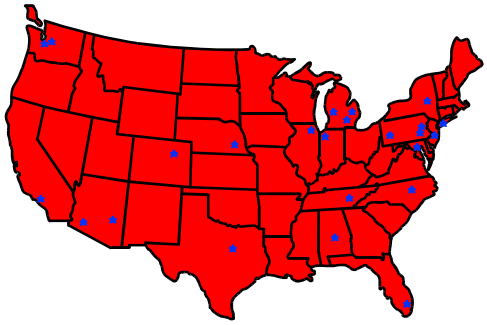
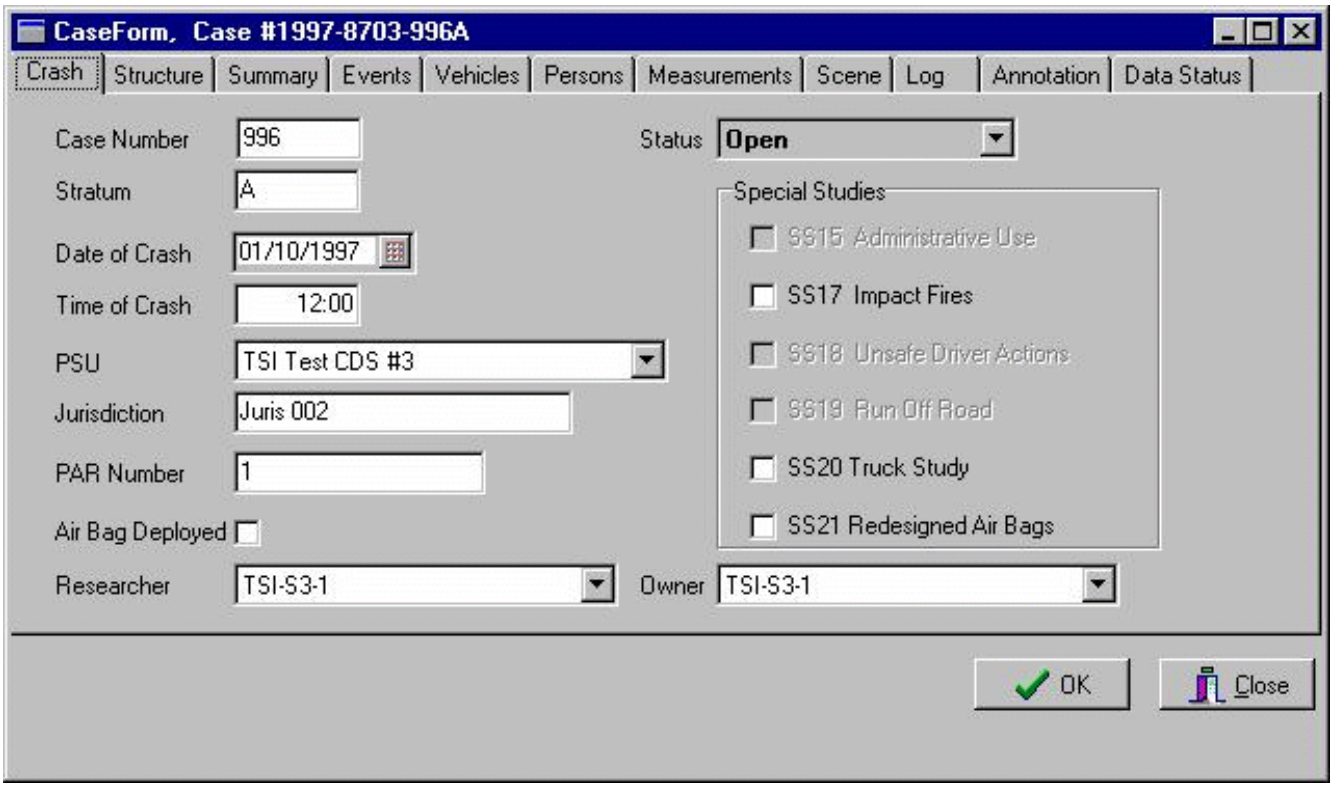
National Automotive Sampling System

Crashworthiness Data System



2000 Coding and Editing Manual

United States Department of Transportation
National Highway Traffic Safety Administration


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Case Number
996
Status
Open
Stratum
A
Special Studies
SS15 Administrative Use
Date of Crash
01/10/1997
SS17 Impact Fires
Time of Crash
12:00
SS18 Unsafe Driver Actions
PSU
TSI Test CDS #3
SS19 Run Off Road
Jurisdiction
Juris 002
SS20 Truck Study
PAR Number
1
SS21 Redesigned Air Bags
Air Bag Deployed
Researcher
TSI-S3-1
Owner
TSI-S3-1
OK
Close

Screen Name: Case Number
Variable Name: Case Number

Element Attributes:

Range:

001-499
501-599 (Fire)
801-899 (Redesigned Air Bags)

Source: Assigned by Automated Case Selection System

Remarks:

This variable is assigned by ACSS (Automated Case Selection System) and cannot be changed.

The three digits are numbers ranging from 001 to 499. No numbers will be skipped. If a case must be dropped, the number will not be reused.

Cases sampled within the NASS CDS sampling frame are numbered 001-499. Cases selected outside of the NASS CDS sampling frame as part of a special study data collection effort are numbered 501-599 or 801-899 by the ACSS.

Screen Name: Stratum
Variable Name: Stratum

Element Attributes:

Range: CDS Sampling Stratum — A, B, C, D, E, F, G, H, J, K

Source: Assigned by Automated Case Selection System

Remarks:

This variable is generated by the ACSS (Automated Case Selection System) and cannot be changed.

The Stratum is the letter identifying which CDS sampling classification the case is assigned.

Screen Name: Date of Crash
Variable Name: Date of Crash (Month/Day/Year)

Element Attributes:

Month: 01-12
Day: 01 through 31
Year: 2000

Source: Assigned by Automated Case Selection System

Remarks:

This variable is assigned by the ACSS (Automated Case Selection System) and cannot be changed.

Screen Name: Time of Crash
Variable Name: Time of Crash

Element Attributes:

0001-2400
9999 Unknown

Source: Police Report

Remarks:

This variable is assigned by the ACSS (Automated Case Selection System) and cannot be changed.

Screen Name: PSU
Variable Name: PSU

Element Attributes:
PSU number

Zone Center One
02 Ulster County, New York
03 Kings County, New York
04 Ocean County, New Jersey
05 Montgomery County, Pennsylvania
06 Philadelphia, Pennsylvania
08 Allegheny County, Pennsylvania (minus Pittsburgh City)
09 Charles and Prince Georges Counties, Maryland
11 Washtenaw County, Michigan
12 Genesee County, Michigan
13 Muskegon County, Michigan
41 Ft. Lauderdale and Hollywood, Florida
43 Wake County, North Carolina
45 Knox County, Tennessee

Zone Center Two
48 Tuscaloosa and Bibb Counties, Alabama
49 Dallas, Texas
72 Chicago, Illinois
73 Lake County, Indiana
74 Douglas County (including city of Omaha), Nebraska
75 Gilpin, Jefferson Counties, Colorado
76 Gila, Graham, Greenlee Counties, Arizona
78 Yuma and La Paz Counties, Arizona
79 Los Angeles (City), California
81 King County, Washington (minus Seattle City)
82 Seattle, Washington

Source: Assigned by Automated Case Selection System.

Remarks:

This variable reports the PSU (Primary Sampling Unit) that selected the case. This variable is assigned by the ACSS and cannot be changed at the PSU.

Screen Name: Jurisdiction
Variable Name: Police Jurisdiction

Element Attributes:
PSU specific list of sampled Police Jurisdiction

Source: Police Report

Remarks:

This variable reports the sampled police jurisdiction from which the case was selected. This variable is selected in the ACSS and cannot be changed at the PSU.

This is an administrative variable.

Screen Name: PAR Number
Variable Name: PAR Number

Element Attributes:
Police report number recorded from the PARS

Source: Police Report

Remarks:

This variable reports the police report number as entered into the ACSS and cannot be changed at the PSU.

This is an administrative variable.

Screen Name: Air Bag Deployed
Variable Name: Did An Air Bag Deploy In The Crash?

Element Attributes: Check box

Source: Police Report

Remarks:

This variable reports the air bag deployment status as entered into the ACSS and cannot be changed at the PSU.

A check in the box indicates a police reported air bag deployment.

Screen Name: Researcher
Variable Name: Researcher Assigned To Case

Element Attributes:
PSU Specific

Source: NASS Personnel Roster.

Remarks:

Select the name of the Researcher assigned the case.

This is an administrative variable.

Screen Name: Owner
Variable Name: Person Who Last Was Working On Case

Element Attributes:
PSU and Zone

Source: NASS Personnel Roster.

Remarks:
This is an administrative variable.

At the PSU level:

Select the name of the Researcher who has the responsibility for the case.

At the Zone Center level:

Select the name of the person who has the primary responsibility for the case review.

Screen Name: Status
Variable Name: Status of Case

Element Attributes:
Open

Source: NASSMAIN Program

Remarks:

The NASSMAIN Program determines the status of the case.

This is an administrative variable.

Screen Name: Special Studies
Variable Name: Special Studies

Element Attributes:

SS17 Impact Fires
SS20 Truck Study
SS21 Redesigned Air Bags

Source: Special study procedures.

Remarks:

A checkmark in the box adjacent to the Special Study identifier means the case qualifies for that special study.

The vehicle qualifying for the special study must be inspected.

A blank box adjacent to the Special Study identifier means the case does not qualify for this special study.

Definition of SS17 (Impact Fires)

The goal of the SS17 (Impact Fire) identifier is to locate complete cases involving impact fires for clinical review.

Impact Fire cases selected within the CDS case sample
NASS CDS cases involving a vehicle fire that originated in a late model year vehicle (LMY), which resulted from an impact with another vehicle or object, and the cases are selected by the automated case selection system (ACSS) as regular CDS cases. In addition, to qualify for the special study the burned vehicle must be inspected. These cases are to be investigated and entered into the EDCS.

Impact Fires selected as a special study case (outside of the CDS sample)
NASS CDS crashes involving a vehicle fire that originated in a late model year (LMY) vehicle which resulted from an impact with another vehicle or object and the crashes are listed but not selected as part of the CDS case sample. In addition, to qualify for the special study the burned vehicle must be inspected. These crashes are to be investigated and entered into EDCS. Case numbers shall be from 501-599

Definition of SS20 (Truck Study)

The primary objective of this study is to 1) determine the circumstances involving the impact between CDS applicable vehicles and medium/heavy trucks, 2) the interaction of old and new underride guards with these impacts, and 3) truck conspicuity information.

ALL Truck Study cases are cases selected within the CDS case sample

Screen Name: Special Studies (cont'd)
Variable Name: Special Studies

Definition of SS21 Redesigned Air Bag Special Study (RABSS)

The primary objective of this special study is to collect data on crashes of high interest (children, out of position occupants, high damage severity, and multiple injured occupants) involving vehicles equipped with a redesigned air bag system in which the air bag deployed. For inclusion in this study the case must meet the following minimum criteria:

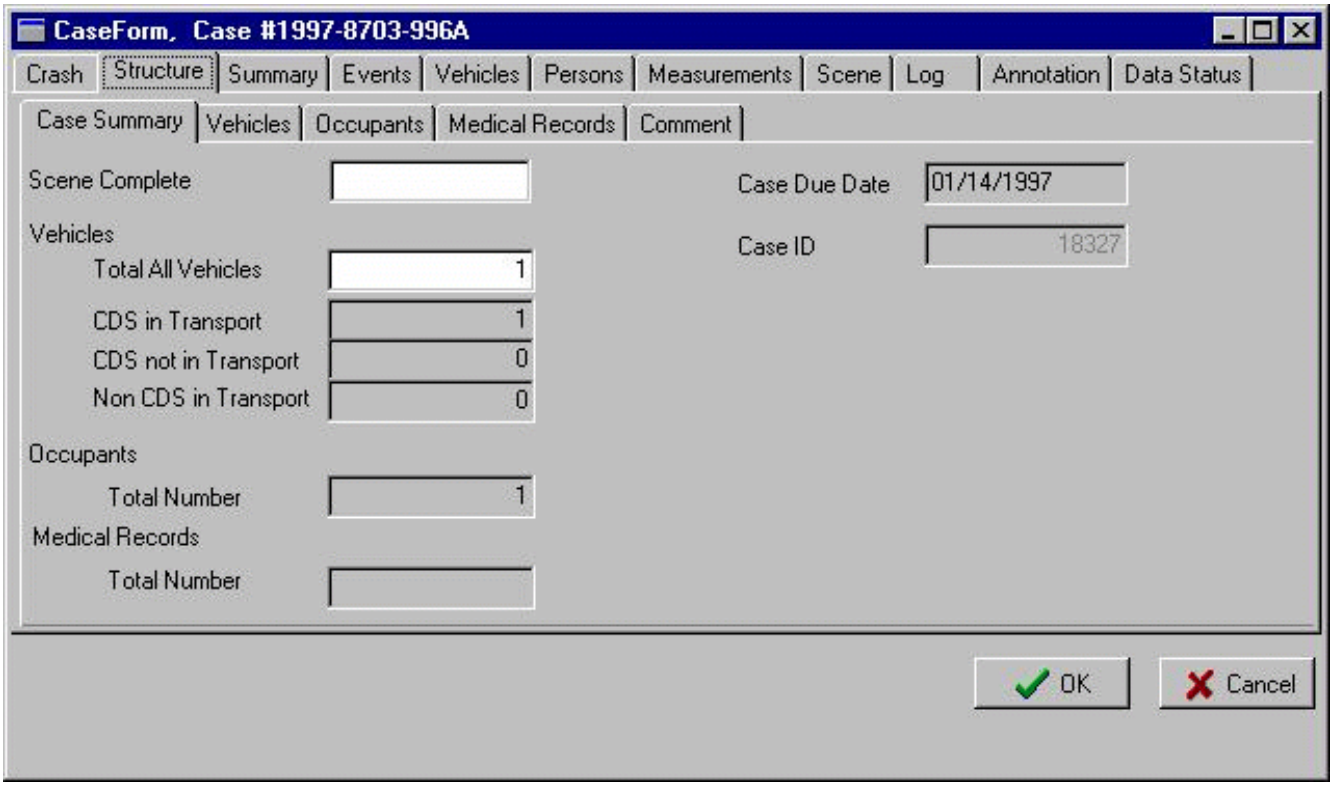
- 1998 or newer model year vehicle equipped with a redesigned air bag.
- The crash configuration to this vehicle must be an impact where the air bag is designed to protect the occupants (e.g., 11, 12, or 1 o'clock PDOF's). Do not include side or back plane impacts. In addition, exclude rollovers with or without ejection.
- An occupant must be seated in a position in which a redesigned air bag has deployed.

Within Sample

All RABSS cases selected within the normal CDS case selection process, are to be completed following normal CDS procedures.

Outside of Sample

All RABSS cases selected outside of the normal CDS sample must have a vehicle inspection. In addition, all normal CDS procedures are to be followed in data collection.


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Case Summary
Vehicles
Occupants
Medical Records
Comment
Scene Complete
Case Due Date
01/14/1997
Vehicles
Total All Vehicles
1
Case ID
18327
CDS in Transport
1
CDS not in Transport
0
Non CDS in Transport
0
Occupants
Total Number
1
Medical Records
Total Number
OK
Cancel

Screen Name: Scene Complete
Variable Name: Scene Completion Date

Element Attributes:

Month: 01-12
Day: 01 through 31
Year: 2000

Source: Researcher Determined Inspection Date

Remarks:

The Researcher enters the date that the scene was inspected .

Screen Name: Vehicles – Total All Vehicles
Variable Name: Total Number of Vehicles in Crash

Element Attributes:

The total number of vehicles (in-transport, CDS, and non-CDS) in the crash

Source: Researcher determined

Remarks:

All in-transport vehicles involved in the crash must be counted. Any not-in-transport CDS applicable inspected vehicles that are struck by any CDS applicable in-transport vehicle must also be counted.

Examples:

The PAR stated that Vehicle 1, a CDS applicable vehicle, struck Vehicle 2, another CDS applicable vehicle. Vehicle 2 then rebounded into vehicle 3, a legally parked CDS applicable inspected vehicle. All inspected vehicles are included in the case.

Vehicle 1, a heavy truck, struck Vehicle 2, a CDS applicable vehicle, and the truck then continued on to strike a legally parked CDS applicable vehicle. The parked vehicle is not included in the case.

Each case must have at least one in-transport/towed CDS applicable vehicle.

Vehicle information must be entered for each in-transport motor vehicle involved in the crash. For example, one CDS applicable vehicle is towing another by a nonfixed linkage (e.g., rope, chain, etc.). Assuming both vehicles are involved in the crash, data are required for both vehicles. If the linkage was fixed (see below for "fixed linkage"), only the power unit would be considered in-transport and only one form required.

When one motor vehicle is towing another, the number of vehicles depends on the crash circumstances and the type of linkage between the vehicles. A fixed linkage is defined as one which has the purpose of keeping the towed unit separated from the power unit by a distance which is essentially constant. Included within this definition are cradle linkages where the towed unit has two or more wheels off the ground. A nonfixed linkage (such as a rope or a chain) requires the towed unit to be manually controlled.

If the linkage between the units is fixed, consider only the vehicle that is the power (i.e., towing) unit and consider the towed unit as cargo throughout the entire crash sequence, regardless of subsequent events/impacts sustained by the towed unit. In other words, a vehicle towed by a fixed linkage: (1) is never considered as an in-transport vehicle, (2) will not have vehicle information entered, and (3) will be considered as cargo associated with the power unit.

If the linkage between the units is nonfixed, each vehicle is considered in-transport, and all vehicle(s) involved in the crash sequence should be recorded individually. Hit-and-run crashes occasionally cause some confusion. Vehicle information is entered for each in-transport motor vehicle involved in the crash independent of the amount of information collected on the vehicles by the police.

Screen Name: Vehicles -- CDS in Transport
Variable Name: Number of CDS in Transport Vehicles in Crash

Element Attributes:

The total number of CDS in Transport vehicles in the crash

Source: Researcher determined

Remarks:

A vehicle is counted when the vehicle has been determined to be a CDS applicable vehicle that is in-transport. This is researcher determined and may not necessarily agree with the police report. For example, the PAR may list a “parked vehicle” as a struck vehicle: upon inspecting the scene the researcher determines there is no “legal’ parking at the scene, so the PAR-reported parked vehicle becomes an in-transport vehicle.

Screen Name: Vehicles -- CDS not in Transport
Variable Name: Number of CDS not in Transport Vehicles in Crash

Element Attributes:

The total number of CDS not in Transport vehicles in the crash

Source: Researcher determined

Remarks:

A vehicle is counted when the vehicle has been determined to be a CDS applicable vehicle that is not in transport. This is researcher determined and may not necessarily agree with the police report. For example, the PAR may list a “parked vehicle” as a struck vehicle: upon inspecting the scene the researcher determines there is no “legal’ parking at the scene, so the PAR-reported parked vehicle becomes an in-transport vehicle.

Screen Name: Vehicles -- Non CDS in Transport
Variable Name: Number of Non CDS in Transport Vehicles in Crash

Element Attributes:

The total number of Non CDS in Transport vehicles in the crash

Source: Researcher determined

Remarks:

A vehicle is counted when the vehicle has been determined to be a CDS applicable vehicle that is in transport. This is researcher determined and may not necessarily agree with the police report. For example, the PAR may list a “parked vehicle” as a struck vehicle: upon inspecting the scene the researcher determines there is no “legal’ parking at the scene, so the PAR-reported parked vehicle becomes an in-transport vehicle.

Screen Name: Occupants – Total Number
Variable Name: Total Number of Occupants in CDS Vehicles in transport

Element Attributes:

The total number of Occupants in vehicles in the crash

Source: Researcher determined

Remarks:

This total number of occupants in vehicles is rolled up from the Structure/Occupants screen.

Screen Name: Medical Records – Total Number
Variable Name: Total Number of Medical Records in Case

Element Attributes:

The total number of Medical Records required for occupants of CDS in Transport vehicles in the crash

Source: Researcher determined

Remarks:

This total number of medical records requested or received for occupants of CDS vehicles in transport is rolled up from the Structure/Medical Records screens.

Screen Name: Case Due Date
Variable Name: Case Due Date

Element Attributes:

Date generated Automated Case Selection System

Source: Automated Case Selection System

Remarks:

This variable is generated by the ACSS (Automated Case Selection System) and cannot be changed.

Screen Name: Case ID
Variable Name: Case Identification Number

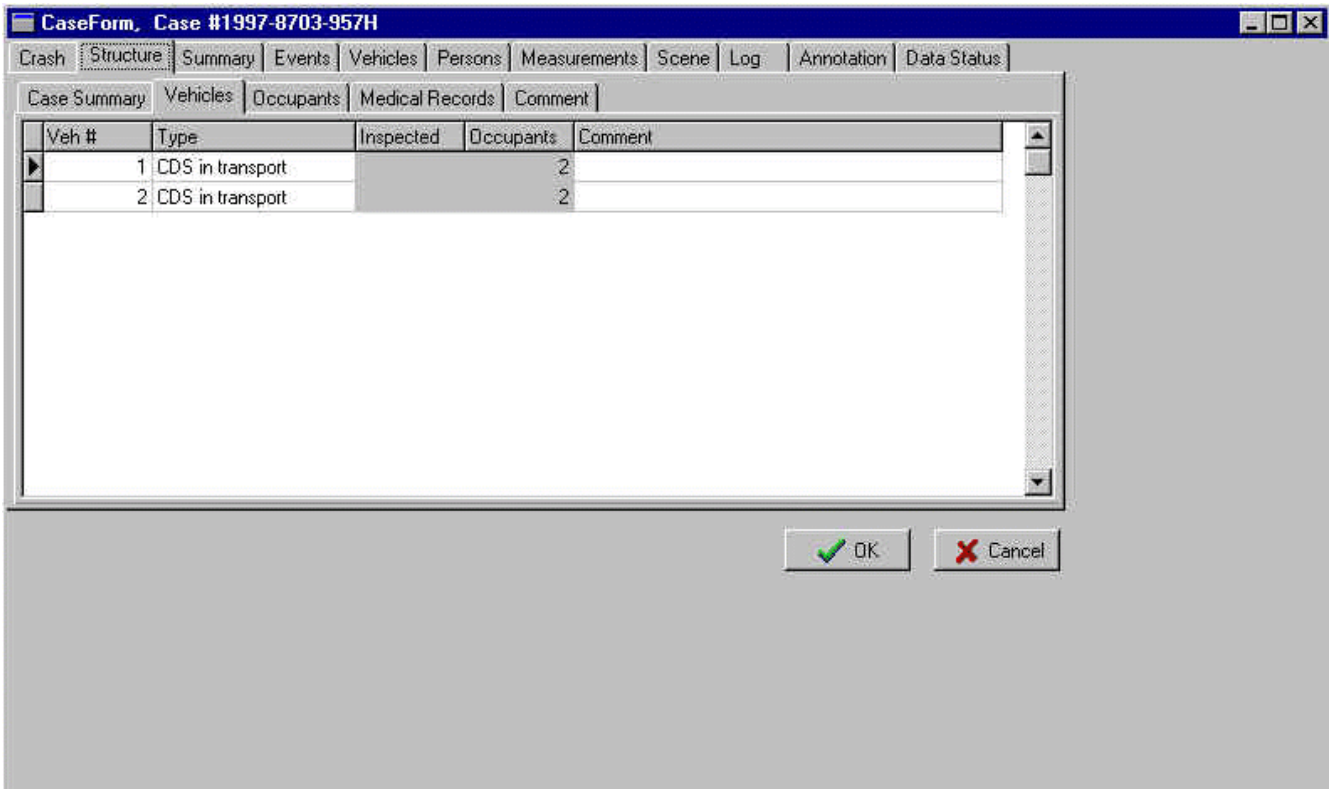
Element Attributes:

Unique Number generated by the NASSMAIN Program

Source: NASSMAIN Program

Remarks:

This variable is generated by the NASSMAIN Program and cannot be changed.


CaseForm, Case #1997-8703-957H
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Case Summary
Vehicles
Occupants
Medical Records
Comment
Veh #
Type
Inspected
Occupants
Comment
1
CDS in transport
2
2
CDS in transport
2
OK
Cancel

Screen Name: Veh #
Variable Name: Vehicle Number

Element Attributes:
As numbered

Source: Researcher determined

Remarks:

Vehicles are numbered starting with "1". Each in-transport motor vehicle is assigned a unique number. Vehicle numbers are to be assigned consecutively according to the order NASS vehicles are listed on the PAR except in the following circumstances: 1) If there are any in-transport NASS vehicles not listed on the PAR, then use the next consecutive number. 2) If there are any CDS or non-CDS applicable and not-in-transport vehicles that are struck by an in-transport CDS applicable vehicle then assign them to the last vehicle numbers in the case (i.e. parked car).

Example:

The PAR stated that Vehicle 3, a Honda Accord, struck Vehicle 2, a Chevrolet Impala, and the Impala rebounded into vehicle 1, a legally parked Toyota Corolla. In the NASS CDS case the Accord is Vehicle 2, the Impala is Vehicle 1, and the Corolla, if inspected, must be assigned as Vehicle 3.

Do not assign a number to an uninspected not in-transport vehicle

Screen Name: Type
Variable Name: Type of Vehicle

Element Attributes:

CDS in transport
NON CDS
CDS NOT-in-transport

Source: Researcher determined

Remarks:

All vehicles involved in the crash must be counted. All in-transport CDS, Non CDS, and inspected not-in-transport vehicles that are struck by any CDC- applicable in-transport vehicle must be counted.

CDS in transport
Is used when the vehicle has been determined to be a CDS applicable vehicle that is in-transport. This is researcher determined and may not necessarily agree with the police report.

NON CDS
Is used when the in-transport vehicle is not a CDS applicable vehicle.

CDS NOT-in-transport
Is used when the inspected vehicle has been determined to be a CDS applicable vehicle that is not-in-transport. This is researcher determined and may not necessarily agree with the police report. Only those inspected vehicles that are struck by an in-transport vehicle are to be included. If an in-transport CDS applicable vehicle impacts a legally parked car, which then strikes another legally, parked car, only the first parked car will be included (if inspected). However, if this second parked car is also struck it also would be included (if inspected).

Screen Name: Inspected
Variable Name: Date of Vehicle Inspection

Element Attributes:

Month: 01-12
Day: 01 through 31
Year: 2000

Source: Date is rolled up from the Vehicle Exterior Form, Vehicle screen.

Remarks:

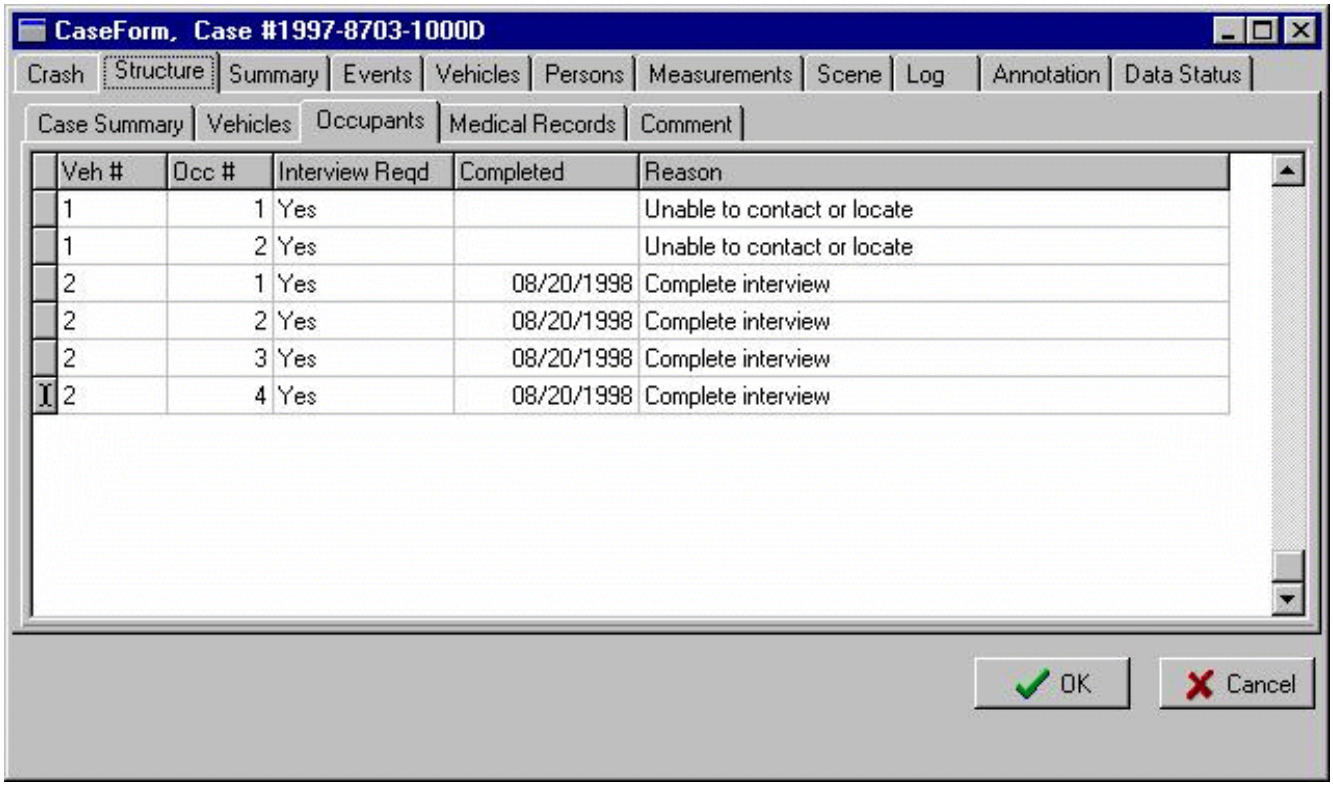
When researcher completes the vehicle inspection he enters the date on the Vehicle Exterior Form, Vehicle screen and it automatically rolls up to this variable.

Screen Name: Occupants
Variable Name: Number of Occupants in this Vehicle

Element Attributes:
Total number of occupants in this vehicle

Source: The number of Occupants is rolled up from the Case Form, Structure, Occupants screen.

Remarks:



Veh #	Occ #	Interview Reqd	Completed	Reason
1	1	Yes		Unable to contact or locate
1	2	Yes		Unable to contact or locate
2	1	Yes	08/20/1998	Complete interview
2	2	Yes	08/20/1998	Complete interview
2	3	Yes	08/20/1998	Complete interview
2	4	Yes	08/20/1998	Complete interview

Screen Name: Veh #
Variable Name: Vehicle Number

Element Attributes:
As numbered from vehicle tab

Source: Researcher determined

Remarks:

Researcher selects edit/insert from main menu. This opens a drop down list of all the vehicles entered on the Structure/Vehicles screen. The researcher then selects the vehicle number for which to enter the rest of the data.

Screen Name: Occ #
Variable Name: Occupant Number

Element Attributes:
As numbered

Source: Researcher determined

Remarks:

Researcher selects edit/insert from main menu. This opens a drop down list of all the vehicles entered on the Structure/Vehicles screen. The researcher then selects the vehicle number for which to enter the rest of the data. This automatically inserts the next available occupant number for this vehicle.

Screen Name: Interview Reqd
Variable Name: Interview Required

Element Attributes:
Yes
No

Source: Researcher determined

Remarks:

This automatically places a “Yes” in this variable. To change it to “No” the researcher must click on the variable box, a drop down list will appear.

Screen Name: Completed
Variable Name: Interview Completion Date

Element Attributes:

Month: 01-12
Day: 01 through 31
Year: 2000

Source: Researcher determined

Remarks:

When researcher completes the interview the date of completion is entered here.

Screen Name: Reason
Variable Name: Interview Completed or Reason why it is not Completed

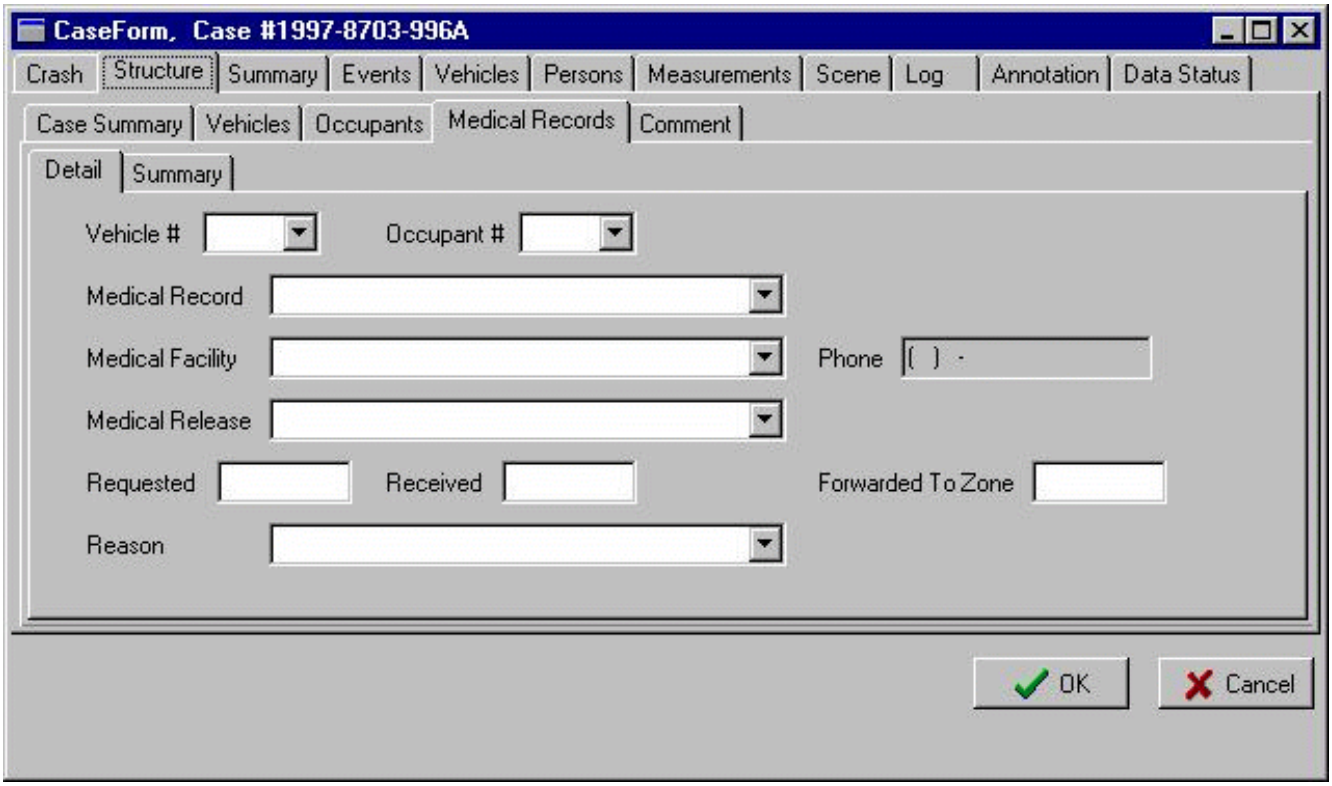
Element Attributes:

Unable to contact or locate
Hit and Run
Fatal - surrogate not available
In intensive care - surrogate not available
Out-of-state resident
Refused interview
Insurance company refusal
Attorney refusal or litigation
No return of questionnaire
Other (specify)
Partial interview
Complete interview

Source: Researcher determined

Remarks:

Select the attribute that best fits the results of the completed interview or Reason of the last interview attempt.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Annotation
Data Status
Case Summary
Vehicles
Occupants
Medical Records
Comment
Detail
Summary
Vehicle #
Occupant #
Medical Record
Medical Facility
Phone
( ) -
Medical Release
Requested
Received
Forwarded To Zone
Reason
OK
Cancel

Screen Name: Veh #
Variable Name: Vehicle Number

Element Attributes:
As numbered

Source: Researcher determined

Remarks:

Researcher selects the appropriate vehicle from the drop down list which lists a number for each CDS vehicle in transport in the case.

Screen Name: Occupant #
Variable Name: Occupant Number

Element Attributes:
As numbered

Source: Researcher determined

Remarks:

Researcher selects the appropriate occupant from the drop down list which lists a number for each occupant in the vehicle selected in the previous variable.

Screen Name: Medical Record
Variable Name: Medical Record

Element Attributes:

Autopsy
Post-ER Medical Record
Admission Records
Discharge Summary
Operative Report
Radiographic
History/Physical Examination
Emergency Room records
Private Physician
Lay Coroner
EMS Record
Interviewee
Police Report
Other (specify)

Source: Researcher determined

Remarks:

Researcher selects the medical record(s) from the drop down list that are needed for this occupant. If more than one type medical record is needed the researcher must select Edit/Insert for each additional record.

Screen Name: Medical Facility
Variable Name: Medical Facility

Element Attributes:
A list of medical facilities specific for each PSU drops down.

Source: Researcher determined

Remarks:

Researcher selects the appropriate medical facility from the drop down list. If more than one facility is used by this occupant, the researcher must select Edit/Insert for each additional facility.

Screen Name: Medical Release
Variable Name: Medical Release

Element Attributes:
Not Required
Required-not obtained
Required-obtained

Source: Researcher determined

Remarks:

The researcher selects the appropriate response from the drop down list.

Screen Name: Requested
Variable Name: Date that Medical Record was Requested

Element Attributes:
Month: 01-12
Day: 01 through 31
Year: 2000

Source: Researcher determined

Remarks:

Researcher enters the date that the medical record was requested.

Screen Name: Received
Variable Name: Date that Medical Record was Received

Element Attributes:
Month: 01-12
Day: 01 through 31
Year: 2000

Source: Researcher determined

Remarks:

Researcher enters the date that the medical record was received.

Screen Name: Forwarded to Zone
Variable Name: Date that Medical Record was Forwarded to the Zone Center

Element Attributes:

Month: 01-12
Day: 01 through 31
Year: 2000

Source: Researcher determined

Remarks:

Researcher enters the date that the medical record was forwarded to the Zone Center.

Screen Name: Reason
Variable Name: Medical Record Obtained or Reason why not

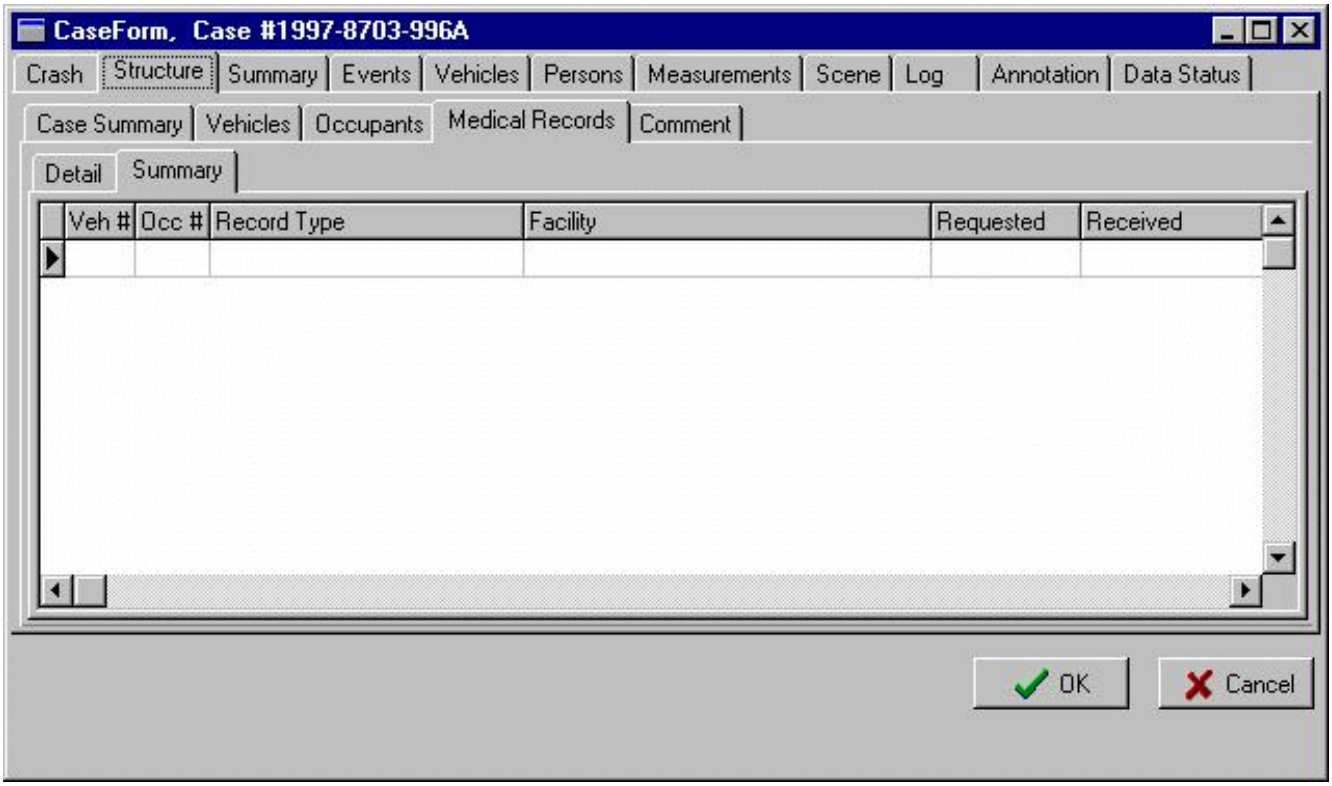
Element Attributes:

No record of treatment at medical facility
Medical release required-not obtained
Injury not related to crash
Noncooperative hospital
Hospital out-of-study area
Private Physician would not release data
Unknown if medically treated
Update pending
Record not received before file closeout
Record not obtained
Record obtained
Partial record obtained - no update pending
Partial record obtained - update pending

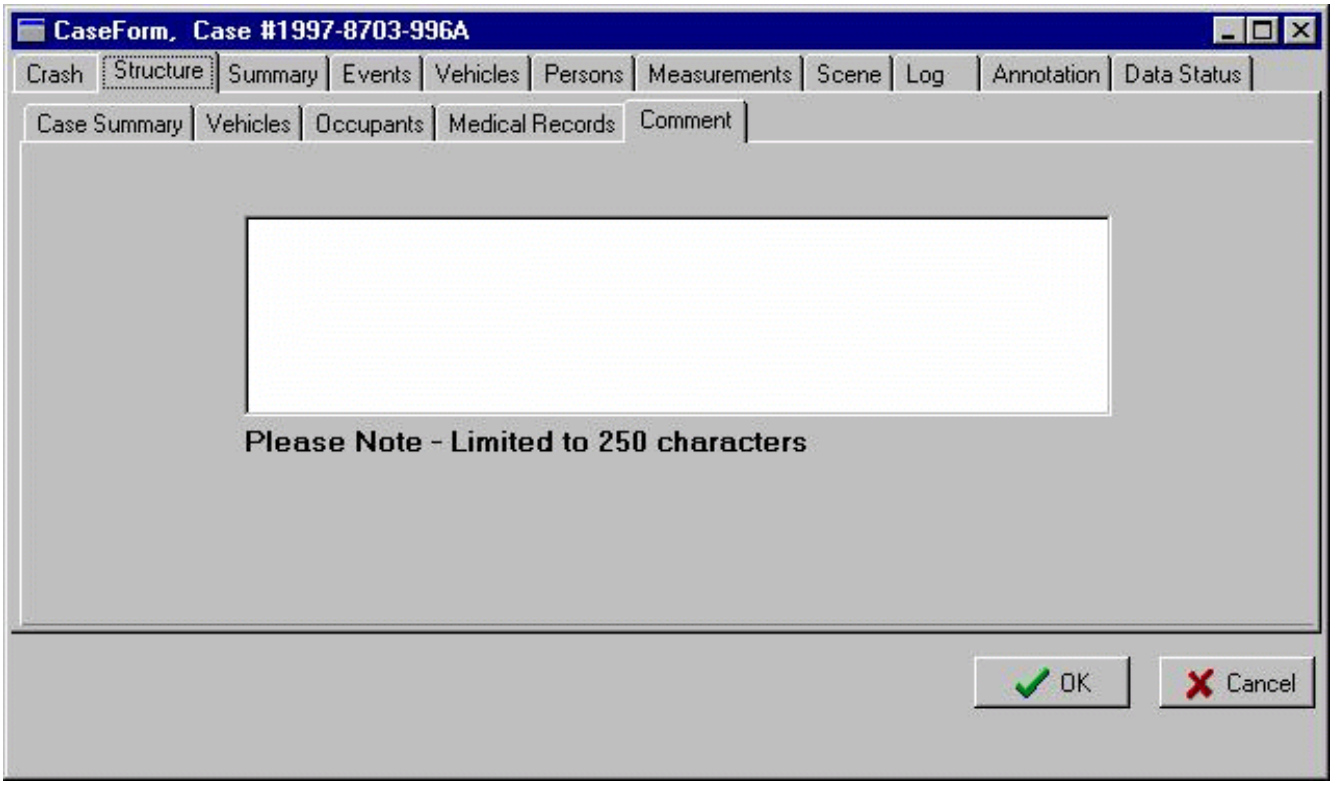
Source: Researcher determined

Remarks:

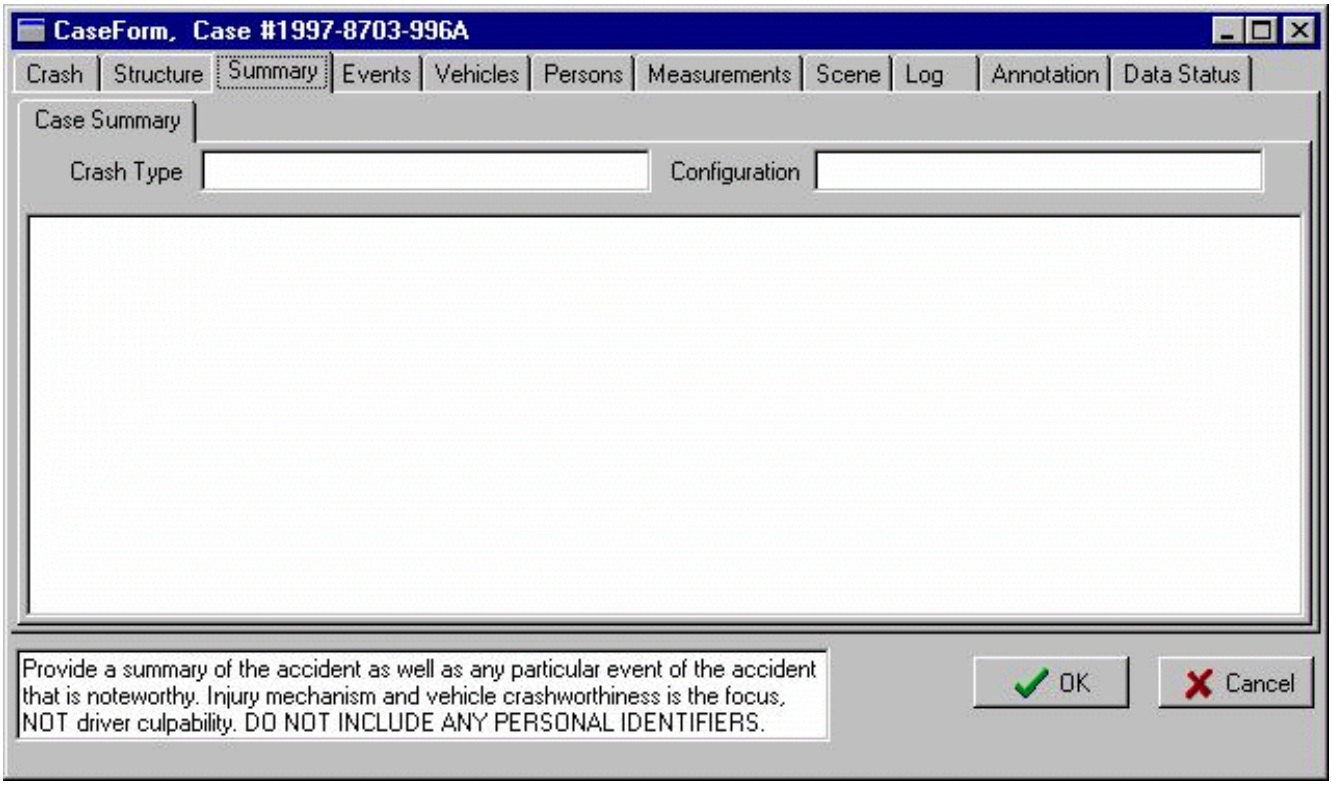
Researcher selects the appropriate response from the drop down list.



Summary screen rolls up what was entered on the previous Medical Records Detail screen.



Any comments about the case structure should be entered on this screen.


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
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Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Case Summary
Crash Type
Configuration
Provide a summary of the accident as well as any particular event of the accident that is noteworthy. Injury mechanism and vehicle crashworthiness is the focus, NOT driver culpability. DO NOT INCLUDE ANY PERSONAL IDENTIFIERS.
OK
Cancel

Screen Name: Crash Type
Variable Name: Crash Type

Element Attributes:
Vehicle to vehicle
Vehicle to object(s)
Multi-vehicle / multi-object

Source: Researcher determined

Remarks:

The researcher selects the crash type which best describes the overall crash scenario.

Vehicle to vehicle
is selected when the overall configuration of the crash is limited to interaction between two vehicles.

Vehicle to object(s)
is selected when a single vehicle is involved and has interaction with one or more fixed or non-fixed objects.

Multi-vehicles / multi - objects
is selected when:

- there are two or more vehicles involved **AND** there is an impact with at least one object

OR

- there are **more than** two vehicles involved in the crash

Screen Name: Configuration
Variable Name: Crash Configuration

Element Attributes:

Head-on
Angle / sideswipe
Rear end
Rollover
Object off road
Object on road
Noncollision

Source: Researcher determined

Remarks:

The Researcher selects the attribute which best describes the type of collision for this crash. The attributes are prioritized in descending order, so if two apply, select the first one on the list. For example, two vehicles collide in an intersection at an angle, then one of the vehicles rolls over. The Researcher selects "**Angle / sideswipe**" for the configuration.

Head-on

is selected when two vehicles impact each other, and generally the front of one vehicle contacts the front of the other vehicle.

Angle / sideswipe

is selected when two vehicles impact each other, and generally:

- the front of one vehicle contacts the side of the other vehicle

OR

- the two vehicles are involved in a "swiping" type configuration (either sideswipe or endswipe)

Rear end

is selected when two vehicles impact each other, and generally the front of one vehicle contacts the rear of the other vehicle.

Rollover

is selected for single vehicle crashes when the vehicle rolls over either on the road or off the road. For crashes involving a vehicle contacting an object off the roadway, and then rolling over, select this attribute based on the above referenced prioritization.

Object off road

is selected when a vehicle strikes a fixed or non-fixed object that is located off the road.

Object on road

is selected when a vehicle strikes a non-fixed object on the road.

Noncollision

is selected when the crash configuration involves some type of noncollision event (i.e., jackknife).

Case Summary Overview

Through the summary, the researcher is able to provide the zone center, a clinical user, or any other person interested in the NASS CDS case a quick reference of crash particulars by providing a non-jargon account of the crash.

The summary should provide a brief synopsis of the crash sequence as reconstructed by the researcher. Do not identify vehicle/driver culpability. For example, suppose vehicle #1 ran a stop sign and struck vehicle #2 in its left side. This situation should be described as follows:

> *Vehicle #1 was going north and vehicle # 2 was going east on an intersecting roadway. The front of vehicle #1 impacted the right side of vehicle #2.*

Thus, the impact configuration is emphasized rather than who was at fault. Any particulars concerning vehicle crashworthiness should be highlighted. Include any abnormal crash occurrences that may be of interest to quality control or the data user. Make sure personal identifiers are not used (i.e., highway/road/street names or names of persons).

Items that are listed on the vehicle and person summary screens should not be included unless unusual circumstances are involved.

Crash Events Overview

A "crash" is the total set of "events" (one or more) that results from an unstabilized situation such that at least one harmful event occurs not directly resulting from a cataclysm. The "crash" is concluded in time when all events which originated from the unstabilized situation have stabilized.

A crash is considered applicable to the NASS CDS if one of its events resulted in harm (except for nonqualifying noncollision events); and that event involved an in-transport CDS applicable vehicle which was reported on a police report as being towed from the scene of the crash due to damage.

Harm can be either an impact or a noncollision event. An impact is defined as any vehicle-to-vehicle or vehicle to object (fixed or nonfixed, stationary or nonstationary) contact which may or may not result in vehicle damage. Noncollision events such as fire/explosion, occupant fell from vehicle, occupant injury without vehicle impact, etc., are included in these variables unless this noncollision event is the only event in the case.

The NASS CDS is only interested in those events that involve in-transport motor vehicles. The motor vehicle can be a: towed CDS applicable vehicle, nontowed CDS applicable vehicle, or a non-CDS applicable vehicle. Events that involve only not in-transport motor vehicles and/or pedestrians and/or nonmotorists are not considered; they are dropped by the researcher from the crash sequence. Below are some examples of nonqualifying events and the researcher should not include them in the crash sequence
:

Not in-transport vehicle impacts pedestrian, pedalcyclist, or other nonmotorist

Not in-transport vehicle impacts an object (fixed or nonfixed)

CRASH EVENTS OVERVIEW (cont'd)

Not in-transport vehicle impacts another not in-transport vehicle

Pedestrian (pedalcyclist, other nonmotorist) impacts an object

Pedestrian (pedalcyclist, other nonmotorist) impacts a not in-transport vehicle

Pedestrian, pedalcyclist, or other nonmotorist inter-impact.

The crash events variables are designed to provide a description of all qualifying events which occurred in the crash sequence. Events are listed in chronological sequence. In events involving impacts with objects, the object is identified subsequent to the vehicle.

With this chronological sequence of qualified crash events in the CDS database, analysts can review the entire series of events involving in-transport motor vehicles. Various areas of concern to the highway safety community will be easily assessed using these variables. For instance, the injury severity in crashes can be assessed relative to the number and type of impacts involved.

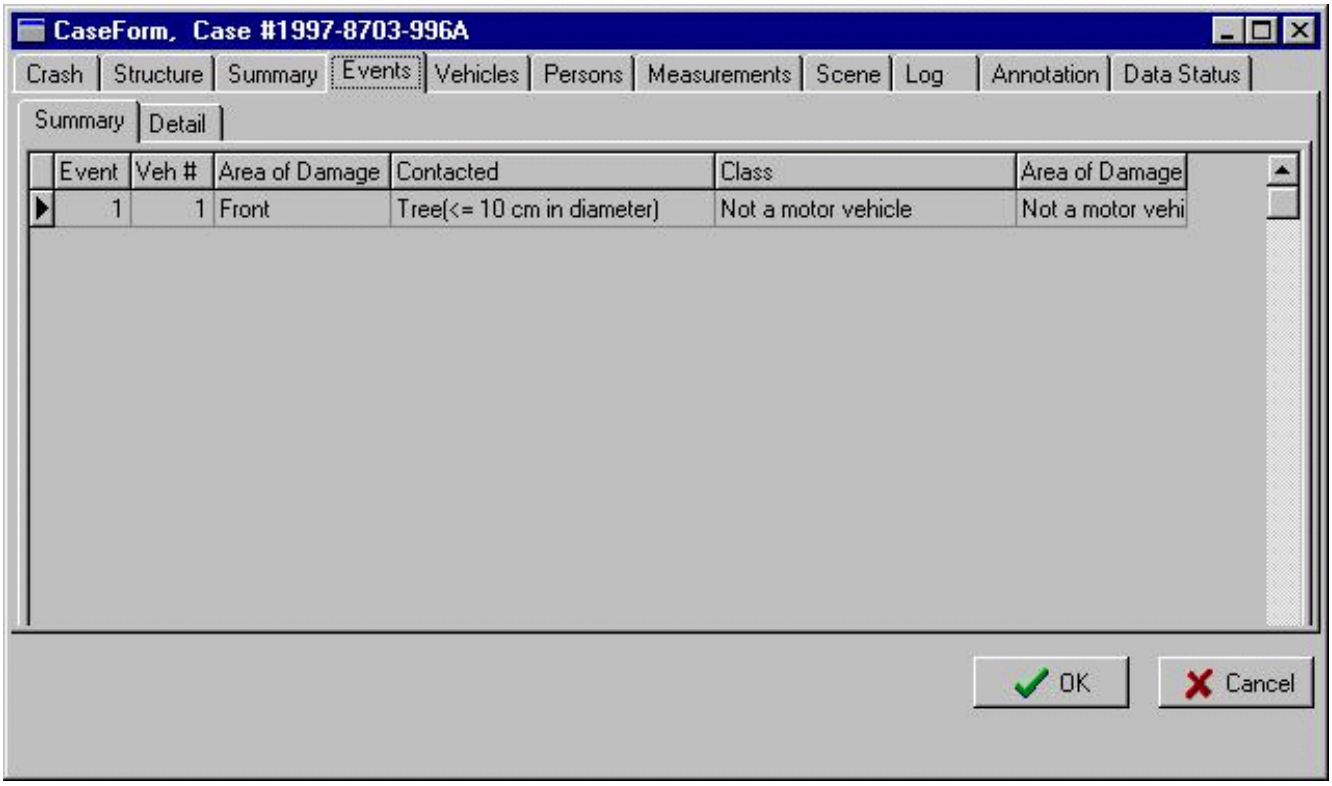
Likewise, certain collision configurations may create a greater hazardous condition for the occupants. A possible area of analysis would be the mix of vehicle classes or the type(s) of object(s) the vehicles impact.

Complete these variables based upon an accurate and complete reconstruction of the vehicle dynamics involved in the crash. All of the injury or damage producing qualifying events or circumstances for the in-transport motor vehicle(s) are coded.

An example of a crash sequence follows:

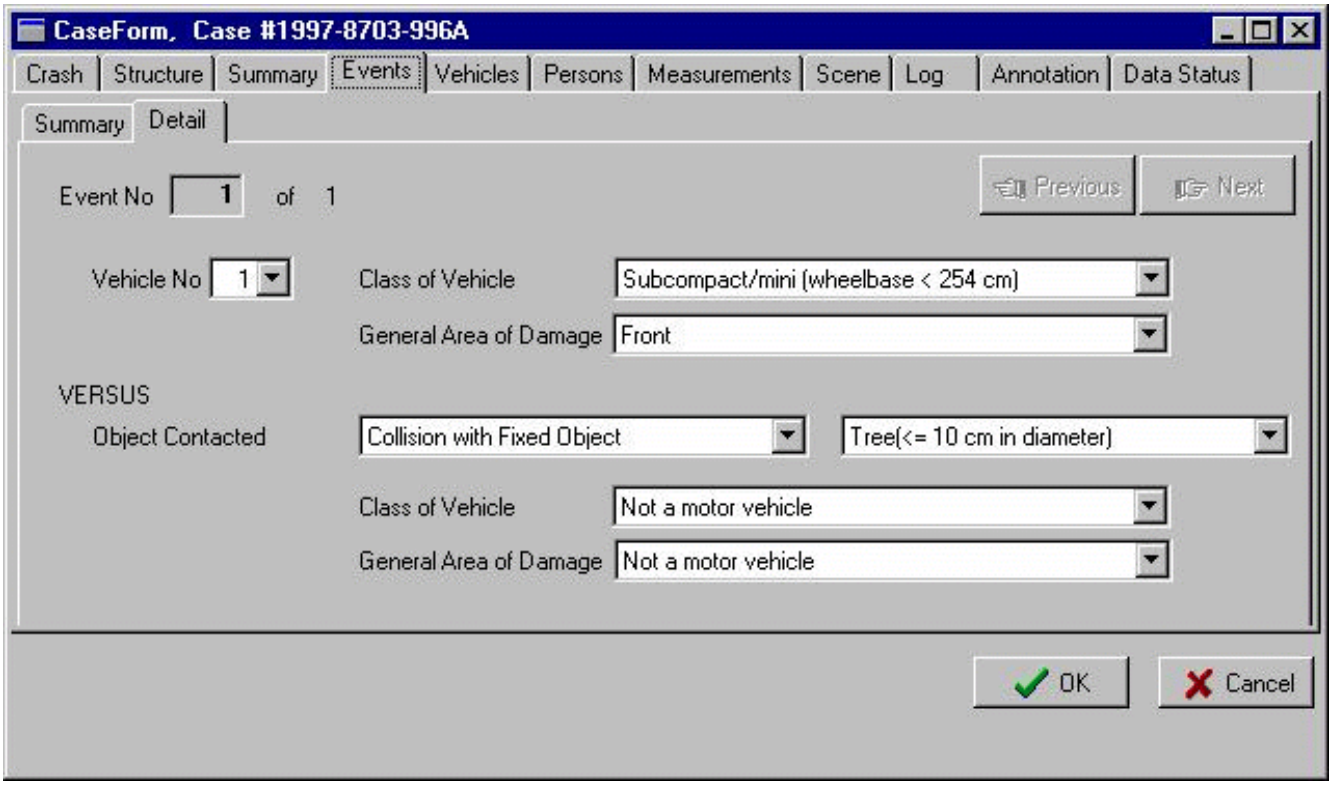
Vehicle 1 (a compact passenger car) went out of control on a wet roadway and struck a median guardrail with its front {Event 1}. The vehicle was redirected by the guardrail and reentered the roadway, where it struck vehicle 2 (a large pickup truck) {Event 2} in the left side with its front. Vehicle 1 spun to a stop in the roadway. During event 2 the driver hit his head on the door pillar breaking his neck {not a coded event}. Vehicle 2, out-of-control, ran off the roadway and struck a pedestrian with its front {Event 3}.

Note: For the driver of vehicle 1, breaking his neck is not a separate codeable event. Rather, this injury, and almost all occupant injuries resulting from occupant interior contact, is a result of a collision event.



Information rolls up from the “detail” tab to the “summary” tab. Use the arrow to the left of the event to highlight an event to focus on the “Detail” screen.

Note: If impact is between two vehicles, double click on the event line to view the vehicle angles, accident types, and CDC for this event.


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Summary
Detail
Event No 1 of 1
Previous
Next
Vehicle No 1
Class of Vehicle
Subcompact/mini (wheelbase < 254 cm)
General Area of Damage
Front
VERSUS
Object Contacted
Collision with Fixed Object
Tree(<= 10 cm in diameter)
Class of Vehicle
Not a motor vehicle
General Area of Damage
Not a motor vehicle
OK
Cancel

Screen Name: Event No
Variable Name: Event Number

Element Attributes:

As assigned

Source: Researcher Determined

Remarks:

Events in the crash should be listed in chronological sequence .

This number is automatically assigned by the EDCS as each event is entered. Events may be renumbered. The events will be displayed in chronological sequence.

Screen Name: Vehicle No
Variable Name: Vehicle Number

Element Attributes:

As entered into Case Form/Structure/Case Summary/Total All Vehicles

Source: Researcher determined

Remarks:

Vehicle numbers must be consecutive beginning with "1". Vehicle numbers are selected from those listed in the vehicle structure. A vehicle may be listed in more than one event.

Screen Name: Class of Vehicle
Variable Name: Class of Vehicle

Element Attributes:

Subcompact/mini (wheelbase < 254 cm)
Compact (wheelbase $ 254 but < 265 cm)
Intermediate (wheelbase $ 265 but < 278 cm)
Full size (wheelbase $ 278 but < 291 cm)
Largest (wheelbase $ 291 cm)
Unknown passenger car size
Compact utility vehicle
Large utility vehicle (# 4,536 kgs GVWR)
Utility station wagon (# 4,536 kgs GVWR)
Unknown utility type
Minivan (# 4,536 kgs GVWR)
Large van (# 4,536 kgs GVWR)
Van based school bus (# 4,536 kgs GVWR)
Other van type (# 4,536 kgs GVWR)
Unknown van type (# 4,536 kgs GVWR)
Compact pickup truck (# 4,536 kgs GVWR)
Large pickup truck (# 4,536 kgs GVWR)
Other pickup truck (# 4,536 kgs GVWR)
Unknown pickup truck type (# 4,536 kgs GVWR)
Other light truck (# 4,536 kgs GVWR)
Unknown light truck type (# 4,536 kgs GVWR)
Unknown light vehicle type
School bus (excludes van based) (> 4,536 kgs GVWR)
Other bus (> 4,536 kgs GVWR)
Unknown bus type
Truck (> 4,536 kgs GVWR)
Tractor without trailer
Tractor - trailer(s)
Unknown medium/heavy truck type
Unknown light/medium/heavy truck type
Motored cycle
Other vehicle
Unknown
Not a motor vehicle

Source: Researcher determined — inputs include police report, vehicle inspection, VIN breakdown, and interviews.

Screen Name: Class of Vehicle (cont'd)
Variable Name: Class of Vehicle

Remarks:

The Passenger Car Classification Subcommittee, A3B11(1), of the Transportation Research Board, Traffic Records and Accident Analysis Committee, A3B11, assessed size based on the vehicle wheelbase. The guidelines for this classification can be found in the report entitled Recommended Definitions for Passenger Car Size Classification by Wheelbase and Weight, August 1984 by the previously mentioned subcommittee. This variable is the same variable that appears in the Identification section of the Vehicle Tab on the General Vehicle Form and Vehicle Exterior Form.

Subcompact/mini (wheelbase < 254 cm)
Choose based upon wheelbase

Compact (wheelbase $ 254 but < 265 cm)
Choose based upon wheelbase

Intermediate (wheelbase $ 265 but < 278 cm)
Choose based upon wheelbase

Full size (wheelbase $ 278 but < 291 cm)
Choose based upon wheelbase

Largest (wheelbase $ 291 cm)
Choose based upon wheelbase

Unknown passenger car size
is used when it is known that a vehicle is a passenger car but the wheelbase is unknown

Compact utility vehicle
refers to vehicle models defined as **Compact utility** under Body Type. Use this attribute if the size of the utility vehicle is unknown.

Large utility vehicle (# 4,536 kgs GVWR)
refers to vehicle models defined as **Large utility** under Body Type. Refers to full-size multipurpose vehicles primarily designed around a shortened pickup truck chassis. While generally a station wagon body style, some models are equipped with a removable top.

Utility station wagon (# 4,536 kgs GVWR)
refers to vehicle models defined as **Utility station wagon** under Body Type. Refers primarily to a pickup truck based chassis enlarged to a station wagon.

Unknown Utility type
is defined as **Utility, unknown body type** under Body Type. This attribute is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type.

Screen Name: Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Minivan (# 4536 kgs. GVWR)
Refers to vehicle models defined as **Minivan** under Body Type. Refers to down-sized passenger or cargo vans.

Large van (# 4536 kgs. GVWR)
Refers vehicle models defined as **Large van** under Body Type. Refers to a standard size cargo or passenger van.

Van based school bus (# 4,536 kgs GVWR)
is a passenger van designed to carry students (passengers) to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. Van based school buses converted for other uses (e.g., church bus) also take this attribute . Refers to vehicles defined as **Van based school bus** under Body Type.

Other van type (# 4,536 kgs GVWR)
Refers to vehicle models defined as **Step van or walk-in van, Van based motorhome, Van based other bus and code Other van type** under Body Type.

Unknown van type (# 4,536 kgs GVWR)
is used when it is known that this vehicle is a light van, but its specific type cannot be determined. Refers to vehicles described as **Unknown van type** under Body Type.

Compact pickup truck
Refers to vehicle models defined as attributes of **Compact pickup truck** in Body Type. Used to describe a pickup truck having a width of 178 centimeters or less.

Large pickup truck
Refers to vehicle models defined as **Large pickup truck** under Body Type. Used to describe a pickup truck having a width greater than 178 centimeters.

Other pickup truck (# 4536 kgs GVWR)
Refers to vehicle models defined as **Pickup with slide-in camper** and **Convertible pickup** under Body Type.

Unknown pickup truck (# 4536 kgs GVWR)
Refers to vehicle models defined as **Unknown pickup style light conventional truck type** under Body Type.

Other light truck (# 4536 kgs GVWR)
Refers to vehicle models defined **as Cab, chassis based (includes rescue vehicles, light stake, dump, and tow truck), Truck based panel, Light truck based motorhome (chassis mounted),** and **Other light conventional truck type** under Body Type.

Screen Name: Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Unknown light truck type
Refers to vehicle models defined as **Unknown light truck type** under Body Type.

Unknown light vehicle type (automobile, utility, van, or light truck)
Refers to vehicle models defined as Unknown light vehicle type (automobile, utility, van, or light truck) under Body Type.

School bus (excludes van based) (> 4536 kgs GVWR)
Refers to those vehicle models defined as **School bus (designed to carry students, not cross country or transit)** under Body Type.

Other bus (>4,536 kgs GVWR)
describes those vehicle models included in **Other bus type (e.g., transit, intercity, bus based motorhome)** under Body Type.

Unknown bus type
Refers to those vehicle models described as **Unknown bus type** under Body Type.

Truck (> 4,536 kgs GVWR)
is defined under Body Type, as **Step van (>4,536 kgs GVWR), Single unit straight truck (4,536 kgs < GVWR = 8,845), Single unit straight truck (8,845 kgs < GVWR = 11,793), Single unit straight truck (>11,793 kgs GVWR), Single unit straight truck, GVWR unknown** and **Medium/heavy truck based motorhome.**

Tractor without trailer
refers to **Truck-tractor with no cargo trailer** under Body Type.

Tractor-trailer(s)
is defined in attributes **Truck-tractor pulling one trailer, Truck-tractor pulling two or more trailers** and **Truck-tractor (unknown if pulling trailer)** under Body Type.

Unknown medium/heavy truck type)
is used when the only available information indicates a truck of medium/heavy size. Refer to **Unknown medium/heavy truck type** under Body Type.

Unknown truck type (light/medium/heavy)
Refers to those vehicles described by **Unknown truck type (light/medium/heavy)** under Body Type.

Motored cycle
refers to Body Type, **Motorcycle, Moped (motorized bicycle), Three-wheel motorcycle or moped, Other motored cycle (minibike, motorscooter)** and **Unknown motored cycle type**.

Screen Name: Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Other vehicle

refers to all vehicles described by **ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle), Snowmobile, Farm equipment other than trucks,** or **Other vehicle type** under Body Type.

Unknown

is used when there is a lack of information regarding the type of vehicle. This lack of information prohibits the accurate classification of this vehicle using one of the preceding codes. This attribute is equivalent to Body Type, **Unknown body type.**

Not a motor Vehicle

Is used when an object is struck.

Screen Name: General Area of Damage
Variable Name: General Area of Damage

Element Attributes:

Noncollision
Unknown

CDC Applicable and Other Vehicles

Front
Right side
Left side
Back
Top
Undercarriage

TDC Applicable Vehicles

Front
Right side
Left side
Back of unit with cargo area (rear of trailer or straight truck)
Back (rear of tractor)
Rear of cab
Front of cargo area
Top
Undercarriage

Source: Researcher determined.

Remarks:

Noncollision
must be used whenever the corresponding Vehicle Number or Object Contacted Category is coded Noncollision.

Unknown
must be coded when the General Area of Damage — 1st on a vehicle is not known from any reliable source.

For vehicles which are CDC applicable (e.g., pickups, light vans, and passenger cars) the guidelines from J224MAR80 must be applied, and the attributes provided under the "CDC Applicable and Other Vehicles" category must be used. This includes rollovers.

For vehicles which are TDC applicable (i.e., medium/heavy trucks) use the guidelines and the attributes provided under the "TDC Applicable Vehicles" category.

Screen Name: Object Contacted
Variable Name: Object Contacted

Element Attributes:

Vehicle Number

Noncollision
Overturn -- rollover (excludes end-over-end)
Rollover -- end-over-end
Fire or explosion
Jackknife
Other intraunit damage (specify):
Noncollision injury
Other noncollision (specify):
Noncollision -- details unknown

Collision With Fixed Object
Tree (# 10 cm in diameter)
Tree (> 10 cm in diameter)
Shrubbery or bush
Embankment
Breakaway pole or post (any diameter)
Concrete traffic barrier
Impact attenuator
Other traffic barrier (includes guardrails) (specify):
Fence
Wall
Building
Ditch or culvert
Ground
Fire hydrant
Curb
Bridge
Other fixed object (specify):
Unknown fixed object

Nonbreakaway Pole or Post
Pole or post (# 10 cm in diameter)
Pole or post (> 10 cm but # 30 cm in diameter)
Pole or post (> 30 cm in diameter)
Pole or post (diameter unknown)

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Element Attributes:

Collision with Nonfixed Object
Passenger car, light truck, van, or other vehicle not in-transport
Medium/heavy truck or bus not in-transport
Pedestrian
Cyclist or cycle
Other nonmotorist or conveyance (specify):
Vehicle occupant
Animal
Train
Trailer, disconnected in transport
Object fell from vehicle in-transport
Other nonfixed object (specify):
Unknown nonfixed object
Other Event (specify):

Other Event (specify)

Unknown Event or Object

**** These two stand alone categories/attributes in red need to be added to NASSMAIN. ****

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Source: Researcher determined: primary sources are the scene and vehicle inspections; secondary sources include the police report and interviewees.

Remarks:

Vehicle Number

If the object contacted by the vehicle under consideration was a motor vehicle in-transport, select the Vehicle Number assigned to that vehicle.

Noncollision

crash circumstances, which result in nonimpact related damage or harm.

Overturn — rollover (excludes end-over-end)
is used whenever a vehicle rolls over or overturns primarily about the longitudinal axis.. This event is reported in the crash sequence variables on the Case Form. It is assumed a rollover will generally involve contact with the road surface or ground. In this situation, the object contacted is encoded **Overturn - rollover** and not **Ground**. In the event another object in the environment is contacted during the rollover sequence, the rollover event is, but may not be encoded in the CDC unless the rollover is applicable to CDC.

Rollover — end-over-end
is used whenever a vehicle rolls over or overturns primarily about the lateral axis of the vehicle.

Fire or explosion
is used whenever a vehicle fire or explosion occurs during the crash sequence or as a result of the crash.

Jackknife
is used whenever there is sufficient uncontrolled rotation (articulation) between a towing unit and a trailing unit such that they contact each other resulting in direct damage to the towing unit. Jackknife may occur to any vehicle which is pulling a trailing unit by a fixed linkage so long as the trailing unit and the pulling vehicle are capable of rotating (articulating) with respect to each other.

Other intraunit damage (specify):
is used whenever there is sufficient uncontrolled motion (other than **Jackknife**) between a towing unit and a trailing unit such that they contact each other resulting in direct damage to the towing unit.

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Remarks:

Noncollision (cont'd)

Noncollision Injury
is used when the event is a noncollision injury (e.g., fell from vehicle)

Other noncollision (specify)
is used only in consultation with the zone center.

Noncollision — details unknown
is used when it is known that the event was a noncollision but specifics are not known.

Collision With Fixed Object

When a vehicle impacts a tree, shrubbery, bush, pole or post and causes the fixed object or any portion thereof to become dislodged or airborne such that the object or portion thereof subsequently falls on the vehicle, the appropriate object contacted attribute for the object in its dislodged or airborne state is the same as when the object was initially.

Tree (# 10 centimeters in diameter) and **Tree (> 10 centimeters in diameter)**
refer to the diameter of the tree measured on the horizontal plane at the point of impact.

Shrubbery or bush
refers to vegetation which is usually of a woody multi-stemmed variety and in most instances is low growing rather than tall. Some common examples are boxwood, hawthorn, and mountain laurel.

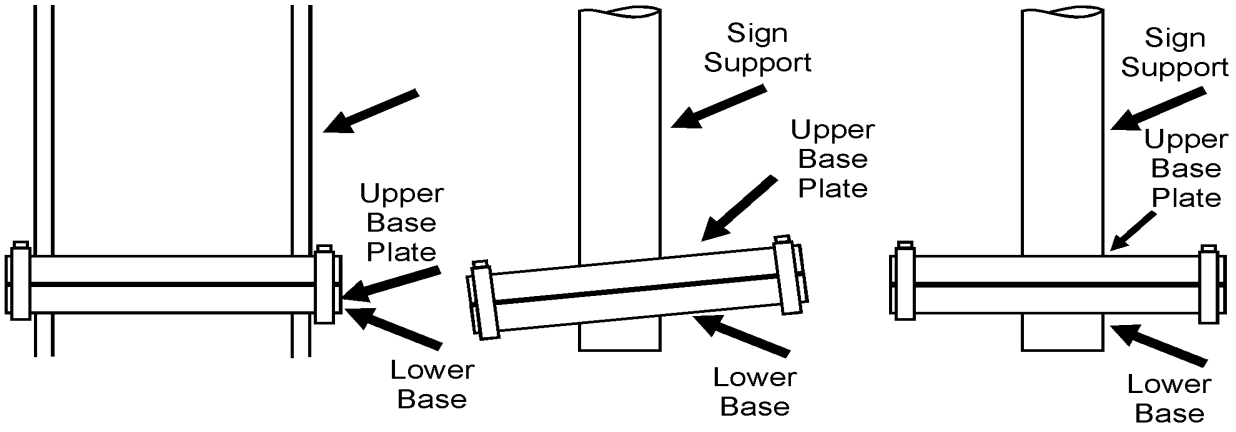
Embankment
is used only when damage or injury results from a vehicle impacting an embankment.

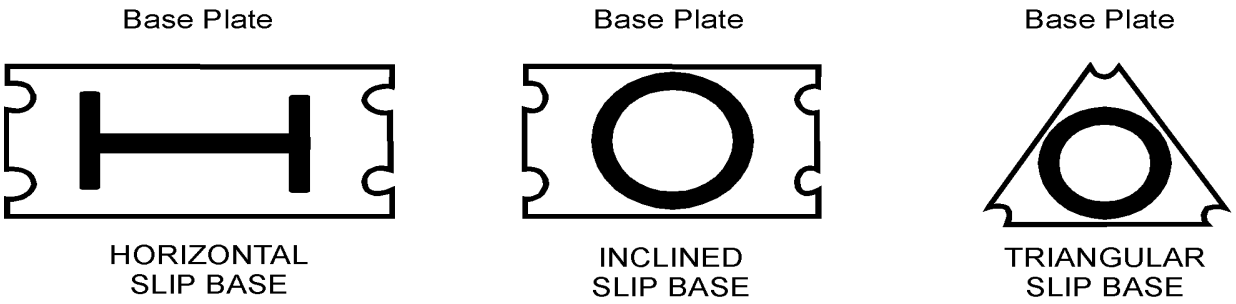
Breakaway pole or post (any diameter)
refers to a pole or post which is mounted on a base designed to readily disengage or fracture from an impacting vehicle above a predetermined force level. A pole or post fitted with such a device is a breakaway pole or post; otherwise, it is a nonbreakaway pole. Common types of breakaway bases are illustrated on the following pages.

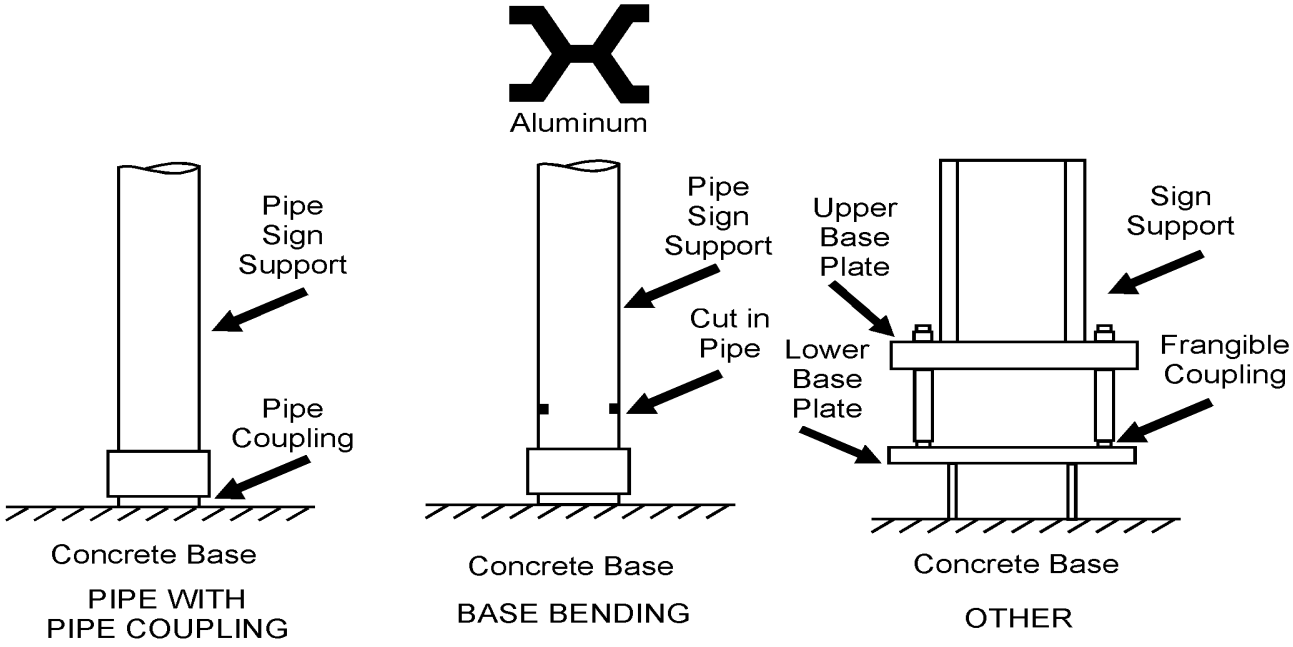
Examples of breakaway poles or posts follow:

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision With Fixed Object (cont'd)
Breakaway pole or post (any diameter)

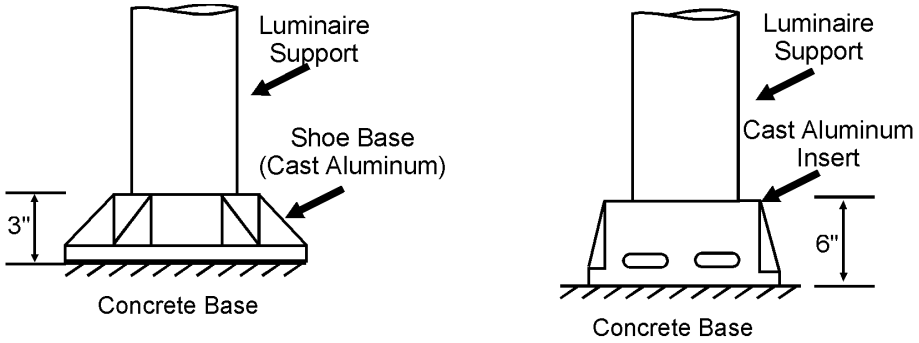




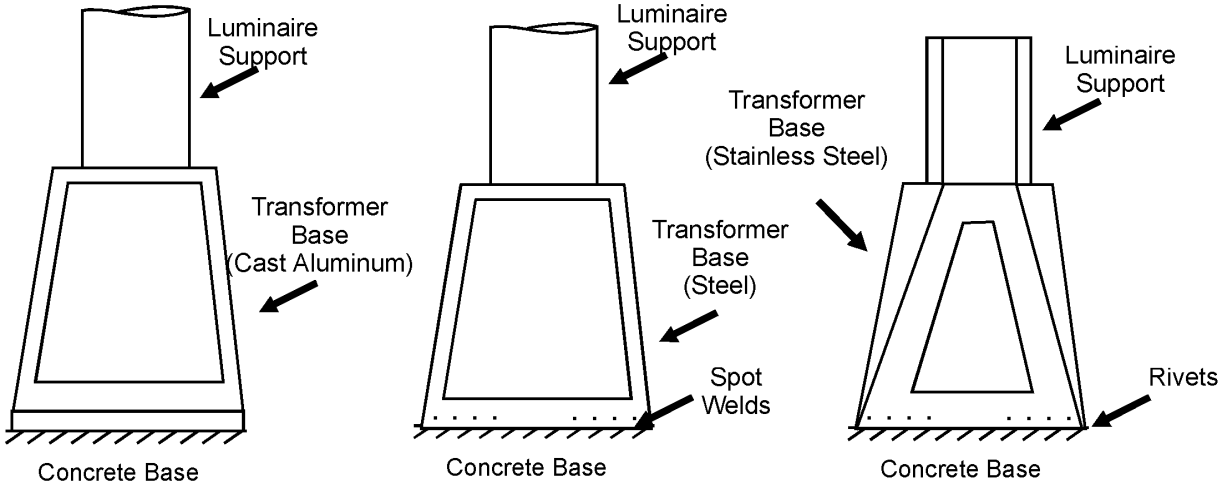


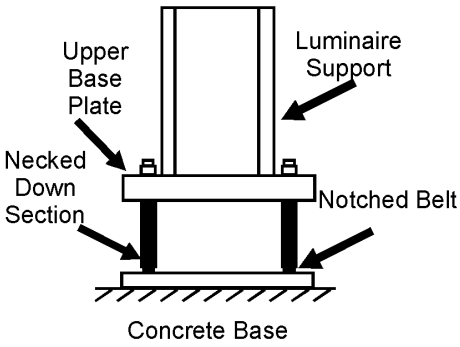
Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision With Fixed Object (cont'd)
Breakaway pole or post (any diameter)

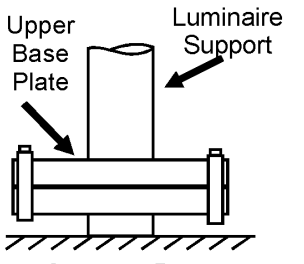


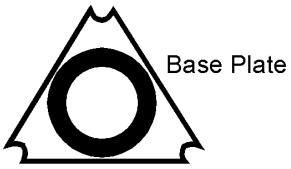
CAST ALUMINUM SHOE BASE/INSERT (FRANGIBLE)



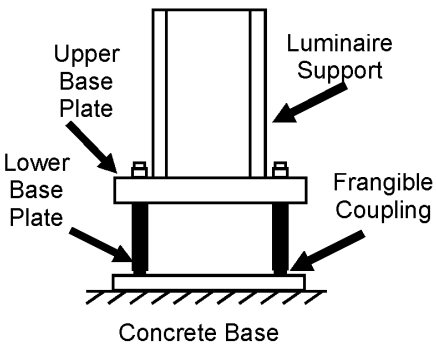


NOTCHED BOLT INSERT





TRIANGULAR SLIP BASE

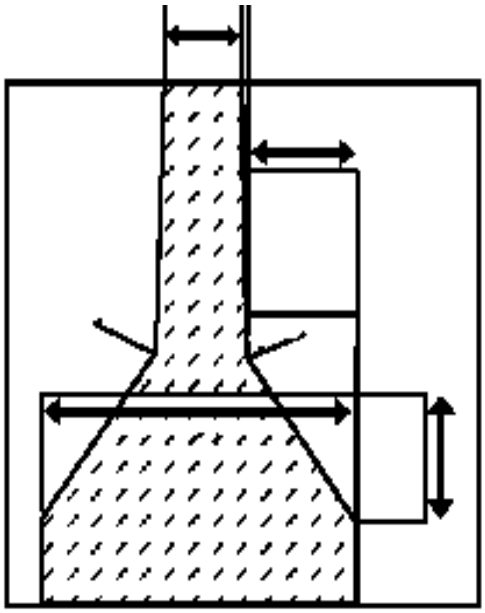


FLUTED ALUMINUM BREAKAWAY COUPLING

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

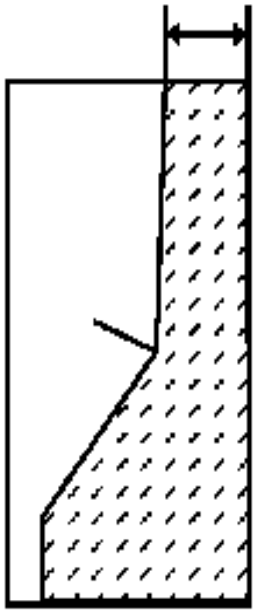
Collision With Fixed Object (cont'd)

Concrete traffic barrier
refers to the longitudinal traffic barriers constructed of concrete and located: on the outside of the road surface, in a median, or in gore areas. This includes all temporary concrete barriers regardless of location (*e.g.*, temporary Jersey barrier on a bridge being used to control traffic during bridge repair/construction). Concrete walls (vertical side surfaces) do not apply here, see Wall. Below are a few of the common designs of concrete traffic barriers.



(Footing & Reinforcing Varies)
MB 5
Concrete Median Barrier

Continuously poured, reinforced, sloped faced, concrete section. Barrier can be anchored by dowels or an asphalt key.



Concrete Safety Shape

Impact attenuator
refers to crash cushions which are barriers placed in front of fixed objects on the highway to absorb energy, and thus, to mitigate the injury effects of collisions at such sites. A number of common impact attenuating devices may be encountered; therefore, be sure to photograph them when encountered.

Other traffic barrier
refers to any longitudinal barrier not constructed of concrete. This includes all permanent guardrails and median barriers not on a bridge.

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision With Fixed Object (cont'd)

Fence
includes both the fence material and the support posts.

Wall
refers to solid, vertical faced, concrete, brick, stone, or other structurally sound roadside devices which may act as a traffic barrier in some locations. Do not confuse this attribute with **Fence** or **Building**. In most instances a wall will be backfilled with soil and will act as a vertically faced embankment.

Building
is used when the vehicle impacts a roofed and walled structure built for permanent use. The type of construction material used is not of interest, nor is the use of the building.

Ditch or culvert
refers to: (1) a man-made structure for drainage purposes, or (2) a man-made structure that allows passage over a drainage area and is that part of the structure which is intended to channel flow through the structure and maintain the stability/integrity of the road bed. If the culvert structure has a portion above the road surface which is of sufficient height to engage above the wheels of an errant CDS applicable vehicle and redirect it, that part of the structure is considered an **Other traffic barrier**. When the sides of the ditch are approximately of equal height, it makes no difference which side of the ditch was struck; however, if the struck side is substantially higher than the other side, enter **Embankment** as the object contacted. Substantial means that an embankment exists with or without a ditch

Ground
refers to an impact with the ground. Collisions which may be classified using this attribute include (but are not limited to) vehicles which sustain undercarriage damage by (1) straddling the pavement and shoulder and impacting a prominent pavement lip, or (2) free falls or vaults from the road surface to the ground.

Fire hydrant
refers to the roadside device used by fire departments to provide water for fighting fires. Usually made of steel, these devices are also referred to as fire plugs or fire stand pipes in some areas.

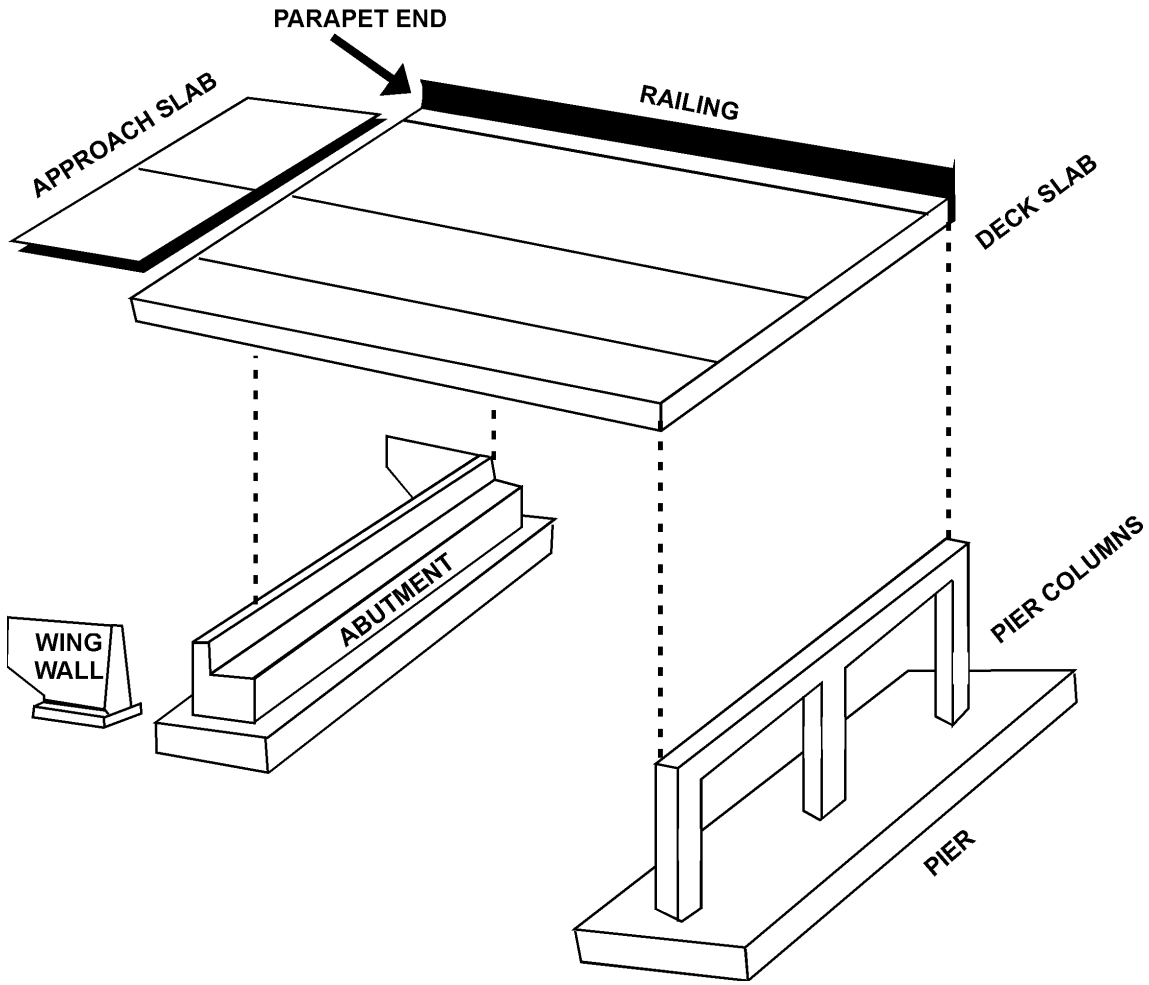
Curb
is used when the vehicle contacts a raised element at the edge of a roadway. Curbs are used to: control drainage, act as deterrents to vehicles leaving the pavement at hazardous points, delineate the edge of the pavement, present a more finished appearance, and assist in the orderly development of the roadway edge. Often a curb serves two or more of these purposes.

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision With Fixed Object (cont'd)

Bridge
encompasses all structural members of an overpass structure used for vehicular or pedestrian traffic. This attribute includes guardrails, permanent concrete barriers, bridge rail/walls, bridge piers, bridge abutments, bridge parapet ends, wing walls associated with bridge abutments, and support columns.

Bridge Components



* Individual components of a bridge collectively become the bridge.

Other fixed object
is used for any other object of sufficient mass or anchored such that it is not readily movable; compare with **Other nonfixed object**. Examples include large boulders, large logs (fallen trees), etc.

Unknown fixed object
is used when it is known that the vehicle struck a fixed object but the specific type of object is not known.

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Nonbreakaway Pole or Post

When a vehicle impacts a tree, shrubbery, bush, pole or post and causes the fixed object or any portion thereof to become dislodged or airborne such that the object or portion thereof subsequently falls on the vehicle, the appropriate object contacted attribute for the object in its dislodged or airborne state is the same as when the object was initially.

Pole or post (≤ 10 centimeters in diameter)
refers to a pole or post whose diameter, when measured using the method shown above, is less than or equal to ten centimeters, and the pole or post is not mounted on a breakaway base.

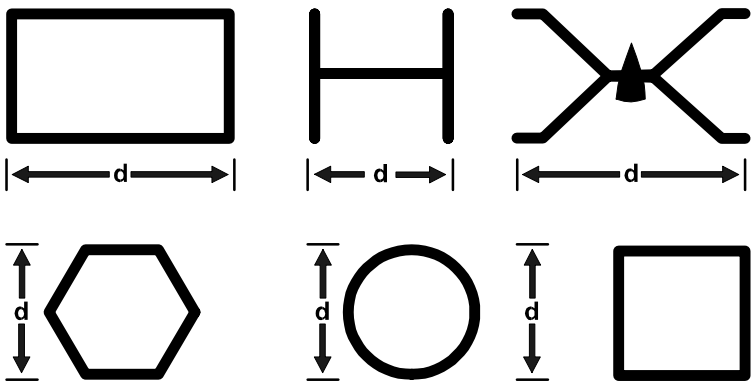
Pole or post (> 10 but ≤ 30 centimeters in diameter)
refers to a pole or post which is not mounted on a breakaway base and whose diameter is within the range specified.

Pole or post (> 30 centimeters in diameter)
refers to poles or posts which are of the correct size and are not mounted on a breakaway base.

Pole, post — diameter unknown
is used for any pole or post, not on a breakaway base, of unknown diameter.

Use the words "pole" and "post" in a general sense and include all types of supports for utility lines, light standards, post mounted mailboxes, warning devices, signs, and traffic control signals. Privately owned, as well as publicly owned, highway devices are included in these attributes. They may be made of wood, metal, or concrete and may have various cross-sectional shapes and dimensions. The pole or post must be nontemporary (i.e., have a permanent base or be anchored in the ground). Fence posts are not included in these attributes.

The following diagrams indicate the proper measurement for determining the "diameter" for use in coding pole/post



Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision with Nonfixed Object

Passenger car, light truck, van, or other vehicle not in-transport
refers to a motor vehicle other than a medium/heavy truck or bus which is not on the roadway **and** not in motion (e.g., vehicle located in parking lane).

Medium/heavy truck or bus not in-transport
refers to a medium/heavy truck or bus which is not on the roadway **and** not in motion (e.g., vehicle located in parking lane).

Pedestrian
is defined as any person who is on a traffic way or on a sidewalk or path contiguous with a traffic way, and who is not in or on a nonmotorist conveyance. This includes persons who are in contact with the ground, roadway, etc., but who are holding onto a vehicle. A nonmotorist conveyance is defined as any human-powered device by which a nonmotorist may move, or by which a pedestrian or nonmotorist may move another nonmotorist, other than by pedaling. A nonmotorist conveyance includes the following: baby carriage, coaster wagon, ice skates, roller skates, push cart, scooter, skate board, skis, sled, wheelchair, rickshaw, etc. This includes those persons in a nonmotorist conveyance who hold onto a motor vehicle in motion. Excluded are pedalcyclists.

Cyclist or cycle
refers to any occupant of a pedalcycle, the cycle, or both. This includes those cyclists who hold onto a motor vehicle in motion.

Other nonmotorist or conveyance
refers to a person who is not an occupant of a motor vehicle in-transport, a pedestrian, or a cyclist. Use this attribute if the impact was with a nonmotorist conveyance or a nonmotorist associated with a nonmotorist conveyance [if an animal is associated with this impact, see **Animal**]. This attribute also would be used for the occupants of a motor vehicle not in-transport, but only if they become separated from the not in- transport vehicle [see **Passenger car, light truck, van, or other vehicle not in transport** and **Medium/heavy truck or bus not in-transport**].

Vehicle occupant
is used when the object contacted was any person who was an occupant of a motor vehicle in-transport; two examples follow. Use this attribute for an occupant who falls from a vehicle and is subsequently run over before stabilization occurred. In addition, use this attribute for any motorcyclist who separates from his/her motorcycle during impact and subsequently impacts a motor vehicle before stabilization occurred.

Animal
is used if the object contacted was an animal (stationary or nonstationary). Where a nonmotorist was associated with the animal (i.e., on the animal, or on or in an animal powered nonmotor vehicle transport device) use the following scheme. If the contact is to:

(1) the animal; the animal and the person; the animal and the conveyance; or the animal, conveyance, and the person; attribute **Animal**;
(2) the conveyance, or to the person, or to both the conveyance and the person, **Other nonmotorist or conveyance**.

Train
refers to any railway train, moving or not moving.

Screen Name: Object Contacted (cont'd)
Variable Name: Object Contacted (cont'd)

Collision with Nonfixed Object (cont'd)

Trailer, disconnected in transport
is used when the vehicle is contacted by or contacts a trailer which has become detached from its towing unit while the towing unit was in-transport. The type of trailer is not of interest; the only factors to consider are the detachment of the trailer and the transport status of the towing unit.

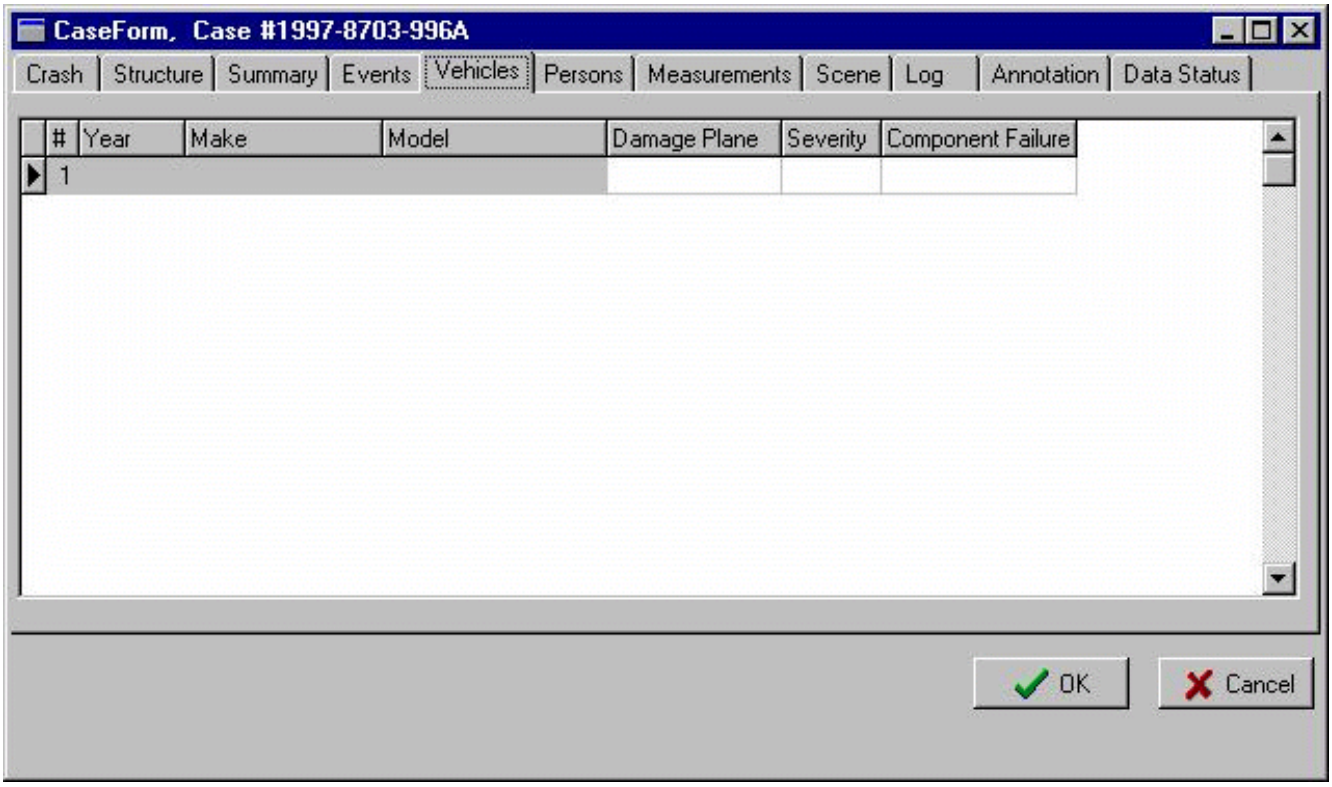
Object fell from vehicle in-transport
is used when the vehicle is contacted by or contacts an object that was being carried by or was attached to a vehicle in-transport but fell from or became detached from that vehicle. For example, a detached side mirror, spare tire, cargo, etc. Detached trailers are entered under trailer, disconnected in transport.

Other nonfixed object
refers to any moveable object that is either readily moveable or is moving and is not specifically named above. Examples include trash cans, grocery carts, unoccupied pedalcycles, small boulders, sheared poles, etc.

Other Event (specify)
is used when an event occurs which cannot be classified using one of the existing attributes or definitions. A complete description should be given as well as describing the event in the Case Summary.

Unknown Event or Object
is used whenever the object contacted is not known or if an unknown event occurs and the researcher cannot determine what the event consisted of and how to enter it.

**** These two stand alone categories/attributes in red need to be added to NASSMAIN. ****


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
#
Year
Make
Model
Damage Plane
Severity
Component Failure
1
OK
Cancel

Screen Name: #
Variable Name: Vehicle Number

Element Attributes:

Source: Rolled up from elsewhere in case

Remarks:

The vehicle number of each in-transport vehicle and inspected not in-transport vehicle in the crash is indicated.

Screen Name: Year
Variable Name: Vehicle Year

Element Attributes:

Source: Rolled up from vehicle table

Remarks:

The year for which vehicle was manufactured is indicated here.

Screen Name: Make
Variable Name: Vehicle Make

Element Attributes:

Source: Rolled up from vehicle table

Remarks:

The make of each vehicle involved in the crash is indicated here.

Screen Name: Model
Variable Name: Vehicle Model

Element Attributes:

Source: Rolled up from vehicle table

Remarks:

The model of each vehicle involved in the crash is indicated.

Screen Name: Damage Plane
Variable Name: Damage Plane

Element Attributes:

Front
Left
Right
Back
Top
Undercarriage
Unknown

Source: Researcher determined

Remarks:

The Researcher must determine the most sever impact and choose the associated damage plane.

All efforts should be made to determine the plane of damage. The vehicle inspection, occupant interview, police report, towyard operator, damage to other vehicles or objects should be considered.

If there is absolutely no information available, then “Unknown” may be used. However, it should rarely be selected.

Screen Name: Severity
Variable Name: Damage Severity

Element Attributes:

Light
Moderate
Severe
Unknown

Source: Vehicle Inspection

Remarks:

The Researcher must determine the damage severity for the most severe **Damage Plane**.

All efforts should be made to determine the damage severity when a vehicle inspection is obtained. If pictures or damaged parts are available, examine and photograph them in an effort to document a "rough" Damage Severity for this vehicle.

If there is absolutely no information available, or no vehicle inspection, then "Unknown" may be used.

Light
includes vehicle generally would not require towing (although this vehicle may have been towed).

Moderate
includes damage to vehicles that may or may not require towing and have less than 60 cm of maximum crush.

Severe
includes towed vehicles with greater than 60 cm of maximum crush.

Screen Name: Component Failure
Variable Name: Component Failure

Element Attributes:

Source: Researcher determined

Remarks:

Any vehicular component that failed during the crash sequence should be noted. The components of special interest to the user may be noted by reviewing the field form variables (*e.g.*, steering columns, seat backs, restraints, glazing, etc.).

Below is an additional list of special interest component failure crashes:

NEED TO UPDATE LIST

SPECIFIC AREAS OF INTEREST TO NHTSA RULE MAKING

CRASH AVOIDANCE

1. Crashes involving vehicles driven by handicapped drivers.
2. Crashes involving vehicles equipped with adaptive aids.
3. Crashes in which failure of a multi piece rim (not a tire failure) caused or contributed to the severity of the crash.
4. Crashes involving malfunction of a speed governor or speed control unit.
5. Crashes where the driver reported confusion about the location of display or control elements of the vehicle.
6. Crashes where under inflation of tires caused or contributed to the severity of crash.
7. Crashes involving pedestrian and/or cyclist injured by impact with outside mirrors.
8. Crashes involving injury to motorcycle drivers due to impact with the motorcycle mirrors.
9. Crashes where driver reported that distortion of image in convex mirror confused him (especially late model GM cars).
10. Crashes where commercial vehicle drivers reported that they could not see car, pedestrian, or cycle in a specific blind spot (such as in the right front area of large truck-tractors).
11. Crashes where driver or a passenger car or light truck reported that they could not see because of an obstruction of view by some part of the vehicle (such as inside mirror or roof support pillar).

Screen Name: Component Failure (cont'd)
Variable Name: Component Failure (cont'd)

12. Crashes where the vehicle's defrost/defog system or wiper system could not provide an adequate view of the traffic scene through the windshield.

13. Crashes involving pickup trucks pulling fifth-wheel type trailer.

14. Crashes involving stalled vehicles

CRASHWORTHINESS

1. Seat and/or seat back failures in crashes and their contributions to occupant injury.

2. Identify external vehicle components (i.e., hood, grill, windshield wiper, etc.) that penetrate the windshield and the degree of such penetration in crashes involving vans and light trucks.

3. Ejections through the hatchback or station wagon rear doors in rear impacts. Identify whether ejection was through window opening or through door or hatchback opening because of latch failure.

4. Cars involving child restraints that break or involve injury. Identify the restraint by make and model, how and which position used.

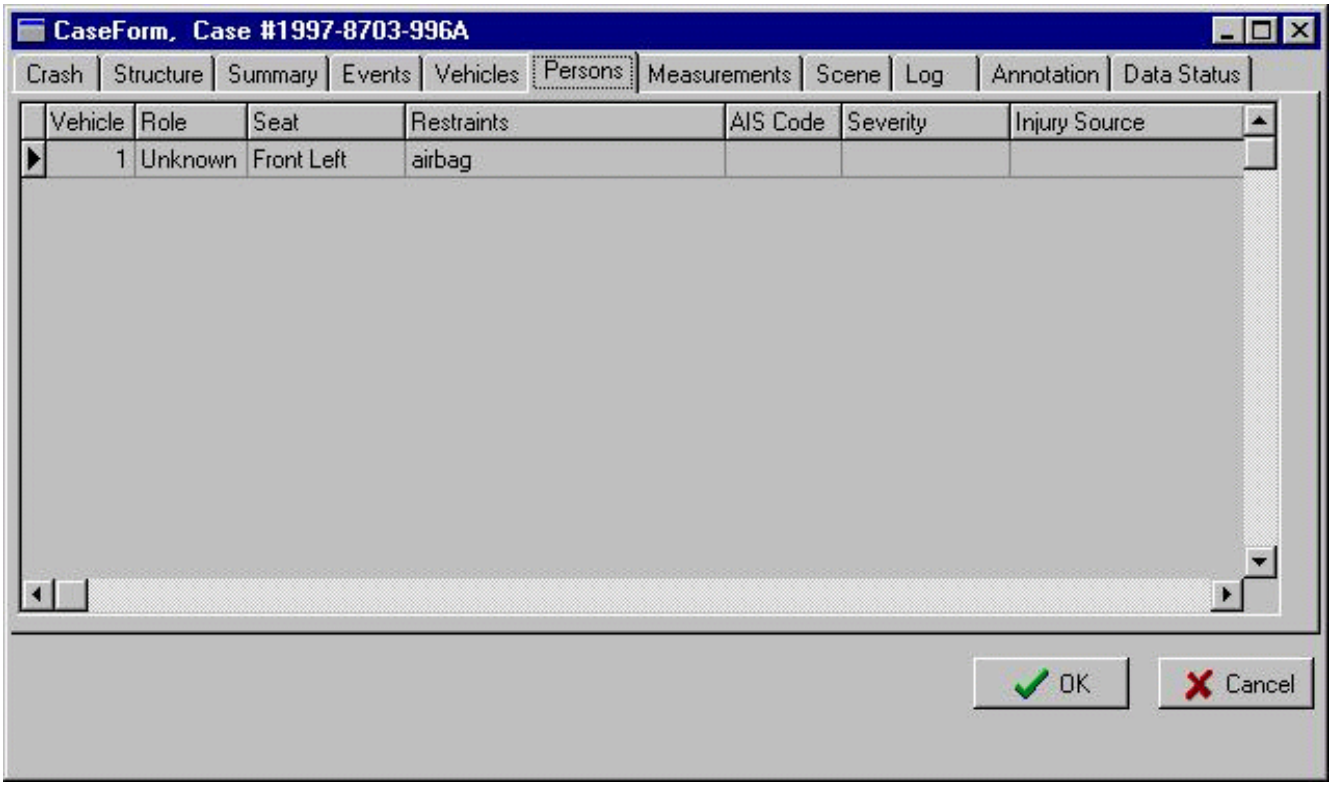
CORROSION

1. Structural rust of uni-body undercarriage, vehicle chassis frames, floor boards in areas of seat belt attachment points, seat or seat track anchorages.

2. Rust which develops in areas where the owner can observe the rust and therefore be forewarned, but which might have safety implications such as cowl area and wipers, around windshield or backlight.

3. Rust on weight bearing or vehicle guidance components, the failure of which could affect vehicle safety and do not normally wear out in service, such as tie rods, control arms, strut rods.

4. Rust of areas where the owners report exhaust intrusion such as wheel wells, wagon tire wells and rear floor pans.


CaseForm, Case #1997-8703-996A
Crash
Structure
Summary
Events
Vehicles
Persons
Measurements
Scene
Log
Annotation
Data Status
Vehicle
Role
Seat
Restraints
AIS Code
Severity
Injury Source
1
Unknown
Front Left
airbag
OK
Cancel

Screen Name: Vehicle
Variable Name: Vehicle Number

Element Attributes:

Range: Numeric value

Source: Rolled up from vehicle table

Remarks:

The vehicle number for each person of an in-transport CDS vehicle involved in the crash is indicated here.

Screen Name: Role
Variable Name: Person Role

Element Attributes:

Range*:*
Driver
Passenger
Unknown

Source: Rolled up from occupant table

Remarks:

Person Role indicates if the person was the ***driver*** or a ***passenger***, or **unknown.**

Screen Name: Seat
Variable Name: Seat Position

Element Attributes:

Range*:*

Source: Look up table from elsewhere in case

Remarks:

The seat position of each person in the vehicle is indicated here. Seat position is indicated as "front left", "second middle", etc.

Screen Name: Restraints
Variable Name: Restraints Use

Element Attributes:

Range*:*

Source: Rolled up from elsewhere in case

Remarks:

The type of restraint "used" by the person during the crash (e.g., combinations of manual belts, automatic belts, air bags, and/or child seats) is indicated.

Screen Name: AIS Code
Variable Name: AIS Code

Element Attributes:

Range*:*

Source: Rolled up from elsewhere in case

Remarks:

The most severe (*i.e.*, highest AIS) injury to the person is indicated by the seven digit AIS90 code.

Screen Name: Severity
Variable Name: Injury Severity

Element Attributes:

Range*:*

Source: Rolled up from elsewhere in case

Remarks:

The most severe (*i.e.*, highest AIS) injury to the person is indicated as minor, moderate, serious, severe, critical, maximum, or injured unknown severity .

Screen Name: Injury Source
Variable Name: Injury Source

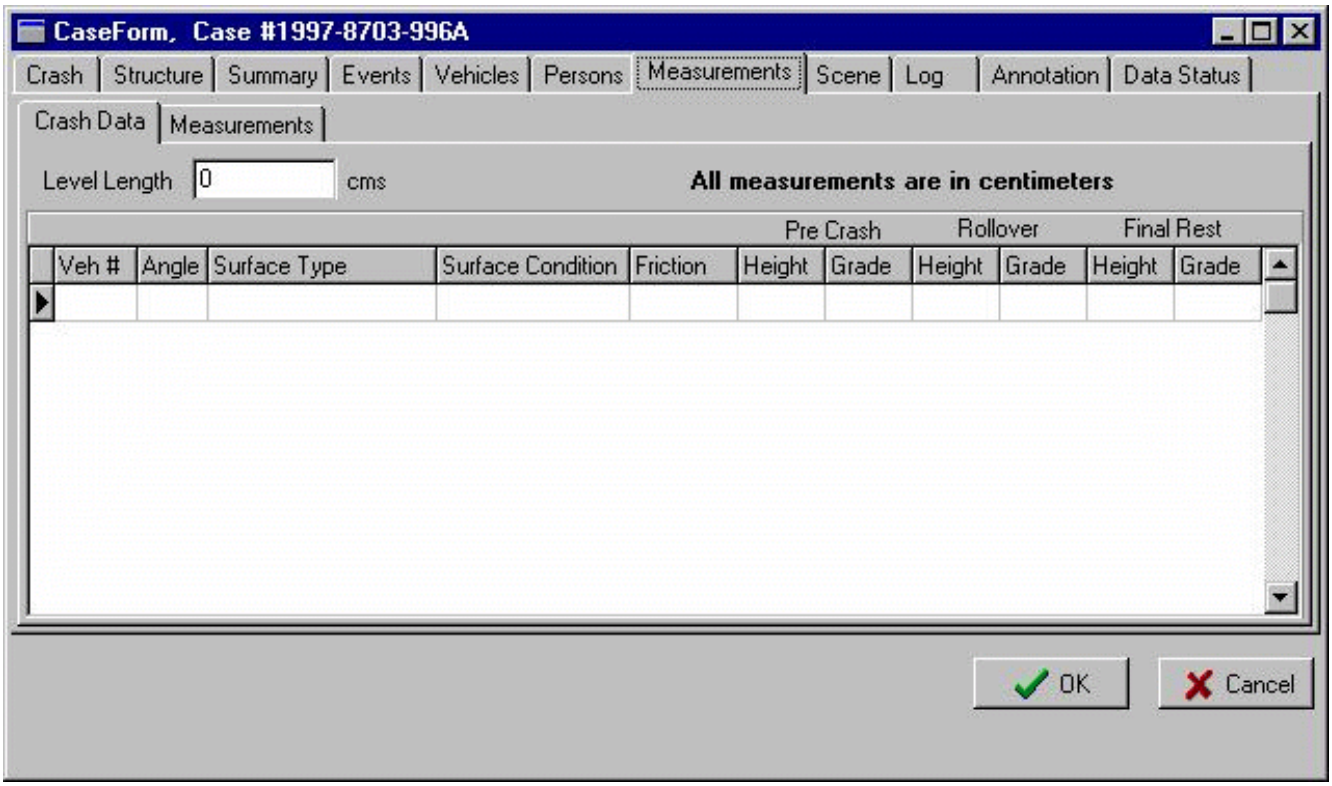
Element Attributes:

Range*:*

Source: Rolled up from elsewhere in case

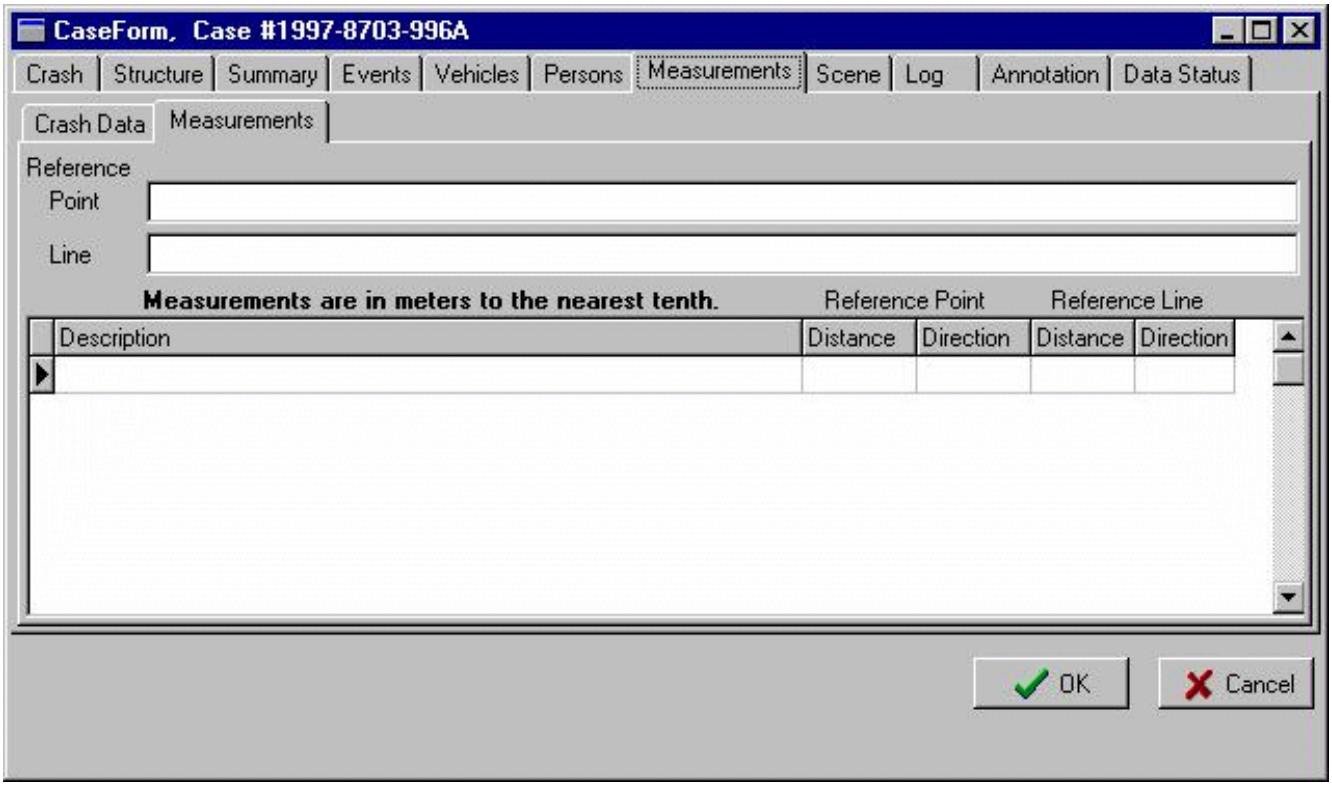
Remarks:

The source of the most severe (*i.e.*, highest AIS) injury to the person is indicated.



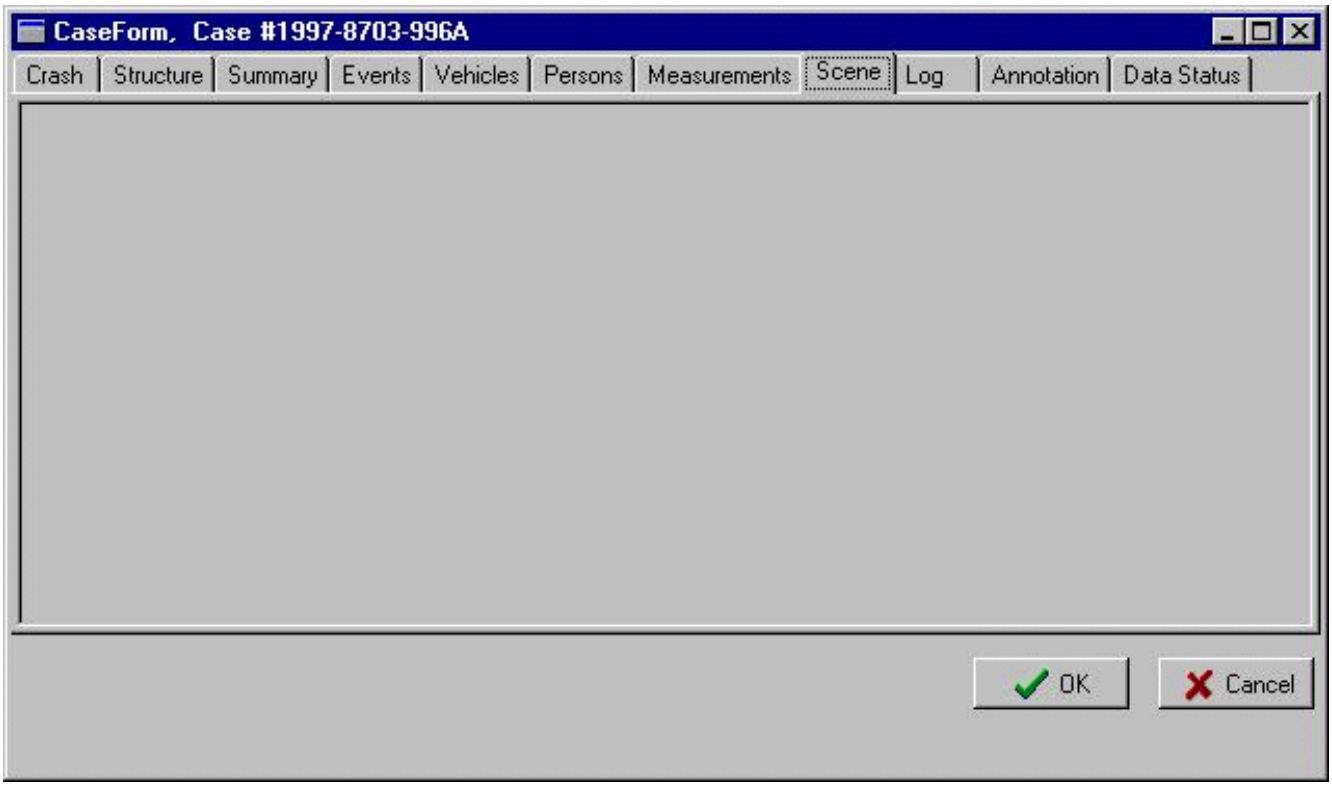
NOTE: **Currently the field measurements are recorded on the Collision Measurement Table (CMT) and scanned into the case. This measurement tab will be disabled pending further enhancements.**

Please write or print legibly on the CMT and use a dark ink or dark lead pencil to assure the scanned version of the page is completely readable.



NOTE: **Currently the field measurements are recorded on the Collision Measurement Table (CMT) and scanned into the case. This measurement tab will be disabled pending further enhancements.**

Please write or print legibly on the CMT and use a dark ink or dark lead pencil to assure the scanned version of the page is completely readable.



Scene Diagram

1. Once you have clicked on the Scene tab to open up a grey window, double click on the window to start Visio.

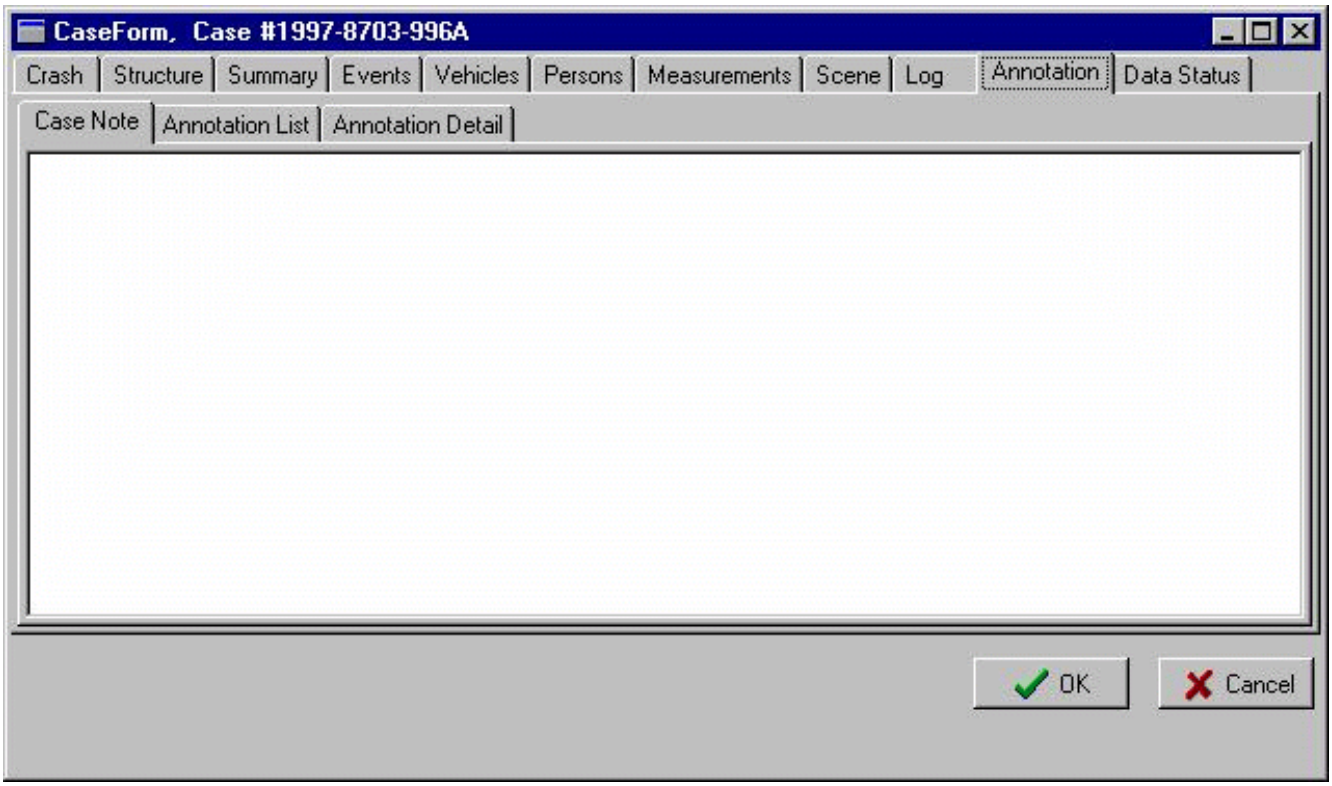
2. Before you start drawing, consider the size of your scene and all the physical evidence and then set the page size of your drawing, scale (1/100, 1/250, etc.), and whether you want to draw it in portrait or landscape mode.

3. Use Visio reference materials or "Help" in Visio, for various techniques.

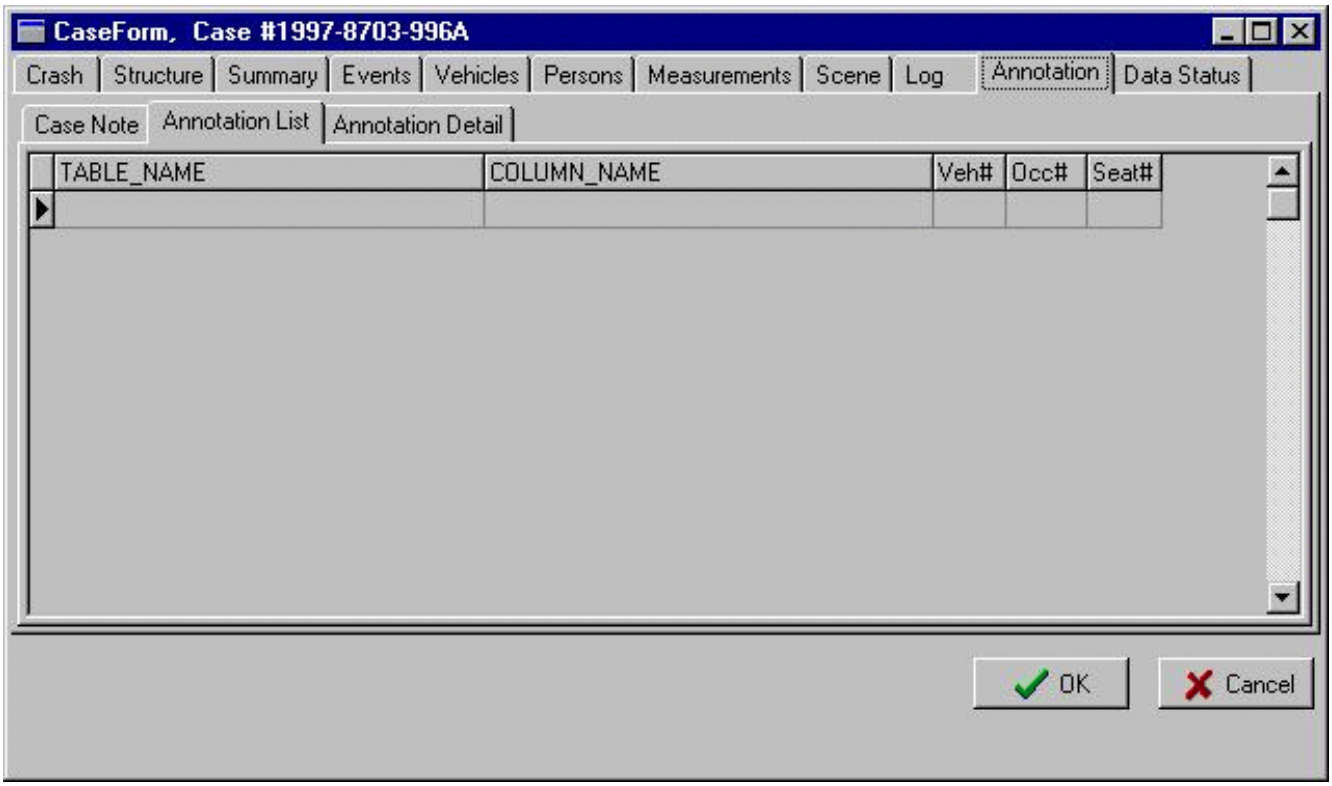
4. Begin the drawing using NASS techniques, be sure to include:

   Document the physical plant:
   - All appropriate road/roadway delineation (e.g., curbs/edge lines, lane markings, median markings, pavement markings, parked vehicles, poles, signs, etc.)
   - All appropriate traffic controls (e.g., signs/signals, etc.)
   - North arrow placed on diagram

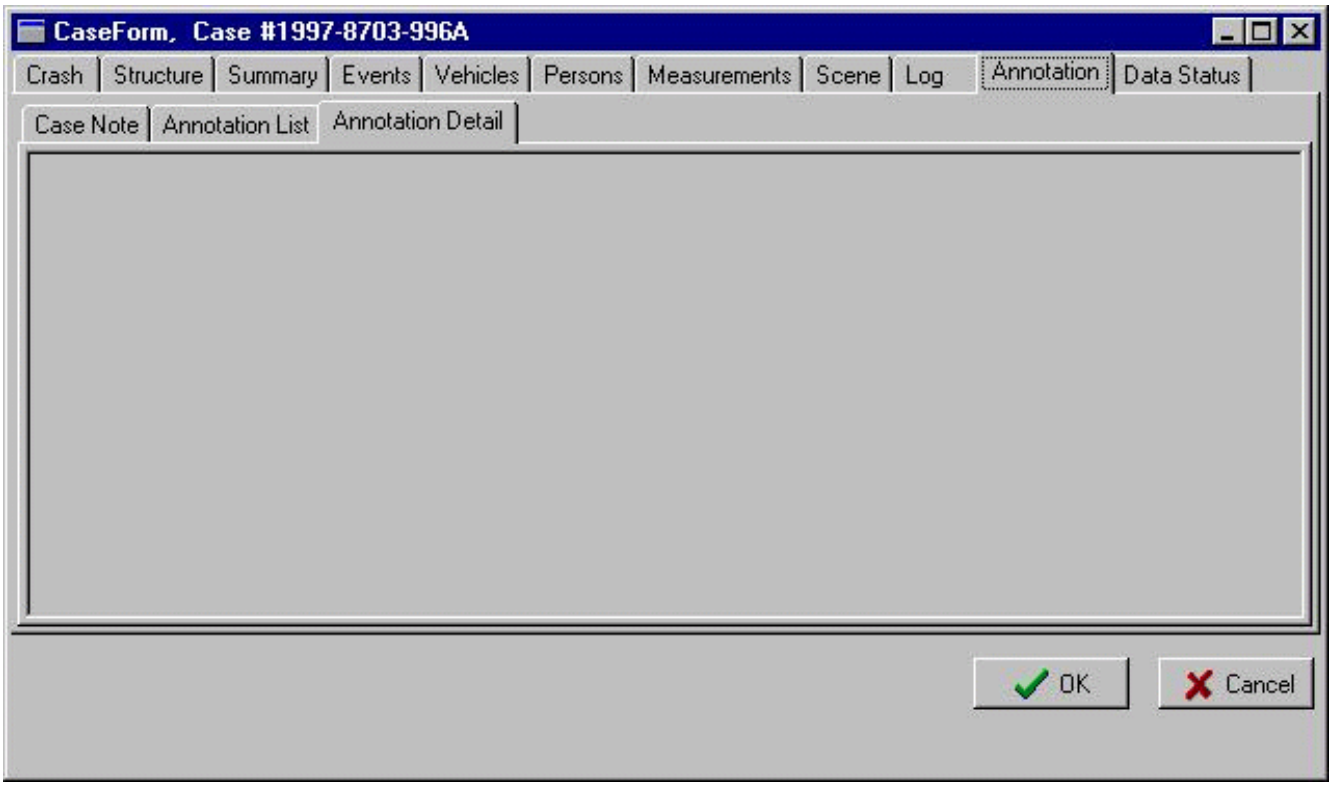
   Document vehicle dynamics including:
   - Reference Point (RP) and Reference Line (RL) relative to the physical features present at the scene
   - Scaled documentation of all crash induced physical evidence.
   - Scaled documentation of all roadside objects contacted
   - Scaled representations of the vehicle(s) at pre-impact, impact, and final rest based upon either physical evidence, and/or reconstructed crash dynamics.



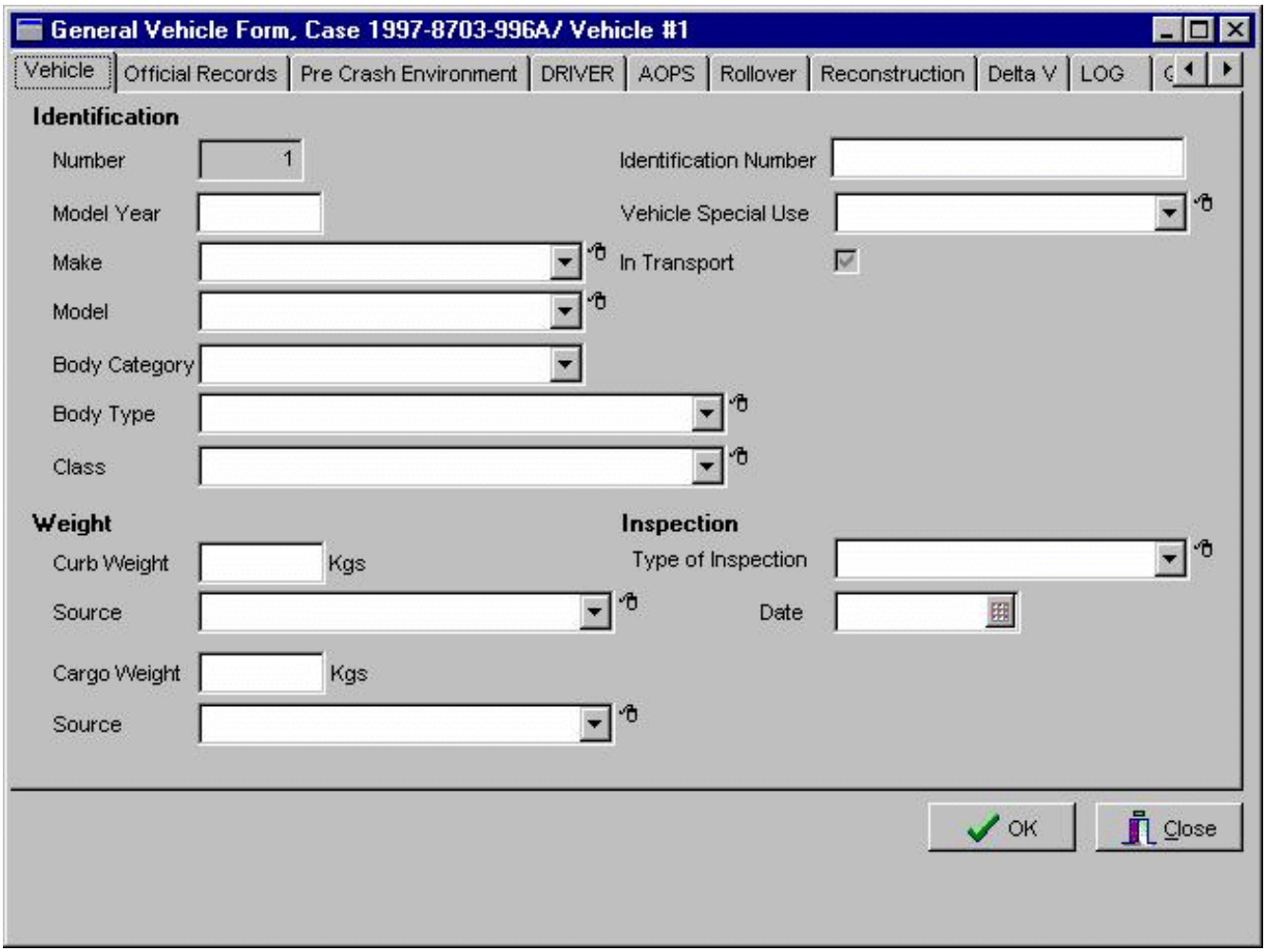
Any general notes about the case should be annotated here.



All annotations to the case are maintained here.



An annotation highlighted on the list on the previous screen will show up in detail on this screen.


General Vehicle Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
Identification
Number
1
Identification Number
Model Year
Vehicle Special Use
Make
In Transport
Model
Body Category
Body Type
Class
Weight
Curb Weight
Kgs
Source
Cargo Weight
Kgs
Source
Inspection
Type of Inspection
Date
OK
Close

Screen Name: Identification Number
Variable Name: Vehicle Number

Element Attributes:
Generated Number

Range:

Source: Generated when vehicle is selected to open General Vehicle Form

Remarks:

Note: Vehicles are entered on the Case Form / Structure Tab / Vehicles sub-tab.

Screen Name: Identification--Model Year
Variable Name: Vehicle Model Year

Element Attributes:
1900 - 2001
Select the model year
Unknown

Range:

Source: Primary source is the VIN during vehicle inspection; secondary sources include the police report and interviews.

Remarks:

Select the model year for which the vehicle was manufactured.

Unknown if the vehicle model year cannot be determined.

Screen Name: Identification--Make
Variable Name: Vehicle Make

Element Attributes:

Vehicle Make-as Selected
Unknown

Source: Vehicle inspection, police report, and interview

Remarks:

Select the vehicle make for this vehicle.

Unknown is used for a "hit-and-run" vehicle unless reliable evidence indicates the make of the vehicle.

Screen Name: Identification--Model
Variable Name: Vehicle Model

Element Attributes:

Vehicle Model-as Selected
Unknown

Source: Vehicle inspection, police report, and interview

Remarks:

Select the vehicle model for this vehicle.

Unknown is used for a "hit-and-run" vehicle unless reliable evidence indicates the make of the vehicle.

Model	Includes	Start	End	Size	Stiffness	Model Code
ACURA						
INTEGRA	RS, LS, GS (use 9 stiffness for front impacts, size value for side or rear impacts)	1986		2	9	31
LEGEND	L, LS, GS, Special Edition, GS-R (use 9 stiffness for front impacts, size value for side or rear impacts)	1986	1995	3	9	32
RL	3.5 (use 9 stiffness for front impacts, size value for side or rear impacts)	1996		4	9	32
NSX	NTX-T	1991		2	2	33
VIGOR	(use 9 stiffness for front impacts, size value for side or rear impacts)	1992	1994	3	9	34
CL	2.2, 2.3, 3.0 Coupe (use 9 stiffness for front impacts, size value for side or rear impacts)	1996		3	9	35
TL	3.2 (Stiffness 9 applies only to frontal imapcts. Use size value for rear or side impacts.)	1996		4	9	35
OTHER AUTOMOBILE		1986				398
UNKNOWN AUTOMOBILE		1986				399
SLX	(Applies to front and rear impacts. Use side value for side impacts.)	1996		3	8	401
OTHER LIGHT TRUCK		1986				498
UNKNOWN TYPE LIGHT TRUCK		1986				499
UNKNOWN VEHICLE		1986				999
ALFA ROMEO						
SPIDER	All roadsters, Veloce, 1750 / 2000 roadsters	1933	1994	1	1	31
SPORTS SEDAN	All 4 door sedans (except 164); Giulia, Super, Berlina, Alfetta, Milano, 1750 / 2000 sedans	1933	1989	PER WB	PER WB	32
SPRINT SPECIAL	All 2-door coupes; Alfetta GT, 1750 / 2000 sedans	1933	1980	PER WB	PER WB	33
GTV-6		1981	1986	1	1	34
164		1990	1995	3	3	35
OTHER AUTOMOBILE		1933	1995			398
UNKNOWN AUTOMOBILE		1933	1995			399
UNKNOWN VEHICLE		1933	1995			999

Model	Includes	Start	End	Size	Stiffness	Model Code
AM GENERAL						
DISPATCHER	Post Office (Jeep)	1965	1994	1	1	401
HUMMER		1993		NA	NA	421
DISPATCHER	DJ - series Post Office Van	1965	1991	NA	NA	466
OTHER LIGHT TRUCK		1940	1994			498
UNKNOWN LIGHT TRUCK		1940	1994			499
MEDIUM / HEAVY TRUCK	Military off-road	1965	1994	NA	NA	884
OTHER MEDIUM / HEAVY TRUCK		1965	1994			898
UNKNOWN TYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1965	1994			899
UNKNOWN MEDIUM / HEAVY TRUCK		1965	1994			899
BUS - REAR ENGINE / FLAT FRONT	Transit	1965	1994	NA	NA	983
OTHER BUS		1965	1994			988
UNKNOWN BUS TYPE		1965	1994			989
UNKNOWN VEHICLE		1965				999
AMC						
RAMBLER / AMERICAN	Rogue, Scambler, 220, 440	1954	1969	3	3	1
REBEL / MATADOR	Barcelona, Classic, Brougham, 550, 660, 770, Marlin: WB = 114"	1964	1978	4	4	2
	Matador: WB = 115"	1964	1978	5	5	2
	Barcelona, Classic, Brougham, 550, 660, 770, Marlin: WB = 115"	1964	1978	5	5	2
	Matador: WB = 114"	1958	1974	4	4	2
AMBASSADOR	Brougham, DPL, SST, DL, Limited, 880. 990	1958	1974	5	5	3
PACER	Limited, DL	1975	1980	2	2	4
AMX	2-seater only	1968	1970	2	2	5
JAVELIN	SST	1968	1974	2	2	6
	AMX	1971	1974	2	2	6
HORNET / CONCORD	Sportabout, limited, DL, SC-360, SST	1970	1983	2	2	7
	AMX	1975	1978	2	2	7
SPIRIT / GREMLIN	Limited, DL. Custom,. X	1970	1983	2	2	8
	GT	1983	1983	2	2	8
	AMX	1979	1983	2	2	8
EAGLE	Concord based	1980	1988	3	3	9
EAGLE SX-4	Spirit / Gremilin based	1981	1984	2	2	10
OTHER AUTOMOBILE		1940	1988			398
UNKNOWN AUTOMOBILE		1940	1988			399
UNKNOWN VEHICLE		1940	1988			999

Model	Includes	Start	End	Size	Stiffness	Model Code
ASTON MARTIN						
LAGONDA	DBMark III, DB4, DB4GT, DB5, DB6, DB7	1965		per WB	= size	31
OTHER AUTOMOBILE		1965				31
SALOON		1968		per WB	= size	31
UNKNOWN AUTOMOBILE		1965				31
VANTAGE		1968		per WB	= size	31
VOLANTE		1968		per WB	= size	31
AUDI						
SUPER 90		1966	1972	2	2	31
100 / A6	S, LS, GL	1970	1977	3	3	32
	A6	1995		3	3	32
	Quattro	1989	1994	3	3	32
FOX		1973	1979	2	2	33
4000	Quattro, Coupe GT, CS, S	1980	1993	2	2	34
5000	Quattro, CS, S, Turbo	1978	1993	3	3	35
80 / 90	Quattro-80	1988	1992	2	2	36
	Quattro-90	1988	1995	2	2	36
200	Quattro	1989	1992	3	3	37
V8 QUATTRO		1990	1994	3	3	38
COUPE QUATTRO		1990	1991	2	2	39
S4 / S6	S4	1992	1995	3	3	40
	S6	1995	1996	3	3	40
CABRIOLET		1994	1998	2	2	41
A4		1996		TBD	TBD	42
A3		1996		2	2	43
A8		1996		TBD	TBD	44
TT	FWD, Quattro, Roadster (Stiffness 9 applies only to frontal imapcts. Use size value for rear or side impacts.)	2000		4	9	45
OTHER AUTOMOBILE		1970				398
UNKNOWN AUTOMOBILE		1970				399
UNKNOWN VEHICLE		1970				999
AUSTIN / AUSTIN HEALEY						
MARINA	GT	1973	1975	2	2	31
AMERICA		1968	1972	1	1	32
HEALEY SPRITE		1958	1970	1	1	33
HEALY 3000	Healy 100	1953	1967	1	1	34
MINI		1960	1969	1	1	35
OTHER AUTOMOBILE		1947	1975			398
UNKNOWN AUTOMOBILE		1947	1975			399
UNKNOWN VEHICLE		1947	1975			999

Model	Includes	Start	End	Size	Stiffness	Model Code
AUTOCAR						
MEDIUM / HEAVY - CBE		1965				801
MEDIUM / HEAVY - COE/ENTRY POSITION UNKNOWN		1968				801
MEDIUM / HEAVY - COE / HIGH ENTRY		1968				801
MEDIUM / HEAVY - COE / LOW ENTRY		1968				801
MEDIUM / HEAVY - OTHER		1968				801
MEDIUM / HEAVY - UNKOWN ENGINE LOCATION		1968				801
MEDIUM / HEAVY BASED MOTORHOME		1968				801
MEDIUM / HEAVY - COE / LOW ENTRY		1968				802
AUTO - UNION - DKW						
MEDIUM / HEAVY - CBE		1965	1988			802
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1965	1988			802
MEDIUM / HEAVY - COE / HIGH ENTRY		1965	1988			802
MEDIUM / HEAVY - OTHER		1965	1988			802
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1965	1988			802
MEDIUM / HEAVY BASED MOTORHOME		1965	1988			802
AVANTI						
OTHER AUTOMOBILE		1940	1966			1
UNKNOWN AUTOMOBILE		1940	1966			399
BERTONE						
OTHER AUTOMOBILE	X / 19	1989	1991			52
UNKNOWN AUTOMOBILE						52

Model	Includes	Start	End	Size	Stiffness	Model Code
BMW						
1600 --- 2002	Ti, Tii, Tilux, 1800i, TR, CS, 1600-2, SA, Turbo, A, 1500, 2600, 501, 502, 200CS	1955	1976	2	2	31
COUPE	2800CS, 3.0CS, 3.0csi, 3.o csl, 3200, 503, 507, M1, 1802, 2000c / s, 2002	1956	1976	3	3	32
BAVARIA SEDAN	2500, 2800, 2.8, Bavarian	1969	1974	3	3	33
3 SERIES	318i, 318ti, 320i, 325e, 325es, 325i, 328, M3	1971		2	2	34
5 SERIES	525i (wagon), M5, 540iA, 540i	1993		3	3	35
	524i, 258i, 530i, 533i, 535i, TD	1975		3	3	35
6 SERIES	630, 633, 635, csi, M6	1976	1989	3	3	36
7 SERIES	733i, 435i, L7, 740i, 750iL	1978		3	3	37
8 SERIES	850, 840ci, 850i	1991	1997	3	3	38
Z3	M coupe (Brickland), M Roadster, 2.3, 2.8 coupe	1996		2	2	39
Z8	Roadstar	2000				40
OTHER AUTOMOBILE		1955				398
UNKNOWN AUTOMOBILE		1955				399
X5	4X4	2000				401
MOTORCYCLE (000-050CC)		1948				701
MOTORCYCLE (051-124CC)		1948				702
MOTORCYCLE (125-349CC)		1950	1966			703
MOTORCYCLE (350-449CC)		1950				704
MOTORCYCLE (450-749CC)		1950				705
MOTORCYCLE (750CC-OVER)		1969				706
MOTORCYCLE (UNKNOWN CC)		1948				709
UNKNOWN MOTORED CYCLE		1948				799
UNKNOWN VEHICLE		1948				999
BRICKLIN						
OTHER AUTOMOBILE		1965	1991			32
UNKNOWN AUTOMOBILE		1965	1991			32

Model	Includes	Start	End	Size	Stiffness	Model Code
BROCKWAY						
MEDIUM / HEAVY TRUCK BASED MOTORHOME		1965	1977			850
MEDIUM / HEAVY - CBE		1965	1977			881
MEDIUM/HEAVE - COE / LOW ENTRY		1965	1977			882
MEDIUM / HEAVY - COE HIGH ENTRY		1965	1977			883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1965	1977			884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1965	1977			890
MEDIUM / HEAVY - OTHER		1965	1977			898
BSA						
MOTORCYCLE (000-050CC)		1950	1972			701
MOTORCYCLE (051-124CC)		1950	1972			702
MOTORCYCLE (125-349CC)		1950	1972			703
MOTORCYCLE (350-449CC)		1950	1972			704
MOTORCYCLE (450-749CC)		1950	1972			705
MOTORCYCLE (750CC-OVER)		1950	1972			706
MOTORCYCLE (UNKNOWN CC)		1950	1972			709
OTHER MOTORED CYCLE		1950	1972			798
UNKNOWN MOTORED CYCLE		1950	1972			799

Model	Includes	Start	End	Size	Stiffness	Model Code
BUICK						
SPECIAL / SKYLARK (thru 1972)	GS, GS-350, GS-400, GS-455, GS California, Sport wagon, Custom	1946	1972	4	4	1
LESABRE / CENTURION / WILDCAT	Wagon, Luxus, Invicta, Custom, Limited	1959	1985	4	4	2
	Wagon, Luxus, Invicta, Custom, Limited	1959	1976	6	6	2
	T-Type (use 9 stiffness for front impacts, size value for side or rear impacts)	1986	1998	4	9	2
ELECTRA / ELECTRA 225 / PARK AVENUE (1991-ON)	LImited, Park Avenue, Ultra (use 9 stiffness for front impacts, size value for side or rear impacts)	1985		4	9	3
	Limited, Park Avenue, Ultra	1977	1984	5	5	3
	Limited, Park Avenue, Ultra	1959	1976	6	6	3
ROADMASTER	Estate Wagon, Limited	1991	1996	4	4	4
RIVIERA	S-Type, T-Type	1963	1965	4	4	5
	S-Type, T-Type	1966	1976	5	5	5
	S-Type, T-Type	1977	1985	4	4	5
	S-Type, T-Type Anniv. Edition, Silver Arrow, (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		4	9	5
	S-Type, T-Type (use 9 stiffness for front impacts, size value for side or rear impacts)	1986	1993	3	9	5
CENTURY	Luxus, Custom	1954	1977	4	4	7
	Custom, FWD (use 9 stiffness for front impacts, size value for side or rear impacts)	1982		3	9	7
	Luxus, Regal	1972	1977	4	4	7
	Custom	1978	1981	3	3	7
APOLLO / SKYLARK (73-1976)	Skylark (1975), S / R	1973	1976	4	4	8
REGAL	Turbo, Luxux, Gran National, GNX, T-Type	1978	1988	3	3	10
SKYHAWK	(use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1989	2	9	12
	S-Type, Roadhawk, T-Type, GT	1975	1981	2	2	12
SKYLARK (1976-1985)	S / R, S, Limited, Sport, T-Type (use 9 stiffness for front impacts, size value for side or rear impacts)	1980	1985	3	9	15
	S / R, S, Limited, Sprot, T-Type	1976	1979	4	4	15
SOMERSET (1985-1987) / SKYLARK (1986-ON)	Skylark (1986-on) (Use 9 stiffness for frontal impacts).	1986		3	9	18
	Somerset, GS Regal, Custom, Limited, T-Type (use 9 stiffness for frontal impacts).	1985	1987	3	9	18
REGAL (FWD)	Limited	1988		3	9	20
REATTA		1988	1991	2	2	21

Model	Includes	Start	End	Size	Stiffness	Model Code
BUICK (cont'd)						
OPEL KADETT		1965	1972	2	2	31
OPEL MANTA	1900, Luxus, Rallye, Sports Coupe	1966	1975	2	2	32
OPEL GT		1969	1975	2	2	33
OPEL ISUZU	Deluxe, Sport	1976	1979	2	2	34
OTHER AUTOMOBILE		1965				398
UNKNOWN AUTOMOBILE		1965				399
UNKNOWN VEHICLE		1965				999
CADILLAC						
DEVILLE / FLEETWOOD	Coupe de Ville, Sedan de Ville, Fleetwood Brougham, Fleetwood 60 Special, d'Elegance (use 9 stiffness for front impacts, size value for side or rear impacts)	1940	1976	6	6	3
	Concourse (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		4	9	3
	FWD d'Elegance (use 9 stiffness for front impacts, size value for side or rear impacts)	1985		4	9	3
	RWD--Coupe de Ville, Sedan de Ville, Fleetwood Brougham, Fleetwood 60 Special, d'Elegance (use 9 stiffness for front impacts, size value for side or rear impacts	1977	1996	5	5	3
LIMOUSINE	Fleetwood 75, Formal, DeVille-Based	1940		6	6	4
ELDORADO	Biarritz, El-doro, Touring Coupe	1940	1978	6	6	5
	Biarritz, El-doro, Touring Coupe (use 9 stiffness for front impacts, size value for side or rear impacts)	1986		3	9	5
	Biarritz, El-doro, Touring Coupe	1979	1985	4	4	5
COMMERCIAL SERIES	Ambulance / Hearse	1940		6	6	6
ALLANTE		1987	1993	2	2	9
SEVILLE	Elegante	1976	1985	4	4	14
	STS (use 9 stiffness for front impacts, size value for side or rear impacts)	1986		3	9	14
CIMARRON	D'oro (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1988	2	9	16
CATERA	RWD	1997		3	3	17
ESCALADE	(use 8 stiffness for end impacts, size value for side impacts)	1999		5	8	401
OTHER AUTOMOBILE		1940				398
UNKNOWN AUTOMOBILE		1940				399
UNKNOWN VEHICLE		1940				999

Model	Includes	Start	End	Size	Stiffness	Model Code
CHECKER						
AEROBUS		1965	1982	per WB	= size	2
MARATHON		1965	1982	per WB	= size	2
OTHER AUTOMOBILE		1965	1982	per WB	= size	2
SUPERBA		1965	1982	per WB	= size	2
TAXI		1965	1982	per WB	= size	2
UNKNOWN AUTOMOBILE		1965	1982	per WB	= size	2
CHEVROLET						
CHEVELLE / MALIBU	Classic, Concours, S-3, Laguna, Nomad, 300, Greenbriar, Estate, Deluxe, SS 396 / 454	1978	1983	3	3	1
	Classic, Concours, S-3, Laguna, Nomad, 300, Greenbriar, Estate, Deluxe, SS 396 / 454	1964	1977	4	4	1
IMPALA / CAPRICE	Brookwood, Kingswood	1977		4	4	2
	St. Wgn. Biscayne, Belair, Super sport, Classic Classic Brougham, Townsman	1955	1976	6	6	2
	Biscayne, Belair, Super sport, Classic Classic Brougham, Townsman	1955	1976	5	5	2
IMPALA		2000		TBD	TBD	2
CORVETTE	Stingray	1963		2	2	4
	Stingray	1953	1962	3	3	4
CORVAIR	Monza, Corsa, 500, Yenko	1960	1969	NA	NA	6
EL CAMINO	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	1959	1960	5	8	7
	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	1978	1994	3	8	7
	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	1964	1977	4	8	7
NOVA (-1979)	Chevy II, LN, LE, Concours SS-350 / 396, Rally	1962	1979	4	4	8
CAMARO	SS, RS, LT, Berlinetta, IROC-Z, Z28	1967	1998	3	3	9
MONTE CARLO (RWD ONLY)	LS, SS, Aerocoupe, Landau	1978	1988	3	3	10
	LS, SS, Aerocoupe, Landau	1970	1977	4	4	10
VEGA	GT, Cosworth	1971	1977	2	2	11
MONZA	Spyder, 2+2, Towne Coupe	1974	1980	2	2	12
CHEVETTE	S, Scooter, CS-4 door	1976	1987	2	2	13
	S, Scooter, CS--2 door	1976	1987	1	1	13
CITATION	X-11, Citation II (use 9 stiffness for front impacts, size value for side or rear impacts)	1980	1985	3	9	15
CAVALIER	CS, RS, Z24, LS	1982		2	9	16
CELEBRITY	CS, Eurosport, VR	1982	1990	3	9	17
BERETTA / CORSICA	GT, Z26 (use 9 stiffness for front impacts, size value for side or rear impacts)	1988	1996	3	9	19

Model	Includes	Start	End	Size	Stiffness	Model Code
CHEVROLET (Cont'd)						
LUMINA	Z-34, Euro (use 9 stiffness for front impacts, size value for side or rear impacts)	1990		3	9	20
SPECTRUM		1985	1989	1	1	31
NOVA / GEO PRIZM	CL, NUMMI-built vehicle (use 9 stiffness for front impacts, size value for side or rear impacts)	1985		2	9	32
SPRINT / GEO SPRINT		1985	1989	1	1	33
GEO METRO	LSi, Xfi	1989		1	1	34
GEO STORM	Gsi	1985	1993	1	1	35
MONTE CARLO (FWD ONLY)	FWD, LS, Z34 (use 9 stiffness for front impacts, size value for side or rear impacts)	1995		3	9	36
MALIBU (1997-)		1997		3	9	37
OTHER AUTOMOBILE	Fleetmaster, Fleetline, Styline Special, One-fifty, Bel-Air, Del Ray, Biscayne	1930				398
UNKNOWN AUTOMOBILE		1930				399
S-10 BLAZER, BLAZER	Blazer (use 9 stiffness for end impacts, size value for side impacts)	1995		2	7	401
	S-10 pickup-based (100.5" WB) (use 7 stiffness for end impacts, size value for side impacts)	1983	1994	2	7	401
GEO TRACKER	Lsi (use 8 stiffness for end impacts, size value for side impacts)	1989		2	8	402
TRAVERSE		2000		TBD	TBD	
FULLSIZE BLAZER (K, Tahoe)	Tahoe (use 8 stiffness for end impacts, size value for side impacts)	1995		3	8	421
	K-series, fullsized pickup-based (use 8 stiffness for end impacts, size value for rear impacts)	1969	1994	3	8	421
AVALANCHE		2000		TBD	TBD	
SUBURBAN	(use 8 stiffness for end impacts, size value for side impacts)	1950		6	8	431
ASTRO VAN	Minivan (use 7 stiffness for end impacts, size value for side impacts)	1985		7	7	441
LUMINA APV / VENTURE.	Venture (use 7 stiffness for end impacts, size value for side impacts)	1990		3	7	442
G-SERIES VAN	Beauville, Chevy Van, Sport Van, G10-G30, Express (use 7 stiffness for end impacts, size value for side impacts)	1957		7	7	461
P-SERIES VAN	(use 7 stiffness for end impacts, size value for side impacts)	1965	1995	7	7	466
VAN DERIVATIVE	Hi-cube, Parcel Van (use 7 stiffness for end impacts, size value for side impacts)	1965		7	7	470

Model	Includes	Start	End	Size	Stiffness	Model Code
CHEVROLET (cont'd)						
S-10 / T-10	4 X 4 (use 8 stiffness for end impacts, size value for side impacts)	1982		PER WB	8	471
LUV	Imported pickup (use 7 stiffness for end impacts, size value for side impacts)	1972	1991	7	7	472
C, K, R, V-SERIES PICKUP	C10-C30, K10-K30, R10-R30, V10-V30, Silverado, C-K 1500, 2500, 3500 (use 8 stiffness for end impacts, size value for side impacts)	1940		PER WB	8	481
OTHER LIGHT TRUCK		1940				498
UNKNOWN LIGHT TRUCK		1940				499
MEDIUM / HEAVY CBE	C50 / 60 / 65; M60/65; H70/80/90; J70 / 80 / 90; Bison 90; all other CBE	1955		NA	NA	881
MEDIUM / HEAVY COE LOW ENTRY	T60 / 65 - all other COE low entry	1960	1980	NA	NA	882
MEDIUM / HEAVY COE HIGH ENTRY	Titan 90, all other COE hight entry	1971	1990	NA	NA	883
MEDIUM / HEAVY; UNKNOWN ENGINE LOCATION		1951				884
MEDIUM / HEAVY; UNKNOWN ENGINE LOCAITON	MKIII, 1500	1965		1	1	890
OTHER MEDIUM / HEAVY TRUCK		1949				898
UNKNOWN TYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1949				899
UNKNOWN MEDIUM / HEAVY TRUCK		1949				899
BUS	S-60 series	1967		NA	NA	981
OTHER BUS		1965				988
UNKNONW BUS TYPE		1965				988
OTHER VEHICLE		1934				998
UNKNOWN VEHICLE		1933				999

Model	Includes	Start	End	Size	Stiffness	Model Code
CHRYSLER						
CORDOBA	Crown, 300, LS	1975	1983	4	4	9
NEW YORKER FIFTH AVENUE (1989)	New Yorker (through 1978)	1946	1989			10
NEWPORT		1979	1983			10
RAMPAGE 2.2 (CAR BASED PICKUP)	GT, Sport	1982	1984	2	2	13
NEW YORKER (1983-1990)		1983	1990			14
NEW YORKER SALON						14
NEW YORKER / E CLASS / IMPERIAL / 5TH AVENUE	Imperial (use 9 stiffness for front impacts, size value for side or rear impacts)	1990	1993	3	9	14
	FWD vehicles, Turbo (use 9 stiffness for front impacts, size value for side or rear impacts)	1983	1993	3	9	14
NEW YORKER / NEWPORT / 5TH AVENUE / IMPERIAL (RWD ONLY)	Custom, Royal, Brougham, Town and Country	1979	1981	5	5	14
	Custom, Royal, Brougham, Town and Country	1946	1978	6	6	14
	Custom, Royal, Brougham, Town and Country	1982	1989	4	4	14
	300	1946	1971	6	6	14
LASER	Turbo, XE, XT (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	1986	2	9	15
LEBARON	FWD except GTS or GTC Sport Coupe (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1994	2	9	16
	Medallion, Salon (RWD), Landau, LX	1977	1981	4	4	16
LEBARON GTS / GTC	GTC-Sport Coupe (use 9 stiffness for front impacts, size value for side or rear impacts)	1987	1995	2	9	17
	GTS-Turbo (use 9 stiffness for front impacts, size value for side or rear impacts)	1985	1995	3	9	17
TC (MASERATI SPORT)	Turbo Convertible	1988	1991	1	1	31
CONQUEST	TSI, Turbo	1987	1989	2	2	35
CONCORDE		1993		4	4	41
LHS	New Yorker (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		4	9	42
SEBRING		1995		3	3	43
CIRRUS	(use 9 stiffness for front impacts, size value for side or rear impacts)	1995		3	9	44
300M		1999		4	9	51
OTHER AUTOMOBILE		1946				398
UNKNOWN AUTOMOBILE		1946				399

Model	Includes	Start	End	Size	Stiffness	Model Code
CHRYSLER (Cont'd)						
TOWN AND COUNTRY	Minivan (use 7 stiffness for end impacts, size value for side impacts)	1990		5	7	441
OTHER LIGHT TRUCK		1946				498
UNKNOWN LIGHT TRUCK		1946				499
UNKNOWN VEHICLE		1946				999
CITROEN						
OTHER AUTOMOBILE		1965	1991			33
UNKNOWN AUTOMOBILE		1965	1991			33
CONSULIER						
OTHER AUTOMOBILE				per WB	= size	398
UNKNOWN AUTOMOBILE				per WB	= size	398
DAEWOO						
LANOS		1999		TBD	TBD	1
NUBIRA		1999		TBD	TBD	2
LEGANZA		1999		TBD	TBD	3
DAIHATSU						
CHARADE		1988	1994	3	3	31
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
ROCKY	(use 8 stiffness for end impacts, size value for side impacts)	1990	1992	1	8	401
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE		1990	1994			999
DELOREAN						
OTHER AUTOMOBILE		1981	1983			34
UNKNOWN AUTOMOBILE						34

Model	Includes	Start	End	Size	Stiffness	Model Code
DESOTO						
OTHER AUTOMOBILE		1940		per WB	= size	398
UNKNOWN AUTOMOBILE		1940		per WB	= size	398
DESTA						
OTHER AUTOMOBILE		1985				48
UNKNOWN AUTOMOBILE						48
DIAMOND REO / REO						
MEDIUM / HEAVY TRUCK BASED MOTORHOME		1954	1975			850
MEDIUM / HEAVY - CBE		1954	1975			881
MEDIUM / HEAVY - COE / LOW ENTRY		1954	1975			882
MEDIUM / HEAVY - COE / HIGH ENTRY		1954	1975			883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1954	1975			884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1954	1975			890
MEDIUM / HEAVY - OTHER		1954	1975			898
DIVCO						
MEDIUM / HEAVY - CBE						803
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN						803
MEDIUM / HEAVY - COE / HIGH ENTRY						803
MEDIUM / HEAVY - COE / LOW ENTRY						803
MEDIUM / HEAVY - OTHER						803
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION						803
MEDIUM / HEAVY BASED MOTORHOME						803

Model	Includes	Start	End	Size	Stiffness	Model Code
DODGE						
DART	Custom, Swinger, Sport, GT, Demon, Special, Special Edition, 170, 270, 340, 360: WB = 111"	1960	1976	4	4	1
	Custom, Swinger, Sport, GT, Demon, Special, Special Edition, 170, 270, 340, 360: WB = 108"	1960	1976	3	3	1
CORONET / CHARGER / MAGNUM	Brougham, Custom, Superbee, Crestwood, Deluxe, XE, R / t, SE 440, 500, Police	1964	1979	4	4	2
	Charger	1964	1978	4	4	2
POLARA / MONACO / ROYAL MONACO	Custom, Special, Crestwood, Brougham, Police Taxi	1977	1978	4	4	3
	Custom, Special, Crestwood, Brougham, Police Taxi	1964	1976	5	5	3
VIPER	RT / 10, GTS	1992		2	2	4
CHALLENGER	R / T, T / A, Rallye	1970	1974	3	3	5
ASPEN	Custom, Special Edition, Police, R / T, Sport: WB = 109"	1976	1980	4	3	6
	Custom, Special Edition, Police, R / T, Sport: WB = 113"	1976	1980	4	3	6
DIPLOMAT	Medallion, Salon, S	1977	1989	4	4	7
OMNI / CHARGER	Charger 2.2	1983	1990	2	2	8
	O24, DeTomaso, Miser, GLH, GLHS, Shelby, America, Expo	1978	1990	2	2	8
MIRADA		1980	1983	4	4	9
ST REGIS	Police, Taxi	1979	1981	5	5	10
ARIES (K)	Custom, SE, LE (use 9 stiffness for front impacts, size value for side or rear impacts)	1981	1989	2	9	11
400	LS (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1983	2	9	12
RAMPAGE	2.2, GT, SPORT (Car-based pickup)	1982	1984			13
600	ES, Turbo (use 9 stiffness for front impacts, size value for side or rear impacts)	1983	1988	2	9	14
DAYTONA	Turbo Z, Shelby Z, Pacifica, C/S Competition, IROC R /T (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	1994	2	9	15
LANCER	Pacifica, Turbo, ES, Shelby (use 9 stiffness for front impacts, size value for side or rear impacts)	1985	1989	3	9	16
SHADOW	ES, Turbo (use 9 stiffness for front impacts, size value for side or rear impacts)	1987	1994	2	9	17
DYNASTY	(use 9 stiffness for front impacts, size value for side or rear impacts)	1988	1993	3	9	18
SPIRIT	ES, Shelby, R / T (use 9 stiffness for front impacts, size value for side or rear impacts)	1989	1995	3	9	19
NEON	Expresso (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		3	9	20
CHALLENGER	all imported	1978	1983	2	2	33

Model	Includes	Start	End	Size	Stiffness	Model Code
DODGE (Cont'd)						
COLT (EXCLUDES VISTA)	RS, Turbo, Custom, GTS, DL, E, Premier, Deluxe Carousel, GT	1977	1980	2	2	34
	RS, Turbo, Custom, GTS, DL, E, Premier, Deluxe Carousel, GT	1974	1976	2	2	34
	RS, Turbo, Custom, GTS, DL, E, Premier, Deluxe Carousel, GT	1980	1994	1	1	34
	RS, Turbo, Custom, GTS, DL, E, Premier, Deluxe Carousel, GT: WB<93"	1977	1980	1	2	34
CONQUEST	Turbo	1984	1989	2	2	35
STEALTH		1991		2	2	39
MONACO		1990	1992	3	3	40
INTREPID		1993		4	4	41
AVENGER		1995		3	3	42
STRATUS	(use 9 stiffness for front impacts, size value for side or rear impacts)	1995		3	9	43
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
RAIDER	Sport (use 8 stiffness for end impacts, size value for side impacts)	1986	1994	1	8	401
DURANGO	Use 8 stiffness for end impacts, size value for side impacts.	1998		4	8	402
RAMCHARGER	(use 8 stiffness for end impacts, size value for side impacts)	1974	1993	3	8	421
VISTA	4 X 4 (use 7 stiffness for end impacts, size value for side impacts)	1984	1991	3	7	441
CARAVAN	Mini-Ram, SE, ES, LE, SE: WB = 119" (use 7 stiffness for end impacts, size value for side impacts)	1984	1998	5	7	442
	Mini-Ram, SE, ES, LE, SE: WB = 112" (use 7 stiffness for end impacts, size value for side impacts)	1984	1998	4	7	442
B-SERIES VANS	Sportsman, Royal, Maxiwagon, Ram, B150-B350, Tradesman, Maxivan (use 7 stiffness for front impacts, size value for side or rear impacts)	1963		7	7	461
VAN DERIVATIVE	Kary Van, Parcel Van (use 7 stiffness for end impacts, size value for side impacts)	1971		7	7	470
D50, COLT PICKUP / RAM 50 / RAM 100	Ram 50 / Ram 100 (use 8 stiffness for end impacts, size value for side impacts)	1983	1993	per WB	8	471
	D50, Colt Pickup (use 8 stiffness for end impacts, size value for side impacts)	1979	1982	per WB	8	471
DAKOTA	WB = 124" (use 8 stiffness for end impacts, size value for side impacts)	1987		6	8	472
	WB = 112" (use 8 stiffness for end impacts, size value for side impacts)	1987		3	8	472

Model	Includes	Start	End	Size	Stiffness	Model Code
DODGE (Cont'd)						
D, W-SERIES PICKUP, W100-W350	Ram, Custom, Royal, Miser, D100-D350 (use 8 stiffness for end impacts, size value for side impacts)	1955	1993	per WB	8	481
RAM PICKUP	1500 / 2500 / 3500, Pickup (use 8 stiffness for end impacts, size value for side impacts)	1994		per WB	8	482
OTHER LIGHT TRUCK		1979				498
UNKNOWN LIGHT TRUCK		1949				499
MEDIUM / HEAVY: CBE		1966				881
MEDIUM / HEAVY: COE LOW ENTRY		1967				882
MEDIUM / HEAVY: COE HIGH ENTRY		1967				883
MEDIUM / HEAVY: UNKNOWN ENGINE LOCATION		1962				884
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1965				890
OTHER MEDIUM / HEAVY TRUCK		1930				898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY		1930				899
UNKNOWN MEDIUM / HEAVY TRUCK		1966				899
MEDIUM BUS	not van based	1966	1998	NA	NA	981
OTHER BUS		1965				988
UNKNOWN BUS TYPE						989
OTHER VEHICLE		1965				998
UNKNOWN VEHICLE		1952				999

Model	Includes	Start	End	Size	Stiffness	Model Code
DUCATI						
MOTORCYCLE (000-050CC)		1965				701
MOTORCYCLE (051-124CC)		1965				702
MOTORCYCLE (125-349CC)		1965				703
MOTORCYCLE (350-449CC)		1965				704
MOTORCYCLE (450-749CC)		1965				705
MOTORCYCLE (750CC-OVER)		1965				706
MOTORCYCLE (UNKNOWN CC)		1965				709
OTHER MOTORED CYCLE		1965				798
UNKNOWN MOTORED CYCLE		1965				799
EAGLE						
SUMMIT	DL, LX, ES	1989	1996	3	3	34
TALON	FWD, TSi, Tsi-FWD, ESi	1990		2	2	37
PREMIER	LX, ES	1988	1992	3	3	40
VISION		1993	1997	4	4	41
MEDALLION	DL, LX	1988	1989	3	3	44
OTHER AUTOMOBILE		1988				398
UNKNOWN AUTOMOBILE		1988				399
SUMMIT WAGON	WB = 99.2" (use 7 stiffness for end impacts, size value for side impacts)	1992	1996	2	7	441
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
EXCALIBER						
OTHER AUTOMOBILE		1940	1991	per WB	= size	398
UNKNOWN AUTOMOBILE		1940	1991	per WB	= size	398
FERRARI						
OTHER AUTOMOBILE	All Models	1965				35
UNKNOWN AUTOMOBILE		1965				35

Model	Includes	Start	End	Size	Stiffness	Model Code
FIAT						
124 (COUPE / SEDAN)	Sport	1967	1975	1	1	31
124 SPIDER / RACER	Spider 2000 / 1500	1968	1983	1	1	32
BRAVA - 131		1975	1982	2	2	33
850 (COUPE / SPYDER)		1967	1973	1	1	34
128		1972	1979	2	2	35
X-1/9		1975	1983	1	1	36
STRADA		1979	1983	1	1	37
OTHER AUTOMOBILE		1967	1983			398
UNKNOWN AUTOMOBILE		1967	1983			399
MEDIUM / HEAVY COE LOW ENTRY		1967	1983			882
MEDIUM / HEAVY COE HIGH ENTRY		1967	1983			883
MEDIUM / HEAVY COE ENTRY POSITION UNKNOWN		1967	1983			890
OTHER MEDIUM / HEAVY TRUCK		1967	1983			898
UNKNOWN MEDIUM / HEAVY TRUCK		1967	1983			899
UNKNOWN VEHICLE		1967	1983			999

Model	Includes	Start	End	Size	Stiffness	Model Code
FORD						
FALCON	Sprint, GT, Futura	1960	1970	4	3	1
FAIRLANE	Torino	1955	1970	4	4	2
MUSTANG / MUSTANG II	Mach, Boss, Granada, Cobra	1965	1973	3	3	3
	Ghia, SVO, GT, LX, Shelby	1974	1998	2	2	3
THUNDERBIRD (ALL SIZES)	Landau, Heritage, Turbo coupe, Elan, Fila	1980	1988	3	3	4
	Landau, Heritage, Turbo coupe, Elan, Fila	1977	1979	4	4	4
	Landau, Heritage, Turbo coupe, Elan, Fila	1972	1976	5	6	4
	Landau, Heritage, Turbo coupe, Elan, Fila	1958	1971	4	4	4
	Landau, Heritage, Turbo coupe, Elan, Fila	1989	1998	4	4	4
	Landau, Heritage, Turbo coupe, Elan, Fila	1955	1957	3	3	4
LTD II	S, Squire, Brougham	1977	1979	4	4	5
LTD / CUSTOM / GALAXIE (ALL SIZES)	XL, Landau, Ranch Wagon, Country Squire, S, 500, Brougham, XL, GT	1983	1986	3	3	6
	XL, Landau, Ranch Wagon, Country Squire, S, 500, Brougham, XL, GT	1978	1982	4	4	6
	XL, Landau, Ranch Wagon, Country Squire, S, 500, Brougham, XL, GT	1963	1977	5	5	6
RANCHERO	Flacon / Fairlane based	1960	1971	3	3	7
	Torino / LTD II based	1972	1979	4	4	7
MAVERICK	Grabber	1969	1978	3	3	8
PINTO	Pony, MPG, ESS (Stiffness for front impacts, Stiffness 2 for rear or side impacts)	1971	1980	1	1/2	9
TORINO / GRAN TORINO / ELITE	GT, Cobra, Sport, Squire, Brougham	1971	1976	4	4	10
GRANADA	ESS, Ghia	1975	1982	3	3	11
FAIRMONT	Futura, Sport Coupe	1978	1983	3	3	12
ESCORT / EXP	L, GL, GLX, SS, GT, LX, ZX2 (use 9 stiffness for front impacts, size value for side or rear impacts)	1981		1	9	13
TEMPO	L, GL, GLX, Sport, 4X4 (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	1994	2	9	15
CROWN VICTORIA		1981		4	4	16
TAURUS	Mt-5, L, GL, LX, SHO	1986		3	3	17
PROBE	GL, LX, GT	1987	1997	2	2	18
ENGLISH FORD	Cortina, Angila, Zephyr / Zodiac	1946	1970	per WB	per WB	31
FIESTA	Sport, Ghia	1978	1980	1	1	32
FESTIVA	L, GL	1988	1993	1	1	33
LASER		1993	1994	per WB	per WB	34
CONTOUR	Sport, LX, SE, SVT	1994		3	9	35
ASPIRE	(use 9 stiffness for front impacts, size value for side or rear impacts)	1994	1997	1	1	36
FOCUS	(use 9 stiffness for front impacts, size value for side or rear impacts)	2000		3	9	37
OTHER AUTOMOBILE	Deluxe, Ford Six, Mainline, Crestline, Model A	1924				398
UNKNOWN AUTOMOBILE		1924				399

Model	Includes	Start	End	Size	Stiffness	Model Code
FORD (Cont'd)						
BRONCO II / BRONCO (-1977) / EXPLORER	Bronco II--Eddie Bauer, XL, XLT, Limited (use 7 stiffness for end impacts, size value for side impacts)	1983	1989	1	7	401
	Explorer (use 7 stiffness for end impacts, size value for side impacts)	1990		1	7	401
	Bronco (use 7 stiffness for end impacts, size value for side impacts)	1966	1977	1	7	401
BRONCO - FULLSIZE	Eddie Bauer, Custom, XL, XLT (use 8 stiffness for end impacts, size value for side impacts)	1978		3	8	421
EXPEDITION		1997		TBD	TBD	422
EXCURSION		2000		TBD	TBD	423
AEROSTAR	XLT, Cargo Van (use 7 stiffness for end impacts, size value for side impacts)	1984	1998	7	7	441
WINDSTAR	(use 7 stiffness for end impacts, size value for side impacts)	1995		5	7	442
E-SERIES VANS	Econoline, Clubwagon, Chateau, E150-E350 (use 7 stiffness for end impacts, size value for side impacts)	1960		7	7	461
VAN DERIVATIVE	Parcel van (use 7 stiffness for end impacts, size value for side impacts)	1960		7	7	470
RANGER	Supercab, 4X4, STX, Splash: WB = 114" (use 8 stiffness for end impacts, size value for side impacts)	1982		4	8	471
	Supercab, 4X4, STX, Splash: WB = 108" (use 8 stiffness for end impacts, size value for side impacts)	1982		3	8	471
COURIER	Imported pickup (use 7 stiffness for end impacts, size value for side impacts)	1972	1991	7	7	472
F-SERIES PICKUP	F100-F350 (use 8 stiffness for end impacts, size value for side impacts)	1940		per WB	8	481
OTHER LIGHT TRUCK		1972				498
UNKNOWN LIGHT TRUCK		1928				499
MEDIUM / HEAVY CBE	F-5 through F-8, L-series, FT-series	1953		NA	NA	881
MEDIUM / HEAVY COE LOW ENGRY	C / Ct series	1964		NA	NA	882
MEDIUM / HEAVY COE HIGH ENTRY	C / CLT series	1967		NA	NA	883
MEDIUM / HEAVY: UNKNOWN ENGINE LOCATION		1956				884
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1956				890
OTHER MEDIUM / HEAVY TRUCK		1965				898

Model	Includes	Start	End	Size	Stiffness	Model Code
FORD (Cont'd)						
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1956				899
UNKNOWN MEDIUM / HEAVY TRUCK		1956				899
MEDIUM BUS	B-series (not van based)	1964		NA	NA	981
OTHER BUS		1965				988
UNKNOWN BUS TYPE		1964				989
OTHER VEHICLE		1950				998
UNKNOWN VEHICLE		1960				999
FREIGHTLINER / WHITE						
MEDIUM / HEAVY TRUCK BASED MOTORHOME						850
MEDIUM / HEAVY - CBE		1965				881
MEDIUM / HEAVY - COE / LOW ENTRY		1968				882
MEDIUM / HEAVY - COE / HIGH ENTRY		1965				883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1963				884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1965				890
MEDIUM / HEAVY - OTHER		1965				898
FWD						
MEIDUM / HEAVY TRUCK BASED MOTORHOME		1965				850
MEDIUM / HEAVY - CBE		1965				881
MEDIUM / HEAVY - COE / LOW ENTRY		1965				882
MEDIUM / HEAVY - COE / HIGH ENTRY		1965				883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1965				884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1965				898
MEDIUM / HEAVY - OTHER		1965				898

Model	Includes	Start	End	Size	Stiffness	Model Code
GMC						
CABALLERO / SPRINT	Sierra Madre del Sur, SP (use 8 stiffness for end impacts, size value for side impacts)	1965	1977	4	8	7
	Sierra Madre del Sur, SP (use 8 stiffness for end impacts, size value for side impacts)	1978	1987	3	8	7
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
JIMMY / TYPHOON / ENVOY	S15 based (100.5" WB) (use 7 stiffness for end impacts, size value for side impacts)	1983		2	7	401
FULLSIZE JIMMY / YUKON	fullsize pikup based (use 8 stiffness for end impacts, size value for side impacts)	1969		3	8	421
SUBURBAN	all models (use 8 stiffness for end impacts, size value for side impacts)	1950		6	8	431
	Yukon XL	2000		TBD	TBD	431
SAFARI (MINIVAN)	(use 7 stiffness for end impacts, size value for side impacts)	1985		7	7	441
G-SERIES VAN	Rally Van, Vandura, G15-G35 (use 7 stiffness for end impacts, size value for side impacts)	1965		7	7	461
P-SERIES VAN	(use 7 stiffness for end impacts, size value for side impacts)	1965		TBD	TBD	466
VAN DERIVATIVE		1965		3	3	470
S15 / T15 / SONOMA	4X4, Cyclone (use 8 stiffness for end impacts, size value for side impacts)	1982		PER WB	8	471
C, K, R, V-SERIES PICKUP	C15-C35, K15-K35, R15-R35, V15-V35, SIERRA (use 8 stiffness for end impacts, size value for side impacts)	1940		PER WB	8	481
OTHER LIGHT TRUCK		1930				498
UNKNOWN LIGHT TRUCK		1951				499
MEDIUM / HEAVY CBE	W5000 / 6000 / 7000 series, Brigadier / General models	1967		NA	NA	881
MEDIUM / HEAVY COE LOW ENTRY	W6000 / W7000, all other COE, low entry	1968		NA	NA	882
MEDIUM / HEAVY COE HIGH ENTRY	Astro 95, all other COE, high entry	1969		NA	NA	883
MEDIUM / HEAVY: UNKNOWN ENGINE LOCATION		1948		NA	NA	884
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1967				890
OTHER MEDIUM / HEAVY TRUCK		1930				898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY		1930				899
UNKNOWN MEDIUM / HEAVY TRUCK		1948				899

Model	Includes	Start	End	Size	Stiffness	Model Code
GMC (Cont'd)						
MEDIUM BUS	B6000	1950		NA	NA	981
OTHER BUS		1965				988
UNKNOWN BUS TYPE		1950				989
UNKNOWN VEHICLE		1940				999
GRUMMAN						
LLV	Postal vehicles (see Chevrolet for VIN)	1987		NA	NA	441
STEP-IN VAN	Multi-stop, step van	1987		NA	NA	442
OTHER LIGHT TRUCK		1987				498
UNKNOWN LIGHT TRUCK		1987				499
MEDIUM / HEAVY TRUCK - CBE		1987				881
MEDIUM / HEAVY TRUCK - COE LOW ENTRY		1987				882
MEDIUM / HEAVY TRUCK - COE HIGH ENTRY		1987				883
MEDIUM / HEAVY TRUCK UNKNOWN ENGINE LOCATION		1987				884
MEDIUM / HEAVY TRUCK ENTRY POSITION UNKNOWN		1987				890
OTHER MEDIUM / HEAVY TRUCK		1987				898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY		1987				899
UNKNOWN MEDIUM / HEAVY TRUCK		1987				899
BUS-FLAT FRONT, REAR ENGINE	Transit	1950		NA	NA	983
OTHER BUS		1950				988
UNKNOWN BUS TYPE		1950				989
UNKNOWN VEHICLE		1950				999

Model	Includes	Start	End	Size	Stiffness	Model Code
HARLEY - DAVIDSON						
MOTORCYCLE (000-050CC)		1965	1966			701
MOTORCYCLE (051-124CC)		1948	1978			702
MOTORCYCLE (125-349CC)		1948	1978			703
MOTORCYCLE (350-449CC)		1969	1974			704
MOTORCYCLE (450-749CC)		1971	1978			705
MOTORCYCLE (750CC-OVER)		1932				706
MOTORCYCLE (UNKNOWN CC)		1932				709
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
HILLMAN						
UNKNOWN AUTOMOBILE		1965	1991			35
OTHER AUTOMOBILE		1965	1991			36
HINO						
MEDIUM / HEAVY - CBE		1985				806
MEDIUM / HEAVY - COE/ENTRY POSITION UNKNOWN		1985				806
MEDIUM / HEAVY - COE/HIGH ENTRY		1985				806
MEDIUM / HEAVY - COE/LOW ENTRY		1985				806
MEDIUM / HEAVY - OTHER		1985				806
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1985				806
MEDIUM / HEAVY BASED MOTORHOME		1985				806

Model	Includes	Start	End	Size	Stiffness	Model Code
HONDA						
CIVIC / CRX / DEL SOL	del Sol	1993	1997	1	1	31
	1300, 1500, CVCC, DX, EX, VX, CRX, S, Si, HF, 4WD Wagon	1973		1	1	31
ACCORD	LX, CVCC, SE-i, LX-i, EX, EX wagon (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1986	2	9	32
	LX, CVCC, SE-i, LX-i, EX, EX wagon, 6 cylinder LX / EX (use 9 stiffness for front impacts, size value for side or rear impacts)	1987		3	9	32
	LX, CVCC, SE-i, LX-i, EX, EX wagon	1976	1981	1	1	32
PRELUDE	Si (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	~~1998~~	2	9	33
	Si	1979	1983	1	1	33
600	Coupe, Sedan	1968	1972	1	1	34
S 2000		2000		TBD	TBD	35
INSIGHT		2000		TBD	TBD	36
OTHER AUTOMOBILE		1968				398
UNKNOWN AUTOMOBILE		1968				399
PASSPORT	LX, EX, DX (use 8 stiffness for end impacts, size value for side impacts)	1994		3	8	401
C-RV	LX, EX (use 8 stiffness for end impacts, size value for side impacts)	1997		3	8	402
ODYSSEY	LX, EX (use 8 stiffness for end impacts, size value for side impacts)	1995		4	8	441
OTHER LIGHT TRUCK		1994				498
UNKNOWN LIGHT TRUCK		1994				499
MOTORCYCLE (000-050CC)		1978				701
MOTORCYCLE (051-124CC)		1965				702
MOTORCYCLE (125-349CC)		1965				703
MOTORCYCLE (350-449CC)		1965				704
MOTORCYCLE (450-749CC)		1970				705
MOTORCYCLE (750CC-OVER)		1970				706
MOTORCYCLE (UNKNOWN CC)		1965				709
ATC / ATV (000-050CC)		1972				731
ATC / ATV (051-124CC)		1972				732
ATC / ATV (125-349CC)		1972				733
ATC / ATV (350CC-OVER)		1972				734

Model	Includes	Start	End	Size	Stiffness	Model Code
HONDA (Cont'd)						
ATC / ATV (UNKNOWN CC)		1972				739
UNKNOWN VEHICLE		1965				999
HUDSON						
OTHER AUTOMOBILE		1940		per WB	= size	398
UNKNOWN AUTOMOBILE		1940		per WB	= size	398
HYUNDAI						
PONY	Pony Excel (foreign)	1979	1988	2	2	31
EXCEL	GL, GLS, GS	1984	1994	1	1	32
SONATA	GL, GLS	1989		3	3	33
SCOUPE	LS Turbo	1991	1995	1	1	34
ELANTRA	GLS, GL	1992		2	2	35
ACCENT	L, GL, GS, Gsi, GT, Brio	1995		1	1	36
TIBURON	FX	1997		2	2	37
SANTA FE		2000		TBD	TBD	401
CROSSTOUR		2000		TBD	TBD	
OTHER AUTOMOBILE		1984				398
UNKNOWN AUTOMOBILE		1984				399
UNKNOWN VEHICLE		1984				999
IMPERIAL						
IMPERIAL	Lebaron	1954	1975	6	6	10
	Mark Cross, Frank Sinatra editions		~~1983~~	4	4	10
OTHER AUTOMOBILE		1965	1975			398
UNKNOWN AUTOMOBILE		1965	1975			399
UNKNOWN VEHICLE		1950	1975			999

Model	Includes	Start	End	Size	Stiffness	Model Code
INFINITI						
M30		1990	1992	3	3	31
Q45	Q45t, Touring	1990		4	4	32
G20	G20t, Touring, Standard	1991	1996	2	2	33
		1999		2	2	33
J30		1993	1997	3	3	34
I30		1996		3	3	35
OTHER AUTOMOBILE		1990				398
UNKNOWN AUTOMOBILE		1990				399
QX4		1997		8	8	401
OTHER LIGHT TRUCK		1997				498
UNKNOWN LIGHT TRUCK		1997				499
UNKNOWN VEHICLE		1990				999

Model	Includes	Start	End	Size	Stiffness	Model Code
INTERNATIONAL HARVESTER / NAVISTAR						
SCOUT	Scout II, Utility pu, SS-2, Roadstar, 800 series, Traveler, Terra Traveltop (use 8 stiffness for front and rear impacts, size value for side impacts)	1962	1980	per WB	8	421
TRAVELALL	1010-1210, 100-200 (use 8 stiffness for front and rear impacts, size value for side impacts)	1963	1975	per WB	8	431
MULTISTOP VAN	Metro RM, 120-160, MS 1210, MS 1510 (use 7 stiffness for front and rear impacts, size value for side impacts)	1960	1984	per WB	7	466
PICKUP	R-100-500, 900A-1500C/D, 1010-1510 (use 8 stiffness for front and rear impacts, size value for side impacts)	1951	1976	per WB	8	481
OTHER LIGHT TRUCK		1960				498
UNKNOWN LIGHT TRUCK		1951				499
TRUCK BASED MOTORHOME		1965				850
MEDIUM HEAVY - CBE	Loadstar / Fleetstar, Paystar, CBE Transtar, 4200, S-series Mixer	1963				881
MEDIUM / HEAVY - COE LOW ENTRY	CO, VCO, DCO, 190-1950, Cargostar, LFM, 5370 (Garbage)	1973				882
MEDIUM / HEAVY - COE HIGH ENTRY	DCO, DCOT, UCO, VCOT, 405-series, COE Transtar, Unistar, Conco 707B, 9600	1961				883
MEDIUM / HEAVY: UNKNOWN ENGINE LOCATION		1948				884
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1964				890
OTHER MEDIUM / HEAVY TRUCK	Fire Truck - R140-R306, CO 8190-	1955	1998			898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1953				899
UNKNOWN MEDIUM / HEAVY TRUCK		1953				899
BUS BASED MOTOHOME		1965				950
CONVENTIONAL BUS	R153-1853 - Loadstar, 1603-1853	1953	~~1998~~			981
BUS-FLAT FRONT, FRONT ENGINE	173FC, 183FC	1972	~~1998~~			982
BUS-FLAT FRONT, REAR ENGINE	183RE, 193RD-transit	1965	~~1998~~			983
OTHER BUS		1953				988
OTHER VEHICLE		1954				998
UNKNOWN VEHICLE		1951				999

Model	Includes	Start	End	Size	Stiffness	Model Code
ISUZU						
I-MARK	S, RS, Turbo	1981	1990	1	1	31
IMPULSE	Turbo, RS	1983	1992	2	2	32
STYLUS		1991	1994	2	2	33
OTHER AUTOMOBILE		1981	1994			398
UNKNOWN AUTOMOBILE		1981	1994			399
TROOPER / TROOPER II	Deluxe, LS (use 8 stiffness for end impacts, size value for side impacts)	1984	~~1998~~	2	7	401
RODEO	(use 8 stiffness for end impacts, size value for side impacts)	1991		3	8	402
AMIGO	(use 8 stiffness for end impacts, size value for side impacts)	1989	1994	2	8	403
OASIS	(use 7 stiffness for end impacts, size values for side impacts)	1996		4	7	441
P'UP (PICKUP) HOMBRE	4x4 (use 8 stiffness for end impacts, size value for side impacts)	1976	1995	3	8	471
	Hombre (use 8 stiffness for end impacts, size value for side impacts)	1996		3	8	471
OTHER LIGHT TRUCK		1981				498
UNKNOWN LIGHT TRUCK		1981				499
MEDIUM / HEAVY - CBE		1981				881
MEDIUM / HEAVY COE LOW ENTRY		1981				882
MEDIUM / HEAVY COE HIGH ENTRY		1981				883
MEDIUM / HEAVY COE UNKNOWN ENGINE LOCATION		1981				884
MEDIUM / HEAVY COE ENTRY POSITION UNKNOWN		1981				890
OTHER MEDIUM / HEAVY TRUCK		1981				898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1981				899
UNKNOWN MEDIUM / HEAVY TRUCK		1981				899
CONVENTIONAL FRONT ENGINE		1981				981
FRONT ENGINE/FLAT FRONT		1981				982
REAR ENGINE/FLAT FRONT		1981				983
OTHER BUS		1981				988

Model	Includes	Start	End	Size	Stiffness	Model Code
ISUZU (Cont'd)						
UNKNOWN BUS TYPE		1981				989
UNKNOWN VEHICLE		1981				999
IVECO / MAGIRUS						
MEDIUM / HEAVY BASED MOTORHOME		1980	1991			850
MEDIUM / HEAVY - CBE		1980	1991			881
MEDIUM / HEAVY - COE/LOW ENTRY		1980	1991			882
MEDIUM / HEAVY - COE/HIGH ENTRY		1980	1991			883
MEDIUM / HEAVY - UNKOWN ENGINE LOCATION		1980	1991			884
MEDIUM / HEAVY - COE/ENTRY POSITION UNKNOWN		1980	1991			890
MEDIUM / HEAVY - OTHER		1980	1991			898
JAGUAR						
XJ-S COUPE		1976		3	3	31
VANDEN PLAS		1999		5	5	32
XJ6 / 12 SEDAN / COUPE / XJ8	L, XJ, C, 340/420 Sedan	1949		3	3	32
XKE	V12, Roadster, 120	1946	1974	2	3	33
	2+2	1946	1974	3	3	33
X 100		1997	1998	TBD	TBD	34
S-TYPE		2000		TBD	TBD	35
OTHER AUTOMOBILE		1949				398
UNKNOWN AUTOMOBILE		1949				399
UNKNOWN VEHICLE		1949				999

Model	Includes	Start	End	Size	Stiffness	Model Code
JEEP / KAISER-JEEP						
CJ-2 / CJ-3 / CJ-4	Military: WB = 81" (use 8 stiffness for end impacts, size value for side impacts)	1940	1966	1	8	401
	Military: WB = 101" (use 8 stiffness for end impacts, size value for side impacts)	1940	1966	2	8	401
CJ-5 / CJ-6 / CH-7 / CH-8	Scrambler, Bolde Eagle, Renegade, Laredo, Wrangler: WB = 84" (use 8 stiffness for end impacts, size value for side impacts)	1967	1993	1	8	402
	Scrambler, Bolde Eagle, Renegade, Laredo, Wrangler: WB = 104" (use 8 stiffness for end impacts, size value for side impacts)	1967	1993	3	8	402
YJ-SERIES	Wrangler (use 8 stiffness for end impacts, size value for side impacts)	1986	1995	1	8	403
CHEROKEE 1984 ON	Grand (use 8 stiffness for end impacts, size value for side impacts)	1992		2	8	404
	Limited, Loredo, Pioneer, Briarwood (use 8 stiffness for end impacts, size value for side impacts)	1984		2	8	404
CHEROKEE (1963 - 1983)	Wide Track, Chief, Commando, Jeepster (use 8 stiffness for end impacts, size value for side impacts)	1963	1983	2	8	421
GRAND WAGONEER	Wagoneer (use 8 stiffness for end impacts, size value for side impacts)	1971	1991	3	8	431
	Custom, Bougham Limited (use 8 stiffness for end impacts, size value for side impacts)	1971	1991	2	8	431
PICKUP	J-10, J-20, Honcho (use 8 stiffness for end impacts, size value for side impacts)	1940	1993	per WB	8	481
COMANCHE	Chief: WB = 119" (use 8 stiffness for end impacts, size value for side impacts)	1986	1992	4	8	482
	Chief: WB = 111" (use 8 stiffness for end impacts, size value for side impacts)	1986	1992	3	8	482
OTHER LIGHT TRUCK		1940				498
UNKNOWN LIGHT TRUCK		1940				499
UNKNOWN VEHICLE		1940				999
JENSEN						
HEALY		1965	1991	per WB	= size	37
OTHER AUTOMOBILE		1965	1991			37
UNKNOWN AUTOMOBILE		1965	1991			37

Model	Includes	Start	End	Size	Stiffness	Model Code
KAWASAKI						
MOTORCYCLE (000-050CC)		1965	1982			701
MOTORCYCLE (051-124CC)		1965				702
MOTORCYCLE (125-349CC)		1965				703
MOTORCYCLE (350-449CC)		1975	1998			704
MOTORCYCLE (450-749CC)		1972				705
MOTORCYCLE (750CC-OVER)		1972				706
MOTORCYCLE (UNKNOWN CC)		1965				709
ATC / ATV (000-050CC)		1970	1988			731
ATC / ATV (051-124CC)		1970				732
ATC / ATV (125-349CC)		1970				733
ATC / ATV (350CC-OVER)		1970				734
ATC / ATV (UNKNOWN CC)		1970				739
OTHER MOTORED CYCLE		1965				798
UNKNOWN MOTORED CYCLE		1965				799
KENWORTH						
MEDIUM / HEAVY TRUCK BASED MOTORHOME		1965				850
MEDIUM / HEAVY - CBE	520, 540, T400, T600, T800, C500-550, W900	1947				881
MEDIUM / HEAVY - COE/LOW ENTRY	L700	1972				882
MEDIUM / HEAVY - COE / HIGH ENTRY	K100, K100E	1965				883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1954				884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1964				890
MEDIUM / HEAVY - OTHER		1965				898

Model	Includes	Start	End	Size	Stiffness	Model Code
KIA						
SEPHIA	RL, LS, GS (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		2	9	31
OTHER AUTOMOBILE		1994				398
UNKNOWN AUTOMOBILE		1994				399
SPORTAGE	EX (use 8 stiffness for end impacts, size value for side impacts)	1995		3	8	401
OTHER LIGHT TRUCK		1995				498
UNKNOWN LIGHT TRUCK		1995				499
UNKNOWN VEHICLE		1994				999
LADA						
OTHER AUTOMOBILE		1965	1991			53
UNKNOWN AUTOMOBILE		1965	1991			53
LAMBORGHINI						
COUNTACH 5000S		1965		per WB	= size	38
JALPA		1965		per WB	= size	38
OTHER AUTOMOBILE		1965				38
UNKNOWN AUTOMOBILE		1965				38
LANCIA						
BETA SEDAN-HPE		1946	1980	2	2	31
BETA COUPE - ZAGATO		1946	1982	1	1	32
SCORPION		1946	1978	1	1	33
OTHER AUTOMOBILE		1946	1982			398
UNKNOWN AUTOMOBILE		1946	1982			399
UNKNOWN VEHICLE		1946	1982			999

Model	Includes	Start	End	Size	Stiffness	Model Code
LAND ROVER						
DISCOVERY (LR)	SD, SE, SE7, LE, LSE, Series II, SER-Li (use 8 stiffness for end impacts, size value for side impacts)	1994		2	8	401
COUNTY LWB (RR) / COUNT CLASSIC (RR)	Count Classic (RR) (use 8 stiffness for end impacts, size value for side impacts)	1994		2	8	421
	County LWB (RR) (use 8 stiffness for end impacts, size value for side impacts)	1987	1994	3	8	421
4.0 SE (RR)	(use 8 stiffness for end impacts, size value for side impacts)	1995		3	8	422
DEFENDER 90 (LR)	(use 8 stiffness for end impacts, size value for side impacts)	1993	1995	1	8	422
OTHER LIGHT TRUCK		1987				498
UNKNOWN LIGHT TRUCK		1987				499
UNKNOWN VEHICLE		1987				999
LEXUS						
ES250 / ES-300		1990		3	3	31
LS400		1990		4	4	32
SC-300 / SC-400	2-door Coupe	1992		3	3	33
GS300 / GS400		1993		3	3	34
OTHER AUTOMOBILE		1990				398
UNKNOWN AUTOMOBILE		1990				399
RX300	(use 8 stiffness for end impacts, size value for side impacts)	1999		3	8	401
LX 450 / 470	(use 8 stiffness for end impacts, size value for side impacts)	1996		3	8	421
OTHER LIGHT TRUCK		1996				498
UNKNOWN LIGHT TRUCK		1996				499
UNKNOWN VEHICLE		1990				999

Model	Includes	Start	End	Size	Stiffness	Model Code
LINCOLN						
CONTINENTAL / TOWN CAR	Continental	1940	1979	6	6	1
	Continental	1980	1981	4	5	1
	Town Car	1982		4	5	1
MARK	VI	1980	1983	4	4	2
	VIII	1993	1998	4	4	2
	LSC, all Signature / Designer Series	1971	1980	5	5	2
	I, II, III, IV, V	1956	1970	4	4	2
	VII	1984	1992	3	3	2
CONTINENTAL (1982-ON)	All Signature / Designer Series	1982	1987	4	5	5
	All Signature / Designer Series	1988		3	3	5
VERSAILLES		1977	1980	3	3	11
LS		2000		TBD	TBD	12
OTHER AUTOMOBILE	Cosmopolitan, Capri, Premiere	1940				398
UNKNOWN AUTOMOBILE		1940				399
NAVIGATOR	(use 8 stiffness for end impacts, size value for side impacts)	1997		5	8	421
BLACKWOOD		2000		TBD	TBD	
OTHER LIGHT TRUCK		1997				498
UNKNOWN LIGHT TRUCK		1997				499
UNKNOWN VEHICLE		1997				999
LOTUS						
ESPRIT		1967		per WB	= size	39
EUROPE		1967		per WB	= size	39
OTHER AUTOMOBILE		1967				39
UNKNOWN AUTOMOBILE		1967				39
MACK						
MEDIUM / HEAVY BASED MOTORHOME	Truck based	1965				850
MEDIUM / HEAVY - CBE		1968				881
MEDIUM / HEAVY - COE / LOW ENTRY		1965				882
MEDIUM / HEAVY - COE / HIGH ENTRY		1977				883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1956				884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1972				890
MEDIUM / HEAVY - OTHER		1971				898

Model	Includes	Start	End	Size	Stiffness	Model Code
MARMON						
MEDIUM / HEAVY - CBE						898
MEDIUM / HEAVY - COE/ENTRY POSITION UNKNOWN						898
MEDIUM / HEAVY - COE/HIGH ENTRY						898
MEDIUM / HEAVY - COE / LOW ENTRY						898
MEDIUM / HEAVY - OTHER						898
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION						898
MEDIUM / HEAVY BASED MOTORHOME						898
MASERATI						
BITURBO		1965		per WB	= size	40
OTHER AUTOMOBILE		1965				40
UNKNOWN AUTOMOBILE		1965				40

Model	Includes	Start	End	Size	Stiffness	Model Code
MAZDA						
RX2		1972	1974	2	2	31
RX3		1972	1978	1	1	32
RX4		1974	1978	2	2	33
RX7	S, GS, GSL, SE	1979	1998	2	2	34
GLC / PROTÉGÉ / 323	DX	1977		1	1	35
	323	1977	1994	1	1	35
	Protege	1990		1	1	35
COSMO		1976	1978	2	2	36
626	GT, GS, GSL, SE	1979		2	2	37
808		1972	1977	1	1	38
MIZER		1976	1976	1	1	39
R-100		1950	1972	1	1	40
616 / 618		1968	1972	2	2	41
1800		1968	1972	2	2	42
929		1988	1996	3	3	43
MX-6	Turbo	1988	1996	2	2	44
MIATA	MX-5	1990		1	1	45
MX-3	GS	1992	1995	1	1	46
MILLENIA		1995		3	3	47
OTHER AUTOMOBILE	1200	1950				398
UNKNOWN AUTOMOBILE		1950				399
NAVAJO	(use 8 stiffness for end impacts, size value for side impacts)	1991	1994	3	8	401
TRIBUTE		2000		TBD	TBD	
MPV	LX, ES, DX, All Sport (use 7 stiffness for end impacts, size value for side impacts)	1989		3	7	441
MAZDA PICKUP	Cab Plus, B-4000 (use 8 stiffness for end impacts, size value for side impacts)	1994		PER WB	8	471
	B-2000, B-2200, B-2600, SE-5, LX (use 8 stiffness for end impacts, size value for side impacts)	1972		PER WB	8	471
OTHER LIGHT TRUCK		1965				498
UNKNOWN LIGHT TRUCK		1965				499
UNKNOWN VEHICLE		1950				999

Model	Includes	Start	End	Size	Stiffness	Model Code
MERCEDES BENZ						
200 / 220 / 230 / 240 / 250 / 260 / 280 / 300 / 320 SE, CD, D, SD, ETC	Sedan and 5 passenger "C" only, SE, CD, D, SD, TD, TE, CE, E, (DOES NOT include 280 SE) (75 on)	1950	1997	3	3	31
230 / 280 SL	2 seater only	1964		1	1	32
300 / 350 / 380 / 450 / 500SL / 560SL	300/500 SL	1990	1994	2	2	33
	2 seater only	1972	1994	2	2	33
350 / 380 / 420 / 450 / 560 / SLC		1973	1994	4	4	34
280 / 300SEL		1967	1972	4	4	35
380 / 420 / 450 / 500 / 560SEL / 500SEC / 560SEC / 350SDL / 300SDL		1973	1994	4	4	36
300 SE / 380 / 450 SE	280 S, 300 SD Sedan / 350 SD	1968	1974	4	4	37
	280 SE	1975	1994	4	4	37
600, 6.9 SEDAN	Pullman	1978	1987	6	6	38
190	D, E, 2.3, 2,5	1984	1993	3	3	39
300	CE Cabriolet	1993	1994	3	3	40
E 400 / 500	SE	1992	1994	3	3	41
C 220 / 280	C220 / C230 (Kompressor) / C280 / C36 / C43	1997		3	3	42
S CLASS	S320 / S350 / S420 / S430 / S500 / S600	1995				43
SL CLASS	SL320 / 500 / 600	1995				44
SLK	SLK 230, Kompressor	1998				45
CL	CL500, CL 600	1998				46
CLK	CLK320, CLK430, Cabriolet	1998				47
E	E300 / TD, E320, E320 Wagon, E420, E430, E55	1996				48
OTHER AUTOMOBILE		1946				398
UNKNOWN AUTOMOBILE		1946				399
M	ML320 / ML430 (use 8 stiffness for end impacts, size value for side impacts)	1997		4	8	401
VAN DERIVATIVE	Kurbstar	1982		NA	NA	470
OTHER LIGHT TRUCK		1946				498
UNKNOWN LIGHT TRUCK		1946				499
MEDIUM / HEAVY - CBE		1965				881
MEDIUM / HEAVY - COE LOW ENTRY		1965				882
MEDIUM / HEAVY - COE HIGH ENTRY		1965				883
MEDIUM / HEAVY; UNKNOWN ENGINE LOCATION		1965				884
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1965				890

Model	Includes	Start	End	Size	Stiffness	Model Code
MERCEDES (Cont'd)						
OTHER MEDIUM / HEAVY TRUCK		1965				898
UNKNOWNTYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1965				899
UNKNOWN MEDIUM / HEAVY TRUCK		1965				899
MEDIUM BUS		1965				981
OTHER BUS		1965				988
UNKNOWN BUS TYPE		1965				989
UNKNOWN VEHICLE		1946				999

Model	Includes	Start	End	Size	Stiffness	Model Code
MERCURY						
CYCLONE	GT, CJ, Spoiler	1964	1971	4	4	2
CAPRI - DOMESTIC	RS, Turbo, GS, Black Magic	1979	1986	2	2	3
COUGAR / XR7	XR-7, RS, LS, GS, Eliminator, Brougham, Villager, (includes all body styles): WB=118"	1977	1979	5	5	4
	XR-7, RS, LS, GS, Eliminator, Brougham, Villager, (includes all body styles): WB=114"	1977	1979	4	4	4
	XR-7, RS, LS, GS, Eliminator, Brougham, Villager, (includes all body styles)	1980	1988	3	3	4
	XR-7, RS, LS, GS, Eliminator, Brougham, Villager, (includes all body styles)	1989	1997	4	4	4
	XR-7, RS, LS, GS, Eliminator, Brougham, Villager, (includes all body styles)	1967	1976	4	4	4
MARQUIS / MONTEREY	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis: WB=121"	1952	1978	5	5	6
	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis	1979	1982	4	4	6
	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis: WB=106"	1982	1998	3	3	6
	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis: WB=114"	1982	1998	4	4	6
	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis: WB=124"	1952	1978	6	6	6
COMET	Capri	1966	1967	4	4	8
	Caliente, GT, Voyager, 202	1971	1977	3	3	8
	Caliente, GT, Voyager, 202	1962	1967	4	4	8
BOBCAT	Runabout, Villager (Stiffness 1 for front and side impacts, Stiffness 2 for rear impacts)	1975	1980	1 / 2	1	9
MONTEGO	GT, MX, Villager, Brougham	1968	1973	3	3	10
	GT, MX, Villager, Brougham: WB = 114"	1972	1976	4	4	10
	GT, MX, Villager, Brougham: WB = 114"	1972	1976	3	3	10
	Comet	1968	1970	3	3	10
MONARCH	Ghia	1975	1980	3	3	11
ZEPHYR	GS, Z-7	1978	1983	3	3	12
LYNX / LN-7 (1982-1983)	L, LS, GS, RS, XR-3 (use 9 stiffness for front impacts, size value for side or rear impacts)	1981	1987	1	9	13
TOPAZ	L, LS, GS, 4 X 4 (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	1994	2	9	15
SABLE	LS, GS	1986		3	3	17
CAPRI - FOREIGN	Capri II	1970	1977	2	2	31
	2 + 2	1989	1994	1	1	31
PANTERA	deTomaso	1972	1974	2	2	33
TRACER	L, GL	1994		1	1	36
MYSTIQUE	(use 9 stiffness for front impacts, size value for side or rear impacts)	1994		3	9	37
COUGAR	V-6, I-4	1999				38
OTHER AUTOMOBILE		1962				398
UNKNOWN AUTOMOBILE		1950				399

Model	Includes	Start	End	Size	Stiffness	Model Code
MERCURY (Cont'd)						
MOUNTAINEER	(use 7 stiffness for end impacts, size value for side impacts)	1996		.	7	401
VILLAGER	LS, GS, Nautica, Estate, Sport (use 7 stiffness for end impacts, size value for side impacts)	1993		4	7	443
OTHER LIGHT TRUCK		1993				498
UNKNOWN LIGHT TRUCK		1993				499
UNKNOWN VEHICLE		1950				999
MERKUR						
XR4Ti	Turbo	1985	1989	3	3	31
SCORPIO	Turbo	1987	1990	3	3	32
OTHER AUTOMOBILE		1985	1990			398
UNKNOWN AUTOMOBILE		1985	1990			399
UNKNOWN VEHICLE		1985	1990			999
MG						
MIDGET	GAN I / II / III / 4 / 5 ? MKI , MKII, MKIII	1962	1980			31
MGB (1976 - 1979)		1976	1979	1	1	32
MGB (1967-1975)	GT, MKIII	1967	1975	1	1	33
MGA	1500, 1600, YT, TC, TD / II, MK I / II, A	1945	1962	1	1	34
TA / TC / TD / TF	Y-Type, 430, TDC	1945	1962	1	1	35
MGC	GT	1968	1969	1	1	36
MAGNETTE / SPORTS SEDANS	ZB, ZA / YA / YB, MK III, MK IV, 1100,1300	1945	1966			
OTHER AUTOMOBILE		1945	1980			398
UNKNOWN AUTOMOBILE		1945	1980			399
UNKNOWN VEHICLE		1945	1980			999

Model	Includes	Start	End	Size	Stiffness	Model Code
MITSUBISHI						
STARION	2+2, LE, Turbo	1983	1990	2	2	31
TREDIA	L, LS, Turbo	1983	1988	2	2	32
CORDIA	L, Turbo	1983	1988	2	2	33
GALANT	Sigma	1985	1988	3	3	34
	ECS, ES, LS, DE, GTZ	1985		3	3	34
MIRAGE	L, Turbo, GS, LS, DS, DE	1985		1	1	35
PRECIS		1987	1994			36
ECLIPSE	GS, DOHL, Turbo, GS-T,GSX, Spyder, RS	1990		2	2	37
SIGMA	(prior to 1989 see Galant)	1989	1990	3	3	38
3000GT	Spyder, VR-4, SL	1991		2	2	39
DIAMANTE	LS, ES, LE	1992		3	3	40
OTHER AUTOMOBILE	500, 1000, Debonair, Galant (1969)	1960				398
UNKNOWN AUTOMOBILE		1960				399
MONTERO	Sport, LS, SR, XLS, ES, LTD (use 8 stiffness for end impacts, size value for side impacts)	1985		1	8	401
MINIVAN	LS (use 8 stiffness for end impacts, size value for side impacts)	1987	1990	1	8	441
EXPO WAGON	LRV, Sport WB = 107.1" (use 7 stiffness for end impacts, size value for side impacts)	1992	1995	3	7	442
	LRV, Sport WB = 99.2" (use 7 stiffness for end impacts, size value for side impacts)	1992	1995	2	7	442
PICKUP	Mighty Max, SPX, 4 X 4 (use 8 stiffness for end impacts, size value for side impacts)	1983	1996	3	8	471
OTHER LIGHT TRUCK		1983				498
UNKNOWN LIGHT TRUCK		1983				499
MEDIUM / HEAVY - COE LOW ENTRY	FUSO FE	1983		NA	NA	882
OTHER MEDIUM / HEAVY TRUCK		1983				898
UNKNOWN TYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1983				899
UNKNOWN MEDIUM / HEAVY TRUCK		1983				899
CONVENTIONAL FRONT ENGINE		1981				981
FRONT ENGINE / FLAT FRONT		1981				982
REAR ENGINE / FLAT FRONT		1981				983
OTHER BUS		1981				988
UNKNOWN TYPE BUS		1981				989
UNKNOWN VEHICLE		1981				999

Model	Includes	Start	End	Size	Stiffness	Model Code
MORRIS						
MINOR		1965	1991	per WB	= size	41
OTHER AUTOMOBILE		1965	1991			41
UNKNOWN AUTOMOBILE		1965	1991			41
MOTO-GUZZI						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)		1965	1976			704
MOTORCYCLE (450-749CC)		1965	1976			705
MOTORCYCLE (750CC-OVER)		1965				706
MOTORCYCLE (UNKNOWN CC)		1965				709
ATC / ATV (000-050CC)						731
ATC / ATV (051-124CC)						732
ATC / ATV (125-349CC)						733
ATC / ATV (350CC-OVER)						734
ATC / ATV (UNKNOWN CC)						739
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
NEOPLAN						
BUS - CONVENTIONAL FRONT ENGINE		1950				902
BUS - FRONT ENGINE / FLAT FRONT		1950				902
BUS - REAR ENGINE / FLAT FRONT		1950				902
BUS BASED MOTORHOME		1950				902
OTHER BUS		1950				902

Model	Includes	Start	End	Size	Stiffness	Model Code
NISSAN / DATSUN						
F10		1977	1978	1	1	31
200 / 240 SX	SE, SE-R, LE	1984	1998	2	2	32
		1974	1983	1	1	32
1200 / 210 / B210	Honeybee	1971	1982	1	1	33
Z-CAR, ZX	240 / 260 / 280Z, 300 ZX, Turbo	1970	1996	1	1	34
	2+2	1975	1978	3	3	34
	2+2	1979	1996	2	2	34
310		1979	1982	1	1	35
510	PL,	1978	1981	1	1	36
	PL, WPL	1968	1973	2	2	36
610	PL	1973	1976	2	2	37
710	PL	1974	1977	2	2	38
810 / MAXIMA	SE, GXE, GLE	1977		3	3	39
ROADSTER	SPL 311, SRL 311, 1600, 2000, convertible, Fairlady	1950	1970	1	1	40
311, 411	1000, Bluebird, PL311 / PL312 / PL410 / PL411 / RL411	1959	1967	1	1	41
STANZA	XE, GXE	1982	1992	2	2	42
SENTRA	E, XE, GXE, SE, SE-R, GLE	1983		1	1	43
PULSAR	EXA	1986	1990	2	2	44
	NX	1983	1990	2	2	44
MICRA		1987	1994	1	1	45
NX 1600 / 2000	T-bar coupe	1992	1994	2	2	46
ALTIMA	XE, GXE, SE, GLE	1993		2	2	47
OTHER AUTOMOBILE	110 sedan, K110	1955				398
UNKNOWN AUTOMOBILE		1955				399
PATHFINDER	MPV, 4X4, XE, LE, SE use 8 stiffness for end impacts, size value for side impacts)	1986		3	8	401
Xterra	XE, SE	2000				
VAN	XE, GXE (use 7 stiffness for end impacts, size value for side impacts)	1988		1	7	441
AXXESS	(use 7 stiffness for end impacts, size value for side impacts)	1989	1990	3	7	442
QUEST	XE, GXE, SE, GLE (use 7 stiffness for end impacts, size value for side impacts)	1993		4	7	443
Altra EV	Electric Vehicle	1998				
DATSUN / NISSAN PICKUP / FRONTIER	PL620, King Cab, Hardbody (use 8 stiffness for end impacts, size value for side impacts)	1955		PER WB	8	471
OTHER LIGHT TRUCK	Patrol (1960) (use 8 stiffness for end impacts, size value for side impacts)	1955		PER WB	8	498
UNKNOWN LIGHT TRUCK		1955				499

Model	Includes	Start	End	Size	Stiffness	Model Code
NISSAN / DATSUN (Cont'd)						
MEDIUM / HEAVY COE HIGH ENTRY		1986				883
OTHER MEDIUM / HEAVY TRUCK		1986				898
UNKNOWN TYPE TRUCK (LIGHT / MEDIUM / HEAVY)		1986				899
UNKNOWN MEDIUM / HEAVY TRUCK		1986				899
UNKNOWN VEHICLE		1950				999
NORTON						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)		1950				704
MOTORCYCLE (450-749CC)		1950				705
MOTORCYCLE (750CC-OVER)		1950				706
MOTORCYCLE (UNKNOWN CC)		1950				709
OTHER MOTORED CYCLE		1950				798
UNKNOWN MOTORED CYCLE		1950				799

Model	Includes	Start	End	Size	Stiffness	Model Code
OLDSMOBILE						
CUTLASS (RWD-ONLY)	Classic	1988	1988	3	3	1
	Supreme, S, LS, Salon, Brougham, Vista Cruiser, Rallye 350, Hurst Olds, 442, Calais	1978	1988	3	3	1
	Supreme, S, LS, Salon, Brougham, Vista Cruiser, Rallye 350, Hurst Olds, 442, Calais (use 9 stiffness for front impacts, size value for side or rear imp	1960	1977	4	4	1
	F85	1960	1972	4	4	1
DELTA 88	Royale, Custom, Delta, Jetstar 88, Delmont 88, Custom Cruiser	1977	1985	4	4	2
	Royale, Custom, Delta, Jetstar 88, Delmont 88, Custom Cruiser	1949	1976	6	6	2
	Royale, Custom, Delta, Jetstar 88, Delmont 88, Custom Cruiser (use 9 stiffness for front impacts, size value for side or rear impacts)	1985		4	9	2
	Starfire		1966	6	6	2
NINETY-EIGHT	Regency, Luxury	1986		4	4	3
	Regency, Luxury	1977	1984	5	5	3
	Regency, Luxury		1976	6	6	3
TORONADO	XSR, Trofeo, Brougham, Custom	1986	1992	3	3	5
	XSR, Trofeo, Brougham, Custom	1979	1985	4	4	5
	XSR, Trofeo, Brougham, Custom	1966	1978	5	5	5
COMMERCIAL SERIES	Ambulance / Hearse	1940		6	6	6
STARFIRE	SX, GT	1975	1980	2	2	12
OMEGA	X-body type FWD (use 9 stiffness for front impacts, size value for side or rear impacts)	1980	1985	3	9	15
	RWD	1975	1979	4	4	15
FIRENZA	S, LS, SX, Cruiser, GT (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1988	2	9	16
CIERA	Cutlass Ciera, Brougham, ES (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1996	3	9	17
CALAIS	GT, ES, 500 (use 9 stiffness for front impacts, size value for side or rear impacts)	1985	1991	3	9	18
CUTLASS (FWD)	Supreme (use 9 stiffness for front impacts, size value for side or rear impacts)	1988		3	9	20
ACHIEVA	SC (use 9 stiffness for front impacts, size value for side or rear impacts)	1992		3	9	21
AURORA	(use 9 stiffness for front impacts, size value for side or rear impacts)	1994		4	9	22
INTRIGUE	GL, GX, GLS	1997				23
ALERO		1999				24
OTHER AUTOMOBILE		1930				398
UNKNOWN AUTOMOBILE		1930				399

Model	Includes	Start	End	Size	Stiffness	Model Code
OLDSMOBILE (Cont'd)						
BRAVADA	(use 7 stiffness for end impacts, size value for side impacts)	1991	1994	2	7	401
	(use 7 stiffness for end impacts, size value for side impacts)	1996		2	7	401
SILHOUETTE	GL, GLS, Series I, Series II, GS, Premier Edition (use 7 stiffness for end impacts, size value for side impacts)	1990		3	7	441
OTHER LIGHT TRUCK		1932				498
UNKNOWN LIGHT TRUCK		1932				499
OTHER VEHICLE		1932				998
UNKNOWN VEHICLE		1932				999
OSHKOSH						
MEDIUM / HEAVY - CBE		1965				805
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1965				805
MEDIUM / HEAVY - COE / HIGH ENTRY		1965				805
MEDIUM / HEAVY - COE / LOW ENTRY		1965				805
MEDIUM / HEAVY - OTHER		1965				805
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1965				805
MEDIUM / HEAVY BASED MOTORHOME		1965				805
OTHER DOMESTIC MANUFACTURER						
OTHER AUTOMOBILE						398
UNKNOWN MAKE						399
OTHER LIGHT TRUCK						498
OTHER MEDIUM / HEAVY TRUCK						898
OTHER BUS						988
OTHER VEHICLE						998

Model	Includes	Start	End	Size	Stiffness	Model Code
OTHER FOREIGN MANUFACTURER						
OTHER AUTOMOBILE						398
OTHER LIGHT TRUCK						498
OTHER MEDIUM / HEAVY TRUCK						898
OTHER BUS						988
OTHER VEHICLE						998
OTHER MAKE						
OTHER AUTOMOBILE						398
OTHER LIGHT TRUCK						498
TRUCK BASED MOTORHOME						850
OTHER MEDIUM / HEAVY TRUCK						898
BUS BASED MOTORHOME						950
OTHER BUS						988
OTHER VEHICLE						998
OTHER MAKE MOPED						
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
OTHER MAKE MOTORED CYCLE						
0-50cc						701
51-124cc						702
125-349cc						703
350-449cc						704
450-749cc						705
750c or greater						706
Unknown cc						709

Model	Includes	Start	End	Size	Stiffness	Model Code
PETERBILT						
MEDIUM / HEAVY BASED MOTORHOME		1965				850
MEDIUM / HEAVY - CBE		1974				881
MEDIUM / HEAVY - COE / LOW ENTRY		1965				882
MEDIUM / HEAVY - COE / HIGH ENTRY		1965				883
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1961				884
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1964				890
MEDIUM / HEAVY - OTHER		1965				898
PEUGEOT						
304		1971	1973	3	3	31
403		1955	1967	3	3	32
404	Station Wagon	1961	1970	4	4	33
		1961	1970	3	3	33
504 / 505	STI, STX, Turbo, S, GL GLS, Liberte	1970	1991	3	3	34
	Station Wagon	1970	1991	4	4	34
604	SL, D	1977	1984	3	3	35
405	Mi-16, DL, S (use 9 stiffness for front impacts, size value for side or rear impacts)	1989	1991	3	9	36
OTHER AUTOMOBILE		1945	1991			398
UNKNOWN AUTOMOBILE		1945	1991			399
MOTORCYCLE (000-050CC)		1965	1983			701
MOTORCYCLE (051-124CC)		1965	1983			702
MOTORCYCLE (UNKNOWN CC)		1965	1983			709
UNKNOWN MOTORED CYCLE		1960	1983			799
UNKNOWN VEHICLE		1945	1983			999

Model	Includes	Start	End	Size	Stiffness	Model Code
PLYMOUTH						
VALIANT / DUSTER / SCAMP	100, 200, Brougham, Signet, Custom, Special, 340 / 360, Twister: WB = 108"	1960	1976	3	3	1
	100, 200, Brougham, Signet, Custom, Special, 340 / 360, Twister: WB = 111"	1960	1976	4	4	1
SATELLITE / BELVEDERE	Belveder I / II, GTX, Roadrunner, Sebring, Sebring Plus, Superbird, Brougham	1951	1974	4	4	2
FURY	Roadrunner	1975	1975	5	5	3
	I, II, III	1957	1974	5	5	3
	Salon, VIP, Sport, Suburban	1975	1978	4	4	3
GRAN FURY	Sedan, Brougham, Custom Sport, Suburban	1975	1981	5	5	4
	Sedan, Brougham, Custom Sport, Suburban	1982	1989	4	4	4
BARRACUDA	Formula, S, 340, AAR, 'Cuda, Gran Coupe	1965	1973	3	3	5
VOLARE	Custom, Premier, Roadrunner, Police: WB=109"	1976	1980	3	3	6
	Custom, Premier, Roadrunner, Police: WB=113"	1976	1980	4	4	6
CARAVELLE	Turbo, SE (use 9 stiffness for front impacts, size value for side or rear impacts)	1985	1989	3	9	7
HORIZON	TC-3, Miser, Turismo 2.2, Custom, SE, America Expo	1978	1990	2	2	8
	Duster	1985	1990	2	2	8
RELIANT (K)	SE, LE (use 9 stiffness for front impacts, size value for side or rear impacts)	1981	1989	2	9	11
SCAMP (CAR BASED PICKUP)	GT, 2.2	1982	1984	2	2	13
SUNDANCE	Turbo (use 9 stiffness for front impacts, size value for side or rear impacts)	1987	1994	2	9	17
ACCLAIM	LX, LE (use 9 stiffness for front impacts, size value for side or rear impacts)	1989	1995	3	9	19
NEON	Expresso, Sport, Highline (use 9 stiffness for front impacts, size value for side or rear impacts)	1994		3	9	20
CRICKET		1971	1972	2	2	31
ARROW	Fire Arrow, GS, GT	1976	1980	1	1	32
SAPPORO	all imported	1978	1983	2	2	33
CHAMP / COLT (EXCLUDES VISTA)	Turbo, Custom	1979	1994	1	1	34
	Station Wagon (WB = 103")	1984	1994	3	2	34
CONQUEST	TSI	1984	1989	2	2	35
LASER	RS, Turbo	1989		2	2	37
BREEZE	(use 9 stiffness for front impacts, size value for side or rear impacts)	1996		3	9	38
PROWLER	Roadster	1997				39
PT CRUISER		2000		TBD	TBD	
OTHER AUTOMOBILE		1930				398
UNKNOWN AUTOMOBILE		1965				399

Model	Includes	Start	End	Size	Stiffness	Model Code
PLYMOUTH (Cont'd)						
TRAILDUSTER	(use 8 stiffness for end impacts, size value for side impacts)	1974	1993	3	8	421
COLT VISTA	4 X 4 (use 7 stiffness for end impacts, size value for side impacts)	1987	1994	3	7	441
VOYAGER (MINIVAN)	SE, LX: WB = 112" (use 7 stiffness for end impacts, size value for side impacts)	1984		4	7	442
	SE, LX: WB = 119" (use 7 stiffness for end impacts, size value for side impacts)	1984		5	7	442
ARROW PICKUP (FOREIGN)	(use 8 stiffness for end impacts, size value for side impacts)	1975	1991	per WB	8	471
OTHER LIGHT TRUCK		1965				498
UNKNOWN LIGHT TRUCK		1974				499
UNKNOWN VEHICLE		1957				999

Model	Includes	Start	End	Size	Stiffness	Model Code
PONTIAC						
LEMANS / TEMPEST (THRU 1979)	Safari, T-37, Luxury, Grand Sport, GT-37, Sprint, Grand Lemans	1976	1977	4	4	1
	Safari, T-37, Luxury, Grand Sport, GT-37, Sprint, Judge Grand AM, Grand Lemans	1973	1975	4	4	1
	Safari, T-37, Luxury, Grand Sport, GT-37, Sprint, Grand Lemans	1978	1979	3	3	1
	Safari, T-37, Luxury, Grad Sport, GTO, GT-37, Sprint, Grand Lemans	1961	1973	4	4	1
BONNEVILLE / CATALINA / PARISIENNE	Brougham, Gand Safari, Safari, Granville, 2+2 Executive, Starchief	1954	1968	5	5	2
	Brougham, Gand Safari, Safari, Granville, 2+2 Executive, Starchief	1977	1981	4	4	2
	Brougham, Gand Safari, Safari, Granville, 2+2 Executive, Starchief	1982	1984	3	3	2
	Parisienne	1983	1984	4	4	2
	SE, SSE, SSEi	1987		4	4	2
	Brougham, Gand Safari, Safari, Granville, 2+2 Executive, Starchief	1969	1976	6	6	2
FIERO	2M4, 2M6, GT, SE	1984	1988	1	1	5
VENTURA	II, SJ, Sprint, Custom	1971	1977	4	4	8
	GTO	1974	1977	4	4	8
FIREBIRD / TRANS- AM	Esprit, Formula, GTA, Redbird, Yellowbird, Skybird, SE	1967	1981	3	3	9
	Esprit, Formula, GTA, Redbird, Yellowbird, Skybird, SE	1982		2	2	9
GRAND PRIX (RWD)	J, LJ, SJ, Brougham, 2+2	1978	1987	3	3	10
	J, LJ, SJ, Brougham, 2+2	1973	1977	4	4	10
	J, LJ, SJ, Brougham, 2+2	1963	1972	5	5	10
ASTRE	Safari, SJ, Custom	1975	1977	2	2	11
SUNBIRD (THRU 80)	Safari, Sport, Formula	1976	1980	2	2	12
T1000 / 1000	4 door	1981	1987	2	2	13
	2 door	1981	1987	1	1	13
PHOENIX	LJ, SJ (use 9 stiffness for front impacts, size value for side or rear impacts)	1980	1984	3	9	15
	LJ, SJ	1977	1979	4	4	15
J2000 / SUNBIRD / SUNFIRE	Sunbird (use 9 stiffness for front impacts, size value for side or rear impacts)	1984	1994	2	9	16
	Sunfire-GT / SE (use 9 stiffness for front impacts, size value for side or rear impacts)	1995		2	9	16
	Le, Se, GT, Convertible (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1994	2	9	16
6000	STE, SE, LE (use 9 stiffness for front impacts, size value for side or rear impacts)	1982	1991	3	9	17
GRAND AM	SE, LE	1980	1980	3	3	18
	SE, LE (use 9 stiffness for front impacts, size value for side or rear impacts)	1985		3	9	18

Model	Includes	Start	End	Size	Stiffness	Model Code
PONTIAC (Cont'd)						
GRAND PRIX (FWD)	SE, McLaren Turbo, GTP (use 9 stiffness for front impacts, size value for side or rear impacts)	1988		3	9	20
LEMANS (1988-on)	SE, Tempest (Canadian)	1988	1993	2	2	31
OTHER AUTOMOBILE	Torpedo, Streamliner, Chieftain Star Chief, Super Cheif	1946				398
UNKNOWN AUTOMOBILE		1926				399
TRANS SPORT / MONTANA	SE, Montana (use 7 stiffness for end impacts, size value for side impacts)	1990		3	7	441
OTHER LIGHT TRUCK		1951				498
UNKNOWN LIGHT TRUCK		1951				499
UNKNOWN VEHICLE		1926				999
PORSCHE						
911	L, S, E, T, SC, Carrera, Slopenose, Speedstar, Carrera Targa, 4S, Turbo, B-series, S-Coupe, S-Cabriolet	1965		1	1	31
	Panorama	1996		1	1	31
912	E, T	1966	1969	1	1	32
		1976	1976			32
914	S, 1.8, 2.0, 914 / 6	1970	1976	2	2	33
924	Turbo, S	1977	1988	1	1	34
928	S, S4, GT, GTS	1978	1995	2	2	35
930	Turbo	1979	1979	1	1	36
944	Turbo, S	1983	1992	1	1	37
959	(Not Imported to U.S.)	1989	1994	1	1	38
968		1992	1995	1	1	39
986 BOXSTER		1997				40
OTHER AUTOMOBILE	Spyder, Speedster (prior to 1965), 356, (A, B, C) Grund, America, Super, 1500	1948		PER WB	PER WB	398
UNKNOWN AUTOMOBILE		1948				399
UNKNOWN VEHICLE		1948				999
RELIANT						
OTHER AUTOMOBILE		1960	1991			49
UNKNOWN AUTOMOBILE		1960	1991			49

Model	Includes	Start	End	Size	Stiffness	Model Code
RENAULT / AMC						
LECAR	R-5, R5TL, GTL, TL, DLX	1976	1983	2	2	31
DAUPHINE / 10 / R-8 / CARAVELLE		1955	1971	1	1	32
12	R-12L, R-12TL / GTL	1972	1977	2	2	33
15	R15TL	1973	1976	2	2	34
16	R16, R-1152	1969	1972	3	3	35
17	R17, Gordini Coupe, R17TL	1973	1980	2	2	36
R18i	Sportwagon, Deluxe, DLX	1981	1986	2	2	37
FUEGO	TL, TS, GTL, GTS, Turbo	1982	1985	2	2	38
ALLIANCE / ENCORE / GTA, CONVERTIBLE	L, DL, Limited, X-37	1983	1987	2	2	39
ALPINE	GT, GTA Coupe (not imported to U.S.)	1971	1990	PER WB	PER WB	41
MEDALLION	DL, LX	1987	1987	3	3	44
PREMIER		1987	1987	3	3	45
OTHER AUTOMOBILE	Juvaquatre,4CV, Fregate, Domaine	1946	1989			398
UNKNOWN AUTOMOBILE		1946	1989			399
UNKNOWN VEHICLE		1946	1989			999
ROLLS ROYCE / BENTLEY						
CLOUD / SHADOW SERIES	Cloud / Shadow Series, Silver Spur, Silver Dawn, Silver Spirit, Silver Seraph	1926		per WB	= size	42
OTHER AUTOMOBILE		1926				42
UNKNOWN AUTOMOBILE		1926				42
SAAB						
99 / 99E / 900	S, Turbo, Cabriolet, GL,GLE, L, LE, 2CM, 4CM, 2EM, 4EM, CM, SE	1969	1998	2	2	31
SONNETT	II, III, V-4	1968	1974	1	1	32
95 / 96 / 97	V-4, M, S, M-S, Special	1959	1973	2	2	33
9000, CS	CS	1993	1998	3	3	34
	S, Turbo, CS, CD, CDE, E, AERO, CSE	1985	1998	3	3	34
9 - 3		1999				35
9 - 5		1999				36
OTHER AUTOMOBILE	Monte Carlo 850, GT850, GT750, 92, 93	1950				398
UNKNOWN AUTOMOBILE		1950				399
UNKNOWN VEHICLE		1950				999

Model	Includes	Start	End	Size	Stiffness	Model Code
SATURN						
SL	SL1, SL2, SL3	1991		3	3	1
SC	includes 3 door coupe	1997		3	3	2
	SC1, SC2	1991	1996	2	2	2
SW	SW1, SW2	1993		3	3	3
EV	EV1 (electric vehicle)	1997		TBD	TBD	4
LS		2000		TBD	TBD	5
OTHER AUTOMOBILE		1991				398
UNKNOWN AUTOMOBILE		1991				399
UNKNOWN VEHICLE		1991				999
SCANIA						
MEDIUM / HEAVY - CBE		1986				807
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN		1986				807
MEDIUM / HEAVY - COE / HIGH ENTRY		1986				807
MEDIUM / HEAVY - COE / LOW ENTRY		1986				807
MEDIUM / HEAVY - OTHER		1986				807
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1986				807
MEDIUM / HEAVY BASED MOTORHOME		1986				807
SIMCA						
OTHER AUTOMOBILE		1965	1991			44
UNKNOWN AUTOMOBILE		1965	1991			44
STERLING						
827S	Li, SL,S, SLI	1986	1991	3	3	31
OTHER AUTOMOBILE	825 S / SL , Oxford Edition	1986	1991			398
UNKNOWN AUTOMOBILE		1986	1991			399
UNKNOWN VEHICLE		1986	1991			999

Model	Includes	Start	End	Size	Stiffness	Model Code
STERLING TRUCKS						
MEDIUM / HEAVY - CBE						808
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN						808
MEDIUM / HEAVY - COE / HIGH ENTRY						808
MEDIUM / HEAVY - COE / LOW ENTRY						808
MEDIUM / HEAVY - OTHER						808
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION						808
STUDEBAKER						
CRUISER		1940	1966	per WB	= size	1
GRAN TURISMO		1940	1966	per WB	= size	1
HAWK		1940	1966	per WB	= size	1
LARK		1940	1966	per WB	= size	1
OTHER AUTOMOBILE		1940	1966			1
UNKNOWN AUTOMOBILE		1940	1966			1
STUTZ						
OTHER AUTOMOBILE				per WB	= size	398
UNKNOWN AUTOMOBILE				per WB	= size	398

Model	Includes	Start	End	Size	Stiffness	Model Code
SUBARU						
DL / FE / G / GF / GL / GLF / STD / LOYALE	4 wheel drive, Turbo	1972	1989	PER WB	=SIZE	31
	Loyale	1990	1994	PER WB	=SIZE	31
STAR	FF-1 Star, 1100	1970	1971	2	2	32
360		1969	1970	1	1	33
LEGACY	Brighton, Outback, Outback II, Outback Limited, Sport Utility Sedan, 30th Anniv. Outback	1989		2	2	34
XT / XT6	4WD Turbo, convertible, DL, GL	1986	1991	2	2	35
JUSTY	DL, GL	1987	1994	1	1	36
SVX	LS,LSL, XR, LSi	1992	1997	3	3	37
IMPREZA	Outback, Outback II, L, LS, Brighton, Outback Sport	1993		2	2	38
BRAT DL, GL		1978	1987	2	2	43
OTHER AUTOMOBILE		1968				398
UNKNOWN AUTOMOBILE		1968				399
FORESTER	L, S	1997				401
UNKNOWN VEHICLE		1958				999
SUNBEAM						
OTHER AUTOMOBILE		1965	1991			45
UNKNOWN AUTOMOBILE		1965	1991			45

Model	Includes	Start	End	Size	Stiffness	Model Code
SUZUKI						
SA310	GLX	1986		1	1	31
SWIFT	GTi, GTX	1989		1	1	34
ESTEEM		1995		TBD	TBD	35
OTHER AUTOMOBILE	800 Fronte, Alto	1989				398
UNKNOWN AUTOMOBILE		1989				399
SAMURAI	Standard, Deluxe (use 8 stiffness for end impacts, size value for side impacts)	1985	1995	1	8	401
SIDEKICK / GRAND VITARA	JS, JX, JLX, Sport	1989				402
X-90 / VITARA		1996				403
OTHER LIGHT TRUCK		1986				498
UNKNOWN LIGHT TRUCK		1986				499
MOTORCYCLE (000-050CC)		1970				701
MOTORCYCLE (051-124CC)		1970				702
MOTORCYCLE (125-349CC)		1969				703
MOTORCYCLE (350-449CC)		1970	1993			704
MOTORCYCLE (450-749CC)		1969				705
MOTORCYCLE (750CC-OVER)		1970				706
MOTORCYCLE (UNKNOWN CC)		1969				709
ATC / ATV (000-050CC)		1969				731
ATC / ATV (051-124CC)		1969				732
ATC / ATV (125-349CC)		1969				733
ATC / ATV (350CC-OVER)		1969				734
ATC / ATV (UNKNOWN CC)		1969				739
UNKNOWN MOTORED CYCLE		1969				799
UNKNOWN VEHICLE		1969				999

Model	Includes	Start	End	Size	Stiffness	Model Code
TOYOTA						
CORONA	Mark II, Custom, 1900, 2000, Deluxe	1966	1982	2	2	31
COROLLA	FX-16 (use 9 stiffness for front impacts, size value for side or rear impacts)	1986		2	9	32
	1100, 1200, 1600, SR-5, LE, Deluxe, Custom	1969	1985	1	1	32
CELICA	1900, 2000, GT, ST, VE	1972		2	2	33
	GTS	1972	1993	2	2	33
SUPRA	Celica Supra, Soarer	1979	1998	3	3	34
CRESSIDA		1978	1992	3	3	35
CROWN	2300, 2600, Toyopets	1958	1971	3	3	36
CARINA	2000	1972	1973	2	2	37
TERCEL	Corolla Tercel, 4WD Wagon, EZ, DX, LE, DLX, CE	1980	1998	2	2	38
STARLET		1981	1984	1	1	39
CAMRY	LE, Deluxe, XLE, Coupe, DLX, SE, All-Trac, CE	1983		3	3	40
MR-2		1985	1995	1	1	41
PASEO	Turbo, T-bar	1992	1997	1	1	42
AVALON	XL, XLS	1995		3	3	43
SOLARA	Camry Solara, SE, SLE	1999				44
ECHO		2000		TBD	TBD	45
MR SPYDER		2000		TBD	TBD	46
OTHER AUTOMOBILE	2000 GT Coupe (1960's), Sports 800, Vipor, Tiara	1960				398
UNKNOWN AUTOMOBILE		1960				399
4-RUNNER	SR5, Limited (use 8 stiffness for end impacts, size value for side impacts)	1985		3	8	401
RAV-4	L, EV - electric	1996		TBD	TBD	402
LANDCRUISER	(use 8 stiffness for end impacts, size value for side impacts)	1964		3	8	421
MINVAN / PREVIA	Previa (use 7 stiffness for end impacts, size value for side impacts)	1991		4	7	441
	LE, Cargo (use 7 stiffness for end impacts, size value for side impacts)	1984	1990	1	7	441
SIENNA	CE, LE, XLE	1998				442
PICKUP	SR-5, Extra Cab, Sport, LN44, Chinook, Wonder Wagon (use 8 stiffness for end impacts, size value for side impacts)	1974	1995	PER WB	8	471
TACOMA	SR5, Xtracab, Limited, Prerunner	1995				472
T-100	DX, SR5, Limited, Xtracab (use 8 stiffness for end impacts, size value for side impacts)	1993	1998	PER WB	8	481
	Tundra	2000		TBD	TBD	481
OTHER LIGHT TRUCK		1970				498
UNKNOWN LIGHT TRUCK		1973				499
UNKNOWN VEHICLE		1966				999

Model	Includes	Start	End	Size	Stiffness	Model Code
TRIUMPH						
SPITFIRE	I, II, III, IV, 1500	1962	1981	1	1	31
GT-6	MK3	1967	1973	1	1	32
TR4	TR2, TR3, TR4A	1958	1968	1	1	33
TR6		1969	1976	1	1	34
TR7 / 8		1975	1981	1	1	35
HERALD	Vitesse	1960	1974	TBD	TBD	36
STAG		1971	1973	2	2	37
OTHER AUTOMOBILE	1200, 1800, 2000, Mayflower, Renown,	1946	1981	PER WB	PER WB	398
UNKNOWN AUTOMOBILE		1946	1981			399
MOTORCYCLE (000-050CC)		1965	1983			701
MOTORCYCLE (051-124CC)		1965	1983			702
MOTORCYCLE (125-349CC)		1950	1974			703
MOTORCYCLE (350-449CC)		1950	1971			704
MOTORCYCLE (450-749CC)		1950	1983			705
MOTORCYCLE (750CC-OVER)		1950	1974			706
MOTORCYCLE (UNKNOWN CC)		1950				709
UNKNOWN MOTORED CYCLE		1950				799
UNKNOWN VEHICLE		1950				999
TVR						
OTHER AUTOMOBILE		1965	1991			46
UNKNOWN AUTOMOBILE		1965	1991			46
UNKNOWN DOMESTIC MANUFACTURER						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNKNOWN MEDIUM / HEAVY TRUCK						899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999

Model	Includes	Start	End	Size	Stiffness	Model Code
UNKNOWN FOREIGN MANUFACTURER						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNKNOWN MEDIUM / HEAVY TRUCK						899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
UNKNOWN MANUFACTURER						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNKNOWN TYPE TRUCK (LIGHT / MEDIUM / HEAVY)						899
UNKNOWN MEDIUM / HEAVY TRUCK						899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
UNKNOWN MEDIUM / HEAVY TRUCKS AND BUSES MANUFACTURER						
UNKNOWN MEDIUM / HEAVY TRUCK						899
UNKNOWN BUS TYPE						988

Model	Includes	Start	End	Size	Stiffness	Model Code
VOLKSWAGEN						
KARMANN GHIA		1954	1974	1	1	31
BEETLE 1300 / 1500	flat windshield, 94.5" WB	1948	1977	1	1	32
SUPER BEETLE	Distinguished by curved windshield, 95.3" WB	1971	1980	2	1	33
411 / 412	Squareback / Fastback	1971	1974	2	1	34
SQUAREBACK / FASTBACK	Type 3, 1600	1965	1974	1	1	35
RABBIT	L, GTI, Sport, LS, Custom, DL, Deluxe	1975	1984	1	1	36
DASHER		1974	1981	2	2	37
SCIROCCO	16V	1975	1988	1	1	38
JETTA	GL, GLI, GT, Carat, TDI, GLX (VR6), GLS (TDI, VR6)	1981	1992	2	2	40
QUANTUM	Synco	1982	1988	2	2	41
GOLF / CABRIOLET	Synco, GTI, Cabriolet, GT, GL	1985	1992	2	1	42
RABBIT PICKUP	car / based pickup	1980	1983	1	1	43
FOX	GL	1987	1994	1	1	44
CORRADO		1989	1994	2	2	45
PASSAT	GL, GLS, TDI, GLX	1990		2	2	46
JETTA III		1993		2	2	47
GOLF / III		1993		2	2	48
	GTI	2000		TBD	TBD	48
NEW BEETLE		1998				49
OTHER AUTOMOBILE		1965				398
UNKNOWN AUTOMOBILE		1965				399
THE THING (181)		1973	1975	1	1	401
VANAGON / CAMPER	Bus, Kombi, Van (use 7 stiffness for end impacts, size value for side impacts)	1955	1991	1	7	441
EUROVAN	(use 7 stiffness for end impacts, size value for side impacts)	1992	1993	7	7	442
	(use 7 stiffness for end impacts, size value for side impacts)	1999		7	7	442
OTHER LIGHT TRUCK		1967	1980			498
UNKNOWN LIGHT TRUCK		1965				499
OTHER VEHICLE		1965				998
UNKNOWN VEHICLE		1956				999

Model	Includes	Start	End	Size	Stiffness	Model Code
VOLVO						
122	S	1958	1968	3	3	31
142 / 144 / 145	S, E, GL, GLS, Deluxe	1968	1974	3	3	32
164	S, E	1969	1975	3	3	33
240 / 242 / 244 / 245	DL. GL, GLE, GLT, Deluxe	1975	1993	3	3	34
262 / 264 / 265	GL, c, Volvo Coupe, Volvo Diesel	1976	1982	3	3	35
1800	E, S, ES, P1800	1960	1973	2	2	36
760 / 780	GLE, Turbo	1983	1990	3	3	38
	GLE, Turbo, Bertone Coupe	1987	1992	3	3	38
740	GLE, GT, Turbo, GL	1986	1992	3	3	39
940	GLE, Turbo, SE	1991	1995	3	3	40
960		1992	1997	3	3	41
850	GLT, Wagon, Turbo, T-5, GTAS, GTMS, Cross Country	1993	1997	3	3	42
70 SERIES	C70, S70, V70	1998				43
90 SERIES	S90, V90	1998				44
S 40		2000		TBD	TBD	45
S 80		2000		TBD	TBD	46
OTHER AUTOMOBILE		1958				398
UNKNOWN AUTOMOBILE		1958				399
MEDIUM / HEAVY CBE		1981	1993			881
		1996				
MEDIUM / HEAVY COE LOW ENTRY		1981	1993			882
		1996				
MEDIUM / HEAVY COE HIGH ENTRY		1981	1993			883
		1996				
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1981	1993			884
		1996				
MEDIUM / HEAVY: COE ENTRY POSITION UNKNOWN		1981	1993			890
		1996				
OTHER MEDIUM / HEAVY TRUCK		1981	1993			898
		1996				
UNKNOWN MEDIUM / HEAVY TRUCK		1981	1993			899
		1996				
MEDIUM BUS		1981				981
OTHER BUS		1981				988
UNKNOWN TYPE BUS		1981				989
UNKNOWN VEHICLE		1958				999

Model	Includes	Start	End	Size	Stiffness	Model Code
WARD LAFRANCE						
MEDIUM / HEAVY - CBE						898
MEDIUM / HEAVY - COE / ENTRY POSITION UNKNOWN						898
MEDIUM / HEAVY - COE / HIGH ENTRY						898
MEDIUM / HEAVY - COE / LOW ENTRY						898
MEDIUM / HEAVY - OTHER						898
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION						898
MEDIUM / HEAVY BASED MOTORHOME						898
WESTERN STAR						
MEDIUM / HEAVY - CBE		1965				804
MEDIUM / HEAVY - COE/ENTRY POSITION UNKNOWN		1965				804
MEDIUM / HEAVY - COE/HIGH ENTRY		1965				804
MEDIUM / HEAVY - COE/LOW ENTRY		1965				804
MEDIUM / HEAVY - OTHER		1965				804
MEDIUM / HEAVY - UNKNOWN ENGINE LOCATION		1965				804
MEDIUM / HEAVY BASED MOTORHOME		1965				804

Model	Includes	Start	End	Size	Stiffness	Model Code
YAMAHA						
MOTORCYCLE (000-050CC)		1979				701
MOTORCYCLE (051-124CC)		1972				702
MOTORCYCLE (125-349CC)		1969				703
MOTORCYCLE (350-449CC)		1972				704
MOTORCYCLE (450-749CC)		1971				705
MOTORCYCLE (750CC-OVER)		1974				706
MOTORCYCLE (UNKNOWN CC)		1969				709
ATC / ATV (000-050CC)		1965	1991			731
ATC / ATV (051-124CC)		1965				732
ATC / ATV (125-349CC)		1965				733
ATC / ATV (350CC-OVER)		1999				734
ATC / ATV (UNKNOWN CC)		1965				739
OTHER MOTORED CYCLE		1965				798
UNKNOWN MOTORED CYCLE		1965				799
YUGO						
GV	GVX, Cabriolet	1986	1992	1	1	31
OTHER AUTOMOBILE		1986	1992			398
UNKNOWN AUTOMOBILE		1986	1992			399
UNKNOWN VEHICLE		1986	1992			999

Screen Name: Identification--Body Category
Variable Name: Vehicle Body Category

Element Attributes:

Automobiles
Automobile Derivatives
Utility Vehicles
Van Based Light Trucks
Light Conventional Trucks
Other Light Trucks
Buses (Excludes Van Based)
Medium/heavy Trucks
Motored Cycles
Other Vehicles

Source: Vehicle inspection, police report, interview, VIN

Remarks:

Automobiles

These light vehicles referred to as automobiles, are designed primarily to transport passengers.

Automobile Derivatives

This describes certain passenger cars that have been modified to perform cargo-related tasks.

Utility Vehicles (< 4,536 kgs GVWR)

Van Based Light Trucks (< 4,536 kgs GVWR)

Light Conventional Trucks (Pickup Style Cab, < 4,536 kgs GVWR)

Other Light Trucks (< 4,536 kgs. GVWR)

Other Light Trucks are used to describe vehicles that are based upon a conventional light pickup frame, but a commercial or recreational body has been affixed to the frame rather than a pickup box.

Buses (Excludes Van Based)

Buses are defined as any medium/heavy motor vehicle designed primarily to transport large groups of passengers.

Screen Name: Identification--Body Category (cont'd)
Variable Name: Vehicle Body Category (cont'd)

Medium/Heavy Trucks (> 4,536 kgs GVWR)

Medium/Heavy Trucks describe a single unit truck specifically designed for carrying cargo on the same chassis as the cab. They pertain to a truck-tractor designed for towing trailers or semi-trailers. Although towing is their primary purpose, some truck-tractors are equipped with cargo areas located rearward of the cab.

Motored Cycles (Does Not Include All Terrain Vehicles/Cycles)

Other Vehicles

Other Vehicles describe all motored vehicles that are designed primarily for off-road use. It is also selected when the body type of the vehicle is unknown

Screen Name: Identification--Body Type
Variable Name: Body Type

Element Attributes:

CDS APPLICABLE VEHICLES

Automobiles

- Convertible (excludes sun-roof, t-bar)
- 2-door sedan, hardtop, coupe
- 3-door sedan, hardtop, coupe
- 3-door/2-door hatchback
- 4-door sedan, hardtop
- 5-door/4-door hatchback
- Station wagon (excluding van and truck based)
- Hatchback, number of doors unknown
- Other automobile type (specify):
- Unknown automobile type

Automobile Derivatives

- Auto based pickup (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup)
- Auto based panel (cargo station wagon, auto based ambulance/hearse)
- Large limousine - more than four side doors or stretched chassis
- Three-wheel automobile or automobile derivative

Utility Vehicles (# 4,536 kgs GVWR)

- Compact utility (examples include: 4-Runner, Amigo, Bravada, Bronco [76 and before], Bronco II, Cherokee [84 and after], Defender, Discovery, Dispatcher, Explorer, Geo Tracker, Golden Eagle, Grand Vitara, Jeep CJ-2 - CJ-7, Laredo, Montero, Mountaineer, Navajo, Passport, Pathfinder, Raider, RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90)
- Large utility (examples include: Bronco-full-size [78 and after], full-size Blazer, full-size Jimmy, Hummer, Jeep Cherokee [83 and before], Durango, Escalade, Landcruiser, LX450, Navigator, Ramcharger, RangeRover, Scout, Tahoe, Trailduster, Yukon),
- Utility station wagon (examples include: Chevrolet Suburban, Expedition, Excursion, GMC Suburban, Grand Wagoneer includes suburban limousine, Travelall)
- Utility, unknown body type

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Van Based Light Trucks (< 4,536 kgs GVWR)

- Minivan (examples include: Aerostar, Astro, Caravan, Expo Wagon, Grand Caravan, Grand Voyager, Lumina APV, Mazda MPV, Mini-Ram, Mitsubishi Minivan, Nissan Minivan, Odyssey, Previa, Quest, Safari, Sienna, Silhouette, Town and Country, Toyota Minivan, Toyota Van, Trans Sport, Vanagon/Camper, Venture, Villager, Vista, Voyager, Windstar)
- Large van (examples include: B150-B350, Beauville, Chateau, Chevy Van, Clubwagon, E150-E350, Econoline, G10-G30, G15-G35, Maxiwagon, Rally Van, Ram, Royal, Sport Van, Sportsman, Tradesman, Vandura, Voyager [83 and before].)
- Step van or walk-in van (# 4,536 kgs GVWR)
- Van based motorhome (# 4,536 kgs GVWR)
- Van based school bus (# 4,536 kgs GVWR)
- Van based other bus (# 4,536 kgs GVWR)
- Other van type (Hi-Cube Van, Kary) (specify):
- Unknown van type

Light Conventional Trucks (Pickup style cab, < 4,536 kgs GVWR)

- Compact pickup (examples include: Arrow Pickup [foreign], Colt P/U, Courier, D50, Dakota, Datsun/Nissan Pickup, Frontier, Hombre, LUV, Mazda Pickup, Mitsubishi Pickup, Pup, Ram 50, Ranger, S-10 , S-15, Sonoma, Sport Trac, T-10, T-15, Tacoma, Toyota Pickup)
- Large Pickup (examples include: C10-C35, Comanche, D100-D350, F100-F350, Jeep Pickup, K10-K35, R100-R500, R10-R35, Ram Pickup, Sierra, Silverado, T100, V10-V35, W100-W350)
- Pickup with slide-in camper
- Convertible pickup
- Unknown pickup style light conventional truck type

Other Light Trucks (< 4,536 kgs GVWR)

- Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
- Truck based panel
- Light truck based motorhome (chassis mounted)
- Other light conventional truck type
- Unknown light truck type
- Unknown light vehicle type (automobile, utility, van, or light truck)

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

OTHER VEHICLES

Buses (Excludes Van Based)

- School bus (designed to carry students, not cross country or transit)
- Other bus type (*e.g.*, transit, intercity, bus based motorhome) (specify):
- Unknown bus type

Medium/Heavy Trucks (> 4,536 kgs GVWR)

- Step van (> 4,536 kgs GVWR)
- Single unit straight truck (4,536 kgs < GVWR # 8,845 kgs)
- Single unit straight truck (8,8845 kgs < GVWR # 11,793 kgs)
- Single unit straight truck (> 11,793 kgs GVWR)
- Single unit straight truck, GVWR unknown
- Medium/heavy truck based motorhome
- Truck-tractor with no cargo trailer
- Truck-tractor pulling one trailer
- Truck-tractor pulling two or more trailers
- Truck-tractor (unknown if pulling trailer)
- Unknown medium/heavy truck type

Unknown truck type (light / medium / heavy)

Motored Cycles (Does Not Include All-Terrain Vehicles/Cycles)

- Motorcycle
- Moped (motorized bicycle)
- Three-wheel motorcycle or moped
- Other motored cycle (minibike, motor scooter) (specify):

Motored Cycles (Does Not Include All-Terrain Vehicles/Cycles) (continued)

- Unknown motored cycle type

Other Vehicles

- ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- Snowmobile
- Farm equipment other than trucks
- Construction equipment other than trucks
- Other vehicle type
- Unknown body type

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Source: Vehicle inspection, police report, and interview

Remarks:

Automobiles

These light vehicles referred to as automobiles, are designed primarily to transport passengers.

Convertible (excludes sun-roof, t-bar)
refers to a passenger car equipped with a removable or retractable roof. To qualify for this attribute, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This attribute takes priority over 2-door or 4-door attributes.

2-door sedan, hardtop, coupe
refers to a passenger car equipped with two doors for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

3-door sedan, hardtop, coupe
refers to a passenger car equipped with three doors (two front seat and one rear seat) for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

3-door/2-door hatchback
refers to a passenger car equipped with two doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

4-door sedan, hardtop
refers to a passenger car equipped with four doors for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

5-door/4-door hatchback
refers to a passenger car equipped with four doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

Station wagon (excluding van and truck based)
refers to a passenger car with an enlarged cargo area. The entire roof covering the cargo area is generally equal in height from front to rear and full height side glass is installed between the C and D-pillars. The rearmost area is not permanently partitioned from the forward passenger compartment area (*e.g.*, "horizontal window shades" to hide cargo do not constitute partitions).

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Hatchback, number of doors unknown
refers to a passenger car with an unknown number of doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

Other automobile type
refers to any passenger car that cannot be described by other automobile attributes.

Unknown automobile type
is used when it is known that the vehicle is a passenger car, but there is insufficient data to determine the type.

Automobile Derivatives
This describes certain passenger cars that have been modified to perform cargo-related tasks.

Auto based pickup
refers to a passenger car based, pickup type vehicle (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup). The roof area (and side glass) rearward of the front seats on a station wagon have been removed and converted into a pickup-type cargo box.

Auto based panel
refers an automotive station wagon that may have sheet metal rearward of the B-pillar rather than glass (cargo station wagon, auto based ambulance/hearse).

Large limousine
refers to an automobile that has sections added within its wheelbase (more than four side doors) or stretched chassis to increase length and passenger/cargo carrying capacity .

Three-wheel automobile or automobile derivative
refers to three-wheel vehicles with an enclosed passenger compartment.

Utility Vehicles (< 4,536 kgs GVWR)

Multi-purpose vehicles (MPV)
are designed to have off-road capabilities. These vehicles are generally four wheel drive (4 x 4), have increased ground clearance, and are equipped with a strong frame. Four wheel drive automobiles are not considered MPVs.

Compact utility
refers to a short wheelbase and narrow tracked multi-purpose vehicle designed to operate in rugged terrain (examples include: 4-Runner, Amigo, Bravada, Bronco [76 and before], Bronco II, Cherokee [84 and after], Defender, Discovery, Dispatcher, Explorer, Geo Tracker, Golden Eagle, Grand Vitara, Jeep CJ-2 - CJ-7, Laredo, Montero, Mountaineer, Navajo, Passport, Pathfinder, Raider, RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90)

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Large utility
refers to full-size multi-purpose vehicles primarily designed around a shortened pickup truck chassis. While generally a station wagon style body, some models are equipped with a removable top (examples include: Bronco-full-size [78 and after], full-size Blazer, full-size Jimmy, Hummer, Jeep Cherokee [83 and before], Durango, Escalade, Landcruiser, LX450, Navigator, Ramcharger, RangeRover, Scout, Tahoe, Trailduster, Yukon),

Utility station wagon
refers primarily to a pickup truck based chassis enlarged to a station wagon (examples include: Chevrolet Suburban, Excursion, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)

Utility, unknown body type
is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type. Class of Vehicle is entered as **(Compact utility vehicle)**.

Van Based Light Trucks (< 4,536 kgs GVWR)

Light trucks (# 4,536 kgs GVWR) are designed to maximize cargo/passenger area versus overall length. Basically a "box on wheels" these vehicles are identifiable by their enclosed cargo/passenger area and relatively short (or non-existent) hood.

Minivan
refers to down-sized cargo or passenger vans examples include: Aerostar, Astro, Caravan, Expo Wagon, Grand Caravan, Grand Voyager, Lumina APV, Mazda MPV, Mini-Ram, Mitsubishi Minivan, Nissan Minivan, Odyssey, Previa, Quest, Safari, Sienna, Silhouette, Town and Country, Toyota Minivan, Toyota Van, Trans Sport, Vanagon/Camper, Venture, Villager, Vista, Voyager, Windstar)

Large van
refers to a standard cargo or passenger van (examples include: B150-B350, Sportsman, Royal, Maxiwagon, Ram, Tradesman, Voyager [83 and before], E150-E350, Econoline, Clubwagon, Chateau, G10-G30, Chevy Van, Beauville, Sport Van, G15-G35, Rally Van, Vandura). These vans will generally have a larger capacity in both volume and GVWR.

Step van or walk-in van (# 4,536 kgs GVWR)
refers to a multi-stop delivery vehicle with a GVWR less than or equal to 4,536 kilograms. Examples are the Grumman LLV used by the US Postal Service or the Aeromate manufactured by Utilimaster Motor Corporation.

Van based motorhome (# 4,536 kgs GVWR)
refers to a van where the chassis and cab portions from the B-pillar forward of this vehicle are the same as in attributes minivan, large van, step van, however, a frame mounted recreational unit is added behind the driver/cab area. This attribute takes priority over attributes minivan and large van

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Van based school bus (# 4,536 kgs GVWR)
is a passenger van designed to carry students (passengers) to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. Van based school buses converted for other uses (*e.g.*, church bus) also take this attribute.

Van based other bus (# 4,536 kgs GVWR)
is a van derivative (*e.g.*, taxi, small local transit) designed to carry passengers for low occupancy functions or purposes. Van based school buses do not use this attribute.

Other van type (Hi-Cube Van, Kary)
refers to a cargo or delivery van where that chassis and cab portions from the B-pillar forward of this vehicle are the same as in Minivans and Large Vans with a frame mounted cargo area unit added behind the driver/cab area, or if the van cannot be described as a Minivan, Large Van, Step-van or a Van-based motorhome. Annotate the van type when using this attribute. This attribute takes priority over Minivans and Large Vans.

Unknown van type
is used when it is known that this vehicle is a light van, but its specific type cannot be determined.

Light Conventional Trucks (Pickup Style Cab, < 4,536 kgs GVWR)
Light Conventional Trucks are used to describe vehicles commonly referred to as pickup trucks and some of their derivatives. These light trucks are characteristically designed with a small cab containing a single row of seats (extended cabs with additional seats are available for some models), a large hood covering a conventional engine placement, and a separate open box area (approximately 180 to 240 centimeters long) for cargo.

Compact pickup
is used to describe a pickup truck having a width of 178 centimeters or less. (examples include: Arrow Pickup [foreign], Colt P/U, Courier, D50, Dakota, Datsun/Nissan Pickup, Frontier, Hombre, LUV, Mazda Pickup, Mitsubishi Pickup, Pup, Ram 50, Ranger, S-10 , S-15, Sonoma, T-10, T-15, Tacoma, Toyota Pickup)

Large Pickup
is used to describe a pickup truck having a width of greater than 178 centimeters (examples include: C10-C35, Comanche, D100-D350, F100-F350, Jeep Pickup, K10-K35, R100-R500, R10-R35, Ram Pickup, Sierra, Silverado, T100, V10-V35, W100-W350)

Pickup with slide-in camper
is used to describe any pickup truck that is equipped with a slide-in camper. A slide-in camper is a unit that mounts within a pickup bed. Pickup bed caps, tonneau covers, or frame mounted campers are not applicable for this attribute.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Convertible pickup
refers to a pickup truck equipped with a removable or retractable roof. To qualify for this attribute, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This attribute takes priority over compact and large pickups.

Unknown pickup style light conventional truck
is used when this vehicle is a Light Conventional Trucks, but there is insufficient data to determine the specific attribute.

Other Light Trucks (< 4,536 kgs. GVWR)
Other Light Trucks are used to describe vehicles that are based upon a conventional light pickup frame, but a commercial or recreational body has been affixed to the frame rather than a pickup box.

Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
is used to describe a light vehicle with a pickup style cab and a commercial (non-pickup) body attached to the frame. Included are pickup based ambulances and tow trucks.

Truck based panel
is used to describe a truck based station wagon that has sheet metal rather than glass above the beltline rearward of the B-pillars.

Light truck based motorhome (chassis mounted)
is used to describe a frame mounted recreational unit attached to a light van or conventional chassis.

Other light conventional truck type
is used for light conventional trucks that cannot be described elsewhere.

Unknown light truck type
is used when it is known that the vehicle is a light truck chassis based vehicle but insufficient data exist to specify what type of light truck it is.

Unknown light vehicle type (automobile, utility, van, or light truck)
is used when it is known that the vehicle is a light vehicle, but insufficient data exists to specify what type of light truck it is.

Buses (Excludes Van Based)
Buses are defined as any medium/heavy motor vehicle designed primarily to transport large groups of passengers.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

School bus
(designed to carry students, not cross country or transit) is a bus designed to carry passengers to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. School buses converted for other uses (*e.g.*, church bus) also take this attribute.

Other bus type
(e.g., transit, intercity, bus based motorhome) is a transport device designed to carry passengers for longer periods of time. These vehicles may be classified as over-the-road, transit, intercity, bus related motorhome (other than school bus based), or other.

Unknown bus type
is used when it is known the transport device is a bus but there is insufficient data to choose between attributes School bus and Other bus type.

Medium/Heavy Trucks (> 4,536 kgs GVWR)
Medium/Heavy Trucks describe a single unit truck specifically designed for carrying cargo on the same chassis as the cab.

They pertain to a truck-tractor designed for towing trailers or semi-trailers. Although towing is their primary purpose, some truck-tractors are equipped with cargo areas located rearward of the cab.

Step van (> 4,536 kgs GVWR)
defines a single unit enclosed body with a GVWR greater than 4,536 kilograms and an integral driver's compartment and cargo area. Step vans are generally equipped with a folding driver seat mounted on a pedestal and a sliding door for easy ingress/egress.

Single unit straight truck (4,536 kgs < GVWR # 8,845 kgs)
describes a non-articulated truck designed to carry cargo. The gross vehicle weight rating of the vehicle must exceed 4,536 kilograms and be less than or equal to 8,845 kilograms.

Single unit straight truck (8,845 kgs < GVWR # 11,793 kgs)
describes a non-articulated truck designed to carry cargo. The gross vehicle weight rating of the vehicle must exceed 8,845 kilograms and be less than or equal to 11,793 kilograms.

Single unit straight truck (> 11,793 kgs GVWR)
describes a non-articulated truck designed to transport cargo with a gross vehicle weight rating in excess of 11,793 kilograms. Use this attribute if it is known that the GVWR of a single unit straight truck is greater than 4,536 kilograms but there is insufficient data to specify the type of single unit truck.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Single unit straight truck, GVWR unknown
is used when the transport vehicle is a single unit straight truck but the GVWR is unknown.

Medium/heavy truck based motorhome
describes a recreational vehicle mounted on a single unit medium/heavy truck chassis.

Truck-tractor with no cargo trailer
describes a fifth wheel equipped tractor/trailer power unit with no trailer attached.

Truck-tractor pulling one trailer
describes a fifth wheel equipped tractor (*i.e.*, power unit of a tractor/trailer combination) pulling one semi-trailer.

Truck-tractor pulling two or more trailers
describes a fifth wheel equipped tractor (*i.e.*, power unit of a tractor/trailer combination) pulling a semi-trailer plus one or more trailers. These additional trailers may be attached with a standard hitch or a converter dolly (for semi-trailers).

Truck-tractor (unknown if pulling trailer)
is used when the vehicle is known to be a truck-tractor, but it is unknown if a trailer was being towed or if more than one trailer was being towed.

Unknown medium/heavy truck type
is used when the only available information indicates a truck of medium/heavy size.

Unknown truck type (light/medium/heavy)
is used when it is known that this vehicle is a truck, but there is insufficient data to classify the vehicle further.

Motored Cycles (Does Not Include All Terrain Vehicles/Cycles)

Motorcycle
is used when the vehicle is a two-wheeled open (*i.e.*, no enclosed body) vehicle propelled by an internal combustion engine. Motorcycles equipped with a side car also take this attribute.

Moped (motorized bicycle)
is used when the vehicle is a motorized bicycle capable of moving either by pedaling or by an internal combustion engine.

Three-wheel motorcycle or moped
is used when the vehicle is a three-wheeled open vehicle propelled by an internal combustion engine or a three-wheeled motorized bicycle capable of moving either by pedaling or by an internal combustion engine.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Other motored cycle (minibike, motor scooter)
is used when the vehicle in question does not qualify for attributes **Motorcycles, moped, three wheeled motorcycle or moped** (*e.g.*, motor scooter).

Unknown motored cycle type
is used when it is known that the vehicle is a motored cycle, but no further data is available.

Other Vehicles
Other Vehicles describe all motored vehicles that are designed primarily for off-road use.

ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
is used for off-road recreational vehicles which cannot be licensed for use on public roadways. ATVs have 4 or more wheels and ATCs have 2 or 3 wheels. Generally, the tires have low pressure and wide profile (*i.e.*, flotation/balloon).

Snowmobile
refers to a vehicle designed to be operated over snow propelled by an internal combustion engine.

Farm equipment other than trucks
refers to farming implements other than trucks propelled by an internal combustion engine (*e.g.*, farm tractors, combines, etc.).

Construction equipment other than trucks
refers to construction equipment other than trucks propelled by an internal combustion engine (*e.g.*, bulldozer, road grader, etc.).

Other vehicle type
is used when the motorized vehicle in question does not qualify for **Construction equipment other than trucks, Farm equipment other than trucks, Snowmobile, ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)** (*e.g.*, go-cart, dune buggy, "kit" car, etc.).

Unknown body type
is used when there is no available information regarding the type of vehicle. This lack of information prohibits the accurate classification of this vehicle within one of the preceding attributes.

Screen Name: Identification--Class of Vehicle
Variable Name: Class of Vehicle

Element Attributes:

Subcompact/mini (wheelbase < 254 cm)
Compact (wheelbase $ 254 but < 265 cm)
Intermediate (wheelbase $ 265 but < 278 cm)
Full size (wheelbase $ 278 but < 291 cm)
Largest (wheelbase $ 291 cm)
Unknown passenger car size
Compact utility vehicle
Large utility vehicle (# 4,536 kgs GVWR)
Utility station wagon (# 4,536 kgs GVWR)
Unknown utility type
Minivan (# 4,536 kgs GVWR)
Large van (# 4,536 kgs GVWR)
Van based school bus (# 4,536 kgs GVWR)
Other van type (# 4,536 kgs GVWR)
Unknown van type (# 4,536 kgs GVWR)
Compact pickup truck (# 4,536 kgs GVWR)
Large pickup truck (# 4,536 kgs GVWR)
Other pickup truck (# 4,536 kgs GVWR)
Unknown pickup truck type (# 4,536 kgs GVWR)
Other light truck (# 4,536 kgs GVWR)
Unknown light truck type (# 4,536 kgs GVWR)
Unknown light vehicle type
School bus (excludes van based) (> 4,536 kgs GVWR)
Other bus (> 4,536 kgs GVWR)
Unknown bus type
Truck (> 4,536 kgs GVWR)
Tractor without trailer
Tractor - trailer(s)
Unknown medium/heavy truck type
Unknown light/medium/heavy truck type
Motored cycle
Other vehicle
Unknown
Not a motor vehicle

Source: Researcher determined — inputs include police report, vehicle inspection, VIN breakdown, and interviews.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle

Remarks:

The Passenger Car Classification Subcommittee, A3B11(1), of the Transportation Research Board, Traffic Records and Accident Analysis Committee, A3B11, assessed size based on the vehicle wheelbase. The guidelines for this classification can be found in the report entitled Recommended Definitions for Passenger Car Size Classification by Wheelbase and Weight, August 1984 by the previously mentioned subcommittee. This variable is the same variable that appears in the Identification section of the Vehicle Tab on the General Vehicle Form and Vehicle Exterior Form.

Subcompact/mini (wheelbase < 254 cm)
Choose based upon wheelbase

Compact (wheelbase $ 254 but < 265 cm)
Choose based upon wheelbase

Intermediate (wheelbase $ 265 but < 278 cm)
Choose based upon wheelbase

Full size (wheelbase $ 278 but < 291 cm)
Choose based upon wheelbase

Largest (wheelbase $ 291 cm)
Choose based upon wheelbase

Unknown passenger car size
is used when it is known that a vehicle is a passenger car but the wheelbase is unknown

Compact utility vehicle
refers to vehicle models defined as **Compact utility** under Body Type. Use this attribute if the size of the utility vehicle is unknown.

Large utility vehicle (# 4,536 kgs GVWR)
refers to vehicle models defined as **Large utility** under Body Type. Refers to full-size multipurpose vehicles primarily designed around a shortened pickup truck chassis. While generally a station wagon body style, some models are equipped with a removable top.

Utility station wagon (# 4,536 kgs GVWR)
refers to vehicle models defined as **Utility station wagon** under Body Type. Refers primarily to a pickup truck based chassis enlarged to a station wagon.

Unknown Utility type
is defined as **Utility, unknown body type** under Body Type. This attribute is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Minivan (# 4536 kgs. GVWR)
Refers to vehicle models defined as **Minivan** under Body Type. Refers to down-sized passenger or cargo vans.

Large van (# 4536 kgs. GVWR)
Refers vehicle models defined as **Large van** under Body Type. Refers to a standard size cargo or passenger van.

Van based school bus (# 4,536 kgs GVWR)
is a passenger van designed to carry students (passengers) to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. Van based school buses converted for other uses (e.g., church bus) also take this attribute Refers to vehicles defined as **Van based school bus** under Body Type.

Other van type (# 4,536 kgs GVWR)
Refers to vehicle models defined as **Step van or walk-in van, Van based motorhome, Van based other bus and code Other van type** under Body Type.

Unknown van type (# 4,536 kgs GVWR)
is used when it is known that this vehicle is a light van, but its specific type cannot be determined. Refers to vehicles described as **Unknown van type** under Body Type.

Compact pickup truck
Refers to vehicle models defined as attributes of **Compact pickup truck** in Body Type. Used to describe a pickup truck having a width of 178 centimeters or less.

Large pickup truck
Refers to vehicle models defined as **Large pickup truck** under Body Type. Used to describe a pickup truck having a width greater than 178 centimeters.

Other pickup truck (# 4536 kgs GVWR)
Refers to vehicle models defined as **Pickup with slide-in camper** and **Convertible pickup** under Body Type.

Unknown pickup truck (# 4536 kgs GVWR)
Refers to vehicle models defined as **Unknown pickup style light conventional truck type** under Body Type.

Other light truck (# 4536 kgs GVWR)
Refers to vehicle models defined **as Cab, chassis based (includes rescue vehicles, light stake, dump, and tow truck), Truck based panel, Light truck based motorhome (chassis mounted),** and **Other light conventional truck type** under Body Type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Unknown light truck type
Refers to vehicle models defined as **Unknown light truck type** under Body Type.

Unknown light vehicle type (automobile, utility, van, or light truck)
Refers to vehicle models defined as Unknown light vehicle type (automobile, utility, van, or light truck) under Body Type.

School bus (excludes van based) (> 4536 kgs GVWR)
Refers to those vehicle models defined as **School bus (designed to carry students, not cross country or transit)** under Body Type.

Other bus (>4,536 kgs GVWR)
describes those vehicle models included in **Other bus type (e.g., transit, intercity, bus based motorhome)** under Body Type.

Unknown bus type
Refers to those vehicle models described as **Unknown bus type** under Body Type.

Truck (> 4,536 kgs GVWR)
is defined under Body Type, as **Step van (>4,536 kgs GVWR), Single unit straight truck (4,536 kgs < GVWR = 8,845), Single unit straight truck (8,845 kgs < GVWR = 11,793), Single unit straight truck (>11,793 kgs GVWR), Single unit straight truck, GVWR unknown** and **Medium/heavy truck based motorhome.**

Tractor without trailer
refers to **Truck-tractor with no cargo trailer** under Body Type.

Tractor-trailer(s)
is defined in attributes **Truck-tractor pulling one trailer, Truck-tractor pulling two or more trailers** and **Truck-tractor (unknown if pulling trailer)** under Body Type.

Unknown medium/heavy truck type)
is used when the only available information indicates a truck of medium/heavy size. Refer to **Unknown medium/heavy truck type** under Body Type.

Unknown truck type (light/medium/heavy)
Refers to those vehicles described by **Unknown truck type (light/medium/heavy)** under Body Type.

Motored cycle
refers to Body Type, **Motorcycle, Moped (motorized bicycle), Three-wheel motorcycle or moped, Other motored cycle (minibike, motorscooter)** and **Unknown motored cycle type**.

Other vehicle
refers to all vehicles described by **ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle), Snowmobile, Farm equipment other than trucks,** or **Other vehicle type** under Body Type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Unknown
is used when there is a lack of information regarding the type of vehicle. This lack of information prohibits the accurate classification of this vehicle using one of the preceding codes. This attribute is equivalent to Body Type, **Unknown body type.**

Not a motor Vehicle
Is used when an object is struck.

Screen Name: Identification--Identification Number
Variable Name: Vehicle Identification Number (VIN)

Element Attributes:

00000000000000000
Enter the entire or partial VIN, left justify

99999999999999999

Source: Primary source is vehicle inspection; a secondary source is the police report.

Remarks:

If a vehicle is inspected, the VIN must be obtained from the vehicle. The PAR may be used to obtain a VIN when a vehicle inspection is not required (*i.e.*, non-tow CDS applicable ***and*** WinSMASH is not applicable; or Body Category, equals **Buses, Medium/Heavy Trucks, Motorcycles,** or **Other Vehicles.**

Enter the entire VIN; leave **"blank"** any column which does not have a VIN character.

If part of the VIN is missing or not decipherable, leave the column any such character would ordinarily occupy **"blank"**.

Use VIN Assist to check the VIN. Additionally, in NASSMAIN the VIN can be checked on the GV Form by going to ***Process / VIN Check Routine.***

00000000000000000
enter a “0" in each position for vehicles not required to have a VIN (e.g., go cart).

99999999999999999
if the entire VIN is unknown, or missing enter a “9" in each position.

If the vehicle is a motor home or school bus, the vehicle chassis VIN is coded and the secondary manufacturer's number should be annotated if indicated on the PAR.

If the vehicle is manufactured by the Ford Motor Company (prior to 1980) and the VIN begins or ends with a script, "*F*", the "*F*" is not entered. Proceed to the next character, as in the example below.

VIN: *F* 3 U 6 2 S 1 0 0 9 3 2 *F*
CODE: 3 U 6 2 S 1 0 0 9 3 2 _ _ _ _ _ _

In addition, if any hyphens, periods, or blank spaces are contained in the string of alphanumeric characters, ignore them as in the example below.

VIN: S M - E 3 0 7 6 4 2 1
CODE: S M E 3 0 7 6 4 2 1 _ _ _ _ _ _ _

Screen Name: Identification--Vehicle Special Use
Variable Name: Vehicle Special Use

Element Attribute:

No special use
Taxi
Vehicle used as school bus
Vehicle used as other bus
Military
Police
Ambulance
Fire truck or car

Other (specify) -- Not to be used starting in the 2000 data collection year
Unknown

Source: Researcher determined; primary source is the police report; secondary sources include vehicle inspection, and interviewees.

Remarks:

No special use
is used when no source indicates or implies that this vehicle was applicable to any of the special uses listed below.

Taxi, **Vehicle used as school bus**, and **Vehicle used as other bus**
are ***"this trip"*** specific. The vehicle must be "on duty" as either a taxi or as a bus. External identification on the vehicle as a bus or taxi is not sufficient to determine its special use.

Taxi
is used when this vehicle was being used during this trip (at the time of the crash) on a "fee-for-hire" basis to transport persons. Most of these vehicles will be marked and formally registered as taxis; however, vehicles which are used as taxis, even though they are not registered (*e.g.*, "Gypsy Cabs"), are included here. ***Taxis and drivers which are off-duty*** at the time of the crash ***are not included***.

Vehicle used as school bus
is used if this motor vehicle (**Body Type**, need not equal **School Bus**) satisfies all of the following criteria:

- ☞ externally identifiable to other traffic units as a school/pupil transport vehicle. The vehicle may be equipped with flashing lights and/or a sway stop arm, and traffic may be required to stop for the vehicle when occupants enter or exit;
- ☞ operated, leased, owned, or contracted by a public or private school-type institution;
- ☞ whose occupants, if any, are associated with the institution; and,
- ☞ the vehicle is in operation at the time of the crash to and from the school or on a school-sponsored activity or trip.

Screen Name: Identification--Vehicle Special Use (cont'd)
Variable Name: Vehicle Special Use (cont'd)

Vehicle used as other bus
is used when this motor vehicle is designed for transporting more than ten persons and does not satisfy all of the above criteria of a school bus.

Military, Police, Ambulance, and **Fire truck or car**
are considered to be in use at all times. Special use means **"in use"** and not necessarily emergency use. External identification to the normal driving public is the sole criterion.

Military
is used for any vehicle which is owned by any of the Armed Forces regardless of body type. This attribute includes:

- military police vehicles;
- military ambulances;
- military hearses; and
- military fire vehicles

Police
is used for any readily identifiable (lights or markings) vehicle which is owned by any local, county, state, or federal police agency. Vehicles not owned by the agency or not readily identifiable which are used by officers or agents (*e.g.*, undercover) are excluded.

Ambulance
is used for any readily identifiable (lights or markings) vehicles: (1) whose sole purpose is to provide ambulance service, or (2) who serve the dual purposes of a hearse--used for funeral services, and an ambulance--used for emergency services. For these dual purpose vehicles (ambulance/hearse), use this attribute only when the vehicle is used as an ambulance.

Fire truck or car
is used for any readily identifiable (lights or markings) vehicle which is owned by any government (typically local) or cooperative agency for the purpose of fire protection. For volunteer fire companies, fire fighting apparatus and other vehicles owned by the company or government qualify for this attribute. Privately owned vehicles, which are not in authorized use, even if equipped with lights, do not qualify (the volunteer firefighter's vehicle).

Unknown
is used when no information is available to determine special use for this trip (e.g., a hit-and-run vehicle).

Screen Name: Identification - In Transport
Variable Name: Is the vehicle in-transport?

Element Attributes:
Check Box

Range:

Source: Researcher determined

Remarks:

A check in this box indicates that the vehicle is in transport. Any changes to the check box will effect the variable **Type** on the **Case Form/Structure/Vehicle Tab**.

Screen Name: Weight--Curb Weight
Variable Name: Curb Weight

Element Attributes:

Curb weight of vehicle.
Unknown

Range:

Source: Researcher determined

Remarks:

Enter this vehicle's curb weight.

Do not confuse the rated Gross Vehicle Weight Rating (GVWR) with the curb weight since it is likely to be significantly greater than the curb weight.

"Vehicle" is defined in this variable to mean the same vehicle identified under **Body Type**.

If the **vehicle model** is known, but the engine size is unknown (*e.g.*, 6 or 8 cylinders), code the average between the high and low curb weights for the model and annotate that the "average" was reported.

When the vehicle specifications do not report the vehicle weight with the proper engine size, adjustments must be made. First, try to determine the weight differences from the vehicle specifications. If the weight difference cannot be determined from the specifications, then adjust as follows: 8 cyl. to 6 cyl. - subtract 100lb/45 kilograms; 6 cyl. to 4 cyl. - subtract 75lb/34 kilograms.

Add 100lb/45 kilograms to the shipping weight to obtain a curb weight on all CDS applicable vehicles.

Towed trailing units are considered cargo weight and not included in the vehicle curb weight

Unknown
is selected when the curb weight of this vehicle cannot be determined.

Screen Name: Weight--Curb Weight Source
Variable Name: Source of Curb Weight Information

Element Attributes:

AAMA
Automotive News
Branham Automobile Reference Book
Gasoline Truck, Import, Truck and Diesel Truck Index
Canadian Specifications
Other (specify)

Source: See Remarks

Remarks:

The sources for obtaining curb weight information are listed below:

Passenger Vehicle Specifications
American Automobile Manufacturers Association (AAMA)
of the U.S., Inc.
300 New Center Building
Detroit, Michigan 48202

Automotive News
Crain Automotive Group, Inc.
965 East Jefferson Avenue
Detroit, Michigan 48207

Branham Automobile Reference Book
Branham Publishing Company
Post Office Box 1948
Santa Monica, California 90406-1948

Gasoline Truck Index, Import Truck Index, and
Diesel Truck Index
Truck Index, Inc.
Post Office Box 10291
Santa Anna, California 92711

If the specification is not available in the sources listed above, then the automated Canadian specifications may be used for this variable.

If not other information is available, data from brochures obtained from vehicle dealers may be used. This will be entered under the "**Other"** attribute. This should then be listed in the "**Specify"** field.

Annotate the source used in the space provided in the General Vehicle Form Data Screen Vehicle this variable.

Screen Name: Weight--Cargo Weight
Variable Name: Cargo Weight

Element Attributes:
Cargo weight of vehicle
Unknown

Source: Researcher determined — inputs include Vehicle Inspection, Interview, PAR, Tow Yard Operator

Remarks:

If Towed Trailing Unit, is Yes – towed trailing unit, then the weight of the trailer and its cargo is coded here. Cargo may also be located in the passenger compartment area and/or trunk.

If there is no cargo then enter the value as zero.

Do not include the weight of the occupants in the cargo weight. The weight of the occupants is included (along with cargo and vehicle curb weight) as a component of the single value which represents the vehicle's combined weight in the WinSMASH Program, if used.

Unknown
is selected if the cargo weight is unknown or if it is unknown if there is cargo in the vehicle.

Screen Name: Weight--Cargo Weight Source
Variable Name: Source of Cargo Weight Information

Element Attributes:
- Vehicle Inspection
- Interview
- PAR
- Tow Yard Operator
- Other (specify)

Source: Researcher determined

Remarks:

This reports the source from which the estimate of the cargo weight, in the vehicle at the time of the crash, was obtained.

Screen Name: Inspection -Type of Inspection
Variable Name: Inspection Type

Element Attributes:

No inspection
Vehicle fully repaired — no damage evident
Partial inspection (specify)
Complete inspection

Source: Researcher determined.

This variable is designed to allow users to identify cases with complete documentation of required damage data (exterior and interior).

No inspection
is selected when neither a complete nor a partial inspection of this vehicle was obtained, irrespective of the reason (*e.g.*, refusal, not required, etc.)

Vehicle fully repaired — no damage evident
is selected when a vehicle is inspected, but is completely repaired and no exterior or interior damage data is available.

Partial inspection (Specify)
is selected when any phase of the inspection is not completed. This includes inspection of partially repaired vehicles and non-towed CDS applicable vehicles. The reason for the partial inspection must be annotated in the “Specify” box.

If the vehicle interior is completely burned out and restraint use cannot be determined then **Partial Inspection** should be selected.

Complete inspection
is selected when both the exterior and the interior of the unrepaired vehicle were inspected and all applicable measurements and photographs were obtained.

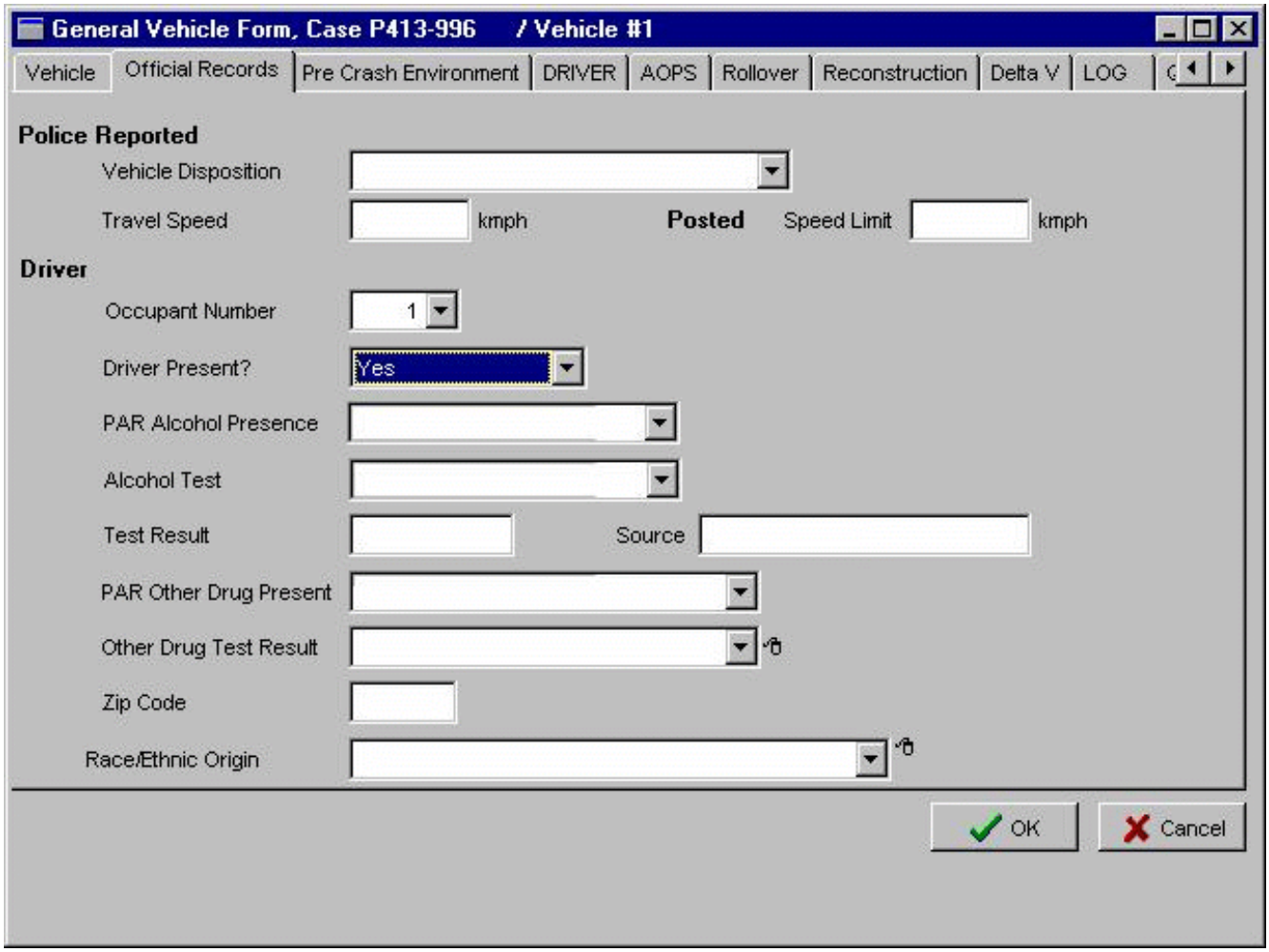
Screen Name: Inspection--Date of Inspection
Variable Name: Date of Inspection

Element Attributes:

Date that vehicle was inspected

Source: Researcher determined.

This variable is designed to allow quality control personnel to evaluate researcher performance in obtaining vehicle inspections.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
Police Reported
Vehicle Disposition
Travel Speed
kmph
Posted
Speed Limit
kmph
Driver
Occupant Number
1
Driver Present?
Yes
PAR Alcohol Presence
Alcohol Test
Test Result
Source
PAR Other Drug Present
Other Drug Test Result
Zip Code
Race/Ethnic Origin
OK
Cancel

Screen Name: Police Reported--Vehicle Disposition
Variable Name: Police Reported Tow Status

Element Attributes:

Not towed due to vehicle damage
Towed due to vehicle damage
Unknown

Source: Police report

Remarks:

The tow status as indicated in this variable is the same tow status that was used in determining the case stratification.

A **"towed"** vehicle is defined as a vehicle which is removed from the crash scene other than by means of its own power. For example, a vehicle which is reported by the police as towed out of a ditch and subsequently driven away, is ***not*** considered a towed vehicle. A vehicle which is driven from the scene and subsequently becomes disabled due to crash-related damage, such that towing is then required, is ***not*** a towed vehicle (even though that towing may be reported on the police report). Carefully scrutinize the PAR to determine the disposition of the vehicle directly from the scene and, if towing is indicated, the reason for the towing.

If after the crash, a vehicle is pushed (by hand or by another vehicle) then consider the vehicle as a towed vehicle.

When a police report indicates that more than one event has occurred (*i.e.*, stabilization is apparent), the disposition of this vehicle is based upon the event sequence selected for stratification. In other words, if the PAR indicates this vehicle was towed from the scene, and a researcher determines from the PAR that towing was ***not*** due to the damage sustained during ***this*** sequence, the correct response for this variable is **Not towed due to vehicle damage**.

When the PAR indicates that this vehicle was towed from the scene and it ***cannot*** be determined whether or not the towing was due to damage, the default response for this variable is **Towed due to vehicle damage**.

Not towed due to vehicle damage
is selected when:

- ☞ the PAR indicates this vehicle was not towed from the scene, or
- ☞ the PAR indicates this vehicle was towed from the scene but ***not*** due to crash-related disabling damage.

Screen Name: Police Reported--Vehicle Disposition (cont'd)
Variable Name: Police Reported Tow Status (cont'd)

Towed due to vehicle damage
is selected when:

- ☞ the PAR indicates this vehicle was towed from the scene due to crash-related disabling damage,

or

- ☞ the PAR indicates this vehicle was towed from the scene and a researcher cannot determine (from the PAR data) if the towing was due to crash-related disabling damage.

Unknown
is selected when the investigating officer reported that the disposition of the vehicle was unknown at the time the PAR was completed. Also, use this attribute if the PAR indicates the vehicle was abandoned. However, if the police report specifies that the vehicle was disabled due to crash-related damage, as well as indicating "unknown" , "abandoned" or blank for the disposition, it can be **assumed** that the vehicle will eventually be towed from the scene. In these instances, **enter Towed due to vehicle damage**

Screen Name: Police Reported--Travel Speed
Variable Name: Police Reported Travel Speed

Element Attributes:
Police reported travel speed
Unknown

Source: Police report only

Remarks:

Enter the travel speed for this vehicle if indicated on the police report by the investigating officer. ***Do not*** use estimates by drivers or witnesses.

Enter the nearest mph/kmph, or if the travel speed is reported as a range, enter the average.

000 kmph
is entered if this vehicle is stopped or indicated by the police as traveling less than 0.5 mph.

Unknown
is selected if the estimated travel speed is unknown.

Screen Name: Posted Speed Limit
Variable Name: Posted Speed Limit

Element Attributes:

Posted speed limit
No statutory limit
Unknown

Source: Primary sources are scene inspection or statutory law. ***Do not*** use the police report for selecting this variable's value.

Remarks:

A speed limit must be identified for all known crash scene locations.

If no speed limit sign is posted within a reasonable distance from the location of the first crash event along the approach leg of the roadway this vehicle was traveling on, then reference state statutes to obtain the applicable statutory maximum speed limit for the location (local or state).

Disregard advisory or other speed signs which do not indicate the legal speed limit. ***Do not confuse*** advisory signs on entrance/exit ramps or near intersections with the actual legal maximum speed limit.

If a state has a statute that uniformly reduces the maximum allowable speed within or near a construction zone, then code the indicated reduced limit.

No statutory limit
is selected for roadways which are neither posted nor have a statutory limit (*e.g.*, parking lot roadways or entrance/exits, service station entrance/exits, or driveways, etc.).

Unknown
is selected only in rare situations where a crash scene cannot be located.

Screen Name: Driver--Occupant Number
Variable Name: Occupant Number

Element Attributes:
Occupant Number

Source: Researcher determined

Remarks:

Select the occupant number of the person who is the driver.

Note: Occupants are entered on the Case Form / Structure Tab / Occupants sub-tab.

Screen Name: Driver--Driver Present?
Variable Name: Is the Driver Present?

Element Attributes:

No Driver Present
Yes
Unknown

Source: Researcher determined - inputs include the police report and interviews.

Remarks:

This variable serves as a flag to identify driverless motor vehicles in-transport.

No Driver Present
is selected if no driver was physically in the vehicle at the time that it was involved in the crash.

Selecting this attribute will preclude you from entering alcohol presence, other drug presence and precrash information for this vehicle.

Yes
includes those instances when the motor vehicle was a “hit-and-run” vehicle.

Unknown
Is selected when it is not known if the driver was in the vehicle at the time of the crash.

Screen Name: Driver--PAR Alcohol Presence
Variable Name: Police Reported Alcohol Presence

Element Attributes:

No alcohol present
Yes - alcohol present
Not reported
Unknown

Source: Police report

Remarks:

The phrase "alcohol present" means that the police report indicates that the driver ha/d consumed an alcoholic beverage. Presence is not an indication that alcohol was in any way a cause of the crash, even though it may have been. Finding opened or unopened alcoholic beverages in the vehicle does not by itself constitute presence.

No alcohol present
is selected if the investigating officer's assessment (as reported on the police report) is that no alcohol was present in the driver.

Yes alcohol present
is selected if the police indicate alcohol presence in the driver via: (1) a specific data element on the police report form, (2) the police charge the driver with DWI/DUI, (3) the police mention in the narrative section of the report that the driver had been drinking (or alcohol was present or involved), or (4) the police report has a positive blood alcohol concentration (BAC) test result (BAC > .00).

Not reported
is selected if there is a specific location on the police report for assessment of alcohol presence but the investigating officer fails to make either a positive or negative assessment.

Unknown
is selected if alcohol presence is indicated as unknown. In general, police reports have blocks to check either positive or negative alcohol presence. However, if a police report has a provision for the investigating officer to respond "unknown presence", then use unknown. In addition, use unknown for hit-and-run drivers unless clear evidence to the contrary exists.

Some PARs have a block labeled **"Alcohol/Drugs"**. If "presence" is indicated, and it cannot be determined which was used (*e.g.*, narrative, arrest/charged section, etc.), then assume alcohol presence. If the police report indicates that a driver was charged with DWI (driving while intoxicated or driving while impaired) and no clarification is offered to indicate if the DWI was alcohol related or other drug related (*i.e.*, a specific data element; mentioned in the narrative section; BAC results), then assume alcohol presence.

Screen Name: Driver--Alcohol Test
Variable Name: Alcohol Test for Driver

Element Attributes:

Test Performed
Test Refused
None Given
BAC test performed, results unknown
Unknown

Source: Police report, medical reports, or other official sources.

Remarks:

No psychomotor (police observation of driver actions) test results are coded here. Also, be aware of preliminary test results. These preliminary tests, including an instrumented field screening test, indicate the presence of alcohol, but not necessarily the particular content level. Preliminary tests are designed to segregate candidates for further testing from those persons where the suspected presence of alcohol is either nonexistent or too low for additional tests.

If an instrumented field screening test was given and it was determined that:

Test Performed

when a test for Blood Alcohol Concentration (BAC) is administered either by the police or at a treatment facility.

Test Refused

when the person refuses to voluntarily take a BAC test, and no subsequent test is given.

None Given

when no BAC test is administered.

BAC test performed, results unknown

when the BAC test has been administered, but the results are unknown. Selecting this attribute will automatically blank out the Test Result variable and the Source variable.

Unknown

is selected when it is not known if a test was administered.

Screen Name: Driver—Test Result
Variable Name: Alcohol Test Result

Element Attributes:

Entered BAC

Blank

Range: 0.0 - 0.9

Source: Police report, medical reports, or other official sources.

Remarks:

Blood Alcohol Concentration (BAC) measures, analytically, the mass of alcohol per unit volume of blood. The standard measure is expressed as the number of **milligrams per deciliter** (tenth of a liter) expressed as a decimal. (*e.g.*, .05 = 50 mg/100 ml; .15 = 150 mg/100 ml) . A blood alcohol concentration (BAC) test could be a blood, breath, or urine test.

If the BAC was given on the police report or subsequently added after the case was initiated, enter the reported value. In essence, if any BAC is obtained, enter the reported value. For example, a BAC of 117 mg/dl is coded as 0.117.

For drivers of nontowed CDS applicable and non-CDS applicable vehicles, use only PAR information when coding test results. However, **all** available sources should be used for drivers of non-towed CDS applicable vehicles with deployed airbags.

Blank If the previous variable Driver– Alcohol Test is coded as “AC Test Performed, results unknown” then this field is blank and cannot be edited.

Screen Name: Driver--Source
Variable Name: Source of Alcohol Test Result

Element Attributes:

PAR
Medical Report
Other Specify

Source: Police report, medical reports, or other official sources.

Remarks:

Enter source of data used to code the Blood Alcohol Concentration (BAC) . Examples include PAR and Medical Reports. Medical Reports include Autopsy Report, ER report, discharge summary, nurses notes, etc.

PAR
is used when the BAC information is obtained from any record associated with the PAR.

Medical Report
is used when the BAC information was obtained from any medical report (i.e., Autopsy Report, ER report, discharge summary, nurses notes, etc.).

Other (Specify)
is used when the BAC information is obtained from some source other than those listed above. An example is a verbal BAC from an **official** source.

Verbal BACs obtained from an official source are acceptable, if written approval has been obtained from the team's zone center.

Other Drugs Overview

These variables focus upon "other drugs". For the purpose of these variables the word "drug" is defined in nonmedical terms. A "drug" is any chemical substance, natural or synthetic which, when taken into the human body, can impair the ability of the person to operate a motor vehicle safely. The word "other" in this phrase means all "drugs" except alcohol, nicotine, aspirin, and drugs administered post-crash.

No laboratory, no matter how modern its equipment or competent its staff, can identify all drugs that are currently abused. Add to this the fact that new drugs, both licit and illicit, become available every week, and it soon becomes evident that the capacity for drug abuse always stays ahead of the capacity for chemical drug detection. Even if the laboratory does have the capability of identifying a particular drug, it will require that the drug be present at a specific minimum **concentration** before it can conclude that a "real" chemical detection has occurred. This is referred to as the **detection threshold**, and it varies from drug to drug, and from one chemical analytic method to another. Some of the analytic methods used by some laboratories to detect certain drugs do not actually seek to find the drug itself, but look instead for a **metabolite** of the drug. A metabolite is a chemical breakdown product of the drug.

Variable Name: Driver--PAR Other Drug Presence
Variable Name: Police Reported Other Drug Presence

Element Attributes:

No other drug(s) present
Yes other drug(s) present
Not reported
Unknown

Source: Police report.

Remarks:

The phrase "other drug present" includes all prescription, "over-the-counter" medications, as well as "illicit" substances (*e.g.*, in most cases, marijuana, cocaine, heroin), . Also, "other drug present" means that the driver had ingested an other drug prior to the crash, but it is not an indication that the drug usage was in any way the cause of the crash (or event), even though it may have been. Finding other drugs in the vehicle does not by itself constitute presence.

No other drug(s) present
is selected if the investigating officer's assessment (as reported on the police report) is that no other drugs were present in the driver.

Yes other drug(s) present
is selected if the police indicate an other drug presence in the driver via: (1) a specific data element on the PAR, or (2) the police mention in the narrative section of the report that the driver had ingested an other drug.

Not reported
is selected if there is a specific location on the police report for assessment of other drug presence but the investigating officer fails to make either a positive or negative assessment. In addition, use this attribute if the PAR does not have a specific location for reporting other drugs and the police do not mention other drugs in the narrative section.

Unknown
is selected if other drug presence is indicated as unknown on the PAR. A growing number of police reports have blocks to check either positive or negative other drug presence. However, if a police report has a provision for the investigating officer to respond "unknown presence", then use this attribute. In addition, use this attribute for hit-and-run drivers unless clear evidence to the contrary exists.

NOTE: The police report must have a specific block on the PAR to report “Other Drug” presence, or it must be specifically mentioned in the narrative section. Some PARs have a block labeled **"Alcohol/Drugs"**. If "presence" is indicated, and it cannot be determined which was used (*e.g.*, narrative, arrest/charged section, etc.), then assume alcohol presence. If the police report indicates that a driver was charged with DWI (driving while intoxicated or driving while impaired) and no clarification

Variable Name: Driver--PAR Other Drug Presence (cont'd)
Variable Name: Police Reported Other Drug Presence (cont'd)

is offered to indicate if the DWI was alcohol related or other drug related (*i.e.*, a specific data element; mentioned in the narrative section; BAC results), then assume alcohol presence.

Screen Name: Driver--Other Drug Test Result
Variable Name: Other Drug Test Result

Element Attributes:

No specimen test given
Drug(s) not found in specimen
Drug(s) found in specimen, specify
Specimen test given, results unknown or not obtained
Unknown if specimen test given

Source: Police report, medical reports, or other official sources.

Remarks:

If a medical, police report, or other official source says that a certain drug was "screened for" or that it was "not detected", then you know that a specimen test was used. In addition, the presence of a measured quantity of an "other drug(s)" means that a specimen test was given. The specimen used in the test that obtained the measurement could be blood, urine, or an other specimen (*e.g.*, nasal swab, saliva). Some drugs are tested using a particular type of specimen; others can be tested in multiple ways. Researchers need to review toxicology (or other official) records carefully to determine which specimen or specimens were used for the driver's evaluation. Specimens are hierarchically ordered with a blood test taking preference over a urine test and urine over other.

Drug(s) not found in specimen
is selected if it is known that the driver had at least one type of specimen tested for other drugs *and* the test results came back "negative".

Drug(s) found in specimen, specify
is selected if it is known that the driver had at least one type of specimen tested for other drugs (excluding alcohol, nicotine, aspirin and drugs administered post-crash) and that the driver had a positive test result. A positive test result is any measured quantity that exceeds the detection threshold of the laboratory which performed the test.

Specimen test given, results unknown or not obtained
is selected if it is known that the driver had at least one type of specimen tested for other drugs, but the results of that test are unknown or not reported.

Unknown if specimen test given
is selected when it cannot be determined if the driver was administered a specimen test for other drugs. This attribute should also be selected if it is known that the driver received treatment at a medical facility but the medical records have not been obtained.

Variable Name: Driver--ZIP Code
Variable Name: Driver's Zip Code

Element Attributes:

(first, second, and third characters): 000,004-098,100-200,
202-212,214-268,270-340,342,346-347,349-352,354-397,400-418,
420-427,430-516,520-528,530-532,534-535,537-551,553-554,556-567,
570-577,580-588,590-606,609-620,622-631,633-641,644-658,660-662,
664-681,683-693,700-701,703-708,710-714,716-731,733-741,743-816,
820-838,840-847,850,852-853,855-857,859-860,863-865,870-875,
877-885,889-891,893- 895,897-898,900-928,930-999

Driver not a resident of U.S. or territories
Enter actual 5-digit zip code
Unknown

* Range is a compilation of Sections 6 and 12 of the National Five Digit Zip Code & Post Office Directory, Volume 2 N-W

Source: Primary source is the police report; secondary sources include interviewees, medical records, and other official documents.

Remarks:

Prioritization of data sources:

First, use the PAR. For the purposes of this variable, a driver is considered to reside at the address listed on the police crash report. This address was most likely taken from the driver's license given to the police officer and/or from the licensing state's drivers license file.

If the driver's address is present and the ZIP code is missing or not available, then determine the correct ZIP code by using the two volume National Five Digit Zip Code & Post Office Directory. Of the seventeen (17) NASS CDS states, five (5) currently do not list the driver's ZIP code (*i.e.*, Arizona, Michigan, New Jersey, Pennsylvania, and Texas).

Second, use official records (*e.g.****, medical)***. If the driver's ZIP code cannot be obtained from the PAR, then use official records, if available, to determine the correct ZIP code.

Third, use interviewee data. When no address (*i.e.*, street number/name, city, state) is present on the PAR, ask the interviewee the driver's ZIP code as a "specific question" during the interview (page one of the Interview Form). If the interviewee does not know the driver's ZIP but does know the driver's address, then use this information to determine the ZIP code. When obtaining address information, determine what the driver considers his/her current permanent mailing address to be.

Variable Name: Driver--ZIP Code (cont'd)
Variable Name: Driver's Zip Code (cont'd)

During the process of obtaining the interview, the vehicle inspection, or the associated medical records, researchers will discover, for some drivers, a conflict between the address listed on the PAR and the driver's current address. In conflict situations, always enter the ZIP code for the address given on the

PAR or on an official document before entering the ZIP code from the information obtained during the interview.

Driver not a resident of U.S. or territories

is selected when the address found on the PAR or obtained from medical records, or during the interview indicates that the driver resides at an address which has not been assigned a ZIP code by the U.S. Post Office.

Unknown

is selected whenever the ZIP cannot be determined. For example, use **Unknown** for "hit-and-run" drivers and for any driver's address that you discover is fictitious. In addition, use **Unknown** if the driver, licensed or not, has no permanent address. For example, the driver could be living out of his/her vehicle (camper, motorhome, etc.), or the driver could be "homeless".

Screen Name: Driver-- Race / Ethnic Origin
Variable Name: Race/Ethnic Origin of Driver

Element Attributes:

White (non-Hispanic)
Black (non-Hispanic)
White (Hispanic)
Black (Hispanic)
American Indian, Eskimo or Aleut
Asian or Pacific Islander
Other (specify):
Unknown

Source: Researcher determined; primary source is the interviewee; secondary sources include police report, medical records, and other official documents.

Remarks:

Note: Although this variable is on the **Official Records Tab**, this variable is a "self identification" by the occupant. This information can be obtained from any of the above sources, however is not always an "official record".

The concept of race as used by the U.S. Census Bureau reflects self-identification; it does not denote any clear-cut scientific definition of biological stock. Self-identification represents self-classification by people according to the race with which they identify themselves. For drivers with parents of different races who cannot provide a single response, use the race of the driver's mother; however, if a single response cannot be provided for the driver's mother, the first race reported by the driver is encoded.

Hispanic is not a race but rather an ethnic origin. Persons of Spanish origin may be of any race. For the purpose of this variable, race and Hispanic origin have been combined using the elements listed above.

Prioritization of data sources:

First, use interviewee data. Ask the interviewee what the driver considers their race and ethnic origin to be. If the response does not clearly fit into one of the race and ethnic origin categories, then use the information provided by the interviewee concerning the driver's nationality/ethnic origin to select the correct element value.

Second, use the PAR. If race is given on the PAR and the PAR scheme is compatible with this variable, then use the PAR information.

If the PAR only indicates White/Caucasian, Black/Negro, Hispanic/Spanish, or Other, then the PAR contains insufficient information for this variable. Additional information is required to determine the combination of race and ethnic origin. In addition, the driver's ***name*** is not a reliable indicator of either race or ethnic origin and ***cannot be used*** when selecting the applicable element value for this variable. For example, a name such as: Mary Perez, tells you neither race (*e.g.*, white or black) nor ethnic origin since the person may or may not consider themselves to be of Hispanic descent.

Screen Name: Driver-- Race / Ethnic Origin (cont'd)
Variable Name: Race/Ethnic Origin of Driver (cont'd)

Third, use official records (*e.g.**, medical)***. If the data needed cannot be obtained from the interviewee and is not available or usable from the PAR, then use official records, if available, to determine the correct element attribute.

White (non-Hispanic)
is selected for drivers who consider themselves as having origins in any of the original peoples of Europe, North Africa, or the Middle East. The person may consider his/her race to be white ***and*** not of Hispanic origin.

Black (non-Hispanic)
is selected for drivers who consider themselves as having origins in any of the black racial groups of Africa. The person may consider his/her race to be Black, Negro, or Afro-American ***and*** not of Hispanic origin.

White (Hispanic)
is selected for drivers who consider themselves as having origins in any of the original peoples of Europe, North Africa, or the Middle East. The person may consider his/her race to be white ***and*** of Hispanic origin.

Black (Hispanic)
is selected for drivers who consider themselves as having origins in any of the black racial groups of Africa. The person may consider his/her race to be Black, Negro, or Afro-American ***and*** of Hispanic origin.

American Indian, Eskimo or Aleut
is selected for drivers who consider themselves as having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition. For example, if a specific (or named) Indian tribe is given, then use this attribute.

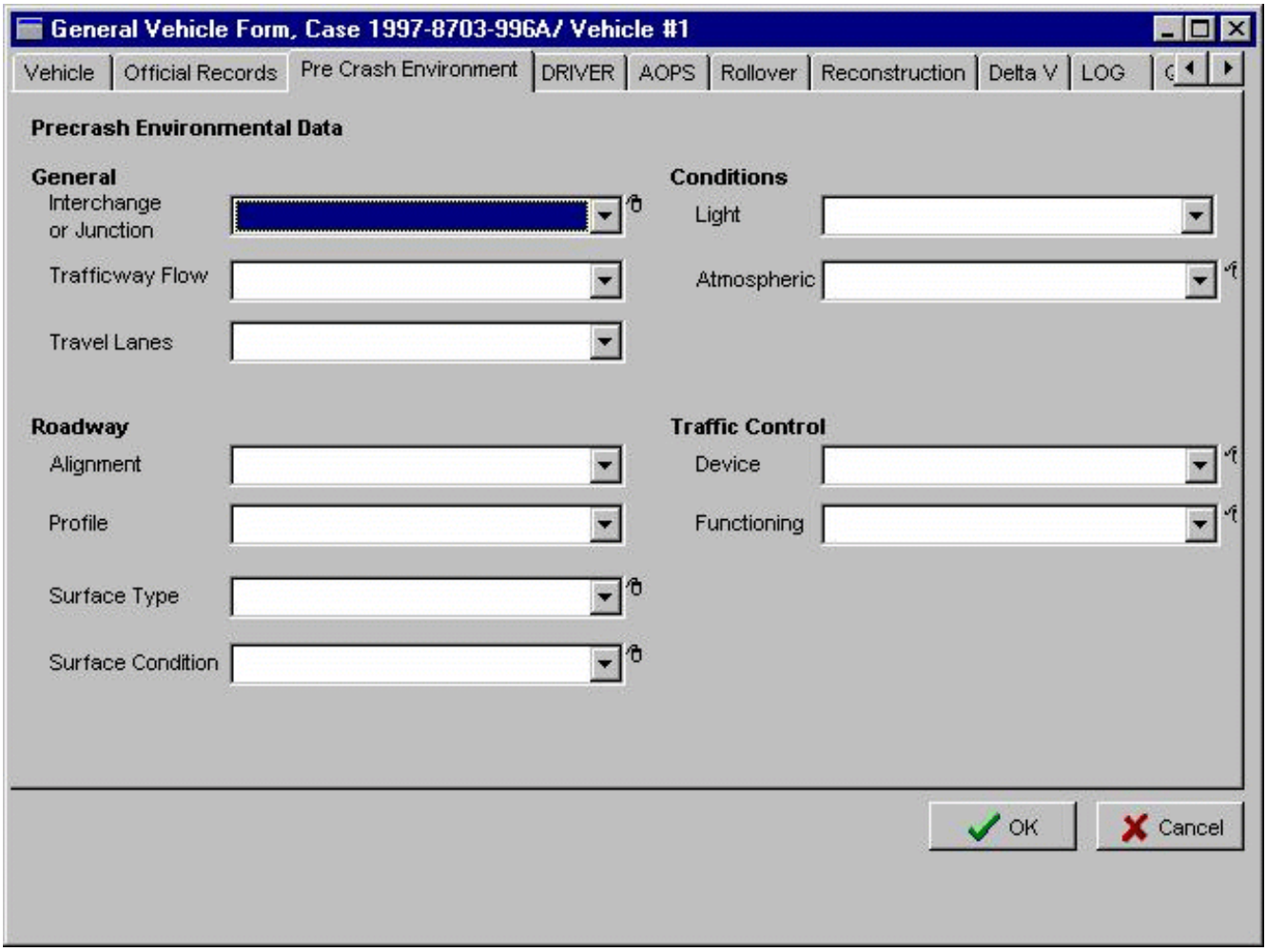
Asian or Pacific Islander
is selected for drivers who consider themselves as having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.

Other
is selected for drivers who consider themselves to be of a race or ethnic origin not described above. Use this attribute for descriptions such as: Eurasian, Cosmopolitan, inter-racial, etc. In addition, if the driver considers him/herself to be of Hispanic origin but not white or black, then use this attribute.

Unknown
is selected when the source(s) available do not provide sufficient information to classify the driver's race **and** ethnic origin. In addition, use this attribute when Hispanic origin is known, but race is not; and when race is known, but Hispanic origin is not.

Pre-Crash Environment Data Overview

The Pre-Crash Environment variables are selected separately for each vehicle involved in the crash. They should be coded for the characteristics of their roadway environment just prior to the critical precrash event



Screen Name: General--Interchange or Junction
Variable Name: Relation to Interchange or Junction

Element Attributes:

Non-interchange area and non-junction
Interchange area related
Intersection related/non-interchange
Driveway, alley access related/non-interchange
Other junction (specify) **/** non-interchange
Unknown type of junction / non interchange
Unknown

Source: Researcher determined — Primary source is the scene inspection, secondary sources include the police report and interviews.

Remarks:

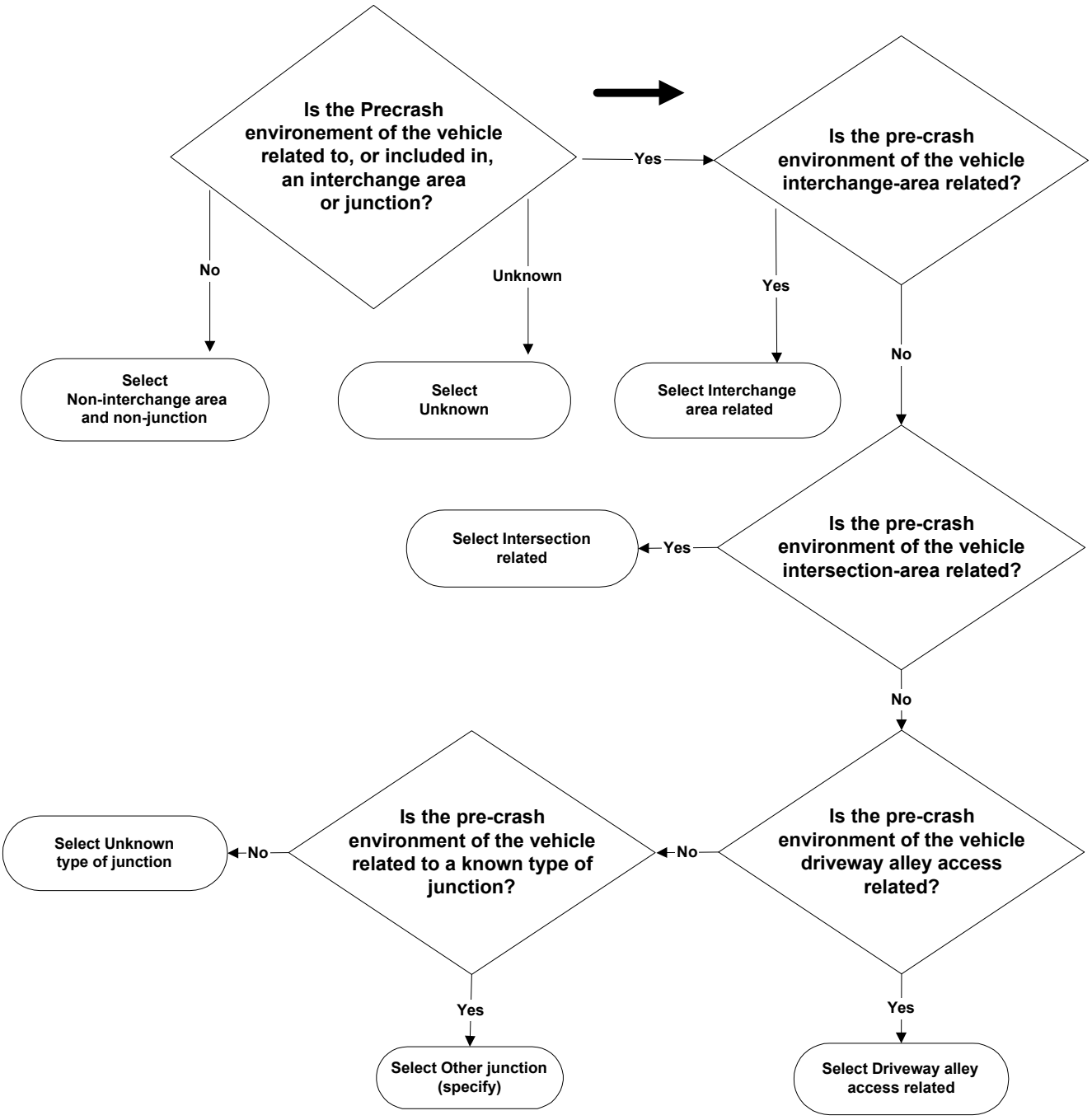
The attribute selected is based on the characteristics of the roadway environment just prior to the critical precrash event for this vehicle

ANSI D16.1 should be referred to for additional information about the characteristics of junctions and interchanges.

A junction is, in general, the area formed by the connection of two roadways. It includes: (1) all at-grade intersections, (2) connections between a driveway access or alley access and a roadway which is not a driveway access or an alley access, (3) connections between two alley accesses or driveway accesses, or (4) a connection between a driveway access and an alley access.

Screen Name: General--Interchange or Junction (cont'd)
Variable Name: Relation to Interchange or Junction (cont'd)

Figure GV- 1: Flowchart for Determining Interchange or Junction



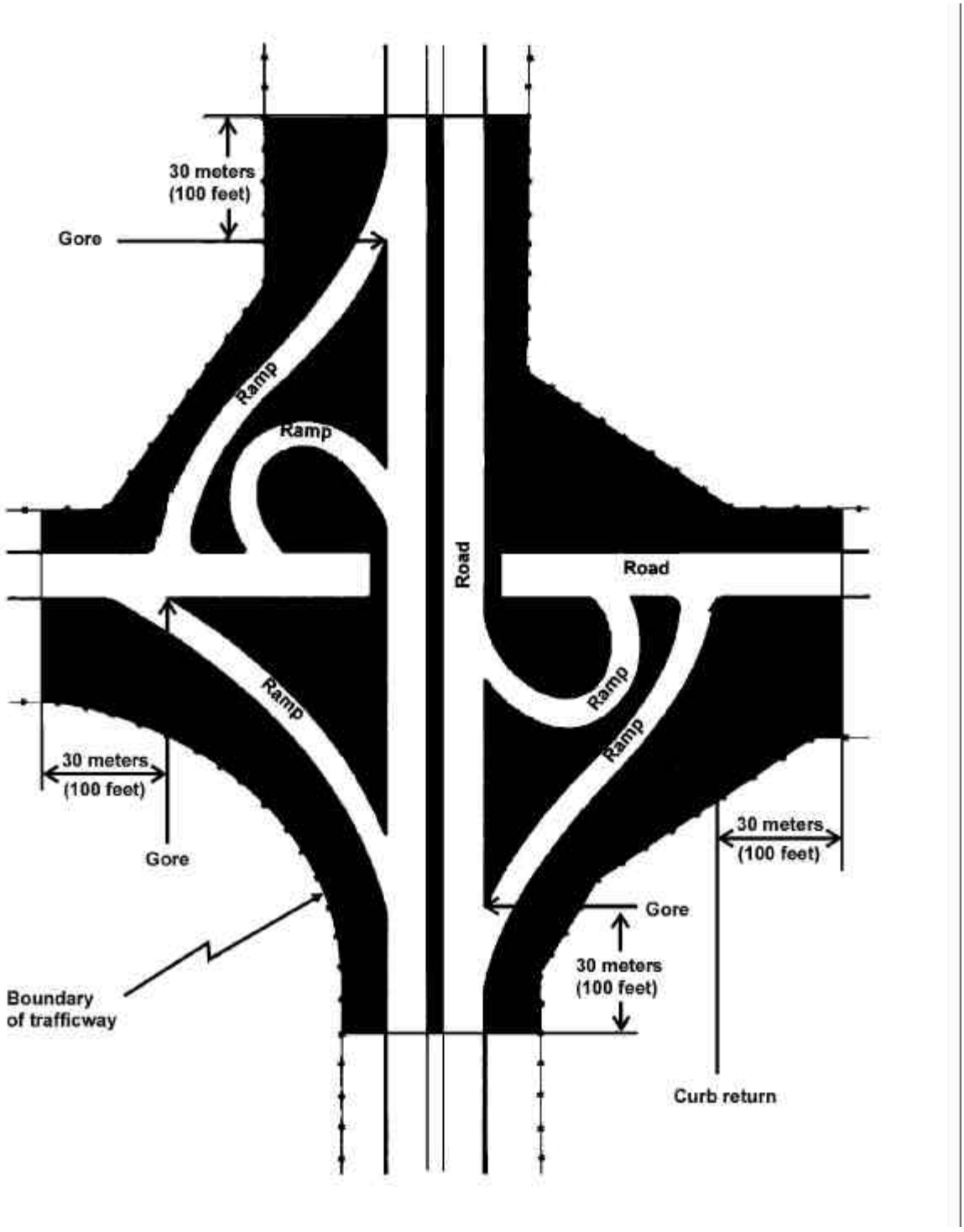
Screen Name: General--Interchange or Junction (cont'd)
Variable Name: Relation to Interchange or Junction (cont'd)

Non-interchange area and non-junction
is selected when the vehicle's environment just prior to the critical precrash event does not occur within an interchange area or within a junction.

Interchange area related
is selected when the vehicle's environment just prior to the critical precrash event occurs within an interchange area. An interchange is the area around a grade separation which involves at least two trafficways. Included within its boundaries are: (1) all ramps which connect the roadways, and (2) each roadway entering or leaving the interchange to a point 30 meters (100 feet) beyond the gore or curb return at the outermost ramp connection for the roadway. One may find included within an interchange area intersections, driveway accesses, and, of course, roadway sections which are non-junction. See Figure.

Screen Name: General--Interchange or Junction (cont'd)
Variable Name: Relation to Interchange or Junction (cont'd)

Figure GV- 2: Interchange Area



Screen Name: General--Interchange or Junction (cont'd)
Variable Name: Relation to Interchange or Junction (cont'd)

Intersection Related

is selected when the vehicle's environment just prior to the critical precrash event: (1) is in an intersection or is in an approach to or exit from an intersection; ***and*** (2) results from an activity, behavior, or control related to the movement of traffic units through the intersection.

"Traffic units" above means any traffic unit (involved or not involved in the crash). If the vehicle's environment just prior to the critical precrash event occurs outside but near an intersection and involves a vehicle which was engaged or should have been engaged in making an intersection-related maneuver such as turning, then **Intersection Related** must be selected. However, if the loss of control is unrelated to the intersection, then select **Non-interchange area and non-junction**.

An intersection is a type of junction which contains a crossing or connection of two or more roadways not classified as a driveway access or alley access.

Intersection related also includes any two leg intersections. To qualify for inclusion at least one of the two legs must be controlled by a regulatory sign (see **Traffic Control Device**) or traffic signal; otherwise, treat the area as a sharp curve.

A rotary or traffic circle is a specialized form of at-grade intersection. Traffic flows by entering and leaving a one-way roadway connecting all intersection approach legs and running continuously around a central island. Rotary intersections are commonly called *traffic circles*, but proper design can result in central islands of various rounded shapes.

Driveway, alley access related

is selected when the vehicle's environment just prior to the critical precrash event: (1) is an approach to or exit from the driveway or alley access; ***and*** (2) results from an activity, behavior, or control related to the movement of traffic units through the driveway or alley access. Use this attribute when the vehicle's environment just prior to the critical precrash event occurs on a NASS roadway which approaches or exits from the driveway or alley access junction and at least one involved pedestrian, other nonmotorist associated with a nonmotorist conveyance or road vehicle was entering or exiting from the driveway or alley. Do not use this attribute if the crash was precipitated by the action of a noncontact road vehicle or person.

Other junction (specify) / non-interchange

is selected when the vehicle's environment just prior to the critical precrash event is not interchange related, is not intersection related, is not driveway, alley access related, but does occur in a junction. The type of junction must be specified when this attribute is selected.

Screen Name: General--Interchange or Junction (cont'd)
Variable Name: Relation to Interchange or Junction (cont'd)

The following are examples of ***non-interchange junctions:***

- A ***channel*** refers to any traffic lane that is directed into a path different than the through lanes by a traffic island. An ***island*** is defined as a raised or painted paved surface. The channel begins and ends at the extension of the island's lateral boundaries unless the channel is preceded or followed by an area of mergence or divergence (see below). Select **Other junction**, specify-***channel*** if the vehicle's roadway environment just prior to the critical precrash event was in the channel or on the traffic island (if the vehicle enters or strikes the island from within the channel).

- A ***crossover*** is a designated opening within a median used primarily for "U" turns". To be considered, the nearest lateral boundary line of the crossover must be greater than 10 meters (33 feet) from the nearest lateral boundary line of any roadway (highway, street, ramp, driveway, or alley) which intersects with either side of the roadways which the median divides. Select **Other junction**, specify-***crossover*** if the characteristics of the vehicle's roadway environment just prior to the critical precrash event were in the junction of a crossover and a roadway. Do not use this attribute if the crash was precipitated by the actions of a noncontact road vehicle or person.

- ***An area of mergence or divergence*** is in, and adjacent to an auxiliary lane, which is adjacent to the through lane(s) and follows an entrance ramp or channel or precedes an exit ramp or channel. A mergence area extends longitudinally from where the ramp or channel ends and ends where the auxiliary lane ends. A divergence area extends longitudinally from where the auxiliary lane begins and ends where the ramp or channel begins. The area extends laterally across the through lane(s), for traffic in the same direction, ending at a centerline, median, or road edge/curb.

Unknown type of junction / non interchange
is selected when it is known that the vehicle's environment just prior to the critical event is in a junction, but the type of junction is unknown.

Unknown
is selected when the environment of the vehicle just prior to the critical event is unknown.

Screen Name: General--Trafficway Flow
Variable Name: Trafficway Flow

Element Attributes:

Not physically divided (two way traffic)
Not physically divided - center 2-way left turn lane
Divided trafficway-median strip without positive barrier
Divided trafficway-median strip with positive barrier
One way traffic
Unknown

Source: Researcher determined-Primary source is the scene inspection; secondary sources include the police report and interviews.

Remarks:

If the collision occurred other than in a junction, select the attribute on the basis of the most representative description of the characteristics of the vehicle's roadway environment just prior to the critical precrash event. If this is off the roadway, select the attribute on the basis of the most representative description of the roadway leading to the point of departure.

If the characteristics of the vehicle's roadway environment just prior to the critical precrash event is represented by the junction of two or more roadways, choose the trafficway flow on the basis of the most representative description of the approach leg to the junction for this vehicle.

A roadway is that part of a trafficway where vehicles travel. A divided trafficway is composed of two or more roadways. A trafficway which has a median that is designed as a two-way left turn lane is considered to be one roadway for lane identification purposes.

The Researcher selects the descriptor that best represents the vehicle's environment just prior to the critical precrash event. If the flow is designed to separate traffic, then choose accordingly.

Not physically divided (two way traffic)
is selected whenever there is no median. Generally, medians are not designed to legally carry traffic.
NOTE: Although gores separate roadways, and traffic islands (associated with channels) separate travel lanes, neither is involved in the determination of trafficway division.

Not physically divided - center 2-way left turn lane
is used whenever the trafficway is physically divided by a two-way left turn lane which is designed to allow left turns to driveways, shopping centers, businesses, etc., while at the same time providing a separation of opposing straight-through travel lanes.

Screen Name: General--Trafficway Flow (cont'd)
Variable Name: Trafficway Flow (cont'd)

Divided trafficway-median strip without positive barrier
is selected whenever the trafficway is physically divided, however, the division is unprotected [*e.g.*, vegetation, gravel, paved medians, trees, water, embankments and ravines that separate a trafficway (*i.e.*, all non-manufactured barriers). NOTE: Raised curbed medians ***DO NOT*** constitute a positive barrier in and by themselves. The unprotected medians can be of any width, however, painted paved flush areas, must be 1.2 meters in width to constitute a median strip.

Divided trafficway — median strip with positive barrier
is selected whenever the traffic is physically divided and the division is protected by any concrete, metal, or other type of longitudinal barrier (*i.e.*, all manufactured barriers). Also bridges or underpass support structures and bridge rails take this attribute.

One way trafficway
is selected primarily whenever the trafficway is undivided and traffic flows in one direction (*e.g.*, one-way streets). However, this attribute can also be selected where a median is present so long as all the traffic on the trafficway goes in the same direction. An example occurs where the opposing roadway of the same named trafficway had to be split by such a distance that the right-of-way divides to accommodate other property. If (rare) one of the trafficways is further divided into multiple roadways by a median, then in this instance **One way trafficway** should be selected. Included are entrance and exit ramps.

Unknown
is selected if the trafficway flow cannot determined (*e.g.*, ongoing construction and movable traffic barriers moved or removed since the crash date).

Screen Name: General--Number of Travel Lanes
Variable Name: Number of Travel Lanes

Element Attributes:

One
Two
Three
Four
Five
Six
Seven or more
Unknown

Source: Researcher determined--Primary source is the scene inspection — secondary sources include the police report and interviews.

Remarks:

The attribute is determined from the same roadway which was used to determine the **Trafficway Flow**. If traffic flows in both directions and is undivided, select the number of lanes in both directions. If the trafficway is divided into two or more roadways, select only the number of lanes for the roadway on which the vehicle under consideration was traveling.

If turn bays, acceleration, deceleration, or center 2-way left turn lanes exist and are physically located within the cross section of the roadway, and these lanes are the most representative of the driver's environment just prior to the critical precrash event, then they are to be included in the number of lanes. Channelized lanes are separated from other through or turn related lanes. (NOTE: The separation normally will not involve a physical barrier.) Because a channelized lane is separated, it should not be included unless it is preceded by a turn bay or turn lane and this bay or lane is felt to be most representative of the driver's environment just prior to impact.

The number of lanes counted does not include any of which are rendered unusable by restriction of the right-of-way (*e.g.*, closed due to construction). Show lanes on the scaled diagrams and annotate why a lane is closed.

Only those lanes ordinarily used for motor vehicle travel should be considered when completing this variable (*i.e.*, pedestrian/bicycle lanes are excluded).

In a number of instances, there will be uncertainty as to the number of lanes due to: (1) nonstandard roadway widths; (2) variability of width in the same roadway due to disrepair and other reasons; or (3) absence of lane, center, and edge lines, etc. The number selected in these cases should represent the number of operational lanes based on customary or observed usage.

On a road that has legal parking such that the legal parking area ends short of the junction of the roadway with another roadway or drive; and the space left between the end of the legal parking area and the beginning of the junction can be utilized for turning by a vehicle on the roadway, do not consider this additional area as another travel lane (regardless of customary or observed usage in this instance).

Screen Name: General--Number of Travel Lanes (cont'd)
Variable Name: Number of Travel Lanes (cont'd)

This area should be construed as additional width to the existing travel lane(s). The only time that another lane will be counted at a junction is when that space is expressly designated for turning, *e.g.*, by lane (line or turn arrow) marking, signs or signals.

The number of lanes for driveways, wide-mouth parking lots, etc. should be selected as follows:

- **T** If it is possible to determine the number of lanes through either lane markings or observed or customary use, select the actual number of lanes present.

- **T** If the number of lanes cannot be accurately established, select **Unknown**.

If the vehicle was on or in a driveway [see Relation to Junction, definitions for **Driveway, alley access related**, or in a crossover (primarily designed as an opening in a median used for "U" turns)] which is in essence a private way, select the number of lanes for that vehicle.

Screen Name: Roadway--Alignment
Variable Name: Roadway Alignment

Element Attributes:

Straight
Curve Right
Curve Left
Unknown

Source: Researcher determined--Primary source is scene inspection; secondary sources include the police report and interviews.

Remarks:

This element is determined from the same roadway which was used to determine Trafficway Flow. Select the descriptor that best represents the vehicle's environment just prior to this vehicle's critical pre-crash event.

Any perceptually determined curvature of a roadway constitutes a curve.

Straight
Refers to a roadway which has no perceptually determined curvature.

Curve right and Curve left
Refer to a perceptually determined curvature of a roadway. The vehicle's direction of travel determines whether the curvature is right or left.

Screen Name: Roadway--Profile
Variable Name: Roadway Profile

Element Attributes:

Level
Uphill grade (> 2%)
Hillcrest
Downhill grade (> 2%)
Sag
Unknown

Source: Researcher determined--Primary source is scene inspection; secondary sources include police report and interviews.

Remarks:

The element attribute is determined from the same roadway which was used to determine **Trafficway Flow**. Measure the area most representative of the pre-crash environment. To determine the grade, the vertical measurement is divided by the horizontal value; the result is a percentage value of the grade.

Level
is selected when the roadway surface tangent gradient is less than or equal to 2%. [i.e. vertical divided by horizontal (vertical **/** horizontal)]

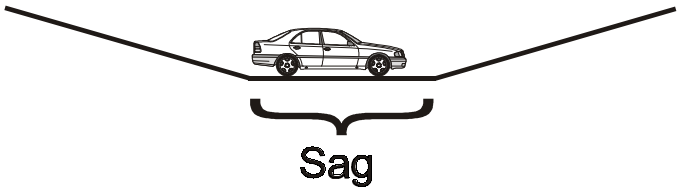
Uphill grade (> 2%)
is selected when the roadway profile is uphill or positive, relative to the direction of travel of this vehicle.

Hillcrest
refers to a surface in vertical transition between two points of tangency.

Screen Name: Roadway--Profile
Variable Name: Roadway Profile

Downhill grade (> 2%)
is used when the roadway profile is downhill or negative, relative to the direction of travel for this vehicle.

Sag
refers to a surface in vertical transition between two points of tangency.



Screen Name: Roadway--Surface Type
Variable Name: Roadway Surface Type

Element Attributes:

Concrete
Bituminous (asphalt)
Brick or block
Slag, gravel or stone
Dirt
Other, specify:
Unknown

Source: Researcher determined Primary source is scene inspection; secondary sources include police report and interviews.

Remarks:

This element attribute is determined from the same roadway which was used to determine the **Trafficway Flow**. If the lateral cross section contains lanes of more than one surface type, select the surface type of the lane the driver's vehicle was traveling on just prior to this vehicle's critical precrash event.

Concrete
is selected when the road surface is made of a material consisting of a conglomerate of gravel, pebbles, broken stone or slag, in a mortar or cement matrix.

Bituminous (asphalt)
is selected when the road surface is made of a product obtained by the distillation of coal and petroleum. Also referred to in non-technical terms as "blacktop".

Brick or block
is selected when the road surface is constructed of paving stone (*e.g.* cobblestone, paving bricks, etc.).

Slag, gravel or stone
is selected when the road surface is constructed of a loose material primarily consisting of the elements of slag, gravel or stone.

Dirt
is selected when the improved road surface is made of a natural earthen surface.

Other specify
Is selected for an other type of surface such as wood.

Unknown
Is selected when the surface type is unknown.

Screen Name: Roadway--Surface Condition
Variable Name: Roadway Surface Condition

Element Attributes:

Dry
Wet
Snow or slush
Ice
Sand, dirt or oil
Other, (specify):
Unknown

Source: Researcher determined Primary source is the police report; secondary sources include interviews, and scene inspection.

Remarks:

This element attribute is based on the location which best represents the Pre-Crash Environment data. The element should be selected based on the same lanes used to select Trafficway Flow.

It is possible for different surface conditions to exist on the same roadway (*e.g.*, intermittent wet and dry sections). The researcher should consider the condition most representative of the roadway immediately prior to this vehicle's critical precrash event.

Sand, dirt or oil
is selected when this attribute is present on another road surface. (*i.e.* a dirt road would not receive this attribute solely due to presence). If the sand, dirt or oil occurs in combination with moisture conditions **Wet**, **Snow** or **Slush**, or **Ice**, then select the moisture condition.

Screen Name: Conditions--Light
Variable Name: Light Conditions

Element Attributes:

Daylight
Dark
Dark, but lighted
Dawn
Dusk
Unknown

Source: Researcher determined — Primary source is the police report; secondary sources include interviews and scene inspection.

Remarks:

The light condition best representing the precrash conditions at the time of the crash is selected based on ambient and artificial sources.

Dark
should be selected when the crash occurred after dusk and before dawn, and no artificial light source is present at the scene.

Dark but lighted
should be selected when the crash occurred after dusk and before dawn, and artificial light source(s) are present at the scene.

NOTE: Dark and **Dark, but lighted** include crashes occurring in tunnels or in underpasses.

Unknown
should be selected when it cannot be reasonably determined what the light conditions were at the time of the crash.

Screen Name: Conditions--Atmospheric
Variable Name: Atmospheric Conditions

Element Attributes:

No adverse atmospheric-related driving conditions.
Rain
Sleet/hail
Snow
Fog
Rain and fog
Sleet and fog
Other (*e.g.*, smog, smoke, blowing sand or dust, etc.) (specify):
Unknown

Source: Researcher determined — primary source is the police report; secondary sources include interviews and scene inspection.

Remarks:

The atmospheric condition is selected with respect to the conditions just prior to the critical event. The element attributes are oriented toward precipitation, or particle dispersion, which may affect the driver's visual ability or the vehicle's control.

It is possible for different drivers to experience different conditions.

Rain
is selected when the precipitation falling at the time of the crash is predominately in the form of water droplets.

Sleet/hail
is selected when the precipitation falling at the time of the crash is predominately in the form of frozen or partially frozen raindrops.

Snow
is selected when the precipitation falling at the time of the crash is predominately in the form of translucent ice crystals originating in the upper atmosphere as frozen particles of water vapor. This attribute includes rain mixed with snow. Accumulation is not necessary to select this attribute.

Fog
is selected when condensed water vapor, in cloud-like masses, is close to the ground limiting visibility at the time of the crash scene.

Other (*e.g.*, smog, smoke, blowing sand or dust, etc.) specify:
is selected when the particular condition was present at the time of the crash. This attribute should not be used solely because of cloudy or overcast skies. Additionally, strong winds will be coded under **Other**, and specified as such.

Screen Name: Traffic Control--Device
Variable Name: Traffic Control Device

Element Attributes:

No traffic control(s)
Traffic control signal (not RR crossing)

Regulatory:
Stop sign
Yield sign
School zone sign
Other regulatory sign (specify):
Warning sign (not RR crossing)
Unknown sign
Miscellaneous/other controls including RR controls (specify):
Unknown

Source: Researcher determined — primary source is scene inspection; secondary sources include the police report and interviews.

Remarks:

This attribute is determined from the same roadway used to define the Trafficway Flow. The Researcher should select the descriptor that best controls traffic in the vehicle's environment just prior to this vehicle's critical precrash event.

This variable measures the above-ground traffic control(s) which regulate vehicular traffic. Excluded are any controls which ***solely*** regulate pedestrians (*e.g.*, wait/walk signals).

Focus on the road segment just prior to the location of the critical pre-crash event and select the traffic control device(s) which is (are) ***most related*** to this event. In-junction crashes should be based on the presence of a traffic control device for the roadway on which the vehicle is traveling. For non-junction crashes, traffic control devices should be selected based on their relationship to the crash circumstances and ***not*** be based merely on presence.

Regulatory signs Give notice of traffic laws or regulations.

Warning signs Call attention to conditions on, or adjacent to, a highway or street that are potentially hazardous to traffic operations.

Guide signs Show route designations, destinations, directions, distances, services, points of interest, and other geographical recreational or cultural information.

Signs come in standard shapes. The ***octagon*** is exclusively used for the STOP sign. The ***equilateral triangle***, with one point downward, is used exclusively for the YIELD sign. The *round* shape is used for the advance warning of a railroad crossing and for the civil defense evacuation route marker. The *pennant* shape, an isosceles triangle, with its longest axis horizontal, is used to warn of no passing

Screen Name: Traffic Control—Device (cont'd)
Variable Name: Traffic Control Device (cont'd)

zones. The *diamond* shape is used only to warn of existing or possible hazards either on or adjacent to the roadway or adjacent thereto. The *(vertical) rectangle*, ordinarily with the longer dimension vertical, is used for regulatory signs, with the exception of STOP signs and YIELD signs. The ***(horizontal) rectangle***, ordinarily with the longer dimension horizontal is used for route markers and recreational area guide signs.

The ***pentagon***, point up, is used for School Advance and School Crossing signs. ***Other*** shapes are reserved for special purposes; for example, the shield or other characteristic design for route markers and crossbuck for railroad crossings.

Signs can be distinguished by their color. The following general rules apply. ***Red*** is used as a background color on prohibitory type regulatory signs (*e.g.*, STOP, Do Not Enter, Wrong Way). It is also used as the circular outline and diagonal bar prohibitory symbol. ***BLACK*** may be used as a background (*e.g.*, ONE WAY); it is used as a message on white, yellow and orange signs. ***WHITE*** is used as the background for route markers, guide signs, and regulatory signs (except STOP). It is used as the legend for brown, green, blue, black and red signs. ***Orange*** is used only as a background color for construction and maintenance signs. ***Yellow*** is used as a background color for warning signs and for school signs. ***Brown***, ***green***, and ***Blue*** are used as a background color for guide signs.

Pavement markings are used to supplement the regulations or warnings of other devices such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. Pavement markings can convey warnings or information to the driver without diverting his attention form the roadway. **Pavement markings are not considered when completing this variable.**

Guide signs do not constitute traffic controls.

The Researcher should consider the intent of this question. If at the time of the crash there was no intent to control (regulate or warn) vehicle traffic, then select **No traffic controls**; otherwise, select the appropriate value.

For example, if the intersection is channelized and controlled differently on the channel than on the through lanes (*e.g.*, signal and yield sign), report the traffic controls depending on whether the roadway (Number of Travel Lanes) was chosen based on its through lanes or its channelized lanes.

The attributes are in prioritized order. This means that **Traffic Control Signal** takes precedence over **school zone signs, other regulatory signs,** and **warning signs**.

If a school guard, police officer, or other officially designated person controls both pedestrian and vehicular traffic, select **miscellaneous/other controls, including RR controls** .

NOTE: The only exception to the prioritization rule is that any ***Officially-designated*** person (**miscellaneous controls**) takes precedence over any other attribute.

Screen Name: Traffic Control—Device (cont'd)
Variable Name: Traffic Control Device (cont'd)

No Traffic Control
is selected when there is no above ground sign or signal to regulate traffic flow. If a traffic control device has been deactivated (e.g. traffic signal that emits no signal) during certain times of the day, and was deactivated at the time of the crash select **No** used for regulatory signs,

Traffic Control Signal (Not RR crossing)
Includes a traffic control that has been recently installed, but not activated as of the time of the crash.

Use **Traffic Control Signal (Not RR crossing)** for all of the following:

- Any signal which processes through the green, amber, and red cycles. The source of the actuation is of no concern.
- A green, amber and red cycling signal which a signal is missing or inoperable.
- A green, amber, and red cycle capability, but is being used to flash amber/red or red/red.
- A flashing beacon — capable of only flashing amber/red or red/red signals.
- Lane use control signals including turn arrows and controls which govern the direction of traffic flow in lanes (*e.g.*, electrically controlled overhead "X" or arrow used at different times of the day or on bridges to govern the direction of traffic flow in the lane.)

Any portable signal that controls traffic flow (*i.e.*, gas-powered directional signal to divert traffic for an impending lane closure).

A traffic control signal that is out (*e.g.* due to a power failure) and was related to the crash, should be indicated as present , unless a temporary control [*e.g.*, stop sign , police officer, miscellaneous controls etc.] has been inserted, in which case the temporary control should be selected.

NOTE: Regulatory signs which are ***enhanced*** by flashing lights should be selected based on their regulatory design. (*e.g.*, a stop sign with a flashing light should be coded as a stop sign - disregard the flashing light).

Screen Name: Traffic Control—Device (cont'd)
Variable Name: Traffic Control Device (cont'd)

Stop sign
is selected when a trafficway is controlled by an octagon-shaped sign, with white letters and border on a red background.

Yield sign
is selected when a trafficway is controlled by an equilateral-shaped triangle, with one point downward, having a red border band and white interior and the word "YIELD" in red inside the border band.

School zone sign
is selected when a school zone warning sign is present. These signs may include a 5-sided sign with the point at the top, a rectangular, school speed zone sign, or some other black printing on a yellow background sign.

A school zone sign is selected only if the crash occurred during the time the sign was in effect (i.e, school must be in-session). If the sign was in effect it does not matter whether or not children were present. The time of the crash should also be correlated to the day of the week and the effect of holidays, vacations, etc.

Other regulatory sign (Specify):
is selected when a regulatory sign other than a "stop" or "yield" sign is present. "Other" signs include speed limit signs, movement signs (*e.g.*, NO TURN, LEFT TURN ONLY, DO NOT ENTER, WRONG WAY, ONE WAY,), parking signs (*e.g.*, NO PARKING, EMERGENCY PARKING ONLY), and other miscellaneous signs (*e.g.*, ROAD CLOSED TO THROUGH TRAFFIC, WEIGHT LIMIT, etc.)

Warning sign (Not RR crossing)
is selected when a sign is used to warn of an existing or potentially hazardous condition on or adjacent to a highway or street. Generally warning signs are diamond-shaped with black legend and a border on a yellow background. Examples include TURN SIGNS, CURVE SIGNS, WINDING ROAD SIGN, STOP AHEAD SIGN, "T" SYMBOL SIGNS, etc. Some warning signs are horizontal rectangles, for example, a large arrow sign intended to give notice of a sharp change in alignment in the direction of travel.

Unknown sign
is used when a regulatory sign ***was present*** at the time of collision but was removed or not available during the scene inspection to determine its type and the PAR is not specific about a traffic control presence.

Screen Name: Traffic Control—Device (cont'd)
Variable Name: Traffic Control Device (cont'd)

Miscellaneous/other controls including RR controls (Specify):
is selected when the following are present:

- A construction warning sign(any black on orange diamond shaped sign).
- Railroad crossing controls are present (e.g., any gates, flashing lights, bells, crossbuck, or railroad crossing sign, circle with a black "X" on a yellow background).
- ***Officially designated*** person controls both pedestrian and vehicular traffic (*e.g.*, police officer, crossing guard, flag person, etc.)

NOTE: An ***officially designated*** person controlling traffic takes precedence over any other attributes.

Screen Name: Traffic Control--Functioning
Variable Name: Traffic Control Device Functioning

Element Attributes:

Traffic control device not functioning (specify):
Traffic control device functioning properly
Unknown

Source: Researcher determined--inputs include scene inspection, interviews, and police report.

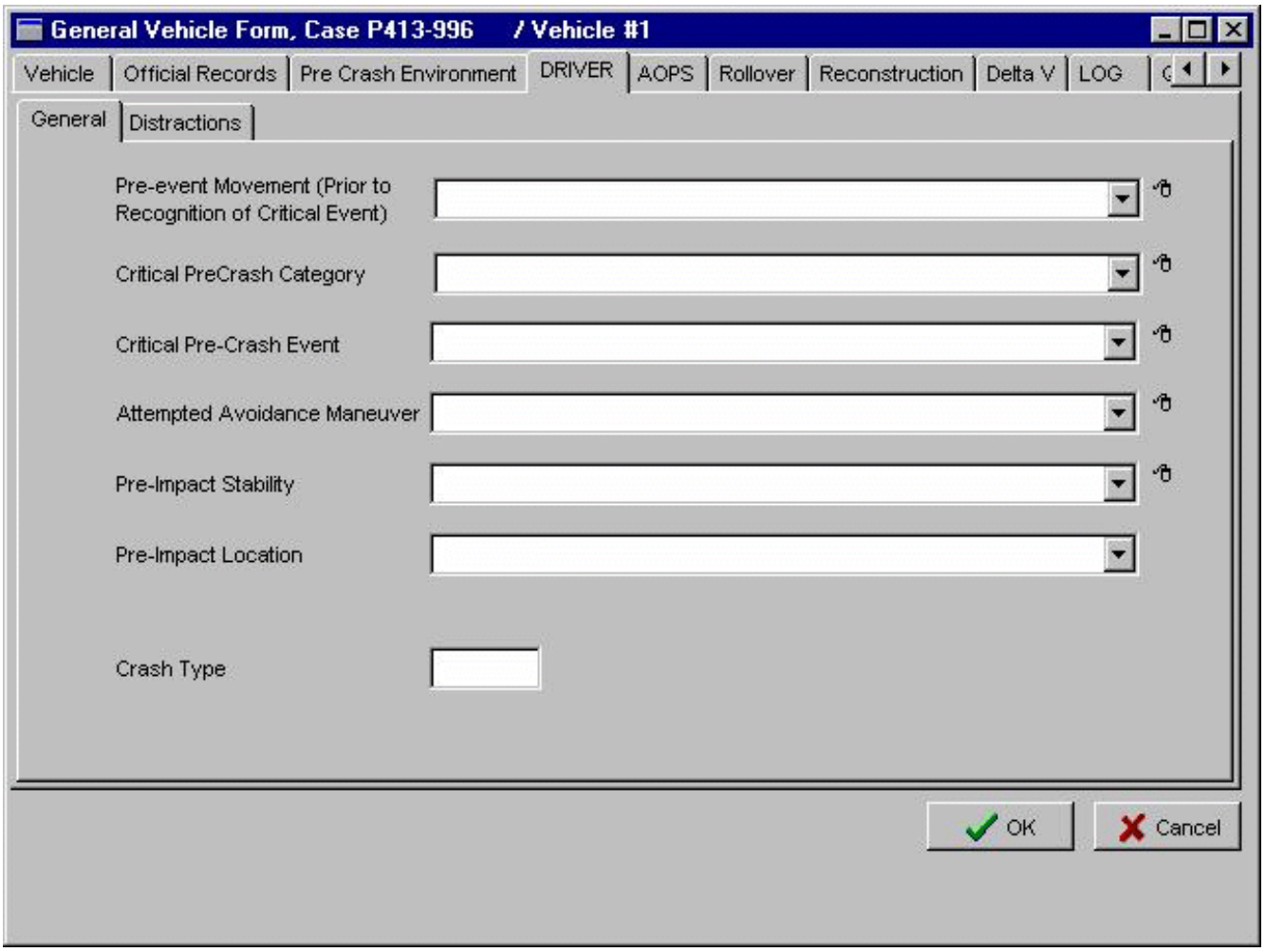
Remarks:

Traffic control device not functioning (specify):
is selected in the following situations:

- The traffic control device was not operating.
- The traffic control device reported has some function, but the function was improper, inadequate, or operating erratically. (*e.g.*, signal works but was stuck on red).
- The traffic control device was defaced, badly worn, rotated so it could not be seen, covered with snow, lying on ground, etc.

Traffic control device functioning properly
is selected when the traffic control device was functioning as designed at the time of the crash.

Unknown
is selected when the status of the traffic control device, at the time of the crash, cannot be determined.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
General
Distractions
Pre-event Movement (Prior to Recognition of Critical Event)
Critical PreCrash Category
Critical Pre-Crash Event
Attempted Avoidance Maneuver
Pre-Impact Stability
Pre-Impact Location
Crash Type
OK
Cancel

Precrash Data Overview

Precrash variables are completed for each of the in-transport vehicles in the case. This means that the entire crash is first completed from the perspective of one vehicle, then from the perspective of a second vehicle, if any, and so forth. The precrash variables are:

Driver's Distraction/Inattention To Driving (Prior To Recognition Of Critical Event)
Pre-Event Movement (Prior to Recognition of Critical Event),
Critical Precrash Category
Critical Precrash Event,
Attempted Avoidance Maneuver,
Pre-Impact Stability
Pre-Impact Location
Crash Type

The precrash variables are designed to identify the following:

- what was this vehicle doing just prior to the critical precrash event,
- what made this vehicle's situation critical,
- what was the avoidance response, if any, to this critical situation, and
- what was the movement of the vehicle just prior to impact?

The most important determination that must be made for each in-transport vehicle is: what was this vehicle's Critical Precrash Event, (*i.e.*, what action by this vehicle, another vehicle, person, animal, or nonfixed object was critical to this vehicle's crash?). Once the critical event is determined, the remaining precrash variables are coded relative to this selected **Critical Precrash Event.**.

Do not consider culpability as a factor for determining precrash data. Many crash scenarios will suggest fault, but this is considered coincidental rather than by design.

Critical Crash Envelope

The critical crash envelope begins at the point where:

(1) the driver recognizes an impending danger (*e.g.*, deer runs into the roadway), or

(2) the vehicle is in an imminent path of collision with another vehicle, pedestrian, pedalcyclist, other nonmotorist, object, or animal.

The critical crash envelope ends when:

(1) (a) the driver has made a successful avoidance maneuver
(b) has full steering control, and

(c) the vehicle is tracking; or

(2) the driver's vehicle impacts another vehicle, pedestrian, pedalcyclist, other nonmotorist, object, or animal.

Precrash Data Overview (cont'd)

Simple Single Critical Crash Envelope

Most crashes involve only a single critical crash envelope in which the object contacted is captured under the Critical Precrash Event, (*e.g.*, a vehicle is traveling straight on a roadway and a deer runs into the roadway and is struck by the vehicle). This scenario, and similar ones, are very straightforward and will not present many problems.

Complex Single Critical Crash Envelope

However, some single critical crash envelopes are more complex.

Example A: A driver avoids one obstacle and ***immediately*** impacts another vehicle, person, object, or animal. Because ***immediate*** is defined as **not** having an opportunity, or sufficient time, to take any additional avoidance actions, the Critical Precrash Event is related to the vehicle, person, object, or animal which the driver successfully avoided instead of the vehicle's first harmful event (*i.e.*, its impact); see examples 4 and 7 below.

Example B: The driver avoids an obstacle only to (a) lose steering control and/or (b) have the vehicle stop tracking, and the vehicle subsequently impacts another vehicle, person, object, or animal. Regardless of whether the driver:

1) attempted to regain steering control
2) caused the vehicle to resume a tracking posture or
3) avoided the impacted vehicle, person, object, or animal

the Critical Precrash Event is similarly related to the vehicle, person, object, or animal which the driver successfully avoided because the driver's critical crash envelope was never stabilized.

In both examples above, the Attempted Avoidance Maneuver records the successful action taken to avoid the Critical Precrash Event.

Vehicles that are not involved in an impact with another vehicle, person, object, or animal in the sequence of crash events (that define this crash) are not included in the CDS; data is not collected for these vehicles. However, these vehicles are included in the Crash Collision Diagram.

The coding order for a single critical crash envelope is illustrated below.

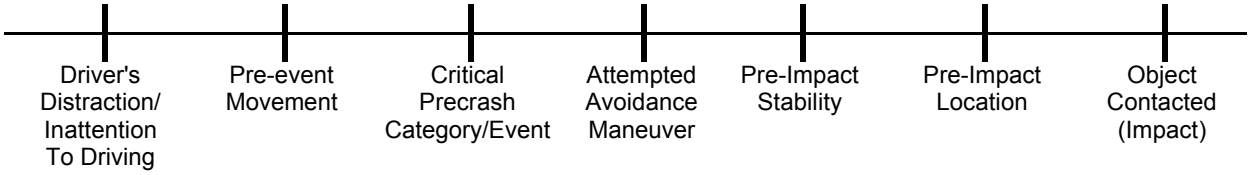
Multiple Critical Crash Envelopes

When a case involves multiple critical crash envelopes, select only the final critical crash envelope. In this situation, encode the variable Pre-Event Movement (Prior to Recognition of Critical Event) as: **Successful avoidance maneuver to a previous critical event**. The final critical crash envelope is

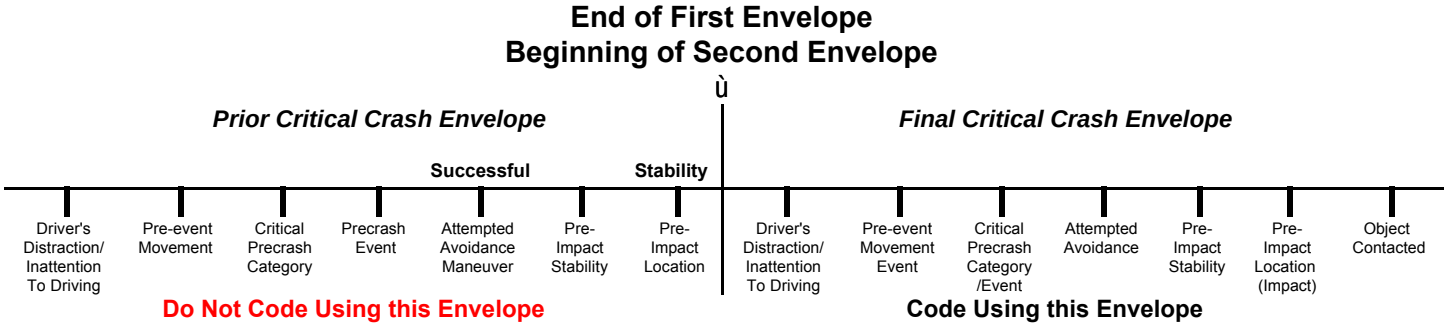
Precrash Data Overview (Cont'd)

the one that resulted in this vehicle's first harmful event (*i.e.*, its impact) as shown in the following illustration.

Typical Order of a Single Critical Crash Envelope



Typical Order of Multiple Critical Crash Envelopes



When there is doubt as to whether this vehicle had experienced a complex single, or multiple critical crash envelopes, choose the Critical Precrash Category/Event, to the vehicle, person, object, or animal which the driver successfully avoided (i.e., default to Complex Single). See Complex Single Critical Crash Envelope examples A and B above.

The following pages have: a method protocol, a flowchart illustrating the proper method and protocol for determining the precrash variables, and eight examples of various crash event sequences which contain one or more critical crash envelopes.

Precrash Data Overview (cont'd)

Method Protocol

Consider the information obtained from the Police Report, scene and vehicle inspections, and from the interviewee(s) as inputs to your decision making process.

1. Determine Critical Precrash Category / Critical Precrash Event.

   What action by this vehicle, another vehicle, person, animal, or object was critical to this driver becoming involved in the crash (*i.e.*, use the "BUT FOR"* test)?

   ASK yourself questions (a) through (f) below. Proceed through each question that applies to the crash you are researching. Stop when the answer to the questions is "Yes". This is the Critical Precrash Category.

   (a) Did the vehicle exhibit a control loss?
   (b) Does the evidence suggest that the vehicle was in an environmentally dangerous position?
   (c) Was another vehicle "in" this vehicle's lane?
   (d) Was another vehicle entering into this vehicle's lane?
   (e) Was a pedestrian, pedalcyclist, or other nonmotorist in or approaching this vehicle's path?
   (f) Was an animal in or approaching this vehicle's path or was an object in this vehicle's path?

3. Determine Attempted Avoidance Maneuver.

   What does your information indicate that the driver tried to do to avoid the crash?

4. Determine Pre-Impact Stability, and Pre-Impact Location

2. Determine Driver's Distraction/Inattention and Pre-Event Movement (Prior to Recognition of Critical Event).

* **FOR EXAMPLE :**

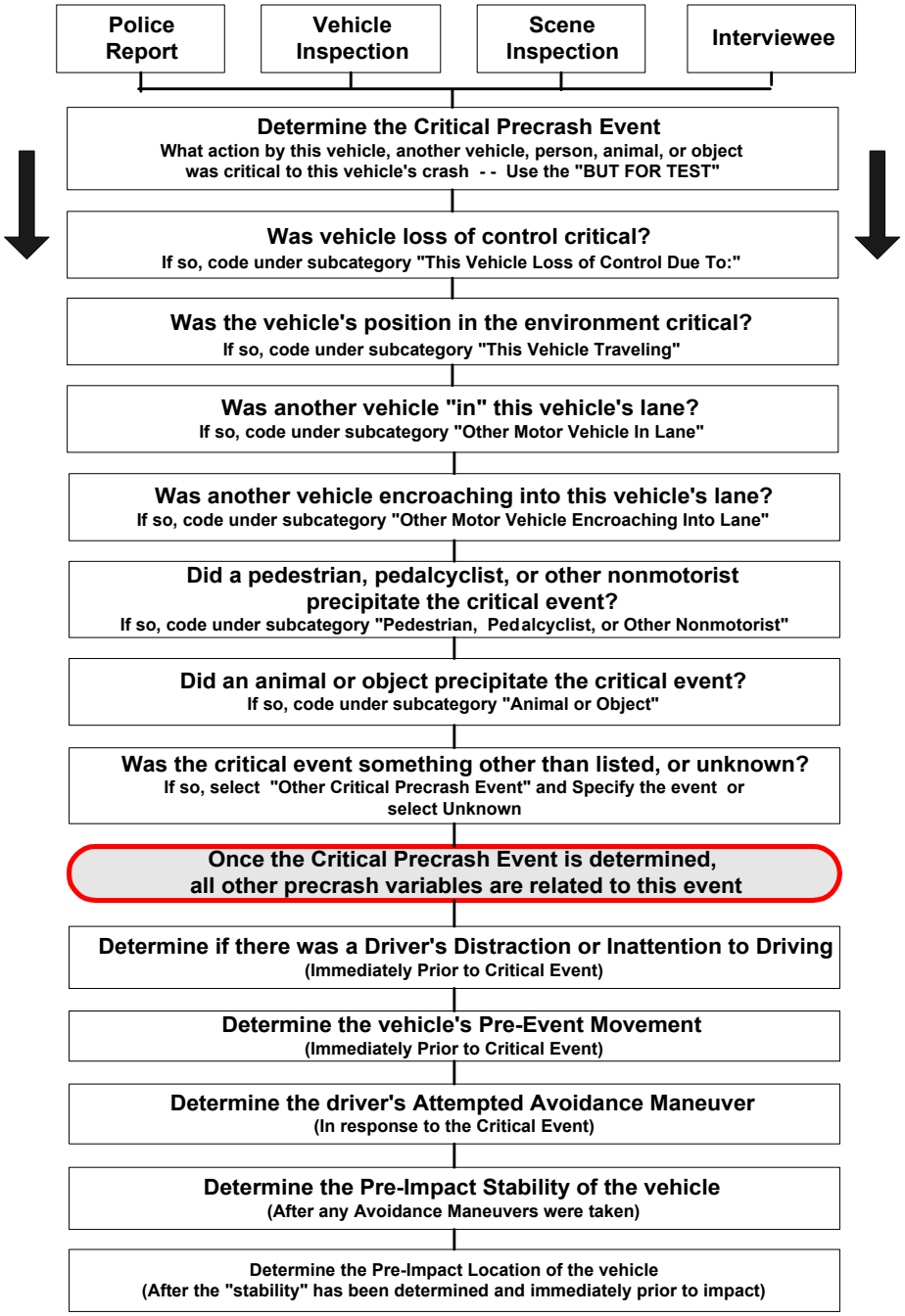
"But for" Vehicle # going left-of-center, this vehicle would not have been involved in this crash.

"But for" having entered into the intersection, this vehicle would not have been involved in this crash.

Precrash Data Overview (Cont'd)

Precrash Methodology Flowchart

*** FOR EXAMPLE** :



"***But for***" Vehicle # going left-of-center, this vehicle would not have been involved in this crash.

"***But for***" having entered into the intersection, this vehicle would not have been involved in this crash.

Precrash Data Overview (cont'd)

Precrash General Rules

1. Attempted Avoidance Maneuver assesses what the vehicle did rather than what the driver stated he/she tried to do.

2. A traffic control signal/sign can never make the situation critical when determining Critical Precrash Event.

3. When you know what the Critical Precrash Category, but are unable to select a specific Critical Precrash Event, use the following guideline:

   Default to one of the "Other Specify" or unknown attributes within each Critical Precrash Event category, rather than coding the entire Critical Precrash Category as "Other critical precrash event".

4. If control is loss due to driver illness such as heart attacks, diabetic comas, etc., then Critical Precrash Event should be coded as Other cause of control loss.

5. When coding Critical Precrash Category as "This vehicle loss of control", the loss of control must have occurred prior to the driver doing any avoidance maneuver. If the driver attempts a maneuver (*i.e.*, brakes, steers, etc.) as a result of the driver's perception of a vehicle, object, pedestrian, or nonmotorist, then select the vehicle, object, pedestrian, or nonmotorist as the critical event because that is what made the situation critical. If the vehicle is in a yaw prior to the driver taking an avoidance action, then loss-of-control is what made it critical (*e.g.*, critical curve scuff, hydroplaning, etc.).

6. The Critical Precrash Category/Event can not be determined from available sources (*e.g.*, PAR, scene inspections, interviews, etc.) which driver had the right-of-way at a controlled or uncontrolled intersection, then use the following as a guideline:

   a. If the junction is controlled by a 3-way / 4-way stop sign, or is uncontrolled, then use the common rule that ***the vehicle on the right has the right-of-way*** for determining encroachment.

   b. If the junction is controlled by an on-colors traffic control device, and both drivers claim a green light, then both vehicles are in an environmentally dangerous position, and Critical Precrash Event for both vehicles should be **This Vehicle Traveling** (Critical Precrash category) Crossing over (passing through) intersection (Critical Precrash Event).

7. For vehicles executing a left turn with the right-of-way, use **Other Motor Vehicle Encroaching Into Lane - From opposite direction-over left lane line,** or **Other Motor Vehicle Encroaching Into Lane - From opposite direction-over right lane line**.

8. "Fixed" objects (e.g., trees, poles, fire hydrants, etc.,) cannot be in the roadway.

Precrash Data Overview (cont'd)

9. A motor vehicle is stopped in a travel lane and is impacted by another motor vehicle ricocheting off a vehicle. The Critical Precrash Event for the vehicle stuck by the ricocheting vehicle is in the category of either: **Other Motor Vehicle In Lane** or **Other Motor Vehicle Encroaching Into Lane**.

10. Pre-Impact stability should be indicated as "**Tracking**" if the following are met:
    a. no skid marks are present at the scene
    b. the PAR or the interviewee does not indicate skidding ***AND***
    c. the vehicle did not rotate 30 degrees or more (either clockwise or counterclockwise).

Precrash Data Overview (cont'd)

Example 1

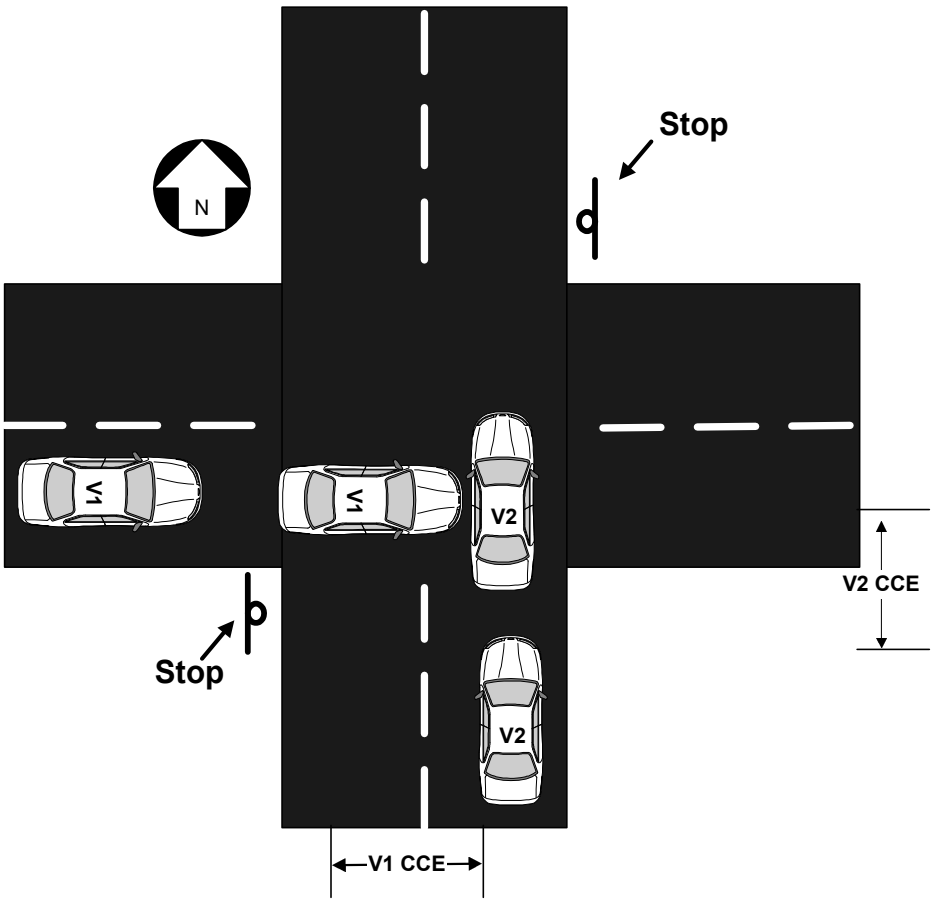
Vehicle 2 is northbound and passing through an intersection on a roadway without a traffic control. The driver of vehicle 1 is dialing on a cellular phone. Vehicle 1 is eastbound on a crossing roadway with a stop sign but did see it or stop or slow down. Driver of Vehicle 2 was attentive but did not see Vehicle 1 approaching. Vehicle 1 crashes into the side of vehicle 2. Vehicle 1 braked (leaving skid marks) just prior to impact, without any steering.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	(Distracted) while dialing cellular phone	Looked but did not see
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	This Vehicle Traveling	Other motor vehicle encroaching into lane
Critical Pre-Crash Event	Crossing over (passing through) intersection	From crossing street across path
Attempted Avoidance Maneuver	Braking (lockup)	No avoidance maneuver
Pre-Impact Stability	Skidding longitudinally - rotation less than 30 degrees	Tracking
Pre-Impact Location	Stayed in original travel lane	Stayed in original travel lane

Precrash Data Overview (cont'd)

In this example, vehicle 1 has one ***critical crash envelope*** (V_1CCE) which begins at the point where driver 1 recognizes that vehicle 1 is in an imminent collision path with vehicle 2. Vehicle 1's critical crash envelope ends at the point of impact with vehicle 2.

Vehicle 2 has one ***critical crash envelope*** (V_2CCE). Although the driver of vehicle 2 did not recognize the danger, vehicle 2's critical crash envelope begins at the point where vehicle 2 is in an imminent path of collision with vehicle 1. Vehicle 2's critical crash envelope ends at the point of impact with vehicle 1.



Precrash Data Overview (cont'd)

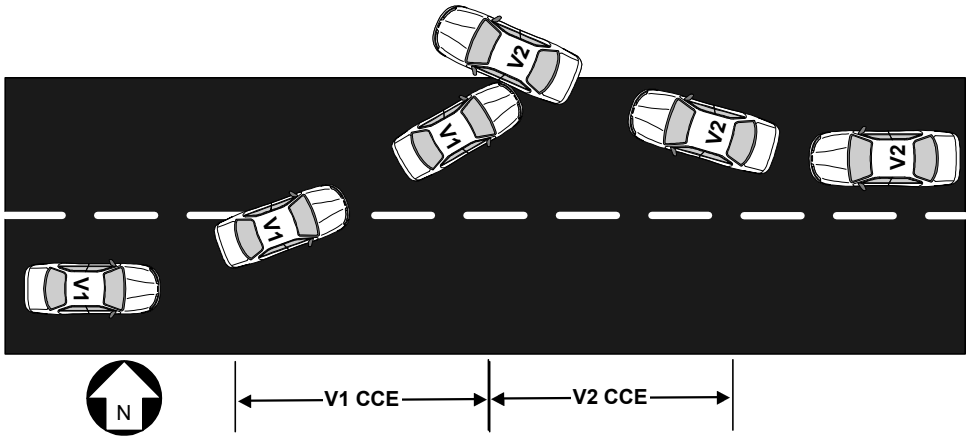
Example 2

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 falls asleep and crosses over the center line into the travel lane of vehicle 2. Vehicle 2 attempted to avoid vehicle 1 by steering right onto the shoulder and accelerating. Vehicle 1 impacted vehicle 2 in the side.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Sleepy or fell asleep	Attentive or not distracted
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	This vehicle traveling	Other motor vehicle encroaching into lane
Critical Pre-Crash Event	Over the lane line on left side of travel lane	From opposite direction over left lane line
Attempted Avoidance Maneuver	No avoidance maneuver	Accelerating and steering right
Pre-Impact Stability	Tracking	Tracking
Pre-Impact Location	Stayed on roadway, but left original travel lane	Departed roadway

In this example, vehicle 1 has one ***critical crash envelope*** (V_1CCE) which begins at the point where vehicle 1 crosses over the lane line and ends at the point of impact with vehicle 2.

Vehicle 2 has one ***critical crash envelope*** (V_2CCE) which begins at the point where driver 2 recognizes vehicle 1 encroaching into his/her travel lane. Vehicle 2's critical crash envelope ends at the point of impact with vehicle 1.



Precrash Data Overview (cont'd)

Example 3

Vehicle 1 is eastbound and passing through an intersection on a roadway without a traffic control. The noncontact vehicle (NCV) is northbound and stopped at the intersection on a crossing roadway with a stop sign. The noncontact vehicle turns right into the travel path of Vehicle 1. Vehicle 1 braked (without lockup) and steered left to avoid the noncontact vehicle. The driver of vehicle 1 successfully avoided the noncontact vehicle, maintained full control of vehicle 1, but consequently put vehicle 1 in the travel path of vehicle 2. Vehicle 2 attempted to avoid vehicle 1 by steering right and braking (with lockup). Vehicle 1 attempted to avoid vehicle 2 by steering right and braking (with lockup). Vehicle 1 and vehicle 2 crashed front left corner to front left corner.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Attentive or not distracted	Attentive or not distracted
Pre-Event Movement	Successful avoidance maneuver to a previous critical event	Going straight
Critical Pre-Crash Category	This vehicle traveling	Other motor vehicle in lane
Critical Pre-Crash Event	Over the lane line on left side of travel lane	Traveling in opposite direction
Attempted Avoidance Maneuver	Braking and steering right	Braking and steering right
Pre-Impact Stability	Skidding longitudinally - rotation less than 30 degrees	Skidding longitudinally - rotation less than 30 degrees
Pre-Impact Location	Stayed in original travel lane	Stayed in original travel lane

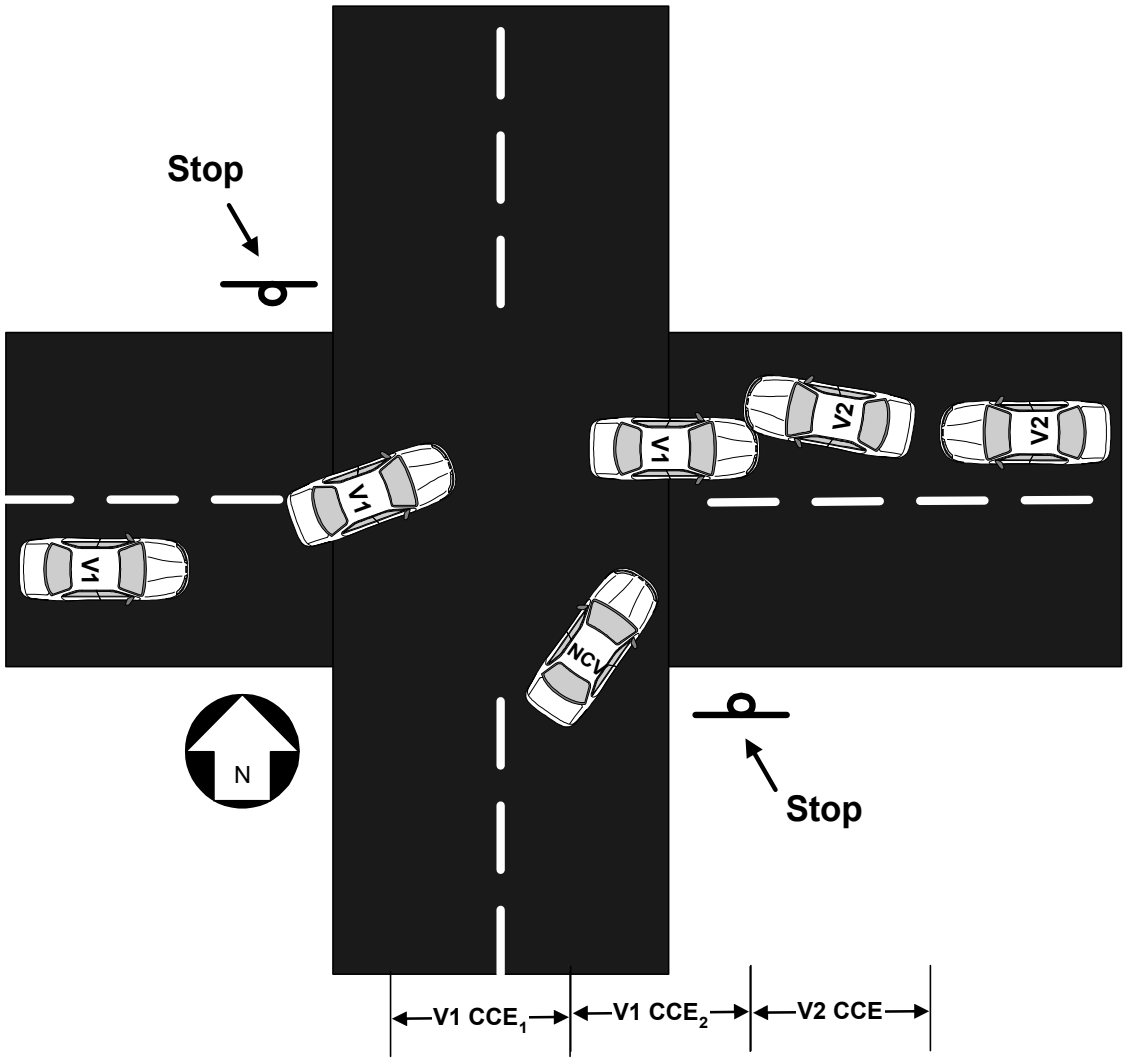
In this example, vehicle 1 has two critical crash envelopes (V_1CCE_1 and V_1CCE_2). Vehicle 1's first ***critical crash envelope*** (V_1CCE_1) ends at the point where the driver of vehicle 1 made a successful avoidance maneuver and maintained full control of the vehicle. Vehicle 1's second ***critical crash envelope*** (V_1CCE_2) begins immediately following the successful avoidance maneuver and ends at the point of impact with vehicle 2. Use the critical crash envelope which resulted in vehicle 1's first impact (V_1CCE_2).

Vehicle 2 has one ***critical crash envelope*** (V_2CCE) which begins at the point where driver 2 recognizes vehicle 1 in his/her travel lane and ends at the point of impact with vehicle 1.

The noncontact vehicle was not involved in an impact with another vehicle, person, animal, or object in the sequence of crash events and is therefore not included in the Crashworthiness Data System. However, the noncontact vehicle must be shown on the Crash Collision Diagram.

Precrash Data Overview (cont'd)

Example 3 (Cont'd)



Precrash Data Overview (cont'd)

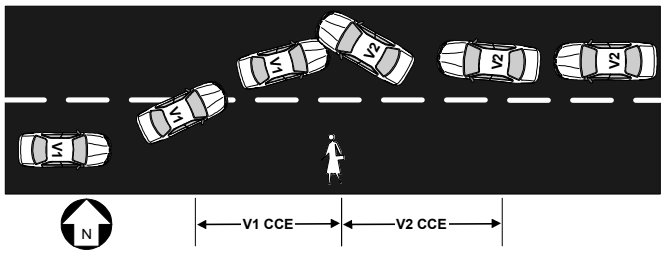
Example 4

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 brakes (without lockup) and steers left to avoid a pedestrian who darted into his/her travel lane. Vehicle 1 crosses over the center line into the travel path of vehicle 2. The driver of vehicle 2 was talking with a passenger and not paying close attention to driving and at the last second attempted to avoid vehicle 1 by braking and steering right onto the shoulder. Vehicle 2 skids and rotates clockwise about 45 degrees before it is impacted in the side by vehicle 1.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Attentive or not distracted	(Distracted) by other object, occupant or event
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	Pedestrian, Pedacyclist, or other nonmotorist	Other Motor Vehicle encroaching into lane
Critical Pre-Crash Event	Pedestrian in roadway	From opposite direction over left lane line
Attempted Avoidance Maneuver	Braking and steering left	Braking and steering right
Pre-Impact Stability	Tracking	Skidding laterally - clockwise rotation
Pre-Impact Location	Stayed on roadway but left original travel lane	Stayed in original travel lane

In this example, vehicle 1 has one critical crash envelope (V_1CCE). Vehicle 1's critical crash envelope involved a successful avoidance of a pedestrian [*i.e.*, Critical Precrash Event equals **Pedestrian in roadway"**] which resulted in an ***immediate*** impact to vehicle 2. Therefore, the pedestrian is coded as the critical precrash event for vehicle 1. Vehicle 1's avoidance maneuver is for this example, the action taken to avoid the pedestrian.

Vehicle 2 has one ***critical crash envelope*** (V_2CCE) which begins at the point where driver 2 recognized and reacted to vehicle 1 in his/her travel lane and ends at the point of impact with vehicle 1.



Precrash Data Overview (cont'd)

Example 5

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 steers left to avoid a pedestrian who darted into his/her travel lane. Vehicle 1 crosses over the center line and the adjacent travel lane, departing the roadway. Then driver 1 reenters the roadway, in full control of the vehicle but traveling in the lane of opposing traffic. Vehicle 2 attempted to avoid vehicle 1 by steering right and braking (with skidding and clockwise rotation of about 45 degrees). Vehicle 1 attempted to avoid vehicle 2 by steering right without braking. Vehicle 1 impacted vehicle 2 in the side.

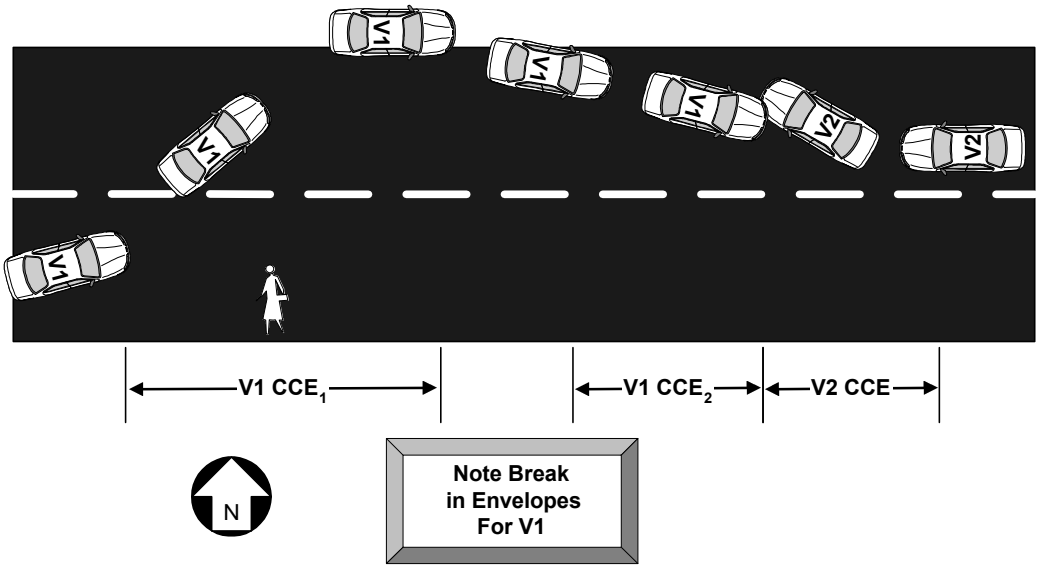
	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Attentive or not distracted	Attentive or not distracted
Pre-Event Movement	Successful avoidance maneuver to a previous critical event	Going straight
Critical Pre-Crash Category	This Vehicle Traveling	Other Motor Vehicle In Lane
Critical Pre-Crash Event	Over the lane line on left side of travel lane	Traveling in opposite direction
Attempted Avoidance Maneuver	Steering right	Braking and steering right
Pre-Impact Stability	Tracking	Skidding laterally - clockwise rotation
Pre-Impact Location	Stayed in original travel lane	Stayed in original travel lane

Precrash Data Overview (cont'd)

Example 5 (cont'd)

In this example, vehicle 1 has two critical crash envelopes (V_1CCE_1 and V_1CCE_2). Vehicle 1's first ***critical crash envelope*** (V_1CCE_1) begins at the point where driver 1 recognizes the pedestrian coming into his/her travel path and ends at the point where the driver of vehicle 1, having made a successful avoidance maneuver, regains full control of the vehicle. Vehicle 1's second ***critical crash envelope*** (V_1CCE_2) begins when driver 1, in full control of vehicle 1, reenters the roadway in the travel lane of opposing traffic and ends at the point of impact with vehicle 2. Use the critical crash envelope which resulted in vehicle 1's first impact (V_1CCE_2).

Vehicle 2 has one critical crash envelope (V_2CCE) which begins at the point where driver 2 recognized and reacted to vehicle 1 in his/her travel lane and ends at the point of impact with vehicle 1.



Precrash Data Overview (cont'd)

Example 6

Vehicle 1 and vehicle 2 are traveling in the same direction in adjacent lanes on a divided highway (with a painted median). While the driver of vehicle 1 was using an electric razor, the vehicle has a blow out, driver 1 loses control, crosses the left lane line and impacts the right rear of vehicle 2. Vehicle 2 is redirected across the painted median, skidding and rotating clockwise, and subsequently impacts vehicle 3. Vehicle 3 attempted to avoid vehicle 2 by steering right and accelerating.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	[Distracted] while using or reaching for device/object brought into in vehicle	Attentive or not distracted
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	This vehicle loss control due to	Other motor vehicle encroaching into lane
Critical Pre-Crash Event	Blow out or flat tire	From adjacent lane (same direction) - over right lane line
Attempted Avoidance Maneuver	No avoidance maneuver	No avoidance maneuver
Pre-Impact Stability	Tracking	Tracking
Pre-Impact Location	Stayed on roadway, but left original travel lane	Stayed in original travel lane

	Vehicle 3
Driver's Distraction/Inattention to Driving	Attentive or not distracted
Pre-Event Movement	Going straight
Critical Pre-Crash Category	Other motor vehicle encroaching into lane
Critical Pre-Crash Event	From opposite direction - over left lane line
Attempted Avoidance Maneuver	Accelerating and steering right
Pre-Impact Stability	Tracking
Pre-Impact Location	Stayed in original travel lane

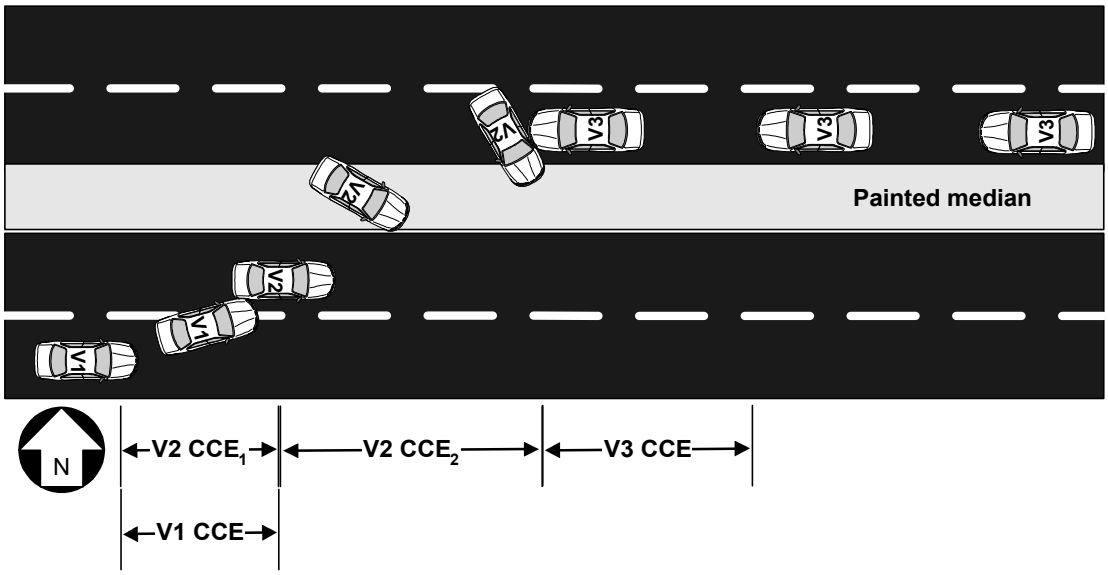
Precrash Data Overview (cont'd)

Example 6 (cont'd)

In this example, vehicle 1 has one ***critical crash envelope*** (V_1CCE) which begins with control loss due to the blow out and ends at the point of impact with vehicle 2. The blow out is the critical precrash event.

Vehicle 2 has two critical crash envelopes (V_2CCE_1 and V_2CCE_2). Vehicle 2's first ***critical crash envelope*** (V_2CCE_1) begins when vehicle 1 enters vehicle 2's travel lane and ends at the point of impact with vehicle 1. Vehicle 2's second ***critical crash envelope*** (V_2CCE_2) begins immediately after the first impact and ends at the point of impact with vehicle 3. Use the critical crash envelope which resulted in vehicle 2's first impact (V_2CCE_1), because the NASS CDS is only interested in coding the critical crash envelope which leads to a vehicle's first harmful event.

For this example, Vehicle 3 has one critical crash envelope (V_3CCE) which begins when driver 3 recognizes and reacts to vehicle 2 which is in an imminent path of collision with vehicle 3 and ends at the point of impact with vehicle 2.



Precrash Data Overview (cont'd)

Example 7

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. A noncontact vehicle is parked in front of a noncontact truck-tractor (with a trailer) on the road shoulder and suddenly enters the roadway into vehicle 1's travel lane. The driver of vehicle 1 instantly brakes (with lockup) and steers left (with counterclockwise rotation) to avoid the noncontact vehicle. Vehicle 1 crosses over the center line and ***immediately*** impacts vehicle 2. Vehicle 2 had no avoidance maneuvers.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Attentive or not distracted	Attentive or not distracted
Pre-Event Movement	Going Straight	Going Straight
Critical Pre-Crash Category	Other motor vehicle encroaching into lane	Other motor vehicle encroaching into lane
Critical Pre-Crash Event	From parking lane	From opposite direction over left lane line
Attempted Avoidance Maneuver	Braking and steering left	No avoidance actions
Pre-Impact Stability	Skidding laterally - counterclockwise rotation	Tracking
Pre-Impact Location	Stayed on roadway but left original travel lane	Stayed in original travel lane

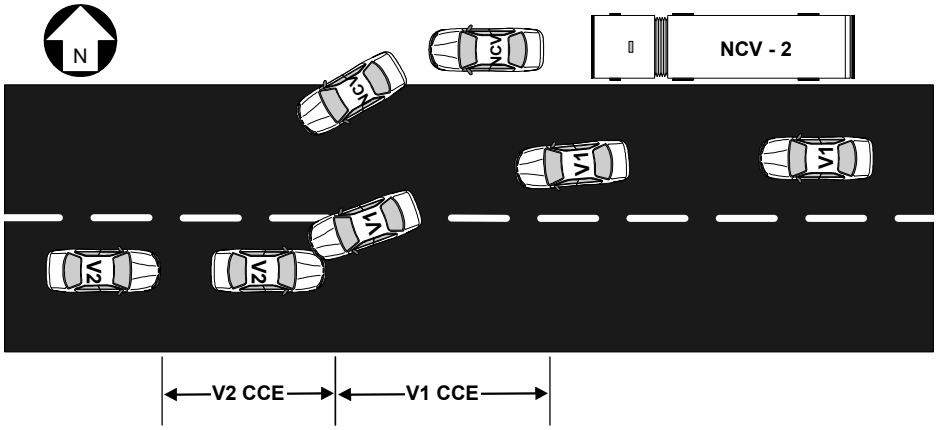
In this example, vehicle 1 has one critical crash envelope (V_1CCE). Vehicle 1's critical crash envelope involved a successful avoidance of a noncontact vehicle and resulted in an ***immediate*** impact to vehicle 2. Vehicle 1's critical crash envelope was initiated by the noncontact vehicle, afterwards there was no opportunity for subsequent avoidance actions. Therefore, the encroachment of the noncontact vehicle into vehicle 1's travel lane is coded as the critical precrash event for vehicle 1. Vehicle 1's avoidance maneuver is coded as the action taken to avoid the noncontact vehicle.

Precrash Data Overview (cont'd)

Example 7 (cont'd)

Vehicle 2 has one ***critical crash envelope*** (V_2CCE) which begins at the point where vehicle 1 is in an imminent path of collision with vehicle 2 and ends at the point of impact with vehicle 1.

The noncontact vehicle and the noncontact truck were not involved in an impact in the sequence of crash events and are therefore not coded in the Crashworthiness Data System. However, the noncontact vehicle and truck must be shown on the Crash Collision diagram.

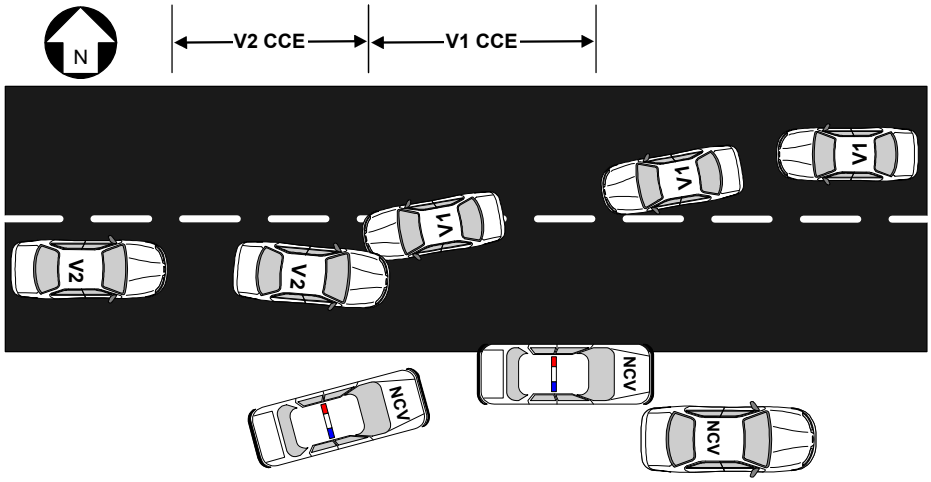


Precrash Data Overview (cont'd)

Example 8

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. Emergency vehicles (with lights activated) are stopped next to a vehicle on the side of the road. The driver of vehicle 1 is looking at the activity going on to his left. Before he is able to react, the front of vehicle 1 contacts the front of vehicle 2. The driver of vehicle 2 also briefly noticed the emergency activity, however, he was attentive to the slowing traffic in front of him. The driver of vehicle 2 noticed vehicle 1 crossing the centerline and slammed on his brakes (with lockup) while attempting to turn to the right. The front of vehicle 1 contacted the front of vehicle 2 in vehicle 2's travel lane.

	Vehicle 1	***Vehicle 2***
Driver's Distraction/Inattention to Driving	Distracted by outside person, object, or event	Attentive or not distracted
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	This vehicle traveling	Other motor vehicle in lane
Critical Pre-Crash Event	Over the lane line on left side of travel lane	Traveling in opposite direction.
Attempted Avoidance Maneuver	No avoidance maneuver	Braking and steering right
Pre-Impact Stability	Tracking	Skidding longitudinally rotation less than 30 degrees
Pre-Impact Location	Stayed on roadway but left original travel lane	Stayed in original travel lane



Screen Name: Pre-Event Movement (Prior to Recognition of Critical Event)
Variable Name: Pre-Event Movement (Prior to Recognition of Critical Event)

Element Attributes:

[No Driver Present]
Going straight
Decelerating in traffic lane
Accelerating in traffic lane
Starting in traffic lane
Stopped in traffic lane
Passing or overtaking another vehicle
Disabled or parked in travel lane
Leaving a parking position
Entering a parking position
Turning right
Turning left
Making a U-turn
Backing up (other than for parking position)
Negotiating a curve
Changing lanes
Merging
Successful avoidance maneuver to a previous critical event
Other (specify):
Unknown

Source: Researcher determined — inputs include scene, interviews and police report.

Remarks:

Record the attribute which best describes this vehicle's activity prior to the driver's realization of an impending critical event or just prior to impact if the driver took no action or had no time to attempt any evasive maneuvers.

Actions taken by the driver, of this vehicle, ***after realization*** of an impending danger are captured in Attempted Avoidance Maneuver.

[No Driver Present]
is pre-coded if on the Official Records Tab the “Driver Present?” variable is coded as “No driver Present”.

Going straight
is selected when this vehicle's path of travel was straight ahead without any attempted or intended changes.

Decelerating in traffic lane
is selected when this vehicle was traveling straight ahead within the traffic lane and was decelerating.

Screen Name: Pre-Event Movement (Prior to Recognition of Critical Event) (cont'd)
Variable Name: Pre-Event Movement (Prior to Recognition of Critical Event) (cont'd)

Accelerating in traffic lane
is selected when this vehicle was traveling straight ahead within the traffic lane and was accelerating.

Starting in traffic lane
is selected when this vehicle was in the process of starting forward from a stopped position within the traffic lane (*e.g.*, start up from traffic signal).

Stopped in traffic lane
is selected when this vehicle was stopped momentarily, with the motor running within the traffic lane (*e.g.*, stopped for traffic signal).

Passing or overtaking another vehicle
is selected when this vehicle was traveling straight ahead and was in the process of passing or overtaking another vehicle on the left or right.

Disabled or parked in travel lane
is selected when this vehicle was parked in a travel lane (*e.g.*, double parked, disabled) with a driver present in the vehicle.

Leaving a parking position
is selected when this vehicle was entering the travel lane from a parking area adjacent to the traffic lanes.

Entering a parking position
is selected when this vehicle was leaving the travel lane to a parking area adjacent to the traffic lanes (*i.e.*, in the process of parking).

Turning right
is selected when this vehicle was moving forward and turned right, changing lanes from one roadway to a different roadway (*e.g.*, from or to a driveway, parking lot, or intersection).

Turning left
is selected when this vehicle was moving forward and turned left, changing lanes from one roadway to a different roadway (*e.g.*, from or to a driveway, parking lot, or intersection).

Making a U-turn
is selected when this vehicle was making a U-turn on the trafficway.

Backing up (other than for parking position)
is selected when this vehicle was traveling backwards within the trafficway. Do not use this attribute if the vehicle was backing into a parking space (See **Entering parking position**)

Screen Name: Pre-Event Movement (Prior to Recognition of Critical Event) (cont'd)
Variable Name: Pre-Event Movement (Prior to Recognition of Critical Event) (cont'd)

Negotiating a curve
is selected when this vehicle was continuing along a roadway that curved to the right or left.

Changing lanes
is selected when this vehicle was traveling straight ahead and changed travel lanes to the right or left while on the same roadway.

Merging
is selected when this vehicle was moving forward and merging from the left or right into a traffic lane (*e.g.*, roadway narrows, exit/entrance ramps).

Successful avoidance maneuver to a previous critical event
is selected when this vehicle responded to a previous critical event and successfully avoided an impact. However, this maneuver precipitated a subsequent critical crash envelope, which resulted in this vehicle's first impact.

Other (specify)
is selected when this vehicle's pre-event movement is known but none of the specified attributes are applicable. The movement must be specified in the "specify box"

Unknown
is selected when the vehicle's movement prior to the driver's realization of an impending critical event is unknown.

Screen Name: Critical Pre Crash Category
Variable Name: Critical Pre Crash Category

Element Attributes:

This Vehicle Loss of Control
This Vehicle Traveling
Other Motor Vehicle In Lane
Other Motor Vehicle Encroaching Into Lane
Pedestrian or Pedalcyclist, or Other Nonmotorist
Object or Animal
Other (Specify)
Unknown

Source: Researcher determined — inputs include scene inspection, vehicle inspection, driver interview, and police report.

Remarks:

When more than one condition applies and it cannot be determined which one had a greater effect, choose the higher listed element (i.e., **This Vehicle Loss of Control** takes precedence over **This Vehicle Traveling).**

This Vehicle Loss of Control

These identify situations where the critical factor leading to the collision involved control loss of this vehicle. Control loss can be related to either mechanical failure or environmentally induced vehicle instability.

This Vehicle Traveling

These identify situations where the critical factor leading to the collision involvs the travel path of this vehicle.

Other Motor Vehicle In Lane

These identify situations where the critical factor leading to the collision involved the travel of the other vehicle in the same lane as this vehicle.

Other Motor Vehicle Encroaching Into Lane

These identify situations where the critical factor leading to the collision involves the other vehicle's movement into or across this vehicle's travel lane from another lane, intersection, driveway, or ramp.

Pedestrian or Pedalcyclist, or Other Nonmotorist

These identify situations where the critical factor leading to the collision for this vehicle involved a pedestrian, pedalcyclist, or other nonmotorist. A pedalcyclist is defined as a person riding a pedal power conveyance (*e.g.*, bicycle, tricycle, etc.). A nonmotorist is defined as a person riding on or in a conveyance which is not motorized or propelled by pedaling (*e.g.*, baby carriage, skate board, roller blades, etc.).

Screen Name: Critical Pre Crash Category (cont'd)
Variable Name: Critical Pre Crash Category (cont'd)

Object or Animal

These identify situations where the critical factor leading to the collision for this vehicle involved an object or animal.

Other (Specify)

is selected when a critical factor not previously listed resulted in the collision for this vehicle. Previous impacts in the crash are not considered as other critical precrash events. For example, use this attribute if the critical event developed from this vehicle's departure from a driveway.

Unknown

is selected when the critical precrash event which resulted in the collision is not known. Missing interviews do not automatically result in the use of the "Unknown" attribute.

Screen Name: Critical Pre-Crash Event
Variable Name: Critical Pre-Crash Event

Element Attributes:

This Vehicle Loss of Control Due To:

Blow out or flat tire
Stalled engine
Disabling vehicle failure (*e.g.*, wheel fell off) (specify):
Non-disabling vehicle problem (*e.g.*, hood flew up) (specify)
Poor road conditions (puddle, pot hole, ice, etc.) (specify)
Traveling too fast for conditions
Other cause of control loss (specify)
Unknown cause of control loss

This Vehicle Traveling

Over the lane line on left side of travel lane
Over the lane line on right side of travel lane
Off the edge of the road on the left side
Off the edge of the road on the right side
End departure
Turning left at intersection
Turning right at intersection
Crossing over (passing through) intersection
This vehicle decelerating
Unknown travel direction

Other Motor Vehicle In Lane

Other vehicle stopped
Traveling in same direction with lower steady speed
Traveling in same direction while decelerating
Traveling in same direction with higher speed
Traveling in opposite direction
In crossover
Backing
Unknown travel direction of other motor vehicle in lane

Other Motor Vehicle Encroaching Into Lane

From adjacent lane (same direction)—over left lane line
From adjacent lane (same direction)—over right lane line
From opposite direction-over left lane line
From opposite direction—over right lane line
From parking lane
From crossing street, turning into same direction
From crossing street, across path
From crossing street, turning into opposite direction
From crossing street, intended path not known
From driveway, turning into same direction
From driveway, across path
From driveway, turning into opposite direction
From driveway, intended path not known
From entrance to limited access highway
Encroachment by other vehicle—details unknown

Pedestrian or Pedalcyclist, or Other Nonmotorist

Pedestrian in roadway
Pedestrian approaching roadway
Pedestrian - unknown location
Pedalcyclist or other nonmotorist in roadway (specify)
Pedalcyclist or other nonmotorist approaching roadway (specify)
Pedalcyclist or other nonmotorist—unknown location (specify)

Object or Animal

Animal in roadway
Animal approaching roadway
Animal—unknown location
Object in roadway
Object approaching roadway
Object—unknown location

Other (specify)

Other critical precrash event (specify):
Unknown

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Source: Researcher determined — inputs include scene inspection, vehicle inspection, driver interview, and police report.

Remarks:

The selection of the **Critical Precrash Category** will determine what **Critical Precrash Events** are available to select.

When more than one condition applies and it cannot be determined which one had a greater effect, choose the higher listed element.

This variable identifies the critical event which made the crash imminent (*i.e.*, something occurred which made the collision possible). Responsive actions to this situation, if any, are coded under **Attempted Avoidance Maneuver**.

A precrash event is coded for each vehicle and identifies the circumstances leading to this vehicle's first impact in the crash.

Do not refer to culpability. Many crash scenarios will suggest fault, but this should be coincidental rather than by design. As an example, vehicle 1 was speeding when vehicle 2 crossed vehicle 1's path from a driveway. The situation which made the precrash event critical for vehicle 1 (since it did not lose control) was vehicle 2's movement across vehicle 1's path **and not** vehicle 1's speed.

This Vehicle Loss Of Control

Blow out or flat tire
is used when a vehicle in motion loses control as the result of a tire "air out".

Stalled engine
refers to a vehicle which is in motion and loses engine power. A stalled engine situation must precipitate a collision to be coded in this variable. A vehicle which is stopped as the result of an engine malfunction does not take this attribute.

Disabling vehicle failure (*e.g.*, wheel fell off)
is selected when a mechanical malfunction, such as a component of the vehicle suspension or steering system, leads to the critical reason for the collision. Specify which component failure was involved in the space provided under this element.

Non-disabling vehicle problem (*e.g.*, hood flew up)
is selected when some mechanical abnormality occurred to this vehicle which leads to the critical reason for the collision. The abnormality must not be disabling damage. A space is provided under this element to specify the non-disabling vehicle problem.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Poor road conditions (puddle, pot hole, ice, etc.)
captures control loss due to environmental conditions of the roadway. These conditions must have initiated the precrash event which resulted in the collision. A space is provided under this element to specify the road condition attributed to initiating the precrash event.

Traveling too fast for conditions
identifies this vehicle's movement relative to its surroundings in which the subsequent loss of control lead to the collision. An example is a roadway departure on a curve where the driver failed to negotiate and departed the roadway resulting in an impact. If the driver merely steered straight while in a curve and departed the roadway, then the category **This Vehicle Traveling** may apply.

Other cause of control loss, specify
is selected when it was determined that this vehicle's loss of control was the primary reason which made the event critical and the above attributes do not adequately identify the control loss condition. The condition cited should be annotated in the space provided.

Unknown cause of control loss
is selected when it is known control loss made the situation critical, but it is not known whether the vehicle or the environment caused the control loss.

This Vehicle Traveling
The attributes identify situations where the critical factor leading to the collision involving the travel path of this vehicle.

Over the lane line on left side of travel lane
is selected when this vehicle departs its lane to the left and is entering or had entered the adjoining lane or shoulder. The change of travel path by this vehicle must precipitate the critical event for the collision. As an example, this vehicle attempts to pass another vehicle on the other vehicle's left and is struck by a vehicle traveling within its travel lane in the opposite direction.

However, by modifying the scenario slightly, the lane change may not always be the factor leading to the precrash event. Consider the same situation where this vehicle is passing to the left of the lead vehicle. If an animal runs into the roadway and is struck by this vehicle, then the correct choice would be **Animal in roadway**.

Over the lane line on right side of travel lane
is selected when this vehicle departs its lane to the right and is entering or had entered the adjoining lane or shoulder. To use this attribute, change of travel path by this vehicle must precipitate the critical event for the collision. As an example, this vehicle attempts to pass another vehicle on the other vehicle's right and is struck in the rear by a vehicle traveling within its travel lane in the same direction. The correct choice for this vehicle would be Over the lane line on right side of travel lane.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

However, by modifying the scenario slightly the lane change may not always be the factor leading to the precrash event. Consider the same situation where this vehicle is passing to the right of the lead vehicle. If an animal runs into the roadway and is struck by this vehicle, then the correct choice would be **Animal in roadway**.

Off the edge of the road on the left side
identifies a situation where the initial precrash event occurred beyond the left side shoulder area. This also includes departure into a median.

Off the edge of the road on the right side
identifies a situation where the initial precrash event occurred beyond the right side shoulder area.

End departure
is selected when the vehicle departs the end of the roadway (*e.g.*, "T" intersection).

Turning left at intersection
is selected when this vehicle attempts a left turn from its roadway to another roadway or driveway.

Turning right at intersection
is selected when this vehicle attempts a right turn from its roadway to another roadway or driveway.

Crossing over (passing through) intersection
identifies this vehicle's travel as proceeding through the intersection without any planned turning.

This vehicle decelerating
is selected when the vehicle is decelerating, or has just stopped and was immediately struck.

Unknown travel direction
is selected for those occasions where this vehicle's travel made the situation critical, but it is unknown which travel direction this vehicle was moving.

Other Motor Vehicle In Lane

These attributes identify situations where the critical factor leading to the collision involved the travel of the other vehicle in the same lane as this vehicle.

Other vehicle stopped
identifies a situation where the other vehicle is not in motion (*i.e.*, stopped, parked, disabled) and in this vehicle's travel lane. This attribute should not be used if the other vehicle just stopped and was immediately struck.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Traveling in same direction with lower steady speed
is selected when the other vehicle was the lead vehicle in the same travel lane, traveling in the same direction, and was traveling slower than this vehicle

Traveling in same direction while decelerating
is selected when the other vehicle was the lead vehicle in the same travel lane, traveling in the same direction, and was decelerating.

Traveling in same direction with higher speed
is selected when the speed of the other vehicle was higher than this vehicle or accelerating. The other vehicle must be overtaking this vehicle.

Traveling in opposite direction
is selected when the other vehicle was in this vehicle's travel lane and traveling head-on in the opposite direction of this vehicle.

In crossover
is selected when the other vehicle enters a crossover already occupied by this vehicle. A crossover is defined as a designated opening within a median used primarily for "U-turns".

Backing
identifies a situation where the other vehicle was in the process of backing up while in this vehicle's travel lane.

Unknown travel direction of other motor vehicle in lane
is selected for situations where the other vehicle's activity (while in the same lane as this vehicle) precipitated the precrash event, but the travel direction and/or speed could not be determined.

Other Motor Vehicle Encroaching Into Lane
These attributes identify situations where the critical factor leading to the collision involves the other vehicle's movement into or across this vehicle's travel lane from another lane, intersection, driveway, or ramp.

From adjacent lane (same direction)—over left lane line
is selected when the other vehicle was traveling in the same direction as this vehicle and crosses the left lane line with respect to this vehicle's travel lane (*i.e.*, other vehicle crosses its right lane line).

From adjacent lane (same direction) — over right lane line
is selected when the other vehicle was traveling in the same direction as this vehicle and crosses the right lane line with respect to this vehicle's travel lane (*i.e.*, other vehicle crosses its left lane line).

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

From opposite direction — over left lane line
identifies a situation where the other vehicle crosses the left lane line while traveling in the opposite direction from this vehicle.

From opposite direction — over right lane line
identifies a situation where the other vehicle crosses the right lane line while traveling in the opposite direction from this vehicle.

From parking lane
is selected when the other vehicle was departing a parking lane and entering the travel lane of this vehicle.

From crossing street, turning into same direction
is selected when the other vehicle was turning from another roadway onto this vehicle's roadway and attempted to travel in the same direction as this vehicle. Use this attribute for entrance ramps leading onto limited access highways.

From crossing street, across path
is selected when the other vehicle was continuing straight through the intersection and attempted to cross over this vehicle's roadway.

From crossing street, turning into opposite direction
is selected when the other vehicle was entering an intersection from another roadway and was turning or attempting to turn onto this vehicle's roadway in the opposite travel direction of this vehicle.

From crossing street, intended path not known
is selected when the other vehicle's entrance into the intersection was the critical factor which led to the collision, however, the other vehicle's travel direction could not be determined.

From driveway, turning into same direction
is selected when the other vehicle was turning from a driveway onto this vehicle's roadway and attempted to travel in the same direction as this vehicle.

From driveway, across path
is selected when the other vehicle was entering this vehicle's roadway from a driveway and was continuing straight across to another driveway or roadway.

From driveway, turning into opposite direction
is selected when the other vehicle was entering this vehicle's roadway from a driveway and was attempting to turn into the opposite travel direction of this vehicle.

From driveway, intended path not known
is used to identify driveway-related precrash events where details surrounding the other vehicle's intended path are not known.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

From entrance to limited access highway
is selected for entrance ramp situations where the other vehicle was attempting to enter (merge) onto the limited access highway which was being traveled by this vehicle.

Encroachment by other vehicle — details unknown
is selected for situations where the other vehicle initiated the critical precrash event, but circumstances surrounding the other vehicle's encroachment are not known.

Pedestrian or Pedalcyclist, or Other Nonmotorist

These attributes identify situations where the critical factor leading to the collision for this vehicle involved a pedestrian, pedalcyclist, or other nonmotorist. A pedalcyclist is defined as a person riding a pedal power conveyance (*e.g.*, bicycle, tricycle, etc.). A nonmotorist is defined as a person riding on or in a conveyance which is not motorized or propelled by pedaling (*e.g.*, baby carriage, skate board, roller blades, etc.).

Pedestrian in roadway
is selected when a pedestrian was present (*e.g.*, sitting, standing, walking, or running, etc.) in the roadway.

Pedestrian approaching roadway
identifies situations where a pedestrian was within the trafficway and moving toward the roadway or attempting to enter the roadway, but was not on the roadway.

Pedestrian — unknown location
is selected when it was determined the presence or action of a pedestrian was the critical factor which lead to this vehicle's collision, but the location or action of the pedestrian was not known.

Pedalcyclist or other nonmotorist in roadway
is selected when a pedalcyclist or other nonmotorist was present in the roadway (irrespective of relative motion).

Pedalcyclist or other nonmotorist approaching roadway
identifies situations where the pedalcyclist or other nonmotorist was within the trafficway and moving toward the roadway or attempting to enter the roadway, but was not on the roadway.

Pedalcyclist or other nonmotorist — unknown location
is selected when it was determined the presence or action of a pedalcyclist or other nonmotorist was the critical factor which led to this vehicle's collision, but the action of the pedalcyclist or other nonmotorist was not known.

Object or Animal
These attributes identify situations where the critical factor leading to the collision for this vehicle involved an object or animal.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Animal in roadway
is selected when an animal was present (*i.e.*, stationary or moving) in the roadway.

Animal approaching roadway
identifies situations where an animal was within the trafficway and moving toward the roadway or attempting to enter the roadway, but not on the roadway.

Animal - unknown location
is selected when it was determined the presence or action of an animal was the critical factor which led to this vehicle's collision, but the action of the animal was not known.

Object in roadway
is used when an object was present in the roadway. An object is defined as being either fixed or nonfixed **(only non-fixed objects are captured in this attribute).**

Object approaching roadway
identifies situations where an object was within the trafficway and moving toward the roadway, but not on the roadway.

Object — unknown location
is selected when it was determined the presence or movement of an object was the critical factor which led to this vehicle's collision, but details surrounding the location of the object were not known.

Other (specify)
These attributes identify situations where the critical factor leading to the collision for this vehicle was not previously listed.

Other (specify)
is selected when a critical factor not previously listed resulted in the collision for this vehicle. Previous impacts in the crash **are not** considered as "other critical precrash events". For example, use this code if the critical event developed from this vehicle's departure from a driveway.

Unknown
is selected when the critical precrash event which resulted in the collision is not known. Missing interviews **do not** automatically result in the use of this "Unknown" code.

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Precrash Event Scenerios for Different Rear-End Collision Situations

Two Vehicle Collisions

			Trail Vehicle	Lead Vehicle
1)	Both vehicles in motion. Leading vehicle, traveling at steady speed, is struck from behind by trailing vehicle.	Pre-Event Movement	Going straight	Going straight
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Traveling in same direction with lower steady speed	Traveling in same direction with higher speed
2)	Both vehicles traveling at same speed. Lead vehicle decelerates and trailing vehicle continues at initial speed. Trailing vehicle eventually applies brakes before striking the lead vehicle.	Pre-Event Movement	Going straight	Going straight
		Critical Precrash Category	Other Motor Vehicle In Lane	This Vehicle Traveling
		Critical Precrash Event	Traveling in same direction while decelerating	This vehicle decelerating
3)	Both vehicles traveling at same speed. Lead vehicle stops and is immediately struck by trailing vehicle.	Pre-Event Movement	Going straight	Going straight
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Traveling in same direction while decelerating	Traveling in same direction with higher speed
4)	Lead vehicle is stopped on roadway and is struck by a trailing vehicle.	Pre-Event Movement	Going straight	Stopped in traffic
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Other vehicle stopped	Traveling in same direction with higher speed
5)	Lead and trailing vehicle stopped on roadway. Lead vehicle backs into trailing vehicle.	Pre-Event Movement	Stopped in traffic lane	Stopped in traffic lane
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Backing	Other vehicle stopped

Screen Name: Critical Pre-Crash Event (cont'd)
Variable Name: Critical Pre-Crash Event (cont'd)

Coding Critical Precrash Event Scenerios for Different Rear-End Collision Situations (continued)

Three Vehicle Collisions

			Trail Vehicle	Middle Vehicle	Lead Vehicle
6)	Two vehicles stopped in traffic, struck by decelerating trailing vehicle	Pre-Event Movement	Decelerating	Stopped in traffic	Stopped in traffic
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Other vehicle stopped	Traveling in same direction while decelerating	Traveling in same direction with higher speed
7)	Lead vehicle stopped in traffic, middle vehicle decelerating, trailing vehicle strikes middle vehicle which strikes lead vehicle.	Pre-Event Movement	Going straight	Decelerating	Stopped in traffic
		Critical Precrash Category	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane	Other Motor Vehicle In Lane
		Critical Precrash Event	Traveling in same direction while decelerating	Traveling in same direction with higher speed	Traveling in same direction with higher speed

Screen Name: Attempted Avoidance Maneuver
Variable Name: Attempted Avoidance Maneuver

Element Attributes:

[No driver present]
No avoidance maneuver
Braking (no lockup)
Braking (lockup)
Braking (lockup unknown)
Releasing brakes
Steering left
Steering right
Braking and steering left
Braking and steering right
Accelerating
Accelerating and steering left
Accelerating and steering right
Other action (specify)
Unknown

Source: Researcher determined — inputs include the driver interview, police report, and the scene inspection.

Remarks:

Attempted avoidance maneuvers are movements/actions taken by the driver, within a *critical crash envelope*, in response to a Critical Precrash Event,. See **Precrash Data Overview** for an expanded discussion on precrash definitions. Attempted avoidance maneuvers occur *after* the driver has *realization* of an impending danger. This variable assesses what the driver's action(s) were in response to his/her realization.

Most crashes have only one critical crash envelope and thus only one Critical Precrash Event; however, multiple critical crash envelopes with their respective Critical Precrash Events, can exist.

This variable may be used independently: (1) of any maneuvers associated with this driver's Crash Type, and (2) this vehicle's first associated crash event.

Select the element value which best describes the actions taken by the driver in response to the Critical Precrash Event, within the *critical crash envelope* that occurred just prior to this vehicle's impact. When there was a known action (*e.g.*, braking), but you cannot determine whether there was more than one action (*e.g.*, braking and steering left), default to the known action (*e.g.*, braking).

[No Driver Present]
is pre-coded if on the Official Records Tab the “Driver Present?” variable is coded as “No driver Present”.

Screen Name: Attempted Avoidance Maneuver (cont'd)
Variable Name: Attempted Avoidance Maneuver (cont'd)

No avoidance maneuver
is selected whenever the driver did not attempt any evasive (pre-impact) maneuvers.

Braking (no lockup)
is selected when there is no indication that the brakes locked up. This attribute can be used with vehicles equipped with anti-lock braking systems (ABS), that perform as designed.

Braking (lockup)
is selected when there is indication that the brakes locked up. This code is generally not a valid choice for vehicles with anti-lock braking systems (ABS), unless definite evidence of lockup exists.

Screen Name: Pre-Impact Stability
Variable Name: Pre-Impact Stability

Element Attributes:

[No driver present]
Tracking
Skidding longitudinally — rotation less than 30 degrees
Skidding laterally — clockwise rotation
Skidding laterally — counterclockwise rotation
Other vehicle loss-of-control (specify)
Precrash stability unknown

Source: Researcher determined — inputs include vehicle and scene evidence, interviews and police report.

Remarks:

The purpose of this variable is to assess the stability of the vehicle **after** the critical event, but before the impact. The stability of the vehicle prior to an avoidance action is not considered except in the following situation:

A vehicle that is out of control (*e.g.*, yawing clockwise) prior to an avoidance maneuver is indicated as **Other vehicle loss-of-control** only if an avoidance action was taken in response to an impending danger.

Thus, this variable focuses upon this vehicle's dynamics after the critical event.

[No Driver Present]
is pre-coded if on the Official Records Tab the “Driver Present?” variable is coded as “No driver Present”.

Tracking
is used when there is no brake lockup and the vehicle continued along its intended path without rotation. Stopped, slowing, turning, or accelerating to avoid a rear-end collision are examples.

Skidding longitudinally — rotation less than 30 degrees
is selected when there is brake lockup or whenever tire marks are apparent without brake lockup (braking or non-braking) and rotation is less than 30 degrees clockwise or counterclockwise. If there is no information to support rotation greater than or equal to 30 degrees, then use this attribute.

Skidding laterally — clockwise rotation
is selected when the vehicle rotates clockwise, relative to the driver's seating position. The vehicle must rotate 30 degrees or more. This attribute also applies when the driver attempts a steering input (*i.e.*, steers right), but the vehicle rotates clockwise.

Screen Name: Pre-Impact Stability (cont'd)
Variable Name: Pre-Impact Stability (cont'd)

Skidding laterally — counterclockwise rotation
is selected when the vehicle rotates counterclockwise, relative to the driver's seating position. The vehicle must rotate 30 degrees or more. This attribute also applies when the driver attempts a steering input (*i.e.*, swerves left), but the vehicle rotates counterclockwise.

Other vehicle loss-of-control
is selected when a driver loses control of a vehicle prior to the critical event.

Precrash stability unknown
is selected when the stability of the vehicle, after the Critical Event, cannot be determined.

Screen Name: Pre-Impact Location
Variable Name: Pre-Impact Location

Element Attributes:

[No driver present]
Stayed in original travel lane
Stayed on roadway but left original travel lane
Stayed on roadway, not known if left original travel lane
Departed roadway
Remained off roadway
Returned to roadway
Entered roadway
Unknown

Source: Researcher determined — inputs include vehicle and scene evidence, interviews and police report.

Remarks:

The purpose of this variable is to assess the location of the vehicle **after** the critical event, but before the impact. Select the attribute which best describes the location of the vehicle (i.e., perimeter of the vehicle from the case diagram).

[No Driver Present]

is pre-coded if on the Official Records Tab the “Driver Present?” variable is coded as “No driver Present”.

Stayed in original travel lane

is selected when the perimeter of the vehicle remained within the boundaries of its initial travel lane.

Stayed on roadway but left original travel lane

is selected when the "majority" of the perimeter of the vehicle departed its initial travel lane; however, the "majority" of the vehicle remained within the boundaries of the roadway (travel lanes).

Stayed on roadway, not known if left original travel lane

is selected when it cannot be ascertained whether the "majority" of the vehicle remained within its initial travel lane. To use this attribute, the "majority" of the vehicle must have remained within the boundaries of the roadway.

Departed roadway

is selected when the "majority" of the vehicle departed the roadway as a result of a precrash motion. The roadway departure must not be related to the post-impact trajectory of a crash within the roadway.

Remained off roadway

the precrash motion occurred outside the boundaries of the roadway. This includes traveling on the shoulders, within the median, on the roadside, or off the trafficway.

Screen Name: Pre-Impact Location (cont'd)
Variable Name: Pre-Impact Location (cont'd)

Returned to roadway
is selected when the "majority" of the vehicle was on the roadway, went off the roadway and then returned to the roadway during precrash motion.

Entered roadway
is selected when the vehicle was not previously on the roadway and then the majority of the vehicle enters the roadway during precrash motion.

Unknown
the precrash motion of the vehicle cannot be determined.

Screen Name: Crash Type
Variable Name: Crash Type

Element Attributes:

As assigned by the selection on the next screens
00 - 93
98
99

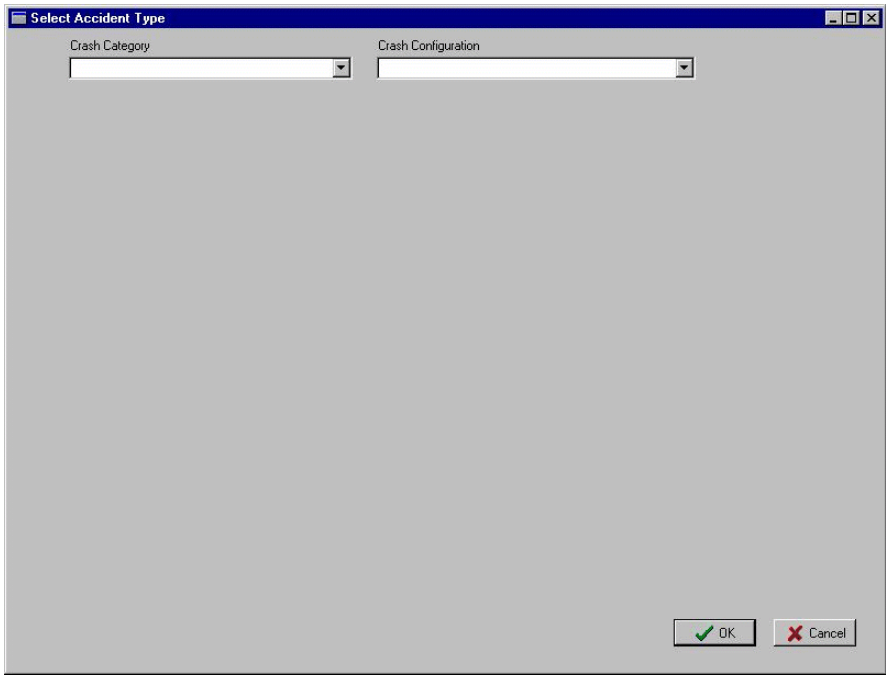
Source: Researcher determined — inputs include police report, scene inspection, vehicle inspection, and interview.

Remarks:

The Crash Type is a numeric value assigned by selecting the **Crash Category** and the **Crash Configuration** on the next screens. The number can be directly entered or edited here, however, the two-step process of selecting the Crash Category And Crash Conguration is preferred to visualize the crash scenario.

The first harmful event may include a collision between a vehicle and some object, accompanied by property damage or human injury. The object may be another vehicle, a person, an animal, a fixed object, the road surface, or the ground. If the first collision is a rollover, the impact is with the ground or road surface. The collision may also involve plowing into soft ground, if severe vehicle deceleration results in damage or injury. A road departure without damage or injury is not defined as a harmful event.

To access the category choices double click on the white box next to Crash Type and the following window opens:



Screen Name: Crash Category
Variable Name: Crash Category

Element Attributes:

Single Driver
Same Trafficway, Same Direction
Same Trafficway, Opposite Direction
Changing Trafficway, Vehicle Turning
Intersecting Paths (Vehicle Damage)
Miscellaneous

Remarks:

Variables CrashType (Category) and Crash Type (Configuration); are used for categorizing the collisions of drivers involved in crashes. A collision is defined here as the first harmful event in a crash between a vehicle and some object, accompanied by property damage or human injury. The object may be another vehicle, a person, an animal, a fixed object, the road surface, or the ground. The first harmful event may also involve plowing into soft ground, if severe vehicle deceleration results in damage or injury. A road departure without damage or injury is not defined as a collision.

To determine the proper crash type, refer to the three step decision process outlined below:

Step 1 - Determine the appropriate Crash Category.
Step 2 - Determine the appropriate Crash Configuration.
Step 3 - Determine the specific Crash Type from the graphic icons .

The attributes for this variable are the categories. The configuration and specific crash type attributes are further discussed under variables Crash Configuration, and Crash Type.

The definitions of each of the six categories are as follows:

Single Driver
The first harmful event involves a collision between an in-transport vehicle and an object, or an off roadway rollover. A harmful event involving two in-transport vehicles is excluded from this category. Note, the impact location on the vehicle is not a consideration for crash types in this category.

Same Trafficway, Same Direction
The first harmful event occurred while both vehicles were traveling in the same direction on the same trafficway.

Same Trafficway, Opposite Direction
The first harmful event occurred while both vehicles were traveling in opposite directions on the same trafficway.

Screen Name: Crash Category (cont'd)
Variable Name: Crash Category (cont'd)

Change Trafficway, Vehicle Turning

The first harmful event occurred when the vehicle is either turning or merging while attempting to change from one trafficway to another trafficway. Trafficway for this variable is loosely defined to include driveways, alleys and parking lots when a vehicle is either entering or exiting a trafficway.

Intersecting Paths (Vehicle Damage)

The first harmful event involves situations where vehicle trajectories intersect. It is important to note the location of damage to each vehicle for crash typing. The location of damage to each vehicle is important to determine the correct crash type.

Miscellaneous

The first harmful event involves a crash type which cannot be described in the Categories above and thus is included in this category. Select this category, if there is insufficient information to choose between categories. Included are vehicles that are backing, third or subsequent vehicles involved in the crash, U-turns, etc.

Each category is subdivided into crash configuration(s). The configurations are described under **Crash Configuration**.

Screen Name: Crash Configuration
Variable Name: Crash Configuration

Element Attributes:

Single Driver
- Right Roadside Departure
- Left Roadside Departure
- Forward Impact

Same Trafficway, Same Direction
- Rear-End
- Forward Impact
- Sideswipe/Angle

Same Trafficway, Opposite Direction
- Head-On
- Forward Impact
- Sideswipe/Angle

Change Trafficway Vehicle Turning
- Turn Across Path
- Turn Into Path

Intersecting Paths (Vehicle Damage)
- Straight Paths

Miscellaneous
- Backing, Etc.

Source: Researcher determined — inputs include police report, scene inspection, vehicle inspection, and interview.

Remarks:

Each category is further defined by a Crash Configuration. The Configurations are discussed below.

Single Driver

Right Roadside Departure; Left Roadside Departure - The vehicle departed either the right or left side of road with the first harmful event occurring off the road. Right versus left is based on the side of the road departed immediately prior to the first harmful event.

Forward Impact - The vehicle struck an object on the road or off the end of a trafficway while moving forward.

Screen Name: Crash Configuration (cont'd)
Variable Name: Crash Configuration (cont'd)

Same Trafficway, Same Direction

Rear-End — The front of the overtaking vehicle impacted the rear of the other vehicle. **Note**, even if the rear-impacted vehicle had started to make a turn, code here (not in **Change Trafficway Vehicle Turning**).

Forward Impact -— The front of the overtaking vehicle impacted the rear of the other vehicle, following a steering maneuver around a noninvolved vehicle or object.

Sideswipe/Angle — The two vehicles are involved in a shallow, glancing impact involving the side of one or both vehicles. **Note**, CDC guidelines for sideswipes are not considered when assessing this configuration.

Same Trafficway, Opposite Direction

Head-On — The frontal area of one vehicle impacted the frontal area of another.

Forward Impact — The frontal area of one vehicle impacted the frontal area of another following a steering maneuver around a noninvolved vehicle or an object.

Sideswipe/Angle — The two vehicles are involved in a shallow, glancing impact involving the side of one or both vehicles.

Changing Trafficway, Vehicle Turning

Turn Across Path — The two vehicles were initially on the same trafficway when one vehicle tried to turn onto another trafficway and pulled ***in front of*** the other vehicle. Vehicles making a "U" turn are identified in **Miscellaneous**.

Turn Into Path — The two vehicles were initially on different trafficways when one attempted to turn into the same trafficway as the other vehicle. **Note**, the focus of this configuration is on the turning maneuver from one trafficway to another and not on the vehicles' plane of contact.

Intersecting Paths (Vehicle Damage)

Straight Paths — The two vehicles were proceeding (or attempting to proceed) straight ahead.

Miscellaneous

Backing, Etc. — One of the two vehicles involved was a backing vehicle, regardless of its location on the trafficway or the damage location on the vehicles. Any crash configuration which cannot be described in the categories above is included here (e.g., U-turns, third or subsequent vehicles involved in the crash, etc.).

Screen Name: Crash Types
Variable Name: Crash Types

Element Values:

Crash Category: Single Driver

Crash Configuration Right Roadside Departure:

01 Drive Off Road
02 Control/Traction Loss
03 Avoid Collision with Vehicle, Pedestrian, Animal
04 Specifics Other
05 Specifics Unknown

Crash Configuration Left Roadside Departure

06 Drive Off Road
07 Control/Traction Loss
08 Avoid Collision With Vehicle, Pedestrian, Animal
09 Specifics Other
10 Specifics Unknown

Crash Configuration Forward Impact

11 Parked Vehicle
12 Stationary Object
13 Pedestrian/Animal
14 End Departure
15 Specifics Other
16 Specifics Unknown

Crash Category: Same Trafficway, Same Direction

Crash Configuration Rear-End

20 Stopped
21 Stopped, Straight
22 Stopped, Left
23 Stopped, Right
24 Slower
25 Slower, Going Straight
26 Slower, Going Left
27 Slower, Going Right
28 Decelerating (Slowing)
29 Decelerating (Slowing), Going Straight
30 Decelerating (Slowing), Going Left
31 Decelerating (Slowing), Going Right
32 Specifics Other
33 Specifics Unknown

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Forward Impact
- 34 This Vehicle's Frontal Area Impacts Another Vehicle
- 35 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 36 This Vehicle's Frontal Area Impacts Another Vehicle
- 37 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 38 This Vehicle's Frontal Area Impacts Another Vehicle
- 39 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 40 This Vehicle's Frontal Area Impacts Another Vehicle
- 41 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 42 Specifics Other
- 43 Specifics Unknown

Crash Configuration: Sideswipe/Angle
- 44 Straight Ahead on Left
- 45 Straight Ahead on Left/Right
- 46 Changing Lanes to the Right
- 47 Changing Lanes to the Left
- 48 Specifics Other
- 49 Specifics Unknown

Crash Category: Same Trafficway Opposite Direction

Crash Configuration: Head-On
- 50 Lateral Move (Left/Right)
- 51 Lateral Move (Going Straight)
- 52 Specifics Other
- 53 Specifics Unknown

Crash Configuration: Forward Impact
- 54 This Vehicle's Frontal Area Impacts Another Vehicle
- 55 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 56 This Vehicle's Frontal Area Impacts Another Vehicle
- 57 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 58 This Vehicle's Frontal Area Impacts Another Vehicle
- 59 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 60 This Vehicle's Frontal Area Impacts Another Vehicle
- 61 This Vehicle Is Impacted by Frontal Area of Another Vehicle
- 62 Specifics Other
- 63 Specifics Unknown

Crash Configuration: Sideswipe/Angle
- 64 Lateral Move (left/Right)
- 65 Lateral Move (Going Straight)
- 66 Specifics Other
- 67 Specifics Unknown

Screen Name: Crash Types
Variable Name: Crash Types

Crash Category: Change Trafficway Vehicle Turning

Crash Configuration: Turn Across Path

68 Initial Opposite Directions (Left/Right)
69 Initial Opposite Directions (Going Straight)
70 Initial Same Directions (Turning Right)
71 Initial Same Directions (Going Straight)
72 Initial Same Directions (Turning Left)
73 Initial Same Directions (Going Straight)
74 Specifics Other
75 Specifics Unknown

Crash Configuration: Turn Into Path

76 Turn Into Same Direction (Turning Left)
77 Turn Into Same Direction (Going Straight)
78 Turn Into Same Direction (Turning Right)
79 Turn Into Same Direction (Going Straight)
80 Turn Into Opposite Directions (Turning Right)
81 Turn Into Opposite Directions (Going Straight)
82 Turn Into Opposite Directions (Turning Left)
83 Turn Into Opposite Directions (Going Straight)
84 Specifics Other
85 Specifics Unknown

Crash Category: Intersecting Paths (Vehicle Damage)

Configuration Straight Paths

86 Striking from the Right
87 Struck on the Right
88 Striking from the Left
89 Struck on the Left
90 Specifics Other
91 Specifics Unknown

Crash Category: Miscellaneous

Crash Configuration: Backing, Etc.

92 Backing Vehicle
93 Other Vehicle or Object
98 Other Crash Type
99 Unknown Crash Type
00 No Impact

Source: Researcher determined — inputs include police report, scene inspection, vehicle inspection, and interview.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Remarks:

The crash types in **Single Driver** involve an impact between a vehicle and an object. The other Categories identify specific collision combinations which must be coded in specified pairs (*i.e.*, the pair attribute defines the Crash Type). As an example, the combination Rear-end, stopped and Rear-end, specifics other or Rear-end, stopped and Slower, straight ahead are not valid since

Rear-end, stopped only has meaning when linked to Stopped.

A crash involving a vehicle impacting a "driverless in-transport vehicle" is coded **"..., specifics other"** in the appropriate configuration-category. For example, a vehicle which impacts the rear of a driverless in-transport vehicle is encoded Rear-end, specifics other.

In crashes involving more than two vehicles or in collision sequences involving a combination of vehicle-to-object-to-vehicle impacts, code the Crash Type for the vehicle(s) involved in the first harmful event. All other vehicles are coded **Other Crash Type**.

Keep in mind that ***intended actions*** play an important role in the coding scheme. For example, crash type Slower, turning left is selected over type (Slower, straight ahead) if the subject vehicle was traveling slower with the ***intention*** of turning left. Note, the turning action need not have occurred prior to the collision. The driver's ***intent*** to turn is the key.

The ***configurations*** are delineated into specific crash types. These types can be identified by referring to the crash type diagrams.

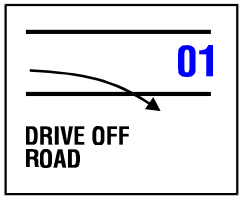
Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Category Single Driver

Crash Configuration: Right Roadside Departure

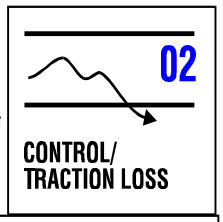
The vehicle departed the right side of the road with the first harmful event occurring off the road.

01 Right Roadside Departure: Drive Off Road



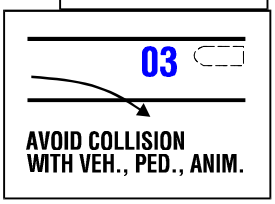
Enter "01" when the vehicle departed the road under a controlled situation (e.g., the driver was distracted, fell asleep, intentionally departed, etc.

02 Right Roadside Departure: Control/Traction Loss



Enter "02" when there is evidence that the vehicle lost traction or "got away" from the driver in some other way (e.g., the vehicle spun off the road as a result of surface conditions, oversteer phenomena, or mechanical malfunctions). If doubt exists, code "01" (Right Roadside Departure, Drive Off Road).

03 Right Roadside Departure: Avoid Collision With Vehicle, Pedestrian, Animal



Enter "03" when the vehicle departed the road to avoid something on the road. Phantom vehicle situations, pedestrians, bicyclists, and other cyclists and nonmotorists are included here.

04 Right Roadside Departure: Specifics Other

Enter "04" if the vehicle departed the road to avoid something on the road other than a vehicle, pedestrian, or animal. Also use "Specifics Other" for crashes involving a driverless in-transport vehicle.

05 Right Roadside Departure: Specifics Unknown

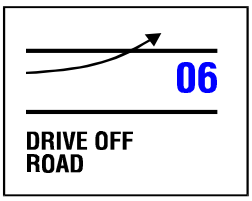
Enter "05" if the vehicle departed the right side of the road for unknown reasons.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Left Roadside Departure

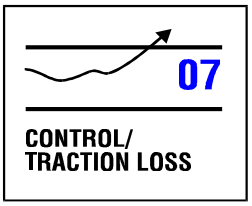
06 Left Roadside Departure: Drive Off Road

Enter "06" when the vehicle departed the road under a controlled situation (e.g., the driver was distracted, fell asleep, intentionally departed, etc.)



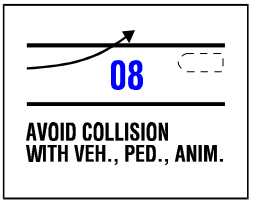
07 Left Roadside Departure: Control/Traction Loss

Enter "07" if there is evidence that the vehicle lost traction or "got away" from the driver in some other way (e.g., the vehicle spun off the road as a result of surface conditions, oversteer phenomena, or mechanical malfunctions.) If doubt exists, code "06" (Left Roadside Departure, Drive Off Road).



08 Left Roadside Departure: Avoid Collision With Vehicle, Pedestrian, Animal

Enter "08" when the vehicle departed the road to avoid something on the road. Phantom vehicle situations, pedestrians, bicyclists, and other cyclists and nonmotorists are included here.



09 Left Roadside Departure: Specifics Other

Enter "09" if the vehicle departed the road to avoid something on the road other than a vehicle, pedestrian, or animal. Also, use "specifics Other" for crashes involving a driverless in-transport vehicle.

10 Left Roadside Departure: Specifics Unknown

Enter "10" if the vehicle departed the left side of the road for unknown reasons.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Forward Impact

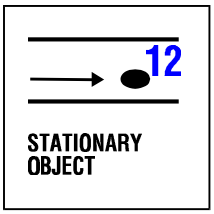
The vehicle struck an object on the road or off the end of a trafficway while moving forward.

11 Forward Impact: Parked Vehicle

Enter "11" if the crash involves impact with a parked vehicle on either side of the road.

12 Forward Impact: Stationary Object

Enter "12" if the crash involves impact with a stationary object on either side of the road.

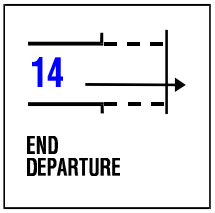


13 Forward Impact: Pedestrian/Animal

Enter "13" if the first harmful event involves impact with a pedestrian or animal on either side of the road. Pedestrians, bicyclists, and other cyclists and nonmotorists are included here. Vehicle plane of contact is NOT a consideration.

14 Forward Impact: End Departure

Enter "14" when the vehicle ran off the end of the road and crashed into something.



15 Forward Impact: Specifics Other

Enter "15" for impacted (striking or struck) trains and nonstationary objects on the road. Also use "Specifics Other" for crashes involving a driverless in-transport motor vehicles.

16 Forward Impact: Specifics Unknown

Enter "16" when the PAR indicates a single driver was involved in a forward impact collision, but no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

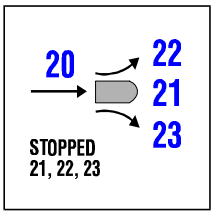
Crash Category: Same Trafficway, Same Direction

Crash Configuration: Rear-End

The front of the overtaking vehicle impacted the rear of the other vehicle. Note, even if the rear-impacted vehicle had started to make a turn, code here (**not** in Crash Category: Change in Trafficway, Vehicle Turning).

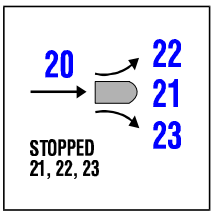
20 Rear-End: Stopped

Enter "20" for a vehicle that impacts another vehicle from the rear when the impacted vehicle was stopped in the trafficway.



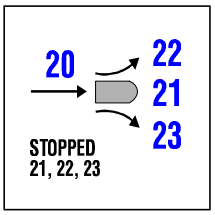
21 Rear-End: Stopped, Straight

Enter "21" for a rear-impacted vehicle that was stopped in the trafficway, and was intending to proceed straight ahead.



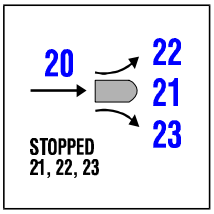
22 Rear-End: Stopped, Left

Enter "22" for a rear-impacted vehicle that was stopped in the trafficway, intending to make a left turn.



23 Rear-End: Stopped, Right

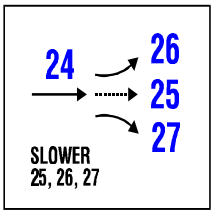
Enter "23" for a rear-impacted vehicle that was stopped in the trafficway, intending to make a right turn.



Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

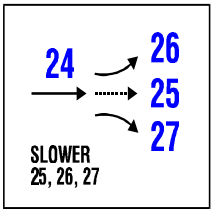
24 Rear-End: Slower

Enter "24" for a vehicle that impacts another vehicle from the rear when the impacted vehicle was going slower than the striking vehicle.



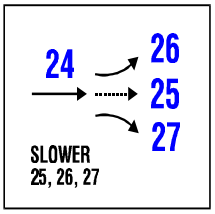
25 Rear-End: Slower, Going Straight

Enter "25" for a rear-impacted vehicle that was going slower than the other vehicle while proceeding straight ahead.



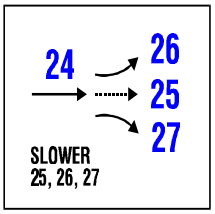
26 Rear-End: Slower, Going Left

Enter "26" for a rear-impacted vehicle that was going slower than the other vehicle while intending to turn left.



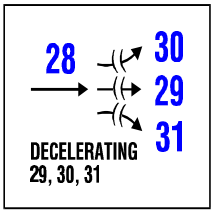
27 Rear-End: Slower, Going Right

Enter "27" for a rear-impacted vehicle that was going slower than the other vehicle while intending to turn right.



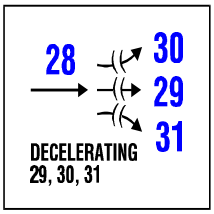
28 Rear-End: Decelerating (Slowing)

Enter "28" for a vehicle impacts another vehicle from the rear when the impacted vehicle was slowing down.



29 Rear-End: Decelerating (Slowing), Going Straight

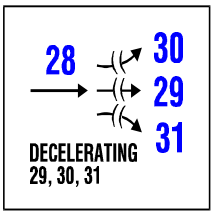
Enter "29" for a rear-impacted vehicle that was slowing down while proceeding straight ahead.



Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

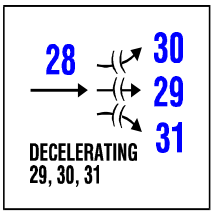
30 Rear-End: Decelerating (Slowing), Going Left

Enter "30" for a rear-impacted vehicle that was slowing down while intending to turn left.



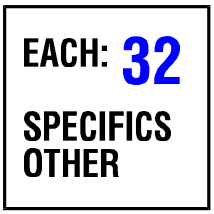
31 Rear-End: Decelerating (Slowing), Going Right

Enter "31" for a rear-impacted vehicle that was slowing down while intending to turn right.



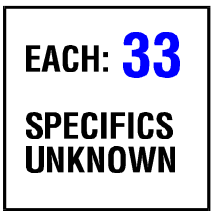
32 Rear-End: Specifics Other

Enter "32" for rear-end collisions which cannot be described in "20"-"31." Enter "Specifics Other" for crashess involving a driverless in-transport vehicle.



33 Rear-End: Specifics Unknown

Enter "33" when the PAR indicates a rear-end collision occurred, but no further classification is possible.

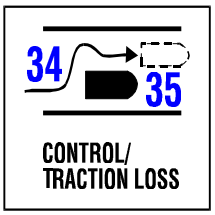


Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Forward Impact

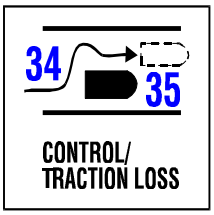
The front of the overtaking vehicle impacted the rear of the other vehicle, following a steering maneuver around a noninvolved vehicle or object.

34 Forward Impact: Control/Traction Loss



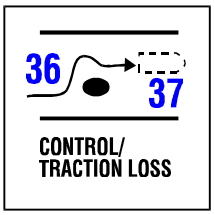
Enter "34" for a vehicle that's frontal area impacts another vehicle due to loss of control or traction (during a maneuver to avoid a collision with a non-involved vehicle) while both are traveling on the same trafficway in the same direction.

35 Forward Impact: Control/Traction Loss



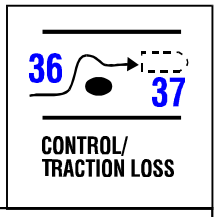
Enter "35" for a vehicle which is impacted by the frontal area of another vehicle due to loss of control or traction (during a maneuver to avoid a collision with a non-involved vehicle) while both are traveling on the same trafficway in the same direction.

36 Forward Impact: Control/Traction Loss



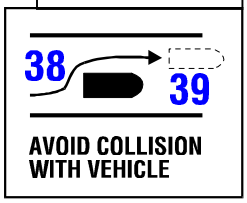
Enter "36" for a vehicle that's frontal area impacts another vehicle due to loss of control or traction (during a maneuver to avoid a collision with an object) while both are traveling on the same trafficway in the same direction.

37 Forward Impact: Control/Traction Loss



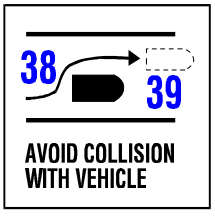
Enter "37" for a vehicle which is impacted by the frontal area of another vehicle due to loss of control or traction (during a maneuver to avoid a collision with an object) while both are traveling on the same trafficway in the same direction.

38 Forward Impact: Avoid Collision with Vehicle



Enter "38" for a vehicle that struck the rear of another vehicle with its front plane while maneuvering to avoid collision with a non-involved vehicle, when loss of control or traction was not a factor, and both were traveling on the same trafficway, in the same direction.

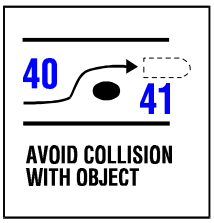
39 Forward Impact: Avoid Collision with Vehicle



Enter "39" for a vehicle that was impacted by the frontal area of another vehicle which was maneuvering to avoid a collision with a non-involved vehicle, when loss of control or traction was not a factor, and both were traveling on the same trafficway, in the same direction.

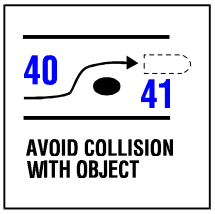
Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

40 Forward Impact: Avoid Collision with Object



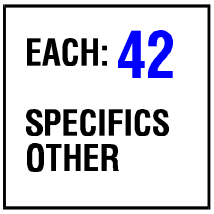
Enter "40" for a vehicle that struck the rear of another vehicle with its front plane while maneuvering to avoid collision with an object, when loss of control or traction was not a factor, and both were traveling on the same trafficway, in the same direction.

41 Forward Impact: Avoid Collision with Object



Enter "41" for a vehicle which was impacted by the frontal area of another vehicle which was maneuvering to avoid a collision with an object, when loss of control or traction was not a factor, and both were traveling on the same trafficway, in the same direction.

42 Forward Impact: Specifics Other



Enter "42" (for both vehicles) for a forward impact collision which occurred while both vehicles were traveling on the same trafficway, in the same direction, and the striking vehicle was attempting to avoid a vehicle or an object which cannot be described by "34" - "40."

Also, use this code for crashes involving a driverless in-transport vehicle which would otherwise qualify for this configuration.

43 Forward Impact: Specifics Unknown

Enter "43" when the PAR indicates that a forward impact collision occurred while both vehicles were traveling on the same trafficway and in the same direction, but no further classification was possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Sideswipe/Angle

The two vehicles are involved in an impact involving the side of one or both vehicles.

The following four codes, "44" (Sideswipe/Angle, straight ahead on left), "45" (Sideswipe/Angle, straight ahead on left/right), "46" (Sideswipe/Angle, changing lanes to the right), "47" (Sideswipe/Angle, changing lanes to the left), identify relative vehicle positions (left versus right) and lane of travel intentions (straight ahead versus changing lanes). From these four codes, four combinations are permitted. They are:

1. "44" and "45"
2. "46" and "45"
3. "45" and "47"
4. "46" and "47".

When used in combination, these codes refer to a sideswipe or angle collision which involved a vehicle to the left of a vehicle to the right where:

1. neither vehicle (codes "44" and "45") intended to change its lane;
2. the vehicle on the left (code "46") was changing lanes to the right, and the vehicle on the right (code "45") was not intending to change its lane;
3. the vehicle on the left (code "45") was not intending to change its lane, and the vehicle on the right (code "47") was changing lanes to the left; and
4. the vehicle on the left (code "46") was changing lanes to the right, and the vehicle on the right (code "47") was changing lanes to the left.

In addition, when:

1. the right sides of the two vehicles impact following a 180 degree rotation of the vehicle on the right, or
2. the left sides of the two vehicles impact following a 180 degree rotation of the vehicle on the left.

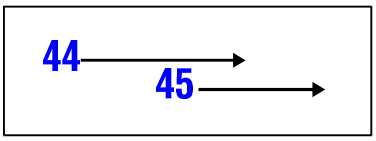
Select the appropriate combination depending upon:

- their positions (i.e., left versus right) and
- the intended lane of travel (straight ahead versus changing lanes) of their drivers.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

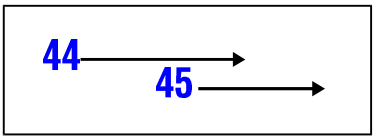
44 Sideswipe/Angle: Straight Ahead on Left

See discussion under Configuration F. Sideswipe/Angle, above for an explanation of when this attribute applies.



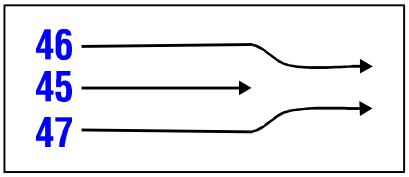
45 Sideswipe/Angle: Straight Ahead on Left/Right

See discussion under Configuration F. Sideswipe/Angle, above for an explanation of when this attribute applies.



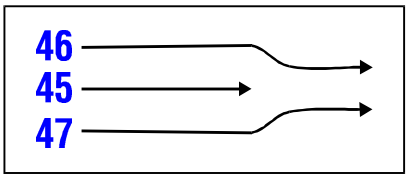
46 Sideswipe/Angle: Changing Lanes to the Right

See discussion under Configuration F. Sideswipe/Angle, above for an explanation of when this attribute applies.



47 Sideswipe/Angle: Changing Lanes to the Left

See discussion under Configuration F. Sideswipe/Angle, above for an explanation of when this attribute applies.



48 Sideswipe/Angle: Specifics Other

Enter "48" if one vehicle was behind the other prior to a sideswipe/angle collision occurring while both vehicles were traveling on the same trafficway and in the same direction.

For example, use this code when two vehicles are on the same trafficway and going the same direction, and one loses control and is struck in the side by the front of the other vehicle. However, if one vehicle rotates such that the impact is front to front, then use code "98" (Other crash type).

Use this code for crashes involving a driverless in-transport vehicle.

49 Sideswipe/Angle: Specifics Unknown

Enter "49" for sideswipe/angle collisions that occur while both vehicles are traveling on the same trafficway and in the same direction, when no further classification is possible.

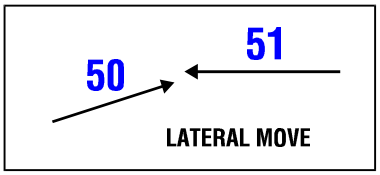
Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Category: Same Trafficway, Opposite Direction

Crash Configuration: Head-On

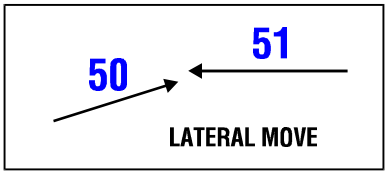
The frontal area of one vehicle impacted the frontal area of another.

50 Head-On: Lateral Move (Left/Right)



Enter "50" for a vehicle that LEAVES ITS LANE [moves laterally (sideways)] immediately before colliding head-on with another vehicle, when the vehicles are traveling on the same trafficway in opposite directions.

51 Head-On: Lateral Move (Going Straight)



Enter "51 " for a vehicle that collides head-on with another vehicle which has IMMEDIATELY LEFT ITS LANE (moved laterally), when the vehicles are traveling on the same trafficway in opposite directions.

52 Head-On: Specifics Other

Enter "52" for a head-on collision that cannot be described by "50"-"51", when the vehicles are traveling on the same trafficway in opposite directions. Clarification: Enter "52" for both vehicles involved in a head-on collision when one is traveling the wrong way on a one way roadway.

Enter "Specifics Other" for crashes involving a driverless in-transport vehicle.

53 Head-On: Specifics Unknown

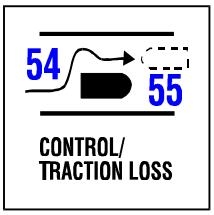
Enter "53" when the PAR indicates a head-on collision occurred between two vehicles traveling on the same trafficway in opposite directions, when no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Forward Impact

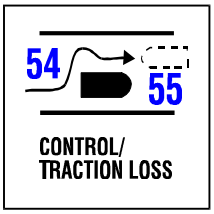
The frontal area of one vehicle impacted the frontal area of another following a steering maneuver around a noninvolved vehicle or an object.

54 Forward Impact: Control/Traction Loss



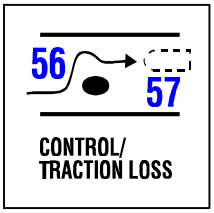
Enter "54" for a vehicle whose frontal area impacts another vehicle due to loss of control or traction (during a maneuver to avoid a collision with a third vehicle) while the vehicles are traveling on the same trafficway in opposite directions.

55 Forward Impact: Control/Traction Loss



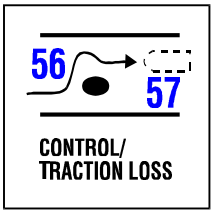
Enter "55" for a vehicle which is impacted by the frontal area of another vehicle due to loss of control or traction (during a maneuver to avoid a collision with a third vehicle) while the vehicles are traveling on the same trafficway in opposite directions.

56 Forward Impact: Control/Traction Loss



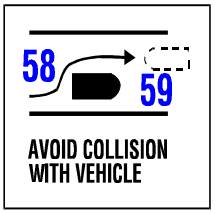
Enter "56" for a vehicle whose frontal area impacts another vehicle due to loss of control or traction (during a maneuver to avoid a collision with an object) while the vehicles are traveling on the same trafficway in opposite directions.

57 Forward Impact: Control/Traction Loss



Enter "57" for a vehicle which is impacted by the frontal area of another vehicle due to loss of control or traction (during a maneuver to avoid a collision with an object) while the vehicles are traveling on the same trafficway in opposite directions.

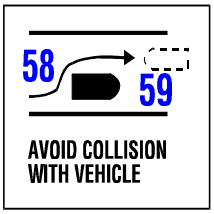
58 Forward Impact: Avoid Collision with Vehicle



Enter "58" for a vehicle whose frontal area impacts another vehicle while maneuvering to avoid a collision with a non-involved vehicle, when loss of control or traction was not a factor, and the vehicles were traveling on the same trafficway, in opposite directions.

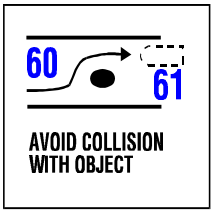
Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

59 Forward Impact: Avoid Collision with Vehicle



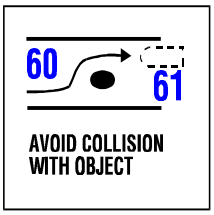
Enter "59" for a vehicle which was impacted by the frontal area of another vehicle which was maneuvering to avoid collision with a non-involved vehicle, when loss of control or traction was not a factor, and the vehicles were traveling on the same trafficway, in opposite directions.

60 Forward Impact: Avoid Collision with Object



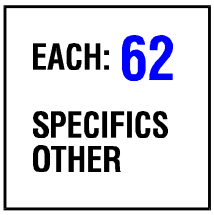
Enter "60" for a vehicle that struck the front of another vehicle with the frontal plane while maneuvering to avoid collision with an object, when loss of control or traction was not a factor, and the vehicles were traveling on the same trafficway, in opposite directions.

61 Forward Impact: Avoid Collision with Object



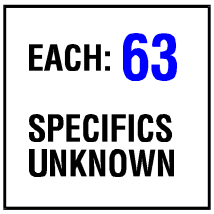
Enter "61 " for a vehicle which was impacted by the frontal area of another vehicle which was maneuvering to avoid collision with an object, when loss of control or traction was not a factor, and the vehicles were traveling on the same trafficway, in opposite directions.

62 Forward Impact: Specifics Other



Enter "62" for forward impact collisions occurring while the vehicles were traveling on the same trafficway in opposite directions which cannot be described by "54"-"61 ". Enter "Specifics Other" for crashes involving a "driverless in-transport vehicle."

63 Forward Impact: Specifics Unknown



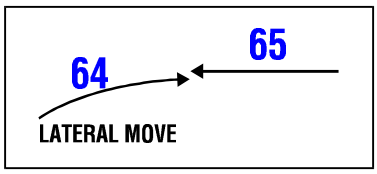
Enter "63" when the PAR indicates a forward impact collision occurred while the vehicles were traveling on the same trafficway in opposite directions, but no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Sideswipe/Angle

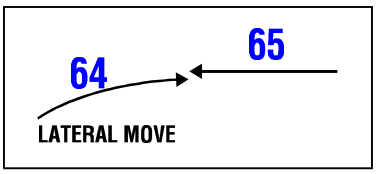
The two vehicles are involved in an impact involving the side of one or both vehicles.

64 Sideswipe/Angle: Lateral Move (Left/Right)



Code "64" identifies the vehicle which infringed upon the other vehicle (code "65") in a Crash Category: Change Trafficway Opposite Direction, Crash Configuration: Sideswipe/Angle collision. Enter "64" for the vehicle which left its lane (moved laterally) leading to the collision.

65 Sideswipe/Angle: Lateral Move (Going Straight)

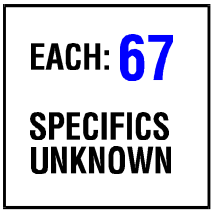


Enter "65" for the vehicle which was infringed upon by the other vehicle (code "64") in a Crash Category: Change Trafficway Opposite Direction, Crash Configuration: Sideswipe/Angle collision.

66 Sideswipe/Angle: Specifics Other

Enter "66" for sideswipe/angle collisions occurring while both vehicles were traveling on the same trafficway in opposite directions which cannot be described by "64"-"65". Enter "Specifics Other" for crashes involving a "driverless in-transport vehicle."

67 Sideswipe/Angle: Specifics Unknown



Enter "67" when the PAR indicates a sideswipe/angle collision occurred while both vehicles were traveling on the same trafficway in opposite directions, but no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

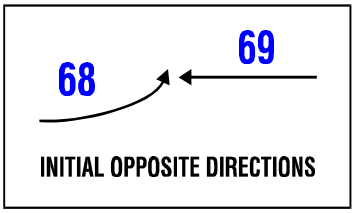
Crash Category: Changing Trafficway, Vehicle Turning

Configuration J. Turn Across Path

The two vehicles were initially on the same trafficway when one vehicle tried to turn onto another trafficway and pulled in front of the other vehicle. Vehicles making a "U" turn are identified in Category VI. Miscellaneous.

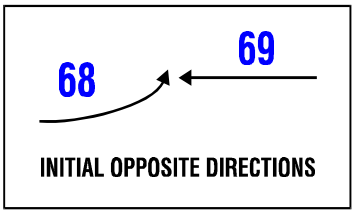
68 Turn Across Path: Initial Opposite Directions (Left/Right)

Code "68" identifies the vehicle which turned across the path of another vehicle (code) in a Category IV, Configuration J collision, in which the vehicles were initially traveling in opposite directions.



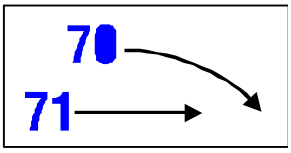
69 Turn Across Path: Initial Opposite Directions (Going Straight)

Enter "69" for a vehicle involved in a collision in which another vehicle (code "68" across its Path, and in which the vehicles were initially traveling in opposite directions.



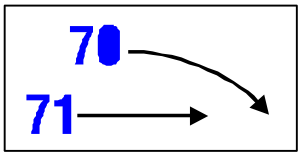
70 Turn Across Path: Initial Same Directions (Turning Right)

Enter "70" for a vehicle which turned right, across the path of another vehicle (code "71"), when both vehicles were initially traveling in the same direction.



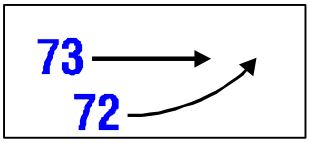
71 Turn Across Path: Initial Same Directions (Going Straight)

Enter "71 " for a vehicle whose path was crossed by a vehicle turning right (code "70"), when both vehicles were initially traveling in the same direction.



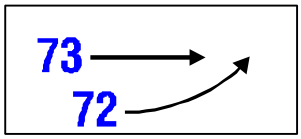
72 Turn Across Path: Initial Same Directions (Turning Left)

Enter "72" for a vehicle which turned left, across the path of another vehicle (code "73"), when both vehicles were initially traveling in the same direction.



Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

73 Turn Across Path: Initial Same Directions (Going Straight)



Enter "73" for a vehicle whose path was crossed by a vehicle turning left (code "72"), when both vehicles were initially traveling in the same direction.

74 Turn Across Path: Specifics Other

Enter "74" for collisions in which one vehicle turned across another's path, which cannot be described by "68"-"72". Enter "Specifics Other" for crashess involving a driverless in-transport vehicle.

75 Turn Across Path: Specifics Unknown

Enter "75" when the PAR indicates one vehicle turned across another's path, causing a collision, but no further classification is possible.

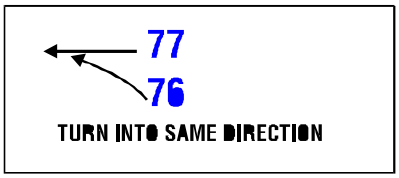
Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

Crash Configuration: Turn Into Path

The two vehicles were initially on different trafficways when one attempted to turn into the same trafficway as the other vehicle.

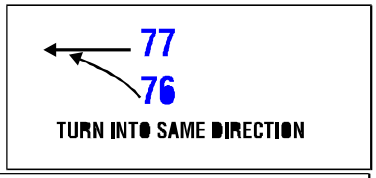
Note, the focus of this configuration is on the turning maneuver from one trafficway to another and not on the vehicles' plane of contact.

76 Turn Into Same Direction (Turning Left)



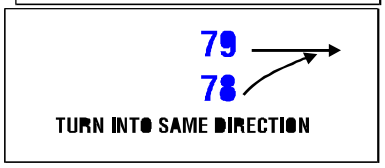
Enter "76" for a vehicle which turned left, into the path of another vehicle (code "77"), so that both vehicles were traveling in the same direction at the time of the collision.

77 Turn Into Same Direction (Going Straight)



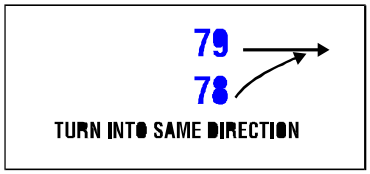
Enter "77" for a vehicle involved in a collision in which another vehicle (code "76") turned left, into its path, so that both vehicles were traveling in the same direction at the time of the collision.

78 Turn Into Same Direction (Turning Right)



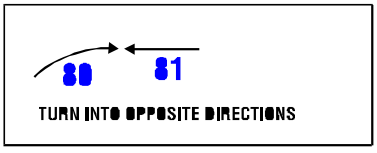
Enter "78" for a vehicle which turned right, into the path of another vehicle (code "79"), so that both vehicles were traveling in the same direction at the time of the collision.

79 Turn Into Same Direction (Going Straight)



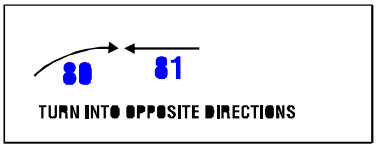
Enter "79" for a vehicle involved in a collision in which another vehicle (code "78") turned right, into its path, so that both vehicles were traveling in the same direction at the time of the collision.

80 Turn Into Opposite Directions (Turning Right)



Enter "80" for a vehicle which turned right, into the path of another vehicle (code "81"), so that the vehicles were traveling in opposite directions at the time of the collision.

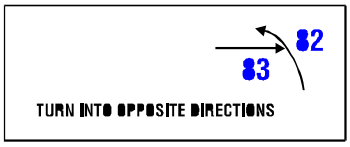
81 Turn Into Opposite Directions (Going Straight)



Enter "81" for a vehicle involved in a collision in which another vehicle (code "80") turned right, into its path, so that the vehicles were traveling in opposite directions at the time of the collision.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

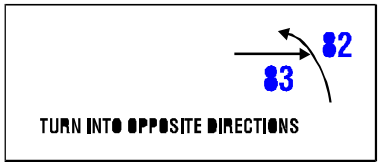
82 Turn Into Opposite Directions (Turning Left)



Enter "82" for a vehicle which turned left, into the path of another vehicle (code "83"), so that the vehicles were traveling in opposite directions at the time of the collision.

Code "82" is used when the driver's vehicle was in the act of making a left turn (e.g., from a driveway, parking lot or intersection). Do not confuse this situation with "**Crash Configuration: Straight Paths**." The driver's intended path is the prime concern.

83 Turn Into Opposite Directions (Going Straight)



Enter "83" for a vehicle involved in a collision in which another vehicle (code "82") turned left, into its path, so that the vehicles were traveling in opposite directions at the time of the collision.

84 Turn Into Path: Specifics Other

Enter "84" for collisions in which one vehicle turned across another's path, which cannot be described by "76"-"83". Enter "Specifics Other" for crashes involving a driverless in-transport vehicle.

85 Turn Into Path: Specifics Unknown

Enter "85" when the PAR indicates one vehicle turned into another's path, causing a collision, but no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

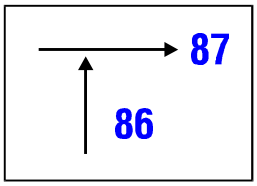
Crash Category: Intersecting Paths (Vehicle Damage)

Crash Configuration: Straight Paths

The two vehicles were proceeding (or attempting to proceed) straight ahead.

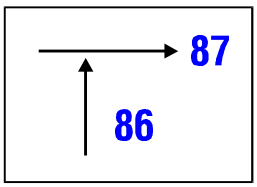
86 Straight Paths: Striking from the Right

Enter "86" for a vehicle which strikes the right side of another vehicle (code "87") from the right when both vehicles were going straight at the time of the collision, i.e., right side damage to 87, front damage to 86.



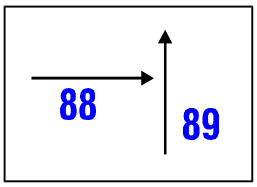
87 Straight Paths: Struck on the Right

Enter "87" for a vehicle which is struck on the right side by another vehicle (code "86") from the right when both vehicles were going straight at the time of the collision, i.e., right side damage to 87, front damage to 86.



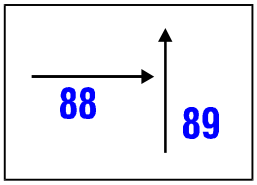
88 Straight Paths: Striking from the Left

Enter "88" for a vehicle which strikes another vehicle (code "89") from the left when both vehicles were going straight at the time of the collision, i.e., left side damage to 89, front damage to 88.



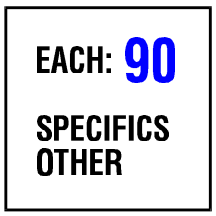
89 Straight Paths: Struck on the Left

Enter "89" for a vehicle which is struck on the left side by another vehicle (code "88") from the left when both vehicles were going straight at the time of the collision, i.e., left side damage to 89, front damage to 88.



90 Straight Paths: Specifics Other

Enter "90" for collisions in which two vehicles, both going straight, collide when their paths intersect, which cannot be described by "86"-"89". Enter "Specifics Other" for crashes involving a driverless in-transport vehicle.



91 Straight Paths: Specifics Unknown

Enter "91 " when the PAR indicates two vehicles, both going straight, collided when their paths intersected, but no further classification is possible.

Screen Name: Crash Types (cont'd)
Variable Name: Crash Types (cont'd)

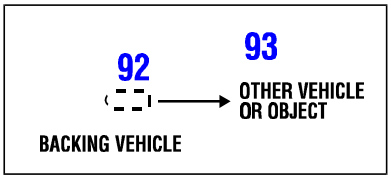
Crash Category: Miscellaneous

Crash Configuration: Backing, Etc.

One of the two vehicles involved was a backing vehicle, regardless of its location on the trafficway or the damage location on the vehicles.

Any crash configuration which cannot be described in the above Crash Categories is included here.

92 Backing, Etc.: Backing Vehicle

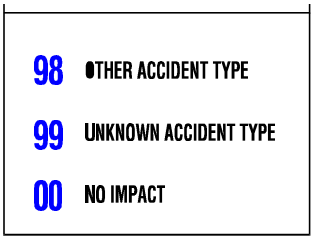


Enter "92" for a backing vehicle which was involved with another vehicle (code 93) or object.

93 Backing, Etc.: Other Vehicle or Object

Enter "93" for the vehicle which was involved with the backing vehicle (code 92).

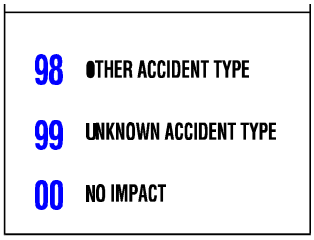
98 Backing, Etc.: Other Crash Type



Code "98" is used for those events and collisions which do not reasonably fit any of the specified types. This code includes (but is not limited to):

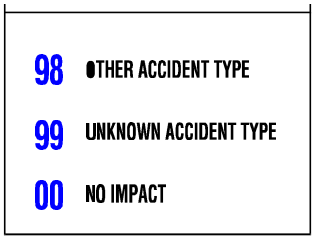
- Rollovers on the road
- U-turns
- Third or subsequent vehicles involved in a crash or
- The second involved vehicle, when the first harmful event involved a vehicle-to-object collision or a non-collision.

99 Backing, Etc.: Unknown Crash Type

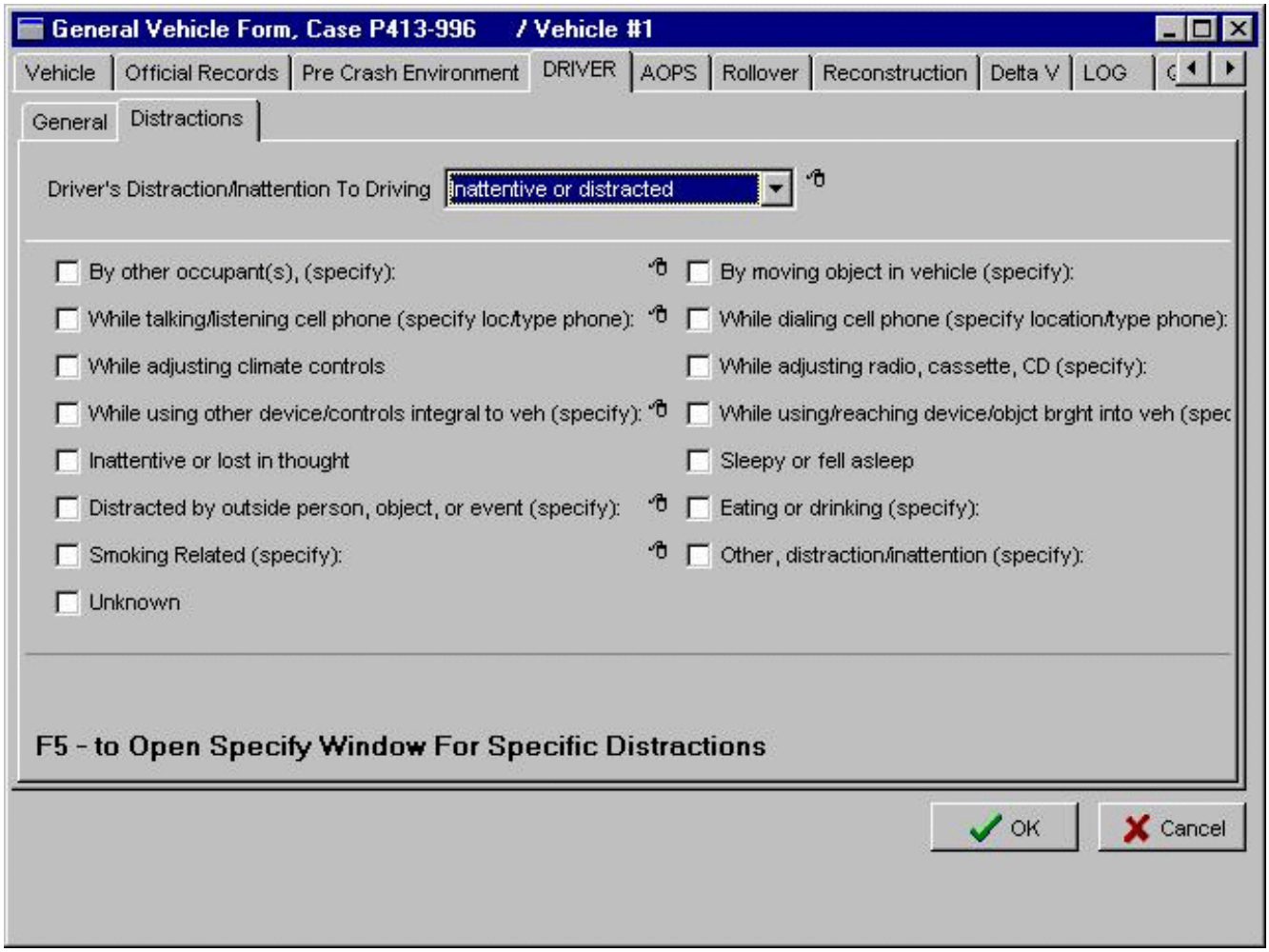


Code "99" when the crash category or configuration is unknown.

00 Backing, Etc.: No Impact



Code "00" identifies non-collision events (fire, immersion, etc.) Rollovers on the road should be coded as Crash Type "98" **Other Accident Type**.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
General
Distractions
Driver's Distraction/Inattention To Driving
Inattentive or distracted
By other occupant(s), (specify):
By moving object in vehicle (specify):
While talking/listening cell phone (specify loc/type phone):
While dialing cell phone (specify location/type phone):
While adjusting climate controls
While adjusting radio, cassette, CD (specify):
While using other device/controls integral to veh (specify):
While using/reaching device/objct brght into veh (spec
Inattentive or lost in thought
Sleepy or fell asleep
Distracted by outside person, object, or event (specify):
Eating or drinking (specify):
Smoking Related (specify):
Other, distraction/inattention (specify):
Unknown
F5 - to Open Specify Window For Specific Distractions
OK
Cancel

Screen Name: Driver's Distraction/Inattention to Driving
Variable Name: Driver's Distraction/Inattention to Driving

Element Attributes:

[No driver present]
Attentive or not distracted
Looked but did not see
Inattentive or distracted
Unknown

Source: Researcher determined — inputs include interviews and police report.

Remarks:

[No Driver Present]

is pre-coded if on the Official Records Tab the “Driver Present?” variable is coded as “No driver Present”.

Attentive or not distracted

is selected when the driver is known to have been completely attentive to driving prior to realization of impending danger.

Looked but did not see

is selected when the driver is paying attention to driving, but does not see the relevant vehicle, object, etc. This attribute should be used when a driver has an opportunity to take some action prior to impact, but the driver takes no action and no other distractions apply. This situation frequently occurs when an overtaking vehicle is in the driver's "blind spot" or at intersections when you look both ways and a crossing vehicle is not noticed. If the driver sees the vehicle, object, etc., but does not consider it a danger then, and no other distractions apply then select Attentive or not distracted

Inattentive or distracted:

is selected when the driver was inattentive or distracted prior to the realization of an impending critical event. Once this attribute is selected, options come into view where the Researcher can select all distractions that apply.

Unknown

is selected when it is unknown if this driver was fully attentive to driving prior to realization of impending danger. Use this attribute if no interview is obtained and there is no other source of information regarding this driver's attention to driving prior to realization of impending danger.

Screen Name: Driver's Distraction/Inattention to Driving (cont'd)
Variable Name: Driver's Distraction/Inattention to Driving (cont'd)

Element Attributes:

Inattentive or distracted:

By other occupant(s), (specify):
By moving object in vehicle (specify):
While talking or listening to cellular phone (specify location and type of phone):
While dialing cellular phone (specify location and type of phone):
While adjusting climate controls
While adjusting radio, cassette, CD (specify):
While using other device/controls integral to vehicle (specify):
While using or reaching for device/object brought into vehicle (specify):
Inattentive or lost in thought
Sleepy or fell asleep
Distracted by outside person, object, or event (specify):
Eating or drinking (specify):
Smoking related (specify):
Other, distraction/inattention (specify):
Unknown

Source: Researcher determined — inputs include interviews and police report.

Remarks:

Select all the attributes which describe this driver's **inattention** to driving prior to the driver's realization of an impending critical event or just prior to impact if realization of an impending critical event does not occur. If this driver's vehicle has two critical crash envelopes, record the attribute(s) which best describe the driver's attention ***prior to the first Critical Precrash Event*** (*i.e.*, prior to realization of the impending danger which the driver successfully avoided). Intoxication is not considered a distraction.

All distractions which indicate "(specify)" require specific information to be annotated. To activate the "specify" window, press the F5 key.

By other occupant(s) (Specify):

is selected when the driver was distracted by another occupant in this driver's vehicle prior to realization of impending danger. Examples of other occupant distraction include conversing with or looking at another occupant. The specific occupant distraction *must be recorded in the "specified box"*

By moving object in vehicle (Specify):

is selected when the driver was distracted by a moving object in this driver's vehicle prior to realization of impending danger. Examples include a dropped object, a moving pet, insect or cargo. The specific object *must be recorded in the "specified box".*

Screen Name: Driver's Distraction/Inattention to Driving (cont'd)
Variable Name: Driver's Distraction/Inattention to Driving (cont'd)

While talking or listening to cellular phone (specify location and type of phone)
is used when the driver is talking or listening on a cellular phone. Specify the type of phone (hands off, hand phone, etc.) and the location of the phone (installed in the console, held in the hand, etc.)

While dialing cellular phone (specify location and type of phone)
Specify the type of phone used (hands off, hand phone, etc.) and indicate where it is located (installed in the console, held in the hand, etc.).

While adjusting climate controls
is selected when someone is distracted from the driving task while adjusting the air conditioner heater, etc.

While adjusting radio, cassette, CD, (specify)
is selected when someone is distracted from the driving task while adjusting or using the radio, cassette, CD which are mounted in the vehicle.

While using other device/controls integral to vehicle, (specify)
is selected when the driver is distracted while using a device in the vehicle including adjusting windows (power or manual) adjusting door locks (power or manual), adjusting side view mirrors (power or manual), adjusting rear view mirror, adjusting seat (power or manual), adjusting steering wheel, and adjusting seat belt, using vehicle's cigarette lighter, etc. (Included here is **all** OEM equipment).

While using or reaching for device/object brought into vehicle (specify)
is selected when the driver is distracted while using or reaching for a device brought into the vehicle including: radar detectors, CB radios, razors, portable CD players, headphones, etc. The use of another device to light a cigarette other than the vehicle's cigarette lighter should be coded under "smoking related". Specify the device in the provided space.

Inattentive or lost in thought
Is selected when the driver is thinking about items other than the driving task (daydreaming).

Sleepy or fell asleep
is selected when the driver was sleeping or dozing prior to realization of impending danger or just prior to impact if realization did not occur.

Distracted by outside person, object, or event (Specify):
is selected when the driver was distracted by an outside person, object or event prior to realization of impending danger. Examples include animals on the roadside or a previous crash. The specific outside person, object, or event must be recorded in the provided space. Do not use this attribute for a person, object or event which the driver has recognized and for which the driver has taken some action (e.g. avoiding a pedestrian on the roadway).

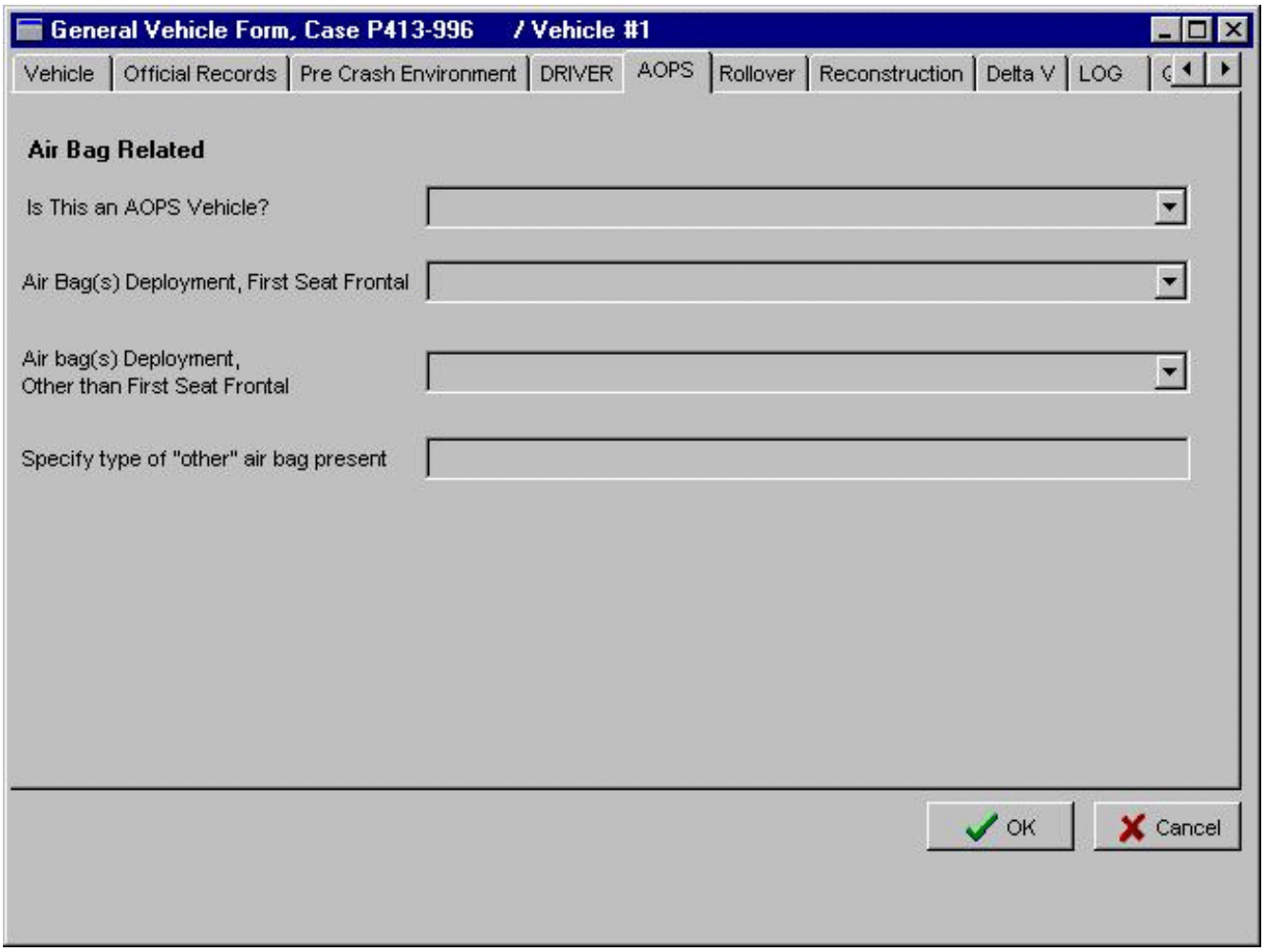
Screen Name: Driver's Distraction/Inattention to Driving (cont'd)
Variable Name: Driver's Distraction/Inattention to Driving (cont'd)

Eating or drinking
is used when the driver is eating or drinking, or involved in an activity related to these actions (*i.e.*, picking food from carton placed on passenger seat, reaching to throw out used food wrapper, etc.)

Smoking related
is selected when the driver is smoking or involved in an activity related to smoking, such as lighting cigarette, putting ashes in the ash tray, etc. The act of using the cigarette lighter of the vehicle, is selected as **While using other device/object in vehicle**.

Other distraction (Specify)
is selected when details regarding this driver's inattention are known but none of the specified attributes are applicable. The **Other Distraction** must be recorded in the provided space. This attribute includes incapacitating illness.

Unknown
is selected when it is known that this driver was inattentive prior to realization of impending danger but details of the distraction are unknown.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
Air Bag Related
Is This an AOPS Vehicle?
Air Bag(s) Deployment, First Seat Frontal
Air bag(s) Deployment, Other than First Seat Frontal
Specify type of "other" air bag present
OK
Cancel

Screen Name: Is this an AOPS Vehicle?
Variable Name: Is this an AOPS Vehicle?

Element Attributes:

No (includes unknown)
Yes - researcher determined
VIN determined air bag system
VIN determined automatic (passive) belts
VIN determined air bag and automatic (passive) belts

Source: Primary source is the vehicle inspection. For uninspected vehicles, the vehicle VIN and year/make/model may be used. The secondary sources are the interviewee, medical records, and police report.

Remarks:
This variable allows users to identify vehicles that were originally equipped (or retro-fitted) with an automatic occupant protection system (AOPS). Automatic occupant protection systems include air bags or automatic (passive) belts. This variable is coded for all vehicle model years.

No (includes unknown)
is selected when it is determined that this vehicle is not equipped with an AOPS. In addition, use this attribute when it is unknown if this vehicle had an AOPS.

Yes — researcher determined
is selected when:
(1) the vehicle inspection reveals the presence of an AOPS **or**
(2) driver or other reliable interview information indicates that the vehicle is equipped with an AOPS.

NOTE: If there is a vehicle inspection and an air bag or automatic belt system is found than this element must be selected. **Without an interview or vehicle inspection, the PAR alone is insufficient to make this choice.**

VIN determined air bag system
is selected when:
(1) the vehicle is not inspected and
(2) there is no interview or medical record information with positive indication of air bag presence or deployment; and
(3) it can be determined from the VIN (or AOPS listing following **Air Bag System Failure** on the Occupant Form) that this vehicle was manufactured with an air bag system. Do not select availability based solely on this attribute.

Screen Name: Is this an AOPS Vehicle?
Variable Name: Is this an AOPS Vehicle?

VIN determined automatic (passive) belts

is selected when:

(1) the vehicle is not inspected and
(2) there is no interview or medical record information with positive indication of automatic belt presence or use; and
(3) it can be determined from the VIN (or AOPS listing) that this vehicle was manufactured with automatic (passive) belts. Do not select availability based solely on this attribute.

VIN determined air bag and automatic (passive) belts

is selected when:

(1) the vehicle is not inspected;
(2) there is no interview or medical record information with positive indication of the presence of an air bag system and automatic belts or deployment of an air bag and use of an automatic belt; and
(3) it can be determined from the VIN (or AOPS listing following **Air Bag System Failure** on the Occupant Form) that this vehicle was manufactured with an air bag and automatic belts. Do not select availability based solely on this attribute.

Screen Name: Air Bag(s) Deployment, First Seat Frontal
Variable Name: Air Bag(s) Deployment, First Seat Frontal

Element Attributes:

Not equipped or not available
No air bags deployed
Single Air Bag Vehicle
Driver air bag deployed
Driver air bag, unknown if deployed
Multiple Air Bag Vehicle
Driver side only deployed
Passenger side only deployed
Driver and passenger side deployed
Driver and passenger side, unknown if deployed
Air bag(s) deployed, details unknown
Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records.

NOTE: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

This variable allows users to identify vehicles that were originally equipped (or retro-fitted) with an air bag system. This variable is coded for all vehicle model years.

First seat frontal air bags are for occupants seated in the front outboard positions in post-1971 passenger cars or 1991 or newer vans or 1993 or newer pickup trucks and utility vehicles. Thus, use attribute **Not equipped/not available** for other vehicles.

Not equipped or not available
is selected when there is no first seat frontal air bag available in the vehicle. Additionally, select this attribute when the vehicle is a post-1971 passenger car; a 1991 or newer van, or 1993 or newer pickup and utility vehicle, but the vehicle was not equipped with an air bag.

No air bags deployed
is selected when an air bag equipped vehicle has one or more impacts, and the first seat frontal air bag(s) did not inflate during the crash.

Driver air bag deployed
is selected when the vehicle is equipped with a frontal driver air bag, and this air bag deployed.

Driver air bag, unknown if deployed
is selected when it is known that the vehicle was equipped with a frontal driver air bag, but the researcher is unable to determine if the air bag deployed (for whatever reason).

Screen Name: Air Bag Related--Air Bag(s) Deployment, First Seat Frontal (cont'd)
Variable Name: Air Bag(s) Deployment, First Seat Frontal (cont'd)

Driver side only deployed
is selected when it is known that the vehicle was equipped with frontal driver and passenger side air bags, but only the driver side air bag deployed (for whatever reason).

Passenger side only deployed
is selected when it is known that the vehicle was equipped with driver and passenger side frontal air bags, but only the passenger side air bag deployed (for whatever reason).

Driver and passenger side deployed
is selected when it is known that the vehicle was equipped with driver and passenger side frontal air bags and both the driver and passenger side air bags deployed.

Driver and passenger side, unknown if deployed
is selected when it is known that the vehicle was equipped with driver and passenger side frontal air bags but the researcher is unable to determine if either of the air bags deployed.

Air bag(s) deployed, details unknown
is selected when it is known that the vehicle had a deployed frontal air bag, but the researcher is unable to determine if more than one frontal air bag deployed, or if the deployed frontal air bag was driver side or passenger side.

This code must also be used if information is known on one air bag, but it is not known for the other air bag.

Unknown
is used when it is unknown if a first seat frontal air bag was available.

Screen Name: Air Bag(s) Deployment, Other Than First Seat Frontal
Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal

Element Attributes:

Not equipped with an "other" air bag
Deployed during crash (as a result of impact)
Deployed inadvertently just prior to crash
Deployed, details unknown
Deployed as a result of a Non-collision event during crash sequence
(*e.g.*, fire, explosion, electrical)
Unknown if deployed
Nondeployed
Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records.

NOTE: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

This variable allows users to identify vehicles that were originally equipped (or retro-fitted) with an air bag system. This variable is coded for all vehicle model years.

"Other" air bags are for occupants in post-1994 passenger cars. Thus, if the vehicle is not a post-1994 passenger car, then use **Not equipped with an "other" air bag**. These air bags are air bags **other** than frontal air bags in the front seat positions. They may include but not be limited to side air bags that are designed to deploy in a side impact and frontal air bags equipped in other than the front seat positions.

Not equipped with an "other" air bag
is selected when the vehicle is a post-1994 passenger car but the vehicle was not equipped with an "other" air bag.

Deployed during crash (as a result of impact)
is used when the vehicle is equipped with an air bag and the "**other**" air bag deployed as a result of an impact. **Note**, an air bag is not designed to deploy in every collision.

Deployed inadvertently just prior to crash
is selected when an "**other**" air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in a crash.

Deployed, details unknown
is used when the researcher cannot determine if the "**other**" air bag deployed
(1) prior to the crash or
(2) during the crash as a result of an impact.

Screen Name: Air Bag(s) Deployment, Other Than First Seat Frontal (cont'd)
Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal (cont'd)

Deployed as a result of a Non-collision event during crash sequence (*e.g.*, fire, explosion, electrical)

is selected if the "**other**" air bag deploys during a crash but not as a result of an impact.

For example, a vehicular fire, occurring as a result of an impact or a Non-collision event prior to any impacts to this vehicle (i.e., fire or explosion), takes this attribute.

Unknown if deployed

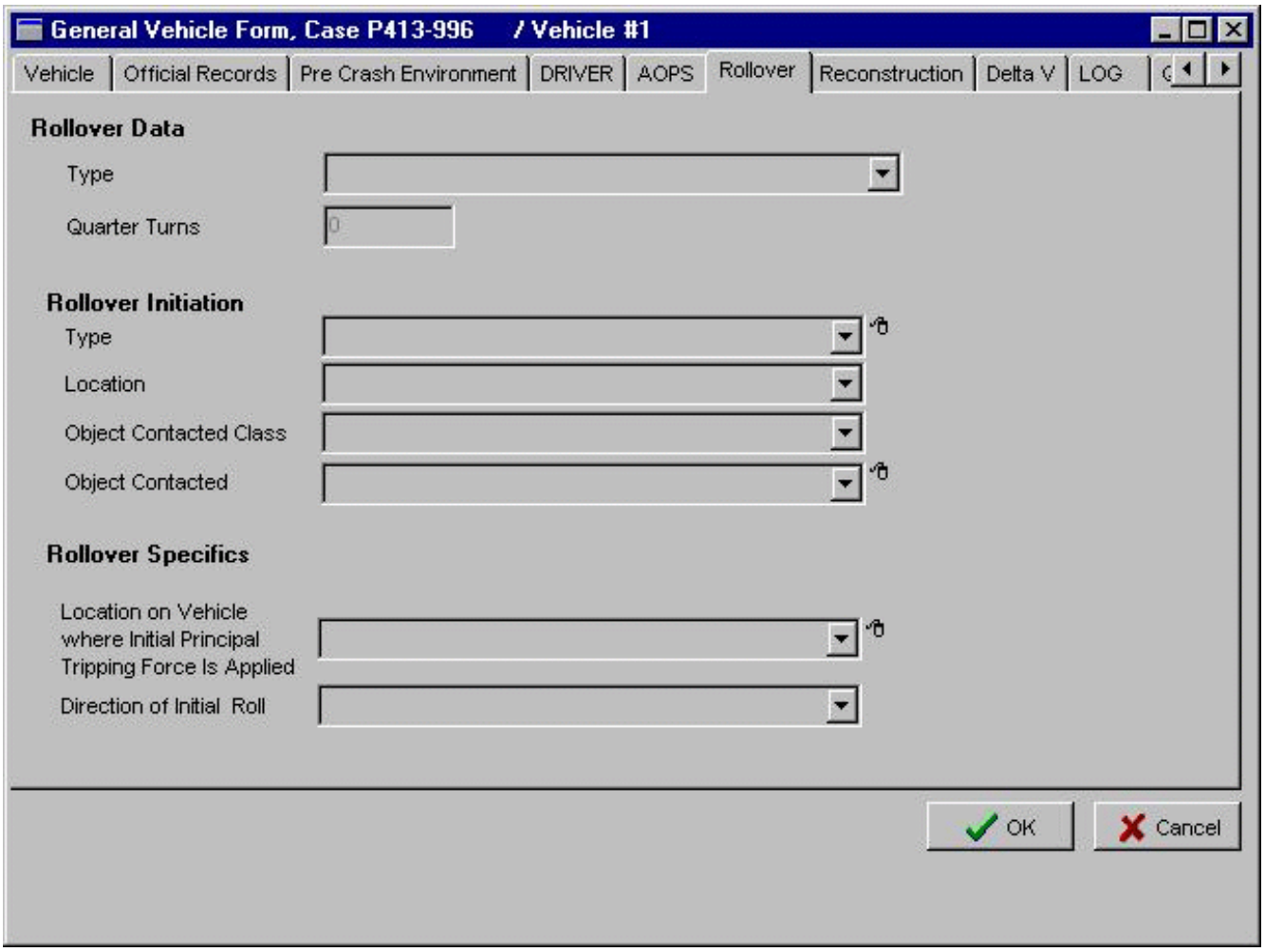
is selected when it is known that the vehicle was equipped with an "**other**" air bag but the researcher is unable to determine if the air bag deployed (for whatever reason). For example, if the vehicle was not inspected and no interview was obtained and no mention of deployment is on the PAR or medical records and:

Nondeployed

is selected when a vehicle equipped with an "**other**" air bag has one or more impacts, and the air bag did not inflate during the crash.

Unknown

is selected when it is unknown if an "**other**" air bag was available.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
Rollover Data
Type
Quarter Turns
0
Rollover Initiation
Type
Location
Object Contacted Class
Object Contacted
Rollover Specifics
Location on Vehicle where Initial Principal Tripping Force Is Applied
Direction of Initial Roll
OK
Cancel

Rollover Data Overview

The following variables provide a coded assessment of the occurrence of a rollover for this vehicle. A rollover is defined as any vehicle rotation of 90 degrees or more about any true longitudinal or lateral axis. A rollover may occur at any time during the crash sequence. When determining rollover presence, consider only the power unit, not any towed or trailing units. The variables also attempt to identify:

- What initiated the rollover
- At what plane of the vehicle exterior the tripping force was applied and
- The direction of the initial roll.

Screen Name: Type
Variable Name: Rollover Type

Element Attributes:

No rollover (no overturning)
Longitudinal axis
Rollover — end-over-end (*i.e.*, primarily about the lateral axis)
Rollover (overturn), details unknown

Source: Primary sources are the vehicle and scene inspections; secondary sources include photographs, police report, driver interviews, and other interviewees.

Remarks:

Rollover is defined as any vehicle rotation of 90 degrees or more about any true longitudinal or lateral axis. Rollover can occur at any time during the collision and is coded independently of other configuration questions.

No rollover (no overturning)
Select this code if uncertainty exists concerning whether or not this vehicle rolled over. In addition, use this attribute if a trailer attached to the vehicle rolled over but the vehicle itself did not.

Longitudinal axis
is selected when the vehicle rolls primarily from side-to-side (e.g., from left side, to top, to right side).

Rollover — end-over-end (*i.e.*, primarily about the lateral axis)
is selected when the rollover is mainly end-over-end. This attribute is used when a rollover is a combination of a side-to-side and end-over-end roll and it cannot be determined which type of rollover is most prevalent.

NOTE: Rollover Types indicated as Rollover – end-over-end (i.e., primarily about the lateral axis) will automatically code all of the rollover variables to reflect an end-over-end rollover.

Rollover (overturn), details unknown
is selected when it is known that the vehicle rolled over, but the number of quarter turns and other rollover details cannot be determined.

Screen Name: Quarter Turns
Variable Name: Number of Quarter Turns

Element Attributes:

Enter the number of quarter turns:
Unknown

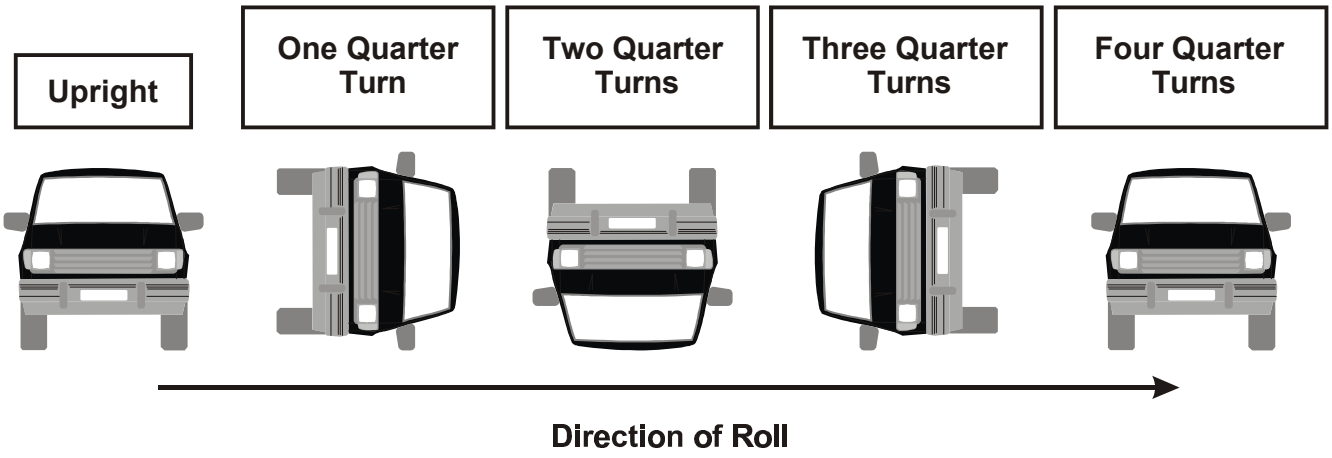
Range 1-20, Unknown

Source: Primary sources are the vehicle and scene inspections; secondary sources include photographs, police report, driver interviews, and other interviewees.

Remarks:

Enter the number of quarter turns
based on the researcher's crash reconstruction. A "quarter turn" is defined as a rotation of 90 degrees about the longitudinal axis of the vehicle; this does not include rotation about the vertical axis, commonly called yaw. Therefore, if a vehicle rolled about the longitudinal axis onto its roof (*i.e.*, side-to-side roll), then it rolled 180 degrees and entered as "2" quarter turns.

In the example below, the vehicle rolled from its upright position to left side, to top, then to the right side, and back onto its wheels. This would be indicated as “4" quarter turns.



Unknown
is selected when it cannot be determined the number of quarter turns the vehicle did during the rollover sequence.

Screen Name: Type
Variable Name: Rollover Initiation Type

Element Attributes:

Trip-over
Flip-over
Turn-over (justify)
Climb-over
Fall-over
Bounce-over
Collision with another vehicle
Other rollover initiation type (specify):
Unknown
[End-over-end]

Source: Researcher determined — primary sources are the scene and vehicle inspections. Secondary sources are photographs, police report, driver interviews, and other interviewees.

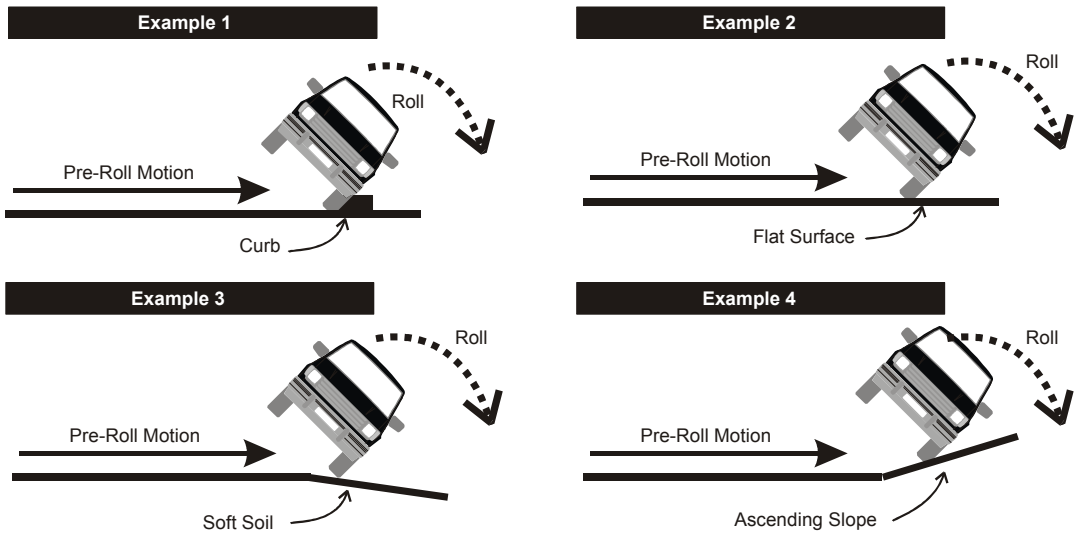
Remarks:

Various types of rollovers are identified above. A vehicle action that cannot be categorized under any of the above elements should be coded **Other rollover initiation type** and specified in the space provided.

The attributes below are used for rollovers initiated about the longitudinal axis. Rollover Types indicated as Rollover – end-over-end (i.e., primarily about the lateral axis) will automatically code all of the rollover variables to reflect an end-over-end rollover.

Trip-over
is selected when the vehicle's lateral motion is suddenly slowed or stopped, inducing a rollover. The opposing force may be produced by a curb, pot-holes, or pavement/soil dug into by a vehicle's wheels.

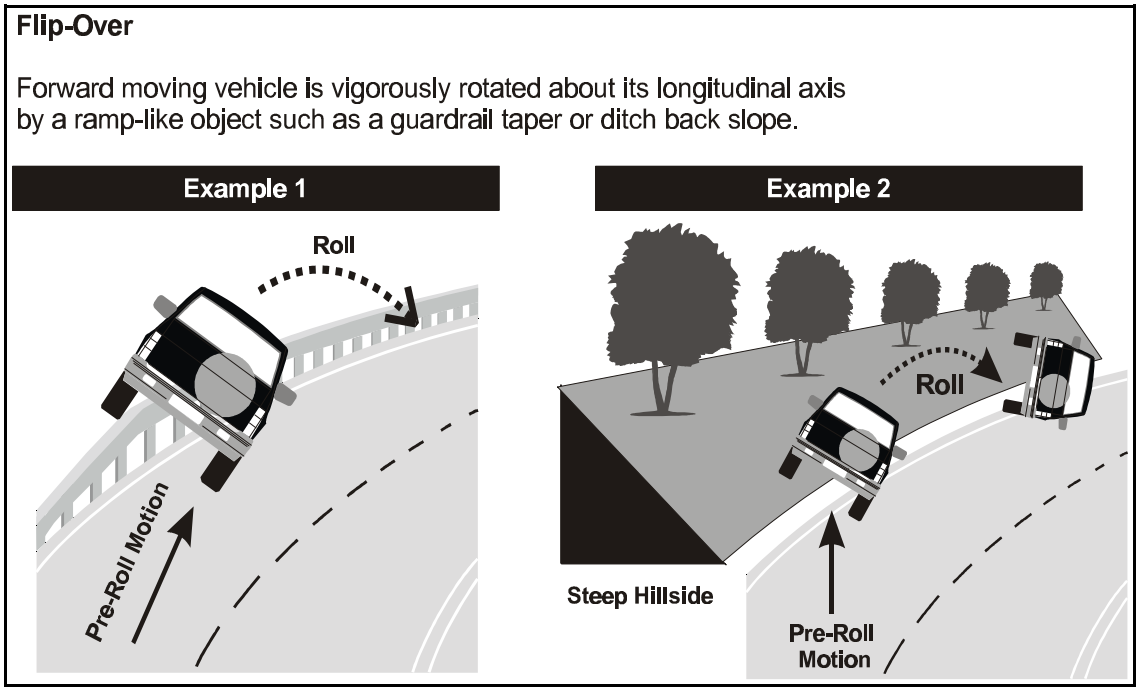
Trip-Over:
The vehicle's lateral motion is resisted by opposing force, inducing roll moment.



Screen Name: Type (cont'd)
Variable Name: Rollover Initiation Type (cont'd)

Flip-Over

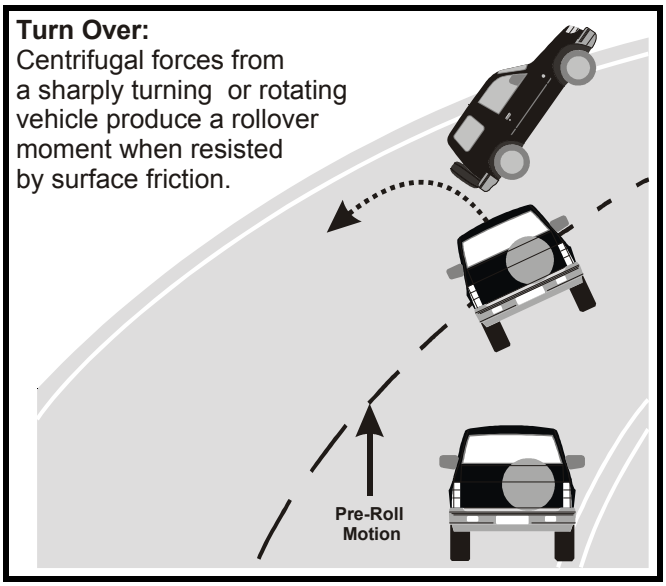
is selected when the vehicle is rotated about its longitudinal axis by a ramp-like object may be in a yaw when it comes in contact with the ramp-like object. For example, if the vehicle traveling forward climbs the down turned end of a guardrail and rolls over about its longitudinal axis, use this code. To use this, the vehicle's roll need not begin on the ramp-like structure or object, For example, if the vehicle transverses the turned-down end of a guardrail, continues along the level portion, then rolls back toward the side of the guardrail from which it came, use this code.



Screen Name: Rollover Initiation—Type (cont'd)
Variable Name: Rollover Initiation Type (cont'd)

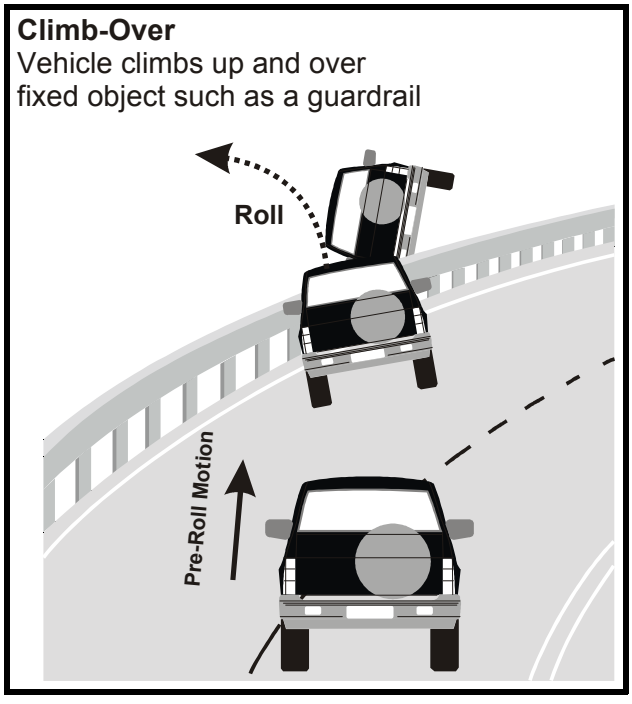
Turn-Over

is selected when centrifugal forces from a sharply turning or rotating vehicle produce a rollover when resisted by normal surface friction. This type of rollover is more likely to occur in vehicles with a higher center of gravity than most passenger vehicles. The surface type includes pavement surfaces plus gravel, grass, dirt, etc. The distinction between **Turn-over** and **Trip-over** is that no furrowing, gouging, etc. occurs to the surface at the point of trip. In addition, see remarks for **Fall-over** below. When turnover is selected, the justification **must be entered**.



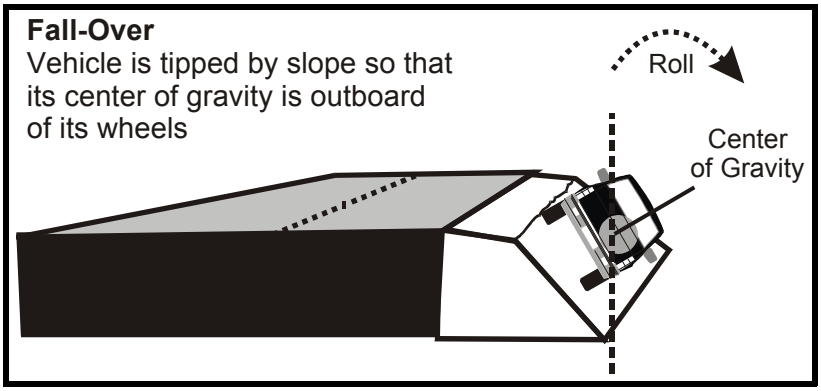
Climb-Over

is selected when a vehicle climbs up and over a fixed object such as a barrier or guardrail. The object should be high enough to lift the vehicle completely off the ground (*i.e.*, the height should exceed the radius of the vehicle's largest diameter wheel). The vehicle must roll to the opposite side from which it approached the object.



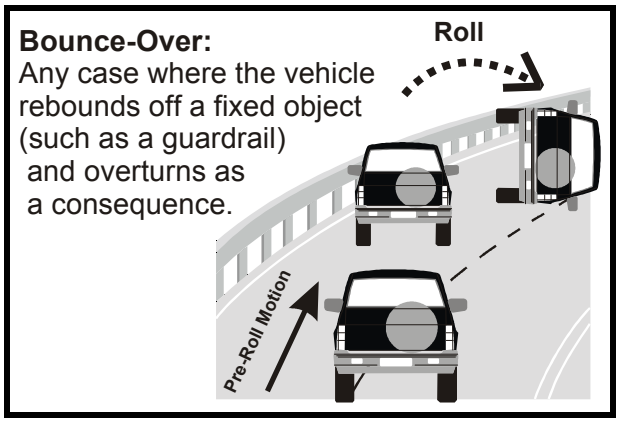
Screen Name: Rollover Initiation—Type (cont'd)
Variable Name: Rollover Initiation Type (cont'd)

Fall-Over



is selected when the surface the vehicle is traversing slopes downward in the direction of movement of the vehicle's center-of-gravity such that the vehicle's center of gravity becomes outboard of its wheels. The distinction between this and **Turn-over** above involves the negative slope of the traversed surface. If the rotation and/or the surface friction causes the trip, then use **Turn-over,** however, if the slope is so negative that a line straight downward through the vehicle's center-of-gravity (as shown in the illustration) would fall outside the vehicle's track, then use this attribute. For example, if a vehicle goes off the road and encounters a substantial surface drop off because of the elevated nature of the road in relation to its environment (*e.g.*, cliff, ditch, etc.), then use this attribute.

Bounce-Over



is selected when a vehicle deflects off of a fixed object (such as a guardrail, barrier, tree, or pole) or a not-in-transport vehicle such that the vehicle's rotation causes it to overturn. The deflection momentum contributes to a rollover. To use this attribute, the rollover must occur in close proximity to the object from which it deflected. For example, if a vehicle strikes a center median barrier and rotates across two traffic lanes prior to the vehicle rolling over, then **Trip-over** or **Turn-over** would apply.

Collision with another vehicle

is selected when an impact with another vehicle causes the rollover. The rollover must be the immediate result of the impact between the vehicles (*e.g.*, intersection crashes where a vehicle is struck in the side and the momentum of the struck vehicle results in the rollover, or offset end-to-end type crashes when one vehicle will vault over the tapered end of another vehicle resulting in a rollover). Otherwise use attributes above. For example, if a vehicle is struck in the side ***and*** the vehicle rotates ***and*** does not produce any wheel/rim gouges or furrows in the surface nor encounters any prominent raised objects (*e.g.*, a high curb) ***and*** overturns in close proximity to the point of impact, then use this attribute.

Screen Name: Rollover Initiation—Type (cont'd)
Variable Name: Rollover Initiation Type (cont'd)

Other rollover initiation type
is selected when this vehicle's rollover initiation type cannot be described above. Whenever this is used, the researcher is required to ***specify*** the type of rollover which occurred.

Unknown
is selected when the type of rollover initiation is unknown

[End-over-end]
is automatically entered when the type of rollover is end-over-end.

Screen Name: Rollover Initiation--Location
Variable Name: Location of Rollover Initiation

Element Attributes:

On roadway
On shoulder — paved
On shoulder — unpaved
On roadside or divided trafficway median
[End-over-end]
[Unknown]

Source: Researcher determined — primary source is the scene inspection. Secondary sources are vehicle inspection, photographs, police report, driver interviews, and other interviewees.

Remarks:

This variable defines the location of the trip point or start of the vehicle's roll that was identified in, Rollover Initiation Type. Physical evidence on and/or off the roadway should be used to identify the point of initial roll. Scenes with no physical evidence such as gouges in the pavement or ground may be determined by the secondary sources listed above.

On roadway
is selected when the rollover initiates in the travel lanes of the roadway (*i.e.*, between painted edgelines or between roadway edges when painted edgelines are absent). The median between roadways (divided highways such as thruways or expressways) is identified as codes On shoulder—paved, On shoulder—unpaved, or On roadside or divided trafficway median as described below. ANSI defines a ***roadway*** as that part of a trafficway designed, improved and ordinarily used for motor vehicle travel, and excludes any shoulder alongside the roadway.

On shoulder — paved
is selected when the rollover initiation occurs on a paved surface outside the painted edgeline or the outer edge or pavement seam of the roadway. A shoulder may exist within the median of a divided highway or on the outermost edge of the roadway. A shoulder is defined as that part of a trafficway contiguous with the roadway for emergency use, for accommodation of stopped road vehicles, and for lateral support of the roadway structure.

On shoulder — unpaved
is selected when the rollover initiation begins within the confines of the ***improved*** area (*i.e.*, gravel or stone) contiguous with the roadway. Unpaved shoulders, for NASS CDS purposes, are composed of loose gravel or stone. Combination gravel/stone and asphalt surfaces, such as macadam or "chip and seal", are considered as paved. Roadways without an improved, contiguous surface will be considered as not having shoulders.

Screen Name: Rollover Initiation--Location (cont'd)
Variable Name: Location of Rollover Initiation (cont'd)

On roadside or divided trafficway median

is selected when the rollover initiation occurs outside the roadway and the shoulder. There are roads where sod or dirt will support the roadway edge. When the rollover initiation occurs within this area, use this attribute because this roadway does not have shoulders. In addition, shoulders end wherever most curbs or fixed objects begin. If the trip begins on a curb that is adjacent on one side to a sidewalk, turf, or dirt, then use this attribute. If the roll is initiated by a fixed object then use this attribute. Care must be exercised with some mountable curbs. If the mountable curb has paving on both sides and its primary function is to control water runoff, then use **On shoulder—paved**.

Screen Name: Rollover Initiation--Object Contacted Class
Variable Name: Rollover Initiation Object Contacted Class

Element Attributes:

Vehicle
[Noncollision]
Collision with Fixed Object
Nonbreakaway Pole or Post
Collision with Nonfixed Object
Unknown Event or Object
[Unknown]

Source: Researcher determined — primary source is the scene inspection. Secondary sources are vehicle inspection, photographs, police report, driver interviews, and other interviewees.

Remarks:
The Object Contacted codes in the next variable are grouped into specific classes. The class is first selected, then the object lists are filtered for items in that specific class.

Vehicle
is selected when the object contacted that caused this vehicle to rollover is another vehicle.

Noncollision
is automatically entered by the program when a “Turn Over” or “Fall Over” is selected as the rollover initiation type, or when the rollover was initiated by a jacknife noncollision. Additionally this code is used for end-over-end rollovers.

Collision with a Fixed Object
is selected when an impact with a fixed object (e.g., a tree, breakaway pole or post, embankment, curb, etc.) Caused the rollover.

Nonbreakaway Pole or Post
is selected when the object contacted that caused the vehicle to rollover was a nonbreakaway pole or post.

Collision with a Non-Fixed Object
is selected when the collision that initiated the rollover is a non-fixed object (e.g., motor vehicle not in transport, animal, train, trailer disconnected in transport, etc.,)

Screen Name: Rollover Initiation--Object Contacted
Variable Name: Rollover Initiation Object Contacted

Element Attributes:

Vehicle number

Non-collision
- Turn-over — fall-over
- Jackknife

Collision With Fixed Object
- Tree (# 10 centimeters in diameter)
- Tree (> 10 centimeters in diameter)
- Shrubbery or bush
- Embankment
- Breakaway pole or post (any diameter)
- Concrete traffic barrier
- Impact attenuator
- Other traffic barrier (includes guardrail) (specify)
- Fence
- Wall
- Building
- Ditch or culvert
- Ground
- Fire hydrant
- Curb
- Bridge
- Other fixed object (specify):
- Unknown fixed object

Nonbreakaway Pole or Post
- Pole or post (# 10 centimeters in diameter)
- Pole or post (> 10 centimeters but # 30 centimeters diameter)
- Pole or post (> 30 centimeters in diameter)
- Pole or post (diameter unknown)

Collision with Nonfixed Object
- Passenger car, light truck, van or other vehicle not in-transport
- Medium/heavy truck or bus not in-transport
- Animal
- Train
- Trailer, disconnected in transport
- Object fell from vehicle in-transport
- Other nonfixed object (specify):
- Unknown nonfixed object

Source: Researcher determined — primary sources are the scene and vehicle inspections; secondary sources include the police report and interviewees.

Remarks:

This variable is related to Rollover Initiation Type, and identifies the source of the force that acted upon the vehicle which resulted in the rollover. These attributes are obtained from the Exterior Vehicle Form, CDC tab, Object Contacted attributes. If the rollover was initiated by an impact which was assigned a CDC, then the applicable element value will be selected for this variable. If the rollover was not initiated by a CDC applicable impact, then it is unlikely that the same value will be selected. Therefore, the researcher must determine the cause (*i.e.*, initiation force) of the rollover and consequently the object contacted during the rollover. For example, if a vehicle strikes a curb which trips the vehicle, then select **Curb** even though the CDC Object Contacted for the rollover would probably equal **Overturn- rollover.**

Screen Name: Rollover Initiation--Object Contacted (cont'd)
Variable Name: Rollover Initiation Object Contacted (cont'd)

Similarly, if a vehicle vaults a longitudinal barrier (Climb-over), then select **Concrete traffic barrier** or **Other traffic barrier**, depending upon the longitudinal barrier design. If a yawing vehicle rolls as a result of centrifugal forces caused by normal surface friction or as a result of burrowing into soft soil, then select **Ground** because the ground applied the force that acted as the tripping mechanism for the rollover.

Vehicle number

select the vehicle number to report the vehicle that impacted this vehicle and caused the rollover to occur [*i.e.*, Rollover initiation type must equal Collision with another vehicle]. Select the vehicle number of the vehicle that initiated the rollover to this vehicle. This will be most common when one vehicle (generally with a high center of gravity) is involved in an offset head-on crash with a second vehicle (possibly with a lower sloping front end) resulting in a vaulting type rollover. Do not use these attributes if the vehicle rolls over subsequent to its impact with another vehicle but because of centrifugal force or a tripping mechanism. These latter two causes would take priority.

Turn-over — fall-over

excludes end-over-end and is used when the vehicle roll is precipitated by centrifugal or gravitational forces and Rollover Initiation Type, has been selected **Turn-over** or **Fall-over**.

Jackknife

is selected when a vehicle rolls over as result of a jackknife and the sole reason for the rollover is the force applied by the jackknifing trailer. For example, if a vehicle is pulling a trailer and the trailer jackknifes (*i.e.*, 90 degrees rotation and intraunit damage) and overturns, for whatever reason (*e.g.*, trailer tires furrow in soft earth, centrifugal force, trailer trips, loadshifts causing it to tip, etc.), ***and*** the trailer's overturning causes this vehicle to overturn, then use this. However, if a centrifugal force or tripping mechanism causes the vehicle to overturn with or without the trailer overturning, then use another attribute.

Tree (# 10 centimeters in diameter)

is selected when a vehicle impacts a tree which has a diameter of ten centimeters or less and the tree either (1) acts like a rigid barrier or (2) bends or breaks causing the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Trip-over, Flip-over, or Bounce-over]. Select another attribute when a vehicle impacts a tree and experiences a subsequent rollover due to centrifugal forces or other tripping mechanisms.

Tree (> 10 centimeters in diameter)

is selected when a vehicle impacts a tree with a diameter of greater than 10 centimeters and the tree either (1) acts like a rigid barrier or (2) bends or breaks causing the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Trip-over, Flip-over, or Bounce-over]. Select another attribute when a vehicle impacts a tree and experiences a subsequent rollover due to centrifugal forces or other tripping mechanisms.

Screen Name: Rollover Initiation--Object Contacted (cont'd)
Variable Name: Rollover Initiation Object Contacted (cont'd)

Shrubbery or bush
is selected when a vehicle impacts shrubbery or bushes and the contacted object causes the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Trip-over or Flip-over]. This will be a very rare occurrence. Subsequent rollovers that result from centrifugal forces or other tripping mechanisms take priority for this variable.

Embankment
is selected when a vehicle rides up or over an embankment and the vehicle rolls over as a result of the angle of the embankment [*i.e.*, Rollover Initiation Type equals Flip-over or Fall-over]. Vehicles which dig into the surface of an embankment and rollover as a result of this tripping mechanism are captured in **Ground**.

Breakaway pole or post (any diameter)
is selected whenever a vehicle impacts a breakaway pole or post (of any diameter) and that pole/post yields creating a ramping mechanism which causes a vehicle rollover. Select another attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Pole or post (# 10 centimeters in diameter)
is selected whenever a vehicle impacts a nonbreakaway pole with a diameter of 10 centimeters or less and that pole either (1) acts like a rigid barrier or (2) breaks or bends causing the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Flip-over or Bounce-over]. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Pole or post (> 10 centimeters but # 30 centimeters in diameter)
is selected whenever a vehicle impacts a nonbreakaway pole with a diameter greater than ten centimeters but less than or equal to thirty centimeters and that pole either (1) acts like a rigid barrier or (2) breaks or bends causing the vehicle to rollover [*i.e.*, 6 equals Flip-over or Bounce-over]. Select another attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Pole or post(> 30 centimeters in diameter)
is selected whenever a vehicle impacts a nonbreakaway pole with a diameter greater than thirty centimeters and that pole either (1) acts like a rigid barrier or (2) breaks or bends causing the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Flip-over or Bounce-over]. Select another attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Pole or post (diameter unknown)
is selected whenever a vehicle impacts a pole or post of an unknown diameter and that pole either (1) acts like a rigid barrier or (2) breaks or bends causing the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Flip-over or Bounce-over)]. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Screen Name: Rollover Initiation--Object Contacted (cont'd)
Variable Name: Rollover Initiation Object Contacted (cont'd)

Concrete traffic barrier
is selected whenever a vehicle impacts a concrete traffic barrier and that impact causes a rollover [*i.e.*, Rollover Initiation Type equals Flip-over, Climb-over, or Bounce-over]. Rollovers which occur subsequent to the impact as a result of centrifugal force or other tripping mechanisms are not considered here. Refer to variable Objected Contacted for examples and definitions of concrete traffic barriers.

Impact Attenuator
is selected whenever a vehicle impacts a crash cushion (refer to variable Objected Contacted) and that impact causes a rollover [*i.e.*, Rollover Initiation Type equals Flip-over or Bounce-over]. Rollovers which occur subsequent to the impact as a result of centrifugal force or other tripping mechanisms are not considered here.

Other traffic barrier
is selected whenever a vehicle impacts a non-concrete longitudinal barrier (*e.g.*, a guardrail) as defined in variable Objected Contacted and that impact causes a rollover [*i.e.*, Rollover Initiation Type equals Flip-over, Climb-over, or Bounce-over Rollovers which occur subsequent to the impact as a result of centrifugal force or other tripping mechanisms are not considered here.

Fence, Wall, and Building
are selected whenever one of these objects is contacted and that impact causes a rollover [*i.e.*, Rollover Initiation Type equals Trip-over, Flip-over, Climb-over, or Bounce-over]. Definitions of these objects are defined in variable Object Contacted . Rollovers which occur subsequent to the impact as a result of centrifugal impacts and tripping mechanisms are not considered for these attributes.

Ditch or Culvert
is selected whenever a vehicle enters a ditch or culvert and the vehicle rolls over as a result of the slope of the ditch/culvert [*i.e.*, Rollover Initiation Type equals Flip-over or Fall-over]. Refer to variable Objected Contacted for definition of ditch or culvert. Vehicles in a ditch which dig into the surface and rollover as a result of this tripping mechanism are captured in **Ground**.

Ground
is selected when a vehicle rolls over as a result of contact with the ground [*i.e.*, Rollover Initiation Type equals Trip-over]. "Ground" applies whether the rollover resulted from digging into soft soil, tripping over an accumulation of dirt or gravel, or gouging into the pavement. Vehicles which dig into the ground on embankments or in ditches and rollover, as a result of that digging, take this attribute.

Fire Hydrant
is selected whenever a vehicle impacts a fire hydrant and that impact causes a rollover. A fire hydrant is defined as a roadside device used by fire departments to provide water for fighting fires. Vehicles which rollover subsequent to a fire hydrant impact but not as a direct result of that impact (*i.e.*, other tripping force) do not take this attribute.

Screen Name: Rollover Initiation--Object Contacted (cont'd)
Variable Name: Rollover Initiation Object Contacted (cont'd)

Curb
includes both mountable and barrier curbs as described for variable Objected Contacted. Curbs which act as a tripping mechanism will frequently have an impact (CDC) associated with them although this is not a criterion for using this attribute. When a curb acts as a tripping mechanism, Rollover Initiation Type is coded Trip over.

Bridge
is selected whenever a vehicle impacts a bridge and that impact causes a rollover [*i.e.*, Rollover Initiation Type equals Flip-over, Climb-over, or Bounce-over]. Refer to variable Objected Contacted for the definition of a bridge. Vehicles which rollover subsequent to a bridge impact but not as a direct result of that impact (*i.e.*, other tripping force) do not take this attribute.

Other fixed object
is selected when a fixed object, other than those previously identified impacted and that impact causes a rollover. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Unknown fixed object
is selected when an unknown fixed object is impacted and that impact causes a rollover. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Passenger car, light truck, van, or other vehicle not in-transport
is selected when a vehicle impacts a not-in-transport passenger car, light truck, van, or any other motor vehicle that is not a medium/heavy truck or bus and that impact causes the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Flip-over, Climb-over, or Bounce-over]. Vehicles which rotate and rollover as a result of centrifugal forces or other tripping mechanisms are not captured in this response.

Medium/heavy truck or bus not in-transport
is selected when a vehicle impacts a not-in-transport medium/heavy truck or bus and that impact causes the vehicle to rollover [*i.e.*, Rollover Initiation Type equals Flip-over, Climb-over, or Bounce-over]. Vehicles which rotate and rollover as a result of centrifugal forces or other tripping mechanisms are not captured in this response.

Animal
is selected when a vehicle impacts an animal and that impact causes the vehicle to rollover. This should be a very rare occurrence. Subsequent rollovers due to other tripping mechanisms are not captured in this response.

Train
is selected when a vehicle is involved in a crash with a train and the impact causes the vehicle to rollover.

Screen Name: Rollover Initiation--Object Contacted (cont'd)
Variable Name: Rollover Initiation Object Contacted (cont'd)

Trailer, disconnected in transport
is selected to report a trailer that has been disconnected from its power unit and subsequently impacted this vehicle and caused the rollover to occur. This will likely occur when a small trailer is involved in a head-on crash with a larger vehicle resulting in a vaulting type rollover. Do not use this attribute if the vehicle rolls over subsequent to an initial impact as centrifugal forces or tripping mechanisms take priority.

Object fell from vehicle in-transport
is selected to report an object that was being carried by or was attached to a vehicle in-transport but fell from or became detached from that vehicle and subsequently impacted this vehicle and caused the rollover to occur. Do not use this attribute if the vehicle rolls over subsequent to an initial impact as centrifugal forces or tripping mechanisms take priority.

Other nonfixed object
is selected when a nonfixed object, other than those described in the above attributes is impacted and that impact causes a rollover. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Unknown nonfixed object
is selected when an unknown nonfixed object is impacted and that impact causes a rollover. Do not use this attribute if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Other event
is selected when circumstances exist that cannot be captured in the element values above (*e.g.*, loadshift, high winds).

Unknown object
is selected when variable a vehicle rolled over and the cause of the rollover (tripping mechanism) cannot be determined.

Screen Name: Rollover Specifics -- Location on Vehicle Where Initial Principal Tripping Force is Applied
Variable Name: Location on Vehicle Where Initial Principal Tripping Force is Applied

Element Attributes:

Wheels/tires
Side plane
End plane
Undercarriage
Other location on vehicle (specify):
Non-contact rollover forces (specify):
[End-over-end]
[Unknown]

Source: Researcher determined — primary source is vehicle inspection. Secondary sources are scene inspection, photographs, police report, driver interviews, and other interviews.

Remarks:

Generally the tripping forces that initiate a rollover are applied at the wheels/tires. Occasionally the tripping force is applied at the undercarriage (*e.g.*, when a vehicle mounts a guardrail) or at the side or end plane (*e.g.*, when a barrier or another vehicle impacts the front or side plane of the vehicle and flips or initiates the rollover sequence). The purpose of this variable is to identify the specific point on the vehicle where the tripping force was applied.

Wheels/Tires
is selected whenever the tripping force is applied to the wheels or tires. The most common occurrences involve wheel/tire impacts to potholes and curbs, and wheels that gouge the pavement or dig into the earth.

Side plane
is selected whenever the side plane other than the wheels and tires is contacted and that contact initiates the rollover.

End plane
is selected whenever the end plane of the vehicle is contacted and sustained the rollover initiating force. For example, a vehicle was traveling at a high rate of speed when it impacted a concrete median barrier [*i.e.*, Rollover Initiation Object Contacted, equals Concrete traffic barrier] with its front left corner. The barrier redirects the vehicle upward and back towards the roadway. As a result, the vehicle rolls over; therefore use this attribute.

Undercarriage
is selected when the rollover was caused by a force acting primarily through the undercarriage plane. For example, a vehicle strikes a guardrail {*i.e.*, Rollover Initiation Object Contacted equals Other traffic barrier (includes guardrail)} with its front right. The vehicle climbs up and over the guardrail and rolls over; therefore use this attribute.

Screen Name: Rollover Specifics -- Location on Vehicle Where Initial Principal Tripping Force is Applied (cont'd)

Variable Name: Location on Vehicle Where Initial Principal Tripping Force is Applied (cont'd)

Other location on vehicle

is selected when the tripping force is applied at a location that cannot be captured above. This attribute should be rarely used and only after consultation with the zone center.

Non-contact rollover forces

is selected when the vehicle roll is precipitated by centrifugal or gravitational forces [*i.e.*, Rollover Initiation Type equals Turn-over or Fall-over]. Specify the non-contact rollover force on the line provided.

Undercarriage

is selected when the rollover was caused by a force acting primarily through the through the undercarriage plane. For example, a vehicle strikes a guardrail with its front right. The vehicle climbs up and over the guardrail and rolls over; therefore use this code.

Screen Name: Rollover Specifics--Direction of Initial Roll
Variable Name: Direction of Initial Roll

Element Attributes:

Roll right-primarily about the longitudinal axis
Roll left-primarily about the longitudinal axis
[Unknown roll direction]
[End-over-end]

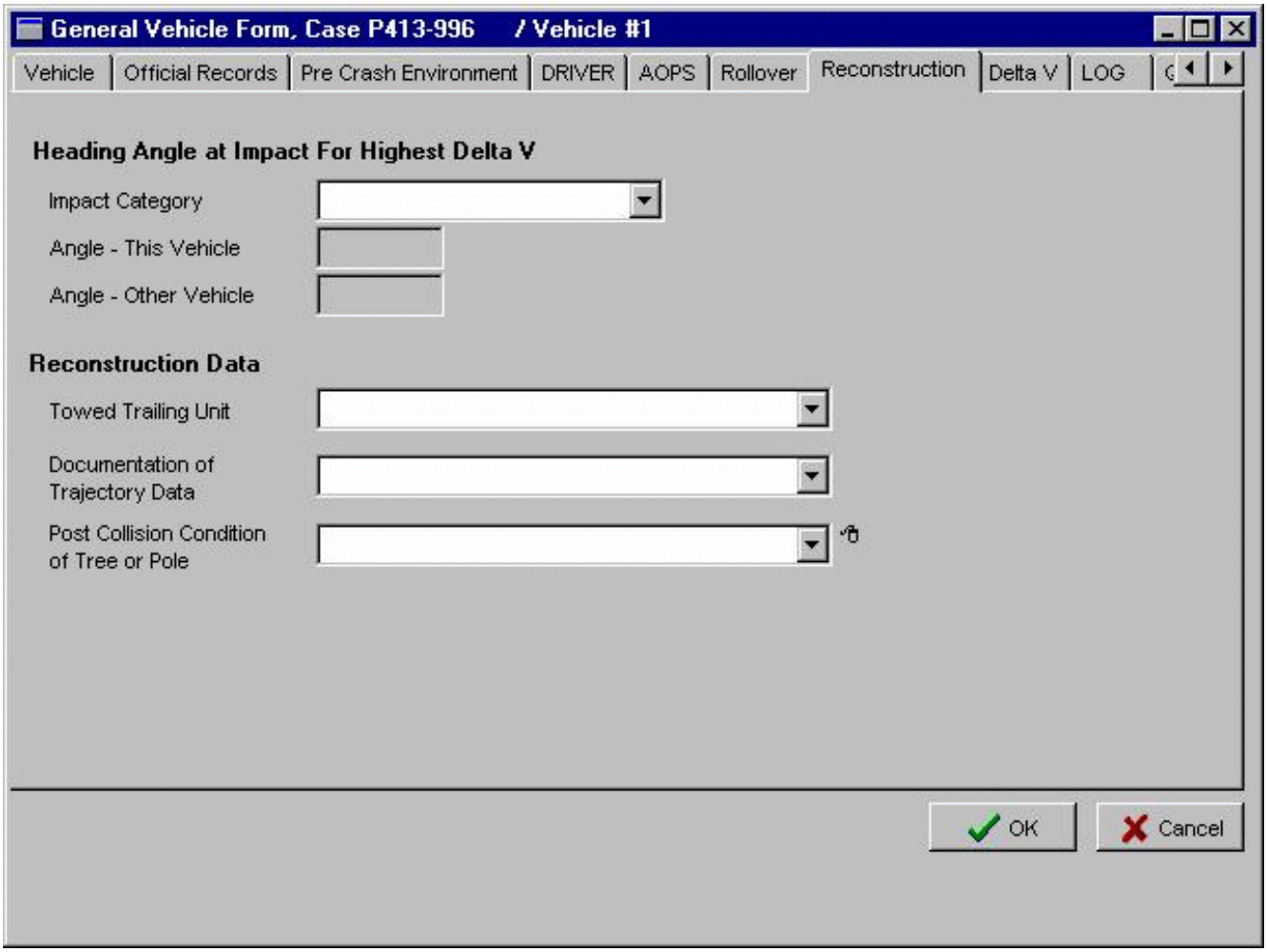
Source: Researcher determined — primary sources are the scene and vehicle inspections. Secondary sources are the police report, driver and other interviews.

Remarks:

During a side-over-side rollover, generally the corner or roof rail with the maximum crush is the trailing side. This will be a good indication of a roll to the right or a roll to the left. Striations or directional gouge marks on the vehicle are a good indication of a vehicle's roll along the longitudinal or lateral axis. Physical evidence at the crash scene, including yaw marks, scuffing, or gouging will also provide insight into the direction of the initial roll. It will not be uncommon to combine both vehicle and scene evidence when determining the direction of the initial roll.

Roll right
is selected when the vehicle rolls over with the right side leading, a clockwise rollover from the driver's view.

Roll left
is selected when the vehicle rolls over with the left side leading, a counterclockwise rollover from the driver's view.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
Heading Angle at Impact For Highest Delta V
Impact Category
Angle - This Vehicle
Angle - Other Vehicle
Reconstruction Data
Towed Trailing Unit
Documentation of Trajectory Data
Post Collision Condition of Tree or Pole
OK
Cancel

Screen Name: Heading Angle at Impact for Highest Delta V--Impact Category
Variable Name: Type of Impact for Highest Delta V

Element Attributes:

Non-horizontal impact
Non-collision
Impact with object
Impact with vehicle
Unknown

Source: Researcher determined - inputs include vehicle inspection, scene diagram

Remarks:

Select the impact category that describes this vehicle's most severe impact. **Note:** when selecting this attribute, parked vehicles are considered vehicles and not objects.

Non-horizontal impact
is selected when the Highest Delta V for this vehicle involves a non-horizontal impact. Though rollovers involve non-horizontal forces, select non-collision.

Non-collision
is selected when the Highest Delta V for this vehicle involves a Non-collision event.

Impact with an object
is selected when a collision with an object results in this vehicle's highest delta V. If this impact is a non-horizontal impact, then select **Non-horizontal impact**.

Impact with vehicle:
is selected when this vehicle's highest Delta V impact is with another vehicle. If this impact is a non-horizontal impact, then select **Non-horizontal impact**.

Unknown
is selected only when you cannot determine which impact is the highest delta V.

Screen Name: Heading Angle at Impact for Highest Delta V--Angle - This Vehicle
Variable Name: Heading Angle for This Vehicle

Element Attributes:

000-359 Code actual value
[Unknown]

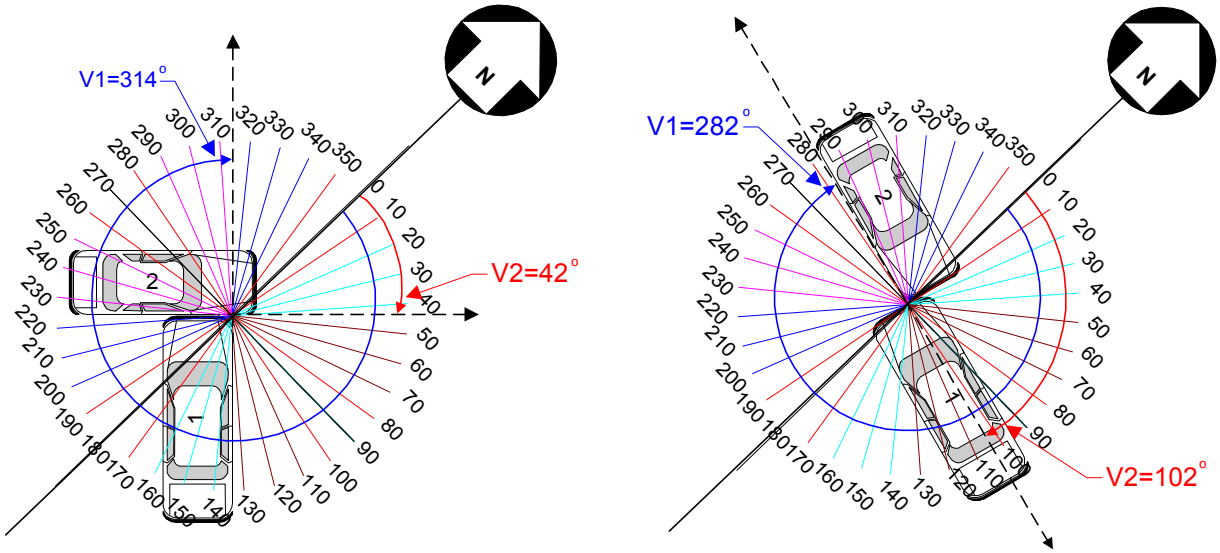
Source: Scene diagram.

Remarks:

Heading Angle for This Vehicle, records the heading angle for this vehicle's highest delta V when this impact was with another vehicle. Heading Angle for Other Vehicle, records the corresponding angle for the other vehicle. Parked vehicles are considered vehicles and not objects.

For vehicle-to-vehicle collisions, use your scene diagram referencing system to determine the heading angles at the point of impact for ***this vehicle's*** highest delta V. All measurements are referenced to the north arrow on the diagram. The heading angle of each vehicle is determined by projecting the longitudinal axis of the vehicle through the extension of the north arrow. The angle value is obtained by using a 360^{E} protractor and measuring in a clockwise direction from the north arrow. The north arrow always represents 0^{E} (degrees). The angle is a positive value.

The following diagrams exemplify the measurement technique.



Screen Name: Reconstruction Data--Towed Trailing Unit
Variable Name: Towed Trailing Unit

Element Attributes:

No towed unit
Yes — towed trailing unit
Unknown

Source: Vehicle inspection, interviews, and police report.

Remarks:

A trailing unit attached by a fixed linkage includes horse trailers, fifth wheel trailers, travel trailers, camper trailers, boat trailers, truck trailers, towed motor vehicles, or any other trailer.

If this variable is **Yes — towed trailing unit**, then enter the weight of the trailer as well as any cargo it may be carrying in variable Vehicle Cargo Weight.

No towed unit
is selected when a trailing unit is not being towed by this CDS applicable vehicle.

Yes — towed trailing unit
is selected when a trailing unit is being towed by this CDS applicable vehicle.

Unknown
is selected when it is uncertain if there was a towed trailing unit.

Screen Name: Reconstruction Data--Documentation of Trajectory Data
Variable Name: Documentation of Trajectory Data

Element Attributes:

No
Yes

Source: Researcher determined — inputs include scene inspection, vehicle inspection, police report, and interviews.

The purpose of this variable is to assess the availability of crash induced physical evidence for impact and final rest, including multiple impacts.

No
means there was insufficient crash induced physical evidence to **know or approximate** the point of impact and final rest position for this vehicle's Highest Delta V CDC.

Yes
is selected when sufficient crash induced physical evidence is available to **know or approximate** the point of impact and final rest position for this vehicle's Highest Delta V CDC, independently of whether the WinSMASH program trajectory algorithm could be used (*e.g.*, multiple impacts, missing vehicle, etc.).

For multiple impacts assess this variable with respect to the highest delta V impact. To code "Yes" the point of impact must be known as well its next point of impact or, if the highest delta V impact is the last impact for this vehicle, its final rest position.

When a non-horizontal and/or rollover type collision is the highest delta V impact for this vehicle, use **Yes** if the point of impact (trip point or first contact) and final rest position are known.

The word "approximated" as used above means that the impact and final rest positions do not need to be known precisely, but they are reasonably accurate based on the available physical evidence.

Screen Name: Reconstruction Data--Post Collision Condition of Tree or Pole
Variable Name: Post Collision Condition of Tree or Pole

Element Attributes:

Not collision (for highest Delta V) with tree or pole
Not damaged
Cracked/sheared
Tilted **<** 45 degrees
Tilted **$** 45 degrees
Uprooted tree
Breakaway pole separated from base
Pole replaced
Other (specify):
Unknown

Source: Researcher determined - input includes vehicle and scene inspection, PAR, interviews, official records.

Remarks:

This variable records the condition of the struck **Tree, Pole** or **Post** for this vehicle's most severe impact.

Not collision (for highest Delta V) **with tree or pole**
is selected when the Object Contacted, that produced this vehicle's most severe impact was not with a tree or pole (*e.g.*, vehicle-to-vehicle collision).

Not damaged
is selected when the tree or pole has no visible damage or minor surface damage.

Cracked/sheared
is selected when the pole or tree is cracked (10% or more of the fibers), sheared, or bent. Bent and cracked poles may be tilted and the bending/cracking can be at any height. This **Tree, Pole** or **Post** attribute takes precedence over Tilted < 45 degrees, Tilted $\geq$ 45 degrees, and Uprooted tree. Fallen limbs do not constitute "cracked" for a tree; the assessment is made at the tree's trunk. This ***does not*** describe metal breakaway poles sheared at their base [see (Separated pole from base)].

Tilted < 45 degrees
is selected when the pole or tree that is inclined at less than a 45 degree angle as a result of this collision. If the tree/pole is also cracked, then use **Cracked/sheared**).

Tilted $ 45 degrees
is selected when the pole or tree that is inclined at a 45 degree angle or greater as a result of this collision. If the tree/pole is also cracked, then use **Cracked/sheared**).

Screen Name: Reconstruction Data--Post Collision Condition of Tree or Pole (cont'd)
Variable Name: Post Collision Condition of Tree or Pole (cont'd)

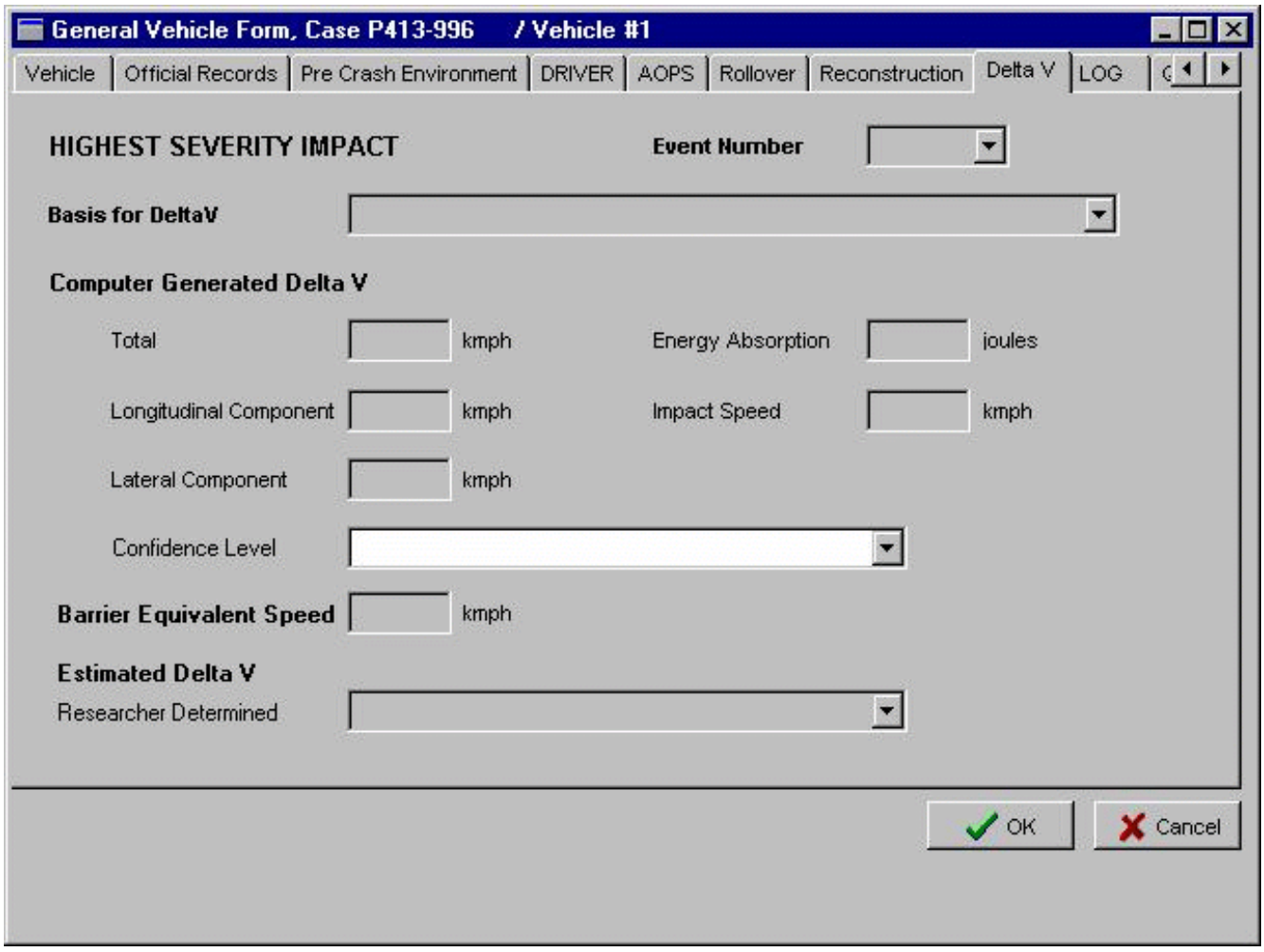
Uprooted tree
is selected when the tree was completely or partially torn out of the ground; the tree trunk remained intact; however, the root system was pulled from the soil.

Breakaway pole separated from base
is selected when the breakaway pole has sheared or separated at the point where it was designed to do so.

Pole replaced
is selected when a replacement pole has been installed and insufficient data exist to categorize the damage to the original pole. This attribute takes precedence over **Unknown**.

Other (specify)
is selected when the **Tree, Pole** or **Post** damage cannot be captured by the preceding attributes.

Unknown
is selected when no data can be obtained regarding the **Tree, Pole** or **Post**.


General Vehicle Form, Case P413-996 / Vehicle #1
Vehicle
Official Records
Pre Crash Environment
DRIVER
AOPS
Rollover
Reconstruction
Delta V
LOG
HIGHEST SEVERITY IMPACT
Event Number
Basis for DeltaV
Computer Generated Delta V
Total
kmph
Energy Absorption
joules
Longitudinal Component
kmph
Impact Speed
kmph
Lateral Component
kmph
Confidence Level
Barrier Equivalent Speed
kmph
Estimated Delta V
Researcher Determined
OK
Cancel

The completion of the variables on the Delta V tab depends on whether or not the vehicle was inspected (i.e., General Vehicle Tab "Vehicle "Type of Inspection").

- **If the vehicle inspection is NOT completed, the Researcher will complete the variables on the Delta V tab of the General Vehicle Form.**

- **If the vehicle is at least partially inspected, the delta V information will be entered on the Vehicle Exterior Form, CDC tab, Detail subtab.**

Screen Name: Highest Severity Impact--Event Number
Variable Name: Event Number for Highest Severity Impact

Element Attributes:

Range:
1-as selected/roll-up

Source: Roll-up from Vehicle Exterior Form/CDC, Researcher determined

Remarks:

The Event Number that the Researcher selects as the highest severity impact is rolled-up from the Vehicle Exterior Form/CDC. If there is no Vehicle Exterior Form the researcher selects the Event Number for the highest severity impact.

Screen Name: Highest Severity Impact--Basis for Delta V
Variable Name: Basis for Computer Generated Delta V for Highest Severity Impact

Element Attributes:

[**When no Vehicle Inspection is completed:**]
Not Inspected
WinSMASH Missing Vehicle

[When vehicle is inspected:]
Delta V Calculated:
[WinSMASH - Damage and trajectory]
[WinSMASH - Damage only]
WinSMASH - Missing vehicle
[WinSMASH - Damage with CDC only]

Source: [Roll-up from Vehicle Exterior Form/CDC, or selected if vehicle was not inspected.] Researcher determined -- inputs include WinSMASH output (if applicable), vehicle inspection, scene inspection, police report, and photographs.

Remarks:
The Basis for Delta V for the highest severity impact is rolled-up from the Vehicle Exterior Form/CDC. If there is no Vehicle inspection, thus no Exterior Form, the researcher selects WinSMASH Missing vehicle to input reconstructed Delta V values. If there is no reconstruction for this vehicles highest delta V, select “not inspected” and the remaining variables on this tab will be disabled (precoded).

Screen Name: Highest Severity Impact--Basis for Delta V (cont'd.)
Variable Name: Basis for Computer Generated Delta V for Highest Severity Impact (cont'd.)

No Vehicle Inspection:

Not Inspected
means that this vehicle has no delta V data due to the vehicle not being inspected AND WinSMASH missing vehicle option is not applicable (i.e., other involved vehicle not inspected, or this is the only vehicle in the crash)

WinSMASH - missing vehicle
means that this vehicle was not inspected, and the delta V data was generated by the WinSMASH program using the inspected vehicle's known damage data.

Vehicle Inspection Completed:

WinSMASH - Damage and trajectory
means that the WinSMASH output is based on trajectory evidence documented at the scene, in addition to vehicle damage.

WinSMASH - Damage only
means the WinSMASH output is based upon complete vehicle damage only.

WinSMASH - Missing vehicle
means that in a two vehicle impact only this vehicle was inspected (damage measurements and CDC obtained), and for the other vehicle, the damage measurements (including CDC) are missing; however, enough data are available to use the WinSMASH Missing Vehicle algorithm.

WinSMASH - Damage with CDC only
means the WinSMASH output is based on a two vehicle collision with insufficient vehicle damage documentation. The two vehicle collision must include: one complete vehicle inspection and the other vehicle must have a complete CDC. Additional crush profile information such as the WinSMASH L, "D", etc may be entered to improve the results.

Screen Name: Highest Severity Impact Computer Generated Delta V--Total
Variable Name: Total Delta V for Highest Severity Impact

Element Attributes:

Range: Nearest kmph
[999] - Unknown

Source: Researcher determined -- Entered from WinSMASH program if vehicle not inspected; If inspected, Rolled-up from Vehicle Exterior Form/CDC,

Remarks:

The Total Delta V for the highest severity impact, automatically generated by the NASSMAIN WinSMASH, is rolled-up from the Vehicle Exterior Form/CDC. If this vehicle was not inspected, and a missing vehicle algorithm was used to calculate the delta V information, the data is entered here.

999
is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

Screen Name: Highest Severity Impact Computer Generated Delta V--Longitudinal Component
Variable Name: Longitudinal Delta V for Highest Severity Impact

Element Attributes:

Range: Nearest KMPH
[999] - Unknown]

Source: Researcher determined -- Entered from WinSMASH program if vehicle not inspected; If inspected, Rolled-up from Vehicle Exterior Form/CDC,

Remarks:

The Longitudinal Delta V for the highest severity impact, automatically generated by the NASSMAIN WinSMASH, is rolled-up from the Vehicle Exterior Form/CDC. If this vehicle was not inspected, and a missing vehicle algorithm was used to calculate the delta V information, the data is entered here.

999
is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

Screen Name: Highest Severity Impact Computer Generated Delta V--Lateral Component
Variable Name: Lateral Delta V for Highest Severity Impact

Element Attributes:

Range: Nearest kmph
[999] - Unknown

Source: Researcher determined -- Entered from WinSMASH program if vehicle not inspected; If inspected, Rolled-up from Vehicle Exterior Form/CDC,

Remarks:

The Lateral Delta V for the highest severity impact, automatically generated by the NASSMAIN WinSMASH, is rolled-up from the Vehicle Exterior Form/CDC. If this vehicle was not inspected, and a missing vehicle algorithm was used to calculate the delta V information, the data is entered here.

999
is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

Screen Name: Highest Severity Impact Computer Generated Delta V--Energy Absorption
Variable Name: Energy Absorption for Highest Severity Impact

Element Attributes:
Nearest joule
[-9999] - Unknown

Source: Researcher determined -- Entered from WinSMASH program if vehicle not inspected; If inspected, Rolled-up from Vehicle Exterior Form/CDC,

Remarks:

The Energy Absorption for the highest severity impact, automatically generated by the NASSMAIN WinSMASH, is rolled-up from the Vehicle Exterior Form/CDC. If this vehicle was not inspected, and a missing vehicle algorithm was used to calculate the delta V information, the data is entered here.

999
is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

Screen Name: Highest Severity Impact Computer Generated Delta V—Impact Speed
Variable Name: Impact Speed for Highest Severity Impact

Element Attributes:

Range: Nearest kmph
[998] - Damage and Trajectory run not made
[999] - Unknown

Source: Researcher determined -- Rolled-up from Vehicle Exterior Form/CDC,

Remarks:

The Impact speed for the highest severity impact, automatically generated by the NASSMAIN WinSMASH (Damage and Trajectory), is rolled-up from the Vehicle Exterior Form/CDC.

998
is rolled up from the Vehicle Exterior Form / CDC tab when the impact did not include the Trajectory portion of theWinSMASH program.

999
is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

Screen Name: Highest Severity Impact Computer Generated Delta V--Confidence Level
Variable Name: Confidence Level for Highest Severity Impact

Element Attributes:

No reconstruction
Collision fits model — results appear reasonable
Collision fits model — results appear high
Collision fits model — results appear low
Borderline reconstruction — results appear reasonable

Source: Researcher determined from WinSMASH program results, vehicle inspection, scene inspection, and injury data.

Remarks:

Select the Confidence Level of the NASSMAIN WinSMASH run that resulted in this vehicle's highest Delta V.

Determine the quality of this vehicle's WinSMASH program for the highest severity impact by evaluating the results of the WinSMASH program and the data used to create those results for this impact.

No reconstruction

is selected when WinSMASH is not used for the highest severity impact or it is used only to get a Barrier Equivalent Speed or an Estimated Delta V for the highest severity impact.

Collision fits model - results appear reasonable

is selected if the results of the WinSMASH in comparison to the actual collision are believed to be within an acceptable range for this impact

Collision fits model - results appear high

is selected if the results of the WinSMASH in comparison to the actual collision appear to over represent this impact. For example, vehicle damage is minor (bumper stroke only), and the total delta V is 25 kmph.

Collision fits model - results appear low

is selected if the results of the WinSMASH in comparison to the actual collision appear to under represent this impact. For example, vehicle damage is severe (60 centimeters of distributed frontal crush), injury level is high (AIS-3,4,5), and the total delta V is 25 kmph.

Borderline reconstruction - results appear reasonable

is selected if the results of the WinSMASH in comparison to the actual collision are within an acceptable range for this impact. However, some collision conditions were borderline for reconstruction.

Use this attribute for all ***uninspected*** vehicles whose delta V is determined by the WinSMASH Missing Vehicle and the results appear reasonable.

Screen Name: Barrier Equivalent Speed
Variable Name: Barrier Equivalent Speed for Highest Severity Impact

Element Attributes:
[Nearest kmph]
[999] - Unknown

Source: WinSMASH program.

Remarks:

Record the Barrier Equivalent speed from the WinSMASH results for this impact, if this vehicle was **not inspected and** a WinSMASH Missing Vehicle algorithm was run. If the vehicle **was inspected**, and WinSMASH was completed, the results will roll up to this screen from the Vehicle Exterior Form / CDC tab.

To generate Barrier Equivalent speed for car to object impacts the WinSMASH program is utilized. For these runs treat the struck object as an immovable barrier.

For car to object impacts where the object moves or sustains damage (poles, trees, large trucks, etc.) or the object is struck (horizontally) during a rollover use the WinSMASH program and treat the object as a rigid barrier.

Screen Name: Estimated Highest Delta V--Researcher Determined
Variable Name: Estimated Severity for Highest Severity Impact

Element Attributes:

[Reconstruction delta V coded]

Estimated Delta V

[Less than 10 kmph]
[Delta V $ 10 kmph < 25 kmph]
[Delta V $ 25 kmph < 40 kmph]
[Delta V $ 40 kmph < 55 kmph]
[Delta V $ 55 kmph]

Other estimates of damage severities

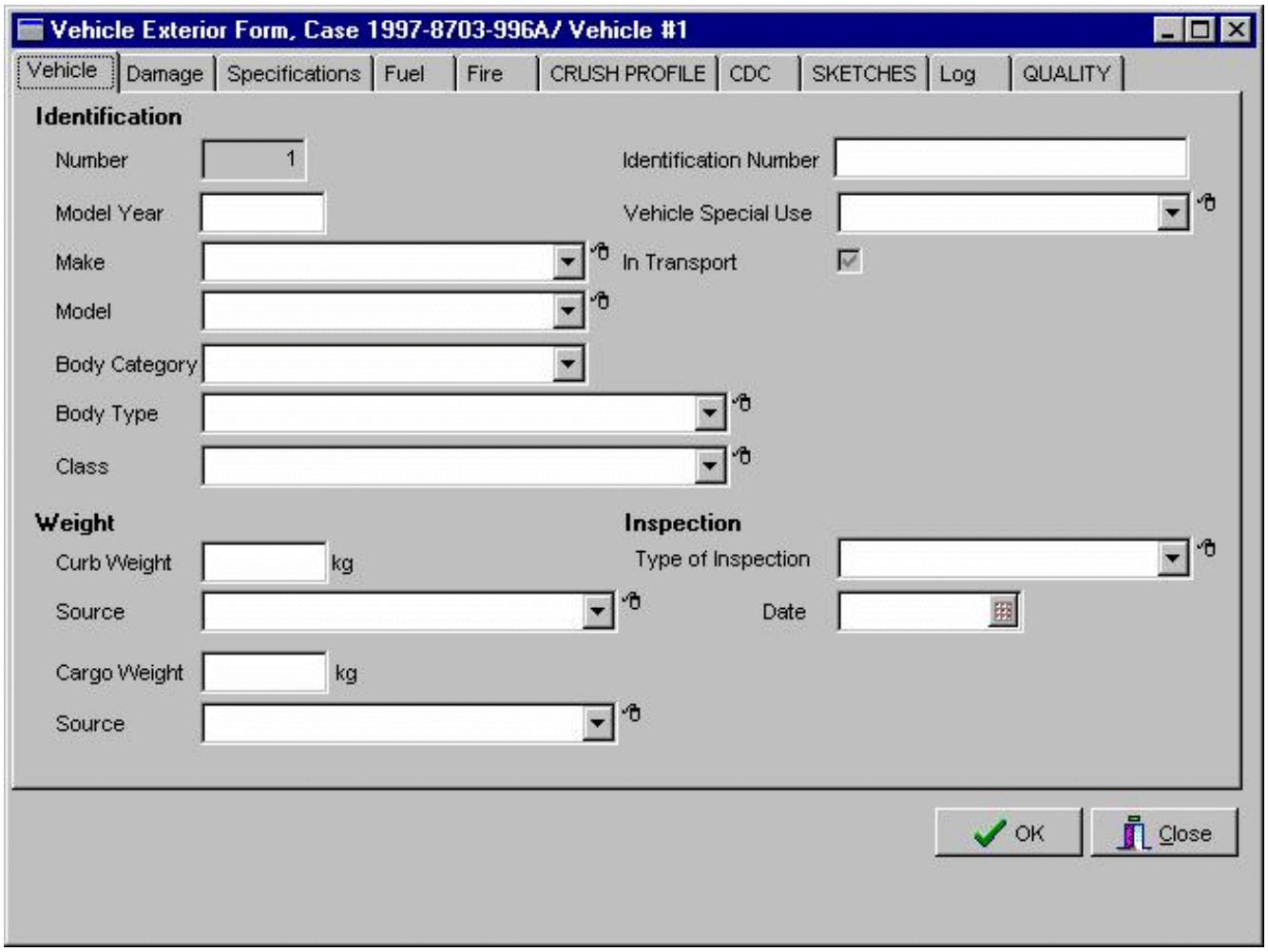
[Minor]
[Moderate]
[Severe]
[Unknown]

Source: Researcher determined.
Remarks: The value that is in this variable is rolled up from the Vehicle Exterior Form, CDC tab.

If the vehicle was not inspected the variable is automatically precoded as either:

- Reconstruction Delta V coded or
- Unknown

based on which selection was made previously on **Basis for Delta V**.


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Identification
Number
1
Identification Number
Model Year
Vehicle Special Use
Make
In Transport
Model
Body Category
Body Type
Class
Weight
Curb Weight
kg
Source
Cargo Weight
kg
Source
Inspection
Type of Inspection
Date
OK
Close

Screen Name: Identification Number
Variable Name: Vehicle Number

Element Attributes:
Generated Number

Range:

Source: Generated when vehicle is selected to open Vehicle Exterior Form

Remarks:

Note: Vehicles are entered on the Case Form / Structure Tab / Vehicles sub-tab.

Screen Name: Identification--Model Year
Variable Name: Vehicle Model Year

Element Attributes:

1900 - 2001
Select the model year
Unknown

Range:

Source: Primary source is the VIN during vehicle inspection; secondary sources include the police report and interviews.

Remarks:

Select the model year for which the vehicle was manufactured.

Unknown
if the vehicle model year cannot be determined.

Screen Name: Identification--Make
Variable Name: Vehicle Make

Element Attributes:

Vehicle Make-as Selected
Unknown

Source: Vehicle inspection, police report, and interview

Remarks:

Select the vehicle make for this vehicle.

Unknown
is used for a "hit-and-run" vehicle unless reliable evidence indicates the make of the vehicle.

Screen Name: Identification--Model
Variable Name: Vehicle Model

Element Attributes:

Vehicle Model-as Selected
Unknown

Source: Vehicle inspection, police report, and interview

Remarks:

Select the vehicle model for this vehicle.

Unknown
is used for a "hit-and-run" vehicle unless reliable evidence indicates the make of the vehicle.

Screen Name: Identification--Body Category
Variable Name: Vehicle Body Category

Element Attributes:

Automobiles
Automobile Derivatives
Utility Vehicles
Van Based Light Trucks
Light Conventional Trucks
Other Light Trucks
Buses (Excludes Van Based)
Medium/heavy Trucks
Motored Cycles
Other Vehicles

Source: Vehicle inspection, police report, interview, VIN

Remarks:

Automobiles

These light vehicles referred to as automobiles, are designed primarily to transport passengers.

Automobile Derivatives

This describes certain passenger cars that have been modified to perform cargo-related tasks.

Utility Vehicles (< 4,536 kgs GVWR)

Van Based Light Trucks (< 4,536 kgs GVWR)

Light Conventional Trucks (Pickup Style Cab, < 4,536 kgs GVWR)

Other Light Trucks (< 4,536 kgs. GVWR)

Other Light Trucks are used to describe vehicles that are based upon a conventional light pickup frame, but a commercial or recreational body has been affixed to the frame rather than a pickup box.

Buses (Excludes Van Based)

Buses are defined as any medium/heavy motor vehicle designed primarily to transport large groups of passengers.

Screen Name: Identification--Body Category (cont'd)
Variable Name: Vehicle Body Category (cont'd)

Medium/Heavy Trucks (> 4,536 kgs GVWR)

Medium/Heavy Trucks describe a single unit truck specifically designed for carrying cargo on the same chassis as the cab. They pertain to a truck-tractor designed for towing trailers or semi-trailers. Although towing is their primary purpose, some truck-tractors are equipped with cargo areas located rearward of the cab.

Motored Cycles (Does Not Include All Terrain Vehicles/Cycles)

Other Vehicles

Other Vehicles describe all motored vehicles that are designed primarily for off-road use. It is also selected when the body type of the vehicle is unknown

Screen Name: Identification--Body Type
Variable Name: Body Type

Element Attributes:

CDS APPLICABLE VEHICLES

Automobiles

- Convertible (excludes sun-roof, t-bar)
- 2-door sedan, hardtop, coupe
- 3-door sedan, hardtop, coupe
- 3-door/2-door hatchback
- 4-door sedan, hardtop
- 5-door/4-door hatchback
- Station wagon (excluding van and truck based)
- Hatchback, number of doors unknown
- Other automobile type (specify):
- Unknown automobile type

Automobile Derivatives

- Auto based pickup (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup)
- Auto based panel (cargo station wagon, auto based ambulance/hearse)
- Large limousine - more than four side doors or stretched chassis
- Three-wheel automobile or automobile derivative

Utility Vehicles (# 4,536 kgs GVWR)

- Compact utility (examples include: 4-Runner, Amigo, Bravada, Bronco [76 and before], Bronco II, Cherokee [84 and after], Defender, Discovery, Dispatcher, Explorer, Geo Tracker, Golden Eagle, Grand Vitara, Jeep CJ-2 - CJ-7, Laredo, Montero, Mountaineer, Navajo, Passport, Pathfinder, Raider, RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90)
- Large utility (examples include: Bronco-full-size [78 and after], full-size Blazer, full-size Jimmy, Hummer, Jeep Cherokee [83 and before], Durango, Escalade, Landcruiser, LX450, Navigator, Ramcharger, RangeRover, Scout, Tahoe, Trailduster, Yukon),
- Utility station wagon (examples include: Chevrolet Suburban, Expedition, Excursion, GMC Suburban, Grand Wagoneer includes suburban limousine, Travelall)
- Utility, unknown body type

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Van Based Light Trucks (< 4,536 kgs GVWR)

- Minivan (examples include: Aerostar, Astro, Caravan, Expo Wagon, Grand Caravan, Grand Voyager, Lumina APV, Mazda MPV, Mini-Ram, Mitsubishi Minivan, Nissan Minivan, Odyssey, Previa, Quest, Safari, Sienna, Silhouette, Town and Country, Toyota Minivan, Toyota Van, Trans Sport, Vanagon/Camper, Venture, Villager, Vista, Voyager, Windstar)
- Large van (examples include: B150-B350, Beauville, Chateau, Chevy Van, Clubwagon, E150-E350, Econoline, G10-G30, G15-G35, Maxiwagon, Rally Van, Ram, Royal, Sport Van, Sportsman, Tradesman, Vandura, Voyager [83 and before].)
- Step van or walk-in van (# 4,536 kgs GVWR)
- Van based motorhome (# 4,536 kgs GVWR)
- Van based school bus (# 4,536 kgs GVWR)
- Van based other bus (# 4,536 kgs GVWR)
- Other van type (Hi-Cube Van, Kary) (specify):
- Unknown van type

Light Conventional Trucks (Pickup style cab, < 4,536 kgs GVWR)

- Compact pickup (examples include: Arrow Pickup [foreign], Colt P/U, Courier, D50, Dakota, Datsun/Nissan Pickup, Frontier, Hombre, LUV, Mazda Pickup, Mitsubishi Pickup, Pup, Ram 50, Ranger, S-10 , S-15, Sonoma, T-10, T-15, Tacoma, Toyota Pickup)
- Large Pickup (examples include: C10-C35, Comanche, D100-D350, F100-F350, Jeep Pickup, K10-K35, R100-R500, R10-R35, Ram Pickup, Sierra, Silverado, T100, V10-V35, W100-W350)
- Pickup with slide-in camper
- Convertible pickup
- Unknown pickup style light conventional truck type

Other Light Trucks (< 4,536 kgs GVWR)

- Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
- Truck based panel
- Light truck based motorhome (chassis mounted)
- Other light conventional truck type
- Unknown light truck type
- Unknown light vehicle type (automobile, utility, van, or light truck)

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

OTHER VEHICLES

Buses (Excludes Van Based)

- School bus (designed to carry students, not cross country or transit)
- Other bus type (*e.g.*, transit, intercity, bus based motorhome) (specify):
- Unknown bus type

Medium/Heavy Trucks (> 4,536 kgs GVWR)

- Step van (> 4,536 kgs GVWR)
- Single unit straight truck (4,536 kgs < GVWR # 8,845 kgs)
- Single unit straight truck (8,8845 kgs < GVWR # 11,793 kgs)
- Single unit straight truck (> 11,793 kgs GVWR)
- Single unit straight truck, GVWR unknown
- Medium/heavy truck based motorhome
- Truck-tractor with no cargo trailer
- Truck-tractor pulling one trailer
- Truck-tractor pulling two or more trailers
- Truck-tractor (unknown if pulling trailer)
- Unknown medium/heavy truck type
- Unknown truck type (light/medium/heavy)

Motored Cycles (Does Not Include All-Terrain Vehicles/Cycles)

- Motorcycle
- Moped (motorized bicycle)
- Three-wheel motorcycle or moped
- Other motored cycle (minibike, motor scooter) (specify):
- Unknown motored cycle type

Other Vehicles

- ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- Snowmobile
- Farm equipment other than trucks
- Construction equipment other than trucks
- Other vehicle type
- Unknown body type

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Source: Vehicle inspection, police report, and interview

Remarks:

Automobiles

These light vehicles referred to as automobiles, are designed primarily to transport passengers.

Convertible (excludes sun-roof, t-bar)
refers to a passenger car equipped with a removable or retractable roof. To qualify for this attribute, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This attribute takes priority over 2-door or 4-door attributes.

2-door sedan, hardtop, coupe
refers to a passenger car equipped with two doors for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

3-door sedan, hardtop, coupe
refers to a passenger car equipped with three doors (two front seat and one rear seat) for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

3-door/2-door hatchback
refers to a passenger car equipped with two doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

4-door sedan, hardtop
refers to a passenger car equipped with four doors for ingress/egress and a separate trunk area for cargo (*i.e.*, trunk lid hinged below the backlight). Folding rear seats do not necessarily violate the separate "trunk area" concept.

5-door/4-door hatchback
refers to a passenger car equipped with four doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

Station wagon (excluding van and truck based)
refers to a passenger car with an enlarged cargo area. The entire roof covering the cargo area is generally equal in height from front to rear and full height side glass is installed between the C and D-pillars. The rearmost area is not permanently partitioned from the forward passenger compartment area (*e.g.*, "horizontal window shades" to hide cargo do not constitute partitions).

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Hatchback, number of doors unknown
refers to a passenger car with an unknown number of doors for ingress/egress and a rear hatch opening for cargo (*i.e.*, hinged above the backlight). The cargo area is not permanently partitioned from the passenger compartment area.

Other automobile type
refers to any passenger car that cannot be described by other automobile attributes.

Unknown automobile type
is used when it is known that the vehicle is a passenger car, but there is insufficient data to determine the type.

Automobile Derivatives
This describes certain passenger cars that have been modified to perform cargo-related tasks.

Auto based pickup
refers to a passenger car based, pickup type vehicle (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup). The roof area (and side glass) rearward of the front seats on a station wagon have been removed and converted into a pickup-type cargo box.

Auto based panel
refers an automotive station wagon that may have sheet metal rearward of the B-pillar rather than glass (cargo station wagon, auto based ambulance/hearse).

Large limousine
refers to an automobile that has sections added within its wheelbase (more than four side doors) or stretched chassis to increase length and passenger/cargo carrying capacity .

Three-wheel automobile or automobile derivative
refers to three-wheel vehicles with an enclosed passenger compartment.

Utility Vehicles (< 4,536 kgs GVWR)

Multi-purpose vehicles (MPV)
are designed to have off-road capabilities. These vehicles are generally four wheel drive (4 x 4), have increased ground clearance, and are equipped with a strong frame. Four wheel drive automobiles are not considered MPVs.

Compact utility
refers to a short wheelbase and narrow tracked multi-purpose vehicle designed to operate in rugged terrain (examples include: 4-Runner, Amigo, Bravada, Bronco [76 and before], Bronco II, Cherokee [84 and after], Defender, Discovery, Dispatcher, Explorer, Geo Tracker, Golden Eagle, Grand Vitara, Jeep CJ-2 - CJ-7, Laredo, Montero, Mountaineer, Navajo, Passport, Pathfinder, Raider, RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90)

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Large utility
refers to full-size multi-purpose vehicles primarily designed around a shortened pickup truck chassis. While generally a station wagon style body, some models are equipped with a removable top (examples include: Bronco-full-size [78 and after], full-size Blazer, full-size Jimmy, Hummer, Jeep Cherokee [83 and before], Durango, Escalade, Landcruiser, LX450, Navigator, Ramcharger, RangeRover, Scout, Tahoe, Trailduster, Yukon),

Utility station wagon
refers primarily to a pickup truck based chassis enlarged to a station wagon (examples include: Chevrolet Suburban, Excursion, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)

Utility, unknown body type
is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type. Class of Vehicle is entered as **(Compact utility vehicle)**.

Van Based Light Trucks (< 4,536 kgs GVWR)
Light trucks (# 4,536 kgs GVWR) are designed to maximize cargo/passenger area versus overall length. Basically a "box on wheels" these vehicles are identifiable by their enclosed cargo/passenger area and relatively short (or non-existent) hood.

Minivan
refers to down-sized cargo or passenger vans examples include: Aerostar, Astro, Caravan, Expo Wagon, Grand Caravan, Grand Voyager, Lumina APV, Mazda MPV, Mini-Ram, Mitsubishi Minivan, Nissan Minivan, Odyssey, Previa, Quest, Safari, Sienna, Silhouette, Town and Country, Toyota Minivan, Toyota Van, Trans Sport, Vanagon/Camper, Venture, Villager, Vista, Voyager, Windstar)

Large van
refers to a standard cargo or passenger van (examples include: B150-B350, Sportsman, Royal, Maxiwagon, Ram, Tradesman, Voyager [83 and before], E150-E350, Econoline, Clubwagon, Chateau, G10-G30, Chevy Van, Beauville, Sport Van, G15-G35, Rally Van, Vandura). These vans will generally have a larger capacity in both volume and GVWR.

Step van or walk-in van (# 4,536 kgs GVWR)
refers to a multi-stop delivery vehicle with a GVWR less than or equal to 4,536 kilograms. Examples are the Grumman LLV used by the US Postal Service or the Aeromate manufactured by Utilimaster Motor Corporation.

Van based motorhome (# 4,536 kgs GVWR)
refers to a van where the chassis and cab portions from the B-pillar forward of this vehicle are the same as in attributes minivan, large van, step van, however, a frame mounted recreational unit is added behind the driver/cab area. This attribute takes priority over attributes minivan and large van.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Van based school bus (# 4,536 kgs GVWR)
is a passenger van designed to carry students (passengers) to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. Van based school buses converted for other uses (*e.g.*, church bus) also take this attribute.

Van based other bus (# 4,536 kgs GVWR)
is a van derivative (*e.g.*, taxi, small local transit) designed to carry passengers for low occupancy functions or purposes. Van based school buses do not use this attribute.

Other van type (Hi-Cube Van, Kary)
refers to a cargo or delivery van where that chassis and cab portions from the B-pillar forward of this vehicle are the same as in Minivans and Large Vans with a frame mounted cargo area unit added behind the driver/cab area, or if the van cannot be described as a Minivan, Large Van, Step-van or a Van-based motorhome. Annotate the van type when using this attribute. This attribute takes priority over Minivans and Large Vans.

Unknown van type
is used when it is known that this vehicle is a light van, but its specific type cannot be determined.

Light Conventional Trucks (Pickup Style Cab, < 4,536 kgs GVWR)
Light Conventional Trucks are used to describe vehicles commonly referred to as pickup trucks and some of their derivatives. These light trucks are characteristically designed with a small cab containing a single row of seats (extended cabs with additional seats are available for some models), a large hood covering a conventional engine placement, and a separate open box area (approximately 180 to 240 centimeters long) for cargo.

Compact pickup
is used to describe a pickup truck having a width of 178 centimeters or less. (examples include: Arrow Pickup [foreign], Colt P/U, Courier, D50, Dakota, Datsun/Nissan Pickup, Frontier, Hombre, LUV, Mazda Pickup, Mitsubishi Pickup, Pup, Ram 50, Ranger, S-10 , S-15, Sonoma, T-10, T-15, Tacoma, Toyota Pickup)

Large Pickup
is used to describe a pickup truck having a width of greater than 178 centimeters (examples include: C10-C35, Comanche, D100-D350, F100 - F350, Jeep Pickup, K10-K35, R100-R500, R10-R35, Ram Pickup, Sierra, Silverado, T100, V10-V35, W100-W350)

Pickup with slide-in camper
is used to describe any pickup truck that is equipped with a slide-in camper. A slide-in camper is a unit that mounts within a pickup bed. Pickup bed caps, tonneau covers, or frame mounted campers are not applicable for this attribute.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Convertible pickup
refers to a pickup truck equipped with a removable or retractable roof. To qualify for this attribute, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This attribute takes priority over compact and large pickups.

Unknown pickup style light conventional truck
is used when this vehicle is a Light Conventional Trucks, but there is insufficient data to determine the specific attribute.

Other Light Trucks (< 4,536 kgs. GVWR)

Other Light Trucks are used to describe vehicles that are based upon a conventional light pickup frame, but a commercial or recreational body has been affixed to the frame rather than a pickup box.

Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
is used to describe a light vehicle with a pickup style cab and a commercial (non-pickup) body attached to the frame. Included are pickup based ambulances and tow trucks.

Truck based panel
is used to describe a truck based station wagon that has sheet metal rather than glass above the beltline rearward of the B-pillars.

Light truck based motorhome (chassis mounted)
is used to describe a frame mounted recreational unit attached to a light van or conventional chassis.

Other light conventional truck type
is used for light conventional trucks that cannot be described elsewhere.

Unknown light truck type
is used when it is known that the vehicle is a light truck chassis based vehicle but insufficient data exist to specify what type of light truck it is.

Unknown light vehicle type (automobile, utility, van, or light truck)
is used when it is known that the vehicle is a light vehicle, but insufficient data exists to specify what type of light truck it is.

Buses (Excludes Van Based)

Buses are defined as any medium/heavy motor vehicle designed primarily to transport large groups of passengers.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

School bus
(designed to carry students, not cross country or transit) is a bus designed to carry passengers to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. School buses converted for other uses (*e.g.*, church bus) also take this attribute.

Other bus type
(e.g., transit, intercity, bus based motorhome) is a transport device designed to carry passengers for longer periods of time. These vehicles may be classified as over-the-road, transit, intercity, bus related motorhome (other than school bus based), or other.

Unknown bus type
is used when it is known the transport device is a bus but there is insufficient data to choose between attributes School bus and Other bus type.

Medium/Heavy Trucks (> 4,536 kgs GVWR)
Medium/Heavy Trucks describe a single unit truck specifically designed for carrying cargo on the same chassis as the cab.

They pertain to a truck-tractor designed for towing trailers or semi-trailers. Although towing is their primary purpose, some truck-tractors are equipped with cargo areas located rearward of the cab.

Step van (> 4,536 kgs GVWR)
defines a single unit enclosed body with a GVWR greater than 4,536 kilograms and an integral driver's compartment and cargo area. Step vans are generally equipped with a folding driver seat mounted on a pedestal and a sliding door for easy ingress/egress.

Single unit straight truck (4,536 kgs < GVWR # 8,845 kgs)
describes a non-articulated truck designed to carry cargo. The gross vehicle weight rating of the vehicle must exceed 4,536 kilograms and be less than or equal to 8,845 kilograms.

Single unit straight truck (8,845 kgs < GVWR # 11,793 kgs)
describes a non-articulated truck designed to carry cargo. The gross vehicle weight rating of the vehicle must exceed 8,845 kilograms and be less than or equal to 11,793 kilograms.

Single unit straight truck (> 11,793 kgs GVWR)
describes a non-articulated truck designed to transport cargo with a gross vehicle weight rating in excess of 11,793 kilograms. Use this attribute if it is known that the GVWR of a single unit straight truck is greater than 4,536 kilograms but there is insufficient data to specify the type of single unit truck.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Single unit straight truck, GVWR unknown
is used when the transport vehicle is a single unit straight truck but the GVWR is unknown.

Medium/heavy truck based motorhome
describes a recreational vehicle mounted on a single unit medium/heavy truck chassis.

Truck-tractor with no cargo trailer
describes a fifth wheel equipped tractor/trailer power unit with no trailer attached.

Truck-tractor pulling one trailer
describes a fifth wheel equipped tractor (*i.e.*, power unit of a tractor/trailer combination) pulling one semi-trailer.

Truck-tractor pulling two or more trailers
describes a fifth wheel equipped tractor (*i.e.*, power unit of a tractor/trailer combination) pulling a semi-trailer plus one or more trailers. These additional trailers may be attached with a standard hitch or a converter dolly (for semi-trailers).

Truck-tractor (unknown if pulling trailer)
is used when the vehicle is known to be a truck-tractor, but it is unknown if a trailer was being towed or if more than one trailer was being towed.

Unknown medium/heavy truck type
is used when the only available information indicates a truck of medium/heavy size.

Unknown truck type (light/medium/heavy)
is used when it is known that this vehicle is a truck, but there is insufficient data to classify the vehicle further.

Motored Cycles (Does Not Include All Terrain Vehicles/Cycles)

Motorcycle
is used when the vehicle is a two-wheeled open (*i.e.*, no enclosed body) vehicle propelled by an internal combustion engine. Motorcycles equipped with a side car also take this attribute.

Moped (motorized bicycle)
is used when the vehicle is a motorized bicycle capable of moving either by pedaling or by an internal combustion engine.

Three-wheel motorcycle or moped
is used when the vehicle is a three-wheeled open vehicle propelled by an internal combustion engine or a three-wheeled motorized bicycle capable of moving either by pedaling or by an internal combustion engine.

Screen Name: Identification--Body Type (cont'd)
Variable Name: Body Type (cont'd)

Other motored cycle (minibike, motor scooter)
is used when the vehicle in question does not qualify for attributes **Motorcycles, moped, three wheeled motorcycle or moped** (*e.g.*, motor scooter).

Unknown motored cycle type
is used when it is known that the vehicle is a motored cycle, but no further data is available.

Other Vehicles
Other Vehicles describe all motored vehicles that are designed primarily for off-road use.

ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
is used for off-road recreational vehicles which cannot be licensed for use on public roadways. ATVs have 4 or more wheels and ATCs have 2 or 3 wheels. Generally, the tires have low pressure and wide profile (*i.e.*, flotation/balloon).

Snowmobile
refers to a vehicle designed to be operated over snow propelled by an internal combustion engine.

Farm equipment other than trucks
refers to farming implements other than trucks propelled by an internal combustion engine (*e.g.*, farm tractors, combines, etc.).

Construction equipment other than trucks
refers to construction equipment other than trucks propelled by an internal combustion engine (*e.g.*, bulldozer, road grader, etc.).

Other vehicle type
is used when the motorized vehicle in question does not qualify for **Construction equipment other than trucks, Farm equipment other than trucks, Snowmobile, ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)** (*e.g.*, go-cart, dune buggy, "kit" car, etc.).

Unknown body type
is used when there is no available information regarding the type of vehicle. This lack of information prohibits the accurate classification of this vehicle within one of the preceding attributes.

Screen Name: Identification--Class of Vehicle
Variable Name: Class of Vehicle

Element Attributes:

Subcompact/mini (wheelbase < 254 cm)
Compact (wheelbase $ 254 but < 265 cm)
Intermediate (wheelbase $ 265 but < 278 cm)
Full size (wheelbase $ 278 but < 291 cm)
Largest (wheelbase $ 291 cm)
Unknown passenger car size
Compact utility vehicle
Large utility vehicle (# 4,536 kgs GVWR)
Utility station wagon (# 4,536 kgs GVWR)
Unknown utility type
Minivan (# 4,536 kgs GVWR)
Large van (# 4,536 kgs GVWR)
Van based school bus (# 4,536 kgs GVWR)
Other van type (# 4,536 kgs GVWR)
Unknown van type (# 4,536 kgs GVWR)
Compact pickup truck (# 4,536 kgs GVWR)
Large pickup truck (# 4,536 kgs GVWR)
Other pickup truck (# 4,536 kgs GVWR)
Unknown pickup truck type (# 4,536 kgs GVWR)
Other light truck (# 4,536 kgs GVWR)
Unknown light truck type (# 4,536 kgs GVWR)
Unknown light vehicle type
School bus (excludes van based) (> 4,536 kgs GVWR)
Other bus (> 4,536 kgs GVWR)
Unknown bus type
Truck (> 4,536 kgs GVWR)
Tractor without trailer
Tractor - trailer(s)
Unknown medium/heavy truck type
Unknown light/medium/heavy truck type
Motored cycle
Other vehicle
Unknown
Not a motor vehicle

Source: Researcher determined — inputs include police report, vehicle inspection, VIN breakdown, and interviews.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle

Remarks:

The Passenger Car Classification Subcommittee, A3B11(1), of the Transportation Research Board, Traffic Records and Accident Analysis Committee, A3B11, assessed size based on the vehicle wheelbase. The guidelines for this classification can be found in the report entitled Recommended Definitions for Passenger Car Size Classification by Wheelbase and Weight, August 1984 by the previously mentioned subcommittee. This variable is the same variable that appears in the Identification section of the Vehicle Tab on the General Vehicle Form and Vehicle Exterior Form.

Subcompact/mini (wheelbase < 254 cm)
Choose based upon wheelbase

Compact (wheelbase $ 254 but < 265 cm)
Choose based upon wheelbase

Intermediate (wheelbase $ 265 but < 278 cm)
Choose based upon wheelbase

Full size (wheelbase $ 278 but < 291 cm)
Choose based upon wheelbase

Largest (wheelbase $ 291 cm)
Choose based upon wheelbase

Unknown passenger car size
is used when it is known that a vehicle is a passenger car but the wheelbase is unknown

Compact utility vehicle
refers to vehicle models defined as **Compact utility** under Body Type. Use this attribute if the size of the utility vehicle is unknown.

Large utility vehicle (# 4,536 kgs GVWR)
refers to vehicle models defined as **Large utility** under Body Type. Refers to full-size multipurpose vehicles primarily designed around a shortened pickup truck chassis. While generally a station wagon body style, some models are equipped with a removable top.

Utility station wagon (# 4,536 kgs GVWR)
refers to vehicle models defined as **Utility station wagon** under Body Type. Refers primarily to a pickup truck based chassis enlarged to a station wagon.

Unknown Utility type
is defined as **Utility, unknown body type** under Body Type. This attribute is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Minivan (# 4536 kgs. GVWR)

Refers to vehicle models defined as **Minivan** under Body Type. Refers to down-sized passenger or cargo vans.

Large van (# 4536 kgs. GVWR)

Refers vehicle models defined as **Large van** under Body Type. Refers to a standard size cargo or passenger van.

Van based school bus (# 4,536 kgs GVWR)

is a passenger van designed to carry students (passengers) to and from educational facilities and/or related functions. The vehicles are characteristically painted yellow and clearly identified as school buses. Use this attribute regardless of whether the vehicle is owned by a school system or a private company. Van based school buses converted for other uses (e.g., church bus) also take this attribute . Refers to vehicles defined as **Van based school bus** under Body Type.

Other van type (# 4,536 kgs GVWR)

Refers to vehicle models defined as **Step van or walk-in van, Van based motorhome, Van based other bus and code Other van type** under Body Type.

Unknown van type (# 4,536 kgs GVWR)

is used when it is known that this vehicle is a light van, but its specific type cannot be determined. Refers to vehicles described as **Unknown van type** under Body Type.

Compact pickup truck

Refers to vehicle models defined as attributes of **Compact pickup truck** in Body Type. Used to describe a pickup truck having a width of 178 centimeters or less.

Large pickup truck

Refers to vehicle models defined as **Large pickup truck** under Body Type. Used to describe a pickup truck having a width greater than 178 centimeters.

Other pickup truck (# 4536 kgs GVWR)

Refers to vehicle models defined as **Pickup with slide-in camper** and **Convertible pickup** under Body Type.

Unknown pickup truck (# 4536 kgs GVWR)

Refers to vehicle models defined as **Unknown pickup style light conventional truck type** under Body Type.

Other light truck (# 4536 kgs GVWR)

Refers to vehicle models defined **as Cab, chassis based (includes rescue vehicles, light stake, dump, and tow truck), Truck based panel, Light truck based motorhome (chassis mounted),** and **Other light conventional truck type** under Body Type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Unknown light truck type
Refers to vehicle models defined as **Unknown light truck type** under Body Type.

Unknown light vehicle type (automobile, utility, van, or light truck)
Refers to vehicle models defined as Unknown light vehicle type (automobile, utility, van, or light truck) under Body Type.

School bus (excludes van based) (> 4536 kgs GVWR)
Refers to those vehicle models defined as **School bus (designed to carry students, not cross country or transit)** under Body Type.

Other bus (>4,536 kgs GVWR)
describes those vehicle models included in **Other bus type (e.g., transit, intercity, bus based motorhome)** under Body Type.

Unknown bus type
Refers to those vehicle models described as **Unknown bus type** under Body Type.

Truck (> 4,536 kgs GVWR)
is defined under Body Type, as **Step van (>4,536 kgs GVWR), Single unit straight truck (4,536 kgs < GVWR = 8,845), Single unit straight truck (8,845 kgs < GVWR = 11,793), Single unit straight truck (>11,793 kgs GVWR), Single unit straight truck, GVWR unknown** and **Medium/heavy truck based motorhome.**

Tractor without trailer
refers to **Truck-tractor with no cargo trailer** under Body Type.

Tractor-trailer(s)
is defined in attributes **Truck-tractor pulling one trailer, Truck-tractor pulling two or more trailers** and **Truck-tractor (unknown if pulling trailer)** under Body Type.

Unknown medium/heavy truck type)
is used when the only available information indicates a truck of medium/heavy size. Refer to **Unknown medium/heavy truck type** under Body Type.

Unknown truck type (light/medium/heavy)
Refers to those vehicles described by **Unknown truck type (light/medium/heavy)** under Body Type.

Motored cycle
refers to Body Type, **Motorcycle, Moped (motorized bicycle), Three-wheel motorcycle or moped, Other motored cycle (minibike, motorscooter)** and **Unknown motored cycle type**.

Other vehicle
refers to all vehicles described by **ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle), Snowmobile, Farm equipment other than trucks,** or **Other vehicle type** under Body Type.

Screen Name: Identification--Class of Vehicle (cont'd)
Variable Name: Class of Vehicle (cont'd)

Unknown
is used when there is a lack of information regarding the type of vehicle. This lack of information prohibits the accurate classification of this vehicle using one of the preceding codes. This attribute is equivalent to Body Type, **Unknown body type.**

Not a motor Vehicle
Is used when an object is struck

Screen Name: Identification--Identification Number
Variable Name: Vehicle Identification Number (VIN)

Element Attributes:
No Vin - enter all zeros
Enter the entire or partial VIN, left justify
Unknown - enter all nines

Source: Primary source is vehicle inspection; a secondary source is the police report.

Remarks:

If a vehicle is inspected, the VIN must be obtained from the vehicle. The PAR may be used to obtain a VIN when a vehicle inspection is not required (*i.e.*, non-tow CDS applicable ***and*** WinSMASH is not applicable; or Body Category, equals **Buses, Medium/Heavy Trucks, Motorcycles,** or **Other Vehicles.**

Enter the entire VIN; leave **"blank"** any column which does not have a VIN character.

If part of the VIN is missing or not decipherable, leave the column any such character would ordinarily occupy **"blank"**.

Use VIN Assist to check the VIN.

00000000000000000
enter a “0" in each position for vehicles not required to have a VIN (e.g., go cart).

99999999999999999
if the entire VIN is unknown, or missing enter a “9" in each position.

Unknown
Enter all nines if the entire VIN is unknown or missing.

If the vehicle is a motor home or school bus, the vehicle chassis VIN is coded and the secondary manufacturer's number should be annotated if indicated on the PAR.

If the vehicle is manufactured by the Ford Motor Company (prior to 1980) and the VIN begins or ends with a script, "*F*", the "*F*" is not entered. Proceed to the next character, as in the example below.

VIN: *F* 3 U 6 2 S 1 0 0 9 3 2 *F*
CODE: 3 U 6 2 S 1 0 0 9 3 2 _ _ _ _ _ _

In addition, if any hyphens, periods, or blank spaces are contained in the string of alphanumeric characters, ignore them as in the example below.

VIN: S M - E 3 0 7 6 4 2 1
CODE: S M E 3 0 7 6 4 2 1 _ _ _ _ _ _ _

Screen Name: Identification--Vehicle Special Use
Variable Name: Vehicle Special Use

Element Attribute:

No special use
Taxi
Vehicle used as school bus
Vehicle used as other bus
Military
Police
Ambulance
Fire truck or car

Other (specify) -- Not to be used starting in the 2000 data collection year
Unknown

Source: Researcher determined; primary source is the police report; secondary sources include vehicle inspection, and interviewees.

Remarks:

No special use
is used when no source indicates or implies that this vehicle was applicable to any of the special uses listed below.

Taxi, **Vehicle used as school bus**, and **Vehicle used as other bus** are ***"this trip"*** specific. The vehicle must be "on duty" as either a taxi or as a bus. External identification on the vehicle as a bus or taxi is not sufficient to determine its special use.

Taxi
is used when this vehicle was being used during this trip (at the time of the crash) on a "fee-for-hire" basis to transport persons. Most of these vehicles will be marked and formally registered as taxis; however, vehicles which are used as taxis, even though they are not registered (*e.g.*, "Gypsy Cabs"), are included here. ***Taxis and drivers which are off-duty*** at the time of the crash ***are not included***.

Vehicle used as school bus
is used if this motor vehicle (**Body Type**, need not equal **School Bus**) satisfies all of the following criteria:

☞ externally identifiable to other traffic units as a school/pupil transport vehicle. The vehicle may be equipped with flashing lights and/or a sway stop arm, and traffic may be required to stop for the vehicle when occupants enter or exit;
☞ operated, leased, owned, or contracted by a public or private school-type institution;
☞ whose occupants, if any, are associated with the institution; and,
☞ the vehicle is in operation at the time of the crash to and from the school or on a school-sponsored activity or trip.

Screen Name: Identification--Vehicle Special Use (cont'd)
Variable Name: Vehicle Special Use (cont'd)

Vehicle used as other bus
is used when this motor vehicle is designed for transporting more than ten persons and does not satisfy all of the above criteria of a school bus.

Military, Police, Ambulance, and **Fire truck or car** are considered to be in use at all times. Special use means **"in use"** and not necessarily emergency use. External identification to the normal driving public is the sole criterion.

Military
is used for any vehicle which is owned by any of the Armed Forces regardless of body type. This attribute includes:

- ☞ military police vehicles;
- ☞ military ambulances;
- ☞ military hearses; and
- ☞ military fire vehicles

Police
is used for any readily identifiable (lights or markings) vehicle which is owned by any local, county, state, or federal police agency. Vehicles not owned by the agency or not readily identifiable which are used by officers or agents (*e.g.*, undercover) are excluded.

Ambulance
is used for any readily identifiable (lights or markings) vehicles: (1) whose sole purpose is to provide ambulance service, or (2) who serve the dual purposes of a hearse--used for funeral services, and an ambulance--used for emergency services. For these dual purpose vehicles (ambulance/hearse), use this attribute only when the vehicle is used as an ambulance.

Fire truck or car
is used for any readily identifiable (lights or markings) vehicle which is owned by any government (typically local) or cooperative agency for the purpose of fire protection. For volunteer fire companies, fire fighting apparatus and other vehicles owned by the company or government qualify for this attribute. Privately owned vehicles, which are not in authorized use, even if equipped with lights, do not qualify (the volunteer firefighter's vehicle).

Unknown
is used when no information is available to determine special use for this trip (e.g., a hit-and-run vehicle).

Screen Name: Identification--In Transport
Variable Name: Is the vehicle in-transport?

Element Attributes:
Check Box

Range:

Source: Researcher determined

Remarks:

A check in this box indicates that the vehicle is in transport. Any changes to the check box will effect the variable **Type** on the **Case Form/Structure/Vehicle Tab**.

Screen Name: Weight--Curb Weight
Variable Name: Curb Weight

Element Attributes:

Curb weight of vehicle.
Unknown

Range:

Source: Researcher determined

Remarks:

Enter this vehicle's curb weight.

Do not confuse the rated Gross Vehicle Weight Rating (GVWR) with the curb weight since it is likely to be significantly greater than the curb weight.

"Vehicle" is defined in this variable to mean the same vehicle identified under **Body Type**.

If the **vehicle model** is known, but the engine size is unknown (*e.g.*, 6 or 8 cylinders), code the average between the high and low curb weights for the model and annotate that the "average" was reported.

When the vehicle specifications do not report the vehicle weight with the proper engine size, adjustments must be made. First, try to determine the weight differences from the vehicle specifications. If the weight difference cannot be determined from the specifications, then adjust as follows: 8 cyl. to 6 cyl. - subtract 100lb/45 kilograms; 6 cyl. to 4 cyl. - subtract 75lb/34 kilograms.

Add 100lb/45 kilograms to the shipping weight to obtain a curb weight on all CDS applicable vehicles.

Towed trailing units are considered cargo weight and not included in the vehicle curb weight

Unknown
is selected when the curb weight of this vehicle cannot be determined.

Screen Name: Weight-- Curb Weight Source
Variable Name: Source of Curb Weight Information

Element Attributes:

AAMA
Automotive News
Branham Automobile Reference Book
Gasoline Truck, Import, Truck and Diesel Truck Index
Canadian Specifications
Other (specify)

Source: See Remarks

Remarks:

The sources for obtaining curb weight information are listed below:

Passenger Vehicle Specifications
American Automobile Manufacturers Association (AAMA)
of the U.S., Inc.
300 New Center Building
Detroit, Michigan 48202

Automotive News
Crain Automotive Group, Inc.
965 East Jefferson Avenue
Detroit, Michigan 48207

Branham Automobile Reference Book
Branham Publishing Company
Post Office Box 1948
Santa Monica, California 90406-1948

Gasoline Truck Index, Import Truck Index, and
Diesel Truck Index
Truck Index, Inc.
Post Office Box 10291
Santa Anna, California 92711

If the specification is not available in the sources listed above, then the automated Canadian specifications may be used for this variable.

If not other information is available, data from brochures obtained from vehicle dealers may be used. This will be entered under the "**Other"** attribute. This should then be listed in the "**Specify"** field.

Annotate the source used in the space provided in the General Vehicle Form Data Screen Vehicle this variable.

Screen Name: Weight--Cargo Weight
Variable Name: Cargo Weight

Element Attributes:
Cargo weight of vehicle
Unknown

Source: Researcher determined — inputs include Vehicle Inspection, Interview, PAR, Tow Yard Operator

Remarks:

If Towed Trailing Unit, is Yes – towed trailing unit, then the weight of the trailer and its cargo is coded here. Cargo may also be located in the passenger compartment area and/or trunk.

If there is no cargo then enter the value as zero.

Do not include the weight of the occupants in the cargo weight. The weight of the occupants is included (along with cargo and vehicle curb weight) as a component of the single value which represents the vehicle's combined weight in the WinSMASH Program, if used.

Unknown
is selected if the cargo weight is unknown or if it is unknown if there is cargo in the vehicle.

Screen Name: Weight--Cargo Weight Source
Variable Name: Source of Cargo Weight Information

Element Attributes:

Vehicle Inspection
Interview
PAR
Tow Yard Operator
Other (specify)

Source: Researcher determined

Remarks:

This reports the source from which the estimate of the cargo weight, in the vehicle at the time of the crash, was obtained.

Screen Name: Inspection--Type of Inspection
Variable Name: Inspection Type

Element Attributes:

No inspection
Vehicle fully repaired — no damage evident
Partial inspection (specify)
Complete inspection

Source: Researcher determined.

This variable is designed to allow users to identify cases with complete documentation of required damage data (exterior and interior).

No inspection
is selected when neither a complete nor a partial inspection of this vehicle was obtained, irrespective of the reason (*e.g.*, refusal, not required, etc.)

Vehicle fully repaired — no damage evident
is selected when a vehicle is inspected, but is completely repaired and no exterior or interior damage data is available.

Partial inspection
is selected when any phase of the inspection is not completed. This includes inspection of partially repaired vehicles and non-towed CDS applicable vehicles.

If the vehicle interior is completely burned out and restraint use cannot be determined then **Partial Inspection** should be selected.

Complete inspection
is selected when both the exterior and the interior of the unrepaired vehicle were inspected and all applicable measurements and photographs were obtained.

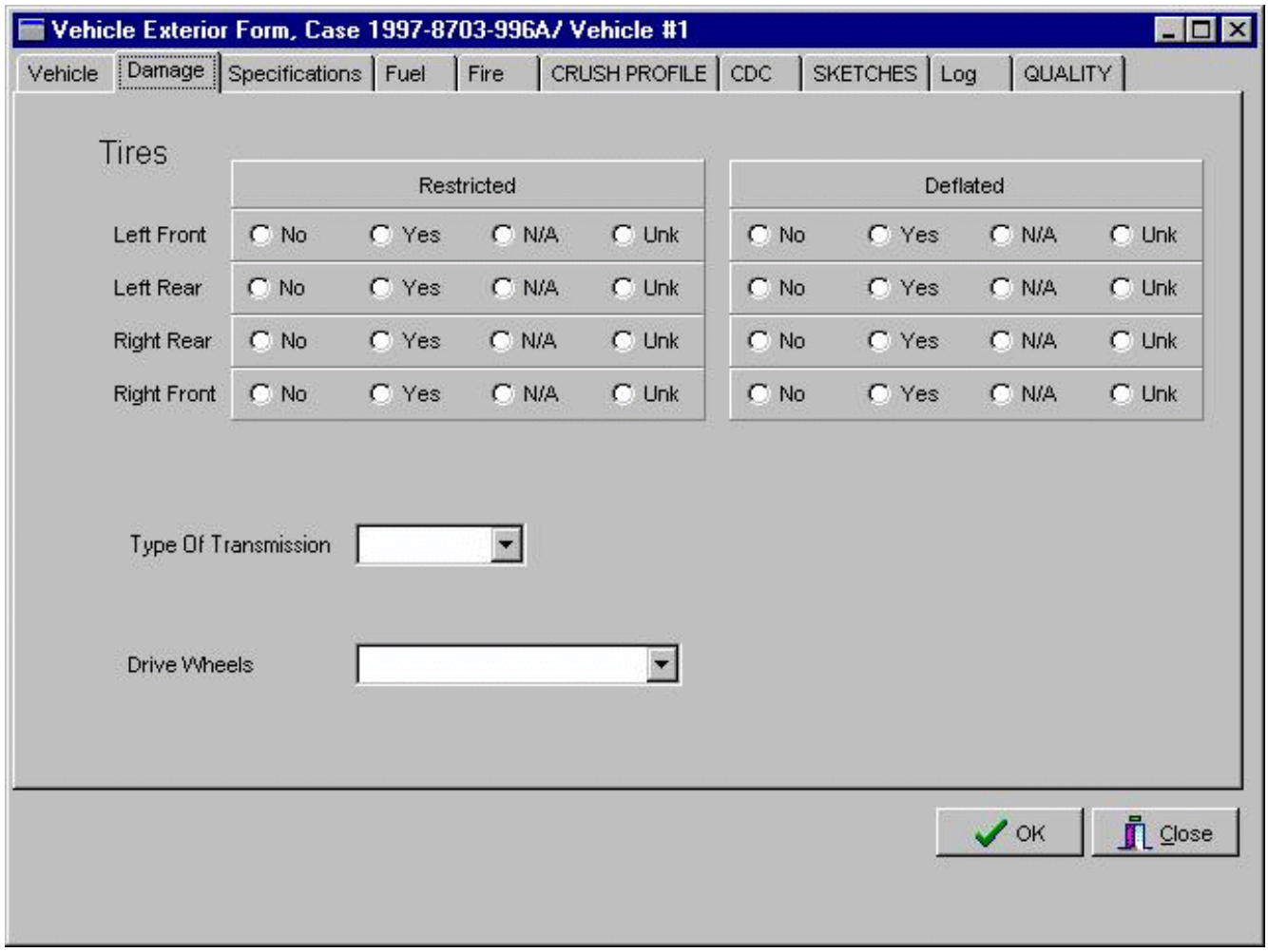
Screen Name: Inspection--Date of Inspection
Variable Name: Date of Inspection

Element Attributes:

Date that vehicle was inspected

Source: Researcher determined.

This variable is designed to allow quality control personnel to evaluate researcher performance in obtaining vehicle inspections.


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Tires
Restricted
Deflated
Left Front
Left Rear
Right Rear
Right Front
No
Yes
N/A
Unk
Type Of Transmission
Drive Wheels
OK
Close

Screen Name: Tires -- Restricted -- Right Front / Left Front / Right Rear / Left Rear
Variable Name: Tire Restricted -- Right Front / Left Front / Right Rear / Left Rear

Element Attributes:

No
Yes
Not Applicable
Unknown

Source: Vehicle inspection

Remarks:

The variable reflects the tire/wheel restriction that occurred as a result of the crash. This variable is being collected for use in modifying input to the WINSMASH computer program

No

The wheel/tire was not restricted

Yes

The wheel/tire was physically restricted

N/A

There is no wheel/tire for this position

Unknown

Use this selection when it cannot be determined if the wheel/tire was restricted as a result of the crash

Screen Name: Tires -- Deflated – Right Front / Left Front / Right Rear / Left Rear
Variable Name: Deflated Tires -- Right Front / Left Front / Right Rear / Left Rear

Element Attributes:

No
Yes
Not Applicable
Unknown

Source: Vehicle inspection

Remarks:

Select the response that best reflects the condition of each tire immediately post crash. This variable is being collected for use in modifying input to the WINSMASH computer program.

No

The tire was not fully deflated

Yes

The tire was fully deflated

N/A

There is no wheel/tire for this position

Unknown

It cannot be determined if the wheel was deflated as a result of the crash

Screen Name: Type of Transmission
Variable Name: Type of Transmission

Element Attributes:

Manual
Automatic
Unknown

Source: Vehicle inspection

Remarks:

The coding of this variable reflects the type of transmission that is in the vehicle.
This variable is being collected for use in modifying input to the WINSMASH computer program.

Manual

The vehicle has a manual transmission

Automatic

The vehicle has an automatic transmission

Unknown

It cannot be determined what type of transmission is in the vehicle.

Screen Name: Drive Wheels
Variable Name: Drive Wheels

Element Attributes:

Front Wheel Drive
Rear Wheel Drive
Four Wheel Drive
All Wheel Drive
Unknown

Source: Vehicle inspection

Remarks:

The coding of this variable reflects the type of drive wheels power the vehicle.
This variable is being collected for use in modifying input to the WINSMASH computer program.

Front Wheel Drive

The vehicle has front wheel drive

Rear Wheel Drive

The vehicle has rear wheel drive

4 Wheel Drive

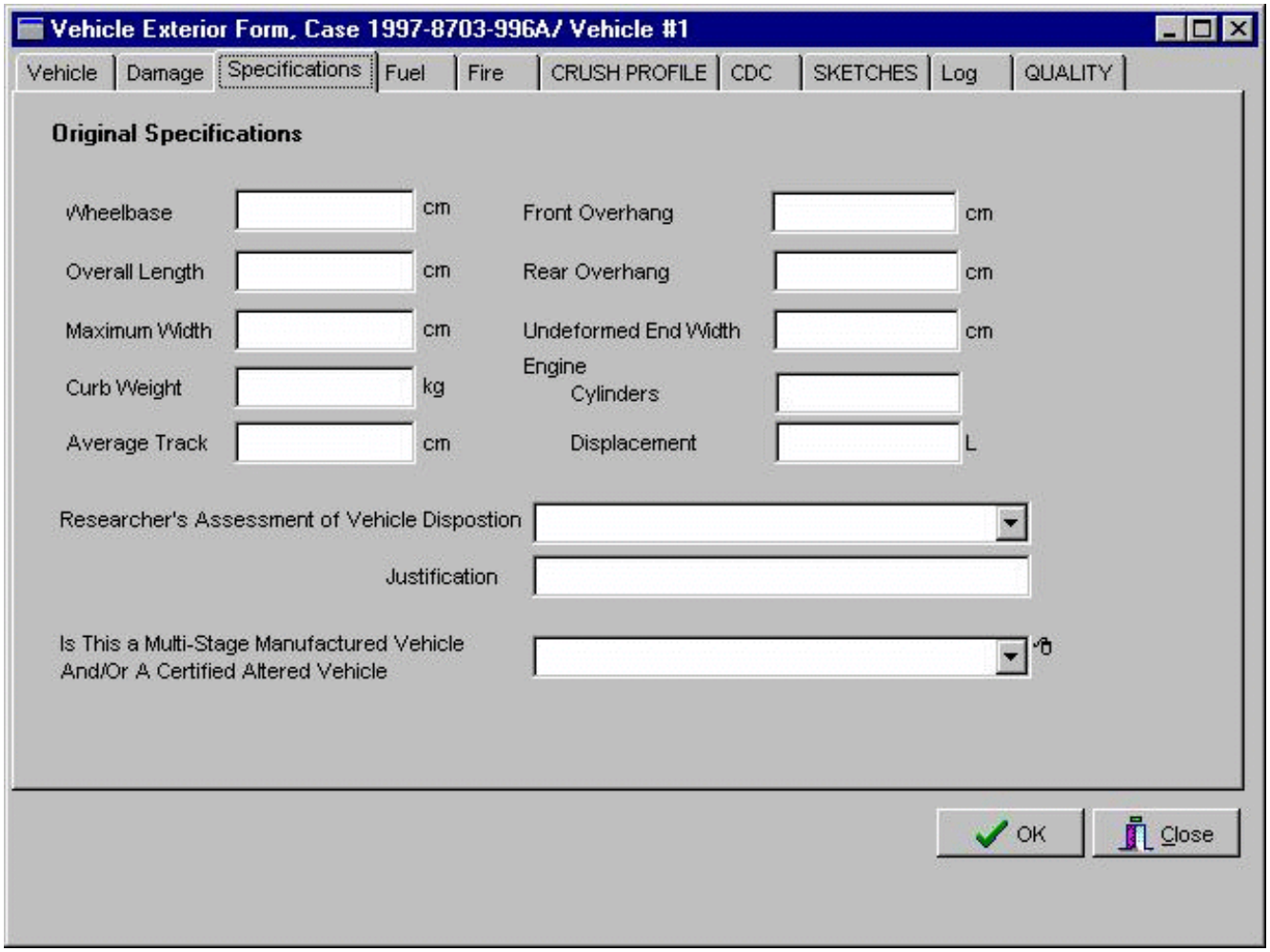
The vehicle has 4 wheel drive

All Wheel Drive

The vehicle has all wheel drive

Unknown

Use this when it cannot be determined what type of drive wheels power the vehicle.


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Original Specifications
Wheelbase
cm
Front Overhang
cm
Overall Length
cm
Rear Overhang
cm
Maximum Width
cm
Undeformed End Width
cm
Curb Weight
kg
Engine
Cylinders
Average Track
cm
Displacement
L
Researcher's Assessment of Vehicle Dispostion
Justification
Is This a Multi-Stage Manufactured Vehicle
And/Or A Certified Altered Vehicle
OK
Close

Screen Name: Original Specifications—Wheelbase
Variable Name: Wheelbase

Element Attributes:

Enter to the nearest centimeter.
Unknown

Source: Vehicle specifications, exemplar vehicle

Remarks:

The wheelbase dimension is obtained from source materials and not from vehicle measurements. If written vehicle specifications cannot be found, after consultation of the zone center, the researcher may take the measurements from an exemplar vehicle.

The coding of this variable reflects the length of the vehicle's original or undamaged wheelbase to the nearest centimeter.

Unknown

is used when this vehicle's original wheelbase cannot be determined.

Screen Name: Original Specifications—Overall Length
Variable Name: Overall Length

Element Attributes:

Enter to the nearest centimeter
Unknown

Source: Vehicle specifications, exemplar vehicle

Remarks:

Enter the overall length of the vehicle, as determined from source materials, to the nearest centimeter.

Any add-on equipment is excluded from the overall length of the vehicle (i.e., a pick-up with an after-market bumper added).

Unknown

is used when this vehicle's original overall length cannot be determined.

Screen Name: Original Specifications—Maximum Width
Variable Name: Maximum Width

Element Attributes:

Enter to the nearest centimeter
Unknown

Source: Vehicle specifications, exemplar vehicle

Remarks:

Enter the overall/maximum width of the vehicle, as determined from source materials, to the nearest centimeter.

Unknown

is used when this vehicle's original overall width cannot be determined.

Screen Name: Original Specifications—Curb Weight
Variable Name: Curb Weight

Element Attributes:

Curb weight of vehicle.
Unknown

Source: Researcher determined

Remarks:

Enter this vehicle's curb weight.

Do not confuse the rated Gross Vehicle Weight Rating (GVWR) with the curb weight since it is likely to be significantly greater than the curb weight.

"Vehicle" is defined in this variable to mean the same vehicle identified under Body Type.

If the vehicle model is known, but the engine size is unknown (*e.g.*, 6 or 8 cylinders), code the average between the high and low curb weights for the model and annotate that the "average" was reported.

When the vehicle specifications do not report the vehicle weight with the proper engine size, adjustments must be made. First, try to determine the weight differences from the vehicle specifications. If the weight difference cannot be determined from the specifications, then adjust as follows: 8 cyl. to 6 cyl. - subtract 100lb/45 kilograms; 6 cyl. to 4 cyl. - subtract 75lb/34 kilograms.

If a source material reports “shipping weight” add 100lb/45 kilograms to obtain a curb weight on all CDS applicable vehicles.

Towed trailing units are considered cargo weight and not included in the vehicle curb weight.

Unknown

is entered when the curb weight of this vehicle cannot be determined.

Screen Name: Original Specifications—Average Track
Variable Name: Average Track Width

Element Attributes:
Enter to the nearest centimeter
Unknown

Source: Vehicle specifications, undamaged measurements

Remarks:

Enter the average track width of the vehicle to the nearest centimeter.

If vehicle specifications cannot be obtained, and there are no post manufacture modifications, and there is no significant damage to the axles, then you can get the value from the case vehicle. Measure both undamaged track widths on the vehicle and record the average.

If an axle is damaged such that an average value cannot be determined, use the measurement of the undamaged axle as the average encoded value.

If both axles are significantly damaged record the value from an exemplar vehicle.

If the vehicle is equipped with dual rear wheels (*i.e.*, some full-size pickup trucks); the track width is measured from the center of the space between the wheels on both sides.

Unknown
is used in the following situations:

- The axles are significantly damaged and there are no specifications available for this vehicle, and an exemplar vehicle was not measured.
- The axle is significantly damaged *and* there were post-manufacture modifications that would alter the track width.
- The measurements were not obtained from this vehicle or and exemplar vehicle and there are no specifications available.

Screen Name: Original Specifications—Front Overhang
Variable Name: Front Overhang

Element Attributes:

Enter to the nearest centimeter
Unknown

Source: Vehicle specifications

Remarks:

Enter the front overhang, as determined from source materials, of the vehicle to the nearest centimeter.

NOTE: the researcher should record, on the sketch page, the front and rear stringline measurements. These measurements will closely represent the original overhang measurements provided a reference line was established and the axles were not moved.

Unknown

If no written specifications can be found , then enter unknown.

Screen Name: Original Specifications—Rear Overhang
Variable Name: Rear Overhang

Element Attributes:

Enter to the nearest centimeter
Unknown

Source: Vehicle specifications

Remarks:

Enter the rear overhang, as determined from source materials, of the vehicle to the nearest centimeter.

NOTE: the researcher should record, on the sketch page, the front and rear stringline measurements. These measurements will closely represent the original overhang measurements provided a reference line was established and the axles were not moved.

Unknown

If no written specifications can be found , then enter unknown.

Screen Name: Original Specifications—Undeformed End Width
Variable Name: Undeformed End Width

Element Attributes:

Enter measured value to the nearest centimeter
Unknown

Source: Vehicle inspection, secondary source of an exemplar vehicle

Remarks:

The undeformed end width is the undamaged dimension of:

1) the contacted end plane or
2) the front undamaged plane if the side plane is contacted.

Measure between the apex of both bumper corners.

Unknown

If the vehicle cannot be directly measured and an exemplar vehicle cannot be found, then enter unknown.

Screen Name: Original Specifications—Engine Cylinders
Variable Name: Engine Cylinders

Element Attributes:

Record number of cylinders
Unknown

Source: Vehicle inspection, specifications, VIN

Remarks:

The coding of this variable reflects the number of cylinders in the vehicle. The information can be found in vehicle specifications. It may also be found in owner's manuals.

Unknown

If the number of engine cylinders cannot be determined, then enter unknown.

Screen Name: Original Specifications—Engine Displacement
Variable Name: Engine Displacement

Element Attributes:

Recorded to the nearest tenth of a Liter
Unknown

Source: Vehicle inspection, specifications, VIN

Remarks:

The coding of this variable reflects the vehicle's engine displacement. The information can be found in vehicle specifications. It may also be found in owner's manuals, or from the vehicle inspection.

Enter the vehicle's engine displacement. It is recorded to the nearest tenth of a liter.

Unknown

If the displacement cannot be determined, then enter unknown.

Screen Name: Researcher's Assessment of Vehicle Disposition
Variable Name: Researcher's Assessment of Vehicle Disposition

Element Attributes:

Not towed due to vehicle damage
Towed due to vehicle damage
Unknown

Source: Primary source is the vehicle inspection; secondary source is interviewee(s).

Remarks:

Determine this variable based on vehicle inspection (which is supplemented by interview data for a repaired vehicle). **Under no circumstance should the PAR be used as a source for coding this variable. "Towing"** is defined identically to the definition in variable **Police Reported-Vehicle Disposition** (*i.e.*, towing must be a result of event-related disabling damage; towing must occur directly from the scene, etc.). A gray area exists, however, when attempting to define the term **"disabling damage"**.

Determine the severity of the damage during the vehicle's inspection. Not towed due to vehicle damage if the damage is **"minor"** (*i.e.*, minor mechanical repairs ***could*** have been completed at the scene). **"Minor mechanical repairs"** refers to items such as: replacing headlights or taillights, changing tires, pulling sheet metal away which may be restricting a wheel, etc.

NOTE: These repairs need not have been completed at the scene. They are merely examples of situations which do *not* require the vehicle to be categorized "disabled" for the NASS CDS study.

Not towed due to vehicle damage

when the vehicle was driven from the scene, or when the vehicle was unnecessarily towed from the scene (*i.e.*, could have been driven).

Towed due to vehicle damage

when the vehicle sustained damage from the crash such that towing was required.

Unknown

when the vehicle was towed from the scene but the reason for the towing cannot be determined

Screen Name: Researcher's Assessment of Vehicle Disposition Justification
Variable Name: Justification for Researcher's Assessment of Vehicle Disposition

Element Attributes:

Enter justification for tow status

Source: Primary source is the vehicle inspection; secondary source is interviewee(s).

Remarks:

Indicate the reason for the determination that the vehicle was or was not towed (i.e., severe damage, restricted tires, etc.)

When there is a conflict between Police reported tow status and the researcher's assessment of tow status, include the reason for the choice. For example, a researcher selects Not towed due to vehicle damage and provides the following annotation: "The vehicle received only broken headlights in the collision; police required that the vehicle be towed".

Screen Name: Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?
Variable Name: Multi-Stage or Altered Vehicle

Element Attributes:

No post manufacturer modifications
Yes — post manufacturer modifications (specify)
Unknown if vehicle is modified

Source: Vehicle Inspection.

Remarks:

Under the "Code of Federal Regulations, Title 49 - Transportation" Chapter V Part 567, Sections 567.5 and 567.7, a label certifying compliance with all Federal Motor Vehicle Safety Standards must be affixed to a multi-stage manufactured vehicle or altered (post manufactured) vehicle.

A multi-stage manufactured vehicle will generally begin as a chassis-cab (incomplete vehicle) and subsequently end up in final-stage as a pickup based utility truck (dump truck, flat bed, stake body, tow truck, etc.) or a van derivative (*i.e.*, van conversion, Hi-cube, motor home, etc.).

Altered vehicles will generally involve a major modification of basic components such as suspension, frame, power plants, etc., with work generally performed by a recognized auto body shop. The lengthening of a standard automobile chassis to create a limousine would be one example of the type of alteration which would qualify for certification.

To determine if the vehicle qualifies, locate the certification label which should include one of the following statements:

Multi-stage vehicle

L Incomplete manufactured vehicle (chassis-cab) certification label should include the statement: **"CHASSIS-CAB MANUFACTURED BY"** or **"CHASSIS-CAB MFD. BY"**.

L Intermediate manufactured vehicle certification label should have the following statement: **"INTERMEDIATE MANUFACTURED BY"** or **"INTERMEDIATE MFD. BY"**.

L Final manufactured vehicle certification label should have the following statements: **"MANUFACTURED BY"** or **"MFD. BY"** and **"INCOMPLETE VEHICLE MANUFACTURED BY"** or **"INC VEH MFD. BY"**.

Altered vehicle

L An altered vehicle certification label should include the statement: **"This vehicle was altered by (individual or corporate name) in (month and year in which alterations were completed) and as altered it conforms to all applicable Federal Motor Vehicle Safety Standards affected by the alteration and in effect in (month, year)."**

Screen Name: Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle? (cont'd)
Variable Name: Multi-Stage or Altered Vehicle (cont'd)

These labels are generally affixed in one of the following areas on the driver's side of the vehicle:

- **L** hinge pillar
- **L** door-latch post
- **L** door edge that meets the door-latch post
- **L** left side of the instrument panel
- **L** inward-facing surface of driver's door

No post manufacturer modifications

is used when this vehicle was a full-line manufactured vehicle. Full-line is interpreted as a vehicle that is completely assembled at the end of a plant assembly line of its original manufacturer. This would include vehicles which only require cosmetic additions such as additional paint, mirrors, wheels, etc., to be customer ready.

Yes — post manufacturer modifications

is used for multi-stage vehicles and/or altered certified vehicles. This includes vehicles which were in various stages of completion (*i.e.*, incomplete, intermediate, final).

Vehicles that are altered via "backyard modification (*i.e.*, addition of air shocks, spring spacers, cosmetic alteration including sheet metal and paint, etc.) are not identified as certified altered vehicles. Only those businesses which specialize in vehicle alterations (*i.e.*, limo body shops, etc.) where a label of alteration is required by federal regulations and is present on the vehicle are identified in this element.

***An image of the certification label(s) is essential and must be included with the case*.** **Categorize this image in the Miscellaneous Category.** Refer to the following illustrations for examples of certifying labels.

Unknown

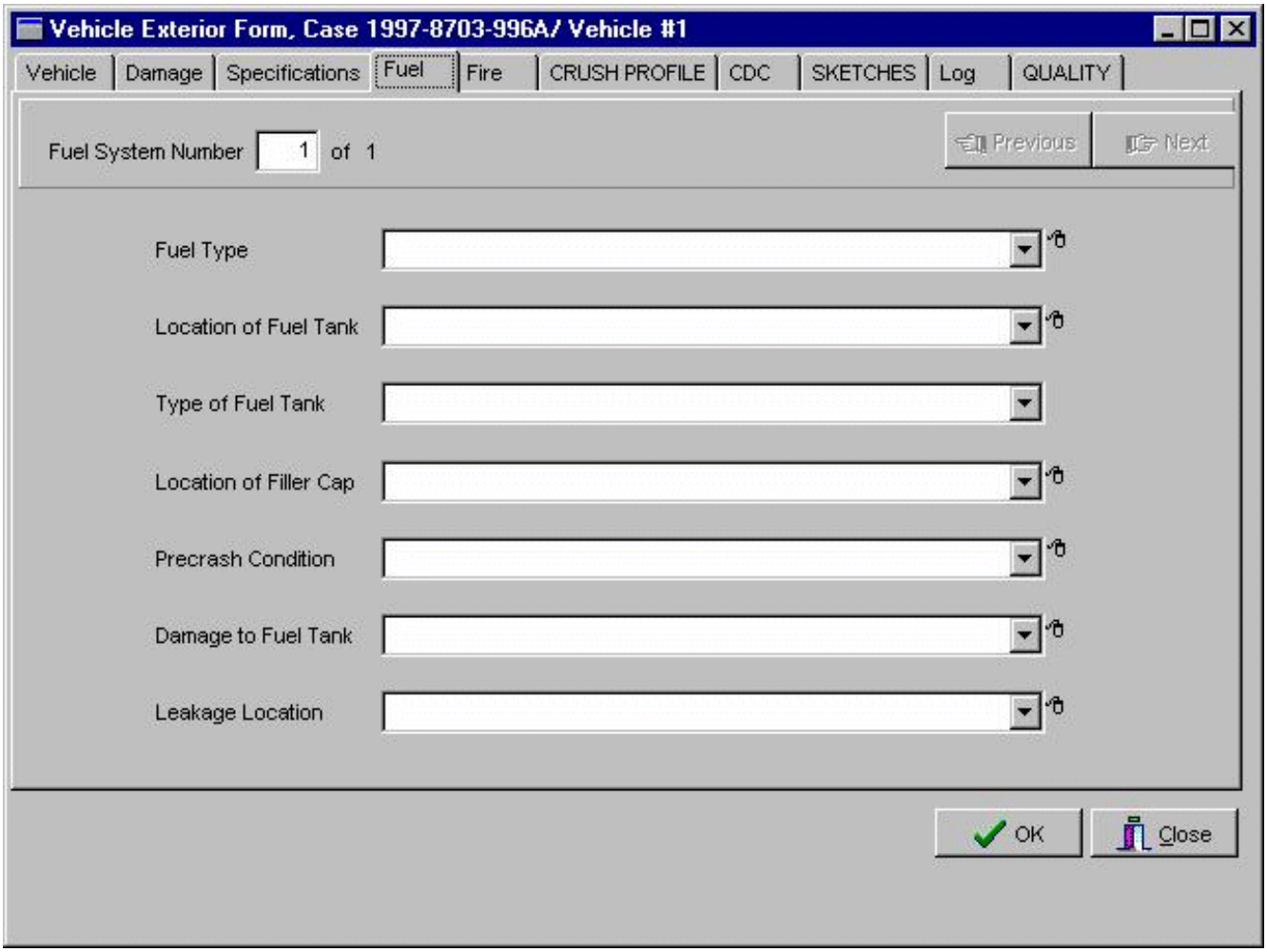
is used in the following situations.

- **L** The vehicle fits the description of a multi-stage or altered vehicle, but the researcher was not able to view the label(s) for positive identification.

- **L** The label(s) was removed/destroyed so a clear determination of whether the vehicle was a certified multi-stage or altered vehicle could not be made.

Fuel Systems

Be sure to photograph all fuel tanks and surrounding area. Refer to the NASS CDS Digital Photography Guideline for a detailed description of the required photographs.



Record all fuel tank locations.

Screen Name: Fuel System Number
Variable Name: Fuel System Number

Element Attributes:
Number of fuel tank

Remarks:

Insert a fuel system for each fuel system in the vehicle.

This variable records those fuel tanks that are permanently affixed to the vehicle as an energy reservoir for the vehicle's engine. Some vehicles may be equipped with reserve tanks. (i.e., one or more tanks connected in series and controlled by the driver).

Extra fuel tanks on-board a vehicle which are not designed to supply fuel to the vehicle's engine are not considered for this variable. Some examples include: fuel cans, bottled gas, and ancillary tanks for occupational related work (*i.e.*, construction, etc.).

Screen Name: Fuel Type
Variable Name: Fuel Type

Element Attributes:

Gasoline
Diesel
CNG (Compressed Natural Gas)
LPG (Liquid Petroleum Gas) also known as Propane
LNG (Liquid Natural Gas)
Methanol (M100 or M85)
Ethanol (E100 or E85)
Other (Hydrogen or others) (specify):

Lead Acid Battery
Nickel-Iron Battery
Nickel-Cadmium Battery
Sodium Metal Chloride Battery
Sodium Sulfur Battery
Other Battery (Specify):
Other Hybrid (specify):
Unknown fuel type

Source: Primary source is the vehicle inspection; secondary source is the interviewee(s).

Remarks:

These variables record the fuel type available in each fuel system during this crash sequence. The type of fuel the engine was operating on will normally be indicated on the vehicle. Typical locations include, but are limited to fuel door, filler cap, fuel gauge and vehicle owner's manual.

Other hybrid (specify)
is used when the vehicle is powered by an alternative energy source such as a "flywheel" technology.

Unknown fuel type
is used when:

- **L** The vehicle was totally destroyed, or
- **L** The fuel type can not be determined.

Screen Name: Location of Fuel Tank
Variable Name: Location of Fuel Tank

Element Attributes:

Aft of rear axle centered
Aft of rear axle left side
Aft of rear axle right side
Forward of rear axle centered
Forward of rear axle left side
Forward of rear axle right side
Over center of the rear axle
Other (specify):
Unknown

Source: Vehicle Inspection.

Remarks:

This variable identifies the location(s) of this vehicle's fuel tank(s).

Be sure to photograph the tank and surrounding area. Refer to the NASS CDS Digital Photography Guideline for a detailed description of the required photographs.

Aft of rear axle centered

is used to identify fuel tanks located in back of the center of the rear wheels (rear axle) and in the center of the vehicle (*e.g.*, between the frame rails if present).

Aft of rear axle left side

is used to identify fuel tanks located in back of the center of the rear wheels (rear axle) and on the left side of the vehicle (*e.g.*, between the frame rails and the outer body surface).

Aft of rear axle right side

is used to identify fuel tanks located in back of the center of the rear wheels (rear axle) and on the right side of the vehicle (*e.g.*, between the frame rails and the outer body surface).

Forward of center of the rear wheels (rear axle) centered

is used to identify fuel tanks located in front of the center of the rear wheels (rear axle) and in the center of the vehicle (*e.g.*, between the frame rails if present).

Forward of center of the rear wheels (rear axle) left side

is used to identify fuel tanks located in front of the center of the rear wheels (rear axle) and in the left side of the vehicle (*e.g.*, between the frame rails and the outer body surface).

Forward of center of the rear wheels (rear axle) right side

is used to identify fuel tanks located in front of the center of the rear wheels (rear axle) and in the right side of the vehicle (*e.g.*, between the frame rails and the outer body surface).

Screen Name: Location of Fuel Tank (cont'd)
Variable Name: Location of Fuel Tank (cont'd)

Over center of the rear axle
is used when any part of the fuel tank is located over the center of the rear wheels (rear axle). This attribute takes priority over the following attributes.

Other (specify)
is used when the fuel tank is in a location other than as specified in the previous attributes . Included in this attribute are fuel tanks located inside the passenger compartment, trunk, cargo area, pickup bed, etc. The location is specified in the space provided.

Unknown
is used when:

L the fuel tank location can not be determined and an exemplar vehicle can not be located.

Screen Name: Type of Fuel Tank
Variable Name: Type of Fuel Tank

Element Attributes:

Metallic
Non-Metallic
Unknown

Source: Vehicle Inspection.

Remarks:

This variable records the composition of the fuel tank that is permanently affixed to the vehicle as an energy reservoir for the vehicle's engine.

Metallic

is used for fuel tanks made from metal. This would include steel, aluminum (alloys), stainless steel, etc.

Non-metallic

is used for fuel tanks which are made from plastic. Plastic tanks are composed of high density polyethylene (HDPE).

Unknown

is used when the type of tank material could not be determined:

- **L** researcher could not make a determination due to inaccessibility, or
- **L** vehicle was dismantled during inspection and the fuel tank(s) was not available.

The following information has been compiled from discussions with automobile manufacturers, service and parts representatives and the National Automotive History Collection. This information cannot be used to code this variable and must be confirmed by visual and/or mechanical means.

Vehicle Fuel Tank Material

HDPE (High Density Polyethylene)

(1) ***Ford Motor Co.***

Ford Aerostar Mini Van	HDPE
Ranger PU (89-on)	HDPE
Explorer	HDPE
Cougar/T-Bird (90-on)	Some have HDPE with steel reinforcement
F Series PU	Some of the earlier models may have HDPE
Escort (91-on)	Some have HDPE
Tracer (91-on)	Some have HDPE
Mustang (93-on)	Some have HDPE

Screen Name: Type of Fuel Tank (cont'd)
Variable Name: Type of Fuel Tank (cont'd)

(2) ***General Motors Corp.***

Chevrolet

Lumina Mini Van	HDPE
"B" Body (91-on)	HDPE
- Caprice	
- Impala	
- Station Wagons	
"L" Body (91-on)	HDPE
- Corsica	
- Beretta	

Pontiac

Tran Sport Mini Van	HDPE
Parisienne	HDPE

Oldsmobile

Silhouette Mini Van	HDPE
Custom Cruiser	HDPE

Buick

LeSabre Estate (90-on)	HDPE
Roadmaster	HDPE

Saturn HDPE - all models

(3) ***Chrysler Corp.***

Plymouth

Voyager Wagon	HDPE in optional 20 gallon tank
Trailduster (80-on)	HDPE

Dodge

Caravan Wagon	HDPE in optional 20 gallon tank
Sportsman(1980)	Optional tank was HDPE
(88-on)	HDPE
Ram Wagon(1980)	Optional tank was HDPE
(88-on)	HDPE
Tradesman(1980)	Optional tank was HDPE
(88-on)	HDPE
Ram Van(1980)	Optional tank was HDPE
(88-on)	HDPE
Ram PU(80-on)	HDPE
Power Ram PU(80-on)	HDPE
Ramcharger(80-on)	HDPE
Dakota(86-on)	HDPE
Monaco	HDPE

Screen Name: Type of Fuel Tank (cont'd)
Variable Name: Type of Fuel Tank (cont'd)

Eagle

Premier(88-on)	HDPE

Jeep

CJ5 (83-91)	Optional tank was HDPE
CJ7 (81-86)	Optional tank was HDPE
CJ8 (81-86)/Scrambler	Optional tank was HDPE
Wrangler (87-on)	Optional tank (22 gal) was HDPE
Cherokee (80-on)	HDPE-some have steel tanks
Wagoneer (80-on)	HDPE
J10, J20 PU (80-on)	HDPE
Grand Wagoneer (84-on)	HDPE

(4) ***Peugeot***

505	HDPE
Station Wagon	HDPE
Sedan	HDPE

(5) ***Volkswagen***

Golf (85-86, 89-on)	HDPE
Jetta (90-on)	HDPE
Passat (92-on)	HDPE
Corrado (89-on)	HDPE

(6) ***Volvo***

700 Series (85-on)	HDPE

(7) ***Saab***

All Models (80-on)	HDPE

(8) ***Merkur***

Scorpio	HDPE
XR4Ti	Some are HDPE

(9) ***Mitsubishi*** Trucks only are HDPE

Screen Name: Type of Fuel Tank (cont'd)
Variable Name: Type of Fuel Tank (cont'd)

All Vehicles from the Following Manufacturers Have Steel Gas Tanks

Acura	Infiniti	Porsche
Alfa Romeo	Isuzu	Renault
Bentley	Lexus	Sterling
BMW	Lincoln	Subaru
Cadillac	Lotus	Suzuki
Geo	Mazda	Toyota
Honda	Mercedes Benz	Yugo
Hyundai	Nissan	

Screen Name: Location of Filler Cap
Variable Name: Location of Filler Cap

Element Attributes:

On back plane
Over the rear axle on left side plane
Over the rear axle on right side plane
Aft of rear axle on left side plane
Aft of rear axle on right side plane
Forward of rear axle on left side plane
Forward of rear axle on right side plane
Other (specify):
Unknown

Source: Vehicle Inspection, secondary source exemplar vehicle

Remarks:

These variables identify the location(s) of the fuel tank filler cap in its original undamaged position on the vehicle.

Be sure to photograph the tank and surrounding area. Refer to the NASS CDS Digital Photography Guideline for a detailed description of the required photographs.

On back plane

is used when the fuel tank filler cap is located on the back plane of the vehicle.

Over the rear axle on left side plane

is used when any part of the fuel tank filler cap is located over the center of the rear wheels (rear axle) on the left side plane. This attribute takes precedence over the following attributes.

Over the rear axle on right side plane

is used when any part of the fuel tank filler cap is located over the center of the rear wheels (rear axle) on the right side plane. This attribute takes precedence over the following attributes.

Aft of rear axle on left side plane

is used when the fuel tank filler cap is located behind the center of the rear wheels (rear axle) and on the left side plane of the vehicle.

Aft of rear axle on right side plane

is used when the fuel tank filler cap is located behind the center of the rear wheels (rear axle) and on the right side plane of the vehicle.

Screen Name: Location of Filler Cap (cont'd)
Variable Name: Location of Filler Cap (cont'd)

Forward of rear axle on left side plane
is used when the fuel tank filler cap is located in front of the center of the rear wheels (rear axle) on the left side plane of the vehicle.

Forward of rear axle on right side plane
is used when the fuel tank filler cap is located in front of the center of the rear wheel(s) (rear axle) on the right side plane of the vehicle.

Other (specify)
is used when the fuel tank filler cap is in a location other than as specified above. The location is specified in the space provided.

Unknown
is used when the fuel tank filler cap location can not be determined and an exemplar vehicle can not be located (e.g., the vehicle was totally destroyed).

Screen Name: Precrash Condition
Variable Name: Precrash Condition of Fuel Tank

Element Attributes:

No damage
Corroded
Leaking
Abraded
Other (specify):
Unknown
[No fuel tank]

Source: Vehicle Inspection, secondary source is the interview

Remarks:

These variables record the damage to the fuel tank(s) that was present prior to the crash. The objective of these variables is to identify damage to the fuel tank(s) that was not a result of the crash. When more than one damage is present select the choice that is higher on the list.

No damage
is used when the fuel tank was not damaged prior to the crash

Corroded
is used when corrosion damage is evident on the fuel tank.

Leaking
is used when there is evidence of leakage present and it can be determined that it is not a result of the collision sequence of events.

Abraded
is used when there is evidence of abrasion or scraping on the fuel tank not a result of the crash.

Other (specify)
is used to indicate other damage not listed above

Unknown
is used when the precrash condition of the fuel tank cannot be determined

Screen Name: Damage to Fuel Tank
Variable Name: Damage to Fuel Tank

Element Attributes:

No damage to tank
Deformed, no seam failure
Deformed, with a seam failure
Punctured
Lacerated (ripped)
Abraded (scraped)
Filler neck separation from the fuel tank
Other damage (specify):
Unknown
[No fuel tank]

Source: Vehicle Inspection.

Remarks:

These variables record the damage to the fuel tank(s) that occurred during the sequence of crash events. The objective of these variables is to identify damage to the fuel tank(s) that may or may not result in a loss of fuel system integrity. If the fuel tank(s) has more than one form of damage, enter the damage that resulted in a fuel system integrity loss. If there were multiple types of integrity loss then select the first attribute which applies from the following prioritized list: Deformed, with a seam failure, Punctured, Lacerated (ripped), Abraded (scraped), Filler neck separation from the fuel tank, Other damage (specify). If there are multiple forms of damage and no fuel system integrity loss, then enter according to the following prioritized list: Deformed, no seam failure, Abraded (scraped), and Other damage (specify).

Be sure to photograph the tank and surrounding area. Refer to the NASS CDS Digital Photography Guideline for a detailed description of the required photographs.

In addition, annotate any pre-crash damage to the fuel tank.

No damage to fuel tank
is used when the fuel tank is not damaged during the sequence of crash events.

Deformed, no seam failure
is used when the fuel tank was deformed or crushed during the crash and the seam did not fail. Tanks which do not have a seam(s) (*e.g.*, extruded fuel tanks such as high density polyethylene HDPE) should be evaluated for deformation and encoded under this attribute if applicable.

Deformed, with a seam failure
is used when the fuel tank was deformed or crushed during the crash and the seam failed. Single piece extruded tanks (*i.e.* no seams, HDPE) which experience integrity loss are ***not*** entered here.

Screen Name: Damage to Fuel Tank (cont'd)
Variable Name: Damage to Fuel Tank (cont'd)

Punctured
is used when the fuel tank was punctured, perforated or pierced during the collision sequence.

Lacerated (ripped)
is used when the fuel tank was lacerated, cut, sliced, ripped or torn during the collision sequence.

Abraded (scraped)
is used when the fuel tank was abraded or scraped during the collision sequence.

Filler neck separation from the fuel tank
is used when the filler neck was separated from the fuel tank during the collision sequence.

Other damage (specify)
is used when damage to the fuel tank can not be described in other attributes. HDPE tanks that are crushed to the point that they crack, causing an integrity loss of the fuel cell, are included here.

Unknown
is used when the fuel tank damage can not be determined.

Screen Name: Leakage Location
Variable Name: Fuel System Leakage Location

Element Attributes:

No fuel leakage

Primary Area Of Leakage
Tank
Filler neck
Cap
Lines/pump/filter
Vent/emission recovery
Other (specify):
Unknown

Source: Vehicle Inspection.

Remarks:

These variables provide information on fuel retention by the fuel system during the crash sequence. The objective of these variables is to report fuel system leakage. If the fuel system has leakage from more than one source, enter the leakage that resulted in a fire. If there are multiple areas of leakage and no fire, then enter the most severe area of leakage. If the severity can not be determined, then use attributes in the priority listed.

Be sure to photograph the area of leakage and surrounding area(s). Refer to the NASS CDS Digital Photography Guideline for a detailed description of the required photographs.

If no fuel leakage was caused by the crash (record no fuel leakage) if the fuel system was leaking prior to the collision, (*i.e.*, corrosion to tank, loose fuel line, etc.) annotate the information.

No fuel leakage
is used when there has been no loss in fuel retention.

Tank
is used when the fuel tank was leaking as a result of an impact during the crash sequence. Also use this attribute when leakage occurs as a result of all the filler neck separating from the fuel tank.

Filler Neck
is used when the filler neck is the source of fuel leakage as a result of an impact during the crash sequence.

Cap
is used when the mouth of the filler neck or the filler cap is the source of fuel leakage that occurred as a result of damage from an impact during this vehicle's crash sequence.

Screen Name: Leakage Location (cont'd)
Variable Name: Fuel System Leakage Location (cont'd)

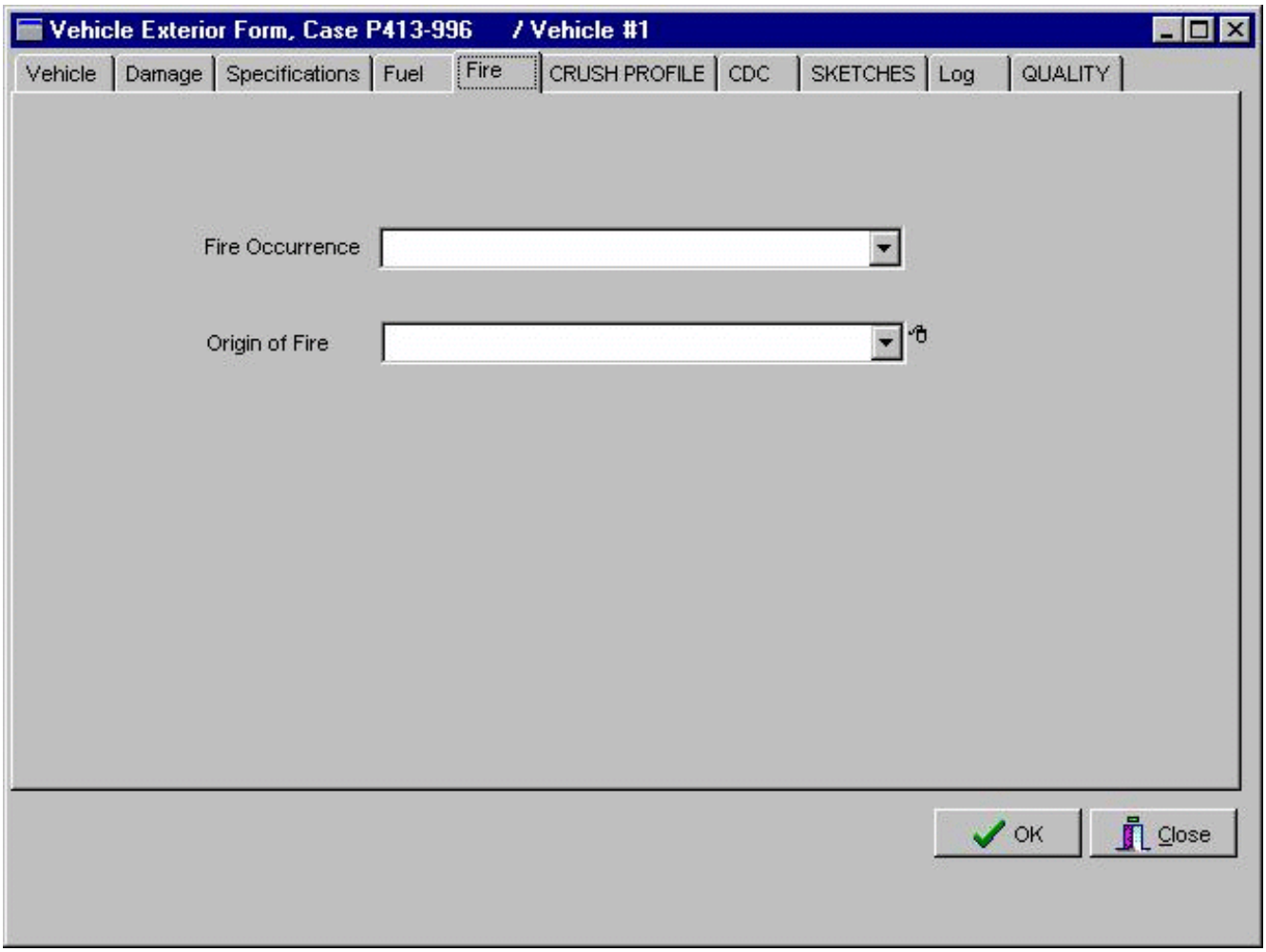
Lines/pump/filter
is used when fuel was leaking from the fuel system lines, pump and/or fuel filter as a result of an impact during the crash sequence.

Vent/emission recovery
is used when fuel was leaking from the vent or emission recovery system as a result of an impact during the crash sequence.

Other (specify)
is used when fuel was leaking, as a result of the crash, from other than the sources specified above.

Unknown
is used when:

- **L** It cannot be determined if the fuel system experienced any leakage, or
- **L** The source of the fuel system leakage could not be determined.


Vehicle Exterior Form, Case P413-996 / Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Fire Occurrence
Origin of Fire
OK
Close

Screen Name: Fire Occurrence
Variable Name: Fire Occurrence

Element Attributes:

Minor fire
Major fire
Unknown

Source: Primary source is the vehicle inspection; secondary sources include the interviewee(s), police report, and occupant medical records.

Remarks:

Fire events are added on the case form.

In order to classify fire damage, a fire must have occurred to this vehicle. (1) The fire could have resulted from an impact with another vehicle or object which consequently caused a fuel system integrity failure or electrical short circuit. (2) If the fire resulted from a noncollision event (*e.g.*, electrical short circuit, fuel leakage, etc.) that occurred prior to this vehicle impacting with another vehicle or object, and if the crash qualifies for the NASS CDS, then both the noncollision event and all subsequent events are entered on the Case Form Events Tab.

As it pertains to the occurrence of fire, the crash circumstances are not considered stabilized until the threat of damage to this vehicle, or injury consequences to this vehicle's occupants, has ceased. Therefore, the crash sequence is not considered stabilized until all occupants have exited the vehicle and the scene has been declared safe by police or other authority. Fires that occur at a later time to vehicles abandoned at the scene (*e.g.*, in open fields, on hillsides, etc) or to vehicles removed from the scene to another location (towyard, curbside, etc.) are not considered part of the crash sequence.

Minor
is a general term used to describe the degree of fire involvement and is used in the following situations:

- **L** Engine compartment only fire
- **L** Trunk compartment only fire
- **L** Partial passenger compartment only fire
- **L** Undercarriage only fire
- **L** Tire(s) only fire

Screen Name: Fire Occurrence (cont'd)
Variable Name: Fire Occurrence (cont'd)

Major

identifies those situations where the vehicle experienced a greater fire involvement than defined under "minor" above and is used in the following situations:

- **L** Combined engine and passenger compartment fire (either partial or total passenger compartment involvement).
- **L** Total passenger compartment fire.
- **L** Combined trunk and passenger compartment fire (either partial or total passenger compartment involvement).
- **L** Combined undercarriage and passenger compartment (either partial or total passenger compartment involvement).
- **L** Combined tire(s) and passenger compartment (either partial or total passenger compartment involvement).

Unknown

is used when it cannot be determined if this vehicle sustained a fire related to the crash, e.g., a fire was reported, but this vehicle was repaired prior to inspection and it cannot be determined if this vehicle was involved in the fire.

Screen Name: Origin of Fire
Variable Name: Origin of Fire

Element Attributes:

Vehicle exterior (front, side, back, top)
Exhaust system
Fuel tank (and other fuel retention system parts)
Engine compartment
Cargo/trunk compartment
Instrument panel
Passenger compartment area
Other location (specify):
Unknown

Source: Primary source is the vehicle inspection; secondary sources include the interviewee(s), and police report.

Remarks:

This variable identifies the location of fire initiation and should not be confused with magnitude of fire. As an example, if the vehicle appeared totally "burned", Passenger compartment area would not necessarily be used unless the fire began in the vehicle's interior.

For many fires it will be difficult to determine fire origin especially when the entire vehicle was involved. The researcher should look for "hot" spots which generally appear lighter in coloration and are often accompanied by warped or melted metal.

If multiple fires occur to the same vehicle, choose the fire that started within this vehicle (*i.e.*, choose an interior fire over an exterior fire), then choose the fire with the greater severity.

Vehicle exterior (front, side, back, top)
identifies fire source as occurring external to the vehicle. This generally occurs in a multiple vehicle collision where another vehicle initiates the fire and the fire is then introduced to this vehicle.

Exhaust system
is used when components of the exhaust system initiated the fire. Components of the exhaust system include: exhaust pipes, muffler/resonator, and catalytic converter.

Fuel tank (and other fuel retention system parts)
includes: the fuel tank(s), fuel supply and vent lines, tank filler neck, and fuel filler cap. Use this attribute when the fuel tank area (defined above) sustains damage such that fuel leaks and is ignited by sparks from contact with the surface of crushing metal components, or is ignited by hot surfaces of the vehicle or object that is involved in producing the damage (*e.g.*, lamp filaments, hot engine components of an impacting vehicle).

Do not use this if fuel leakage occurs and is ignited in this vehicle's engine compartment [*i.e.*, use Engine compartment]. If fuel leakage occurs in the fuel tank area and spills onto and is ignited by hot exhaust system components, then use Exhaust system.

Screen Name: Origin of Fire (cont'd)
Variable Name: Origin of Fire (cont'd)

Engine compartment

is used when the fire initiates in the area (open or enclosed) which houses the engine. Generally, most engine compartments are located at the front end of the vehicle under the hood. However, some engines are mounted midway (referred to as mid- engine) on the chassis, and some are located at the rear of the vehicle.

The reason for fire initiation in these areas is inconsequential (whether fuel or electrical), but the fire's relative location to the engine is the important consideration.

Cargo/trunk compartment

identifies areas which are separated from the passenger compartment by a solid partition. In passenger automobiles, the partition will generally be formed by the seat back(s), package shelf, and trunk lid. However, areas designed to accommodate cargo (*e.g.*, the area behind the second seat of a station wagon) are not considered a cargo compartment unless these areas were walled off by a solid partition. Please note, a grate fencing is not considered a solid partition. A solid partition is generally composed of a material which limits air flow between areas.

Cargo boxes on pickup trucks are generally separated from the occupant compartment by the back wall of the cab and are classified as a cargo compartment. Please note, operable windows in backlights of pickup cabs are considered part of the solid partition, regardless of opening status.

Light vans will generally not have a separate cargo compartment unless a solid wall was installed.

Instrument panel

is used when the fire originated under the instrument panel. The instrument panel is defined as the panel extending horizontally from A-pillar to A-pillar and vertically from the lower part of the windshield to the lowest vertical edge of the panel.

Passenger Compartment area

is used when the fire initiated within the designated passenger area. This includes cargo areas adjacent to seating areas which were not separated by a solid partition.

Other location

is used when none of the other attributes apply . Included in this attribute are fires occurring with wheels or brakes.

Unknown

is used when the location of where the fire initiated cannot be determined, e.g.:

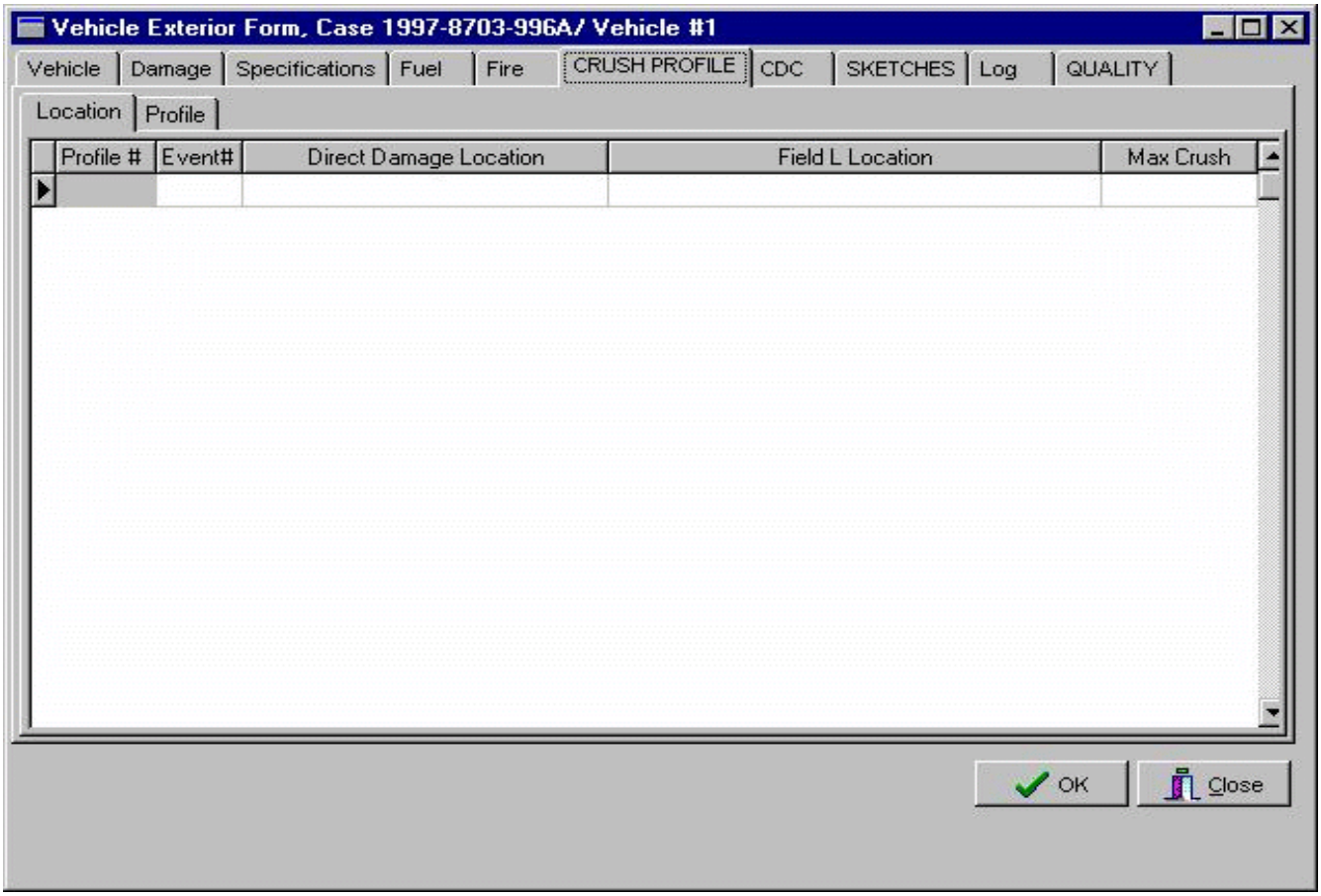
- **L** The vehicle was totally destroyed by fire and the origin could not be determined.
- **L** A combination of areas were involved but an estimate of point of origin could not be made.
- **L** A fire was reported, but the vehicle was repaired prior to inspection.

INSTRUCTIONS FOR COMPLETION OF CRUSH PROFILE TAB

*(**Note**: All Measurements Are Metric)*

The established protocol for obtaining crush data is defined in the *NASS Vehicle Measurement Techniques* . The procedures for recording that data in a format that will maintain system-wide consistency are included in the following remarks.

Select the event that corresponds to the profile being measured. The following data are required for each profile.



Location

Locate an end of damage with respect to the post crash centerpoint or bumper corner of the end plane or, for side impacts, to an undamaged axle. Spaces are provided to record the " Direct Damage Location", " Field L Location", and " Max Crush" Location. These required measurements are used to assist with CDC assignments (direct) and to determine the "D" dimension if not measured on the vehicle. The following examples include the data that are required.

Direct Damage Location

- **L** The left end begins 4 centimeters right of post crash center of the end plane, or
- **L** The rearmost end begins 48 centimeters rearward of the rear axle (side plane)

Field L Location

- **L** Entire end plane involved, or
- **L** C_1 is 102 centimeters forward of the rear axle

Max Crush (Location)

- **L** located 15 centimeters left of post crash center of the end plane, or
- **L** located at C_3
- **L** located 5 centimeters forward of the rear axle

These data are required for each impact. A space is provided to indicate the "Specific Impact Number".

Screen Name: Profile #
Variable Name: Profile Number

Element Attributes:

Range: 1-as assigned

Source: Vehicle inspection.

Remarks:

This field cannot be edited by the researcher. When the researcher selects an Event # (next variable) the system automatically assigns a Profile # for each profile documented for that event.

NOTE:

For each crush profile to be documented on the profile tab a specific location line must first be completed including:

Profile #
Event #
Direct Damage Location
Field L Location
Max Crush

NOTE: There can be more than one crush profile for each event. For corner type impacts where the researcher is unsure, in the field, whether it is an end impact or side impact, complete a location line for each plane so you can document the crush on both the end and the side plane. In this situation, there will be two profile numbers for the same event number.

Screen Name: Event #
Variable Name: Event Number

Element Attributes:

Range: 1-as selected

Source: Vehicle inspection.

Remarks:

The researcher chooses from the events that they have previously specified in the case structure for this vehicle.

NOTE:

For each crush profile to be documented on the profile tab a specific location line must first be completed including:

Profile #
Event #
Direct Damage Location
Field L Location
Max Crush

NOTE: There can be more than one crush profile for each event. For corner type impacts where the researcher is unsure, in the field, whether it is an end impact or side impact, complete a location line for each plane so you can document the crush on both the end and the side plane. In this situation, there will be two profile numbers for the same event number.

Screen Name: Direct Damage Location
Variable Name: Direct Damage Location

Element Attributes:

Range: Text field

Source: Vehicle inspection.

Remarks:

This describes the location of the direct damage. This must be referenced to a retrievable point on the damaged plane. Locate an end of damage with respect to the post crash centerpoint or bumper corner of the end plane or, for side impacts, to an undamaged axle. These required measurements are used to assist with CDC assignments (direct) and to determine the "D" dimension if not measured on the vehicle. The following examples include the data that are required:

- **L** The left end begins 4 centimeters right of post crash center of the end plane, or
- **L** The rearmost end begins 48 centimeters rearward of the rear axle (side plane)

Screen Name: Field L
Variable Name: Location of Field L

Element Attributes:

Remarks:

This describes the location of the Field L. This must be referenced to a retrievable point on the damaged plane. Locate an end of damage with respect to the post crash centerpoint or bumper corner of the end plane or, for side impacts, to an undamaged axle. These required measurements are used to assist with CDC assignments (direct) and to determine the "D" dimension if not measured on the vehicle. The following examples include the data that are required:

- **L** Entire end plane involved, or
- **L** C_1 is 102 centimeters forward of the rear axle

Screen Name: Max Crush
Variable Name: Location of Max Crush

Element Attributes:

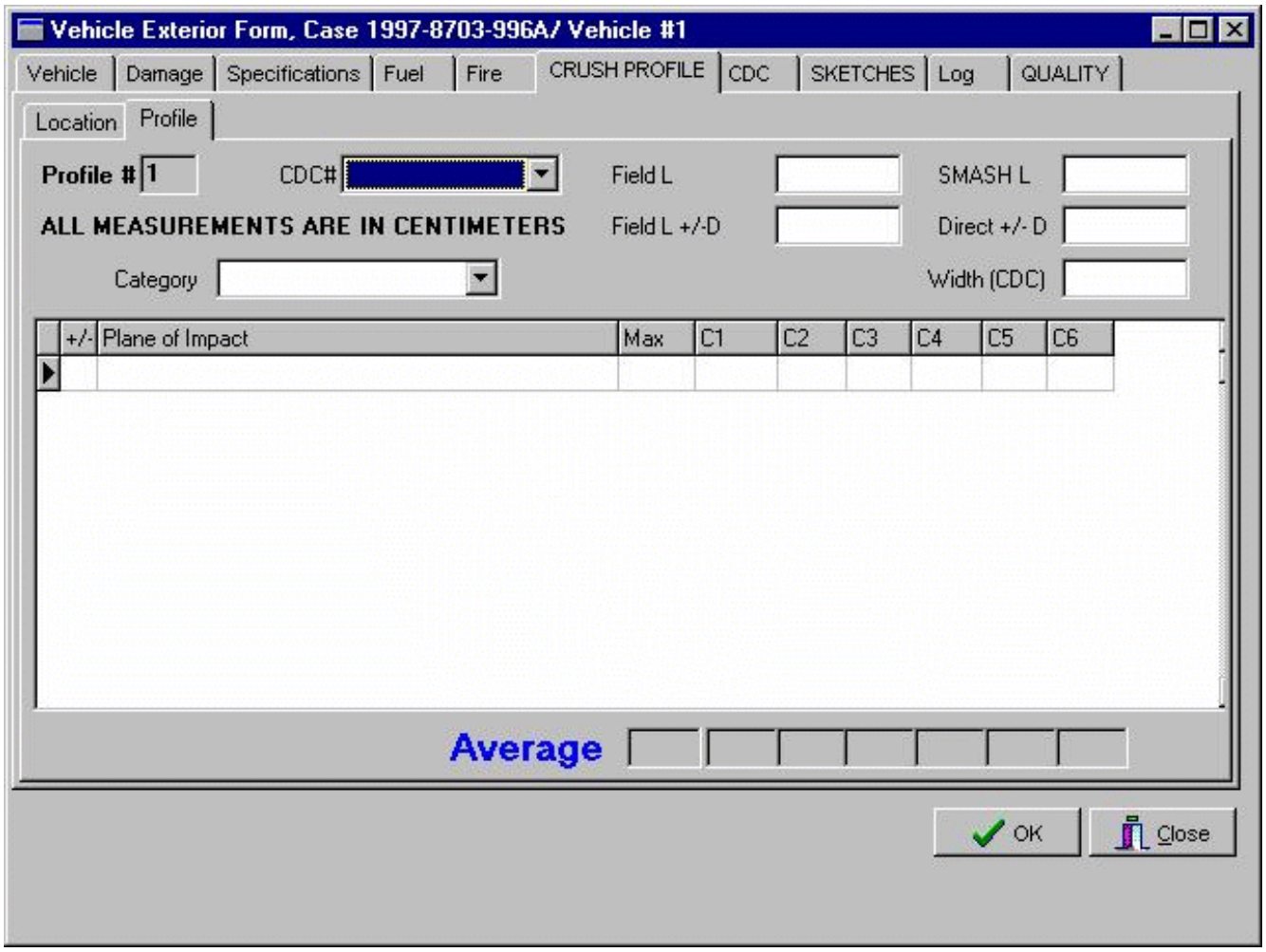
Range: Value

Source: Vehicle Inspection

Remarks:

This describes the location in the crush profile of the maximum crush. This must be referenced to a "C" value or a retrievable point on the damaged plane. Examples include:

- **L** located 15 centimeters left of post crash center of the end plane, or
- **L** located at C_3
- **L** located 5 centimeters forward of the rear axle


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Location
Profile
Profile # 1
CDC#
Field L
SMASH L
ALL MEASUREMENTS ARE IN CENTIMETERS
Field L +/-D
Direct +/- D
Category
Width (CDC)
+/-
Plane of Impact
Max
C1
C2
C3
C4
C5
C6
Average
OK
Close

Crush Profile Summary

Several data elements are required to properly complete the crush profile data portion of data entry. These data are grouped together as they are generally obtained during the vehicle inspection. Each column (or associated group of columns) is explained as below.

INSTRUCTIONS FOR COMPLETION OF CRUSH PROFILE FIELD MEASUREMENTS TAB

Profile Number

contains the impact sequence number specific to this vehicle for which the data are being obtained.

CDC #

The element attributes are generated from the CDCs entered on the CDC/Detail Tab (e.g. 1-F Front, 2-L Left Side). Select the CDC number that matches the event/damage for which you are going to document the crush profile.

Field L

Enter the Field L used during the vehicle inspection to measure the crush profile. Recall that the Field L represents both direct and induced damage as measured along the reference line (shock cord). This measurement is used to locate the position of the C-measurements.

WinSMASH L

Note change

This equals the **Field L** for all side impacts and for minor end impacts where the direct and induced damage does **not** extend all the way across the endplane. Use the **Undeformed End Width** for all end impacts where the direct and induced damage **extends all** the way across the endplane.

Field L +/-D

The measurement from the damaged center of the endplane or wheelbase to the center of the Field L, measured in the field on the damaged vehicle. Indicate whether "D" is a positive or negative value.

Direct ± D

The measurement from the damaged center of the endplane or wheelbase to the center of the direct damage, measured in the field on the damaged vehicle. Indicate whether "D" is a positive or negative value.

Category

Select the plane (side, end, top, or under) of the crush profile being documented.

Width CDC

Contains the length of direct damage as measured on the vehicle.

Plane of Impact

On the first line select the vertical level at which the crush profile is measured (i.e., bumper, above bumper, sill, mid-door). Use Edit/Insert at the top of the screen to insert another line. On the next line(s) select an operator (Free-space and/or Stand Adjustment) to adjust the measurements. The values are entered at the Max and C1 through C6 positions. Then insert another line and select Result for the computer to generate the actual crush. After the results are generated, if changes are made to Cs or freespace, you have to select result again to re-generate the new results. If more than one vertical level are measured for averaging (i.e., bumper and above bumper), then insert another line and select the second vertical level and follow the same procedures as above. After you get your second result, the computer will generate the average at the bottom of the screen.

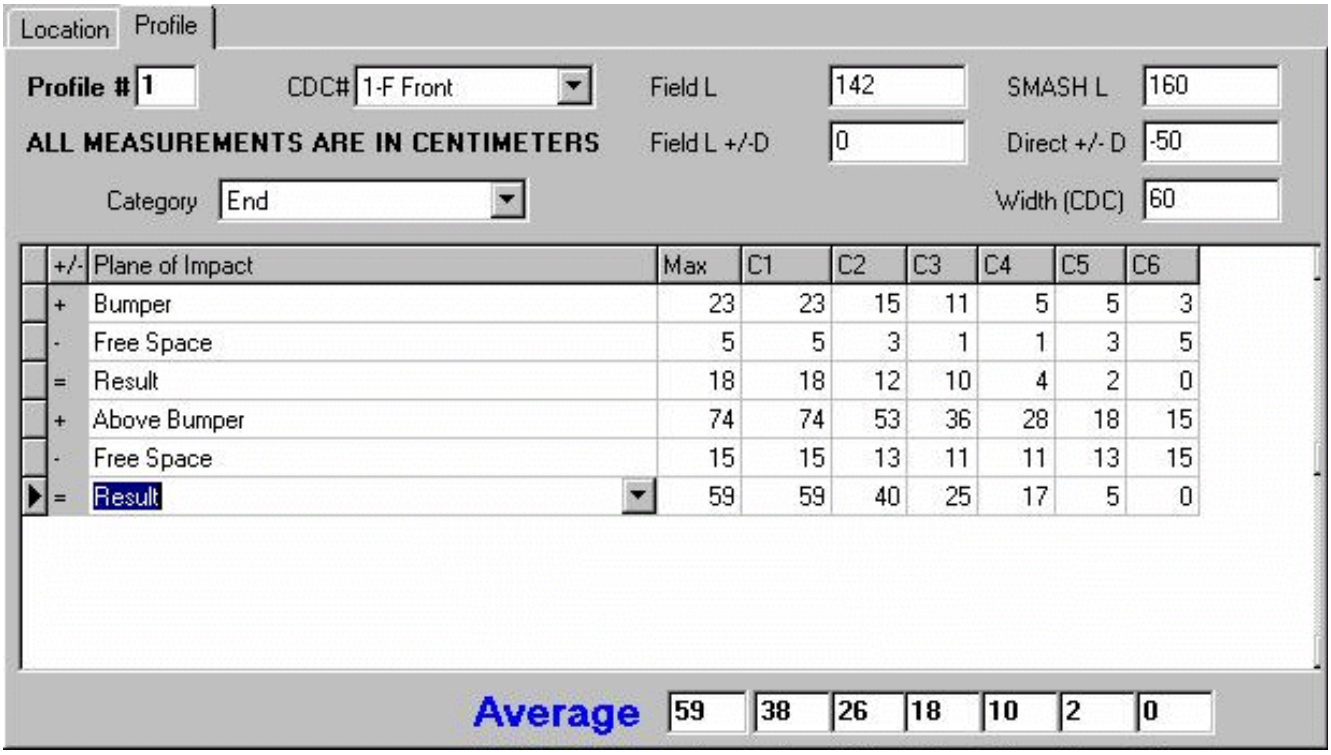
Max

contains the measured maximum crush for the profile being documented. Recall that maximum crush is determined after free space is subtracted.

C1-C6

contains the recorded two, four, or six C-measurements (as appropriate), to the nearest centimeter, on the line for the crush profile being documented. If only two or four C-values are collected (rare occasions) leave the remaining C-value fields blank. On the line beneath, annotate the free space to be subtracted and/or stand adjustment.

In the following example, a crush profile for a frontal bumper underride impact is displayed. This example is used as a guideline.



Screen Name: Profile #
Variable Name: Profile Number

Element Attributes:

Range: 1-as assigned

Source: Vehicle inspection.

Remarks:

This field cannot be edited by the researcher. When the researcher selects an Event # the system automatically assigns a Profile # for each profile documented for that event.

To complete a second crush profile for the same event (e.g., corner impact) return to the crush profile location sub tab and select Edit/Insert and complete the location variables. With profile #2 still highlighted on the location sub tab, return to the profile sub tab to enter the crush data. Likewise, the researcher can complete a second CDC for the same event. Each crush profile should be initially linked to the corresponding CDC # on the crush profile tab, profile sub tab. Once researchers make a final decision on which is the correct CDC/crush profile for the corner impact, they should annotate the incorrect CDC to the correct CDC, by right clicking on the screen of the correct CDC. Then delete the incorrect CDC from the CDC/Detail screen by going to that screen and, on the main menu, select edit/delete. This blanks out the CDC # on the crush profile/profile sub tab of the incorrect crush profile and thus unlinks it from the data base. This leaves only the correct CDC and crush profile in the data base. However, it keeps the incorrect CDC annotated to the correct CDC screen and the incorrect crush profile on its screen (unlinked to a CDC #) for Zone Center use.

Screen Name: CDC #
Variable Name: CDC Number

Element Attributes: Generated (# and plane of contact) from documented CDCs

Range: 1-as selected

Source: Vehicle inspection.

Remarks:

The element attributes are generated from the CDCs entered on the CDC/Detail Tab (e.g. 1-F Front, 2-L Left Side). Select the CDC number that matches the event/damage for which you are going to document the crush profile.

Screen Name: Field L
Variable Name: Field L

Element Attributes:

Entered number
Unknown

Range:

Source: Vehicle Inspection

Remarks:

Enter the Field L used during the vehicle inspection to measure the crush profile. Recall that the Field L represents both direct and induced damage as measured along the reference line (shock cord). This measurement is used to locate the position of the C-measurements.

Screen Name: WinSMASH L
Variable Name: WinSMASH L

Element Attributes:

Entered number
Unknown

Range:

Source: Vehicle Inspection

Remarks:

The WinSMASH L is the "L" that will be used for the WinSMASH program. This equals the **Field L** for all side impacts and for minor end impacts where the direct and induced damage does **not** extend all the way across the endplane. Use the **Undeformed End Width** for all end impacts where the direct and induced damage **extends all** the way across the endplane.

Screen Name: Field L +/- D
Variable Name: Field L +/- D

Element Attributes:

Entered number
Unknown

Range:

Source: Vehicle Inspection

Remarks:

This is the Field L +/- D that will be used for the WinSMASH program. It is the measurement from the damaged center of the endplane or wheelbase to the center of the Field L, measured in the field on the damaged vehicle. Indicate whether "D" is a positive or negative value.

Screen Name: Direct +/- D
Variable Name: Direct +/- D

Element Attributes:
As assigned

Range:

Source: Vehicle Inspection

Remarks:
This is the Direct +/- D that will be used for the WinSMASH program. It is the measurement from the damaged center of the endplane or wheelbase to the center of the direct damage, measured in the field on the damaged vehicle. Indicate whether "D" is a positive or negative value.

Screen Name: Category
Variable Name: Category

Element Attributes:

Side
End
Top (specify)
Under (specify)

Range:

Source: Vehicle inspection

Remarks:

This is the impact plane on which measurements are being taken. This field must be selected in order to enter a crush profile.

Screen Name: Width (CDC)
Variable Name: Width (CDC)

Element Attributes:

Source: Vehicle inspection.

Remarks:

The direct damage width, measured on the vehicle, that is used in determining the CDC for this impact/event.

Screen Name: Plane of Impact
Variable Name: Vertical level at which crush measurements are taken for a particular crush profile.

Element Attributes:

END PLANE
+ Bumper
+ Above Bumper
minus Free Space
+ Stand Adjustment
minus Stand Adjustment

SIDE
+Sill
+ Mid Door
+ Upper Door
+ Lower Door
minus Free Space
+ Stand Adjustment
minus Stand Adjustment

TOP
+Top

UNDER
+Under

Source: Vehicle inspection.

Remarks:

On the first line select the vertical level at which the crush profile is measured (*i.e.*, bumper, above bumper, sill, mid-door, etc.). Use Edit/Insert at the top of the screen to insert another line. On the next line(s) select an operator (Free-space and/or Stand Adjustment) to adjust the measurements. The values are entered at the Max and C1 through C6 positions. Then insert another line and select Result for the computer to generate the actual crush. After the results are generated, if changes are made to Cs or freespace, you have to select result again to re-generate the new results. If more than one vertical level is measured for averaging (i.e., bumper and above bumper), then insert another line and select the second vertical level and follow the same procedures as above. After you get your second result, the computer will generate the average at the bottom of the screen.

Note: the operator column +/- is automatically assigned when the attribute is selected. All freespace is (-) subtracted from the C measurements measured to the stringline, while stand adjustments can be either (+) added or (-) subtracted from the C measurements measured to the stringline. If the stands had to be set out further than the overall length of the vehicle, a minus Stand Adjustment must be used. If the stands had to be set shorter than the overall length of the vehicle, a + Stand Adjustment must be used.

Screen Name: Max
Variable Name: Maximum crush for this vertical level of crush measurements for this crush profile

Element Attributes:

Source: Vehicle inspection.

Remarks:

This is the maximum crush measured at the vehicle for the profile being documented. Recall that maximum crush is determined after free space is subtracted and/or stand adjustment is added (+) or subtracted (minus) if appropriate.

If the Max crush falls at a C location, the values at that C location must also be entered here, along with any freespace or stand adjustments.

When averaging techniques are used, Max crush is NOT averaged.

Screen Name: C1, C2, C3, C4, C5, C6
Variable Name: C1, C2, C3, C4, C5, C6

Element Attributes:

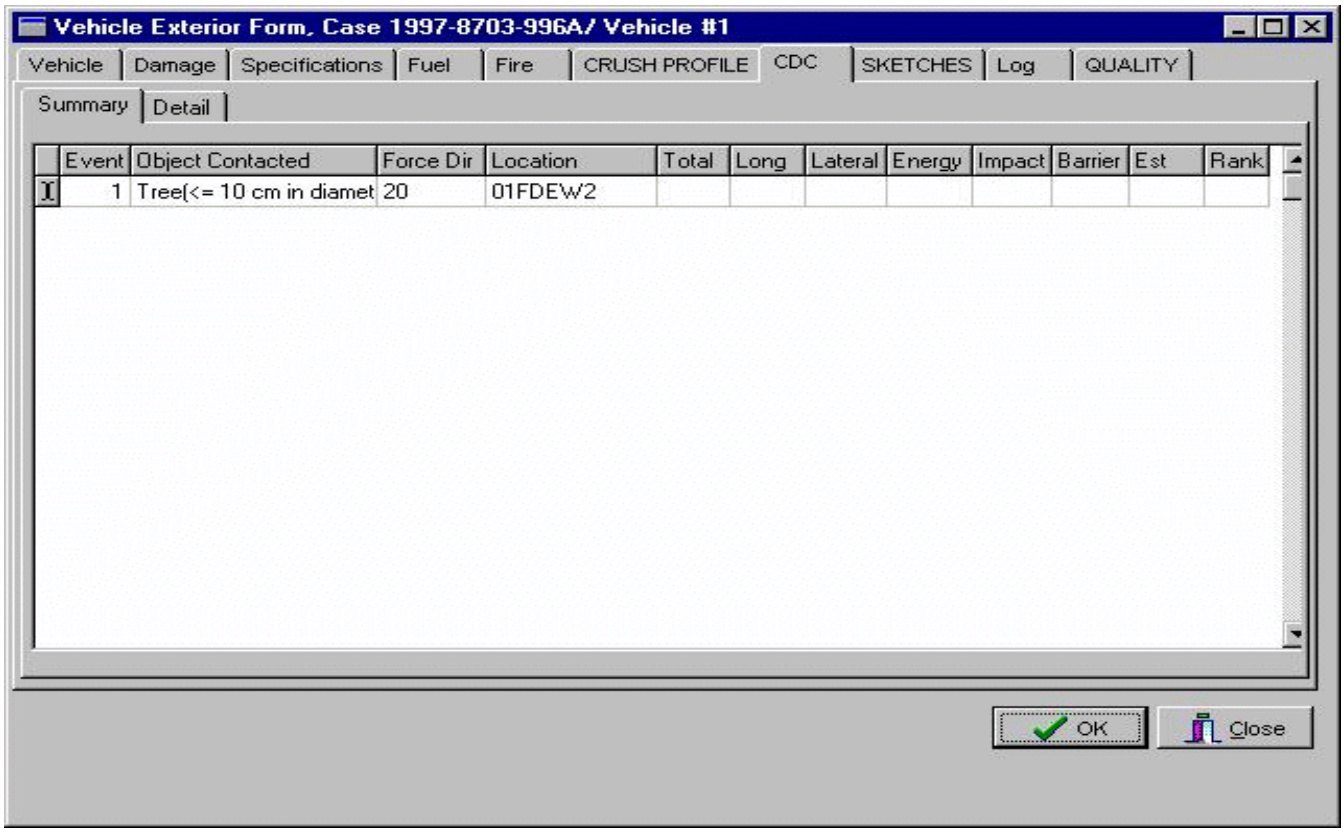
Source: Vehicle inspection.

Remarks:

The damage measurements associated with a specific impact/CDC are entered regardless of the use of a reconstruction program. Record the C-values for each impact to the nearest centimeter.

Record two, four, or six C-measurements (as appropriate) on the line for the crush profile being documented. On the line beneath, annotate the free space to be subtracted and/or stand adjustment.

The NASSMAIN WinSMASH program will automatically use the resultant C values for each event on which you select to run WinSMASH. You run the WinSMASH while on the CDC tab after the available damage data for the vehicle or vehicles involved in this event has been recorded. Highlight the CDC of the impact you want to run, then click on “Process” from the main menu at the top of the screen. Then click on “Run WinSMASH”.


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Summary
Detail
Event
Object Contacted
Force Dir
Location
Total
Long
Lateral
Energy
Impact
Barrier
Est
Rank
1
Tree(<= 10 cm in diamet
20
01FDEW2
OK
Close

Screen Names:		**Variable Names:**	
	Event		Event Number
	Object Contacted		Object Contacted
	Force Dir		Direction of Force
	Location		Damage Location (CDC)
	Total		Total Delta V
	Long		Long Delta V
	Lateral		Lateral Delta V
	Energy		Energy Dissipated
	Impact		Impact Speed
	Barrier		Barrier Equivalent Speed (BES)
	Est		Estimated Delta V
	Rank		Rank in order of severity

Element Attributes:

Range:

Source: Roll-up from CDC/Detail Tab

Remarks:

The researcher CANNOT enter information on this CDC/Summary tab. It is entered on the next tab, CDC/Detail, and rolls-up to this screen.

Direct Damage

The CDC generated for a particular impact is based upon damage resulting from ***direct*** contact only; it does not include ***induced*** damage. All CDCs are based upon the procedures in SAE J224 MAR80.

Intraunit Damage

Intraunit ***direct*** damage caused by a jackknife can generate a CDC for the power (*i.e.*, towing) unit ***only***. The towed unit (if towed by a fixed linkage) is considered cargo, and even if that unit is another vehicle, a CDC is ***not*** applicable for any damage it may sustain. If the impact is to the cargo unit only and ***induced*** damage is incurred by the power unit, no CDC is generated for the ***induced*** damage to the power unit. If a trailer disconnects and subsequently causes direct damage to the power unit, then a CDC is generated for that damage because the trailer is now considered an object set in motion, the damage is no longer considered intraunit, and the Object Contacted is “Non-fixed object” (i.e., the trailer). If, during an impact, cargo located in the trailing unit or in the bed of a pickup truck causes direct damage to the power unit or pickup truck respectively, then no CDC is generated for that damage. When intraunit direct damage caused by a jackknife exists, an Event Sequence Number is entered and the Object Contacted is equal to the Vehicle Number

Add-on Components

Add-on components (*e.g.*, snow plow blade, pickup cap, etc.) are considered cargo, and NO CDC is entered for direct damage sustained by the add-on component.

Overlapping Damage

During some crash sequences, a vehicle will sustain "overlapping damage" (*i.e.*, multiple impacts in the same area of the vehicle). If the direct damage caused by each object contacted cannot be separated and described with individual CDCs, then one CDC is generated to describe all of the damage and this CDC is encoded. The vehicle or object contacted that caused the most damage is assigned to this CDC. Partial CDCs are expected for the other impacts that helped cause this overlapping damage.

Verbal Descriptions

Verbal descriptions by drivers, occupants, or owners may ***not*** form the basis for a CDC ***except*** in ***pedestrian impacts*** or ***very minor crashes*** (no residual damage); ***the vehicle must have been inspected*** or at least images of the damage must be obtained. In cases involving no residual damage and where the vehicle is involved with another vehicle or object, that other vehicle or object must be inspected.

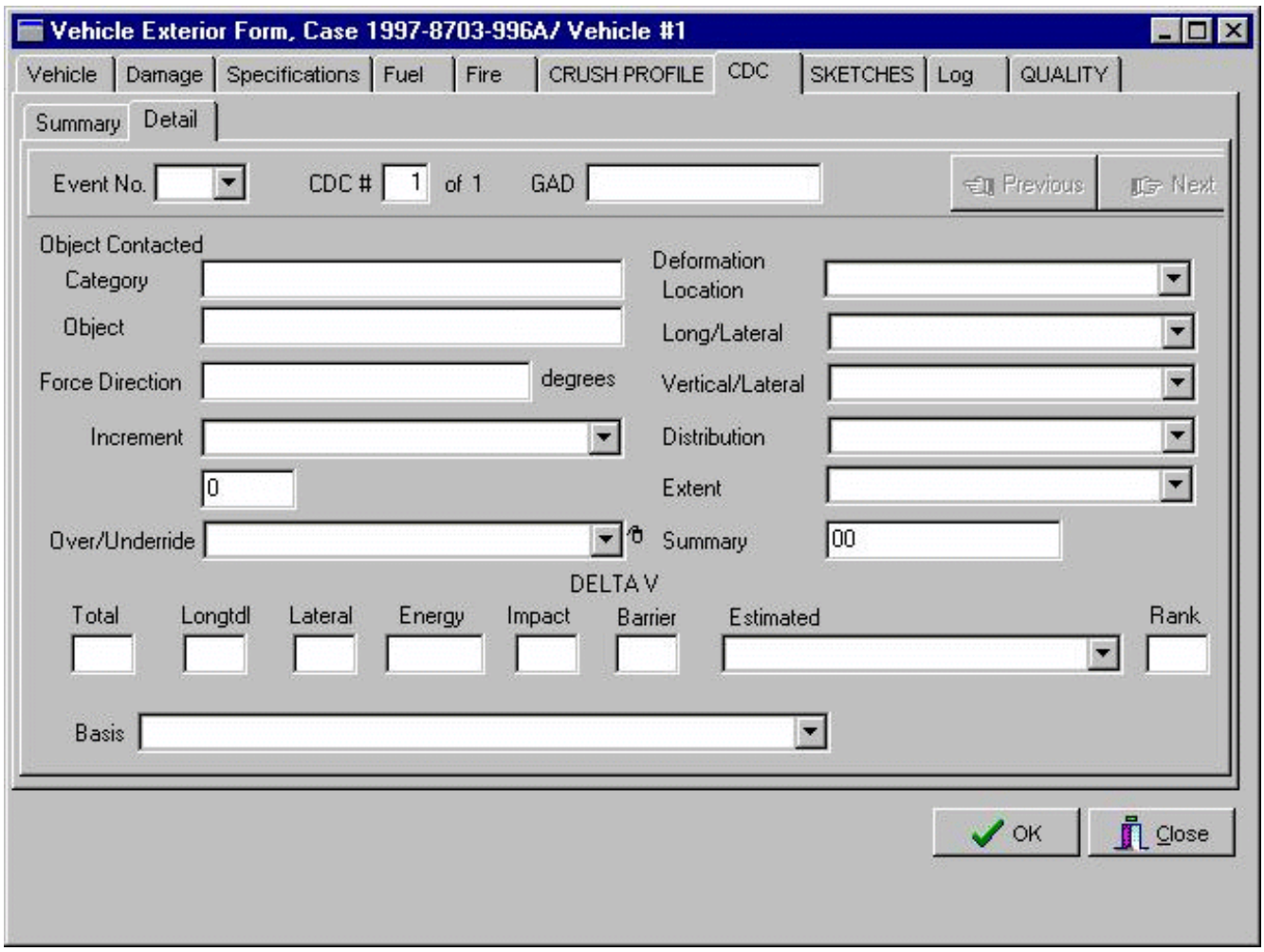
Additional Information

Refer to the document entitled: "Collision Deformation Classification/Truck Deformation Classification Advanced Reference Module", for more detailed discussions regarding CDC guidelines.

Multiple Impacts/Events

If the vehicle is involved in multiple impacts/events, the corresponding CDCs are ranked in order of highest crash severity, based on energy management (Delta V), and amount of reduction of occupant space for non-collision events.

All CDCs/impacts must be ranked by order of severity. Use WinSMASH output, barrier equivalent speeds, and severity estimates to help rank CDCs.


Vehicle Exterior Form, Case 1997-8703-996A/ Vehicle #1
Vehicle
Damage
Specifications
Fuel
Fire
CRUSH PROFILE
CDC
SKETCHES
Log
QUALITY
Summary
Detail
Event No.
CDC #
1
of 1
GAD
Previous
Next
Object Contacted
Category
Object
Force Direction
degrees
Increment
0
Over/Underride
Deformation Location
Long/Lateral
Vertical/Lateral
Distribution
Extent
Summary
00
DELTA V
Total
Longtdl
Lateral
Energy
Impact
Barrier
Estimated
Rank
Basis
OK
Close

Screen Name: Event No.
Variable Name: Event Number

Element Attributes:

Range: 1-as selected

Source: Vehicle inspection.

Remarks:

Once the CDC/Detail tab is selected the researcher must select Edit/Insert from the Main Menu at the top of the screen to activate the tab. This will automatically insert 1 of 1 for the CDC #.

The researcher chooses from the events that they have previously specified in the case structure for this vehicle.

There can be more than one CDC or crush profile for each event (e.g., a corner impact where the researcher is not sure, in the field, whether the end plane or the side plane is the initial plane of contact). See the next variable, CDC No., for details.

Screen Name: CDC No.
Variable Name: CDC Number

Element Attributes:

Range: 1-as selected

Source: Vehicle inspection.

Remarks:

Once the CDC/Detail tab is selected the researcher must select Edit/Insert from the Main Menu at the top of the screen to activate the tab. This will automatically insert 1 of 1 for the CDC #.

To complete a second CDC for the same event (e.g., corner impact) the researcher selects Edit/Insert again and CDC # changes to 2 of 2. Likewise, the researcher can complete a second crush profile for the same event. Each crush profile should be initially linked to the corresponding CDC # on the crush profile/profile sub tab. Once researchers make a final decision on which is the correct CDC/crush profile for the corner impact, they should annotate the incorrect CDC by right clicking on the screen of the correct CDC. Then delete the incorrect CDC from the CDC/Detail screen by going to that screen and, on the main menu, select edit/delete. This blanks out the CDC # on the crush profile/profile sub tab of the incorrect crush profile and thus unlinks it from the data base. This leaves only the correct CDC and crush profile in the data base. However, it keeps the incorrect CDC annotated to the correct CDC screen and the incorrect crush profile on its screen (unlinked to a CDC #) for Zone Center use.

To complete a CDC for a different event the researcher selects the corresponding Event No.

Screen Name: GAD
Variable Name: General Area of Damage

Element Attributes:

Range:

Source: Roll-up from Case Form/Events

Remarks:

The researcher CANNOT enter information in this field. It is entered on the Case Form/Events tab, and rolls-up to this screen.

Screen Name: Object Contacted Category and Object
Variable Name: Object Contacted Category and Object

Element Attributes:

Range: 1-as selected

Source: Vehicle inspection.

Remarks:

Once the Event Number is selected the Object Contacted Category and Object will roll-up to these fields from the Case Form/Events Tab. If the event is not listed or incorrect, it must be entered on the Case Form/Events Tab.

Screen Name: Force Direction
Variable Name: Direction of Force

Element Attributes:

Entered number (0-350)
Nonhorizontal Force
Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

0-350

An estimated CDC is indicated for each impact. In this estimate, write the direction of principal force in positive increments of ten degrees. Thus, if the direction appeared to be approximately ten degrees to the right of straight-ahead, indicate "10". If the direction of force appeared to be ten degrees left of straight-ahead, indicate "350". The final coding of the CDC reflects the direction of force in clock positions.

Nonhorizontal Force

Select this any time a vehicle becomes inverted and impacts any object or vehicle while inverted. In addition, use this selection in any other circumstance which is consistent with the directions contained in SAE J224 MAR80.

Unknown

Select this when the force direction cannot be determined via vehicle inspection or images/photographs.

Screen Name: Increment
Variable Name: Increment of Clock Direction

Element Attributes:

00 No shift
20 End shift vertical up; top shift up
40 End shift vertical down; top shift rearward
60 End, top, or bowing shift lateral right
80 End, top, or bowing shift lateral left
Unknown

Source: Vehicle inspection

Remarks:

The coding of this variable reflects whether the end of the vehicle has been shifted >10 cm. This variable is being collected for use in modifying the CDC for the vehicle.

00 - No shift
Less than 10cm of shift or for roof shift, no visible shift

20 - Up
Upward shift of >10cm of at least 1 frame rail.

40 - Down
Downward shift of >10cm of at least 1 frame rail.

60 - Right
End or top shift lateral right. This includes bowing to the right

80 - Left
End or top shift lateral left. This includes bowing to the left

Unknown
Use this when it cannot be determined whether the vehicle has end shift or bowing >10 cm.

To select lateral end shift, both frame rails or the entire end (of a unibody) must shift >10cm.

To select vertical end shift, only one frame rail (nearest the direct damage) needs to shift >10cm.

To select lateral shift for bowing (side impact, measured on the opposite side of the impact) only one bumper corner has to bow (shift) laterally >10cm.

**** Proposed change to add the element **Unknown** has not taken place yet.****

Screen Name: Over/Underride
Variable Name: Override/Underride (this vehicle)

Element Attributes:

None
Override
Underride
Medium/heavy truck or bus override
Unknown

Source: Vehicle inspection (with exceptions as noted).

Remarks:

None

Is selected when both vehicles are inspected and there is no override/underride, or not an end-to-end impact between two CDS vehicles; or no medium/heavy truck or bus override.

Override

Is selected when 2 CDS applicable vehicles are involved in an end-to-end impact, and this vehicle overrides the other vehicle

Underride

Is selected when 2 CDS applicable vehicles impact (end-to-end), and this vehicle underrides the other vehicle .

Medium/heavy truck or bus override

Is selected when a CDS applicable vehicle's end impacts with the end or side a medium/heavy truck or bus and this CDS vehicle's end (front or back) underrides the medium/heavy truck or bus.

Unknown

It cannot be determined if an override/underride occurred, or the impact configuration for two CDS applicable vehicles cannot be determined.

Override/Underride is coded from the perspective of vehicle impact configuration and is ***not*** based on: coding in columns 5 and/or 6 of the CDC, or vehicle measurement techniques (*i.e.*, the "13-centimeters" rule for WinSMASH purposes). It is only relevant for end-to-end impacts between two CDS applicable vehicles, or any configuration impact between a CDS applicable vehicle and a Medium/heavy truck or bus.

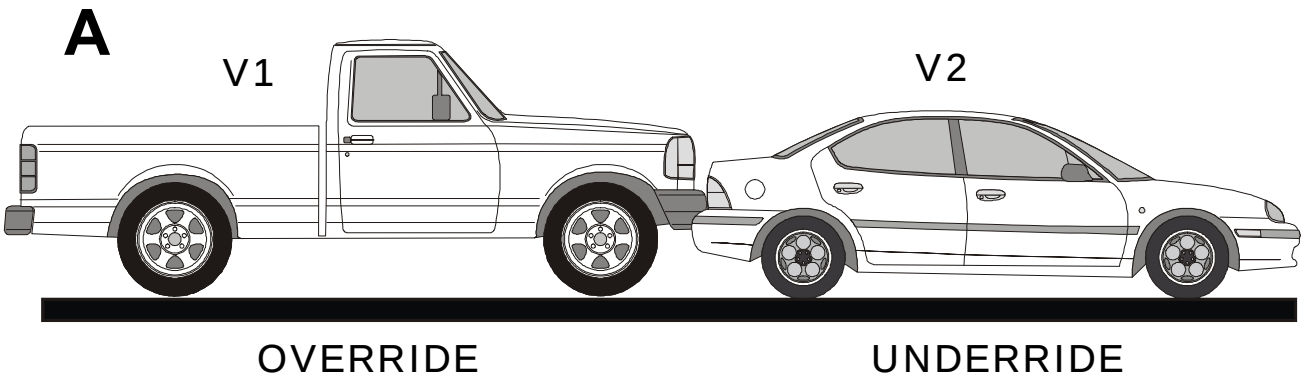
This variable is intended to capture those instances where there is an uneven damage pattern caused by uneven amounts of crush at different vertical levels of the front and/or rear planes of the vehicle. Because of the different crush stiffness' involved in these locations, these variables are included to alert the vehicle safety analysts to uneven crush patterns in front and rear impacts, which are not identified in the CDC (*i.e.*, columns 5 and/or 6).

For this variable an impact with a not-in-transport vehicle (either CDS applicable or a medium/heavy truck) is considered a vehicle-to-vehicle impact and not a vehicle-to-object impact.

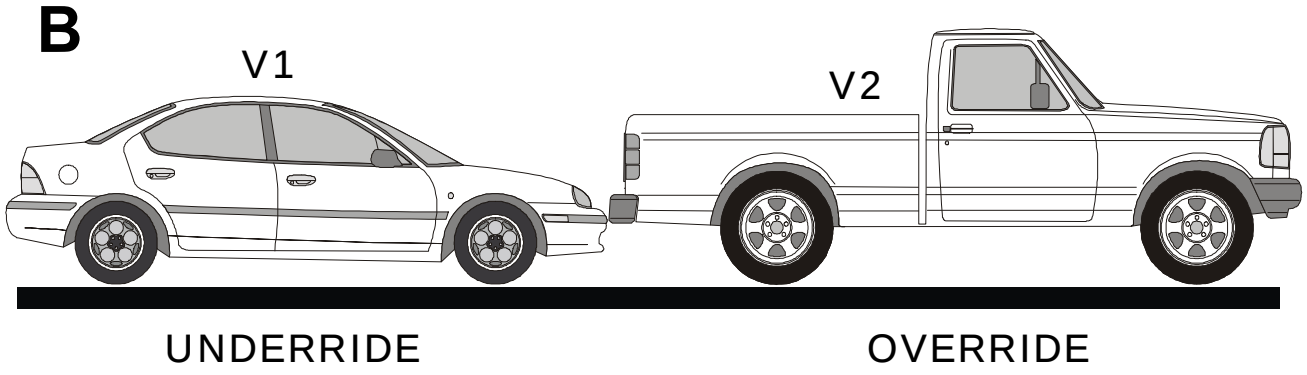
Screen Name: Over/Underride (cont'd)
Variable Name: Override/Underride (this vehicle) (cont'd)

The term "override" means a vehicle overrode (*i.e.*, goes on top of) the bumper (front or rear) of the other vehicle (except for trucks/buses where the impact configuration does not matter.) The term "underride" means a vehicle underrode (*i.e.*, goes below) the bumper (front or rear) of the other vehicle (except for trucks/buses where the impact configuration does not matter.)

If a vehicle is not equipped with a bumper (*e.g.*, rear of some pickup trucks), then consider the equivalent end structure for coding these variables.



As indicated in **Situation A**, the trunk area of V2 is damaged (*i.e.*, "crushed") while the rear bumper is relatively undisturbed. Hence, the uneven damage pattern. Conversely, the front of V1 is "crushed" at bumper height only, or is crushed ***uniformly*** at the bumper and grille levels (*i.e.*, an "even" damage pattern). Even though V1 may not exhibit the uneven damage pattern, it would still receive an applicable override code due to the resultant underride damage to V2.



When the bumper receives measurable crush and the area above the bumper also receives measurable crush, the override/underride codes are applicable if the impact configuration applies. For example, (**Situation B**) the front bumper (V1) may be crushed 2" rearward and the grille area may be crushed 6" rearward. While the averaging technique rule for WINSMASH does not apply for the different levels of crush, the impact may in fact meet the configuration rule for the override/underride variables.

Screen Name: Deformation Location
Variable Name: Deformation Location

Element Attributes:

F -- Front
R -- Right side
L -- Left side
B -- Back (rear)
T -- Top
U -- Undercarriage
9 -- Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Refer to the documents entitled: SAE J224MAR80 and "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the Element Attributes as well as instruction on proper usage.

Screen Name: Long/Lateral
Variable Name: Specific Longitudinal or Lateral Location

Element Attributes:

Front, Rear or Side Impacts

D Distributed- — side or end
L Left — front or rear
C Center — front or rear
R Right- — front or rear
F Side front — left or right
P Side center section — L or R
B Side rear — left or right
Y Side (F + P) or end (L + C)
Z Side (P + B) or end © + R)
9 Unknown

Top or Undercarriage

D Distributed (F+P+B)
F Front Section
P Center Section
B Rear Section
Y F+P
Z P+B
9 Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Element Attributes **"F"**, **"P"**, **"B"**, **"Y"**, **"Z"**, and **"D"** must be used for vehicles with top or undercarriage deformation.

Refer to the documents entitled: SAE J224 MAR80 and "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the Element Attributes as well as instruction on proper usage.

Screen Name: Vertical/Lateral
Variable Name: Specific Vertical or Lateral Location

Element Attributes:

CDC (Vertical - Front, Rear, or Side Impacts)

- A All
- H Top of frame to top
- E Everything below belt line
- G Belt line and above
- M Middle — top of frame to belt line or hood
- L Frame — top of frame, frame, bottom of frame (including undercarriage)
- W Below undercarriage level (wheels and tires only)
- 9 Unknown

CDC (Lateral - Top and Undercarriage Impacts)

- D Distributed
- L Left
- C Center
- R Right
- Y Left and Center (L + C)
- Z Right and Center ® + C)
- 9 Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Refer to the document entitled: SAE J224 MAR80 and "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the Element Attributes as well as instruction on proper usage.

Screen Name: Distribution
Variable Name: Type of Damage Distribution

Element Attributes:

W Wide impact area
N Narrow impact area
S Sideswipe
O Rollover (includes side)
A Overhanging structure
E Corner
K Conversion impact type
U No residual deformation
9 Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Refer to the documents entitled: SAE J224 MAR80 and "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the Element Attributes as well as instruction on proper usage.

Note: When recording a **"K"** conversion impact type enter the first half of the **"K"** conversion in one CDC and enter the second half of the **"K"** conversion in the next CDC.

Screen Name: Extent
Variable Name: Deformation Extent Guide

Element Attributes:

One
Two
Three
Four
Five
Six
Seven
Eight
Nine
Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Extent zone is based on direct damage only. When a body panel is torn loose from the vehicle frame due to impact; consider it as not representative of residual crush.

When you average two crush profiles, use the largest maximum crush for your extent zone (*i.e.*, do not average the maximum crush).

Refer to the documents entitled: SAE J224 MAR80 and "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the Element Attributes as well as instruction on proper usage.

WinSMASH Overview

The WinSMASH program reconstructs a single two dimensional vehicle-to-vehicle impact, or vehicle-to-large object impact that resembles a barrier collision. The impact must be instantaneous (80 to 150 milliseconds) and common velocity must be obtained during the impact. The vehicle's stiffness parameters must match the vehicle size and stiffness model, and the crush information must be known. Due to these assumptions, the following collisions cannot be run on WinSMASH:

- rollovers
- yielding fixed objects
- stiffness altered (e.g., snowplow blade, excessive corrosion, non-OEM bumpers).
- sideswipes
- non-horizontal forces
- severe override/underride
- undercarriage damage
- collisions with moving trains/large trucks
- towing trailers or vehicles
- collisions with animals/pedestrians/cyclists
- insufficient data (vehicle inspection required: see WinSMASH Missing Vehicle)
- multiple impacts to the same area.

Damage Algorithm (WinSMASH)

The damage algorithm is the most often used portion of WinSMASH. This subroutine can be used to generate a speed change, when scene data are not available . Because the Delta V is based entirely on vehicle deformation, care must be taken to provide accurate information. An example of a WinSMASH DAMAGE output follows:

Example A: SUMMARY OF WinSMASH RESULTS USING DAMAGE

	SPEED CHANGE (DAMAGE)	
VEHICLE #1		
TOTAL	29 KMPH	(18 MPH)
LONGITUDINAL	-29 KMPH	(-18 MPH)
LATERAL	0 KMPH	(0 MPH)
PDOF ANGLE	0 DEGREES	
ENERGY DISSIPATED = 50208 JOULES (37026 FT-LB)		
VEHICLE #2		
TOTAL	38 KMPH	(24 MPH)
LONGITUDINAL	38 KMPH	(24 MPH)
LATERAL	0 KMPH	(0 MPH)
PDOF ANGLE	-180 DEGREES	
ENERGY DISSIPATED = 64964 JOULES (47908 FT-LB)		

WinSMASH Overview (cont'd)

Damage & Trajectory Algorithm (WinSMASH)

In this method the scene data as well as vehicle data are used to estimate Delta V. This subroutine calculates either a damage and trajectory estimate in axial (velocity vectors are within ten degrees of parallel) collisions or a Conservation of Linear Momentum solution in angular collisions greater than ten degrees. Because the scene data are calculated separately in the Conservation of Linear Momentum solution, a separate Delta V is generated and a comparison with the damage Delta V can be made for accuracy.

Reconciliation Of Different Results Between Damage And Trajectory (WinSMASH)

1. The axial collision solution is used when the initial velocity vectors are within ten degrees of parallel. Examples of use in WinSMASH are: head-on collisions, rear-end collisions, vehicles sliding sideways traveling straight into an oncoming vehicle or a stationary barrier, barrier impacts, etc.

The transition between the axial and angular solutions (*i.e.*, a velocity vector change from within ten degrees of parallel to just outside ten degrees of parallel) may sometimes produce abrupt changes in Delta V results. Therefore, the researcher should remember when running these cases to examine their results carefully.

The axial collision printout will calculate impact speed (spinout and damage). and the SPEED CHANGE (DAMAGE) , which should be used, if reasonable.

Example B: SUMMARY OF WinSMASH RESULTS USING DAMAGE & TRAJECTORY FOR AN AXIAL COLLISION (<10E)

PSU99 CASE # 001B 1985 OLDS 98 AND 1985 OLDS Firenza Head on

	SPEED CHANGE (DAMAGE)		IMPACT SPEED (DAMAGE AND SPINOUT)	
VEHICLE #1				
TOTAL	41 KMPH	(26 MPH)	44 KMPH	(28 MPH)
LONGITUDINAL	-41 KMPH	(-25 MPH)	44 KMPH	(28 MPH)
LATERAL	7 KMPH	(4 MPH)	0 KMPH	(0 MPH)
PDOF	-10 DEGREES			
ENERGY DISSIPATED =	113645 JOULES (83809 FT-LB)			
VEHICLE #2				
TOTAL	53 KMPH	(33 MPH)	51 KMPH	(32 MPH)
LONGITUDINAL	-53 KMPH	(-33 MPH)	51 KMPH	(32 MPH)
LATERAL	9 KMPH	(6 MPH)	0 KMPH	(0 MPH)
PDOF ANGLE	-10 DEGREES			
ENERGY DISSIPATED =	116586 JOULES (85978 FT-LB)			

WinSMASH Overview (cont'd)

2. The conservation of linear momentum solution is used for angle collisions (greater than ten degrees from parallel). The reconstruction program produces two independent estimates of Delta V. The total, longitudinal, and lateral Delta Vs associated with "**speed change damage**" should be compared respectively to the Total, Longitudinal and lateral Delta Vs associated with***"linear momentum and trajectory***" . The results will seldom be precisely equal. Experience indicates that a satisfactory agreement exists between two estimates when their Delta V components differ by no more than 4 kmph or ten (10) percent, whichever is greater, and the angles are within the same o'clock direction. Be sure, when comparing Delta Vs, to compare the V_1 total Delta V due to "damage" with the V_1 total Delta V due to "linear momentum and trajectory". Likewise, make the same comparison for V_1 longitudinal Delta V, etc. When the agreement is not satisfactory, the data associated with each option should be reviewed for accuracy.

Example C: **SUMMARY OF WinSMASH RESULTS USING DAMAGE & TRAJECTORY FOR AND ANGLED COLLISION (>10E)**

PSU 99 Case No. 103D	**1985 Olds 98 and 1985 Olds Firenza**		**Angle**
	SPEED CHANGE (DAMAGE)	**SPEED CHANGE (LINEAR MOMENTUM AND TRAJECTORY)**	**IMPACT SPEED (LINEAR MOMENTUM AND TRAJECTORY)**
VEHICLE #1			
TOTAL	27 KMPH (17 MPH)	29 KMPH (18 MPH)	41 KMPH (25 MPH)
LONGITUDINAL	-21 KMPH (-13 MPH)	-23 KMPH (-14 MPH)	41 KMPH (25 MPH)
LATITUDINAL	17 KMPH (11 MPH)	18 KMPH (11MPH)	0 KMPH (0 MPH)
PDOF ANGLE	-40 DEGREES	-39 DEGREES	
ENERGY DISSIPATED = 86522 JOULES (63807 FT-LB)			
VEHICLE #2			
TOTAL	35 KMPH (22 MPH)	38 KMPH (23 MPH)	35 KMPH (22 MPH)
LONGITUDINAL	-22 KMPH (-14MPH)	-24 KMPH (-15 MPH)	35 KMPH (22 MPH)
LATITUDINAL	-27 KMPH (-16 MPH)	-29 KMPH (-18 MPH)	0 KMPH (0 MPH)
PDOF ANGLE	50 DEGREES	51 DEGREES	
ENERGY DISSIPATED = 40805 JOULES (30092 FT-LB)			

In **Example C** a good match is present, so additional reruns would not be made to improve the accuracy. Once the speed changes agree satisfactorily, the results for Total, Longitudinal, and Lateral speed changes are each averaged and the averaged values must be entered on the General Vehicle Form. If agreement cannot be reached between the two methods, contact your zone center.

WinSMASH Overview (cont'd)

WinSMASH MISSING VEHICLE

This WinSMASH MISSING Vehicle program is designed to handle vehicle-to-vehicle impacts when data on one of the vehicles are missing.

Since the WinSMASH MISSING Vehicle program is based on the WinSMASH DAMAGE program the same basic WinSMASH assumptions must not be violated. Due to violations in the basic WinSMASH assumptions or the collision condition being outside of the scope of the WinSMASH MISSING Vehicle program, the following collision types are ***not*** applicable:

- Side-to-side collisions
- Sideswipe
- Severe underride/override
- Non-horizontal force
- Undercarriage damage
- Collisions with vehicles "out of scope" (stiffness, size)
- Multiple impacts to the same area on the known vehicle
- Insufficient data

Information required on "unknown vehicle"

1. Size and stiffness category
2. Curb weight (± 90 kilograms)
3. Heading angle at impact (approximate)
4. Area of damage (third character of CDC — "Area of Deformation")

Warnings:

1. When using The WinSMASH MISSING Vehicle program for pickups and vans, you must know additional information for a valid run.
   a. Wheelbase [to determine size and stiffness (side impacts)]
   b. Curb weight (± 90 kilograms)
   c. Stiffness
      - Rear impacts: Vehicles must have OEM (original equipment manufacturer) bumpers.
      - Front impacts: Vehicle cannot have add-on equipment (*e.g.*: plow, winch, Nerf bars, etc.).

2. The WinSMASH MISSING Vehicle program results that are too high or low are not to be entered on the file.

3. Do not confuse the heading angle with the PDOF.

4. Check the PDOF result for the unknown vehicle. This PDOF must be a reasonably collinear angle for this collision.

Table Of Weights To Be Used For Known Occupants With Unknown Weight

For known occupants with unknown weights, use the occupant's age or age group in the table below to determine the appropriate weight to add.*

(All Weights Are In Kilograms)

Age	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Male	8	12	14	16	18	20	22	25	28	30	35	37	43	49
Female	7	11	13	15	17	19	21	24	28	30	34	40	45	49

Age	14	15	16	17	18	19		20-24	25-34	35-44	45-54	55-64	65-97
Male	56	60	64	66	70	69		72	78	80	79	78	74
Female	53	54	56	59	57	57		58	61	64	66	65	65

Age Group	Child (0-12)	Adolescent (13-17)	Adult (18-97)
Male	23**	61**	77
Female	23***	54**	63

Sources of Information:

National Center for Health Statistics, M. F. Najjar and M. Rowland: Anthropometric Reference Data and Prevalence of Overweight: United States, 1976-1980. *Vital and Health Statistics*. Series 11, Number 238. DHHS Publication Number (PHS)87-1688. Public Health Service. Washington. U.S. Government Printing Office, October 1987. Data are from Tables 3-5, 12-14, and 18 on pages 14-16, 23-25, and 29; the original data are based on 50th percentile rounded to the nearest pound. All weights were subsequently converted to kilograms.

** *Originally based on 6 and 7 year olds rounded to the nearest 5 pounds. All weights were subsequently converted to kilograms.*

*** *Originally based on 15 year olds rounded to the nearest 5 pounds. All weights were subsequently converted to kilograms.*

NASSMAIN WinSMASH

The NASSMAIN WinSMASH program will automatically use the resultant C values for each event on which you select to run WinSMASH. You run the WinSMASH while on the CDC tab after the available damage data for the vehicle or vehicles involved in this event have been recorded. Highlight the CDC of the impact you want to run, then click on "Process" from the main menu at the top of the screen. Then click on "Run WinSMASH". Next select the WinSMASH Calculation Type (Standard, Barrier, Missing Damage, or Pole) you want to run using the following Delta V Decision Rules which are listed in order of precedence:

DELTA V DECISION RULES
Including, BARRIER EQUIVALENT AND SPEED ESTIMATE

1. First, select the WinSMASH program Standard, or Barrier routine, when you have sufficient damage information (CDC and Crush profile) for each vehicle involved in this impact. If the Barrier routine is selected (i.e., for a tree impact) then vehicle two is blank and data can be entered for vehicle one only. If the results look reasonable, go to the Review Tab and select the "Final" box, which will complete the Delta V variables of the CDC tab of the Vehicle Exterior (VE) Form including the Barrier Equivalent Speed using the results from WinSMASH. It will also record the Impact Speed **ONLY** when calculated by WinSMASH using the Damage and Trajectory routine(i.e., Standard or Barrier calculation type with known rest and impact positions) . Select the basis for Delta V based on the routine used to get the results.

2. If you have one known vehicle and one unknown or partially known vehicle select the WinSMASH MISSING routine and then type the word "MISSING" in the CDC block of the unknown vehicle. If the results look reasonable go to the Review Tab and select the "Final" box, which will complete the Delta V variables of the CDC tab of the Vehicle Exterior (VE) Form including the Barrier Equivalent Speed using the results from WinSMASH. Since the Impact Speed was not calculated, it will be filled in with a 998 for both vehicles. If the results **are not** reasonable then use the WinSMASH "Standard" calculation type using all of the available information (e.g., CDC, WinSMASH L, Ds, estimated crush) on the partially known vehicle. If these results look reasonable select the "Final" box on the Review Tab, which will automatically record the results. Record the basis for Delta V based on the routine used to get the Final results. If the results look reasonable, **always** code the "Confidence Level" as "Borderline reconstruction ~ results look reasonable" for the **uninspected missing** vehicle.

3. For car to fixed object impacts where the object moves or sustains damag (poles, trees, large trucks, etc.) or the object is struck (horizontally) during a rollover, use the WinSMASH damage routine and treat the object as a rigid barrier. If the results look reasonable record **only** the barrier equivalent speed change. **DO NOT** select the "Final" box of the Review Tab. Record the Basis for Total Delta V as appropriate (e.g. Yielding object, Vehicle out of scope, etc).

4. For car-to-car or car-to-object impacts where a crush profile is roughly estimated or you only have a CDC for all vehicles involved (*e.g.*, partially repaired vehicle, only have photos of damage, etc.), use the WinSMASH damage routine to get an estimated Delta V. If the results look reasonable, then use the calculated Delta V to select the range in the Estimated Highest Delta V. **DO NOT** select the "Final" box of the Review Tab. Record the Basis for Total Delta V as appropriate (e.g. insufficient data).

DELTA V DECISION RULES (cont'd)

5. For large non-fixed objects such as large animals, where there is significant crush, use the WinSMASH damage routine to get an estimated Delta V. If the results look reasonable, then use the calculated Delta V to select the range in the Estimated Highest Delta V. **DO NOT** select the "Final" box of the Review Tab. For smaller non-fixed objects record Estimated Highest Delta V as minor moderate or severe. Record the Basis for Total Delta V as appropriate (e.g. Non-fixed object).

6. For a CDS applicable vehicle that cannot be adequately represented by the parameters in an acceptable reconstruction size/stiffness category (*e.g.*, winch, non-standard bumper etc.) use the WinSMASH damage routine to get an estimated Delta V. If the results look reasonable, then use the calculated Delta V to select the range in the Estimated Highest Delta V. **DO NOT** select the "Final" box of the Review Tab. If a crush profile cannot be obtained then record Estimated Highest Delta V as minor moderate or severe. Record the Basis for Total Delta V as appropriate (e.g. vehicle is beyond the scope).

7. For cases where there are two or more significant impacts with overlapping or masking of damage/ such that individual crush profiles cannot be obtained then record the Basis for Total Delta V as overlapping damage and select the Estimated Highest Delta V as minor moderate or severe.

   NOTE: For car-to-car impacts where one car is known and the other has masked damage as described above, treat the masked vehicle as a missing vehicle and follow the item number 2 instructions.

8. For sideswipe, severe override/underride, undercarriage, non-horizontal and rollover type impacts record the Basis for Total Delta V as appropriate (e.g. Sideswipe, Non-horizontal etc), and select the Estimated Highest Delta V as minor, moderate, or severe.

9. Definitions for Minor, Moderate, or Severe:

   Rollover — damage assessment priority shall be given to passenger compartment.

   Top Plane

Minor	is selected when there is surface scratching or dents; includes CDC extent zones 1& 2.
Moderate	is selected when the passenger compartment maximum crush extends into CDC extent zone 3.
Severe	is selected when the passenger compartment maximum crush is greater than CDC extent zone 3.

   Side Plane

Minor	is selected when there is surface scratching or dents with no passenger compartment intrusion.
Moderate	is selected when there is 25 cm (10 inches) or less passenger compartment intrusion.
Severe	is selected when there is greater than 25 cm (10 inches) passenger compartment intrusion.

DELTA V DECISION RULES (cont'd)

Swiping Type Impacts

Minor is selected when there is minor crush that does not result in passenger compartment intrusion.

Moderate is selected when the maximum crush extends beyond the side door impact protection (*i.e.*, door beam) that can result in up to 25cm (10 inches) passenger compartment intrusion.

Severe is selected when the maximum crush results in greater than 25 cm (10 inches) passenger compartment intrusion.

Severe Override/underride Impacts

Minor is selected when only the hood/trunk and top of fenders are involved and there is no passenger compartment intrusion.

Moderate is selected when only the hood/trunk and top of fenders are involved and there is minimal passenger compartment intrusion.

Severe is selected when only the hood/trunk and top of fenders are involved and there is major passenger compartment intrusion.

Undercarriage Impacts

Minor is selected when it is a swiping type impact with surface scratching or dents.

Moderate is selected when modest crush or bending occurs.

Severe is selected when significant crush or bending occurs.

Overlapping (Masked) Impacts

Minor is selected when the maximum crush attributed to the most severe impact (via estimate) is less than 10 cm.

Moderate is selected when the maximum crush attributed to the most severe impact (via estimate) is 10cm-35cm.

Severe is selected when the maximum crush attributed to the most severe impact (via estimate) is greater than 35cm.

Other Non-Horizontal Impacts

Minor is selected when the maximum crush is less than 10 cm.

Moderate is selected when the maximum crush is 10cm-35cm.

Severe is selected when the maximum crush is greater than 35cm.

Screen Name: DELTA V–Total
Variable Name: Total Delta V

Element Attributes:

Range:
[Generated kmph]
[999-Unknown]

Source: WinSMASH program.

Remarks:

The Total Delta V is automatically generated by the NASSMAIN WinSMASH program for this impact.

The NASSMAIN WinSMASH program will automatically use the resultant C values for each event on which you select to run WinSMASH. You run the WinSMASH while on the CDC tab after the available damage data for the vehicle or vehicles involved in this event has been recorded. Highlight the CDC of the impact you want to run, then click on "Process" from the main menu at the top of the screen. Then click on "Run WinSMASH". Next select the type of WinSMASH you want to run using the Delta V Decision Rules listed in the previous section.

Unknown
is used when the results for this impact are unobtainable or unreasonable.

Do not enter 999. It will be automatically generated by NASSMAIN based on your selection for the Basis for the Delta V Entry, except for when you use the Missing Vehicle option. Then you will have to enter 999.

Screen Name: DELTA V -- Longtdl
Variable Name: Longitudinal Delta V

Element Attributes:

Range:
[Generated KMPH]
[999-Unknown]

Source: WinSMASH program.

Remarks:

The Longitudinal Component of Delta V is automatically generated by the NASSMAIN WinSMASH program for this impact.

Do not enter 999. It will be automatically generated by NASSMAIN based on your selection for the Basis for the Delta V Entry, except for when you use the Missing Vehicle option. Then you will have to enter 999.

Screen Name: DELTA V -- Lateral
Variable Name: Lateral Delta V

Element Attributes:

Range:
[Generated kmph]
[999 - Unknown]

Source: WinSMASH program.

Remarks:

The Lateral Component of Delta V is automatically generated by the NASSMAIN WinSMASH program for this impact.

Do not enter 999. It will be automatically generated by NASSMAIN based on your selection for the Basis for the Delta V Entry, except for when you use the Missing Vehicle option. Then you will have to enter 999.

Screen Name: Energy
Variable Name: Energy Absorption

Element Attributes:
[Generated joules]
[-9999 - Unknown]

Source: WinSMASH program.

Remarks:

Enter The Energy Absorption is automatically generated by the NASSMAIN WinSMASH program for this impact.

Do not enter 9999. It will be automatically generated by NASSMAIN based on your selection for the Basis for the Delta V Entry, except for when you use the Missing Vehicle option. Then you will have to enter 9999.

Screen Name: Impact
Variable Name: Impact Speed or change to Impact Seymour!

Element Attributes:

Range:
[Generated kmph]
[998 - Damage and Trajectory run not made]
[999 – Unknown]

Source: WinSMASH program — damage and trajectory routine

Remarks:

The Impact Speed is automatically generated by the NASSMAIN WinSMASH damage and trajectory program for this impact.

Do not enter 998 or 999. They will be automatically generated by NASSMAIN based on your selection for the Basis for the Delta V Entry, except for when you use the Missing Vehicle option. Then you will have to enter 998.

Screen Name: Barrier
Variable Name: Barrier Equivalent Speed

Element Attributes:
[Generated kmph]
[999 - Unknown]

Source: WinSMASH program.

Remarks:

The Barrier Equivalent speed is automatically generated by the NASSMAIN WinSMASH for this impact.

For car to object impacts where the object moves or sustains damage (poles, trees, large trucks, etc.) or the object is struck (horizontally) during a rollover use the WinSMASH program and treat the object as a barrier.

Screen Name: Estimated
Variable Name: Estimated Severity

Element Attributes:

[Reconstruction delta V]
Estimated Delta V
Less than 10 kmph
Delta V $ 10 kmph < 25 kmph
Delta V $ 25 kmph < 40 kmph
Delta V $ 40 kmph < 55 kmph
Delta V $ 55 kmph
Other estimates of damage severities
Minor
Moderate
Severe
Unknown

Source: Researcher determined.

Remarks:
Reconstruction delta V can not be selected, it is always generated by NASSMAIN when the Delta V variables are generated by the NASSMAIN WinSMASH.

The purpose of this variable is to record an estimate of the Delta V for those situations where the NASSMAIN WinSMASH program (including the Barrier Equivalent Speed) cannot be properly utilized (*e.g.*, overlapping damage, crush profile not measured, severe underride/override, swiping, or rollover type impacts).

For car-to-car or car-to-object impacts where a crush profile is roughly estimated or you only have a CDC for all vehicles involved (*e.g.*, partially repaired vehicle, only have photos of damage, etc.), use the WinSMASH damage routine to get an estimated Delta V. If the results look reasonable, then record the calculated Delta V as a range in the Estimated Highest Delta V. Record the Basis for Total Delta V as appropriate (e.g. insufficient data, etc).

For cases where there are two or more significant impacts with overlapping or masking of damage such that individual crush profiles cannot be obtained then record the Basis for Total Delta V as overlapping damage and record the Estimated Highest Delta V as minor, moderate or severe.

Screen Name: Estimated (cont'd)
Variable Name: Estimated Severity (cont'd)

Minor, Moderate and Severe are defined below for different damage types:

Rollover — damage assessment priority shall be given to passenger compartment.

Top Plane

Minor is used when there is surface scratching or dents; includes CDC extent zones 1 & 2.

Moderate is used when the passenger compartment maximum crush extends into CDC extent zone 3.

Severe is used when the passenger compartment maximum crush is greater than CDC extent zone 3.

Side Plane

Minor is used when there is surface scratching or dents with no passenger compartment intrusion.

Moderate is used when there is 25 cm or less passenger compartment intrusion.

Severe is used when there is greater than 25 cm passenger compartment intrusion.

Swiping Type Impacts

Minor is used when there is minor crush that does not result in passenger compartment intrusion.

Moderate is used when the maximum crush extends beyond the side door impact protection (*i.e.*, door beam) that can result in up to 25cm passenger compartment intrusion.

Severe is used when the maximum crush results in greater than 25 cm passenger compartment intrusion.

Severe Override/underride Impacts

Minor is used when only the hood/trunk and top of fenders are involved and there is no passenger compartment intrusion.

Moderate is used when only the hood/trunk and top of fenders are involved and there is minimal passenger compartment intrusion.

Severe is used when only the hood/trunk and top of fenders are involved and there is major passenger compartment intrusion.

Screen Name: Estimated (cont'd)
Variable Name: Estimated Severity (cont'd)

Undercarriage Impacts

Minor is used when it is a swiping type impact with surface scratching or dents.

Moderate is used when modest crush or bending occurs.

Severe is used when significant crush or bending occurs.

Overlapping (Masked) Impacts

Minor is used when the maximum crush attributed to the most severe impact (via estimate) is less than 10 cm.

Moderate is used when the maximum crush attributed to the most severe impact (via estimate) is 10cm -35cm.

Severe is used when the maximum crush attributed to the most severe impact (via estimate) is greater than 35cm.

Other Non-Horizontal Impacts

Minor is used when the maximum crush is less than 10 cm.

Moderate is used when the maximum crush is 10cm -35cm.

Severe is used when the maximum crush is greater than 35cm.

Other Non-Horizontal Impacts

Minor is coded when the maximum crush is less than 10 cm .

Moderate is coded when the maximum crush is 10cm -35cm.

Severe is coded when the maximum crush is greater than 35cm.

Screen Name: Rank
Variable Name: Severity Rank

Element Attributes:

1-as selected

Source: Researcher determined

Remarks:

The severity assigned to each CDC must be ranked. Enter the **Rank** for every CDC that has been listed.

Indicate the **Rank** for the event that resulted in the seventy that has been coded. If a Delta V, Barrier Equivalent Speed, or estimate is known, than the **Rank** of the event must be entered.

If the vehicle is involved in multiple impacts/events, the corresponding CDCs are ranked in order of highest crash severity, based on energy management (Delta V), and amount of reduction of occupant space for non-collision events.

Use the NASSMAIN WinSMASH results, barrier equivalent speeds, and severity estimates to help rank CDCs.

Screen Name: Basis
Variable Name: Basis for Delta V Entry

Element Attributes:

Delta V Calculated:
[WinSMASH - Damage and trajectory]
[WinSMASH - Damage only]
WinSMASH - Missing vehicle
[WinSMASH - Damage with CDC only]

Delta V Not Calculated
At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable WinSMASH program, regardless of collision conditions.

All vehicles within scope (CDC applicable) of WinSMASH program but one of the collision conditions is beyond the scope of the WinSMASH program or other acceptable reconstruction techniques, or there is insufficient damage data.

Rollover
Other non-horizontal forces
Sideswipe type damage
Severe override
Yielding object
Overlapping damage
Insufficient data available (specify):
Other (specify):

Source: Researcher determined — inputs include WinSMASH output (if applicable), vehicle inspection, scene inspection, police report, and photographs.

Remarks:

This variable is used to indicate: (1) which NASSMAIN WinSMASH program or routine was used to compute this vehicle's highest delta V or (2) the reason a NASSMAIN WinSMASH program was not applied to the most severe impact.

NASSMAIN WinSMASH - Damage and trajectory
means that the NASSMAIN WinSMASH output is based on trajectory evidence documented at the scene, in addition to complete vehicle damage data.

NASSMAIN WinSMASH - Damage only
means the WinSMASH output is based upon complete vehicle damage only.

NASSMAIN WinSMASH - Missing vehicle
means that in a two vehicle impact only one vehicle is inspected (damage measurements and CDC obtained), and for the other vehicle, the damage measurements (including CDC) are missing; however, enough data are available to use the WinSMASH Missing Vehicle algorithm.

Screen Name: Basis (cont'd)
Variable Name: Basis for Delta V Entry (cont'd)

WinSMASH - Damage with CDC only

means the WinSMASH output is based on a two vehicle collision with insufficient vehicle damage documentation. The two vehicle collision must include: one complete vehicle inspection and the other vehicle must have a complete CDC. Additional crush profile information such as the WinSMASH L, "D", etc may be entered to improve the results.

At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable WinSMASH program, regardless of collision conditions.

means that one of the vehicles (which may be this vehicle) involved in this impact cannot **be adequately represented** by the parameters in an acceptable reconstruction size/stiffness category (e.g., large truck, motorcycle, bus, etc.). As a general rule in CDS NASS, any vehicle that is not applicable for a CDC is not applicable for an the NASSMAIN WinSMASH program.

All vehicles within scope (CDC applicable) of WinSMASH program but one of the collision conditions is beyond the scope of the WinSMASH program or other acceptable reconstruction techniques, regardless of the adequacy of damage data.

Rollover

means that the involved vehicle fits the vehicle parameters for an acceptable WinSMASH program; however, the rollover collision is beyond the scope of the program.

Other non-horizontal force

means that the involved vehicle fits the vehicle parameter for an acceptable WinSMASH program; however, the other non-horizontal force is beyond the scope of the program e.g., large object falling on vehicle).

Sideswipe type damage

means that the involved vehicle fits the vehicle parameters for an acceptable WinSMASH program; however, the sideswipe type of collision is beyond the scope of the program.

Severe override

means that the involved vehicle fits the vehicle parameters for an acceptable WinSMASH program; however, the severe override type of collision is beyond the scope of the program.

Yielding object

means that the involved vehicle fits the vehicle parameters for an acceptable WinSMASH program; however, the collision with a yielding object (e.g., sheared utility pole) is beyond the scope of the program.

Screen Name: Basis (cont'd)
Variable Name: Basis for Computer Generated Delta V for Highest Severity Impact (cont'd)

Overlapping damage

means that the involved vehicle fits the vehicle parameters for an acceptable WinSMASH program; however, collisions involving overlapping damage (i.e., multiple impacts in the same area) are beyond the scope of the program.

All vehicle and collision conditions are within scope of one of the acceptable WinSMASH programs, but there is insufficient data available (specify):

means that the involved vehicles and the collision type are applicable for an acceptable WinSMASH program, but due to insufficient data on one or both of the vehicles or object, an acceptable WinSMASH program cannot be used.

Other (specify):

means that Delta V could not be calculated for a reason not identified in the current pick list. The reason must be specified on the line provided.

INSTRUCTIONS FOR COMPLETION OF VEHICLE DAMAGE SKETCH

The Vehicle Sketch enables researchers to report data that are not encoded and might otherwise be omitted from the case. Pertinent data such as scrapes, scratches, buckling, paint transfers, and other indications of engagement or relative motion are reported on this page. In addition, sketch the vehicle damage profile on the outlines provided, using the established protocol as below.

- **L** Outline the damage profile produced by the impact.
- **L** Use cross hatches to indicate direct damage.
- **L** Highlight induced damage and/or remote buckling with diagonal lines.

Although researchers are reporting a vehicle's crash related damage, other damage may be observed which existed prior to the crash or is towing damage. This type of damage must also be indicated and annotated accordingly.

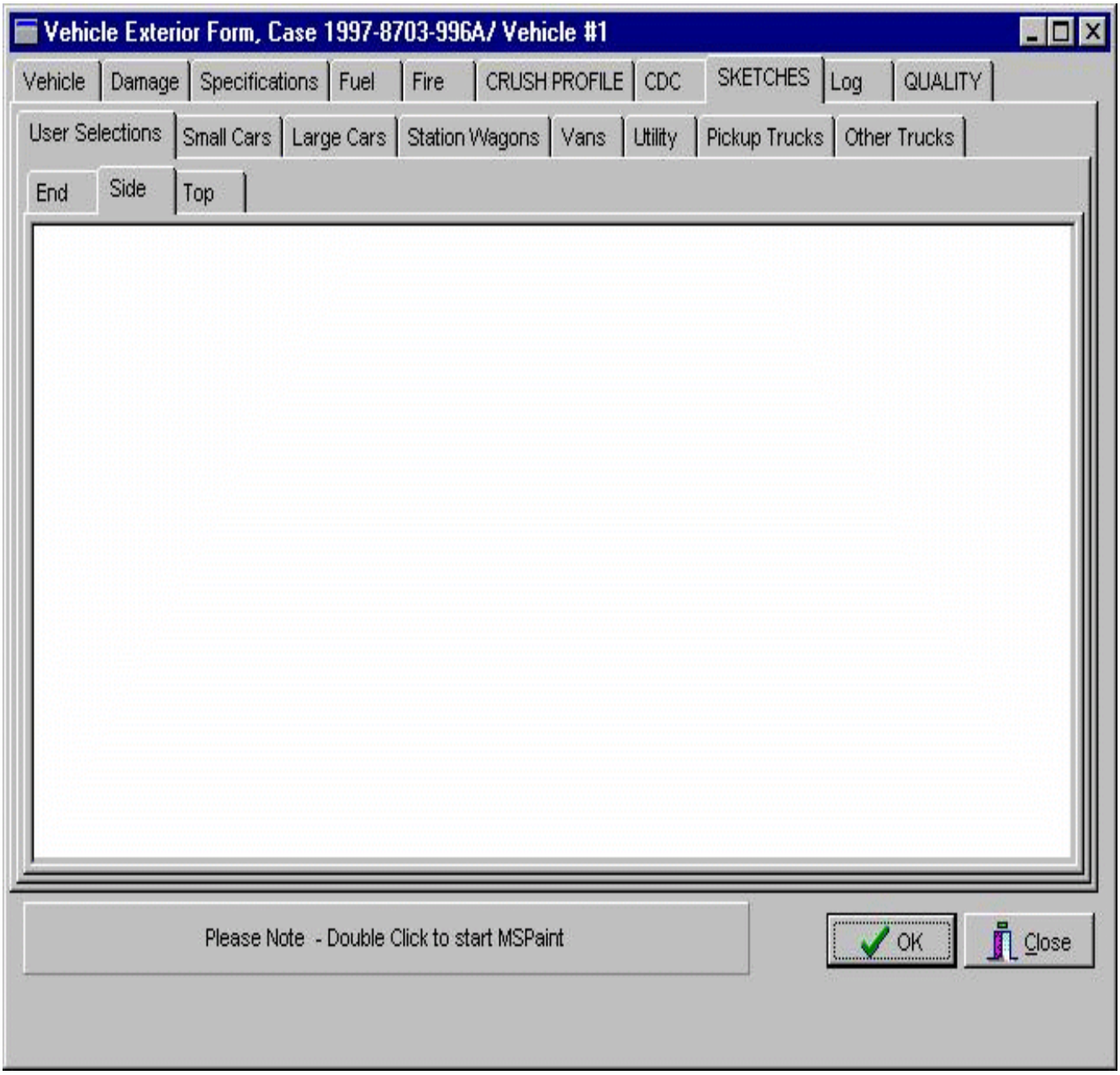
Relevant measurements are required on the Vehicle Sketch page in order to support other data elements.

CDC extent zone measurements are required; although, only the measurements which pertain to the damaged plane are needed (*i.e.*, hood length for frontal, side extents for side impacts, etc.). Obtain all measurements which may be needed when questions arise regarding the damaged plane. If doubt exists concerning whether an impact is to a front or a side plane, obtain both front and side extent zone measurements.

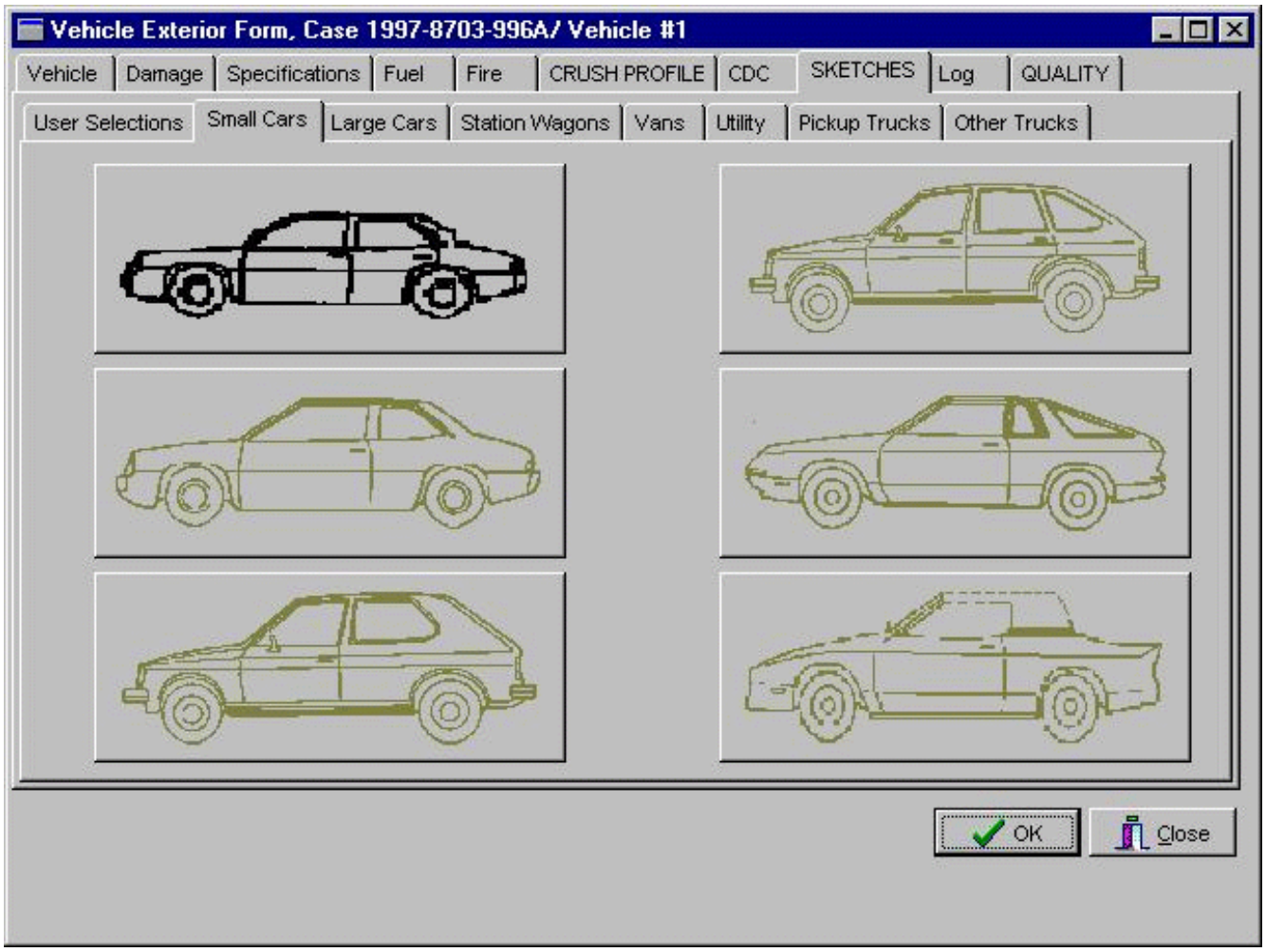
In addition, front and back pre-crash bumper height measurements must be obtained for vehicles sustaining any end plane impact with another vehicle (in-transport or not in-transport) [*i.e.*, column (3) of CDC (including nonselected CDCs) must equal "F" or "B"].

- **L** Measure from the bottom of the bumper face (reinforcement bar) to the ground.
- **L** Include a calibrated instrument (contour gauge rod or 1 meter scale) in the photographs of the vehicle's bumper height.

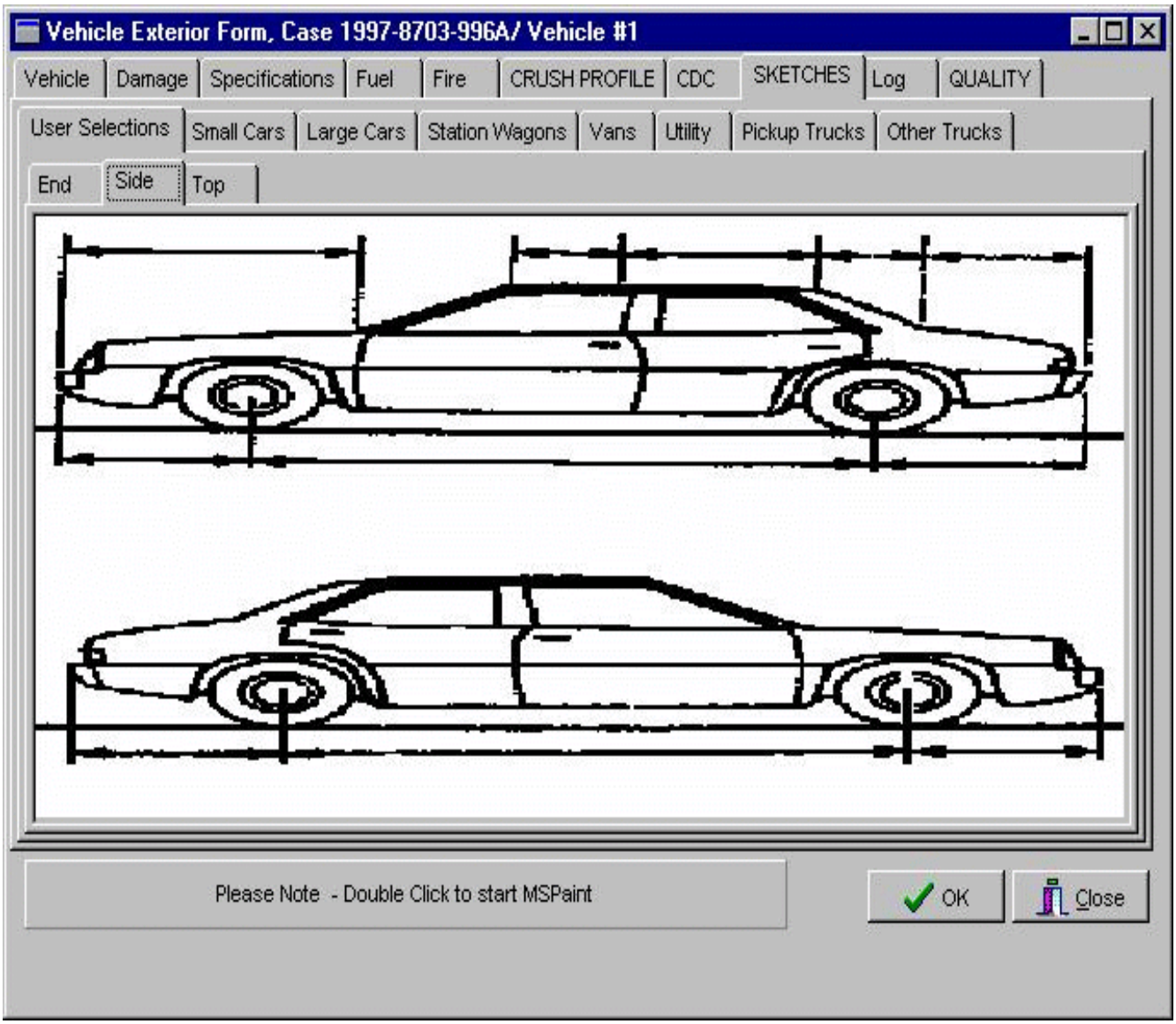
The following screens exemplify the procedures to complete the vehicle sketches .



First, select the SKETCHES Tab. Then select the User Selections sub-tab.

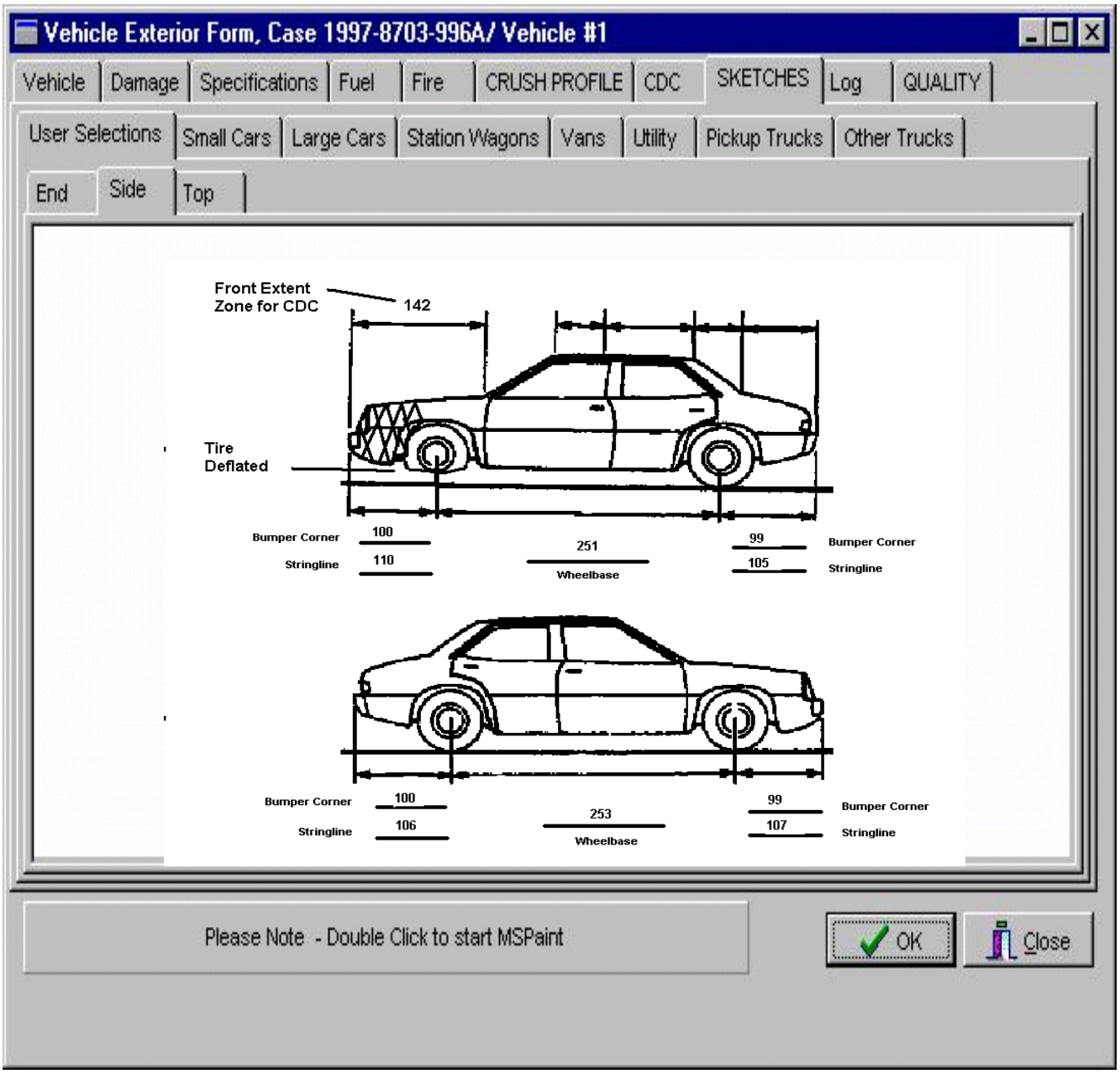


Next, select the size of the vehicle you are sketching. Then you select the style of vehicle that best matches the one you are sketching.

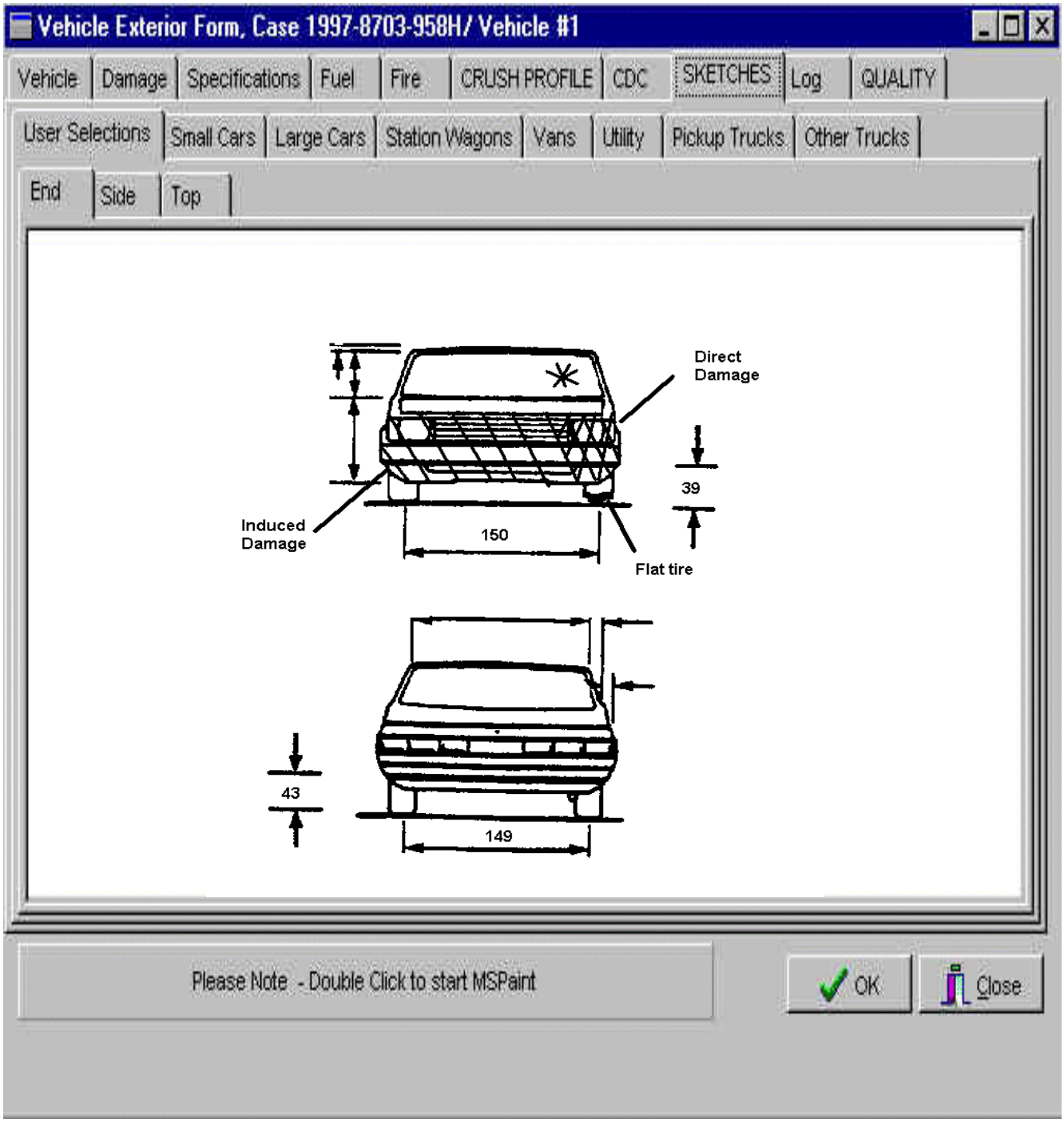


Next, select the End, Side or Top tab for completing the sketches. Then you double click on the image to start MSPaint and begin sketching the damage and documenting the required measurements.

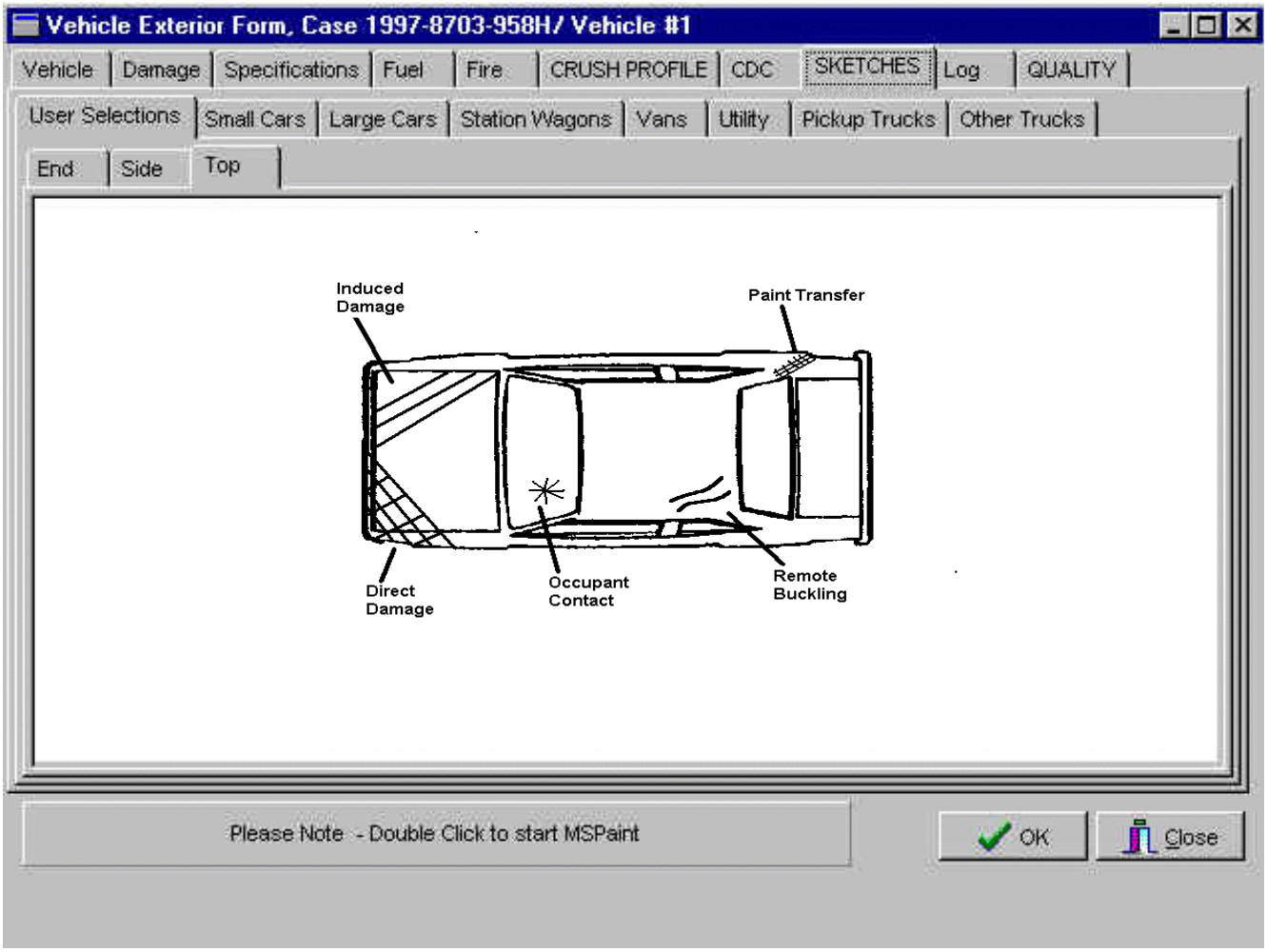
Side View Example

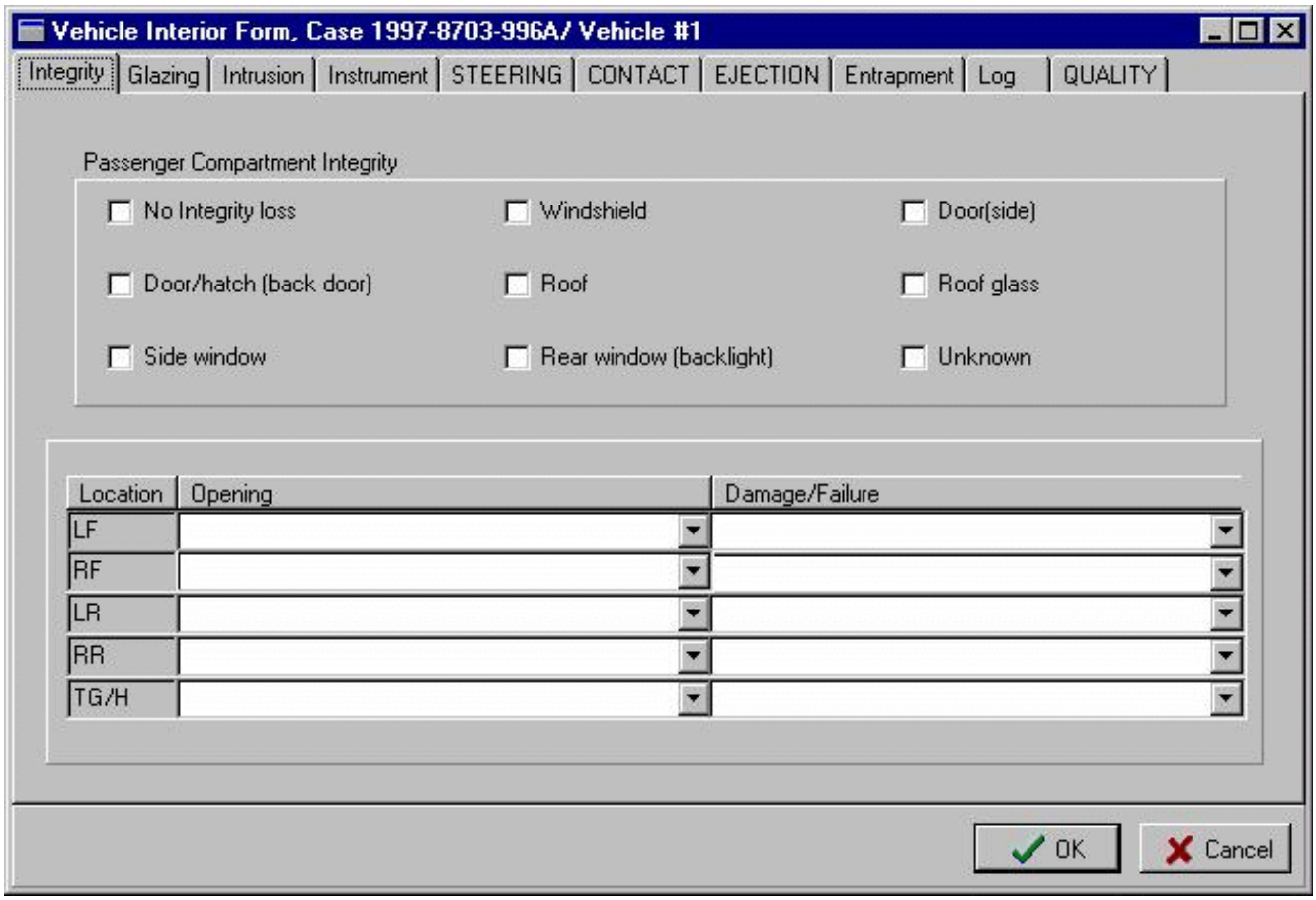


End View Example



Top View Example




Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Passenger Compartment Integrity
No Integrity loss
Windshield
Door(side)
Door/hatch (back door)
Roof
Roof glass
Side window
Rear window (backlight)
Unknown
Location
Opening
Damage/Failure
LF
RF
LR
RR
TG/H
OK
Cancel

Screen Name: Passenger Compartment Integrity
Variable Name: Passenger Compartment Integrity

Element Attributes:

No integrity loss
Windshield
Door (side)
Door/hatch (back door)
Roof
Roof glass
Side window
Rear window (backlight)
Unknown

Source: Vehicle inspection.

Remarks:

Select all that apply.

Consider the passenger compartment as a "package" which is designed to contain the occupant. If an opening occurs of sufficient magnitude through which an occupant could have been ejected totally or partially (although it is not necessary for an occupant to have been ejected), the integrity of the compartment should be considered to have been lost. While it is difficult to define the magnitude of the opening in a universal manner, the minimum size of the opening would be equivalent to the head of most adults (approximately 15- 20 centimeters). Components which may lose their integrity are restricted to the windshield glazing, window glazing (side, rear, or roof), door or roof.

The question of integrity loss is assessed with respect to impact related damage. The damage can be either direct or induced. Damage which is not impact related (*e.g.*, fire, extrication) is not considered.

Doors which open upon impact or glazing that is broken during the impact sequence are considered integrity loss. However, doors which were left open prior to an impact do not constitute damage related loss of integrity and should be reported under **Door, Tailgate Or Hatch Opening**, select **Other**.

No integrity loss
is selected when the doors, roof, and glazing (as listed below) remained intact during the impact sequence.

Windshield
is selected when the glazing is either holed/slit or displaced sufficiently to allow an adult size head to pass through.

Screen Name: Passenger Compartment Integrity (cont'd)
Variable Name: Passenger Compartment Integrity (cont'd)

Door (side)
refers to the door structure and excludes glazing areas. All side doors, whether hinged or sliding are considered here.

Door/hatch (back door)
identifies integrity loss of the back door structure and not the glazing. Back doors include hatchback, tailgate, and liftback. In situations where the rear hatch or upper portion of the tailgate is made entirely of glazing material and secured with a latching mechanism, only the latching mechanism should be considered for this attribute. Integrity loss through shattered or displaced rear window glazing is identified in **Rear window**

Roof
refers only to the roof structure and not glazing areas. Roof structures containing metal panels (*e.g.*, "T" top roofs) are reported here as well as closed convertible tops.

Roof glass
reports glazing material in the roof structure which is broken or displaced.

Side window
refers to glazing which was broken or displaced during the crash sequence. Glazing which was totally open prior to the crash and broken (*i.e.*, sidelight rolled down into the door area) is not entered as integrity loss.

Rear window (backlight)
includes backlights, hatchbacks / tailgates / liftbacks, and rear door glazing which were broken or displaced.

Unknown
is used in the following situations:

- extrication damage masked integrity loss, and
- integrity loss could not be determined due to circumstances beyond the researcher's control.

Screen Name: Passenger Compartment Integrity (cont'd)
Variable Name: Passenger Compartment Integrity (cont'd)

Door, Tailgate, or Hatch Opening Overview

It is the intent of these variables to capture whether a passenger compartment door, tailgate, or hatch opened or remained closed during the crash sequence. The reason the doors came open during the crash is also reported.

The areas of interest include the left front, right front, left rear, right rear, and tailgate/hatch doors (*i.e.*, LF, RF, LR, LR2, RR,RR2, TG/H, respectively). The LF and RF doors are the forward most side doors on the left and right sides of a vehicle and the LR and RR doors are the next door (or set of doors) rearward of the LF and RF doors. There are situations where two adjacent doors are used to cover a single opening (*i.e.*, side or rear of a cargo van). These should be treated as a single door. Side doors are applicable whether hinged or on tracks.

Generally, hatch doors meet the following criteria:

- provide access to the rear cargo area of a passenger car type vehicle, through a large opening backlight,
- are composed primarily of glass and may or may not be framed,
- are hinged at the top and latched at the bottom, and
- are not used in conjunction with a lower door or tailgate.

Some vehicles are equipped with frame less glass hatches which may shatter as a result of an impact. This situation is considered a glazing loss (refer to **Glazing**) rather than a hatch opening unless the hatch did, in fact, open prior to the glass breaking (*i.e.*, release of the latching/hinging mechanism). Some glass hatches may be bordered by a narrow band of metal. The condition of this metal band is the focus of this variable group. These remarks also apply when the upper window of a tailgate assembly is being considered.

Generally, tailgates exist on the rear end plane of station wagon type vehicles. They may be one or two piece assemblies. In the instance of a two piece unit, they will be hinged at the top and bottom with a horizontal seam. One piece units may be hinged at the top for some vehicles or at the bottom with retracting rear windows for others. Pickup truck tailgates are not included in these variables.

Rear doors may be single or double units covering a single opening. The rear doors are hinged on one or both sides with a vertical seam present in dual door applications. Rear doors are most commonly found on van type vehicles and are indicated under descriptor - "TG/H".

Screen Name: Opening
Variable Name: Door, Tailgate, or Hatch Opening

Element Attributes:

No door/gate/hatch
Door/gate/hatch remained closed and operational
Door/gate/hatch came open during collision
Door/gate/hatch jammed shut
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

This variable identifies the operational status of a door, tailgate or hatch during a crash sequence. Priority is given to doors which **"open"** during the collision. Doors which are pushed inwards and jammed, such that a gap or space occurs, are captured under this variable as **door / gate / hatch jammed shut.** The gap or space that occurs is coded under the variable **Integrity Loss.** Where multiple doors cover a single opening, and the disposition of each door was different, select the response for the door which is first identified in the following priority list:

1. Door/gate/hatch came open during collision
2. Door/gate/hatch jammed shut,
3. Other (specify):
4. Door/gate/hatch remained closed and operational
5. Unknown

As an example, if one door came open and the other was jammed shut, the proper response would be Door/gate/hatch came open during collision. Gaps caused by body deformation are not selected as door opening events. These gaps will be selected in Passenger Compartment Integrity.

No door/gate/hatch

is selected when no door, tailgate, or hatch exists in the appropriate area (*i.e.*, LF, RF, LR, RR, TG/H).

Door/gate/hatch remained closed and operational

for any door, tailgate, or hatch which did not open during the crash sequence and remained operational.

Door/gate/hatch came open during collision

is selected when the door assembly opened during the crash sequence, irrespective of the cause. Further, the magnitude of the opening created is inconsequential when selecting this response. Note, if this response is selected then the **Damage/Failure** responses for the next variable, must be indicated, based on what caused the door / hatch to come open. The researcher must consider the potential that a sprung-mass situation may exist. In this condition, the door may have been opened after the crash, but due to vehicle body stresses the door cannot be shut. This is an important consideration when assessing whether the door came open during the collision.

Screen Name: Opening (cont'd)
Variable Name: Door, Tailgate, or Hatch Opening (cont'd)

Door/gate/hatch jammed shut

is selected when a door is rendered inoperable due to being jammed shut. Inoperable is defined as the inability of the researcher to open the door wide enough (through the use of reasonable force) to allow passage of an adult head. It is irrelevant whether the jamming is a result of latch or hinge failure, the displacement of adjacent body panels, or direct damage. Undamaged locked doors should not be considered as jammed or inoperable. Doors which were pried open following the crash are an indication of jamming and should be closely examined. In this situation, the researcher should thoroughly annotate and photograph the door area to support this conclusion.

Other

is selected for those situations which cannot be identified with other elements. Doors which are open prior to the crash are reported here (*e.g.*, hatchbacks open for cargo reasons, ventilation, etc.).

Unknown

is used when the researcher could not make a performance assessment of the door, tailgate or hatch.

Screen Name: Damage/Failure
Variable Name: Damage/Failure Associated with Door, Tailgate, or Hatch Opening in Collision

Element Attributes:

Door operational (no damage)
Latch/striker failure due to damage
Hinge failure due to damage
Door structure failure due to damage
Door support (*i.e.*, pillar, sill, roof side rail, etc.) failure due to damage
Latch/striker and hinge failure due to damage
Other failure (specify):
Unknown
[No door/gate/hatch]
[Door not opened]

Source: Vehicle inspection.

Remarks:

This variable is designed to capture the reason a door opened during the collision sequence.

[No door/gate/hatch or door not opened]
is automatically selected when:
no door, tailgate, or hatch exists
the door/tailgate/hatch did not open during the crash sequence or
the door/tailgate/hatch is jammed shut

Doors which were open prior to the crash (hatchbacks open for cargo reasons, ventilation, etc.) also are reported here.

Door operational (no damage)
is selected when the door, tailgate, or hatch opened during the crash sequence, but the unit was undamaged and remained operational.

Latch/striker failure due to damage
is selected when the door, tailgate, or hatch opened as a result of a failure of the latch/striker assembly. The failure must be due to damage, either direct or induced, and must result in the forced unlatching of the latch/striker assembly or shearing of the striker post.

Hinge failure due to damage
is selected to indicate that a hinge failure exists as a result of either direct or induced damage. A hinge failure includes the complete separation of the hinge assembly from the door structure, pillar or of the two or more components which comprise the hinge assembly.

Screen Name: Damage/Failure (cont'd)
Variable Name: Damage/Failure Associated with Door, Tailgate, or Hatch Opening in Collision (cont'd)

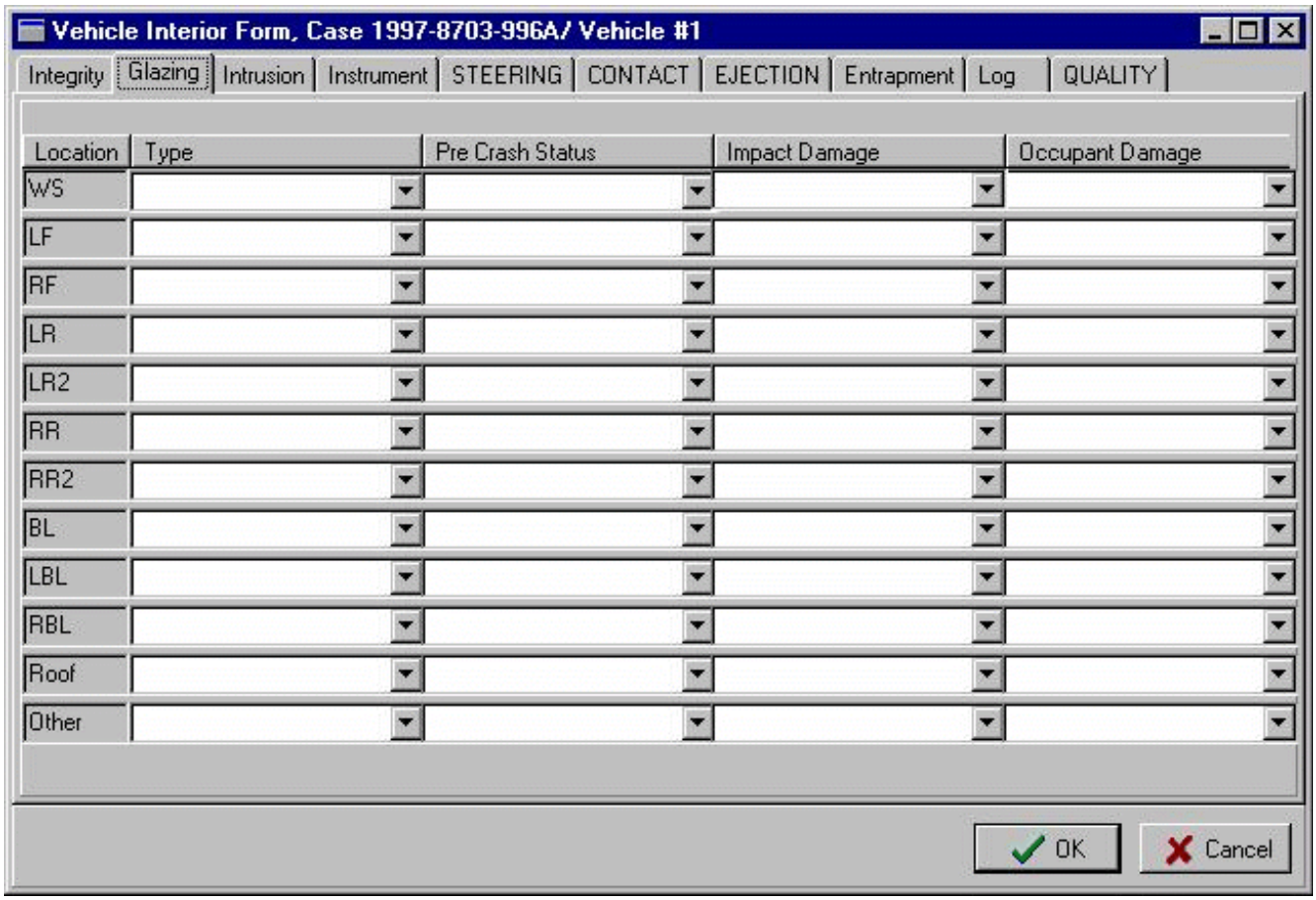
Door structure failure due to damage
is selected anytime the door structure sustained damage which allowed the latch, striker, or hinge to separate from the mounting surface (*i.e.*, torn metal). The door structure is defined as all components of the door assembly exclusive of the door skin.

Door support (*i.e.*, pillar, sill, roof side rail, etc.)
is selected to define situations where the latch/striker assembly did not fail, but the door support areas are damaged sufficiently to allow for the door to open. This includes, but is not limited to, the failure of pillars, sills and/or roof side rails at its most severe level.

Latch/striker and hinge failure due to damage
Latch/striker and hinge failure due to damage is used to describe situations where the entire door and adjacent components (*i.e.*, pillars) are torn away by an impact. Failure must be present to the latch/striker and at least one hinge, resulting in the door opening (*i.e.*, door partially or completely torn off).

Other failure
is used to indicate that an opening exists which cannot be described with the attributes above. This includes vehicles with a canvas roof and door structure (*i.e.*, Jeeps, etc.).

Unknown
is used when it cannot be determined which attribute applies.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Location
Type
Pre Crash Status
Impact Damage
Occupant Damage
WS
LF
RF
LR
LR2
RR
RR2
BL
LBL
RBL
Roof
Other
OK
Cancel

Glazing Type and Damage Overview

Glazing is defined for these variables as a covering for openings in the vehicle's structure which has the ability to allow light to pass. The areas of interest include: the windshield, sidelight windows, backlight (hatchback, tailgate, liftback, rear window), and roof. Composition of glazing materials in use include: glass, plastic, and glass-plastic.

The potential for occupant ejection is a major concern of rulemakers at NHTSA. These variables are designed to record the successes and failures of occupant containment by glazing when there is an occurrence of occupant contact to the glazing, or glazing damage by impact forces or vehicle damage.

There is glass that involves a plastic anti-lacerative layer applied to the inner surface of windshields (such as Inner Shield, Securiflex, etc.). Glass - plastic should not be confused with the current design of laminate windshields which are made with a layer of plastic (Polyvinyl Butyral) between two layers of annealed glass.

Researchers are required to thoroughly inspect all glazing for direct occupant contact / damage and encode their findings. This information is recorded independent of occupant ejection.

Glazing variables are divided into four sections.

- **Type**
- **Precrash Glazing Status**
- **Impact Damage**
- **Occupant Damage**

These sections are further divided into twelve specific areas of interest or Locations:

WS	=	windshield
LF	=	left front window (driver's window)
RF	=	right front window
LR	=	left rear window (adjacent to LF window)
LR2	=	2nd left rear window (adjacent to LR window)
RR	=	right rear window (adjacent to RF window)
RR2	=	2nd right rear window (adjacent to RR window)
BL	=	backlight, tailgate / hatchback / liftgate window
LBL	=	left backlight (left side of a divided backlight, i.e., rear doors on some vans)
RBL	=	right backlight (right side of a divided backlight, i.e., rear doors on some vans)
Roof	=	sun roof, moon roof, "T" roof, etc.
Other	=	other sidelights, door wing windows, and any other light not identified above

The "other" category (as noted) encompasses areas where glazing may be directly contacted by occupants or damaged from impact forces and not identified by a specific location. This would include wing windows located in door areas. In the event more than one "other" area was involved, select the area with the highest priority number as ranked above. When more than one glazing has priority, the researcher should select the glazing which is closest to the front of the vehicle with the left side taking precedence over the right side. The researcher must specify the selected glazing in the space provided.

Screen Name: Type
Variable Name: Type of Window/Windshield Glazing

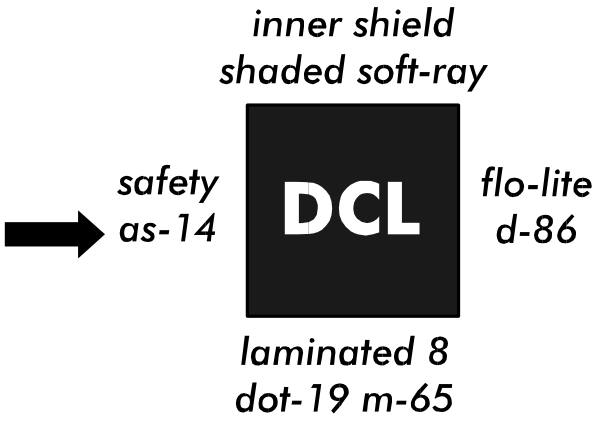
Element Attributes:

No glazing
AS-1 - Laminated
AS-2 - Tempered
AS-3 - Tempered-tinted (original)
AS-2 - Tempered-with after market tint
AS-3 - Tempered-tinted (with additional after market tint)
AS-14 - Glass / Plastic (Anti-Lacerative) not plastic
Glazing removed prior to crash
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

Glazing types are identified by unique AS (American Standard) numbers which are etched in the glazing surface. The AS numbers are generally grouped with other glazing information and together make up an informational symbol referred to as a "watermark" (see diagram below). The arrow indicates the “AS number” within the watermark.



Glazing types are used whether or not the glazing area was identified as damaged from impact forces or direct occupant contact. When all side and rear windows have been broken out, examine the window track or frame for remnants of broken glass. If glass is present and the remnants are small clear granules (or cracked in granule size pieces), then it is permissible to select (AS-2 — Tempered). If these remnants are tinted, then it is permissible to select [AS-3 — Tempered – tinted (original)]. If these remnants have any plastic tint shield clinging to them, then it is permissible to select (AS-2 — Tempered – with after market tint) or [AS-3 — Tempered – tinted (with additional after market tint)].

Screen Name: Type (cont'd)
Variable Name: Type of Window/Windshield Glazing (cont'd)

No glazing
is selected for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

AS-1 — Laminated
refers to a layer of plastic between two layers of glass. This type of glazing is widely used in current windshield installations.

AS-2 — Tempered
refers to glass which is designed to break into small glass granules when damaged.

AS-3 — Tempered – tinted (original)
refers to manufactured tinted (privacy) glass which has the ability to break into small glass granules when damaged. Glazing which has an aftermarket plastic tint shield applied should be listed as **AS-2 — Tempered – with after market tint**.

AS-2 — Tempered – with after market tint
refers to AS-2 glazing which has an aftermarket plastic tint shield applied.

AS-3 — Tempered – tinted (with additional after market tint)
refers to AS-3 glazing which has an additional aftermarket plastic tint shield applied.

AS-14
refers to glazing which uses plastic on its inner surface. This is used in anti-Lacerative windshields (*i.e.*, Inner Shield, Securiflex, etc.).

Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Other (specify)
refers to any glazing which has an AS number different from AS-1, AS-2, AS-3 and AS-14. Write the AS number of the glazing in the "specify" space provided. This includes plastic (AS-11C), and bullet proof (AS-10). Plastic side and rear windows in convertibles and Jeeps are examples of glazing that will be entered here.

Unknown
is used in the following situations.

- Due to factors beyond the researcher's control, an adequate determination of glazing presence could not be made.
- A reasonable determination of the "AS" number could not be made.

Screen Name: Pre Crash Status
Variable Name: Window Pre-crash Status

Element Attributes:

Fixed
Closed
Partially opened
Fully opened
Unknown
[No glazing]
[Glazing removed]

Source: Vehicle inspection with verification from interview, if possible.

Remarks: This variable records the operational modes of the glazing prior to the crash.

No glazing

is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Fixed

identifies glazing which is not designed to open (*e.g.* windshields, etc.).

Closed

refers to any operable glazing which was fully closed (*i.e.*, no air gaps).

Partially opened

refers to any operable glazing which is not firmly closed (*i.e.*, air gaps present) and not fully opened. Note, the researcher should select the placement of the window in relationship to the opening and not by window design limitations (i.e., rear sedan windows designed not to fully open).

Fully opened

refers to any operable glazing which is attached to the vehicle (*i.e.*, window tracks) and was placed in the open position such that the glazing was not restricting the opening of the vehicle structure. This element is assessed independently of window design limitations (*i.e.*, side windows designed to only roll down halfway cannot receive this attribute).

Glazing removed prior to crash

includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Unknown

is used in the following situations.

- Due to factors beyond the researcher's control, an adequate determination of glazing presence could not be made.

Screen Name: Impact Damage
Variable Name: Glazing Damage From Impact Forces

Element Attributes:

No glazing damage from impact forces
Glazing in place and cracked from impact forces
Glazing in place and holed from impact forces
Glazing out-of-place (cracked or not) and not holed from impact forces
Glazing out-of-place and holed from impact forces
Glazing disintegrated from impact forces
Unknown if damaged
[No glazing]
[Glazing removed]

Source: Vehicle inspection

Remarks:

This variable identifies damage to the glazing as a result of impact forces and/or vehicle damage (including damage from interior loose objects). Damage caused by direct occupant contact should be recorded in the variable **Occupant Damage**.

NOTE: glazing(s) which are retracted into vehicle body panels (*i.e.*, fully open) are to be assessed and coded as best as possible by the Researcher.

No glazing

is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

No glazing damage from impact forces

is selected when there was no damage to the glazing from impact forces. Glazing damage for these variables is defined as cracking, holed, out-of-place or disintegrated. Glazing which is scratched is considered not damaged.

Glazing in place and cracked from impact forces

is selected when the glazing remained within the confines of its specific area and was cracked. Displaced glazing which was not totally separated from the vehicle should be treated as "in place". This would include windshields with partial bond separation and dislodged side glazing(s).

Glazing in place and holed from impact forces

is selected when the glazing was "holed". "Holed" refers to a hole or slit in the glazing which is large enough in size to allow passage of an adult head (approximately 15-20 centimeters). For the purpose of this variable, the hole or slit must have been produced by impact force and/or vehicle damage and not by direct occupant contact.

Screen Name: Impact Damage (cont'd)
Variable Name: Glazing Damage From Impact Forces (cont'd)

Glazing out-of-place (cracked or not) and not holed from impact forces
refers to glazing which was totally separated from the vehicle as the result of impact forces and/or vehicle damage. Windshields with 100 percent bond separation should receive this attribute. Caution must be exercised by the researcher not to consider shattered tempered glass (*i.e.*, sidelights, etc.) as out-of-place. This situation should be identified as **Glazing disintegrated from impact forces**.

Glazing out-of-place and holed from impact forces
refers to glazing that was totally separated from the vehicle during the crash sequence and was holed/slit as the result of impact forces or vehicle damage. "Holed" refers to either a hole or slit in the glazing which is large enough in size to allow passage of an adult head (approximately 15-20 centimeters).

Glazing disintegrated from impact forces
refers to glazing that was totally destroyed by impact forces or vehicle damage. This usually occurs with shattered tempered glass (*i.e.*, sidelights, etc.). Windshields that are separated from the vehicle should not be considered disintegrated. Uncertainty may exist when determining the cause of shattered sidelight glazing when the collision occurred adjacent to an occupied seat. As a rule of thumb, impact forces and/or vehicle damage generally cause disintegration of the sidelight prior to occupant contact.

Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Unknown if damaged
is selected in the following situations.

- The degree of damage could not be determined as the result of post impact damage (*i.e.*, extrication, towing operations, etc.).

- Due to factors beyond the researcher's control, an adequate determination of glazing damage could not be made (*i.e.*, catastrophic type vehicle damage, etc.). This should be a rare occurrence.

- The cause of glazing damage (*i.e.*, impact forces versus occupant contact) could not be determined by the researcher. Caution, it is anticipated this reason will be rarely used. When confronted with this dilemma, every effort must be made to select a known value for damaged glazing.

Screen Name: Occupant Damage
Variable Name: Glazing Damage from Occupant Contact

Element Attributes:

No occupant contact
Glazing contacted by occupant but no glazing damage
Glazing in place and cracked by occupant contact
Glazing in place and holed by occupant contact
Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
Glazing out-of-place by occupant contact and holed by occupant contact
Glazing disintegrated by occupant contact
Unknown if contacted by occupant
[No glazing]
[Glazing removed]

Source: Vehicle inspection.

Remarks:

These variables report direct occupant contact to the glazing during the crash sequence. The responses are prioritized, the further you go down the list, the higher the priority, [*i.e.*, **Glazing in place and holed by occupant contact** takes precedence over **Glazing in place and cracked by occupant contact**, etc.].

NOTE: glazing(s) which are retracted into vehicle body panels (*i.e.*, fully open) are to be assessed and coded as best as possible by the Researcher.

No occupant contact
is selected when there are no direct occupant contact(s) detected on the glazing.

Glazing contacted by occupant but no glazing damage
is selected when an occupant directly contacted the glazing, but the contact did not result in glazing damage.

Glazing in place and cracked by occupant contact
refers to glazing that was damaged (not holed) by direct occupant contact. The term "in place" describes glazing which has remained within the confines of its specific area. Displaced glazing which was not totally separated from the vehicle should be treated as "in place". This would include windshields with partial bond separation and dislodged side glazing.

Glazing in place and holed by occupant contact
is selected when the glazing was "holed". "Holed" refers to a hole or slit in the glazing which was produced by direct occupant contact. This opening is equivalent in size to the space necessary to allow passage of an adult head (approximately 15 -20 centimeters).

Screen Name: Occupant Damage (cont'd)
Variable Name: Glazing Damage from Occupant Contact (cont'd)

Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
refers to glazing which was directly contacted by an occupant and was totally separated from the vehicle during the crash sequence. Windshields with 100 percent bond separation are reported here. Caution must be exercised by the researcher not to consider shattered tempered glass (*i.e.*, sidelights, etc.) as out-of-place. This situation is reported as **Glazing disintegrated by occupant contact**

Glazing out-of-place by occupant contact and holed by occupant contact
refers to glazing which was contacted and holed by direct occupant contact and totally separated from the vehicle during the crash sequence. "Holed" refers to a hole or slit in the glazing which was produced by direct occupant contact. This opening is equivalent in size to the space necessary to allow passage of an adult head (approximately 15 -20 centimeters).

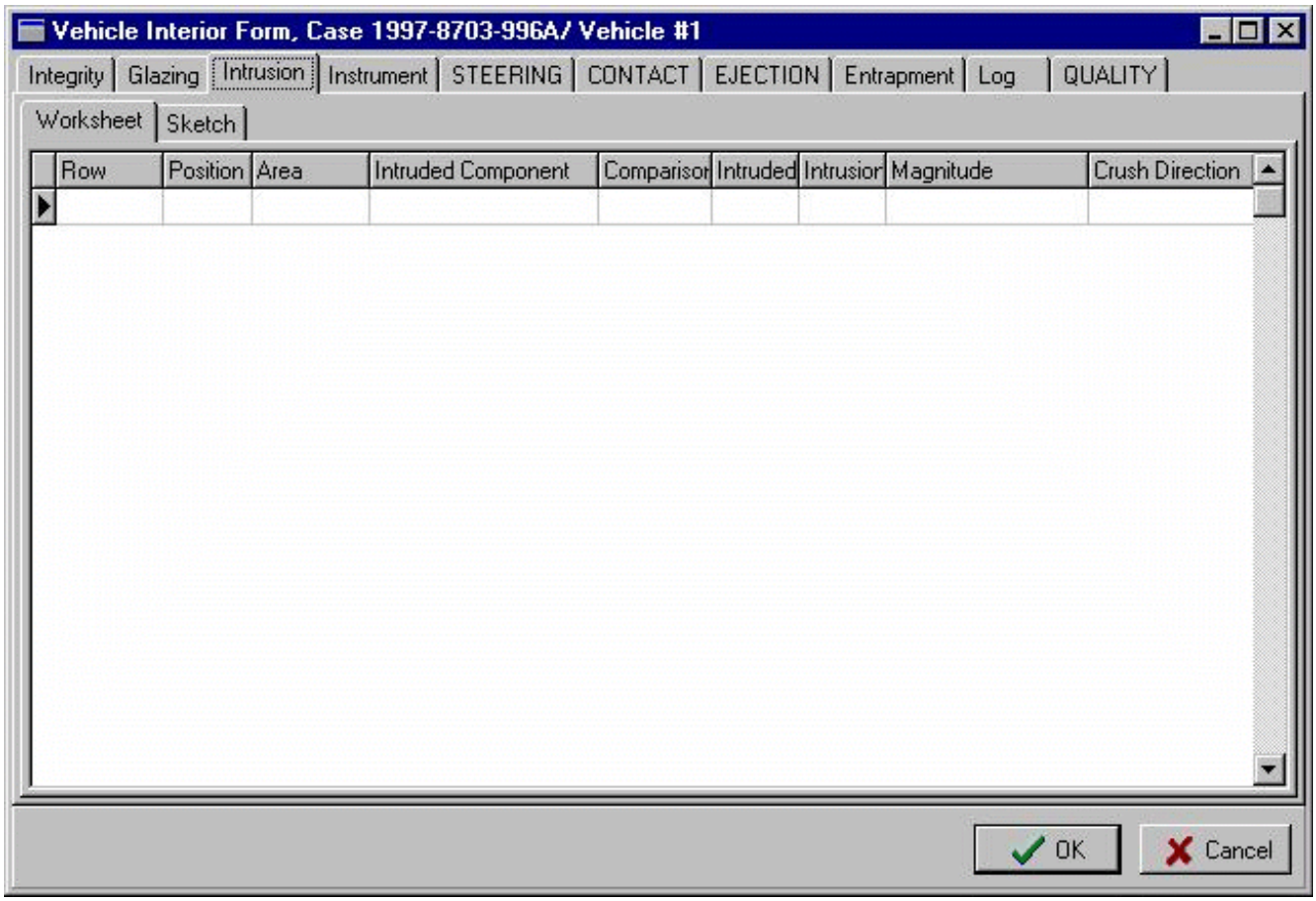
Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash. Glazing retracted into vehicle body panels (*i.e.*, fully open) is not considered in this element.

Glazing disintegrated by occupant contact
refers to glazing that was totally destroyed by direct occupant contact. This usually occurs with shattered tempered glass (*i.e.*, sidelights, etc.). Windshields that were separated from the vehicle should not be considered disintegrated. Uncertainty may exist when determining the cause of shattered sidelight glazing when the collision occurred adjacent to an occupied seat. As a rule of thumb, impact forces and/or vehicle damage generally cause disintegration of the sidelight prior to occupant contact. If the glazing is indicated in **Impact Damage** as "Disintegrated by Impact Forces" this variable must be coded as **No Occupant Contact**.

Unknown if contacted by occupant
is selected in the following situations.

- Direct occupant contact/damage could not be determined due to post impact damage (*i.e.*, extrication, towing operations, etc.).

- Due to factors beyond the researcher's control, an adequate determination of direct occupant contact/damage could not be made.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Worksheet
Sketch
Row
Position
Area
Intruded Component
Comparison
Intruded
Intrusion
Magnitude
Crush Direction
OK
Cancel

Occupant Area Intrusion Overview

If there is no intrusion leave the Intrusion Worksheet **blank.**

Displacement of less than three centimeters is not considered to be an intrusion.

Intrusion results whenever the internal boundary surface of the passenger compartment is moved inward due to direct or indirect damage resulting from the application of a crushing force to the exterior surface of a vehicle. A passenger compartment is defined as that interior occupant space which is normally available for occupant seating, based upon both the vehicle design and seat configuration at the time of the crash. Adjacent cargo areas and other enclosed areas are included for consideration in the following situations.

- The area behind the last row of seats designed by the manufacturer for cargo is integral with the passenger compartment.

- An area where a seat row was either removed or folded down to accommodate cargo.

Intrusion can occur from the vertical, longitudinal, or lateral direction. Intrusion can also occur from the displacement of interior seatbacks and/or seat cushions.

Measurement of Passenger Compartment Intrusion

Types of Intrusion

Two types of intrusions occur most often in crashes. They are:

Type A: Intrusion which is limited to one part of the passenger compartment and where the other side of the vehicle remains relatively free of distortion. This is likely to be the case in the majority of crashes. In many cases it will be possible to obtain undeformed vehicle dimensions as the vehicle is symmetrical about the longitudinal centerline.

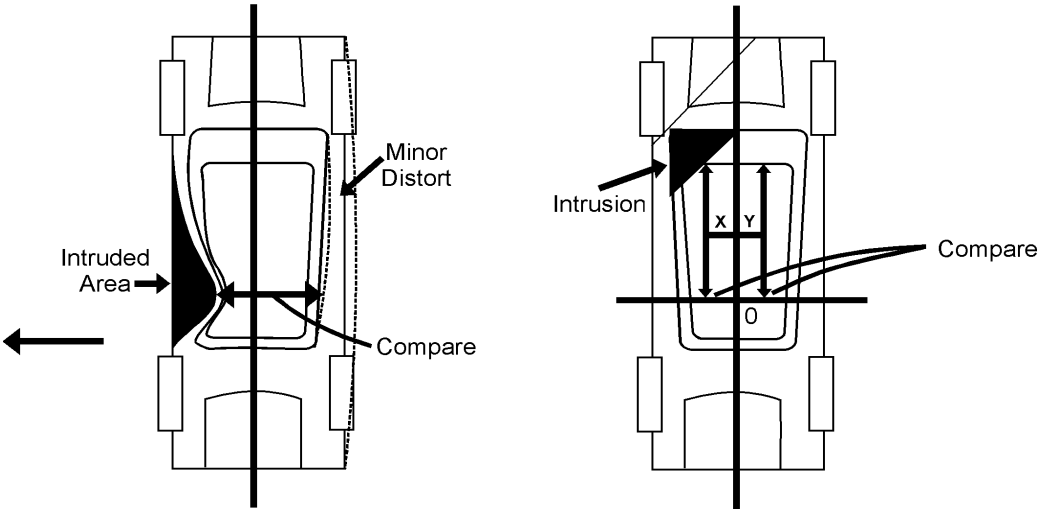
Type B: Intrusion which occurs in many sections of the passenger compartment with little of the vehicle remaining free of distortion. In this case, it will be necessary to obtain "original" dimensions by comparison with a second (unintruded) vehicle of the same type.

Occupant Area Intrusion Overview (cont'd)

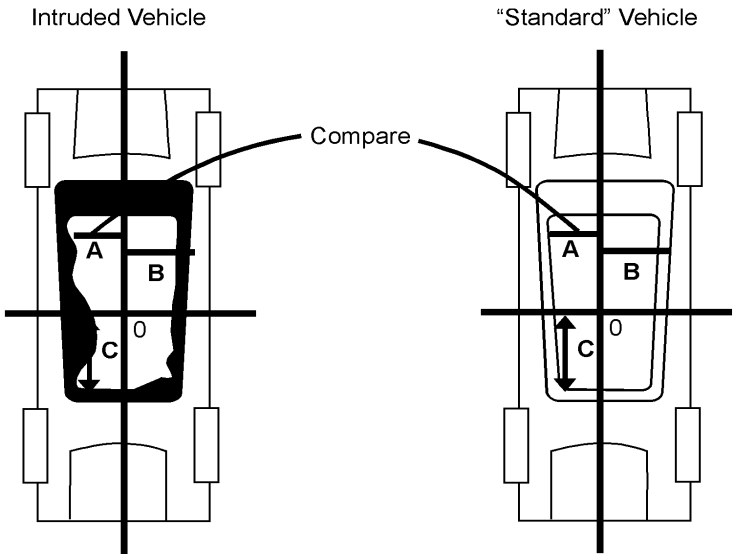
FIGURE 1

Establishment of Reference Axis. In order to compare one side of a vehicle with the other or compare two vehicles, a coordinate system within the vehicle is required. An example of Type A and Type B intrusions are shown in Figure 1.

TYPE A INTRUSION:

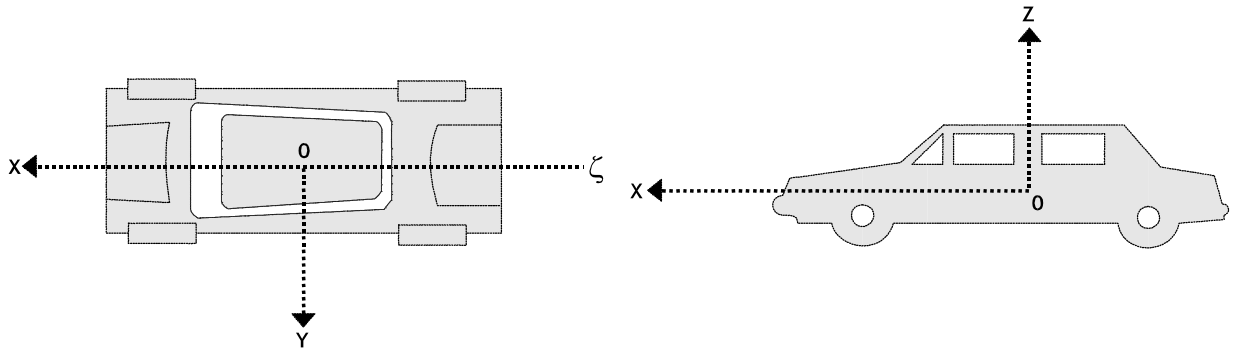


TYPE B INTRUSION:



Occupant Area Intrusion Overview (cont'd)

FIGURE 2



The x-axis is on the longitudinal centerline of the vehicle. This could be set up along the transmission drive shaft tunnel for a rear wheel drive vehicle or along a centerline which is equidistant from the sides of the vehicle in a front wheel drive vehicle.

The y-axis is in a side-to-side or lateral direction. This plane may be set up in any convenient location which can be readily established in the "reference" vehicle.

The z-axis is the vertical axis. A location at the top of the transmission drive shaft tunnel may be convenient to reference roof collapse in many cases. The point established by these intersecting planes defines the origin **(O)**.

Establishing a frame of reference and measuring intrusion can be simplified.

- In a frontal collision, there is rarely intrusion at the rear, and vice-versa for a rear collision.
- Side impacts generally damage only one side of the vehicle.
- Roof impacts leave the floor pan undistorted.

Not all intrusions require the establishment of all three axes.

The ordering of intrusions reflects the intrusion severity as recorded in column three (*i.e.*, Magnitude of Intrusion variables).

An intruded component is assessed for its Dominant Crush Direction as determined from the Magnitude of Intrusion. For example, an instrument panel may intrude both longitudinally and vertically. The coded intrusion will reflect the instrument panel with the dominant crush direction (vertical or longitudinally). If the dominant intrusion can not be determined in the field (i.e., an exemplar vehicle is required for comparison measurements) the Researcher should document the component (i.e., instrument panel) in both directions. However, during final completion of the case, only the instrument panel intrusion with the greater magnitude is coded, the other intrusion row is deleted.

Occupant Area Intrusion Overview (cont'd)

This system is defined by an orthogonal set of axes (x-y-z) and an origin (**O**) as shown in Figure 2. The position of the origin is typically on the longitudinal centerline of the vehicle and has an arbitrary location, both vertically and longitudinally. However, its location must be identical for the intruded and "reference" vehicle. Note, the axes are referenced to the floor plane of the vehicle.

NOTE: The extent of a component intrusion into a row sector should not exceed the pre-impact dimension of that sector. For example, if the front row width is 150 centimeters, each sector is equal to 50 centimeters. If the driver-side door panel intrudes 60 centimeters laterally, the intrusion is listed as:

- Front Row Left (sector 11) Intrusion Magnitude = 50cm (maximum amount for that sector)
- Front Row Middle (sector 12) Intrusion Magnitude = 10cm (the remaining amount for the door panel intrusion).

Catastrophic should only be used to describe intrusion damage which is so severe that the researcher is unable to discern any of the following:

- specific occupant locations
- intruding components
- magnitude of intrusions and
- dominant crush.

Screen Name: Row
Variable Name: Row

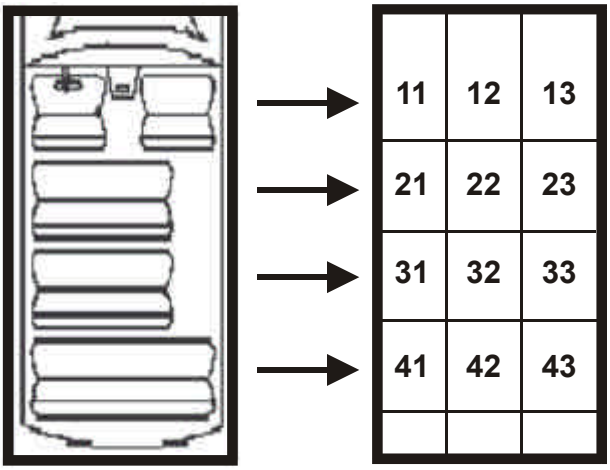
Element Attributes:

Front Row
Second Row
Third Row
Fourth Row
Catastrophic
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

The interior space of a vehicle is divided into specific sectors as outlined in the following diagram. These sectors are based upon seat rows and **not** occupant seat locations. Cargo areas open to the passenger area (*i.e.*, station wagons, vans, etc.) are assessed in these variables. Intrusion into the trunk area of an automobile with a rear seat position or into a cargo area covered by a privacy curtain/shelf is excluded.



Front Row, Second Row, Third Row, Fourth Row are identified by the presence of an installed seat.

When the entire seat row is folded down or removed prior to the crash, this area is considered an **Other** enclosed area**.**

Screen Name: Row (cont'd)
Variable Name: Row (cont'd)

The following rules guide us in the determination of "seat rows" versus "other enclosed areas" and in the derivation of the lateral dimension of each row sector.

- Cargo areas in passenger cars which are separated from the passenger compartment are not considered for intrusion. This would include trunk areas and rear cargo areas of hatchbacks and station wagons which were covered by a privacy curtain/shelf. The area above the privacy curtain/shelf is considered for intrusion and would be listed under **Other** enclosed area.

- The area behind the front row of a pickup truck where jump seats are installed should be identified by the status of these seats prior to the crash. When at least one seat was in the operational mode (*i.e.*, open) at the time of the crash, the entire area is listed as row 2. Otherwise, this area is assessed under **Other** enclosed area.

- A problematic area in vans is the situation where a row was removed prior to the crash. A seat row area that was removed prior to an crash should be selected as an **Other** enclosed area; however, it should be tabulated as a seat row to identify any sequential rows.

- Vans with single seating positions behind the Front Row (usually high back swivel chairs) are compressed into a single seat row.

- The fifth row in a van (envisioned as a rare occurrence) is identified as an **Other** enclosed area.

Catastrophic

is used when the intrusion damage to the occupant compartment is so devastating that the researcher is not able to discern any of the following: specific occupant locations, intruding components, magnitude of intrusions, and dominant crush. When catastrophic is selected, the program automatically encodes the **Area** as "other"; the **Magnitude** as "Catastrophic"; and the **Crush Direction** as "Catastrophic". **The Researcher must** select the **Intruded Component** as "Catastrophic"; **AND** leave the columns for **Comparison, Intruded**, and **Intrusion** blank.

Other (Specify):

is an area where no defined row exists. This would include an area where the entire seat row was folded down prior to the crash. Occasionally, the middle seat row in a passenger van will be removed leaving only the front and rearmost seat rows. If intrusion occurs within this area, the location should be identified here and specified.

Unknown

is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair (or repaired) at the time of inspection.

Screen Name: Position
Variable Name: Position

Element Attributes:

Left
Middle
Right

Source: Vehicle inspection.

Remarks:

Each row is equally divided into three sectors regardless of the seating configuration.

In the situation where half of the row is folded down (*i.e.*, split back seats) to accommodate cargo, the entire lateral area (wall-to-wall) is divided into three equal sectors.

The following rules guide us in the determination of "seat rows" versus "other enclosed areas" and in the derivation of the lateral dimension of each row sector.

- The lateral occupant space dimension for the front seat row is obtained by measuring the distance from the vehicle's side-surface to side-surface (undamaged dimension) and dividing by three. **Note, there is no implied correlation between seating capacity and sectors.**

- The area behind the front row of a pickup truck where jump seats are installed should be identified by the status of these seats prior to the crash. When at least one seat was in the operational mode (*i.e.*, open) at the time of the crash, the entire area is divided into three sectors.

Left

is defined as the left sector of the row (i.e., sectors 11, 21, 31, 41). The lateral dimension of this area is mathematically determined by dividing the original wall-to-wall dimension by three.

Middle

is defined as the center sector of the row (i.e., sectors 12, 22, 32, 42). .

Right

is defined as the right sector of the row (i.e., sectors 13, 23, 33, 43).

**** **Unknown** should not be selected and should be deleted from NASSMAIN. ****

Screen Name: Area
Variable Name: Area

Element Attributes:
Interior Components
Exterior Components
Other

Source: Vehicle inspection.

Remarks:

This variable filters the forthcoming intruding components with respect to whether they were internal or external to the occupant compartment.

Screen Name: Intruded Component
Variable Name: Intruded Component

Element Attributes:

Interior Components
- Steering assembly
- Instrument panel left
- Instrument panel center
- Instrument panel right
- Toe pan
- A (A1/A2)-pillar
- B-pillar
- C-pillar
- D-pillar
- Side panel - forward of the A1/A2-pillar
- Door panel (side)
- Side panel - rear of the B-pillar
- Roof (or convertible top)
- Roof side rail
- Windshield
- Windshield header
- Window frame
- Floor pan (includes sill)
- Backlight header
- Front seat back
- Second seat back
- Third seat back
- Fourth seat back
- Fifth seat back
- Seat cushion
- Back door/panel (*e.g.*, tailgate)
- Other interior component (specify):
- [Unknown]
- Catastrophic

Exterior Components
- Hood
- Outside surface of this vehicle (specify):
- Other exterior object in the environment (specify):
- Unknown exterior object
- Catastrophic
- Intrusion of unlisted component(s)
- Unknown

Source: Vehicle inspection.

Remarks:

Select the component which has reduced the occupant space for that sector. An intruded component is assessed for its Dominant Crush Direction as determined from the Magnitude of Intrusion. For example, an instrument panel may intrude both longitudinally and vertically. The final coded intrusion will reflect the instrument panel with the dominant crush direction (vertical or longitudinally). If the dominant intrusion can not be determined in the field (i.e., an exemplar vehicle is required for comparison measurements) the Researcher should document the component (i.e., instrument panel) in both directions. However, during final completion of the case, only the instrument panel intrusion with the greater magnitude is coded, the other intrusion row is deleted.

Screen Name: Intruded Component (cont'd)
Variable Name: Intruded Component (cont'd)

INTERIOR COMPONENTS:

Steering assembly
consists of the entire steering column which includes the steering rim, hub, and spokes.

Instrument panel left
refers to the left one-third of the panel. This should correlate with the same lateral dimension generated for the sector "11" (Front Seat Left) in variables Row and Position.

Instrument panel center
refers to the center one-third area of the instrument panel. This should correlate with the same lateral dimension generated for the sector "12" (Front Seat Middle) in variable Row and Position.

Instrument panel right
refers to the right one-third of the instrument panel. This should correlate with the same lateral dimension generated for the sector "13" (Front Seat Right) in variables Row and Position.

Toe pan
refers to the front portion of the floor that angles up to meet the dash panel.

A (A1/A2)-pillar
refers to the upper and lower portion of the forward most structural post of the passenger compartment on both side planes. Some vehicles (*e.g.*, GM APV minivan) are designed with two upper A-pillars on each side. The forward most pillar is called an A1-pillar which is primarily designed to secure the windshield to the vehicle. The second pillar is labeled as an A2-pillar. This pillar generally lends support to the roof and also helps to establish the front door opening. Annotation should be provided on the Interior Vehicle Form specifying which pillar was most severely intruded.

B-pillar
refers to the upper and lower portion of the structural post located at the rear edge of the front doors on both side planes. It should be noted, some vehicles do not have upper B-pillars.

C-pillar
refers to the upper and lower portion of the structural side post located at the rearmost edge of the rear door of a four door vehicle or the upper portion of the structural side post located between the backlight and side window glass on two door vehicles.

D-pillar
refers to the upper and lower portion of the structural post rearward of the C-pillar. D-pillars are usually available on station wagons, vans, or utility vehicles. The D-pillar is not to be confused with the C-pillar which is the rearmost pillar of the passenger compartment on most two and four door vehicles.

Screen Name: Intruded Component (cont'd)
Variable Name: Intruded Component (cont'd)

Side panel forward of the A1/A2-pillar
refers to the interior panel located on the side of the vehicle and forward of the front doors. This includes areas directly below the instrument panel sometimes referred to as a "kickpanel".
See **A-pillar** for A1/A2 definition.

Door panel (side)
refers to the side interior surface and related components of a door.

Side panel rear of the B-pillar
refers to any side surface area excluding doors, window frames, and associated glazing rearward of the B-pillar, below the roof rail, above the sill, and in front of any back door or wall.

Roof (or convertible top)
refers to the top structural member of the greenhouse supported by the side pillars, windshield header and backlight header.

Roof side rail
refers to the longitudinal horizontal stiffeners located along the edge of the roof.

Windshield
refers to the lateral glazing located at the forward most surface of the greenhouse.

Windshield header
refers to the front forward lateral edge of the roof directly above the windshield.

Window frame
refers to the longitudinal frame that encloses the side window glazings and composes that portion of the door above the window sill.

Floor pan (includes sill)
refers to the floor of the vehicle. This includes the lower portion of the passenger compartment (*e.g.*, door sills).

Backlight header
refers to the rear most lateral edge of the roof directly above the backlight.

Front seat back
refers to the back support of the front seat.

Second seat back
refers to the back support of any second-row seat.

Third seat back
refers to the back support of any third-row seat.

Fourth seat back
refers to the back support of any fourth-row seat.

Fifth seat back
refers to the back support of any fifth-row seat.

Seat cushion
refers to the horizontal portion of the seat assembly that was designed for seating.

Back door / panel (*e.g.*, tailgate)
refers to the interior surface and related components of the back door or if no door exists, the interior surface of the back wall.

Other interior component
refers to any interior component that may intrude into an occupant seating position.

EXTERIOR COMPONENTS:

Hood
refers to the horizontal structure covering the front compartment of the vehicle located forward of the windshield.

Outside surface of this vehicle
is selected when any outside surface of this vehicle not mentioned above has violated the internal boundary surface of the passenger compartment (*e.g.*, spare tire, jack, outside mirror, etc.).

Other exterior object in the environment
refers to an object external to the vehicle (trees, poles, other vehicle, etc.) which penetrates the internal boundary of this vehicle.

Unknown exterior object
is selected if there is evidence that an object intruded but it's unknown what that object was.

Intrusion of unlisted component(s)
is used if there is intrusion of any component not listed above.

Unknown
is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.

Screen Name: Comparison
Variable Name: Comparison Value (of intrusion)

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining comparison values found in **Occupant Area Intrusion Overview**.

Enter the Comparison value for the intruded component.

Screen Name: Intruded
Variable Name: Intruded Value (of intrusion)

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining intruded values found in **Occupant Area Intrusion Overview**.

Enter the Comparison value for the intruded component.

Screen Name: Intrusion
Variable Name: Intrusion

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining Intrusion values found in **Occupant Area Intrusion Overview**.

The Intrusion value is computed if the Researcher enters both an **Intruded** value and a **Comparison** value.

The extent of a component intrusion into a row sector should not exceed the pre-impact dimension of that sector. For example, if the front row width is 150 centimeters, each sector is equal to 50 centimeters. If the driver-side door panel intrudes 60 centimeters laterally, the intrusion is listed as:

- Front Row Left (sector 11) Intrusion Magnitude = 50cm (maximum amount for that sector)
- Front Row Middle (sector 12) Intrusion Magnitude = 10cm (the remaining amount for the door panel intrusion).

If the magnitude cannot be measured, but can be visibly seen, estimate the intrusion in the Magnitude variable that follows this variable.

Unknown
is used in the following situations.
- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.
- The researcher was not able to measure or reasonably estimate the intrusion.

Screen Name: Magnitude
Variable Name: Magnitude of Intrusion

Element Attributes:

$ 2 cms
$ 3 cm but < 8 cm
$ 8 cm but < 15 cm
$ 15 cm but < 30 cm
$ 30 cm but < 46 cm
$ 46 cm but < 61 cm
$ 61 cm
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

When the **Intrusion** is calculated by the program, is automatically assigns a magnitude or range to the intrusion. The researcher may select a magnitude for an intruded component while awaiting comparison values. If the magnitude cannot be measured, due to physical limitations but can be visibly seen, estimate the magnitude of the intrusion.

Unknown
is used in the following situations.
- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.
- The researcher was not able to measure or reasonably estimate the intrusion.

Screen Name: Crush Direction
Variable Name: Crush Direction

Variable Name: Crush Direction

Element Attributes:

Vertical
Longitudinal
Lateral
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

This variable assesses the direction of displacement for the intruded component. The direction of movement is determined independently from the PDOF applied to the vehicle.

Vertical

refers to components which intrude into the passenger compartment from either an upward or downward direction.

Longitudinal

refers to components which move forward or rearward into the passenger compartment.

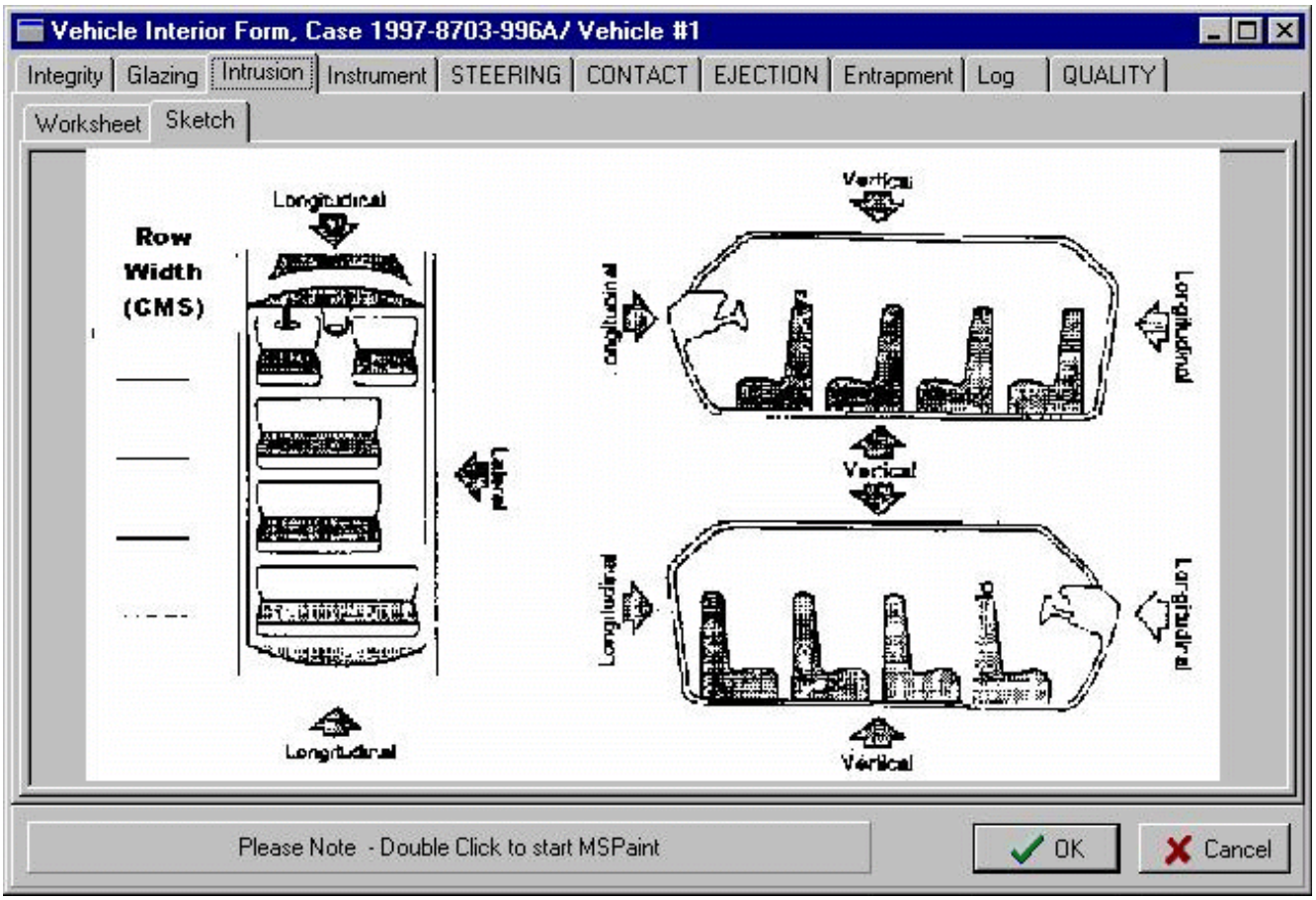
Lateral

refers to components which are displaced either left or right within the passenger compartment.

Unknown

is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.

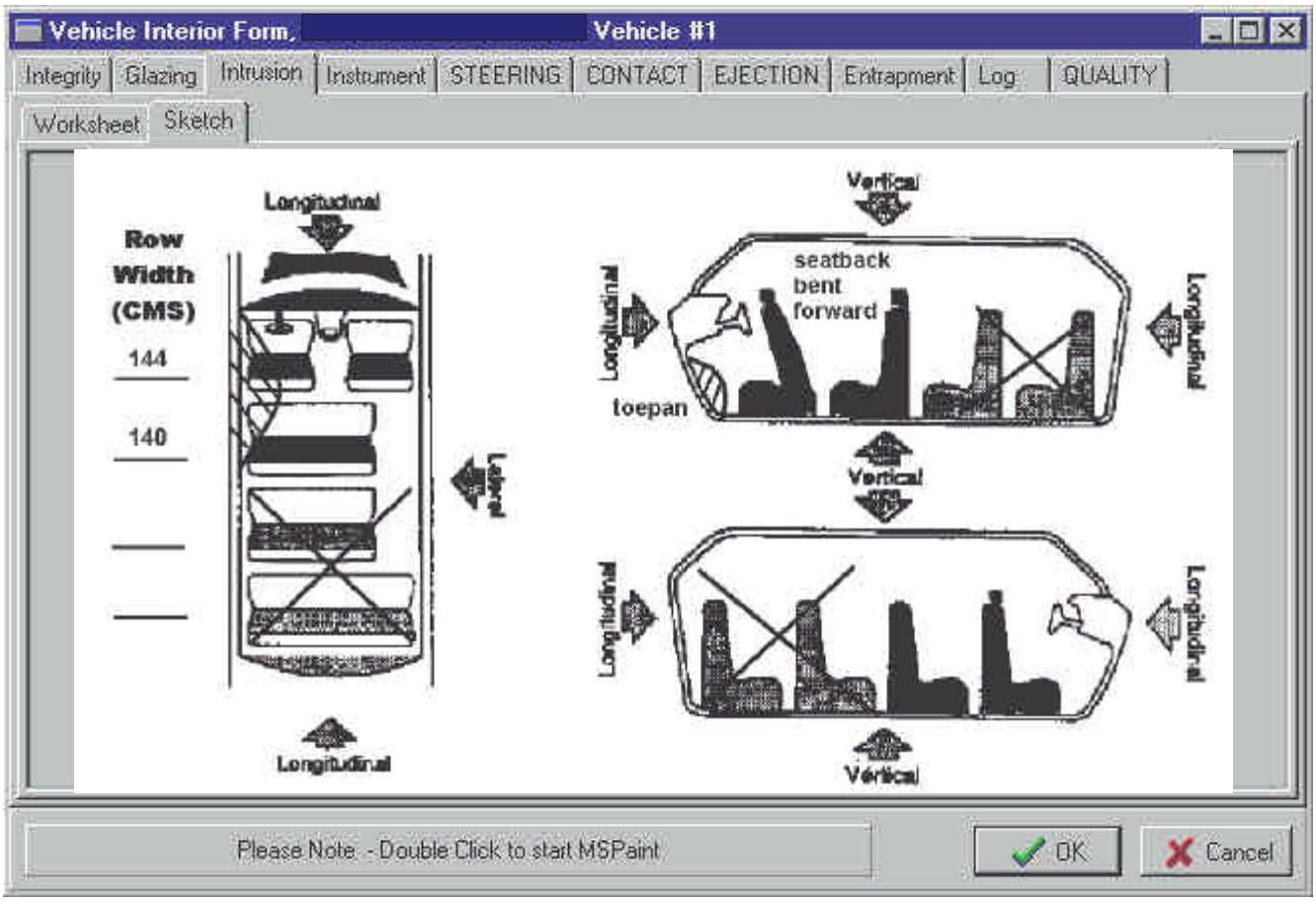

Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Worksheet
Sketch
Row Width (CMS)
Longitudinal
Lateral
Vertical
Please Note - Double Click to start MSPaint
OK
Cancel

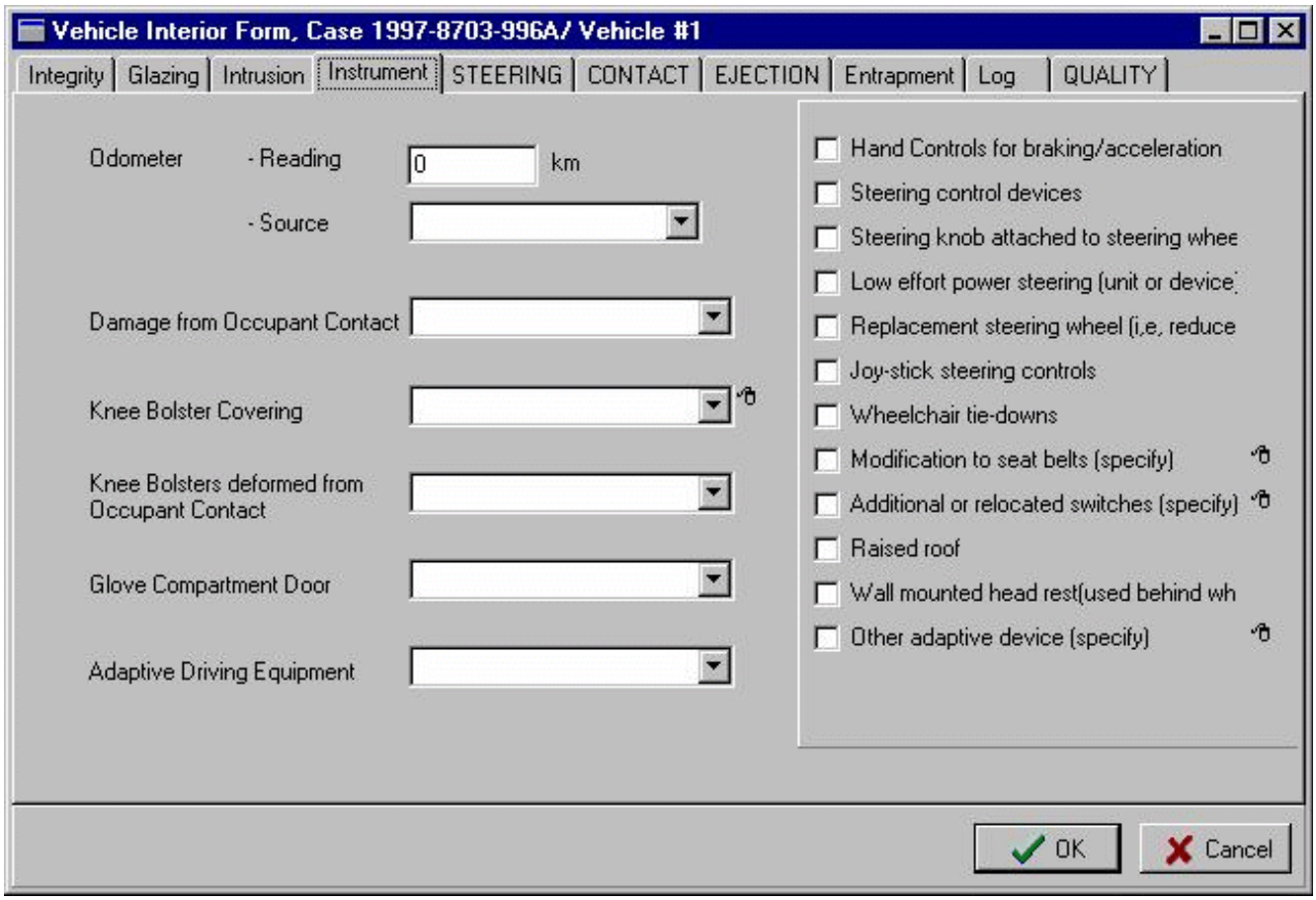
Intrusion Sketch Completion

The following should be included for all intrusion sketches:

- Row width for all rows in the vehicle
- A rough sketch of the Intruded components and their approximate displacement
- Cross out or erase rows which are not present in the vehicle
- Applicable annotations

An example sketch is provided below:




Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Odometer
- Reading
0
km
- Source
Damage from Occupant Contact
Knee Bolster Covering
Knee Bolsters deformed from Occupant Contact
Glove Compartment Door
Adaptive Driving Equipment
Hand Controls for braking/acceleration
Steering control devices
Steering knob attached to steering whee
Low effort power steering (unit or device
Replacement steering wheel (i,e, reduce
Joy-stick steering controls
Wheelchair tie-downs
Modification to seat belts (specify)
Additional or relocated switches (specify)
Raised roof
Wall mounted head rest(used behind wh
Other adaptive device (specify)
OK
Cancel

Screen Name: Odometer Reading
Variable Name: Odometer Reading

Element Attributes:

Range: 000, 001 through 1,000,000
Unknown

Source: Primary source is the vehicle inspection, secondary sources include the interviewee, and repair facility.

Remarks:

Enter the number of miles displayed on the odometer.

This variable measures the distance the vehicle has traveled. However, in cases where it is known that the odometer was working but had turned over (*i.e.*, recycled) the recorded value represents the total distance traveled by the vehicle rather than the reading on the odometer. Annotate in **Odometer Source** the source of information when it is determined that the odometer had turned over.

Unknown
is used when:

- it is known that the odometer was disconnected or broken before the collision;
- the vehicle is equipped with an electronic instrument cluster and an analog "back-up" odometer is not present; or
- the vehicle's odometer reading is unknown.
- the vehicle was manufactured without an odometer.

Screen Name: Odometer - - Source
Variable Name: Odometer Source

Element Attributes:

Vehicle Inspection
Interview
Other
Repair Facility

Source: Primary source is the vehicle inspection; secondary sources include Interviewees and repair facilities

Remarks:

Indicate the source that was used to make the vehicle's mileage determination. For example: if it is evident from the vehicle inspection that the vehicle has gone over 100,000 miles, and the odometer indicates 2,300 miles, code the mileage as 102,300 (164,636 kilometers) and indicate the source as **Vehicle Inspection.**

Screen Name: Damage from Occupant Contact
Variable Name: Instrument Panel Damage from Occupant Contact

Element Attributes:

No
Yes
Unknown

Source: Vehicle inspection only.

Remarks:

Instrument panel damage is defined as damage caused by occupant contact during the impact sequence. This damage includes: breakage, dents, scratches, and abrasions. Deformities resulting from impact forces such as lateral shift or buckling are excluded.

On vehicles without knee bolsters, The instrument panel is defined as that panel extending horizontally from A-pillar to A-pillar (Figure 1) and vertically from the lower part of the windshield to the lowest vertical edge of the panel (Figure 2). This excludes the steering assembly and all center mounted consoles.

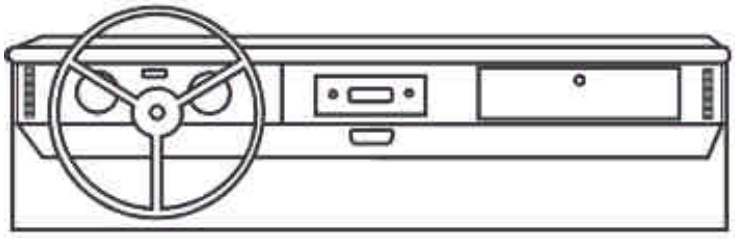


FIGURE 1

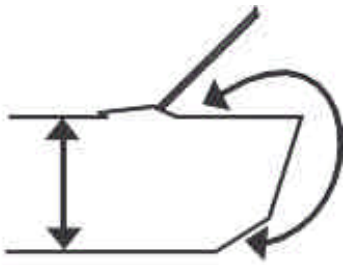


FIGURE 2

No

is selected when the instrument panel was not damaged by occupant contact.

Yes

is selected when the instrument panel was damaged by occupant contact.

Unknown

is selected when:

- the instrument panel is under repair or replaced.
- it cannot be determined if there was occupant contact to the instrument panel.

Screen Name: Knee Bolster Covering
Variable Name: Type of Knee Bolster Covering

Element Attributes:

No Knee Bolster
Padded
Rigid Plastic
Other (specify):_____
Unknown

Source: Vehicle inspection.

Remarks:

Knee bolsters are generally present in vehicles equipped with air bags.

More recent vehicles have bolsters which are not so obvious. Generally, presence of an air bag or a two point automatic belt system would be a solid indicator of bolster presence. When in doubt, **and** in the presence of either an air bag or two point belt, record bolster presence.

The most obvious of this device is the "parcel tray" type of bolster in the Volkswagen Rabbit which was equipped with the two point shoulder belt that was anchored in the top of the door frame and at the console.

No knee bolster
is selected when no knee bolster is present.

Padded
refers to a knee bolster which is covered with a soft, pliable or padded surface.

Rigid plastic
refers to a knee bolster that is either constructed of or covered by a hard, rigid plastic surface.

Other
is selected when a knee bolster is present but it is constructed of or covered by some other material such as metal.

Unknown
is selected when it cannot be determined if a knee bolster is present or the covering cannot be identified (*e.g.* burned vehicles). This should be a rare occurrence.

Screen Name: Knee Bolsters Deformed from Occupant Contact
Variable Name: Knee Bolsters Deformed from Occupant Contact

Variable Name:

Element Attributes:

No- deformation
Yes - deformation
Unknown
[No knee bolster]

Source: Vehicle inspection.

Remarks:

Knee bolsters are defined as energy absorbing panels fitted to the lower portion of the instrument panel to help restrict forward movement of the front seat occupant's lower body during an crash. Knee bolsters may or may not extend from A-pillar to A-pillar depending on the vehicle make and model. Vehicles equipped with an air bag are generally equipped with a knee bolster.

Vehicles equipped ***ONLY*** with a passive restraint system using **only** an upper torso (shoulder) belt (such as certain Volkswagen Rabbits) generally are equipped with a knee bolster. This padded attachment is designed to prevent the occupant from submarining under the shoulder belt and instrument panel during an impact. This variable reports deformation (indentation) of the knee bolster as a result of occupant contact and not as a result of impact related damage.

[No knee bolster]
is automatically selected when no knee bolster is present.

No deformation
is selected when a knee bolster is present but is not deformed by occupant contact.

Yes — deformation
is selected when occupant caused deformation is present on the knee bolster. Minor dents are considered deformation; however, scuffing and transfers are not deformation. Occupant contact evidence is included on the Vehicle Interior Sketches , Point of Contact Sketches, and highlighted in the photographs.

Unknown
is selected when knee bolster deformation is present but it is unknown if it was caused by an occupant .

Screen Name: Glove Compartment Door
Variable Name: Did Glove Compartment Door Open During Collision(s)?

Element Attributes:

No glove compartment door
No — door did not open
Yes — door opened
Unknown

Source: Researcher determined — inputs include the vehicle inspection and interview.

Remarks:

This variable reports the status of the glove compartment door (if present) during the crash. The primary objective is to determine whether the door latch mechanism released during a collision(s).

No glove compartment door

is selected when no glove compartment door is available

No — door did not open

is selected when the door did not open or the door opened but the latch mechanism did not fail (*e.g.*, body of door separates from the latch mechanism which is intact and engaged).

Yes — door opened

is selected when the door opened because the latch mechanism released. Reasons may include: occupant contact, shifting or buckling of vehicle components, or impact forces.

Unknown

is selected when:

- that portion of the instrument panel is under repair, or
- the glove box door is known to be open but it is unknown whether the door opened as a result of the crash [*i.e.*, door could have been open prior to the crash, or it could have been opened after the crash (*e.g.*, to remove driver registration information)].

Screen Name: Adaptive Driving Equipment
Variable Name: Adaptive (Assistive) Driving Equipment

Element Attributes:

No adaptive driving equipment
Adaptive driving equipment installed
Unknown

Source: Investigator determined — primary source is the vehicle inspection, secondary source is driver interview.

Remarks:

Adaptive driving equipment is defined as equipment whose primary purpose is to assist persons with disabilities in the operation of a vehicle. This variable is designed to capture those vehicles that have this type of after-market adaptive driving equipment installed. Use of the equipment at the time of the crash is irrelevant. Be alert for evidence of equipment that may have been removed between the time of the crash and the time of inspection. The device(s) must be present at the driving position (e.g., wheelchair tie downs).

No adaptive driving equipment

is used when it is determined that no adaptive equipment was present in the vehicle at the time of the crash.

Adaptive equipment installed

is used when it is determined that adaptive equipment was present in the vehicle at the time of the crash. Use of the equipment at the time of the crash is not to be considered.

Element Attributes: ***Check all that apply***

(_) Hand controls for braking/acceleration
(_) Steering control devices (attached to OEM steering wheel)
(_) Steering knob attached to steering wheel
(_) Low effort power steering (unit or device)
(_) Replacement steering wheel (*i.e.* reduced diameter)
(_) Joy-stick steering controls
(_) Wheelchair tie-downs
(_) Modifications to seat belts (specify)
(_) Additional or relocated switches (specify)
(_) Raised roof
(_) Wall mounted head rest (used behind wheelchair)
(_) Other adaptive device (specify)

Hand controls for braking / acceleration

does not include normal cruise control

Steering control devices (attached to OEM steering wheel)

includes handles and arms used to assist in the operation of the vehicle

Steering knob attached to steering wheel

is used to help in the turning of the vehicle. May sometimes be referred to as a "suicide knob".

Screen Name: Adaptive Driving Equipment (cont'd)
Variable Name: Adaptive (Assistive) Driving Equipment (cont'd)

Low effort power steering (unit or device)
can possibly be identified by looking under the hood for an enhanced pump.

Replacement steering wheel (i.e. reduced diameter)
some after-market suppliers have "chain-link" type steering wheels, they are **NOT** considered as adaptive equipment for persons with disabilities.

Joy-stick steering controls

Wheelchair tie-downs
are selected ONLY if they are present at the drivers' location.

Modifications to seat belts (specify)
comfort devices such as lambs wool coverings are NOT considered here.

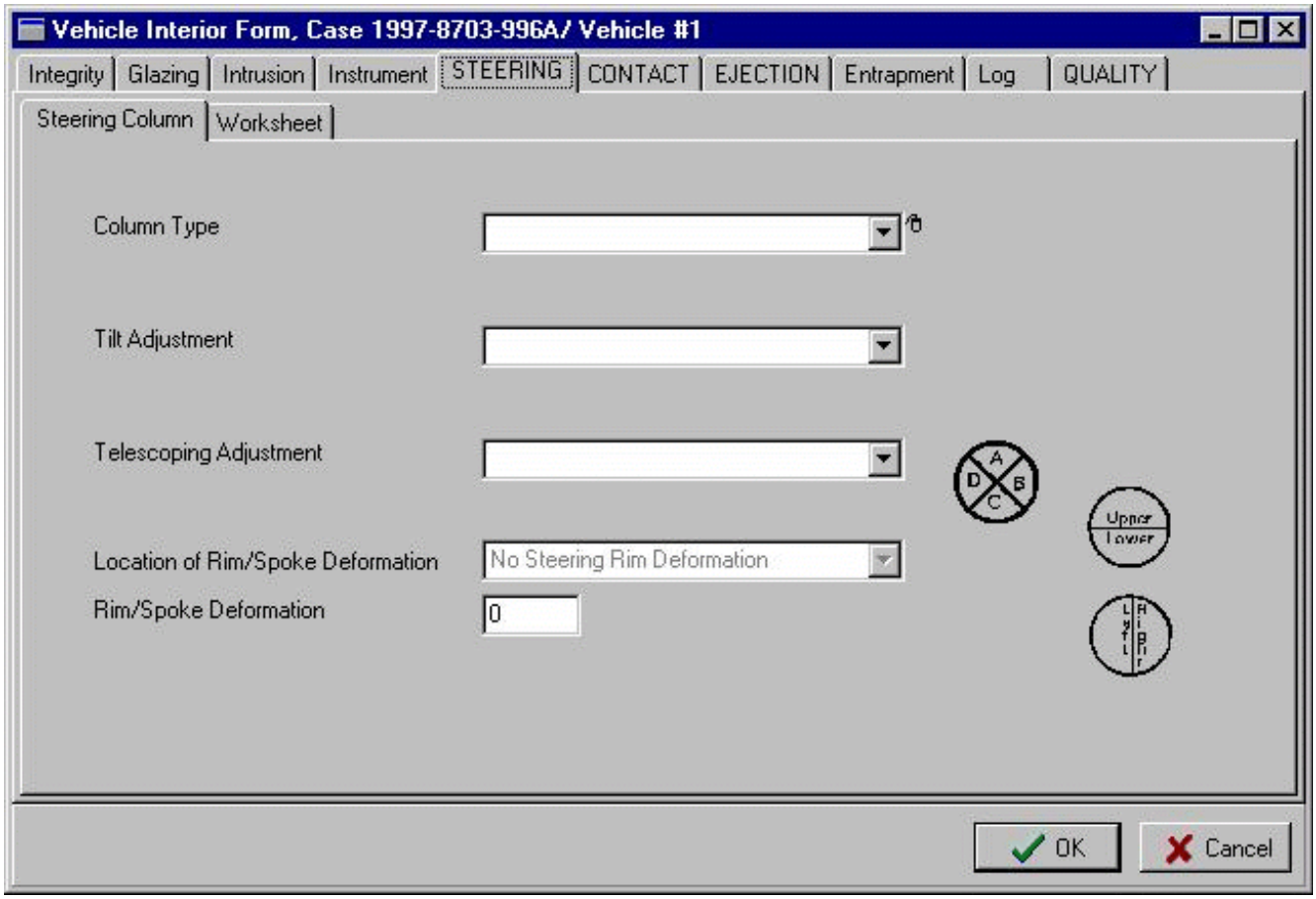
Additional or relocated switches (specify)

Raised Roof
will look like a second roof, not a camper-van type

Wall mounted head rest (used behind wheelchair)
are selected ONLY if they are present at the drivers' location

Other adaptive device (specify)
must be specified and sketched if possible. As an example, after-market pedal extenders used specifically for assist persons with disabilities in the operation of the foot controls would be included in this element.

Unknown
is used when it cannot be determined if any adaptive driving devices were installed in the vehicle at the time of the crash.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Steering Column
Worksheet
Column Type
Tilt Adjustment
Telescoping Adjustment
Location of Rim/Spoke Deformation
No Steering Rim Deformation
Rim/Spoke Deformation
0
A
B
C
D
Upper
Lower
OK
Cancel

Screen Name: Column Type
Variable Name: Steering Column Type

Element Attributes:

Fixed column
Tilt column
Telescoping column
Tilt and telescoping column
Other column type (specify):
Unknown

Source: Vehicle inspection.

Fixed column

refers to a non-adjustable steering column. Note if "Fixed column" is selected the variables **Tilt Adjustment** and **Telescoping Adjustment** will be pre-coded as "No tilt steering column" and "No telescoping column", respectively.

Tilt column

refers to a steering column designed to allow the steering wheel or column to be tilted at an angle selected by the operator to improve driving comfort. The presence of these types can generally be verified by the existence of an extra control stalk on the column. This stalk is separate from the turn signal, headlight, or wiper controls and is usually mounted near the bend point of the tilt wheel, or near the lower part of the instrument panel for the tilt column. Characteristically, the control stalk is unmarked and may be located on the left or right side of the column in relative proximity to the steering wheel end. Some vehicles are equipped with a "lever" device on the underside of the column, which allows placement of the entire column for driver comfort.

Telescoping column

refers to a steering column that has an adjustable length. The column can be shortened or lengthened to suit operator comfort. The telescoping feature can generally be identified by the presence of a knurled ring around the column. Rotating this ring allows the column to be lengthened or shortened, while re-tightening the ring locks the column at the desired adjustment.

Tilt and telescoping column

refers to a column that has both the tilt wheel and adjustable length features.

Other column type (specify)

includes steering columns which cannot be described above. This would include swing away columns, etc.

Unknown

Unknown is used if the column type cannot be determined.

Screen Name: Tilt Adjustment
Variable Name: Tilt Steering Column Adjustment

Element Attributes:

Full up
Between full up and center
Center
Between center and full down
Full down
Unknown
[No tilt steering column]

Source: Investigator determined; primary source is the vehicle inspection, other input is driver interview.

Remarks:

This variable is used to describe the pre-impact tilt position of adjustable steering columns.

Full up

refers to a vertically adjustable steering column that was in its highest position possible at the time of the crash.

Between full up and center

refers to a vertically adjustable steering column that was somewhere between full up and the center position at the time of the crash.

Center

refers to a vertically adjustable steering column that was in the center-most position (*e.g.* equal amounts of adjustment both above and below this position) at the time of the crash.

Between center and full down

refers to a vertically adjustable steering column that was somewhere between the center and full down position at the time of the crash.

Full down

refers to a vertically adjustable steering column that in its lowest possible position at the time of the crash.

Unknown

is selected when: it cannot be determined if the vehicle was equipped with a vertically adjustable steering column or the researcher cannot determine the pre-impact position of the vertically adjustable steering column.

Screen Name: Telescoping Adjustment
Variable Name: Telescoping Steering Column Adjustment

Element Attributes:

Full back
Between full back and midpoint
Midpoint
Between midpoint and full forward
Full forward
Unknown
[No telescoping steering column]

Source: Investigator determined; primary source is the vehicle inspection, other input is driver interview.

Remarks:

This variable is used to describe the pre-impact telescoping position of adjustable steering columns.

No telescoping steering column
is selected when the steering column does not have an adjustment to move the steering column/wheel longitudinally (forward and backward).

Full back
refers to a longitudinally adjustable steering column that was in its rearward-most position (toward the rear of the vehicle) at the time of the crash.

Between full back and midpoint
refers to a longitudinally adjustable steering column that was somewhere between the full back position (toward the rear of the vehicle) and the center position at the time of the crash.

Midpoint
refers to a longitudinally adjustable steering column that was in the center-most position (mid-point of the overall movement range) at the time of the crash.

Between midpoint and full forward
refers to a longitudinally adjustable steering column that was somewhere between the center position and the full forward position (toward the front of the vehicle) at the time of the crash.

Full forward
refers to a longitudinally adjustable steering column that was in the forward most position (toward the front of the vehicle) at the time of the crash.

Unknown
is selected when it cannot be determined if the vehicle was equipped with a longitudinally adjustable steering column or the researcher cannot determine the pre-impact position of the longitudinally adjustable steering column.

Screen Name: Location of Rim / Spoke Deformation
Variable Name: Location of Rim / Spoke Deformation

Element Attributes:

No steering rim deformation

Quarter Sections
Section A
Section B
Section C
Section D

Half Sections
Upper half of rim/spoke
Lower half of rim/spoke
Left half of rim/spoke
Right half of rim/spoke

Complete steering wheel collapse
Undetermined location
Unknown

Source: Vehicle inspection.

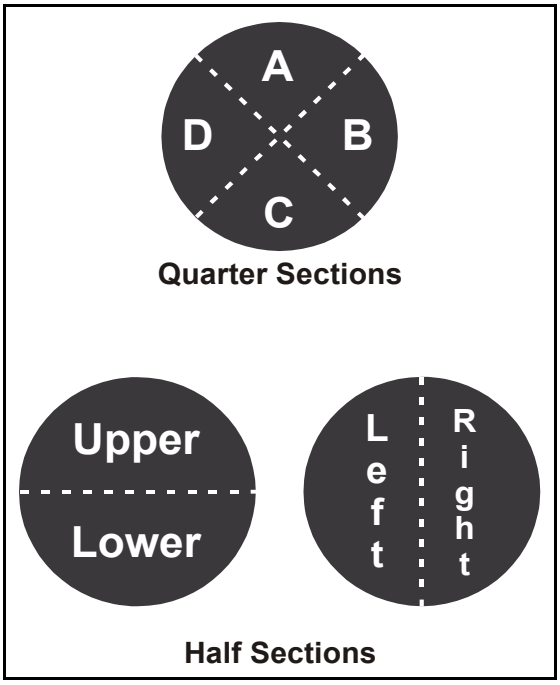
Remarks:

The variable **Rim / Spoke Deformation** must be coded with a value, in order to classify the **Location of Rim / Spoke Deformation**.

The steering wheel rim is divided into four quarter sections (A through D) and four half sections (upper half, lower half, left half, right half).

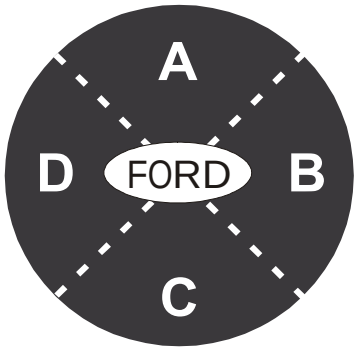
Note, the half designation should not be considered as a grouping of quarter sections.

The accompanying diagrams identify the location of the quarter and half sections.



Screen Name: Location of Rim / Spoke Deformation (cont'd)
Variable Name: Location of Rim / Spoke Deformation (cont'd)

Evaluate the deformation of the rim with respect to the wheel design and not the wheel position observed during the vehicle inspection. For example, if the designed top section was deformed and rotated to the bottom position, then the correct response for this variable is Quarter Sections - Section A; see below.



Straight Ahead Position

Post-Impact Position

When evaluating which quarter or half to encode, place primary emphasis upon downward deflection (toward the instrument panel) since the coding captures occupant-caused deformation. When two half sections are deformed, select the half with the greatest deformation.

Complete steering wheel collapse
is selected in the event two half sections are deformed axially downward (toward the instrument panel) beyond the hub.

Undetermined location
is selected when it is known the rim was deformed, but as the result of extrication or other post-impact activity the original deformed section could not be determined.

Unknown
is selected in the following situations.

- It is not known if the rim was deformed by occupant contact.
- An assessment of rim damage could not be made as the vehicle was repaired.

Screen Name: Rim /Spoke Deformation
Variable Name: Steering Rim / Spoke Deformation

Element Attributes:

Record actual measured deformation to the nearest centimeters.

Indeterminate - Observed
Unknown

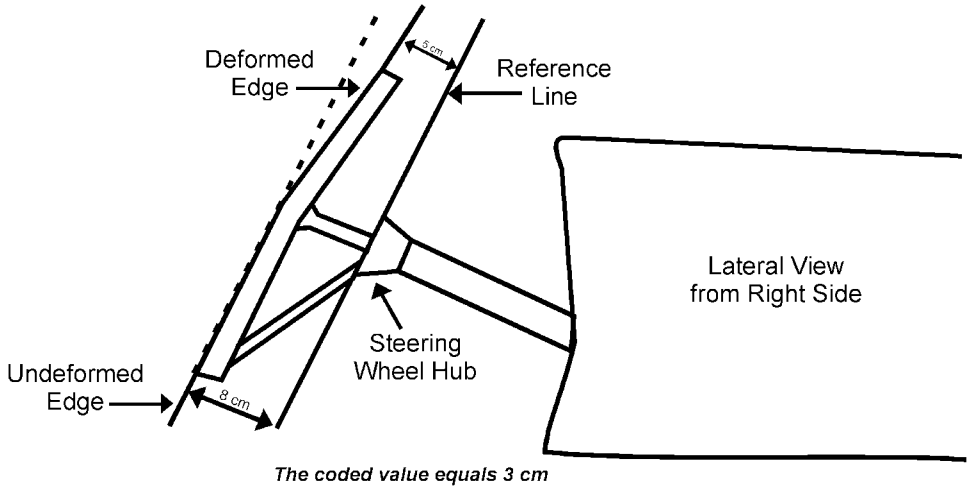
Source: Vehicle inspection.

Remarks:

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

The following diagram illustrates this measurement procedure. The undeformed edge is 8 centimeters from the reference line. The deformed edge is 5 centimeters from the reference line. Therefore, 3 centimeters of deformation occurred.



The coded value equals 3 cm

Value of Zero
is entered when there was no deformation caused by occupant contact of the rim or spokes. Check your observation by placing a flat object (*i.e.*, clipboard) across the plane of the steering rim prior to selecting this attribute.

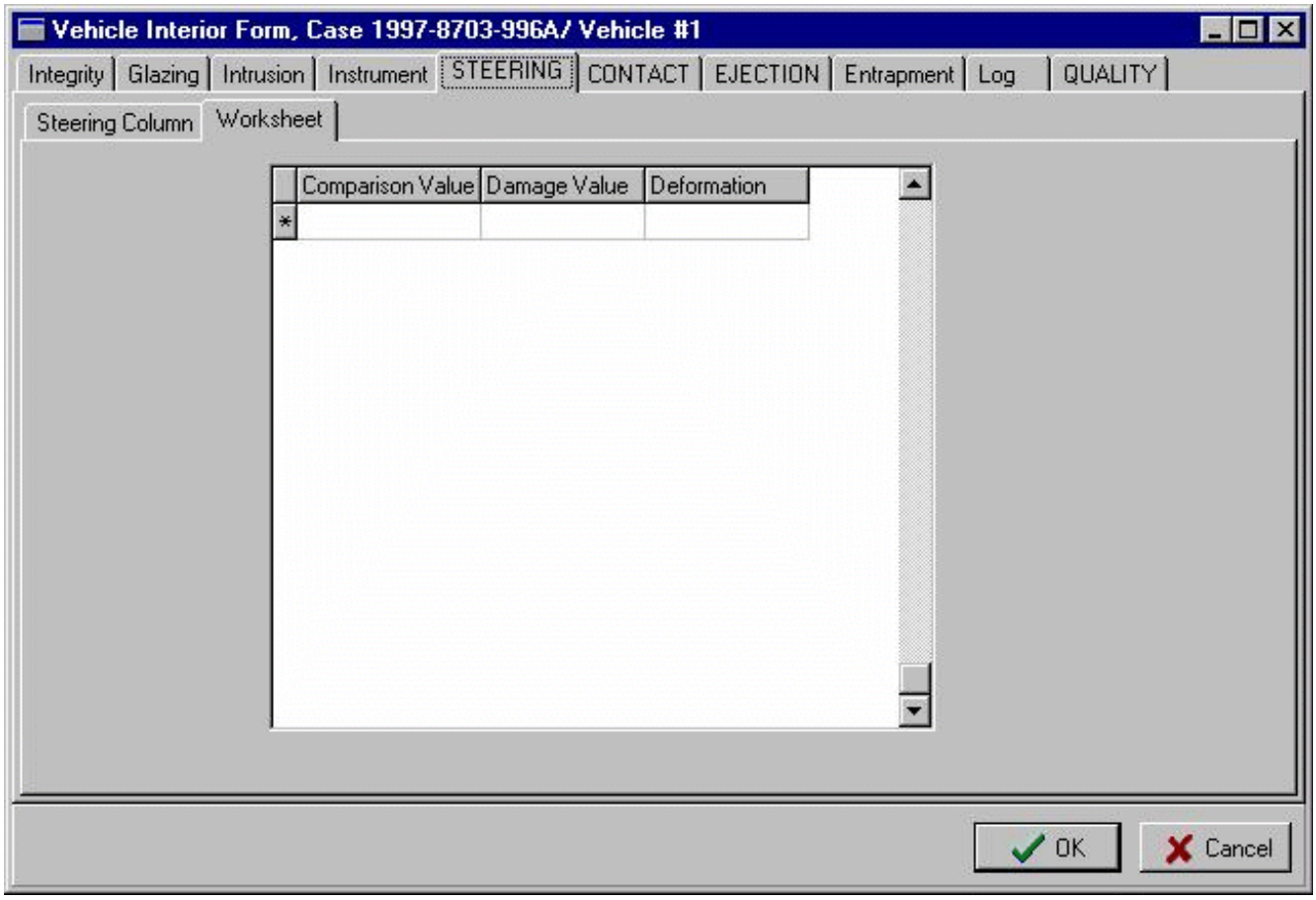
Screen Name: Rim / Spoke Deformation (cont'd)
Variable Name: Steering Rim / Spoke Deformation (cont'd)

Value of 1
is entered when the deformation is greater than zero but less than 1.5 centimeters.

Indeterminate - Observed
is selected when the situation does not permit the direct measurement of a deformed rim.

Unknown
is selected in the following situations:

- It is not known if the rim was deformed by occupant contact.
- An assessment of rim damage cannot be made because the vehicle is repaired.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Steering Column
Worksheet
Comparison Value
Damage Value
Deformation
OK
Cancel

Screen Name: Comparison Value
Variable Name: Comparison Value

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

Screen Name: Damage Value
Variable Name: Damage Value

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

Screen Name: Deformation
Variable Name: Deformation

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

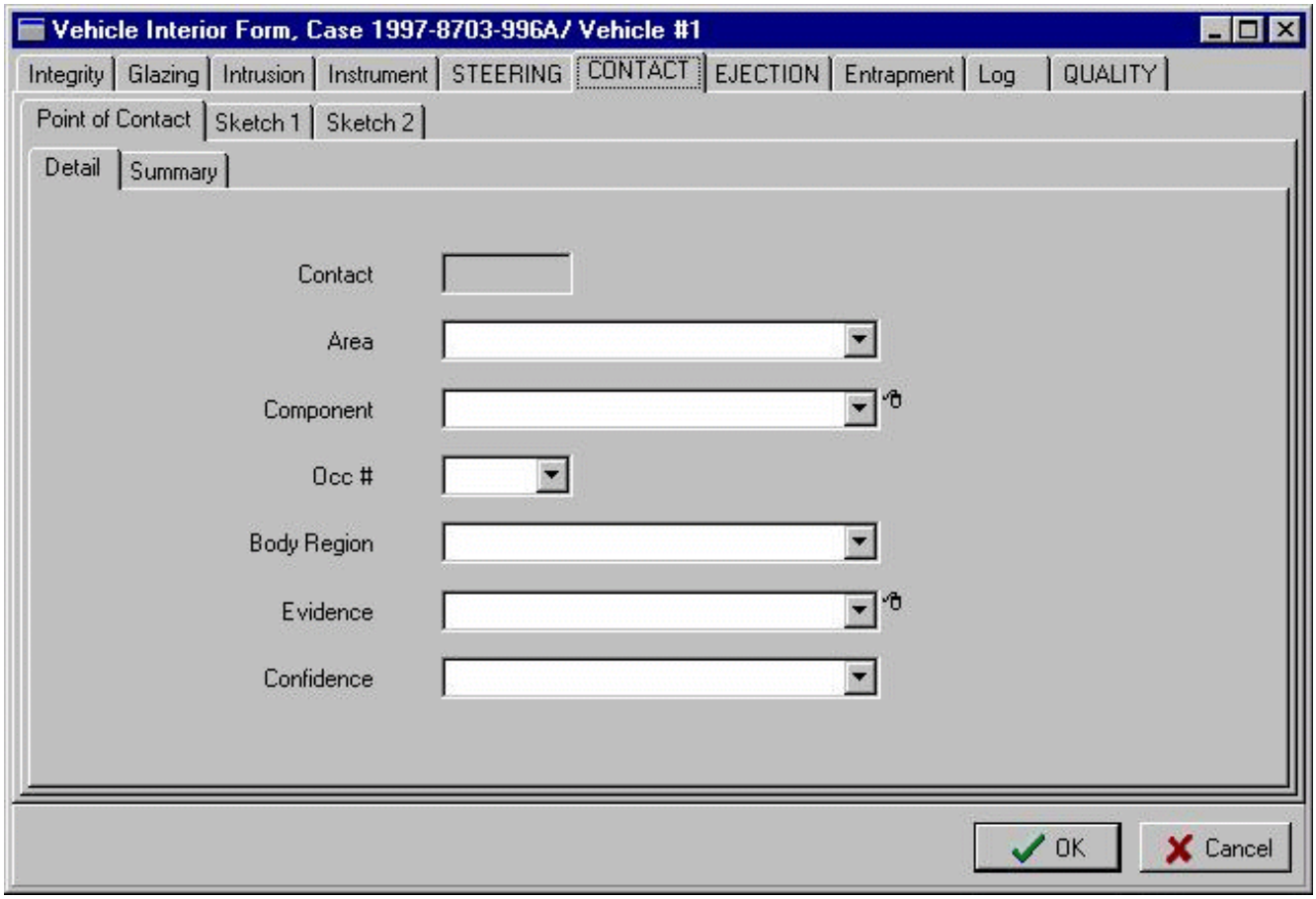
Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Detail
Summary
Contact
Area
Component
Occ #
Body Region
Evidence
Confidence
OK
Cancel

Overview / Instructions for Completion of Vehicle Interior Sketches And Point of Occupant Contact Pages

The Vehicle Interior Sketches page and corresponding Point of Occupant Contact page provide a valuable link between vehicle interior documentation and occupant injury data. Properly completed, these records identify evidence of occupant contact points and relate the contact points to the part of the occupant's body that produced the evidence.

In completing the Vehicle Interior Sketches, assess the occupant trajectory in conjunction with the impact configuration, direction of force, and use of restraints. As contact points are identified, they should be documented as follows.

- Open up Sketch 1 and Sketch 2 (by double clicking) to open them in Paint.
- Leave the Sketches open or minimized for ease in navigating between the Detail Tab, and the Sketches.
- Within the vehicle, highlight the contact point with yellow (or similar) tape for photographic purposes.
- Sketch the damaged area on Sketches 1 and 2 (*e.g.*, radio, glove compartment, damage to instrument panel structure, etc.).
- Label the Contact point with a sequential alpha character beginning with the letter “A”. To add contacted components go to the Title Bar and select “**Edit**” and then “**Insert**” and contact point “B” will appear.
- On the Detail tab Select the Area (e.g., front, side, roof, Air Bag, etc.,).
- Select the interior component contacted (i.e., windshield).
- Select the number of the contacting occupant if it can be determined. (Note: if an occupant list for this vehicle does not appear, they must be added into the case structure on the Case Form, Structure tab, Occupant sub-tab).
- Select the Body Region that is suspected of causing the contact point (e.g., head, ankle - left, elbow - right, etc.,).
- Identify the type of evidence present (e.g., bent, cracked, scuffed, , etc.) in the "Evidence" variable.
- Specify the confidence level which you feel best represents your selection of this particular component as a contact point, using the scale of: Certain, Probable, Possible, Unknown.
-
- Annotate suspected area(s) through which the occupant was ejected or the area in which the occupant was entrapped.

Screen Name: Contact
Variable Name: Contact

Element Attributes:

A
B
C
D, etc.

Source: Vehicle inspection

Remarks:

Identify the contact point. This will correspond to the label used in Sketch 1 or Sketch 2. To add contact points go to the main menu and select "**Edit**" and then "**Insert**" and contact point "B" will appear.

Screen Name: Area
Variable Name: Contact Area Label

Element Attributes:

Front
Left Side
Right Side
Interior
Air Bag
Roof
Floor
Rear
Adaptive (Assistive) Driving Equipment

Source: Vehicle inspection

Remarks:

Identify the name of the area of the vehicle interior an occupant contacted. Choose the area from the pick list of valid attributes for interior components.

Screen Name: Component
Variable Name: Contacted Component

Element Values:

FRONT
- Windshield
- Mirror
- Sunvisor
- Steering wheel rim
- Steering wheel hub/spoke
- Steering wheel rim/hub/spoke
- Steering column, transmission selector lever, other attachment
- Cellular telephone or CB radio
- Add on equipment (*e.g.*, tape deck, air conditioner)
- Left instrument panel and below
- Center instrument panel and below
- Right instrument panel and below
- Glove compartment door
- Knee bolster
- [Dr only] WS incl 1/+: fr hdr, A pill, instr pnl, mirror, or steering assembly
- [Pass only] WS incl 1/+: fr hdr, A pill, instr pnl, or mirror
- Windshield reinforced by exterior object (specify)
- Other front object (specify):

LEFT SIDE
- Left side interior surface, excluding hardware or armrests
- Left side hardware or armrest
- Left A (A1/A2)-pillar
- Left B-pillar
- Other left pillar (specify):
- Left side window glass
- Left side window frame
- Left side window sill
- Lt side glass +: frame, win sill, A pill, B pill, or roof side rail
- Other left side object (specify):

RIGHT SIDE
- Right side interior surface, excluding hardware or armrests
- Right side hardware or armrest
- Right A (A1/A2)-pillar
- Right B-pillar
- Other right pillar (specify):
- Right side window glass
- Right side window frame
- Right side window sill
- Rt side glass +: frame, win sill, A pill, B pill, or roof side rail
- Other right side object (specify):

INTERIOR
- Seat, back support
- Belt restraint webbing/buckle
- Belt restraint B-pillar or door frame attachment point
- Other restraint system component (specify):
- Head restraint system
- Other occupants (specify):
- Interior loose objects
- Child safety seat (specify):
- Other interior object (specify):

AIR BAG
- Air bag-driver side
- Air bag compartment cover-driver side
- Air bag-passenger side
- Air bag compartment cover-passenger side
- Other air bag (specify)
- Other air bag compartment cover (specify)

Screen Name: Component (cont'd)
Variable Name: Contacted Component (cont'd)

Element Values: (cont'd)

ROOF
- Front header
- Rear header
- Roof left side rail
- Roof right side rail
- Roof or convertible top

FLOOR
- Floor (including toe pan)
- Floor or console mounted transmission lever, including console
- Parking brake handle
- Foot controls including parking brake

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

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT
- Hand controls for braking/acceleration
- Steering control devices (attached to OEM steering wheel)
- Steering knob attached to steering wheel
- Replacement steering wheel (*i.e.*,reduced diameter)
- Joy stick steering controls
- Wheelchair tie-downs
- Modification to seat belts,(specify):
- Additional or relocated switches, (specify):
- Raised roof
- Wall mounted head rest (used behind wheel chair)
- Other adaptive device (specify):

Source: Vehicle inspection secondary inputs include: interviewee, and medical records.

Remarks:

The researcher should record only those contact mechanisms which can be documented by some physical evidence (*e.g.*, scuffs, hair, smudges, dents, cracks, etc.).

The element values encoded can be based on physical evidence, occupant kinematics, and interviewee information. Although physical evidence is preferred, it does not have to be present to support a contact mechanism.

* **Note**: Whenever an "other" code is selected as injury source, clearly identify, in the space provided a description of the "other" source.

Steering Rim / Hub / Spoke
is selected when there is continuous or simultaneous contact by a single body region to the Steering Rim / Hub / Spoke. Additionally, use this attribute when the steering wheel is determined to be the suspected injury source, but it cannot be further determined if the rim / hub/ spoke are involved.

[Dr only] WS incl 1/+: fr hdr, A pill, instr pnl, mirror, or steering assembly
should be selected for contacts on the left (driver) side of the vehicle interior. This code applies only when there is a continuous or simultaneous contact to the windshield and one of the listed components by a single Body Region of the occupant.

Screen Name: Component (cont'd)

Variable Name: Contacted Component (cont'd)

Note: Some vehicles (*e.g.*, GM APV minivans) are designed with two upper A-pillars on each side. The forward most pillar is called an A1-pillar which is primarily designed to secure the windshield to the vehicle. The second pillar is labeled as an A2-pillar. This pillar generally lends support to the roof and also helps to establish the front door opening. Annotation should be provided on the Interior Vehicle Form specifying which pillar was most severely intruded.

[Pass only] WS incl 1/+: fr hdr, A pill, instr pnl, or mirror
should be selected for contacts on the right (passenger) side of the vehicle interior. This code applies only when there is a continuous or simultaneous contact to the windshield and one of the listed components by a single Body Region of the occupant.

Windshield reinforced by exterior object
is selected when, for example, an occupant contacts a windshield which has been reinforced by the hood of the occupant's vehicle.

Lt (Rt) side glass +: frame, win sill, A pill, B pill, or roof side rail
apply when there is a simultaneous or continuous contact by a single body region of an occupant to the appropriate side window glass and at least one of the listed components. The window sill consists, for this element, of the upper portion of the side interior surface immediately adjacent to the bottom of the side window opening.

Child restraining devices have caused confusion when they are the source of the injury. The child restraint (*i.e.*, infant/child seat, booster seat, etc.) is considered to be an integral restraint (*e.g.*, the whole seat is the restraint). When the restraint is used by an infant or child it should be coded as one unit. In the CDS the analyst is concerned with the complete seat and its performance.

Child safety seat
if contact with a child safety seat occurs from either:
(a) an infant or child restrained by the child safety seat or
(b) any passenger including an infant or child who contacts a child safety seat but is not restrained by that seat.

When any body member of an infant or child, restrained by child safety seat, contacts an interior object other than the child safety seat, then code the appropriate interior object (*i.e.*, Seat, back support ; Head restraint system etc.)

Screen Name: Occupant Number
Variable Name: Occupant Number

Element Attributes:

Source: Vehicle inspection

Remarks:

The Researcher should Identify the number of the occupant who is suspected of contacting the identified component, if it can be determined.

Note: If an occupant list for this vehicle does not appear, they must be added into the case structure on the Case Form, Structure tab, Occupant sub-tab).

Screen Name: Body Region
Variable Name: Body Region

Element Attributes:

Abdomen
Ankle – Left
Ankle – Right
Back
Buttock – Both
Buttock – Left
Buttock – Right
Buttock – Unknown
Chest
Elbow – Left
Elbow – Right
Elbow – Unknown
Face
Flank – Left
Flank – Right
Foot – Left
Foot – Right
Foot – Unknown
Genitals
Hand – Left
Hand – Right
Hand – Unknown
Head
Hip-Left
Hip – Right
Hip – Unknown
Knee – Left
Knee – Right
Knee – Unknown
Lower Arm – Left
Lower Arm – Right
Lower Arm – Unknown
Lower Leg – Left
Lower Leg – Right
Lower Leg – Unknown
Neck
Shoulder – Left
Shoulder – Right
Shoulder – Unknown
Thigh – Left
Thigh – Right
Thigh – Unknown
Upper Arm – Left
Upper Arm – Right
Upper Arm – Unknown
Upper Leg – Left
Upper Leg – Right
Upper Leg – Unknown
Wrist – Left
Wrist – Right
Wrist – Unknown

Source: Vehicle inspection

Remarks:

The Researcher should identify the **suspected** body region of the occupant that contacted the identified component, if it can be determined or presumed.

Screen Name: Evidence
Variable Name: Evidence

Element Attributes:

- Bent
- Cracked
- Scuffed
- Transfer (specify)
- Blood
- Hair
- Stretched
- Scratched
- Teeth marks
- Imprint
- Spider Web
- Other (specify)
- Combination (specify)
- Child Seat
- Moved

Source: Vehicle inspection

Remarks:

The Researcher should identify the type of contact evidence present (i.e., scuff, tissue transfer, tooth mark, etc.) that indicates an occupant contact.

Note: Blood, in and by itself, is not a reliable indicator of a contact point.

Screen Name: Confidence
Variable Name: Confidence Level of Occupant Contact

Variable Name: Confidence

Element Attributes:
Certain
Probable
Possible
Unknown

Source: Vehicle inspection

Remarks:

Specify the level of confidence, which best represents the Researchers certainty of **this component**, as an occupant contact.

Certain
if there is no reasonable doubt in the mind of the researcher, that this component was contacted by the occupant based on occupant location, crash dynamics, contact points.

Probable
in those situations where there is not a certainty based on the factors noted above for **Certain**.

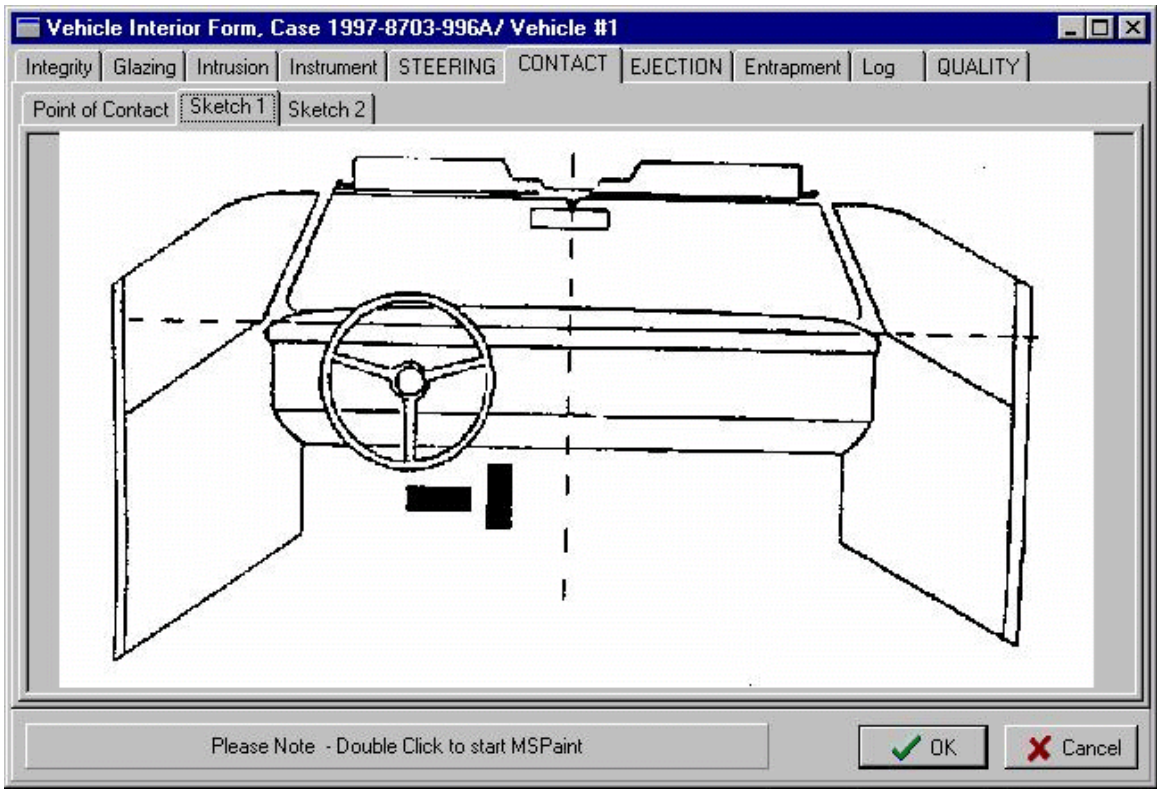
Possible
if there is no supporting physical evidence of occupant contact, however there is damage, and based on occupant location, crash dynamics, and component location, it is possible the occupant contacted the suspected component.

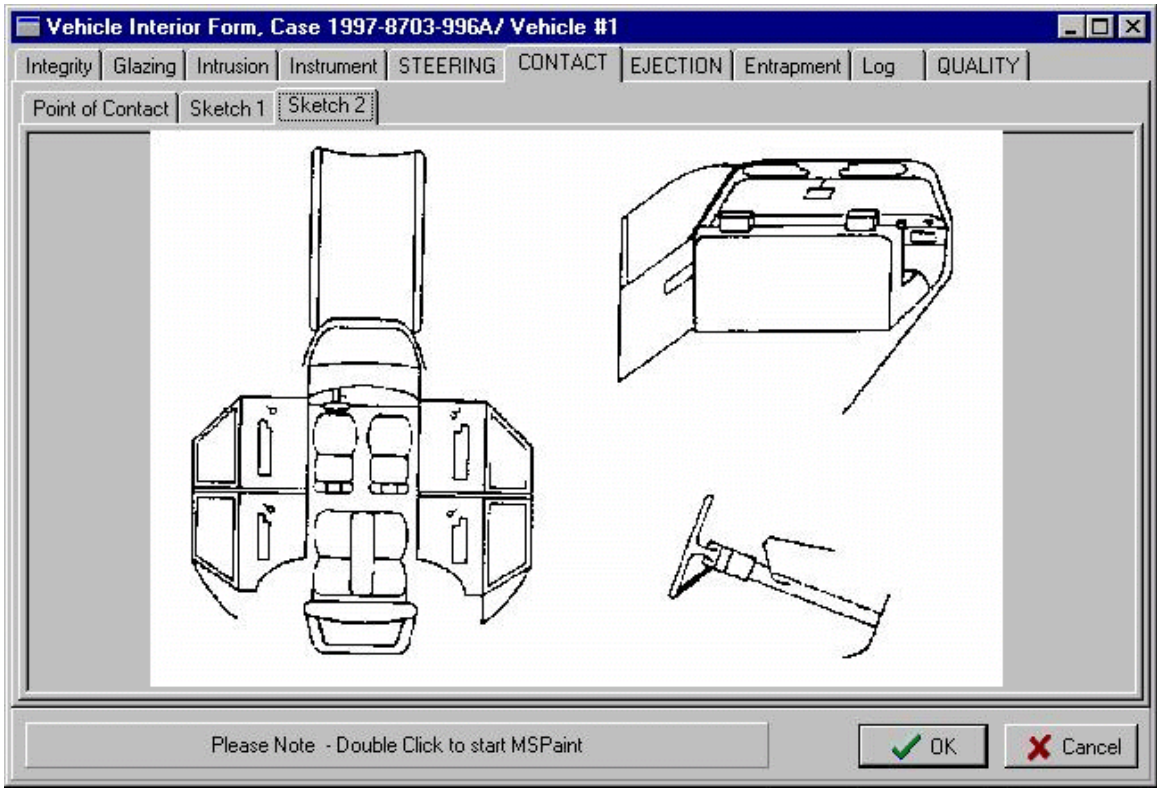
Unknown
If it is unknown whether the component listed as a contact point was contacted by the occupant or some type of induced or post-crash damage.

Summary Tab

Remarks:

All contacts that are documented on the Detail tab will be displayed on this tab. This tab is generally used as an overview for all of the contact points. No fields can be edited here. To edit a contact, highlight the letter and then switch to the detail tab and make any corrections.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Please Note - Double Click to start MSPaint
OK
Cancel


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Please Note - Double Click to start MSPaint
OK
Cancel

Instructions for Completion of Vehicle Interior Sketches

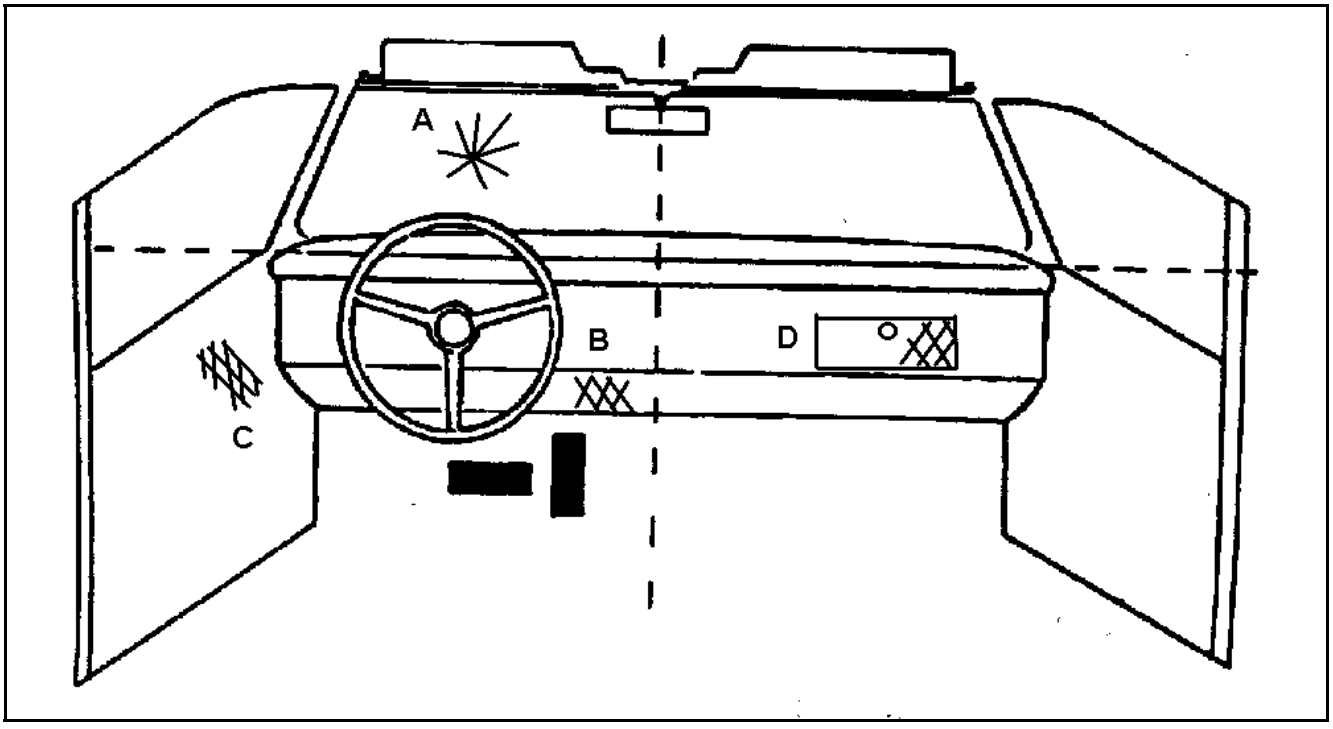
- Open up Sketch 1 and Sketch 2 (by double clicking) to open them in Paint.
- Leave the Sketches open or minimized for ease in navigating between the Detail Tab, and the Sketches.

For each documented Contact Point:

- Sketch the damaged area on Sketches 1 and 2 (*e.g.*, windshield, instrument panel, glove compartment, front seat back, etc.).
- Label the Contact point with a sequential alpha character beginning with the letter “A”.
- Provide any annotations as necessary

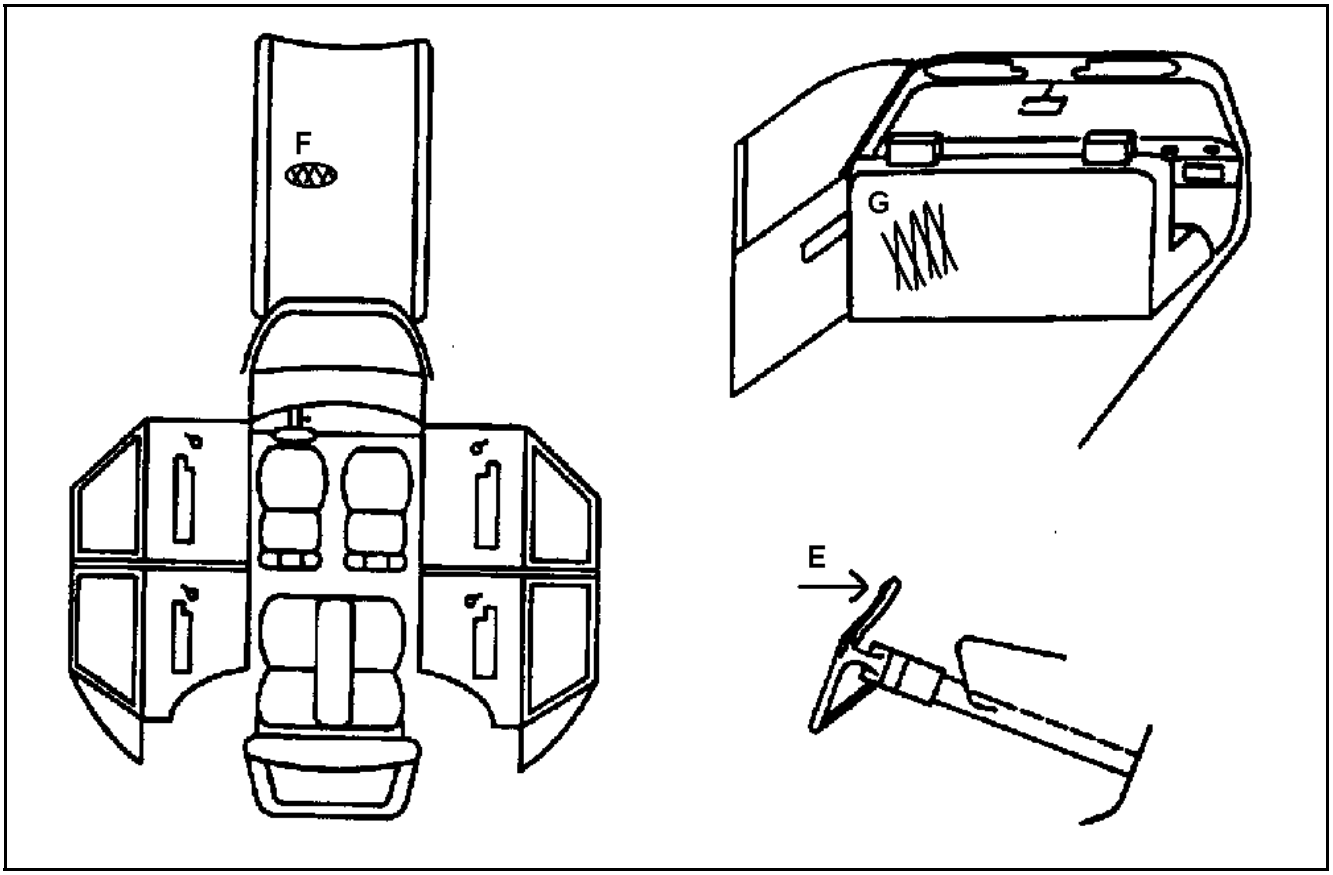
Examples of a basic vehicle interior sketches are shown:

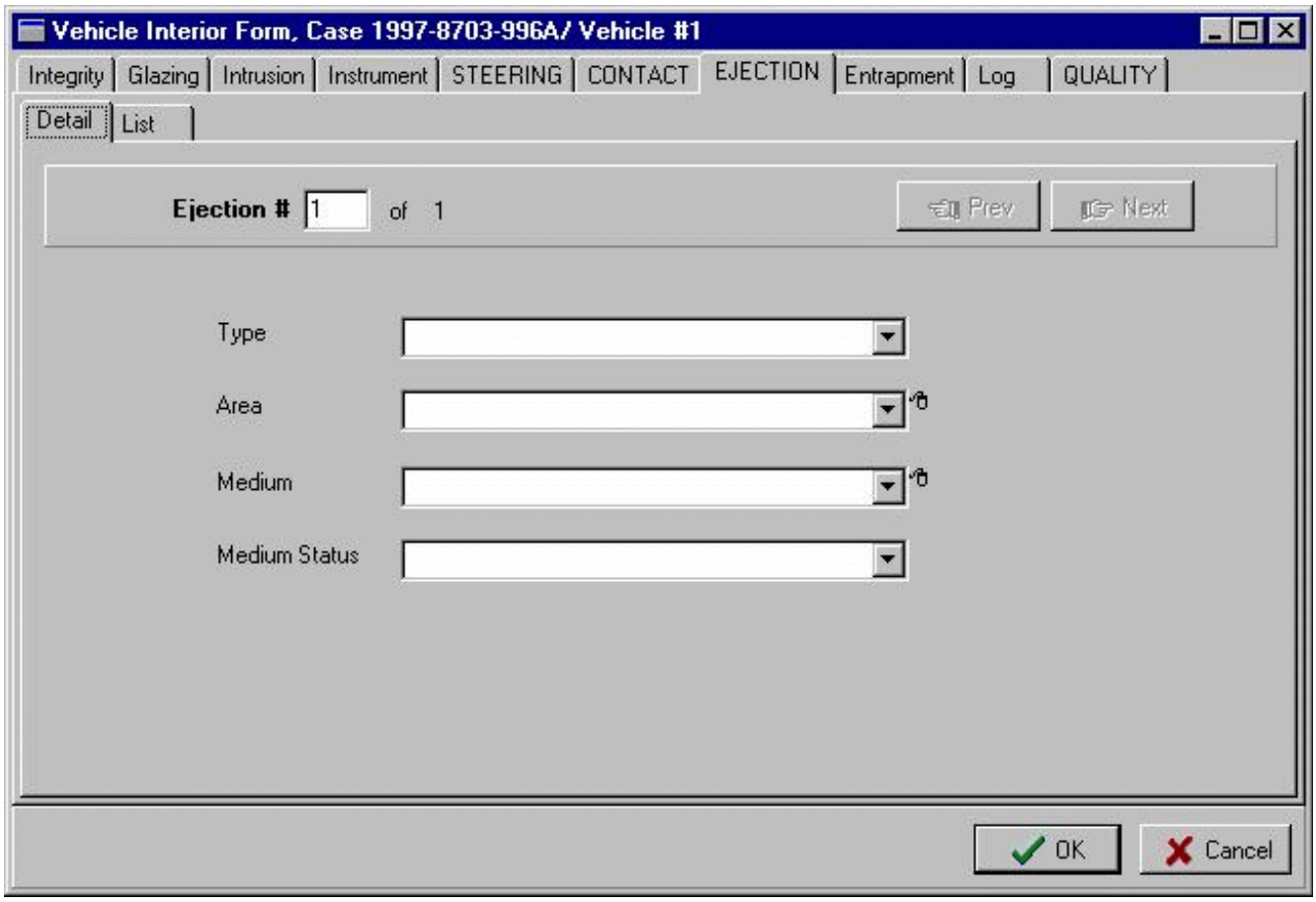
Vehicle Interior / Contact / Sketch 1 Completed



Instructions for Completion of Vehicle Interior Sketches (cont'd)

Vehicle Interior / Contact / Sketch 2 Completed




Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Detail
List
Ejection # 1 of 1
Prev
Next
Type
Area
Medium
Medium Status
OK
Cancel

Ejection / Entrapment Overview

Variables in this section provide an assessment of the occurrence of entrapment or ejection of an occupant. These variables in this section are coded based upon vehicle inspection. Verification of questionable ejection or entrapment will come from the interview.

Historically, ejection from the vehicle has been a major cause of fatalities and more serious injuries. The chances of being killed if ejected are about 1 in 5; whereas, if the occupant remains inside the vehicle, the chances of dying are reduced to about 1 in 200 for all fatal crashes. Unfortunately ejection from the vehicle is not that uncommon and has become a significant part of the fatality (30%) and severe (15%) injury crashes. Further contributing to the ejection problem is the increase in window surface area and more hatchback models. Despite the current emphasis on restraint use through legal requirements for occupants to be buckled up, a significant portion of the population continues to be unrestrained and at risk to ejection. All evidence indicates that this trend will continue into the foreseeable future.

A problem not often addressed is that of partial ejection. This refers to those instances where some part but not all of an occupant's body is, at some time during the crash sequence, outside the occupant compartment. Although it would not seem to be a problem it can be, and often is, fatal if the part outside is the occupant's head. Because of the dynamics of the vehicle and the kinematics of the occupants during an ejection sequence, it is often the occupant's own vehicle which causes the injury as it rolls onto the occupant.

Entrapment poses a different problem area. Recent years have brought about a vast improvement in the delivery of emergency medical attention to motor vehicle crash victims. This improvement has been achieved through the establishment of regional trauma centers, well equipped Mobile Intensive Care Units manned by trained paramedics even in rural areas, and a general increase in the knowledge of how to treat acute trauma. This improvement has not helped those victims who are restrained within the vehicle by deformed components. The improved care cannot be delivered because the personnel are unable to get to the victim, remove the victim from the vehicle, and deliver the victim to a treatment facility in a reasonable amount of time. Also, previous extrication tools used by rescue personnel were crude and sometimes injury causing themselves, an example of which is the large metal cutting saws. Within the last few years a device known as the "Jaws of Life" was developed and widely distributed. It is a hydraulically driven mechanism which can be used to increase the size of openings, extricate entrapped occupant's limbs and force open doors which are jammed. This development came about because of the perceived need for an extrication tool which operated quickly yet did not further injure the occupant.

Ejection / Entrapment Overview (cont'd)

Federal Motor Vehicle Safety Standards (FMVSS) which were developed in response to the problems seen in these areas are FMVSS 201 (Occupant Protection in Interior Impact), FMVSS 205 (Glazing Materials), FMVSS 206 (Door Locks and Door Retention Components), FMVSS 212 (Windshield Mounting), and FMVSS 214 (Roof Crush Resistance Passenger Cars).

Analytically this group of variables is a stand alone package most of the time. It can form the basis of an analysis without the use or comparison to any other variables. This would be used mostly in exploring the number and types of ejections and entrapments. Expanding the scope somewhat to include injury severity allows a determination of the increase or decrease in the ejection problem. Inclusion of injury source would provide an idea of the severity of all occurrences of entrapment and ejection. Injury source also provides an idea of the kinematics of the occupant during the sequence. The addition of a cross-tabulation for AIS level would show the relative severity between the injuries incurred inside the vehicle and those outside the vehicle.

Other areas of interest to the analyst are the ejection route and performance of integral structures. The integral structure performance is directly governed by the FMVSS 206 and 212. These areas are of increasing interest to NHTSA since the real world performance can help support the findings from the staged collisions and will help determine the effectiveness of the standards.

Lastly, an alternative glazing techniques was introduced in windshields. This type of window have a plastic layer on the interior surface of the window. Tests have shown a reduction in Lacerative injuries which was the primary objective but also an increased resistance to ejection through the window. Further study of real world performance is needed to provide an accurate evaluation of this secondary benefit.

Gathering the data, which will allow the researcher to accurately select the variables, is a multistage process. It will begin with the PAR which may give an indication of either ejection or entrapment. Inspection of the vehicle will provide the evidence needed to substantiate either occurrence. Further, documentation should be obtained through the scene inspection, interview, and injury data. Only at the end of the data gathering process should these variables be selected. Particular attention should be paid to the vehicle inspection since most evidence of ejection will be less apparent and not easily discerned.

In summary, this group of variables assesses the level of a very significant problem in today's crash picture. Correct accurate assessment is a result of a multistage research process which will be individualized by case. Attention to detail will result in a correct assessment. This is one area which is directly tied to the FMVSS, and all gathered data results in a direct evaluation of the applicable standards.

Screen Name: Ejection #
Variable Name: Ejection Number

Element Value:
Number as assigned

Source: Vehicle inspection

Remarks:

Each potential ejection is added by the researcher as it is located. The system will automatically increment the count. To add an ejection, go to the Title Bar and select "**Edit**" and then "**Insert**" and contact point "B" will appear.

Screen Name: Ejection -Type
Variable Name: Ejection - Type

Element Value:

No Ejection
Complete ejection
Partial ejection
Ejection, unknown degree
Unknown

Source: Vehicle inspection

Remarks:

Ejection refers to persons being completely or partially thrown from the vehicle as a result of an impact or rollover. If a person already has a body part protruding from the vehicle (*e.g.*, an elbow, arm, etc.) and the PDOF acting on the vehicle would likely cause further protrusions of the body part, then at least partial ejection is selected.

No Ejection

is selected when there is no indication of any occupant being either partially or fully ejected from the vehicle.

Complete ejection

is selected when an the occupant's body is entirely outside of the vehicle during the crash sequence. It is important to note that even though the body may be outside the vehicle, it may still be in contact with the vehicle. This code also includes occupants who are not initially in the seating compartment of the vehicle (e.g., pickup beds, boot of a convertible, and persons riding on open tailgates).

Partial ejection

is selected when part of the occupant's body remains **in** the vehicle, and any part of it is forced outside of the vehicle during the crash sequence. This code **does not apply** to those occupants who are not initially in the seating compartment of the vehicle,] they are indicated as "**Complete ejection**".

Ejection, unknown degree

is selected when it is suspected (or known) that an ejection of the occupant occurred, however, at the time of the vehicle inspection the researcher was unable to determine if the ejection was **Partial** or **Complete**.

Unknown

is selected when:

- the vehicle has been completely repaired
- it cannot be determined if an ejection is applicable

Screen Name: Ejection--Area
Variable Name: Ejection Area

Element Attributes:

Windshield
Left front
Right front
Left rear
Right rear
Rear
Roof
Other area (specify)
Unknown

Source: Vehicle inspection

Remarks:

Rear

is restricted to persons riding in a passenger compartment, who are ejected through the rear window, tailgate (*e.g.*, station wagon), hatchback, etc.

Roof

applies to all hardtops, convertibles, sun roofs, t-bar roofs, and detachable hardtops (such as fiberglass tops) that are used to cover areas designed for passenger protection.

Examples follow for how variable, Ejection Medium, and Medium Status (Immediately Prior to Impact), should be selected when **Area** equals **Roof**.

Screen Name: Ejection — Area (cont'd)
Variable Name: Ejection Area (cont'd)

Ejection	Roof Type	Area	Ejection Medium	Medium Status
Ejection	Hardtop, ripped open during crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, attached prior to crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, detached prior to crash	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in down or open position	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in closed position	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, closed, and ripped open during crash	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, open/removed prior to crash	Roof	Non-fixed roof structure	Open

Ejection Attributes are designated for use with areas designed for passenger protection (*e.g.*, passenger cars, vans, light truck cabs, self-contained mini- Recreational Vehicles and mini-motor homes). Trailers, add-on campers, etc., are to be assigned **Other area**.

Other area
also applies to persons riding on open tailgates.

Unknown
is selected when it is known from the vehicle inspection that an occupant was ejected (i.e., partial, full, or unknown degree) however, the area of potential ejection is unknown.

Screen Name: Ejection--Medium
Variable Name: Ejection Medium

Element Attributes:

Door/hatch/tailgate
Non-fixed roof structure
Fixed glazing
Non-fixed glazing (specify)
Integral structure
Other medium (specify)
Unknown

Source: Vehicle inspection,

Remarks:

Door/hatch/tailgate
includes any door, hatch, or tailgate that is opened during the course of the impact sequence.

Non-fixed roof structure
applies only to convertible, sun roofs, t-bar roofs, and removable hardtops when retracted / detached prior to the crash.

Fixed glazing
refer to any glazing in the vehicle that cannot be opened.

Non-fixed glazing
refer to any glazing in the vehicle that can be opened to any degree.

Integral structure
includes removable hardtops when attached to the vehicle prior to the crash. This also should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

Other medium
applies to persons riding in pickup beds, on open tailgates, and for other situations which cannot be classified above. In addition, use this attribute when someone is ejected from a trailer, add-on camper, etc.

Unknown
is selected when the ejection medium it is not known.

Screen Name: Ejection—Medium Status
Variable Name: Ejection Medium Status

Element Attributes:

Open
Closed
[Integral Structure]
Unknown

Source: Vehicle inspection

Remarks:

This variable is a description of the status of the area through which an occupant was ejected and is the status of the medium immediately prior to the impact.

Open

applies to convertible roofs, sun roofs, t-bar roofs, windows, doors or tailgates that are completely or partially open immediately prior to impact, or to other open areas of vehicles such as pickup beds, etc.

Closed

refers to a window that is completely closed when damaged, or to a convertible, sun, or t-bar roof that is closed when damaged. Sun and t-bar roofs are captured here if the ejection occurred through the designed opening in the sun or t-bar roof. However, if the roof was of a sun or t-bar type but the ejection occurred because a sizable opening was torn in the roof structure, then select **Integral structure**. This is also used for fixed glazings such as windshields and backlights which are in place prior to the collision. This also refers to a door that is closed, but when damaged, experiences latch and/or hinge failure causing the door to open.

Integral structure

should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

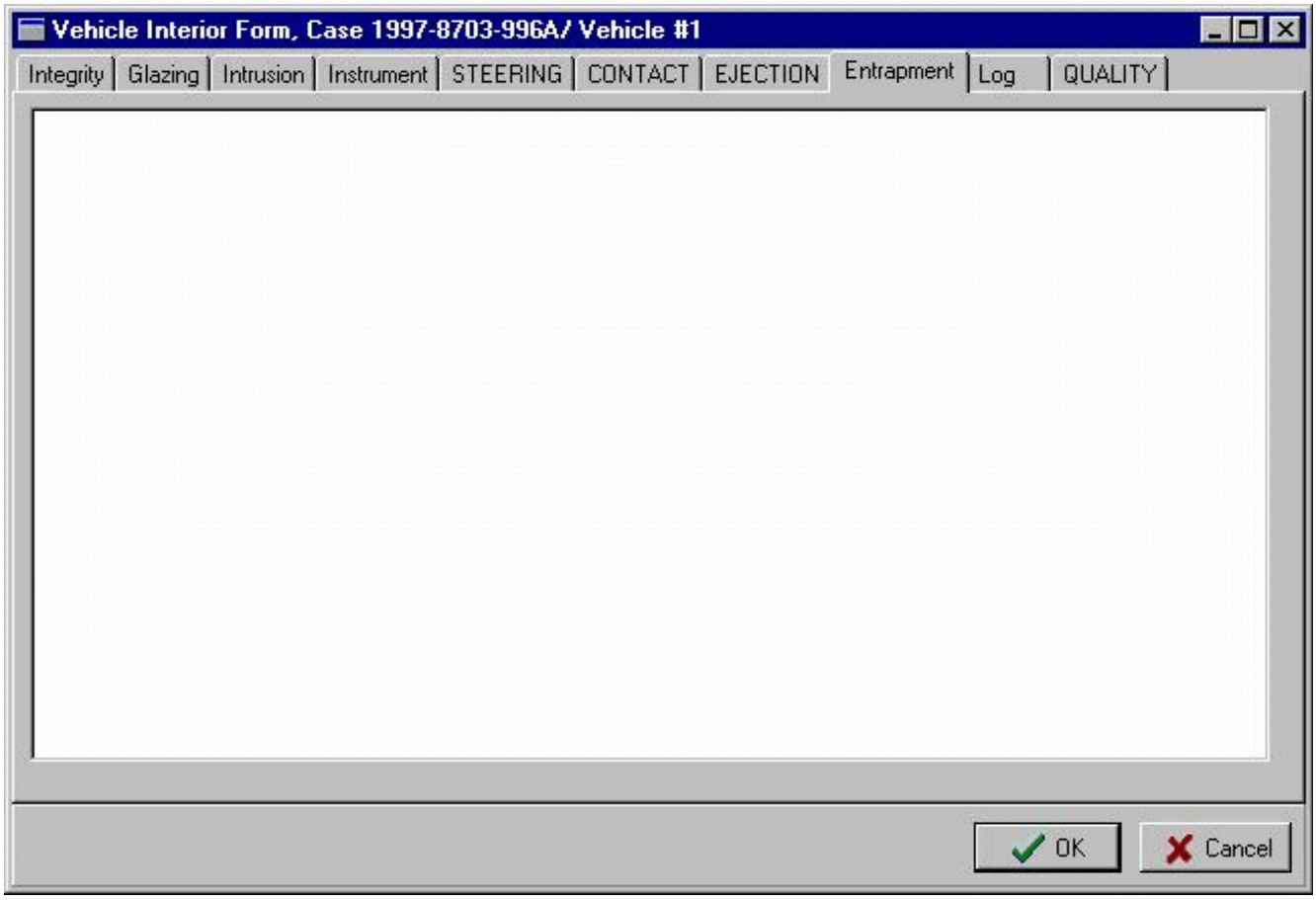
Unknown

is used when the medium status prior to the impact is unknown.

Ejection List Tab

Remarks:

All ejections that are documented on the preceding tabs will be displayed on this tab. This tab is generally used as an overview for all of the ejections. No fields can be edited here. To edit an ejection, return to the Detail tab, use the Previous and Next buttons to navigate to the ejection, and make any corrections.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
OK
Cancel

Screen Name: Entrapment
Variable Name: Entrapment

Element Attributes:

Not entrapped/exit not inhibited
Entrapped/pinned — mechanically restrained
Could not exit vehicle due to jammed doors, fire, etc. (specify)
Unknown

Source: Vehicle inspection,

Remarks:

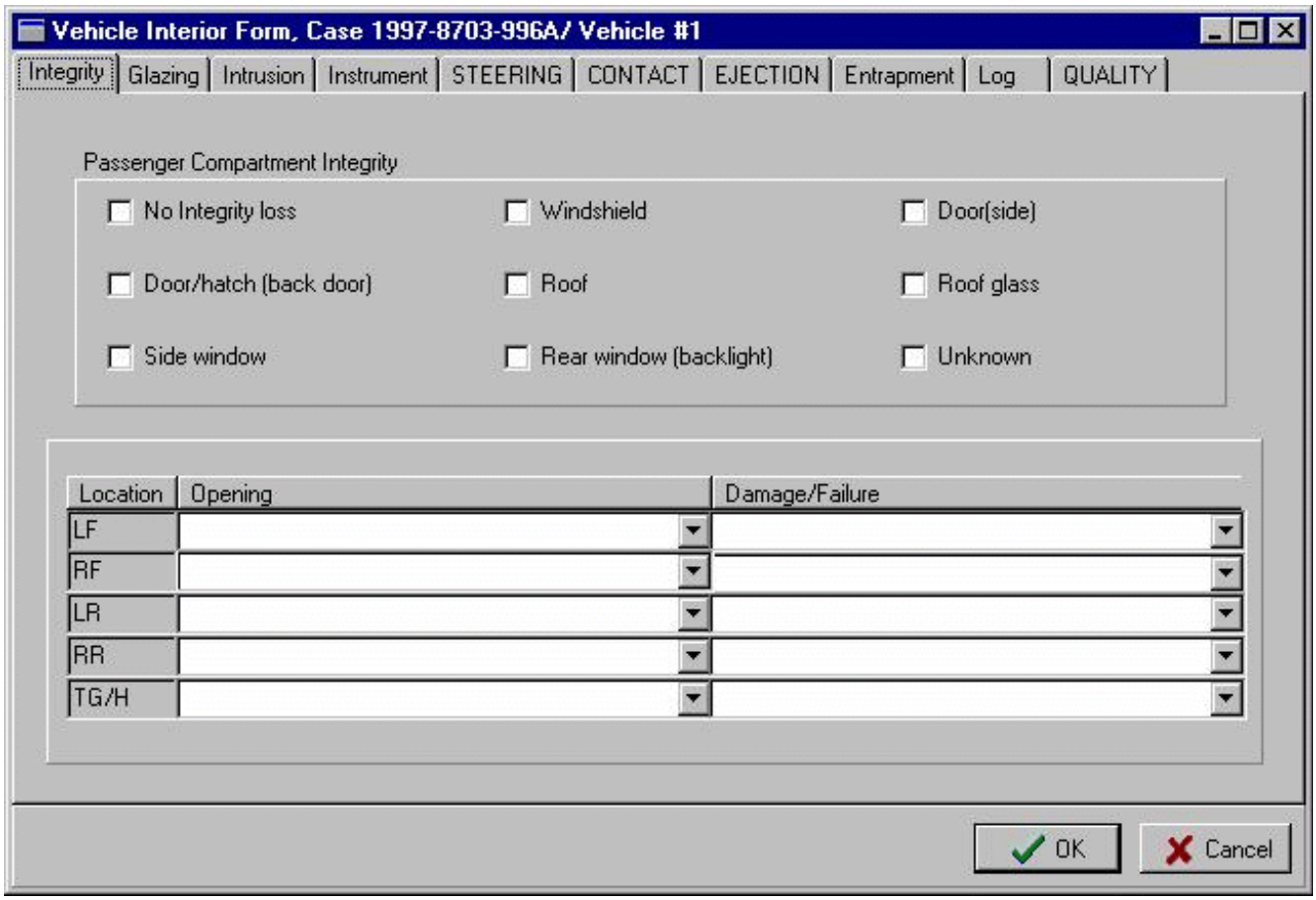
Not entrapped/exit not inhibited
is used when this occupant exited the vehicle and his/her egress was not inhibited in any way by intruding vehicle components, jammed doors, etc.

Entrapped/pinned — mechanically restrained
is used when this occupant was physically restrained in the seat position by an intruding vehicle component. The occupant could not move from the post impact position without some part of the vehicle being cut away, bent or moved.

Could not exit vehicle due to jammed doors, fire, etc. (specify)
is used when this occupant could not exit the vehicle due to jammed door(s), roof collapse, etc. This occupant, however could move about within the vehicle.

Unknown
is used when there is no knowledge of the manner of this occupant's exit from the vehicle.

**** These elements need to be added to this variable so that it matches the OA Form. ****


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Passenger Compartment Integrity
No Integrity loss
Windshield
Door(side)
Door/hatch (back door)
Roof
Roof glass
Side window
Rear window (backlight)
Unknown
Location
Opening
Damage/Failure
LF
RF
LR
RR
TG/H
OK
Cancel

Screen Name: Passenger Compartment Integrity
Variable Name: Passenger Compartment Integrity

Element Attributes:

No integrity loss
Windshield
Door (side)
Door/hatch (back door)
Roof
Roof glass
Side window
Rear window (backlight)
Unknown

Source: Vehicle inspection.

Remarks:

Select all that apply.

Consider the passenger compartment as a "package" which is designed to contain the occupant. If an opening occurs of sufficient magnitude through which an occupant could have been ejected totally or partially (although it is not necessary for an occupant to have been ejected), the integrity of the compartment should be considered to have been lost. While it is difficult to define the magnitude of the opening in a universal manner, the minimum size of the opening would be equivalent to the head of most adults (approximately 15- 20 centimeters). Components which may lose their integrity are restricted to the windshield glazing, window glazing (side, rear, or roof), door or roof.

The question of integrity loss is assessed with respect to impact related damage. The damage can be either direct or induced. Damage which is not impact related (*e.g.*, fire, extrication) is not considered.

Doors which open upon impact or glazing that is broken during the impact sequence are considered integrity loss. However, doors which were left open prior to an impact do not constitute damage related loss of integrity and should be reported under **Door, Tailgate Or Hatch Opening**, select **Other**.

No integrity loss
is selected when the doors, roof, and glazing (as listed below) remained intact during the impact sequence.

Windshield
is selected when the glazing is either holed/slit or displaced sufficiently to allow an adult size head to pass through.

Screen Name: Passenger Compartment Integrity (cont'd)
Variable Name: Passenger Compartment Integrity (cont'd)

Door (side)
refers to the door structure and excludes glazing areas. All side doors, whether hinged or sliding are considered here.

Door/hatch (back door)
identifies integrity loss of the back door structure and not the glazing. Back doors include hatchback, tailgate, and liftback. In situations where the rear hatch or upper portion of the tailgate is made entirely of glazing material and secured with a latching mechanism, only the latching mechanism should be considered for this attribute. Integrity loss through shattered or displaced rear window glazing is identified in **Rear window**

Roof
refers only to the roof structure and not glazing areas. Roof structures containing metal panels (*e.g.*, "T" top roofs) are reported here as well as closed convertible tops.

Roof glass
reports glazing material in the roof structure which is broken or displaced.

Side window
refers to glazing which was broken or displaced during the crash sequence. Glazing which was totally open prior to the crash and broken (*i.e.*, sidelight rolled down into the door area) is not entered as integrity loss.

Rear window (backlight)
includes backlights, hatchbacks / tailgates / liftbacks, and rear door glazing which were broken or displaced.

Unknown
is used in the following situations:

- extrication damage masked integrity loss, and
- integrity loss could not be determined due to circumstances beyond the researcher's control.

Screen Name: Passenger Compartment Integrity (cont'd)
Variable Name: Passenger Compartment Integrity (cont'd)

Door, Tailgate, or Hatch Opening Overview

It is the intent of these variables to capture whether a passenger compartment door, tailgate, or hatch opened or remained closed during the crash sequence. The reason the doors came open during the crash is also reported.

The areas of interest include the left front, right front, left rear, right rear, and tailgate/hatch doors (*i.e.*, LF, RF, LR, LR2, RR,RR2, TG/H, respectively). The LF and RF doors are the forward most side doors on the left and right sides of a vehicle and the LR and RR doors are the next door (or set of doors) rearward of the LF and RF doors. There are situations where two adjacent doors are used to cover a single opening (*i.e.*, side or rear of a cargo van). These should be treated as a single door. Side doors are applicable whether hinged or on tracks.

Generally, hatch doors meet the following criteria:

- provide access to the rear cargo area of a passenger car type vehicle, through a large opening backlight,
- are composed primarily of glass and may or may not be framed,
- are hinged at the top and latched at the bottom, and
- are not used in conjunction with a lower door or tailgate.

Some vehicles are equipped with frame less glass hatches which may shatter as a result of an impact. This situation is considered a glazing loss (refer to **Glazing**) rather than a hatch opening unless the hatch did, in fact, open prior to the glass breaking (*i.e.*, release of the latching/hinging mechanism). Some glass hatches may be bordered by a narrow band of metal. The condition of this metal band is the focus of this variable group. These remarks also apply when the upper window of a tailgate assembly is being considered.

Generally, tailgates exist on the rear end plane of station wagon type vehicles. They may be one or two piece assemblies. In the instance of a two piece unit, they will be hinged at the top and bottom with a horizontal seam. One piece units may be hinged at the top for some vehicles or at the bottom with retracting rear windows for others. Pickup truck tailgates are not included in these variables.

Rear doors may be single or double units covering a single opening. The rear doors are hinged on one or both sides with a vertical seam present in dual door applications. Rear doors are most commonly found on van type vehicles and are indicated under descriptor - "TG/H".

Screen Name: Opening
Variable Name: Door, Tailgate, or Hatch Opening

Element Attributes:

No door/gate/hatch
Door/gate/hatch remained closed and operational
Door/gate/hatch came open during collision
Door/gate/hatch jammed shut
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

This variable identifies the operational status of a door, tailgate or hatch during a crash sequence. Priority is given to doors which **"open"** during the collision. Doors which are pushed inwards and jammed, such that a gap or space occurs, are captured under this variable as **door / gate / hatch jammed shut.** The gap or space that occurs is coded under the variable **Integrity Loss.** Where multiple doors cover a single opening, and the disposition of each door was different, select the response for the door which is first identified in the following priority list:

1. Door/gate/hatch came open during collision
2. Door/gate/hatch jammed shut,
3. Other (specify):
4. Door/gate/hatch remained closed and operational
5. Unknown

As an example, if one door came open and the other was jammed shut, the proper response would be Door/gate/hatch came open during collision. Gaps caused by body deformation are not selected as door opening events. These gaps will be selected in Passenger Compartment Integrity.

No door/gate/hatch

is selected when no door, tailgate, or hatch exists in the appropriate area (*i.e.*, LF, RF, LR, RR, TG/H).

Door/gate/hatch remained closed and operational

for any door, tailgate, or hatch which did not open during the crash sequence and remained operational.

Door/gate/hatch came open during collision

is selected when the door assembly opened during the crash sequence, irrespective of the cause. Further, the magnitude of the opening created is inconsequential when selecting this response. Note, if this response is selected then the **Damage/Failure** responses for the next variable, must be indicated, based on what caused the door / hatch to come open. The researcher must consider the potential that a sprung-mass situation may exist. In this condition, the door may have been opened after the crash, but due to vehicle body stresses the door cannot be shut. This is an important consideration when assessing whether the door came open during the collision.

Screen Name: Opening (cont'd)
Variable Name: Door, Tailgate, or Hatch Opening (cont'd)

Door/gate/hatch jammed shut

is selected when a door is rendered inoperable due to being jammed shut. Inoperable is defined as the inability of the researcher to open the door wide enough (through the use of reasonable force) to allow passage of an adult head. It is irrelevant whether the jamming is a result of latch or hinge failure, the displacement of adjacent body panels, or direct damage. Undamaged locked doors should not be considered as jammed or inoperable. Doors which were pried open following the crash are an indication of jamming and should be closely examined. In this situation, the researcher should thoroughly annotate and photograph the door area to support this conclusion.

Other

is selected for those situations which cannot be identified with other elements. Doors which are open prior to the crash are reported here (*e.g.*, hatchbacks open for cargo reasons, ventilation, etc.).

Unknown

is used when the researcher could not make a performance assessment of the door, tailgate or hatch.

Screen Name: Damage/Failure
Variable Name: Damage/Failure Associated with Door, Tailgate, or Hatch Opening in Collision

Element Attributes:

Door operational (no damage)
Latch/striker failure due to damage
Hinge failure due to damage
Door structure failure due to damage
Door support (*i.e.*, pillar, sill, roof side rail, etc.) failure due to damage
Latch/striker and hinge failure due to damage
Other failure (specify):
Unknown
[No door/gate/hatch]
[Door not opened]

Source: Vehicle inspection.

Remarks:

This variable is designed to capture the reason a door opened during the collision sequence.

[No door/gate/hatch or door not opened]
is automatically selected when:
no door, tailgate, or hatch exists
the door/tailgate/hatch did not open during the crash sequence or
the door/tailgate/hatch is jammed shut

Doors which were open prior to the crash (hatchbacks open for cargo reasons, ventilation, etc.) also are reported here.

Door operational (no damage)
is selected when the door, tailgate, or hatch opened during the crash sequence, but the unit was undamaged and remained operational.

Latch/striker failure due to damage
is selected when the door, tailgate, or hatch opened as a result of a failure of the latch/striker assembly. The failure must be due to damage, either direct or induced, and must result in the forced unlatching of the latch/striker assembly or shearing of the striker post.

Hinge failure due to damage
is selected to indicate that a hinge failure exists as a result of either direct or induced damage. A hinge failure includes the complete separation of the hinge assembly from the door structure, pillar or of the two or more components which comprise the hinge assembly.

Screen Name: Damage/Failure (cont'd)
Variable Name: Damage/Failure Associated with Door, Tailgate, or Hatch Opening in Collision (cont'd)

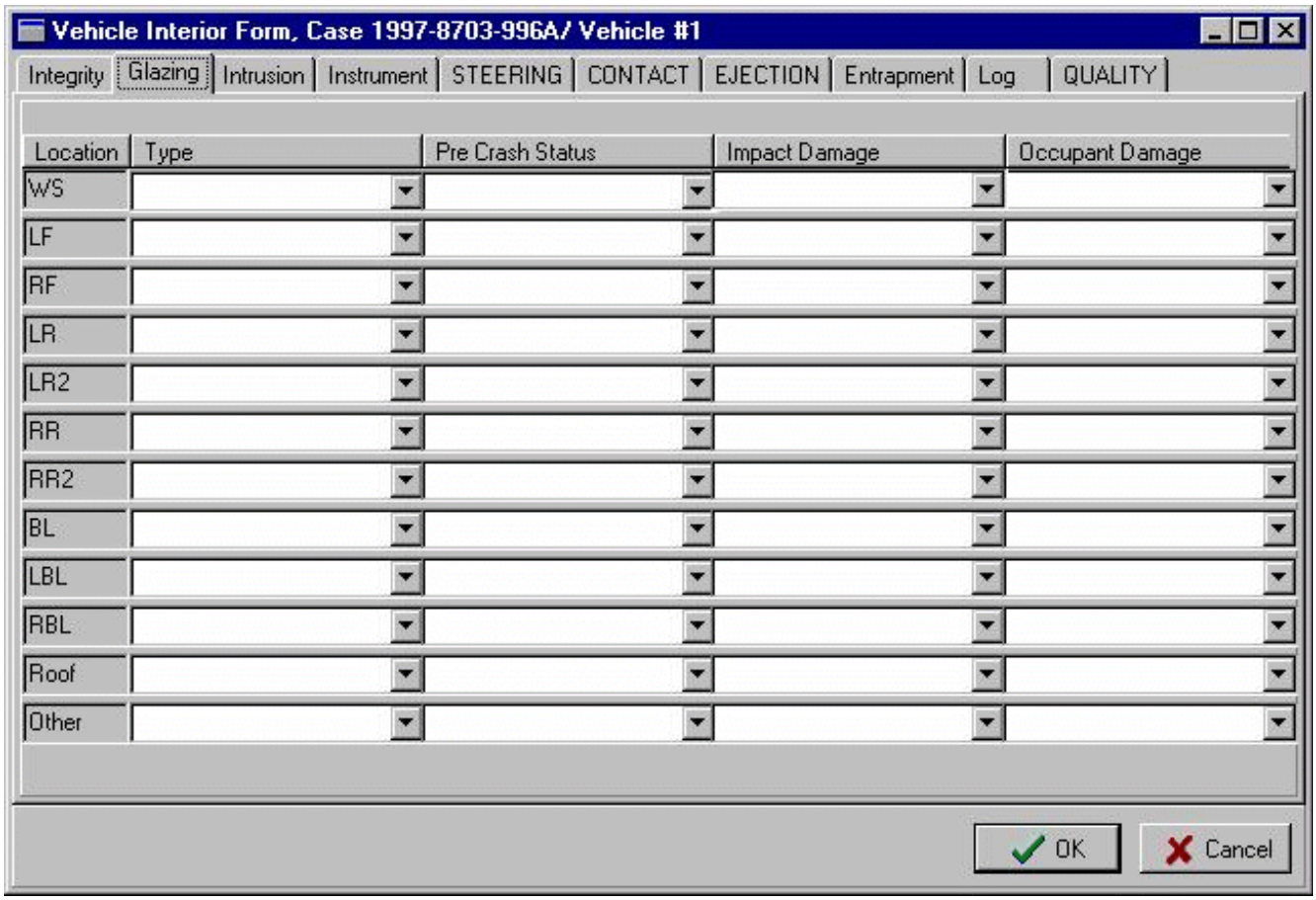
Door structure failure due to damage
is selected anytime the door structure sustained damage which allowed the latch, striker, or hinge to separate from the mounting surface (*i.e.*, torn metal). The door structure is defined as all components of the door assembly exclusive of the door skin.

Door support (*i.e.*, pillar, sill, roof side rail, etc.)
is selected to define situations where the latch/striker assembly did not fail, but the door support areas are damaged sufficiently to allow for the door to open. This includes, but is not limited to, the failure of pillars, sills and/or roof side rails at its most severe level.

Latch/striker and hinge failure due to damage
Latch/striker and hinge failure due to damage is used to describe situations where the entire door and adjacent components (*i.e.*, pillars) are torn away by an impact. Failure must be present to the latch/striker and at least one hinge, resulting in the door opening (*i.e.*, door partially or completely torn off).

Other failure
is used to indicate that an opening exists which cannot be described with the attributes above. This includes vehicles with a canvas roof and door structure (*i.e.*, Jeeps, etc.).

Unknown
is used when it cannot be determined which attribute applies.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Location
Type
Pre Crash Status
Impact Damage
Occupant Damage
WS
LF
RF
LR
LR2
RR
RR2
BL
LBL
RBL
Roof
Other
OK
Cancel

Glazing Type and Damage Overview

Glazing is defined for these variables as a covering for openings in the vehicle's structure which has the ability to allow light to pass. The areas of interest include: the windshield, sidelight windows, backlight (hatchback, tailgate, liftback, rear window), and roof. Composition of glazing materials in use include: glass, plastic, and glass-plastic.

The potential for occupant ejection is a major concern of rulemakers at NHTSA. These variables are designed to record the successes and failures of occupant containment by glazing when there is an occurrence of occupant contact to the glazing, or glazing damage by impact forces or vehicle damage.

There is glass that involves a plastic anti-lacerative layer applied to the inner surface of windshields (such as Inner Shield, Securiflex, etc.). Glass - plastic should not be confused with the current design of laminate windshields which are made with a layer of plastic (Polyvinyl Butyral) between two layers of annealed glass.

Researchers are required to thoroughly inspect all glazing for direct occupant contact / damage and encode their findings. This information is recorded independent of occupant ejection.

Glazing variables are divided into four sections.

- **Type**
- **Precrash Glazing Status**
- **Impact Damage**
- **Occupant Damage**

These sections are further divided into twelve specific areas of interest or Locations:

WS	=	windshield
LF	=	left front window (driver's window)
RF	=	right front window
LR	=	left rear window (adjacent to LF window)
LR2	=	2nd left rear window (adjacent to LR window)
RR	=	right rear window (adjacent to RF window)
RR2	=	2nd right rear window (adjacent to RR window)
BL	=	backlight, tailgate / hatchback / liftgate window
LBL	=	left backlight (left side of a divided backlight, i.e., rear doors on some vans)
RBL	=	right backlight (right side of a divided backlight, i.e., rear doors on some vans)
Roof	=	sun roof, moon roof, "T" roof, etc.
Other	=	other sidelights, door wing windows, and any other light not identified above

The "other" category (as noted) encompasses areas where glazing may be directly contacted by occupants or damaged from impact forces and not identified by a specific location. This would include wing windows located in door areas. In the event more than one "other" area was involved, select the area with the highest priority number as ranked above. When more than one glazing has priority, the researcher should select the glazing which is closest to the front of the vehicle with the left side taking precedence over the right side. The researcher must specify the selected glazing in the space provided.

Screen Name: Type
Variable Name: Type of Window/Windshield Glazing

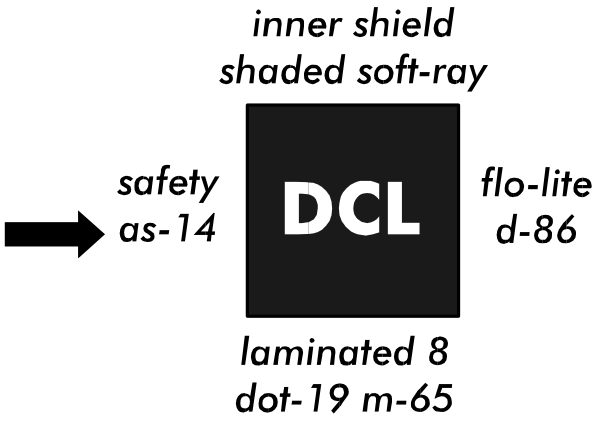
Element Attributes:

No glazing
AS-1 - Laminated
AS-2 - Tempered
AS-3 - Tempered-tinted (original)
AS-2 - Tempered-with after market tint
AS-3 - Tempered-tinted (with additional after market tint)
AS-14 - Glass / Plastic (Anti-Lacerative) not plastic
Glazing removed prior to crash
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

Glazing types are identified by unique AS (American Standard) numbers which are etched in the glazing surface. The AS numbers are generally grouped with other glazing information and together make up an informational symbol referred to as a "watermark" (see diagram below). The arrow indicates the “AS number” within the watermark.



Glazing types are used whether or not the glazing area was identified as damaged from impact forces or direct occupant contact. When all side and rear windows have been broken out, examine the window track or frame for remnants of broken glass. If glass is present and the remnants are small clear granules (or cracked in granule size pieces), then it is permissible to select (AS-2 — Tempered). If these remnants are tinted, then it is permissible to select [AS-3 — Tempered – tinted (original)]. If these remnants have any plastic tint shield clinging to them, then it is permissible to select (AS-2 — Tempered – with after market tint) or [AS-3 — Tempered – tinted (with additional after market tint)].

Screen Name: Type (cont'd)
Variable Name: Type of Window/Windshield Glazing (cont'd)

No glazing
is selected for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

AS-1 — Laminated
refers to a layer of plastic between two layers of glass. This type of glazing is widely used in current windshield installations.

AS-2 — Tempered
refers to glass which is designed to break into small glass granules when damaged.

AS-3 — Tempered – tinted (original)
refers to manufactured tinted (privacy) glass which has the ability to break into small glass granules when damaged. Glazing which has an aftermarket plastic tint shield applied should be listed as **AS-2 — Tempered – with after market tint**.

AS-2 — Tempered – with after market tint
refers to AS-2 glazing which has an aftermarket plastic tint shield applied.

AS-3 — Tempered – tinted (with additional after market tint)
refers to AS-3 glazing which has an additional aftermarket plastic tint shield applied.

AS-14
refers to glazing which uses plastic on its inner surface. This is used in anti-Lacerative windshields (*i.e.*, Inner Shield, Securiflex, etc.).

Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Other (specify)
refers to any glazing which has an AS number different from AS-1, AS-2, AS-3 and AS-14. Write the AS number of the glazing in the "specify" space provided. This includes plastic (AS-11C), and bullet proof (AS-10). Plastic side and rear windows in convertibles and Jeeps are examples of glazing that will be entered here.

Unknown
is used in the following situations.

- Due to factors beyond the researcher's control, an adequate determination of glazing presence could not be made.
- A reasonable determination of the "AS" number could not be made.

Screen Name: Pre Crash Status
Variable Name: Window Pre-crash Status

Element Attributes:

Fixed
Closed
Partially opened
Fully opened
Unknown
[No glazing]
[Glazing removed]

Source: Vehicle inspection with verification from interview, if possible.

Remarks: This variable records the operational modes of the glazing prior to the crash.

No glazing

is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Fixed

identifies glazing which is not designed to open (*e.g.* windshields, etc.).

Closed

refers to any operable glazing which was fully closed (*i.e.*, no air gaps).

Partially opened

refers to any operable glazing which is not firmly closed (*i.e.*, air gaps present) and not fully opened. Note, the researcher should select the placement of the window in relationship to the opening and not by window design limitations (i.e., rear sedan windows designed not to fully open).

Fully opened

refers to any operable glazing which is attached to the vehicle (*i.e.*, window tracks) and was placed in the open position such that the glazing was not restricting the opening of the vehicle structure. This element is assessed independently of window design limitations (*i.e.*, side windows designed to only roll down halfway cannot receive this attribute).

Glazing removed prior to crash

includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Unknown

is used in the following situations.

- Due to factors beyond the researcher's control, an adequate determination of glazing presence could not be made.

Screen Name: Impact Damage
Variable Name: Glazing Damage From Impact Forces

Element Attributes:

No glazing damage from impact forces
Glazing in place and cracked from impact forces
Glazing in place and holed from impact forces
Glazing out-of-place (cracked or not) and not holed from impact forces
Glazing out-of-place and holed from impact forces
Glazing disintegrated from impact forces
Unknown if damaged
[No glazing]
[Glazing removed]

Source: Vehicle inspection

Remarks:

This variable identifies damage to the glazing as a result of impact forces and/or vehicle damage (including damage from interior loose objects). Damage caused by direct occupant contact should be recorded in the variable **Occupant Damage**.

NOTE: glazing(s) which are retracted into vehicle body panels (*i.e.*, fully open) are to be assessed and coded as best as possible by the Researcher.

No glazing

is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

No glazing damage from impact forces

is selected when there was no damage to the glazing from impact forces. Glazing damage for these variables is defined as cracking, holed, out-of-place or disintegrated. Glazing which is scratched is considered not damaged.

Glazing in place and cracked from impact forces

is selected when the glazing remained within the confines of its specific area and was cracked. Displaced glazing which was not totally separated from the vehicle should be treated as "in place". This would include windshields with partial bond separation and dislodged side glazing(s).

Glazing in place and holed from impact forces

is selected when the glazing was "holed". "Holed" refers to a hole or slit in the glazing which is large enough in size to allow passage of an adult head (approximately 15-20 centimeters). For the purpose of this variable, the hole or slit must have been produced by impact force and/or vehicle damage and not by direct occupant contact.

Screen Name: Impact Damage (cont'd)
Variable Name: Glazing Damage From Impact Forces (cont'd)

Glazing out-of-place (cracked or not) and not holed from impact forces
refers to glazing which was totally separated from the vehicle as the result of impact forces and/or vehicle damage. Windshields with 100 percent bond separation should receive this attribute. Caution must be exercised by the researcher not to consider shattered tempered glass (*i.e.*, sidelights, etc.) as out-of-place. This situation should be identified as **Glazing disintegrated from impact forces**.

Glazing out-of-place and holed from impact forces
refers to glazing that was totally separated from the vehicle during the crash sequence and was holed/slit as the result of impact forces or vehicle damage. "Holed" refers to either a hole or slit in the glazing which is large enough in size to allow passage of an adult head (approximately 15-20 centimeters).

Glazing disintegrated from impact forces
refers to glazing that was totally destroyed by impact forces or vehicle damage. This usually occurs with shattered tempered glass (*i.e.*, sidelights, etc.). Windshields that are separated from the vehicle should not be considered disintegrated. Uncertainty may exist when determining the cause of shattered sidelight glazing when the collision occurred adjacent to an occupied seat. As a rule of thumb, impact forces and/or vehicle damage generally cause disintegration of the sidelight prior to occupant contact.

Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Unknown if damaged
is selected in the following situations.

- The degree of damage could not be determined as the result of post impact damage (*i.e.*, extrication, towing operations, etc.).

- Due to factors beyond the researcher's control, an adequate determination of glazing damage could not be made (*i.e.*, catastrophic type vehicle damage, etc.). This should be a rare occurrence.

- The cause of glazing damage (*i.e.*, impact forces versus occupant contact) could not be determined by the researcher. Caution, it is anticipated this reason will be rarely used. When confronted with this dilemma, every effort must be made to select a known value for damaged glazing.

Screen Name: Occupant Damage
Variable Name: Glazing Damage from Occupant Contact

Element Attributes:

No occupant contact
Glazing contacted by occupant but no glazing damage
Glazing in place and cracked by occupant contact
Glazing in place and holed by occupant contact
Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
Glazing out-of-place by occupant contact and holed by occupant contact
Glazing disintegrated by occupant contact
Unknown if contacted by occupant
[No glazing]
[Glazing removed]

Source: Vehicle inspection.

Remarks:

These variables report direct occupant contact to the glazing during the crash sequence. The responses are prioritized, the further you go down the list, the higher the priority, [*i.e.*, **Glazing in place and holed by occupant contact** takes precedence over **Glazing in place and cracked by occupant contact**, etc.].

NOTE: glazing(s) which are retracted into vehicle body panels (*i.e.*, fully open) are to be assessed and coded as best as possible by the Researcher.

No occupant contact
is selected when there are no direct occupant contact(s) detected on the glazing.

Glazing contacted by occupant but no glazing damage
is selected when an occupant directly contacted the glazing, but the contact did not result in glazing damage.

Glazing in place and cracked by occupant contact
refers to glazing that was damaged (not holed) by direct occupant contact. The term "in place" describes glazing which has remained within the confines of its specific area. Displaced glazing which was not totally separated from the vehicle should be treated as "in place". This would include windshields with partial bond separation and dislodged side glazing.

Glazing in place and holed by occupant contact
is selected when the glazing was "holed". "Holed" refers to a hole or slit in the glazing which was produced by direct occupant contact. This opening is equivalent in size to the space necessary to allow passage of an adult head (approximately 15 -20 centimeters).

Screen Name: Occupant Damage (cont'd)
Variable Name: Glazing Damage from Occupant Contact (cont'd)

Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact
refers to glazing which was directly contacted by an occupant and was totally separated from the vehicle during the crash sequence. Windshields with 100 percent bond separation are reported here. Caution must be exercised by the researcher not to consider shattered tempered glass (*i.e.*, sidelights, etc.) as out-of-place. This situation is reported as **Glazing disintegrated by occupant contact**

Glazing out-of-place by occupant contact and holed by occupant contact
refers to glazing which was contacted and holed by direct occupant contact and totally separated from the vehicle during the crash sequence. "Holed" refers to a hole or slit in the glazing which was produced by direct occupant contact. This opening is equivalent in size to the space necessary to allow passage of an adult head (approximately 15 -20 centimeters).

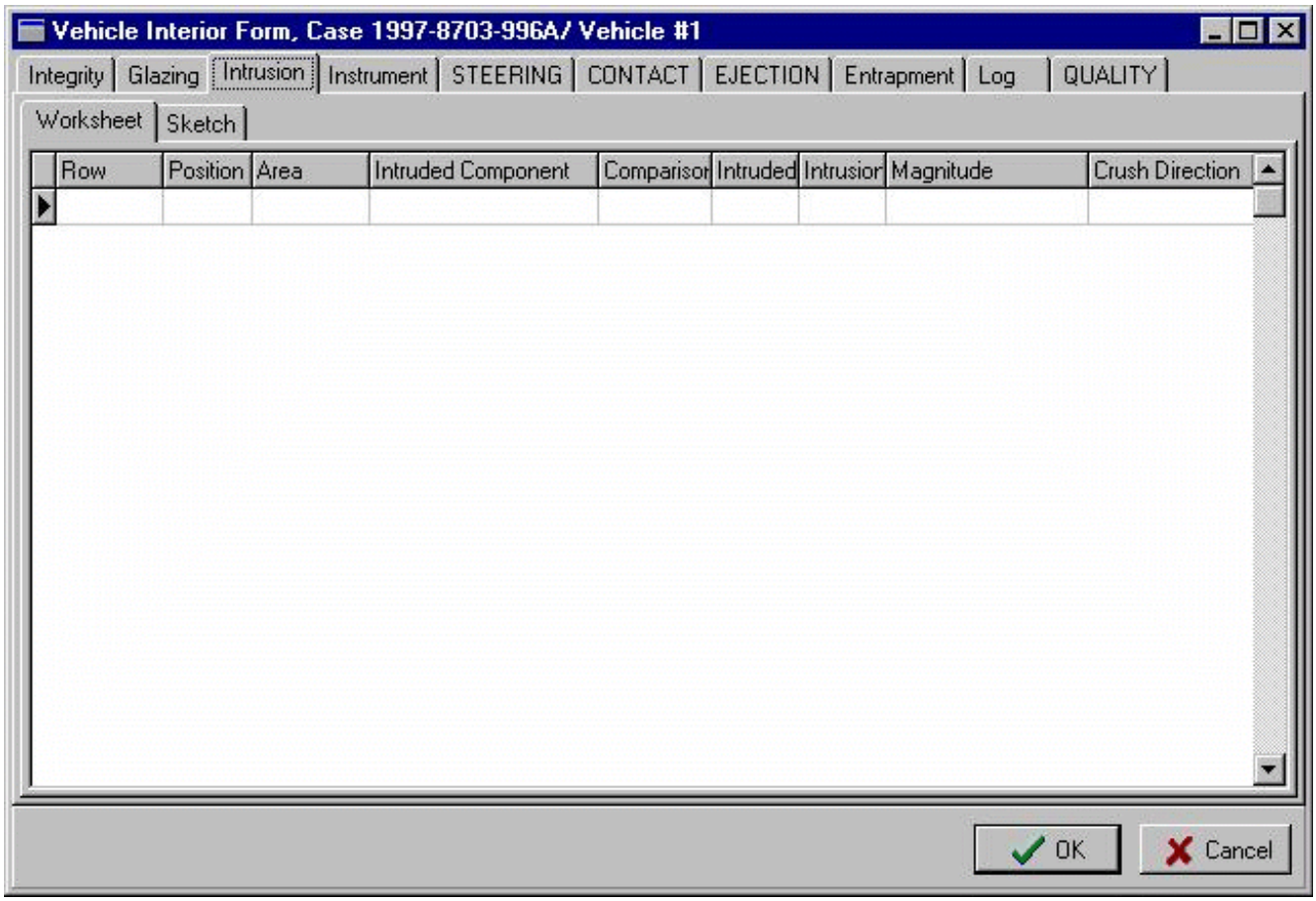
Glazing removed prior to crash
includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash. Glazing retracted into vehicle body panels (*i.e.*, fully open) is not considered in this element.

Glazing disintegrated by occupant contact
refers to glazing that was totally destroyed by direct occupant contact. This usually occurs with shattered tempered glass (*i.e.*, sidelights, etc.). Windshields that were separated from the vehicle should not be considered disintegrated. Uncertainty may exist when determining the cause of shattered sidelight glazing when the collision occurred adjacent to an occupied seat. As a rule of thumb, impact forces and/or vehicle damage generally cause disintegration of the sidelight prior to occupant contact. If the glazing is indicated in **Impact Damage** as "Disintegrated by Impact Forces" this variable must be coded as **No Occupant Contact**.

Unknown if contacted by occupant
is selected in the following situations.

- Direct occupant contact/damage could not be determined due to post impact damage (*i.e.*, extrication, towing operations, etc.).

- Due to factors beyond the researcher's control, an adequate determination of direct occupant contact/damage could not be made.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Worksheet
Sketch
Row
Position
Area
Intruded Component
Comparison
Intruded
Intrusion
Magnitude
Crush Direction
OK
Cancel

Occupant Area Intrusion Overview

If there is no intrusion leave the Intrusion Worksheet **blank.**

Displacement of less than three centimeters is not considered to be an intrusion.

Intrusion results whenever the internal boundary surface of the passenger compartment is moved inward due to direct or indirect damage resulting from the application of a crushing force to the exterior surface of a vehicle. A passenger compartment is defined as that interior occupant space which is normally available for occupant seating, based upon both the vehicle design and seat configuration at the time of the crash. Adjacent cargo areas and other enclosed areas are included for consideration in the following situations.

- The area behind the last row of seats designed by the manufacturer for cargo is integral with the passenger compartment.

- An area where a seat row was either removed or folded down to accommodate cargo.

Intrusion can occur from the vertical, longitudinal, or lateral direction. Intrusion can also occur from the displacement of interior seatbacks and/or seat cushions.

Measurement of Passenger Compartment Intrusion

Types of Intrusion

Two types of intrusions occur most often in crashes. They are:

Type A: Intrusion which is limited to one part of the passenger compartment and where the other side of the vehicle remains relatively free of distortion. This is likely to be the case in the majority of crashes. In many cases it will be possible to obtain undeformed vehicle dimensions as the vehicle is symmetrical about the longitudinal centerline.

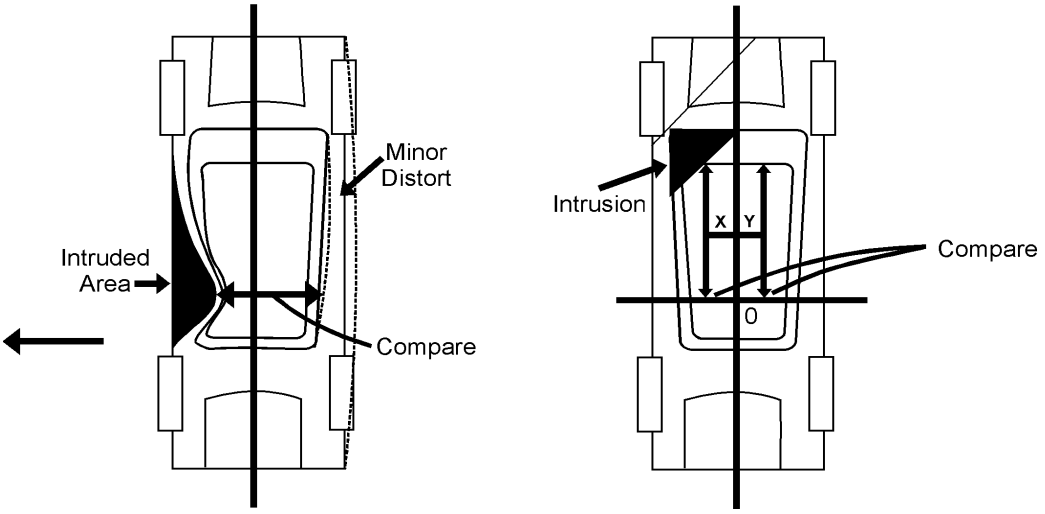
Type B: Intrusion which occurs in many sections of the passenger compartment with little of the vehicle remaining free of distortion. In this case, it will be necessary to obtain "original" dimensions by comparison with a second (unintruded) vehicle of the same type.

Occupant Area Intrusion Overview (cont'd)

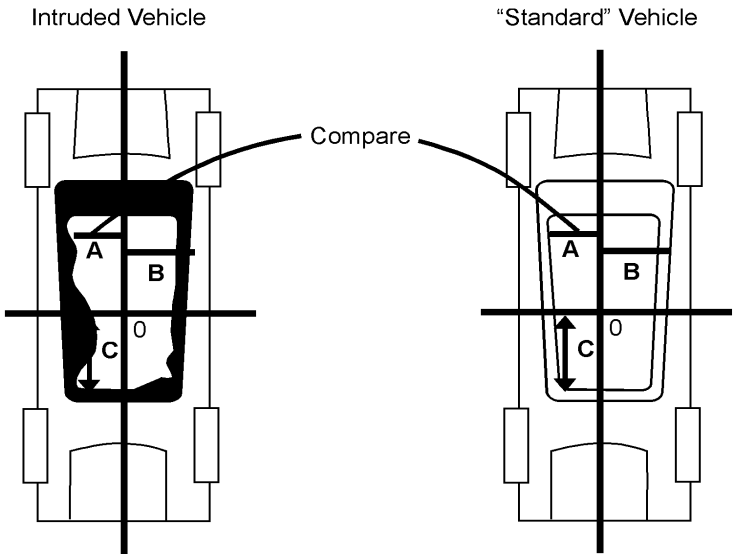
FIGURE 1

Establishment of Reference Axis. In order to compare one side of a vehicle with the other or compare two vehicles, a coordinate system within the vehicle is required. An example of Type A and Type B intrusions are shown in Figure 1.

TYPE A INTRUSION:

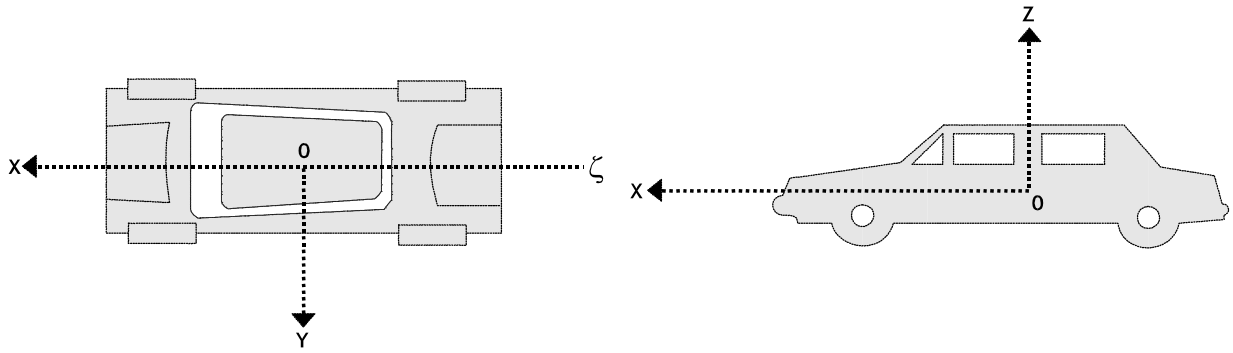


TYPE B INTRUSION:



Occupant Area Intrusion Overview (cont'd)

FIGURE 2



The x-axis is on the longitudinal centerline of the vehicle. This could be set up along the transmission drive shaft tunnel for a rear wheel drive vehicle or along a centerline which is equidistant from the sides of the vehicle in a front wheel drive vehicle.

The y-axis is in a side-to-side or lateral direction. This plane may be set up in any convenient location which can be readily established in the "reference" vehicle.

The z-axis is the vertical axis. A location at the top of the transmission drive shaft tunnel may be convenient to reference roof collapse in many cases. The point established by these intersecting planes defines the origin **(O)**.

Establishing a frame of reference and measuring intrusion can be simplified.

- In a frontal collision, there is rarely intrusion at the rear, and vice-versa for a rear collision.
- Side impacts generally damage only one side of the vehicle.
- Roof impacts leave the floor pan undistorted.

Not all intrusions require the establishment of all three axes.

The ordering of intrusions reflects the intrusion severity as recorded in column three (*i.e.*, Magnitude of Intrusion variables).

An intruded component is assessed for its Dominant Crush Direction as determined from the Magnitude of Intrusion. For example, an instrument panel may intrude both longitudinally and vertically. The coded intrusion will reflect the instrument panel with the dominant crush direction (vertical or longitudinally). If the dominant intrusion can not be determined in the field (i.e., an exemplar vehicle is required for comparison measurements) the Researcher should document the component (i.e., instrument panel) in both directions. However, during final completion of the case, only the instrument panel intrusion with the greater magnitude is coded, the other intrusion row is deleted.

Occupant Area Intrusion Overview (cont'd)

This system is defined by an orthogonal set of axes (x-y-z) and an origin (**O**) as shown in Figure 2. The position of the origin is typically on the longitudinal centerline of the vehicle and has an arbitrary location, both vertically and longitudinally. However, its location must be identical for the intruded and "reference" vehicle. Note, the axes are referenced to the floor plane of the vehicle.

NOTE: The extent of a component intrusion into a row sector should not exceed the pre-impact dimension of that sector. For example, if the front row width is 150 centimeters, each sector is equal to 50 centimeters. If the driver-side door panel intrudes 60 centimeters laterally, the intrusion is listed as:

- Front Row Left (sector 11) Intrusion Magnitude = 50cm (maximum amount for that sector)
- Front Row Middle (sector 12) Intrusion Magnitude = 10cm (the remaining amount for the door panel intrusion).

Catastrophic should only be used to describe intrusion damage which is so severe that the researcher is unable to discern any of the following:

- specific occupant locations
- intruding components
- magnitude of intrusions and
- dominant crush.

Screen Name: Row
Variable Name: Row

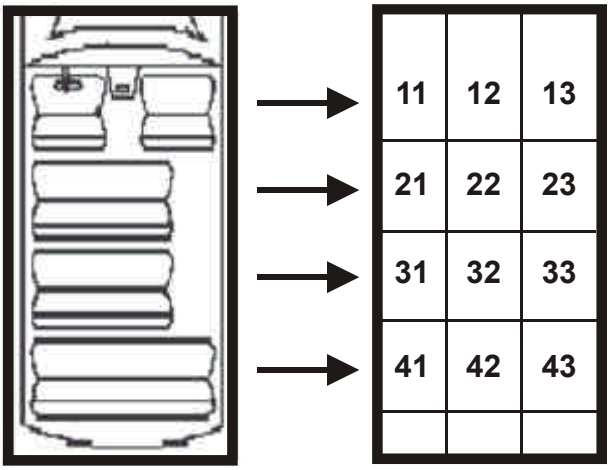
Element Attributes:

Front Row
Second Row
Third Row
Fourth Row
Catastrophic
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

The interior space of a vehicle is divided into specific sectors as outlined in the following diagram. These sectors are based upon seat rows and **not** occupant seat locations. Cargo areas open to the passenger area (*i.e.*, station wagons, vans, etc.) are assessed in these variables. Intrusion into the trunk area of an automobile with a rear seat position or into a cargo area covered by a privacy curtain/shelf is excluded.



Front Row, Second Row, Third Row, Fourth Row are identified by the presence of an installed seat.

When the entire seat row is folded down or removed prior to the crash, this area is considered an **Other** enclosed area**.**

Screen Name: Row (cont'd)
Variable Name: Row (cont'd)

The following rules guide us in the determination of "seat rows" versus "other enclosed areas" and in the derivation of the lateral dimension of each row sector.

- Cargo areas in passenger cars which are separated from the passenger compartment are not considered for intrusion. This would include trunk areas and rear cargo areas of hatchbacks and station wagons which were covered by a privacy curtain/shelf. The area above the privacy curtain/shelf is considered for intrusion and would be listed under **Other** enclosed area.

- The area behind the front row of a pickup truck where jump seats are installed should be identified by the status of these seats prior to the crash. When at least one seat was in the operational mode (*i.e.*, open) at the time of the crash, the entire area is listed as row 2. Otherwise, this area is assessed under **Other** enclosed area.

- A problematic area in vans is the situation where a row was removed prior to the crash. A seat row area that was removed prior to an crash should be selected as an **Other** enclosed area; however, it should be tabulated as a seat row to identify any sequential rows.

- Vans with single seating positions behind the Front Row (usually high back swivel chairs) are compressed into a single seat row.

- The fifth row in a van (envisioned as a rare occurrence) is identified as an **Other** enclosed area.

Catastrophic

is used when the intrusion damage to the occupant compartment is so devastating that the researcher is not able to discern any of the following: specific occupant locations, intruding components, magnitude of intrusions, and dominant crush. When catastrophic is selected, the program automatically encodes the **Area** as "other"; the **Magnitude** as "Catastrophic"; and the **Crush Direction** as "Catastrophic". **The Researcher must** select the **Intruded Component** as "Catastrophic"; **AND** leave the columns for **Comparison, Intruded**, and **Intrusion** blank.

Other (Specify):

is an area where no defined row exists. This would include an area where the entire seat row was folded down prior to the crash. Occasionally, the middle seat row in a passenger van will be removed leaving only the front and rearmost seat rows. If intrusion occurs within this area, the location should be identified here and specified.

Unknown

is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair (or repaired) at the time of inspection.

Screen Name: Position
Variable Name: Position

Element Attributes:

Left
Middle
Right

Source: Vehicle inspection.

Remarks:

Each row is equally divided into three sectors regardless of the seating configuration.

In the situation where half of the row is folded down (*i.e.*, split back seats) to accommodate cargo, the entire lateral area (wall-to-wall) is divided into three equal sectors.

The following rules guide us in the determination of "seat rows" versus "other enclosed areas" and in the derivation of the lateral dimension of each row sector.

- The lateral occupant space dimension for the front seat row is obtained by measuring the distance from the vehicle's side-surface to side-surface (undamaged dimension) and dividing by three. **Note, there is no implied correlation between seating capacity and sectors.**

- The area behind the front row of a pickup truck where jump seats are installed should be identified by the status of these seats prior to the crash. When at least one seat was in the operational mode (*i.e.*, open) at the time of the crash, the entire area is divided into three sectors.

Left

is defined as the left sector of the row (i.e., sectors 11, 21, 31, 41). The lateral dimension of this area is mathematically determined by dividing the original wall-to-wall dimension by three.

Middle

is defined as the center sector of the row (i.e., sectors 12, 22, 32, 42). .

Right

is defined as the right sector of the row (i.e., sectors 13, 23, 33, 43).

**** **Unknown** should not be selected and should be deleted from NASSMAIN. ****

Screen Name: Area
Variable Name: Area

Element Attributes:
Interior Components
Exterior Components
Other

Source: Vehicle inspection.

Remarks:

This variable filters the forthcoming intruding components with respect to whether they were internal or external to the occupant compartment.

Screen Name: Intruded Component
Variable Name: Intruded Component

Element Attributes:

Interior Components
- Steering assembly
- Instrument panel left
- Instrument panel center
- Instrument panel right
- Toe pan
- A (A1/A2)-pillar
- B-pillar
- C-pillar
- D-pillar
- Side panel - forward of the A1/A2-pillar
- Door panel (side)
- Side panel - rear of the B-pillar
- Roof (or convertible top)
- Roof side rail
- Windshield
- Windshield header
- Window frame
- Floor pan (includes sill)
- Backlight header
- Front seat back
- Second seat back
- Third seat back
- Fourth seat back
- Fifth seat back
- Seat cushion
- Back door/panel (*e.g.*, tailgate)
- Other interior component (specify):
- [Unknown]
- Catastrophic

Exterior Components
- Hood
- Outside surface of this vehicle (specify):
- Other exterior object in the environment (specify):
- Unknown exterior object
- Catastrophic
- Intrusion of unlisted component(s)
- Unknown

Source: Vehicle inspection.

Remarks:

Select the component which has reduced the occupant space for that sector. An intruded component is assessed for its Dominant Crush Direction as determined from the Magnitude of Intrusion. For example, an instrument panel may intrude both longitudinally and vertically. The final coded intrusion will reflect the instrument panel with the dominant crush direction (vertical or longitudinally). If the dominant intrusion can not be determined in the field (i.e., an exemplar vehicle is required for comparison measurements) the Researcher should document the component (i.e., instrument panel) in both directions. However, during final completion of the case, only the instrument panel intrusion with the greater magnitude is coded, the other intrusion row is deleted.

Screen Name: Intruded Component (cont'd)
Variable Name: Intruded Component (cont'd)

INTERIOR COMPONENTS:

Steering assembly
consists of the entire steering column which includes the steering rim, hub, and spokes.

Instrument panel left
refers to the left one-third of the panel. This should correlate with the same lateral dimension generated for the sector "11" (Front Seat Left) in variables Row and Position.

Instrument panel center
refers to the center one-third area of the instrument panel. This should correlate with the same lateral dimension generated for the sector "12" (Front Seat Middle) in variable Row and Position.

Instrument panel right
refers to the right one-third of the instrument panel. This should correlate with the same lateral dimension generated for the sector "13" (Front Seat Right) in variables Row and Position.

Toe pan
refers to the front portion of the floor that angles up to meet the dash panel.

A (A1/A2)-pillar
refers to the upper and lower portion of the forward most structural post of the passenger compartment on both side planes. Some vehicles (*e.g.*, GM APV minivan) are designed with two upper A-pillars on each side. The forward most pillar is called an A1-pillar which is primarily designed to secure the windshield to the vehicle. The second pillar is labeled as an A2-pillar. This pillar generally lends support to the roof and also helps to establish the front door opening. Annotation should be provided on the Interior Vehicle Form specifying which pillar was most severely intruded.

B-pillar
refers to the upper and lower portion of the structural post located at the rear edge of the front doors on both side planes. It should be noted, some vehicles do not have upper B-pillars.

C-pillar
refers to the upper and lower portion of the structural side post located at the rearmost edge of the rear door of a four door vehicle or the upper portion of the structural side post located between the backlight and side window glass on two door vehicles.

D-pillar
refers to the upper and lower portion of the structural post rearward of the C-pillar. D-pillars are usually available on station wagons, vans, or utility vehicles. The D-pillar is not to be confused with the C-pillar which is the rearmost pillar of the passenger compartment on most two and four door vehicles.

Screen Name: Intruded Component (cont'd)
Variable Name: Intruded Component (cont'd)

Side panel forward of the A1/A2-pillar
refers to the interior panel located on the side of the vehicle and forward of the front doors. This includes areas directly below the instrument panel sometimes referred to as a "kickpanel".
See **A-pillar** for A1/A2 definition.

Door panel (side)
refers to the side interior surface and related components of a door.

Side panel rear of the B-pillar
refers to any side surface area excluding doors, window frames, and associated glazing rearward of the B-pillar, below the roof rail, above the sill, and in front of any back door or wall.

Roof (or convertible top)
refers to the top structural member of the greenhouse supported by the side pillars, windshield header and backlight header.

Roof side rail
refers to the longitudinal horizontal stiffeners located along the edge of the roof.

Windshield
refers to the lateral glazing located at the forward most surface of the greenhouse.

Windshield header
refers to the front forward lateral edge of the roof directly above the windshield.

Window frame
refers to the longitudinal frame that encloses the side window glazings and composes that portion of the door above the window sill.

Floor pan (includes sill)
refers to the floor of the vehicle. This includes the lower portion of the passenger compartment (*e.g.*, door sills).

Backlight header
refers to the rear most lateral edge of the roof directly above the backlight.

Front seat back
refers to the back support of the front seat.

Second seat back
refers to the back support of any second-row seat.

Third seat back
refers to the back support of any third-row seat.

Fourth seat back
refers to the back support of any fourth-row seat.

Fifth seat back
refers to the back support of any fifth-row seat.

Seat cushion
refers to the horizontal portion of the seat assembly that was designed for seating.

Back door / panel (*e.g.*, tailgate)
refers to the interior surface and related components of the back door or if no door exists, the interior surface of the back wall.

Other interior component
refers to any interior component that may intrude into an occupant seating position.

EXTERIOR COMPONENTS:

Hood
refers to the horizontal structure covering the front compartment of the vehicle located forward of the windshield.

Outside surface of this vehicle
is selected when any outside surface of this vehicle not mentioned above has violated the internal boundary surface of the passenger compartment (*e.g.*, spare tire, jack, outside mirror, etc.).

Other exterior object in the environment
refers to an object external to the vehicle (trees, poles, other vehicle, etc.) which penetrates the internal boundary of this vehicle.

Unknown exterior object
is selected if there is evidence that an object intruded but it's unknown what that object was.

Intrusion of unlisted component(s)
is used if there is intrusion of any component not listed above.

Unknown
is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.

Screen Name: Comparison
Variable Name: Comparison Value (of intrusion)

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining comparison values found in **Occupant Area Intrusion Overview**.

Enter the Comparison value for the intruded component.

Screen Name: Intruded
Variable Name: Intruded Value (of intrusion)

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining intruded values found in **Occupant Area Intrusion Overview**.

Enter the Comparison value for the intruded component.

Screen Name: Intrusion
Variable Name: Intrusion

Element Attributes:
Record to the nearest centimeter
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

Follow the instructions for determining vehicle intrusions, establishing axes, and determining Intrusion values found in **Occupant Area Intrusion Overview**.

The Intrusion value is computed if the Researcher enters both an **Intruded** value and a **Comparison** value.

The extent of a component intrusion into a row sector should not exceed the pre-impact dimension of that sector. For example, if the front row width is 150 centimeters, each sector is equal to 50 centimeters. If the driver-side door panel intrudes 60 centimeters laterally, the intrusion is listed as:

- Front Row Left (sector 11) Intrusion Magnitude = 50cm (maximum amount for that sector)
- Front Row Middle (sector 12) Intrusion Magnitude = 10cm (the remaining amount for the door panel intrusion).

If the magnitude cannot be measured, but can be visibly seen, estimate the intrusion in the Magnitude variable that follows this variable.

Unknown
is used in the following situations.
- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.
- The researcher was not able to measure or reasonably estimate the intrusion.

Screen Name: Magnitude
Variable Name: Magnitude of Intrusion

Element Attributes:

$ 2 cms
$ 3 cm but < 8 cm
$ 8 cm but < 15 cm
$ 15 cm but < 30 cm
$ 30 cm but < 46 cm
$ 46 cm but < 61 cm
$ 61 cm
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

When the **Intrusion** is calculated by the program, is automatically assigns a magnitude or range to the intrusion. The researcher may select a magnitude for an intruded component while awaiting comparison values. If the magnitude cannot be measured, due to physical limitations but can be visibly seen, estimate the magnitude of the intrusion.

Unknown
is used in the following situations.
- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.
- The researcher was not able to measure or reasonably estimate the intrusion.

Screen Name: Crush Direction
Variable Name: Crush Direction

Variable Name: Crush Direction

Element Attributes:

Vertical
Longitudinal
Lateral
[Catastrophic]
[Unknown]

Source: Vehicle inspection.

Remarks:

This variable assesses the direction of displacement for the intruded component. The direction of movement is determined independently from the PDOF applied to the vehicle.

Vertical

refers to components which intrude into the passenger compartment from either an upward or downward direction.

Longitudinal

refers to components which move forward or rearward into the passenger compartment.

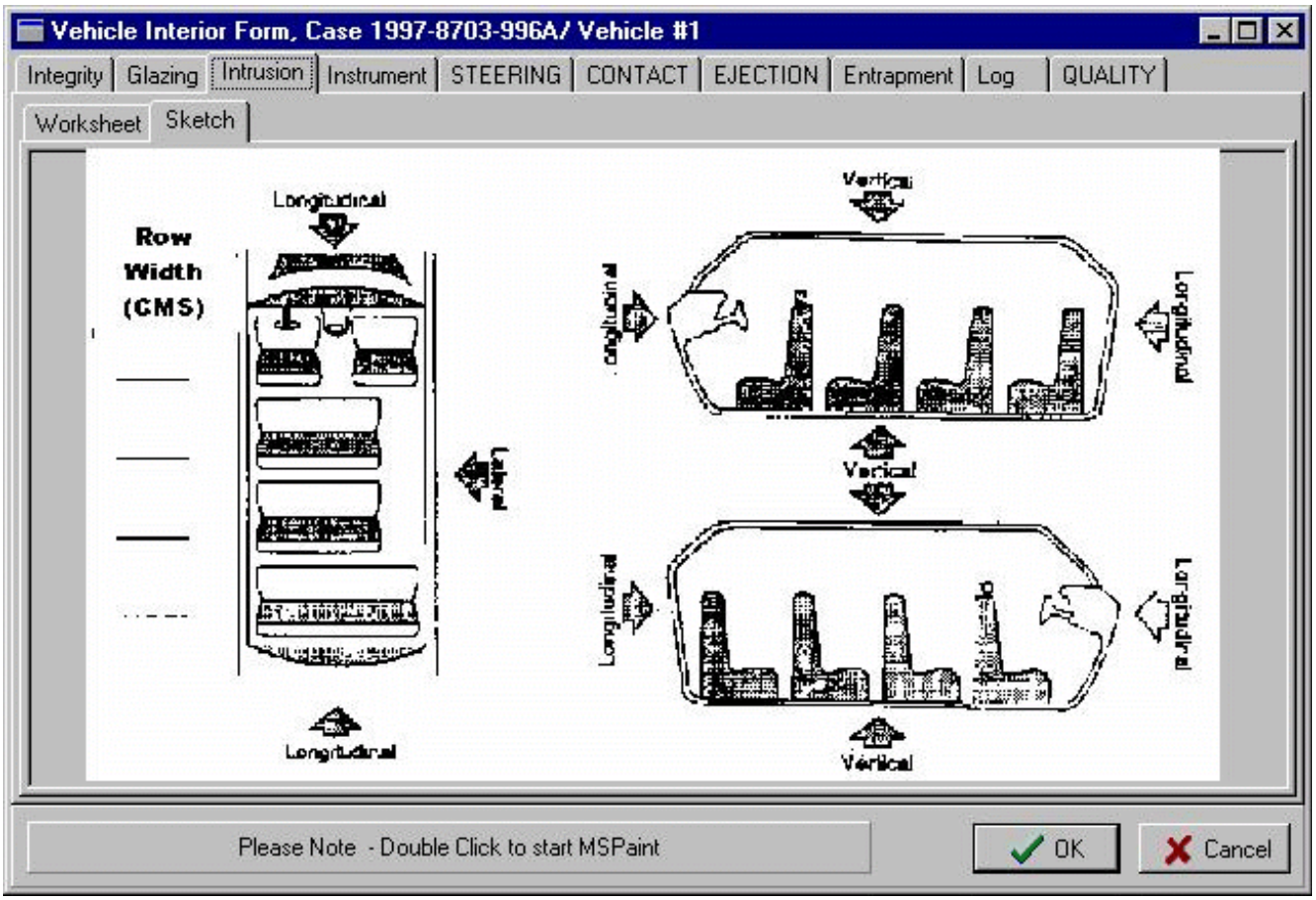
Lateral

refers to components which are displaced either left or right within the passenger compartment.

Unknown

is used for the following situations.

- The researcher cannot determine if there was any intrusion.
- The vehicle was under repair at the time of inspection.

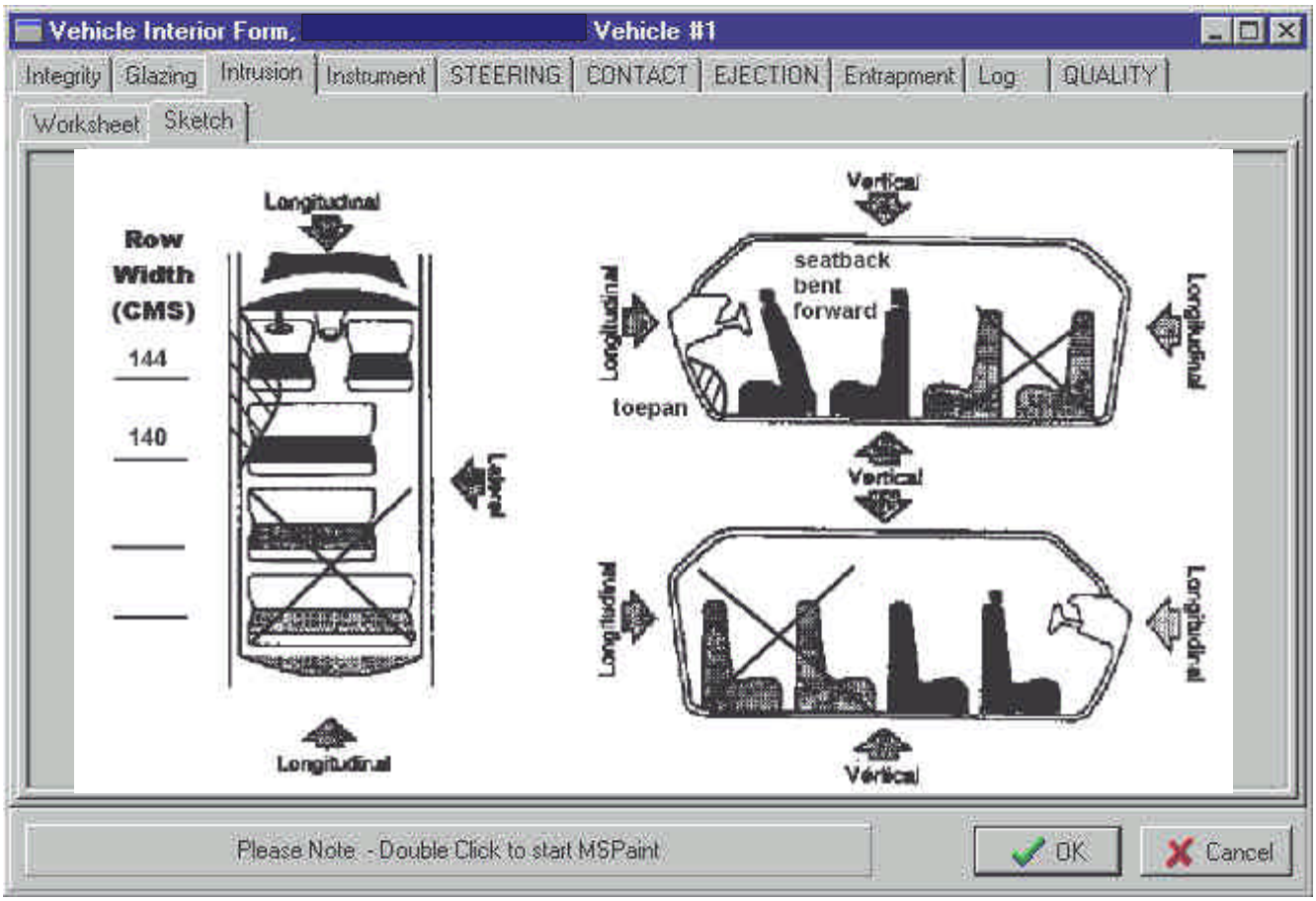

Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Worksheet
Sketch
Row Width (CMS)
Longitudinal
Lateral
Vertical
Please Note - Double Click to start MSPaint
OK
Cancel

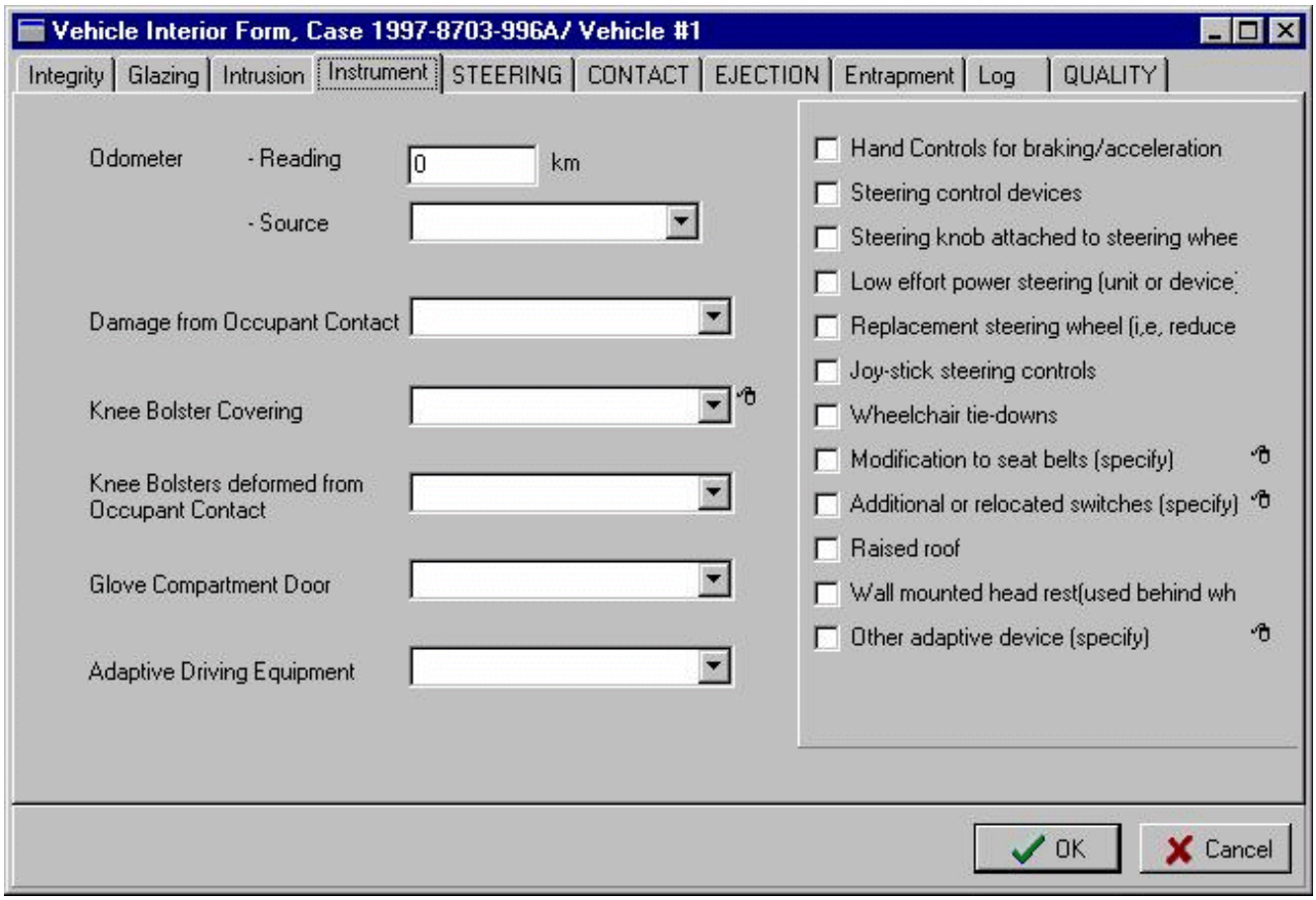
Intrusion Sketch Completion

The following should be included for all intrusion sketches:

- Row width for all rows in the vehicle
- A rough sketch of the Intruded components and their approximate displacement
- Cross out or erase rows which are not present in the vehicle
- Applicable annotations

An example sketch is provided below:




Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Odometer
- Reading
0
km
- Source
Damage from Occupant Contact
Knee Bolster Covering
Knee Bolsters deformed from Occupant Contact
Glove Compartment Door
Adaptive Driving Equipment
Hand Controls for braking/acceleration
Steering control devices
Steering knob attached to steering whee
Low effort power steering (unit or device
Replacement steering wheel (i,e, reduce
Joy-stick steering controls
Wheelchair tie-downs
Modification to seat belts (specify)
Additional or relocated switches (specify)
Raised roof
Wall mounted head rest(used behind wh
Other adaptive device (specify)
OK
Cancel

Screen Name: Odometer Reading
Variable Name: Odometer Reading

Element Attributes:

Range: 000, 001 through 1,000,000
Unknown

Source: Primary source is the vehicle inspection, secondary sources include the interviewee, and repair facility.

Remarks:

Enter the number of miles displayed on the odometer.

This variable measures the distance the vehicle has traveled. However, in cases where it is known that the odometer was working but had turned over (*i.e.*, recycled) the recorded value represents the total distance traveled by the vehicle rather than the reading on the odometer. Annotate in **Odometer Source** the source of information when it is determined that the odometer had turned over.

Unknown
is used when:

- it is known that the odometer was disconnected or broken before the collision;
- the vehicle is equipped with an electronic instrument cluster and an analog "back-up" odometer is not present; or
- the vehicle's odometer reading is unknown.
- the vehicle was manufactured without an odometer.

Screen Name: Odometer - - Source
Variable Name: Odometer Source

Element Attributes:

Vehicle Inspection
Interview
Other
Repair Facility

Source: Primary source is the vehicle inspection; secondary sources include Interviewees and repair facilities

Remarks:

Indicate the source that was used to make the vehicle's mileage determination. For example: if it is evident from the vehicle inspection that the vehicle has gone over 100,000 miles, and the odometer indicates 2,300 miles, code the mileage as 102,300 (164,636 kilometers) and indicate the source as **Vehicle Inspection.**

Screen Name: Damage from Occupant Contact
Variable Name: Instrument Panel Damage from Occupant Contact

Element Attributes:

No
Yes
Unknown

Source: Vehicle inspection only.

Remarks:

Instrument panel damage is defined as damage caused by occupant contact during the impact sequence. This damage includes: breakage, dents, scratches, and abrasions. Deformities resulting from impact forces such as lateral shift or buckling are excluded.

On vehicles without knee bolsters, The instrument panel is defined as that panel extending horizontally from A-pillar to A-pillar (Figure 1) and vertically from the lower part of the windshield to the lowest vertical edge of the panel (Figure 2). This excludes the steering assembly and all center mounted consoles.

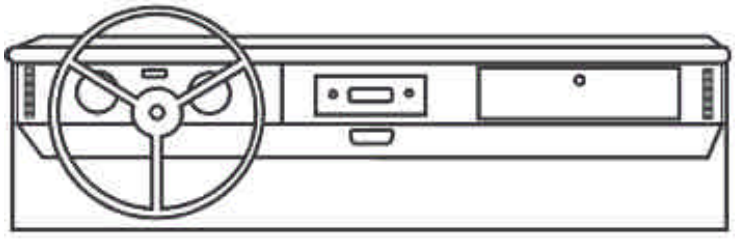


FIGURE 1

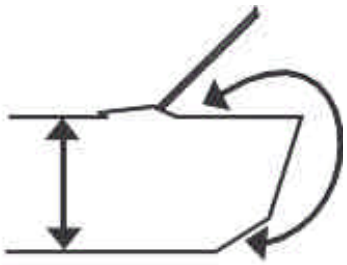


FIGURE 2

No

is selected when the instrument panel was not damaged by occupant contact.

Yes

is selected when the instrument panel was damaged by occupant contact.

Unknown

is selected when:

- the instrument panel is under repair or replaced.
- it cannot be determined if there was occupant contact to the instrument panel.

Screen Name: Knee Bolster Covering
Variable Name: Type of Knee Bolster Covering

Element Attributes:

No Knee Bolster
Padded
Rigid Plastic
Other (specify):_____
Unknown

Source: Vehicle inspection.

Remarks:

Knee bolsters are generally present in vehicles equipped with air bags.

More recent vehicles have bolsters which are not so obvious. Generally, presence of an air bag or a two point automatic belt system would be a solid indicator of bolster presence. When in doubt, **and** in the presence of either an air bag or two point belt, record bolster presence.

The most obvious of this device is the "parcel tray" type of bolster in the Volkswagen Rabbit which was equipped with the two point shoulder belt that was anchored in the top of the door frame and at the console.

No knee bolster
is selected when no knee bolster is present.

Padded
refers to a knee bolster which is covered with a soft, pliable or padded surface.

Rigid plastic
refers to a knee bolster that is either constructed of or covered by a hard, rigid plastic surface.

Other
is selected when a knee bolster is present but it is constructed of or covered by some other material such as metal.

Unknown
is selected when it cannot be determined if a knee bolster is present or the covering cannot be identified (*e.g.* burned vehicles). This should be a rare occurrence.

Screen Name: Knee Bolsters Deformed from Occupant Contact
Variable Name: Knee Bolsters Deformed from Occupant Contact

Variable Name:

Element Attributes:

No- deformation
Yes - deformation
Unknown
[No knee bolster]

Source: Vehicle inspection.

Remarks:

Knee bolsters are defined as energy absorbing panels fitted to the lower portion of the instrument panel to help restrict forward movement of the front seat occupant's lower body during an crash. Knee bolsters may or may not extend from A-pillar to A-pillar depending on the vehicle make and model. Vehicles equipped with an air bag are generally equipped with a knee bolster.

Vehicles equipped ***ONLY*** with a passive restraint system using **only** an upper torso (shoulder) belt (such as certain Volkswagen Rabbits) generally are equipped with a knee bolster. This padded attachment is designed to prevent the occupant from submarining under the shoulder belt and instrument panel during an impact. This variable reports deformation (indentation) of the knee bolster as a result of occupant contact and not as a result of impact related damage.

[No knee bolster]
is automatically selected when no knee bolster is present.

No deformation
is selected when a knee bolster is present but is not deformed by occupant contact.

Yes — deformation
is selected when occupant caused deformation is present on the knee bolster. Minor dents are considered deformation; however, scuffing and transfers are not deformation. Occupant contact evidence is included on the Vehicle Interior Sketches , Point of Contact Sketches, and highlighted in the photographs.

Unknown
is selected when knee bolster deformation is present but it is unknown if it was caused by an occupant .

Screen Name: Glove Compartment Door
Variable Name: Did Glove Compartment Door Open During Collision(s)?

Element Attributes:

No glove compartment door
No — door did not open
Yes — door opened
Unknown

Source: Researcher determined — inputs include the vehicle inspection and interview.

Remarks:

This variable reports the status of the glove compartment door (if present) during the crash. The primary objective is to determine whether the door latch mechanism released during a collision(s).

No glove compartment door

is selected when no glove compartment door is available

No — door did not open

is selected when the door did not open or the door opened but the latch mechanism did not fail (*e.g.*, body of door separates from the latch mechanism which is intact and engaged).

Yes — door opened

is selected when the door opened because the latch mechanism released. Reasons may include: occupant contact, shifting or buckling of vehicle components, or impact forces.

Unknown

is selected when:

- that portion of the instrument panel is under repair, or
- the glove box door is known to be open but it is unknown whether the door opened as a result of the crash [*i.e.*, door could have been open prior to the crash, or it could have been opened after the crash (*e.g.*, to remove driver registration information)].

Screen Name: Adaptive Driving Equipment
Variable Name: Adaptive (Assistive) Driving Equipment

Element Attributes:

No adaptive driving equipment
Adaptive driving equipment installed
Unknown

Source: Investigator determined — primary source is the vehicle inspection, secondary source is driver interview.

Remarks:

Adaptive driving equipment is defined as equipment whose primary purpose is to assist persons with disabilities in the operation of a vehicle. This variable is designed to capture those vehicles that have this type of after-market adaptive driving equipment installed. Use of the equipment at the time of the crash is irrelevant. Be alert for evidence of equipment that may have been removed between the time of the crash and the time of inspection. The device(s) must be present at the driving position (e.g., wheelchair tie downs).

No adaptive driving equipment

is used when it is determined that no adaptive equipment was present in the vehicle at the time of the crash.

Adaptive equipment installed

is used when it is determined that adaptive equipment was present in the vehicle at the time of the crash. Use of the equipment at the time of the crash is not to be considered.

Element Attributes: ***Check all that apply***

(_) Hand controls for braking/acceleration
(_) Steering control devices (attached to OEM steering wheel)
(_) Steering knob attached to steering wheel
(_) Low effort power steering (unit or device)
(_) Replacement steering wheel (*i.e.* reduced diameter)
(_) Joy-stick steering controls
(_) Wheelchair tie-downs
(_) Modifications to seat belts (specify)
(_) Additional or relocated switches (specify)
(_) Raised roof
(_) Wall mounted head rest (used behind wheelchair)
(_) Other adaptive device (specify)

Hand controls for braking / acceleration

does not include normal cruise control

Steering control devices (attached to OEM steering wheel)

includes handles and arms used to assist in the operation of the vehicle

Steering knob attached to steering wheel

is used to help in the turning of the vehicle. May sometimes be referred to as a "suicide knob".

Screen Name: Adaptive Driving Equipment (cont'd)
Variable Name: Adaptive (Assistive) Driving Equipment (cont'd)

Low effort power steering (unit or device)
can possibly be identified by looking under the hood for an enhanced pump.

Replacement steering wheel (i.e. reduced diameter)
some after-market suppliers have "chain-link" type steering wheels, they are **NOT** considered as adaptive equipment for persons with disabilities.

Joy-stick steering controls

Wheelchair tie-downs
are selected ONLY if they are present at the drivers' location.

Modifications to seat belts (specify)
comfort devices such as lambs wool coverings are NOT considered here.

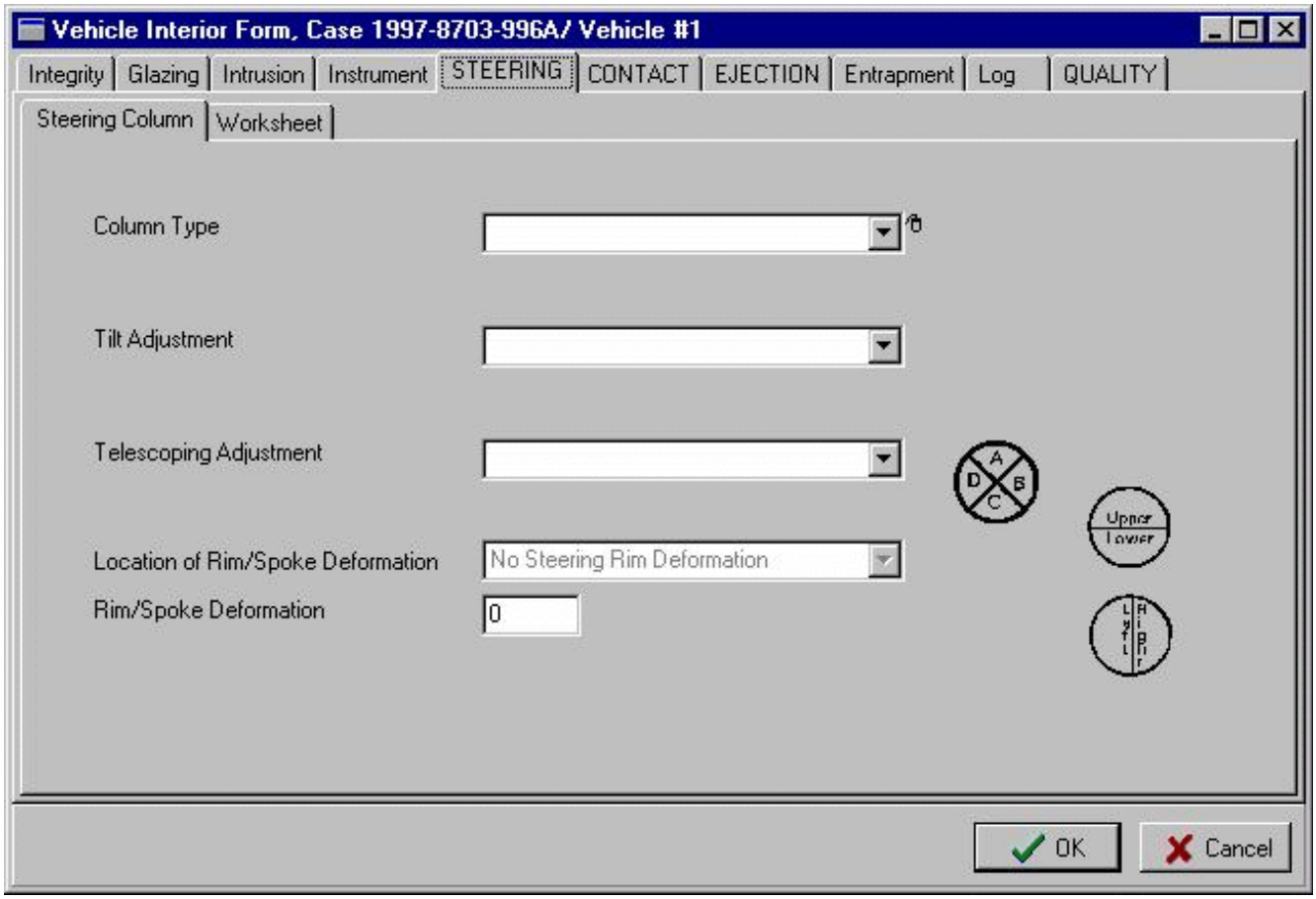
Additional or relocated switches (specify)

Raised Roof
will look like a second roof, not a camper-van type

Wall mounted head rest (used behind wheelchair)
are selected ONLY if they are present at the drivers' location

Other adaptive device (specify)
must be specified and sketched if possible. As an example, after-market pedal extenders used specifically for assist persons with disabilities in the operation of the foot controls would be included in this element.

Unknown
is used when it cannot be determined if any adaptive driving devices were installed in the vehicle at the time of the crash.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Steering Column
Worksheet
Column Type
Tilt Adjustment
Telescoping Adjustment
Location of Rim/Spoke Deformation
No Steering Rim Deformation
Rim/Spoke Deformation
0
A
B
C
D
Upper
Lower
OK
Cancel

Screen Name: Column Type
Variable Name: Steering Column Type

Element Attributes:

Fixed column
Tilt column
Telescoping column
Tilt and telescoping column
Other column type (specify):
Unknown

Source: Vehicle inspection.

Fixed column

refers to a non-adjustable steering column. Note if "Fixed column" is selected the variables **Tilt Adjustment** and **Telescoping Adjustment** will be pre-coded as "No tilt steering column" and "No telescoping column", respectively.

Tilt column

refers to a steering column designed to allow the steering wheel or column to be tilted at an angle selected by the operator to improve driving comfort. The presence of these types can generally be verified by the existence of an extra control stalk on the column. This stalk is separate from the turn signal, headlight, or wiper controls and is usually mounted near the bend point of the tilt wheel, or near the lower part of the instrument panel for the tilt column. Characteristically, the control stalk is unmarked and may be located on the left or right side of the column in relative proximity to the steering wheel end. Some vehicles are equipped with a "lever" device on the underside of the column, which allows placement of the entire column for driver comfort.

Telescoping column

refers to a steering column that has an adjustable length. The column can be shortened or lengthened to suit operator comfort. The telescoping feature can generally be identified by the presence of a knurled ring around the column. Rotating this ring allows the column to be lengthened or shortened, while re-tightening the ring locks the column at the desired adjustment.

Tilt and telescoping column

refers to a column that has both the tilt wheel and adjustable length features.

Other column type (specify)

includes steering columns which cannot be described above. This would include swing away columns, etc.

Unknown

Unknown is used if the column type cannot be determined.

Screen Name: Tilt Adjustment
Variable Name: Tilt Steering Column Adjustment

Element Attributes:

Full up
Between full up and center
Center
Between center and full down
Full down
Unknown
[No tilt steering column]

Source: Investigator determined; primary source is the vehicle inspection, other input is driver interview.

Remarks:

This variable is used to describe the pre-impact tilt position of adjustable steering columns.

Full up

refers to a vertically adjustable steering column that was in its highest position possible at the time of the crash.

Between full up and center

refers to a vertically adjustable steering column that was somewhere between full up and the center position at the time of the crash.

Center

refers to a vertically adjustable steering column that was in the center-most position (*e.g.* equal amounts of adjustment both above and below this position) at the time of the crash.

Between center and full down

refers to a vertically adjustable steering column that was somewhere between the center and full down position at the time of the crash.

Full down

refers to a vertically adjustable steering column that in its lowest possible position at the time of the crash.

Unknown

is selected when: it cannot be determined if the vehicle was equipped with a vertically adjustable steering column or the researcher cannot determine the pre-impact position of the vertically adjustable steering column.

Screen Name: Telescoping Adjustment
Variable Name: Telescoping Steering Column Adjustment

Element Attributes:

Full back
Between full back and midpoint
Midpoint
Between midpoint and full forward
Full forward
Unknown
[No telescoping steering column]

Source: Investigator determined; primary source is the vehicle inspection, other input is driver interview.

Remarks:

This variable is used to describe the pre-impact telescoping position of adjustable steering columns.

No telescoping steering column
is selected when the steering column does not have an adjustment to move the steering column/wheel longitudinally (forward and backward).

Full back
refers to a longitudinally adjustable steering column that was in its rearward-most position (toward the rear of the vehicle) at the time of the crash.

Between full back and midpoint
refers to a longitudinally adjustable steering column that was somewhere between the full back position (toward the rear of the vehicle) and the center position at the time of the crash.

Midpoint
refers to a longitudinally adjustable steering column that was in the center-most position (mid-point of the overall movement range) at the time of the crash.

Between midpoint and full forward
refers to a longitudinally adjustable steering column that was somewhere between the center position and the full forward position (toward the front of the vehicle) at the time of the crash.

Full forward
refers to a longitudinally adjustable steering column that was in the forward most position (toward the front of the vehicle) at the time of the crash.

Unknown
is selected when it cannot be determined if the vehicle was equipped with a longitudinally adjustable steering column or the researcher cannot determine the pre-impact position of the longitudinally adjustable steering column.

Screen Name: Location of Rim / Spoke Deformation
Variable Name: Location of Rim / Spoke Deformation

Element Attributes:

No steering rim deformation

Quarter Sections
Section A
Section B
Section C
Section D

Half Sections
Upper half of rim/spoke
Lower half of rim/spoke
Left half of rim/spoke
Right half of rim/spoke

Complete steering wheel collapse
Undetermined location
Unknown

Source: Vehicle inspection.

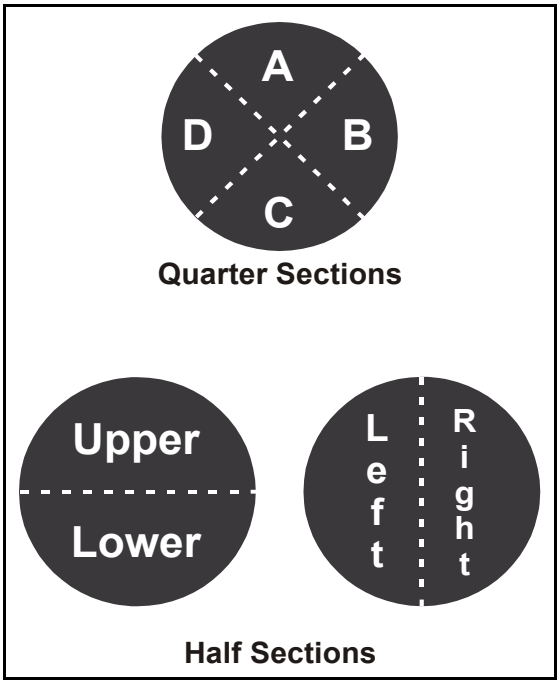
Remarks:

The variable **Rim / Spoke Deformation** must be coded with a value, in order to classify the **Location of Rim / Spoke Deformation**.

The steering wheel rim is divided into four quarter sections (A through D) and four half sections (upper half, lower half, left half, right half).

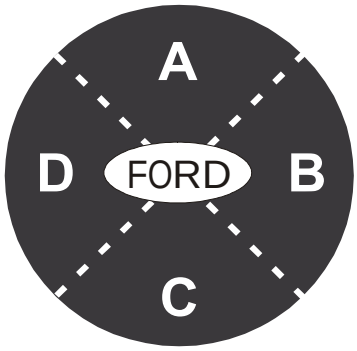
Note, the half designation should not be considered as a grouping of quarter sections.

The accompanying diagrams identify the location of the quarter and half sections.



Screen Name: Location of Rim / Spoke Deformation (cont'd)
Variable Name: Location of Rim / Spoke Deformation (cont'd)

Evaluate the deformation of the rim with respect to the wheel design and not the wheel position observed during the vehicle inspection. For example, if the designed top section was deformed and rotated to the bottom position, then the correct response for this variable is Quarter Sections - Section A; see below.



Straight Ahead Position

Post-Impact Position

When evaluating which quarter or half to encode, place primary emphasis upon downward deflection (toward the instrument panel) since the coding captures occupant-caused deformation. When two half sections are deformed, select the half with the greatest deformation.

Complete steering wheel collapse
is selected in the event two half sections are deformed axially downward (toward the instrument panel) beyond the hub.

Undetermined location
is selected when it is known the rim was deformed, but as the result of extrication or other post-impact activity the original deformed section could not be determined.

Unknown
is selected in the following situations.

- It is not known if the rim was deformed by occupant contact.
- An assessment of rim damage could not be made as the vehicle was repaired.

Screen Name: Rim /Spoke Deformation
Variable Name: Steering Rim / Spoke Deformation

Element Attributes:

Record actual measured deformation to the nearest centimeters.

Indeterminate - Observed
Unknown

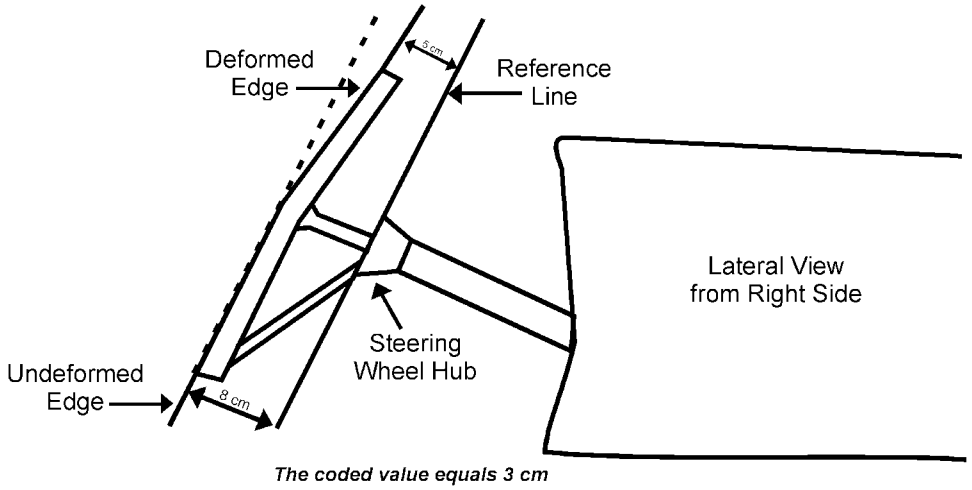
Source: Vehicle inspection.

Remarks:

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

The following diagram illustrates this measurement procedure. The undeformed edge is 8 centimeters from the reference line. The deformed edge is 5 centimeters from the reference line. Therefore, 3 centimeters of deformation occurred.



The coded value equals 3 cm

Value of Zero
is entered when there was no deformation caused by occupant contact of the rim or spokes. Check your observation by placing a flat object (*i.e.*, clipboard) across the plane of the steering rim prior to selecting this attribute.

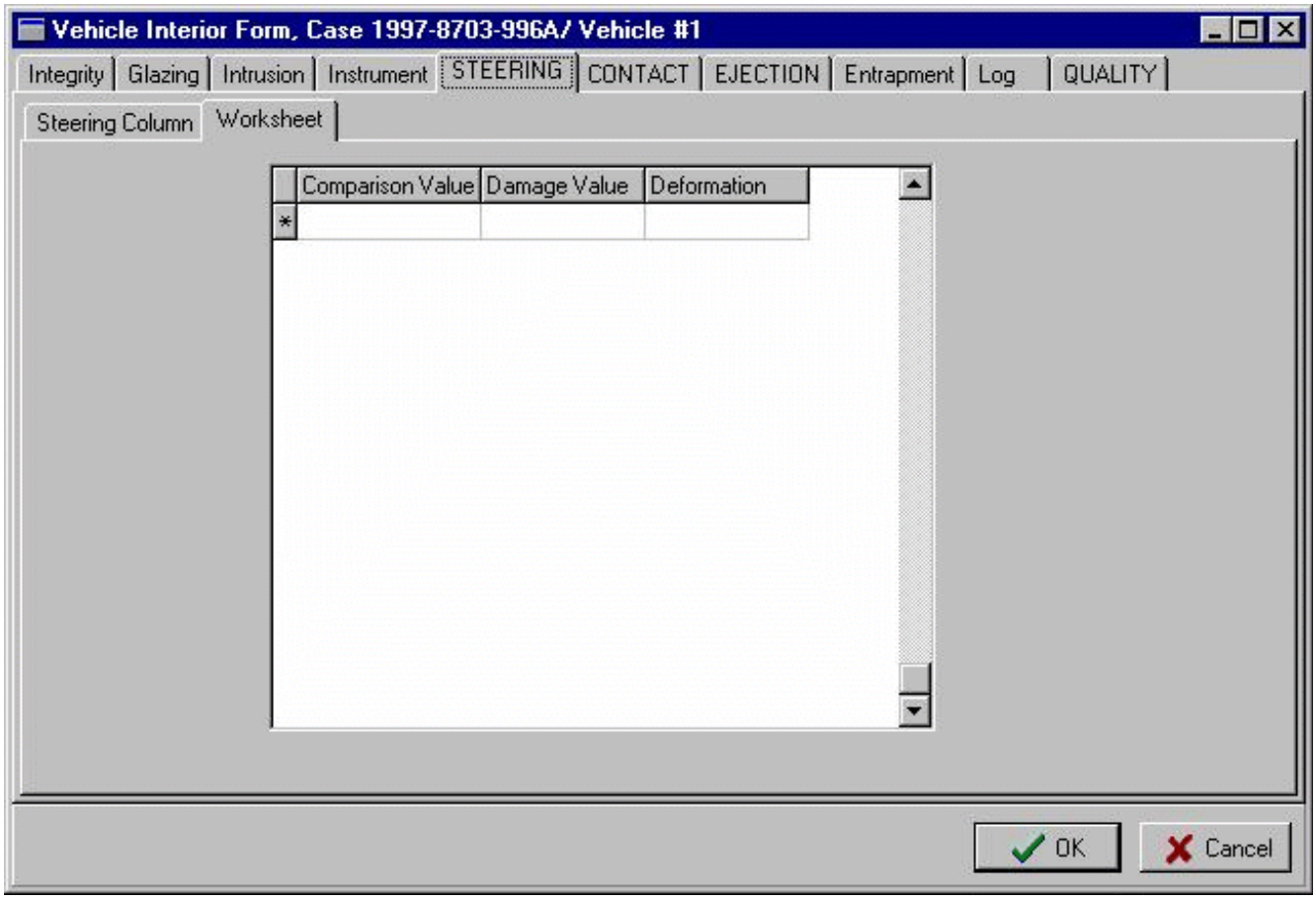
Screen Name: Rim / Spoke Deformation (cont'd)
Variable Name: Steering Rim / Spoke Deformation (cont'd)

Value of 1
is entered when the deformation is greater than zero but less than 1.5 centimeters.

Indeterminate - Observed
is selected when the situation does not permit the direct measurement of a deformed rim.

Unknown
is selected in the following situations:

- It is not known if the rim was deformed by occupant contact.
- An assessment of rim damage cannot be made because the vehicle is repaired.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Steering Column
Worksheet
Comparison Value
Damage Value
Deformation
OK
Cancel

Screen Name: Comparison Value
Variable Name: Comparison Value

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

Screen Name: Damage Value
Variable Name: Damage Value

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

Screen Name: Deformation
Variable Name: Deformation

Element Attributes:

No steering rim deformation
Record actual measured deformation to the nearest centimeters.
Actual measured value in centimeters

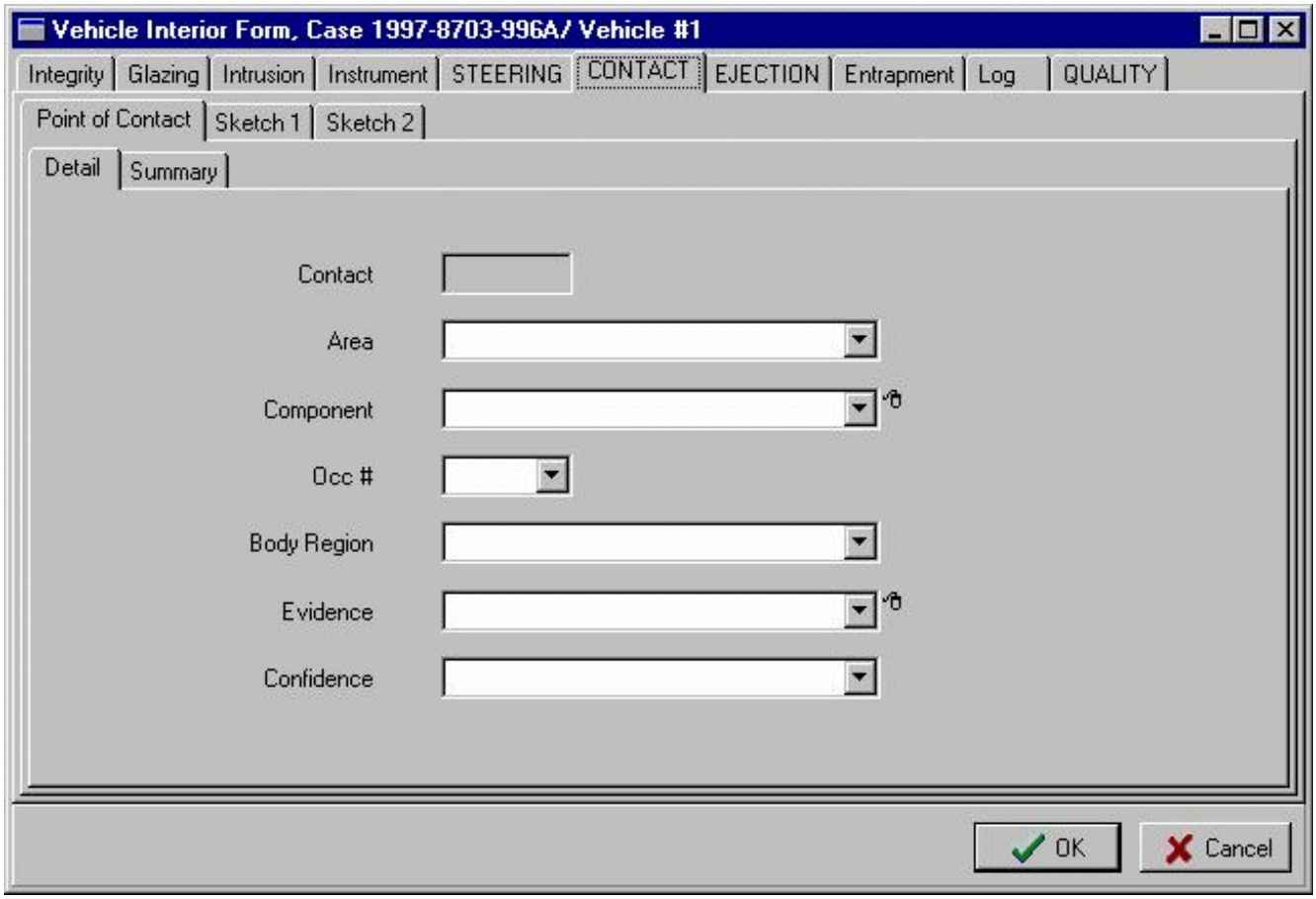
Source: Vehicle inspection.

Remarks:

Refer to the measurement diagram illustrated in **Rim / Spoke Deformation**.

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Detail
Summary
Contact
Area
Component
Occ #
Body Region
Evidence
Confidence
OK
Cancel

Overview / Instructions for Completion of Vehicle Interior Sketches And Point of Occupant Contact Pages

The Vehicle Interior Sketches page and corresponding Point of Occupant Contact page provide a valuable link between vehicle interior documentation and occupant injury data. Properly completed, these records identify evidence of occupant contact points and relate the contact points to the part of the occupant's body that produced the evidence.

In completing the Vehicle Interior Sketches, assess the occupant trajectory in conjunction with the impact configuration, direction of force, and use of restraints. As contact points are identified, they should be documented as follows.

- Open up Sketch 1 and Sketch 2 (by double clicking) to open them in Paint.
- Leave the Sketches open or minimized for ease in navigating between the Detail Tab, and the Sketches.
- Within the vehicle, highlight the contact point with yellow (or similar) tape for photographic purposes.
- Sketch the damaged area on Sketches 1 and 2 (*e.g.*, radio, glove compartment, damage to instrument panel structure, etc.).
- Label the Contact point with a sequential alpha character beginning with the letter “A”. To add contacted components go to the Title Bar and select “**Edit**” and then “**Insert**” and contact point “B” will appear.
- On the Detail tab Select the Area (e.g., front, side, roof, Air Bag, etc.,).
- Select the interior component contacted (i.e., windshield).
- Select the number of the contacting occupant if it can be determined. (Note: if an occupant list for this vehicle does not appear, they must be added into the case structure on the Case Form, Structure tab, Occupant sub-tab).
- Select the Body Region that is suspected of causing the contact point (e.g., head, ankle - left, elbow - right, etc.,).
- Identify the type of evidence present (e.g., bent, cracked, scuffed, , etc.) in the "Evidence" variable.
- Specify the confidence level which you feel best represents your selection of this particular component as a contact point, using the scale of: Certain, Probable, Possible, Unknown.
-
- Annotate suspected area(s) through which the occupant was ejected or the area in which the occupant was entrapped.

Screen Name: Contact
Variable Name: Contact

Element Attributes:

A
B
C
D, etc.

Source: Vehicle inspection

Remarks:

Identify the contact point. This will correspond to the label used in Sketch 1 or Sketch 2. To add contact points go to the main menu and select "**Edit**" and then "**Insert**" and contact point "B" will appear.

Screen Name: Area
Variable Name: Contact Area Label

Element Attributes:

Front
Left Side
Right Side
Interior
Air Bag
Roof
Floor
Rear
Adaptive (Assistive) Driving Equipment

Source: Vehicle inspection

Remarks:

Identify the name of the area of the vehicle interior an occupant contacted. Choose the area from the pick list of valid attributes for interior components.

Screen Name: Component
Variable Name: Contacted Component

Element Values:

FRONT
- Windshield
- Mirror
- Sunvisor
- Steering wheel rim
- Steering wheel hub/spoke
- Steering wheel rim/hub/spoke
- Steering column, transmission selector lever, other attachment
- Cellular telephone or CB radio
- Add on equipment (*e.g.*, tape deck, air conditioner)
- Left instrument panel and below
- Center instrument panel and below
- Right instrument panel and below
- Glove compartment door
- Knee bolster
- [Dr only] WS incl 1/+: fr hdr, A pill, instr pnl, mirror, or steering assembly
- [Pass only] WS incl 1/+: fr hdr, A pill, instr pnl, or mirror
- Windshield reinforced by exterior object (specify)
- Other front object (specify):

LEFT SIDE
- Left side interior surface, excluding hardware or armrests
- Left side hardware or armrest
- Left A (A1/A2)-pillar
- Left B-pillar
- Other left pillar (specify):
- Left side window glass
- Left side window frame
- Left side window sill
- Lt side glass +: frame, win sill, A pill, B pill, or roof side rail
- Other left side object (specify):

RIGHT SIDE
- Right side interior surface, excluding hardware or armrests
- Right side hardware or armrest
- Right A (A1/A2)-pillar
- Right B-pillar
- Other right pillar (specify):
- Right side window glass
- Right side window frame
- Right side window sill
- Rt side glass +: frame, win sill, A pill, B pill, or roof side rail
- Other right side object (specify):

INTERIOR
- Seat, back support
- Belt restraint webbing/buckle
- Belt restraint B-pillar or door frame attachment point
- Other restraint system component (specify):
- Head restraint system
- Other occupants (specify):
- Interior loose objects
- Child safety seat (specify):
- Other interior object (specify):

AIR BAG
- Air bag-driver side
- Air bag compartment cover-driver side
- Air bag-passenger side
- Air bag compartment cover-passenger side
- Other air bag (specify)
- Other air bag compartment cover (specify)

Screen Name: Component (cont'd)
Variable Name: Contacted Component (cont'd)

Element Values: (cont'd)

ROOF
- Front header
- Rear header
- Roof left side rail
- Roof right side rail
- Roof or convertible top

FLOOR
- Floor (including toe pan)
- Floor or console mounted transmission lever, including console
- Parking brake handle
- Foot controls including parking brake

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

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT
- Hand controls for braking/acceleration
- Steering control devices (attached to OEM steering wheel)
- Steering knob attached to steering wheel
- Replacement steering wheel (*i.e.*,reduced diameter)
- Joy stick steering controls
- Wheelchair tie-downs
- Modification to seat belts,(specify):
- Additional or relocated switches, (specify):
- Raised roof
- Wall mounted head rest (used behind wheel chair)
- Other adaptive device (specify):

Source: Vehicle inspection secondary inputs include: interviewee, and medical records.

Remarks:

The researcher should record only those contact mechanisms which can be documented by some physical evidence (*e.g.*, scuffs, hair, smudges, dents, cracks, etc.).

The element values encoded can be based on physical evidence, occupant kinematics, and interviewee information. Although physical evidence is preferred, it does not have to be present to support a contact mechanism.

* **Note**: Whenever an "other" code is selected as injury source, clearly identify, in the space provided a description of the "other" source.

Steering Rim / Hub / Spoke
is selected when there is continuous or simultaneous contact by a single body region to the Steering Rim / Hub / Spoke. Additionally, use this attribute when the steering wheel is determined to be the suspected injury source, but it cannot be further determined if the rim / hub/ spoke are involved.

[Dr only] WS incl 1/+: fr hdr, A pill, instr pnl, mirror, or steering assembly
should be selected for contacts on the left (driver) side of the vehicle interior. This code applies only when there is a continuous or simultaneous contact to the windshield and one of the listed components by a single Body Region of the occupant.

Screen Name: Component (cont'd)
Variable Name: Contacted Component (cont'd)

Note: Some vehicles (*e.g.*, GM APV minivans) are designed with two upper A-pillars on each side. The forward most pillar is called an A1-pillar which is primarily designed to secure the windshield to the vehicle. The second pillar is labeled as an A2-pillar. This pillar generally lends support to the roof and also helps to establish the front door opening. Annotation should be provided on the Interior Vehicle Form specifying which pillar was most severely intruded.

[Pass only] WS incl 1/+: fr hdr, A pill, instr pnl, or mirror
should be selected for contacts on the right (passenger) side of the vehicle interior. This code applies only when there is a continuous or simultaneous contact to the windshield and one of the listed components by a single Body Region of the occupant.

Windshield reinforced by exterior object
is selected when, for example, an occupant contacts a windshield which has been reinforced by the hood of the occupant's vehicle.

Lt (Rt) side glass +: frame, win sill, A pill, B pill, or roof side rail
apply when there is a simultaneous or continuous contact by a single body region of an occupant to the appropriate side window glass and at least one of the listed components. The window sill consists, for this element, of the upper portion of the side interior surface immediately adjacent to the bottom of the side window opening.

Child restraining devices have caused confusion when they are the source of the injury. The child restraint (*i.e.*, infant/child seat, booster seat, etc.) is considered to be an integral restraint (*e.g.*, the whole seat is the restraint). When the restraint is used by an infant or child it should be coded as one unit. In the CDS the analyst is concerned with the complete seat and its performance.

Child safety seat
if contact with a child safety seat occurs from either:
(a) an infant or child restrained by the child safety seat or
(b) any passenger including an infant or child who contacts a child safety seat but is not restrained by that seat.

When any body member of an infant or child, restrained by child safety seat, contacts an interior object other than the child safety seat, then code the appropriate interior object (*i.e.*, Seat, back support ; Head restraint system etc.)

Screen Name: Occupant Number
Variable Name: Occupant Number

Element Attributes:

Source: Vehicle inspection

Remarks:

The Researcher should Identify the number of the occupant who is suspected of contacting the identified component, if it can be determined.

Note: If an occupant list for this vehicle does not appear, they must be added into the case structure on the Case Form, Structure tab, Occupant sub-tab).

Screen Name: Body Region
Variable Name: Body Region

Element Attributes:

Abdomen
Ankle – Left
Ankle – Right
Back
Buttock – Both
Buttock – Left
Buttock – Right
Buttock – Unknown
Chest
Elbow – Left
Elbow – Right
Elbow – Unknown
Face
Flank – Left
Flank – Right
Foot – Left
Foot – Right
Foot – Unknown
Genitals
Hand – Left
Hand – Right
Hand – Unknown
Head
Hip-Left
Hip – Right
Hip – Unknown
Knee – Left
Knee – Right
Knee – Unknown
Lower Arm – Left
Lower Arm – Right
Lower Arm – Unknown
Lower Leg – Left
Lower Leg – Right
Lower Leg – Unknown
Neck
Shoulder – Left
Shoulder – Right
Shoulder – Unknown
Thigh – Left
Thigh – Right
Thigh – Unknown
Upper Arm – Left
Upper Arm – Right
Upper Arm – Unknown
Upper Leg – Left
Upper Leg – Right
Upper Leg – Unknown
Wrist – Left
Wrist – Right
Wrist – Unknown

Source: Vehicle inspection

Remarks:

The Researcher should identify the **suspected** body region of the occupant that contacted the identified component, if it can be determined or presumed.

Screen Name: Evidence
Variable Name: Evidence

Element Attributes:

- Bent
- Cracked
- Scuffed
- Transfer (specify)
- Blood
- Hair
- Stretched
- Scratched
- Teeth marks
- Imprint
- Spider Web
- Other (specify)
- Combination (specify)
- Child Seat
- Moved

Source: Vehicle inspection

Remarks:

The Researcher should identify the type of contact evidence present (i.e., scuff, tissue transfer, tooth mark, etc.) that indicates an occupant contact.

Note: Blood, in and by itself, is not a reliable indicator of a contact point.

Screen Name: Confidence
Variable Name: Confidence Level of Occupant Contact

Variable Name: Confidence

Element Attributes:
Certain
Probable
Possible
Unknown

Source: Vehicle inspection

Remarks:

Specify the level of confidence, which best represents the Researchers certainty of **this component**, as an occupant contact.

Certain
if there is no reasonable doubt in the mind of the researcher, that this component was contacted by the occupant based on occupant location, crash dynamics, contact points.

Probable
in those situations where there is not a certainty based on the factors noted above for **Certain**.

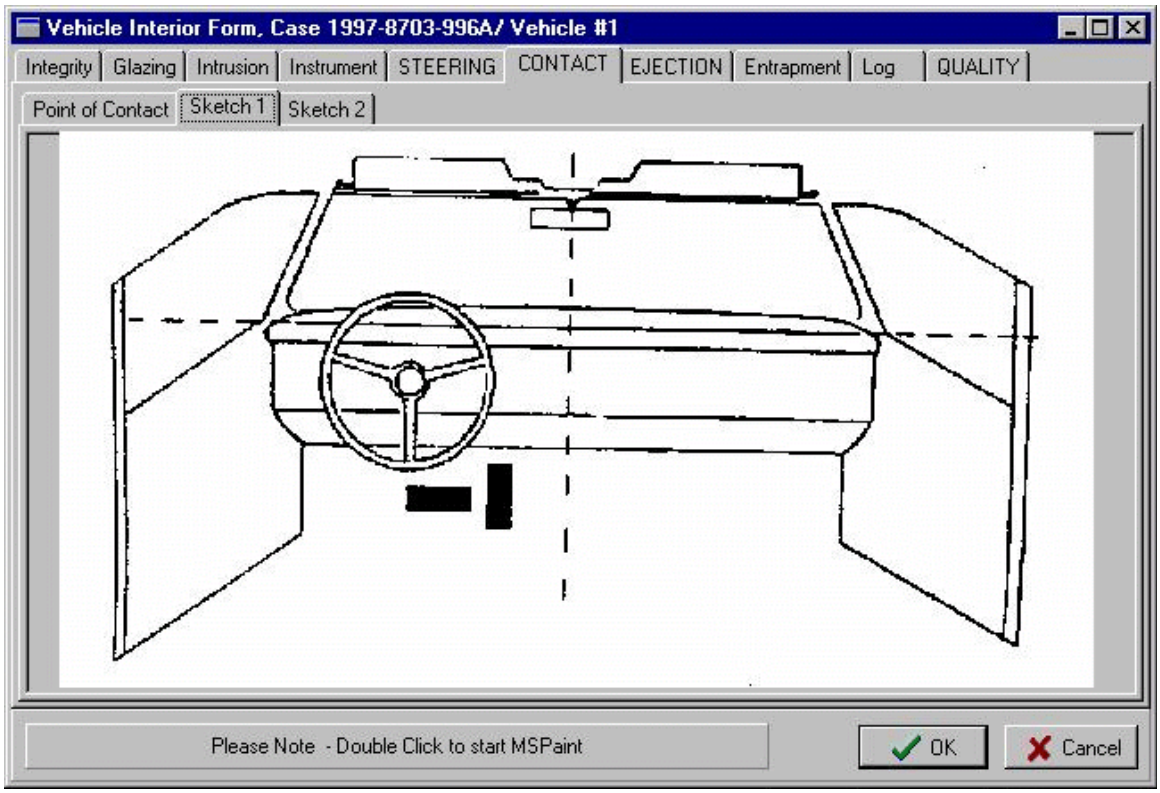
Possible
if there is no supporting physical evidence of occupant contact, however there is damage, and based on occupant location, crash dynamics, and component location, it is possible the occupant contacted the suspected component.

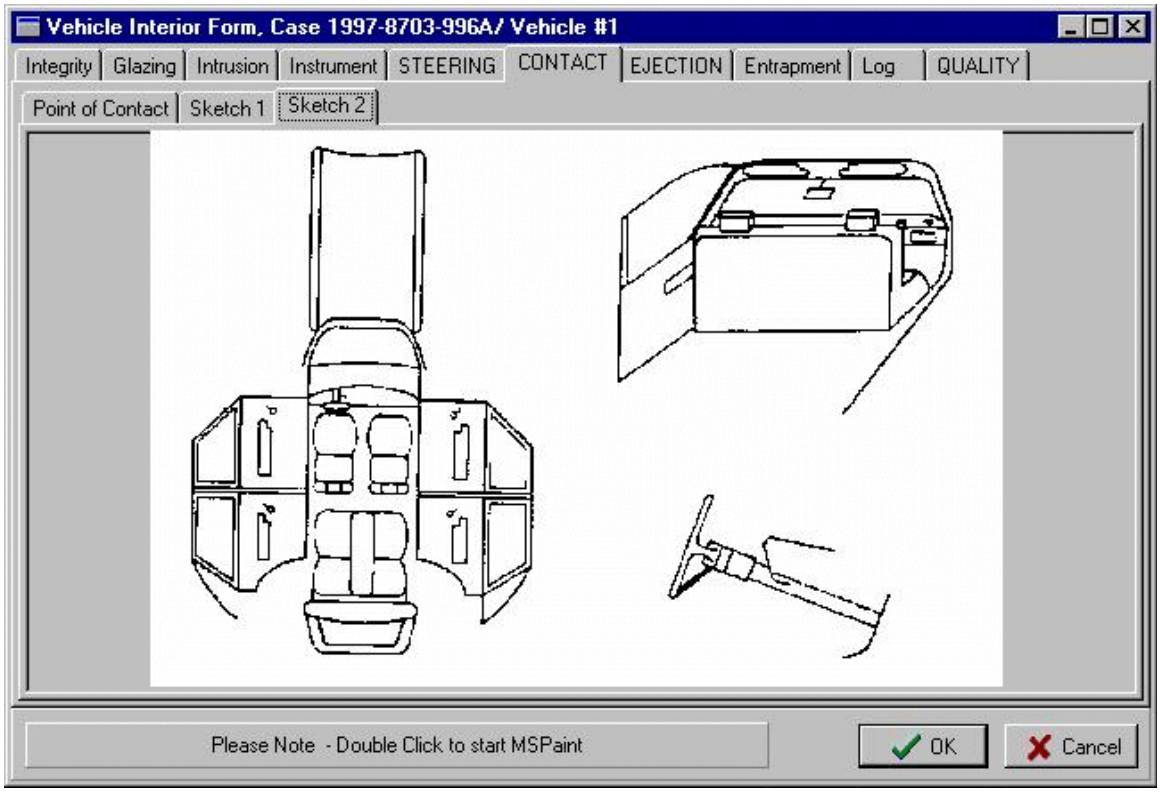
Unknown
If it is unknown whether the component listed as a contact point was contacted by the occupant or some type of induced or post-crash damage.

Summary Tab

Remarks:

All contacts that are documented on the Detail tab will be displayed on this tab. This tab is generally used as an overview for all of the contact points. No fields can be edited here. To edit a contact, highlight the letter and then switch to the detail tab and make any corrections.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Please Note - Double Click to start MSPaint
OK
Cancel


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Point of Contact
Sketch 1
Sketch 2
Please Note - Double Click to start MSPaint
OK
Cancel

Instructions for Completion of Vehicle Interior Sketches

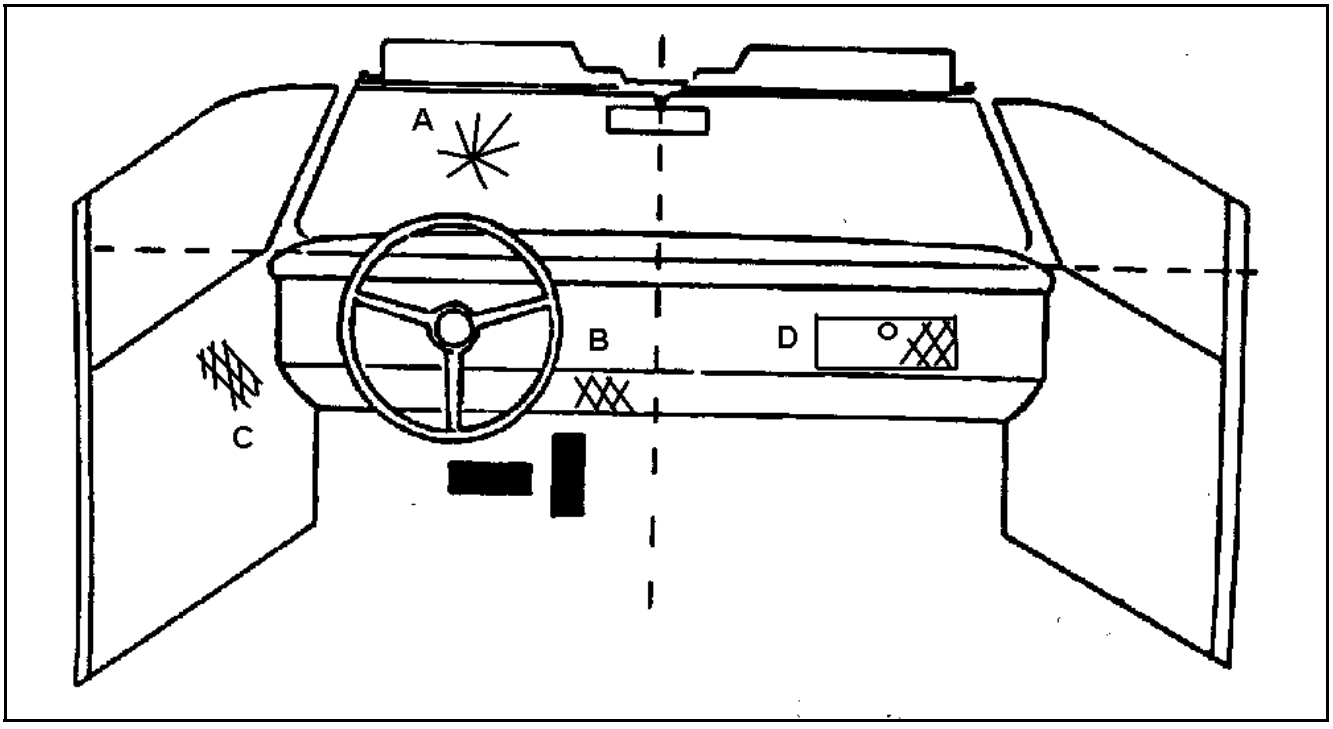
- Open up Sketch 1 and Sketch 2 (by double clicking) to open them in Paint.
- Leave the Sketches open or minimized for ease in navigating between the Detail Tab, and the Sketches.

For each documented Contact Point:

- Sketch the damaged area on Sketches 1 and 2 (*e.g.*, windshield, instrument panel, glove compartment, front seat back, etc.).
- Label the Contact point with a sequential alpha character beginning with the letter “A”.
- Provide any annotations as necessary

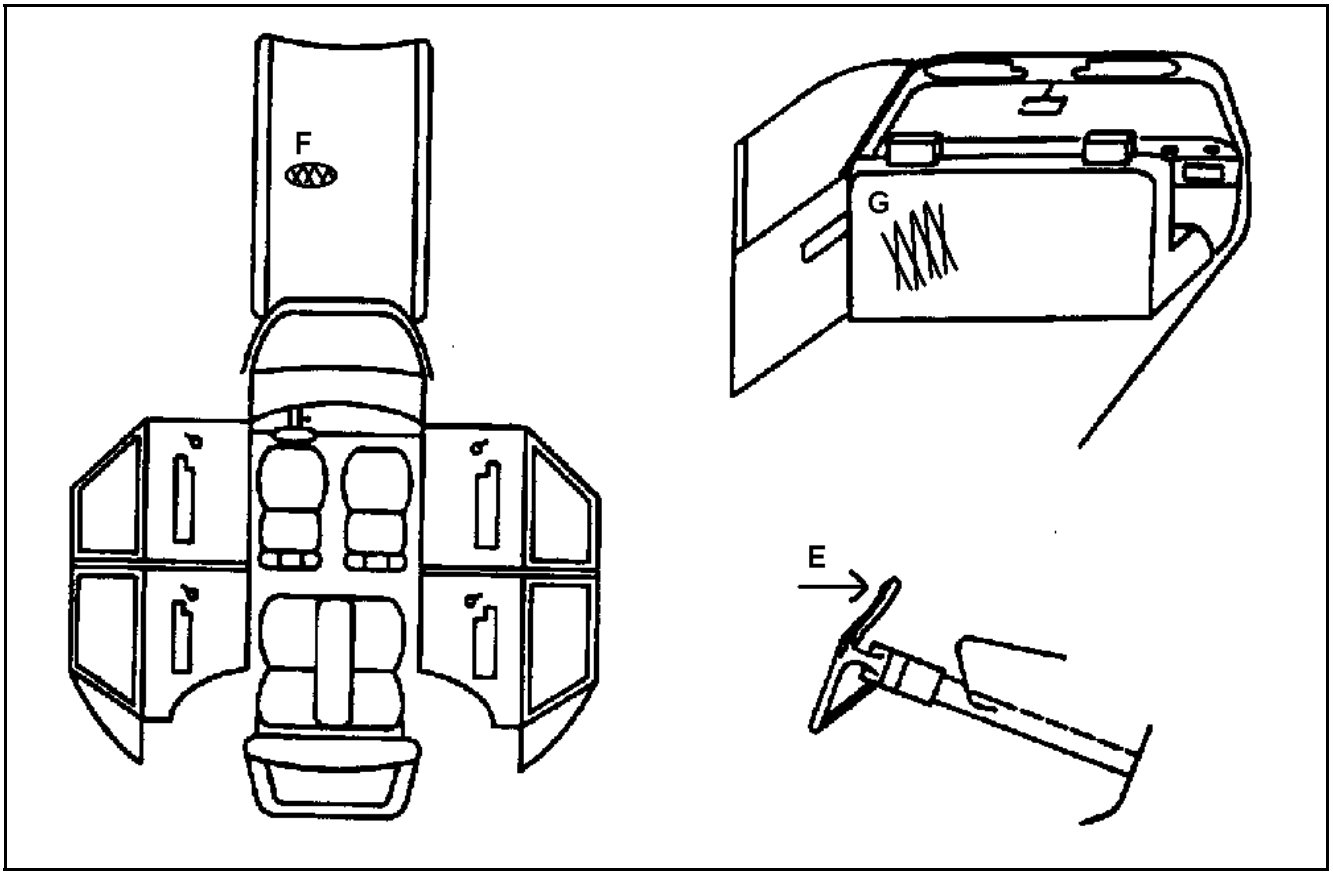
Examples of a basic vehicle interior sketches are shown:

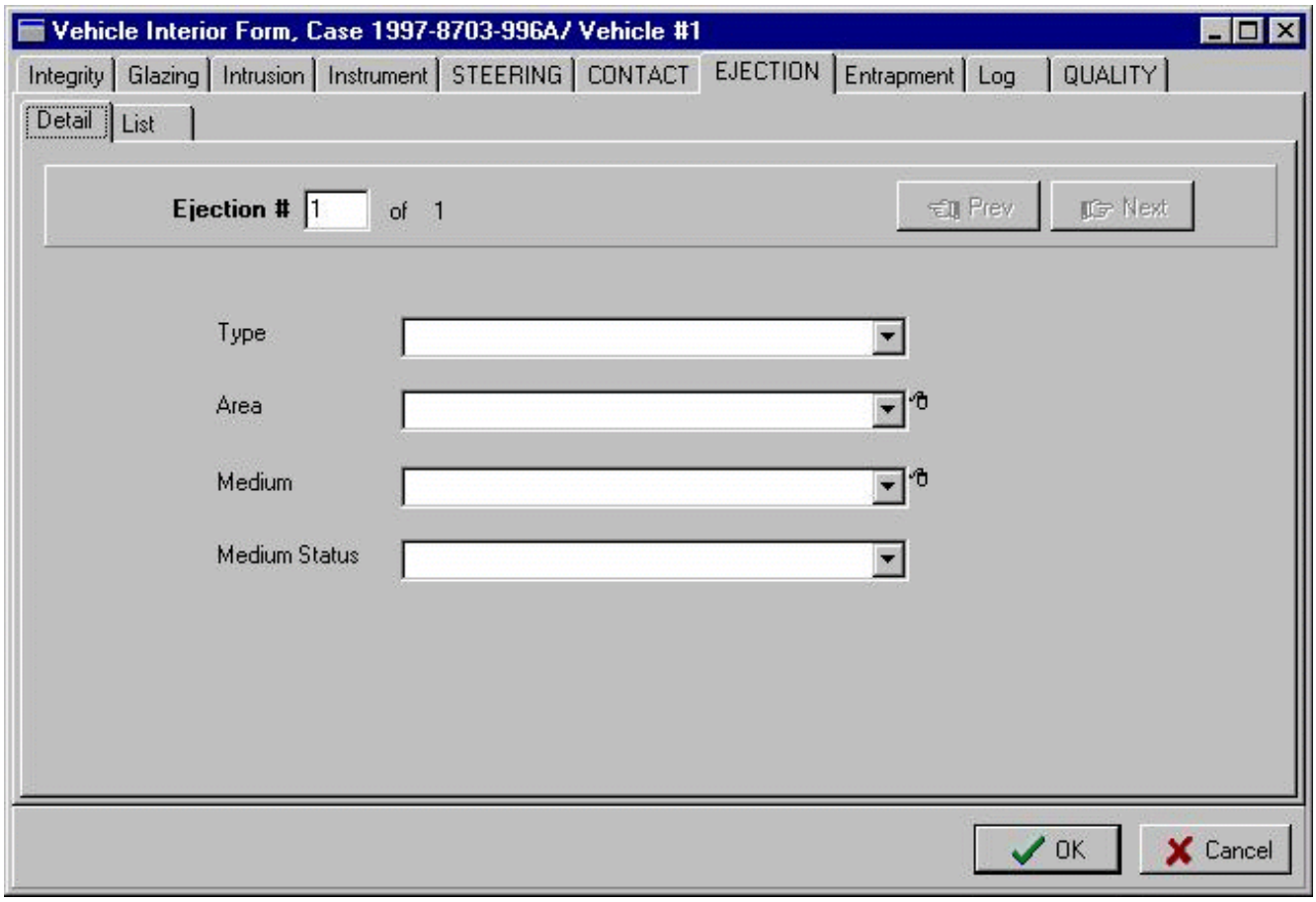
Vehicle Interior / Contact / Sketch 1 Completed



Instructions for Completion of Vehicle Interior Sketches (cont'd)

Vehicle Interior / Contact / Sketch 2 Completed




Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
Detail
List
Ejection # 1 of 1
Prev
Next
Type
Area
Medium
Medium Status
OK
Cancel

Ejection / Entrapment Overview

Variables in this section provide an assessment of the occurrence of entrapment or ejection of an occupant. These variables in this section are coded based upon vehicle inspection. Verification of questionable ejection or entrapment will come from the interview.

Historically, ejection from the vehicle has been a major cause of fatalities and more serious injuries. The chances of being killed if ejected are about 1 in 5; whereas, if the occupant remains inside the vehicle, the chances of dying are reduced to about 1 in 200 for all fatal crashes. Unfortunately ejection from the vehicle is not that uncommon and has become a significant part of the fatality (30%) and severe (15%) injury crashes. Further contributing to the ejection problem is the increase in window surface area and more hatchback models. Despite the current emphasis on restraint use through legal requirements for occupants to be buckled up, a significant portion of the population continues to be unrestrained and at risk to ejection. All evidence indicates that this trend will continue into the foreseeable future.

A problem not often addressed is that of partial ejection. This refers to those instances where some part but not all of an occupant's body is, at some time during the crash sequence, outside the occupant compartment. Although it would not seem to be a problem it can be, and often is, fatal if the part outside is the occupant's head. Because of the dynamics of the vehicle and the kinematics of the occupants during an ejection sequence, it is often the occupant's own vehicle which causes the injury as it rolls onto the occupant.

Entrapment poses a different problem area. Recent years have brought about a vast improvement in the delivery of emergency medical attention to motor vehicle crash victims. This improvement has been achieved through the establishment of regional trauma centers, well equipped Mobile Intensive Care Units manned by trained paramedics even in rural areas, and a general increase in the knowledge of how to treat acute trauma. This improvement has not helped those victims who are restrained within the vehicle by deformed components. The improved care cannot be delivered because the personnel are unable to get to the victim, remove the victim from the vehicle, and deliver the victim to a treatment facility in a reasonable amount of time. Also, previous extrication tools used by rescue personnel were crude and sometimes injury causing themselves, an example of which is the large metal cutting saws. Within the last few years a device known as the "Jaws of Life" was developed and widely distributed. It is a hydraulically driven mechanism which can be used to increase the size of openings, extricate entrapped occupant's limbs and force open doors which are jammed. This development came about because of the perceived need for an extrication tool which operated quickly yet did not further injure the occupant.

Ejection / Entrapment Overview (cont'd)

Federal Motor Vehicle Safety Standards (FMVSS) which were developed in response to the problems seen in these areas are FMVSS 201 (Occupant Protection in Interior Impact), FMVSS 205 (Glazing Materials), FMVSS 206 (Door Locks and Door Retention Components), FMVSS 212 (Windshield Mounting), and FMVSS 214 (Roof Crush Resistance Passenger Cars).

Analytically this group of variables is a stand alone package most of the time. It can form the basis of an analysis without the use or comparison to any other variables. This would be used mostly in exploring the number and types of ejections and entrapments. Expanding the scope somewhat to include injury severity allows a determination of the increase or decrease in the ejection problem. Inclusion of injury source would provide an idea of the severity of all occurrences of entrapment and ejection. Injury source also provides an idea of the kinematics of the occupant during the sequence. The addition of a cross-tabulation for AIS level would show the relative severity between the injuries incurred inside the vehicle and those outside the vehicle.

Other areas of interest to the analyst are the ejection route and performance of integral structures. The integral structure performance is directly governed by the FMVSS 206 and 212. These areas are of increasing interest to NHTSA since the real world performance can help support the findings from the staged collisions and will help determine the effectiveness of the standards.

Lastly, an alternative glazing techniques was introduced in windshields. This type of window have a plastic layer on the interior surface of the window. Tests have shown a reduction in Lacerative injuries which was the primary objective but also an increased resistance to ejection through the window. Further study of real world performance is needed to provide an accurate evaluation of this secondary benefit.

Gathering the data, which will allow the researcher to accurately select the variables, is a multistage process. It will begin with the PAR which may give an indication of either ejection or entrapment. Inspection of the vehicle will provide the evidence needed to substantiate either occurrence. Further, documentation should be obtained through the scene inspection, interview, and injury data. Only at the end of the data gathering process should these variables be selected. Particular attention should be paid to the vehicle inspection since most evidence of ejection will be less apparent and not easily discerned.

In summary, this group of variables assesses the level of a very significant problem in today's crash picture. Correct accurate assessment is a result of a multistage research process which will be individualized by case. Attention to detail will result in a correct assessment. This is one area which is directly tied to the FMVSS, and all gathered data results in a direct evaluation of the applicable standards.

Screen Name: Ejection #
Variable Name: Ejection Number

Element Value:
Number as assigned

Source: Vehicle inspection

Remarks:

Each potential ejection is added by the researcher as it is located. The system will automatically increment the count. To add an ejection, go to the Title Bar and select "**Edit**" and then "**Insert**" and contact point "B" will appear.

Screen Name: Ejection -Type
Variable Name: Ejection - Type

Element Value:

No Ejection
Complete ejection
Partial ejection
Ejection, unknown degree
Unknown

Source: Vehicle inspection

Remarks:

Ejection refers to persons being completely or partially thrown from the vehicle as a result of an impact or rollover. If a person already has a body part protruding from the vehicle (*e.g.*, an elbow, arm, etc.) and the PDOF acting on the vehicle would likely cause further protrusions of the body part, then at least partial ejection is selected.

No Ejection

is selected when there is no indication of any occupant being either partially or fully ejected from the vehicle.

Complete ejection

is selected when an the occupant's body is entirely outside of the vehicle during the crash sequence. It is important to note that even though the body may be outside the vehicle, it may still be in contact with the vehicle. This code also includes occupants who are not initially in the seating compartment of the vehicle (e.g., pickup beds, boot of a convertible, and persons riding on open tailgates).

Partial ejection

is selected when part of the occupant's body remains **in** the vehicle, and any part of it is forced outside of the vehicle during the crash sequence. This code **does not apply** to those occupants who are not initially in the seating compartment of the vehicle,] they are indicated as "**Complete ejection**".

Ejection, unknown degree

is selected when it is suspected (or known) that an ejection of the occupant occurred, however, at the time of the vehicle inspection the researcher was unable to determine if the ejection was **Partial** or **Complete**.

Unknown

is selected when:

- the vehicle has been completely repaired
- it cannot be determined if an ejection is applicable

Screen Name: Ejection--Area
Variable Name: Ejection Area

Element Attributes:

Windshield
Left front
Right front
Left rear
Right rear
Rear
Roof
Other area (specify)
Unknown

Source: Vehicle inspection

Remarks:

Rear

is restricted to persons riding in a passenger compartment, who are ejected through the rear window, tailgate (*e.g.*, station wagon), hatchback, etc.

Roof

applies to all hardtops, convertibles, sun roofs, t-bar roofs, and detachable hardtops (such as fiberglass tops) that are used to cover areas designed for passenger protection.

Examples follow for how variable, Ejection Medium, and Medium Status (Immediately Prior to Impact), should be selected when **Area** equals **Roof**.

Screen Name: Ejection — Area (cont'd)
Variable Name: Ejection Area (cont'd)

Ejection	Roof Type	Area	Ejection Medium	Medium Status
Ejection	Hardtop, ripped open during crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, attached prior to crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, detached prior to crash	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in down or open position	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in closed position	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, closed, and ripped open during crash	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, open/removed prior to crash	Roof	Non-fixed roof structure	Open

Ejection Attributes are designated for use with areas designed for passenger protection (*e.g.*, passenger cars, vans, light truck cabs, self-contained mini- Recreational Vehicles and mini-motor homes). Trailers, add-on campers, etc., are to be assigned **Other area**.

Other area
also applies to persons riding on open tailgates.

Unknown
is selected when it is known from the vehicle inspection that an occupant was ejected (i.e., partial, full, or unknown degree) however, the area of potential ejection is unknown.

Screen Name: Ejection--Medium
Variable Name: Ejection Medium

Element Attributes:

Door/hatch/tailgate
Non-fixed roof structure
Fixed glazing
Non-fixed glazing (specify)
Integral structure
Other medium (specify)
Unknown

Source: Vehicle inspection,

Remarks:

Door/hatch/tailgate
includes any door, hatch, or tailgate that is opened during the course of the impact sequence.

Non-fixed roof structure
applies only to convertible, sun roofs, t-bar roofs, and removable hardtops when retracted / detached prior to the crash.

Fixed glazing
refer to any glazing in the vehicle that cannot be opened.

Non-fixed glazing
refer to any glazing in the vehicle that can be opened to any degree.

Integral structure
includes removable hardtops when attached to the vehicle prior to the crash. This also should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

Other medium
applies to persons riding in pickup beds, on open tailgates, and for other situations which cannot be classified above. In addition, use this attribute when someone is ejected from a trailer, add-on camper, etc.

Unknown
is selected when the ejection medium it is not known.

Screen Name: Ejection—Medium Status
Variable Name: Ejection Medium Status

Element Attributes:

Open
Closed
[Integral Structure]
Unknown

Source: Vehicle inspection

Remarks:

This variable is a description of the status of the area through which an occupant was ejected and is the status of the medium immediately prior to the impact.

Open

applies to convertible roofs, sun roofs, t-bar roofs, windows, doors or tailgates that are completely or partially open immediately prior to impact, or to other open areas of vehicles such as pickup beds, etc.

Closed

refers to a window that is completely closed when damaged, or to a convertible, sun, or t-bar roof that is closed when damaged. Sun and t-bar roofs are captured here if the ejection occurred through the designed opening in the sun or t-bar roof. However, if the roof was of a sun or t-bar type but the ejection occurred because a sizable opening was torn in the roof structure, then select **Integral structure**. This is also used for fixed glazings such as windshields and backlights which are in place prior to the collision. This also refers to a door that is closed, but when damaged, experiences latch and/or hinge failure causing the door to open.

Integral structure

should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

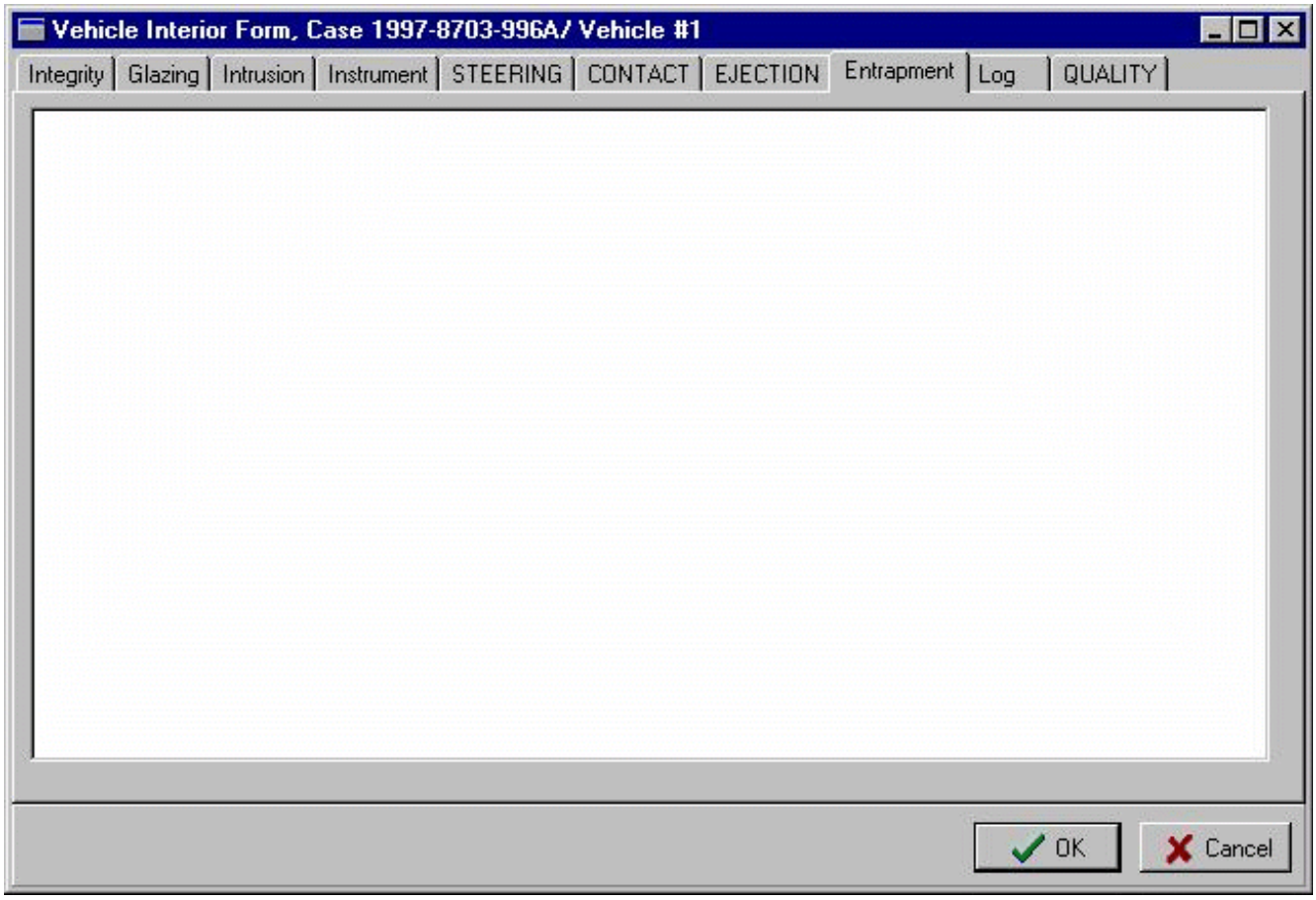
Unknown

is used when the medium status prior to the impact is unknown.

Ejection List Tab

Remarks:

All ejections that are documented on the preceding tabs will be displayed on this tab. This tab is generally used as an overview for all of the ejections. No fields can be edited here. To edit an ejection, return to the Detail tab, use the Previous and Next buttons to navigate to the ejection, and make any corrections.


Vehicle Interior Form, Case 1997-8703-996A/ Vehicle #1
Integrity
Glazing
Intrusion
Instrument
STEERING
CONTACT
EJECTION
Entrapment
Log
QUALITY
OK
Cancel

Screen Name: Entrapment
Variable Name: Entrapment

Element Attributes:

Not entrapped/exit not inhibited
Entrapped/pinned — mechanically restrained
Could not exit vehicle due to jammed doors, fire, etc. (specify)
Unknown

Source: Vehicle inspection,

Remarks:

Not entrapped/exit not inhibited
is used when this occupant exited the vehicle and his/her egress was not inhibited in any way by intruding vehicle components, jammed doors, etc.

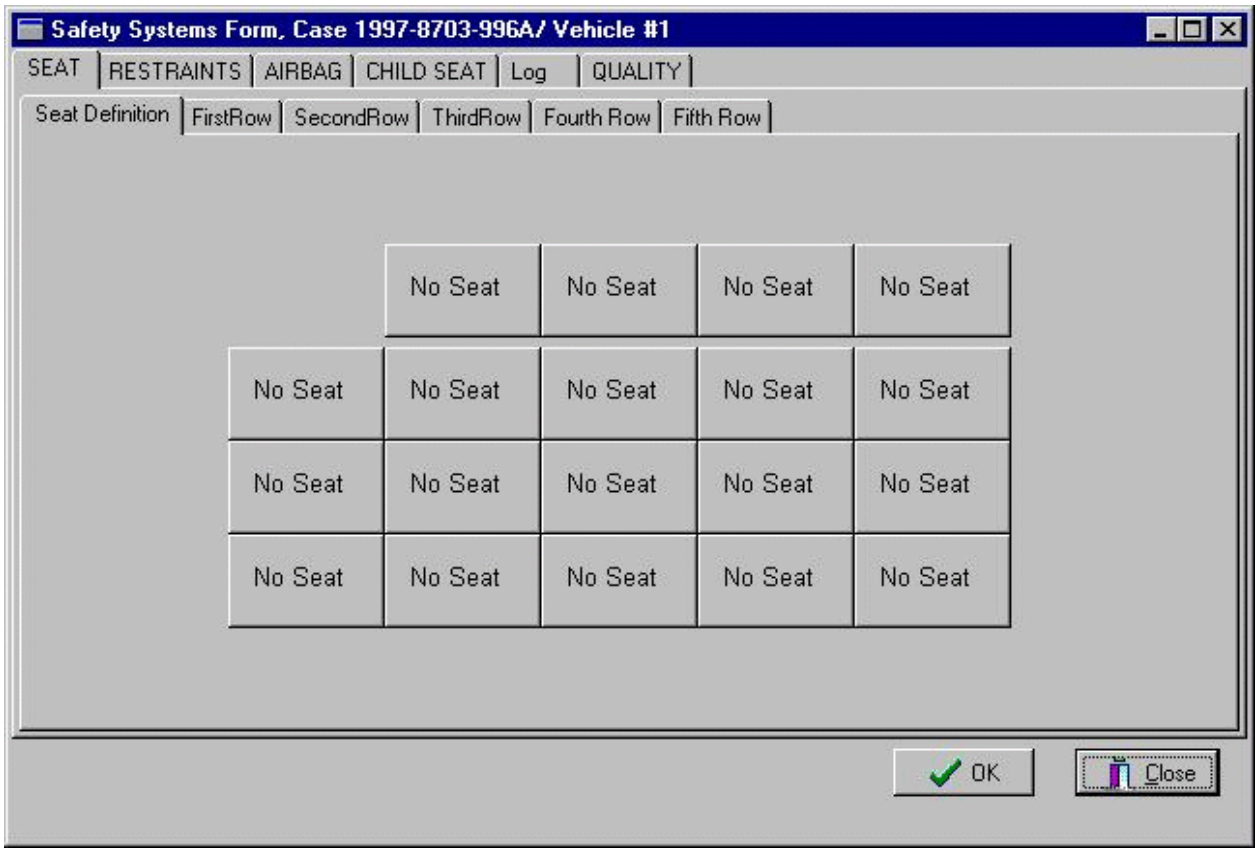
Entrapped/pinned — mechanically restrained
is used when this occupant was physically restrained in the seat position by an intruding vehicle component. The occupant could not move from the post impact position without some part of the vehicle being cut away, bent or moved.

Could not exit vehicle due to jammed doors, fire, etc. (specify)
is used when this occupant could not exit the vehicle due to jammed door(s), roof collapse, etc. This occupant, however could move about within the vehicle.

Unknown
is used when there is no knowledge of the manner of this occupant's exit from the vehicle.

**** These elements need to be added to this variable so that it matches the OA Form. ****

SAFETY SYSTEMS FORM



Safety Systems Form Overview

Information recorded on the Safety System Form is based solely on the evidence obtained during the vehicle inspection.

An indication of restraint usage is determined **for every seating position in the vehicle, regardless of whether the seating position is occupied**. This includes Integrated Child Safety Seats (CSS) and Child seats (infant, booster, convertible, toddler, etc.) that are in the vehicle at the time of inspection.

The "indication of usage" represents **"recent usage"** rather than "usage ever", whenever possible. The following evidence is sought when assessing restraint usage:

- **belts/fittings damaged by occupant loading**: deformed anchor components, stretched webbing, latch metal peening (loading impression on metal);

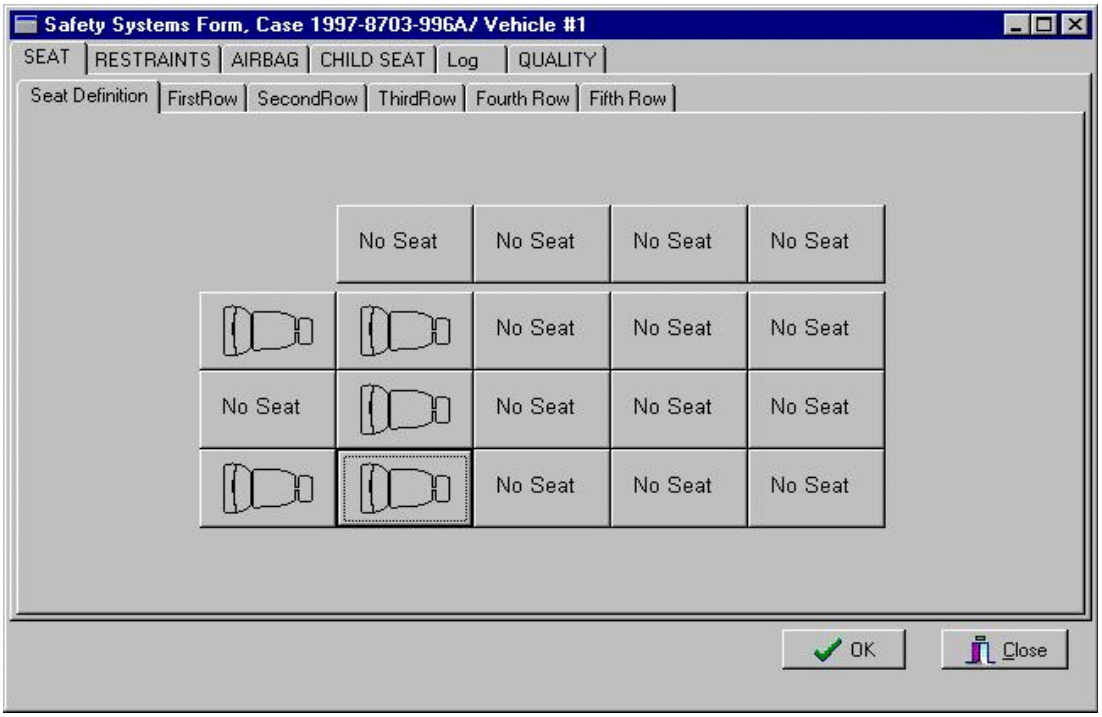
- **placement of belts**: on, behind, or under seatbacks or cushions; and,

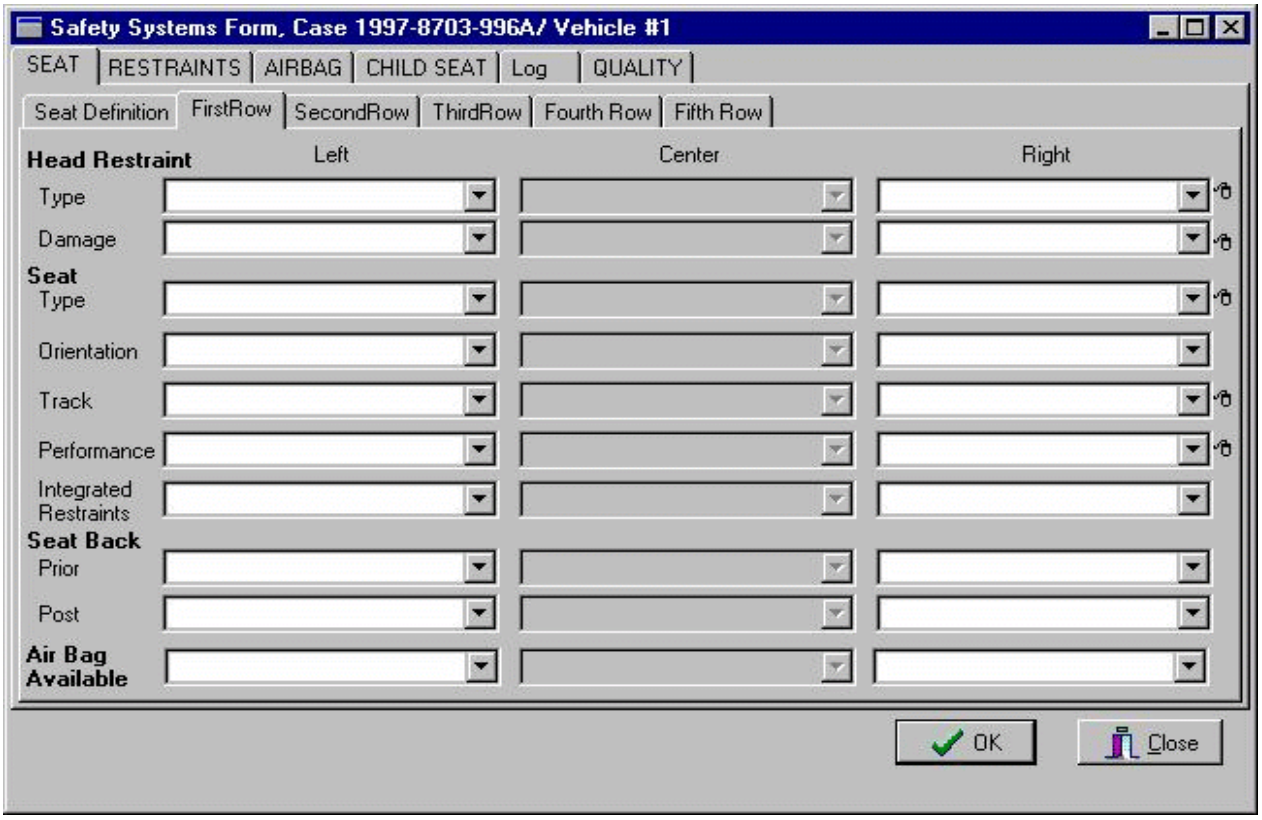
- **condition of belts**: dirty, dust covered, mechanically unusable, knotted, size adjustment on fixed length belts, cut for convenience or comfort (out of the way, near housings), or cut for occupant extraction by emergency personnel (usually at an easily accessible position).

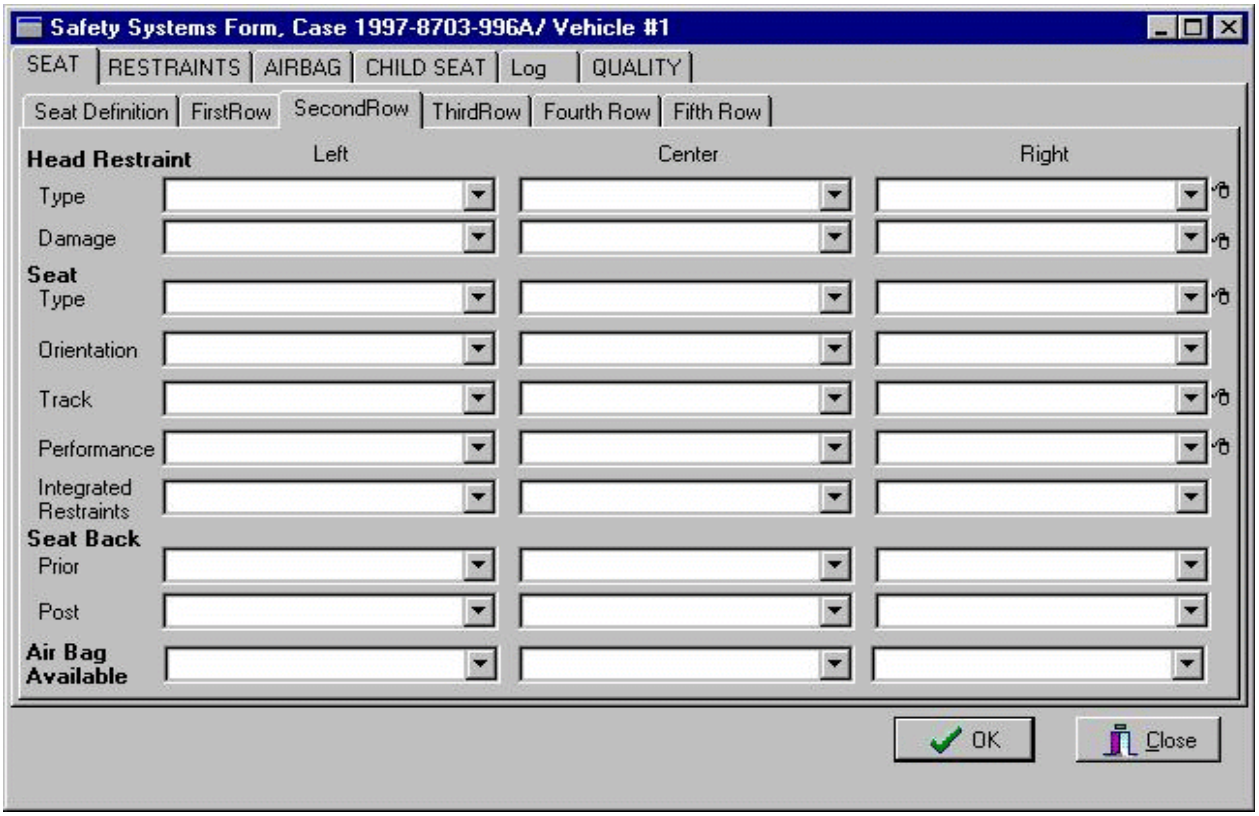
Restraint "usage in this crash" is ***not*** generally determined on the Safety System screens. Vehicle evidence along with police report information, interviews, relationship of contact points to seat position given the PDOF applied to the vehicle, presence of belt-caused occupant injuries, and presence or absence of ejection are considered before encoding restraint usage on the Occupant Assessment screens .

Potential Safety Bulletins should be submitted when there is a failure of a safety system. Areas of concern are: **** List to be created by NHTSA for later addition to manual. ****

Select the available seats in this vehicle




Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Seat Definition
FirstRow
SecondRow
ThirdRow
Fourth Row
Fifth Row
Head Restraint
Left
Center
Right
Type
Damage
Seat
Type
Orientation
Track
Performance
Integrated Restraints
Seat Back
Prior
Post
Air Bag Available
OK
Close


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Seat Definition
FirstRow
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Fourth Row
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Head Restraint
Left
Center
Right
Type
Damage
Seat
Type
Orientation
Track
Performance
Integrated Restraints
Seat Back
Prior
Post
Air Bag Available
OK
Close

Screen Name: Head Restraint -Type
Variable Name: Head Restraint Type at This Occupant Position

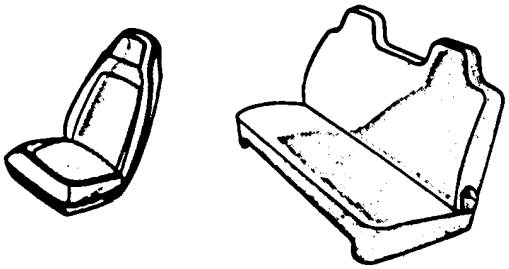
Element Attributes:

No head restraints
Integral
Adjustable
Add-on
Other (specify)
Unknown

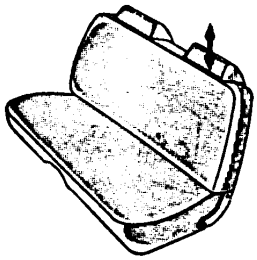
Source: Vehicle inspection.

Remarks:

Many passenger cars have head restraints for the front outboard seat positions. The head restraints can be of any design but must meet the requirements of FMVSS 202 (Head Restraints). Some examples of head restraint styles are shown below.



INTEGRAL



ADJUSTABLE

Any damage to a head restraint caused by the occupant in the seat position having the head restraint should be identified.

No head restraints

is used when (1) no head restraint is available for this seating position, or (2) there had been a head restraint but it had been removed prior to the crash.

Integral

refer to head restraints which are a continuous part of the seat back structure or those which are a separate structure but are not vertically adjustable.

Screen Name: Head Restraint—Type (cont'd)
Variable Name: Head Restraint Type at This Occupant Position (cont'd)

Adjustable
apply to:

- head restraints which can be moved vertically to accommodate occupants of varying heights, and
- head restraints which have a fixed outer framework and a separate center section which is adjustable vertically.

Add-on
refer to clamp-on, strap-on, or even bolt-on head restraints on a vehicle not originally equipped with head restraints. ThIs attribute should be infrequently used.

Unknown
is used when the type of head restraint cannot be determined

Note: Manufacturers are providing head restraints for rear seat occupants. These head restraints may be the same or similar to those used in the front seats, or they may be a slight rise in the rear seat back.

Screen Name: Head Restraint – Damage
Variable Name: Head Restraint Damage by Occupant at This Occupant Position

Element Attributes:

No damage
Damaged during crash
Unknown
[No Head Restraints]

Source: Vehicle inspection.

Remarks:

No damage

There was no damage to the head restraint by the occupant.

Damaged during crash

Any damage to a head restraint caused by the occupant in the seat position having the head restraint should be identified.

Unknown

is used when it is unknown if damage to the restraint was caused by an occupant in the appropriate seat position.

Note: Manufacturers are providing head restraints for rear seat occupants. These head restraints may be the same or similar to those used in the front seats, or they may be a slight rise in the rear seat back. Any damage to a rear seat head restraint by the occupant in the seat position must be captured regardless of the height of the restraint.

Screen Name: Seat – Type
Variable Name: Seat Type

Element Attributes:

Bucket
Bucket with folding back
Bench
Bench with separate back cushions
Bench with folding back(s)
Split bench with separate back cushions
Split bench with folding back(s)
Pedestal (*i.e.*, column supported)
Box mounted seat (*i.e.*, van type)
Other seat type (specify)
Unknown

Source: Vehicle inspection.

Remarks:

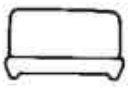
This variable assesses the type of seat present at this position.

The type of seat in which an occupant is positioned may have an effect on the occupant kinematics. For this reason the type of seat is important to analysts.

Pedestal (*i.e.*, column supported)
includes both swivel and non-swivel type pedestal seats. A pedestal seat can be differentiated from a bucket seat by the presence of a column supporting the pedestal seat.

Below are examples of some seats and appropriate attributes.

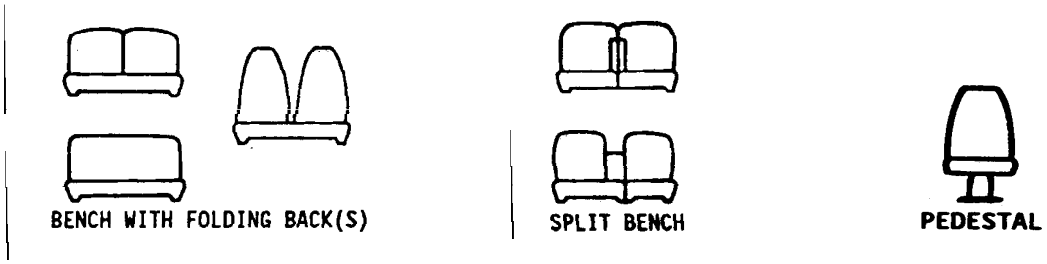
BUCKET



BENCH

BENCH WITH SEPARATE BACK CUSHIONS

Screen Name: Seat –Type (cont'd)
Variable Name: Seat Type (cont'd)



The term "folding back(s)" for both bench and bucket-type seats refers to seat backs which are designed to fold significantly forward of upright.

Seats which recline only rearward are not considered to be folding backs. If the seat back does not fold forward at the position you are assessing, do not use the folding back attributes. Folding backs, because of the additional possibility of failure of the folding mechanism, take precedence over solid or separate back cushions. For example, a bench seat with separate back cushions which fold forward would be **Bench with folding back(s)**.

The rear seats in many late model vehicles may be of unusual design. The researcher is cautioned to view only the seat type for the occupant's position. If the seat is of a bench type and the back cushion for the position folds, then the proper attribute is **Bench with folding back(s).** The fact that the seat cushion may also fold is not considered.

At the time of the inspection if a seat was folded down, record the data as if the seat was in the upright position. If any seat has been removed and cannot be inspected that data is to be recorded.

Box mounted seat (*i.e.*, van type)
is used to identify elevated seats which have as a part of their attachment design a box which is fastened to the floor and has seat tracks bolted to the top of the box. This type is often found in front row locations of vans. Do not confuse this design with pedestal seats which require a single post support column.

Screen Name: Seat – Orientation
Variable Name: Seat Orientation

Range:

Element Attributes:

Forward facing seat
Rear facing seat
Side facing seat (inward)
Side facing seat (outward)
Other (specify):
Unknown

Source: Vehicle inspection.

Remarks:

Most seats are fixed in terms of their orientation within the vehicle; however, some seats (*e.g.*, swivel or reversible) can be oriented in more than one direction. Swivel seats and reversible seats (*e.g.*, some station-wagons or vans) are entered according to their orientation at the time of impact [*i.e.*, **Forward facing seat** or **Rear facing seat].**

Forward facing seat

is used when the seat is oriented towards the front plane of the vehicle.

Rear facing seat

is used when the seat is oriented towards the rear plane of the vehicle.

Side facing seat (inward)

is used when the seat is oriented towards either the right or left planes of the vehicle and faces inward.

Side facing seat (outward)

is used when the seat is oriented towards either the right or left planes of the vehicle and faces outward.

Other

is used when a seat is oriented such that the above attributes do not apply.

Unknown

is used when the seat orientation cannot be determined.

Screen Name: Seat -- Track
Variable Name: Seat Track Position

Element Attributes:

Non-adjustable seat track

Adjustable Seat Track
Seat at forward most track position
Seat between forward most and middle track positions
Seat at middle track position
Seat between middle and rear most track position
Seat at rear most track position
Unknown

Source: Vehicle inspection.

Remarks:
The researcher should attempt to determine the seat position at impact. When the researcher begins the interior inspection, he/she should note the position of the seat. The researcher should then move the seat forward and back along its track and determine the number of positions. Once this has been done, the seat should be moved to the position initially observed and photographed.

If the seat has electric adjusters with no distinct track positions, attempt to determine the relative position of the seat and select accordingly.

Non-adjustable seat track

Use this for seats that cannot be moved longitudinally.

Adjustable Seat Track

Seat at forward most track position

Use this if the seat is at the forward limit of the track.

Seat between forward most and middle track position

Use this if the seat is at any position between the most forward and middle seat positions.

Seat at middle track position

Use this if the seat is in the position mid-range between the forward and rear most track position.

Screen Name: Seat -- Track (cont'd)
Variable Name: Seat Track Position (cont'd)

Seat between middle and rear most track position

Use this if the seat is at any position between the middle and rearmost track position.

Seat at rear most track position

Use this attribute if the seat is at the rear limit of the track.

Unknown

Use this attribute if the seat position at impact cannot be determined.

Screen Name: Seat -- Performance
Variable Name: Seat Performance

Element Attributes:

No seat performance failure(s)
Seat adjusters failed
Seat back folding locks or "seat back" failed (specify)
Seat tracks/anchors failed
Deformed by impact of occupant
Deformed by passenger compartment intrusion (specify)
Combination of above (specify)
Other (specify)
Unknown

Source: Vehicle inspection.

Remarks:
This variable assesses the performance of the seat. The attributes are indications of whether the seat failed or was deformed in any way. Select the attribute which corresponds to the appropriate seat performance failure or deformation. Minor smudges, scrapes, dents, etc. are not considered deformation. If a failure or deformity occurs, then document the failure or deformation with a diagram and explanation. In addition, include photographs of the seat failure or deformity.

No seat performance failure(s)

is used if the seat was not deformed or no portion of the seat structure failed during the crash.

Seat adjusters failed

is used if any of the mechanisms used to adjust a seat's "comfort" position are separated or deformed during the crash as a result of occupant loading.

Seat adjuster mechanisms include:

- Height adjustment
- Longitudinal (horizontal) seat track adjustment
- Rocker adjustment
- Swivel/rotational adjustment
- Seat back recliner adjustment
  For a seat back recliner failure, the seat back must have released in a rearward direction. Do not use this attribute if the seat back failed in a forward direction and the seat has a folding lock mechanism (*e.g.*, front seats in 2-door vehicles); see **Seat back folding locks failed** below.

This should be used when multiple adjuster failures have been detected. Be sure to include supportive written and photographic documentation to support all failures.

Screen Name: Seat -- Performance (cont'd)
Variable Name: Seat Performance (cont'd)

Seat back folding locks or "seat back" failed

is used when the mechanism which is designed to lock the seat back in its upright position fails or separates allowing the seat back to move forward during the collision as a result of occupant loading

"Seat back" failed refers to forward facing seats where seat back structural failures (*e.g.*, seat back hinge points) resulted in a separation of the seat back from its anchorage points. Again, to be considered applicable for this, the seat must have failed while moving forward during the collision as a result of occupant loading.

Seat tracks/anchors failed

is used if the seat separates, to any degree, from a seat track during the crash. In addition, use this if the seat anchor that attaches the seat track to the floorpan separates, to any degree, during the crash. Box mounted seats are included in this if a separation occurred between the box and the floor or the box and the seat track/anchor. Seat track or anchor failures must be a result of occupant loading.

Deformed by impact of occupant

is used when the seat is changed in form from its original design from occupant loading during the crash. Situations where seats are deformed and also experience mechanical failures should be identified under **Combination of above.**

Deformed by passenger compartment intrusion

is used when the seat is deformed or failed by intrusion of an interior vehicle component(s) or exterior vehicle component(s) into the passenger compartment.

Combination of above

is used when any combination of the above occurs and describes multiple seat failures or deformations. Seat failures or deformations which are not described in the above are reported below. Seat failures or deformations listed in the above take priority over others

Other

is used when the only seat failure(s) or deformation(s) which occur are not described in the above (*e.g.*, impact forces).

Unknown

is used if the seat performance cannot be determined.

Screen Name: Seat -- Integrated Restraints
Variable Name: Does the Seat Have Integrated Passenger Belts?

Element Attributes:

No
Yes
Unknown

Source: Vehicle inspection

Remarks:

An integral seat is a seat structure, which replaces existing seats with multi-functional seats containing built-in occupant protection devices. Previous seating structures operated independently of the occupant restraint system, perhaps only having an upper ring that guided the seat belt across the torso. The new seats are designed to contain the occupant restraint systems, as well as being designed to help retain the occupant in the seat by use of clever designs of the lower seat pan and the back seat structure.

If you were to remove the seat and the restraint comes with the seat indicate “Yes”.

Screen Name: Seat Back -- Prior
Variable Name: Seat back Incline Prior to Impact

Element Values:

Not adjustable
Upright
Slightly reclined
Completely reclined

Unknown

Source: Vehicle inspection

Remarks:

This variable is for adjustable (reclining) seat backs only

Not adjustable
is used for seating positions where there is a seat back which is fixed in position.

Upright
is used when the seatback is in the fully upright position (i.e., perpendicular to the seat cushion)

Slightly reclined
is used when the seat back is in a slightly reclined position

Completely reclined
is used when the seat back is in a position that is rearward to the limit of its range of movement.

Unknown
is used when the pre-impact position could not be ascertained.

Screen Name: Seat Back -- Post
Variable Name: Seat Back Incline Position Post Impact

Element Attributes:

Moved to completely rearward position
Moved to rearward midrange position
Moved to completely rearward position
Retained pre-impact position
Moved to upright position
Moved to slightly forward position
Moved to Forward midrange position
Complete forward position
Unknown
[Not adjustable]

Source: Vehicle inspection

Remarks:

This variable is for adjustable (reclining) seat backs only. Select the attribute that describes the backrest position post-impact as determined from the vehicle inspection. The final coding of this variable on the Occupant form will take into account information gathered from the occupant interviews.

Unknown

is used when the post crash seat back position could not be determined.

Screen Name: Air Bag Available
Variable Name: Air Bag Available

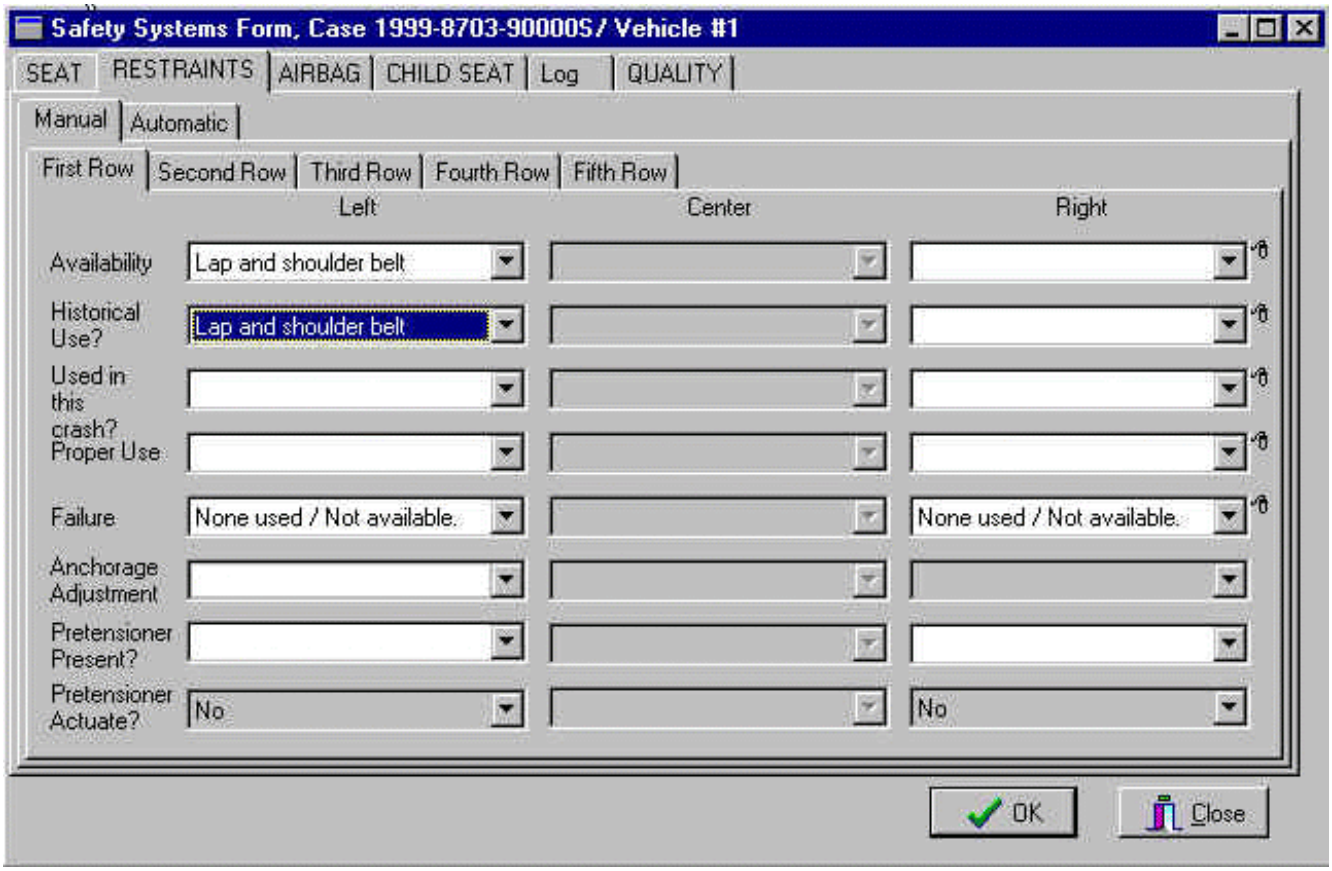
Element Attributes:

No
Yes
Unknown

Source: Vehicle inspection

Remarks:

Air bags are assumed not to be present (*i.e.*, **Not equipped/not available**) at this position, unless there is a positive indication of their presence.


Safety Systems Form, Case 1999-8703-900005 / Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Manual
Automatic
First Row
Second Row
Third Row
Fourth Row
Fifth Row
Left
Center
Right
Availability
Lap and shoulder belt
Historical Use?
Lap and shoulder belt
Used in this crash?
Proper Use
Failure
None used / Not available.
None used / Not available.
Anchorage Adjustment
Pretensioner Present?
Pretensioner Actuate?
No
No
OK
Close

Screen Name: Availability
Variable Name: Manual (Active) Belt System Availability

Element Attributes:

None available
Belt removed/destroyed
Shoulder belt
Lap belt
Lap and shoulder belt
Belt available - type unknown
Shoulder belt (lap belt destroyed/removed)
Lap belt (shoulder belt destroyed/removed)
Other belt (specify)
Unknown

Source: Vehicle inspection

Remarks:

Some belt restraint systems are a combination of manual (active) and automatic (passive) occupant protection devices. For this variable, consider only the manual portion of the system.

Availability is assessed based on the seat position regardless of whether it is occupied. Select the manual belt system which was available for use, if so desired, by the occupant relative to the seat position in the vehicle.

Not available

indicates: (1) that at the time of the crash the designated seating position was not equipped with a manufacture installed or post manufacturer installed manual belt (lap, shoulder, or lap and shoulder); (2) the seat position was equipped only with an automatic (passive) belt system.

Belt removed/destroyed

indicates that the manual belt, initially installed at this occupant's seating position, was subsequently removed or destroyed (*e.g.*, unbolted, cutout, etc.). If the belt is present but nonfunctional, then select the type of manual belt available on this variable and use **Inoperative** for **Used In This Crash?**

Belts which are knotted, buckled at the rear of the seat (bench or bucket), stored below the seat, etc., are available if they were otherwise operative.

Screen Name: Availability (cont'd)
Variable Name: Manual (Active) Belt System Availability (cont'd)

Shoulder belt
is used when this occupant's seat position was equipped with a manual upper torso restraint and no lap belt. The population of vehicles equipped with only manual shoulder belts is very small, therefore, care must be taken that a two-point passive belt is not identified as a manual belt (*e.g.*, Volkswagen Rabbits 1981-1984).

Lap belt
is used when this occupant's seat position is equipped with a manual belt that secures the pelvic area of the occupant in the seat and there is no manual upper torso belt.

Lap and shoulder belt
is used when both a manual upper torso belt and a manual lap (pelvic area) belt are present at this occupant's seat position.

Belt available — type unknown
When the specific manual belt system cannot be determined, but it is known some type of belt is present, then use this attribute (this **may** occur when inspecting completely burned or stripped vehicles).

Shoulder belt (lap belt destroyed/removed)
is used for integral noncontinuous loop manual belt systems when the lap belt portion of the belt has been removed or destroyed leaving only the shoulder belt portion present at this occupant's seating position.

Lap belt (shoulder belt destroyed/removed)
is used for integral noncontinuous loop manual belt systems when the shoulder belt portion of the belt has been removed or destroyed leaving only the lap belt portion present at this occupant's seating position.

Other belt (specify)
is used when the belt system is nonstandard or cannot be described with other attributes. Specify (write out in the Specify Box) the type of manual belt (*e.g.*, 5 point competition harness, 4 inch wide webbing, etc.). In addition, use this attribute if a properly position "self-contained" built-in child safety seat was available at this occupant's seating position. Other child restraints are not recorded here.

Unknown
is used when it cannot be determined whether or not manual belts were available for this occupant's seat position.

Screen Name: Historical Use
Variable Name: Historical Use of Manual (Active) Belt System

Element Attributes:

None used / not available / removed or destroyed
Inoperative (specify)
Shoulder belt
Lap belt
Lap and shoulder belt
Belt used — type unknown
Other belt used (specify)
Shoulder with child safety seat
Lap with child safety seat
Lap and shoulder with child safety seat
Belt used with child safety seat — type unknown
Other belt used with child safety seat (specify)
Unknown if belt used

Source: Vehicle inspection

Remarks:

Select the manual belt system (or portion of the system) which has historically been used by an occupant in this seat position. The correctness of the use is not assessed on this variable. This variable only identifies historical manual belt usage; do not consider the presence and use of a passive belt system.

None used / not a available / removed or destroyed

is used when there is no evidence present that a manual belt was worn. Note: the "**not available / removed or destroyed**" within this selection is automatically selected when the corresponding attribute is selected in **Manual Belt Availability**.

Inoperative (specify)

includes belts which are knotted, jammed, tucked behind the seat, or in any other fashion rendered unusable. In addition, use this attribute for belts which are inoperative because of extreme deterioration from aging. A belt system that was completely removed from or cut out of a vehicle is assigned **None used, not available, or belt removed/destroyed**.

Shoulder belt

is used when evidence is present that indicates a manual shoulder belt alone was in use. This can occur when: (1) the vehicle was not equipped with a lap belt, (2) only the shoulder belt portion of a non-integral system was in use, or (3) when the lap belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional shoulder belt portion in use.

Screen Name: Historical Use (cont'd)
Variable Name: Historical Use of Manual (Active) Belt System (cont'd)

Lap belt
is used when evidence is present that indicates a manual lap belt alone was in use. This can occur when: (1) the vehicle was not equipped with a shoulder belt, (2) only the lap belt portion of a non-integral system was in use, or (3) when the shoulder belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional lap belt portion in use. **Note**, manual lap belts can be used in conjunction with a two-point automatic belt system. For manual and automatic belt combinations, use this attribute for the manual lap belt usage.

Lap and shoulder belt
is used when evidence is present that indicates the occupant is: (1) "encompassed" ***both*** in the lap and upper torso region by a manual lap and shoulder belt combination, or (2) using only a portion of an ***intact integral*** lap and shoulder belt system. For example, if a person has an integral lap and shoulder belt but is only using the lap portion (*i.e.*, having the shoulder belt behind his or her back), then use this attribute.

Belt used — type unknown
is used when the type of manual belt system cannot be determined.

Shoulder / lap / lap and shoulder belt used with child seat
is used when evidence is present that indicates the vehicle's manual belt system anchors a child safety seat to the vehicle. These attributes do not refer to the belts which are part of the child seat itself.

Belt used with child safety seat — type unknown
is used when evidence is present that indicates a belt was used with a child safety seat, however the vehicle belt type is unknown, not the child safety seat type.

Other belt used with child safety seat
is used when evidence is present that indicates a built-in child safety seat is "self contained" (does not use any part of the regular existing manual belt system available at the occupant seating position).

Unknown if belt used
is used if it cannot be determined whether or not a manual belt was in use by the occupant at the time of the crash.

Screen Name: Used in this crash?
Variable Name: Manual (Active) Belt System Used in this Crash?

Element Attributes:

None used not available / removed or destroyed
Inoperative (specify)
Shoulder belt
Lap belt
Lap and shoulder belt
Belt used — type unknown
Other belt used (specify)
Shoulder belt with child safety seat
Lap belt with child safety seat
Lap and shoulder belt with child safety seat
Belt with child safety seat — type unknown
Other belt with child safety seat (specify)
Unknown if belt used

Source: Vehicle Inspection

Remarks:

Select the manual belt system or portion of the system which was in use at the time of the crash by the occupant. The correctness of the use is not assessed on this variable. This variable only identifies manual belt usage; do not consider the presence and use of a passive belt system.

None used / not available / removed or destroyed

is used when a manual belt was available but not worn at the time of the crash. **Note:** the "**not available / removed or destroyed**" within this selection is automatically selected when the corresponding attribute is selected in **Manual Belt Availability**.

Inoperative

includes belts which are knotted, jammed, tucked behind the seat, or in any other fashion rendered unusable. In addition, use this attribute for belts which are inoperative because of extreme deterioration from aging. A belt system that was completely removed from or cut out of a vehicle is assigned **None used, not available, or belt removed/destroyed.**

Shoulder belt

is used when a manual shoulder belt alone was in use. This can occur when: (1) the vehicle was not equipped with a lap belt, (2) only the shoulder belt portion of a non-integral system was in use, or (3) when the lap belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional shoulder belt portion in use.

Screen Name: Used in this crash? (cont'd)
Variable Name: Manual (Active) Belt System Used in This Crash? (cont'd)

Lap belt
is used when a manual lap belt alone was in use. This can occur when: (1) the vehicle was not equipped with a shoulder belt, (2) only the lap belt portion of a non-integral system was in use, or (3) when the shoulder belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional lap belt portion in use. **Note**, manual lap belts can be used in conjunction with a two-point automatic belt system. For manual and automatic belt combinations, use this attribute for the manual lap belt usage.

Lap and shoulder belt
is used when the occupant is: (1) "encompassed" ***both*** in the lap and upper torso region by a manual lap and shoulder belt combination, or (2) using only a portion of an ***intact integral*** lap and shoulder belt system. For example, if a person has an integral lap and shoulder belt but is only using the lap portion (*i.e.*, having the shoulder belt behind his or her back), then use this attribute. Improper use of the belt is assessed in Proper Use of Manual (Active) Belts.

Belt used — type unknown
is used when the type of manual belt system cannot be determined.

Shoulder / lap / lap and shoulder belt used with child seat
is used when the vehicle's manual belt system anchors a child safety seat to the vehicle. These attributes do not refer to the belts which are part of the child seat itself.

Belt with child safety seat — type unknown
is used when the vehicle belt type is unknown, not the child safety seat type.

Other belt with child safety seat
is used when a built-in child safety seat is "self contained" (does not use any part of the regular existing manual belt system available at the occupant seating position).

Unknown if belt used
is used if it cannot be determined whether or not a manual belt was in use by the occupant at the time of the crash.

Screen Name: Proper Use
Variable Name: Proper Use of Manual (Active) Belts

Element Attributes:

Used properly
Used properly with child seat
Shoulder belt worn under arm
Shoulder belt worn behind back or seat
Belt worn around more than one person
Lap belt worn on abdomen
Lap belt or lap and shoulder belt used improperly with child safety seat (specify)
Other improper use of manual belt system (specify)
Unknown

Source: Vehicle inspection

Remarks:

This variable must be assessed by the researcher using all available vehicle data. An improperly used manual belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure. If there is an improperly used belt and/or a belt system failure, they should be noted in the Case Summary.

Belt used properly with child seat

is to be indicated only when the manual belt is installed so as to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the manual seat belts) and is occupied by a child.

Shoulder belt worn behind back or seat

is used when an occupant has an integral lap and shoulder belt but is only wearing the lap portion (*e.g.*, having the manual shoulder belt behind his or her back).

Belt worn around more than one person

is used when more than one occupant is sharing the same manual belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another.

Lap belt worn on abdomen

is used when the manual lap belt, or lap belt portion of a manual system, is worn above the occupant's pelvic bones.

Screen Name: Proper Use (cont'd)
Variable Name: Proper Use of Manual (Active) Belts (cont'd)

Lap belt or lap and shoulder belt used improperly with child safety seat
is used when a child safety seat is not installed according to the manufacturer's directions and is occupied by a child. Specify how the manual belt was used improperly. This also includes built-in child seats.

Other improper use of manual belt (system)
is used to describe any improper use of the manual belt system which is not listed above. For example, use this when a manual shoulder belt is worn on the outside of an occupant's arm (*i.e.*, humeral area) as opposed to under the arm or on top of the shoulder/clavicle.

Unknown
is used:

- when it is not known whether the manual belts used were used properly or improperly, or
- when a child safety seat is occupied by a child, but it is unknown if the seat was installed (using either the manufacturer's or the vehicle's manual belts) according to the manufacturer's directions.

Screen Name: Failure
Variable Name: Manual (Active) Belt Failure Modes During Crash

Element Attributes:

No manual belt failure(s)
Torn webbing (stretched webbing not included)
Broken buckle or latch plate
Upper anchorage separated
Other anchorage separated (specify)
Broken retractor
Combination of above (specify)
Other manual belt failure (specify)
Unknown

Source: Vehicle inspection

Remarks:

If any component of the manual belt system fails during the impact as a result of occupant loading, the failure is captured in this variable. The failure is also recorded on the **Case Form / Summary Tab** and documented with images.

If a failure occurs, select the attribute which corresponds to the appropriate manual belt failure mode that describes the component of the restraint system which failed (*i.e.*, torn webbing, broken buckle or latchplate, anchorage separation, broken retractor). A complete and documented description of the failed component and the way it failed must accompany the case.

No manual belt failure(s)

is used when there is no physical evidence from the vehicle inspection to indicate that a failure occurred.

Combination of above (specify)

is used when any combination of specified attributes occur and describes multiple manual belt failure modes. Manual belt failure modes which are not described are reported in **other manual belt failure**. Manual belt failures **with specific attributes** take priority over the **Other manual belt failure** code.

Other manual belt failure (specify)

is used when the only manual belt failure(s) which occur are not described with a specific attribute.

Unknown

is used when it can not be determined if the manual belt failed.

Screen Name: Anchorage Adjustment
Variable Name: Manual Shoulder Belt Upper Anchorage Adjustment

Element Attributes:

None for manual shoulder belt
In full up position
In mid position
In full down position
Position unknown
Unknown if adjuster present

Source: Vehicle inspection

Remarks:

Complete this variable regardless of manual shoulder belt usage.

No upper anchorage adjustment for manual shoulder belt
is used when a manual shoulder belt is present but there is no adjustment mechanism at the upper anchorage point.

In full up position
is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in its highest position at the time of the crash (*e.g.* closest position to the roof).

In mid position
is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in a middle position at the time of the crash (somewhere between full up and full down).

In full down position
is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in its lowest position at the time of the crash (closest position to the floor).

Position unknown
is used when the manual shoulder belt is equipped with an adjustable upper anchorage point but it cannot be determined what the position was at the time of the crash.

Unknown if adjuster present
is used when it cannot be determined if the manual shoulder belt was equipped with an adjustable upper anchorage device.

**** “Unknown adjustment” needs to be changed to “Unknown if adjuster present” ****
in NASSMAIN to distinguish it from “Position unknown.

Screen Name: Pretensioners Present
Variable Name: Seat Belt Pretensioners Present

Element Attributes:

None for manual shoulder belt
Seat belt pretensioner present
Unknown if position has seat belt pretensioners

Source: Vehicle Inspection

Remarks:

Complete this variable regardless of manual belt usage.

Seat belt pretensioners are present in more recent model year vehicles. They are only present in vehicles that are equipped with air bags. They may be identified during vehicle inspection because the seat belt may not be able to be retracted. They are designed to take the slack up in the seat belt during a crash of sufficient deceleration.

None for manual belt

is used when a manual belt is present but there is no seat belt pretensioner present.

Seat belt pretensioner present

is used when the manual belt is equipped with a seat belt pretensioner. They will only be present in a vehicles with air bags.

Unknown if position has a seat belt pre-tensioner

is used when it cannot be determined if the manual belt was equipped with a pretensioner.

Screen Name: Pretensioners Actuate?
Variable Name: Pretensioners Actuate

Element Attributes:

No
Yes
Unknown

Source: Vehicle Inspection

Remarks:

Complete this variable regardless of manual belt usage.

Seat belt pretensioners are present in more recent model year vehicles. They are only present in vehicles that are equipped with air bags. They may be identified during vehicle inspection because the seat belt may not be able to be retracted. They are designed to take the slack up in the seat belt during a crash of sufficient deceleration.

No

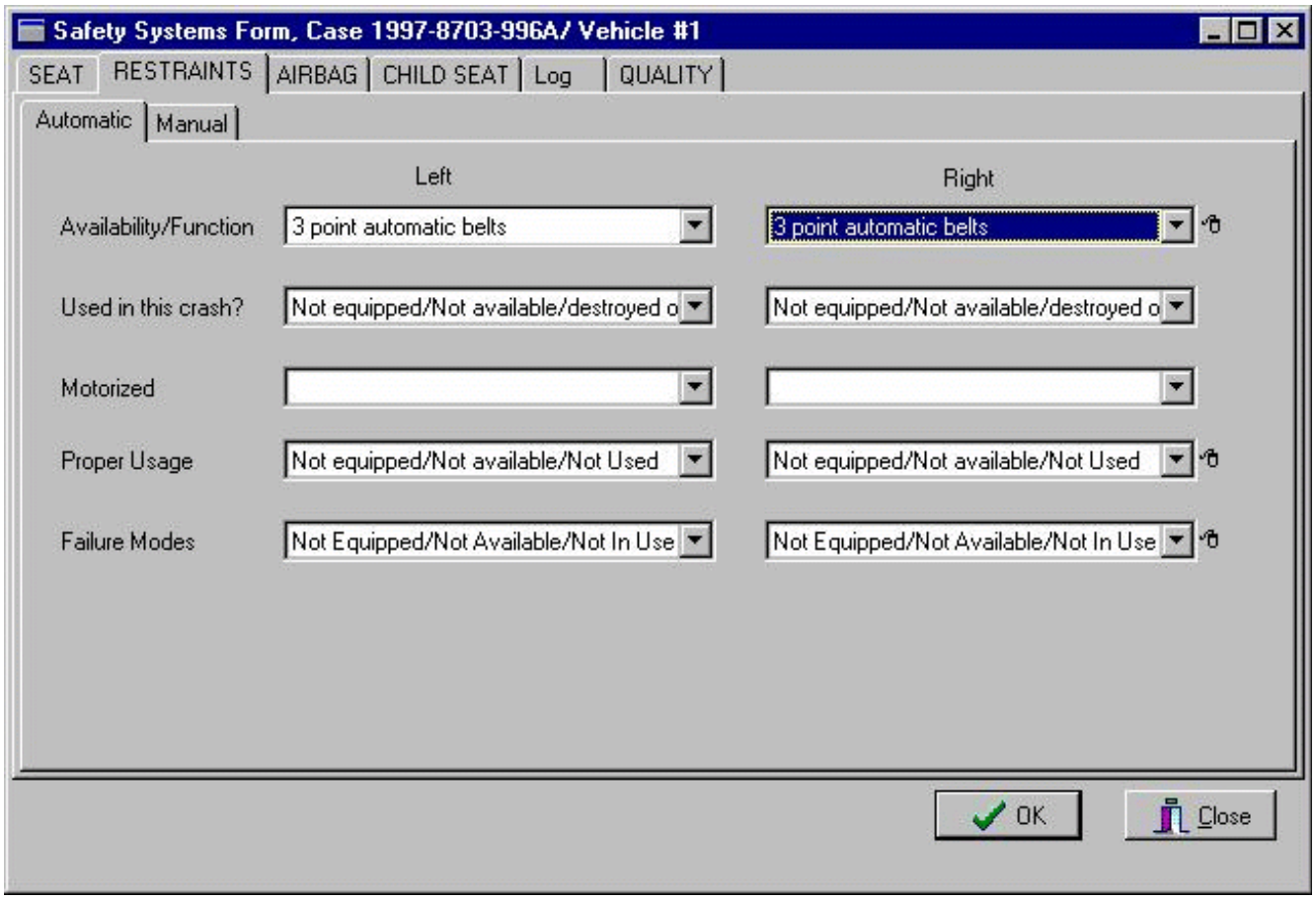
is used when a pretensioner is present, but there is no indications that it activated during the crash.

Yes

is used when a pretensioner is present, and there is positive indication that it activated during the crash.

Unknown

is used when it cannot be determined if the pretensioner activated during the crash.


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Automatic
Manual
Left
Right
Availability/Function
3 point automatic belts
3 point automatic belts
Used in this crash?
Not equipped/Not available/destroyed o
Not equipped/Not available/destroyed o
Motorized
Proper Usage
Not equipped/Not available/Not Used
Not equipped/Not available/Not Used
Failure Modes
Not Equipped/Not Available/Not In Use
Not Equipped/Not Available/Not In Use
OK
Close

Screen Name: Availability/Function
Variable Name: Automatic (Passive) Belt System Availability/Function

Element Attributes:

Not equipped/not available
2 point automatic belts
3 point automatic belts
Automatic type unknown
Automatic belts destroyed or rendered inoperative
Unknown

Source: Vehicle inspection

Remarks:

Some belt restraint systems are a combination of manual (active) and automatic (passive) occupant protection devices. For this variable, consider only the automatic portion of the system. Select the automatic belt system which was available at the time of the crash for this occupant.

Automatic belts are designed to restrain an occupant and allow an occupant egress (the act of going from an enclosed place) without the requirement of manually activating the belt. Some systems use only a torso belt (2 point automatic belts), while others are designed with a lap and torso belt (3 point automatic belts). A clue for proper system identification involves the egress issue. If you are sitting in the occupant's position and all belts are attached and you open the door, then determine if you ***have to*** detach any belt in order to exit the vehicle. Belts which do not require detaching are automatic belts. Note: The ease of egress is not considered because many automatic belt systems may appear cumbersome.

Availability is assessed based on the occupant's seating position. Select the automatic belt system which was available for use, if so desired, by the occupant relative to the occupant's seating position in the vehicle. Availability is also determined by presence, functional status, and use of the automatic belt system. Any occupant who is using a belt restraint system, or portion thereof, must by default have that system available to them. The correctness and/or appropriateness of the use is considered in Proper Use of Automatic (Passive) Belt System.

Not equipped/not available

indicates:

- that at the time of the crash the designated seating position that the occupant was in, was not equipped with a manufacturer installed or post manufacture installed automatic belt (2- point or 3-point)
- the occupant was not in a designated seat position (*e.g.*, on the floor)
- the occupant was not the person assigned the designated seat position and was not using an automatic belt (*e.g.*, sitting side-by-side) **or**
- the seat position that the occupant was in was equipped only with a manual (active) belt system.

Screen Name: Availability/Function (cont'd)
Variable Name: Automatic (Passive) Belt System Availability/Function (cont'd)

2 point automatic belts

is used when a torso belt is anchored along the inboard side of the front seat and anchored either at the upper window frame of the door surface (adjacent to the upper B-pillar) or attached to a motorized track located along the upper A-pillar, roof side rail, and upper B-pillar. A two point automatic belt system requires the presence of either a manual lap belt or a knee bolster.

3 point automatic belts

is used for an automatic belt system consisting of a lap and torso belt. This system uses a common anchor for both belts located on the inboard side of the front seat and two anchors along the door surface (*e.g.*, commonly used in General Motors cars beginning in 1987 until mid- 1990's). This system can be detected by sitting in the occupant's position with the latch plate/buckle attached and opening the door. If the belt travels with the door and allows egress without detaching the belt, then use this attribute -- the system is automatic.

Automatic belts — type unknown

is used when a vehicle inspection occurs and the occupant's seating position is known to have automatic belts but the researcher is not able to determine from the vehicle inspection what type of automatic belts are available.

If the type of automatic belt system is determinable, then the system's mechanization can also be determined because most manufacturers use the same type of system for a given vehicular model. In addition, this code takes precedence over the following code **Automatic belts destroyed or rendered inoperative**.

Automatic belts destroyed or rendered inoperative

is used when the automatic belt, initially installed at this occupant's seating position, was subsequently removed or destroyed (*e.g.*, unbolted, cutout, etc.) or in any way rendered inoperative. In addition, use this attribute for belts which are extremely deteriorated from aging. Do not use this attribute for motorized belt tracks which are mechanically or electrically inoperative. This is considered under Automatic Belt Use System.

Belts which are knotted, buckled at the rear of the seat (bench or bucket), etc., are available if they were otherwise operative.

Unknown

is used for front out-board occupants of passenger vehicles when it cannot be determined whether or not this occupant's seating position was equipped with an automatic belt system.

Screen Name: Used in this crash?
Variable Name: Automatic (Passive) Belt System Use

Element Attributes:

Not equipped / not available / destroyed or rendered inoperative
Automatic belt in use
Not in use (manually disconnected, motorized track inoperative) (specify)
Automatic belt use unknown
Unknown

Source: Vehicle inspection

Remarks:

Not equipped / not available / destroyed or rendered inoperative

is automatically selected when **Automatic Availability** is selected as "Not equipped not available". Additionally, select this code when automatic belts are present, but were destroyed or rendered inoperative at the time of the crash.

Automatic belt in use

is used when this automatic belt was hooked up (in use) at the time of the crash. The correctness of the use is not assessed on this variable.

Not in use (manually disconnected, motorized track inoperative)

is used when the automatic belt's latch plate/buckle was detached at the time of the crash. For example, this attribute is used to capture disconnected 3-point, door mounted automatic belts (*i.e.*, 1987 to mid-1990 General Motors vehicles) which can be used similar to an active lap and shoulder belt system.

This is also used for motorized tracks which were ***not in the restrained position*** at the time of the crash. The motorized track may be inoperative because of fuse removal, electric motor failure, or track failure when the malfunction prevents the automatic belt system from moving along its track into the restrained position.

Note! This variable does not assess how this occupant uses the automatic belt when entering or exiting the seating position. For example, this occupant may routinely manually detach/attach the latch plate/buckle (*i.e.*, uses the automatic belt system as if it were a manual belt system). This variable assumes that the nonmotorized automatic belt is available and functioning and assesses whether or not the latch plate/buckle was attached at the time of the crash. If the latch plate/buckle was attached at the time of the crash, then use Automatic belt in use. On the other hand, if it was detached, then use Automatic belt not in use (manually disconnected, motorized track inoperative).

For motorized belts, this variable assumes that the motorized belt system is locked in the restrained position with the belt attached at the time of the crash. If the motorized belt system was locked in the restrained position and the belt was attached at the time of the crash, then use Automatic belt in use. If the motorized belt system was not locked in the restrained position or the belt was detached, then use Automatic belt not in use (manually disconnected motorized track inoperative).

Automatic belt use unknown

is used when the researcher is unable to determine if the automatic belt was in use.

Screen Name: Motorized
Variable Name: Automatic (Passive) Belt System Type

Element Attributes:

Non-motorized system
Motorized system
Unknown

Source: Vehicle inspection

Remarks:

Non-motorized system

is used when the automatic belt system available to this occupant does not require a motor for operation.

Motorized system

is used when the automatic belt system available to this occupant requires a motor for operation.

Unknown

is used when it is known that an automatic belt is available but the type (non-motorized or motorized) cannot be determined.

Screen Name: Proper Use
Variable Name: Proper Use of Automatic (Passive) Belt System

Element Attributes:

Used properly
Used properly with child safety seat
Shoulder belt worn under arm
Shoulder belt worn behind back
Belt worn around more than one person
Lap portion worn on abdomen
Lap / shoulder belt or automatic shoulder belt used improperly with child safety seat (specify)
Other improper use (specify)
Unknown

Source: Vehicle inspection

Remarks:

This variable must be assessed by the researcher using all available data. An improperly used automatic belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure which is addressed in Automatic (Passive) Belt Failure Modes During Crash. If there is an improperly used belt and/or a belt system failure, they should be noted on the **Case Form / Summary Tab.**

Automatic belt used properly with child safety seat

is to be used only when the automatic belt is properly installed around the child safety seat to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the automatic seat belts).

Automatic shoulder belt worn behind back is used:

- when an occupant has a three point automatic belt but is only wearing the lap portion (*i.e.*, having the automatic torso belt behind the occupant's back), or

- when an occupant has a two point automatic belt and is not wearing the torso portion (*i.e.*, the automatic torso belt is attached and is behind the occupant's back).

Automatic belt worn around more than one person

is used when more than one occupant is sharing the same automatic belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another. If the occupants are using a three point automatic belt such that the torso portion is worn behind one or more of the occupants backs while the lap portion encompasses their hips, then use this attribute.

Screen Name: Proper Use (cont'd)
Variable Name: Proper Use of Automatic (Passive) Belt System (cont'd)

Lap portion of automatic belt worn on abdomen
is used when the lap belt portion of a three point automatic belt system is worn above the occupant's pelvic bones.

lap / shoulder belt or automatic shoulder belt used improperly with child safety seat
is used when an automatic belt is not installed properly around a child safety seat according to the manufacturer's directions. Specify how the automatic belt was used improperly.

Other improper use of automatic belt system
is used to describe any improper use of the automatic belt system which is not listed above. This includes when an automatic shoulder belt is worn on the outside of an occupant's arm as opposed to under the arm or on top of the shoulder.

Unknown
is used when it is not known whether the automatic belts were used properly.

Screen Name: Failure Modes
Variable Name: Automatic (Passive) Belt Failure Modes During Crash

Element Attributes:

No automatic belt failure(s)
Torn webbing (stretched webbing not included)
Broken buckle or latchplate
Upper anchorage separated
Other anchorage separated (specify)
Broken retractor
Combination of above (specify)
Other automatic belt failure (specify)
Unknown

Source: Vehicle inspection

Remarks:

If any component of the automatic belt system fails during the impact, the failure is captured in this variable. The failure is also recorded on the **Case Form / Summary Tab** and documented with images as needed. Automatic belt system failures, unlike manual belt system failures, are not limited to those that resulted from occupant loading.

If a failure occurs, select the attribute which corresponds to the appropriate automatic belt failure mode that describes the component of the restraint system which failed (*i.e.*, torn webbing, broken buckle or latchplate, anchorage separation, broken retractor). A complete and documented description of the failed component and the way it failed must accompany the case.

No automatic belt failure(s)

is used when there is no physical evidence from the vehicle inspection to indicate or support that a failure occurred.

Combination of above, specify

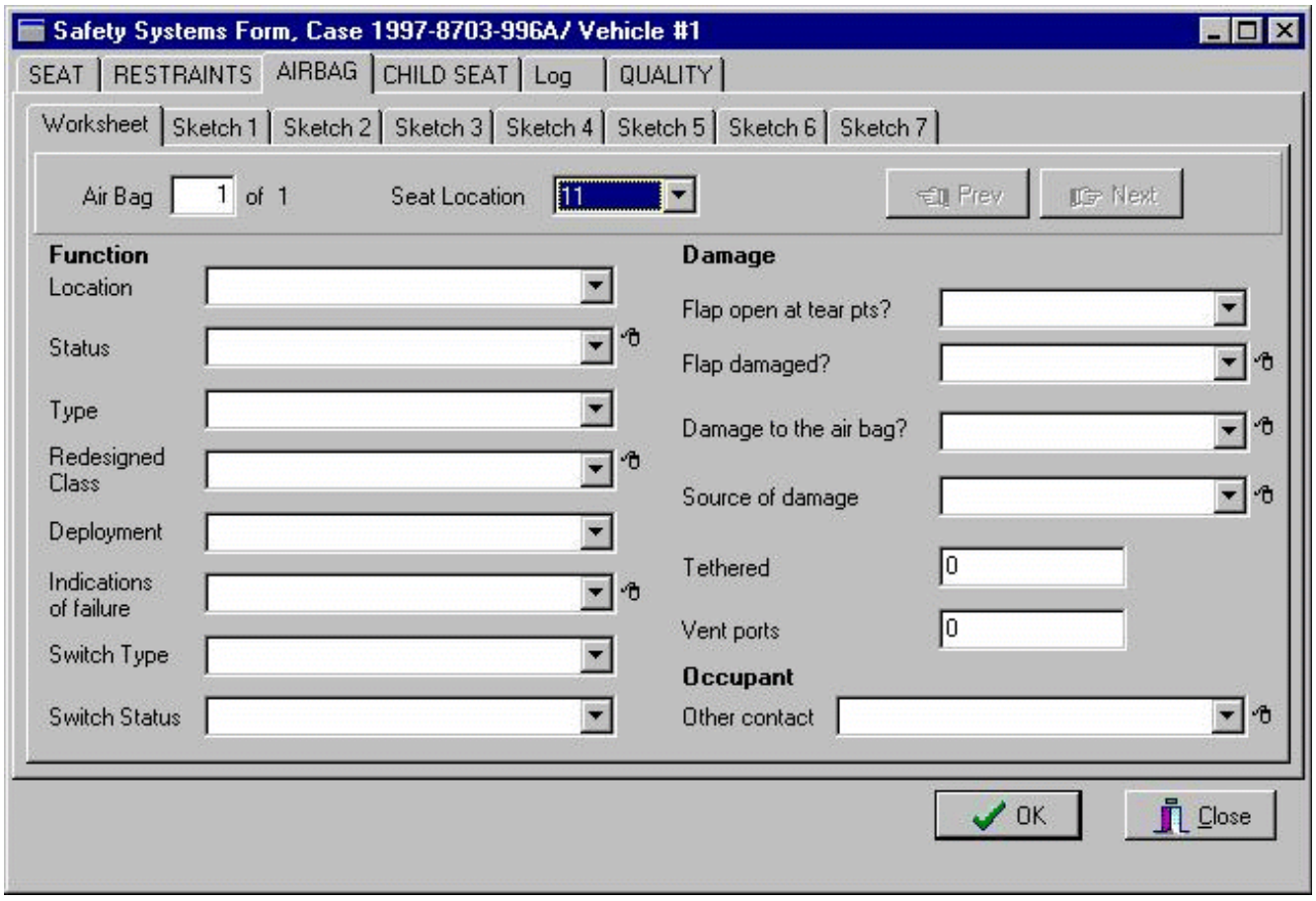
is used when any combination of specified attributes occurs and describes multiple automatic belt failure modes. Automatic belt failures which are not described are reported in **Other automatic belt failure**. Automatic belt failures listed with specific attributes take priority over other attributes.

Other automatic belt failure, specify

is used when the only automatic belt failure(s) which occur are not described in the specific attributes. An example of this would be when the 2 point automatic “track mouse” is ripped from the mechanism.

Unknown

is used when it cannot be determined if the automatic belt failed.


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
Air Bag 1 of 1
Seat Location 11
Prev
Next
Function
Location
Status
Type
Redesigned Class
Deployment
Indications of failure
Switch Type
Switch Status
Damage
Flap open at tear pts?
Flap damaged?
Damage to the air bag?
Source of damage
Tethered 0
Vent ports 0
Occupant
Other contact
OK
Close

Screen Name: Air Bag
Variable Name: Air Bag Number for this Seating Position

Element Attributes:
Air bag number

Source: Vehicle inspection

Remarks:

Assigned by the system, one for every single air bag

If air bags are available for the occupant, indicate the information on all air bags. Do so by inserting another air bag. To insert another air bag go to the menu bar and select **Edit / Insert**, then indicate its location, and complete the information about the air bag.

Screen Name: Seat Location
Variable Name: Seat Location for Air bag(s) Data

Element Attributes:
Seat Number (based on defined seats for this vehicle)

Source: Vehicle inspection

Remarks:

Select the seat location (number) from the list of available seats for the available air bag(s).

If air bags are available for the occupant, indicate the information on all air bags. Do so by inserting another air bag. To insert another air bag go to the menu bar and select **Edit / Insert**, then indicate its location, and complete the information about the air bag.

Screen Name: Function – Location
Variable Name: Deployment Location of Air Bag

Element Attributes:

Steering Wheel Hub
Top Instrument Panel
Mid Instrument Panel
Bottom Instrument Panel
Seat Back
Seat Cushion
Pillar (A or B)
Door
Roof Side Rail
Other (specify)
Unknown

Source: Vehicle inspection

Remarks:

Enter the location of the air bag

Steering Wheel

is used for an air bag that is designed to deploy from a module integrated with the steering wheel. It is designed to protect the vehicle's driver primarily from frontal impacts.

Top Instrument Panel Location

is used for those air bags that deploy rearward from a location on the top of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts.

Mid Instrument Panel Location

is used for those air bags that deploy rearward from a location in the middle of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts.

Bottom Instrument Panel Location

is used for those air bags that deploy rearward from a location in the bottom of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts. This includes "knee bags".

Seat Back

is located on the outside portion of the seat back and is designed to protect the torso of occupants primarily from side impacts.

Seat Cushion

is located on the outside portion of the seat cushion and is designed to protect the torso of occupants primarily from side impacts.

Screen Name: Function – Location
Variable Name: Deployment Location of Air Bag

Pillar (A or B)
is primarily a tubular shaped bag that is tethered at the A pillar and is stored in the roof side rail and is designed to protect the head of occupants primarily from side impacts

Door
is located in the door is designed to protect the torso of occupants primarily from side impacts.

Roof Side Rail
is primarily a curtain type bag that is stored in the roof side rail and is designed to protect the head of occupants primarily from side impacts

Other (specify)
is used when the location of the air bag cannot be captured in the above attributes. This should be a rare occurrence. The location of the air bag must be specified.

**** Need to add the (specify) in NASSMAIN ****

Screen Name: Function -- Status
Variable Name: Air Bag Status

Element Attributes:

Air Bag Available
Air bag disconnected (specify):
Air bag not reinstalled
Unknown

Source: Vehicle inspection

Remarks:

Air bag available

is used when the vehicle is equipped with an air bag for this seating position. Deployment of the air bag system has no bearing on this variable.

Air bag disconnected

is used when any component of the air bag was rendered inoperative prior to the collision (*e.g.*, fuse removed).

Air bag not reinstalled

is used when the air bag for this seating position was not replaced after a prior deployment to the crash being researched.

Unknown

is used when it cannot be ascertained whether an air bag was available at the time of the crash.

Screen Name: Function -- Type
Variable Name: Type of Air Bag

Element Attributes:

Original manufacturer install
Retrofitted Air Bag
Replacement Air Bag
Unknown Type

Source: Vehicle inspection

Remarks:

Original manufacturer install

is used when it can be determined that the vehicle was equipped with an air bag system in this seating position that was installed by the manufacturer at the time the vehicle was built (OEM).

Retrofitted air bag

is used when it can be determined that the vehicle was equipped with an air bag system for this seating position but that the vehicle was not built with a manufacturer equipped air bag system. This is an after market product and should not be confused with **Replacement air bag**. Replacement retrofit air bags are also included in this category.

Replacement air bag

is used when it can be determined that the vehicle was equipped with an OEM air bag system for this seating position, and that this system had been replaced due to a previous deployment.

Screen Name: Function -- Redesigned Class
Variable Name: Redesigned Air Bag

Element Attributes:

Not Redesigned
Redesigned
Advanced (specify)
Unknown

Source: Vehicle inspection

Remarks:

This variable indicates whether the vehicle was equipped with a redesigned air bag for this location.

Not Redesigned

indicates that the vehicle was not equipped with a redesigned air bag for this location. Generally, vehicles manufactured with OEM air bags prior to 1997 are coded as **Not Redesigned.**

Redesigned

indicates that the vehicle was equipped with a redesigned air bag for this location. Redesigned class of air bag includes "second generation" air bags. See the chart beginning on the next page.

Advanced (specify)

this includes air bags such as "smart" air bags that will not deploy if the position is not occupied. Specify the type of advanced air bag that is found.

Unknown

is used when it is not known if the air bag was redesigned.

**** Need to add (specify) to NASSMAIN for "Advanced" ****

1998 RABSS Safety Features								
Make/Model	Manu-facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
3 Series	BMW	4-dr. sedan	PC	RC	Yes	No	Yes	No
5 Series	BMW	4-dr. sedan	PC	RC	Yes	No	Yes	No
7 Series	BMW	4-dr. sedan	PC	RC	Yes	Availabl e	Yes	No
M3	BMW	2-dr.	PC	RC	Yes	No	Yes	No
Z3	BMW	2-dr. coupe	PC	RC	Available	No	Yes	No
RC - Running Change in model year 1998. There will be a code "3" as VIN identifier in position 8.								
LHS	Chrysler	4-dr	PC	Yes	No	No	No	No
Sebring	Chrysler	2-dr/conv.	PC	Driver Only	No	No	Yes	No
Town & Country	Chrysler	minivan	VAN	Pass. Only	No	No	No	No
300 M	Chrysler	4-dr	PC	Yes	No	No	No	No
Dodge Avenger	Chrysler	2-dr	PC	No	No	No	Yes	No
Dodge Caravan	Chrysler	Minivan	VAN	Pass. Only	No	No	No	No
Dodge Dakota	Chrysler	Std.Cab/ClubCab	Truck	Yes	No	No	Yes	No
Dodge Durango	Chrysler	4-dr	MPV	Yes	No	No	No	No
Dodge Intrepid	Chrysler	4-dr	PC	Yes	No	No	No	No
Dodge Neon	Chrysler	2-dr/'4-dr	PC	Yes	No	No	Yes	No
Dodge Ram Pickup	Chrysler	Std.Cab/Club Cab	Truck	Yes	No	No	Yes	No
Dodge Ram Wagon	Chrysler	Wagon	MPV	Yes	No	No	Yes	No
Dodge Stratus	Chrysler	4-dr	PC	Yes	No	No	Yes	No
Dodge Viper	Chrysler	coupe/roadster	PC	Yes	No	No	No	No
Jeep Cherokee	Chysler	4-dr	MPV	Yes	No	No	Yes	No
Jeep Gr. Cherokee	Chrysler	4-dr	MPV	Driver Only	No	No	No	No
Jeep Wrangler	Chrysler	2-dr	MPV	Yes	No	No	Yes	No
Plymouth Prowler	Chrysler	conv.	PC	Yes	No	No	No	No
Plymouth Voyager	Chrysler	minivan	VAN	Pass. Only	No	No	No	No
Club Wagon	Ford	Van	Van	Yes	No	No	Yes	No
Contour	Ford	4-dr. sedan	PC	RC	No	No	No	No
Cougar	Ford	2-dr.	PC	Yes	No	No	No	No
Crown Victoria	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Econoline Van	Ford	Van	Van	Yes	No	No	Yes	No
Escort	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Escort ZX2	Ford	4-dr. sedan	PC	RC	No	No	No	No
Expedition	Ford	4-dr.	SUV	Yes	No	No	No	No
Explorer	Ford	4-dr.	SUV	Yes	No	No	No	No
F150/F250 Light Duty	Ford	2-dr.	TRUCK	Yes	No	No	No	No
Mustang	Ford	2-dr.	PC	Yes	No	No	No	No
Taurus	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Windstar	Ford	Wagon Van	VAN	RC	No	No	No	No
Lincoln Continental	Ford	4-dr sedan	PC	Yes	No	No	No	No
Lincoln Navigator	Ford	4-dr.	SUV	Yes	No	No	No	No
Lincoln Town Car	Ford	4-dr sedan	PC	Yes	No	No	No	No

1998 Safety Features								
Make/Model	**Manu-facturer**	**Body Styles**	**Vehicle Type**	**Redesigned Air Bag**	**Side Air Bags**		**Seat Belt Pretens.**	**Dual Stage Passenger Air Bag**
					Front	**Rear**		
Mercury Grand Marquis	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Mountaineer	Ford	4-dr/2-dr	SUV	Yes	No	No	No	No
Mercury Mystique	Ford	4-dr. sedan	PC	RC	No	No	No	No
Mercury Sable	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Tracer	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Villager	Ford	Van	VAN	Yes	No	No	No	No
RC - Running Change in model year 1998. There will be a code "F" in VIN position 4, or a "K" for Escort ZX2, or codes <= 55 in VIN positions 6 and 7 for light trucks.								
EV1	GM	2-dr.	PC	Yes	No	No	No	No
Monte Carlo	GM	2-dr. coupe	PC	Yes	No	No	No	No
Buick Century	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Lesabre	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Park Avenue	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Regal	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Rivera	GM	4-dr. sedan	PC	RC	No	No	No	No
Cadillac Catera	GM	4-dr. sedan	PC	RC	No	No	Yes	No
Cadillac Deville	GM	4-dr. sedan	PC	Yes	Yes	No	No	No
Cadillac Eldorado	GM	4-dr. sedan	PC	Yes	No	No	No	No
Cadillac Seville	GM	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Chevy Astro	GM	Van	VAN	Yes	No	No	No	No
Chevy Blazer	GM	4-dr	SUV	Yes	No	No	No	No
Chevy Cavalier	GM	convertible	PC	Yes	No	No	No	No
Chevy Express	GM	Van	Van	Yes	No	No	No	No
Chevy Camaro	GM	2-dr.	PC	Yes	No	No	No	No
Chevy Corvette	GM	2-dr. coupe	PC	RC	No	No	No	No
Chevy Lumina	GM	4-dr. sedan	PC	Yes	No	No	No	No
Chevy Prizm	GM	4-dr. sedan	PC	Yes	Available	No	Yes	No
Chevy Suburban	GM	4-dr.	SUV	Yes	No	No	No	No
Chevy Tahoe	GM	4-dr	SUV	Yes	No	No	No	No
Chevy 7200 GVWR	GM	reg./ext. cab	TRUCK	Yes	No	No	No	No
Chevy Venture	GM	Van	VAN	Yes	Yes	No	Yes	No
Geo Metro	GM	2-dr./4-dr.	PC	Yes	No	No	No	No
Geo Tracker	GM	2-dr./4-dr.	MPV	Yes	No	No	No	No
Oldsmobile Alero	GM	2-dr. coupe	PC	Yes	No	No	No	No
Oldsmobile Aurora	GM	4-dr. sedan	PC	RC	No	No	No	No
Oldsmobile Cutlass	GM	4-dr. sedan	PC	Yes	No	No	No	No
Oldsmonile Intrigue	GM	4-dr. sedan	PC	RC	No	No	No	No
Oldsmobile Silhouette	GM	Van	VAN	Yes	Yes	No	Yes	No
Oldsmobile 88	GM	4-dr. sedan	PC	Yes	No	No	No	No

1998 Safety Features								
Make/Model	Manu-facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Pontiac Bonneville	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Firebird	GM	convertible	PC	Yes	No	No	No	No
Pontiac Grand Am	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Grand Prix	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Sunfire	GM	sedan	PC	Yes	No	No	No	No
Pontiac Transport	GM	Van	VAN	Yes	Yes	No	Yes	No
Saturn SL	GM	4-dr. sedan	PC	Yes	No	No	No	No
Saturn Wagon	GM	wagon	PC	Yes	No	No	No	No
RC - Running Change in model year 1998. There will be a VIN break point: for Corvette: Driver side - 106874, Passenger Side - 107296; for Oldsmobile Ingtrigue: Driver Side (Grey interior) 308218, Driver Side (Neutral interior) 308160, for Passenger Side -308671; Buick Rivera - W4706785; Oldsobile Aurora - W4112855.								
CR-V	Honda	2-dr.	MPV	Yes	No	No	Yes	No
EV Plus	Honda	2-dr. hatchback	PC	Yes	No	No	No	No
Integra	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Odyssey	Honda	5-dr. mini-van	MPV	Yes	No	No	No	No
Passport	Honda	5-dr.	SUV	Yes	No	No	No	No
Prelude	Honda	2-dr. coupe	PC	RC	No	No	No	No
Accord Coupe	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Accord Sedan	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Acura 2.3	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.0	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.5RL	Honda	4-dr. sedan	PC	Yes	No	No	Yes	No
Acura NSX	Honda	2-dr.	PC	No	No	No	Yes	No
Acura SLX	Honda	5. dr.	SUV	Yes	No	No	No	No
Civic Coupe	Honda	2-dr. coupe	PC	RC	No	No	No	No
Civic Sedan	Honda	4-dr. sedan	PC	Yes	No	No	No	No
RC - Running Change in model year 1998. No VIN identifier.								
Jaguar XJ Series	Jaguar	4-dr.sdn swb	PC		Yes	No	Yes	No
Jaguar XK8	Jaguar	4-dr. sedan	PC		No	No	Yes	No
Jaguar VDP	Jaguar	4-dr.sdn swb	PC		No	No	No	No
626	Mazda	2-dr.	PC	RC	No	No	No	No
RC - Running Change in model year 1998; from June production vehicles.								

1998 Safety Features								
Make/Model	Manu-facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
129 SL500	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129SL500Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan-swb	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S420	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140S600	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 CL500	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
140 CL600	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
163 ML320	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
163 ML430	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
170 SLK230	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
202 C230	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280Sprt	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C43	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
210 E300	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E55	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr stnwagon	PC	No	Yes	No	Yes	No
220 S430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
220 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
Eclipse	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Mirage	Mitsubishi	2-dr./4-dr. sedan	PC	Yes	No	No	No	No
Montero	Mitsubishi	4-dr.	SUV	VIN	No	No	No	No
VIN - VIN Identifier for Redesigned Air Bag - JA4MR51R6WJ000101								

1998 Safety Features								
Make/Model	Manu-facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Infiniti G20	Nissan	4-dr. sedan	PC	No	Yes	No	No	No
Infiniti Q45	Nissan	4-dr. sedan	PC	RC	Yes	No	Yes	No
Infiniti QX4	Nissan	4-dr wgn	SUV	RC	No	No	No	No
Infiniti I30	Nissan	4-dr. sedan	PC	No	Yes	No	No	No
Altima	Nissan	4-dr. sedan	PC	RC	No	No	No	No
Frontier	Nissan	4-dr.	SUV	RC	No	No	No	No
Maxima	Nissan	4-dr. sedan	PC	No	Available	No	No	No
Pathfinder	Nissan	4-dr.	SUV	RC	No	No	No	No
Sentra	Nissan	4-dr.	PC	RC	No	No	No	No
200SX	Nissan	2-dr.	PC	RC	No	No	No	No
RC - Running Change in model year 1998; Infiniti Q45 VIN start JN1BY31A7WM500008; Infiniti QX4 VIN start JNRAR05YOWW025978; Altima-1N4DL01D2WC100043; Frontier - 1N6DD26S3WC300033; Pathfinder - JN8AR05Y7WW234493; Sentra - 1N4AB41D5WC700018; 200SX - 1N4AB42D2WC500020.								
911	Porsche	2-dr.	PC	No	Yes	No	No	No
Boxster	Porsche	2-dr.	PC	No	Yes	No	No	No
Saab 9-3	Saab	2-dr. hb	PC	No	No	No	Yes	No
Saab 9-3	Saab	4-dr. hb	PC	No	No	No	Yes	No
Saab 9-3	Saab	Convertible	PC	No	No	No	Yes	No
Saab 9-5	Saab	4-dr. sedan	PC	No	No	No	Yes	No
Forester	Subaru	4-dr.	PC	RC	No	No	No	No
Impreza	Subaru	4-dr. sedan	PC	RC	No	No	No	No
Legacy	Subaru	4-dr. sedan	PC	RC	Available	No	No	No
RC - Running Change in model year 1998; Legacy starting VIN - Sedan W*20486, S/W W*307101, Outback W*617283; Impreza - W*400001 or W*500001 or W*800001; Forester - W*750001.								
Lexus LX470	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Lexus RX300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus SC300/400	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
LexusLS400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus GS300/400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus ES300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Avalon	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Camry	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Celica	Toyota	2-dr.	PC	Yes	No	No	Yes	No
Corolla	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Land Cruiser	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Paseo	Toyota	2-dr. coupe	PC	Yes	No	No	Yes	No
RAV-4	Toyota	2-dr.	MPV	Yes	No	No	Yes	No
Sienna	Toyota	Van	VAN	Yes	No	No	Yes	No
Solara	Toyota	2-dr coupe	PC	Yes	No	No	Yes	No
Tacoma	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
Tercel	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Tundra	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
T150	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
4 Runner	Toyota	4-dr.	SUV	Yes	No	No	No	No

1998 Safety Features								
Make/Model	Manu-facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Audi A4	Volkswagon	4-dr	PC	RC	Yes	No	Yes	No
Audi A6	Volkswagon	wagon	PC	Yes	Yes	No	Yes	No
Audi A8	Volkswagon	sedan	PC	RC	Yes	No	Yes	No
Audi Cabriolet	Volkswagon	2-dr.	PC	RC	No	No	Yes	No
Cabrio	Volkswagon	2-dr	PC	No	Available	No	Yes	No
EuroVan	Volkswagon	Van	Van	Yes	No	No	No	No
GTI	Volkswagon	2-dr	PC	No	Available	No	Yes	No
Golf	Volkswagon	2-dr	PC	No	Available	No	Yes	No
Jetta	Volkswagon	4-dr.	PC	No	Available	No	Yes	No
New Beetle	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Passat	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Passat Wagon	Volkswagon	4-dr	PC	No	Yes	No	Yes	No
C70	Volvo	All	PC	RC	Yes	No	Yes	No
V70	Volvo	All	PC	RC	Yes	No	Yes	No
S80	Volvo	All	PC	No		No	No	No
S90/V90	Volvo	All	PC	No	Yes	No	Yes	No
RC - Running Change in model year 1998; V70 starting VIN - 447706; C70 - 001920.								

1999 RABSS Safety Features								
Make/Model	Manu facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
3 Series	BMW	4-dr. sedan	PC	Yes	Yes	No	Yes	No
5 Series	BMW	4-dr. sedan	PC	Yes	Yes	Yes	Yes	No
7 Series	BMW	4-dr. sedan	PC	Yes	Yes	Yes	Yes	No
M3	BMW	2-dr. coupe	PC	Yes	Yes	No	Yes	No
Z3	BMW	2-dr. coupe	PC	Yes	Yes	No	Yes	No
Dodge Avenger	Chrysler	2-dr.	PC	Yes	No	No	No	No
Dodge Caravan	Chrysler	minivan	VAN	Yes	No	No	No	No
Dodge Dakota	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Durango	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Intrepid	Chrysler	2-dr.	PC	Yes	No	No	No	No
Dodge Neon	Chrysler	2-dr./4-dr.	PC	Yes	No	No	No	No
Dodge Ram Pickup	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Ram Wagon	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Stratus	Chrysler	4-dr.	PC	Yes	No	No	No	No
Dodge Viper	Chrysler	2-dr.	PC	Yes	No	No	No	No
Eagle Talon	Chrysler	2-dr.	PC	Yes	No	No	No	No
Jeep Cherokee	Chrysler	4-dr.	MPV	Yes	No	No	No	No
Jeep Grand Cherokee	Chrysler	4-dr.	MPV	Yes	No	No	No	No
Jeep Wrangler	Chrysler	4-dr.	MPV	Yes	No	No	No	No
LHS	Chrysler	4-dr.	PC	Yes	No	No	No	No
Plymouth Prowler	Chrysler	2-dr.	PC	Yes	No	No	No	No
Plymouth Voyager	Chrysler	minivan	VAN	Yes	No	No	No	No
Sebring	Chrysler	2-dr.	PC	Yes	No	No	No	No
Town & Country	Chrysler	minivan	VAN	Yes	No	No	No	No
300M	Chrysler	4-dr.	PC	Yes	No	No	No	No
Leganza	Daewoo	4-dr.	PC		No	No	Yes	No
Nubira	Daewoo	2-dr.	PC		No	No	Yes	No
F131	Ferrari/Fiat	2-dr. coupe	PC		No	No	Yes	No
Contour	Ford	4-dr sedan	PC	Yes	No	No	No	No
Cougar	Ford	2-dr coupe	PC	Yes	Available	No	No	No
Crown Victoria	Ford	4-dr sedan	PC	Yes	No	No	No	No
Econoline	Ford	Van	VAN	Yes	No	No	Yes	No
Escort	Ford	2-dr	PC	Yes	No	No	No	No
Expedition	Ford	4-dr	SUV	Yes	No	No	No	No
Explorer	Ford	4-dr/ 2-dr	SUV	Yes	Available	No	No	No
F150/F250 Light Duty	Ford	2-dr	Truck	Yes	No	No	No	No
Mustang	Ford	2-dr	PC	Yes	No	No	No	No
Ranger	Ford	2-dr	Truck	Yes	No	No	No	No
Taurus	Ford	4-dr sedan	PC	Yes	No	No	No	No
Windstar	Ford	Wagon Van	VAN	Yes	Available	No	No	No
Lincoln Continental	Ford	4-dr sedan	PC	Yes	Yes	No	No	No
Lincoln LS	Ford		PC	Yes	No	No	No	No
Lincoln Navigator	Ford	4-dr	SUV	Yes	No	No	No	No
Lincoln Town Car	Ford	4-dr sedan	PC	Yes	Yes	No	No	No

1999 Safety Features								
Make/Model	Manufacturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Mercury Grand Marquis	Ford	4-dr	PC	Yes	No	No	No	No
Mercury Mountaineer	Ford	4-dr/2-dr	SUV	Yes	Available	No	No	No
Mercury Mystique	Ford		PC	Yes	No	No	No	No
Mercury Sable	Ford	4-dr sedan	PC	Yes	No	No	No	No
Mercury Tracer	Ford	4-dr sedan	PC	Yes	No	No	No	No
Mercury Villager	Ford	Van	VAN	Yes	No	No	No	No
Buick Century	GM	Sedan	PC	Yes	No	No	No	No
Buick LeSabre	GM	4-dr	PC	Yes	Yes	No	No	No
Buick Park Avenue	GM	4-dr	PC	Yes	No	No	No	No
Buick Regal	GM	Sedan	PC	Yes	No	No	No	No
Buick Riviera	GM	4-dr	PC	Yes	No	No	No	No
Cadillac Catera	GM	4-dr	PC	Yes	Available	No	Yes	No
Cadillac Deville	GM	Sedan	PC	Yes	Yes	No	Yes	No
Cadillac Eldorado	GM	2-dr	PC	Yes	No	No	No	No
Cadillac Seville	GM	4-dr	PC	Yes	Yes	No	Yes	No
Chev Astro	GM	Van	Van	Yes	No	No	No	No
Chev Blazer	GM	2-dr	SUV	Yes	No	No	No	No
Chev Cavalier	GM	Sedan	PC	Yes	No	No	No	No
Chev Camaro	GM	Coupe/conv.	PC	Yes	No	No	No	No
Chev Corvette	GM	Coupe,conv.,HT. coupe	PC	Yes	No	No	No	No
Chev Express	GM	Cargo,10+,20+,30+ pass.	Van	Yes	No	No	No	No
Chev Impala	GM	Sedan	PC	Yes	No	No	No	No
Chev Lumina	GM	Sedan	PC	Yes	No	No	No	No
Chev Malibu	GM	Sedan	PC	Yes	No	No	No	No
Chev Prizm	GM	2-dr	PC	Yes	Yes	No	Yes	No
Chev Suburban	GM	Suburban	SUV	Yes	No	No	No	No
Chev Tahoe	GM	2-dr,4-dr	SUV	Yes	Yes	No	Yes	Yes
Chev Venture	GM	4-dr	VAN	Yes	Yes	No	Yes	No
Chev 7200 GVWR	GM	reg/ext. cab	Pickup	Yes	No	No	No	No
EV1	GM	2-dr	PC	Yes	No	No	No	No
Geo Metro	GM	4-dr/2-dr	PC	Yes	No	No	No	No
Geo Tracker	GM	2-dr/4-dr	MPV	Yes	No	No	No	No
Monte Carlo	GM	Coupe	PC	Yes	No	No	No	No
Olds Cutlass	GM	Sedan	PC	Yes	No	No	No	No
Olds Alero	GM	Coupe	PC	Yes	No	No	No	No
Olds Amora	GM	4-dr	PC	Yes	No	No	No	No
Olds Intrigue	GM	Sedan	PC	Yes	No	No	No	No
Olds 88	GM	4-dr	PC	Yes	No	No	No	No

1999 Safety Features								
Make/Model	Manu facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Pont Bonneville	GM	4-dr	PC	Yes	No	No	No	No
Pont Firebird	GM	Coupe	PC	Yes	No	No	No	No
Pont Firebird	GM	Convertible	PC	Yes	No	No	No	No
Pont Grand Am	GM	Coupe	PC	Yes	No	No	No	No
Pont Grand Am	GM	Sedan	PC	Yes	No	No	No	No
Pont Grand Prix	GM	Sedan/Coupe	PC	Yes	No	No	No	No
Pontiac Montana	GM	4-dr	VAN	Yes	Yes	No	No	No
Pont Sunfire	GM	Coupe	PC	Yes	No	No	No	No
Pont Transport	GM	4-dr	VAN	Yes	Yes	No	No	No
Saturn SL, SL1, SL2	GM	Sedan	PC	Yes	No	No	No	No
Saturn Wagon	GM	Wagon	PC	Yes	No	No	No	No
Silhouette	GM	Reg. Cab	Truck	Yes	Yes	No	No	No
Accord	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Acura 2.3CL	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.0CL	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.5RL	Honda	4-dr sedan	PC	Yes	Yes	No	Yes	Yes
Acura NSX	Honda	2-dr	PC	No	No	No	Yes	No
Acura SLX	Honda	5-dr.	SUV	Yes	No	No	No	No
Civic	Honda	4-dr. sedan	PC	Yes	No	No	No	No
CR-V	Honda	2-dr.	SUV	Yes	No	No	Yes	No
EV Plus	Honda	2-dr. hatchback	PC	Yes	No	No	No	No
Integra	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Odyssey	Honda	5-dr. minivan	VAN	Yes	No	No	No	No
Passport	Honda	5-dr.	SUV	Yes	No	No	No	No
Prelude	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Accent	Hyundai	2-dr.	PC	Yes	No	No	No	No
Elantra	Hyundai	4-dr. sedan	PC	Yes	No	No	Yes	No
Sonata	Hyundai	4-dr. sedan	PC	Yes	Available	No	Yes	No
Tiburon	Hyundai	2-dr.	PC	Yes	No	No	No	No
Amigo	Isuzu	2-dr	MPV		No	No	No	No
Rodeo	Isuzu	4-dr.	SUV		No	No	No	No
Trooper	Isuzu	4-dr.	SUV		No	No	No	No
Jaguar VDP	Jaguar	4-dr. sdn swb	PC		Yes	No	No	No
Jaguar XJ Series	Jaguar	4-dr. sdn swb	PC		Yes	No	Yes	No
Jaguar XK8	Jaguar	4-dr. sedan	PC		No	No	Yes	No
Jaguar X200	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Jaguar X300	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Jaguar X350	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Sephia	Kia	4-dr sedan	PC		No	No	No	No
Sportage	Kia	2-dr	MPV		No	No	No	No
Discovery Series II	Land Rover	4-dr.	SUV	Yes	No	No	Yes	No
Ranger Rover 4.0SE, 4.6 HSE	Land Rover	4-dr.	SUV	RC	Yes	No	Yes	No
RC - Running Change in model year 1999; VIN code of "PV" in positions 4-5.								

1999 Safety Features								
Make/Model	Manu facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Millenia	Mazda	2-dr	PC	Yes	No	No	No	No
MX-5	Mazda	2-dr	PC	Yes	No	No	No	No
Protégé	Mazda	2-dr	PC	Yes	No	No	No	No
626	Mazda	2-dr	PC	Yes	No	No	No	No
202 C43	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C230	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280Sprt	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 CL500	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
140 CL600	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
210 E55	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E300	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr stnwagon	PC	No	Yes	No	Yes	No
210 E430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
163 ML320	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
163 ML430	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr.sedan-swb	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S420	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S600	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
220 S430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes &	No
220 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes &	No
129 SL500	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL500Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
170 SLK230	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
Diamante	Mitsubishi	4-dr. sedan	PC	Yes	No	No	Yes	No
Eclipse	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Eclipse Spyd	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Galant LS, GTZ	Mitsubishi	4-dr. sedan	PC	Yes	Yes	No	No	No
Galant ES, DE	Mitsubishi	4-dr. sedan	PC	Yes	Available	No	No	No
Mirage	Mitsubishi	2-dr./4-	PC	Yes	No	No	No	No
Montero	Mitsubishi	4-dr.	SUV	Yes	No	No	No	No
Montero Sport	Mitsubishi	4-dr.	SUV	Yes	No	No	No	No
3000Gt	Mitsubishi	2-dr.	PC	Yes	No	No	No	No

1999 Safety Features								
Make/Model	Manu facturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Infiniti G20	Nissan	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Infiniti I30	Nissan	4-dr. sedan	PC	No	Yes	No	Yes	No
Infiniti Q45	Nissan	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Infiniti QX4	Nissan	4-dr wgn	SUV	Yes	Available	No	Available	No
Altima	Nissan	4-dr.	PC	Yes	No	No	No	No
Frontier	Nissan	4-dr.	SUV	Yes	No	No	No	No
Maxima	Nissan	4-dr. sedan	PC	No	Available	No	Yes	No
Pathfinder	Nissan	4-dr.	SUV	Yes	Available	No	Available	No
Sentra	Nissan	4-dr.	PC	Yes	No	No	No	No
200SX	Nissan	2-dr	PC	Yes	No	No	No	No
Boxster	Porsche	2-dr. coupe	PC	No	Yes	No	No	No
911	Porsche	2-dr. coupe	PC	No	Yes	No	No	No
Bentley Arnage	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Bentley Azure	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Bentley Continental	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Silver Seraph	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Silver Spur Park Ward	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Saab 9-3	Saab	2-DOOR HB	PC	Yes	Yes	No	No	No
Saab 9-3	Saab	4-DOOR HB	PC	Yes	Yes	No	No	No
Saab 9-3	Saab	Convertible	PC	Yes	Yes	No	No	No
Saab 9-5	Saab	4-DR SEDAN	PC	Yes	Yes	No	No	No
Forester	Subaru	4-dr	PC	Yes	No	No	No	No
Impreza	Subaru	4-dr	PC	Yes	No	No	No	No
Legacy	Subaru	4-dr	PC	Yes	No	No	No	No
Esteem	Suzuki	2-dr. sedan	PC	Yes	No	No	No	No
Vitara	Suzuki	4-dr. sedan	PC	Yes	No	No	No	No
Avalon	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Celica	Toyota	2-dr	PC	Yes	No	No	No	No
Camry	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Corolla	Toyota	4-dr. sedan	PC	Yes	Yes	No	No	No
Landcruiser	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Paseo	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
RAV-4	Toyota	4-dr.	MPV	Yes	No	No	Yes	No
Sienna	Toyota	Van	VAN	Yes	No	No	Yes	No
Solara	Toyota	2-dr coupe	PC	Yes	Available	No	Yes	No
Tacoma	Toyota	2-dr. P/U	PC	Yes	No	No	Yes	No
Tercel	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No

1999 Safety Features								
Make/Model	Manufacturer	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Tundra	Toyota	2-dr. P/U	PC	Yes	No	No	Yes	No
T-150	Toyota	2-dr	Truck	Yes	No	No	No	No
4-Runner	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Lexus ES300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus GS300/400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus LS400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus LX 470	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Lexus RX 300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus SC300/300	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Audi A4	Volkswagon	wagon	PC	Yes	Yes	No	Yes	No
Audi A6	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Audi A8	Volkswagon	sedan	PC	Yes	Yes	No	Yes	No
Audi Cabriolet	Volkswagon	2-dr.	PC	Yes	No	No	Yes	No
Cabrio	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
EuroVan	Volkswagon	Van	VAN	Yes	No	No	Yes	No
Golf	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
GTI	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Jetta	Volkswagon	4-dr. sedan	PC	Yes	Yes	No	Yes	No
New Beetle	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Passat	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Passat Wagon	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
C70	Volvo	All	PC	Yes	Yes	No	Yes	No
S70/V70	Volvo	All	PC	Yes	Yes	No	Yes	No
S80	Volvo	All	PC	No	Yes	No	Yes	No
S90/V90	Volvo	All	PC	No	Yes	No	Yes	No

Screen Name: Function -- Deployment
Variable Name: Air Bag Deployment

Variable Name: System Deployment

Element Attributes:

Deployed during crash (as a result of impact)
Deployed inadvertently just prior to crash
Deployed, detail unknown
Deployed as a result of a noncollision event during crash sequence (e.g., fire, explosion, electrical)
Unknown if deployed
Nondeployed

Source: Vehicle inspection

Remarks:

Deployed during crash (as a result of impact)

is used when the vehicle is equipped with an air bag and the air bag deployed as a result of an impact which produced a longitudinal deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag. Note, an air bag is not designed to deploy in every collision.

Deployed inadvertently just prior to crash

is used when an air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in an crash.

Deployed, crash details unknown

is used when the researcher cannot determine if the air bag deployed (1) prior to the crash or (2) during the crash as a result of an impact which produced a deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag.

Deployed as a result of a noncollision event during crash sequence (*e.g.*, fire, explosion, electrical)

is used if the air bag deploys during an crash but not as a result of an impact.

For example, a vehicular fire, occurring as a result of:

- an impact or
- a noncollision event

prior to any impacts to this vehicle.

Screen Name: Function -- Deployment (cont'd)
Variable Name: Air Bag Deployment (cont'd)

Unknown if deployed

is used when it is known that the vehicle was equipped with an air bag but the researcher is unable to determine if the air bag deployed (for whatever reason). For example, if the vehicle was sufficiently damaged so that a determination of deployment cannot be made from the vehicle inspection or the deployment status at the time of the crash cannot be determined..

Non-deployed

is used when an air bag equipped vehicle has one or more impacts, and the air bag did not inflate during the crash.

Screen Name: Function -- Indications of Failure
Variable Name: Indications of Air Bag Failure

Element Attributes:

No
Yes (specify):
Unknown

Source: Vehicle inspection

Remarks:

This variable flags "indications of air bag failures" and means that something abnormal has occurred to the air bag system. It may not necessarily mean that the air bag system was defective.

A vehicle inspection is required in order to report an indication of air bag failure because the vehicle's deceleration may have been below the ***threshold*** for the air bag's deployment.

No

is used whenever the air bag deployed and there are no indications of air bag failure. Also use this when an air bag did not deploy and no failure is suspected and the vehicle inspection indicates that the deceleration sustained by the vehicle was near or below the ***deployment threshold***.

Yes, specify

is used whenever an indication of air bag failure is suspected and specify the failure. An indication of air bag failure could be a cut in or blowout of the fabric, a rupture along a fabric seam, a cover which does not open properly causing a misaligned deployment, partial inflation, or any number of other problems. If an indication of air bag failure is suspected, then document the condition with images, then call your zone center for assistance.

Unknown

is used when it is not known if the bag failed

Screen Name: Function -- Switch Type
Variable Name: Type of Cutoff Switch

Element Attributes:

None present
Originally equipped
Retro fit
Switch present, type unknown
Unknown if switch present

Source: Vehicle inspection

Remarks:

Air bag cutoff switches were designed to be installed by manufacturers in vehicles with only one row of occupant seating. This was done so that if a child seat was used, the air bag could be turned off. More recently NHTSA has permitted the public to request air bag cutoff switches to be installed by dealers. The retro fit switch can be located in the glove compartment. **Close up images of the switch are required.**

None present
is used when there is no air bag cutoff switch present for this occupant position.

Originally equipped
is used when a vehicle is originally equipped by the manufacturer with an air bag cutoff switch for this occupant position is present. This switch will not be present for the driver's position.

Retro fit
is used when an air bag cutoff switch for this occupant position has been added.

Switch present, type unknown
is used when an air bag cutoff switch for this occupant position is present and it is not known if it is original or retro fit.

Unknown if switch present
is used when it is not known if an air bag cutoff switch is present

Screen Name: Function -- Switch Status
Variable Name: Cutoff Switch Position Status

Element Attributes:

Switch on
Switch off
Switch status unknown.
[Unknown if switch present]
[None present]

Source: Vehicle inspection

Remarks:

Air bag cutoff switches were designed to be installed by manufacturers in vehicles with only one row of occupant seating. This was done so that if a child seat was used, the air bag could be turned off. More recently NHTSA has permitted the public to request air bag cutoff switches to be installed by dealers. The retro fit switch can be located in the glove compartment. Close up images of the switch are required.

Switch on

is used when an air bag cutoff switch for this occupant position is present and is in the on position.

Switch off

is used when an air bag cutoff switch for this occupant position is present and is in the off position.

Switch position unknown

is used when an air bag cutoff switch for this occupant position is present and its position is unknown

None present

is precoded when there is no air bag cutoff switch present for this occupant position.

Unknown if switch present

is precoded when it is not known if an air cutoff switch is present

Screen Name: Damage – Flap Open at Tear Points?
Variable Name: Did Air Bag Module Cover Flap(s) Open at Designated Tear Points?

Element Attributes:

No
Yes

Unknown flaps / seams opened at tear points

Source: Vehicle inspection.

Remarks:

A designated tear point is a weakened area of the flap material designed to allow the air bag easy escape from its storage area during deployment. Some air bags in the seat cushion and seat back may not have cover flaps, but will deploy through a seam that separates during the air bag deployment.

No

is used when it can be determined that the module cover flap(s) for this air bag opened somewhere other than their designated tear points. A non-linear tear in the flap is an indication that the flap opened irregularly, not at the designated tear point.

Yes

is used when it can be determined that the module cover flap(s) for this air bag opened up at their designated tear points. Linear and symmetrical tears are good indications of proper separation of the cover flap(s) at their designated tear points.

Unknown if flaps / seams open at tear points

is used when it is not known if the air bag opened at the tear points.

Screen Name: Damage -- Flap Damaged
Variable Name: Were the Cover Flap(s) Damaged

Element Attributes:

No
Yes (specify)
Unknown

Source: Vehicle inspection.

Remarks:

No

is used when it can be determined that no damage was present on the air bag module cover flap(s). Normal separation/tearing at the designated tear points does not constitute damage.

Yes (specify)

is used when it can be determined that the air bag module cover flap(s) sustained damage. Abnormal separation/tearing at the designated tear points constitutes damage. Damage can also be cuts, tears, holes, burns, abrasions, etc.. The researcher must specify the type of damage that is being reported.

Unknown

is used when it cannot be determined if the air bag flap(s) sustained damage.

Screen Name: Damage -- Damage to the Air Bag?
Variable Name: Was there damage to the air bag?

Element Attributes:

Not damaged

Yes — Air Bag Damaged
Ruptured
Cut
Torn
Holed
Burned
Abraded
Other damage (specify)
Damaged, details unknown
Deployed, Unknown if damaged

Source: Vehicle inspection

Remarks:

Damage to the air bag must occur during the crash sequence. If multiple damage types apply select the attribute that most deteriorates the effectiveness of the air bag. If you cannot make this determination then select the attribute in a hierarchical manner from the top of the list down.

Not damaged
is used when no damage to the air bag for this occupant position was sustained.

Ruptured
describes damage to the air bag that resembles a stellate or starlike pattern of damage, with multiple tears originating from a single point of origin.

Cut
describes openings in the air bag which are generally linear and have smooth edges.

Torn
describes openings which have ragged edges but which are generally linear in appearance.

Holed
describes damage which is circular in appearance with or without ragged edges.

Burned
describes damage resulting from heat which scorches, melts or burns the bag.

Abraded
is a pattern of damage to the surface of the bag that appears as a fraying of the surface threads.

Screen Name: Damage -- Damage to the Air Bag? (cont'd)
Variable Name: Was there damage to the air bag? (cont'd)

Other damage (specify)
is used to describe damage which is not captured in any of the attributes above.

Damaged, details unknown
is used when it is known that the air bag sustained damage, but the type of damage cannot be determined.

Deployed, unknown if damaged
is used when cannot be determined if the air bag sustained damage.

Screen Name: Damage -- Source of Damage
Variable Name: Source of Air Bag Damage

Element Attributes:

Object worn by occupant (specify)
Object carried by occupant (specify)
Adaptive/assistive controls, (specify)
Cover flaps
Fire in vehicle
Thermal burns
Windshield

Other damage source (specify)
Rescue or emergency efforts
Damaged unknown source
[Air Bag Not Damaged]

Source: Vehicle inspection

Remarks:

**** "Cover flaps" and "Windshield" are not attributes at this time. ****
They need to be added to NASSMAIN.

This is a hierarchical variable, that is, if more than one element applies, then select the first attribute that applies. The attribute **Rescue or emergency efforts** should **only** be used when:

- no other sources of damage apply, **AND**
- it is known the damage was from rescue or emergency efforts, or any other post-crash source.

Object worn by occupant (specify)

is selected when the object is fastened, attached, or worn by the occupant. Be sure to specify the object.

Object carried by occupant (specify)

is used when the object is held in the mouth, the hand(s), arm(s), etc., by the occupant. Be sure to specify the object.

Adaptive/assistive controls (specify)

is used when adaptive/assistive controls damages the air bag for this occupant position. Be sure to specify the object / control.

Fire in vehicle

is used when there was a fire in the occupant compartment which damaged the air bag.

Thermal burns

is used when the air bag is burned or scorched by the inflation or chemicals.

Screen Name: Damage -- Source of Damage (cont'd)
Variable Name: Source of Air Bag Damage (cont'd)

Other damage source (specify)
is used whenever there is damage to the air bag and it cannot be fit into any of the categories above.

Rescue or emergency efforts
is used **only** when:

- no other sources of damage apply, **AND**
- it is known the damage was from rescue or emergency efforts, or any other post-crash source

Damaged, unknown source
is used when there is damage to the air bag, but the source of the damage cannot be determined.

Screen Name: Damage -- Tethered
Variable Name: Was the Air Bag Tethered

Element Attributes:

Enter number of tethers
Indeterminate
Unknown

Source: Vehicle inspection

Remarks:

A tether is a strap that is used to shape the air bag upon deployment. Stitching on the air bag is a good indicator of the presence of tethers.

0 (zero)
is used when there are no tethers present on the air bag.

Enter number of tethers
is used when the air bag has tethers. Their number should be specified.

Indeterminate
is used when it is known that the air bag has tethers, but the number of tethers is unknown

Unknown
is used when it is not known if the air bag was tethered.

Screen Name: Damage -- Vent Ports
Variable Name: Did the Air Bag Have Vent Ports?

Element Attributes:

Enter number of vent ports
Indeterminate
Unknown if vent ports present

Source: Vehicle inspection

Remarks:

Vent ports are circular holes designed for the venting of gasses resulting from the deployment process of the air bag. The location of the ports is normally on the rear surface of the air bag.

0 (zero)
is used when there are no vent ports present on the air bag.

Enter number of vent ports
is used when the air bag has vent ports. Their number should be specified.

Indeterminate
is used when it is known that the air bag has vent ports, but the number of vent ports is unknown.

Unknown
is used when it is not known if the air bag has vent ports

Screen Name: Occupant – Other Contact
Variable Name: Was the Air Bag in this Occupant's Position Contacted by Another Occupant?

Element Attributes:

No
Yes (specify)
Deployed, unknown if other occupant contact to air bag

Source: Vehicle inspection

Remarks:

No

is used when there is no contact to the air bag for this occupant position by any occupant other than the occupant in this occupant position.

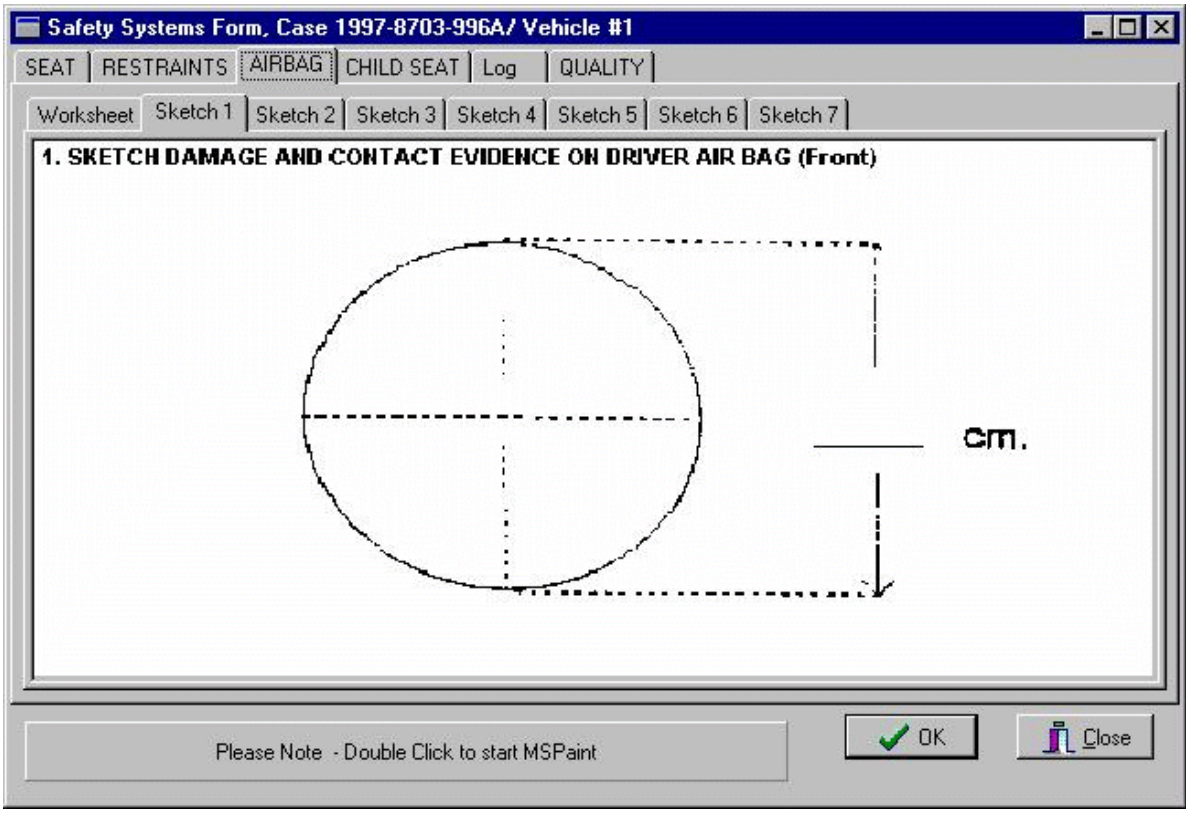
Yes (specify)

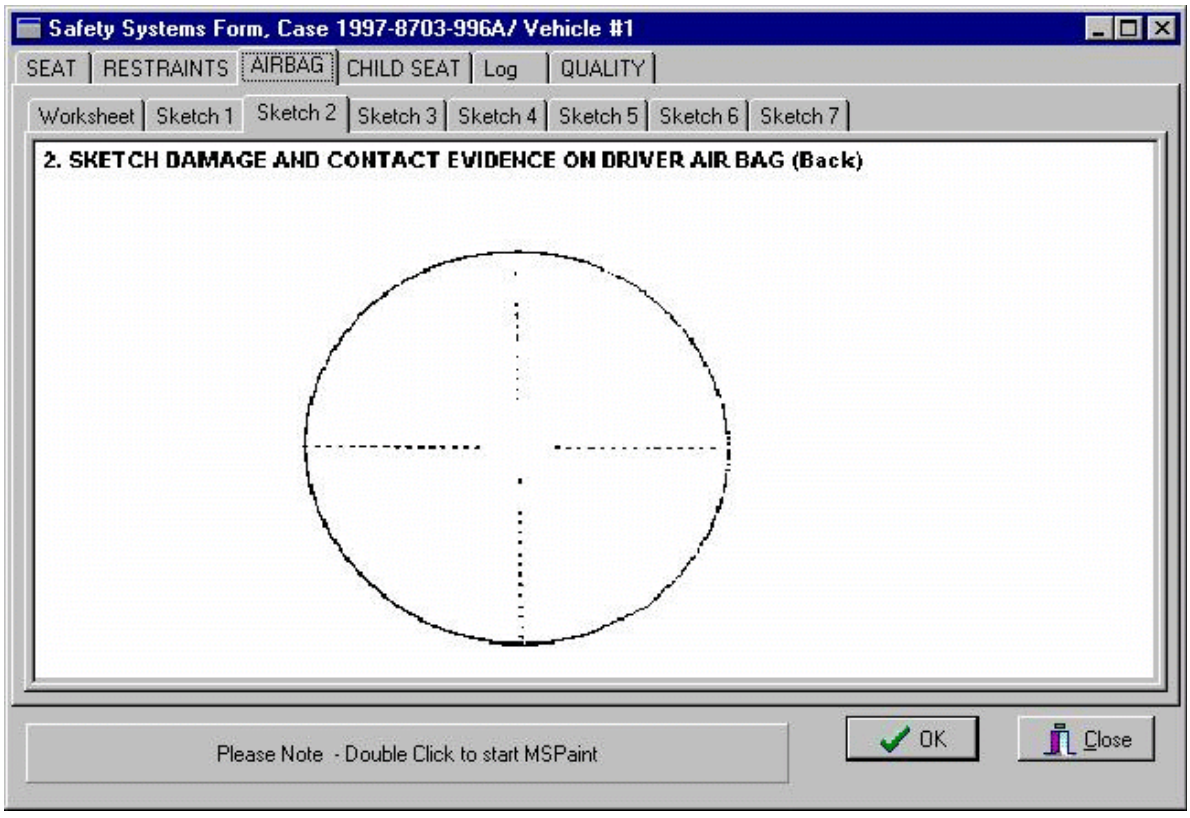
Identify the occupant and describe the type of contact. Examples include:

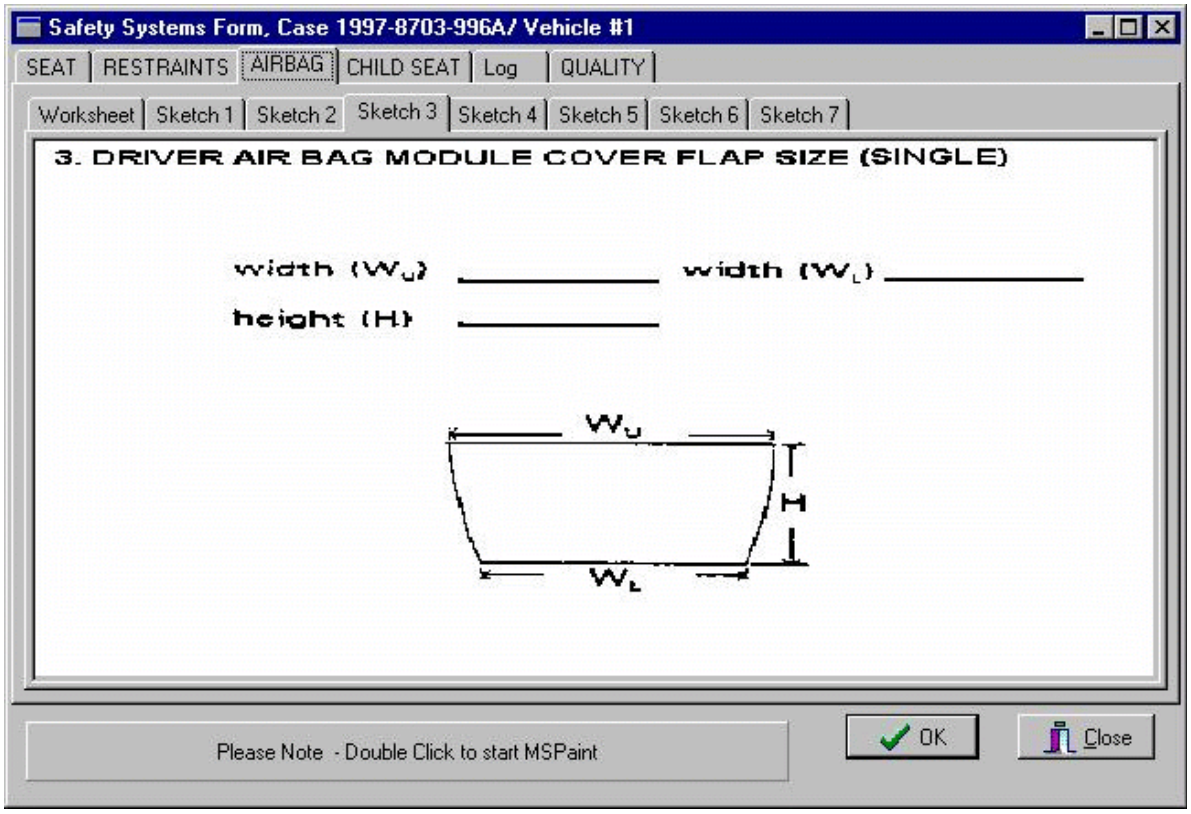
- when a driver contacts the passenger air bag and vice-versa
- when the center front seat occupant strikes the outer seat position air bag and
- when multiple occupants in the same seat position contact one air bag.

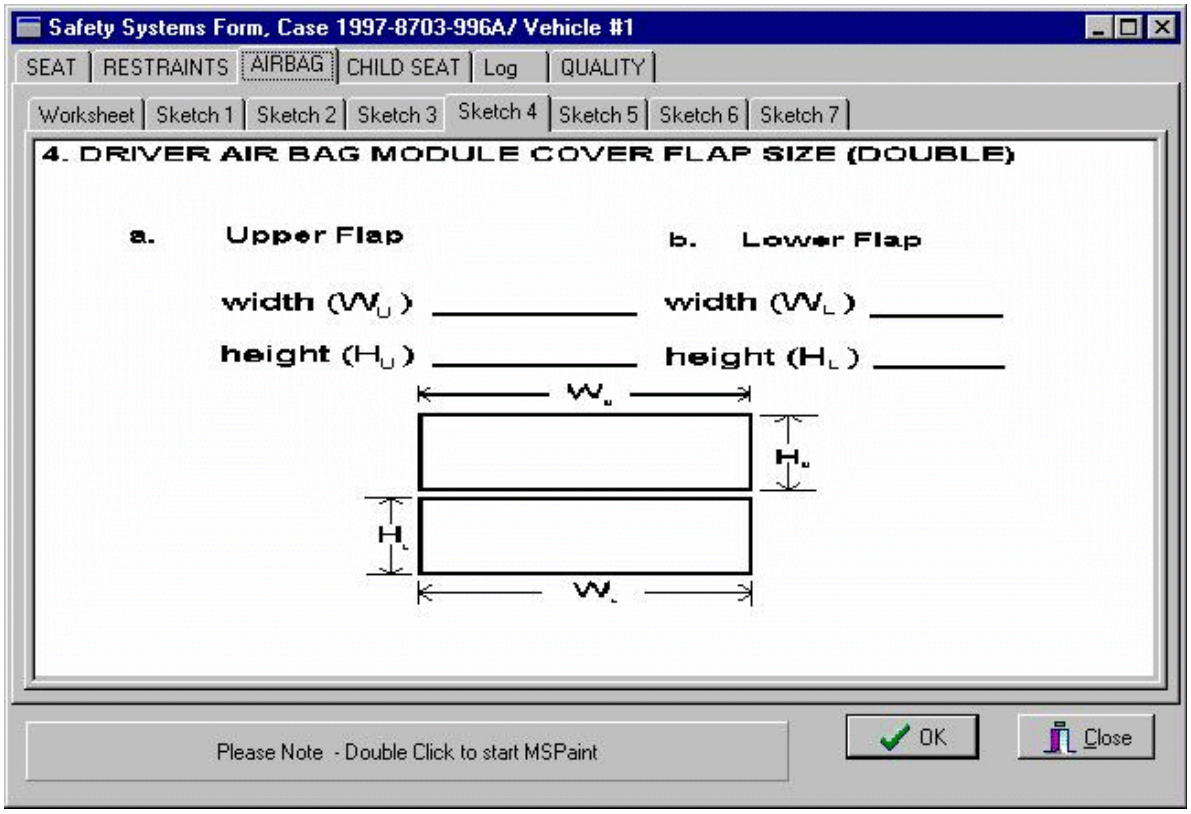
Deployed, unknown if other occupant contact to air bag

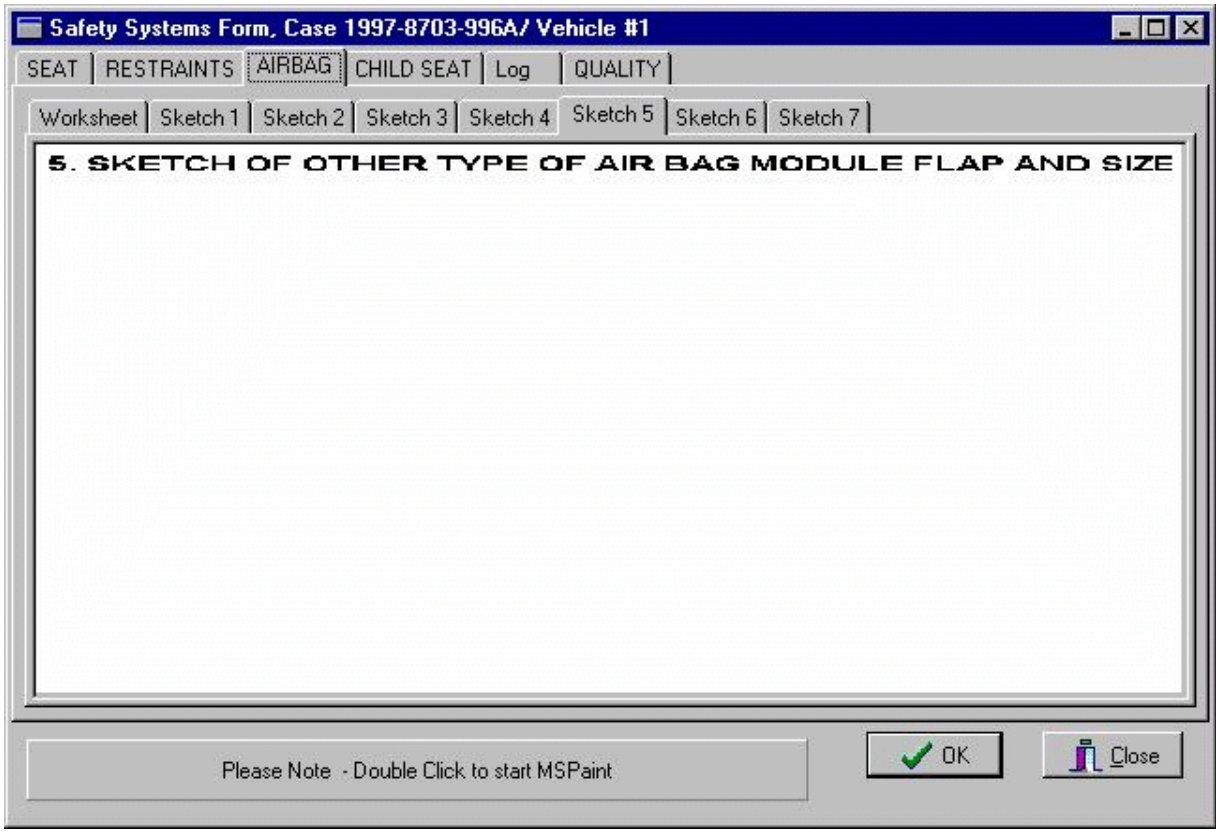
is used when it is not known if another occupant contacted the air bag.

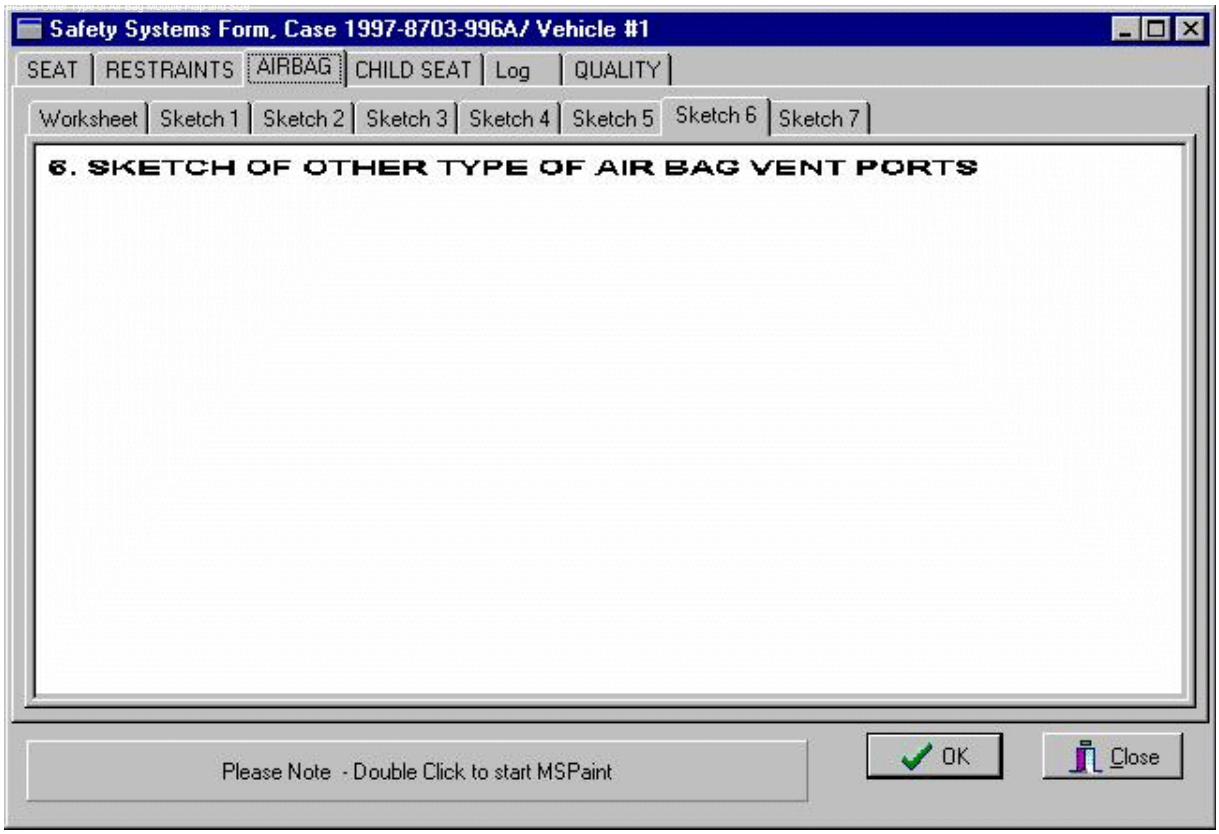

Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
1. SKETCH DAMAGE AND CONTACT EVIDENCE ON DRIVER AIR BAG (Front)
cm.
Please Note - Double Click to start MSPaint
OK
Close

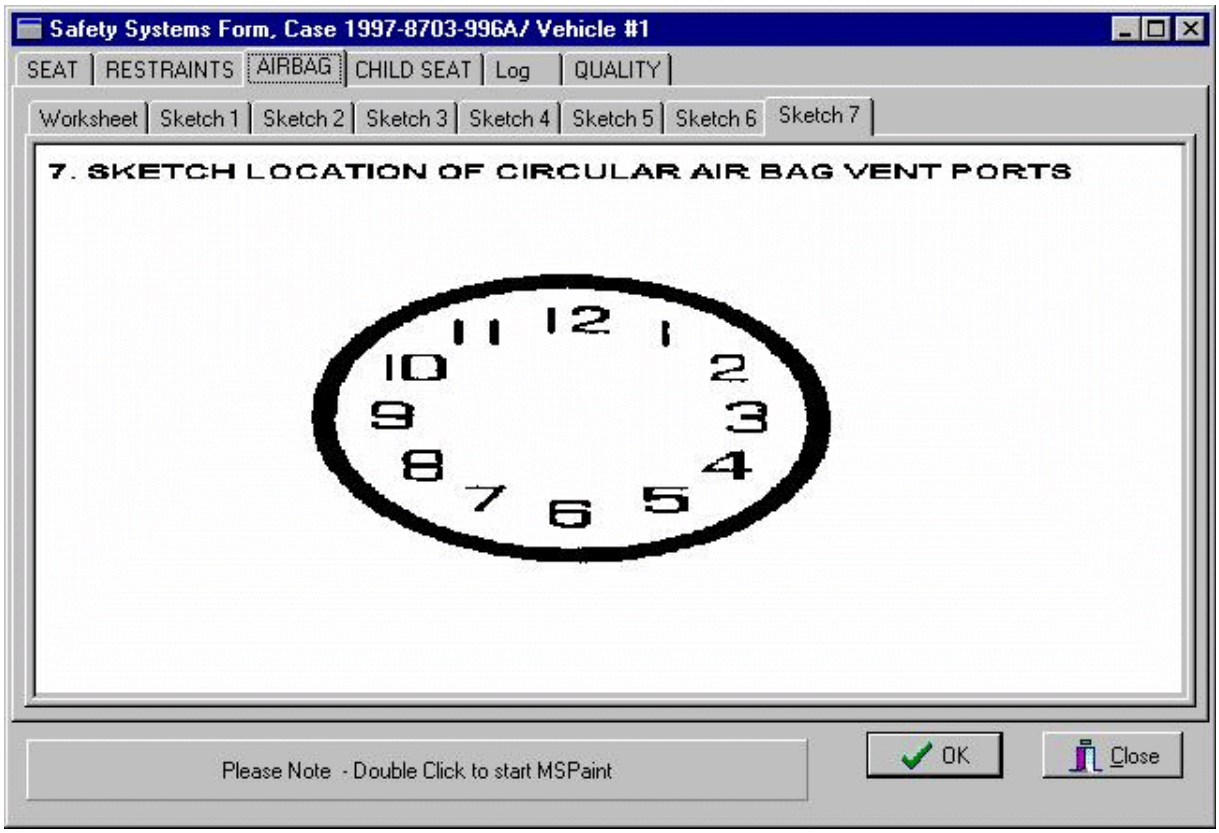

Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
2. SKETCH DAMAGE AND CONTACT EVIDENCE ON DRIVER AIR BAG (Back)
Please Note - Double Click to start MSPaint
OK
Close

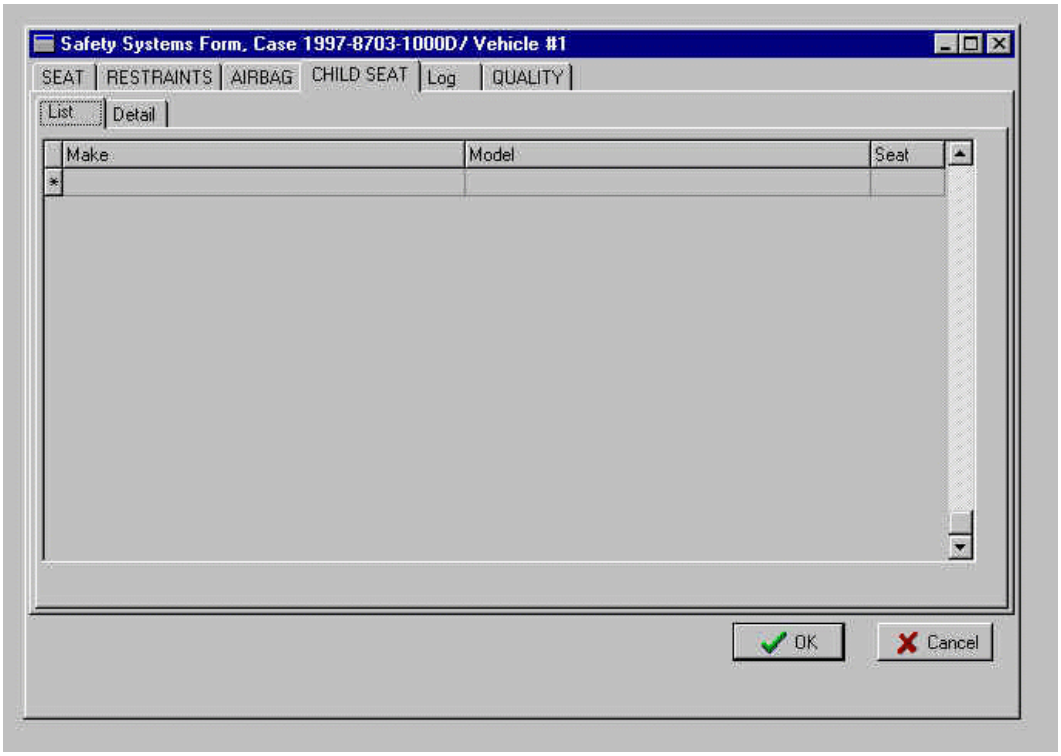

Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
3. DRIVER AIR BAG MODULE COVER FLAP SIZE (SINGLE)
width (W_U) _____
width (W_L) _____
height (H) _____
W_U
H
W_L
Please Note - Double Click to start MSPaint
OK
Close


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
4. DRIVER AIR BAG MODULE COVER FLAP SIZE (DOUBLE)
a. Upper Flap
b. Lower Flap
width (W_U) _____
width (W_L) _____
height (H_U) _____
height (H_L) _____
W_u
H_u
H_L
W_L
Please Note - Double Click to start MSPaint
OK
Close

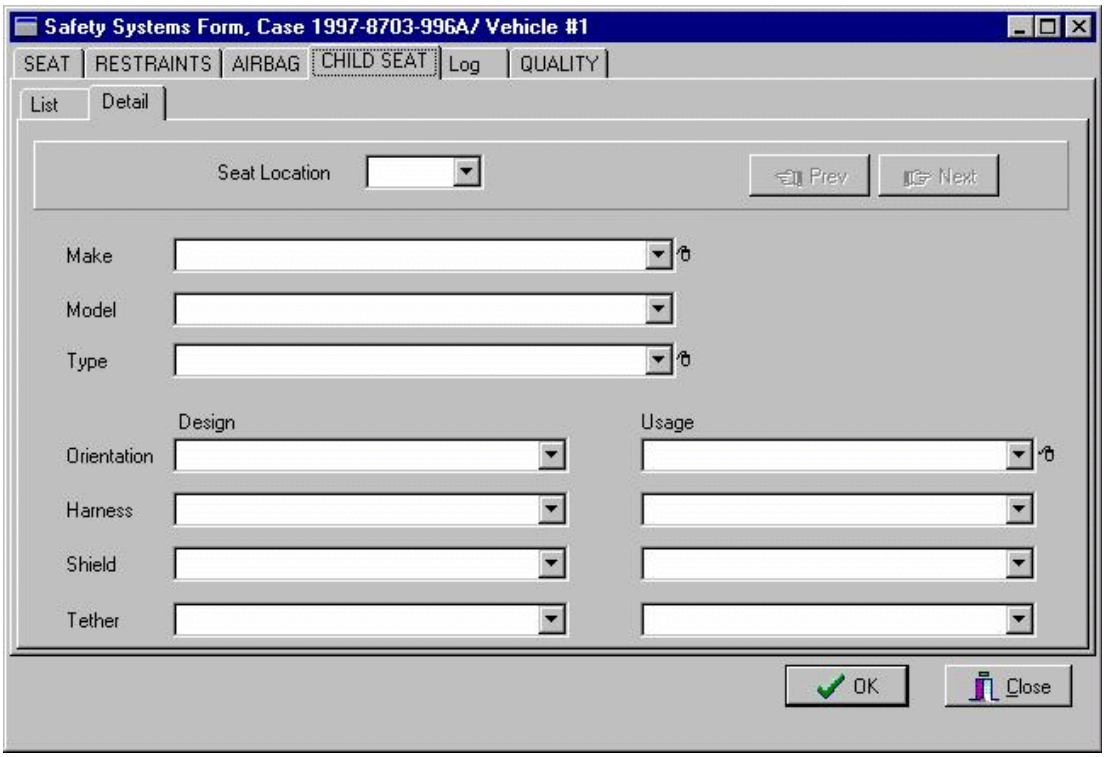

Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
5. SKETCH OF OTHER TYPE OF AIR BAG MODULE FLAP AND SIZE
Please Note - Double Click to start MSPaint
OK
Close


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
6. SKETCH OF OTHER TYPE OF AIR BAG VENT PORTS
Please Note - Double Click to start MSPaint
OK
Close


Safety Systems Form, Case 1997-8703-996A/ Vehicle #1
SEAT
RESTRAINTS
AIRBAG
CHILD SEAT
Log
QUALITY
Worksheet
Sketch 1
Sketch 2
Sketch 3
Sketch 4
Sketch 5
Sketch 6
Sketch 7
7. SKETCH LOCATION OF CIRCULAR AIR BAG VENT PORTS
12
1
2
3
4
5
6
7
8
9
10
11
Please Note - Double Click to start MSPaint
OK
Close



The list of child seats is rolled up from the next Screen: Child Seat Detail



Child Restraint Overview

These variables are designed to capture a description of child restraints used in all the towed CDS applicable vehicles involved in the crash. Information about the seat is of two types: characteristics and usage.

Injury and death of young children has long been a significant part of the motor vehicle crash problem. Unrestrained children have a much greater tendency to be out of place (*i.e*. not in a designated seating position and generally standing or kneeling on the seat cushion). On impact this makes them very susceptible to injury or death since they are unrestrained. For a number of years, motor vehicle crashes have been the leading cause of injury and death to children under the age of five. Many states have attempted to address this problem by legislation requiring young children to be protected by some sort of child restraint. While these efforts have resulted in a reduction of injuries and death, little data on the real world performance of the child seats has been gathered. Police reports many times fail to note the use of such a restraint.

Specifications for these seats come from Federal Motor Vehicle Safety Standard (FMVSS) 213 (Child Seating Systems). Approval of design and testing is the responsibility of the NHTSA. Most states with child restraint laws require the use of a DOT approved seat.

Performance of the seat is also an extremely critical issue. Other than staged laboratory tests, very little data exists on what happens to these seats and how well they perform in protecting the occupants. Analysts will compare use, injury severity levels, and delta V's for initial gross performance levels. Once that type of analysis is done, source of injury will be examined, along with seat type and make/model. All of these analyses will initially be used to evaluate the effectiveness of FMVSS 213 and help determine if the standard should be updated or modified. The other main use of performance analysis is to determine if any type or make/model has any significant problems.

All of the analyses are very dependent on having enough data. Researchers noting that a child younger than five years is an occupant in a CDS applicable vehicle must pursue the interview questions with the presumption that a child seat was present, especially if the jurisdiction has a child restraint law or ordinance. Probing questions should be asked during the interview, and whenever possible, an inspection of the seat should take place. Of course, if the seat is still with the vehicle it should be inspected and photographed at the same time as the vehicle. However, finding the seat with the vehicle is not a common occurrence. If the child restraint is not present during the vehicle inspection, researchers must attempt to locate and obtain and inspection and photograph the child safety seat. This is another area where the perseverance of the researcher pays off in needed information.

Child restraints are a major issue, and data collection in this area has a high priority. Much information is needed to provide a reliable evaluation of the real world performance of these restraints.

Some manufacturers are incorporating Child Safety Seats (CSS) into the vehicle's seat installed in the vehicle. This type of CSS is termed an Integrated Child Safety Seat. Should the Researcher encounter this seat type during a vehicle inspection, the documentation of the seat and CSS are required on the Safety Systems Form, regardless of whether it was occupied at the time of the crash.

Screen Name: Seat Location
Variable Name: Seat Location for Child Seat(s) Data

Element Attributes:
Seat number (based on defined seats for this vehicle)

Source: Vehicle inspection

Remarks:

Select the seat location (number) from the list of available seats for the available child seats.

If the child seat is belted into a specific seat location in the vehicle, identify that location. If it is not, leave it blank. All child seats are to be identified, whether or not they are known to be occupied. Seat locations that can be selected are only those previously defined in the **Seat tab.**

Child seats and occupants are “linked” together on the Occupant Form. Refer to the **Child Seat** tab on the Occupant Form for more information.

Screen Name: Make
Variable Name: Child Seat Make

Element Attributes:

As listed in **Manufacturers' Instructions for Child Safety Seats**

Source: Vehicle inspection

Remarks:

The Make of the Child Safety Seat is selected. Please refer to the make / model defined in the manual: **Manufacturers' Instructions for Child Safety Seats**.

Screen Name: Model
Variable Name: Child Seat Model

Element Attributes:

As listed in **Manufacturers' Instructions for Child Safety Seats**

Source: Vehicle inspection

Remarks:

The Models of the Child Safety Seat is selected. Please refer to the make / model defined in the manual: **Manufacturers' Instructions for Child Safety Seats**.

Screen Name: Type
Variable Name: Type of Child Safety Seat

Element Attributes:

Infant seat
Toddler seat
Convertible seat
Booster seat
Other type child safety seat (specify)
Unknown child safety seat type
Unknown if child safety seat used

Source: Vehicle inspection, secondary source includes the **Manufacturers' Instructions for Child Safety Seats**

Remarks:

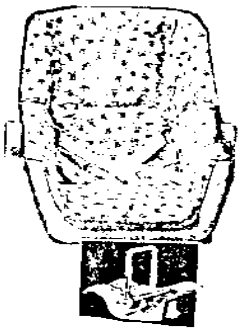
Effective September, 1999, some child safety seat changes will occur. Universal anchors will be required in a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system). Vehicles will be equipped with an independent system consisting of two lower anchorages and one upper anchorage. Each lower anchorage will consist of a rigid round rod or "bar" unto which a hook, buckle, or other connector can be snapped. The bars will be located at the intersection of the vehicle seat cushion and the seat back. The upper anchorage will be a ring-like object to which the upper tether of a child restraint system can be attached. The new independent anchorage system will be required to be installed at two rear seating positions. In addition, a tether anchorage will be required at a third position. Starting in the Fall of 1999, the tether anchoring system will be required, with the lower anchors being phased in over several years.

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

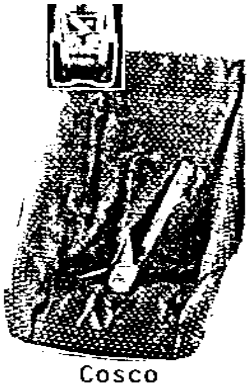
Infant seat

is used when the seat is designed to only face the rear of the vehicle and the maximum capacity is 8-9 kilograms (this information will usually be found on the manufacturer's label). Infant safety seats are equipped with a five-point harness (straps) to secure the infant to the safety seat and use the vehicle's safety belt system (*i.e.*, manual or automatic) to secure the seat to the vehicle. The five-point infant seat system includes a pair of straps that go over the infant's shoulders, a crotch strap, and the vehicle's belts as lap belts to secure the seat to the vehicle. The seat is tub-shaped and cradles the baby in a generally reclined position. Examples are shown below.

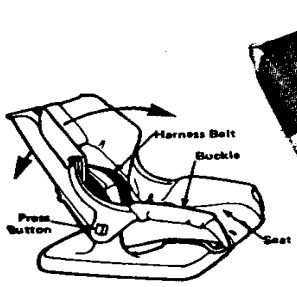
Kolcraft
"Baby's First Touch"

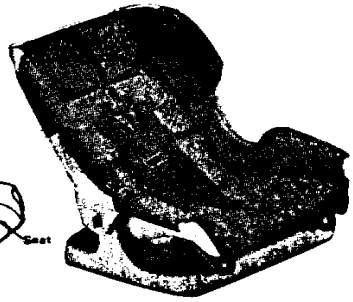


Century
"Kanga-Rocka-Roo"

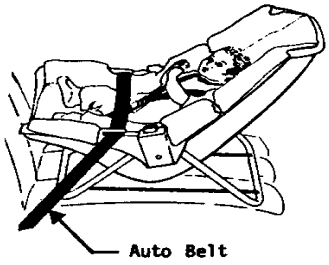


Cosco
"Day Cradle/Carrier"





Cosco/Peterson
"First Ride"

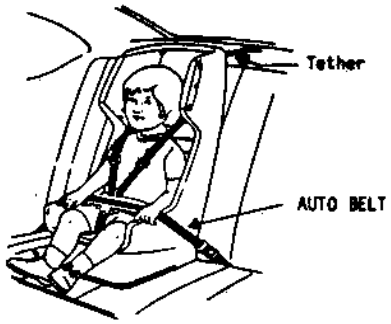


Questor
"Dyn-o-mite"

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

Toddler seat

is used when the seat is designed to ***only*** face the front of the vehicle and to carry a child weighing approximately 9-23 kilograms (this information will usually be found on the manufacturer's label). The toddler seat may also be referred to as a "child seat". Most have a five-point harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which ***must*** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in a generally upright sitting position, although some seats have multiple positions. Examples are shown below.

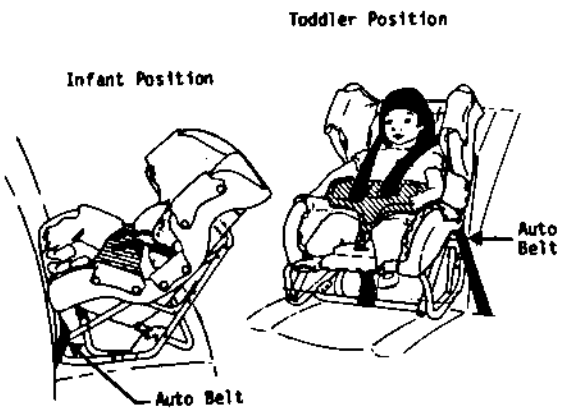


Harness Type

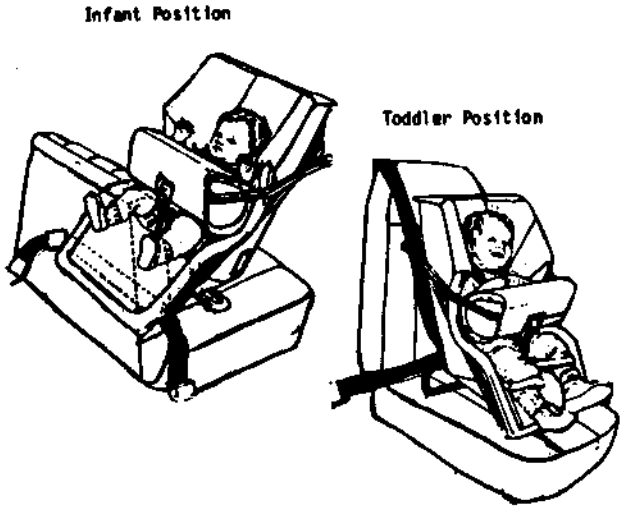
Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

Convertible seat

is used when the seat is designed to face the ***front or rear*** of the vehicle and to carry a child ranging from birth to approximately 23 kilograms (this information will usually be found on the manufacturer's label). Most have a harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which ***must*** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in either a generally reclined rearward facing position (for small infants--birth to 9 kilograms) or a generally upright forward sitting position (for larger children--9-23 kilograms). Examples are shown below:



Harness Type
Century "200"

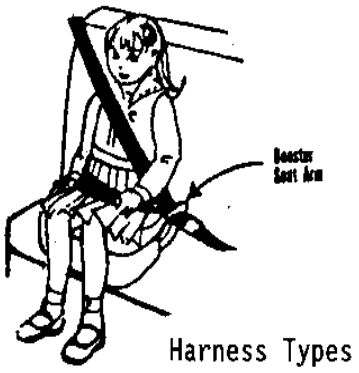


Combination Harness and Shield
Type Cosco/Peterson "SAFE & SNUG"

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

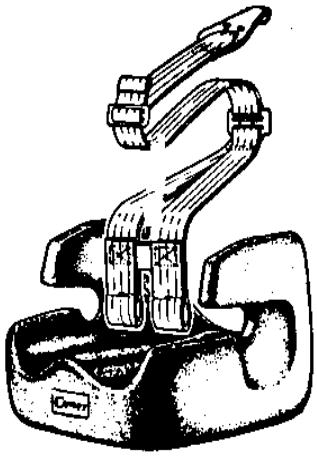
Booster seat

is used when the seat is designed as a forward facing platform without a back and adjusts to children up to 27 kilograms. This booster seat may or may not have a shield. The booster seat restrains the child in a raised upright sitting position with either a harness or shield. Booster seats are designed primarily to fill the gap between when a child outgrows the standard child safety seat and when the child can use the adult belt (*i.e.*, manual or automatic) and still see out the window. Some models can also be used for smaller children, as small as 9 kilograms. Examples of booster seats are shown below.

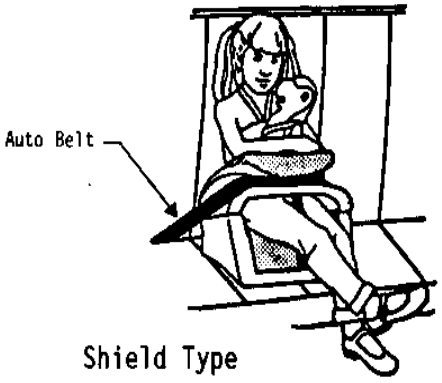


Harness Types

Strolee
"Wee Care"



Century
"Safe-T-Rider"

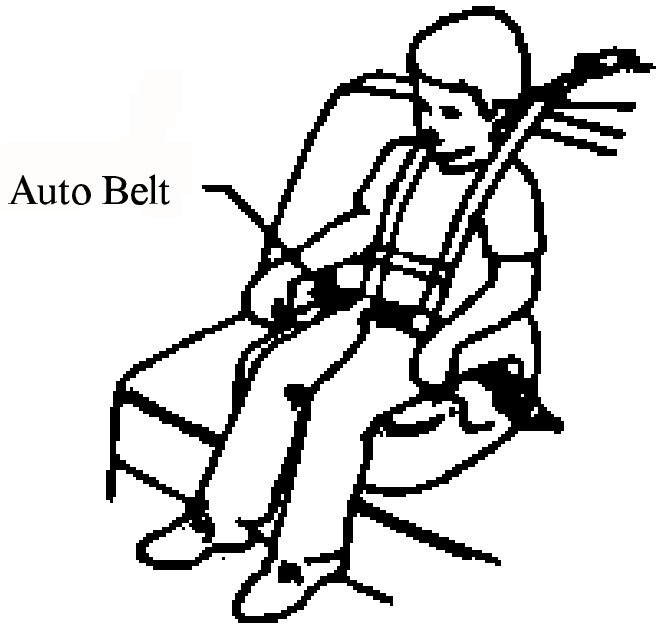


Shield Type

Collier-Keyworth
"Co-Pilot"

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

Used with lap belt and harness



Some of the above child, convertible and booster seats require a tether. When a tether-required seat is placed in the vehicle's front seat, the tether should run over the top of the seat and attach to a rear manual seat belt or possibly to one of the anchors for a front seat belt (*i.e.*, manual or automatic). When a tether-required seat is placed in the vehicle's rear seat, the tether should run over the top of the rear seat and attach to an anchor on the rear window shelf or possibly pass through the rear window shelf and attach to one of the anchors for a rear manual seat belt.

Other type child safety seat
is used when the infant or child safety seat cannot be described.

Unknown child safety seat type
is used when the type of child safety seat is unknown.

Screen Name: Design Orientation
Variable Name: Child safety seat design orientation (orientation)

Element Attributes:

Rear facing for this age/weight
Forward facing for this age/weight
Unknown design or orientation for this age/weight, or Unknown age/weight

Source: Vehicle inspection, and the **Manufacturers' Instructions for Child Safety Seats**

Remarks:

The researcher must determine from the seat, using the **Manufacturers' Instructions for Child Safety Seats guideline**, the designed orientation for this person's weight. Next, the actual orientation of the seat at-impact must be determined to obtain the correct attribute.

For example, a one and one-half year old child whose weight is 12 kilograms was sitting in a forward facing Century 5000 STE child safety seat. The correct attribute based upon the **Manufacturers' Instructions for Child Safety Seats** is **Forward facing for this age/weight**. The researcher must carefully review the sub-categories and choose the appropriate attribute based on designed orientation at the occupant's age and weight.

Screen Name: Design / Harness
Variable Name: Child safety seat harness design

Element Attributes:

Not designed with harness
Designed with harness
Unknown if designed with harness

Source: Vehicle inspection, and the **Manufacturers' Instructions for Child Safety Seats**

Remarks:

A harness is a belt type restraint that is part of the child seat. The purpose is to hold the child in the child seat.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the harness to each seat individually.

An "after market" harness is one added by the user to a child safety seat not originally designed to use the device.

Screen Name: Design / Shield
Variable Name: Child safety seat shield design

Element Attributes:

Not Designed With Shield
Designed With Shield
Unknown If Designed With Shield

Source: Vehicle inspection, and the **Manufacturers' Instructions for Child Safety Seats**

Remarks:

Shields are generally used on booster, convertible and toddler seats. The shield is a padded portion of the seat that is placed in front of the child's torso. In booster seats the shield is used when there is only a lap belt available. When the lap / shoulder combination is used with a booster seat, the shield is not used.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the shield to each seat individually.

An "after market" Shield is one added by the user to a child safety seat not originally designed with the device.

Screen Name: Design / Tether
Variable Name: Child safety seat tether design

Element Attributes:

Not Designed With Tether
Designed With Tether
Unknown If Designed With Tether

Source: vehicle inspection, and the **Manufacturers' Instructions for Child Safety Seats**

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the tether to each seat individually.

Effective September, 1999, some child safety seat changes will occur. Universal anchors will be required in a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system). Vehicles will be equipped with an independent system consisting of two lower anchorages and one upper anchorage. Each lower anchorage will consist of a rigid round rod or "bar" unto which a hook, buckle, or other connector can be snapped. The bars will be located at the intersection of the vehicle seat cushion and the seat back. The upper anchorage will be a ring-like object to which the upper tether of a child restraint system can be attached. The new independent anchorage system will be required to be installed at two rear seating positions. In addition, a tether anchorage will be required at a third position. Starting in the Fall of 1999, the tether anchoring system will be required, with the lower anchors being phased in over several years.

An "after market" tether is one added by the user to a child safety seat not originally designed with the device.

Screen Name: Usage / Orientation
Variable Name: Child safety seat use orientation (orientation)

Element Attributes:
Rear facing
Forward facing
Other orientation (specify)
Unknown orientation

Source: Vehicle inspection

Remarks:

Select the orientation of the child seat at the time of the crash.

Rear facing
if at the time of the crash the seat was facing the rear of the vehicle.

Forward facing
if at the time of the crash the seat was facing the front of the vehicle.

Other orientation
if the seat was facing other than rear or forward at the time of the crash (*e.g.*, on the floor, sideways, on top of or underneath something).

Unknown orientation
when a child safety seat is present but the orientation at the time of the crash is unknown

Screen Name: Usage / Harness
Variable Name: Child safety seat harness use

Element Attributes:

Harness not used
Harness used
Unknown if harness used
After market harness added, not used
After market harness used
Child safety seat used but no after market harness added
Unknown if after market harness added or used

Source: Vehicle inspection

Remarks:

Indicate the usage of the Child Safety Seat harness at the time of the crash.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the harness to each seat individually.

Screen Name: Usage / Shield
Variable Name: Child safety seat shield use

Element Attributes:

Shield not used
Shield used
Unknown if shield used
After market shield added, not used
After market shield used
Child Safety seat used, but no after market shield added
Unknown if After Market Shield Added or Used

Source: Vehicle inspection

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the shield to each seat individually.

Screen Name: Usage / Tether
Variable Name: Child safety seat tether use

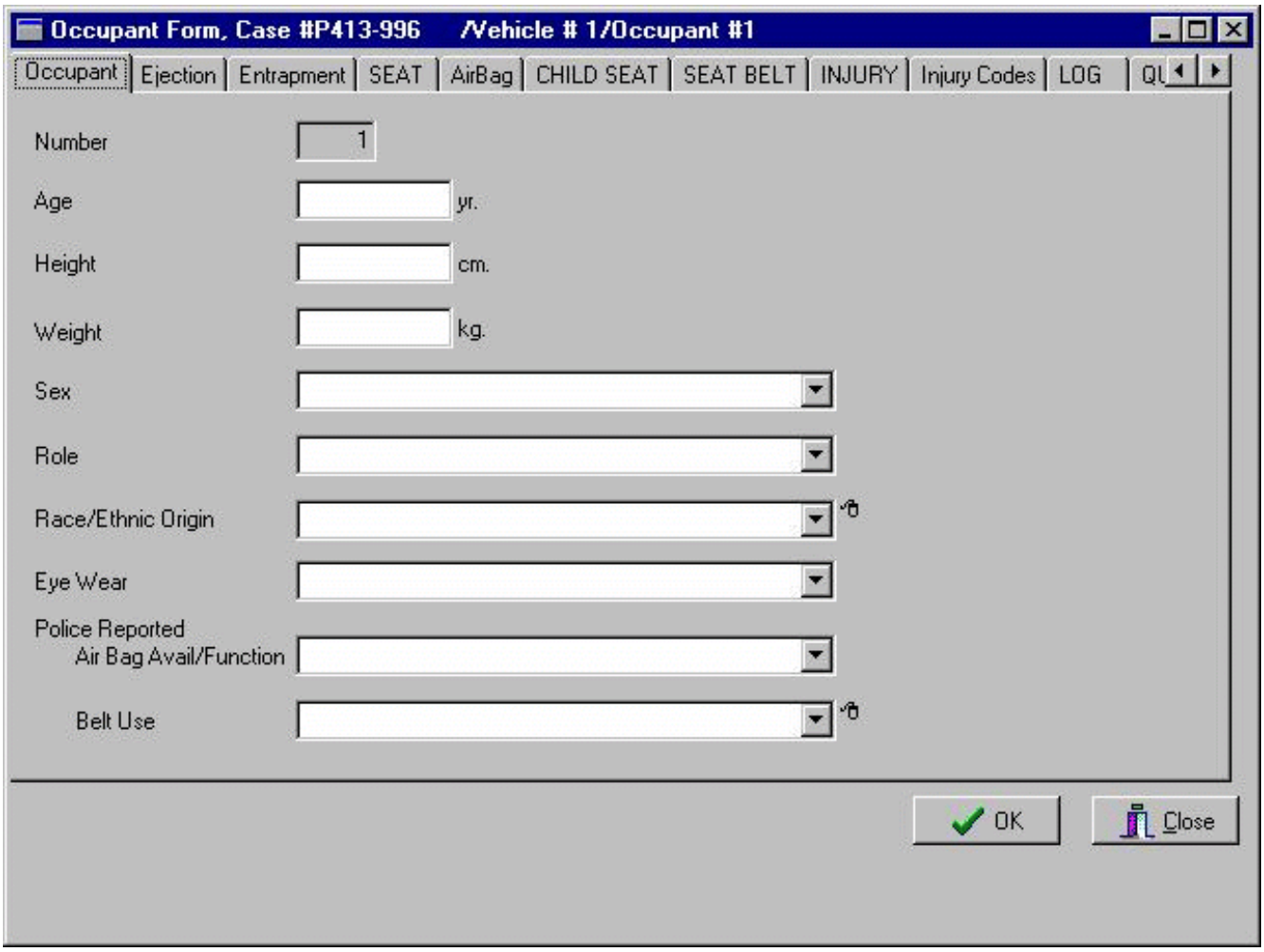
Element Attributes:

Tether not used
Tether used
Unknown if tether used
After market tether added, not used
After market tether used
Child safety seat used, but no after market tether added
Unknown if after market tether added or used

Source: Vehicle inspection

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the tether to each seat individually.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Number
1
Age
yr.
Height
cm.
Weight
kg.
Sex
Role
Race/Ethnic Origin
Eye Wear
Police Reported
Air Bag Avail/Function
Belt Use
OK
Close

Occupant Overview

This section provides a base of information that is vital to the analytical process. Ergonomic engineers design the interior of vehicles to be most comfortable for a range of occupants. The height and weight for a particular age bracket are considered in establishing the leg room, head room, and other interior dimensions for a vehicle. Restraint design relies heavily on this type of information. Initial designs of active belts were determined to be very uncomfortable and difficult to wear. The use of a wider range of heights and weights, which also has a bearing on seat adjustments, resulted in belts which were much more comfortable to wear and therefore encouraged use.

Occupant demographics and position play an important role in the injury mechanism, restraint system effectiveness, and vehicle design analysis. For example, the vehicle design, which includes the restraint system, must take into consideration the differences between a 163 centimeters, 45 kilograms driver and a 198 centimeters, 136 kilograms passenger. Both of these occupants must be provided with the same amount of protection by the vehicle in a crash.

Societal costs are also derived from these variables and the related injury assessment variables in this and the Occupant Injury Form.

In many cases the only source for this information is the interview. For this reason the researcher should ask probing questions to elicit complete and accurate responses to these, and all other, variables.

Federal Motor Vehicle Safety Standards--FMVSS 202 (Head Restraints), FMVSS 206 (Door Locks and Door Retention Components), FMVSS 207 (Seating Systems), FMVSS 208 (Occupant Protection), FMVSS 212 (Windshield Mountings), FMVSS 213 (Child Restraint System), and FMVSS 214 (Side Door Strength), are all assessed relative to their potential for reduction of injury to occupants. For this reason it is necessary to have the occupant's characteristics as complete as possible for correct and accurate assessment of the various vehicle components and FMVSSs which apply.

The Occupant Form is also where the Researcher makes their final determination of certain data that is collected from different sources within the case. Data collected from the vehicle inspection, interview, scene, and medical data is assimilated here on the Occupant Form. For example, the Interviewee may say they were wearing the seatbelt; the interior vehicle inspection may indicate that no belt was in use at the time of the crash; the medical report **may not** indicate either way. The researcher must then make their final decision, based on all available evidence, whether or not the seatbelt was worn on the Seatbelt Tab of this form.

Screen Name: Number
Variable Name: Occupant Number

Element Attributes:
Pre-assigned

Source: User assigned on Case Form

Remarks:

Occupants for this vehicle must be added into the case structure on the Case Form, Structure tab, Occupant sub-tab.

1. Occupant numbers must be assigned sequentially, beginning in the enclosed area with "1". No numbers may be skipped. Assign numbers left to right and front to back among occupants.

2. Assign numbers last to persons on the vehicle or in an unenclosed area. Persons appended to vehicle for motion (*e.g.*, bicyclist holding onto vehicle) are either pedestrians or other nonmotorists and not occupants; therefore, no form is completed, and no number is assigned.

3. Drivers do not have to be "1" (*e.g.*, right hand drive vehicles containing left front occupant). The assumed driver of a hit-and- run vehicle is assigned "1".

4. For each seating location begin numbering with the occupant seated. For each additional occupant in the lap or lying across, assign one number higher. If an occupant is on the floor in front of a person(s) assign one number higher.

5. Occupants sharing a seating position should be assigned numbers using the guidelines stated in the first paragraph above.

Screen Name: Age
Variable Name: Occupant's Age

Element Attributes:

Enter actual age in months if under 1 year, in years or months if older than 1 year.
Unknown

Source: Primary source is interviewee; secondary sources include police reports and other official records (*i.e.*, medical records).

Remarks:

The occupant's age at the time of the crash is recorded with respect to the occupant's last birthday.

If under the age of one year enter the actual age in months. If less than one month old enter one month.

If you are unable to obtain the age of a driver, request a driver's license record. **This action must be discussed and a policy determined with your zone center and COTR. Licensing file data takes precedence over police or interview data.**

Variable Name: Height
Variable Name: Occupant's Height

Element Attributes:
Entry defaults to inches, but may also be entered in centimeters
Unknown

Source: Researcher determined--inputs include interviewee or official records (*e.g.*, medical).

Remarks:

Enter actual height to nearest inch / centimeter (program automatically converts inches to centimeters).

The PAR may be used as a source if it contains this data, but it is superseded if other data exists.

Autopsies often include this information; use it when present.

If you are unable to obtain the height of a driver, request a driver's license record. **This action must be discussed and a policy determined with your zone center and COTR. Licensing file data takes precedence over police or interview data.**

Screen Name: Weight
Variable Name: Occupant's Weight

Element Attributes:
Entry defaults to pounds, but may also be entered in kilograms.
Unknown

Source: Researcher determined--inputs include interviewee or official records (*e.g.*, medical).

Remarks:

Enter actual weight to nearest pound/kilogram. **The appropriate units must be selected for the English or Metric system.**

The PAR may be used as a source if it contains this data, but it is superseded if other data exists.

Autopsies often include this information; use it when present.

Screen Name: Sex
Variable Name: Occupant's Sex

Element Attributes:

Male
Female — Not reported pregnant
Female — pregnant - 1st trimester (1st-3rd month)
Female — pregnant - 2nd trimester (4th-6th month)
Female — pregnant - 3rd trimester (7th-9th month)
Female — pregnant - term unknown
Unknown

Source: Primary source is the interview, secondary sources include police report and official records (*e.g.* medical).

Remarks:

Male
consists of men and boys.

Female — Not reported pregnant
consists of women and girls who are reported as not pregnant at the time of the crash. This includes any females for whom pregnancy status is unknown.

Female — pregnant - 1st trimester (1st-3rd month)
consists of women and girls who are reported to be pregnant and were in the first three months of their pregnancy at the time of the crash.

Female — pregnant - 2nd trimester (4th-6th month)
consists of women and girls who were reported to be pregnant and were in the second three months of their pregnancy at the time of the crash.

Female — pregnant - 3rd trimester (7th-9th+ month)
consists of women and girls who were reported to be pregnant and were in the final third of their pregnancy at the time of the crash. Pregnant females who were over nine months pregnant are also included.

Female — pregnant - term unknown
consists of women and girls who were reported to be pregnant at the time of the crash but the stage of their pregnancy could not be determined.

Unknown
is used when the gender of the occupant cannot be determined.

Screen Name: Role
Variable Name: Occupant's Role

Element Attributes:
Driver
Passenger
Unknown

Source: Primary source is interviewee; secondary source is police report.

Remarks:

Hit-and-run vehicles are assumed to have only one occupant (unless reliable evidence to the contrary exists), and that person is assumed to be the driver. All other persons riding in or on the vehicle are considered to be passengers.

Screen Name: Race/Ethnic Origin
Variable Name: Race/Ethnic Origin of Occupant

Element Attributes:

White (non-Hispanic)
Black (non-Hispanic)
White (Hispanic)
Black (Hispanic)
American Indian, Eskimo or Aleut
Asian or Pacific Islander
Other (specify):
Unknown

Source: Researcher determined; primary source is the interviewee; secondary sources include police report, medical records, and other official documents.

Remarks:

The concept of race as used by the U.S. Census Bureau reflects **self-identification**; it does not denote any clear-cut scientific definition of biological stock. Self-identification represents self-classification by people according to the race with which they identify themselves. For drivers with parents of different races who cannot provide a single response, use the race of the driver's mother; however, if a single response cannot be provided for the driver's mother, the first race reported by the driver is encoded.

Hispanic is not a race but rather an ethnic origin. Persons of Spanish origin may be of any race. For the purpose of this variable, race and Hispanic origin have been combined using the elements listed above.

Prioritization of data sources:

***First, use interviewee data*:**
Ask the interviewee what the driver considers their race and ethnic origin to be. If the response does not clearly fit into one of the race and ethnic origin categories, then use the information provided by the interviewee concerning the driver's nationality/ethnic origin to select the correct element value.

***Second, use the PAR*:**
If race is given on the PAR and the PAR scheme is compatible with this variable, then use the PAR information. Researchers in states whose only available data source is the PAR, must use **Unknown**.

If the PAR indicates White/Caucasian, Black/Negro, Hispanic/Spanish, or Other, then the PAR contains insufficient information for this variable. Additional information is required to determine the combination of race and ethnic origin. In addition, the driver's ***name*** is not a reliable indicator of either race or ethnic origin and ***cannot be used*** when selecting the applicable element value for this variable. For example, a name such as: Mary Perez, tells you neither race (*e.g.*, white or black) nor ethnic origin since the person may or may not consider themselves to be of Hispanic descent.

When Hispanic origin is known but race is not and when race is known but Hispanic origin is not, enter **Unknown**.

Screen Name: Race/Ethnic Origin (cont'd)
Variable Name: Race/Ethnic Origin of Occupant (cont'd)

Third, use official records (*e.g.,* ***medical):***
If the data needed cannot be obtained from the interviewee and is not available or usable from the PAR, then use official records, if available, to determine the correct element attribute.

White (non-Hispanic)
is used for drivers who consider themselves as having origins in any of the original peoples of Europe, North Africa, or the Middle East. The person may consider his/her race to be white ***and*** not of Hispanic origin.

Black (non-Hispanic)
is used for drivers who consider themselves as having origins in any of the black racial groups of Africa. The person may consider his/her race to be Black, Negro, or Afro-American ***and*** not of Hispanic origin.

White (Hispanic)
is used for drivers who consider themselves as having origins in any of the original peoples of Europe, North Africa, or the Middle East. The person may consider his/her race to be white ***and*** of Hispanic origin.

Black (Hispanic)
is used for drivers who consider themselves as having origins in any of the black racial groups of Africa. The person may consider his/her race to be Black, Negro, or Afro-American ***and*** of Hispanic origin.

American Indian, Eskimo or Aleut
is used for drivers who consider themselves as having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition. For example, if a specific (or named) Indian tribe is given, then use this attribute.

Asian or Pacific Islander
is used for drivers who consider themselves as having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.

Other
is used for drivers who consider themselves to be of a race or ethnic origin not described above. Use this attribute for descriptions such as: Eurasian, Cosmopolitan, inter-racial, etc. In addition, if the driver considers him/herself to be of Hispanic origin but not white or black, then use this code.

Unknown
is used when the source(s) available do not provide sufficient information to classify the driver's race. In addition use this code when Hispanic origin is known but race is not and when race is known but Hispanic origin is not.

Screen Name: Eye Wear
Variable Name: Occupant's Eye Wear

Element Attributes:

No
Eyeglasses/sunglasses
Contact lenses
Contact lenses with sunglasses
Unknown

Source: Researcher determined — primary source is the interview and secondary sources includes vehicle inspection and medical records.

Remarks:

This variable refers to all occupants. The occupant must be wearing the glasses/lenses at the time of the crash.

The presence of glasses in the vehicle does not in itself mean that an occupant was wearing them. Additional information must be obtained to determine that they were worn (injuries, air bag damage, etc.)

No

no eyeglasses/sunglasses or contact lenses were worn by this occupant.

Eyeglasses/sunglasses

if this occupant was wearing eyeglasses or sunglasses at the time of impact.

Contact lenses

if this occupant was wearing contact lenses at the time of impact.

Contact lenses with sunglasses

if the occupant is wearing contact lenses with sunglasses.

Unknown

it is not known if the occupant in this position was wearing eyewear.

Screen Name: Police Reported–Air Bag Avail/Function
Variable Name: Police Reported Air Bag Availability/Function

Element Attributes:

No air bag available
Police did not indicate air bag availability/function
Deployed
Not deployed
Unknown if deployed
Police indicated "unknown"

Source: Police report.

Remarks:

This variable captures what was documented on the PAR regarding the availability and functioning of any air bag system. The entire PAR (especially narrative) must be reviewed to make a determination to code this variable.

Police did not indicate air bag availability/function

is used in two instances. The first is when the PAR has a space, box, line, etc. to indicate air bag availability/function but there is no response present. The second is when there is no area of the PAR for the officer to report air bag availability/function.

Screen Name: Police Reported—Belt Use
Variable Name: Police Reported Belt Use

Element Attributes:

None used
Police did not indicate belt use
Shoulder belt
Lap belt
Lap and shoulder belt
Belt used, type not specified
Child safety seat
Automatic belt
Other type belt, (specify)
Police indicated "unknown"

Source: Police report.

Remarks:

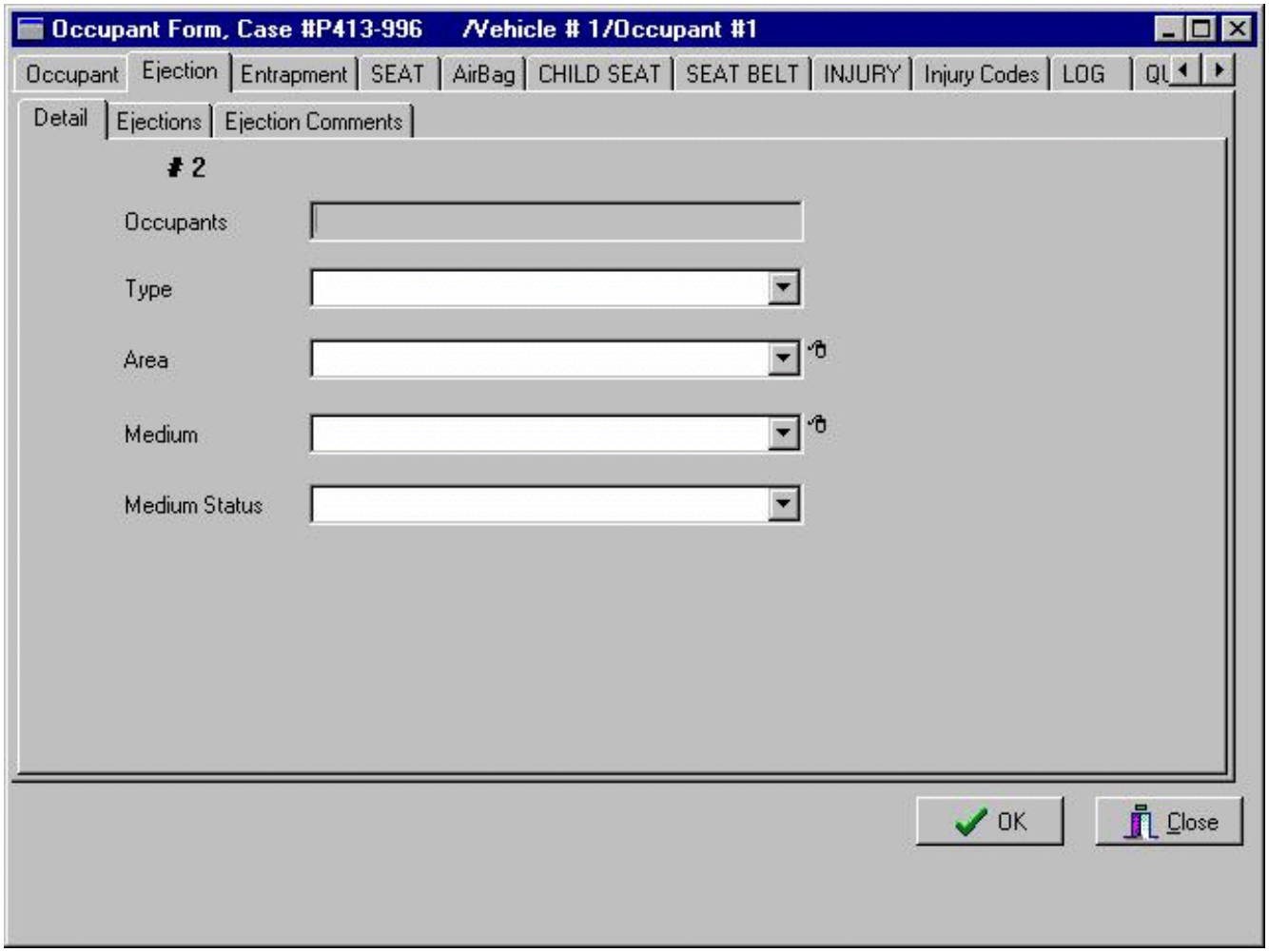
This variable captures what was documented on the PAR regarding occupant use of available vehicle restraints (*i.e.*, manual belts, child safety seat, or automatic restraints). Select the first attribute which applies. The entire PAR (especially narrative) must be reviewed to make a determination to code this variable.

Police did not indicate restraint use

is used in two instances. The first is when the PAR has a space, box, line, etc. to indicate restraint use but there is no response present. The second is when there is no area of the PAR for the officer to report restraint use.

Belt used, type not specified

is used when the PAR indicates that available ***belts*** were used, but it is unclear what type of belts were actually in use.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Detail
Ejections
Ejection Comments
2
Occupants
Type
Area
Medium
Medium Status
OK
Close

Ejection / Entrapment Overview

Variables in this section provide an assessment of the occurrence of entrapment or ejection of this occupant. All of the variables in this section are considered final assessments, which are selected at the end of all field research and interviewing. Much of the information regarding them comes from the vehicle inspection. Verification of questionable ejection or entrapment comes from the interview.

Historically, ejection from the vehicle has been a major cause of fatalities and more serious injuries. The chances of being killed if ejected are about 1 in 5; whereas, if the occupant remains inside the vehicle, the chances of dying are reduced to about 1 in 200 for all fatal crashes. Unfortunately ejection from the vehicle is not that uncommon and has become a significant part of the fatality (30%) and severe (15%) injury crashes. Further contributing to the ejection problem is the increase in window surface area and more hatchback models. Despite the current emphasis on restraint use through legal requirements for occupants to be buckled up, a significant portion of the population continues to be unrestrained and at risk to ejection. All evidence indicates that this trend will continue into the foreseeable future.

A problem not often addressed is that of partial ejection. This refers to those instances where some part but not all of an occupant's body is, at some time during the crash sequence, outside the occupant compartment. Although it would not seem to be a problem it can be, and often is, fatal if the part outside is the occupant's head. Because of the dynamics of the vehicle and the kinematics of the occupants during a rollover ejection sequence, it is often the occupant's own vehicle which causes the injury as it rolls onto the occupant.

Entrapment poses a different problem area. Recent years have brought about a vast improvement in the delivery of emergency medical attention to motor vehicle crash victims. This improvement has been achieved through the establishment of regional trauma centers, well equipped Mobile Intensive Care Units manned by trained paramedics even in rural areas, and a general increase in the knowledge of how to treat acute trauma. This improvement has not helped those victims who are restrained within the vehicle by deformed components. The improved care cannot be delivered because the personnel are unable to get to the victim, remove the victim from the vehicle, and deliver the victim to a treatment facility in a reasonable amount of time. Also, previous extrication tools used by rescue personnel were crude and sometimes injury causing themselves, an example of which is the large metal cutting saws. Within the last few years a device known as the "Jaws of Life" was developed and widely distributed. It is a hydraulically driven mechanism which can be used to increase the size of openings, extricate entrapped occupant's limbs and force open doors which are jammed. This development came about because of the perceived need for an extrication tool which operated quickly yet did not further injure the occupant.

Federal Motor Vehicle Safety Standards (FMVSS) which were developed in response to the problems seen in these areas are FMVSS 201 (Occupant Protection in Interior Impact), FMVSS 205 (Glazing Materials), FMVSS 206 (Door Locks and Door Retention Components), FMVSS 212 (Windshield Mounting), and FMVSS 214 (Roof Crush Resistance Passenger Cars).

Ejection / Entrapment Overview (cont'd)

Analytically this group of variables is a stand alone package most of the time. It can form the basis of an analysis without the use or comparison to any other variables. This would be used mostly in exploring the number and types of ejections and entrapments. Expanding the scope somewhat to include injury severity allows a determination of the increase or decrease in the ejection problem. Inclusion of injury source would provide an idea of the severity of all occurrences of entrapment and ejection. Injury source also provides an idea of the kinematics of the occupant during the sequence. The addition of a cross-tabulation for AIS level would show the relative severity between the injuries incurred inside the vehicle and those outside the vehicle.

Other areas of interest to the analyst are the ejection route and performance of integral structures. The integral structure performance is directly governed by the FMVSS 206 and 212. These areas are of increasing interest to NHTSA since the real world performance can help support the findings from the staged collisions and will help determine the effectiveness of the standards.

Lastly, an alternative glazing techniques was introduced in windshields. This type of window have a plastic layer on the interior surface of the window. Tests have shown a reduction in lacerative injuries which was the primary objective but also an increased resistance to ejection through the window. Further study of real world performance is needed to provide an accurate evaluation of this secondary benefit.

Gathering the data, which will allow the researcher to accurately select the variables, is a multistage process. It will begin with the PAR which may give an indication of either ejection or entrapment. Inspection of the vehicle will provide the evidence needed to substantiate either occurrence. Further, documentation should be obtained through the scene inspection, interview, and injury data. Only at the end of the data gathering process should these variables be selected. Particular attention should be paid to the vehicle inspection since most evidence of ejection will be less apparent and not easily discerned.

Occupant mobility refers to the level of assistance that the occupant used in exiting the vehicle.

In summary, this group of variables assesses the level of a very significant problem in today's crash picture. Correct accurate assessment is a result of a multistage research process which will be individualized by case. Attention to detail will result in a correct assessment. This is one area which is directly tied to the FMVSS, and all gathered data results in a direct evaluation of the applicable standards.

Ejection / Entrapment Overview (cont'd)

Special Conditions for *Ejection and Entrapment*

Using the guidelines given below, *Ejection/Entrapment* variables may be completed for towed CDS applicable vehicles based on PAR and crash severity when there is ***no vehicle inspection, no interview***, and ***the answer is obvious***. If there is any doubt, annotate accordingly and select **Unknown.**

1. Select **Not entrapped** for occupants fleeing from towed CDS applicable vehicles.

2. For other towed CDS applicable vehicles:

   (a) **No Ejection** may be used ***if the PAR specifically so states for a given occupant***. For all other occupants about whom the PAR is silent, select **Unknown**.

   If the PAR indicates that an occupant is ejected, this is sufficient to select **Complete ejection** or **Partial ejection** if the PAR so states. If complete versus partial ejection is not stated on the PAR, then select **Ejection, unknown degree** may be used.

   Note, however, that these three variables can be used only if the PAR provides sufficient detail.

   (b) Entrapment may be selected as **Not entrapped** ***if the PAR specifically so states for a given occupant***. For all other occupants about whom the PAR is silent, use **Unknown**.

   Recall, however, that if the PAR states that an occupant is entrapped, this is ***not sufficient*** to select Entrapment (because PAR definition of entrapment is different from NASS definition). Unless Entrapment is verified through other sources, Entrapment must be selected as **Unknown**.

Screen Name: Ejection--Type
Variable Name: Ejection

Element Value:

No ejection
Complete ejection
Partial ejection
Ejection, unknown degree
Unknown

Source: Researcher determined--inputs include the vehicle inspection, interviewee, medical records, and the police report.

Remarks:

The coding of ejection for this variable is done by either linking it to an ejection that has been noted during the vehicle inspection, if present, or inserting one. In either condition, the information can be modified. If no ejection is the only information then do not link it.

Ejection refers to persons being completely or partially thrown from the vehicle as a result of an impact or rollover. If a person already has a body part protruding from the vehicle (*e.g.*, an elbow, arm, etc.) and the PDOF acting on the vehicle would likely cause further protrusions of the body part, then at least partial ejection is selected.

No ejection

for any persons riding on the exterior of a vehicle, such as the fenders **(this does not include pickup beds, boot of a convertible, and persons riding on open tailgates)**.

Complete ejection

refers to a situation where the occupant's body is entirely outside the vehicle but may be in contact with the vehicle.

Partial ejection

refers to a situation where part of the occupant's body remains in the vehicle. This does not apply to occupants who are not initially in the seating compartment of the vehicle [*e.g.*, pickup beds, boot of a convertible, and persons riding on open tailgates, since any ejection for them is selected as **Complete ejection**].

Police reported ejections may be used if there is no vehicle inspection or occupant interview, provided that the ejectee was in the seating compartment of the vehicle, and there is no evidence which contradicts the reported ejection.

Screen Name: Ejection--Area
Variable Name: Ejection Area

Element Attributes:

Windshield
Left front
Right front
Left rear
Right rear
Rear
Roof
Other area (*e.g.*, back of pickup, etc.) (specify)
Unknown

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

The coding of ejection for this variable is done by either linking it to an ejection that has been noted during the vehicle inspection, if present, or inserting one. In either condition, the information can be modified.

Rear

is restricted to persons riding in a passenger compartment, who are ejected through the rear window, tailgate (*e.g.*, station wagon), hatchback, etc.

Roof

applies to all hardtops, convertibles, sun roofs, t-bar roofs, and detachable hardtops (such as fiberglass tops) that are used to cover areas designed for passenger protection.

Screen Name: Ejection--Area (cont'd)
Variable Name: Ejection Area (cont'd)

When **Ejection Area** equals **Roof,** follow examples illustrated below when selecting **Ejection Medium** and **Medium Status** (immediately prior to impact).

Ejection	Roof Type	Area	Ejection Medium	Medium Status
Ejection	Hardtop, ripped open during crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, attached prior to the crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, detached prior to crash	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in down or open position prior to crash	Roof	Non-fixed roof structure	Open
Ejection	Convertible, in closed position	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, closed and ripped open during the crash	Roof	Non-fixed roof structure	Closed
Ejection	Sun or t-bar, open/removed prior to the crash	Roof	Non-fixed roof structure	Open

The specific Ejection--Area attributes are designated for use with areas designed for passenger protection (*e.g.*, passenger cars, vans, light truck cabs, self-contained mini- RVs and mini-motor homes). Trailers, add-on campers, etc., are to be assigned **Other area**.

Other area
also applies to persons riding on open tailgates.

Unknown
if the sole source for the ejection is the police report, unless the PAR provides a clear, distinguishable avenue of occupant ejection.

Screen Name: Ejection--Medium
Variable Name: Ejection Medium

Element Attributes:

Door/hatch/tailgate
Nonfixed roof structure
Fixed glazing
Nonfixed glazing (specify)
Integral structure
Other medium (specify)
Unknown

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

The coding of ejection for this variable is done by either linking it to an ejection that has been noted during the vehicle inspection, if present, or inserting one. In either condition, the information can be modified.

Door/hatch/tailgate

includes any door, hatch, or tailgate that is opened during the course of the impact sequence.

Non-fixed roof structure

applies only to convertible, sun roofs, t-bar roofs, and removable hardtops when detached / retracted prior to the crash.

Fixed glazing

refers to any glazing in the vehicle that cannot be opened

Non-fixed glazing

refer to any glazing in the vehicle that can be opened to any degree.

Integral structure

includes removable hardtops when attached to the vehicle prior to the crash. This also should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

Other medium

applies to persons riding in pickup beds, on open tailgates, and for other situations which cannot be classified above. In addition, use this attribute when someone is ejected from a trailer, add-on camper, etc.

Unknown

if the sole source for the ejection is the police report, unless the PAR provides a clear, distinguishable avenue of occupant ejection.

Screen Name: Ejection--Medium Status
Variable Name: Ejection Medium Status (Immediately Prior to Impact)

Element Attributes:
Open
Closed
Integral Structure
Unknown

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

The coding of ejection for this variable is done by either linking it to an ejection that has been noted during the vehicle inspection, if present, or inserting one. In either condition, the information can be modified.

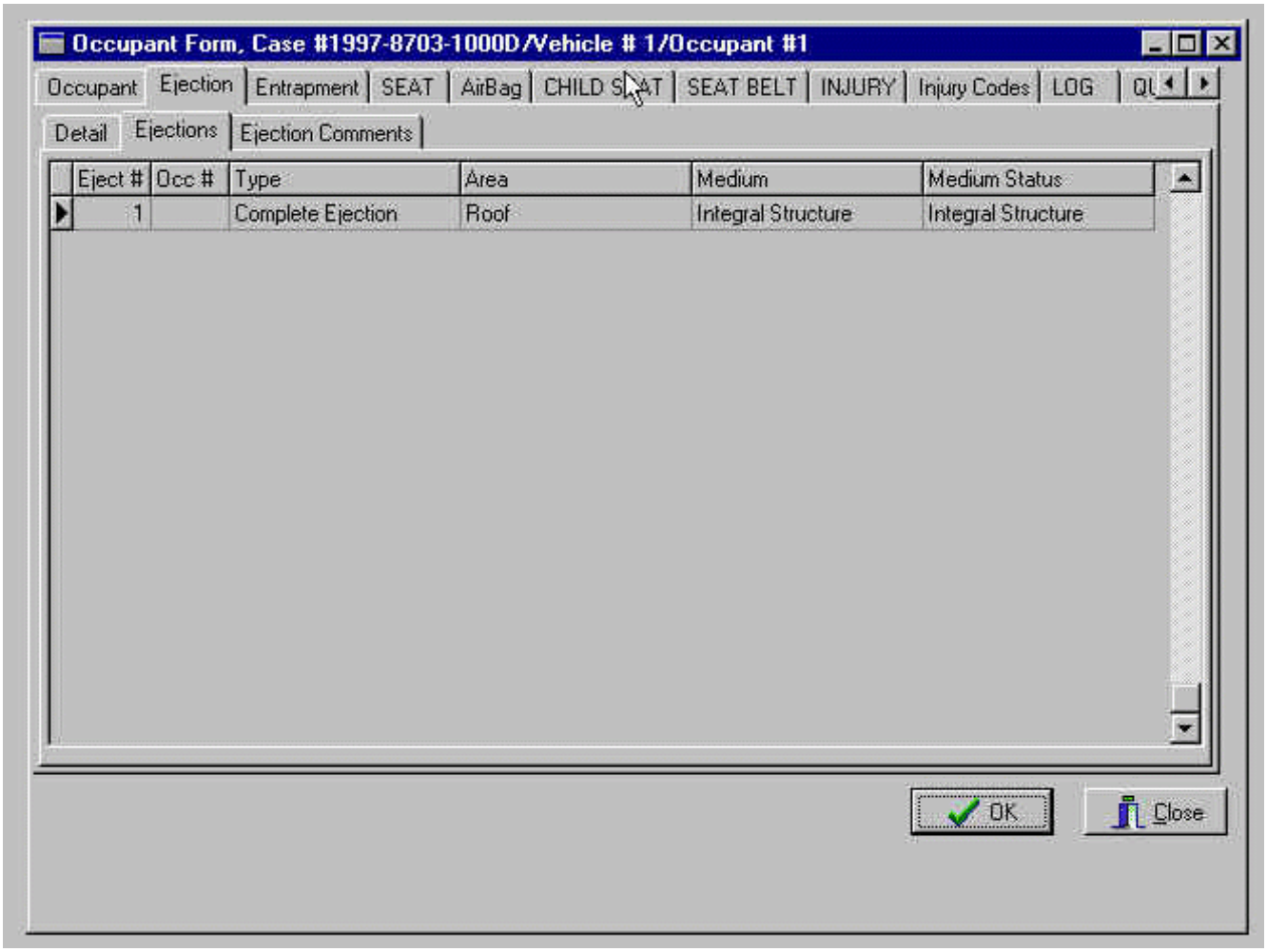
This variable is a description of the status of the area through which an occupant was ejected and is the status of the medium immediately prior to the impact.

Open
applies to convertible roofs, sun roofs, t-bar roofs, windows, doors or tailgates that are completely or partially open immediately prior to impact, or to other open areas of vehicles such as pickup beds, etc.

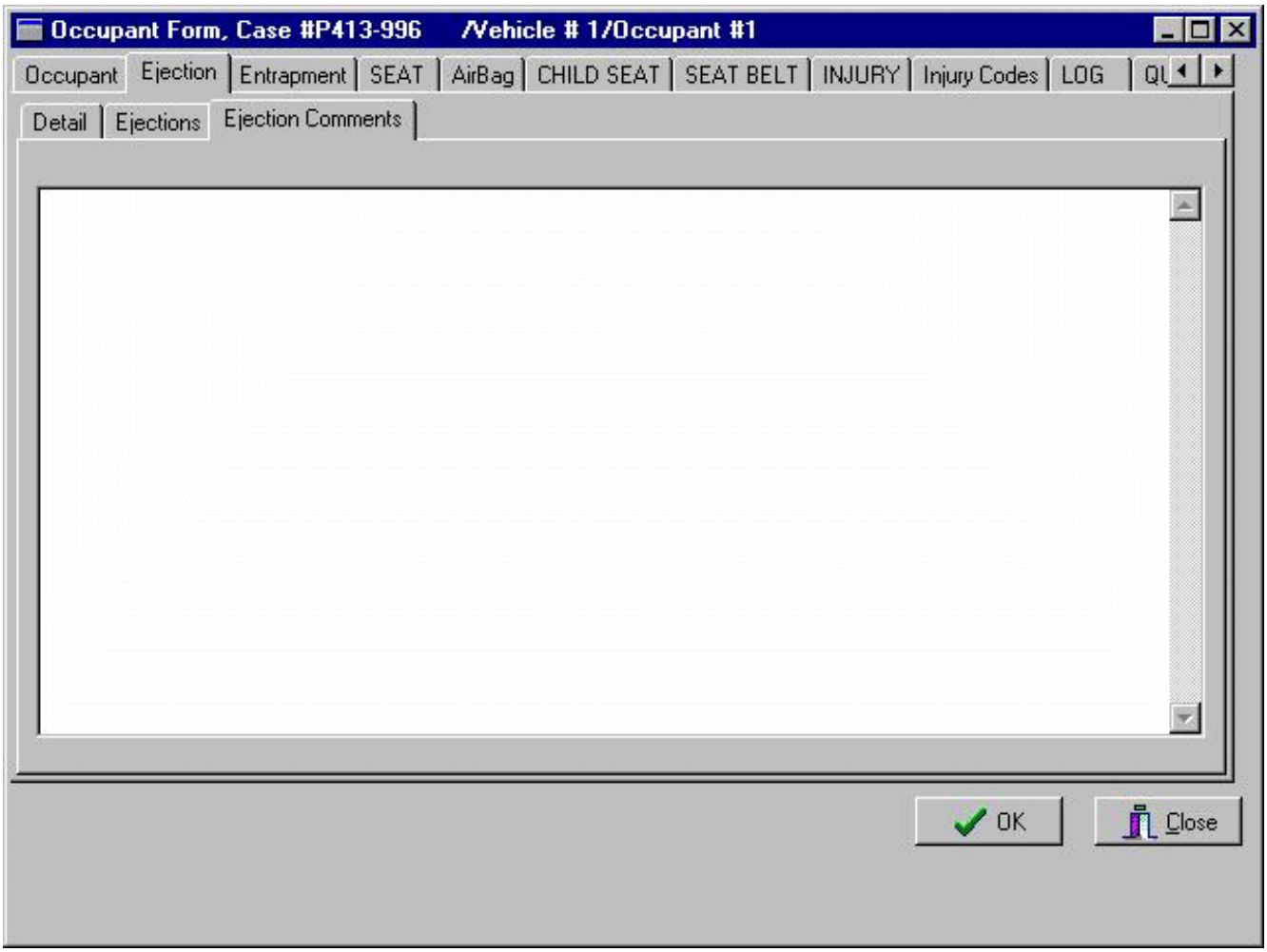
Closed
refers to a window that is completely closed when damaged, or to a convertible, sun, or t-bar roof that is closed when damaged. Sun and t-bar roofs are captured here if the ejection occurred through the designed opening in the sun or t-bar roof. However, if the roof was of a sun or t-bar type but the ejection occurred because a sizable opening was torn in the roof structure, then select **Integral structure**. This is also used for fixed glazings such as windshields and backlights which are in place prior to the collision. This also refers to a door that is closed, but when damaged, experiences latch and/or hinge failure causing the door to open.

Integral structure
includes removable hardtops when attached to the vehicle prior to the crash. This also should be used when any vehicle structure, not designed to be opened (*e.g.*, standard roof), is torn open during the crash such as to permit ejection.

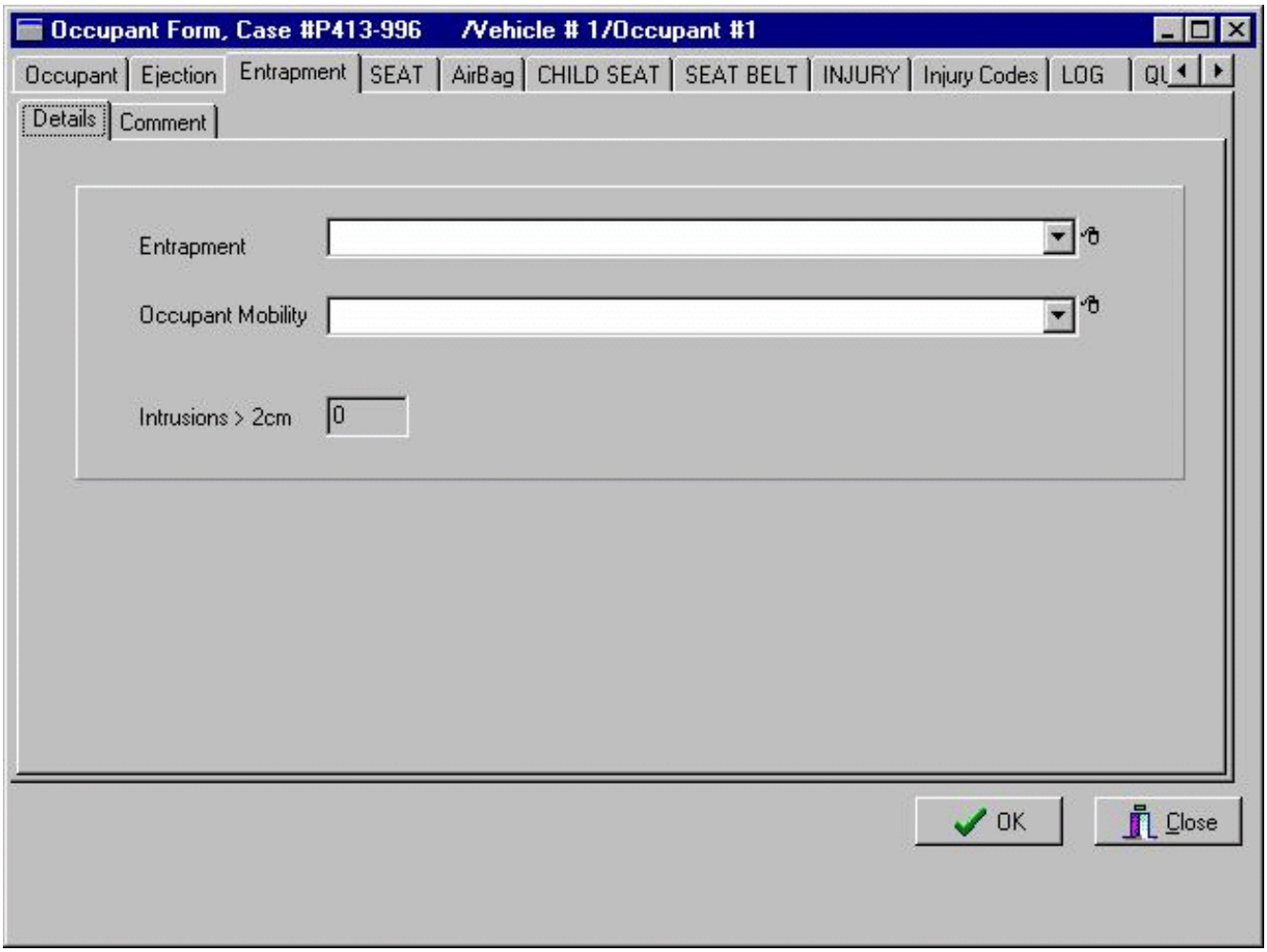
Unknown
if the sole source for the ejection is the police report, unless there is a clear indication on the PAR of the medium status.



This is a roll-up table which list all of the ejections that were entered under **Detail**.



This screen is for adding further annotations about any ejection.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Details
Comment
Entrapment
Occupant Mobility
Intrusions > 2cm
0
OK
Close

Screen Name: Entrapment--Entrapment
Variable Name: Entrapment

Element Attributes:

Not entrapped/exit not inhibited
Entrapped/pinned — mechanically restrained
Could not exit vehicle due to jammed doors, fire, etc (specify)
Unknown

Source: Researcher determined — inputs include the vehicle inspection, interview and police report.

Remarks:

Not entrapped/exit not inhibited

is used when this occupant exited the vehicle and his/her egress was not inhibited in any way by intruding vehicle components, jammed doors, etc.

Entrapped/pinned — mechanically restrained

is used when this occupant was physically restrained in the seat position by an intruding vehicle component. The occupant could not move from the post impact position without some part of the vehicle being cut away, bent or moved.

Could not exit vehicle due to jammed doors, fire, etc. (specify)

is used when this occupant could not exit the vehicle due to jammed door(s), roof collapse, etc. This occupant, however could move about within the vehicle.

Unknown

is used when there is no knowledge of the manner of this occupant's exit from the vehicle and generally, no inspection of the vehicle.

Screen Name: Entrapment -- Occupant Mobility
Variable Name: Occupant Mobility

Range:

Element Attributes:

Occupant fatal before removed from vehicle
Removed from vehicle while unconscious or not oriented to time or place
Removed from vehicle due to perceived serious injuries
Exited from vehicle with some assistance
Exited from vehicle under own power
Occupant fully ejected
Removed from vehicle for other reasons (specify):
Unknown

Source: Researcher determined — inputs include fire and or EMS personnel/records, interviews, witnesses, medical records, PAR.

Remarks:

The variable attributes are hierarchical.

Do not rely on the interview alone to make this selection. Consider all .information (EMS, medicals, etc.) when making your selection.

Occupant fatal before removed from vehicle
is used when it can be determined that the occupant was deceased prior to removal from the vehicle.

Removed from vehicle while unconscious or not oriented to time or place
is used when it can be determined that the occupant was unconscious or had diminished awareness (not oriented to time and place) when they were removed from the vehicle.

Removed from the vehicle due to perceived serious injuries
is used when it can be determined that the occupant was injured but conscious and oriented and had to be removed from the vehicle due to their serious injuries (*e.g.* broken femur). A key factor to consider is the perceived seriousness of the injury. Generally this involves removal by EMS personnel.

Exited the vehicle with some assistance
is used when the occupant was able to exit the vehicle partially under their own power but their condition was such that some assistance in exiting was necessary.

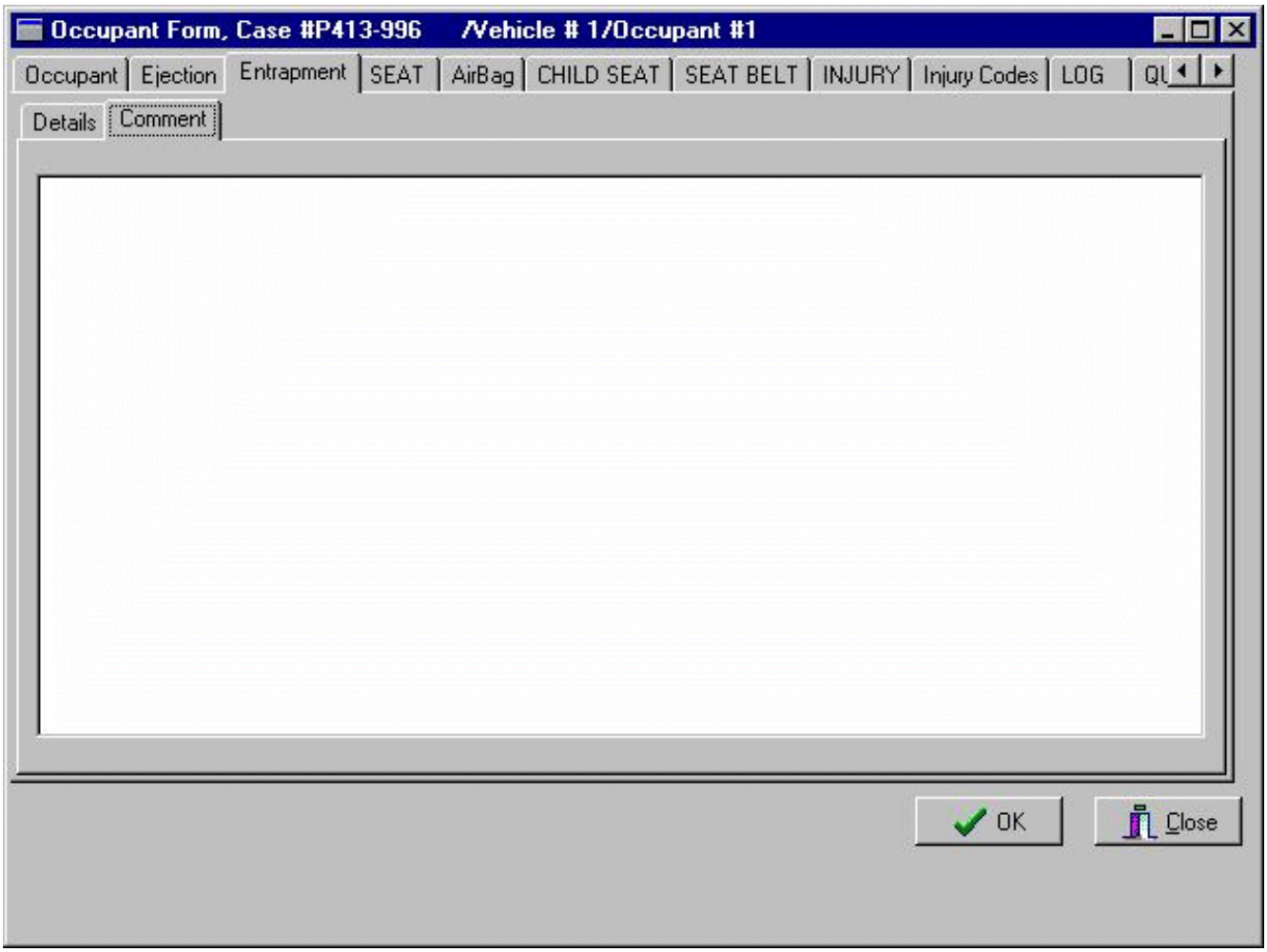
Exited the vehicle under own power
is used when the occupant was able to exit the vehicle without assistance from another person.

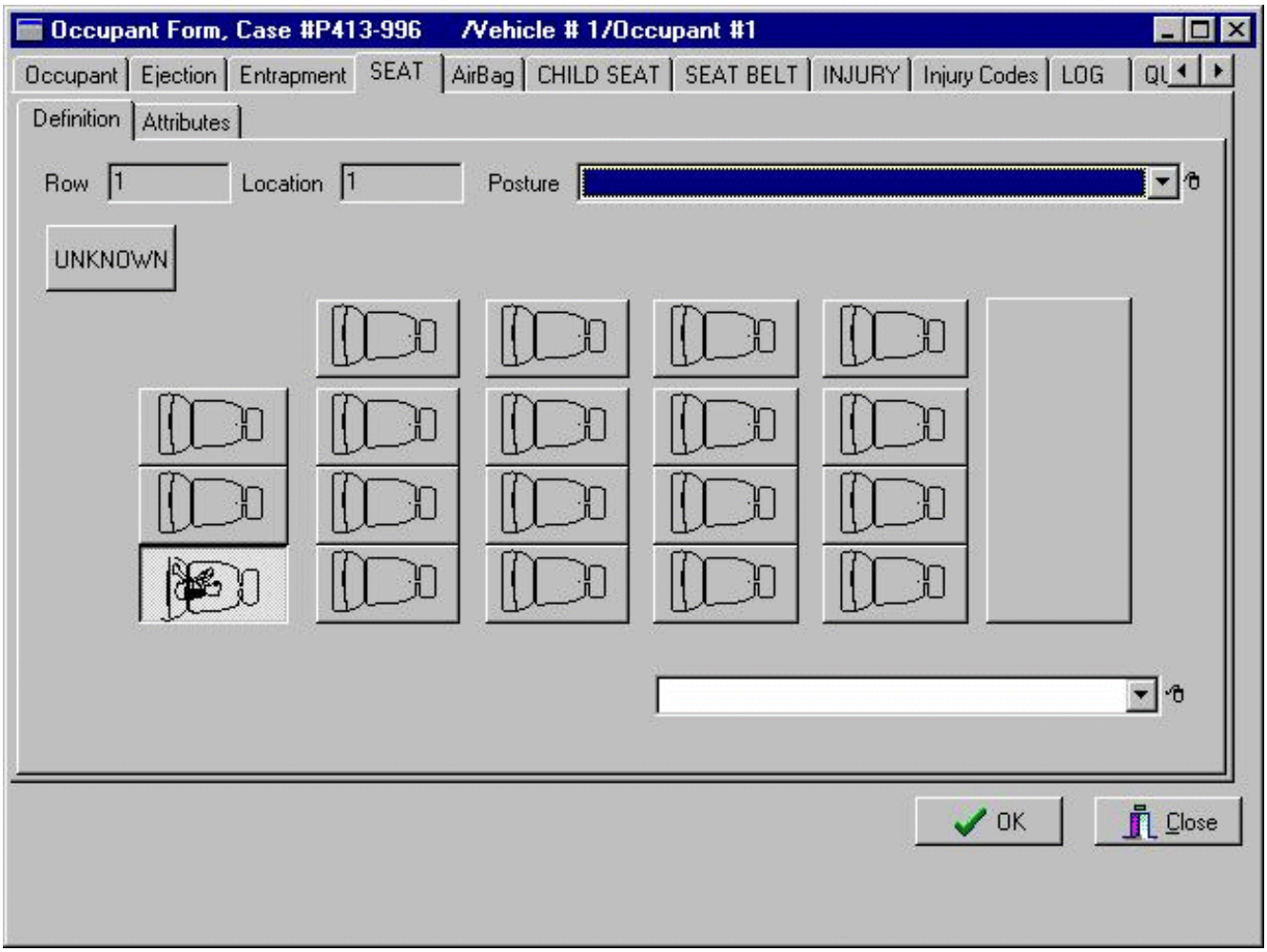
Occupant fully ejected
is used when the occupant was completely ejected from the vehicle.

Screen Name: Entrapment—Occupant Mobility (cont'd)
Variable Name: Occupant Mobility (cont'd)

Removed from vehicle for other reasons (specify):
includes those people who require assistance in exiting the vehicle and would have required assistance even if there had not been a crash i.e., infants, severely disabled, intoxicated persons.

Unknown
is used when the researcher cannot reasonably determine the manner of exit by the occupant.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Details
Comment
OK
Close


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Definition
Attributes
Row
1
Location
1
Posture
UNKNOWN
OK
Close

Screen Name: Seat Location Identification
Variable Name: Occupant's Seat Position

Element Attributes:
As selected

Source: Interviewee, police report**,** and vehicle inspection

Remarks:

Identify the seat location where this occupant was located. "Click" on the appropriate seat.

More than one person may be assigned to a seating position. When this happens, the appropriate **Posture** must be selected to account for this.

The seating position by the steering wheel should be assigned to the assumed driver of a hit-and-run vehicle unless evidence indicates a different position for the person or persons.

Seating positions indicate areas of the vehicle, and may not indicate the actual presence of a seat. If a person is between two bucket seats, then they are assigned to that position and their "Posture" is **Sitting on a console**. An occupant sitting side-by-side of another occupant in the same seating position is placed in that position with their posture indicated as **Sitting side by side another occupant** and the posture is described in the place indicated.

If the only seat in the front seating area is a driver's seat (*e.g.*, bucket, pedestal, etc.) and the occupant was in the area but not in the seat, assign the appropriate seating position (maybe the front right seating location) and the "Posture" will be indicated appropriately

The area at the rear of the vehicle is the location to indicate those occupants riding on a fender, the boot of a convertible, the open cargo box on a light truck, etc. or for anyone in the fifth or higher numbered seat area.

If seating in the vehicle is longitudinal rather than lateral, use the basic idea of a vehicle interior being divided laterally into roughly equal thirds and visualize lateral rows of seats to determine what seat position is the best descriptor.

If a seat row has more than three designated seat positions, the occupants in the left and right positions have their positions assigned as usual while the two center positions are assigned as side-by-side depending upon the seat row.

Persons appended to the vehicle in motion are not considered to be occupants of the vehicle.

Screen Name: Posture
Variable Name: Occupant's Posture

Element Attributes:

Normal posture
Abnormal posture
Kneeling or standing on seat
Lying on or across seat
Kneeling, standing or sitting in front of seat
Sitting sideways or turned to talk with another occupant or to look out a rear window
Sitting on a console
Lying back in a reclined seat position
Bracing with feet or hands on a surface in front of seat
Sitting on or in the lap of another occupant
Sitting side by side another occupant
Other abnormal posture (specify):
Unknown

Source: Primary source is interviewee; secondary sources include vehicle inspection, police report, or official records (*i.e.*, medical).

Remarks:

This variable is designed to capture those instances where an occupant was not in the usual upright, **forward facing seated position** except for occupants correctly seated in child safety seats.

The occupant's posture is assessed as the last known position that the occupant was in just prior to impact. If the occupant cannot recall his/her position just prior to impact, then assign the last known position just prior to recognizing an impending danger.

The posture of an occupant of a child safety seat is normal if the occupant is correctly seated in the seat as designed. If the occupant is not seated (*i.e.*, kneeling or standing) in the child safety seat as designed, then the occupant's posture is abnormal and **Other abnormal posture** is used.

It is extremely important in locating injuries associated with various items within the passenger compartment to know as much as possible about the occupant's trajectory or path inside the vehicle during the collision. The accuracy of this analysis depends on knowing exactly where the occupant was before the collision. Therefore, details about the occupant's posture are necessary.

As an example, if the right front passenger was sitting sideways in the seat facing the driver immediately prior to a frontal collision, it is reasonable to assume that his injuries would be confined to the right side of his body from contact with the instrument panel area. If he is reported simply as "sitting on the seat", his normal position would be with his right toward the door. For the same collision situation described above he would probably then contact the instrument panel with the front of his body rather than the side.

Screen Name: Posture (cont'd)
Variable Name: Occupant's Posture (cont'd)

Kneeling or standing on seat
is used whenever an occupant is not seated but is kneeling or standing on a seat.

Lying on or across seat
is used whenever an occupant is not seated but is lying with body, or body and legs across one or more seating positions.

Kneeling, standing or sitting in front of seat
is used whenever an occupant is not seated but is on the floor kneeling, standing, or sitting in front of a seat, which may be occupied.

Sitting sideways or turned to talk with another occupant or to look out a rear window
is used whenever an occupant is seated but is sitting sideways or turned to talk with another occupant or to look out a rear window just prior to impact.

Sitting on a console
is used whenever an occupant is not in a seat position but is sitting on a console.

Lying back in a reclined seat position
is used whenever an occupant in a seat position has reclined the seat back rearward and is lying back in the seat.

Bracing with feet or hands on a surface in front of seat
is used whenever a seated occupant has assumed a position of bracing on the surface in front of the seat position just prior to the collision.

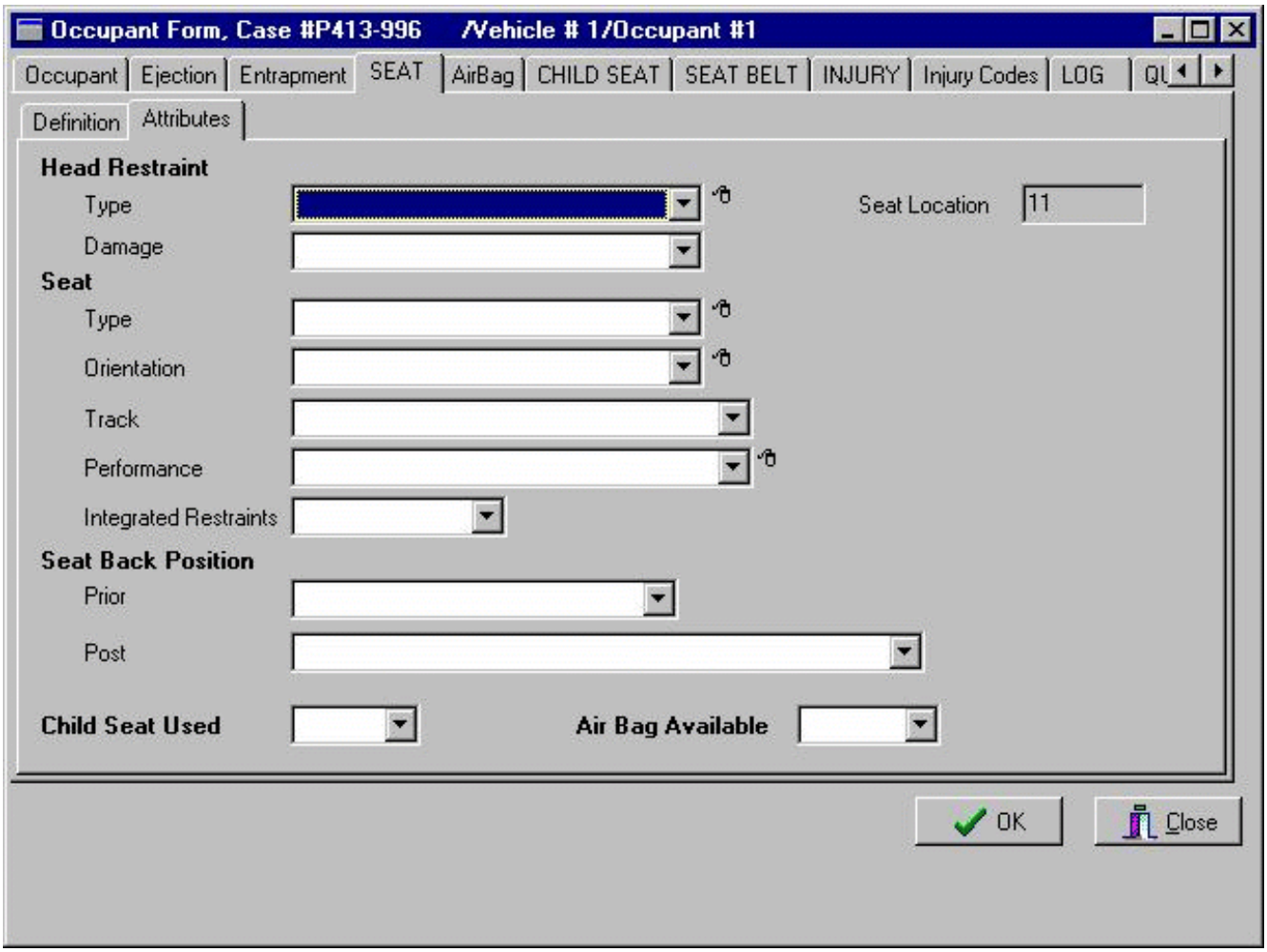
Sitting on or in the lap of another occupant
is used whenever two occupants occupy the same seat position by sitting on, or in the lap of, the other occupant.

Sitting side-by-side another occupant in the same seating location, not primarily in their lap
is used when a seated occupant is in the same seating location as another occupant but is not in their lap.

Other abnormal posture (specify)
includes but is not limited to:

- sitting normally (not kneeling, etc.) in a designed rearward or side-facing seat except for occupants correctly seated in child safety seat
- leaning over in the seat
- being in an enclosed area that does not have designated seating positions
- being in an unenclosed area
- incorrectly seated in a child safety seat

Unknown
if the occupant's posture cannot be determined.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Definition
Attributes
Head Restraint
Type
Damage
Seat Location
11
Seat
Type
Orientation
Track
Performance
Integrated Restraints
Seat Back Position
Prior
Post
Child Seat Used
Air Bag Available
OK
Close

Screen Name: Head Restraint--Type
Variable Name: Head Restraint Type at This Occupant Position

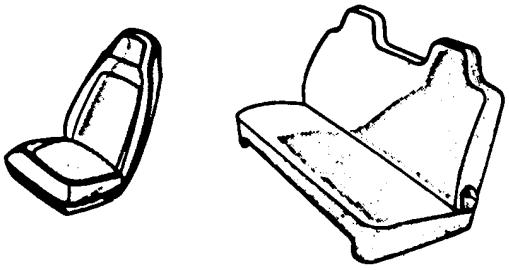
Element Attributes:

No head restraints
Integral
Adjustable
Add-on
Other (specify)
Unknown

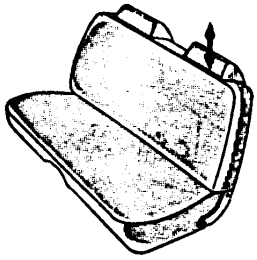
Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

Many passenger cars have head restraints for the front outboard seat positions. The head restraints can be of any design but must meet the requirements of FMVSS 202 (Head Restraints). Some examples of head restraint styles are shown below.



INTEGRAL



ADJUSTABLE

Some manufacturers are providing head restraints for rear seat occupants.

No head restraints

is used when (1) no head restraint is available for this seating position, or (2) there had been a head restraint but it had been removed prior to the crash.

Integral

refer to head restraints which are a continuous part of the seat back structure or those which are a separate structure but are not vertically adjustable. Some rear seats may have a slight rise in the rear seat back, these are also classified as integral head restraints.

Screen Name: Head Restraint—Type (cont'd)
Variable Name: Head Restraint Type at This Occupant Position (cont'd)

Adjustable

apply to:

- head restraints which can be moved vertically to accommodate occupants of varying heights, and
- head restraints which have a fixed outer framework and a separate center section which is adjustable vertically.

Add-on

refer to clamp-on, strap-on, or even bolt-on head restraints on a vehicle not originally equipped with head restraints. This attribute should be infrequently used.

Unknown

is used when the type of head restraint cannot be determined

Screen Name: Head Restraint--Damage
Variable Name: Head Restraint Damage by Occupant at This Occupant Position

Element Attributes:

No damage
Damaged during crash
Unknown
[No Head Restraints]

Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

Some manufacturers are providing head restraints for rear seat occupants. These head restraints may be the same or similar to those used in the front seats, or they may be a slight rise in the rear seat back. Any damage to a rear seat head restraint by the occupant in the seat position must be captured regardless of the height of the restraint.

No damage

There was no damage to the head restraint by the occupant.

Damaged during crash

Any damage to a head restraint caused by the occupant in the seat position having the head restraint should be identified and photographed

Unknown

is used when it is unknown if damage to the restraint was caused by an occupant in the appropriate seat position.

Screen Name: Seat – Type
Variable Name: Seat Type

Element Attributes:

Occupant not seated or no seat
Bucket
Bucket with folding back
Bench
Bench with separate back cushions
Bench with folding back(s)
Split bench with separate back cushions
Split bench with folding back(s)
Pedestal (*i.e.*, column supported)
Box mounted seat (*i.e.*, van type)
Other seat type (specify)
Unknown

Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

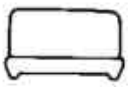
This variable assesses the type of seat present at this position.

The type of seat in which an occupant is positioned may have an effect on the occupant kinematics. For this reason the type of seat is important to analysts.

Pedestal (*i.e.*, column supported)
includes both swivel and non-swivel type pedestal seats. A pedestal seat can be differentiated from a bucket seat by the presence of a column supporting the pedestal seat.

Below are examples of some seats and appropriate attributes.

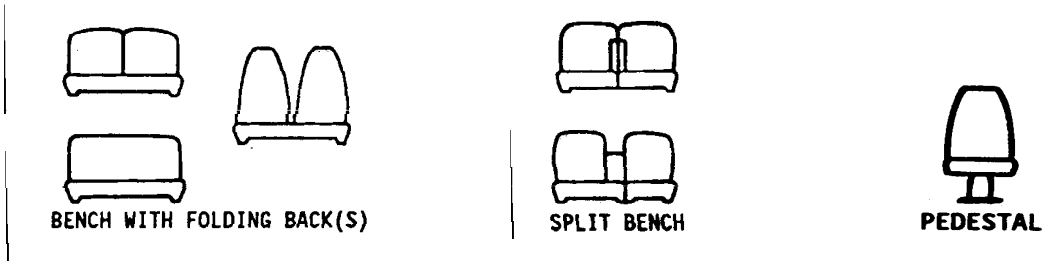
BUCKET



BENCH

BENCH WITH SEPARATE BACK CUSHIONS

Screen Name: Seat –Type (cont'd)
Variable Name: Seat Type (cont'd)



The term "folding back(s)" for both bench and bucket-type seats refers to seat backs which are designed to fold significantly forward of upright.

Seats which recline only rearward are not considered to be folding backs. If the seat back does not fold forward at the position you are assessing, do not use the folding back attributes. Folding backs, because of the additional possibility of failure of the folding mechanism, take precedence over solid or separate back cushions. For example, a bench seat with separate back cushions which fold forward would be **Bench with folding back(s)**.

The rear seats in many late model vehicles may be of unusual design. The researcher is cautioned to view only the seat type for the occupant's position. If the seat is of a bench type and the back cushion for the position folds, then the proper attribute is **Bench with folding back(s).** The fact that the seat cushion may also fold is not considered.

At the time of the inspection if a seat was folded down, record the data as if the seat was in the upright position. If any seat has been removed and cannot be inspected that data is to be recorded.

Box mounted seat (*i.e.*, van type)
is used to identify elevated seats which have as a part of their attachment design a box which is fastened to the floor and has seat tracks bolted to the top of the box. This type is often found in front row locations of vans. Do not confuse this design with pedestal seats which require a single post support column.

Screen Name: Seat--Orientation
Variable Name: Seat Orientation

Range:

Element Attributes:

Forward facing seat
Rear facing seat
Side facing seat (inward)
Side facing seat (outward)
Other (specify):
Unknown

Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

Most seats are fixed in terms of their orientation within the vehicle; however, some seats (*e.g.*, swivel or reversible) can be oriented in more than one direction. Swivel seats and reversible seats (*e.g.*, some station-wagons or vans) are entered according to their orientation at the time of impact [*i.e.*, **Forward facing seat** or **Rear facing seat].**

Forward facing seat
is used when the seat is oriented towards the front plane of the vehicle.

Rear facing seat
is used when the seat is oriented towards the rear plane of the vehicle.

Side facing seat (inward)
is used when the seat is oriented towards either the right or left planes of the vehicle and faces inward.

Side facing seat (outward)
is used when the seat is oriented towards either the right or left planes of the vehicle and faces outward.

Other
is used when a seat is oriented such that the above attributes do not apply.

Unknown
is used when the seat orientation cannot be determined.

Screen Name: Seat--Track
Variable Name: Seat Track Position

Element Attributes:
Non-adjustable seat track
Adjustable Seat Track
Seat at forward most track position
Seat between forward most and middle track positions
Seat at middle track position
Seat between middle and rear most track position
Seat at rear most track position
Unknown

Source: Researcher determined--Vehicle inspection, interviews confirming or secondary source.

Remarks:

The researcher should attempt to determine the seat position at impact. When the researcher begins the interior inspection, he/she should note the position of the seat. The researcher should then move the seat forward and back along its track and determine the number of positions. Once this has been done, the seat should be moved to the position initially observed and photographed. Interviewee data must be taken into consideration before assigning the final code.

If the seat has electric adjusters with no distinct track positions, attempt to determine the relative position of the seat and select accordingly.

Non-adjustable seat track
Use this for seats that cannot be moved longitudinally.

Adjustable Seat Track

Seat at forward most track position
Use this if the seat is at the forward limit of the track.

Seat between forward most and middle track position
Use this if the seat is at any position between the most forward and middle seat positions.

Seat at middle track position
Use this if the seat is in the position mid-range between the forward and rear most track position.

Seat between middle and rear most track position
Use this if the seat is at any position between the middle and rearmost track position.

Seat at rear most track position
Use this attribute if the seat is at the rear limit of the track.

Unknown
Use this attribute if the seat position at impact cannot be determined.

Screen Name: Seat--Performance
Variable Name: Seat Performance

Element Attributes:

No seat performance failure(s)
Seat adjusters failed
Seat back folding locks or "seat back" failed (specify)
Seat tracks/anchors failed
Deformed by impact of occupant
Deformed by passenger compartment intrusion (specify)
Combination of above (specify)
Other (specify)
Unknown

Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

This variable assesses the performance of the seat during the crash sequence. The attributes are indications of whether the seat failed or was deformed in any way. Select the attribute which corresponds to the appropriate seat performance failure or deformation. Minor smudges, scrapes, dents, etc. are not considered deformation. Interviews can be used as a confirming source for coding this variable.

If a failure or deformity occurs, then document the failure or deformation with a diagram and explanation. In addition, include photographs of the seat failure or deformity.

No seat performance failure(s)

is used if the seat was not deformed or no portion of the seat structure failed during the crash.

Seat adjusters failed

is used if any of the mechanisms used to adjust a seat's "comfort" position are separated or deformed during the crash as a result of occupant loading.

Seat adjuster mechanisms include:

- Height adjustment
- Longitudinal (horizontal) seat track adjustment
- Rocker adjustment
- Swivel/rotational adjustment
- Seat back recliner adjustment

For a seat back recliner failure, the seat back must have released in a rearward direction. Do not use this attribute if the seat back failed in a forward direction and the seat has a folding lock mechanism (*e.g.*, front seats in 2-door vehicles); see **Seat back folding locks failed** below.

This code should be used when multiple adjuster failures have been detected. Be sure to include supportive written and photographic documentation to support all failures.

Screen Name: Seat—Performance (cont'd)
Variable Name: Seat Performance (cont'd)

Seat back folding locks or "seat back" failed
is used when the mechanism which is designed to lock the seat back in its upright position fails or separates allowing the seat back to move forward during the collision as a result of occupant loading

"Seat back" failed refers to forward facing seats where seat back structural failures (*e.g.*, seat back hinge points) resulted in a separation of the seat back from its anchorage points. Again, to be considered applicable for this, the seat must have failed while moving forward during the collision as a result of occupant loading.

Seat tracks/anchors failed
is used if the seat separates, to any degree, from a seat track during the crash. In addition, use this if the seat anchor that attaches the seat track to the floorpan separates, to any degree, during the crash. Box mounted seats are included in this if a separation occurred between the box and the floor or the box and the seat track/anchor. Seat track or anchor failures must be a result of occupant loading.

Deformed by impact of occupant
is used when the seat is changed in form from its original design from occupant loading during the crash. Situations where seats are deformed and also experience mechanical failures should be identified under **Combination of above.**

Deformed by passenger compartment intrusion
is used when the seat is deformed or failed by intrusion of an interior vehicle component(s) or exterior vehicle component(s) into the passenger compartment.

Combination of above
is used when any combination of the above occurs and describes multiple seat failures or deformations. Seat failures or deformations which are not described in the above are reported below. Seat failures or deformations listed in the above take priority over others

Other
is used when the only seat failure(s) or deformation(s) which occur are not described in the above (*e.g.*, impact forces).

Unknown
is used if the seat performance cannot be determined.

Screen Name: Seat--Integrated Restraints
Variable Name: Does the Seat Have Integrated Passenger Belts?

Element Attributes:

No
Yes
Unknown

Source: Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).

Remarks:

A seat with integrated belt restraints is multi-functional and contains built-in occupant protection devices. Previously all seating structures operated independently of the occupant restraint system, perhaps only having an upper ring that guided the seat belt across the torso. These seats are designed to contain the occupant restraint systems, as well as being designed to help retain the occupant in the seat by use of designs of the lower seat pan and the back seat structure.

If you were to remove the seat and the belt restraints come with the seat indicate **Yes**.

Screen Name: Seat Back Position -- Prior
Variable Name: Seat back Incline Prior to Impact

Element Values:
Not adjustable
Upright
Slightly reclined
Completely reclined

Unknown

Source: Researcher determined--driver/occupant interview and vehicle inspection when the seat back incline position prior to impact can be determined from the vehicle inspection.

Remarks:

This variable is for adjustable (reclining) seat backs only

Not adjustable
is used for seating positions where there is a seat back which is fixed in position.

Upright
is used when the seatback is in the fully upright position (i.e., perpendicular to the seat cushion).

Slightly reclined
is used when the seat back is in a slightly reclined position.

Completely reclined
is used when the seat back is in a position that is rearward to the limit of its range of movement.

Unknown
is used when the pre-impact seat back position could not be determined from any source.

Screen Name: Seat Back Position -- Post
Variable Name: Seat Back Incline Position Post Impact

Element Attributes:

Moved to completely rearward position
Moved to rearward midrange position
Moved to completely rearward position
Retained pre-impact position
Moved to upright position
Moved to slightly forward position
Moved to Forward midrange position
Complete forward position
Unknown
[Not adjustable]

Source: Researcher determined--driver/occupant interview and vehicle inspection when the seat back incline position post impact can be determined from the vehicle inspection.

Remarks:

This variable is for adjustable (reclining) seat backs only. This variable reflects the change in the seat back incline position as a result of forces upon it during the crash sequence. Select the attribute that describes the backrest position post-impact as a result of these forces.

Unknown

is used when the post crash seat back position could not be determined.

Screen Name: Child Seat Used
Variable Name: Child Safety Seat Used

Element Attributes:

No
Yes
Unknown

Source: Researcher determined — inputs include vehicle inspection, interviewee and police report.

Remarks:

No
is used when a child safety seat is not being used by this occupant.

Yes
is used when a child safety seat is being used by this occupant.

Unknown
is used when it is unknown if this person was using a child safety seat.

Screen Name: Air Bag Available
Variable Name: Air Bag Available

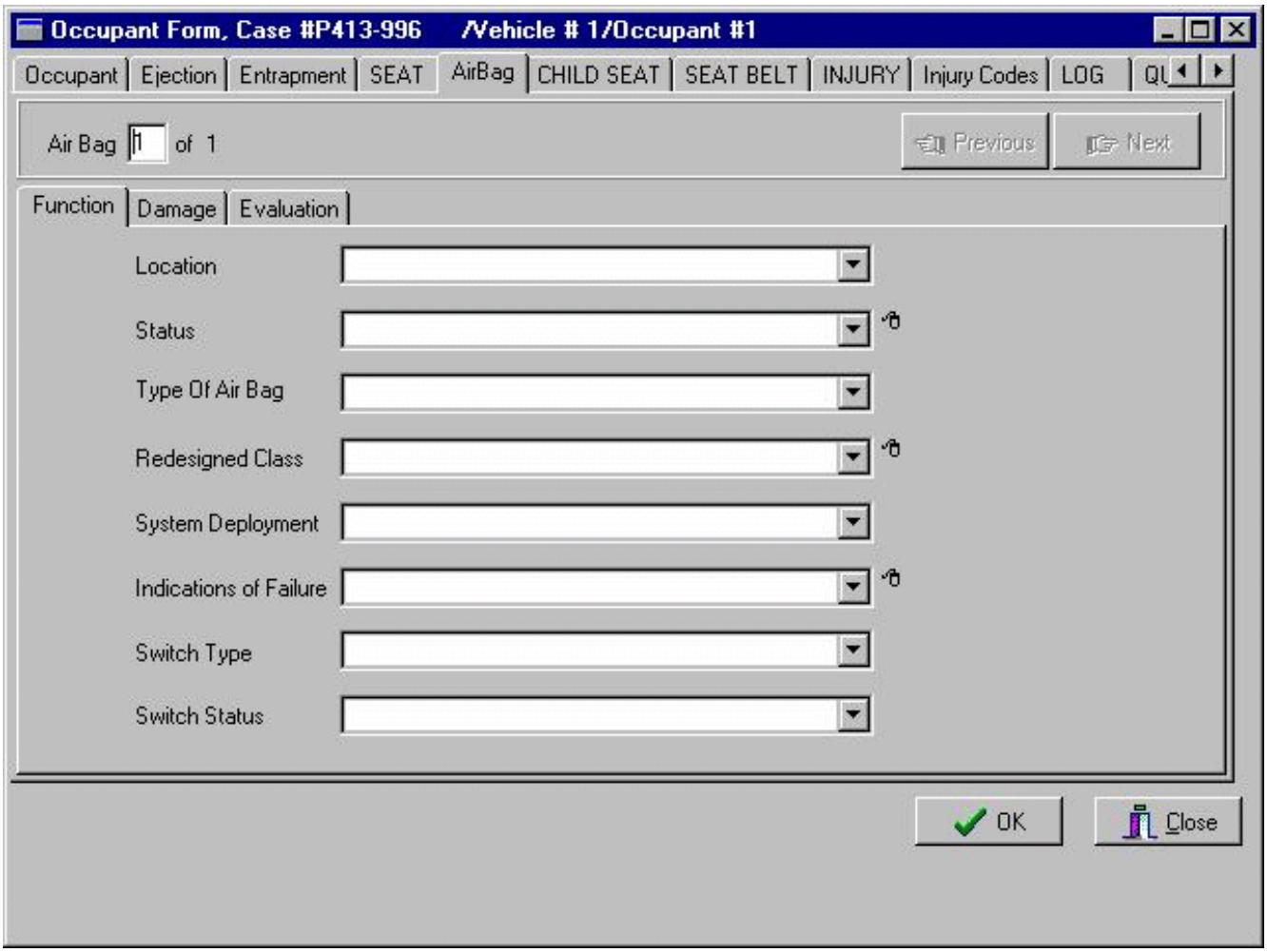
Element Attributes:

No
Yes
Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview and medical records.

Remarks:

This variable indicates whether there was ever an air bag present of any type for this seating location. Additional information about it's availability or non-availability is coded on the **Air Bag tab**


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Air Bag 1 of 1
Previous
Next
Function
Damage
Evaluation
Location
Status
Type Of Air Bag
Redesigned Class
System Deployment
Indications of Failure
Switch Type
Switch Status
OK
Close

Screen Name: Location
Variable Name: Deployment Location of Air Bag

Element Attributes:

Steering Wheel Hub
Top Instrument Panel
Mid Instrument Panel
Bottom Instrument Panel
Seat Back
Seat Cushion
Pillar (A or B)
Door
Roof Side Rail
Other
Unknown

Source: Vehicle inspection

Remarks:

Enter the location of the air bag. If air bags are available for the occupant, indicate the information on all air bags. Do so by inserting another air bag. To insert another air bag go to the menu bar and select **Edit / Insert**, then indicate its location, and complete the information about the air bag.

Steering Wheel
is used for an air bag that is designed to deploy from a module integrated with the steering wheel. It is designed to protect the vehicle's driver primarily from frontal impacts.

Top Instrument Panel
is used for those air bags that deploy rearward from a location on the top of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts.

Mid Instrument Panel
is used for those air bags that deploy rearward from a location in the middle of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts.

Bottom Instrument Panel
is used for those air bags that deploy rearward from a location in the bottom of the instrument panel. They are designed to protect front seat passengers primarily from frontal impacts. This includes "knee bags".

Seat Back
is located on the outside portion of the seat back and is designed to protect the torso of occupants primarily from side impacts.

Seat Cushion
is located on the outside portion of the seat cushion and is designed to protect the torso of occupants primarily from side impacts.

Screen Name: Location (cont'd)
Variable Name: Deployment Location of Air Bag (cont'd)

Pillar (A or B)
is primarily a tubular shaped bag that is tethered at the A pillar and is stored in the roof side rail and is designed to protect the head of occupants primarily from side impacts

Door
is located in the door is designed to protect the torso of occupants primarily from side impacts.

Roof Side Rail
is primarily a curtain type bag that is stored in the roof side rail and is designed to protect the head of occupants primarily from side impacts

Other (specify)
is used when the location of the air bag cannot be captured in the above attributes. This should be a rare occurrence. The location of the air bag must be specified.

Screen Name: Status
Variable Name: Air Bag Status

Element Attributes:
Air Bag Available
Air bag disconnected (specify):
Air bag not reinstalled
Unknown

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include interview, repair facilities, tow facility, medical records.

Remarks:

Air bag available
is used when the vehicle is equipped with an air bag for this seating position. Non-deployment of the air bag system has no bearing on this variable.

Air bag disconnected
is used when any component of the air bag was rendered inoperative prior to the collision (*e.g.*, fuse removed).

Air bag not reinstalled
is used when the air bag for this seating position was not replaced after a prior deployment to the crash being researched.

Unknown
is used when it cannot be ascertained whether an air bag was available at the time of the crash.

Screen Name: Type of Air Bag
Variable Name: Type of Air Bag

Element Attributes:

Original manufacturer install
Retrofitted Air Bag
Replacement Air Bag
Unknown

Source: Researcher determined—primary source is the interview, secondary sources may include the repair facility and documents found in the vehicle.

Remarks:

Original manufacturer install

is used when it can be determined that the vehicle was equipped with an air bag system in this seating position that was installed by the manufacturer at the time the vehicle was built (OEM—Original Equipment Manufacturer).

Retrofitted air bag

is used when it can be determined that the vehicle was equipped with an air bag system for this seating position but that the vehicle was not built with a manufacturer equipped air bag system. This is an after market product and should not be confused with **Replacement Air Bag**. Replacement **Retrofit Air Bags** are also included in this category.

Replacement air bag

is used when it can be determined that the vehicle was equipped with an OEM air bag system for this seating position and that this system had been replaced due to a previous deployment.

Unknown type

With no interview or other confirming source, assume that the type of air bag is unknown.

Screen Name: Redesigned Class
Variable Name: Redesigned Air Bag

Element Attributes:

Not Redesigned
Redesigned
Advanced (specify)
Unknown

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include VIN and interview.

Remarks:

This variable indicates whether the vehicle was equipped with a redesigned air bag for this location. Redesigned air bags include second generation air bags, next generation air bags, Air Bag II, advanced air bags, and other innovative systems that have been developed to make use of air bag protection technology

Not Redesigned

indicates that the vehicle was not equipped with a depowered air bag or an advanced air bag for this location.

Redesigned

indicates that the vehicle was equipped with a redesigned air bag for this location. Redesigned class of air bag includes “second generation” air bags. Vehicles with these air bags were first manufactured in 1998 See the **Redesigned Air Bag Special Study** instruction for additional detail on vehicle applicability.

Advanced (specify)

this includes air bags such as “smart” air bags that will not deploy if the position is not occupied. Specify the type of advanced air bag found.

Unknown

is used when it is not known if the air bag was redesigned

1998 RABSS Safety Features								
Make/Model	**Manu-Facture**	**Body Styles**	**Vehicle Type**	**Redesigned Air Bag**	**Side Air Bags**		**Seat Belt Pretens.**	**Dual Stage Passenger Air Bag**
					Front	**Rear**		
3 Series	BMW	4-dr. sedan	PC	RC	Yes	No	Yes	No
5 Series	BMW	4-dr. sedan	PC	RC	Yes	No	Yes	No
7 Series	BMW	4-dr. sedan	PC	RC	Yes	Availabl e	Yes	No
M3	BMW	2-dr.	PC	RC	Yes	No	Yes	No
Z3	BMW	2-dr. coupe	PC	RC	Available	No	Yes	No
RC - Running Change in model year 1998. There will be a code "3" as VIN identifier in position 8.								
LHS	Chrysler	4-dr	PC	Yes	No	No	No	No
Sebring	Chrysler	2-dr/conv.	PC	Driver Only	No	No	Yes	No
Town & Country	Chrysler	minivan	VAN	Pass. Only	No	No	No	No
300 M	Chrysler	4-dr	PC	Yes	No	No	No	No
Dodge Avenger	Chrysler	2-dr	PC	No	No	No	Yes	No
Dodge Caravan	Chrysler	Minivan	VAN	Pass. Only	No	No	No	No
Dodge Dakota	Chrysler	Std.Cab/ClubCab	Truck	Yes	No	No	Yes	No
Dodge Durango	Chrysler	4-dr	MPV	Yes	No	No	No	No
Dodge Intrepid	Chrysler	4-dr	PC	Yes	No	No	No	No
Dodge Neon	Chrysler	2-dr/'4-dr	PC	Yes	No	No	Yes	No
Dodge Ram Pickup	Chrysler	Std.Cab/Club Cab	Truck	Yes	No	No	Yes	No
Dodge Ram Wagon	Chrysler	Wagon	MPV	Yes	No	No	Yes	No
Dodge Stratus	Chrysler	4-dr	PC	Yes	No	No	Yes	No
Dodge Viper	Chrysler	coupe/roadster	PC	Yes	No	No	No	No
Jeep Cherokee	Chysler	4-dr	MPV	Yes	No	No	Yes	No
Jeep Gr. Cherokee	Chrysler	4-dr	MPV	Driver Only	No	No	No	No
Jeep Wrangler	Chrysler	2-dr	MPV	Yes	No	No	Yes	No
Plymouth Prowler	Chrysler	conv.	PC	Yes	No	No	No	No
Plymouth Voyager	Chrysler	minivan	VAN	Pass. Only	No	No	No	No
Club Wagon	Ford	Van	Van	Yes	No	No	Yes	No
Contour	Ford	4-dr. sedan	PC	RC	No	No	No	No
Cougar	Ford	2-dr.	PC	Yes	No	No	No	No
Crown Victoria	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Econoline Van	Ford	Van	Van	Yes	No	No	Yes	No
Escort	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Escort ZX2	Ford	4-dr. sedan	PC	RC	No	No	No	No
Expedition	Ford	4-dr.	SUV	Yes	No	No	No	No
Explorer	Ford	4-dr.	SUV	Yes	No	No	No	No
F150/F250 Light Duty	Ford	2-dr.	TRUCK	Yes	No	No	No	No
Mustang	Ford	2-dr.	PC	Yes	No	No	No	No
Taurus	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Windstar	Ford	Wagon Van	VAN	RC	No	No	No	No
Lincoln Continental	Ford	4-dr sedan	PC	Yes	No	No	No	No
Lincoln Navigator	Ford	4-dr.	SUV	Yes	No	No	No	No
Lincoln Town Car	Ford	4-dr sedan	PC	Yes	No	No	No	No
Mercury Grand Marquis	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Mountaineer	Ford	4-dr/2-dr	SUV	Yes	No	No	No	No
Mercury Mystique	Ford	4-dr. sedan	PC	RC	No	No	No	No
Mercury Sable	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Tracer	Ford	4-dr. sedan	PC	Yes	No	No	No	No
Mercury Villager	Ford	Van	VAN	Yes	No	No	No	No
RC - Running Change in model year 1998. There will be a code "F" in VIN position 4, or a "K" for Escort ZX2, or codes <= 55 in VIN positions 6 and 7 for light trucks.								
EV1	GM	2-dr.	PC	Yes	No	No	No	No
Monte Carlo	GM	2-dr. coupe	PC	Yes	No	No	No	No

1998 Safety Features								
Make/Model	Manu-Facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Buick Century	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Lesabre	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Park Avenue	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Regal	GM	4-dr. sedan	PC	Yes	No	No	No	No
Buick Rivera	GM	4-dr. sedan	PC	RC	No	No	No	No
Cadillac Catera	GM	4-dr. sedan	PC	RC	No	No	Yes	No
Cadillac Deville	GM	4-dr. sedan	PC	Yes	Yes	No	No	No
Cadillac Eldorado	GM	4-dr. sedan	PC	Yes	No	No	No	No
Cadillac Seville	GM	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Chevy Astro	GM	Van	VAN	Yes	No	No	No	No
Chevy Blazer	GM	4-dr	SUV	Yes	No	No	No	No
Chevy Cavalier	GM	convertible	PC	Yes	No	No	No	No
Chevy Express	GM	Van	Van	Yes	No	No	No	No
Chevy Camaro	GM	2-dr.	PC	Yes	No	No	No	No
Chevy Corvette	GM	2-dr. coupe	PC	RC	No	No	No	No
Chevy Lumina	GM	4-dr. sedan	PC	Yes	No	No	No	No
Chevy Prizm	GM	4-dr. sedan	PC	Yes	Available	No	Yes	No
Chevy Suburban	GM	4-dr.	SUV	Yes	No	No	No	No
Chevy Tahoe	GM	4-dr	SUV	Yes	No	No	No	No
Chevy 7200 GVWR	GM	reg./ext. cab	TRUCK	Yes	No	No	No	No
Chevy Venture	GM	Van	VAN	Yes	Yes	No	Yes	No
Geo Metro	GM	2-dr./4-dr.	PC	Yes	No	No	No	No
Geo Tracker	GM	2-dr./4-dr.	MPV	Yes	No	No	No	No
Oldsmobile Alero	GM	2-dr. coupe	PC	Yes	No	No	No	No
Oldsmobile Aurora	GM	4-dr. sedan	PC	RC	No	No	No	No
Oldsmobile Cutlass	GM	4-dr. sedan	PC	Yes	No	No	No	No
Oldsmonile Intrigue	GM	4-dr. sedan	PC	RC	No	No	No	No
Oldsmobile Silhouette	GM	Van	VAN	Yes	Yes	No	Yes	No
Oldsmobile 88	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Bonneville	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Firebird	GM	convertible	PC	Yes	No	No	No	No
Pontiac Grand Am	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Grand Prix	GM	4-dr. sedan	PC	Yes	No	No	No	No
Pontiac Sunfire	GM	sedan	PC	Yes	No	No	No	No
Pontiac Transport	GM	Van	VAN	Yes	Yes	No	Yes	No
Saturn SL	GM	4-dr. sedan	PC	Yes	No	No	No	No
Saturn Wagon	GM	wagon	PC	Yes	No	No	No	No
RC - Running Change in model year 1998. There will be a VIN break point: for Corvette: Driver side - 106874, Passenger Side - 107296; for Oldsmobile Ingtrigue: Driver Side (Grey interior) 308218, Driver Side (Neutral interior) 308160, for Passenger Side - 308671; Buick Rivera - W4706785; Oldsobile Aurora - W4112855.								
CR-V	Honda	2-dr.	MPV	Yes	No	No	Yes	No
EV Plus	Honda	2-dr. hatchback	PC	Yes	No	No	No	No
Integra	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Odyssey	Honda	5-dr. mini-van	MPV	Yes	No	No	No	No
Passport	Honda	5-dr.	SUV	Yes	No	No	No	No
Prelude	Honda	2-dr. coupe	PC	RC	No	No	No	No
Accord Coupe	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Accord Sedan	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Acura 2.3	Honda	2-dr. coupe	PC	Yes	No	No	No	No

1998 Safety Features								
Make/Model	Manu-Facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Acura 3.0	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.5RL	Honda	4-dr. sedan	PC	Yes	No	No	Yes	No
Acura NSX	Honda	2-dr.	PC	No	No	No	Yes	No
Acura SLX	Honda	5. dr.	SUV	Yes	No	No	No	No
Civic Coupe	Honda	2-dr. coupe	PC	RC	No	No	No	No
Civic Sedan	Honda	4-dr. sedan	PC	Yes	No	No	No	No
RC - Running Change in model year 1998. No VIN identifier.								
Jaguar XJ Series	Jaguar	4-dr.sdn swb	PC		Yes	No	Yes	No
Jaguar XK8	Jaguar	4-dr. sedan	PC		No	No	Yes	No
Jaguar VDP	Jaguar	4-dr.sdn swb	PC		No	No	No	No
626	Mazda	2-dr.	PC	RC	No	No	No	No
RC - Running Change in model year 1998; from June production vehicles.								
129 SL500	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129SL500Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan-swb	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S420	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140S600	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 CL500	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
140 CL600	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
163 ML320	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
163 ML430	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
170 SLK230	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
202 C230	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280Sprt	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C43	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
210 E300	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E55	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr stnwagon	PC	No	Yes	No	Yes	No
220 S430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
220 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
Eclipse	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Mirage	Mitsubishi	2-dr./4-dr. sedan	PC	Yes	No	No	No	No
Montero	Mitsubishi	4-dr.	SUV	VIN	No	No	No	No
VIN - VIN Identifier for Redesigned Air Bag - JA4MR51R6WJ000101								

1998 Safety Features								
Make/Model	**Manu-Facture**	**Body Styles**	**Vehicle Type**	**Redesigned Air Bag**	**Side Air Bags**		**Seat Belt Pretens.**	**Dual Stage Passenger Air Bag**
					Front	**Rear**		
Infiniti G20	Nissan	4-dr. sedan	PC	No	Yes	No	No	No
Infiniti Q45	Nissan	4-dr. sedan	PC	RC	Yes	No	Yes	No
Infiniti QX4	Nissan	4-dr wgn	SUV	RC	No	No	No	No
Infiniti I30	Nissan	4-dr. sedan	PC	No	Yes	No	No	No
Altima	Nissan	4-dr. sedan	PC	RC	No	No	No	No
Frontier	Nissan	4-dr.	SUV	RC	No	No	No	No
Maxima	Nissan	4-dr. sedan	PC	No	Available	No	No	No
Pathfinder	Nissan	4-dr.	SUV	RC	No	No	No	No
Sentra	Nissan	4-dr.	PC	RC	No	No	No	No
200SX	Nissan	2-dr.	PC	RC	No	No	No	No
RC - Running Change in model year 1998; Infiniti Q45 VIN start JN1BY31A7WM500008; Infiniti QX4 VIN start JNRAR05YOWW025978; Altima-1N4DL01D2WC100043; Frontier - 1N6DD26S3WC300033; Pathfinder - JN8AR05Y7WW234493; Sentra - 1N4AB41D5WC700018; 200SX - 1N4AB42D2WC500020.								
911	Porsche	2-dr.	PC	No	Yes	No	No	No
Boxster	Porsche	2-dr.	PC	No	Yes	No	No	No
Saab 9-3	Saab	2-dr. hb	PC	No	No	No	Yes	No
Saab 9-3	Saab	4-dr. hb	PC	No	No	No	Yes	No
Saab 9-3	Saab	Convertible	PC	No	No	No	Yes	No
Saab 9-5	Saab	4-dr. sedan	PC	No	No	No	Yes	No
Forester	Subaru	4-dr.	PC	RC	No	No	No	No
Impreza	Subaru	4-dr. sedan	PC	RC	No	No	No	No
Legacy	Subaru	4-dr. sedan	PC	RC	Available	No	No	No
RC - Running Change in model year 1998; Legacy starting VIN - Sedan W*20486, S/W W*307101, Outback W*617283; Impreza - W*400001 or W*500001 or W*800001; Forester - W*750001.								
Lexus LX470	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Lexus RX300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus SC300/400	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
LexusLS400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus GS300/400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus ES300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Avalon	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Camry	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Celica	Toyota	2-dr.	PC	Yes	No	No	Yes	No
Corolla	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Land Cruiser	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Paseo	Toyota	2-dr. coupe	PC	Yes	No	No	Yes	No
RAV-4	Toyota	2-dr.	MPV	Yes	No	No	Yes	No
Sienna	Toyota	Van	VAN	Yes	No	No	Yes	No
Solara	Toyota	2-dr coupe	PC	Yes	No	No	Yes	No
Tacoma	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
Tercel	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Tundra	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
T150	Toyota	2-dr.	TRUCK	Yes	No	No	No	No
4 Runner	Toyota	4-dr.	SUV	Yes	No	No	No	No
Audi A4	Volkswagon	4-dr	PC	RC	Yes	No	Yes	No
Audi A6	Volkswagon	wagon	PC	Yes	Yes	No	Yes	No
Audi A8	Volkswagon	sedan	PC	RC	Yes	No	Yes	No
Audi Cabriolet	Volkswagon	2-dr.	PC	RC	No	No	Yes	No

1998 Safety Features								
Make/Model	Manu-Facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Cabrio	Volkswagon	2-dr	PC	No	Available	No	Yes	No
EuroVan	Volkswagon	Van	Van	Yes	No	No	No	No
GTI	Volkswagon	2-dr	PC	No	Available	No	Yes	No
Golf	Volkswagon	2-dr	PC	No	Available	No	Yes	No
Jetta	Volkswagon	4-dr.	PC	No	Available	No	Yes	No
New Beetle	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Passat	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Passat Wagon	Volkswagon	4-dr	PC	No	Yes	No	Yes	No
C70	Volvo	All	PC	RC	Yes	No	Yes	No
V70	Volvo	All	PC	RC	Yes	No	Yes	No
S80	Volvo	All	PC	No		No	No	No
S90/V90	Volvo	All	PC	No	Yes	No	Yes	No
RC - Running Change in model year 1998; V70 starting VIN - 447706; C70 - 001920.								

1999 RABSS Safety Features								
Make/Model	Manu facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
3 Series	BMW	4-dr. sedan	PC	Yes	Yes	No	Yes	No
5 Series	BMW	4-dr. sedan	PC	Yes	Yes	Yes	Yes	No
7 Series	BMW	4-dr. sedan	PC	Yes	Yes	Yes	Yes	No
M3	BMW	2-dr. coupe	PC	Yes	Yes	No	Yes	No
Z3	BMW	2-dr. coupe	PC	Yes	Yes	No	Yes	No
Dodge Avenger	Chrysler	2-dr.	PC	Yes	No	No	No	No
Dodge Caravan	Chrysler	minivan	VAN	Yes	No	No	No	No
Dodge Dakota	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Durango	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Intrepid	Chrysler	2-dr.	PC	Yes	No	No	No	No
Dodge Neon	Chrysler	2-dr./4-dr.	PC	Yes	No	No	No	No
Dodge Ram Pickup	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Ram Wagon	Chrysler	2-dr.	Truck	Yes	No	No	No	No
Dodge Stratus	Chrysler	4-dr.	PC	Yes	No	No	No	No
Dodge Viper	Chrysler	2-dr.	PC	Yes	No	No	No	No
Eagle Talon	Chrysler	2-dr.	PC	Yes	No	No	No	No
Jeep Cherokee	Chrysler	4-dr.	MPV	Yes	No	No	No	No
Jeep Grand Cherokee	Chrysler	4-dr.	MPV	Yes	No	No	No	No
Jeep Wrangler	Chrysler	4-dr.	MPV	Yes	No	No	No	No
LHS	Chrysler	4-dr.	PC	Yes	No	No	No	No
Plymouth Prowler	Chrysler	2-dr.	PC	Yes	No	No	No	No
Plymouth Voyager	Chrysler	minivan	VAN	Yes	No	No	No	No
Sebring	Chrysler	2-dr.	PC	Yes	No	No	No	No
Town & Country	Chrysler	minivan	VAN	Yes	No	No	No	No
300M	Chrysler	4-dr.	PC	Yes	No	No	No	No
Leganza	Daewoo	4-dr.	PC		No	No	Yes	No
Nubira	Daewoo	2-dr.	PC		No	No	Yes	No
F131	Ferrari/Fiat	2-dr. coupe	PC		No	No	Yes	No
Contour	Ford	4-dr sedan	PC	Yes	No	No	No	No
Cougar	Ford	2-dr coupe	PC	Yes	Available	No	No	No
Crown Victoria	Ford	4-dr sedan	PC	Yes	No	No	No	No
Econoline	Ford	Van	VAN	Yes	No	No	Yes	No
Escort	Ford	2-dr	PC	Yes	No	No	No	No
Expedition	Ford	4-dr	SUV	Yes	No	No	No	No
Explorer	Ford	4-dr/ 2-dr	SUV	Yes	Available	No	No	No
F150/F250 Light Duty	Ford	2-dr	Truck	Yes	No	No	No	No
Mustang	Ford	2-dr	PC	Yes	No	No	No	No
Ranger	Ford	2-dr	Truck	Yes	No	No	No	No
Taurus	Ford	4-dr sedan	PC	Yes	No	No	No	No
Windstar	Ford	Wagon Van	VAN	Yes	Available	No	No	No
Lincoln Continental	Ford	4-dr sedan	PC	Yes	Yes	No	No	No
Lincoln LS	Ford		PC	Yes	No	No	No	No
Lincoln Navigator	Ford	4-dr	SUV	Yes	No	No	No	No
Lincoln Town Car	Ford	4-dr sedan	PC	Yes	Yes	No	No	No
Mercury Grand Marquis	Ford	4-dr	PC	Yes	No	No	No	No
Mercury Mountaineer	Ford	4-dr/2-dr	SUV	Yes	Available	No	No	No
Mercury Mystique	Ford		PC	Yes	No	No	No	No

1999 Safety Features								
Make/Model	Manu facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Mercury Sable	Ford	4-dr sedan	PC	Yes	No	No	No	No
Mercury Tracer	Ford	4-dr sedan	PC	Yes	No	No	No	No
Mercury Villager	Ford	Van	VAN	Yes	No	No	No	No
Buick Century	GM	Sedan	PC	Yes	No	No	No	No
Buick LeSabre	GM	4-dr	PC	Yes	Yes	No	No	No
Buick Park Avenue	GM	4-dr	PC	Yes	No	No	No	No
Buick Regal	GM	Sedan	PC	Yes	No	No	No	No
Buick Riviera	GM	4-dr	PC	Yes	No	No	No	No
Cadillac Catera	GM	4-dr	PC	Yes	Available	No	Yes	No
Cadillac Deville	GM	Sedan	PC	Yes	Yes	No	Yes	No
Cadillac Eldorado	GM	2-dr	PC	Yes	No	No	No	No
Cadillac Seville	GM	4-dr	PC	Yes	Yes	No	Yes	No
Chev Astro	GM	Van	Van	Yes	No	No	No	No
Chev Blazer	GM	2-dr	SUV	Yes	No	No	No	No
Chev Cavalier	GM	Sedan	PC	Yes	No	No	No	No
Chev Camaro	GM	Coupe/conv.	PC	Yes	No	No	No	No
Chev Corvette	GM	Coupe,conv.,HT. coupe	PC	Yes	No	No	No	No
Chev Express	GM	Cargo,10+,20+,30+ pass.	Van	Yes	No	No	No	No
Chev Impala	GM	Sedan	PC	Yes	No	No	No	No
Chev Lumina	GM	Sedan	PC	Yes	No	No	No	No
Chev Malibu	GM	Sedan	PC	Yes	No	No	No	No
Chev Prizm	GM	2-dr	PC	Yes	Yes	No	Yes	No
Chev Suburban	GM	Suburban	SUV	Yes	No	No	No	No
Chev Tahoe	GM	2-dr,4-dr	SUV	Yes	Yes	No	Yes	Yes
Chev Venture	GM	4-dr	VAN	Yes	Yes	No	Yes	No
Chev 7200 GVWR	GM	reg/ext. cab	Pickup	Yes	No	No	No	No
EV1	GM	2-dr	PC	Yes	No	No	No	No
Geo Metro	GM	4-dr/2-dr	PC	Yes	No	No	No	No
Geo Tracker	GM	2-dr/4-dr	MPV	Yes	No	No	No	No
Monte Carlo	GM	Coupe	PC	Yes	No	No	No	No
Olds Cutlass	GM	Sedan	PC	Yes	No	No	No	No
Olds Alero	GM	Coupe	PC	Yes	No	No	No	No
Olds Amora	GM	4-dr	PC	Yes	No	No	No	No
Olds Intrigue	GM	Sedan	PC	Yes	No	No	No	No
Olds 88	GM	4-dr	PC	Yes	No	No	No	No
Pont Bonneville	GM	4-dr	PC	Yes	No	No	No	No
Pont Firebird	GM	Coupe	PC	Yes	No	No	No	No
Pont Firebird	GM	Convertible	PC	Yes	No	No	No	No
Pont Grand Am	GM	Coupe	PC	Yes	No	No	No	No
Pont Grand Am	GM	Sedan	PC	Yes	No	No	No	No
Pont Grand Prix	GM	Sedan/Coupe	PC	Yes	No	No	No	No
Pontiac Montana	GM	4-dr	VAN	Yes	Yes	No	No	No
Pont Sunfire	GM	Coupe	PC	Yes	No	No	No	No
Pont Transport	GM	4-dr	VAN	Yes	Yes	No	No	No
Saturn SL, SL1, SL2	GM	Sedan	PC	Yes	No	No	No	No
Saturn Wagon	GM	Wagon	PC	Yes	No	No	No	No
Silhouette	GM	Reg. Cab	Truck	Yes	Yes	No	No	No

1999 Safety Features								
Make/Model	Manu facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Accord	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Acura 2.3CL	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.0CL	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Acura 3.5RL	Honda	4-dr sedan	PC	Yes	Yes	No	Yes	Yes
Acura NSX	Honda	2-dr	PC	No	No	No	Yes	No
Acura SLX	Honda	5-dr.	SUV	Yes	No	No	No	No
Civic	Honda	4-dr. sedan	PC	Yes	No	No	No	No
CR-V	Honda	2-dr.	SUV	Yes	No	No	Yes	No
EV Plus	Honda	2-dr. hatchback	PC	Yes	No	No	No	No
Integra	Honda	4-dr. sedan	PC	Yes	No	No	No	No
Odyssey	Honda	5-dr. minivan	VAN	Yes	No	No	No	No
Passport	Honda	5-dr.	SUV	Yes	No	No	No	No
Prelude	Honda	2-dr. coupe	PC	Yes	No	No	No	No
Accent	Hyundai	2-dr.	PC	Yes	No	No	No	No
Elantra	Hyundai	4-dr. sedan	PC	Yes	No	No	Yes	No
Sonata	Hyundai	4-dr. sedan	PC	Yes	Available	No	Yes	No
Tiburon	Hyundai	2-dr.	PC	Yes	No	No	No	No
Amigo	Isuzu	2-dr	MPV		No	No	No	No
Rodeo	Isuzu	4-dr.	SUV		No	No	No	No
Trooper	Isuzu	4-dr.	SUV		No	No	No	No
Jaguar VDP	Jaguar	4-dr. sdn swb	PC		Yes	No	No	No
Jaguar XJ Series	Jaguar	4-dr. sdn swb	PC		Yes	No	Yes	No
Jaguar XK8	Jaguar	4-dr. sedan	PC		No	No	Yes	No
Jaguar X200	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Jaguar X300	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Jaguar X350	Jaguar	4-dr. sedan	PC		Yes	No	No	No
Sephia	Kia	4-dr sedan	PC		No	No	No	No
Sportage	Kia	2-dr	MPV		No	No	No	No
Discovery Series II	Land Rover	4-dr.	SUV	Yes	No	No	Yes	No
Ranger Rover 4.0SE, 4.6 HSE	Land Rover	4-dr.	SUV	RC	Yes	No	Yes	No
RC - Running Change in model year 1999; VIN code of "PV" in positions 4-5.								
Millenia	Mazda	2-dr	PC	Yes	No	No	No	No
MX-5	Mazda	2-dr	PC	Yes	No	No	No	No
Protégé	Mazda	2-dr	PC	Yes	No	No	No	No
626	Mazda	2-dr	PC	Yes	No	No	No	No
202 C43	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C230	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
202 C280Sprt	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 CL500	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
140 CL600	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK320	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr coupe	PC	No	Yes	No	Yes	No
208 CLK430	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
210 E55	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No

1999 Safety Features								
Make/Model	Manu facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
210 E300	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
210 E320	Mercedes	4-dr stnwagon	PC	No	Yes	No	Yes	No
210 E430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
163 ML320	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
163 ML430	Mercedes	4-dr mpv	MPV	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr.sedan-swb	PC	No	Yes	No	Yes	No
140 S320	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S420	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
140 S600	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes	No
220 S430	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes &	No
220 S500	Mercedes	4-dr. sedan	PC	No	Yes	No	Yes &	No
129 SL500	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL500Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
129 SL600Sprt	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
170 SLK230	Mercedes	2-dr conv	PC	No	Yes	No	Yes	No
Diamante	Mitsubishi	4-dr. sedan	PC	Yes	No	No	Yes	No
Eclipse	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Eclipse Spyd	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Galant LS, GTZ	Mitsubishi	4-dr. sedan	PC	Yes	Yes	No	No	No
Galant ES, DE	Mitsubishi	4-dr. sedan	PC	Yes	Available	No	No	No
Mirage	Mitsubishi	2-dr./4-	PC	Yes	No	No	No	No
Montero	Mitsubishi	4-dr.	SUV	Yes	No	No	No	No
Montero Sport	Mitsubishi	4-dr.	SUV	Yes	No	No	No	No
3000Gt	Mitsubishi	2-dr.	PC	Yes	No	No	No	No
Infiniti G20	Nissan	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Infiniti I30	Nissan	4-dr. sedan	PC	No	Yes	No	Yes	No
Infiniti Q45	Nissan	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Infiniti QX4	Nissan	4-dr wgn	SUV	Yes	Available	No	Available	No
Altima	Nissan	4-dr.	PC	Yes	No	No	No	No
Frontier	Nissan	4-dr.	SUV	Yes	No	No	No	No
Maxima	Nissan	4-dr. sedan	PC	No	Available	No	Yes	No
Pathfinder	Nissan	4-dr.	SUV	Yes	Available	No	Available	No
Sentra	Nissan	4-dr.	PC	Yes	No	No	No	No
200SX	Nissan	2-dr	PC	Yes	No	No	No	No
Boxster	Porsche	2-dr. coupe	PC	No	Yes	No	No	No
911	Porsche	2-dr. coupe	PC	No	Yes	No	No	No
Bentley Arnage	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Bentley Azure	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Bentley Continental	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Silver Seraph	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Silver Spur Park Ward	Rolls Royce	4-dr. sedan	PC		No	No	Yes	No
Saab 9-3	Saab	2-DOOR HB	PC	Yes	Yes	No	No	No
Saab 9-3	Saab	4-DOOR HB	PC	Yes	Yes	No	No	No

1999 Safety Features								
Make/Model	Manu facture	Body Styles	Vehicle Type	Redesigned Air Bag	Side Air Bags		Seat Belt Pretens.	Dual Stage Passenger Air Bag
					Front	Rear		
Saab 9-3	Saab	Convertible	PC	Yes	Yes	No	No	No
Saab 9-5	Saab	4-DR SEDAN	PC	Yes	Yes	No	No	No
Forester	Subaru	4-dr	PC	Yes	No	No	No	No
Impreza	Subaru	4-dr	PC	Yes	No	No	No	No
Legacy	Subaru	4-dr	PC	Yes	No	No	No	No
Esteem	Suzuki	2-dr. sedan	PC	Yes	No	No	No	No
Vitara	Suzuki	4-dr. sedan	PC	Yes	No	No	No	No
Avalon	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Celica	Toyota	2-dr	PC	Yes	No	No	No	No
Camry	Toyota	4-dr. sedan	PC	Yes	Available	No	Yes	No
Corolla	Toyota	4-dr. sedan	PC	Yes	Yes	No	No	No
Landcruiser	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Paseo	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
RAV-4	Toyota	4-dr.	MPV	Yes	No	No	Yes	No
Sienna	Toyota	Van	VAN	Yes	No	No	Yes	No
Solara	Toyota	2-dr coupe	PC	Yes	Available	No	Yes	No
Tacoma	Toyota	2-dr. P/U	PC	Yes	No	No	Yes	No
Tercel	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Tundra	Toyota	2-dr. P/U	PC	Yes	No	No	Yes	No
T-150	Toyota	2-dr	Truck	Yes	No	No	No	No
4-Runner	Toyota	4-dr.	SUV	Yes	No	No	Yes	No
Lexus ES300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus GS300/400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus LS400	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus LX 470	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Lexus RX 300	Toyota	4-dr. sedan	PC	Yes	Yes	No	Yes	No
Lexus SC300/300	Toyota	4-dr. sedan	PC	Yes	No	No	Yes	No
Audi A4	Volkswagon	wagon	PC	Yes	Yes	No	Yes	No
Audi A6	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Audi A8	Volkswagon	sedan	PC	Yes	Yes	No	Yes	No
Audi Cabriolet	Volkswagon	2-dr.	PC	Yes	No	No	Yes	No
Cabrio	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
EuroVan	Volkswagon	Van	VAN	Yes	No	No	Yes	No
Golf	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
GTI	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Jetta	Volkswagon	4-dr. sedan	PC	Yes	Yes	No	Yes	No
New Beetle	Volkswagon	2-dr	PC	Yes	Yes	No	Yes	No
Passat	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
Passat Wagon	Volkswagon	4-dr	PC	Yes	Yes	No	Yes	No
C70	Volvo	All	PC	Yes	Yes	No	Yes	No
S70/V70	Volvo	All	PC	Yes	Yes	No	Yes	No
S80	Volvo	All	PC	No	Yes	No	Yes	No
S90/V90	Volvo	All	PC	No	Yes	No	Yes	No

Screen Name: System Deployment
Variable Name: Air Bag Deployment

Variable Name: System Deployment

Element Attributes:

Deployed during crash (as a result of impact)
Deployed inadvertently just prior to crash
Deployed, detail unknown
Deployed as a result of a noncollision event during crash sequence (*e.g.*, fire, explosion, electrical)
Unknown if deployed
Non-deployed

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include interview, repair facilities, tow facility, medical records.

Remarks:

Although rarely occurring, an air bag may partially deploy. These air bags should be coded under **Deployed during crash**.

Deployed during crash (as a result of impact)

is used when the vehicle is equipped with an air bag and the air bag deployed (or partially deployed) as a result of an impact which produced a longitudinal deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag. Note, an air bag is not designed to deploy in every collision.

Deployed inadvertently just prior to crash

is used when an air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in a crash.

Deployed, crash details unknown

is used when the researcher cannot determine if the air bag deployed (1) prior to the crash or (2) during the crash as a result of an impact which produced a deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag.

Deployed as a result of a noncollision event during crash sequence (*e.g.*, fire, explosion, electrical)

is used if the air bag deploys during a crash but not as a result of an impact.

For example, a vehicular fire, occurring as a result of:

- an impact or
- a noncollision event

prior to any impacts to this vehicle.

Screen Name: System Deployment (cont'd)
Variable Name: Air Bag Deployment (cont'd)

Unknown if deployed

is used when it is known that the vehicle was equipped with an air bag but the researcher is unable to determine if the air bag deployed (for whatever reason). For example, if the vehicle was sufficiently damaged so that a determination of deployment cannot be made from the vehicle inspection or the deployment status at the time of the crash cannot be determined..

Non-deployed

is used when an air bag equipped vehicle has one or more impacts, and the air bag did not inflate during the crash.

Screen Name: Indications of Failure
Variable Name: Indications of Air Bag Failure

Element Attributes:

No
Yes (specify):
Unknown

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include interview, repair facilities, tow facility, medical records.

Remarks:

This variable flags "indications of air bag failures" and means that something abnormal has occurred to the air bag system. It may not necessarily mean that the air bag system was defective.

A vehicle inspection is required in order to report an indication of air bag failure because the vehicle's deceleration may have been below the ***threshold*** for the air bag's deployment.

No

is used whenever the air bag deployed and there are no indications of air bag failure. Also use this when an air bag did not deploy and no failure is suspected and the vehicle inspection indicates that the deceleration sustained by the vehicle was near or below the ***deployment threshold***.

Yes, specify

is used whenever an indication of air bag failure is suspected and specify the failure. An indication of air bag failure could be a cut in or blowout of the fabric, a rupture along a fabric seam, a cover which does not open properly causing a misaligned deployment, partial inflation, or any number of other problems. If an indication of air bag failure is suspected, then document the condition with images, then call your zone center for assistance.

Unknown

is used when it is not known if the bag failed

Screen Name: Switch Type
Variable Name: Type of Cutoff Switch

Element Attributes:
None present
Originally equipped
Retro fit
Switch present, type unknown
Unknown if switch present

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include interview, repair facilities, tow facility.

Remarks:

Air bag cutoff switches were designed to be installed by manufacturers in vehicles with only one row of occupant seating. This was done so that if a child seat was used, the air bag could be turned off. Recently NHTSA has permitted the public to request air bag cutoff switches to be installed by dealers. The retro fit switch can be located in the glove compartment. **Close up images of the switch are required.**

None
is used when there is no air bag cutoff switch present for this occupant position.

Originally equipped
is used when a vehicle is originally equipped by the manufacturer with an air bag cutoff switch for this occupant position is present. This switch will not be present for the driver's position.

Retro fit
is used when an air bag cutoff switch for this occupant position has been added.

Switch present, type unknown
is used when an air bag cutoff switch for this occupant position is present and it is not known if it is original or retro fit.

Unknown if switch present
is used when it is not known if an air bag cutoff switch is present.

Screen Name: Switch Status
Variable Name: Cutoff Switch Position Status

Element Attributes:
Switch on
Switch off
Switch status unknown.
[Unknown if switch present]
[None present]

Source: Researcher determined--, primary source is vehicle inspection, secondary sources include interview, repair facilities, tow facility.

Remarks:

Air bag cutoff switches were designed to be installed by manufacturers in vehicles with only one row of occupant seating. This was done so that if a child seat was used, the air bag could be turned off. More recently NHTSA has permitted the public to request air bag cutoff switches to be installed by dealers. The retro fit switch can be located in the glove compartment. **Close up images of the switch are required.**

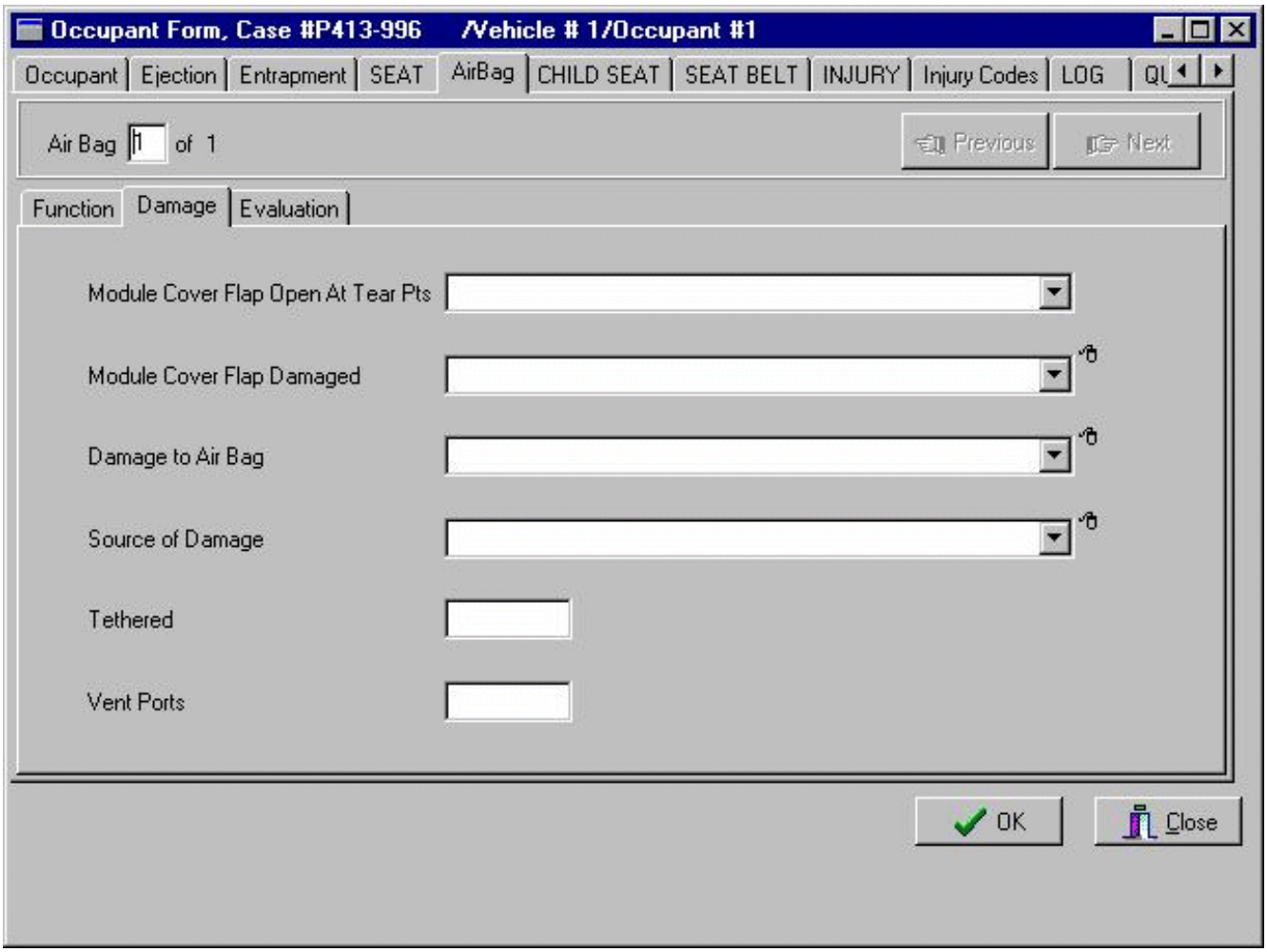
Switch on
is used when an air bag cutoff switch for this occupant position is present and is in the on position.

Switch off
is used when an air bag cutoff switch for this occupant position is present and is in the off position.

Switch status unknown
is used when an air bag cutoff switch for this occupant position is present and its position is unknown.

None present
is precoded when there is no air bag cutoff switch present for this occupant position.

Unknown if switch present
is precoded when it is not known if an air cutoff switch is present.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Air Bag 1 of 1
Previous
Next
Function
Damage
Evaluation
Module Cover Flap Open At Tear Pts
Module Cover Flap Damaged
Damage to Air Bag
Source of Damage
Tethered
Vent Ports
OK
Close

Screen Name: Module Cover Flap Open At Tear Pts?
Variable Name: Did Air Bag Module Cover Flap(s)/Seam(s) Open at Designated Tear Points?

Element Attributes:

No
Yes
Unknown if flaps/seams opened at tear points

Source: Vehicle inspection.

Remarks:

A designated tear point is a weakened area of the flap material designed to allow the air bag easy escape from its storage area during deployment. Some air bags in the seat cushion and seat back may not have cover flaps, but will deploy through a seam that separates during the air bag deployment.

No

is used when it can be determined that the module cover flap(s)/seam(s) for this air bag opened somewhere other than their designated tear points. A non-linear tear in the flap is an indication that the flap opened irregularly, not at the designated tear point.

Yes

is used when it can be determined that the module cover flap(s)/seam(s) for this air bag opened up at their designated tear points. Linear and symmetrical tears are good indications of proper separation of the cover flap(s) at their designated tear points.

Unknown if flaps / seams opened at tear points

is used when it is not known if the air bag opened at the tear points.

Screen Name: Module Cover Flap Damaged
Variable Name: Were the Cover Flap(s) Damaged

Element Attributes:

No
Yes (specify)
Unknown

Source: Vehicle inspection.

Remarks:

No

is used when it can be determined that no damage was present on the air bag module cover flap(s). Normal separation/tearing at the designated tear points does not constitute damage.

Yes — specify

is used when it can be determined that the air bag module cover flap(s) sustained damage. Abnormal separation/tearing at the designated tear points constitutes damage. Damage can also be cuts, tears, holes, burns, abrasions, etc.. The researcher must specify the type of damage that is being reported.

Unknown

is used when it cannot be determined if the air bag flap(s) sustained damage.

Screen Name: Damage to Air Bag?
Variable Name: Was There Damage To The Air Bag?

Element Attributes:

Not damaged

Yes — Air Bag Damaged

Ruptured
Cut
Torn
Holed
Burned
Abraded
Other damage (specify)
Damaged, details unknown
Deployed, unknown if damaged
Unknown

Source Vehicle inspection

Remarks:

Damage to the air bag must occur during the crash sequence. If multiple damage types apply select the attribute that most deteriorates the effectiveness of the air bag. If you cannot make this determination then select the attribute in a hierarchical manner from the top of the list down.

Not damaged
is used when no damage to the air bag for this occupant position was sustained.

Ruptured
describes damage to the air bag that resembles a stellate or starlike pattern of damage, with multiple tears originating from a single point of origin.

Cut
describes openings in the air bag which are generally linear and have smooth edges.

Torn
describes openings which have ragged edges but which are generally linear in appearance.

Holed
describes damage which is circular in appearance with or without ragged edges. If a burn causes a hole, then select burned

Burned
describes damage resulting from heat which scorches, melts or burns the bag.

Abraded
is a pattern of damage to the surface of the bag that appears as a fraying of the surface threads.

Screen Name: Damage to Air Bag? (cont'd)
Variable Name: Was There Damage To The Air Bag? (cont'd)

Other damage (specify)
is used to describe damage which is not captured in any of the attributes above.

Damaged, Details unknown
is used when it is known that the air bag sustained damage, but the type of damage cannot be determined.

Deployed, unknown if damaged
is used when cannot be determined if the air bag sustained damage.

Screen Name: Source of Damage
Variable Name: Source of Air Bag Damage

Element Attributes:

Object worn by occupant (specify)
Object carried by occupant (specify)
Adaptive/assistive controls (specify)
Cover flaps
Fire in vehicle
Thermal burns
Windshield

Other damage source (specify)
Rescue or emergency efforts
Unknown
[Air Bag Not Damaged]

Source: Vehicle inspection (with interview/medical records as confirming source for objects worn/carried by occupant)

Remarks:

This is a hierarchical variable, that is, if more than one element applies, then select the first attribute that applies. The attribute **Rescue or emergency efforts** should **only** be used when:

- no other sources of damage apply, **AND**
- it is known the damage was from rescue or emergency efforts, or any other post-crash source.

Object worn by occupant (specify)

is selected when the object is fastened, attached, or worn by the occupant. Be sure to specify the object.

Object carried by occupant (specify)

is used when the object is held in the mouth, the hand(s), arm(s), etc., by the occupant. Be sure to specify the object.

Adaptive/assistive controls (specify)

is used when adaptive/assistive controls damages the air bag for this occupant position. Be sure to specify the object/control.

Cover flaps

is used when the air bag cover flaps damaged the air bag for this occupant position.

Fire in vehicle

is used when there was a fire in the occupant compartment which damaged the air bag.

Thermal burns

is used when the air bag is burned or scorched by the inflator or chemicals.

Screen Name: Source of Damage (cont'd)
Variable Name: Source of Air Bag Damage (cont'd)

Other damage source (specify)

is used whenever there is damage to the air bag and it cannot be fit into any of the categories above. Be sure to specify the object/source.

Rescue or emergency efforts

is used **only** when:

- no other sources of damage apply, **AND**
- it is known the damage was from rescue or emergency efforts, or any other post-crash source

Unknown

is used when there is damage to the air bag, but the source of the damage cannot be determined.

Screen Name: Tethered
Variable Name: Was the Air Bag Tethered

Element Attributes:
No--enter 0 (zero)
Yes--enter number of tethers
Indeterminate
Unknown

Source: Vehicle inspection

Remarks:

A tether is a strap that is used to shape the air bag upon deployment. Stitching on the air bag is a good indicator of the presence of tethers.

No–enter 0 (zero)
is used when there are no tethers present on the air bag.

Enter number of tethers
is used when the air bag has tethers and the number of tethers can be determined .

Indeterminate
is used when it is known that the air bag has tethers, but the number of tethers is unknown.

Unknown
is used when it is not known if the air bag was tethered.

Screen Name: Vent Ports
Variable Name: Did the Air Bag Have Vent Ports?

Element Attributes:
No--enter 0 (zero)
Yes-- enter the number of vent ports
Indeterminate
Unknown

Source: Vehicle inspection

Remarks:

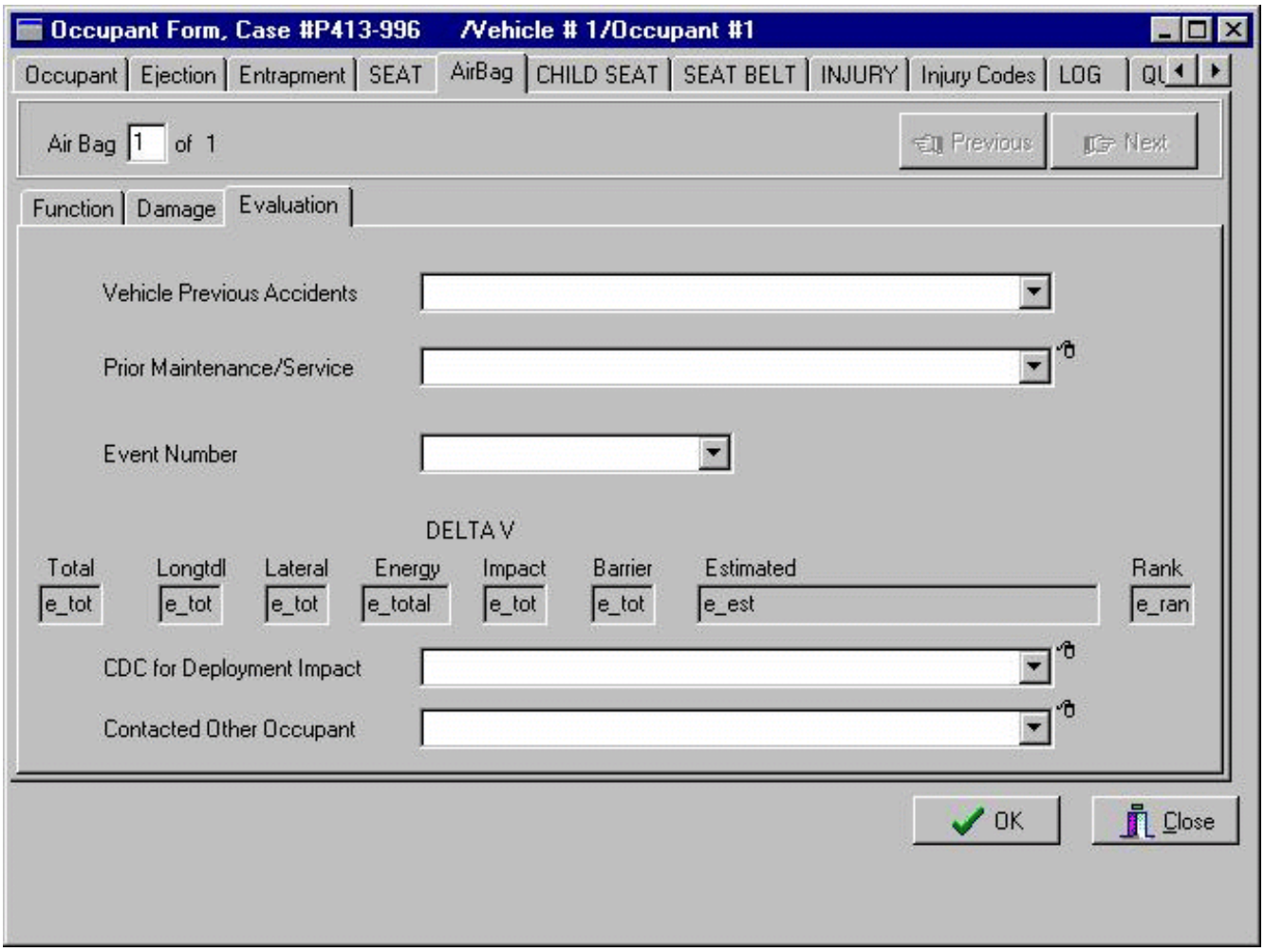
Vent ports are circular holes designed for the venting of gasses resulting from the deployment process of the air bag. The location of the ports is normally on the rear surface of the air bag.

0 (zero)
is used when there are no vent ports present on the air bag.

Enter number of vent ports
is used when the air bag has vent ports and the number can be determined.

Indeterminate
is used when it is known that the air bag has vent ports, but the number of vent ports is unknown.

Unknown
is used when it is not known if the air bag has vent ports.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Air Bag 1 of 1
Previous
Next
Function
Damage
Evaluation
Vehicle Previous Accidents
Prior Maintenance/Service
Event Number
DELTA V
Total
Longtdl
Lateral
Energy
Impact
Barrier
Estimated
Rank
e_tot
e_tot
e_tot
e_total
e_tot
e_tot
e_est
e_ran
CDC for Deployment Impact
Contacted Other Occupant
OK
Close

Screen Name: Vehicle Previous Crashes
Variable Name: Had The Vehicle Been In Previous Crashes?

Element Attributes:

No previous crashes
Previous crash(es) without deployment(s)
One previous crash with deployment
More than one previous crash with at least one deployment
Previous crashes, unknown deployment status
Unknown

Source: Researcher determined — primary source is the interview, secondary source may include a repair facility.

Remarks:

No previous crashes
is used for vehicles which are equipped with an air bag for this occupant position, and have not been involved in any previous crashes.

Previous crash(es) without deployment(s)
is used when it can be determined that the vehicle had been in previous crash(es) which did not involve an air bag deployment for this occupant position.

One previous crash with deployment
is used when it can be determined that the vehicle had been in only one previous crash and the air bag for this occupant position deployed in that crash.

More than one previous crash with at least one deployment
is used when it can be determined that the vehicle had been in more than one previous crash at least one of which involved an air bag deployment for this occupant position.

Previous crashes, unknown deployment status
is used when it can be determined that the vehicle had been in at least one previous crash, but the deployment status for this occupant position in any of these previous crashes cannot be determined.

Unknown
is used when it cannot be determined if the vehicle had been in previous crash(es) and/or the air bag deployment status for this occupant position cannot be determined.

Screen Name: Prior Maintenance/Service
Variable Name: Had Any Prior Maintenance/Service Been Performed On This Air Bag System?

Element Attributes:
No prior maintenance
Yes, prior maintenance (specify)
Unknown

Source: Researcher determined — primary source is the interview, secondary sources may include repair facilities and or documents found in the vehicle.

Remarks:

This variable is specific for the air bag at this occupant's position.

No prior maintenance
is used when it can be determined that the vehicle was equipped with an air bag system, but never had any maintenance/service performed on the air bag system.

Yes, prior maintenance, specify
is used when it can be determined that the vehicle was equipped with an air bag system and that the system had some previous maintenance/service performed. If possible, the researcher must specify exactly what type of maintenance/service was performed and a date of service if possible.

Unknown
is used when it cannot be determined if the vehicle's air bag system had previous maintenance/service.

Screen Name: Event Number
Variable Name: Air Bag Deployment Accident Event Sequence Number

Element Attributes:

Event #

Deployed, unknown event

Source Primary sources are the scene and vehicle inspections; secondary sources include the police report and the interviewee.

Remarks:

Event #

Select the event number that is directly related to the deployment for of this occupant position air bag.

Deployed, unknown event

is used when this air bag for this occupant position deployed, but the event associated with the deployment cannot be determined.

Screen Name: CDC For Deployment Impact
Variable Name: CDC For Air Bag Deployment Impact

Element Attributes:
Highest delta V
Second highest delta V
Other Delta V (specify)
Deployed, unknown event

Source: Researcher determined — primary sources are the scene and vehicle inspection; secondary sources are the police report and the interviewee.

Remarks:

It is not necessary to run a reconstruction program to code this variable. Determination of the proper code can be made by visual estimation if no other means are available.

Highest delta V
is used when it is determined that the crash event which is associated with the air bag deployment for this occupant position is also the event which produced the highest delta V for this vehicle.

Second highest delta V
is used when it is determined that the crash event which is associated with the air bag deployment for this occupant position is also the event that produced the second highest delta V for this vehicle.

Other Delta V (specify)
is used when it is determined that the crash event which is associated with the air bag deployment for this occupant position did not produce either the highest or second highest delta V.

Deployed, unknown event
is used when it cannot be determined which crash event is associated with the air bag deployment for this occupant position.

Screen Name: Contacted Other Occupant
Variable Name: Was the Air Bag in This Occupant's Position Contacted by Another Occupant?

Element Attributes:

No
Yes (specify)
Deployed unknown if other occupant contact to air bag

Source: Vehicle inspection, secondary sources include: interview for confirming information and medical information

Remarks:

No

is used when there is no contact to the air bag for this occupant position by any occupant other than the occupant in this occupant position.

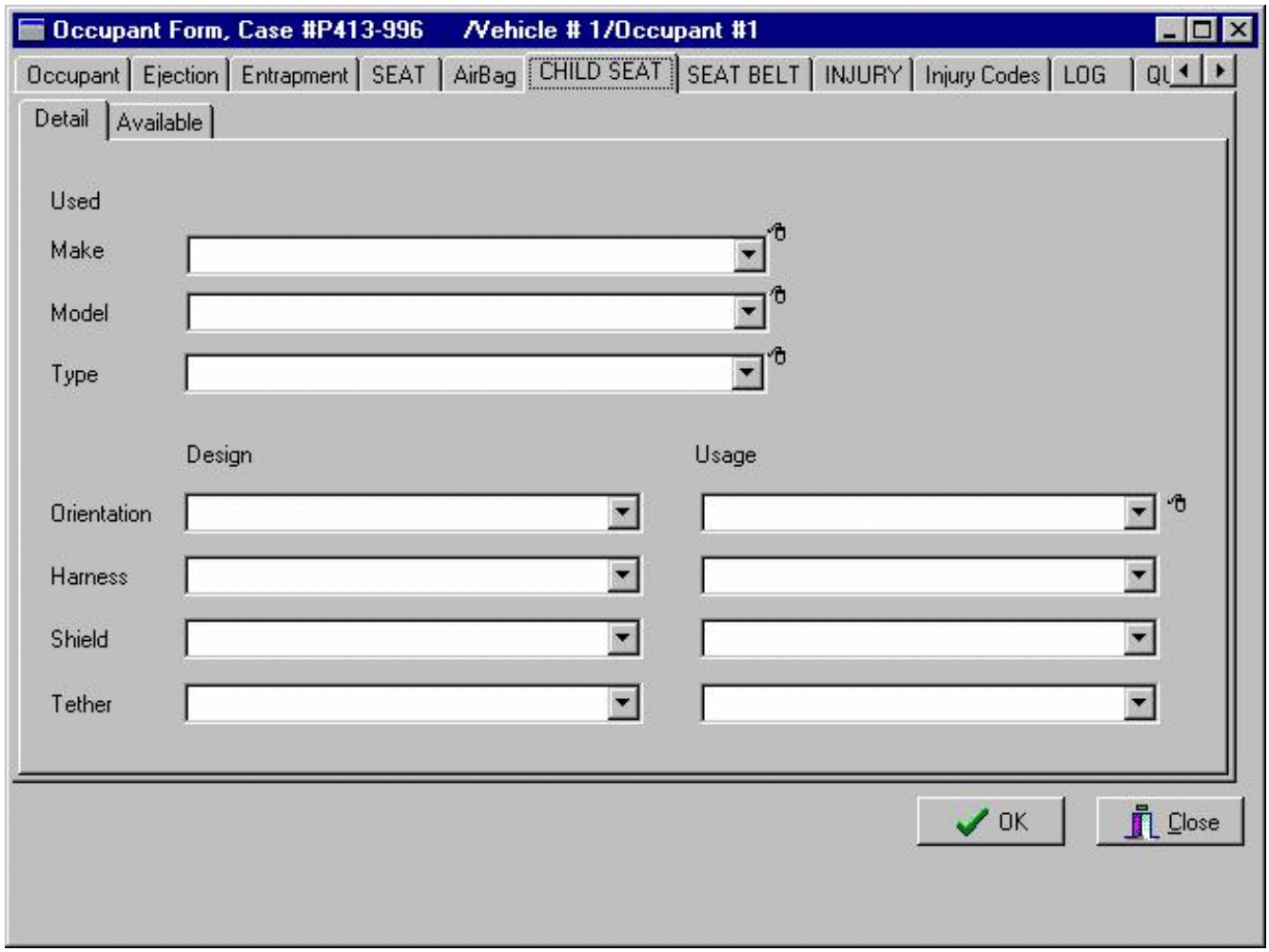
Yes (specify)

identify the occupant and describe the type of contact. Examples include:

- when a driver contacts the passenger air bag and vice-versa
- when the center front seat occupant strikes the outer seat position air bag and
- when multiple occupants in the same seat position contact one air bag.

Deployed, unknown if other occupant contact to air bag

is used when it is not known if another occupant contacted the air bag.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
Detail
Available
Used
Make
Model
Type
Design
Usage
Orientation
Harness
Shield
Tether
OK
Close

Child Restraint Overview

These variables are designed to describe of child restraints used in all the towed CDS applicable vehicles involved in the crash. Information about the seat is of two types: characteristics and usage.

Injury and death of young children has long been a significant part of the motor vehicle crash problem. Unrestrained children have a much greater tendency to be out of place (*i.e.* not in a designated seating position and generally standing or kneeling on the seat cushion). On impact this makes them very susceptible to injury or death since they are unrestrained. For a number of years, motor vehicle crashes have been the leading cause of injury and death to children under the age of five. Many states have attempted to address this problem by legislation requiring young children to be protected by some sort of child restraint. While these efforts have resulted in a reduction of injuries and death, little data on the real world performance of the child seats has been gathered. Police reports many times fail to note the use of such a restraint.

Specifications for these seats come from Federal Motor Vehicle Safety Standard (FMVSS) 213 (Child Seating Systems). Approval of design and testing is the responsibility of the NHTSA. Most states with child restraint laws require the use of a DOT approved seat.

Performance of the seat is also an extremely critical issue. Other than staged laboratory tests, very little data exists on what happens to these seats and how well they perform in protecting the occupants. Analysts will compare use, injury severity levels, and delta V's for initial gross performance levels. Once that type of analysis is done, source of injury will be examined, along with seat type and make/model. All of these analyses will initially be used to evaluate the effectiveness of FMVSS 213 and help determine if the standard should be updated or modified. The other main use of performance analysis is to determine if any type or make/model has any significant problems.

All of the analyses are very dependent on having enough data. Researchers noting that a child younger than five years is an occupant in a CDS applicable vehicle must pursue the interview questions with the presumption that a child seat was present, especially if the jurisdiction has a child restraint law or ordinance. **Probing questions should be asked during the interview, and whenever possible, an inspection of the seat should take place. Of course, if the seat is still with the vehicle it should be inspected and photographed at the same time as the vehicle. However, finding the seat with the vehicle is not a common occurrence. This is another area where the perseverance of the researcher pays off in needed information. If the child restraint is not present during the vehicle inspection, researchers must attempt to locate, obtain an inspection, and photograph the child safety seat.**

If the child seat is belted into a specific seat location, identify that location. If it is not, leave it blank. All child seats are to be identified, whether or not they are known to be occupied. Seat locations that can be selected are only those previously defined on the **Occupant Form/Seat tab.**

Some manufacturers are incorporating Child Safety Seats (CSS) into the vehicle's seat installed in the vehicle. This type of CSS is termed an Integrated Child Safety Seat. Should the Researcher encounter this seat type during a vehicle inspection, the documentation of the seat and CSS are required on the Safety Systems Form, regardless of whether it was occupied at the time of the crash.

Child restraints are a major issue, and data collection in this area has a high priority. Much information is needed to provide a reliable evaluation of the real world performance of these restraints.

Screen Name: Make
Variable Name: Child Seat Make

Element Attributes:

As listed in **Manufacturers' Instructions for Child Safety Seats**

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , and the interview

Remarks:

The Make of the Child Safety Seat is selected. Please refer to the make / model defined in the manual: **Manufacturers' Instructions for Child Safety Seats**.

Screen Name: Model
Variable Name: Child Seat Model

Element Attributes:

As listed in **Manufacturers' Instructions for Child Safety Seats**

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , and the interview

Remarks:

The Model of the Child Safety Seat is selected. Please refer to the make / model defined in the manual: **Manufacturers' Instructions for Child Safety Seats**.

Screen Name: Type
Variable Name: Type of Child Safety Seat

Element Attributes:

Infant seat
Toddler seat
Convertible seat
Booster seat
Other type child safety seat (specify)
Unknown child safety seat type

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , secondary source includes the interview

Remarks:

Effective September, 1999, some child safety seat changes will occur. Universal anchors will be required in a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system). Vehicles will be equipped with an independent system consisting of two lower anchorages and one upper anchorage. Each lower anchorage will consist of a rigid round rod or "bar" unto which a hook, buckle, or other connector can be snapped. The bars will be located at the intersection of the vehicle seat cushion and the seat back. The upper anchorage will be a ring-like object to which the upper tether of a child restraint system can be attached. The new independent anchorage system will be required to be installed at two rear seating positions. In addition, a tether anchorage will be required at a third position. Starting in the Fall of 1999, the tether anchoring system will be required, with the lower anchors being phased in over several years.

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

Infant seat

Convertible seat used in infant position

Convertible seat used in toddler position

High backed belt positioning booster seat

Booster seat with shield

Screen Name: Type (cont'd)
Variable Name: Type of Child Safety Seat (cont'd)

Infant seat

is used when the seat is designed to only face the rear of the vehicle and the maximum capacity is 8-9 kilograms (this information will usually be found on the manufacturer's label). Infant safety seats are equipped with a five-point harness (straps) to secure the infant to the safety seat and use the vehicle's safety belt system (*i.e.*, manual or automatic) to secure the seat to the vehicle. The five-point infant seat system includes a pair of straps that go over the infant's shoulders, a crotch strap, and the vehicle's belts as lap belts to secure the seat to the vehicle. The seat is tub-shaped and cradles the baby in a generally reclined position. Examples are shown in the **Manufacturers' Instructions for Child Safety Seats**.

Toddler seat

is used when the seat is designed to ***only*** face the front of the vehicle and to carry a child weighing approximately 9-23 kilograms (this information will usually be found on the manufacturer's label). The toddler seat may also be referred to as a "child seat". Most have a five-point harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which ***must*** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in a generally upright sitting position, although some seats have multiple positions. There are not many toddler-only seats. Examples are shown in the **Manufacturers' Instructions for Child Safety Seats**.

Convertible seat

is used when the seat is designed to face the ***front or rear*** of the vehicle and to carry a child ranging from birth to approximately 23 kilograms (this information will usually be found on the manufacturer's label). Most have a harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which ***must*** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in either a generally reclined rearward facing position (for small infants--birth to 9 kilograms) or a generally upright forward sitting position (for larger children--9-23 kilograms). Examples are shown in the **Manufacturers' Instructions for Child Safety Seats**.

Booster seat

is used when the seat is designed as a forward facing platform without a back and adjusts to children up to 27 kilograms. This booster seat may or may not have a shield. The booster seat restrains the child in a raised upright sitting position with either a harness or shield. Booster seats are designed primarily to fill the gap between when a child outgrows the standard child safety seat and when the child can use the adult belt (*i.e.*, manual or automatic) and still see out the window. Some models can also be used for smaller children, as small as 9 kilograms. Examples of booster seats are shown in the **Manufacturers' Instructions for Child Safety Seats**.

Other type child safety seat

is used when the infant or child safety seat cannot be described.

Unknown child safety seat type

is used when the type of child safety seat is unknown.

Screen Name: Design Orientation
Variable Name: Child safety seat design orientation (orientation)

Element Attributes:
Rear facing for this age/weight
Forward facing for this age/weight
Unknown design or orientation for this age/weight, or unknown age/weight

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , secondary source includes the interview

Remarks:

The researcher must determine from the seat, using the **Manufacturers' Instructions for Child Safety Seats** , the designed orientation for this person's weight. Next, the actual orientation of the seat at-impact must be determined to obtain the correct attribute.

For example, a one and one-half year old child whose weight is 12 kilograms was sitting in a forward facing Century 5000 STE child safety seat. The correct attribute based upon the **Manufacturers' Instructions for Child Safety Seats** is **Forward facing for this age/weight**. The researcher must carefully review the sub-categories and choose the appropriate attribute based on designed orientation at the occupant's age and weight.

Screen Name: Design Harness
Variable Name: Child safety seat harness design

Element Attributes:
Not designed with harness
Designed with harness
Unknown if designed with harness

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , secondary source includes the interview

Remarks:

A harness is a belt type restraint that is part of the child seat. The purpose is to hold the child in the child seat.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the harness to each seat individually.

An "after market" harness is one added by the user to a child safety seat not originally designed to use the device.

Screen Name: Design Shield
Variable Name: Child safety seat shield design

Element Attributes:
Not Designed With Shield
Designed With Shield
Unknown If Designed With Shield

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , secondary source includes the interview

Remarks:

Shields are generally used on booster, convertible and toddler seats. The shield is a padded portion of the seat that is placed in front of the child's torso. In booster seats the shield is used when there is only a lap belt available. When the lap / shoulder combination is used with a booster seat, the shield is not used.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the shield to each seat individually.

An "after market" Shield is one added by the user to a child safety seat not originally designed with the device.

Screen Name: Design Tether
Variable Name: Child safety seat tether design

Element Attributes:
Not Designed With Tether
Designed With Tether
Unknown If Designed With Tether

Source: Vehicle inspection, child seat inspection, and **Manufacturers' Instructions for Child Safety Seats** , secondary source includes the interview

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the tether to each seat individually.

An "after market" tether is one added by the user to a child safety seat not originally designed with the device.

Effective September, 1999, some child safety seat changes will occur. Universal anchors will be required in a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system). Vehicles will be equipped with an independent system consisting of two lower anchorages and one upper anchorage. Each lower anchorage will consist of a rigid round rod or "bar" unto which a hook, buckle, or other connector can be snapped. The bars will be located at the intersection of the vehicle seat cushion and the seat back. The upper anchorage will be a ring-like object to which the upper tether of a child restraint system can be attached. The new independent anchorage system will be required to be installed at two rear seating positions. In addition, a tether anchorage will be required at a third position. Starting in the Fall of 1999, the tether anchoring system will be required, with the lower anchors being phased in over several years.

When a tether-required seat is placed in the vehicle's front seat, the tether should run over the top of the seat and attach to a rear manual seat belt or possibly to one of the anchors for a front seat belt (*i.e.*, manual or automatic). When a tether-required seat is placed in the vehicle's rear seat, the tether should run over the top of the rear seat and attach to an anchor on the rear window shelf or possibly pass through the rear window shelf and attach to one of the anchors for a rear manual seat belt.

Screen Name: Usage Orientation
Variable Name: Child safety seat use orientation (orientation)

Element Attributes:
Rear facing
Forward facing
Other orientation (specify)
Unknown orientation

Source: Vehicle inspection, child seat inspection, secondary sources include the interview, PAR, and medical reports

Remarks:

Select the orientation of the child seat at the time of the crash.

Rear facing
if at the time of the crash the seat was facing the rear of the vehicle.

Forward facing
if at the time of the crash the seat was facing the front of the vehicle.

Other orientation
if the seat was facing other than rear or forward at the time of the crash (*e.g.*, on the floor, sideways, on top of or underneath something).

Unknown orientation
when a child safety seat is present but the orientation at the time of the crash is unknown

Screen Name: Usage Harness
Variable Name: Child safety seat harness use

Element Attributes:

Harness not used
Harness used
Unknown If harness used
After market harness added, not used
After market harness used
Child safety seat used, but no after market harness added
Unknown if after market harness added or used

Source: Vehicle inspection, child seat inspection, secondary sources include the interview, PAR, and medical reports

Remarks:

Indicate the usage of the Child Safety Seat harness at the time of the crash.

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the harness to each seat individually.

Screen Name: Shield Usage
Variable Name: Child safety seat shield use

Element Attributes:

Shield not used
Shield used
Unknown if shield used
After market shield added, not used
After market shield used
Child safety seat used, but no after market shield added
Unknown if after market shield added or used

Source: Vehicle inspection, child seat inspection, secondary sources include the interview, PAR, and medical reports

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the shield to each seat individually.

Screen Name: Usage Tether
Variable Name: Child safety seat tether use

Element Attributes:

Tether not used
Tether used
Unknown if tether used
After market tether added, not used
After market tether used
Child safety seat used, but no after market tether added
Unknown if After Market Tether Used

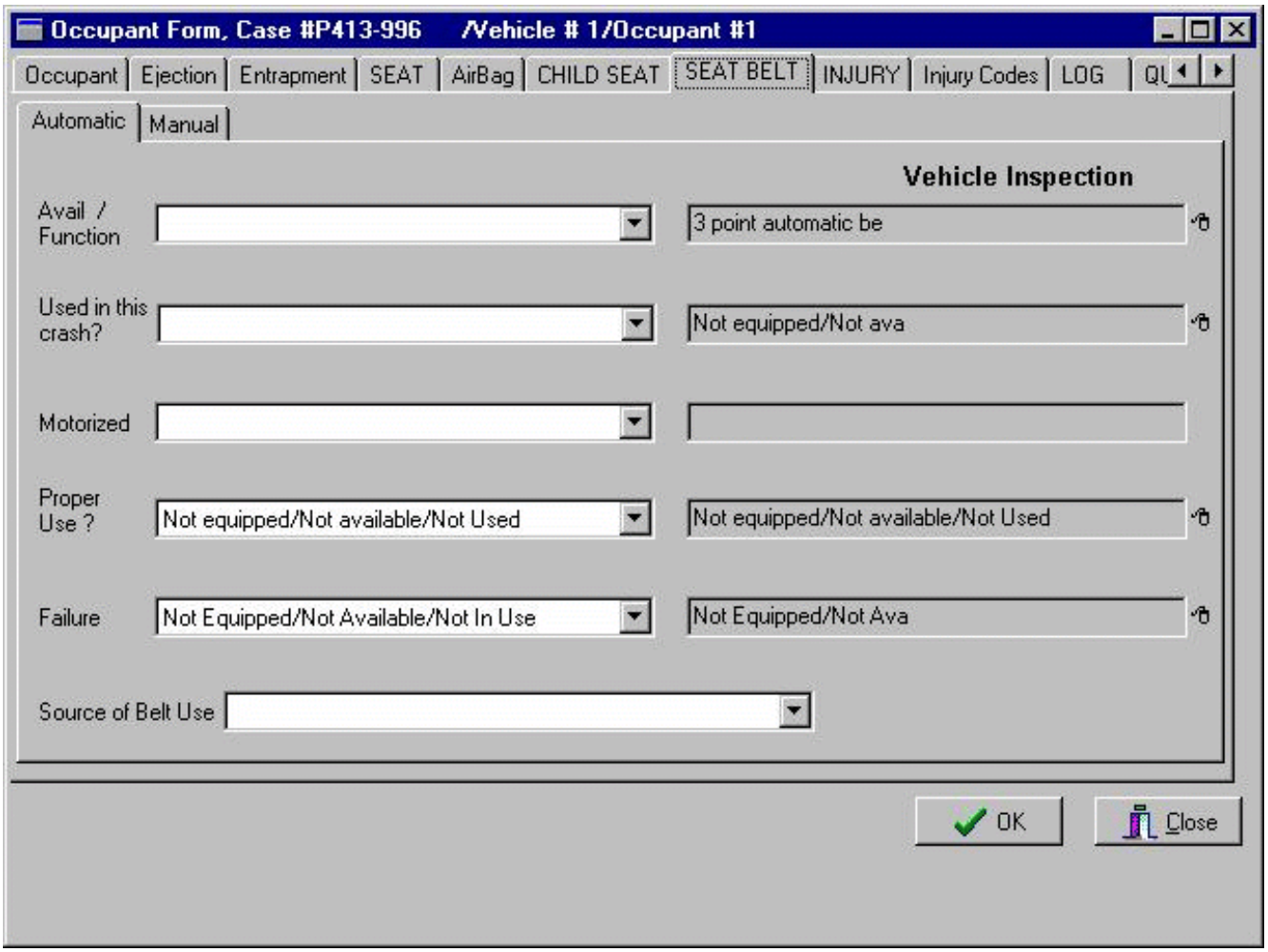
Source: Vehicle inspection, child seat inspection, secondary sources include the interview, PAR, and medical reports

Remarks:

Refer to the **Manufacturers' Instructions for Child Safety Seats** to ascertain the design of the seat and the applicability of the tether to each seat individually.

Effective September, 1999, some child safety seat changes will occur. Universal anchors will be required in a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system). Vehicles will be equipped with an independent system consisting of two lower anchorages and one upper anchorage. Each lower anchorage will consist of a rigid round rod or "bar" unto which a hook, buckle, or other connector can be snapped. The bars will be located at the intersection of the vehicle seat cushion and the seat back. The upper anchorage will be a ring-like object to which the upper tether of a child restraint system can be attached. The new independent anchorage system will be required to be installed at two rear seating positions. In addition, a tether anchorage will be required at a third position. Starting in the Fall of 1999, the tether anchoring system will be required, with the lower anchors being phased in over several years.

When a tether-required seat is placed in the vehicle's front seat, the tether should run over the top of the seat and attach to a rear manual seat belt or possibly to one of the anchors for a front seat belt (*i.e.*, manual or automatic). When a tether-required seat is placed in the vehicle's rear seat, the tether should run over the top of the rear seat and attach to an anchor on the rear window shelf or possibly pass through the rear window shelf and attach to one of the anchors for a rear manual seat belt.



The **Vehicle Inspection** portion of the above screen shows what was determined at the vehicle inspection which is the primary source of information for these variables. However, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of these variables.

Screen Name: Availability / Function
Variable Name: Automatic (Passive) Belt System Availability/Function

Element Attributes:

Not equipped/not available
2 point automatic belts
3 point automatic belts
Automatic type unknown
Automatic belts destroyed or rendered inoperative
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

Some belt restraint systems are a combination of manual (active) and automatic (passive) occupant protection devices. For this variable, consider only the automatic portion of the system. Select the automatic belt system which was available at the time of the crash for this occupant.

Automatic belts are designed to restrain an occupant and allow an occupant egress (the act of going from an enclosed place) without the requirement of manually activating the belt. Some systems use only a torso belt (2 point automatic belts), while others are designed with a lap and torso belt (3 point automatic belts). A clue for proper system identification involves the egress issue. If you are sitting in the occupant's position and all belts are attached and you open the door, then determine if you ***have to*** detach any belt in order to exit the vehicle. Belts which do not require detaching are automatic belts. Note: The ease of egress is not considered because many automatic belt systems may appear cumbersome.

Availability is assessed based on the occupant's seating position. Select the automatic belt system which was available for use by the occupant relative to the occupant's seating position in the vehicle. Availability is also determined by presence, functional status, and use of the automatic belt system. Any occupant who is using a belt restraint system, or portion thereof, must by default have that system available to them. The correctness and/or appropriateness of the use is considered in **Proper Use of Automatic (Passive) Belt System**.

Not equipped/not available indicates:

- that at the time of the crash the designated seating position that the occupant was in, was not equipped with a manufacturer installed or post manufacture installed automatic belt (2- point or 3-point)
- the occupant was not in a designated seat position (*e.g.*, on the floor)
- the occupant was not the person assigned the designated seat position and was not using an automatic belt (*e.g.*, sitting side-by-side) **or**
- the seat position that the occupant was in was equipped only with a manual (active) belt system.

Screen Name: Availability / Function (cont'd)
Variable Name: Automatic (Passive Belt System Availability/Function (cont'd)

2 point automatic belts
is used when a torso belt is anchored along the inboard side of the front seat and anchored either at the upper window frame of the door surface (adjacent to the upper B-pillar) or attached to a motorized track located along the upper A-pillar, roof side rail, and upper B-pillar. A two point automatic belt system requires the presence of either a manual lap belt or a knee bolster.

3 point automatic belts
is used for an automatic belt system consisting of a lap and torso belt. This system uses a common anchor for both belts located on the inboard side of the front seat and two anchors along the door surface (e.g., commonly used in General Motors cars beginning in 1987 until mid- 1990's). This system can be detected by sitting in the occupant's position with the latch plate/buckle attached and opening the door. If the belt travels with the door and allows egress without detaching the belt, then use this attribute – the system is automatic.

Automatic belts — type unknown
is used when:
- no vehicle inspection occurs and the occupant's seating position is known to have automatic belts but the type (2 point versus 3 point) is unknown, or
- a vehicle inspection occurs and the occupant's seating position is known to have automatic belts but the researcher is not able to determine from the vehicle inspection or any secondary sources what type of automatic belts are available.

If the type of automatic belt system is determinable, then the system's mechanization can also be determined because most manufacturers use the same type of system for a given vehicular model. In addition, this code takes precedence over the following code **Automatic belts destroyed or rendered inoperative**.

Automatic belts destroyed or rendered inoperative
is used when the automatic belt, initially installed at this occupant's seating position, was subsequently removed or destroyed (*e.g.*, unbolted, cutout, etc.) or in any way rendered inoperative. In addition, use this attribute for belts which are extremely deteriorated from aging. Do not use this attribute for motorized belt tracks which are mechanically or electrically inoperative. This is considered under Automatic Belt System Failure.

Belts which are knotted, buckled at the rear of the seat (bench or bucket), etc., are available if they were otherwise operative.

Unknown
is used for front out-board occupants of uninspected passenger vehicles when it cannot be determined whether or not this occupant's seating position was equipped with an automatic belt system.

**** The word "**Avail**" in NASSMAIN needs to be changed to "**Availability**" ****

Screen Name: Used in this crash?
Variable Name: Automatic (Passive) Belt System Use

Element Attributes:

Not equipped / not available / destroyed or rendered inoperable
Automatic belt in use
Not in use (manually disconnected, motorized track inoperative) (specify)
Automatic belt use unknown
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection,** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

Not equipped / not available / destroyed or rendered inoperative

is automatically selected when **Automatic Availability** is selected as "Not equipped not available". Additionally, select this code when automatic belts are present, but were destroyed or rendered inoperative at the time of the crash.

Automatic belt in use

is used when this automatic belt was hooked up (in use) at the time of the crash. The correctness of the use is not assessed on this variable.

Not in use (manually disconnected, motorized track inoperative)

is used when the automatic belt's latch plate/buckle was detached at the time of the crash. For example, this attribute is used to capture disconnected 3-point, door mounted automatic belts (i.e., 1987 to mid-1990 General Motors vehicles) which can be used similar to an active lap and shoulder belt system.

This is also used for motorized tracks which were ***not in the restrained position*** at the time of the crash. The motorized track may be inoperative because of fuse removal, electric motor failure, or track failure when the malfunction prevents the automatic belt system from moving along its track into the restrained position.

Note! This variable does not assess how this occupant uses the automatic belt when entering or exiting the seating position. For example, this occupant may routinely manually detach/attach the latch plate/buckle (*i.e.*, uses the automatic belt system as if it were a manual belt system). This variable assumes that the nonmotorized automatic belt is available and functioning and assesses whether or not the latch plate/buckle was attached at the time of the crash. If the latch plate/buckle was attached at the time of the crash, then use Automatic belt in use. On the other hand, if it was detached, then use Automatic belt not in use (manually disconnected, motorized track inoperative).

Screen Name: Used in this crash? (cont'd)
Variable Name: Automatic (Passive) Belt System Use (cont'd)

Not in use (manually disconnected, motorized track inoperative) cont'd

For motorized belts, this variable assumes that the motorized belt system is locked in the restrained position with the belt attached at the time of the crash. If the motorized belt system was locked in the restrained position and the belt was attached at the time of the crash, then use Automatic belt in use. If the motorized belt system was not locked in the restrained position or the belt was detached, then use Automatic belt not in use (manually disconnected motorized track inoperative).

Automatic belt use unknown

is used when the researcher is unable to determine if the automatic belt was in use.

Screen Name: Motorized
Variable Name: Automatic (Passive) Belt System Type

Element Attributes:
Non-motorized system
Motorized system
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

Non-motorized system
is used when the automatic belt system available to this occupant does not require a motor for operation.

Motorized system
is used when the automatic belt system available to this occupant requires a motor for operation.

Unknown
is used when it is known that an automatic belt is available but the type (non-motorized or motorized) cannot be determined.

Screen Name: Proper Use
Variable Name: Proper Use of Automatic (Passive) Belt System

Element Attributes:

Used properly
Used properly with child safety seat
Shoulder belt worn under arm
Shoulder belt worn behind back
Belt worn around more than one person
Lap portion worn on abdomen
Lap/shoulder belt or automatic shoulder belt used improperly with child safety seat (specify)
Other improper use (specify)
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

This variable must be assessed by the researcher using all available data. An improperly used automatic belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure which is addressed in **Automatic (Passive) Belt Failure Modes During Crash**. If there is an improperly used belt and/or a belt system failure, they should be noted on the **Case Form / Summary Tab.**

Automatic belt used properly with child safety seat

is to be used only when the automatic belt is properly installed around the child safety seat to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the automatic seat belts).

Automatic shoulder belt worn behind back is used:

when an occupant has a three point automatic belt but is only wearing the lap portion (i.e., having the automatic torso belt behind the occupant's back), or

when an occupant has a two point automatic belt and is not wearing the torso portion (i.e., the automatic torso belt is attached and is behind the occupant's back).

Automatic belt worn around more than one person

is used when more than one occupant is sharing the same automatic belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another. If the occupants are using a three point automatic belt such that the torso portion is worn behind one or more of the occupants backs while the lap portion encompasses their hips, then use this attribute.

Screen Name: Proper Use (cont'd)
Variable Name: Proper Use of Automatic (Passive) Belt System (cont'd)

Lap portion of automatic belt worn on abdomen
is used when the lap belt portion of a three point automatic belt system is worn above the occupant's pelvic bones.

Lap/shoulder belt or automatic shoulder belt used improperly with child safety seat (specify)
is used when an automatic belt is not installed properly around a child safety seat according to the manufacturer's directions. Specify how the automatic belt was used improperly.

Other improper use of automatic belt system
is used to describe any improper use of the automatic belt system which is not listed above. This includes when an automatic shoulder belt is worn on the outside of an occupant's arm as opposed to under the arm or on top of the shoulder.

Unknown
is used when it is not known whether the automatic belts were used properly.

Screen Name: Failure
Variable Name: Automatic (Passive) Belt Failure Modes During Crash

Element Attributes:

No automatic belt failure(s)
Torn webbing (stretched webbing not included)
Broken buckle or latchplate
Upper anchorage separated
Other anchorage separated (specify)
Broken retractor
Combination of above (specify)
Other automatic belt failure (specify)
Unknown

Source: Researcher determined—primary source is vehicle inspection, additional input may include the interview and police report if a vehicle inspection is obtained.

Remarks:
The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

If any component of the automatic belt system fails during the impact, the failure is captured in this variable. The failure is also recorded on the **Case Form / Summary Tab** and documented with images as needed. Automatic belt system failures, unlike manual belt system failures, are not limited to those that resulted from occupant loading.

If a failure occurs, select the attribute which corresponds to the appropriate automatic belt failure mode that describes the component of the restraint system which failed (*i.e.*, torn webbing, broken buckle or latchplate, anchorage separation, broken retractor). A complete and documented description of the failed component and the way it failed must accompany the case.

No automatic belt failure(s)
is used when there is no physical evidence from the vehicle inspection to indicate or support that a failure occurred.

Combination of above (specify)
is used when any combination of specified attributes occurs and describes multiple automatic belt failure modes. Automatic belt failures which are not described are reported in Other automatic belt failure. Automatic belt failures listed with specific attributes take priority over other attributes.

Other automatic belt failure (specify)
is used when the only automatic belt failure(s) which occur are not described in the specific attributes. An example of this would be when the 2 pt automatic “track mouse” is ripped from the mechanism.

Unknown
is used when it cannot be determined if the automatic belt failed.

Screen Name: Source of Belt Use
Variable Name: Source of Researcher's Determination of Belt Use

Element Attributes:

Vehicle Inspection
Official Injury Data
Driver/occupant interview
Other (specify)
Unknown if belt used

Source: Researcher determined.

Remarks:

This variable explains what preponderance of information the researcher used to make the determination that the automatic seat belt was used, **not** whether the belt system was available. **The PAR is not an acceptable source to list for belt use determination**. If multiple sources of information are available, select the source that gives the most reliable information.

Vehicle Inspection

Is used if the vehicle inspection gave definitive indications that the belt was in use.

Official Injury Data

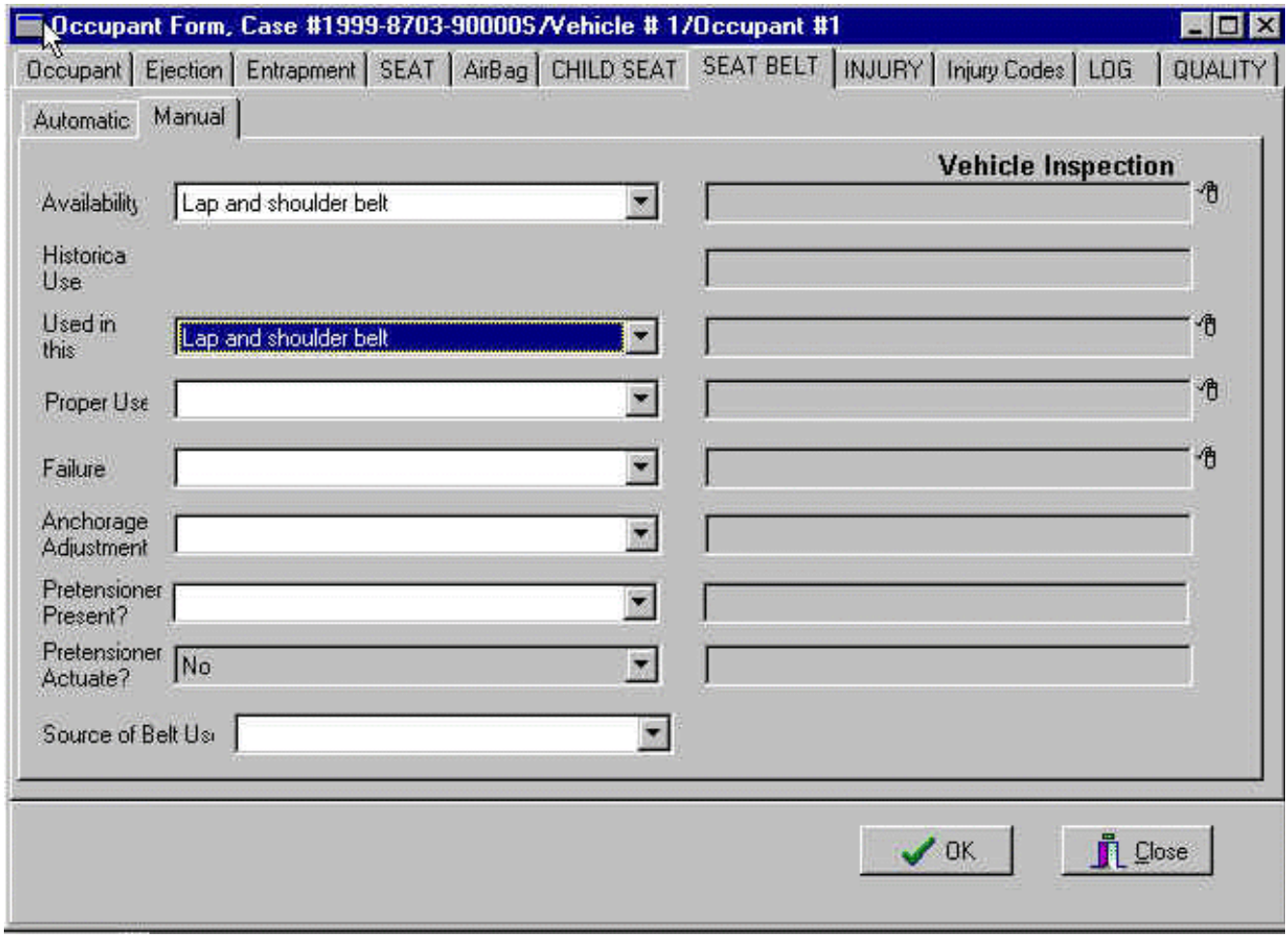
is used if the official injury data makes a specific mention of injury patterns that can be attributed to the use of a seat belt, and the vehicle inspection did not give definitive indications of usage.

Driver/occupant interview

is used if the vehicle inspection did not give definitive indications of usage or there was no vehicle inspection, however the interview(s) provided significant information to code belt use.

Other (specify)

is used when information from other official sources such as the EMS, fire department (e.g., rescue or extrication personnel), or on-scene photographs indicates that the occupant was or was not restrained by a manual or automatic belt at the time of the crash. Specify the source of the information.


Occupant Form, Case #1999-8703-90000S/Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
QUALITY
Automatic
Manual
Vehicle Inspection
Availability
Lap and shoulder belt
Historica Use
Used in this
Lap and shoulder belt
Proper Use
Failure
Anchorage Adjustment
Pretensioner Present?
Pretensioner Actuate?
No
Source of Belt Us
OK
Close

Screen Name: Availability
Variable Name: Manual (Active) Belt System Availability

Element Attributes:

None available
Belt removed/destroyed
Shoulder belt
Lap belt
Lap and shoulder belt
Belt available - type unknown
Shoulder belt (lap belt destroyed/removed)
Lap belt (shoulder belt destroyed/removed)
Other belt (specify)
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

Some belt restraint systems are a combination of manual (active) and automatic (passive) occupant protection devices. For this variable, consider only the manual portion of the system. Select the manual belt system which was available at the time of the crash for this occupant.

Select the manual belt system which was available for use by the occupant relative to the seat position in the vehicle.

Not available

indicates: (1) that at the time of the crash the designated seating position was not equipped with a manufacturer installed or post manufacturer installed manual belt (lap, shoulder, or lap and shoulder); (2) the seat position was equipped only with an automatic (passive) belt system.

Belt removed/destroyed

indicates that the manual belt, initially installed at this occupant's seating position, was subsequently removed or destroyed (*e.g.*, unbolted, cutout, etc.). If the belt is present but nonfunctional, then select the type of manual belt available on this variable and use **Inoperative** for **Used In This Crash?**

Belts which are knotted, buckled at the rear of the seat (bench or bucket), stored below the seat, etc., are available if they were otherwise operative.

Screen Name: Availability (cont'd)
Variable Name: Manual (Active) Belt System Availability (cont'd)

Shoulder belt
is used when this occupant's seat position was equipped with a manual upper torso restraint and no lap belt. The population of vehicles equipped with only manual shoulder belts is very small, therefore, care must be taken that a two-point passive belt is not identified as a manual belt.

Lap belt
is used when this occupant's seat position is equipped with a manual belt that secures the pelvic area of the occupant in the seat and there is no manual upper torso belt.

Lap and shoulder belt
is used when both a manual upper torso belt and a manual lap (pelvic area) belt are present at this occupant's seat position.

Belt available — type unknown
is used when there is no vehicle inspection and there is disagreement regarding the type of manual belt system among the secondary sources. When the specific manual belt system cannot be determined, but it is known some type of belt is present, then use this attribute.

Shoulder belt (lap belt destroyed/removed)
is used for integral noncontinuous loop manual belt systems when the lap belt portion of the belt has been removed or destroyed leaving only the shoulder belt portion present at this occupant's seating position.

Lap belt (shoulder belt destroyed/removed)
is used for integral noncontinuous loop manual belt systems when the shoulder belt portion of the belt has been removed or destroyed leaving only the lap belt portion present at this occupant's seating position.

Other belt (specify)
is used when the belt system is nonstandard or cannot be described with other attributes. Specify (write out in the Specify Box) the type of manual belt (*e.g.*, 5 point competition harness, 4 inch wide webbing, etc.) In addition, use this attribute if a properly positioned "built-in" child safety seat was available at this occupant's seating position. Other child restraints are not recorded here.

Unknown
is used when it cannot be determined whether or not manual belts were available for this occupant's seat position.

Screen Name: Used in this crash?
Variable Name: Manual (Active) Belt System Used in This Crash?

Element Attributes:

Not used/not available/removed or destroyed
Inoperative (specify)
Shoulder belt
Lap belt
Lap and shoulder belt
Belt used — type unknown
Other belt used (specify)
Shoulder w/ child safety seat
Lap w/ child safety seat
Lap and shoulder w/ child safety seat
Belt w/ child safety seat — type unknown
Other belt w/ child safety seat (specify)
Unknown if belt used

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

Select the manual belt system or portion of the system which was in use at the time of the crash by the occupant. The correctness of the use is not assessed on this variable. This variable only identifies manual belt usage; do not consider the presence and use of a passive belt system.

None used / not available / removed or destroyed
is used when a manual belt was available but not worn.

Inoperative (specify)
includes belts which are knotted, jammed, tucked behind the seat, or in any other fashion rendered unusable. In addition, use this attribute for belts which are inoperative because of extreme deterioration from aging. A belt system that was completely removed from or cut out of a vehicle is assigned None used / not available / removed or destroyed.

Shoulder belt
is used when a manual shoulder belt alone was in use. This can occur when: (1) the vehicle was not equipped with a lap belt, (2) only the shoulder belt portion of a nonintegral system was in use, or (3) when the lap belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional shoulder belt portion in use.

Screen Name: Used in this crash? (cont'd)
Variable Name: Manual (Active) Belt System Used in This Crash? (cont'd)

Lap belt
is used when a manual lap belt alone was in use. This can occur when: (1) the vehicle was not equipped with a shoulder belt, (2) only the lap belt portion of a nonintegral system was in use, or (3) when the shoulder belt portion of a noncontinuous loop integral lap and shoulder belt system was cut out leaving only a functional lap belt portion in use. **Note**, manual lap belts can be used in conjunction with a two-point automatic belt system. For manual and automatic belt combinations, use this attribute for the manual lap belt usage.

Lap and shoulder belt
is used when the occupant is: (1) "encompassed" ***both*** in the lap and upper torso region by a manual lap and shoulder belt combination, or (2) using only a portion of an ***intact integral*** lap and shoulder belt system. For example, if a person has an integral lap and shoulder belt but is only using the lap portion (*i.e.*, having the shoulder belt behind his or her back), then use this attribute. Improper use of the belt is assessed in Proper Use of Manual (Active) Belts.

Belt used — type unknown
is used when it is known that the type of manual belt system being used cannot be determined.

Other belt (specify)
is used when the belt system is nonstandard or cannot be described with other attributes. Specify (write out in the Specify Box) the type of manual belt (*e.g.*, 5 point competition harness, 4 inch wide webbing, etc.

Shoulder with child safety seat
is used when the vehicle's manual shoulder belt system anchors a child safety seat to the vehicle. These attributes do not refer to the belts which are part of the child seat itself.

Lap with child safety seat
is used when the vehicle's manual lap belt system anchors a child safety seat to the vehicle. These attributes do not refer to the belts which are part of the child seat itself.

Belt with child safety seat — type unknown
is used when the vehicle belt type is unknown, not the child safety seat type.

Other belt with child safety seat (specify)
is used when a built-in child safety seat is "self contained" (does not use any part of the regular existing manual belt system available at the occupant seating position).

Unknown if belt used
is used if it cannot be determined whether or not a manual belt was in use by the occupant at the time of the crash.

Screen Name: Proper Use
Variable Name: Proper Use of Manual (Active) Belts

Element Attributes:

Used properly
Used properly w/ child seat
Shoulder belt worn under arm
Shoulder belt worn behind back or seat
Belt worn around more than one person
Lap belt worn on abdomen
Lap or lap / shoulder belt used improperly w/ child safety seat (specify)
Other improper use (specify)
Unknown

Source: Researcher determined—primary source is vehicle inspection, secondary sources include medical records, and the interview.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

This variable must be assessed by the researcher using all available vehicle data. An improperly used manual belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure. If there is an improperly used belt and/or a belt system failure, they should be noted in the Case Summary.

Belt used properly w/ child seat

is to be indicated only when the manual belt is installed so as to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the manual seat belts) and is occupied by a child.

Shoulder belt worn behind back or seat

is used when an occupant has an integral lap and shoulder belt but is only wearing the lap portion (*e.g.*, having the manual shoulder belt behind his or her back).

Belt worn around more than one person

is used when more than one occupant is sharing the same manual belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another.

Lap belt worn on abdomen

is used when the manual lap belt, or lap belt portion of a manual system, is worn above the occupant's pelvic bones.

Screen Name: Proper Use (cont'd)
Variable Name: Proper Use of Manual (Active) Belts (cont'd)

Lap or lap / shoulder belt used improperly with child safety seat
is used when a child safety seat is not installed according to the manufacturer's directions and is occupied by a child. Specify how the manual belt was used improperly. This also includes built-in child seats.

Other improper use (specify)
is used to describe any improper use of the manual belt system which is not listed above. For example, use this when a manual shoulder belt is worn on the outside of an occupant's arm (*i.e.*, humeral area) as opposed to under the arm or on top of the shoulder/clavicle.

Unknown
is used:

when it is not known whether the manual belts used were used properly or improperly, or

when a child safety seat is occupied by a child, but it is unknown if the seat was installed (using either the manufacturer's or the vehicle's manual belts) according to the manufacturer's directions.

Screen Name: Failure
Variable Name: Manual (Active) Belt Failure Modes During Crash

Element Attributes:

No manual belt failure(s)
Torn webbing (stretched webbing not included)
Broken buckle or latchplate
Upper anchorage separated
Other anchorage separated (specify)
Broken retractor
Combination of above (specify)
Other manual belt failure (specify)
Unknown

Source: Researcher determined—primary source is vehicle inspection, additional input may include the interview and police report if a vehicle inspection is obtained.

Remarks:

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

If any component of the manual belt system fails during the impact as a result of occupant loading, the failure is captured in this variable. The failure is also recorded on the **Case Form / Summary tab** and documented with photographs.

If a failure occurs, select the attribute which corresponds to the appropriate manual belt failure mode that describes the component of the restraint system which failed (*i.e.*, torn webbing, broken buckle or latchplate, anchorage separation, broken retractor). A complete and documented description of the failed component and the way it failed must accompany the case.

No manual belt failure(s)
is used when there is no physical evidence from the vehicle inspection to indicate that a failure occurred.

Combination of above (specify)
is used when any combination of specified attributes occur and describes multiple manual belt failure modes. Manual belt failure modes which are not described are reported in other manual belt failure. Manual belt failures **with specific attributes** take priority over the **Other manual belt failure** code.

Other manual belt failure
is used when the only manual belt failure(s) which occur are not described with a specific attribute.

Unknown
is used when it can not be determined if the manual belt failed.

Screen Name: Anchorage Adjustment
Variable Name: Manual Shoulder Belt Upper Anchorage Adjustment

Element Attributes:

None for manual shoulder belt
In full up position
In mid position
In full down position
Position unknown
Unknown if adjuster present

Source: Researcher determined—primary source is vehicle inspection, secondary sources include the interview.

Remarks:

Complete this variable regardless of manual shoulder belt usage.

The **Vehicle Inspection** portion of this screen shows what was determined **at the vehicle inspection** which is the primary source of information for these variables. **However**, the researcher should use all the available information, placing emphasis on the vehicle inspection information, to make the final determination for completion of this variable.

None for manual shoulder belt

is used when a manual shoulder belt is present but there is no adjustment mechanism at the upper anchorage point.

In full up position

is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in its highest position at the time of the crash (*e.g*. closest position to the roof).

In mid position

is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in a middle position at the time of the crash (somewhere between full up and full down).

In full down position

is used when the manual shoulder belt is equipped with an adjustable upper anchorage point and it was in its lowest position at the time of the crash (closest position to the floor).

Position unknown

is used when the manual shoulder belt is equipped with an adjustable upper anchorage point but it cannot be determined what the position was at the time of the crash.

Unknown if adjuster present

is used when it cannot be determined if the manual shoulder belt was equipped with an adjustable upper anchorage device.

Screen Name: Pretensioners Present
Variable Name: Seat Belt Pretensioners Present

Element Attributes:

None for manual shoulder belt
Seat belt pretensioner present
Unknown if position has seat belt pre-tensioners

Source: Researcher determined--primary source is vehicle inspection, secondary sources include the interview and manufacturers' data.

Remarks:

Complete this variable regardless of manual belt usage.

Seat belt pre-tensioners are present in more recent model year vehicles. They are only present in vehicles that are equipped with air bags. They may be identified during vehicle inspection because the seat belt may not be able to be retracted. They are designed to take the slack up in the seat belt during a crash of sufficient deceleration.

None for manual belt

is used when a manual belt is present but there is no seat belt pre-tensioner present.

Seat belt pre-tensioner present

is used when the manual belt is equipped with a seat belt pre-tensioner. They will only be present in a vehicles with air bags.

Unknown if position has a seat belt pre-tensioner

is used when it cannot be determined if the manual belt was equipped with a pre-tensioner.

Screen Name: Pretensioners Actuate?
Variable Name: Pretensioners Actuate

Element Attributes:

No
Yes
Unknown

Source: Researcher determined--primary source is vehicle inspection, secondary sources include the interview.

Remarks:

Complete this variable regardless of manual belt usage.

Seat belt pretensioners are present in more recent model year vehicles. They are only present in vehicles that are equipped with air bags. They may be identified during vehicle inspection because the seat belt may not be able to be retracted. They are designed to take the slack up in the seat belt during a crash of sufficient deceleration.

No

is used when a pretensioner is present, but there is no indications that it activated during the crash.

Yes

is used when a pretensioner is present, and there is positive indication that it activated during the crash.

Unknown

is used when it cannot be determined if the pretensioner activated during the crash.

Screen Name: Source of Belt Use
Variable Name: Source of Researcher's Determination of Belt Use

Element Attributes:
Vehicle Inspection
Official Injury Data
Driver/occupant interview
Other (specify)
Unknown if belt used

Source: Researcher determined

Remarks:

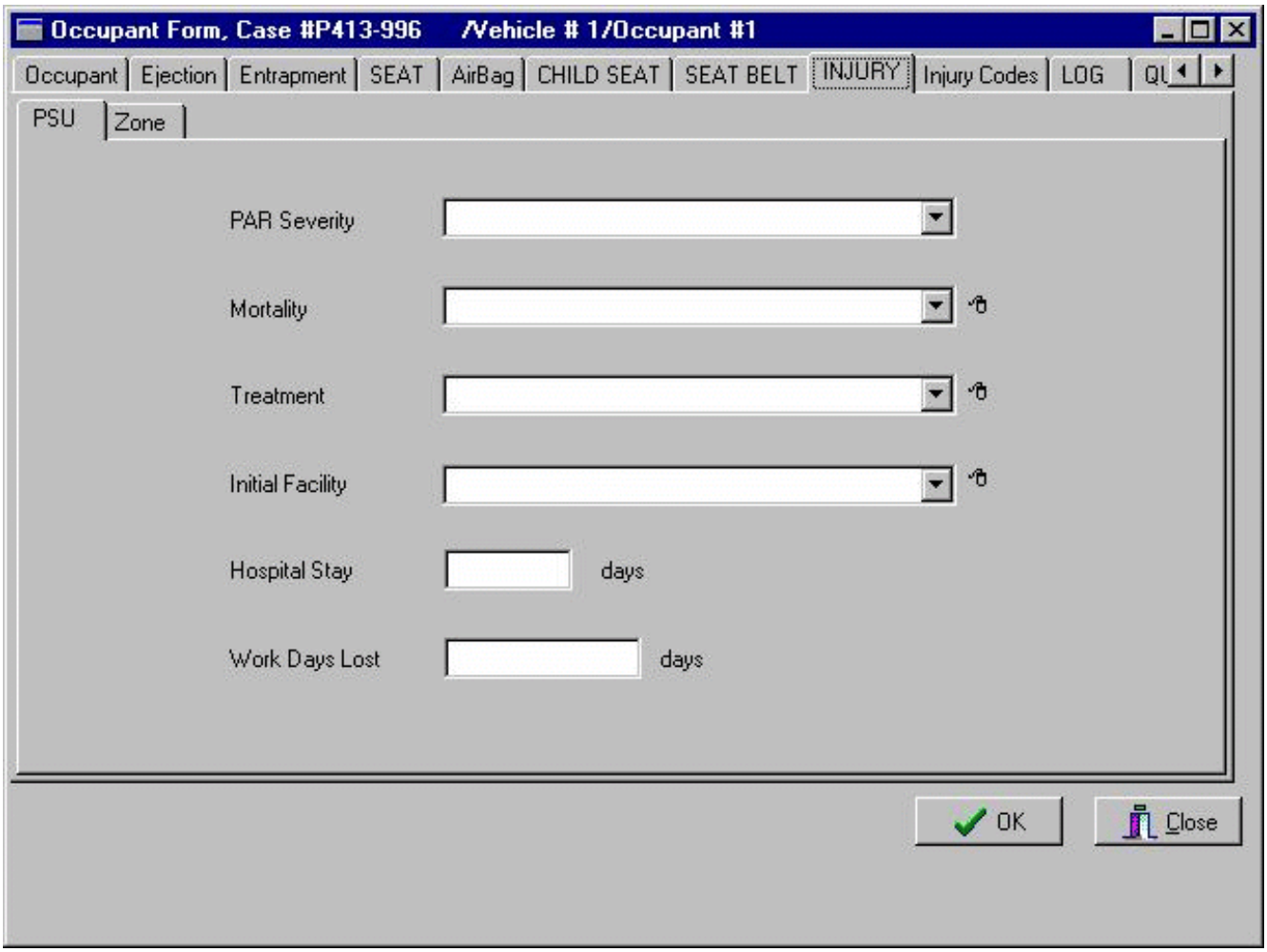
This variable explains what preponderance of information the researcher used to make the determination whether the manual seat belt was used, **not** whether the belt system was available. **The PAR is not an acceptable source to list for belt use determination.** If multiple sources of information are available, select the source that gives the most reliable information.

Vehicle Inspection
Is used if the vehicle inspection gave definitive indications that the belt was in use.

Official Injury Data
is used if the official injury data makes a specific mention of injury patterns that can be attributed to the use of a seat belt, and the vehicle inspection did not give definitive indications of usage.

Driver/occupant interview
is used if the vehicle inspection did not give definitive indications of usage or there was no vehicle inspection, however the interview(s) provided significant information to code belt use.

Other (specify)
is used when information from other official sources such as the EMS, fire department (e.g., rescue or extrication personnel), or on-scene photographs indicates that the occupant was or was not restrained by a manual or automatic belt at the time of the crash. Specify the source of the information.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
PSU
Zone
PAR Severity
Mortality
Treatment
Initial Facility
Hospital Stay
days
Work Days Lost
days
OK
Close

Screen Name: PAR Severity
Variable Name: Police Injury Severity (Police Rating)

Element Attributes:

O — No injury
C — Possible injury
B — Nonincapaciting injury
A — Incapacitating injury
K — Killed
U — Injury, severity unknown
Died prior to crash
Unknown

Source: Police report.

Remarks:

Select the police reported injury severity for this occupant. It is possible that the police could have updated the PAR between the time it was stratified and when it was picked up. For example, a person might have been listed originally with incapacitating injuries. Later the person dies, and the PAR is changed accordingly. Therefore, use the latest information on the PAR at the time it was obtained from the police agency.

If the police report contains a detailed description of the injuries but does not translate the injuries into the KABCO codes, use the police method for doing so. For example, injuries which are considered to be of an incapacitating nature are classified as "A" , nonincapacitating-evident injuries are classified as "B", and possible injuries are "C", Property damage only is classified as "O".

U — Injury, severity unknown
is used when the police report indicates a "U" or in any other way communicates the idea that the person was injured but their severity is unknown.

Died prior to crash
is only used if the police explicitly so indicate.

As a general rule, if the PAR is "blank" where the injury severity is assessed and the person was at the scene during the police investigation, then select “O” - No injury. If the PAR is "blank" and the person was not present during the police investigation, then select “Unknown”.

Not all states use the KABCOU scheme. Listed below, by state, are alternative schemes; a mapping to the NASS scheme is provided.

Screen Name: PAR Severity (cont'd)
Variable Name: Police Injury Severity (Police Rating) (cont'd)

State	PAR Code/Definition			NASS Scheme/Code
Alabama	K	=	Killed	K
	A	=	Visible or carried from scene	A
	B	=	Bruise/abrasion/swelling	B
	C	=	No visibility - has pain/faint	C
	Blank	=	No documentation of driver or occupant injury	O
		=	No set unknown code	U
Arizona	1	=	No injury	O
	2	=	Possible injury	C
	3	=	Non-incapacitating injury	B
	4	=	Incapacitating injury	A
	5	=	Fatal	K
	6	=	Unknown	U
California	1	=	Fatal	K
	2	=	Severe wound/distorted member	A
	3	=	Other visible injury	B
	4	=	Complaint of pain	C
	Blank	=	Occupant present	O
	Blank	=	Occupant not present	U
Colorado*	5	=	Fatal	K
	4	=	Evident - incapacitating	A
	3	=	Evident - non-incapacitating	B
	2	=	Possible injury	C
	1	=	No injury	O
C There is a box at the top of the PAR indicating number of persons injured. If this box is marked 0 and the injury attribute is left "blank", assume "No injury". If the box is marked 1 (or more) pertaining to the vehicle occupants in question and the injury attribute is "blank", assume "Injured, severity unknown". If "blanks" are present in both the persons injured box and the injury box, assume "Unknown".				
Florida	1	=	No injury	O
	2	=	Possible injury	C
	3	=	Non-incapacitating injury	B
	4	=	Incapacitating injury	A
	5	=	Fatal (IN 90 Days) injury	K
	6	=	Non-Traffic fatality	U
		=	No set unknown code	?? U ??

Screen Name: PAR Severity (cont'd)
Variable Name: Police Injury Severity (Police Rating) (cont'd)

State	PAR Code/Definition			NASS Scheme/Code
	Nature of Most Severe Injury {21}	**Location of Most Severe Injury {22}**	**Victim's Injury Status {23}**	
Indiana	1-11 Any Entry	1-12 Any Entry	6 Dead	K
	1-11 Any Entry	1-12 Any Entry	2 Semiconscious 3 Incoherent 4 Unconscious	A
	1 Severed 2 Internal 4 Severe Burn 7 Severe Bleed (Arterial) 8 Fracture/ dislocation	1-12 Any Entry	1 Conscious 5 Shock 7 Refused Med	A
	3 Minor Burn 6 Minor Bleed 10 Complaint of Pain 11 None Visible	3 Eye	1 Conscious 5 Shock 7 Refused Med	A
	3 Minor Burn 6 Minor Bleed	1-2, 4-12 (Any EXCEPT Eye)	1 Conscious 5 Shock 7 Refused Med	B
	5 Abrasion 9 Contusion/ Bruise	1-12 Any Entry	1 Conscious 5 Shock 7 Refused Med	B
	10 Complaint of Pain 11 None Visible	1-2, 4-12 (Any EXCEPT Eye)	1 Conscious 5 Shock 7 Refused Med	C
	11 None Visible	Blank or Slashed	1 Conscious	O
	Blank or Slashed	Blank or Slashed	Blank or Slashed	O
	Unknown	Unknown	Unknown	U

Screen Name: PAR Severity (cont'd)
Variable Name: Police Injury Severity (Police Rating) (cont'd)

State			PAR Code/Definition	NASS Scheme/Code
Maryland	5	=	Fatal	K
	4	=	Incapacitating	A
	3	=	Non-incapacitating	B
	2	=	Possible injury	C
	1	=	No injury/Damage only	O
	Blank	=	No documentation of driver or occupants on front of PAR	
Nebraska	1	=	Fatal	K
	2	=	Incapacitating injury	A
	3	=	Non-incapacitating injury	B
	4	=	Possible injury	C
	0	=	No injury	O
	Blank	=	Occupant present	O
	Blank	=	Occupant not present	U

New Jersey	**Location of Injury**	**Type of Injury**	**Victim's Condition**	
	Any entry	Any entry	Killed	K
	Any entry	Any entry	Incapacitated	A
	Any entry	amputation, concussion, internal, fracture/dislocation	Moderate injury complaint of pain	A
	Eye	burn, bleeding, complaint of pain	Moderate injury Complaint of pain	A
	Any entry	bleeding, contusion, bruise, abrasion	Moderate injury	B
	Any entry (except eye)	complaint of pain	Complaint of pain	C
	-	-	-	O
	U	U	U	U

Screen Name: PAR Severity (cont'd)
Variable Name: Police Injury Severity (Police Rating) (cont'd)

State	PAR Code/Definition			NASS Scheme/Code
	Location of Injury {14}	**Type of Injury {15}**	**Victim's Status {16}**	
New York	1-12 Any entry	1-13 Any entry	1 Apparent death	K
	1-12 Any entry	1-13 Any entry	2 Unconscious, 3 Semi-conscious, 4 Incoherent	A
	1-12 Any entry	1 Amputation, 2 Concussion, 3 Internal, 5 Severe Bleeding, 7 Moderate Burn, 8 Severe Burn, 9 Fracture - Dislocation	5 Shock, 6 Conscious	A
	3 Eye	4 Minor Bleeding, 6 Minor Burn, 12 Complaint of Pain	5 Shock, 6 Conscious	A
	All but eye 1, 2, 4-12	4 Minor Bleeding, 6 Minor Burn	5 Shock, 6 Conscious	B
	1-12 Any entry	10 Contusions - Bruise, 11 Abrasion	5 Shock, 6 Conscious	B
	All but eye 1, 2, 4-12	12 Complaint of Pain	5 Shock, 6 Conscious	C
	-	13 None Visible	6 Conscious	O
	X	X	X	U

Screen Name: PAR Severity (cont'd)
Variable Name: Police Injury Severity (Police Rating) (cont'd)

State			PAR Code/Definition	NASS Scheme/Code
Pennsylvania	0	=	No injury	0
	1	=	Death	K
	2	=	Major injury	A
	3	=	Moderate injury or	A
	4	=	Minor injury [and] Type of Apparent Injury - amputation - broken bone(s) - distorted member - other incapacitating injury	A
	3	=	Moderate injury or	B
	4	=	Minor injury [and] Type of Apparent Injury - abrasions/bruises - burns - bleeding wound - concussion - other non-incapacitating injury	B
	3	=	Moderate injury [and] Type of Apparent Injury - Unknown	B
	3	=	Moderate injury or	C
	4	=	Minor injury [and] Type of Apparent Injury - complaint of pain - limping - swelling	C
	4	=	Minor injury [and] Type of Apparent Injury - Unknown	C
	9	=	Unknown if injured [and] Type of Apparent Injury - Complaint of pain	C
	9	=	Unknown if injured [and] Type of Apparent Injury - Unknown	U
Tennessee	4	=	Fatal Injury	K
	3	=	Incapacitating injury	A
	2	=	Non-incapacitating injury	B
	1	=	Possible injury	C
	0	=	No injury	0
Washington	1	=	No injury	0
	2	=	Dead at scene	K
	3	=	Dead on arrival	K
	4	=	Died in hospital	K
	5	=	Disabling injury	A
	6	=	Non-disabling injury	B
	7	=	Possible injury	C
	Blank	=	Unknown	U

Screen Name: Mortality
Variable Name: Mortality

Element Attributes:

Not Fatal
Fatal
Fatal — ruled disease (specify)

Source: Researcher determined — inputs include interviewee, police report, and medical records.

Remarks:

Official sources (if they exist) take precedence over interview data.

Not Fatal

is used when death does not occur or occurs more than 30 days after the crash.

Fatal

is used when death occurs within 30 days of the crash. Death must have occurred as a consequence of injuries sustained in the traffic crash. Interview information alone should not be sufficient to select this attribute.

Fatal — ruled disease (specify)

is used in two situations. The first is when the effects of a disease can be deemed as a cause of the crash. Cause means that the on-set of the disease occurred prior to the first harmful event. When determining the time of on-set (relative to the first harmful event), the researcher can use any information source available. The researcher makes his/her determination after weighing all the evidence. (**NOTE:** The use of all available information sources is restricted to the determination of when the on-set occurred.)

Second is when a medical examiner (or other official vested by the state to verify the cause of death) or an official medical report verifies that the death resulted from either (1) a diseased condition, or (2) not from crash related injuries.

Screen Name: Treatment
Variable Name: Treatment

Element Attributes:

No treatment
Dead on Arrival (DOA) at hospital
Dead Prior To Admission
Hospitalized
Transported and released
Treatment at scene - non-transported
Treatment later
Treatment - other (specify)
Transported to a medical facility - unknown if treated
Unknown

Source: Researcher determined — inputs include interviewee, police report, and medical records.

Remarks:

Official sources (if they exist) take precedence over interview data.

No treatment

includes persons transported to a hospital but who refuse treatment. A person who is declared dead at the scene of the crash and is not transported to a hospital is coded **No treatment.**

Dead On Arrival (DOA) at hospital

includes persons who are transported from the scene to a hospital facility and pronounced dead on arrival **at the hospital**. This means that no treatment was attempted at the hospital facility (e.g., no CPR, no examination, no x-rays, etc.)

Dead Prior To Admission

includes persons who are transported from the scene to a hospital facility and treated in the ER, but died prior to admission. See **Hospital Stay** for hospitalization criteria.

Hospitalized

is used when hospitalization occurs as a result of injury (need ***not*** be taken directly to a hospital). See Hospital Stay for hospitalization criteria. Also use this attribute if a person is treated and released, then is subsequently hospitalized as a result of injuries sustained in the crash.

Screen Name: Treatment (cont'd)
Variable Name: Treatment (cont'd)

Transported and released

is used when the person went ***directly*** from the crash scene to a treatment facility (hospital, clinic, doctor's office, etc.), and the person ***is examined*** for injuries at the facility. The person need not have been injured. The means of transportation is ***not*** a consideration.

Treatment at scene — non-transported

includes treatment at scene such as: first aid, self-treatment, EMT treatment, doctor treatment, etc.--and the person is not transported or does not go to a treatment facility (*e.g.*, doctor, clinic, hospital, etc.) as a result of injuries sustained in this crash.

Treatment later

includes only professional treatment (*e.g.*, doctor, clinic, hospital, etc.) where the person:

- did not go directly from the scene to treatment, **and**
- was treated and released

If a person is treated at the scene, is not transported from the scene, and subsequently receives later treatment (without being hospitalized), then use this attribute. Later is defined as more than one hour after leaving the scene of the crash.

Treatment — other (specify)

includes non-professional treatment such as first aid, self-treatment, etc., not at the scene of the crash. If this is used, then Type of Medical Facility (for Initial Treatment), must be assigned Not treated at a medical facility.

Transported to a medical facility-unknown if treated

is used when the person went ***directly*** from the crash scene to a treatment facility (hospital, clinic, doctor's office, etc.), and no other information about treatment is known.

If a person survives the injuries and receives treatment at a hospital, but is not admitted for hospitalization, that person's treatment is either Transported and released or Treatment later, depending upon whether the person went directly or indirectly to the hospital. It does not matter if the person is treated for one hour or twelve, only that the person is released following treatment. Nor does it matter if the treatment begins prior to midnight and spans into the following day.

Screen Name: Initial Facility
Variable Name: Type of Medical Facility (for Initial Treatment)

Element Attributes:

Not treated at a medical facility
Trauma center
Hospital
Medical clinic
Physician's office
Treatment later at medical facility
Other (specify)
Unknown

Source: Researcher determined — inputs include police report, interviewee, official records, and the American College of Surgeons classification criteria.

Remarks:

The treatment of injuries by a physician immediately (*i.e.*, within one hour) following a crash is of utmost importance in serious injury crashes. In order to assess the quality of immediate care available to the victims in CDS crashes, the following criteria are used to categorize the various treatment facilities. Teams must develop a listing of treatment facilities serving their PSU and categorize each into this variable's scheme. Teams must communicate their list to their respective zone center.

Not treated at a medical facility

is used when the person was not injured or receives nonprofessional treatment such as first-aid, self-treatment, etc. In addition, use this attribute for persons who "died" at the scene or "died in-route" to a medical facility. Treatment at the scene or in-route to a medical facility by emergency medical personnel is ***not*** considered initial treatment for the purposes of this variable. This is true even if the facility has radio communications with their EMTs. If a person arrives at a medical facility and subsequently dies or is declared dead after some treatment, but prior to admission, then use one of the other attributes. For example, an occupant arrives with no vital signs, CPR in progress, and a "flat" EKG and is declared "dead on arrival" on the ER report.

Trauma center

is used when the occupant was initially treated at a Level I or Level II Trauma Center as defined by the American College of Surgeon's Committee on Trauma report entitled: "Hospital and prehospital resources for optimal care of the injured patient", *American College of Surgeons Bulletin*, Vol. 71, No. 10, October 1986, pp. 4-12.

The fact that a medical facility calls itself a "Trauma Center" or something of the same nature does not mean that it satisfies the criteria for Trauma center. The facility must meet the criteria as noted in the preceding paragraph. Teams should contact their "hospitals" and ask each what they consider themselves to be (according to criteria referenced above). Teams should also be alert for communication releases (*i.e.*, newspapers, radio, TV, etc.) which concern the trauma capability status of their area emergency rooms. **If the status of a hospital should change, notify your Zone Center.**

Screen Name: Initial Facility (cont'd)
Variable Name: Type of Medical Facility (for Initial Treatment) (cont'd)

Hospital
is used for all "hospitals" which do not fall into the definition of a Level I or Level II Trauma Center as defined.

Medical clinic
is used for treatment facilities which provide outpatient medical care with related in-house laboratory facilities (e.g, x- ray). These are usually a group practice in which several physicians work cooperatively. This also includes school clinics, work place clinics, or similar facilities if they are staffed by a physician while open. If a doctor is not normally present at a clinic while it is open, then the appropriate attribute is Other.

Physician's office
is used when the person is initially treated in an office of a professional health care provider which does not qualify for Trauma center, Hospital, or Medical clinic.

Treatment later at medical facility
use this attribute when the person receives treatment at a medical facility more than one hour after departing the scene of the crash.

Other (specify)
is used when a health care provider's facility is used for the initial treatment, and the facility does not qualify for Trauma center, Hospital, Medical clinic, or Physician's office above.

Unknown
is used when it is unknown what type of initial treatment facility was used or when it is unknown if treatment of any kind was obtained.

Screen Name: Hospital Stay
Variable Name: Hospital Stay

Element Attributes:

0 (zero) Not hospitalized
Enter the number of days (up through 60)
61 (61 days or more)
Unknown

Source: Researcher determined — inputs include interviewee and medical reports.

Remarks:

Official sources (if they exist) take precedence over interview data.

0 (zero) Not hospitalized

is used when the person was not injured or injured but not admitted to the facility (*i.e.*, admission to the facility's emergency room is not "admission" to the facility for the purposes of the hospitalization question). In addition, use this attribute if fatal at scene, pronounced dead on arrival, or survival does not extend beyond the emergency room.

The basis for the number of days is an overnight criterion. Every time a person remains past midnight subsequent to admission, it is one day. However, there are two exceptions. One exception occurs when a person dies on the same day as the admission. In this situation, 1 is entered. The other exception occurs when a person is ***admitted*** in the early morning hours (between midnight and 7:00 a.m.), usually for observation, and is subsequently released later in the same day (usually late morning or early afternoon) 1 is entered because the person was hospitalized , Treatment equals Hospitalized.

If your information indicates that the person died while in a critical care unit [*e.g.*, intensive (*i.e.*, ICU), coronary (i.e., CCU), etc.], then at least 1 is entered even if the person expires on the same day. In other words, a person is considered admitted if they are still alive when they are transferred to a critical care unit. On the other hand, in the event that the person survives the emergency room but subsequently dies during surgery, then Not hospitalized is used, because a person who goes directly from the emergency room to an operating room is not considered to have been admitted.

If a person is admitted, lives four days in the hospital, and subsequently expires, enter 4.

This variable reports the number of days this occupant is hospitalized at a primary care facility. Primary care facilities includes medical facilities that receive patients via air transfer (*e.g.*, "lifeline" and "medivac"). However, the number of days spent at secondary care facilities (*i.e.*, rehabilitation or convalescent units, centers, facilities; or nursing homes) are ***not*** included in this variable.

Screen Name: Work Days Lost
Variable Name: Working Days Lost

Element Attributes:

0 (zero) No working days lost
Enter the number of days (up through 60)
61 (61 days or more)
Not working prior
Unknown

Source: Primary source is the interviewee; a secondary source is the person's employer.

Remarks:

Report the actual number of "work" days lost due to the crash by an employed person or a full-time college student. Children, adolescents, retirees, or unemployed persons are included in **Not working prior to crash**.

If no interview is obtained, assume that persons over 65 or under 17 are not employed full-time; for these persons Not working prior to crash is used unless the person is fatally injured.

Employed is defined to mean that the person was scheduled to work at least four hours on each of the days lost. Each such day is counted as a full day so long as the person was scheduled to work at least four hours on the day lost. Do ***not*** accumulate the hours and convert to equivalent full-time days; however, if the person works less than full-time but greater than four hours per day annotate "part-time" or "PT".

If during the interview a reasonable projection of future days lost can be made, then add those days to those already known to have been lost. If a reasonable projection cannot be made, then select Unknown.

The days lost need not be due to injury.

Days lost include Saturdays, Sundays, and afternoon and evening shifts if so scheduled. Do not count double shifts or days at time and one-half pay, etc., as more than one day.

If the reported work days lost includes a fraction, round one-half (½) day or greater up to a whole day. Less than one-half day is excluded (rounded down).

If someone loses their job as a result of the crash, then count only the work days lost between the crash and the date of termination, inclusive.

Do not include days lost by persons who were not directly involved in the crash but who lost days because of it (*e.g.*, husband who was not in crash but stayed home to take care of wife who was injured and required assistance).

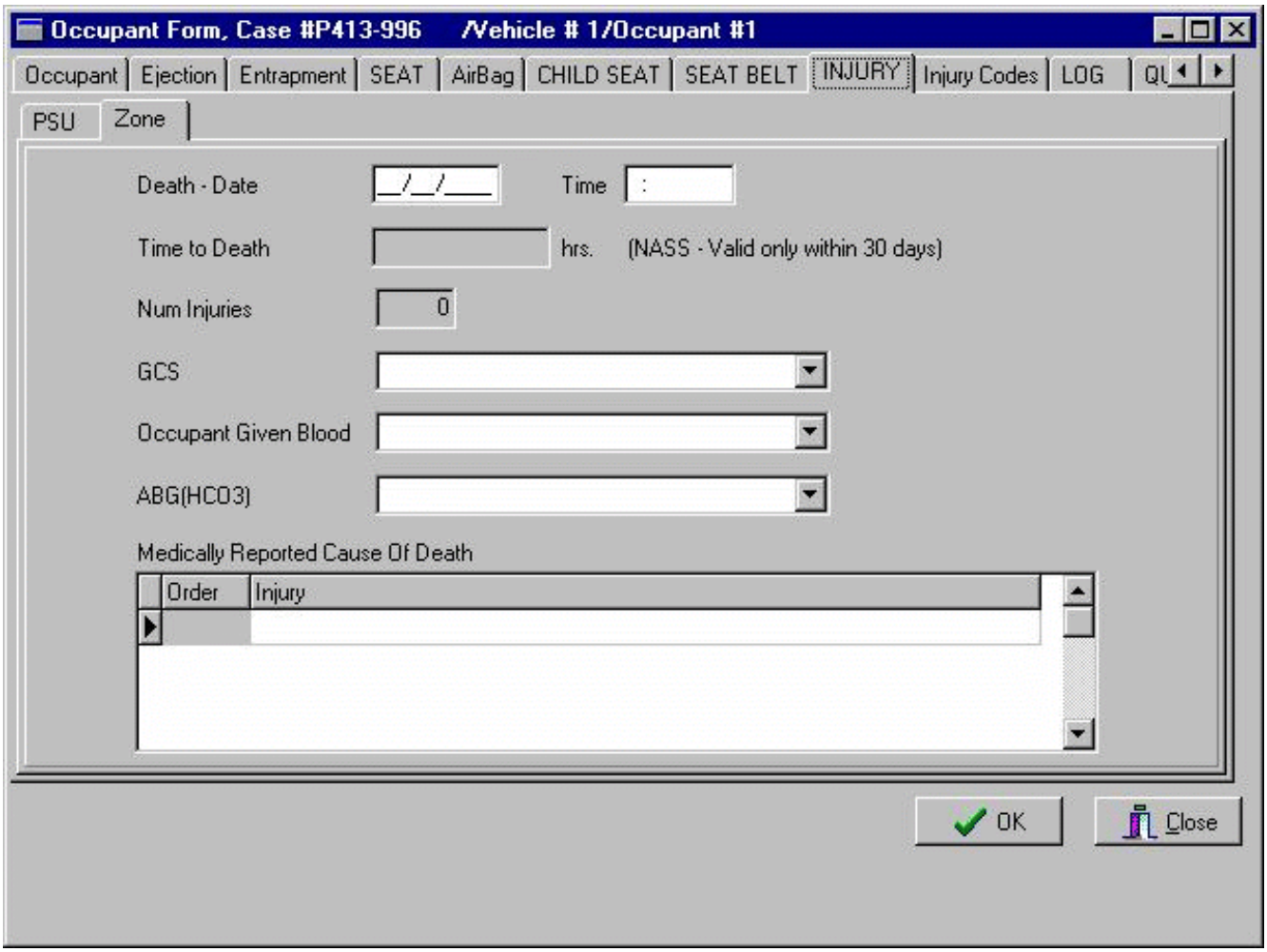
If an involved person changes their work schedule as a result of a crash (*e.g.*, to take care of someone injured in the crash), then the work time, which was given up as a result of the crash, shall not be considered as lost.

Screen Name: Work Days Lost (cont'd)

Variable Name: Working Days Lost (cont'd)

Not working prior to crash

is used when a person is not employed, not a full-time college student, or works less than four hours per day. This includes all persons (except fatals) who do not qualify to lose working days.


Occupant Form, Case #P413-996 /Vehicle # 1/Occupant #1
Occupant
Ejection
Entrapment
SEAT
AirBag
CHILD SEAT
SEAT BELT
INJURY
Injury Codes
LOG
PSU
Zone
Death - Date
__/__/____
Time
:
Time to Death
hrs.
(NASS - Valid only within 30 days)
Num Injuries
0
GCS
Occupant Given Blood
ABG(HCO3)
Medically Reported Cause Of Death
Order
Injury
OK
Close

Screen Name: Death - Date
Variable Name: Death Date

Element Attributes:
Enter Date of Death

Source: Zone Center determined from police report, hospital/medical records, autopsy report, or other official records for actual time of death for fatally injured occupants.

Remarks:

Enter the date that the occupant died.

Screen Name: Time
Variable Name: Death Time

Element Attributes:
Enter Time of Death

Source: Zone Center determined from police report, hospital/medical records, autopsy report, or other official records for actual time of death for fatally injured occupants.

Remarks:

Enter the time that the occupant died using the 24 hour military clock.

Screen Name: Time to Death
Variable Name: Death Time

Element Attributes:
Enter Time of Death

Source: Zone Center determined from police report, hospital/medical records, autopsy report, or other official records for actual time of death for fatally injured occupants.

Remarks:

The system computes the time to death based on the crash date and the date and time of death entered previously. This value is valid in NASS only up to 30 days.

Screen Name: Num Injuries
Variable Name: Number of Injuries for This Occupant

Element Attributes:

0 (zero) No injuries
The actual number of injuries recorded for this occupant will be rolled up

Source: Zone Center determined — inputs include official medical records and interviewee data from the PSU and PAR (see limitations below).

Remarks:

The Zone Center will record this occupant's total number of injury rows that were recorded on the Occupant Injury Screen.

The PAR may be used for coding **Injured, details unknown** if the **Police reported injury** for the occupant is **K**, **A**, or **B** or **Unknown if injured** if the **Police reported injury** is **C,** or **U** AND *no other injury information is available.*

0 (zero) No injuries

is used when the occupant is uninjured.

Screen Name: GCS
Variable Name: Glasgow Coma Scale (GCS) Score (at Medical Facility)

Element Attributes:

Not injured
Injured — not treated at medical facility
No GCS Score at medical facility
3-15 Enter the actual value of the initial GCS Score recorded at medical facility
Injured, details Unknown
Unknown if injured

Source: Zone Center determined from official medical records.

Remarks:

Report the actual value of the ***initial*** GCS score obtained at a medical facility. The Glasgow Coma Scale assesses three neurologic functions: **eye opening**, **motor response**, and **verbal response**. The GCS value can often be found in medical records by looking for the abbreviation "**GCS**". The number following the abbreviation is the score unless the value is less than "03" or greater than "15". It is not uncommon to find the GCS Score accompanied by information about eye pupil size and motor strength.

If more than one Glasgow Coma Scale (GCS) Score is recorded in the document without reference to initial GCS Score, then select the GCS Score to be entered in the following order:

(a) enter the GCS Score from the medical record with the earliest time to hospital treatment (*i.e.*, enter ER record over discharge summary)
(b) enter the GCS Score that appears first in a medical record other than the ER record
(c) if two or more GCS Scores are recorded in the same record without reference to time, enter the lowest GCS Score.

"15" is entered when the occupant's medical record does not specifically indicate the GCS Score but does indicate one or more of the following pieces of information:

- **L** AxOx3 (alert and oriented times three)
- **L** neurologically intact, normal, etc., or
- **L** CN II-XII okay, normal, intact, etc.

Injured — not treated at medical facility

is used when the person was injured and received only nonprofessional treatment such as first-aid, self-treatment, etc., or was treated at the scene by emergency medical personnel. In addition, use this for persons who "died" at the scene or "died in-route" to a medical facility. This is true even if the medical facility has radio communications with the emergency medical personnel.

Screen Name: GCS (cont'd)
Variable Name: Glasgow Coma Scale (GCS) Score (at Medical Facility) (cont'd)

No GCS Score at medical facility

is used when the occupant was injured and received professional medical treatment but no Glasgow Coma Scale Score was assessed or recorded at a medical facility. Use this if the only GCS Score obtained was reported on an emergency medical report. If GCS Scores are obtained by both emergency medical personnel and at a medical facility, then report the initial score obtained at the medical facility.

Use this attribute If a person was treated at a medical facility and their medical records are pending.

Screen Name: Occupant Given Blood?
Variable Name: Was the Occupant Given Blood?

Element Attributes:

No — blood not given
1 unit given
2 units given
3 units given
4 units given
5 units given
6 units given
7 units given
8 units given
9 units given
10 or more units given
Blood given, # units unknown
Unknown if blood given

Source: Zone Center determined from official medical records or Emergency Medical Service (EMS) reports.

Remarks:

In general, blood consists of red blood cells (erythrocytes), white blood cells (leukocytes) and platelets (thrombocytes) suspended in plasma. In a transfusion, blood can be given in four separate forms: whole blood, packed red blood cells, plasma, or platelets; or in a combination of these forms.

Whole blood is blood from which none of the elements have been removed.

Packed red blood cells are whole blood from which plasma has been removed.

Plasma is the fluid (pale yellow liquid) of the blood in which the particulate components are suspended. Plasma is often given to burn patients.

Platelets are known for their role in blood coagulation. Platelets are often given when blood clotting is desired.

No — blood not given
is used whenever, Glasgow Coma Scale (GCS) Score equals Not injured or Injured - not treated at medical facility, or it is known that the person did not receive any professional treatment. In addition, use this when:

- **L** Fit is known that the occupant was injured and not given blood; or
- **L** Fan occupant is transported and released ***and*** not subsequently hospitalized independent of whether the occupant's records are acquired.

Screen Name: Occupant Given Blood? (cont'd)
Variable Name: Was the Occupant Given Blood? (cont'd)

Enter the number of units of blood
when this occupant was given "blood" in any of the four forms, or combinations, discussed above for injuries sustained as a result of their motor vehicle traffic crash. ***Excluded*** are transfusions which result from noninjury. For example, if a spontaneous abortion results to a mother who was not injured, but who was given a transfusion, then do not consider this occupant to have had blood given. Whenever an occupant is "taken to surgery" researchers should be alert to the possibility that a blood transfusion occurred. Whenever a transfusion occurs, select the number of units of blood given.

Yes, blood given, amount not specified
is used when this occupant was given blood, but the amount was not specified.

Unknown if blood given
Use this when the occupant is:

- **L** injured and treated at a medical facility but it cannot be determined if blood was given.
- **L** hospitalized ***and*** the occupant's records are inconclusive regarding whether blood was given;
- **L** taken to surgery, regardless of hospitalization (*e.g.*, died prior to being hospitalized), ***and*** the occupant's records are inconclusive regarding whether blood was given; or
- **L** hospitalized ***or*** taken to surgery ***and*** the medical records are pending.

Screen Name: ABG (HCO3)
Variable Name: Arterial Blood Gases -- ABG (HCO3)

Element Attributes:

Not injured
Injured, ABGs not measured or reported
ABG=2, 3, 4, , , …., 50
ABGs reported, HCO_3 unknown
Injured, details unknown
Unknown if injured

Source: Zone Center determined from official medical records.

Remarks:

The table below presents the normal measures of arterial blood gases followed by the definitions of these measures and other keywords.

Arterial Blood Gases (ABGs)

Measure	Normal	Respiratory Acidosis	Respiratory alkalosis	Metabolic acidosis	Metabolic alkalosis
pH	**7.35 to 7.45**	**Normal or Decreased**	**Increased**	**Decreased**	**Increased**
PO_2	**90 to 95 mm Hg**	**Decreased**	**Altered**	**Normal or increased**	**Normal or decreased**
PCO_2	**34 to 46 mm Hg**	**Increased**	**Decreased**	**Decreased**	**Increased**
HCO_3	**24 to 26 mEq/L**	**Increased**	**Decreased**	**Decreased**	**Increased**
RR	**10/min to 20/min**	**Irregular**	**Altered**	**Increased**	**Decreased**

Definitions of Measures

pH — the symbol relating the hydrogen ion (H^+) concentration or activity of a solution to that of a given standard solution. Numerically the pH is approximately equal to the negative logarithm of H^+ concentration expressed in molarity pH 7 is neutral; above it alkalinity increases and below it acidity increases.

Screen Name: ABG (HCO3) (cont'd)
Variable Name: Arterial Blood Gases -- ABG (HCO3) (cont'd)

PO_2, pO_2, Po_2 oxygen partial pressure (tension).

PCO_2, pCO_2, Pco_2 carbon dioxide partial pressure or tension.

HCO_3 bicarbonate radical.

RR respiratory rate.

Alphabetical Definitions of Keywords

acidosis (as"i-do/sis) — a pathologic condition resulting from accumulation of acid or depletion of the alkaline reserve (bicarbonate content) in the blood and body tissues, and characterized by an increase in hydrogen ion concentration (decrease in pH). metabolic a. — a disturbance in which the acid-base status of the body shifts toward the acid side because of loss of base or retention of noncarbonic, or fixed (nonvolatile), acids; called also nonrespiratory a. respiratory a. — a state due to excess retention of carbon dioxide in the body; called also hypercapnic a.

alkali (al/kah-li) — any of a class of compounds which form soluble soaps with fatty acids ... and form soluble carbonates.

alkalosis (al"kah-lo/sis) — a pathologic condition resulting from accumulation of base, or from loss of acid without comparable loss of base in the body fluids, and characterized by decrease in hydrogen ion concentration (increase in pH). metabolic a. — a disturbance in which the acid-base status of the body shifts toward the alkaline side because of retention of base or loss of noncarbonic, or fixed (nonvolatile), acids. respiratory a. — a state due to excess loss of carbon dioxide from the body.

anion (an/i-on) — an ion carrying a negative charge owing to a surplus of electrons.

bicarbonate (bi-kar/bo-na-t) — any salt containing the HCO_3- anion. blood b. — the bicarbonate of the blood, an index of the alkali reserve.

ion (i/on) — an atom or radical having a charge of positive (cation) or negative (anion) electricity owing to the loss (positive) or gain (negative) of one or more electrons.

mEq/L milliequivalent per liter: a milliequivalent is the number of grams of a solute contained in one milliliter of a normal solution; therefore, the normal range for the bicarbonate of blood is 0.024–0.026 grams per milliliter. Thus, for a thousand milliliters, the normal values become 24 to 26 grams.

Screen Name: ABG (HCO3) (cont'd)
Variable Name: Arterial Blood Gases -- ABG (HCO3) (cont'd)

Medical records often provide ABG information in a condensed format. For example, a medical record presented the ABG information as follows.

ABG:7.56 / 25 / 171 / 100 %

This equates to: pH = 7.56; PCO_2 = 25; PO_2 = 171 -- at 100 percent saturation

In this example, the measure desired is not reported; use ABGs reported, HCO_3 unknown. The measure of interest is the HCO_3 (also referred to as the **bicarbonate**). Researchers must look carefully at their reported ABGs to insure that the desire measure is being obtained. The closeness in range between the normal values of HCO_3 and PCO_2, makes mistaking them easy. In general, when ABGs are reported as a set of three values, consider them to be the pH, PCO_2, and.PO_2.

Actual Values

are used to report the measured HCO_3 (bicarbonate) value obtained for this occupant. If multiple ABG HCO_3 values are reported, enter the lowest value.

Injured, ABGs not measured or reported

is used when the occupant is injured ***and***:

(1) was not treated at a medical facility

(2) was treated at a medical facility but no official medical records were obtained, or

(3) no ABG measures are reported in any of the occupant's obtained official medical records.

ABGs reported, HCO_3 unknown

is used when ABG value(s) are reported in this occupant's medical records but the HCO_3 measure is unknown.

Screen Name: Medically Reported Cause of Death
Variable Name: 1st, 2nd, 3rd, Medically Reported Cause of Death

Element Attributes:

Select the injuries which have been identified that reportedly contributed to this occupant's death
Mode of death given but specific injuries are not linked to cause of death (specify)
Other result (includes fatal ruled disease) (specify)
Unknown

Source: Zone Center determined from official records

Remarks:

Select up to three specific injuries detailed in a medically reported "cause of death" statement.

This variable records the injury(s) which was/were determined by the medical professional completing the report, or by trained Zone Center injury coders using official medical records, to be the cause of death. A "cause of death" statement may appear at the beginning or end of an official medical record or it may also appear in a "diagnosis" section or body of a medical record. Like the coding rule for injuries, probable or possible causes of death are not used. If the occupant was killed and no official medical data was obtained, or the data obtained inadequately describes injuries which could have an affect on the occupant's death, then assign cause of death equal to **Unknown**. If the occupant was killed and acquired medical data do not provide a specific official medically reported cause of death, then the Zone Center injury coder will determine if injury data are sufficient to enter the 1st cause of death, and/or 2nd, and/or 3rd with an appropriate injury row(s).

Select the injury(s) which caused the death.

If the "cause of death" statement consist of nonspecific indefinite injuries (*e.g.*, multiple injuries of head, trunk, etc., blunt force injuries of the chest etc., massive injury, and multiple traumatic injuries) and injuries are detailed in the official medical records such that the cause of death can be logically determined, then choose up to three specific injuries using the following guidelines:

- **L** Proceed by first considering specific AIS-6 injuries, followed by AIS-5, then AIS-4, then AIS-3.

  Note: AIS levels do not automatically identify an injury as the selected cause of death. For example, if the occupant has an AIS-6 burn injury but the medical says that the occupant was dead prior to the occupant's vehicle catching on fire, then burn was not the cause of death.

- **L** Within each AIS level, determine the contribution the specific injury had on the occupant's chance of survival.

Screen Name: Medically Reported Cause of Death (cont'd)
Variable Name: 1st, 2nd, 3rd, Medically Reported Cause of Death (cont'd)

Mode of death given but specific injuries are not linked to cause of death (specify)
is used when it is determined that the occupant qualifies for Fatal in variable, Mortality, but specific injuries are not medically reported for the cause of death. The official medical report may give a mode of death such as (1) acute pulmonary embolis, (2) respiratory failure, (3) cardiac arrest, or (4) asphyxiation. This is also used when the cause of death is reported from complications or consequences of injuries.

Other result
is used when it is determined that the occupant qualifies for **Fatal-ruled disease** in **Mortality**.

If no cause of death is directly from an injury and there is no officially reported mode of death, then encode cause of death as Other result.

EMERGENCY MEDICAL SERVICE (EMS) OVERVIEW

Emergency Medical Service (EMS) personnel are integral to the survivability of the people involved in crashes. The following variables attempt to collect some basic information on their involvement with ECDS crashes.

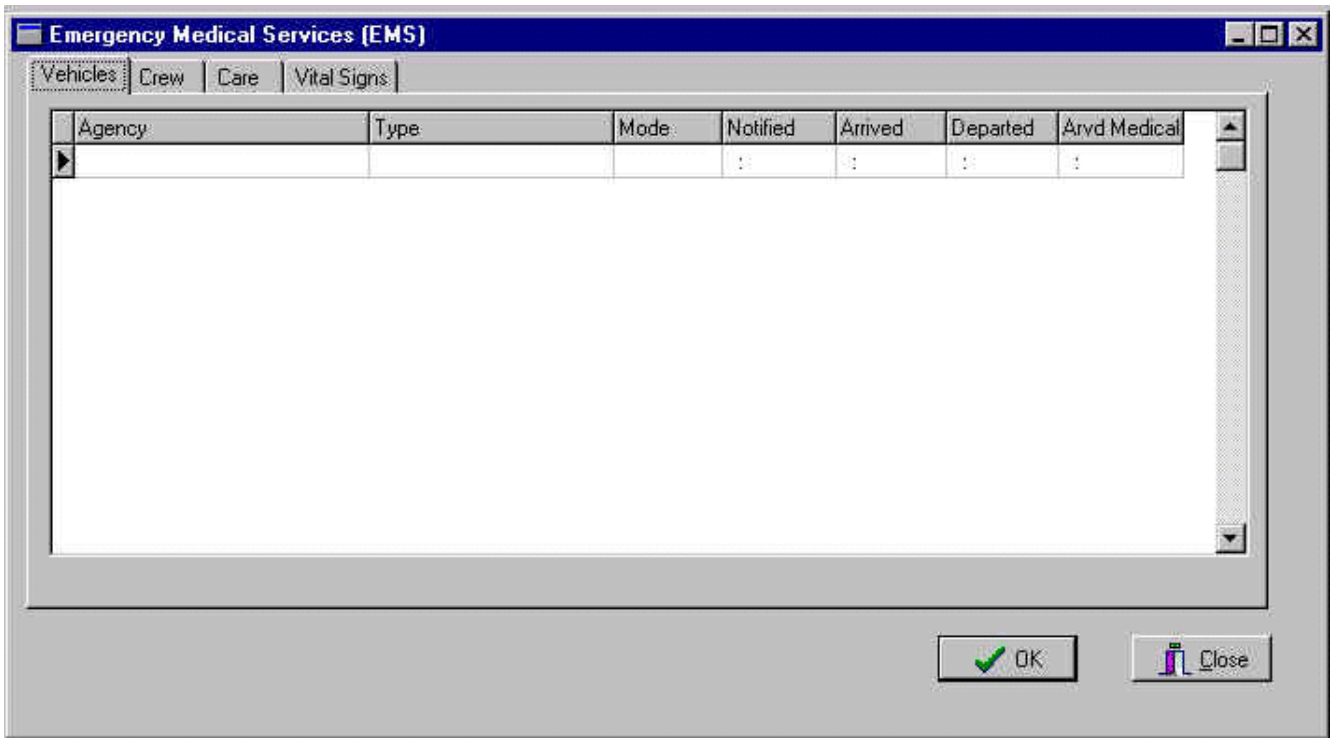
Information is required for all units that respond to the scene of the crash and administers care or transports any occupants. Correspondingly any occupant who receives care or is transported must have information added.

ANY TIME THERE IS INFORMATION THAT AN EMERGENCY UNIT RESPONDED TO THE SCENE OF THE CRASH AN EMS RECORD SHOULD BE REQUESTED FOR EACH OCCUPANT WITH A PAR REPORTED INJURY .

Any time an EMS unit responds to the scene of a crash, all crash involved persons are deemed to receive care if a run sheet is filled out for them.

Please note that there is only **ONE NOTIFICATION TIME** and **ONE ARRIVAL TIME** for a crash.

Do not collect EMS information for those occupants who are declared dead at the scene of the crash. These occupants will have **Treatment** coded as **No Treatment** and **Mortality** coded as **Fatal** or **Fatal Ruled Disease.**


Emergency Medical Services (EMS)
Vehicles
Crew
Care
Vital Signs
Agency
Type
Mode
Notified
Arrived
Departed
Arvd Medical
OK
Close

Screen Name: Responding Agency
Variable Name: Responding Agency

Element Attributes:

Fire Department
Rescue Squad
Police Department
Trauma Unit
Disaster Unit
Ambulance Service Unit
Hospital
Mortuaries/Funeral Home
Other, Specify
Unknown

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

Indicate the responding agency of the EMS vehicle. The classification of that vehicle will be entered under **EMS Form/Vehicles/ Responding Emergency Vehicle Type.**

Fire Department

Any vehicle that belongs to a fire department will be classified here.

Rescue Squad

Make this selection only if it is not associated with a fire department, police department, or hospital.

Police Department

Any vehicle that belongs to a police department will be classified here.

Trauma Unit

All trauma units that cannot be classified as a fire department, police department or hospital will fall here.

Disaster Unit

This will primarily occur during some national disaster.

Screen Name: Responding Agency (cont'd)
Variable Name: Responding Agency (cont'd)

Remarks:

Ambulance Service Unit
An ambulance not otherwise connected with any other type will be entered here.

Hospital
Any unit that belongs to a hospital will be classified here.

Mortuaries/Funeral Home
In some very rural areas, the only unit available may be from a mortuary or funeral home. In those cases, make this selection.

Other, Specify

Unknown

Screen Name: Type of Vehicle
Variable Name: Responding Emergency Vehicle Type

Element Attributes:

Ambulance
Fire Truck/Apparatus
Other
Unknown

Source: EMS records, Emergency room records, PAR

Remarks:

This variable captures information irrespective of the operating authority or organization that is sponsoring/running the vehicle. Thus a fire department or hospital that uses an ambulance for EMS will be coded as **Ambulance**.

Ambulance

An ambulance is a vehicle that is specifically designed to provide care and transport people. An ambulance run by a Fire department should be included here. Helicopters/planes should be included here.

Fire Truck/Apparatus

Includes any vehicle other than an ambulance run by the Fire department.

Other, specify

Any other unit not covered above will be entered here. This is very unlikely to occur.

Unknown

Screen Name: Mode
Variable Name: Transportation Mode

Element Attributes:
Land
Air

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

Indicate what type of EMS vehicle came to the crash scene or transfer vehicle. Assume it is a road vehicle, unless contrary information is present.

Land

Air

Screen Name: Notification Time
Variable Name: FIRST Notification Time

Element Attributes:

Enter the EMS notification time in military time format.
8888 Not Applicable
9999 Unknown

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

This variable indicates the **earliest time** that **ANY vehicle was notified** to come to the crash scene. The notification can be made by any source (police, involved persons, witnesses, etc.).

There will be only ONE notification time for a crash

Indicate the earliest time that any unit, or the EMS notification system was notified to come to the crash scene for any occupant in the crash. It will be the earliest of the times listed below.

Time incident reported (e.g., received by 911)
Time dispatch notified
Time EMS unit notified
Time unit responds

Screen Name: Arrival Time
Variable Name: FIRST Arrival Time

Element Attributes:

Enter the EMS notification time in military time format.
8888 Not Applicable
9999 Unknown

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

This variable indicates the earliest time that ANY vehicle arrived at the crash scene.

There will be only ONE arrival time for a crash.

Indicate the earliest time that any unit arrived at the crash scene.

Indicate the time that the EMS unit stops physical motion at the scene. If an individual EMT arrives at the scene by private vehicle, that time is NOT the recorded value for this variable .

Screen Name: Departed
Variable Name: Time of Departure From the Scene

Element Attributes:

Enter the EMS departure time in military time format.
8886 Transport refused
8887 Not transported
8888 Not Applicable
9999 Unknown

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

Enter the time that the unit departed for the treatment unit or transfer vehicle.

8886 Transport refused

Use this attribute when a person refuses transport to a treatment facility, regardless of treatment level at the crash site.

8887 Not transported

Use this attribute for instances other than transport being refused. This generally will include those cases when the EMTs see no need for transport.

8888 Not applicable

Units which just provide treatment at the crash site and do not transport occupants are entered as **Not applicable .**

Units which do not respond to the crash site, but do receive patient(s) at a transfer point in order to transfer them to a treatment facility, are entered as **Not Applicable** .

**** The 8887 code and the 8888 code are not accepted at the present time, ****
leave them blank for Not transported or Not applicable until NASSMAIN is changed.

9999 Unknown

Use this attribute for instances where the time of departure cannot be determined from any source.

Screen Name: Arvd Medical
Variable Name: Arrived at Medical Facility

Element Attributes:

Enter the EMS arrival time in military time format.
8888 Not Applicable
9999 Unknown

Source: EMS records, Emergency room records, PAR, interviewee

Remarks:

Enter the time that the unit with the occupant arrived at the treatment facility.

This may be the unit that responded to the crash site or a unit which received the occupant at a point between the crash site and the treatment facility .

8888 Not applicable

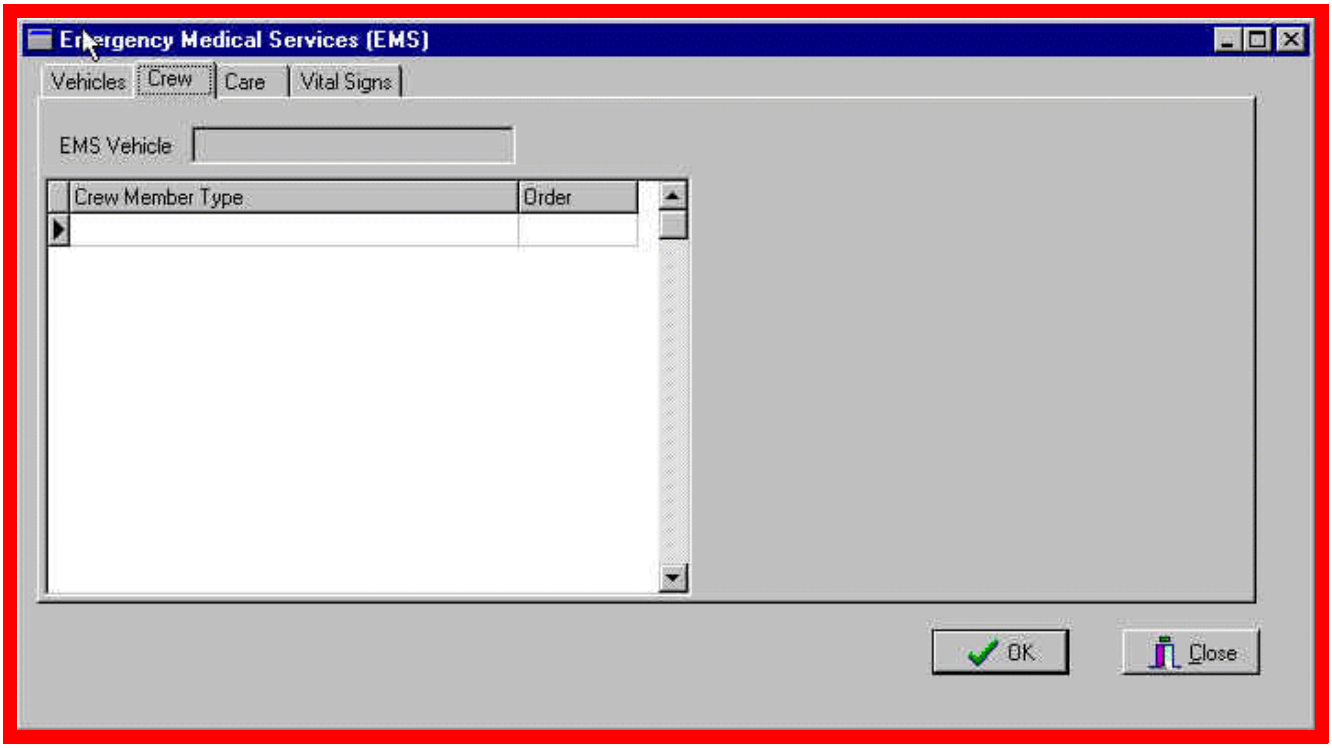
Units which just provide treatment at the crash site and do not transport occupants are entered as **Not applicable .**

Units which leave the scene and only transport occupant(s) to a transfer vehicle are entered as **Not Applicable** .

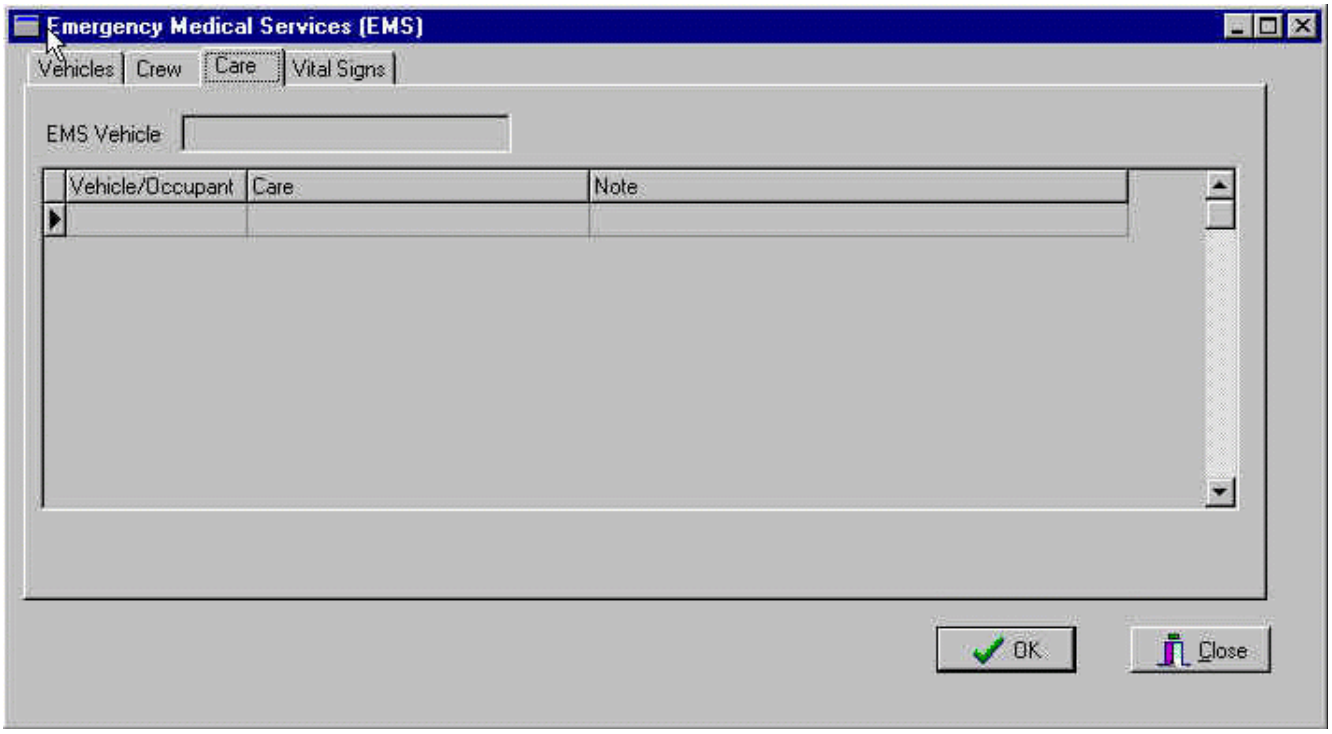
**** The 8888 code is not accepted at the present time, ****
leave it blank for Not applicable until NASSMAIN is changed.

9999 Unknown

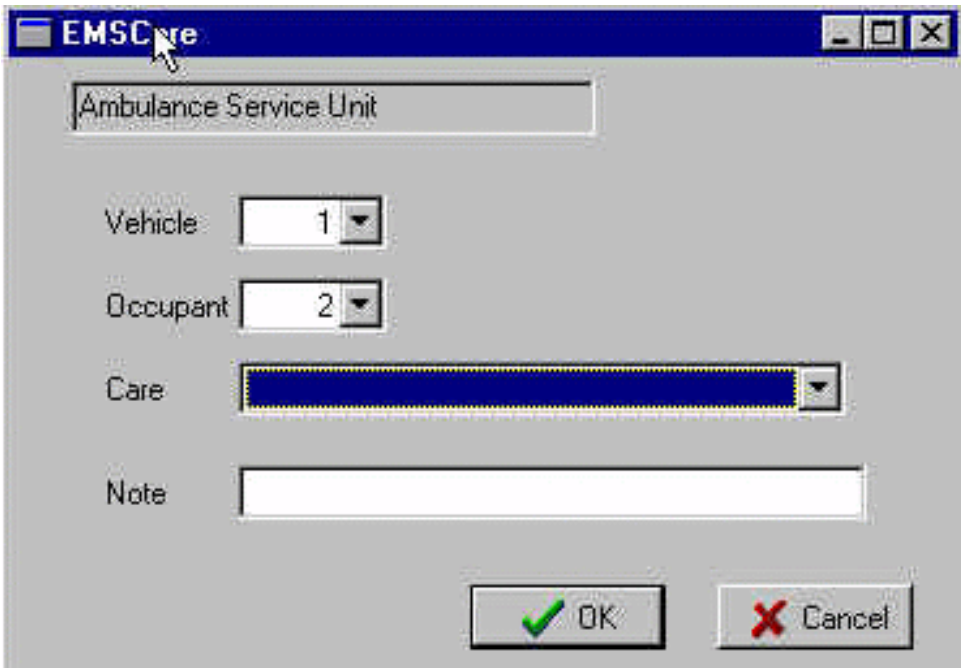
Use this attribute for instances where the time of departure cannot be determined from any source.



**** This Tab needs to be deleted from NASSMAIN (or grayed out) ****
and should not be used by NASS Researchers.



Select edit/insert from the main menu. A new screen appears (see below) from which you select Vehicle #, Occupant # and Care.



Screen Name: Care
Variable Name: Vehicle #

Element Attributes:

Enter the vehicle # for the occupant being reported on

Source: EMS records, Emergency room records, PAR

Remarks:

Screen Name: Care
Variable Name: Occupant #

Element Attributes:

Enter the occupant # for the occupant being reported on

Source: EMS records, Emergency room records, PAR

Remarks:

Screen Name: Care
Variable Name: Type of EMS Care Administered

Element Attributes:

No Care Administered
Basic Life Support
Advanced Life Support
Care administered, type unknown
Unknown if care administered

Source: EMS records, Emergency room records, PAR

Remarks:

For this variable, the taking of a pulse, blood pressure, or just the general assessment of a person's health is considered care. Therefore all crash involved persons receive care from any EMS unit at the scene. This minimal level of care is considered **Basic Life Support.** However, not all persons are transported, and some persons refuse transport.

Indicate what type of EMS care was administered:

No Care Administered

Select this when this occupant was transported but did not receive any treatment **including monitoring of vital signs.**

Basic Life Support

Includes non-invasive care such as stabilizing the patient, stop bleeding, and opening of air way, vitals, and basic CPR.

Advanced Life Support

In addition to the care listed under **Basic Life Support**, this includes invasive procedures (IV Fluids, intubation), burn care, emergency cardiac care/CPR (use of defibrillator).

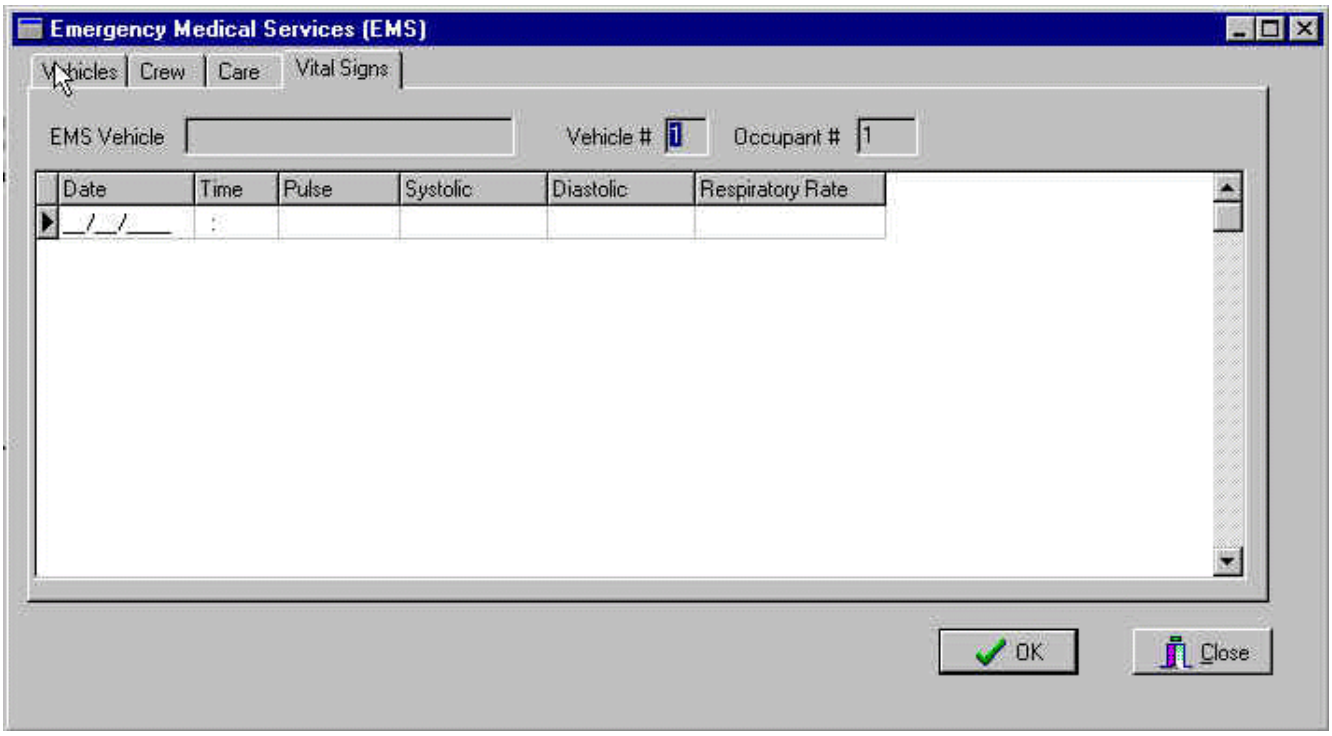
Care Administered, Type Unknown

Use this attribute in instances where treatment was definitely administered, e.g. severity of injuries but NO details are available.

Unknown if Care Administered

Use if there is evidence that EMS responded to the crash site but no further information is available about this occupant and the police crash report assigns this occupant an injury code of K, A, B or C.

**** NASSMAIN is scheduled to be changed, at some time in the future, to match the**** above five attributes. Until then, if you have any questions, call your Zone Center.


Emergency Medical Services (EMS)
Vehicles
Crew
Care
Vital Signs
EMS Vehicle
Vehicle #
1
Occupant #
1
Date
Time
Pulse
Systolic
Diastolic
Respiratory Rate
__/__/____
:
OK
Close

Screen Name: Date
Variable Name: Date of Reading

Element Attributes:
Date (MM/dd/yyyy)
Source: EMS records

Remarks:

Enter the date that the vital signs readings were taken. If the date on the reading grid in the EMS records is blank, use the incident date recorded on the EMS form.

Screen Name: Time
Variable Name: Time of Reading

Element Attributes:

Enter time, in military time format, for the vital signs reading that was taken
9999 Unknown

Source: EMS records

Remarks:

Enter the time that the vital signs readings were taken

9999 Unknown

Enter 9 in the first space of the variable, then the program will fill in the remainder of the attribute.

Screen Name: Pulse
Variable Name: Pulse

Element Attributes:

0-300, Enter pulse of patient
P Palpable
U Unknown

Source: EMS records

Remarks:

Enter the recorded pulse count of the patient. Range is 0-300.

P Palpable

Enter P (the rest of the word is automatically filled in) when palpable is used in the EMS record.

U Unknown

Enter U (the rest of the word is automatically filled in) when there is no recorded value for pulse.

Screen Name: Systolic
Variable Name: Systolic Blood Pressure

Element Attributes:

0-300, Enter systolic value for patient
P Palpable
U Unknown

Source: EMS records

Remarks:

Enter the recorded systolic pressure value of the patient. Range is 0-300.

P Palpable

Enter P (the rest of the word is automatically filled in) when palpable is used in the EMS record.

U Unknown

Enter U (the rest of the word is automatically filled in) when there is no recorded value for systolic blood pressure.

Screen Name: Diastolic
Variable Name: Diastolic Blood Pressure

Element Attributes:

0-300, Enter diastolic value for patient
P Palpable
U Unknown

Source: EMS records

Remarks:

Enter the recorded diastolic pressure value of the patient. Range is 0-300.

P Palpable

Enter P (the rest of the word is automatically filled in) when palpable is used in the EMS record.

U Unknown

Enter U (the rest of the word is automatically filled in) when there is no recorded value for diastolic blood pressure.

Screen Name: Respiratory Rate
Variable Name: Respiratory Rate

Element Attributes:

0-???, Enter the respiratory rate of the patient
A Agonal
U Unknown

Source: EMS records

Remarks:

Enter the recorded diastolic pressure value of the patient. Range is 0-???

A Agonal

Enter A (the rest of the word is automatically filled in) when agonal is used in the EMS record.

U Unknown

Enter U (the rest of the word is automatically filled in) when there is no recorded value for respiratory rate.