLOYMENT INVESTIGATION
CALSPAN CASE NO. 94-34
VEHICLE: 1991 FORD CROWN VICTORIA
DATE: [redacted] 1994

CRASH DATA

Location:	Four-leg intersection
City/Township:	[redacted].C.
Area/Type:	Urban/Commercial
Crash Date/Time:	[redacted] 1994, daylight hours
Investigating Police Agency:	[redacted] Police Department
Crash Type:	Offset, head-on configuration
Air Bag Vehicle Driver Injury Severity:	Serious (AIS-3)

AMBIENCE

Viewing Conditions:	Daylight
Weather:	Clear
Precipitation:	None
Road Surface:	Dry

HIGHWAY

Type:	Intersection if two state routes
Number of Lanes:	2, divided
Surface:	Asphalt

HIGHWAY (CONT'D.)

Median:	Curbed
Edge:	Gravel/grass shoulders
Vertical Alignment:	Level
Horizontal Alignment:	Straight
Traffic Density:	Moderate

TRAFFIC CONTROLS

Signals:	Overhead signal system
Signs:	None pertinent
Markings:	Unknown
Speed Limit:	56 km/h (35 mph)

VEHICLES

	Air Bag Vehicle	Vehicle #2
Description:	1991 Ford Crown Victoria, 4 dr. sedan	1991 Nissan Sentra, 4 dr. sedan
V.I.N.	2FACP74F5MX	1N4EB32A5MC
Odometer:	80,465 km (50,000 miles)	Unknown
Engine:	5.0 liter, V-8	1.6 liter, 4 cylinder
Transmission:	4-speed automatic	Unknown
Steering:	Power-assisted	Unknown
Brakes:	Power-assisted	Unknown

VEHICLES (CONT'D.)

	Air Bag Vehicle	Vehicle #2
Padding:	Upper, mid, and lower instrument panel, soft-edged steering wheel rim and air bag module cover, adjustable head restraints, door panels	Upper, mid, and lower instrument panel
Manual Restraints:	3-point lap and shoulder belts in the four outboard seated positions, center rear lap belt	Rear seat lap belts
Automatic Restraints:	Driver's side air bag Supplemental Restraint System which deployed as a result of the crash	3-point door mounted lap and shoulder belt systems for the front outboard seated positions
Tow Status:	Towed due to damage	Towed due to damage

VEHICLE DAMAGE

	Air Bag Vehicle	Vehicle #2
Exterior:	The 1991 Ford Crown Victoria sustained moderate right frontal damage from its impact sequence with vehicle #2. Direct contact damage appeared to have involved the right corner area of the front bumper. Maximum crush was estimated at 10-15 cm (4-6") located at the right corner of the bumper. Damaged components included the front bumper, header panel, right headlamp assembly, and the right front fender.	Vehicle #2, the 1991 Nissan Sentra, sustained moderate center frontal damage from its offset, head-on impact with the air bag equipped Crown Victoria. Maximum crush was estimated at 20-25 cm (8-10") located at the mid point of the front bumper. Components damaged by the impact included the front bumper facia and reinforcement bar, grille, both headlamp assemblies, and the hood.

VEHICLE DAMAGE (CONT'D.)

	Air Bag Vehicle	Vehicle #2
CDC:	01-FREE-1	12-FZEN-1

Interior (Air Bag Vehicle): Damage to the interior of the 1991 Ford Crown Victoria was limited to deployment of the supplemental driver's side air bag system. There was no intrusion of the interior components or damage related to occupant contact.

SUPPLEMENTAL RESTRAINT SYSTEM

The 1991 Ford Crown was equipped with a driver's side Supplemental Restraint System (SRS) which deployed as a result of the right frontal impact sequence with vehicle #2. Although the air bag vehicle was not inspected for this remote investigation, the typical Crown Victoria SRS consists of three front mounted crash sensors, an instrument panel mounted diagnostic module and safeing sensor, an instrument cluster SRS indicator lamp, the steering wheel mounted air bag module, and the clockspring assembly between steering wheel and the column.

The Crown Victoria driver's side air bag module consists of asymmetrical cover flaps which open in an H-configuration. The large upper module cover flaps are 12.4 cm (4.875") in height and 20.3 cm (8.0") in height while the lower cover flaps have respective measurements of 3.5 cm (1.375") and 20.3 cm (8.0").

The driver's side air bags are constructed of a woven nylon fabric with a neoprene liner and are approximately 61.0 cm (24") in diameter. The Crown Victoria air bags are tethered by four internal tether straps which extend from a 17.8 cm (7.0") diameter octagonal reinforcement that is sewn to the center of the bag. In addition, the bags are vented by two 2.5 cm (1.0") diameter ports located on the bag side of the bag at the 2 and 8 o'clock positions. It was unknown if there was damage or contact evidence on the deployed air bag and/or module cover flaps.

COLLISION SEQUENCE

Pre-Crash: The driver of the air bag equipped Ford Crown Victoria was en route to a medical appointment and was traveling on a state route on an approach to a four-leg intersection. As she approached the intersection, the overhead traffic signal was in a green phase. The driver stated that she decelerated her vehicle and initiated a left turn across the intersection.

COLLISION SEQUENCE (CONT'D.)

Pre-Crash (Cont'd.): Vehicle #2, the 1991 Nissan Sentra, was traveling in the opposite direction of the Crown Victoria and approached the intersection on the green signal phase. The driver of vehicle #2 proceeded into the intersection as the driver of the Crown Victoria initiated her left turn across its path of travel. The driver of the Crown Victoria stated that she did not detect the Nissan prior to impact, however, she estimated the speed of the vehicle at 72 km/h (45 mph).

Crash: The center frontal area of the Nissan Sentra impacted the right front corner area of the Ford Crown Victoria. Resultant directions of force were 12 o'clock for the Nissan and 1 o'clock for the Crown Victoria. As a result of the head-on impact configuration, the Crown Victoria underwent a sufficient longitudinal deceleration which was sufficient to deploy the driver's side supplemental air bag system. Based on photographs of the involved vehicles (included as Attachment A), velocity changes were estimated at 14-18 km/h (9-11 mph) for the Crown Victoria and 16-19 km/h (10-12 mph) for the Nissan Sentra.

The driver of the Crown Victoria stated that the vehicles came to rest engaged at the point of impact, therefore impact speeds were comparable to the velocity changes.

Post-Crash: The driver of the Crown Victoria noted that the impact stalled the engine of her vehicle as it came to rest at or near the point of impact within the four-leg intersection. She remained in her vehicle following the crash and waited for emergency personnel to arrive on-scene. The driver was removed from the vehicle by rescue and was transported to a local hospital where she was admitted for treatment of her injuries.

HUMAN FACTORS/OCCUPANT DATA

Air Bag Vehicle

Driver:	67 year old female
Height:	162.6 cm (64.0")
Weight:	68.9 kg (152 lbs.)
Manual Restraint Usage:	3-point lap and shoulder belt
Usage Source:	Driver interview
Eyeware:	Prescription eyeglasses; remained on face, deformed beyond repair
Type of Medical Treatment:	Admitted to a local hospital for 3 days for surgical repair of right arm

DRIVER INJURIES

Injury	Severity OIC/AIS	Injury Mechanism
Displaced, comminuted fracture of the right distal radius (Galeazzi fracture)	Serious (752804.31)	Upper air bag module cover flap
Fracture of the tip of the ulnar styloid process	Moderate (732202.21)	Upper air bag module cover flap
Dislocation of the right 1st metacarpal from the trapezium	Minor (750404.11)	Upper air bag module cover flap
Contusion with abrasion over the left anterior breast	Minor (490402.12, 490202.12)	Air bag
Facial contusions over the lips and both cheeks	Minor (290402.18, 290402.11, 290402.12)	Air bag

DRIVER KINEMATICS

The driver of the Ford Crown Victoria stated that she was in a normal driving posture with the seat track adjusted to a forward position. She was wearing the manual 3-point lap and shoulder belt system. The driver noted that as she approached the intersection, she had both hands on the steering wheel at the 3 and 9 o'clock positions. As she initiated the left turn, her right hand moved to the 11 o'clock position with her forearm extending across the air bag module cover flaps.

At impact, the supplemental driver's side air bag deployed. The large upper air bag module cover flap probably contacted the anterior aspect of the driver's right forearm which resulted in a displaced, comminuted (Galeazzi) fracture of the right distal radius, a fracture of the tip of the radial styloid process, and a dislocation of the right 1st metacarpal from the trapezium. The deploying air bag subsequently contacted and expanded across the driver's chest and face which resulted in a contusion and abrasion of the left anterior breast and facial contusions of the lips and both cheeks. The driver stated that the deployed air bag tore her silk blouse from the collar to the mid chest area. She was also wearing prescription eyeglasses which consisted of plastic frames. The driver reported that her involvement with the air bag deformed the frames, however, the glasses remained on her face.

The driver stated that she heard a loud "bang" at impact that was similar to a gun shot. In addition, she detected a blackish powder within the interior of the vehicle immediately following the crash, both of which she attributed to air bag deployment.

MEDICAL TREATMENT

The driver was removed from the vehicle by emergency medical technicians (EMTs). The EMTs placed a soft cervical collar and a splint on the driver's right forearm. She was subsequently transported by ambulance to a local hospital where she was admitted for treatment. The right forearm fractures were diagnosed by X-ray and the attending physician referred her to an orthopedic surgeon who scheduled reduction surgery.

The driver was admitted to surgery on the day following the crash. The radial fracture required open reduction and internal fixation which required the placement of a steel plate that was affixed with six screws. In addition to the plate, the driver required an autogenous bone graft with bone harvested from the right iliac crest. She was discharged following three days of hospitalization.

Following her discharge, the driver stated that she walked with the use of a cane for several weeks due to the soreness associated with the bone graft. She also noted that she developed trigger finger which resulted from the fractures and trauma to the nerves and ligaments.

ATTACHMENT A

PHOTOGRAPHS
CALSPAN CASE NO. 94-34

1. Frontal damage to the Ford Crown Victoria.

2. Center frontal damage to vehicle #2.

3. Driver's injuries post-surgery.

4. Accident site.

ATTACHMENT B

NASS Occupant Forms

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

OCCUPANT ASSESSMENT FORM

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. ~~Primary Sampling Unit Number~~ ____
2. Case Number - ~~Stratum~~ 94-34
3. Vehicle Number 01
4. Occupant Number 01

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age 67
   Code actual age at time of accident.
   (00) Less than one year old (specify by month): _____
   (97) 97 years and older
   (99) Unknown

6. Occupant's Sex 2
   (1) Male
   (2) Female
   (9) Unknown

7. Occupant's Height 163
   Code actual height to the nearest centimeter.
   (999) Unknown

   64 inches X 2.54 = 163 centimeters

8. Occupant's Weight 069
   Code actual weight to the nearest kilogram.
   (999)Unknown

   152 pounds X .4536 = 069 kilograms

9. Occupant's Role 1
   (1) Driver
   (2) Passenger
   (9) Unknown

OCCUPANT'S SEATING

10. Occupant's Seat Position 11
    Front Seat
    (11) Left side
    (12) Middle
    (13) Right side
    (14) Other (specify): _____
    (15) On or in the lap of another occupant

    Second Seat
    (21) Left side
    (22) Middle
    (23) Right side
    (24) Other (specify): _____
    (25) On or in the lap of another occupant

    Third Seat
    (31) Left side
    (32) Middle
    (33) Right side
    (34) Other (specify): _____
    (35) On or in the lap of another occupant

    Fourth Seat
    (41) Left side
    (42) Middle
    (43) Right side
    (44) Other (specify): _____
    (45) On or in the lap of another occupant

    (97) In or on unenclosed area
    (98) Other seat (specify): _____
    (99) Unknown

11. Occupant's Posture 0
    (0) Normal posture

    Abnormal posture
    (1) Kneeling or standing on seat
    (2) Lying on or across seat
    (3) Kneeling, standing or sitting in front of seat
    (4) Sitting sideways or turned to talk with another occupant or to look out a rear window
    (5) Sitting on a console
    (6) Lying back in a reclined seat position
    (7) Bracing with feet or hands on a surface in front of seat
    (8) Other abnormal posture (specify): _____
    (9) Unknown

EJECTION/ENTRAPMENT

12. Ejection 0
    (0) No ejection
    (1) Complete ejection
    (2) Partial ejection
    (3) Ejection, unknown degree
    (9) Unknown

13. Ejection Area 0
    (0) No ejection
    (1) Windshield
    (2) Left front
    (3) Right front
    (4) Left rear
    (5) Right rear
    (6) Rear
    (7) Roof
    (8) Other area (e.g., back of pickup, etc.) (specify):_____
    (9) Unknown

14. Ejection Medium 0
    (0) No ejection
    (1) Door/hatch/tailgate
    (2) Nonfixed roof structure
    (3) Fixed glazing
    (4) Nonfixed glazing (specify):
    _____
    (5) Integral structure
    (8) Other medium (specify):
    _____
    (9) Unknown

15. Medium Status (Immediately Prior To Impact) 0
    (0) No ejection
    (1) Open
    (2) Closed
    (3) Integral structure
    (9) Unknown

16. Entrapment 0
    (NOTE: Entrapped means that part of the person was in the vehicle and mechanically restrained; jammed doors and immobilizing injuries by themselves are not sufficient to constitute entrapment.)
    (0) Not entrapped
    (1) Entrapped
    (9) Unknown

RESTRAINT SYSTEM EVALUATION

17. Manual (Active) Belt System Availability 4
(0) None available
(1) Belt removed/destroyed
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt available—type unknown

Integral Belt Partially Destroyed
(6) Shoulder belt (lap belt destroyed/removed)
(7) Lap belt (shoulder belt destroyed/removed)

(8) Other belt (specify):

(9) Unknown

18. Manual (Active) Belt System Use 04
(00) None used, not available, or belt removed/destroyed
(01) Inoperative (specify):

(02) Shoulder belt
(03) Lap belt
(04) Lap and shoulder belt
(05) Belt used—type unknown
(08) Other belt used (specify):

(12) Shoulder belt used with child safety seat
(13) Lap belt used with child safety seat
(14) Lap and shoulder belt used with child safety seat
(15) Belt used with child safety seat—type unknown
(18) Other belt used with child safety seat (specify):
(99) Unknown if belt used

19. Proper Use of Manual (Active) Belts 1
(0) None used or not available
(1) Belt used properly
(2) Belt used properly with child safety seat

Belt Used Improperly
(3) Shoulder belt worn under arm
(4) Shoulder belt worn behind back or seat
(5) Belt worn around more than one person
(6) Lap belt worn on abdomen
(7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of manual belt system (specify):

(9) Unknown

20. Manual (Active) Belt Failure Modes During Accident 1
(0) No manual belt used
(1) No manual belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify):

(6) Broken retractor
(7) Combination of above (specify):

(8) Other manual belt failure (specify):

(9) Unknown

21. Air Bag System Availability/Function 1
(0) Not equipped/not available
(1) Air bag

Non-functional
(2) Air bag disconnected (specify):

(3) Air bag not reinstalled
(9) Unknown

22. Air Bag System Deployment 1
(0) Not equipped/not available
(1) Air bag deployed during accident (as a result of impact)
(2) Air bag deployed inadvertently just prior to accident
(3) Air bag deployed, accident sequence undetermined
(4) Nondeployed
(5) Unknown if deployed
(6) Air bag deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
(9) Unknown

23. Are There Indications of Air Bag System Failure? 1
(0) Not equipped/not available
(1) No
(2) Yes (specify):

(9) Unknown

Note: See Variables 44 through 48 (Page 5) for Information on Automatic Belts

24. Police Reported Restraint Use 1
(0) None used
(1) Police did not indicate restraint use
(2) Shoulder belt
(3) Lap belt
(4) Lap and shoulder belt
(5) Belt used, type not specified
(6) Child safety seat
(7) Other or automatic restraint (specify):

(8) Restrained, type unknown
(9) Police indicated "unknown"

HEAD RESTRAINT AND SEAT EVALUATION

25. Head Restraint Type/Damage by Occupant at This Occupant Position: 3
    (0) No head restraints
    (1) Integral—no damage
    (2) Integral—damaged during accident
    (3) Adjustable—no damage
    (4) Adjustable—damaged during accident
    (5) Add-on—no damage
    (6) Add-on—damaged during accident
    (8) Other (specify): _____
    (9) Unknown

26. Seat Type (this Occupant Position): 06
    (00) Occupant not seated or no seat
    (01) Bucket
    (02) Bucket with folding back
    (03) Bench
    (04) Bench with separate back cushions
    (05) Bench with folding back(s)
    (06) Split bench with separate back cushions
    (07) Split bench with folding back(s)
    (08) Pedestal (i.e., column supported)
    (09) Other seat type (specify): _____
    (10) Box mounted seat (i.e., van type)
    (99) Unknown

27. Seat Performance (this Occupant Position): 1
    (0) Occupant not seated or no seat
    (1) No seat performance failure(s)
    (2) Seat adjusters failed
    (3) Seat back folding locks or "seat back" failed (specify): _____
    (4) Seat track/anchors failed
    (5) Deformed by impact of occupant
    (6) Deformed by passenger compartment intrusion (specify): _____
    (7) Combination of above (specify): _____
    (8) Other (specify): _____
    (9) Unknown

CHILD SAFETY SEAT

28. Child Safety Seat Make/Model 000
(000) No child safety seat
Applicable codes are found in your NASS CDS Data Collection, Coding and Editing
(950) Built-in child safety seat
(997) Other make/model (specify):
_____
(998) Unknown make/model
(999) Unknown if child safety seat used

29. Type of Child Safety Seat 0
(0) No child safety seat
(1) Infant seat
(2) Toddler seat
(3) Convertible seat
(4) Booster seat
(7) Other type child safety seat (specify):
_____
(8) Unknown child safety seat type
(9) Unknown if child safety seat used

30. Child Safety Seat Orientation 00
(00) No child safety seat

Designed for Rear Facing for This Age/Weight
(01) Rear facing
(02) Forward facing
(08) Other orientation (specify):
_____
(09) Unknown orientation

Designed For Forward Facing for This Age/Weight
(11) Rear facing
(12) Forward facing
(18) Other orientation (specify):
_____
(19) Unknown orientation

Unknown Design or Orientation For This Age/Weight, or Unknown Age/Weight
(21) Rear facing
(22) Forward facing
(28) Other orientation (specify):
_____
(29) Unknown orientation

(99) Unknown if child safety seat used

31. Child Safety Seat Harness Usage 00

32. Child Safety Seat Shield Usage 00

33. Child Safety Seat Tether Usage 00

Note: Options below applicable to Variables OA31-OA33.
(00) No child safety seat

Not Designed With Harness/Shield/Tether
(01) After market harness/shield/tether added, not used
(02) After market harness/shield/tether used
(03) Child safety seat used, but no after market harness/shield/tether added
(09) Unknown if harness/shield/tether added or used

Designed With Harness/Shield/Tether
(11) Harness/shield/tether not used
(12) Harness/shield/tether used
(19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether
(21) Harness/shield/tether not used
(22) Harness/shield/tether used
(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

INJURY CONSEQUENCES

34. Injury Severity (Police Rating) 9

(0) O - No injury
(1) C - Possible injury
(2) B - Nonincapacitating injury
(3) A - Incapacitating injury
(4) K - Killed
(5) U - Injury, severity unknown
(6) Died prior to accident
(9) Unknown

35. Treatment - Mortality 3
(0) No treatment
(1) Fatal
(2) Fatal - ruled disease (specify):

_____

Nonfatal
(3) Hospitalization
(4) Transported and released
(5) Treatment at scene - nontransported
(6) Treatment later
(8) Treatment - other (specify):

_____
(9) Unknown

36. Type Of Medical Facility (for Initial Treatment) 2
(0) Not treated at a medical facility
(1) Trauma center
(2) Hospital
(3) Medical clinic
(4) Physician's office
(5) Treatment later at medical facility
(8) Other (specify):

_____
(9) Unknown

37. Hospital Stay 03
(00) Not Hospitalized
_____Code the number of days (up through 60) that the occupant stayed in hospital.
(61) 61 days or more
(99) Unknown

38. Working Days Lost 97
_____Code the number of days (up through 60) that the occupant lost from work due to the accident
(00) No working days lost
(61) 61 days or more
(62) Fatally injured
(97) Not working prior to accident
(99) Unknown

STOP - GO TO VARIABLE 44 ON PAGE 7

VARIABLES 39 THROUGH 43 ARE COMPLETED BY THE ZONE CENTER

39. Time to Death 00
_____Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 +n up through 30 days = 60)
(00) Not fatal
(96) Fatal - ruled disease
(99) Unknown

40. 1st Medically Reported Cause of Death 00

41. 2nd Medically Reported Cause of Death 00

42. 3rd Medically Reported Cause of Death 00
_____Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
(00) Not fatal or no additional causes
(96) Mode of death given but specific injuries are not linked to cause of death. (specify):

_____
(97) Other result (includes fatal ruled disease) (specify):

_____
(99) Unknown

43. Number of Recorded Injuries for This Occupant 08
_____Code the actual number of injuries recorded for this occupant.
(00) No recorded injuries
(97) Injured, details unknown
(99) Unknown if injured

AUTOMATIC BELT SYSTEM

44. Automatic (Passive) Belt System Availability/ Function — 0
(0) Not equipped/not available
(1) 2 point automatic belts
(2) 3 point automatic belts
(3) Automatic belts - type unknown

Non-functional
(4) Automatic belts destroyed or rendered inoperative
(9) Unknown

45. Automatic (Passive) Belt System Use — 0
(0) Not equipped/not available/destroyed or rendered inoperative
(1) Automatic belt in use
(2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify): _____
(3) Automatic belt use unknown
(9) Unknown

46. Automatic (Passive) Belt System Type — 0
(0) Not equipped/not available
(1) Non-motorized system
(2) Motorized system
(9) Unknown

47. Proper Use of Automatic (Passive) Belt System — 0
(0) Not equipped/not available/not used
(1) Automatic belt used properly
(2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly
(3) Automatic shoulder belt worn under arm
(4) Automatic shoulder belt worn behind back
(5) Automatic belt worn around more than one person
(6) Lap portion of automatic belt worn on abdomen
(7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify): _____
(8) Other improper use of automatic belt system (specify): _____
(9) Unknown

48. Automatic (Passive) Belt Failure Modes During Accident — 0
(0) Not equipped/not available/not in use
(1) No automatic belt failure(s)
(2) Torn webbing (stretched webbing not included)
(3) Broken buckle or latchplate
(4) Upper anchorage separated
(5) Other anchorage separated (specify): _____
(6) Broken retractor
(7) Combination of above (specify):
(8) Other automatic belt failure (specify): _____
(9) Unknown

49. Seat Orientation (this Occupant Position) — 1
(0) Occupant not seated or no seat
(1) Forward facing seat
(2) Rear facing seat
(3) Side facing seat (inward)
(4) Side facing seat (outward)
(8) Other (specify): _____
(9) Unknown

Check the Primary Source Used In Determining Belt Use.

[ ] Not equipped/not available/destroyed or rendered inoperative
[ ] Vehicle inspection
[ ] Official injury data
[✓] Driver/occupant interview
[ ] Other (specify): _____
[ ] Unknown if belt used

ARE ALL APPLICABLE MEDICAL RECORDS INCLUDED WITH INITIAL SUBMISSION? NO [ ] YES [ ]

UPDATE CANDIDATE? NO [ ] YES [ ]

STOP - VARIABLES 50 THROUGH 53 ARE COMPLETED BY THE ZONE CENTER

TRAUMA DATA

50. Glasgow Coma Scale (GCS) Score (at Medical Facility) 02
    (00) Not injured
    (01) Injured - not treated at medical facility
    (02) No GCS Score at medical facility
    (03-15) Code the actual value of the initial GCS Score recorded at medical facility.
    (97) Injured, details unknown
    (99) Unknown if injured

51. Was the Occupant Given Blood? 1
    (1) No - blood not given
    (2) Yes - blood given
    (specify units):_____
    (9) Unknown if blood given

52. Arterial Blood Gases (ABG) - HCO_3 01
    (00) Not injured
    (01) Injured, ABGs not measured or reported
    (02-50) Code the actual value of the HCO_3
    (96) ABGs reported , HCO_3 unknown
    (97) Injured, details unknown
    (99) Unknown if injured

BELT USE DETERMINATION

53. Primary Source of Belt Use Determination 3
    (0) Not equipped/not available/destroyed or rendered inoperative
    (1) Vehicle inspection
    (2) Official injury data
    (3) Driver/occupant interview
    (8) Other (specify):_____
    (9) Unknown if belt used

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~~	94-34	4. Occupant Number	01

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
1st	5. 2	6. 7	7. 5	8. 28	9. 04	10. 3	11. 1	12. 16	13. 1	14. 1	15. 00
2nd	16. 2	17. 7	18. 3	19. 22	20. 02	21. 2	22. 1	23. 16	24. 1	25. 1	26. 00
3rd	27. 2	28. 7	29. 5	30. 04	31. 04	32. 1	33. 1	34. 16	35. 1	36. 1	37. 00
4th	38. 2	39. 4	40. 9	41. 04	42. 02	43. 1	44. 2	45. 45	46. 1	47. 1	48. 00
5th	49. 2	50. 4	51. 9	52. 02	53. 02	54. 1	55. 2	56. 45	57. 1	58. 1	59. 00
6th	60. 7	61. 2	62. 9	63. 04	64. 02	65. 1	66. 8	67. 45	68. 1	69. 1	70. 00
7th	71. 7	72. 2	73. 9	74. 04	75. 02	76. 1	77. 1	78. 45	79. 1	80. 1	81. 00
8th	82. 7	83. 2	84. 9	85. 04	86. 02	87. 1	88. 2	89. 45	90. 1	91. 1	92. 00
9th	93.	94.	95.	96.	97.	98.	99.	100.	101.	102.	103.
10th	104.	105.	106.	107.	108.	109.	110.	111.	112.	113.	114.

HS Form 433B (1/94)

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.

SOURCE OF INJURY DATA

OFFICIAL
(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
(5) Lay coroner report
(6) E.M.S. personnel
(7) Interviewee
(8) Other source (specify):

(9) Police

INJURY SOURCE

FRONT
(01) Windshield
(02) Mirror
(03) Sunvisor
(04) Steering wheel rim
(05) Steering wheel hub/spoke
(06) Steering wheel (combination of codes 04 and 05)
(07) Steering column, transmission selector lever, other attachment
(08) Add on equipment (e.g., CB, tape deck, air conditioner)
(09) Left instrument panel and below
(10) Center instrument panel and below
(11) Right instrument panel and below
(12) Glove compartment door
(13) Knee bolster
(14) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, mirror, or steering assembly (driver side only)
(15) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, or mirror (passenger side only)
(16) Driver side air bag compartment cover
(17) Passenger side air bag compartment cover
(18) Windshield reinforced by exterior object (specify):
(19) Other front object (specify):

LEFT SIDE
(20) Left side interior surface, excluding hardware or armrests
(21) Left side hardware or armrest
(22) Left A (A1/A2)-pillar
(23) Left B-pillar
(24) Other left pillar (specify):
(25) Left side window glass or frame
(26) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(27) Other left side object (specify):
(28) Left side window sill

RIGHT SIDE
(30) Right side interior surface, excluding hardware or armrests
(31) Right side hardware or armrest
(32) Right A (A1/A2)-pillar
(33) Right B-pillar
(34) Other right pillar (specify):
(35) Right side window glass or frame
(36) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(37) Other right side object (specify):
(38) Right side window sill

INTERIOR
(40) Seat, back support
(41) Belt restraint webbing/buckle
(42) Belt restraint B-pillar or door frame attachment point
(43) Other restraint system component (specify):
(44) Head restraint system
(45) Air bag (use codes "16" and "17" for injuries sustained from air bag compartment covers)
(46) Other occupants (specify):
(47) Interior loose objects
(48) Child safety seat (specify):
(49) Other interior object (specify):

ROOF
(50) Front header
(51) Rear header
(52) Roof left side rail
(53) Roof right side rail
(54) Roof or convertible top

FLOOR
(56) Floor (including toe pan)
(57) Floor or console mounted transmission lever, including console
(58) Parking brake handle
(59) Foot controls including parking brake

REAR
(60) Backlight (rear window)
(61) Backlight storage rack, door, etc.
(62) Other rear object (specify):

EXTERIOR of OCCUPANT'S VEHICLE
(65) Hood
(66) Outside hardware (e.g., outside mirror, antenna)
(67) Other exterior surface or tires (specify):
(68) Unknown exterior objects

EXTERIOR OF OTHER MOTOR VEHICLE
(70) Front bumper
(71) Hood edge
(72) Other front of vehicle (specify):
(73) Hood
(74) Hood ornament
(75) Windshield, roof rail, A-pillar
(76) Side surface
(77) Side mirrors
(78) Other side protrusions (specify)
(79) Rear surface
(80) Undercarriage
(81) Tires and wheels
(82) Other exterior of other motor vehicle (specify):
(83) Unknown exterior of other motor vehicle

OTHER VEHICLE OR OBJECT IN THE ENVIRONMENT
(84) Ground
(85) Other vehicle or object (specify)
(86) Unknown vehicle or object

NONCONTACT INJURY
(90) Fire in vehicle
(91) Flying glass
(92) Other noncontact injury source (specify):
(93) Air bag exhaust gases
(97) Injured, unknown source

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

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

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, 06, 08) Level of Consciousness
(10) Concussion

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

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

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