



**National  
Automotive  
Sampling  
System**

**Crashworthiness  
Data  
System**



**2006  
Coding and  
Editing Manual**



United States Department of Transportation  
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## Appendix A

### Stiffness Values

CRASH

CaseForm, Case #A004-702

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

Case Number: 702      Status: Open

Stratum: S

Date of Crash: 2/5/2006      Sunday

Time of Crash: [ ]

PSU: [ ]

Jurisdiction: [ ]

PAR Number: 509041360

Researcher: [ ]      Owner: [ ]

Special Studies

SS15: Administrative Use

Save      Close

**CASE NUMBER**

**Screen Name:** Case Number

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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

**STRATUM**

**Screen Name:**        **Stratum**

*SAS Data Set:*        *N/A*

*SAS Variable:*        *N/A*

**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.

**DATE OF CRASH (MONTH/DAY/YEAR)**

**Screen Name:** Date of Crash

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *MONTH, DAYWEEK, YEAR*

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: Calendar year of the crash

**Source:** Assigned by Automated Case Selection System

**Remarks:**

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

**TIME OF CRASH**

**Screen Name :** Time of Crash

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *TIME*

**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.

**PSU**

**Screen Name:** PSU

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *PSU*

**Element Attributes:**

PSU number

**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.

**POLICE JURISDICTION**

**Screen Name:** Jurisdiction

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.**

**PAR NUMBER**

**Screen Name:** PAR Number

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Police report number recorded from the PAR

**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.

**RESEARCHER ASSIGNED TO CASE**

**Screen Name:** Researcher

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

PSU Specific

**Source:** NASS Personnel Roster.

**Remarks:**

Select the name of the Researcher assigned the case.

This is an administrative variable.

**STATUS OF CASE**

**Screen Name:** Status

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Open

**Source:** NASSMAIN Program

**Remarks:**

The NASSMAIN Program determines the status of the case.

This is an administrative variable.

**SPECIAL STUDIES**

**Screen Name:** Special Studies

**SAS Data Set:** *SPECSTDY*

**SAS Variable:** *STUDY*

**Element Attributes:** Special Studies to be determined by NHTSA HQ Staff.

**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.

**PERSON WHO LAST WAS WORKING ON CASE**

**Screen Name:** Owner

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

CASE

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

Case | Vehicles | Occupants | Medical Records | Comment | Dates

Scene Complete: 02/01/2005      Due Date: 03/05/2005

Vehicles

Total All Vehicles	2
CDS in Transport	2
CDS not in Transport	0
Non CDS in Transport	0

Case ID: 180007733

Type: CDS

Status: Structure

Occupants

Total Number	2
--------------	---

Medical Records

Total Number	
--------------	--

Close

**DATE SCENE COMPLETED (MONTH/DAY/YEAR)**

**Screen Name:** Scene Complete

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: Calendar year of data collection

**Source:** Researcher

**Remarks:**

Enter the date that the required scene inspection (including field sketch) was completed.

**TOTAL NUMBER OF VEHICLES IN CRASH**

Page 1 of 2

**Screen Name:** Vehicles – Total All Vehicles**SAS Data Set:** N/A**SAS Variable:** N/A**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.

**NUMBER OF CDS IN TRANSPORT VEHICLES IN CRASH**

**Screen Name:** Vehicles -- CDS in Transport

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

The total number of CDS in Transport vehicles in the crash

**Source:** Researcher determined

**Remarks:**

The number of CDS in transport vehicles is rolled up from the Structure/Vehicles screen.

**NUMBER OF CDS NOT IN TRANSPORT VEHICLES IN CRASH**

**Screen Name:** Vehicles -- CDS not in Transport

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

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

**Source:** Researcher determined

**Remarks:**

The number of CDS not in transport vehicles is rolled up from the Structure/Vehicles screen.

**NUMBER OF NON CDS IN TRANSPORT VEHICLES IN CRASH**

**Screen Name:** Vehicles -- Non CDS in Transport

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

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

**Source:** Researcher determined

**Remarks:**

The number of non CDS in transport vehicles is rolled up from the Structure/Vehicles screen.

**TOTAL NUMBER OF OCCUPANTS IN CDS VEHICLES IN TRANSPORT**

**Screen Name:** Occupants – Total Number of Occupants in CDS Vehicles in Transport

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**TOTAL NUMBER OF MEDICAL RECORDS IN CASE**

**Screen Name:** Medical Records – Total Number

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**CASE DUE DATE**

**Screen Name:** Due Date

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Date generated by 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.

**CASE IDENTIFICATION NUMBER**

**Screen Name:** Case ID

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *SCASEID*

**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.

**TYPE OF CASE**

**Screen Name:** Type

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

CDS  
SCI-CDS  
TRUCK-CDS

**Source:** NASSMAIN Program

**Remarks:**

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

VEHICLES

The screenshot shows a software window titled "CaseForm, Case #2005-4-010G". The window has a menu bar with options: Crash, Structure, Summary, Events, Vehicle, Persons, Scene, Annotation, Quality Review, and Other Response. Below the menu bar, there are sub-tabs: Case, Vehicles, Occupants, Medical Records, Comment, and Dates. The "Vehicles" sub-tab is active, displaying a table with the following data:

Veh #	Type	Inspected	Occupants	Comment
1	CDS in transport	02/03/2005	1	
2	CDS in transport		1	UNABLE TO LOCATE VEHICLE

At the bottom right of the window, there is a "Close" button with a small icon.

**VEHICLE NUMBER****Screen Name:** Veh #**SAS Data Set:** N/A**SAS Variable:** N/A**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**

**TYPE OF VEHICLE**

**Screen Name:** Type

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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. 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.

**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. 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. 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).

**DATE OF VEHICLE INSPECTION**

**Screen Name:** Inspected

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: As appropriate

**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.

**NUMBER OF OCCUPANTS IN THIS VEHICLE**

**Screen Name:** Occupants

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Total number of occupants in this vehicle

**Source:** The number of Occupants is rolled up from the Case Form, Structure, and Occupant's screen.

**Remarks:**

OCCUPANTS

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

Case | Vehicles | Occupants | Medical Records | Comment | Dates

Veh #	Occ #	Interview Req'd	Completed	Reason
1	1	Yes	2/8/2005	Complete interview
2	1	No	N/A	Not Applicable

Close

**VEHICLE NUMBER**

**Screen Name:** Veh #

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**OCCUPANT NUMBER**

**Screen Name:** Occ #

*SAS Data Set:* N/A

*SAS Variable:* N/A

**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.

**INTERVIEW REQUIRED**

**Screen Name:** Interview Reqd

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**INTERVIEW COMPLETION DATE**

**Screen Name:** Completed

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: As appropriate

**Source:** Researcher determined

**Remarks:**

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

**INTERVIEW COMPLETED OR REASON WHY IT IS NOT COMPLETED**

**Screen Name:** Reason

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

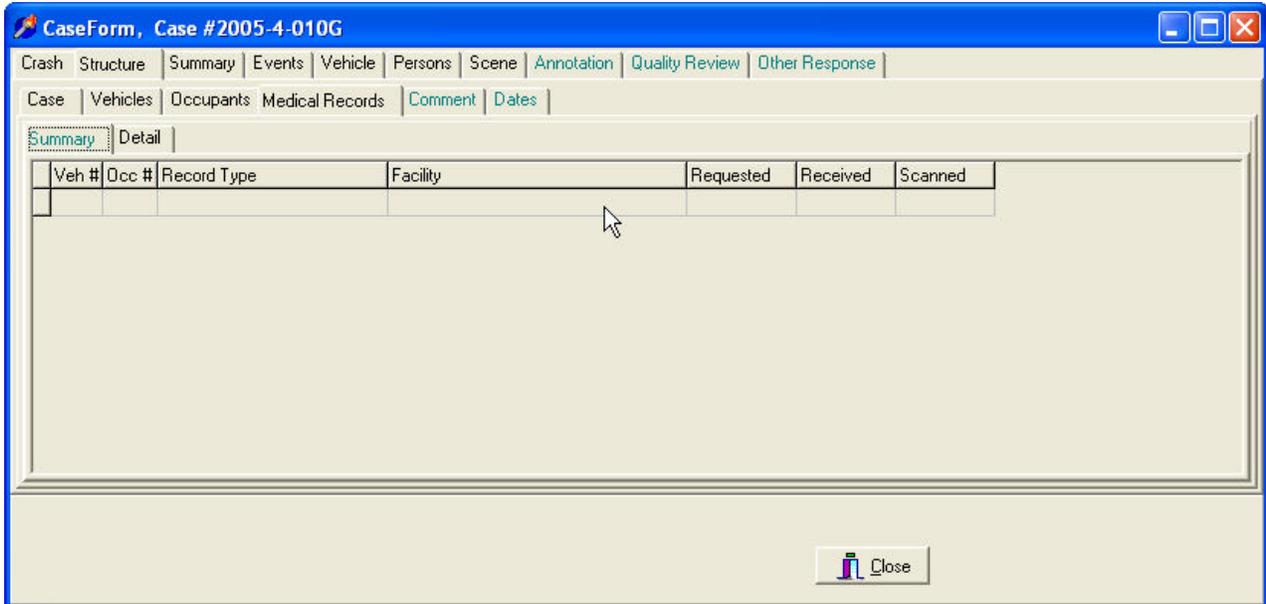
Unable to contact or locate  
Hit and Run  
Fatal - surrogate not available  
In intensive care - surrogate not available  
Out-of-state resident  
Refused interview  
Insurance company refusal  
Attorney refusal or litigation  
No return of questionnaire  
Other (specify)  
Partial interview  
Complete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

**Source:** Researcher determined

**Remarks:**

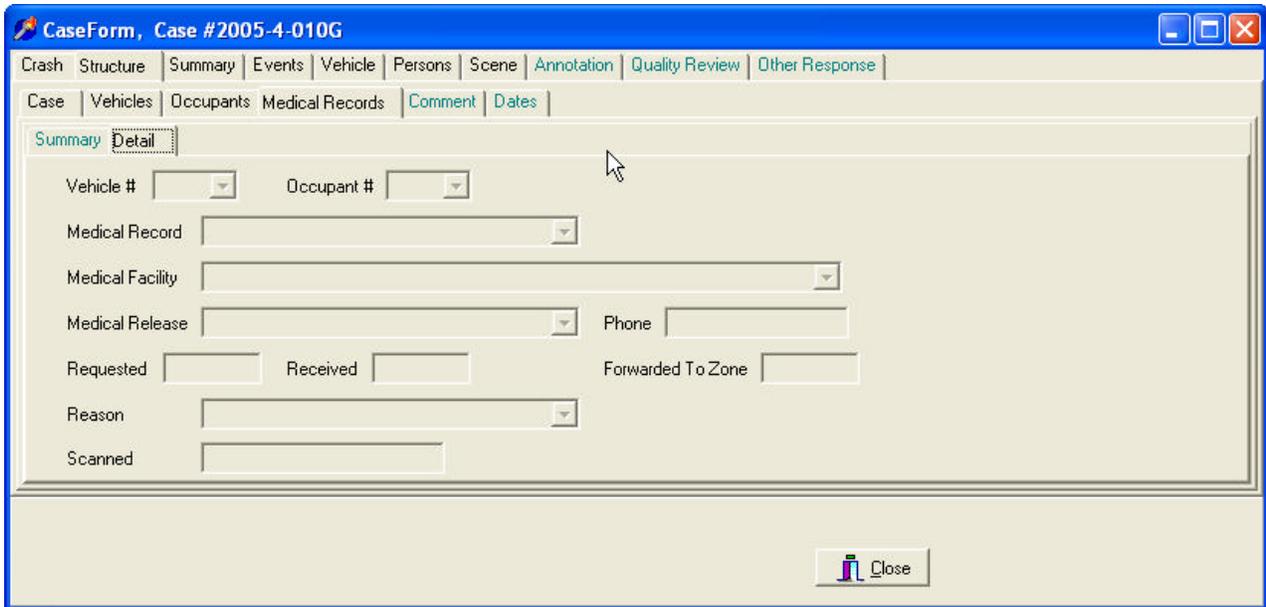
Select the attribute that best fits the results of the completed interview or Reason of the last interview attempt.

MEDICAL RECORDS/SUMMARY



The screenshot shows a software window titled "CaseForm, Case #2005-4-010G". The main menu includes "Crash", "Structure", "Summary", "Events", "Vehicle", "Persons", "Scene", "Annotation", "Quality Review", and "Other Response". A sub-menu is open showing "Case", "Vehicles", "Occupants", "Medical Records", "Comment", and "Dates". The "Medical Records" sub-menu is further expanded to show "Summary" and "Detail". The main content area contains a table with the following headers: "Veh #", "Occ #", "Record Type", "Facility", "Requested", "Received", and "Scanned". The table is currently empty. A "Close" button is located at the bottom right of the window.

STRUCTURE/MEDICAL RECORDS/DETAIL



The screenshot shows the same software window as above, but with the "Detail" view selected. The main content area contains several input fields: "Vehicle #" and "Occupant #" are dropdown menus; "Medical Record" is a dropdown menu; "Medical Facility" is a text input field; "Medical Release" is a dropdown menu; "Phone" is a text input field; "Requested" and "Received" are date input fields; "Forwarded To Zone" is a text input field; "Reason" is a dropdown menu; and "Scanned" is a text input field. A "Close" button is located at the bottom right of the window.

**VEHICLE NUMBER**

**Screen Name:** Vehicle #

*SAS Data Set:* N/A

*SAS Variable:* N/A

**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.

**OCCUPANT NUMBER**

**Screen Name:** Occupant #

*SAS Data Set:* N/A

*SAS Variable:* N/A

**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.

**MEDICAL RECORD**

**Screen Name:** Medical Record

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Autopsy  
Post-ER Medical Record  
Admission Records  
Discharge Face Sheet  
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.

**MEDICAL FACILITY**

**Screen Name:** Medical Facility

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**MEDICAL RELEASE**

**Screen Name:** Medical Release

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

- Not Required
- Required-not obtained
- Required-obtained

**Source:** Researcher determined

**Remarks:**

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

**DATE THAT MEDICAL RECORD WAS REQUESTED**

**Screen Name:** Requested

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: As appropriate

**Source:** Researcher determined

**Remarks:**

Researcher enters the date that the medical record was requested.

**DATE THAT MEDICAL RECORD WAS RECEIVED**

**Screen Name:** Received

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: As appropriate

**Source:** Researcher determined

**Remarks:**

Researcher enters the date that the medical record was received.

**DATE THAT MEDICAL RECORD WAS FORWARDED TO THE ZONE CENTER**

**Screen Name:** Forwarded to Zone

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Month: 01-12  
Day: 01 through 31  
Year: As appropriate

**Source:** Researcher determined

**Remarks:**

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

**MEDICAL RECORD OBTAINED OR REASON WHY NOT**

**Screen Name:** Reason

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

No record of treatment at medical facility  
Medical release required-not obtained  
Injury not related to crash  
Non-cooperative 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.

COMMENT

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response |

Case | Vehicles | Occupants | Medical Records | Comment | Dates |

Please Note - Limited to 250 characters

Close

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

CASE SUMMARY

The screenshot shows a software window titled "CaseForm, Case #2005-8701-957315". The window has a blue title bar and standard Windows window controls (minimize, maximize, close). Below the title bar is a menu bar with the following items: Crash, Structure, Summary, Events, Vehicle, Persons, Scene, Annotation, Quality Review, and Other Response. The "Summary" menu item is currently selected. Below the menu bar is a sub-header "Case Summary". There are two dropdown menus: "Crash Type" and "Configuration". Below these are two instructions: "Double Click to View in separate Window" and "Right click on summary to change Font". A large, empty text area with a vertical scrollbar is positioned below the instructions. At the bottom of the window, there is a text box containing the instruction: "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." To the right of this text box are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red X icon).

**CRASH TYPE**

**Screen Name:** Crash Type

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *CRSHDSC1*

**Element Attributes:**

Vehicle to vehicle  
Vehicle to object(s)  
Multi- vehicle  
Multi- vehicle to object(s)

**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**

is selected when there are more than two vehicles involved

**Multi-vehicles to object(s)**

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

**CRASH CONFIGURATION**

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**Screen Name:** Configuration**SAS Data Set:** *ACCIDENT***SAS Variable:** *CRSHDSC2***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.

**[DATA ENTRY FIELD FOR CASE SUMMARY]**

**Screen Name:** N/A

**SAS Data Set:** *ACCDESC*

**SAS Variable:** *LINENO*

**Element Attributes:**

The LINENO by LINENO narrative summary of the crash as developed by the researcher.

**Source:** Researcher determined

**Remarks:**

**CASE SUMMARY**

**Screen Name:** Case Summary

**SAS Data Set:** *ACCDESC*

**SAS Variable:** *SUMTEXT*

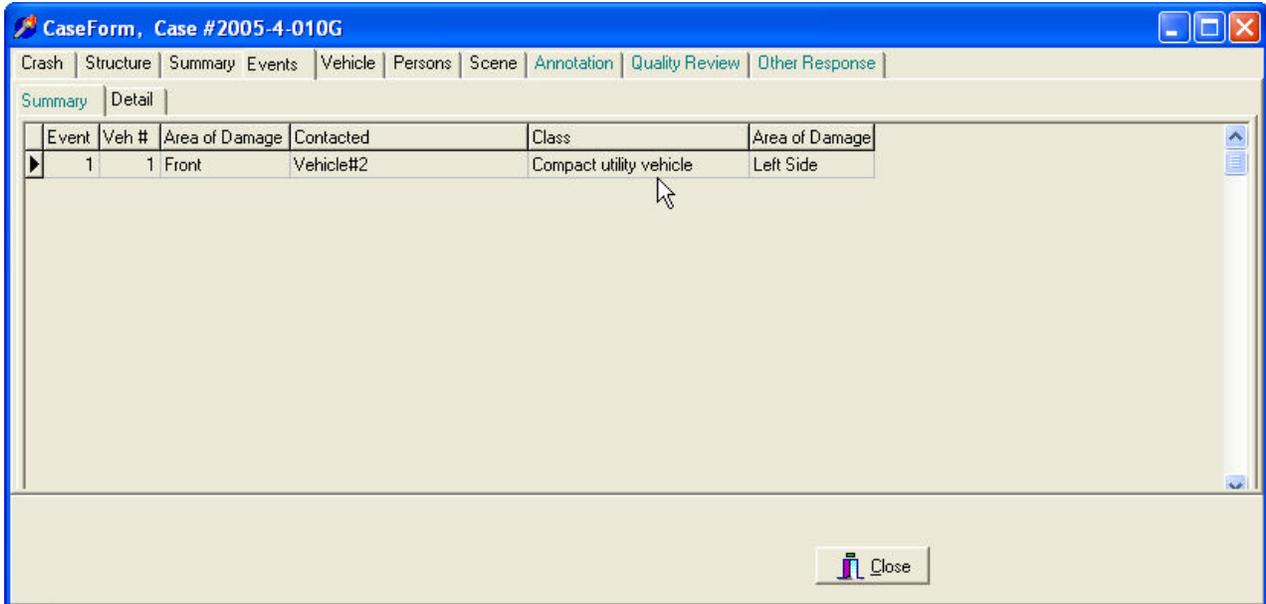
**Element Attributes:**

The narrative summary of the crash as developed by the researcher.

**Source:** Researcher determined

**Remarks:**

EVENTS/SUMMARY



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.**

EVENTS / DETAIL

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

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 Vehicle Vehicle#2

Class of Vehicle Compact utility vehicle General Area of Damage Left Side

Close

**CRASH EVENTS OVERVIEW**

Page 1 of 2

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)

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.

**EVENT NUMBER****Screen Name:** Event No**SAS Data Set:** *EVENT***SAS Variable:** *ACCSEQ***Element Attributes:**

As assigned

**Source:** Researcher Determined**Remarks:**

The researcher selects edit/insert from main menu, this opens a new detail tab for each event. 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.

**VEHICLE NUMBER**

**Screen Name:** Vehicle No

**SAS Data Set:** *EVENT*

**SAS Variable:** *VEHNUM*

**Element Attributes:**

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

**Source:** Researcher determined by selecting the vehicle from the drop down list.

**Remarks:**

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

**CLASS OF VEHICLE**

Page 1 of 5

**Screen Name:** Class of Vehicle**SAS Data Set:** *EVENT***SAS Variable:** *CLASS1***Element Attributes:**

- 0 Not a motor vehicle
- 1 Subcompact/mini ( wheelbase < 254 cm)
- 2 Compact (wheelbase ≥ 254 but < 265 cm)
- 3 Intermediate (wheelbase ≥ 265 but < 278 cm)
- 4 Full size ( wheelbase ≥ 278 but < 291 cm)
- 5 Largest (wheelbase ≥ 291 cm)
- 9 Unknown passenger car size
- 14 Compact utility vehicle
- 15 Large utility vehicle (≤ 4,536 kgs GVWR)
- 16 Utility station wagon (≤ 4,536 kgs GVWR)
- 19 Unknown utility type
- 20 Minivan (≤ 4,536 kgs GVWR)
- 21 Large van (≤ 4,536 kgs GVWR)
- 24 Van based school bus ( ≤ 4,536 kgs GVWR)
- 28 Other van type (≤ 4,536 kgs GVWR)
- 29 Unknown van type ( ≤ 4,536 kgs GVWR)
- 30 Compact pickup truck (≤ 4,536 kgs GVWR)
- 31 Large pickup truck (≤ 4,536 kgs GVWR)
- 38 Other pickup truck (≤ 4,536 kgs GVWR)
- 39 Unknown pickup truck type ( ≤ 4,536 kgs GVWR)
- 45 Other light truck (≤ 4,536 kgs GVWR)
- 48 Unknown light truck type ( ≤ 4,536 kgs GVWR)
- 49 Unknown light vehicle type
- 50 School bus (excludes van based) (> 4,536 kgs GVWR)
- 58 Other bus (> 4,536 kgs GVWR)
- 59 Unknown bus type
- 60 Truck (> 4,536 kgs GVWR)
- 67 Tractor without trailer
- 68 Tractor - trailer(s)
- 78 Unknown medium/heavy truck type
- 79 Unknown light/medium/heavy truck type
- 80 Motored cycle
- 90 Other vehicle
- 99 Unknown

Class of Vehicle (cont'd)

Page 2 of 5

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

**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.

**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.

**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.

Class of Vehicle (cont'd)

Page 5 of 5

**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.

**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**.

**GENERAL AREA OF DAMAGE**

**Screen Name:** General Area of Damage

**SAS Data Set:** *EVENT*

**SAS Variable:** *GADEVI*

**Element Attributes:**

0 Not a motor vehicle  
 N Noncollision  
 9 Unknown

**CDC Applicable and Other Vehicles**

F Front  
 R Right side  
 L Left side  
 B Back of unit with cargo area  
 T Top  
 U Undercarriage

**TDC Applicable Vehicles**

F Front  
 R Right side  
 L Left side  
 B Back of unit with cargo area  
 (rear of trailer or straight truck)  
 D Back (rear of tractor)  
 C Rear of cab  
 V Front of cargo area  
 T Top  
 U 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.

**OBJECT CONTACTED**

Page 1 of 10

Screen Name: Object Contacted

SAS Data Set: *EVENT*SAS Variable: *OBJCONT***Element Attributes:**

01-30 — Vehicle Number

**Noncollision**

- 31 Overturn — rollover (excludes end-over-end)
- 32 Rollover - end-over-end
- 33 Fire or explosion
- 34 Jackknife
- 35 Other intraunit damage (specify):
- 36 Noncollision injury
- 38 Other noncollision (specify):
- 39 Noncollision — details unknown

**Collision With Fixed Object**

- 41 Tree ( $\leq 10$  cm in diameter)
- 42 Tree ( $> 10$  cm in diameter)
- 43 Shrubbery or bush
- 44 Embankment
- 45 Breakaway pole or post (any diameter)
- 50 Nonbreakaway Pole or post ( $\leq 10$  cm in diameter)
- 51 Nonbreakaway Pole or post ( $> 10$  cm but  $\leq 30$  cm in diameter)
- 52 Nonbreakaway Pole or post ( $> 30$  cm in diameter)
- 53 Nonbreakaway Pole or post (diameter unknown)
- 54 Concrete traffic barrier
- 55 Impact attenuator
- 56 Other traffic barrier (includes guardrail) (specify):
- 57 Fence
- 58 Wall

- 59 Building
- 60 Ditch or culvert
- 61 Ground
- 62 Fire hydrant
- 63 Curb
- 64 Bridge
- 68 Other fixed object (specify):
- 69 Unknown fixed object

**Collision with Nonfixed Object**

- 70 Passenger car, light truck, van, or other vehicle not in-transport
- 71 Medium/heavy truck or bus not in-transport
- 72 Pedestrian
- 73 Cyclist or cycle
- 74 Other nonmotorist or conveyance (specify)
- 75 Vehicle occupant
- 76 Animal
- 77 Train
- 78 Trailer, disconnected in transport
- 79 Object fell from vehicle in-transport
- 88 Other nonfixed object (specify):
- 89 Unknown nonfixed object

**Other event (specify)**

- 98 Other event (specify):

**Unknown event or object**

- 99 Unknown event or object

Object Contacted (cont'd)

Page 2 of 10

**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.

Object Contacted (cont'd)

Page 3 of 10

**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.

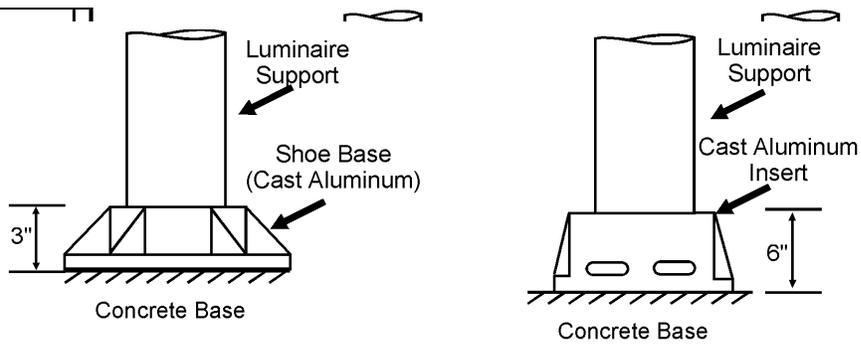
Examples of breakaway poles or posts follow:

Object Contacted (cont'd)

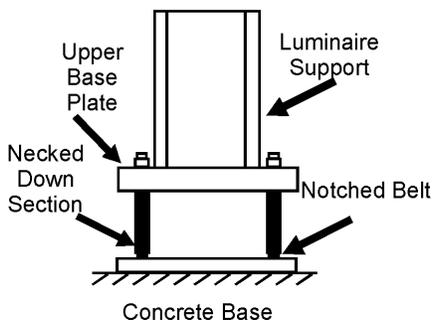
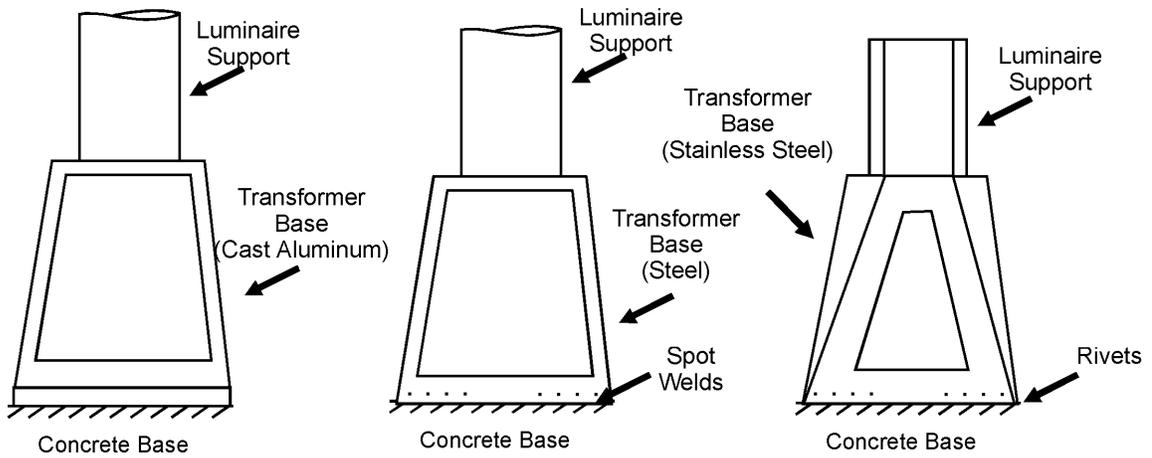
Collision With Fixed Object (cont'd)

Breakaway pole or post (any diameter)

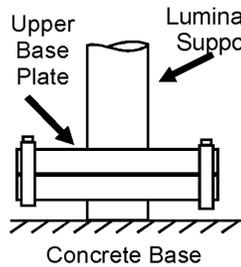
Object Contacted (cont'd)



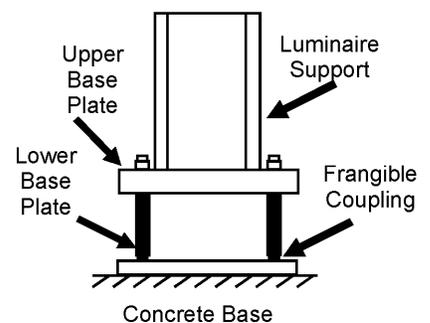
CAST ALUMINUM SHOE BASE/INSERT (FRANGIBLE)



NOTCHED BOLT INSERT



TRIANGULAR SLIP BASE

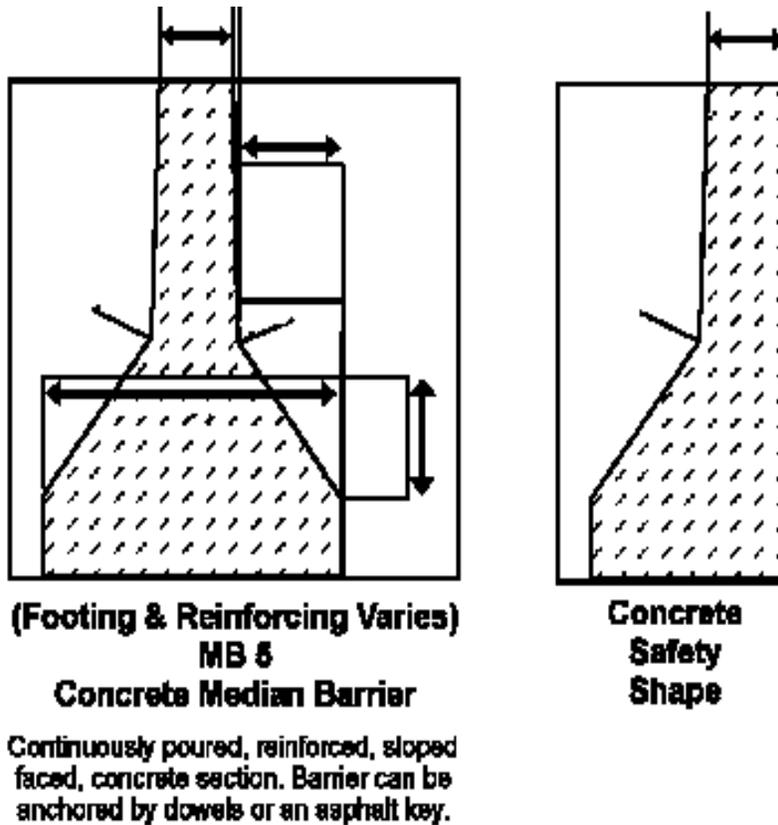


FLUTED ALUMINUM BREAKAWAY COUPLING

**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.



**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.

Object Contacted (cont'd)

Page 6 of 10

### 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**

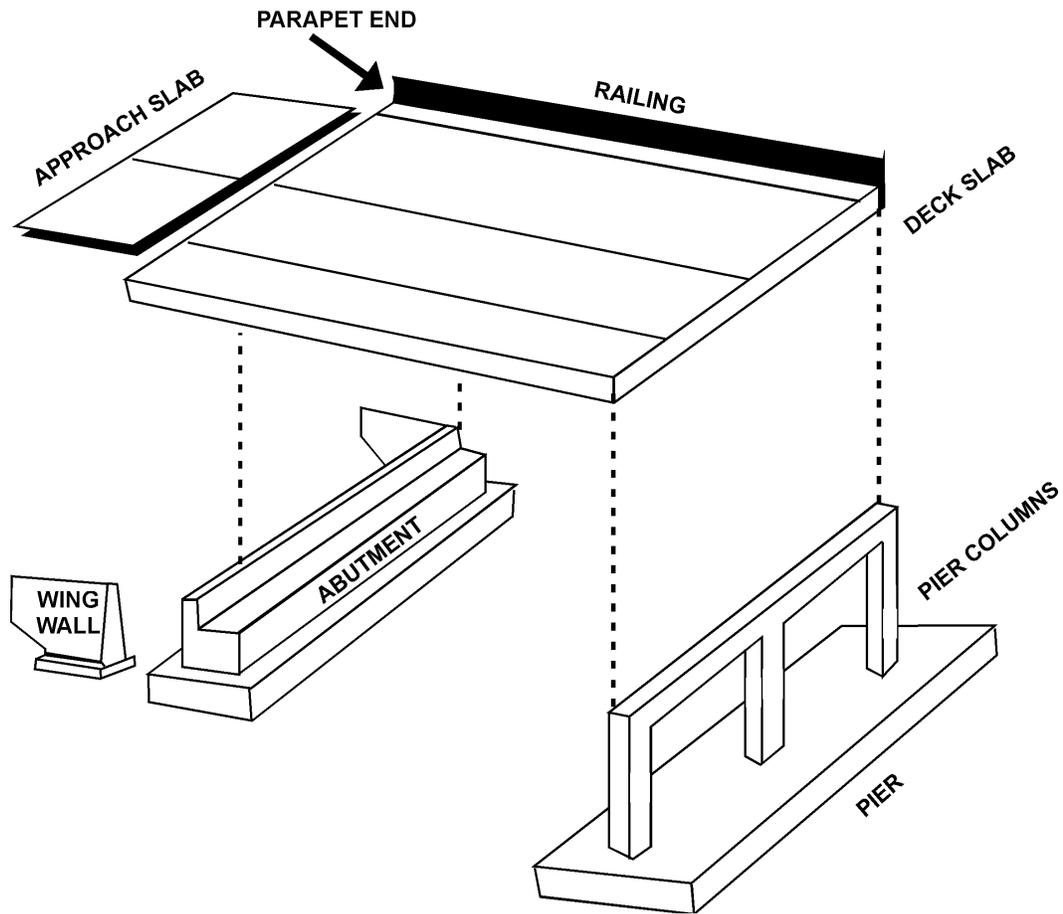
is used when the vehicle contacts a raised element at the edge of a roadway. Curbs are used to: control drainage, act as deterrents to vehicles leaving the pavement at hazardous points, delineate the edge of the pavement, present a more finished appearance, and assist in the orderly development of the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

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**



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.

**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 ( $\leq 10$  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  $\leq 30$  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)**

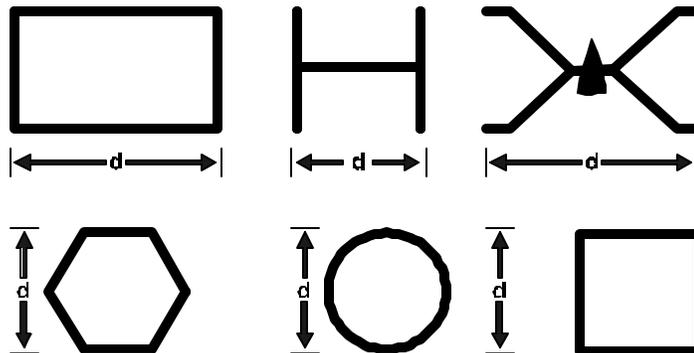
refers to poles or posts which are of the correct size and are not mounted on a breakaway base.

**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



Object Contacted (cont'd)

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

**Train**

refers to any railway train, moving or not moving.

Object Contacted (cont'd)

Page 10 of 10

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.

**CLASS OF VEHICLE CONTACTED**

Page 1 of 2

**Screen Name:** Object Contacted-Class of Vehicle**SAS Data Set:** *EVENT***SAS Variable:** *CLASS2***Element Attributes:**

- 0 Not a motor vehicle
- 1 Subcompact/mini ( wheelbase < 254 cm)
- 2 Compact (wheelbase ≥ 254 but < 265 cm)
- 3 Intermediate (wheelbase ≥ 265 but < 278 cm)
- 4 Full size ( wheelbase ≥ 278 but < 291 cm)
- 5 Largest (wheelbase ≥ 291 cm)
- 9 Unknown passenger car size
- 14 Compact utility vehicle
- 15 Large utility vehicle (≤ 4,536 kgs GVWR)
- 16 Utility station wagon (≤ 4,536 kgs GVWR)
- 19 Unknown utility type
- 20 Minivan (≤ 4,536 kgs GVWR)
- 21 Large van (≤ 4,536 kgs GVWR)
- 24 Van based school bus ( ≤ 4,536 kgs GVWR)
- 28 Other van type (≤ 4,536 kgs GVWR)
- 29 Unknown van type ( ≤ 4,536 kgs GVWR)
- 30 Compact pickup truck (≤ 4,536 kgs GVWR)
- 31 Large pickup truck (≤ 4,536 kgs GVWR)
- 38 Other pickup truck (≤ 4,536 kgs GVWR)
- 39 Unknown pickup truck type ( ≤ 4,536 kgs GVWR)
- 45 Other light truck (≤ 4,536 kgs GVWR)
- 48 Unknown light truck type ( ≤ 4,536 kgs GVWR)
- 49 Unknown light vehicle type
- 50 School bus (excludes van based) (> 4,536 kgs GVWR)
- 58 Other bus (> 4,536 kgs GVWR)
- 59 Unknown bus type
- 60 Truck (> 4,536 kgs GVWR)
- 67 Tractor without trailer
- 68 Tractor - trailer(s)
- 78 Unknown medium/heavy truck type
- 79 Unknown light/medium/heavy truck type
- 80 Motored cycle
- 90 Other vehicle
- 99 Unknown

Class of Vehicle Contacted Cont'd

Page 2 of 2

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

**Remarks:**

See the descriptions listed under Class of Vehicle.

**Not a motor Vehicle**

Is used when an object is struck.

**GENERAL AREA OF DAMAGE OF VEHICLE CONTACTED**

**Screen Name:** Object Contacted-General Area of Damage

**SAS Data Set:** *EVENT*

**SAS Variable:** *GADEV2*

**Element Attributes:****Element Attributes:**

0 Not a motor vehicle  
 N Noncollision  
 9 Unknown

**CDC Applicable and Other Vehicles**

F Front  
 R Right side  
 L Left side  
 B Back  
 T Top (rear of trailer or straight truck)  
 U Undercarriage

**TDC Applicable Vehicles**

F Front  
 R Right side  
 L Left side  
 B Back of unit with cargo area  
 D Back (rear of tractor)  
 C Rear of cab  
 V Front of cargo area  
 T Top  
 U Undercarriage

**Source:** Researcher determined.

**Remarks:**

See the choices listed under General Area of Damage

**Not a motor Vehicle**

Is used when an object is struck.

VEHICLE

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

#	Year	Make	Model	Damage Plane	Severity	Component Failure
▶ 1	2003	HYUNDAI	ACCENT	Front	Moderate	N/A
2	1993	NISSAN / DATSUN	PATHFINDER	Left	Light	UNKNOWN

Close

**VEHICLE NUMBER****Screen Name:** #*SAS Data Set:* N/A*SAS Variable:* N/A**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.

**VEHICLE YEAR**

**Screen Name :** Year

**SAS Data Set:** *ACCIDENT*

**SAS Variable:** *YEAR*

**Element Attributes:**

**Source:** Rolled up from vehicle table

**Remarks:**

The year for which vehicle was manufactured is indicated here.

**VEHICLE MAKE**

**Screen Name:** Make

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

**Source:** Rolled up from vehicle table

**Remarks:**

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

**VEHICLE MODEL**

**Screen Name:** Model

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

**Source:** Rolled up from vehicle table

**Remarks:**

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

**DAMAGE PLANE**

**Screen Name:** Damage Plane

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Front  
Left  
Right  
Back  
Top  
Undercarriage  
Unknown

**Source:** Researcher determined

**Remarks:**

The Researcher must determine the most severe 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.

**DAMAGE SEVERITY**

**Screen Name:** Severity

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Minor  
Moderate  
Severe  
Unknown

**Source:** Rolled up from Exterior Vehicle/CDC/Delta V tab.

**Remarks:**

**COMPONENT FAILURE**

Page 1 of 2

**Screen Name:** Component Failure**SAS Data Set:** N/A**SAS Variable:** N/A**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:

The researcher should complete a Field Safety Notification (FSN) Form if any of the below described specific area of interest are observed.

**SPECIFIC AREAS OF INTEREST TO NHTSA RULE MAKING****CRASH AVOIDANCE**

1. Crashes involving vehicles being operated or equipped with adaptive equipment.
2. Crashes in which failure of a multi piece rim (not a tire failure) caused or contributed to the severity of the crash.
3. Crashes involving malfunction of a speed governor or speed control unit.
4. Crashes where the driver reported confusion about the location of display or control elements of the vehicle.
5. Crashes where under inflation of tires caused or contributed to the severity of crash.
6. Crashes involving pedestrian and/or cyclist injured by impact with outside mirrors.
7. Crashes involving injury to motorcycle drivers due to impact with the motorcycle mirrors.
8. 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).

9. 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).
10. Rollover crashes with vehicles equipped with electronic stability control
11. Crashes involving pickup trucks pulling fifth-wheel type trailer.
12. 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 fracture or involve injury. Identify and document the restraint by make, model, and seat position.

PERSONS

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

Vehicle	Role	Seat	Restraints	AIS Code	Severity	Injury Source
▶ 1	Driver	Front Left	manual-used/auto-not used	4904021	Minor	Belt restraint webbing.
2	Driver	Not Defined				

Close

**VEHICLE NUMBER**

**Screen Name:** Vehicle

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**PERSON ROLE**

**Screen Name:** Role

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Driver  
Passenger  
Unknown

**Source:** Rolled up from occupant table

**Remarks:**

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

**SEAT POSITION**

**Screen Name:** Seat

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:****Range:**

**Source:** Rolled up 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.

**RESTRAINTS USE**

**Screen Name:** Restraints

*SAS Data Set:* N/A

*SAS Variable:* N/A

**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.

**AIS CODE**

**Screen Name:** AIS Code

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

**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.

**INJURY SEVERITY**

**Screen Name:** Severity

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

**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.

**INJURY SOURCE**

**Screen Name:** Injury Source

**SAS Data Set:** N/A

**SAS Variable:** N/A

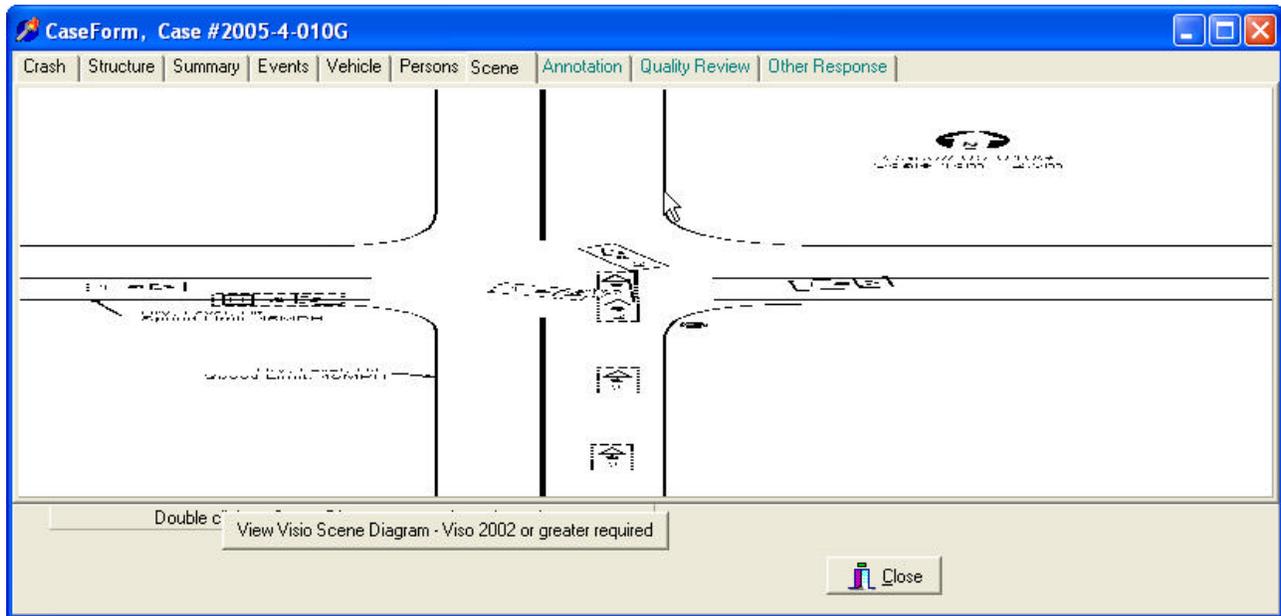
**Element Attributes:**

**Source:** Rolled up from elsewhere in case

**Remarks:**

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

## SCENE



### Scene Diagram

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

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.

Use reference materials or “Help” in the drawing program, for various techniques.

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.

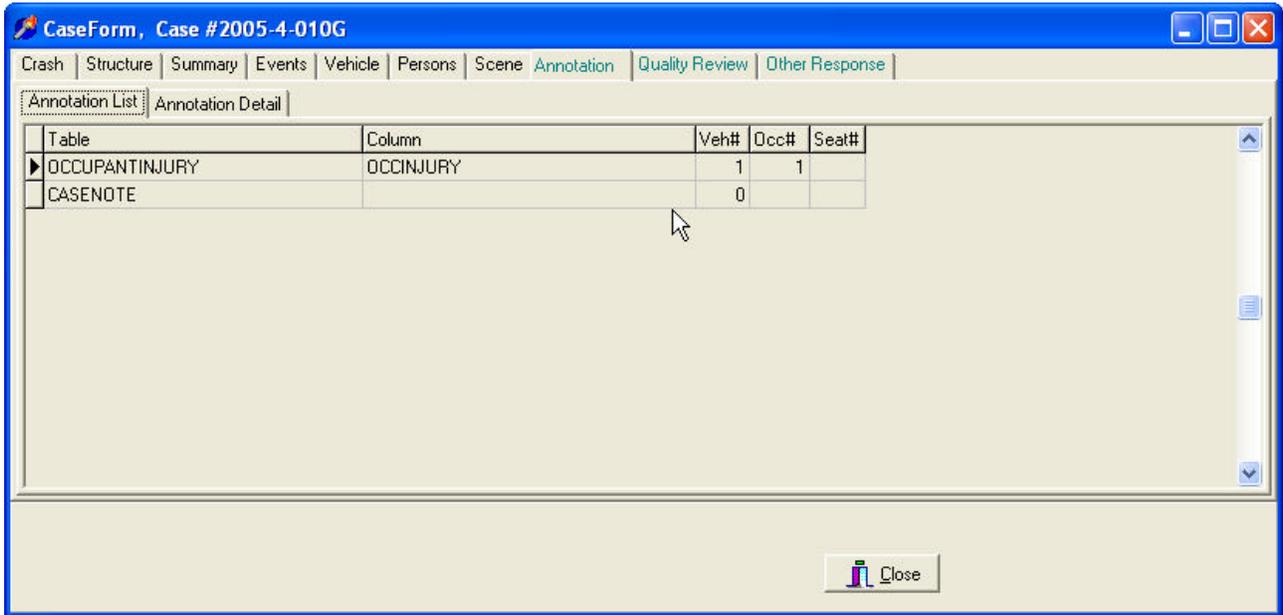
CASE NOTE

The screenshot shows a software window titled "CaseForm, Case #2004-903-702S". The window has a menu bar with options: Crash, Structure, Summary, Events, Vehicle, Persons, Scene, Annotation (highlighted), Quality Review, and Other Response. Below the menu bar is a sub-menu bar with options: Case Note (highlighted), Annotation List, and Annotation Detail. The main area is a large text input field with a cursor. At the bottom right, there are two buttons: "Save" with a green checkmark icon and "Close" with a red 'X' icon.

Any general notes about the case should be annotated here.

Do not include any personal identifiers, such as: names of any kind, (zone center personnel), names of agencies, tow yards, or hospitals.

ANNOTATION LIST



CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

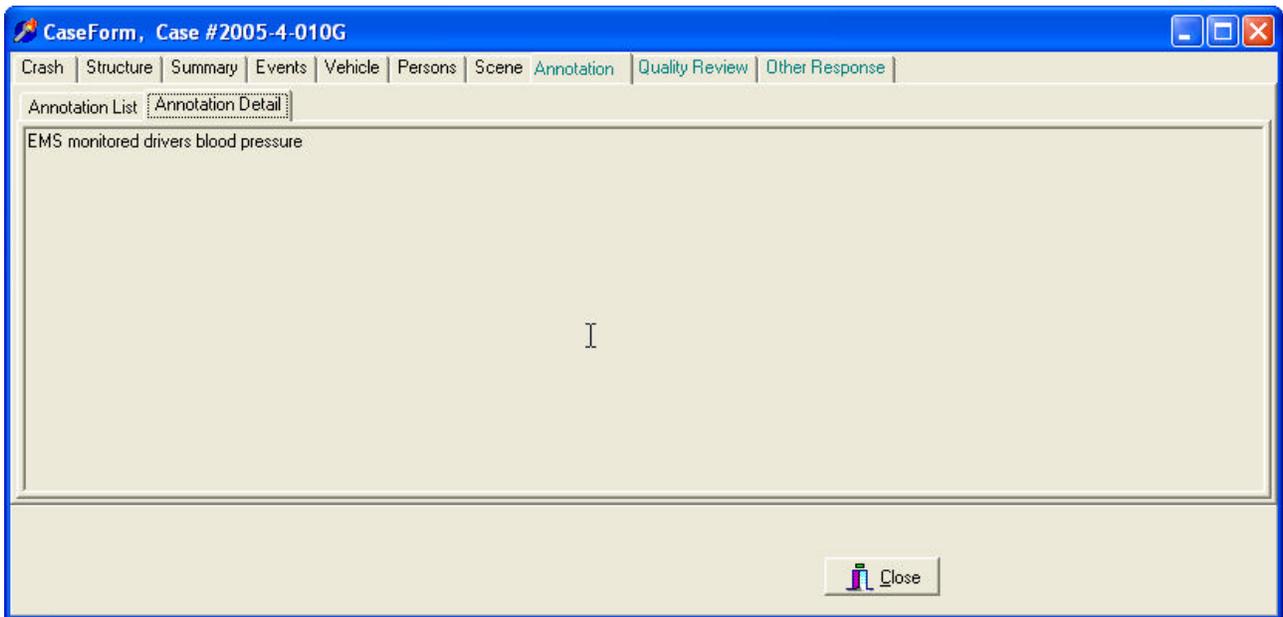
Annotation List | Annotation Detail

Table	Column	Veh#	Occ#	Seat#
▶ OCCUPANTINJURY	OCCINJURY	1	1	
CASENOTE		0		

Close

All annotations to the case are maintained here.

ANNOTATION DETAIL



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

PSU REVIEW

CaseForm, Case #2005-4-010G

Crash | Structure | Summary | Events | Vehicle | Persons | Scene | Annotation | Quality Review | Other Response

PSU Review | Zone Review

List | Detail

Form [ ] Tab [ ] Veh# [ ] Occ # [ ]

Original [ ] Suggested [ ]

Comment [ ]

Close

ZONE REVIEW

The screenshot shows a software window titled "CaseForm, Case #2005-4-010G". The window has a menu bar with options: Crash, Structure, Summary, Events, Vehicle, Persons, Scene, Annotation, Quality Review, and Other Response. Below the menu bar, there are tabs for "PSU Review" and "Zone Review", with "Zone Review" being the active tab. Underneath, there are sub-tabs for "List" and "Detail", with "Detail" selected. The main area contains several input fields: "Form" is set to "General Vehicle Form", "Tab" is "confidence", "Veh #" is "1", and "Occ #" is empty. "Original" is "Borderline reconstruction - results appear reasona" and "Final" is "Collision fits model - results appear reasonable". There are also empty dropdown menus for "Reason" and "Change". A large "Comment" text area is at the bottom, with a mouse cursor hovering over it. A "Close" button is located at the bottom right of the window.

VEHICLE

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

**Identification**

Number: 1      Identification Number: 1G5J7H1C4W

Model Year: 1998      Vehicle Special Use: No Special Use

Make: TOYOTA      In Transport:

Model: SIENNA

Body Category: Van Based Light Trucks (<= 4,536 kgs GVWR)

Body Type: Minivan

Class: Minivan (<= 4,536 kgs GVWR)

**Weight**

Curb Weight: [ ] kgs      Source: [ ]

Cargo Weight: [ ] kgs      Source: [ ]

**Inspection**

Complete Inspection

Date: 01/01/2006

Save

**VEHICLE NUMBER**

**Screen Name:** Number

**SAS Data Set:** *GV*

**SAS Variable:** *VEHNO*

**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.

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

**VEHICLE MODEL YEAR**

**Screen Name:** Identification--Model Year

**SAS Data Set:** *GV*

**SAS Variable:** *MODEL\_YR*

**Element Attributes:**

1900	current data collection year plus one
9999	Unknown

**Range:** 1900-current year+1

**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.

**VEHICLE MAKE**

**Screen Name:** Identification--Make

**SAS Data Set:** *GV*

**SAS Variable:** *MAKE (for SAS code); OMAKE (for Oracle code)*

**Element Attributes:**

Vehicle Make-as Selected  
99 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.

**VEHICLE MODEL**

**Screen Name:** Identification—Model

**SAS Data Set:** *GV*

**SAS Variable:** *MODEL (for SAS code); OMODEL (for Oracle code)*

**Element Attributes:**

Vehicle Model-as Selected  
999 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.

**VEHICLE BODY CATEGORY**

Page 1 of 2

**Screen Name:** Body Category**SAS Data Set:** N/A**SAS Variable:** N/A**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

Unknown Body Type

**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.

Vehicle Body Category cont'd

Page 2 of 2

**Buses (Excludes Van Based)**

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

**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.

**BODY TYPE**

Page 1 of 12

Screen Name: Body Type

SAS Data Set: *GV*SAS Variable: *BODYTYPE***Element Attributes:****CDS APPLICABLE VEHICLES****Automobiles**

- 01 Convertible (excludes sun-roof, t-bar)
- 02 2-door sedan, hardtop, coupe
- 03 3-door/2-door hatchback
- 17 3-door coupe
- 04 4-door sedan, hardtop
- 05 5-door/4-door hatchback
- 06 Station wagon (excluding van and truck based)
- 07 Hatchback, number of doors unknown
- 08 Other automobile type (specify):
- 09 Unknown automobile type

**Automobile Derivatives**

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

**Utility Vehicles (<=4,536 kgs GVWR)**

- 14 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)
- 15 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)
- 16 Utility station wagon (examples include: Chevrolet Suburban, Expedition, Excursion, GMC Suburban, Grand Wagoneer includes suburban limousine, Travelall)
- 19 Utility, unknown body type

Body Type cont'd

Page 2 of 12

- Van Based Light Trucks (<=4,536 kgs GVWR)**
- 20 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)
- 21 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].)
- 22 Step van or walk-in van (<=4,536 kgs GVWR)
- 23 Van based motorhome (<=4,536 kgs GVWR)
- 24 Van based school bus (<=4,536 kgs GVWR)
- 25 Van based other bus (<=4,536 kgs GVWR)
- 28 Other van type (Hi-Cube Van, Kary) (specify):
- 29 Unknown van type
- Light Conventional Trucks (Pickup style cab, <=4,536 kgs GVWR)**
- 30 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)
- 31 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)
- 32 Pickup with slide-in camper
- 33 Convertible pickup
- 39 Unknown pickup style light conventional truck type
- Other Light Trucks (<=4,536 kgs GVWR)**
- 40 Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
- 41 Truck based panel
- 42 Light truck based motorhome (chassis mounted)
- 45 Other light conventional truck type
- 48 Unknown light truck type
- 49 Unknown light vehicle type (automobile, utility, van, or light truck)

Body Type cont'd

Page 3 of 12

**OTHER VEHICLES****Buses (Excludes Van Based)**

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

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

- 60 Step van (> 4,536 kgs GVWR)
- 61 Single unit straight truck (4,536 kgs <GVWR<=8,845 kgs)
- 62 Single unit straight truck (8,8845 kgs <GVWR<=11,793 kgs)
- 63 Single unit straight truck (> 11,793 kgs GVWR)
- 64 Single unit straight truck, GVWR unknown
- 65 Medium/heavy truck based motorhome
- 67 Truck-tractor with no cargo trailer
- 68 Truck-tractor pulling one trailer
- 69 Truck-tractor pulling two or more trailers
- 70 Truck-tractor (unknown if pulling trailer)
- 74 Medium / Heavy Pickyo >=4,536 kgs
- 78 Unknown medium/heavy truck type

**Unknown truck type (light / medium / heavy)**

- 79 Unknown truck type (light / medium / heavy)

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

- 80 Motorcycle
- 81 Moped (motorized bicycle)
- 82 Three-wheel motorcycle or moped
- 88 Other motored cycle (minibike, motor scooter) (specify):
- 89 Unknown motored cycle type

**Other Vehicles**

- 90 ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- 91 Snowmobile
- 92 Farm equipment other than trucks
- 93 Construction equipment other than trucks
- 97 Other vehicle type

**Unknown Vehicle Type**

- 99 Unknown body type

**Source:** Vehicle inspection, police report, and interview

**Remarks:**

**Automobiles**

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

**01 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.

**02 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.

**03 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.

**17 3-door 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.

**04 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.

**05 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.

**06 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).

Body Type cont'd

Page 5 of 12

**07 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.

**08 Other automobile type**

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

**09 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.

**10 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.

**11 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).

**12 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 .

**13 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.

**14 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,

Body Type cont'd

Page 6 of 12

RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90)

### 15 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).

### 16 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.

### 20 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).

### 21 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.

### 22 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.

Body Type cont'd

Page 7 of 12

**23 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.

**24 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.

**25 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.

**28 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.

**29 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.

**30 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)

**31 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)

Body Type cont'd

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**32 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.

**33 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.

**39 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.

**40 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.

**41 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.

**42 Light truck based motorhome (chassis mounted)**

is used to describe a frame mounted recreational unit attached to a light van or conventional chassis.

**45 Other light conventional truck type**

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

**48 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.

**49 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.

Body Type cont'd

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**Buses (Excludes Van Based)**

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

**50 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.

**58 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.

**59 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.

**60 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.

**61 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.

**62 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.

**63 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

Body Type cont'd

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truck is greater than 4,536 kilograms but there is insufficient data to specify the type of single unit truck.

**64 Single unit straight truck, GVWR unknown**

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

**65 Medium/heavy truck based motorhome**

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

**67 Truck-tractor with no cargo trailer**

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

**68 Truck-tractor pulling one trailer**

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

**69 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).

**70 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.

**78 Unknown medium/heavy truck type**

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

**79 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)****80 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.

**81 Moped (motorized bicycle)**

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

Body Type cont'd

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**82 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.

**88 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).

**89 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.

**90 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).

**91 Snowmobile**

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

**92 Farm equipment other than trucks**

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

**93 Construction equipment other than trucks**

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

**97 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 Vehicle Type**

Unknown Vehicle Type describes all motored vehicles where the body type cannot be differentiated among a light vehicle type, bus, medium/heavy truck, motored cycle, or any other motored vehicle type.

Body Type cont'd

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**99 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.

**CLASS OF VEHICLE**

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**Screen Name:** Class of Vehicle**SAS Data Set:** N/A**SAS Variable:** N/A**Element Attributes:**

- 1 Subcompact/mini (wheelbase < 254 cm)
- 2 Compact (wheelbase ≥ 254 but < 265 cm)
- 3 Intermediate (wheelbase ≥ 265 but < 278 cm)
- 4 Full size (wheelbase ≥ 278 but < 291 cm)
- 5 Largest (wheelbase ≥ 291 cm)
- 9 Unknown passenger car size
- 14 Compact utility vehicle
- 15 Large utility vehicle (≤ 4,536 kgs GVWR)
- 16 Utility station wagon (≤ 4,536 kgs GVWR)
- 19 Unknown utility type
- 20 Minivan (≤ 4,536 kgs GVWR)
- 21 Large van (≤ 4,536 kgs GVWR)
- 24 Van based school bus ( ≤ 4,536 kgs GVWR)
- 28 Other van type (≤ 4,536 kgs GVWR)
- 29 Unknown van type ( ≤ 4,536 kgs GVWR)
- 30 Compact pickup truck (≤ 4,536 kgs GVWR)
- 31 Large pickup truck (≤ 4,536 kgs GVWR)
- 38 Other pickup truck (≤ 4,536 kgs GVWR)
- 39 Unknown pickup truck type (≤ 4,536 kgs GVWR)
- 45 Other light truck (≤ 4,536 kgs GVWR)
- 48 Unknown light truck type ( ≤ 4,536 kgs GVWR)
- 49 Unknown light vehicle type
- 50 School bus (excludes van based) (> 4,536 kgs GVWR)
- 58 Other bus (> 4,536 kgs GVWR)
- 59 Unknown bus type
- 60 Truck (> 4,536 kgs GVWR)
- 67 Tractor without trailer
- 68 Tractor - trailer(s)
- 78 Unknown medium/heavy truck type
- 79 Unknown light/medium/heavy truck type
- 80 Motored cycle
- 90 Other vehicle
- 99 Unknown

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

**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  $\geq$  254 but < 265 cm)**

Choose based upon wheelbase.

**Intermediate (wheelbase  $\geq$  265 but < 278 cm)**

Choose based upon wheelbase.

**Full size (wheelbase  $\geq$  278 but < 291 cm)**

Choose based upon wheelbase.

**Largest (wheelbase  $\geq$  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 ( $\leq$  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 ( $\leq$  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.

**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.

Class of vehicle cont'd

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**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.

**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.

Class of vehicle cont'd

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**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.

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**.

**VEHICLE IDENTIFICATION NUMBER (VIN)**

**Screen Name:** Identification--Identification Number

**SAS Data Set:** *GV*

**SAS Variable:** *VIN*

**Element Attributes:**

[11 character field in SAS]

0000000000000000

Enter the entire or partial VIN, left justify

9999999999999999.

00000000000 VIN not required on vehicle

**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*.

**0000000000000000**

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

**9999999999999999**

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.

Vehicle Identification Number cont'd

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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

## VEHICLE SPECIAL USE

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**Screen Name:** Vehicle Special Use

**SAS Data Set:** *GV*

**SAS Variable:** *VEHUSE*

**Element Attribute:**

- 0 No special use
- 1 Taxi
- 2 Vehicle used as school bus
- 3 Vehicle used as other bus
- 4 Military
- 5 Police
- 6 Ambulance
- 7 Fire truck or car
- 9 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.
- 

**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).

**IN TRANSPORT**

**Screen Name:** Is the vehicle in-transport?

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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**.

**CURB WEIGHT**

**Screen Name:** Weight--Curb Weight

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBWGT*

**Element Attributes:**

Curb weight of vehicle (kgs)  
999999 Unknown

**Range:** 450 – 100,000

**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 100 lbs/45 kilograms; 6 cyl. to 4 cyl. - subtract 75 lbs/34 kilograms.

Add 100 lbs/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.

**SOURCE OF CURB WEIGHT INFORMATION**

**Screen Name:** Curb Weight Source

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBSRC*

**Element Attributes:**

- 0 [Curb weight unknown]
- 1 AAMA
- 2 Automotive News
- 3 Branham Automobile Reference Book
- 4 Gasoline Truck, Import, Truck and Diesel Truck Index
- 5 Canadian Specifications
- 8 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

Source of Curb Weight Information cont'd

Page 2 of 2

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.

**CARGO WEIGHT**

**Screen Name:** Weight--Cargo Weight

**SAS Data Set:** *GV*

**SAS Variable:** *CARGOWGT*

**Element Attributes:**

Cargo weight of vehicle (kgs)  
8888 [Non CDS vehicle]  
9999 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.

**SOURCE OF CARGO WEIGHT INFORMATION**

**Screen Name:** Weight--Cargo Weight Source

**SAS Data Set:** *GV*

**SAS Variable:** *CARGOSRC*

**Element Attributes:**

- 0 [Cargo weight unknown]
- 1 Vehicle Inspection
- 2 Interview
- 3 PAR
- 4 Tow Yard Operator
- 7 [Non CDS vehicle]
- 8 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.

**INSPECTION TYPE**

**Screen Name:** Inspection - Type of Inspection

**SAS Data Set:** *GV*

**SAS Variable:** *INSPTYPE*

**Element Attributes:**

0	No inspection
1	Vehicle fully repaired — no damage evident
2	Partial inspection-Non tow
3	Partial inspection-other (specify)
4	Complete inspection
8	Non CDS vehicle

**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-Non Tow**

is used when the vehicle is a non-towed CDS applicable vehicle and a complete exterior inspection was obtained.

**Partial inspection-Other (Specify)**

is selected when any phase of the inspection is not completed. This includes inspection of partially repaired vehicles. This attribute is not used for non-towed CDS applicable vehicles where a complete exterior inspection was obtained. 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.

**DATE OF INSPECTION**

**Screen Name:** Inspection-Date of Inspection

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

SPECIFICATIONS

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle Specifications Official Records PreCrash Driver Rollover Reconstruction DeltaV Log Review

TOYOTA SIENNA 1998

**Original Specifications**

Wheelbase	<input type="text"/>	cms	Front Overhang	<input type="text"/>	cms
Overall Length	<input type="text"/>	cms	Rear Overhang	<input type="text"/>	cms
Maximum Width	<input type="text"/>	cms	Undeformed End Width	<input type="text"/>	cms
Curb Weight	<input type="text"/>	kgs	Engine	<input type="text"/>	
Average Track	<input type="text"/>	cms	Cylinders	<input type="text"/>	
			Displacement	<input type="text"/>	L

Researcher's Assessment of Vehicle Disposition

Justification

Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle

Save

**WHEELBASE**

**Screen Name:** Original Specifications—Wheelbase

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *WHEELBAS*

**Element Attributes:**

999 Enter to the nearest centimeter.  
Unknown

**Range:** 100 – 650 cms

**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.

**OVERALL LENGTH**

**Screen Name:** Original Specifications—Overall Length

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *OVERALL*

**Element Attributes:**

Enter to the nearest centimeter  
9999 Unknown

**Range:** 100 – 850 cms

**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.

**MAXIMUM WIDTH**

**Screen Name:** Original Specifications—Maximum Width

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *MAXWIDTH*

**Element Attributes:**

Enter to the nearest centimeter  
999 Unknown

**Range:** 100 – 350 cms

**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.

**CURB WEIGHT**

**Screen Name:** Original Specifications—Curb Weight

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBWGT*

**Element Attributes:**

999999 Curb weight of vehicle (kgs)  
Unknown

**Range:** 450 – 100,000

**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 100 lbs/45 kilograms; 6 cyl. to 4 cyl. - subtract 75 lbs/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.

**AVERAGE TRACK WIDTH**

**Screen Name:** Original Specifications—Average Track

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ORIGAVTW*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 100-200, 999

**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 an exemplar vehicle and there are no specifications available.

**FRONT OVERHANG**

**Screen Name:** Original Specifications—Front Overhang

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *FTOVHANG*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 25-150, 999

**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.

**REAR OVERHANG**

**Screen Name:** Original Specifications—Rear Overhang

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *RROVHANG*

**Element Attributes:**

Code to the nearest centimeter

999 Unknown

**Range:** 25-200, 999

**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.

**UNDEFORMED END WIDTH**

**Screen Name:** Original Specifications—Undeformed End Width

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *UNENDW*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 100-250, 999

**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.

**ENGINE CYLINDERS**

**Screen Name:** Original Specifications—Engine Cylinders

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ENGCYL*

**Element Attributes:**

Code the number of cylinders  
99 Unknown

**Range:** 1-14, 99

**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.

**ENGINE DISPLACEMENT**

**Screen Name:** Original Specifications—Engine Displacement

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ENGDISP*

**Element Attributes:**

Code to the nearest liter  
99 Unknown

**Range:** 0-10, 99

**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.

**RESEARCHER'S ASSESSMENT OF VEHICLE DISPOSITION**

**Screen Name:** Researcher's Assessment of Vehicle Disposition

**SAS Data Set:** *GV*

**SAS Variable:** *TOWRES*

**Element Attributes:**

0	Not towed due to vehicle damage
1	Towed due to vehicle damage
7	Vehicle not inspected
8	Not a CDS vehicle
9	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.

**JUSTIFICATION FOR RESEARCHER'S ASSESSMENT OF VEHICLE DISPOSITION**

**Screen Name:** Researcher's Assessment of Vehicle Disposition Justification

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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".

## MULTI-STAGE OR ALTERED VEHICLE

Page 1 of 2

**Screen Name:** Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ALTVEH*

**Element Attributes:**

- 0 No post manufacturer modifications
- 1 Yes — post manufacturer modifications (specify)
- 9 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**

Incomplete manufactured vehicle (chassis-cab) certification label should include the statement: "**CHASSIS-CAB MANUFACTURED BY**" or "**CHASSIS-CAB MFD. BY**".

Intermediate manufactured vehicle certification label should have the following statement: "**INTERMEDIATE MANUFACTURED BY**" or "**INTERMEDIATE MFD. BY**".

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**

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).**

These labels are generally affixed in one of the following areas on the driver's side of the vehicle:

- hinge pillar
- door-latch post
- door edge that meets the door-latch post
- left side of the instrument panel
- 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.

- 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.
- 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.

OFFICIAL RECORDS

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

**Police Reported**

Tow Status

Travel Speed  kmp **Posted** Speed Limit  kmp

**Driver**

Driver Present? Yes

Occupant Number

PAR Alcohol Presence

Alcohol Test BAC test performed, results unknown

Test Result  Unknown Source

PAR Other Drug Present

Other Drug Test Result

Zip Code

Race/Ethnic Origin

Save

**POLICE REPORTED TOW STATUS**

**Screen Name:** Police Reported-Tow Status

**SAS Data Set:** *GV*

**SAS Variable:** *TOWPAR*

**Element Attributes:**

- 0 Not towed due to vehicle damage
- 1 Towed due to vehicle damage
- 9 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**.

Police Reported Tow Status cont'd

Page 2 of 2

**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.

**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**

**POLICE REPORTED TRAVEL SPEED**

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

**SAS Data Set:** *GV*

**SAS Variable:** *TRAVELSP*

**Element Attributes:**

Enter police reported travel speed  
999 Unknown

**Range:** 0-240, 999

**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.

**POSTED SPEED LIMIT**

**Screen Name:** Posted Speed Limit

**SAS Data Set:** *GV*

**SAS Variable:** *SPLIMIT*

**Element Attributes:**

	Enter posted speed limit in kmph
000	No statutory limit
999	Unknown

**Range:** 0-122, 999

**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.

**IS THE DRIVER PRESENT?**

**Screen Name:** Driver Present?

**SAS Data Set:** *GV*

**SAS Variable:** *DRPRES*

**Element Attributes:**

0	No Driver Present
1	Yes
9	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.

**OCCUPANT NUMBER**

**Screen Name:** Occupant Number

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**[NUMBER OF OCCUPANTS]**

**Screen Name:** N/A

**SAS Data Set:** *GV*

**SAS Variable:** *OCUPANTS*

**Element Attributes:**

This information rolls up from the number of occupants structured into the case for this vehicle.

88 Non CDS vehicle

**Source:** This information rolls up from the number of occupants

**Remarks:**

This information rolls up from the number of occupants and is NOT entered in the field.

**NUMBER OF OCCUPANT FORMS**

**Screen Name:** N/A

**SAS Data Set:** *GV*

**SAS Variable:** *OCCFORMS*

**Element Values:**

**Range:** 1-30 Blank (GV07 = 50-99)  
00 No driver present  
88 Not a CDS vehicle

This information rolls up from the number of occupants structured into the case for this vehicle.

88 Non CDS vehicle

**Source:** Researcher determined – inputs include police report, vehicle inspection and interviews

**Remarks:**

If this vehicle is a police reported *towed* CDS applicable vehicle [*i.e.*, GV07, Body Type, equals “01”-“49” *and* GV10, Police Reported Vehicle Disposition, equals “1” (Towed due to vehicle damage)], then an Occupant Assessment Form must be completed for each occupant. Enter the number of forms encoded and submitted for this vehicle. If this vehicle is not a CDS applicable vehicle (*i.e.*, GV07 equals “50”-“99”), then this variable must be left **“blank”**.

**Code “00”** (Zero Occupant Assessment Forms submitted) when:

- This vehicle is a police reported *nontowed* CDS vehicle [*i.e.*, GV07 equals “01”-“49” *and* GV10 equals “0” (Not towed due to vehicle damage) or “9” (Unknown)], or

This vehicle was in-transport and unoccupied

**Code “01”** (One occupant) includes the case of a “hit-and-run” police reported towed CDS applicable vehicle, where it is assumed that only one occupant/driver was present. Additional Occupant Assessment Forms (and thus increase the number coded here) can be submitted if reliable evidence exists that additional occupants were present.

**POLICE REPORTED ALCOHOL PRESENCE**

Page 1 of 2

**Screen Name:** PAR Alcohol Presence**SAS Data Set:** *GV***SAS Variable:** *DRINKING***Element Attributes:**

0	No alcohol present
1	Yes - alcohol present
7	Not reported
8	[No driver present]
9	Unknown

**Source:** Police report**Remarks:**

The phrase "alcohol present" means that the police report indicates that the driver had 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

Police Reported Alcohol Presence cont'd

Page 2 of 2

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.

**ALCOHOL TEST FOR DRIVER**

Page 1 of 2

**Screen Name:** Alcohol Test**SAS Data Set:** N/A**SAS Variable:** N/A**Element Attributes:**

Test Performed  
Test Refused  
None Given  
BAC test performed, results unknown  
[No driver present]  
Unknown if test given

**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.

**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.

Alcohol test for driver cont'd

Page 2 of 2

**Unknown**

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

**ALCOHOL TEST RESULT****Screen Name:** Test Result**SAS Data Set:** *GV***SAS Variable:** *ALCTEST***Element Attributes:**

	Enter BAC
[95	Test Refused]
[96	None Given]
[97	BAC test performed, results unknown]
[98	No driver present]
[99	Unknown if test given]

**Range:** 0-49 (0-.49), 95-99**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 “BAC Test performed, results” unknown” then this field is blank and cannot be edited.

**SOURCE OF ALCOHOL TEST RESULT**

**Screen Name:** Source

**SAS Data Set:** *GV*

**SAS Variable:** *ALCSRC*

**Element Attributes:**

- 0 [No alcohol test result]
- 1 Police reported
- 2 Company reported
- 3 Medical record
- 4 Autopsy
- 5 Lay coroner
- 6 [No driver present]
- 7 Other (specify)
- 8 Not applicable

**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.

**Police reported**

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

**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.

**POLICE REPORTED OTHER DRUG PRESENCE**

**Screen Name:** PAR Other Drug Presence

**SAS Data Set:** *GV*

**SAS Variable:** *DRUGS*

**Element Attributes:**

- 0 No other drug(s) present
- 1 Yes other drug(s) present
- 7 Not reported
- 8 [No driver present]
- 9 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.

Police Reported Other Drug Presence cont'd

Page 2 of 2

**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 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.

**OTHER DRUG TEST RESULT**

**Screen Name:** Other Drug Test Result

**SAS Data Set:** *GV*

**SAS Variable:** *SPECOTH*

**Element Attributes:**

- 0 No specimen test given
- 1 Drug(s) not found in specimen
- 2 Drug(s) found in specimen, specify
- 3 Specimen test given, results unknown or not obtained
- 8 [No driver present]
- 9 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.

Other drug test result cont'd

Page 2 of 2

**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.

## DRIVER'S ZIP CODE

Page 1 of 2

Screen Name: ZIP Code

SAS Data Set: GV

SAS Variable: DRZIP

## Element Attributes:

	Enter driver's zip code
00001	Driver not a resident of U.S. or territories
99998	[No driver present]
99999	Unknown

**Range:** 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.

**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.

Driver's Zip Code cont'd

Page 2 of 2

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".

**RACE/ETHNIC ORIGIN OF DRIVER**

**Screen Name:** Race / Ethnic Origin

**SAS Data Set:** *GV*

**SAS Variable:** *DRRACE*

**Element Attributes:**

- 1 White (non-Hispanic)
- 2 Black (non-Hispanic)
- 3 White (Hispanic)
- 4 Black (Hispanic)
- 5 American Indian, Eskimo or Aleut
- 6 Asian or Pacific Islander
- 7 Other (specify):
- 8 [No driver present]
- 9 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.

**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.

PRECRASH

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

Trafficway  
Relation to ...  
Junction [ ] Flow [ ]

Roadway  
Travel Lanes [ ]  
Alignment [ ] Surface Type [ ]  
Profile [ ] Surface Condition [ ]

Conditions  
Light [ ]  
Atmosphere [ ]

Traffic Control Devices  
Device [ ]  
Functioning [ ]

Save

PRECRASH DATA OVERVIEW

The PreCrash 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.

## RELATION TO INTERCHANGE OR JUNCTION

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**Screen Name:** Trafficway-Relation to Junction

**SAS Data Set:** *GV*

**SAS Variable:** *RELINTER*

**Element Attributes:**

0	Non-interchange area and non-junction
1	Interchange area related
2	Intersection related/non-interchange
3	Driveway, alley access related/non-interchange
4	Other junction (specify) / non-interchange
5	Unknown type of junction / non interchange
9	Unknown

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

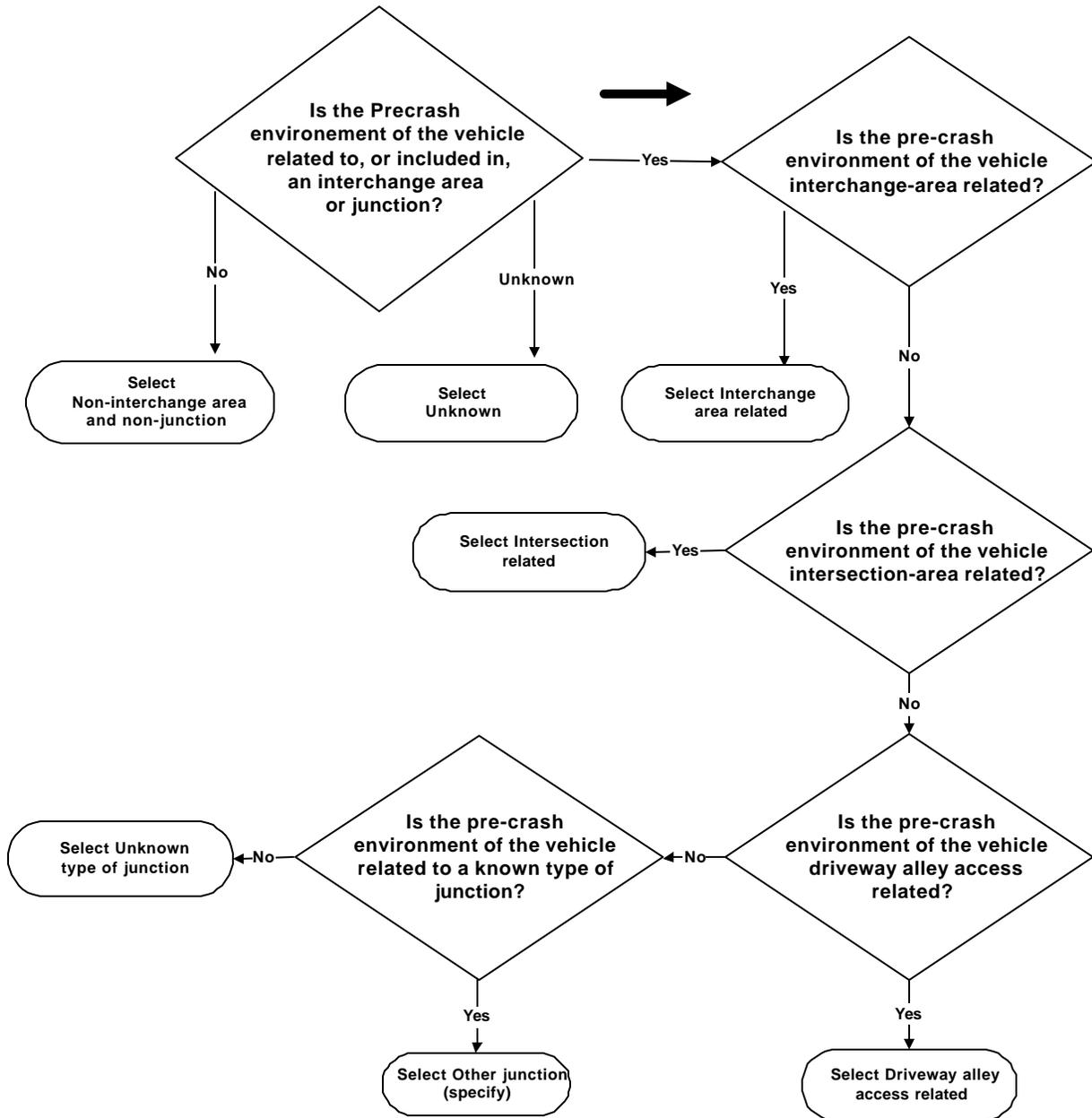
**Remarks:**

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.

Figure GV- 1: Flowchart for Determining Interchange or Junction



Relation to Interchange or Junction cont'd

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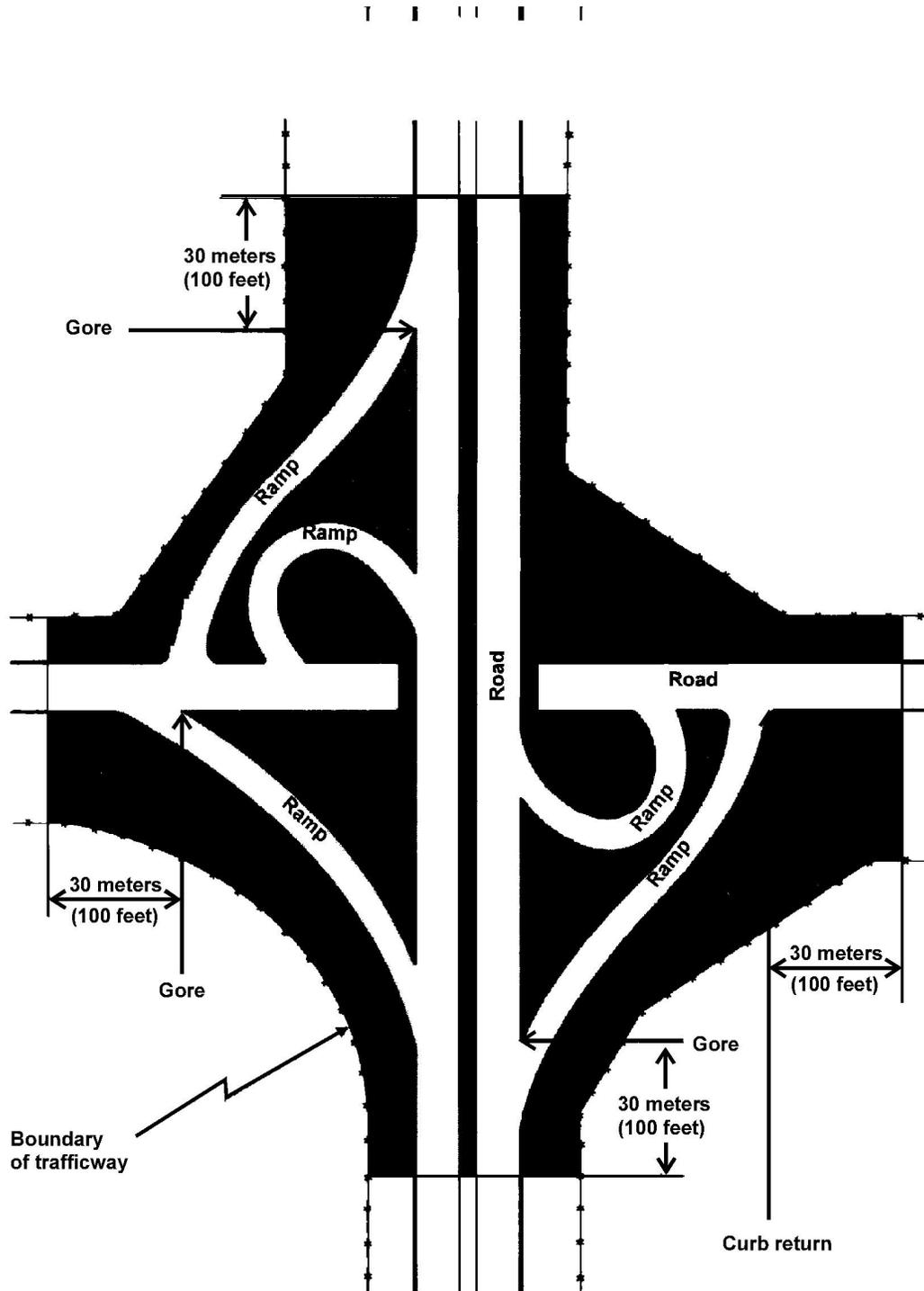
**Non-interchange area and non-junction**

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.

Figure GV- 2: Interchange Area



**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.

Relation to Interchange or Junction cont'd

Page 6 of 6

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 merge 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 merge 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 merge 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.

## TRAFFICWAY FLOW

Page 1 of 2

**Screen Name:** Trafficway-Flow**SAS Data Set:** *GV***SAS Variable:** *TRAFFLOW***Element Attributes:**

- 1 Divided trafficway-median strip without positive barrier
- 2 Divided trafficway-median strip with positive barrier
- 3 One way traffic
- 4 Not physically divided (two way traffic)
- 5 Not physically divided with two way left turn lane
- 9 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 with two-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.

**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 be determined (*e.g.*, ongoing construction and movable traffic barriers moved or removed since the crash date).

## NUMBER OF TRAVEL LANES

Page 1 of 2

**Screen Name:** Roadway-Number of Travel Lanes

**SAS Data Set:** *GV*

**SAS Variable:** *LANES*

**Element Attributes:**

- |   |               |
|---|---------------|
| 1 | One           |
| 2 | Two           |
| 3 | Three         |
| 4 | Four          |
| 5 | Five          |
| 6 | Six           |
| 7 | Seven or more |
| 9 | 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).

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:

- 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.
- 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.

**ROADWAY ALIGNMENT**

**Screen Name:** Roadway-Alignment

**SAS Data Set:** *GV*

**SAS Variable:** *ALIGNMNT*

**Element Attributes:**

- 1 Straight
- 2 Curve Right
- 3 Curve Left
- 9 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.

## ROADWAY PROFILE

Page 1 of 2

**Screen Name:** Roadway-Profile

**SAS Data Set:** *GV*

**SAS Variable:** *PROFILE*

**Element Attributes:**

- |   |                       |
|---|-----------------------|
| 1 | Level                 |
| 2 | Uphill grade (> 2%)   |
| 3 | Hillcrest             |
| 4 | Downhill grade (> 2%) |
| 5 | Sag                   |
| 9 | 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.



Roadway Profile cont'd

Page 2 of 2

**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

**SAS Data Set:** *GV*

**SAS Variable:** *SURTYPE*

**Element Attributes:**

- 1 Concrete
- 2 Bituminous (asphalt)
- 3 Brick or block
- 4 Slag, gravel or stone
- 5 Dirt
- 8 Other, specify:
- 9 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 another type of surface such as wood.

**Unknown**

is selected when the surface type is unknown.

**ROADWAY SURFACE CONDITION**

**Screen Name:** Surface Condition

**SAS Data Set:** *GV*

**SAS Variable:** *SURCOND*

**Element Attributes:**

- |   |                   |
|---|-------------------|
| 1 | Dry               |
| 2 | Wet               |
| 3 | Snow or slush     |
| 4 | Ice               |
| 5 | Sand, dirt or oil |
| 8 | Other, (specify): |
| 9 | 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.

**LIGHT CONDITIONS**

**Screen Name:** Conditions--Light

**SAS Data Set:** *GV*

**SAS Variable:** *LGTCOND*

**Element Attributes:**

1	Daylight
2	Dark
3	Dark, but lighted
4	Dawn
5	Dusk
9	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.

**ATMOSPHERIC CONDITIONS**

Page 1 of 2

**Screen Name:** Conditions--Atmospheric**SAS Data Set:** *GV***SAS Variable:** *WEATHER***Element Attributes:**

- 0 No adverse atmospheric-related driving conditions.
- 1 Rain
- 2 Sleet/hail
- 3 Snow
- 4 Fog
- 5 Rain and fog
- 6 Sleet and fog
- 8 Other (*e.g.*, smog, smoke, blowing sand or dust, etc.) (specify):
- 9 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.

Atmospheric conditions cont'd

Page 2 of 2

**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.

## TRAFFIC CONTROL DEVICE

Page 1 of 5

Screen Name: Traffic Control--Device

SAS Data Set: *GV*SAS Variable: *TRAFCONT***Element Attributes:**

- 0 No traffic control(s)
- 1 Traffic control signal (not RR crossing)

**Regulatory:**

- 2 Stop sign
- 3 Yield sign
- 4 School zone sign
- 5 Other regulatory sign (specify):
- 6 Warning sign (not RR crossing)
- 7 Unknown sign
- 8 Miscellaneous/other controls including RR controls (specify):
- 9 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 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 Traffic Control Device 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 from 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.

### **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).

**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.

**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.

**TRAFFIC CONTROL DEVICE FUNCTIONING**

**Screen Name:** Traffic Control--Functioning

**SAS Data Set:** *GV*

**SAS Variable:** *TRCTLFCT*

**Element Attributes:**

[0	No traffic control(s)]
1	Traffic control device not functioning (specify):
2	Traffic control device functioning properly
9	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

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

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

Save

**PRECRASH DATA OVERVIEW**

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Pre-crash 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 pre-crash variables are:

Driver's Distraction/Inattention To Driving (Prior To Recognition Of Critical Event)  
Pre-Event Movement (Prior to Recognition of Critical Event),  
Critical Pre-crash Category  
Critical Pre-crash Event,  
Attempted Avoidance Maneuver,  
Pre-Impact Stability  
Pre-Impact Location  
Crash Type

The pre-crash variables are designed to identify the following:

what was this vehicle doing just prior to the critical pre-crash 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 Pre-crash 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 pre-crash variables are coded relative to this selected **Critical Pre-crash Event**.

Do not consider culpability as a factor for determining pre-crash 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.

### **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.

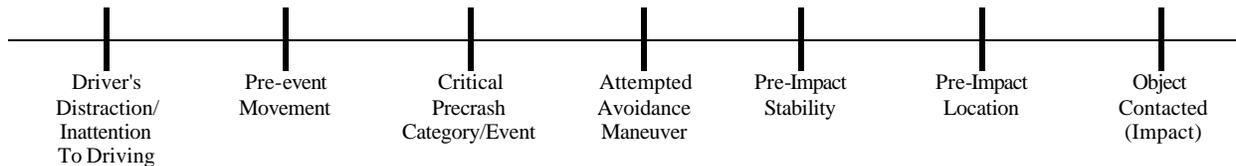
The coding order for a single critical crash envelope is illustrated below.

### **Multiple Critical Crash Envelopes**

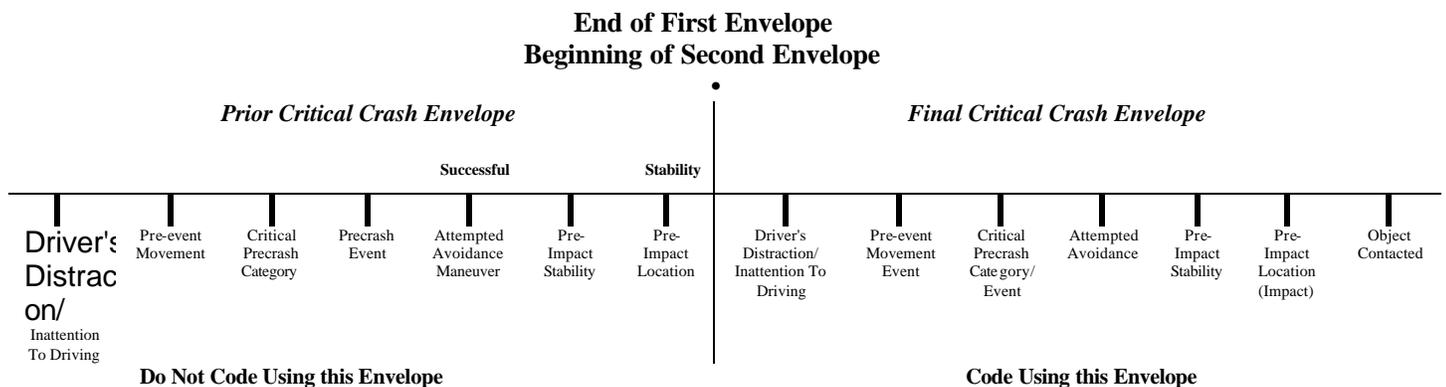
When a case involves multiple critical crash envelopes, select only the final critical crash envelope. In this situation, encode the variable Pre-Event Movement (Prior to Recognition of Critical Event)

as: **Successful avoidance maneuver to a previous critical event**. The final critical crash envelope is 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.

**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?

2. Determine Attempted Avoidance Maneuver.

What does your information indicate that the driver tried to do to avoid the crash?

3. Determine Pre-Impact Stability, and Pre-Impact Location

4. Determine Driver's Distraction/Inattention and Pre-Event Movement (Prior to Recognition of Critical Event).

\* **FOR EXAMPLE :**

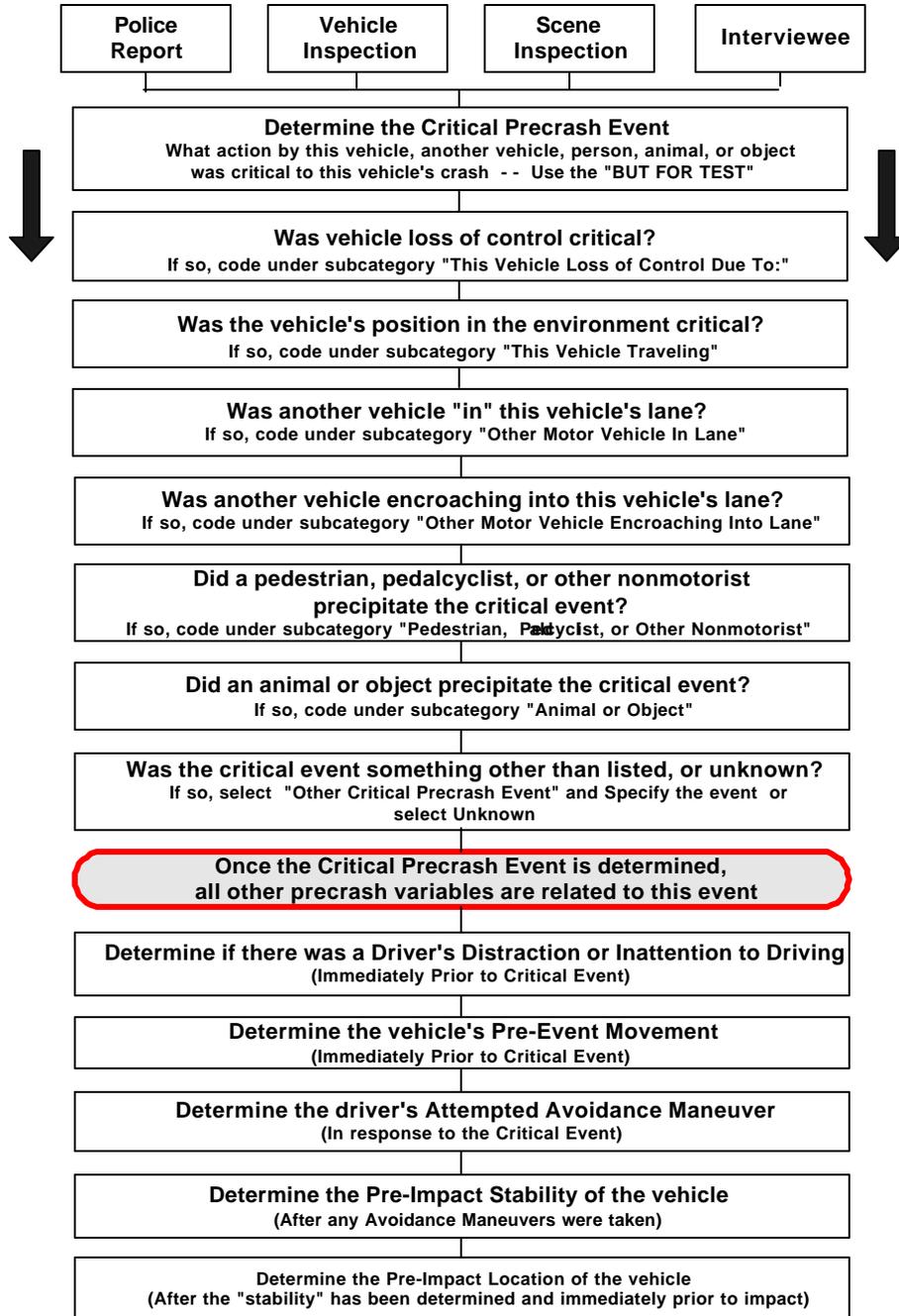
**"But for"** Vehicle # going left-of-center, this vehicle would not have been involved in this crash.

**"But for"** having entered into the intersection, this vehicle would not have been involved in this crash.

Precrash 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 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 lost 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.
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).

**Example 1**

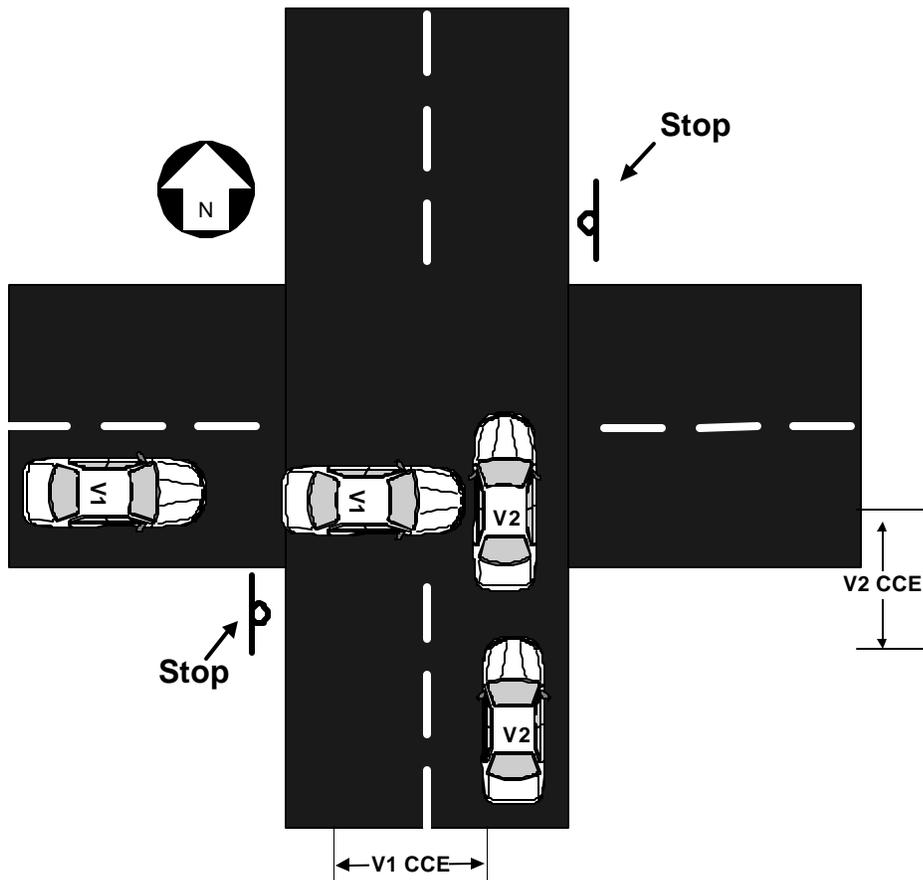
Vehicle 2 is northbound and passing through an intersection on a roadway without a traffic control. The driver of vehicle 1 is dialing on a cellular phone. Vehicle 1 is eastbound on a crossing roadway with a stop sign but did see it or stop or slow down. Driver of Vehicle 2 was attentive but did not 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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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

Example 1 (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.



**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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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<sub>1</sub>CCE) 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<sub>2</sub>CCE) 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.

**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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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

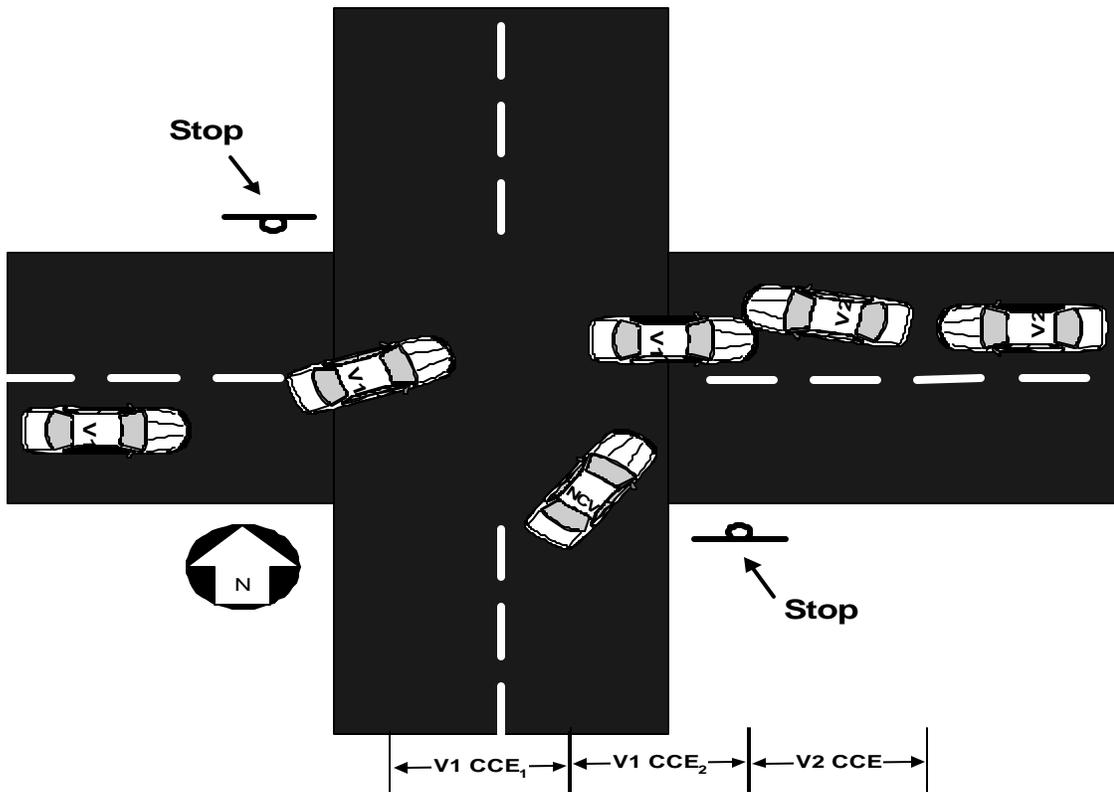
In this example, vehicle 1 has two critical crash envelopes ( $V_1CCE_1$  and  $V_1CCE_2$ ). Vehicle 1's first Precrash Data

***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.

Example 3 (cont'd)



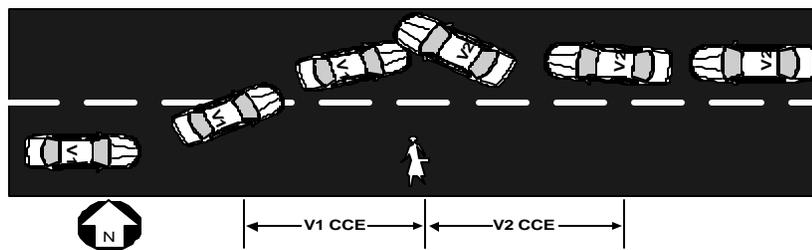
**Example 4**

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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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.



**Example 5**

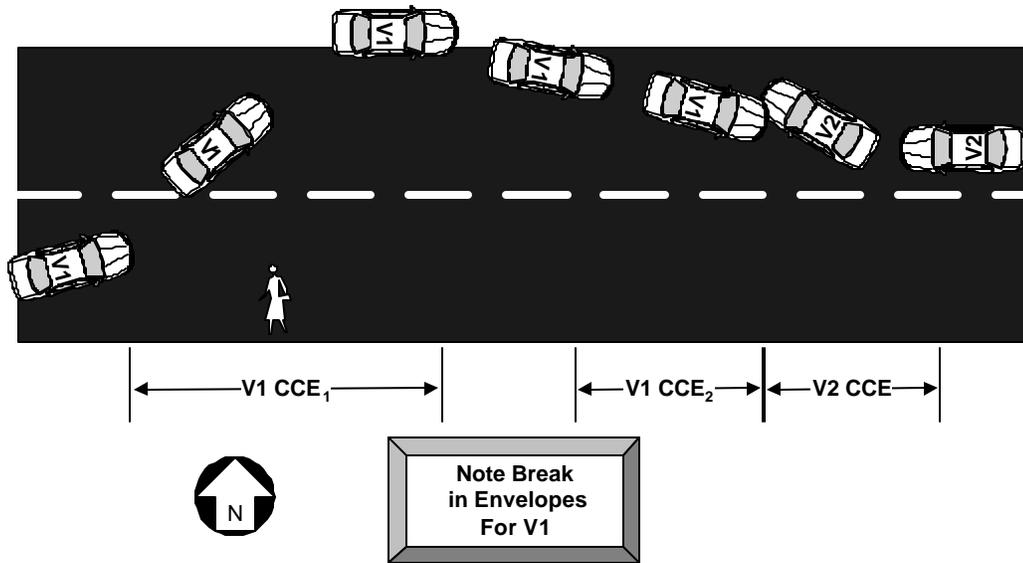
Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 steers left to avoid a pedestrian who darted into his/her travel lane. Vehicle 1 crosses over the center line and the adjacent travel lane, departing the roadway. Then driver 1 reenters the roadway, 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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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

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.



**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.

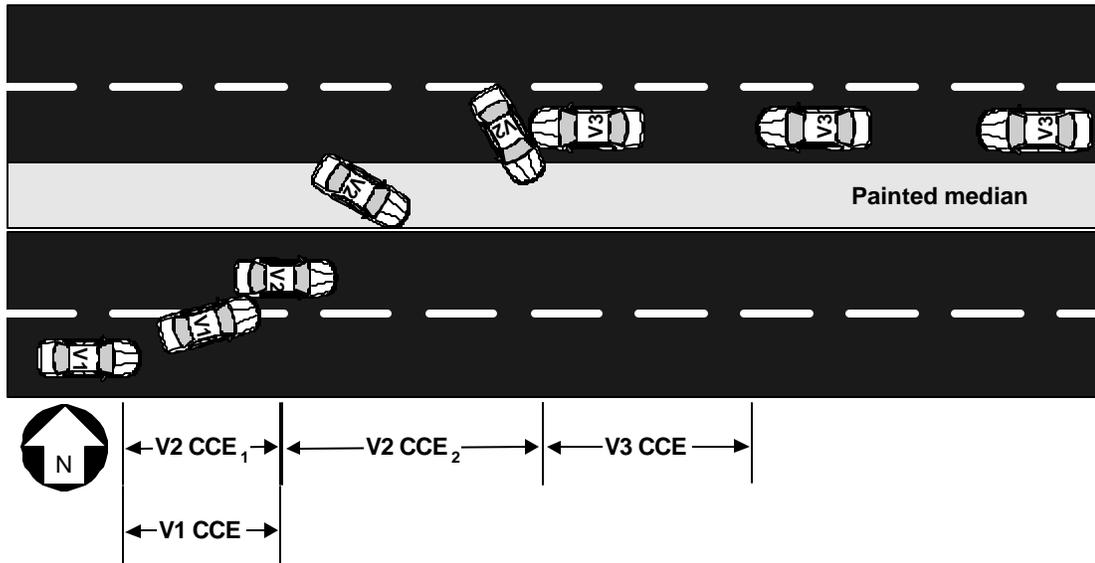
<i>Vehicle 1</i>		<i>Vehicle 2</i>
Driver's Distraction/Inattention to Driving	[Distracted] while using or reaching for device/object brought into in vehicle	Attentive or not distracted
Pre-Event Movement	Going straight	Going straight
Critical Pre-Crash Category	This vehicle loss control due to	Other 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
<i>Vehicle 3</i>		
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	

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.



**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.

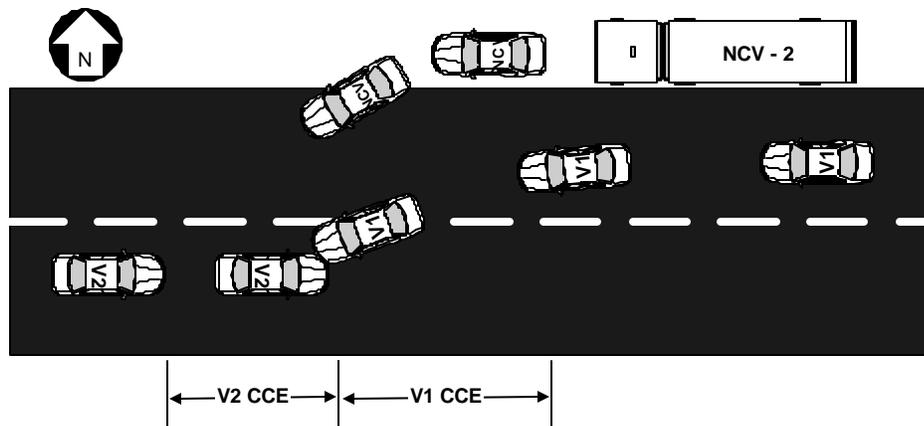
	<i>Vehicle 1</i>	<i>Vehicle 2</i>
Driver's Distraction/Inattention to Driving	Attentive or not distracted	Attentive or not distracted
Pre-Event Movement	Going Straight	Going Straight
Critical Pre-Crash Category	Other motor vehicle encroaching into lane	Other motor vehicle encroaching into lane
Critical 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<sub>1</sub>CCE). 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.

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.

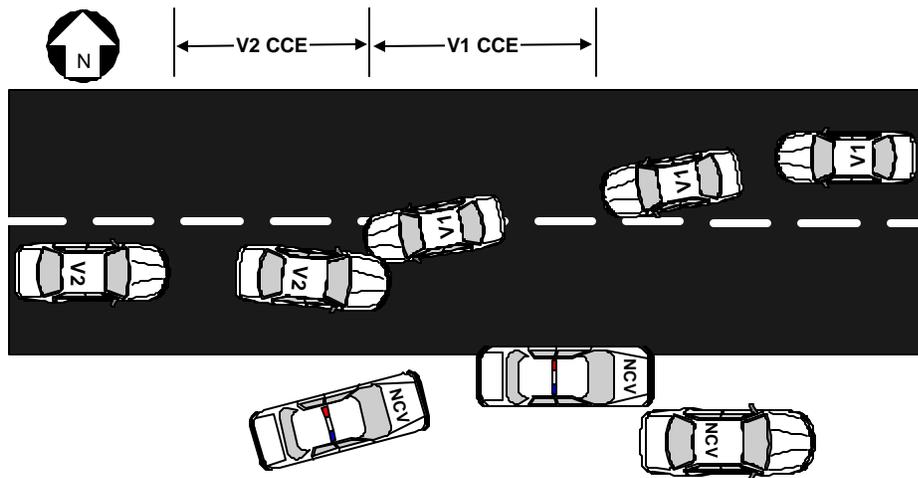
The noncontact vehicle and the noncontact truck were not involved in an impact in the sequence of crash events and are therefore not coded in the Crashworthiness Data System. However, the noncontact vehicle and truck must be shown on the Crash Collision diagram.



**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.

	<i>Vehicle 1</i>	<i>Vehicle 2</i>
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



**PRE-EVENT MOVEMENT (PRIOR TO RECOGNITION OF CRITICAL EVENT)**

Page 1 of 3

**Screen Name:** Pre-Event Movement (Prior to Recognition of Critical Event)**SAS Data Set:** *GV***SAS Variable:** *REMOVE***Element Attributes:**

- 0 [No Driver Present]
- 1 Going straight
- 2 Decelerating in traffic lane
- 3 Accelerating in traffic lane
- 4 Starting in traffic lane
- 5 Stopped in traffic lane
- 6 Passing or overtaking another vehicle
- 7 Disabled or parked in travel lane
- 8 Leaving a parking position
- 9 Entering a parking position
- 10 Turning right
- 11 Turning left
- 12 Making a U-turn
- 13 Backing up (other than for parking position)
- 14 Negotiating a curve
- 15 Changing lanes
- 16 Merging
- 17 Successful avoidance maneuver to a previous critical event
- 98 Other (specify):
- 99 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.

**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**)

**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.

**CRITICAL PRE CRASH CATEGORY**

Page 1 of 2

**Screen Name:** Critical Pre Crash Category**SAS Data Set:** N/A**SAS Variable:** N/A**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 involves 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.).

**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.

## CRITICAL PRE-CRASH EVENT

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Screen Name: Critical Pre-Crash Event

SAS Data Set: GV

SAS Variable: PREEVENT

## Element Attributes:

*This Vehicle Loss of Control Due To:*

- 1 Blow out or flat tire
- 2 Stalled engine
- 3 Disabling vehicle failure (*e.g.*, wheel fell off) (specify):
- 4 Non-disabling vehicle problem (*e.g.*, hood flew up) (specify)
- 5 Poor road conditions (puddle, pot hole, ice, etc.) (specify)
- 6 Traveling too fast for conditions
- 8 Other cause of control loss (specify)
- 9 Unknown cause of control loss

*This Vehicle Traveling*

- 10 Over the lane line on left side of travel lane
- 11 Over the lane line on right side of travel lane
- 12 Off the edge of the road on the left side
- 13 Off the edge of the road on the right side
- 14 End departure
- 15 Turning left at intersection
- 16 Turning right at intersection
- 17 Crossing over (passing through) intersection
- 18 This vehicle decelerating
- 19 Unknown travel direction

*Other Motor Vehicle In Lane*

- 50 Other vehicle stopped
- 51 Traveling in same direction with lower steady speed
- 52 Traveling in same direction while decelerating
- 53 Traveling in same direction with higher speed
- 54 Traveling in opposite direction
- 55 In crossover
- 56 Backing
- 59 Unknown travel direction of other motor vehicle in lane

*Other Motor Vehicle Encroaching Into Lane*

- 60 From adjacent lane (same direction)—over left lane line

*Other MV Encroaching Into Lane cont'd*

- 61 From adjacent lane (same direction)—over right lane line
- 62 From opposite direction—over left lane line
- 63 From opposite direction—over right lane line
- 64 From parking lane
- 65 From crossing street, turning into same direction
- 66 From crossing street, across path
- 67 From crossing street, turning into opposite direction
- 68 From crossing street, intended path not known
- 70 From driveway, turning into same direction
- 71 From driveway, across path
- 72 From driveway, turning into opposite direction
- 73 From driveway, intended path not known
- 74 From entrance to limited access highway
- 78 Encroachment by other vehicle—details unknown

*Pedestrian or Pedalcyclist, or Other Nonmotorist*

- 80 Pedestrian in roadway
- 81 Pedestrian approaching roadway
- 82 Pedestrian - unknown location
- 83 Pedalcyclist or other nonmotorist in roadway (specify)
- 84 Pedalcyclist or other nonmotorist approaching roadway (specify)
- 85 Pedalcyclist or other nonmotorist—unknown location (specify)

*Object or Animal*

- 87 Animal in roadway
- 88 Animal approaching roadway
- 89 Animal—unknown location
- 90 Object in roadway
- 91 Object approaching roadway
- 92 Object—unknown location

*Other (specify)*

- 98 Other critical precrash event (specify):
- 99 Unknown

**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.

**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**.

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.

**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).

**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.

**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 led to this vehicle's collision, but the location or action of the pedestrian was not known.

**Pedalcyclist or other nonmotorist in roadway, (specify)**

is selected when a pedalcyclist or other nonmotorist was present in the roadway (irrespective of relative motion).

**Pedalcyclist or other nonmotorist approaching roadway, (specify)**

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, (specify)**

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.

**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.

**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	

Coding Critical Precrash Event Scenerios for Different Rear-End Collision Situations cont'd

Three Vehicle Collisions

			<b>Trail Vehicle</b>	<b>Middle Vehicle</b>	<b>Lead Vehicle</b>
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

## ATTEMPTED AVOIDANCE MANEUVER

Page 1 of 2

**Screen Name:** Attempted Avoidance Maneuver

**SAS Data Set:** *GV*

**SAS Variable:** *MANEUVER*

**Element Attributes:**

0	[No driver present]
1	No avoidance maneuver
2	Braking (no lockup)
3	Braking (lockup)
4	Braking (lockup unknown)
5	Releasing brakes
6	Steering left
7	Steering right
8	Braking and steering left
9	Braking and steering right
10	Accelerating
11	Accelerating and steering left
12	Accelerating and steering right
98	Other action (specify)
99	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).

Attempted Avoidance Maneuver cont'd

Page 2 of 2

**[No Driver Present]**

is pre-coded if on the Official Records Tab the "Driver Present?" variable is coded as "No driver Present".

**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.

## PRE-IMPACT STABILITY

Page 1 of 2

**Screen Name:** Pre-Impact Stability

**SAS Data Set:** *GV*

**SAS Variable:** *PREISTAB*

**Element Attributes:**

- 0 [No driver present]
- 1 Tracking
- 2 Skidding longitudinally — rotation less than 30 degrees
- 3 Skidding laterally — clockwise rotation
- 4 Skidding laterally — counterclockwise rotation
- 8 Other vehicle loss-of-control (specify)
- 9 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.

**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, (specify)**

is selected when a driver loses control of a vehicle prior to the critical event.

**Pre-crash stability unknown**

is selected when the stability of the vehicle, after the Critical Event, cannot be determined.

## PRE-IMPACT LOCATION

Page 1 of 2

**Screen Name:** Pre-Impact Location

**SAS Data Set:** *GV*

**SAS Variable:** *PREILOC*

**Element Attributes:**

0	[No driver present]
1	Stayed in original travel lane
2	Stayed on roadway but left original travel lane
3	Stayed on roadway, not known if left original travel lane
4	Departed roadway
5	Remained off roadway
6	Returned to roadway
7	Entered roadway
9	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.

**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.

## CRASH TYPE

Page 1 of 2

**Screen Name:** Crash Type

**SAS Data Set:** *GV*

**SAS Variable:** *ACCTYPE*

**Element Attributes:**

As assigned by the selection on the next screens

00 - 93

98

99

SEE FOLLOWING VARIABLES FOR CODES

**Source:** Researcher determined — inputs include police report, scene inspection, vehicle inspection, and interview.

**Remarks:**

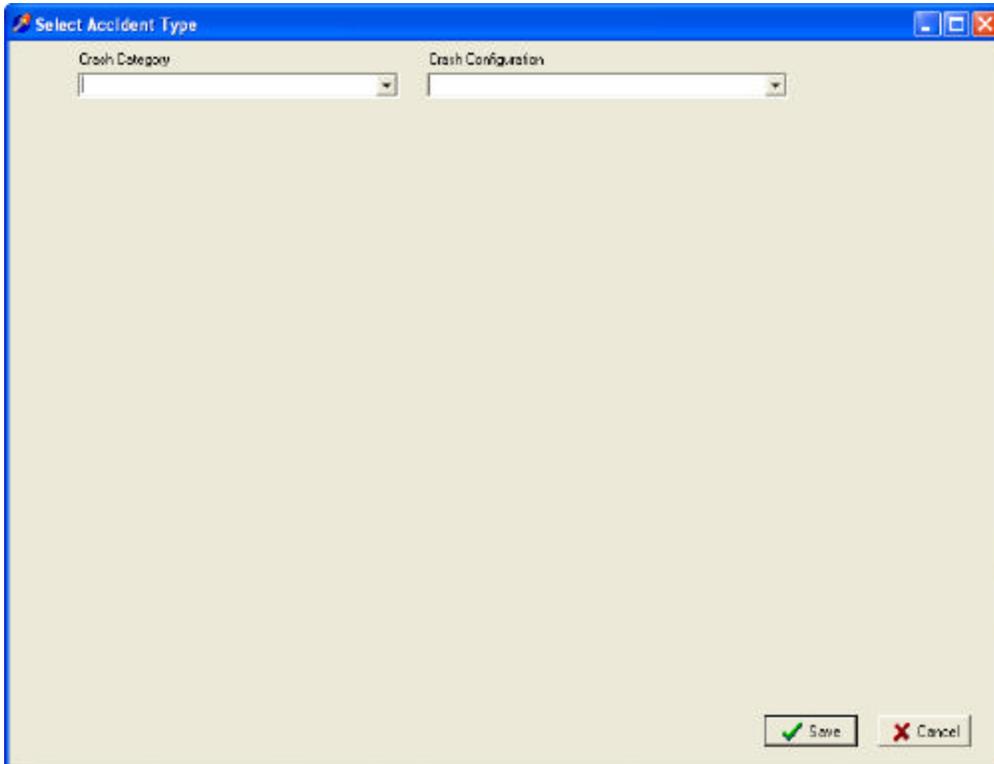
The Crash Type is a numeric value assigned by selecting the **Crash Category** and the **Crash Configuration** on the next screens/pages. The number can be directly entered or edited here, however, the two-step process of selecting the Crash Category And Crash Configuration is preferred to visualize 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.

Crash Type (cont'd)

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To access the category choices double click on the white box next to Crash Type and the following window opens:



**CRASH CATEGORY**

Page 1 of 2

**Screen Name:** Crash Category**SAS Data Set:** N/A**SAS Variable:** N/A**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.

Crash Category cont'd

Page 2 of 2

**Same Trafficway, Opposite Direction**

The first harmful event occurred while both vehicles were traveling in opposite directions on the same trafficway.

**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**.

**CRASH CONFIGURATION**

Page 1 of 3

**Screen Name:** Crash Configuration**SAS Data Set:** N/A**SAS Variable:** N/A**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.

### 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

Crash Configuration cont'd

Page 3 of 3

described in the categories above is included here (e.g., U-turns, third or subsequent vehicles involved in the crash, etc.).

**CRASH TYPES**

**Screen Name:** Crash Types

**SAS Data Set:** *GV*

**SAS Variable:** *ACCTYPE*

**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

Crash Types cont'd

Page 2 of 25

31 Decelerating (Slowing), Going Right

32 Specifics Other

33 Specifics Unknown

**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 Types cont'd

Page 3 of 25

## Crash Configuration: Sideswipe/Angle

- 64 Lateral Move (left/Right)
- 65 Lateral Move (Going Straight)
- 66 Specifics Other
- 67 Specifics Unknown

**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  
Crash Types cont'd

Page 4 of 25

99 Unknown Crash Type  
00 No Impact

**Source:** Researcher determined — inputs include police report, scene inspection, vehicle inspection, and interview.

**Remarks:**

### **Crash Category: Single Driver**

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.

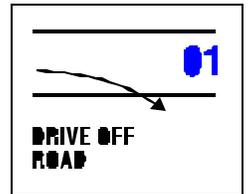
Crash Category Single Driver cont'd

**Crash Configuration: Right Roadside Departure**

The vehicle departed the right side of the road with the first harmful event occurring off the road.

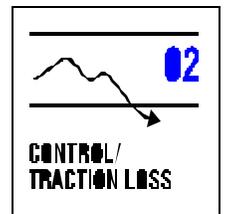
**01 Right Roadside Departure: Drive Off Road**

Enter "01" when the vehicle departed the road under a controlled situation (e.g., the driver was distracted, fell asleep, intentionally departed, etc).



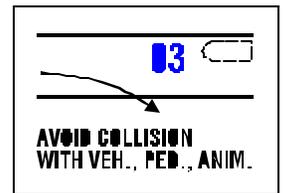
**02 Right Roadside Departure: Control/Traction Loss**

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**

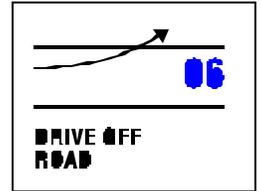
Enter "05" if the vehicle departed the right side of the road for unknown reasons.



**Crash Configuration: Left Roadside Departure**

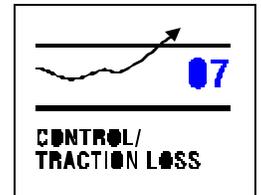
**06 Left Roadside Departure: Drive Off Road**

Enter "06" when the vehicle departed the road under a controlled situation (e.g., the driver was distracted, fell asleep, intentionally departed, etc.)



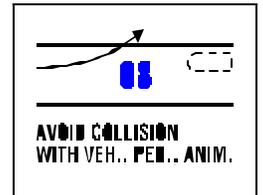
**07 Left Roadside Departure: Control/Traction Loss**

Enter "07" if there is evidence that the vehicle lost traction or "got away" from the road some other way (e.g., the vehicle spun off the road as a result of surface condition phenomena, or mechanical malfunctions.) If doubt exists, code "06" (Left Roadside 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.



**Crash Configuration: Forward Impact**

The vehicle struck an object on the road or off the end of a trafficway while moving forward.

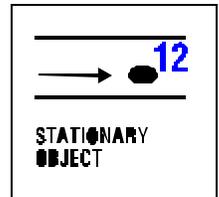
**11 Forward Impact: Parked Vehicle**

Enter "11" if the crash involves impact with a parked vehicle on either side of the road.



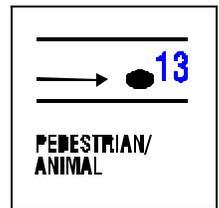
**12 Forward Impact: Stationary Object**

Enter "12" if the crash involves impact with a stationary object on either side of the road.



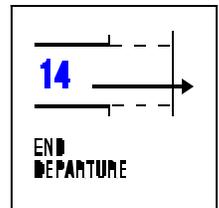
**13 Forward Impact: Pedestrian/Animal**

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**

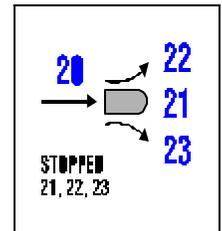
Enter "16" when the PAR indicates a single driver was involved in a forward impact collision, but no further classification is possible.

**Crash Category: Same Trafficway, Same Direction****Crash Configuration: Rear-End**

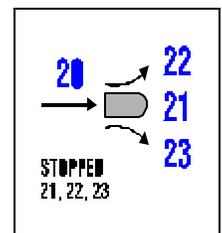
The front of the overtaking vehicle impacted the rear of the other vehicle. Note, even if the rear-impacted vehicle had started to make a turn, code here (**not** in Crash Category: Change in Trafficway, Vehicle Turning).

**20 Rear-End: Stopped**

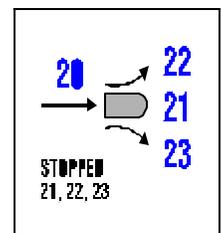
Enter "20" for a vehicle that impacts another vehicle from the rear when the impacted vehicle was stopped in the trafficway.

**21 Rear-End: Stopped, Straight**

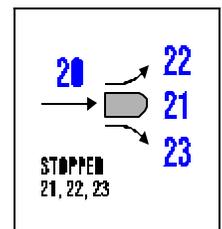
Enter "21" for a rear-impacted vehicle that was stopped in the trafficway, and was intending to proceed straight ahead.

**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**

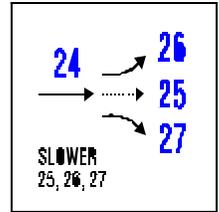
Enter "23" for a rear-impacted vehicle that was stopped in the trafficway, intending to make a right turn.



Crash Types cont'd

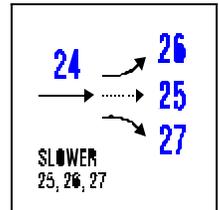
**24 Rear-End: Slower**

Enter "24" for a vehicle that impacts another vehicle from the rear when the impacted vehicle was going slower than the striking vehicle.



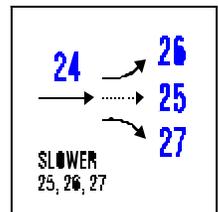
**25 Rear-End: Slower, Going Straight**

Enter "25" for a rear-impacted vehicle that was going slower than the other vehicle while proceeding straight ahead.



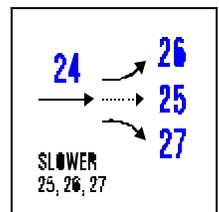
**26 Rear-End: Slower, Going Left**

Enter "26" for a rear-impacted vehicle that was going slower than the other vehicle while intending to turn left.



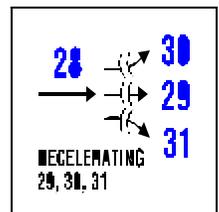
**27 Rear-End: Slower, Going Right**

Enter "27" for a rear-impacted vehicle that was going slower than the other vehicle while intending to turn right.



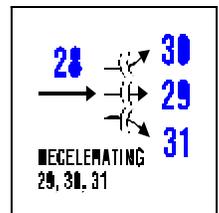
**28 Rear-End: Decelerating (Slowing)**

Enter "28" for a vehicle impacts another vehicle from the rear when the impacted vehicle was slowing down.



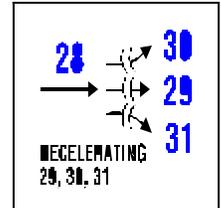
**29 Rear-End: Decelerating (Slowing), Going Straight**

Enter "29" for a rear-impacted vehicle that was slowing down while proceeding straight ahead.



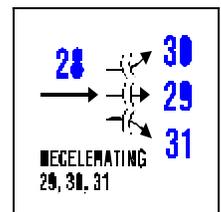
**30 Rear-End: Decelerating (Slowing), Going Left**

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 crashes 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.

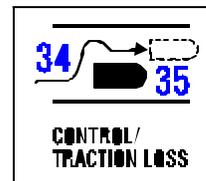


**Crash Configuration: Forward Impact**

The front of the overtaking vehicle impacted the rear of the other vehicle, following a steering maneuver around a noninvolved vehicle or object.

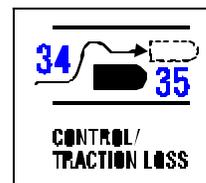
**34 Forward Impact: Control/Traction Loss**

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.



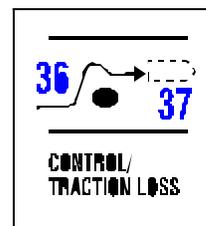
**35 Forward Impact: Control/Traction Loss**

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.



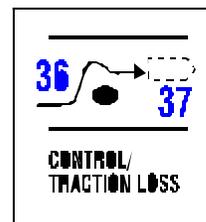
**36 Forward Impact: Control/Traction Loss**

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.



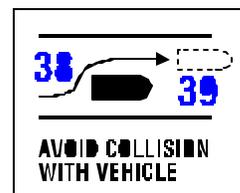
**37 Forward Impact: Control/Traction Loss**

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.

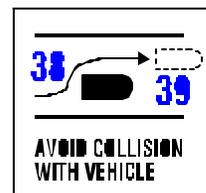


**38 Forward Impact: Avoid Collision with Vehicle**

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**

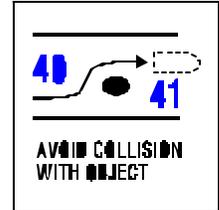


Crash Types cont'd

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.

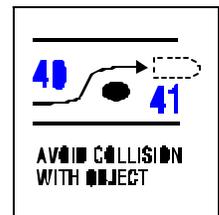
**40 Forward Impact: Avoid Collision with Object**

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.



Crash Types cont'd

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**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:

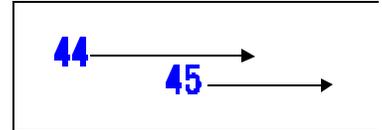
1. the right sides of the two vehicles impact following a 180 degree rotation of the vehicle on the right, or
2. the left sides of the two vehicles impact following a 180 degree rotation of the vehicle on the left.

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.

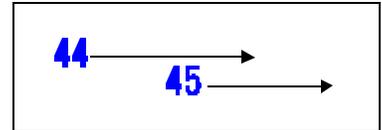
**44 Sideswipe/Angle: Straight Ahead on Left**

See discussion under Configuration: Sideswipe/Angle, above for an explanation of when this attribute applies.



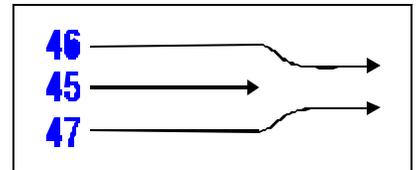
**45 Sideswipe/Angle: Straight Ahead on Left/Right**

See discussion under Configuration: Sideswipe/Angle, above for an explanation of when this attribute applies.



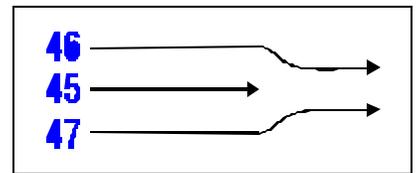
**46 Sideswipe/Angle: Changing Lanes to the Right**

See discussion under Configuration: Sideswipe/Angle, above for an explanation of when this attribute applies.



**47 Sideswipe/Angle: Changing Lanes to the Left**

See discussion under Configuration: 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.

**EACH: 48**  
**SPECIFICS**  
**OTHER**

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.

**EACH: 49**  
**SPECIFICS**  
**UNKNOWN**

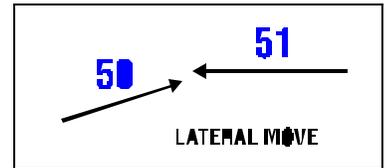
**Crash Category: Same Trafficway, Opposite Direction**

**Crash Configuration: Head-On**

The frontal area of one vehicle impacted the frontal area of another.

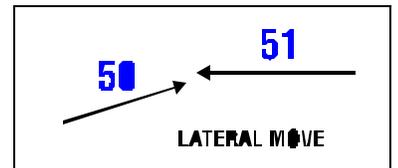
**50 Head-On: Lateral Move (Left/Right)**

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**

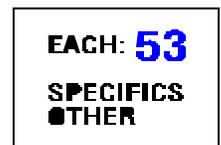
Enter "52" for a head-on collision that cannot be described by "50"- "51", when traveling on the same trafficway in opposite directions. Clarification: Enter "52" for both vehicles involved in a head-on collision when one is traveling the a one way roadway.



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.

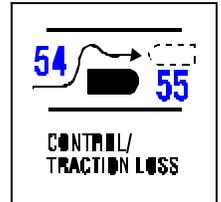


**Crash Configuration: Forward Impact**

The frontal area of one vehicle impacted the frontal area of another following a steering maneuver around a noninvolved vehicle or an object.

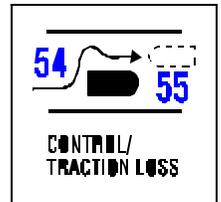
**54 Forward Impact: Control/Traction Loss**

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.



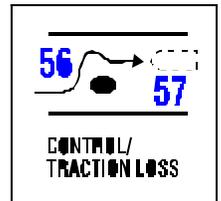
**55 Forward Impact: Control/Traction Loss**

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.



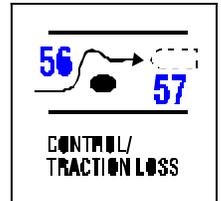
**56 Forward Impact: Control/Traction Loss**

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.



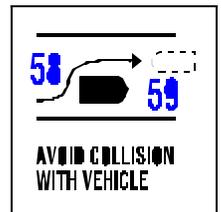
**57 Forward Impact: Control/Traction Loss**

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.



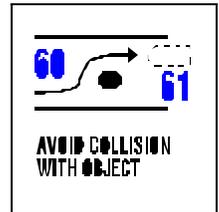
**59 Forward Impact: Avoid Collision with Vehicle**

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.



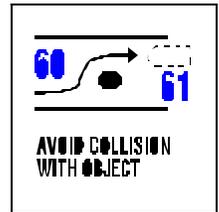
**60 Forward Impact: Avoid Collision with Object**

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.

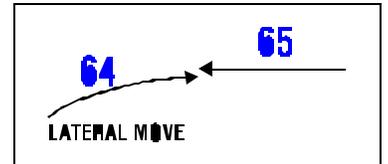


**Crash Configuration: Sideswipe/Angle**

The two vehicles are involved in an impact involving the side of one or both vehicles.

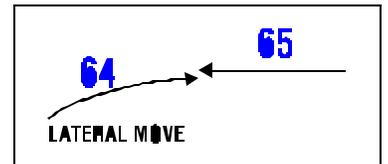
**64 Sideswipe/Angle: Lateral Move (Left/Right)**

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.



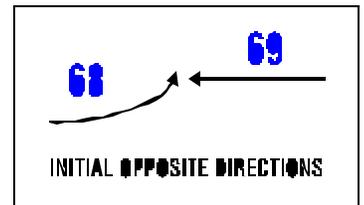
**Crash Category: Changing Trafficway, Vehicle Turning**

**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.

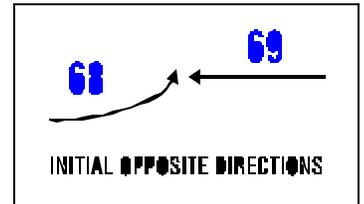
**68 Turn Across Path: Initial Opposite Directions (Left/Right)**

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.



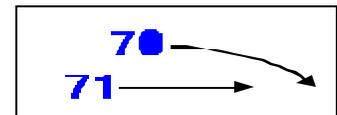
**69 Turn Across Path: Initial Opposite Directions (Going Straight)**

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.



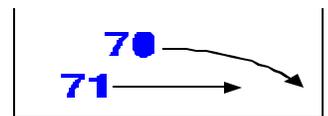
**70 Turn Across Path: Initial Same Directions (Turning Right)**

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.



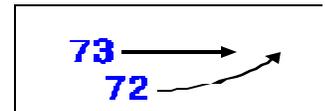
**72 Turn Across Path: Initial Same Directions (Turning Left)**

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.



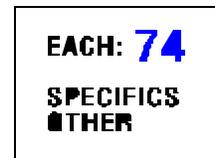
**73 Turn Across Path: Initial Same Directions (Going Straight)**

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.



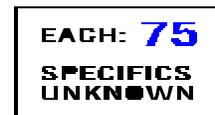
**74 Turn Across Path: Specifics Other**

Enter "74" for collisions in which one vehicle turned across another's path, which cannot be described by "68"- "72". Enter "Specifics Other" for crashes 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.



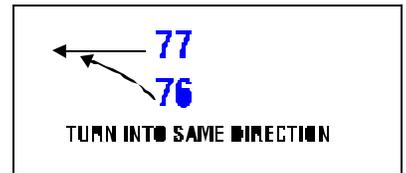
**Crash Configuration: Turn Into Path**

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.

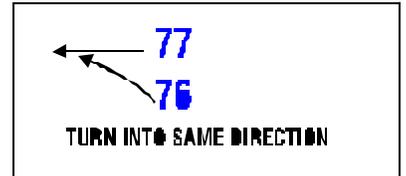
**76 Turn Into Same Direction (Turning Left)**

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.



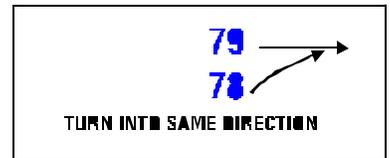
**77 Turn Into Same Direction (Going Straight)**

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.



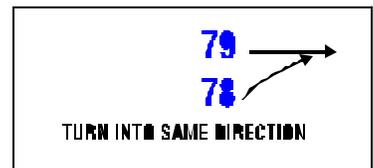
**78 Turn Into Same Direction (Turning Right)**

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.



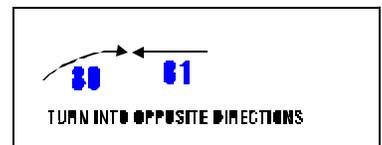
**79 Turn Into Same Direction (Going Straight)**

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.



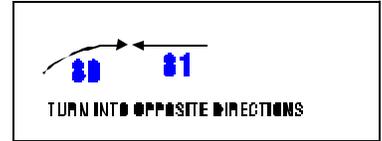
**80 Turn Into Opposite Directions (Turning Right)**

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.



**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.



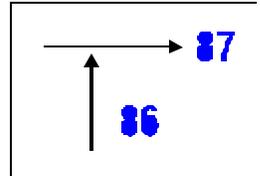
**Crash Category: Intersecting Paths (Vehicle Damage)**

Crash Configuration: Straight Paths

The two vehicles were proceeding (or attempting to proceed) straight ahead.

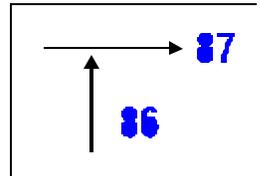
**86 Straight Paths: Striking from the Right**

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.



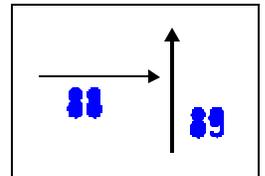
**87 Straight Paths: Struck on the Right**

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.



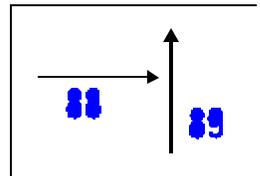
**88 Straight Paths: Striking from the Left**

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.



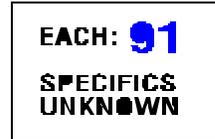
**90 Straight Paths: Specifics Other**

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.



**Crash Category: Miscellaneous**

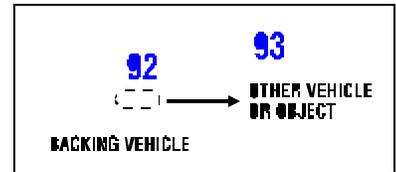
**Crash Configuration: Backing, Etc.**

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.



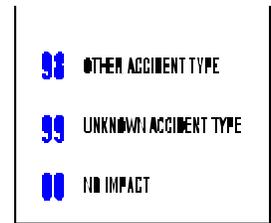
**93 Backing, Etc.: Other Vehicle or Object**

Enter "93" for the vehicle which was involved with the backing vehicle (code 92).

**98 Backing, Etc.: Other Crash Type**

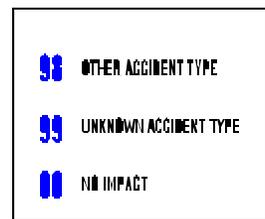
Code "98" is used for those events and collisions which do not reasonably fit any of the specified types. This code includes (but is not limited to):

- 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**

Crash Types cont'd

Code "00" identifies non-collision events (fire, immersion, etc.) Rollovers on the road should be coded as Crash Type "98" **Other Accident Type**.

98	OTHER ACCIDENT TYPE
99	UNKNOWN ACCIDENT TYPE
00	NO IMPACT

DRIVER/DISTRACTIONS

General Vehicle Form, Case 2006-903-702S/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash Driver | Rollover | Reconstruction | DeltaV | Log | Review

General | Distractions

Driver's Distraction/Inattention To Driving: Inattentive or distracted

<input type="checkbox"/> By other occupant(s), (specify):	<input type="checkbox"/> Inattentive or lost in thought
<input type="checkbox"/> By moving object in vehicle (specify):	<input type="checkbox"/> Sleepy or fell asleep
<input type="checkbox"/> While talking/listening cell phone (specify loc/type phone):	<input type="checkbox"/> Distracted by outside person, object, or event (specify):
<input type="checkbox"/> While dialing cell phone (specify location/type phone):	<input type="checkbox"/> Eating or drinking (specify):
<input type="checkbox"/> While adjusting climate controls	<input type="checkbox"/> Smoking Related (specify):
<input type="checkbox"/> While adjusting radio, cassette, CD (specify):	<input type="checkbox"/> Other, distraction/inattention (specify):
<input type="checkbox"/> While using other device/controls integral to vehicle (specify)	<input type="checkbox"/> Unknown
<input type="checkbox"/> While using/reaching device/object brought into vehicle (specify)	

Save

**DRIVER'S DISTRACTION/INATTENTION TO DRIVING**

**Screen Name:** Driver's Distraction/Inattention to Driving

**SAS Data Set:** *GV*

**SAS Variable:** *DRATENTN*

**Element Attributes:**

0	[No driver present]
1	Attentive or not distracted
2	Looked but did not see
3	Inattentive or distracted
9	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.

## DRIVER'S DISTRACTIONS

Page 1 of 3

**Screen Name:** Driver's Distraction/Inattention to Driving

**SAS Data Set:** *DISTRACT*

**SAS Variable:** *DRIVDIS*

**Element Attributes:****Inattentive or distracted:**

- |    |  |
|----|--|
| 1  | By other occupant(s), (specify):   |
| 2  | By moving object in vehicle (specify):   |
| 3  | While talking or listening to cellular phone (specify location and type of phone): |
| 4  | While dialing cellular phone (specify location and type of phone):                 |
| 5  | While adjusting climate controls   |
| 6  | While adjusting radio, cassette, CD (specify):                                     |
| 7  | While using other device/controls integral to vehicle (specify):                   |
| 8  | While using or reaching for device/object brought into vehicle (specify):          |
| 9  | Sleepy or fell asleep  |
| 10 | Distracted by outside person, object, or event (specify):                          |
| 11 | Eating or drinking (specify):  |
| 12 | Smoking related (specify):   |
| 97 | Inattentive or lost in thought   |
| 98 | Other, distraction/inattention (specify):  |
| 99 | 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

**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"*.

**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.

**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

Driver's Distraction/Inattention to Driving cont'd

Page 3 of 3

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).

**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 integral vehicle**.

**Inattentive or lost in thought**

Is selected when the driver is thinking about items other than the driving task (daydreaming).

**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.

## ROLLOVER

General Vehicle Form, Case 2006-903-702S/ Vehicle #2

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

**Rollover Data**

Type: No rollover (no overturning)

Quarter Turns: No Rollover

Interrupted Rollover:

**Pre Rollover**

Maneuver:

**Rollover Initiation**

Type: No rollover

Location: No rollover

Object Contacted Class: No Rollover

Object Contacted: No Rollover

**Rollover Specifics**

Location on Vehicle where Initial Principal Tripping Force Is Applied: No rollover

Direction of Initial Roll: No rollover

Save

## 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.

**ROLLOVER TYPE**

**Screen Name:** Rollover Data-Type

**SAS Data Set:** *GV*

**SAS Variable:** *ROLLTYPE*

**Element Attributes:**

0	No rollover (no overturning)
1	Rollover — Longitudinal axis
2	Rollover — end-over-end ( <i>i.e.</i> , primarily about the lateral axis)
97	[Not a CDS Vehicle ]
99	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). If it is known that it rolled over the longitudinal axis, but the number of turns is unknown, then indicate **Longitudinal axis** and indicate **Unknown** on then next variable.

**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 rollover details cannot be determined. If it is known that it rolled over the longitudinal axis, but the number of turns is unknown, then indicate **Longitudinal axis** and indicate **Unknown** on then next variable.

**NUMBER OF QUARTER TURNS**

**Screen Name:** Rollover Data-Quarter Turns

**SAS Data Set:** *GV*

**SAS Variable:** *ROLLTURN*

**Element Attributes:**

Enter the number of quarter turns:  
 0 No rollover  
 88 Not a CDS Vehicle  
 99 Unknown

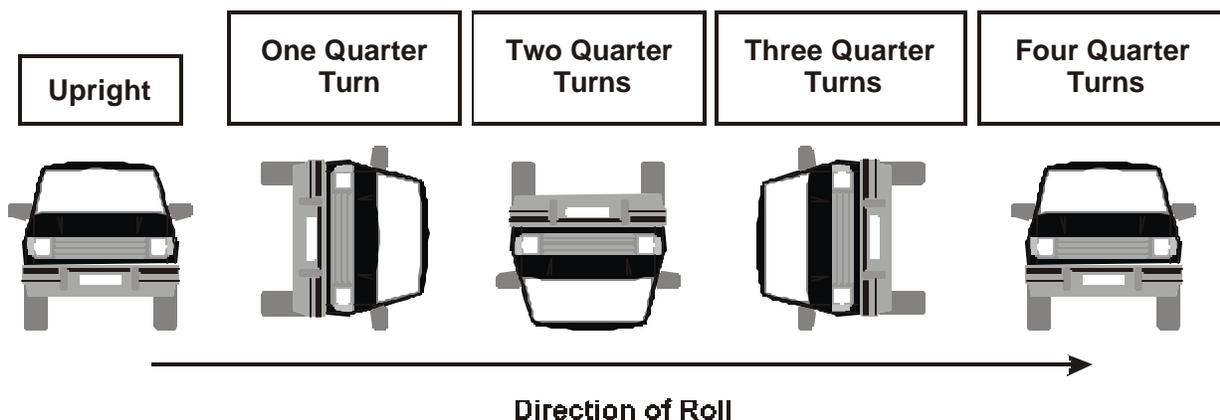
**Range** 1-20, Unknown

**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.

**INTERRUPTED ROLL**

**Screen Name:** Interrupted roll

**SAS Data Set:**

**SAS Variable:**

**Element Attributes:**

1	Yes
2	No
9	Unknown
8	[No rollover]

**Source:** Vehicle inspection, scene inspection, interviews, and police report.

**Remarks:**

The purpose of this variable is to determine if the vehicle's rollover sequence was acted upon by another vehicle or object between the trip point and the final rest position. Examples may include the vehicle striking a tree with its top during the rollover sequence, or contacting an object in the environment. This impact should have an effect on the distance the vehicle would have traveled from trip point to final rest.

**Note:**

If the researcher determines that the rollover sequence was interrupted, an event and CDC should be assigned to the vehicle damage from the object which interrupted the roll.

**Yes**

is selected when the rollover sequence was interrupted.

**No**

is selected when the rollover sequence was not interrupted.

**Unknown**

is selected when it is unknown if the rollover sequence was interrupted.

**PRE ROLLOVER MANUEVER**

Page 1 of 2

Screen Name : Maneuver

*SAS Data Set:**SAS Variable:**Element Attributes:*

1	No rollover
2	Departing roadway (to paved surface)
3	Departed roadway (to non-paved surface)
4	Returning to roadway (from paved surface)
5	Returning to roadway (from non-paved surface)
6	On roadway maneuver
7	Off roadway maneuver
9999	Unknown

**Source:** Researcher determined — primary sources are the scene and vehicle inspections. Secondary sources are photographs, police report, driver interviews, and other interviewees.

**Remarks:**

Determine the last controlled maneuver, relative to the roadway, prior to the initiation of the rollover.

**No rollover**

No rollover occurred involving this vehicle.

**Departing roadway (to paved surface)**

Vehicle departs roadway to a paved shoulder, gore or other area as the last movement prior to the tripping point. This area is usually delineated by painted lines or ceramic dots.

**Departing roadway (to non-paved surface)**

Vehicle departs roadway to an unpaved shoulder or unimproved area as the last movement prior to the trip point.

**Returning to roadway (from paved surface)**

Vehicle returns to the roadway from a paved shoulder or other area as the last movement prior to the trip point. Painted lines or ceramic dots usually delineate this area.

Pre-rollover maneuver cont'd

Page 2 of 2

**Returning to roadway (from non-paved surface**

Vehicle returns to the roadway from an unpaved shoulder or other area as the last movement prior to the trip point.

**On Roadway maneuver**

The vehicle remained predominantly on the roadway and the trip point is on the roadway or immediately next to it.

**Off Roadway maneuver**

The vehicle departed the roadway completely. While off the roadway the vehicle began or completed a maneuver different than the one that took it off the roadway.

**Unknown**

The researcher is unable to determine the maneuvers or location of the vehicle just prior to the rollover initiation. This code should be used only in very rare instances.

## ROLLOVER INITIATION TYPE

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**Screen Name:** Rollover Initiation-Type

**SAS Data Set:** *GV*

**SAS Variable:** *ROLINTYP*

**Element Attributes:**

0	[No rollover (no overturning)]
1	Trip-over
2	Flip-over
3	Turn-over (justify)
4	Climb-over
5	Fall-over
6	Bounce-over
7	Collision with another vehicle
8	Other rollover initiation type (specify):
97	[Not a CDS Vehicle ]
98	[End-over-end]
99	Unknown

**Source:** Researcher determined — primary sources are the scene and vehicle inspections. Secondary sources are photographs, police report, driver interviews, and other interviewees.

**Remarks:**

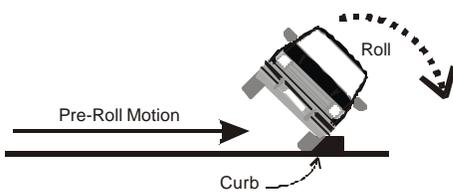
Various types of rollovers are identified above. A vehicle action that cannot be categorized under any of the above elements should be coded **Other rollover initiation type** and specified in the space provided. The attributes below are used for rollovers initiated about the longitudinal axis. Rollover 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**

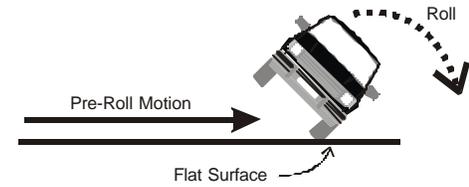
is selected when the vehicle's lateral motion is suddenly slowed or stopped, inducing a rollover. The opposing force may be produced by a curb, pot-holes, or pavement/soil dug into by a vehicle's wheels.

**Trip-Over:**  
The vehicle's lateral motion is resisted by opposing force, inducing roll moment.

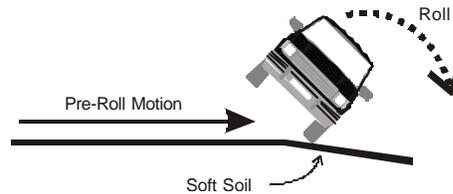
Example 1



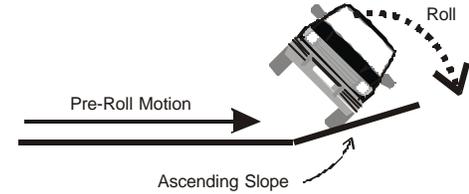
Example 2



Example 3



Example 4

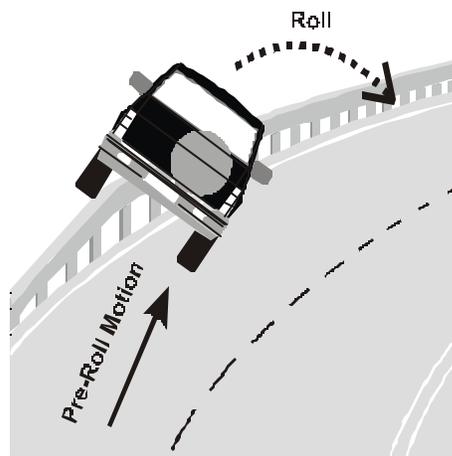


**Flip-Over**  
is selected when the vehicle is rotated about its longitudinal axis by a ramp-like object may be in a yaw when it comes in contact with the ramp-like object. For example, if the vehicle traveling forward climbs the down turned end of a guardrail and rolls over about its longitudinal axis,

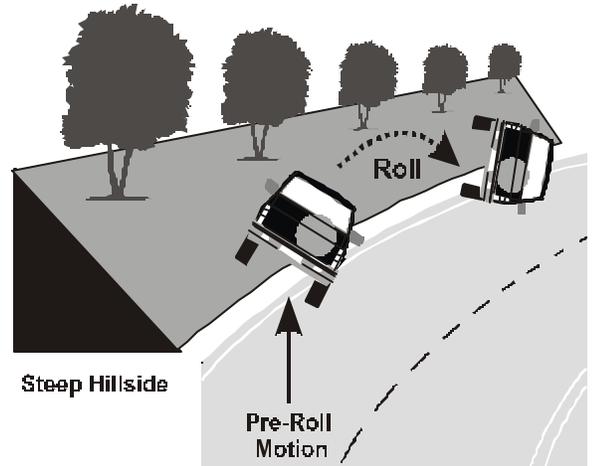
**Flip-Over**

Forward moving vehicle is vigorously rotated about its longitudinal axis by a ramp-like object such as a guardrail taper or ditch back slope.

Example 1



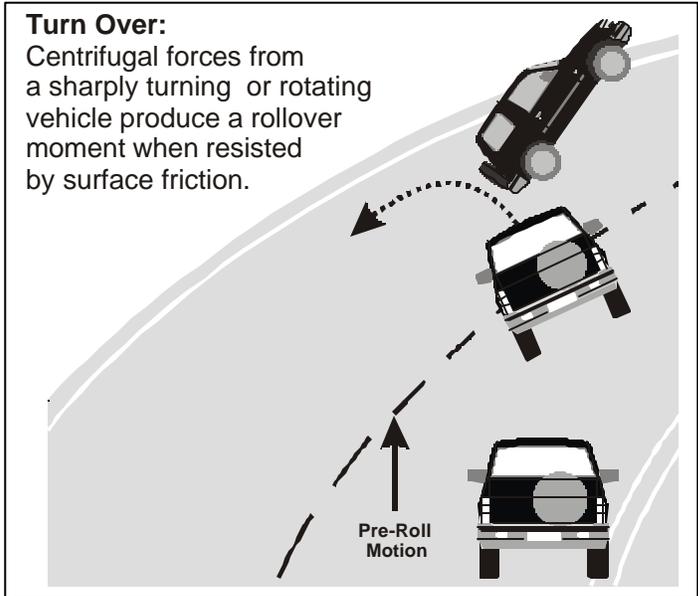
Example 2



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.

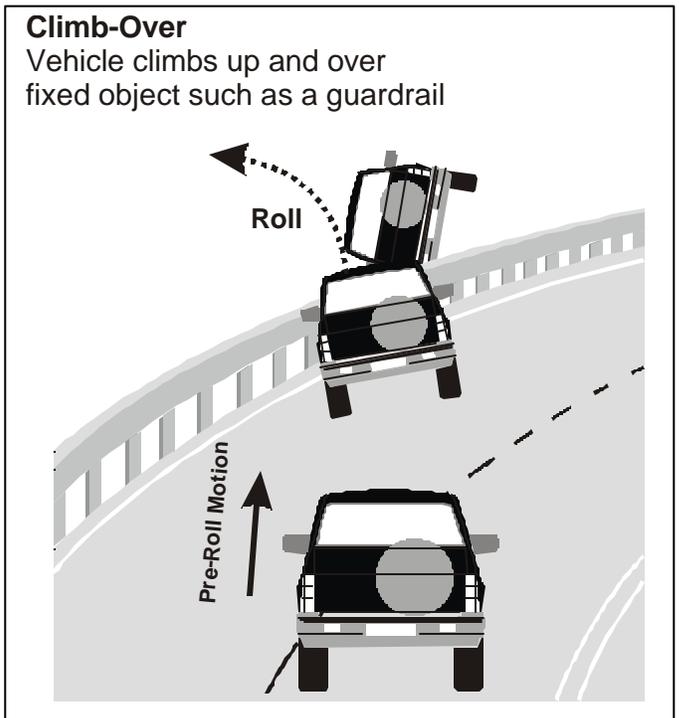
**Turn-Over**

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.



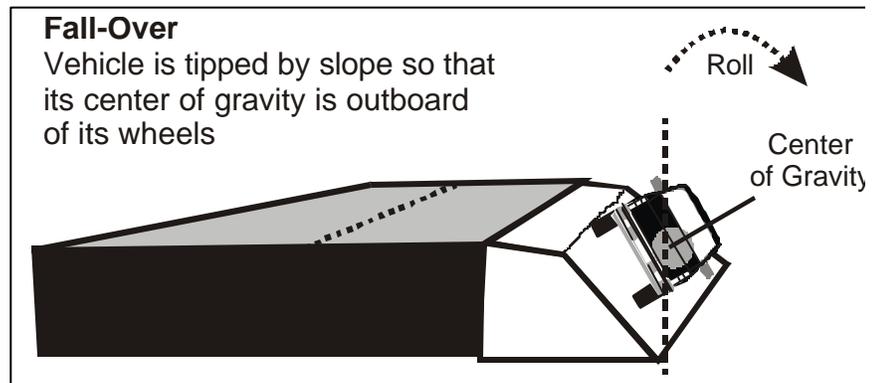
**Climb-Over**

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.

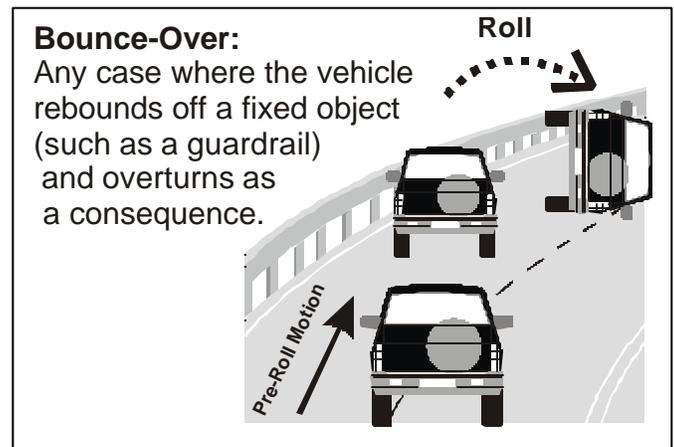


**Fall-Over**

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.

Rollover Initiation Type cont'd

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**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.

## LOCATION OF ROLLOVER INITIATION

Page 1 of 2

**Screen Name:** Rollover Initiation-Location

**SAS Data Set:** *GV*

**SAS Variable:** *ROLINLOC*

**Element Attributes:**

- 0 [No rollover (no overturning)]
- 1 On roadway
- 2 On shoulder — paved
- 3 On shoulder — unpaved
- 4 On roadside or divided trafficway median
- 7 [Not a CDS Vehicle]
- 8 [End-over-end]
- 9 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.

**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**.

**ROLLOVER INITIATION OBJECT CONTACTED CLASS**

**Screen Name:** Rollover Initiation--Object Contacted Class

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Vehicle  
Non-collision  
Collision with Fixed Object  
Nonbreakaway Pole or Post  
Collision with Nonfixed Object  
Other event  
Unknown Event or Object

**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 jackknife 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.,)

**ROLLOVER INITIATION OBJECT CONTACTED**

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**Screen Name:** Rollover Initiation--Object Contacted**SAS Data Set:** *GV***SAS Variable:** *ROLLOBJ***Element Attributes:**

[0 No rollover (no overturning)]

**Vehicle number (1-30)****Non-collision**

- 31 Turn-over — fall-over
- 32 No rollover impact initiation (end-over-end)
- 34 Jackknife

**Collision With Fixed Object**

- 41 Tree (<=10 centimeters in diameter)
- 42 Tree (> 10 centimeters in diameter)
- 43 Shrubbery or bush
- 44 Embankment
- 45 Breakaway pole or post (any diameter)

**Nonbreakaway Pole or Post**

- 50 Pole or post (<=10 centimeters in diameter)
- 51 Pole or post (> 10 centimeters but <= 30 centimeters diameter)
- 52 Pole or post (> 30 centimeters in diameter)
- 53 Pole or post (diameter unknown)
- 54 Concrete traffic barrier
- 55 Impact attenuator
- 56 Other traffic barrier (includes guardrail) (specify)
- 57 Fence

**Nonbreakaway Pole or Post cont'd**

- 58 Wall
- 59 Building
- 60 Ditch or culvert
- 61 Ground
- 62 Fire hydrant
- 63 Curb
- 64 Bridge
- 68 Other fixed object (specify):
- 69 Unknown fixed object

Rollover Initiation Object Contacted cont'd

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**Collision with Nonfixed Object**

- 70 Passenger car, light truck, van or other vehicle not in-transport
- 71 Medium/heavy truck or bus not in-transport
- 76 Animal
- 77 Train
- 78 Trailer, disconnected in transport
- 79 Object fell from vehicle in-transport
- 88 Other nonfixed object (specify):
- 89 Unknown nonfixed object

**Other Event**

- 98 Other event (specify)

**Unknown Event or Object**

- 99 Unknown event or object

**[97 Not a CDS Vehicle ]**

**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**.

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.

**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.*, 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.

**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.

**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.

**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.

## LOCATION ON VEHICLE WHERE INITIAL PRINCIPAL TRIPPING FORCE IS APPLIED

Page 1 of 2

**Screen Name:** Rollover Specifics -- Location on Vehicle Where Initial Principal Tripping Force is Applied

**SAS Data Set:** *GV*

**SAS Variable:** *TRIPLOC*

**Element Attributes:**

- 0 [No rollover (no overturning)]
- 1 Wheels/tires
- 2 Side plane
- 3 End plane
- 4 Undercarriage
- 5 Other location on vehicle (specify):
- 6 Non-contact rollover forces (specify):
- 7 [Not a CDS Vehicle ]
- 8 [End-over-end]
- 9 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

Location on Vehicle Where Initial Principal Tripping Force is Applied cont'd

Page 2 of 2

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.

**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.

**DIRECTION OF INITIAL ROLL**

**Screen Name:** Rollover Specifics--Direction of Initial Roll

**SAS Data Set:** *GV*

**SAS Variable:** *ROLINDIR*

**Element Attributes:**

- 0 [No rollover (no overturning)]
- 1 Roll right-primarily about the longitudinal axis
- 2 Roll left-primarily about the longitudinal axis
- 7 [Not a CDS Vehicle ]
- 8 [End-over-end]
- 9 Unknown roll direction

**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.

## ESTIMATED DISTANCE FROM TRIP POINT TO FINAL REST POSITION

Page 1 of 2

**Screen Name:** Estimated distance

**SAS Data Set:**

**SAS Variable:**

**Element Attributes:**

9 Enter to the nearest meter  
Unknown

**Source:** Vehicle inspection and scene inspection. A PAR can be a secondary source if a scaled reconstruction of the crash is documented.

**Remarks:**

The purpose of this variable is to determine the estimated distance from tripping point to the final rest position of the vehicle that rolled over. The measurement should be obtained along a linear path. Total distance in meters rounded to the nearest whole number, examples 41.4 m = 41 m or 41.5 m = 42 m

This measurement should be measured in the field along the path of the vehicle and the final rest measurement should be taken to the center of gravity (CG) of the vehicle at final rest.

In cases where an accurate estimate of the distance cannot be obtained, (i.e., vehicle rolled down a ravine or off a cliff) "Unknown" should be coded.

If a vehicle rolls and then slides to final rest, the entire distance from the point of trip to final rest will be measured.

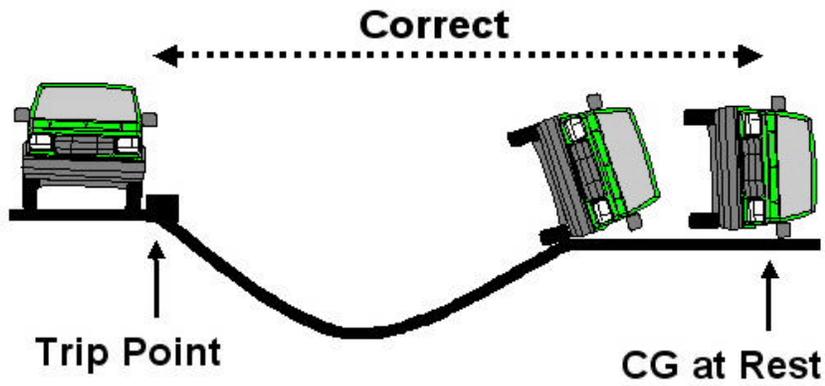
In the situation where the vehicle overturns and climbs a positive embankment and stops, then gravity causes the vehicle to slide or roll down the embankment, code only the distance traveled during the initial roll, (i.e., distance up the embankment.).

See example 1 and 2

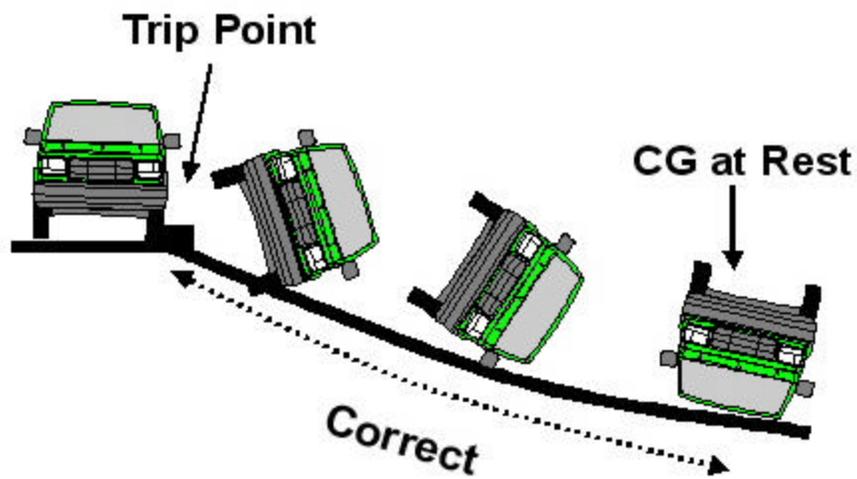
**Unknown**

is selected when the researcher could not determine the distance from tripping mechanism to final rest.

Example 1



Example 2



RECONSTRUCTION

General Vehicle Form, Case 2006-903-7025/ Vehicle #1

Vehicle | Specifications | Official Records | PreCrash | Driver | Rollover | Reconstruction | DeltaV | Log | Review

**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



**TYPE OF IMPACT FOR HIGHEST DELTA V**

**Screen Name:** Heading Angle at Impact for Highest Delta V--Impact Category

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

HEADING ANGLE FOR THIS VEHICLE

Screen Name: Heading Angle at Impact for Highest Delta V--Angle - This Vehicle

SAS Data Set: GV

SAS Variable: ANGTHIS

Element Attributes:

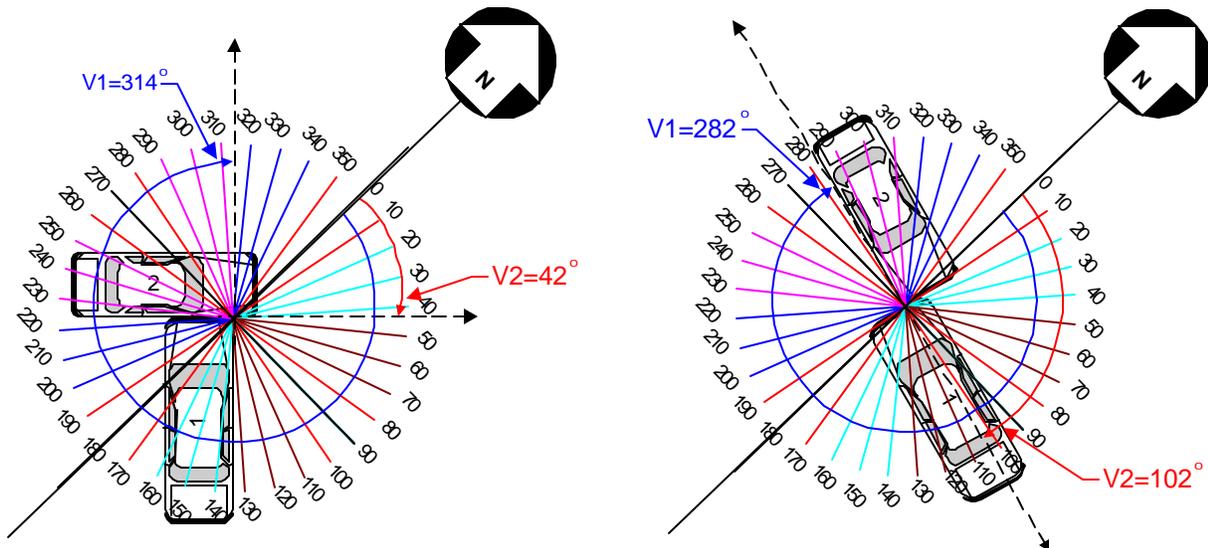
- 000-359 Code actual value
- 888 [Not a CDS Vehicle ]
- 996 [Non-horizontal impact]
- 997 [Non-collision]
- 998 [Impact with object]
- 999 [Unknown]

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- protractor and measuring in a clockwise direction from the north arrow. The north arrow always represents 0- (degrees). The angle is a positive value. The following diagrams exemplify the measurement technique.



**HEADING ANGLE FOR OTHER VEHICLE**

**Screen Name:** Heading Angle at Impact for Highest Delta V--Angle - Other Vehicle

**SAS Data Set:** *GV*

**SAS Variable:** *ANGOTHER*

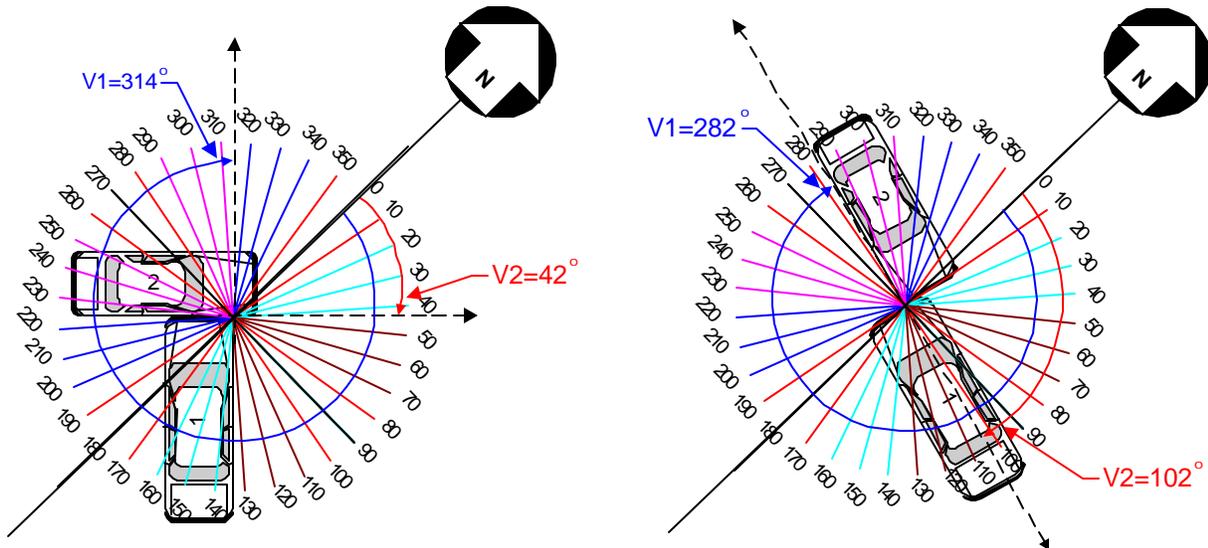
**Element Attributes:**

- 000-359 Code actual value
- 888 [Not a CDS Vehicle ]
- 996 [Non-horizontal impact]
- 997 [Non-collision]
- 998 [Impact with object]
- 999 [Unknown]

**Source:** Scene diagram.

**Remarks:**

Heading Angle for Other Vehicle, records the heading angle for the other vehicle's highest delta V when this impact was with another vehicle. Heading Angle for This 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 *the other 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- protractor and measuring in a clockwise direction from the north arrow. The north arrow always represents 0- (degrees). The angle is a positive value.



**TOWED TRAILING UNIT**

**Screen Name:** Reconstruction Data--Towed Trailing Unit

**SAS Data Set:** *GV*

**SAS Variable:** *TOWHITCH*

**Element Attributes:**

- 0 No towed unit
- 1 Yes — towed trailing unit
- 8 [Not a CDS Vehicle ]
- 9 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.

## DOCUMENTATION OF TRAJECTORY DATA

**Screen Name:** Reconstruction Data--Documentation of Trajectory Data

**SAS Data Set:** *GV*

**SAS Variable:** *DOCTRAJ*

**Element Attributes:**

0	No
1	Yes
8	[Not a CDS Vehicle ]

**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.

## POST COLLISION CONDITION OF TREE OR POLE

Page 1 of 2

**Screen Name:** Reconstruction Data--Post Collision Condition of Tree or Pole

**SAS Data Set:** *GV*

**SAS Variable:** *CONDTREE*

**Element Attributes:**

0	Not collision (for highest Delta V) with tree or pole
1	Not damaged
2	Cracked/sheared
3	Tilted < 45 degrees
4	Tilted $\geq$ 45 degrees
5	Uprooted tree
6	Breakaway pole separated from base
7	Pole replaced
8	Other (specify):
88	[Not a CDS Vehicle ]
99	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**).

**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**.

## DELTA V

The screenshot shows a software window titled "General Vehicle Form, Case 2006-903-70257 Vehicle #1". The window has a menu bar with options: Vehicle, Specifications, Official Reports, PreCrash, Driver, Rollover, Reconstruction, Detail, Log, and Review. The main content area is divided into several sections:

- HIGHEST SEVERITY IMPACT**: Includes a dropdown menu for "Event Number".
- Basic for DeltaV**: A dropdown menu.
- Computer Generated Delta V**: A section with a "kmph" label. It contains:
  - Total: Input field with "kmph" dropdown.
  - Longitudinal: Input field with "kmph" dropdown.
  - Lateral: Input field with "kmph" dropdown.
  - Confidence Level: Dropdown menu.
  - Barrier Equivalent Speed: Input field with "kmph" dropdown.
  - Energy Absorption: Input field with "joules" label.
  - Impact Speed: Input field with "kmph" dropdown.
- Estimated Delta V**: A dropdown menu with "Researcher Determined" selected.

At the bottom right of the window, there is a "Save" button with a green checkmark icon and a small printer icon.

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.

**EVENT NUMBER FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact--Event Number

**SAS Data Set:** *GV*

**SAS Variable:** *ACCSEQDV*

**Element Attributes:**

	Code sequence number
88	[Not a CDS Vehicle ]
99	Unknown event

**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.

**BASIS FOR COMPUTER GENERATED DELTA V FOR HIGHEST SEVERITY IMPACT**

Page 1 of 2

**Screen Name:** Highest Severity Impact--Basis for Delta V**SAS Data Set:** *GV***SAS Variable:** *HDVBASIS***Element Attributes:****When no Vehicle Inspection is completed:**

- 0 Not Inspected
- 3 WinSMASH Missing Vehicle

**When vehicle is inspected:****Delta V Calculated:**

- 1 [WinSMASH - Damage and trajectory]
- 2 [WinSMASH - Damage only]
- 3 WinSMASH - Missing vehicle
- 4 [WinSMASH - Damage with CDC only]

**Delta V Not Calculated**

- 5 At least one vehicle is beyond scope of WinSMASH
- 6 Rollover
- 7 Other non-horizontal forces
- 8 Sideswipe type damage
- 9 Severe override
- 10 Yielding object
- 11 Overlapping damage
- 12 Insufficient data (specify):
- 88 [Not a CDS Vehicle ]
- 98 Other
- 99 Unknown

**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).

Basis for Computer Generated Delta V for Highest Severity Impact cont'd

Page 2 of 2

**No Vehicle Inspection:****Not Inspected**

means that this vehicle has no delta V data due to the vehicle not being inspected AND the 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.

**TOTAL DELTA V FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact Computer Generated Delta V--Total

**SAS Data Set:** *GV*

**SAS Variable:** *HDVTOTAL*

**Element Attributes:**

**Range:** Nearest kmph  
[888] – Not a CDS vehicle  
[999] - Unknown

**Source:** Researcher determined -- Entered from WinSMASH program if the vehicle is not inspected. If inspected, data is rolled-up from Vehicle Exterior Form/CDC,

**Range:** 1-160, 888, 999

**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.

**LONGITUDINAL DELTA V FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact Computer Generated Delta V--  
Longitudinal Component

**SAS Data Set:** *GV*

**SAS Variable:** *HDVLONG*

**Element Attributes:****Range:**

Nearest KMPH  
888 [Not a CDS Vehicle]  
999 Unknown

**Source:** Researcher determined -- Entered from the WinSMASH program if the vehicle is not inspected. If inspected, the data is rolled-up from Vehicle Exterior Form/CDC

**Range:** -160-160, 888, 999

**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.

**LATERAL DELTA V FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact Computer Generated Delta V--Lateral Component

**SAS Data Set:** *GV*

**SAS Variable:** *HDVLAT*

**Element Attributes:****Range:**

Nearest kmph  
888 [Not a CDS Vehicle]  
999 Unknown

**Source:** Researcher determined -- Entered from WinSMASH program if vehicle not inspected; If inspected, Rolled-up from Vehicle Exterior Form/CDC

**Range:** -160-160, 888, 999

**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.

**ENERGY ABSORPTION FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact Computer Generated Delta V--Energy Absorption

**SAS Data Set:** *GV*

**SAS Variable:** *HENERGY*

**Element Attributes:**

	Nearest joule
8888888	[Not a CDS Vehicle ]
9999999	Unknown

**Source:** Researcher determined -- Entered from the WinSMASH program if the vehicle is not inspected. If inspected the data is rolled-up from Vehicle Exterior Form/CDC

**Range:** 40-1000000, 8888888, 9999999

**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.

**9999999**

is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

**IMPACT SPEED FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Highest Severity Impact Computer Generated Delta V—Impact Speed

**SAS Data Set:** *GV*

**SAS Variable:** *HIMPCTSP*

**Element Attributes:****Range:**

Nearest kmph  
998 Damage and Trajectory run not made  
888 [Not a CDS Vehicle ]  
999 Unknown

**Source:** Researcher determined -- Rolled-up from Vehicle Exterior Form/CDC

**Range:** 1-160, 888, 998, 999

**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 the WinSMASH program.

**999**

is rolled-up from the Vehicle Exterior Form/CDC when the results for this impact are unobtainable.

**CONFIDENCE LEVEL FOR HIGHEST SEVERITY IMPACT**

Page 1 of 2

**Screen Name:** Highest Severity Impact Computer Generated Delta V--Confidence Level

**SAS Data Set:** *GV*

**SAS Variable:** *DVCONFID*

**Element Attributes:**

0	No reconstruction
1	Collision fits model — results appear reasonable
2	Collision fits model — results appear high
3	Collision fits model — results appear low
4	Borderline reconstruction — results appear reasonable
8	[Not a CDS Vehicle ]

**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.

Confidence Level for Highest Severity Impact cont'd

Page 2 of 2

**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.

**BARRIER EQUIVALENT SPEED FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Barrier Equivalent Speed

**SAS Data Set:** *GV*

**SAS Variable:** *HBAREQSP*

**Element Attributes:**

	Nearest kmph
888	[Not a CDS Vehicle]
999	Unknown

**Source:** WinSMASH program.

**Range:** 1-160, 888, 999

**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.

**ESTIMATED SEVERITY FOR HIGHEST SEVERITY IMPACT**

**Screen Name:** Estimated Highest Delta V--Researcher Determined

**SAS Data Set:** *GV*

**SAS Variable:** *HDVEST*

**Element Attributes:**

0 Reconstruction delta V coded

**Estimated Delta V**

1 Less than 10 kmph  
2 Delta V  $\geq$  10 kmph < 25 kmph  
3 Delta V  $\geq$  25 kmph < 40 kmph  
4 Delta V  $\geq$  40 kmph < 55 kmph  
5 Delta V  $\geq$  55 kmph

**Other estimates of damage severities**

6 Minor  
7 Moderate  
8 Severe  
88 [Not a CDS Vehicle ]  
99 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 Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

**Identification**

Number: 1      Identification Number: 1G5J7H1C4W

Model Year: 1998      Vehicle Special Use: No Special Use

Make: TOYOTA      In Transport:

Model: SIENNA

Body Category: Van Based Light Trucks (<= 4,536 kgs GVWR)

Body Type: Minivan

Class: Minivan (<= 4,536 kgs GVWR)

**Weight**

Curb Weight: 2100 Kgs

Source: [Dropdown]

Cargo Weight: [Input] Kgs

Source: [Dropdown]

**Inspection**

Complete Inspection [Dropdown]

Date: 06/01/2000 [Calendar Icon]

Save      Close

**VEHICLE NUMBER**

**Screen Name:** Number

**SAS Data Set:** *ALL (except ACCIDENT, ACCDESC, EVENT, ACCDER, EMS, SPECSTDY)*

**SAS Variable:** *VEHNO*

**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.

**VEHICLE MODEL YEAR**

**Screen Name:** Identification--Model Year

**SAS Data Set:** *GV*

**SAS Variable:** *MODELYR*

**Element Attributes:**

1900 - current data collection year plus one  
9999 - Unknown

**Range:** 1900 (current year+1)

**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.

**VEHICLE MAKE**

**Screen Name:** Identification--Make

**SAS Data Set:** *GV*

**SAS Variable:** *MAKE (for SAS code); OMAKE (for Oracle code)*

**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.

See appendix for list of makes.

**VEHICLE MODEL**

**Screen Name:** Identification—Model

**SAS Data Set:** *GV*

**SAS Variable:** *MODEL (for SAS code); OMODEL (for Oracle code)*

**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.

See appendix for list of Models

**VEHICLE BODY CATEGORY**

Page 1 of 2

**Screen Name:** Body Category**SAS Data Set:** N/A**SAS Variable:** N/A**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  
Unknown Body Type

**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.

**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.

**BODY TYPE**

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**Screen Name:** Body Type**SAS Data Set:** *GV***SAS Variable:** *BODYTYPE***Element Attributes:****CDS APPLICABLE VEHICLES****Automobiles**

- 01 Convertible (excludes sun-roof, t-bar)
- 02 2-door sedan, hardtop, coupe
- 03 3-door/2-door hatchback
- 17 3-door coupe
- 04 4-door sedan, hardtop
- 05 5-door/4-door hatchback
- 06 Station wagon (excluding van and truck based)
- 07 Hatchback, number of doors unknown
- 08 Other automobile type (specify):
- 09 Unknown automobile type

**Automobile Derivatives**

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

**Utility Vehicles (<=4,536 kgs GVWR)**

- 14 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)
- 15 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)
- 16 Utility station wagon (examples include: Chevrolet Suburban, Expedition, Excursion, GMC Suburban, Grand Wagoneer includes suburban limousine, Travelall)
- 19 Utility, unknown body type

Body Type (cont'd)

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- Van Based Light Trucks (<=4,536 kgs GVWR)**
- 20 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)
  - 21 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].)
  - 22 Step van or walk-in van (<=4,536 kgs GVWR)
  - 23 Van based motorhome (<=4,536 kgs GVWR)
  - 24 Van based school bus (<=4,536 kgs GVWR)
  - 25 Van based other bus (<=4,536 kgs GVWR)
  - 28 Other van type (Hi-Cube Van, Kary) (specify):
  - 29 Unknown van type
- Light Conventional Trucks (Pickup style cab, <=4,536 kgs GVWR)**
- 30 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)
  - 31 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)
  - 32 Pickup with slide-in camper
  - 33 Convertible pickup
  - 39 Unknown pickup style light conventional truck type
- Other Light Trucks (<=4,536 kgs GVWR)**
- 40 Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
  - 41 Truck based panel
  - 42 Light truck based motorhome (chassis mounted)
  - 45 Other light conventional truck type
  - 48 Unknown light truck type
  - 49 Unknown light vehicle type (automobile, utility, van, or light truck)

Body Type (cont'd)

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**OTHER VEHICLES****Buses (Excludes Van Based)**

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

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

- 60 Step van (> 4,536 kgs GVWR)
- 61 Single unit straight truck (4,536 kgs <GVWR<=8,845 kgs)
- 62 Single unit straight truck (8,8845 kgs <GVWR<=11,793 kgs)
- 63 Single unit straight truck (> 11,793 kgs GVWR)
- 64 Single unit straight truck, GVWR unknown
- 65 Medium/heavy truck based motorhome
- 67 Truck-tractor with no cargo trailer
- 68 Truck-tractor pulling one trailer
- 69 Truck-tractor pulling two or more trailers
- 70 Truck-tractor (unknown if pulling trailer)
- 74 Medium/Heavy pickup truck (= 4,536 kgs GVWR)
- 78 Unknown medium/heavy truck type

**Unknown truck type (light / medium / heavy)**

- 79 Unknown truck type (light / medium / heavy)

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

- 80 Motorcycle
- 81 Moped (motorized bicycle)
- 82 Three-wheel motorcycle or moped
- 88 Other motored cycle (minibike, motor scooter) (specify):
- 89 Unknown motored cycle type

**Other Vehicles**

- 90 ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- 91 Snowmobile
- 92 Farm equipment other than trucks
- 93 Construction equipment other than trucks
- 97 Other vehicle type

**Unknown Vehicle Type**

- 99 Unknown body type

Body Type (cont'd)

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**Source:** Vehicle inspection, police report, and interview

**Remarks:**

**Automobiles**

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

**01 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.

**02 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.

**03 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.

**17 3-door 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.

**04 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.

**05 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.

**06 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).

Body Type (cont'd)

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**07 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.

**08 Other automobile type**

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

**09 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.

**10 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.

**11 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).

**12 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 .

**13 Three-wheel automobile or automobile derivative**

refers to three-wheel vehicles with an enclosed passenger compartment.

**Utility Vehicles (<=4,536 kgs GVWR)****also referred to as:**

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.

**14 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,

Body Type cont'd

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RAV4, RX-300, Renegade, Rocky, Rodeo, S-10 Blazer, S-15 Jimmy, Samurai, Scrambler, Sidekick, Sportage, Thing, Trooper, Trooper II, Wrangler, Xterra, X-90).

**15 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).

**16 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.

**20 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).

**21 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.

**22 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.

Body Type (cont'd)

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**23 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.

**24 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.

**25 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.

**28 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.

**29 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.

**30 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).

**31 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).

**32 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.

**33 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.

**39 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.

**40 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.

**41 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.

**42 Light truck based motorhome (chassis mounted)**

is used to describe a frame mounted recreational unit attached to a light van or conventional chassis.

**45 Other light conventional truck type**

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

**48 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.

**49 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.

Body Type (cont'd)

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**Buses (Excludes Van Based)**

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

**50 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.

**58 Other bus type**

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

**59 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.

**60 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.

**61 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.

**62 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.

**63 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

Body Type (cont'd)

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truck is greater than 4,536 kilograms but there is insufficient data to specify the type of single unit truck.

**64 Single unit straight truck, GVWR unknown**

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

**65 Medium/heavy truck based motorhome**

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

**67 Truck-tractor with no cargo trailer**

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

**68 Truck-tractor pulling one trailer**

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

**69 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).

**70 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.

**74 Medium/Heavy pickup truck (= 4,536 kgs GVWR)****78 Unknown medium/heavy truck type**

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

**79 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.

Motorcycles (Does Not Include All Terrain Vehicles/Cycles)

**80 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.

Body Type (cont'd)

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**81 Moped (motorized bicycle)**

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

**82 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.

**88 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).

**89 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.

**90 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).

**91 Snowmobile**

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

**92 Farm equipment other than trucks**

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

**93 Construction equipment other than trucks**

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

**97 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.).

Body Type (cont'd)

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**Unknown Vehicle Type**

Unknown Vehicle Type describes all motored vehicles where the body type cannot be differentiated among a light vehicle type, bus, medium/heavy truck, motored cycle, or any other motored vehicle type.

**99 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.

**CLASS OF VEHICLE**

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**Screen Name:** Class of Vehicle**SAS Data Set:** N/A**SAS Variable:** N/A**Element Attributes:**

- 1 Subcompact/mini (wheelbase < 254 cm)
- 2 Compact (wheelbase ≥ 254 but < 265 cm)
- 3 Intermediate (wheelbase ≥ 265 but < 278 cm)
- 4 Full size (wheelbase ≥ 278 but < 291 cm)
- 5 Largest (wheelbase ≥ 291 cm)
- 9 Unknown passenger car size
- 14 Compact utility vehicle
- 15 Large utility vehicle (≤ 4,536 kgs GVWR)
- 16 Utility station wagon (≤ 4,536 kgs GVWR)
- 19 Unknown utility type
- 20 Minivan (≤ 4,536 kgs GVWR)
- 21 Large van (≤ 4,536 kgs GVWR)
- 24 Van based school bus ( ≤ 4,536 kgs GVWR)
- 28 Other van type (≤ 4,536 kgs GVWR)
- 29 Unknown van type ( ≤ 4,536 kgs GVWR)
- 30 Compact pickup truck (≤ 4,536 kgs GVWR)
- 31 Large pickup truck (≤ 4,536 kgs GVWR)
- 38 Other pickup truck (≤ 4,536 kgs GVWR)
- 39 Unknown pickup truck type ( ≤ 4,536 kgs GVWR)
- 45 Other light truck (≤ 4,536 kgs GVWR)
- 48 Unknown light truck type ( ≤ 4,536 kgs GVWR)
- 49 Unknown light vehicle type
- 50 School bus (excludes van based) (> 4,536 kgs GVWR)
- 58 Other bus (> 4,536 kgs GVWR)
- 59 Unknown bus type
- 60 Truck (> 4,536 kgs GVWR)
- 67 Tractor without trailer
- 68 Tractor - trailer(s)
- 78 Unknown medium/heavy truck type
- 79 Unknown light/medium/heavy truck type
- 80 Motored cycle
- 90 Other vehicle
- 99 Unknown

Class of vehicle (cont'd)

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

**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  $\geq$  254 but < 265 cm)**

Choose based upon wheelbase.

**Intermediate (wheelbase  $\geq$  265 but < 278 cm)**

Choose based upon wheelbase.

**Full size (wheelbase  $\geq$  278 but < 291 cm)**

Choose based upon wheelbase.

**Largest (wheelbase  $\geq$  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 ( $\leq$  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 ( $\leq$  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.

**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.

Class of vehicle (cont'd)

Page 4 of 5

**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.

**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.

Class of vehicle (cont'd)

Page 5 of 5

**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.

**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**.

**VEHICLE IDENTIFICATION NUMBER (VIN)**

**Screen Name:** Identification--Identification Number

**SAS Data Set:** *GV*

**SAS Variable:** *VIN*

**Element Attributes:**

00000000000000000000 VIN not required on vehicle  
 Enter the entire or partial VIN, left justify

99999999999999999999 Unknown

**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.*

**00000000000000000000**

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

**99999999999999999999**

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.

Vehicle identification number cont'd

Page 2 of 2

**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

## VEHICLE SPECIAL USE

Page 1 of 3

**Screen Name:** Vehicle Special Use

**SAS Data Set:** *GV*

**SAS Variable:** *VEHUSE*

**Element Attribute:**

0	No special use
1	Taxi
2	Vehicle used as school bus
3	Vehicle used as other bus
4	Military
5	Police
6	Ambulance
7	Fire truck or car
9	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.

**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).

**IN TRANSPORT**

**Screen Name:** Is the vehicle in-transport?

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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**.

**CURB WEIGHT**

**Screen Name:** Weight--Curb Weight

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBWGT*

**Element Attributes:**

999999 Curb weight of vehicle (kgs)  
Unknown

**Range:** 450 – 100,000

**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 100 lbs/45 kilograms; 6 cyl. to 4 cyl. - subtract 75 lbs/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.

**SOURCE OF CURB WEIGHT INFORMATION**

**Screen Name:** Curb Weight Source

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBSRC*

**Element Attributes:**

- 0 [Curb weight unknown]
- 1 AAMA
- 2 Automotive News
- 3 Branham Automobile Reference Book
- 4 Gasoline Truck, Import, Truck and Diesel Truck Index
- 5 Canadian Specifications
- 8 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

Source of Curb Weight Information (cont'd)

Page 2 of 2

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

If no 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.

**CARGO WEIGHT**

**Screen Name:** Weight--Cargo Weight

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CARGOWGT*

**Element Attributes:**

                    Cargo weight of vehicle (kgs)  
9999            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.

**SOURCE OF CARGO WEIGHT INFORMATION**

**Screen Name:** Weight--Cargo Weight Source

**SAS Data Set:** *GV*

**SAS Variable:** *CARGOWGT*

**Element Attributes:**

- 0 [Cargo weight unknown]
- 1 Vehicle Inspection
- 2 Interview
- 3 PAR
- 4 Tow Yard Operator
- 8 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.

**INSPECTION TYPE**

**Screen Name:** Inspection - Type of Inspection

**SAS Data Set:** *GV*

**SAS Variable:** *INSPTYPE*

**Element Attributes:**

0	No inspection
1	Vehicle fully repaired — no damage evident
2	Partial inspection-Non tow
3	Partial inspection other (specify)
4	Complete inspection
8	Non CDS vehicle

**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 Other (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.

**DATE OF INSPECTION**

**Screen Name:** Inspection-Date of Inspection

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**[TIRE TO INSPECTION INTERVAL]**

**Screen Name:** Inspection Interval

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**  
Number of days

**Source:** Calculated field.

This variable is designed to calculate the number of days from crash date to vehicle inspection date.

TIRES GENERAL

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

General | Tires

Transmission  
Type Of Transmission: Manual | Drive Wheels: Front Wheel Drive (FWD)

Total GVWR: 2100 kgs | Gross Axle Weight Rating (GAWR): Front 2500 kgs | Rear 2500 kgs

Recommended - (pressure in kiloPascals)

	Size	Cold Pressure
Front	Light Truck High Flotation (specify)   31X12.32P65LT	Unknown kPa
Rear	Light Truck Metric (specify)   LT656/54L65	Unknown kPa

Save | Close

**TYPE OF TRANSMISSION**

**Screen Name:** Type of Transmission

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *TRANS*

**Element Attributes:**

1	Manual
2	Automatic
9	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.

**DRIVE WHEELS**

**Screen Name:** Drive Wheels

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *DRIVE*

**Element Attributes:**

- |   |                   |
|---|-------------------|
| 1 | Front Wheel Drive |
| 2 | Rear Wheel Drive  |
| 3 | Four Wheel Drive  |
| 4 | All Wheel Drive   |
| 9 | 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**

In a front-wheel drive vehicle, power from the engine is transferred to the front tires.

**Rear Wheel Drive**

In a rear-wheel drive vehicle, power from the engine is transferred to the rear tires.

**4 Wheel Drive**

In a four-wheel drive vehicle, power is delivered to all four wheels only when the driver requests it.

**All Wheel Drive**

In an all-wheel drive vehicle, power is distributed to all four of the vehicle's tires, all of the time.

**Unknown**

Use this when it cannot be determined what type of drive wheels power the vehicle.

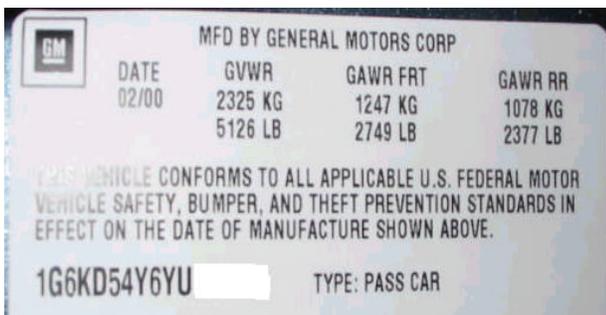
**TOTAL GROSS VEHICLE WEIGHT RATING (KGS)****Screen Name:** Total GVWR (kgs)**SAS Data Set:** *VEHSPEC***SAS Variable:** *GVWR***Element Attributes:**

Indicate the total GVWR as indicated on the tire or other placard.  
9999 Unknown

**Source:** Vehicle inspection/placard**Remarks:**

The Gross Vehicle Weight Rating (GVWR) is the maximum permissible total weight of the unit, including the vehicle itself plus all fluids, optional equipment, accessories, all cargo, driver and passengers.

Take a photo of the placard and categorize it in the **vehicle identification category**.



**FRONT GROSS AXLE WEIGHT RATING (KGS)**

**Screen Name:** Gross Axle Weight Rating Front (kgs)

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *FGAWR*

**Element Attributes:**

Indicate the front GAWR as indicated on the tire or other placard.  
9999 Unknown

**Source:** Vehicle inspection

**Range:** 454-2750, 9999

**Remarks:**

The Front Gross Axle Weight Rating (GAWR) is the maximum weight that the front axle, suspension and tire system is designed to carry.

If the placard only indicates the front GVWR instead, enter that information and annotate the entry.

**REAR GROSS AXLE WEIGHT RATING (KGS)**

**Screen Name:** Gross Axle Weight Rating Rear (kgs)

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *RGAWR*

**Element Attributes:**

Indicate the rear GAWR as indicated on the tire placard.  
9999 Unknown

**Source:** Vehicle inspection

**Range:** 454-3742, 9999

**Remarks:**

The Rear Gross Axle Weight Rating (GAWR) is the maximum weight that the rear axle, suspension and tire system is designed to carry.

If the placard only indicates the rear GVWR instead, enter that information and annotate the entry.

**MANUFACTURER'S RECOMMENDED FRONT/REAR TIRE SIZE**

**Screen Name:** Recommended Front/Rear Size

**SAS Data Set:** *TIRE*

**SAS Variable:** *RECTIRE1, RECTIRE2, RECTIRE3*

**Element Attributes:**

- 1 P-Metric (specify)
- 2 Light Truck Metric (specify)
- 3 Light Truck High Flotation (specify)
- 4 Light Truck Numeric (specify)
- 7 No recommendation
- 8 Other (specify)
- 9 Unknown

**Source:** Vehicle inspection from placard on vehicle

**Remarks:**

**MANUFACTURER’S RECOMMENDED FRONT/REAR TIRE SIZE**

**Screen Name:** Recommended Front/Rear Size

**SAS Data Set:** *TIRE*

**SAS Variable:** *RECSIZE1, RECSIZE2, RECSIZE3*

**Element Attributes:**

- P-Metric P n n n / n n n n
- P-Metric (specify)
- Light Truck Metric (specify)
- Light Truck High Flotation (specify)
- Light Truck Numeric (specify)
- Other (specify)
- 999 Unknown
- 9997 No Additional Recommendation

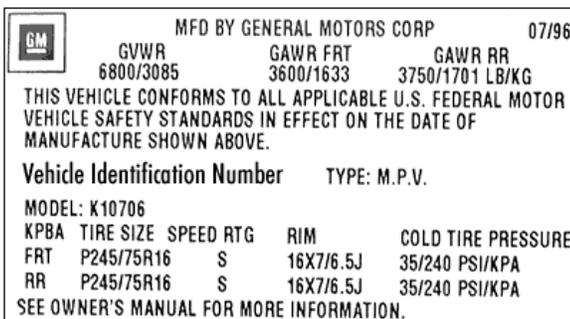
**Source:** Vehicle inspection from placard on vehicle

**Range:** 69-552, 997,999

**Remarks:**

The tire placard may be found in any number of places: B pillar, door, glove compartment door, center console door, trunk lid, etc.

Placards may list more than one tire size for a vehicle. Take a photo of the placard and categorize it in the vehicle identification category.



If a character cannot be read then leave a blank space where the character belongs.

**a**=alpha value to enter      **n**=numeric value to enter  
**P**=P-Metric tire *precoded*      **LT**=Light Truck designation *precoded*  
**Blanks permitted at any location**

**EXTERIOR VEHICLE FORM**

**TIRE/GENERAL**

Manufacturer's Recommended Tire Size Front/Rear (cont'd)

Page 2 of 2

P-Metric                    P          /            

P215/65R15, P215/65R15

P= Passenger Car Tire

215= Section Width in Millimeters

65= Aspect Ratio

R= Radial Construction

15= Rim Diameter in Inches

Light Truck Metric            L T          /            

LT235/75R15

LT= Light Truck Tire

235= Section Width in Millimeters

75= Aspect Ratio

R= Radial Construction

15= Rim Diameter in Inches

Light Truck High Flotation          X       .                L T

31X10.50R15LT

31= Tire Diameter in Inches

10.50= Section Width in Millimeters

R= Radial Construction

LT= Light Truck Tire

15= Rim Diameter in Inches

Light Truck Numeric               .                .    L T

8.75R16.5LT

8.75=Section Width in Inches

R=Radial Construction

16.5=Rim Diameter in Inches

LT=Light Truck Designation

**MANUFACTURER RECOMMENDED TIRE PRESSURE – COLD – FRONT/REAR (KILOPASCALS)**

**Screen Name:** Recommended (pressure in kilopascals) Front/Rear Cold Pressure

**SAS Data Set:** *TIRE*

**SAS Variable:** *RECPRES1, RECPRES2, RECPRES3*

**Element Attributes:**

Indicate the recommended cold tire pressure for the front/rear tires  
Entry defaults to psi, but may also be entered in kPa  
997 No recommendation  
999 Unknown

**Source:** Vehicle inspection

**Range:** 69-552, 997, 999

**Remarks:**

Enter recommended pressure in psi / kPa (program automatically converts psi to kPa).

If the tire placard or owner’s manual doesn’t specify whether the recommended tire pressure is a hot or cold pressure, assume that it is a cold pressure.

TIRE/TIRES/LIST

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

General | Tires

List | Detail

Location	Manufacturer	Model	Size	Max Pres	Meas Press	Depth (mm)
LF (Left Front)	AKURET	Other (specify)	P155/15Q44	Jkknown	Unknown	Unknown
LR (Left Rear)	AKURET	Other (specify)	P155/15Q44	Jkknown		
RR (Right Rear)	AKURET	Other (specify)	P155/15Q44	Jkknown		
RF (Right Front)	AKURET	Other (specify)	P155/15Q44	Jkknown		

Save Close

TIRE/TIRES/DETAIL

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

General | Tires

List | Detail

Location: LF (Left Front)

Manufacturer: AKURET

Model: Other (specify)

Size: P-Metric (specify)  
P155/15Q44

Max Pressure: Unknown kPa

Tread Depth: Unknown mm

Meas. Pressure: Unknown kPa

Restricted: Yes

<< Front >>

Tire Damage

Right Mouse Click on Check Box to View Specify

None
  Tire puncture in tread
  Sidewall Separation
  Tire rotted
  Unknown

Tread Separation
  Tire puncture in sidewall
  Tire cut/torn
  Other (specify)

Save Close

**TIRE LOCATION**

**Screen Name:** Location

**SAS Data Set:** *TIRE*

**SAS Variable:** *TLOC*

**Element Attributes:**

- 1 RF (Right Front)
- 2 LF (Left Front)
- 3 RR (Right Rear)
- 4 LR (Rear)

**Source:** Vehicle inspection

**Remarks:**

Enter the location of the tire being examined. If there are double tires on a vehicle, only record information on the outer tires.

**TIRE MANUFACTURER**

Page 1 of 3

**Screen Name:** Manufacturer**SAS Data Set:** *TIRE***SAS Variable:** *TMAKE***Element Attributes:**

1-181	(see list)
887	Tire missing
888	Other make (specify)
999	Unknown

**Source:** Vehicle inspection**Range:** 1-181, 887, 888,999**Remarks:**

Choose the manufacturer from drop down list. The name of the manufacturer maybe found on the sidewall of the tire. If it cannot be read then indicate "Unknown".

If the tire is missing and cannot be examined then indicate "Tire missing". If the wheel hub is resting on the tire or the tire can be found elsewhere (i.e., in the bed of a pickup) and it can be ascertained that this is the "missing" tire for the vehicle, then indicate the appropriate information about the tire.

Manufacturers that are presently in the database can be found on the next page.

**EXTERIOR VEHICLE FORM****TIRE/TIRES/DETAIL**

Tire manufacturer cont'd

Page 2 of 3

AKURET	1	DUNLOP	46	M&H	90
ALLEGIANCE IV	177	DURALON	47	MABOR	91
AMERICAN	2	DYNASTAR	48	MARSHAL	92
AMERICAN RADIAL	3	ELDORADO	49	MASTERCRAFT	93
APACHE	4	ELECTRA	50	MAXXIS	94
ARIZONIAN	5	EMBASSY	51	MEDALIST	95
ARMSTRONG	6	ESCORT	52	MENTOR	96
ASTRO	7	EUROTECH	53	MERIT	97
ATLAS	8	EXXON	54	MICHELIN	98
AURORA	9	FALKEN	55	MICKEY THOMPSON	99
AVON	10	FEDERAL	56	MILLER	100
BARUM	11	FIRESTONE	57	MITAS	101
BFGOODRICH	12	FISK	58	MODI	102
BIG O	13	FORMULA	59	MOHAWK	103
BILT-MOR	14	FRONTIER	60	MONARCH	104
BRADLEY	15	FULDA	61	MONTGOMERY WARD	105
BRIDGESTONE	16	FUTURA	62	MRF	106
BRIGADIER	17	GENERAL	63	MULTI-MILE	107
BRUNSWICK	18	GILLETE	64	NANKANG/BRADLEY	108
CARQUEST	19	GISLAVED	65	NATIONAL	109
CASCADE	20	GOODRICH	66	NITTO	110
CAVALIER	21	GOODYEAR	67	NOKIAN	111
CEAT	22	GT TIRE	68	NTB	112
CENTENNIAL	23	GT TIRE US	69	OHTSU	113
CHENG SHIN	24	GUARDIAN	70	PACEMARK	114
CONCORDE	25	GUARDSMAN	71	PANTHER	115
CONTENTAL/TAG	26	HALLMARK	72	PARKWAY	116
CONTINENTAL	27	HANKOOK	73	PARNELLI	117
CO-OP	28	HERCULES	74	PATHFINDER	181
COOPER	29	HIGH COUNTRY	75	PATRIOT	118
COOPER-EXPORT	30	HOOD	76	PEERLESS	119
CORDOVAN	31	HOOSIER	77	PENSKE	120
CORNELL	32	JETZON	78	PHILLIPS	121
COSMO	33	JUPITER	79	PIRELLI	122
CRESTWOOD	34	KELLY	80	POLARIS	123
CROWN	35	KELLY-SPRINGFIELD	81	POS-A-TRAC	124
DANZIG	36	KINGSTAR	82	POS-A-TRACTION	125
DAYTON	37	KIRKLAND	83	REGUL	126
DEAN	38	KIRKWOOD	84	RELIANT	127
DELTA	39	K-MART	85	REMINGTON	128
DENMAN	40	KUMHO	86	REPUBLIC	129
DIAMOND	41	LARAMIE	87	REYNOLDS	130
DOMINATOR	42	LASSA	88	RIKEN	131
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**EXTERIOR VEHICLE FORM****TIRE/TIRES/DETAIL**

Tire manufacturer cont'd

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**TIRE MODEL**

**Screen Name:** Model

**SAS Data Set:** *TIRE*

**SAS Variable:** *TMODEL*

**Element Attributes:**

8 Specify model

9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The name of the model maybe found on the sidewall of the tire. If it cannot be read then indicate "Unknown".

**TIRE TYPE ON VEHICLE**

**Screen Name:**        Size

**SAS Data Set:**        *TIRE*

**SAS Variable:**        *TYPE*

**Element Attributes:**

- 1     P-Metric (specify)
- 2     Light Truck Metric (specify)
- 3     Light Truck High Flotation (specify)
- 4     Light Truck Numeric (specify)
- 8     Other (specify)
- 9     "UNKNOWN"

**Source:**            Vehicle inspection

**Remarks:**

## TIRE SIZE ON VEHICLE

Page 1 of 2

Screen Name: Size

SAS Data Set: TIRE

SAS Variable: SIZE

## Element Attributes:

P-Metric P n n n / n n a n n

P-Metric (specify)

Light Truck Metric (specify)

Light Truck High Flotation (specify)

Light Truck Numeric (specify)

Other (specify)

9 Unknown

Source: Vehicle inspection

## Remarks:

There will be many characters on the tire sidewall that identify various characteristics of the tire. We are only interested in recording the tire size information. This information is demarked in various ways depending on the type of tire.

If a character cannot be read then leave a blank space where the character belongs.

**a=alpha value to enter      n=numeric value to enter**  
**P=P-Metric tire *precoded*      LT=Light Truck designation *precoded***  
**Blanks permitted at any location**

P-Metric P n n n / n n a n n

P215/65R15, P215/65R15

P= Passenger Car Tire

215= Section Width in Millimeters

65= Aspect Ratio

R= Radial Construction

15= Rim Diameter in Inches

Light Truck Metric L T n n n / n n a n n**LT235/75R15**

LT= Light Truck Tire

235= Section Width in Millimeters

75= Aspect Ratio

R= Radial Construction

Tire Size On Vehicle cont'd

15= Rim Diameter in Inches

Light Truck High Flotation       X       .                L T

**31X10.50R15LT**

31= Tire Diameter in Inches

10.50= Section Width in Millimeters

R= Radial Construction

LT= Light Truck Tire

15= Rim Diameter in Inches

**Light Truck Numeric**

   .                .       L T

**8.75R16.5LT**

8.75=Section Width in Inches

R=Radial Construction

16.5=Rim Diameter in Inches

LT=Light Truck Designation

**TIRE MAXIMUM PRESSURE (KILOPASCALS)****Screen Name:** Max Pressure**SAS Data Set:** *TIRE***SAS Variable:** *MAXPRES***Element Attributes:**

Specify tire maximum pressure in psi  
Entry defaults to psi, but may also be entered in kPa  
999 Unknown

**Range:** 172KPA – 621 KPA**Source:** Vehicle inspection**Remarks:**

Enter the maximum pressure in psi / kPa (program automatically converts psi to kPa) as indicated on the tire sidewall. If this information cannot be read that enter “Unknown”

**MINIMUM TREAD DEPTH (MM)****Screen Name:** Tread Depth**SAS Data Set:** *TIRE***SAS Variable:** *DEPTH***Element Attributes:**

Specify tread depth  
Entry defaults to 1/32 inch, but may also be entered in mm  
99 Unknown

**Range:** 0mm – 25mm**Source:** Vehicle inspection**Remarks:**

Indicate the tread depth in 1/32 inch (program automatically converts 1/32 inch to mm).

The Minimum Tire Tread Depth is to be measured using the supplied tire tread depth indicator. The measurement should be taken on the shallowest groove of the tread. Be careful not to measure on a wear bar indicator. The measurement is to be documented to the nearest 32<sup>nd</sup> inch.

**TIRE MEASURED PRESSURE (KILOPASCALS)**

**Screen Name:** Meas. Pressure

**SAS Data Set:** *TIRE*

**SAS Variable:** *PRES*

**Element Attributes:**

Specify measured pressure of the tire in psi  
Entry defaults to psi, but may also be entered in kPa

888 Tire flat  
999 Unknown

**Source:** Vehicle inspection

**Range:** 34-689, 888, 999

**Remarks:**

Enter measured pressure in psi / kPa (program automatically converts psi to kPa).  
The PAR may be used as a source if it contains this data, but it is superseded if other data exists.

The *Measured Pressure* is to be documented using the supplied air pressure gauge. Adhere to the following instructions when taking and reading the pressure:

The pressure gauge should be cleared before taking the reading. It should be placed over the tire's valve stem and press firmly so that no escaping air is heard. If the vehicle is equipped with dual rear wheels, document only the outboard tires. NOTE: Testing has revealed that a tire will normally lose 0.1 psi for each reading.

Record the pressure of the tire at the time of inspection, regardless of whether the tire has been replaced or re-inflated since the crash.

**TIRE RESTRICTED**

**Screen Name:** Restricted

**SAS Data Set:** *TIRE*

**SAS Variable:** *RESTRCT*

**Element Attributes:**

0	No
1	Yes
7	Not applicable
9	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

**EXTERIOR VEHICLE FORM**  
**LOCATION**

**TIRE/TIRES/DETAIL**

**Screen Name:** Location

**SAS Data Set:** *TIRE*

**SAS Variable:** *DAMAGE*

**Element Attributes:**

- 1 RF (Right Front)
- 2 LF (Left Front)
- 3 RR (Right Rear)
- 4 LR (Left Rear)

**Source:** Vehicle inspection

**Remarks:**

Enter the location of the tire being examined. If there are double tires on a vehicle, only record information on the outer tires

**TIRE DAMAGE**

**Screen Name:**        Damage

**SAS Data Set:**        *TIREDMG*

**SAS Variable:**        *DAMTYPE*

**Element Attributes:**

- Unknown
- 1    Tread separation
- 2    Sidewall separation
- 3    Tire puncture in tread
- 4    Tire puncture in sidewall
- 5    Tire cut/torn
- 6    Tire rotted
- 88   Other (specify)

**Source:**        Vehicle inspection

**Remarks:**

PICK AS MANY TYPES OF DAMAGE AS APPLICABLE AND DOCUMENT WITH PHOTOS.

SPECIFICATIONS

Exterior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

TOYOTA SIENNA 1998

**Original Specifications**

Wheelbase	<input type="text"/>	cm	Front Overhang	<input type="text"/>	cm
Overall Length	<input type="text"/>	cm	Rear Overhang	<input type="text"/>	cm
Maximum Width	<input type="text"/>	cm	Undeformed End Width	<input type="text"/>	cm
Curb Weight	<input type="text"/>	kg	Engine Cylinders	<input type="text"/>	
Average Track	<input type="text"/>	cm	Displacement	<input type="text"/>	L

Researcher's Assessment of Vehicle Disposition

Justification

Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle

Save Close

**WHEELBASE**

**Screen Name:** Original Specifications—Wheelbase

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *WHEELBAS*

**Element Attributes:**

999 Enter to the nearest centimeter.  
Unknown

**Range:** 100 – 650 cms

**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.

**OVERALL LENGTH**

**Screen Name:** Original Specifications—Overall Length

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *OVERALL*

**Element Attributes:**

Enter to the nearest centimeter  
9999 Unknown

**Range:** 100 – 1000 cms

**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.

**MAXIMUM WIDTH**

**Screen Name:** Original Specifications—Maximum Width

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *MAXWIDTH*

**Element Attributes:**

Enter to the nearest centimeter  
999 Unknown

**Range:** 100 – 350 cms

**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.

**CURB WEIGHT**

**Screen Name:** Original Specifications—Curb Weight

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *CURBWGT*

**Element Attributes:**

999999 Curb weight of vehicle (kgs)  
Unknown

**Range:** 450 – 100,000

**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.

**AVERAGE TRACK WIDTH**

**Screen Name:** Original Specifications—Average Track

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ORIGAVTW*

**Element Attributes:**

	Code to the nearest centimeter
999	Unknown

**Range:** 100-200, 999

**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 an exemplar vehicle and there are no specifications available.

**FRONT OVERHANG**

**Screen Name:** Original Specifications—Front Overhang

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *FTOVHANG*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 25-150, 999

**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.

**REAR OVERHANG**

**Screen Name:** Original Specifications—Rear Overhang

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *RROVHANG*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 25-200, 999

**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.

**UNDEFORMED END WIDTH**

**Screen Name:** Original Specifications—Undeformed End Width

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *UNENDW*

**Element Attributes:**

Code to the nearest centimeter  
999 Unknown

**Range:** 100-250, 999

**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.

**ENGINE CYLINDERS**

**Screen Name:** Original Specifications—Engine Cylinders

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ENGCYL*

**Element Attributes:**

Code the number of cylinders  
99 Unknown

**Range:** 1-14, 99

**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.

**ENGINE DISPLACEMENT**

**Screen Name:** Original Specifications—Engine Displacement

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ENGDISP*

**Element Attributes:**

Code to the nearest liter  
99 Unknown

**Range:** 0.0-10.0, 99

**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.

**RESEARCHER'S ASSESSMENT OF VEHICLE DISPOSITION**

**Screen Name:** Researcher's Assessment of Vehicle Disposition

**SAS Data Set:** *GV*

**SAS Variable:** *TOWRES*

**Element Attributes:**

0	Not towed due to vehicle damage
1	Towed due to vehicle damage
9	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

**JUSTIFICATION FOR RESEARCHER'S ASSESSMENT OF VEHICLE DISPOSITION**

**Screen Name:** Researcher's Assessment of Vehicle Disposition Justification

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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".

**MULTI-STAGE OR ALTERED VEHICLE**

Page 1 of 2

**Screen Name:** Is This a Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?

**SAS Data Set:** *VEHSPEC*

**SAS Variable:** *ALTVEH*

**Element Attributes:**

- 0 No post manufacturer modifications
- 1 Yes — post manufacturer modifications (specify)
- 9 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***

Incomplete manufactured vehicle (chassis-cab) certification label should include the statement: "**CHASSIS-CAB MANUFACTURED BY**" or "**CHASSIS-CAB MFD. BY**".

Intermediate manufactured vehicle certification label should have the following statement: "**INTERMEDIATE MANUFACTURED BY**" or "**INTERMEDIATE MFD. BY**".

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***

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)."**

These labels are generally affixed in one of the following areas on the driver's side of the vehicle:

- hinge pillar
- door-latch post
- door edge that meets the door-latch post
- left side of the instrument panel
- 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.

- 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.
- 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 systems and note if any damage.

The screenshot shows a software window titled "Exterior Vehicle Form, Case 2005-2-012K/ Vehicle #1". The window has a menu bar with options: Vehicle, Tire, Specifications, Fuel, Fire, Crush, CDC, EDR, Sketches, and Review. Below the menu bar, there is a "Fuel System Number" field showing "1 of 1" and two buttons: "Previous" and "Next". The main area contains several dropdown menus: "Fuel Type" (Diesel), "Damage to Fuel Tank" (No damage to tank), "Leakage Location" (No applicable), "Location of Fuel Tank" (No applicable), "Type of Fuel Tank" (No applicable), "Location of Filler Cap" (No applicable), and "Precrash Condition" (Corroded). At the bottom of the window, there are two buttons: "Save" and "Close".

**Note:** Code Fuel Type and Damage to Fuel Tank for each Fuel System noted. Code other variables only if a leak, damage or fire occurred

**FUEL SYSTEM NUMBER**

**Screen Name:** Fuel System Number

**SAS Data Set:** *FUELTANK*

**SAS Variable:** *TANKNO*

**Element Attributes:**

Number of fuel tank

**Remarks:**

Use Edit/Insert to add a fuel system for **each** fuel system in the vehicle.

This variable records those fuel systems 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.).

**FUEL TYPE**

**Screen Name:** Fuel Type

**SAS Data Set:** *FUELTANK*

**SAS Variable:** *FUELTP*

**Element Attributes:**

- |    |  |
|----|--|
| 1  | Gasoline   |
| 2  | Diesel   |
| 3  | CNG (Compressed Natural Gas)                     |
| 4  | LPG (Liquid Petroleum Gas) also known as Propane |
| 5  | LNG (Liquid Natural Gas)                         |
| 6  | Methanol (M100 or M85)                           |
| 7  | Ethanol (E100 or E85)                            |
| 8  | Other ( Hydrogen or others) (specify):           |
| 10 | Lead Acid Battery                                |
| 11 | Nickel-Iron Battery                              |
| 12 | Nickel-Cadmium Battery                           |
| 13 | Sodium Metal Chloride Battery                    |
| 14 | Sodium Sulfur Battery                            |
| 15 | Nickel-Metal Hydride (NiMH)                      |
| 18 | Other Battery (Specify):                         |
| 98 | Other Hybrid (specify):                          |
| 99 | 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:

- The vehicle was totally destroyed, or
- The fuel type can not be determined.

**DAMAGE TO FUEL TANK**

Page 1 of 2

**Screen Name:** Damage to Fuel Tank**SAS Data Set:** *FUELTANK***SAS Variable:** *FUELDAM***Element Attributes:**

- 0 Electric/solar powered
- 1 No damage to tank
- 2 Deformed, no seam failure
- 3 Deformed, with a seam failure
- 4 Punctured
- 5 Lacerated (ripped)
- 6 Abraded (scraped)
- 7 Filler neck separation from the fuel tank
- 8 Other damage (specify):
- 9 Unknown

**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.

**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.

**FUEL SYSTEM LEAKAGE LOCATION**

Page 1 of 2

**Screen Name:** Leakage Location**SAS Data Set:** *FUELTANK***SAS Variable:** *FUELLEAK***Element Attributes:**

- 0 Electric/solar powered
- 1 No fuel leakage

**Primary Area Of Leakage**

- 2 Tank
- 3 Filler neck
- 4 Cap
- 5 Lines/pump/filter
- 6 Vent/emission recovery
- 8 Other (specify):
- 9 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.

Leakage Location (cont'd)

Page 2 of 2

**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.

**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:

- It cannot be determined if the fuel system experienced any leakage, or
- The source of the fuel system leakage could not be determined.

## LOCATION OF FUEL TANK

Page 1 of 2

**Screen Name:** Location of Fuel Tank

**SAS Data Set:** *FUELTANK*

**SAS Variable:** *FUELLOC*

**Element Attributes:**

- 0 Electric/solar powered
- 1 Aft of rear axle centered
- 2 Aft of rear axle left side
- 3 Aft of rear axle right side
- 4 Forward of rear axle centered
- 5 Forward of rear axle left side
- 6 Forward of rear axle right side
- 7 Over center of the rear axle
- 8 Other (specify):
- 9 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).

**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:

the fuel tank location can not be determined and an exemplar vehicle can not be located.

## TYPE OF FUEL TANK

Page 1 of 4

Screen Name: Type of Fuel Tank

SAS Data Set: *FUELTANK*SAS Variable: *FUELTK*

## Element Attributes:

0	Electric/solar powered
1	Metallic
2	Non-Metallic
9	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:

- researcher could not make a determination due to inaccessibility, or
- 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

(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
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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
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) <b>Peugeot</b>	
505	HDPE
Station Wagon	HDPE
Sedan	HDPE
(5) <b>Volkswagen</b>	
Golf (85-86, 89-on)	HDPE
Jetta (90-on)	HDPE
Passat (92-on)	HDPE
Corrado (89-on)	HDPE
(6) <b>Volvo</b>	
700 Series (85-on)	HDPE
(7) <b>Saab</b>	
All Models (80-on)	HDPE

Type of Fuel Tank (cont'd)

- (8) *Mercur*  
Scorpio HDPE  
XR4Ti Some are HDPE
- (9) *Mitsubishi* Trucks only are HDPE

**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	

**LOCATION OF FILLER CAP**

**Screen Name:** Location of Filler Cap

**SAS Data Set:** *FUELTANK*

**SAS Variable:** *FUELCAP*

**Element Attributes:**

- 0 Electric/solar powered
- 1 On back plane
- 2 Over the rear axle on left side plane
- 3 Over the rear axle on right side plane
- 4 Aft of rear axle on left side plane
- 5 Aft of rear axle on right side plane
- 6 Forward of rear axle on left side plane
- 7 Forward of rear axle on right side plane
- 8 Other (specify):
- 9 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.

Location of Filler Cap (cont'd)

Page 2 of 2

**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.

**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).

**PRECRASH CONDITION OF FUEL TANK**

**Screen Name:** Precrash Condition

**SAS Data Set:** *FUELTANK*

**SAS Variable:** *FUELPRE*

**Element Attributes:**

0	Electric/solar powered
1	No damage
2	Corroded
3	Leaking
4	Abraded
8	Other (specify):
9	Unknown

**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 perish condition of the fuel tank cannot be determined

FIRE

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

Fire Occurrence

Origin of Fire

Save Close

**FIRE OCCURRENCE**

Page 1 of 2

**Screen Name:** Fire Occurrence**SAS Data Set:** *GV***SAS Variable:** *FIRE***Element Attributes:**

0	No fire
1	Minor fire
2	Major fire
7	Vehicle not inspected
8	Not a CDS vehicle
9	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/Events Tab.

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:

- Engine compartment only fire
- Trunk compartment only fire
- Partial passenger compartment only fire

Fire Occurrence (cont'd)

Page 2 of 2

- Undercarriage only fire
- Tire(s) only fire
- 

**Major**

identifies those situations where the vehicle experienced a greater fire involvement than defined under “minor” above and is used in the following situations:

- Combined engine and passenger compartment fire (either partial or total passenger compartment involvement).
- Total passenger compartment fire.
- Combined trunk and passenger compartment fire (either partial or total passenger compartment involvement).
- Combined undercarriage and passenger compartment (either partial or total passenger compartment involvement).
- 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.

**ORIGIN OF FIRE**

Page 1 of 3

**Screen Name:** Origin of Fire**SAS Data Set:** *GV***SAS Variable:** *FIREORIG***Element Attributes:**

- 0 No fire
- 1 Vehicle exterior (front, side, back, top)
- 2 Exhaust system
- 3 Fuel tank (and other fuel retention system parts)
- 4 Engine compartment
- 5 Cargo/trunk compartment
- 6 Instrument panel
- 7 Passenger compartment area
- 8 Other location (specify):
- 77 Vehicle not inspected
- 88 Not a CDS vehicle
- 99 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 the magnitude of the 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.

**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.:

- The vehicle was totally destroyed by fire and the origin could not be determined.
- A combination of areas were involved but an estimate of point of origin could not be made.
- A fire was reported, but the vehicle was repaired prior to inspection.

CRUSH LOCATION

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

Location | Profile

Profile #	Event#	Direct Damage Location	Field L Location	Max Crush
-----------	--------	------------------------	------------------	-----------

Save Close

The established protocol for obtaining crush data is defined in the *NASS Vehicle Measurement Techniques*.

**PROFILE NUMBER**

**Screen Name:** Profile #

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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. For rollover crashes the researcher will complete a location line for Rollover(Top) and Rollover(Side) so you can document the crush on both planes. In this situation, there will be two profile numbers for the same event number.

**EVENT NUMBER**

**Screen Name :** Event #

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

Rollovers require two crush profiles. Complete a location line for each plane, a top plane and a side plane. Rollover crush should be confined to the green house. In this situation there will be two profiles for the same event number.

**DIRECT DAMAGE LOCATION**

**Screen Name:** Direct Damage Location

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *DMGLOC*

**Element Attributes:**

**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:

- The left end begins 4 centimeters right of post crash center of the end plane, or
- The rearmost end begins 48 centimeters rearward of the rear axle (side plane)

Rollover damage should be described as area of primary contact, (i.e., Right roof rail or Left side roof rail to center of roof.)

**LOCATION OF FIELD L**

**Screen Name:** Field L

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *FIELDLOC*

**Element Attributes:****Range:****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:

- Entire end plane involved, or
- C<sub>1</sub> is 102 centimeters forward of the rear axle

A Field L is not measured for rollovers, in the text field **"not measured rollover"** should be entered.

**LOCATION OF MAX CRUSH**

**Screen Name:** Max Crush

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *CMAXLOC*

**Element Attributes:**

**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:

- located 15 centimeters left of post crash center of the end plane, or
- located at C<sub>3</sub>
- located 5 centimeters forward of the rear axle

Rollover max crush location should be described as above.

**EXTERIOR VEHICLE FORM**  
**CRUSH PROFILE**

**CRUSH/PROFILE**

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

Location Profile

Profile # 1    CDC# [dropdown]    Field L [input]    SMASH L [input]  
ALL MEASUREMENTS ARE IN CENTIMETERS    Field L +/- D [input]    Direct +/- D [input]  
Category [dropdown]    Width (CDC) [input]

+/-	Plane of Impact	Max	C1	C2	C3	C4	C5	C6

Unknown Crush    **Average** [input] [input] [input] [input] [input] [input]

Save    Close

**PROFILE NUMBER**

**Screen Name:** Profile #

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

**Range:** 1-as assigned

**Source:** Vehicle inspection.

**Remarks:**

This contains the impact sequence number specific to this vehicle for which the data are being obtained. 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.

**CDC NUMBER**

**Screen Name:** CDC #

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *DEFORMNO*

**Element Attributes:** Generated (# and plane of contact) from documented CDCs

**Range:** 1-5

**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. You may have multiple CDCs that describe a single impact to a vehicle. They will be differentiated by DEFORNNO.

**FIELD L****Screen Name:** Field L**SAS Data Set:** *CDCCRSH***SAS Variable:** *FIELDL***Element Attributes:**

	Entered number
997	Not applicable
999	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.

Unknown should be used for rollover cases.

**WINSMASH L**

**Screen Name:** WinSMASH L

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

Unknown should be used for rollover cases.

**FIELD L +/- D****Screen Name:** Field L +/- D**SAS Data Set:** *CDCCRS***SAS Variable:** *FIELDD***Element Attributes:**

	Entered number
997	Not applicable
999	Unknown

**Range:** -300-300,997,999**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.

Unknown should be used for rollover cases.

**DIRECT +/- D****Screen Name:** Direct +/- D**SAS Data Set:** *CDCCRSH***SAS Variable:** *D***Element Attributes:**

	Entered number
997	Not applicable
999	Unknown

**Range:** -390-299,997,999**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.

Unknown should be used for rollover cases.

**CATEGORY**

**Screen Name:** Category

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Side

End

Top (specify)

Rollover (side)

Rollover (top)

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.

Rollover (side) and Rollover (top) should be selected to correspond with the plane of measurement.

**WIDTH (CDC)****Screen Name:** Width (CDC)**SAS Data Set:** *CDCCRSH***SAS Variable:** *DIRDAMW***Element Attributes:**Entered number  
999 Unknown**Range:** 1-659, 999**Source:** Vehicle inspection.**Remarks:**

The direct damage width, measured on the vehicle, that is used in determining the CDC for this impact/event.

A CDC width should be obtained for rollover cases.

**VERTICAL LEVEL AT WHICH CRUSH MEASUREMENTS ARE TAKEN FOR A PARTICULAR CRUSH PROFILE.**

Page 1 of 4

**Screen Name:** Plane of Impact

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

END PLANE

- (+) Bumper
- (+) Above Bumper
- (-) Free Space
- (+) Stand Adjustment
- (-) Stand Adjustment

SIDE

- (+) Sill
- (+) Mid Door
- (+) Upper Door
- (+) Lower Door
- (-) Free Space
- (+) Stand Adjustment
- (-) Stand Adjustment

TOP

- (+) Top

UNDER

- (+) Under

ROLLOVER (Top)

- Unknown
- Right A-pillar
- Left A-pillar
- Right B-pillar
- Left B-pillar
- Right C-pillar
- Left C-pillar
- Right D-pillar
- Left D-pillar
- Left windshield header
- Right windshield header
- Left back light header
- Right back light header
- Right Roof
- Left Roof
- Right Side
- Left Side

Vertical level at which crush measurements are taken for a particular crush profile. (cont'd)

Page 2 of 4

Other (specify)

ROLLOVER (Side)

Unknown  
Right A-pillar  
Left A-pillar  
Right B-pillar  
Left B-pillar  
Right C-pillar  
Left C-pillar  
Right D-pillar  
Left D-pillar  
Left windshield header  
Right windshield header  
Left back light header  
Right back light header  
Right Roof  
Left Roof  
Right Side  
Left Side  
Other (specify)

**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

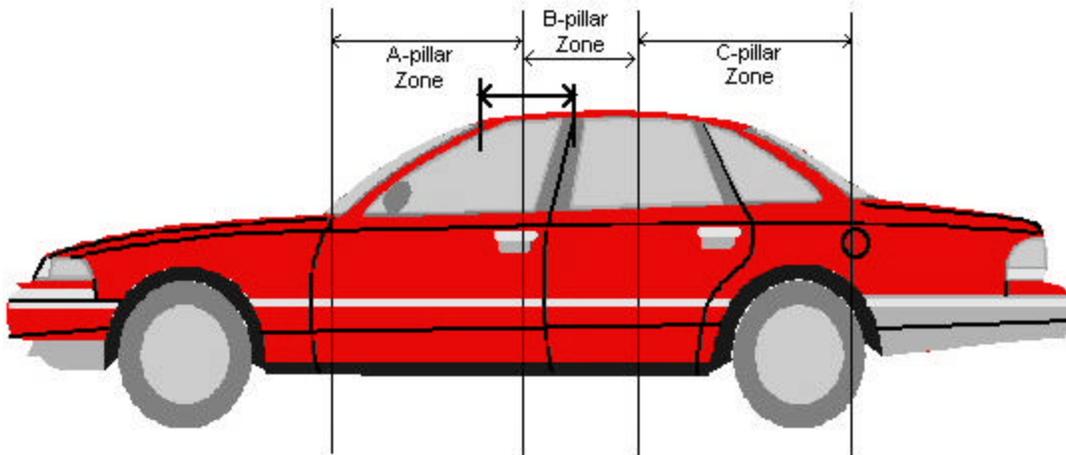
Vertical level at which crush measurements are taken for a particular crush profile. (cont'd)

Page 3 of 4

must be used. If the stands had to be set shorter than the overall length of the vehicle, a + Stand Adjustment must be used.

Selection criteria for Rollover (Top) or (Side)

Side Plane measurement protocol:



**A-pillar Zone** starts at the base of the A-pillar and extends to half of the width between the windshield top frame point and the mid point of the B-pillar.

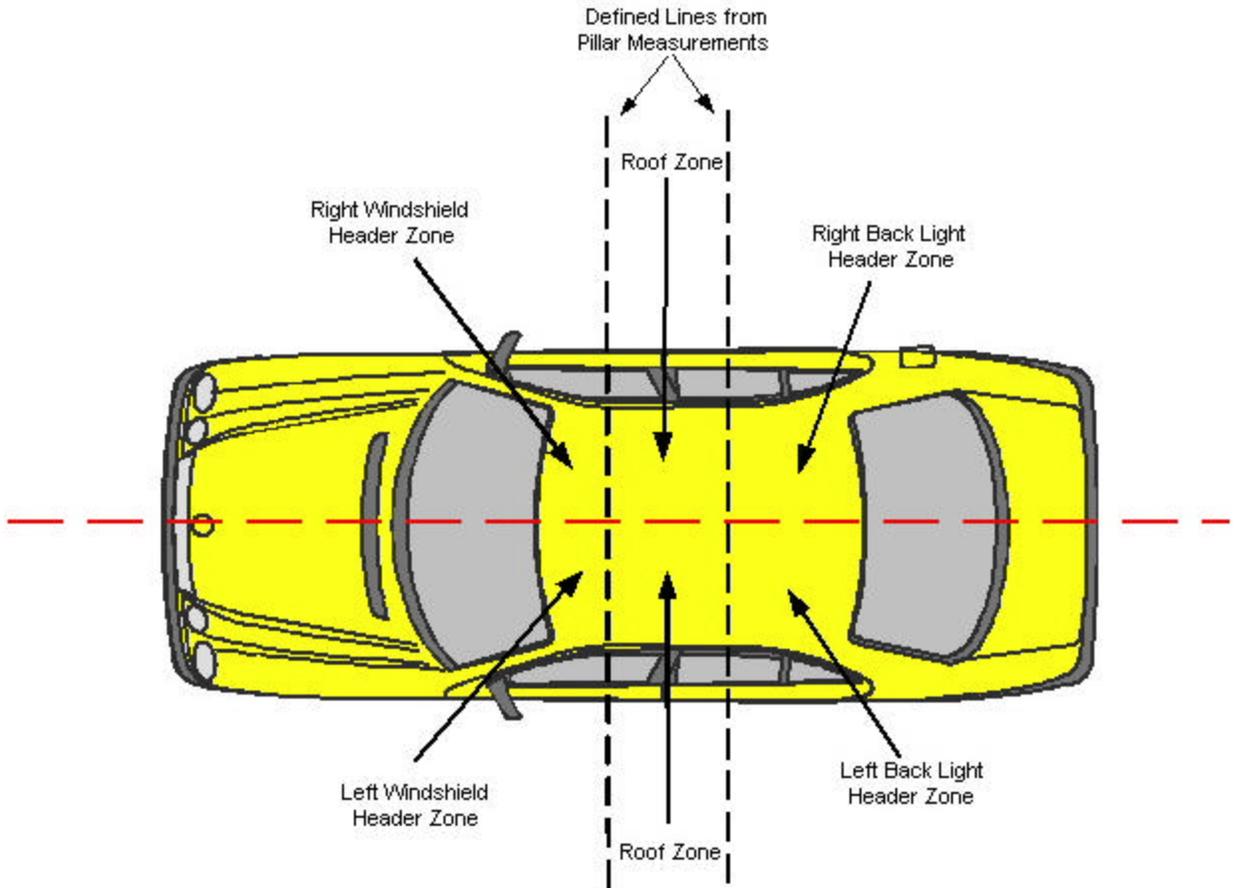
**B-pillar Zone** starts where the A-pillar zone ends and extends to the half of the width between the mid point of the B pillar and the mid point of the C-pillar or where the B-pillar ends.

**C-pillar Zone** starts where B-pillar zone ends and extends to the half of the width between the mid point of the C-pillar and the mid point of the D-pillar or where the C-pillar ends.

**D-pillar Zone** starts where C-pillar zone ends and extends to the half of the width between the mid point of the D-pillar and the mid point of the E-pillar or where the D-pillar ends.

Vertical level at which crush measurements are taken for a particular crush profile. (cont'd)

Top Plane measurement protocol:



The defined zones created in the Side Plane measurement protocol should be extended onto the Top Plane. This allows for the Top Plane to be zoned as the above illustration depicts. The Roof Zone is the entire area from Windshield Header Zone to the Back Light Header Zone.

**MAXIMUM CRUSH FOR THIS VERTICAL LEVEL OF CRUSH MEASUREMENTS FOR THIS CRUSH PROFILE**

**Screen Name:** Max

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *CMA*

**Element Attributes:**

	Entered number
997	Not applicable
999	Unknown

**Range:** blank, 0-250, 997, 999

**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

**Rollover crashes**

This is the maximum crush measured at the component selected in Plane of Impact.

**C1, C2, C3, C4, C5, C6**

**Screen Name:** C1, C2, C3, C4, C5, C6

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *C1, C2, C3, C4, C5, C6*

**Element Attributes:**

Entered number  
997 Not applicable  
999 Unknown

**Range:** blank, 0-250,997,999

**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".

Rollover crashes require no entries.

CDC/SUMMARY

Event	Object Contacted	Force Dir	Location	Total	Long	Lateral	Energy	Impact	Barrier	Est	Rank
1	Vehicle#3	Unknown	99FLAW2								

CDC/DETAIL

Event No. 1 GAD Front Previous Next

Object Contacted  
Category: Vehicle  
Object: Vehicle#3  
Deformation Location: F Front  
Long/Lateral: L Left - front or rear  
Force Direction: Unknown degrees  
Vertical/Lateral: A All  
Increment: Unknown Shift  
Distribution: W Wide Impact Area  
Clock: 99  
Extent: Two  
Over/Underide: [dropdown]  
Summary: 99FLAW2  
Heading Angle: [input]

DELTA V  
Total [input] Longtdl [input] Lateral [input] Energy [input] Impact [input] Barrier [input] Estimated [input] Rank [input]  
Basis [input]

**EVENT NUMBER**

**Screen Name:** Event No.

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *ACCSEQ*

**Element Attributes:**

Entered number

**Range:** 1-20

**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.

**[DEFORMATION NUMBER]****Screen Name:** N/A**SAS Data Set:** *CDCCRSH***SAS Variable:** *DEFORMNO***Element Attributes:**

1 - 5

**Range:** 1-5**Source:** Vehicle inspection.**Remarks:**

Certain impacts to a vehicle require more than one CDC to describe the damage.

One example are impacts with an object such as a fence where there is continuous contact with the object as it contacts multiple planes of the vehicle. The fence initially contacts the front of the vehicle, then as the vehicle proceeds into the fence, it contacts the vehicle sides and the top of the vehicle. There will be a separate CDC entered for each of these planes.

The other situation involves an impact where the vehicle initially contacts another vehicle with its front then rotates and causes a slap the to the side of the vehicle. This would require to different CDCs to two different planes.

**GENERAL AREA OF DAMAGE**

**Screen Name:** GAD

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**OBJECT CONTACTED CATEGORY AND OBJECT**

Page 1 of 2

**Screen Name:** Object Contacted Category and Object**SAS Data Set:** *CDCCRS***SAS Variable:** *OBJCONT***Source:** Vehicle inspection.**Element Attributes:**

01-30 — Vehicle Number

**Noncollision**

- 31 Overturn — rollover (excludes end-over-end)
- 32 Rollover - end-over-end
- 33 Fire or explosion
- 34 Jackknife
- 35 Other intraunit damage (specify):
- 36 Noncollision injury
- 38 Other noncollision (specify):
- 39 Noncollision — details unknown

**Collision With Fixed Object**

- 41 Tree ( $\leq 10$  cm in diameter)
- 42 Tree ( $> 10$  cm in diameter)
- 43 Shrubbery or bush
- 44 Embankment
- 45 Breakaway pole or post (any diameter)
- 50 Nonbreakaway Pole or post ( $\leq 10$  cm in diameter)
- 51 Nonbreakaway Pole or post ( $> 10$  cm but  $\leq 30$  cm in diameter)
- 52 Nonbreakaway Pole or post ( $> 30$  cm in diameter)
- 53 Nonbreakaway Pole or post (diameter unknown)
- 54 Concrete traffic barrier
- 55 Impact attenuator
- 56 Other traffic barrier (includes guardrail) (specify):
- 57 Fence

- 58 Wall
- 59 Building
- 60 Ditch or culvert
- 61 Ground
- 62 Fire hydrant
- 63 Curb
- 64 Bridge
- 68 Other fixed object (specify):
- 69 Unknown fixed object

**Collision with Nonfixed Object**

- 70 Passenger car, light truck, van, or other vehicle not in-transport
- 71 Medium/heavy truck or bus not in-transport
- 72 Pedestrian
- 73 Cyclist or cycle
- 74 Other nonmotorist or conveyance (specify)
- 75 Vehicle occupant
- 76 Animal
- 77 Train
- 78 Trailer, disconnected in transport
- 79 Object fell from vehicle in-transport
- 88 Other nonfixed object (specify):
- 89 Unknown nonfixed object

**Other event (specify)**

- 98 Other event (specify):

**Unknown event or object**

- 99 Unknown event or object

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

Object Contacted Category and Object

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**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.

SEE CASE FORM/EVENTS TAB FOR DETAILS ON CODING ATTRIBUTES.

**DIRECTION OF FORCE**

**Screen Name:** Force Direction

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *PDOF*

**Element Attributes:**

Entered number (to nearest 10 deg)  
998 Non horizontal force  
999 Unknown

**Range:** 0 – 350, 998,999

**Source:** Restricted to vehicle inspection or photographs.

**Remarks:****0-350**

An estimated CDC is indicated for each impact. In this estimate, write the principal direction of 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.

**[CLOCK]**

**Screen Name:** Clock

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *CLOCK*

**Element Attributes:**

[00 Non horizontal force]

[1 – 12 Direction of clock force]

[99 Unknown]

**Source:** Restricted to vehicle inspection or photographs.

**Remarks:**

The clock direction rolls up from the **Direction of Force** previously entered.

**INCREMENT OF CLOCK DIRECTION**

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**Screen Name:** Increment**SAS Data Set:** *CDCCRS***SAS Variable:** *SHIFT***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
99	Unknown Shift

**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 uni-body) must shift >10cm.

To select vertical end shift, only one frame rail (nearest the direct damage) needs to shift >10cm.

Increment of Clock Direction (cont'd)

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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.

**VERRIDE/UNDERRIDE (THIS VEHICLE)**

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**Screen Name:** Over/Underride**SAS Data Set:** *CDCCRS***SAS Variable:** *RIDEUP***Element Attributes:**

- |   |                                    |
|---|------------------------------------|
| 1 | None                               |
| 2 | Override                           |
| 3 | Underride                          |
| 4 | Medium/heavy truck or bus override |
| 9 | 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.

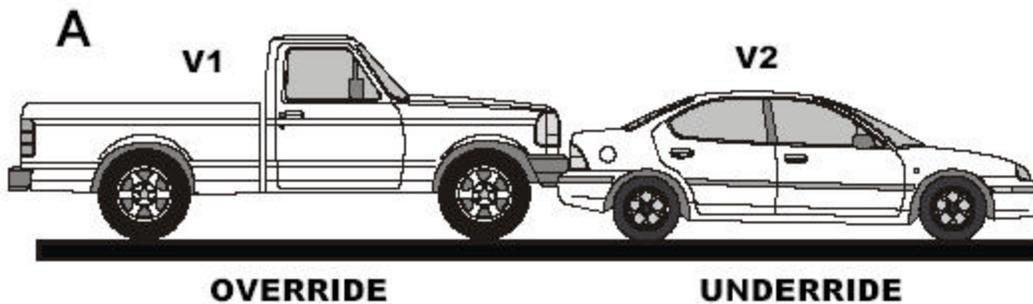
Override/Underride is coded from the perspective of vehicle impact configuration and is *not* based on: coding in columns 5 and/or 6 of the CDC, or vehicle measurement techniques (*i.e.*, the "13-centimeters" rule for WinSMASH purposes). It is only relevant for end-to-end impacts between two CDS applicable 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).

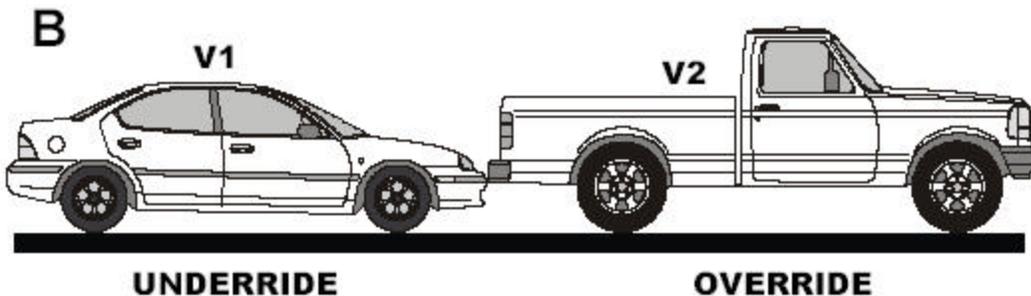
For this variable an impact with a not-in-transport vehicle (either CDS applicable or a medium/heavy truck) is considered a vehicle-to-vehicle impact and not a vehicle-to-object impact.

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.

HEADING ANGLE

Screen Name: Heading Angle

SAS Data Set:

SAS Variable:

Element Attributes:

- 000-355 Code actual value in 5 degree increments
- 999 Unknown

Source: Scene diagram.

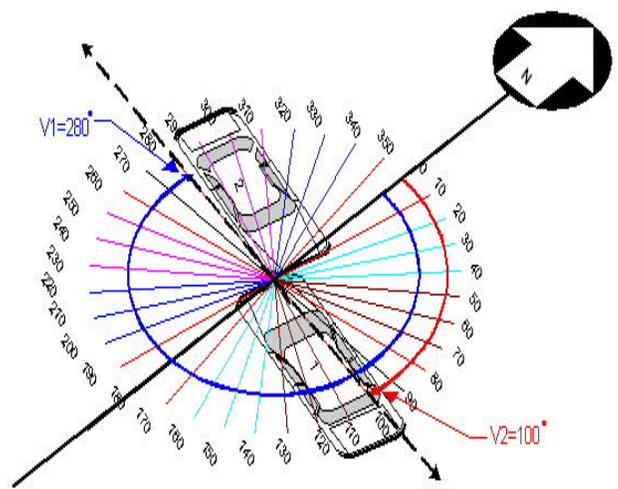
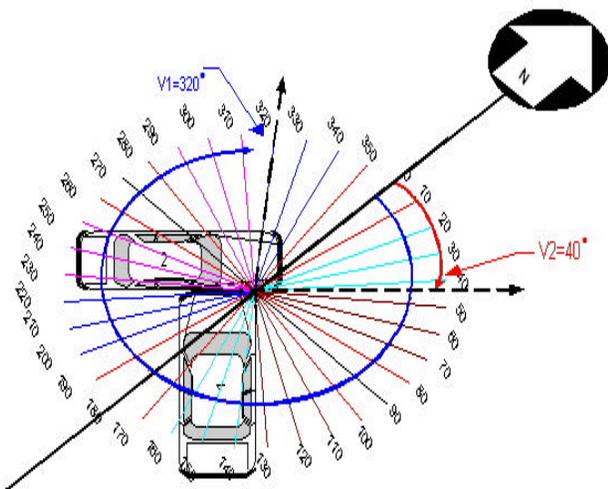
Remarks:

Heading Angle records the heading angle for this vehicle.

For vehicle-to-vehicle collisions, use your scene diagram referencing system to determine the heading angles at the point of impact for *this vehicle and for this CDC only*. 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- protractor and measuring in a clockwise direction from the north arrow. The north arrow always represents 0- (degrees). The angle is a positive value. The following diagrams exemplify the measurement technique.

Unknown:

is used when the heading angle can not be determined.



**Screen Name:** Deformation Location

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *GAD*

**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.

**SPECIFIC LONGITUDINAL OR LATERAL LOCATION**

Screen Name: Long/Lateral

*SAS Data Set:* CDCCRS

*SAS Variable:* SHL

**Element Attributes:**

<b>Front, Rear or Side Impacts</b>		<b>Top or Undercarriage</b>	
D	Distributed- — side or end	D	Distributed (F+P+B)
L	Left — front or rear	F	Front Section
C	Center — front or rear	P	Center Section
R	Right- — front or rear	B	Rear Section
F	Side front — left or right	Y	F+P
P	Side center section — L or R	Z	P+B
B	Side rear — left or right	9	Unknown
Y	Side (F + P) or end (L + C)		
Z	Side (P + B) or end (L + R)		
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.

**SPECIFIC VERTICAL OR LATERAL LOCATION**

**Screen Name:** Vertical/Lateral

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *SVL*

**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 (R + 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.

**TYPE OF DAMAGE DISTRIBUTION**

**Screen Name:**           Distribution

**SAS Data Set:**         *CDCCRSH*

**SAS Variable:**        *TDD*

**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.

**DEFORMATION EXTENT GUIDE**

**Screen Name:** Extent

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *EXTENT*

**Element Attributes:**

- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 6 Six
- 7 Seven
- 8 Eight
- 9 Nine
- 99 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 two crush profiles are averaged, use the largest maximum **resultant** 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**

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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.

**Note:**

Refer to Appendix A for changes in the Stiffness value of certain vehicle types.

**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)

---

**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 (<10°)

**PSU99 CASE # 001B 1985 OLDS 98 AND 1985 OLDS Firenza Head on**

	<b>SPEED CHANGE (DAMAGE)</b>		<b>IMPACT SPEED (DAMAGE AND SPINOUT)</b>	
<b>VEHICLE #1</b>				
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)	

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<sub>1</sub> total Delta V due to "damage" with the V<sub>1</sub> total Delta V due to "linear momentum and trajectory". Likewise, make the same comparison for V<sub>1</sub> 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 AN ANGLED COLLISION (>10°)**

<b>PSU 99 Case No. 103D</b>	<b>1985 Olds 98 and 1985 Olds Firenza</b>		<b>Angle</b>
<b>SPEED CHANGE (DAMAGE) MOMENTUM</b>	<b>SPEED CHANGE (LINEAR MOMENTUM AND TRAJECTORY)</b>	<b>IMPACT SPEED (LINEAR AND</b>	
<b>VEHICLE #1</b>			
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 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 ( $\pm$  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, vans and sport utility vehicles, you must know additional information for a valid run.
  - a. Wheelbase [to determine size and stiffness (side impacts)]
  - b. Curb weight ( $\pm$  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)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	8	12	14	16	18	20	22	25	28	30	35	37	43	49
	7	11	13	15	17	19	21	24	28	30	34	40	45	49

	14	15	16	17	18	19		20-24	25-34	35-44	45-54	55-64	65-97
	56	60	64	66	70	69		72	78	80	79	78	74
	53	54	56	59	57	57		58	61	64	66	65	65

	Child (0-12)	Adolescent (13-17)	Adult (18-97)
<b>Male</b>	23**	61**	77
<b>Female</b>	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**

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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, BARRIER EQUIVALENT AND SPEED ESTIMATE DECISION RULES**

1. First, use the WinSmash program Standard or Barrier calculation type, if applicable. If the results look reasonable, complete the Delta V variables of the CDC tab of the Vehicle Exterior (VE) Form including the Barrier Equivalent Speed (BES) using the results from WinSmash. Record the Impact Speed **ONLY** when calculated by WinSmash using the Damage and Trajectory routine. Record the basis for delta V based on the routine used to get the results.

If you have one known vehicle and one partially known vehicle use the WinSmash Standard calculation type entering all of the available information (e.g., CDC, WinSmash L, Ds, estimated crush) on the partially known vehicle. If the results are reasonable, 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, leave it blank and the computer will put in "A998". Record the basis for delta V for both vehicles as "Damage Only" or "Standard". If results are **NOT** reasonable use rule #2 and treat the partially know vehicle as an unknown vehicle.

2. If you have one known vehicle and one unknown vehicle, then use the WinSmash Missing Vehicle calculation type. If the results are reasonable, 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. Record the basis for delta V for both vehicles as Missing Vehicle. 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 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 damage routine and treat the object as a rigid barrier. If the results look reasonable record only the barrier equivalent speed. 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 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).
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. For smaller non-fixed objects record Estimated Highest Delta V as minor. 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 record the calculated Delta V as a range in the Estimated Highest Delta V. 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 record 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 rule 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 record the Estimated Highest Delta V as minor, moderate or severe.

### **Definitions for Minor, Moderate, or Severe:**

**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 (10 inches) or less passenger compartment intrusion.

Severe is used when there is greater than 25 cm (10 inches) 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 (10 inches) passenger compartment intrusion.

Severe is used when the maximum crush results in greater than 25 cm (10 inches) 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.

**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 (estimate) is less than 10 cm.

Moderate is used when the maximum crush attributed to the most severe impact (estimate) is 10cm-35cm.

Severe is used when the maximum crush attributed to the most severe impact (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.

**TOTAL DELTA V****Screen Name:** DELTA V–Total**SAS Data Set:** *CDCCRS***SAS Variable:** *DVTOTAL***Element Attributes:**999 Generated kmph  
Unknown**Range:** 1-160, 999**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.

**LONGITUDINAL DELTA V**

**Screen Name:** DELTA V -- Longtdl

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *DVLONG*

**Element Attributes:**

Generated kmph  
999 Unknown

**Range:** -160-160, 999

**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.

**LATERAL DELTA V**

**Screen Name:** DELTA V -- Lateral

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *DVLAT*

**Element Attributes:**

Generated kmph  
999 Unknown

**Range:** -160-160, 999

**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.

**ENERGY ABSORPTION**

**Screen Name:** Energy

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *ENERGY*

**Element Attributes:**

9,999,999 Generated joules  
Unknown

**Range:** 150 – 1,100,000, 9,999,999

**Source:** WinSMASH program.

**Remarks:**

Enter The Energy Absorption is automatically generated by the NASSMAIN WinSMASH program for this impact.

Do not enter 9,999,999. 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 9999.

**IMPACT SPEED OR CHANGE TO IMPACT**

**Screen Name:** Impact

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *IMPACTSP*

**Element Attributes:**

	Generated kmph
998	Damage and Trajectory run not made
999	Unknown

**Range:** 1 – 160, 998, 999

**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.

**BARRIER EQUIVALENT SPEED**

**Screen Name:** Barrier

**SAS Data Set:** *CDCCRSH*

**SAS Variable:** *BAREQSP*

**Element Attributes:**

Generated kmph  
999 Unknown

**Range:** 1-160, 999

**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.

## ESTIMATED SEVERITY

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Screen Name: Estimated

*SAS Data Set:* CDCCRSH*SAS Variable:* DVEST**Element Attributes:**

- |   |   |
|---|---|
| 0 | Reconstruction delta V]                     |
|   | <b>Estimated Delta V</b>                    |
| 1 | Less than 10 kmph                           |
| 2 | Delta V $\geq$ 10 kmph < 25 kmph            |
| 3 | Delta V $\geq$ 25 kmph < 40 kmph            |
| 4 | Delta V $\geq$ 40 kmph < 55 kmph            |
| 5 | Delta V $\geq$ 55 kmph                      |
|   | <b>Other estimates of damage severities</b> |
| 6 | Minor                                       |
| 7 | Moderate                                    |
| 8 | Severe                                      |
| 9 | 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.

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>i.e.</i> , 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.

**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.

**SEVERITY RANK**

**Screen Name:** Rank

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *RANK*

**Range:** 1-29

**Element Attributes:**  
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 severity that has been coded. If a Delta V, Barrier Equivalent Speed, or estimate is known, then 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.

**BASIS FOR DELTA V ENTRY**

**Screen Name:** Basis

**SAS Data Set:** *CDCCRS*

**SAS Variable:** *DVBASIS*

**Element Attributes:**

- Delta V Calculated
- 1 WinSMASH - Damage only
- 2 WinSMASH - Damage and trajectory
- 3 WinSMASH - Missing vehicle
- 4 WinSMASH - Damage with CDC only
- Delta V Not Calculated
- 5 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.

- 6 Rollover
- 7 Other non-horizontal forces
- 8 Sideswipe type damage
- 9 Severe override
- 10 Yielding object
- 11 Overlapping damage
- 12 Insufficient data available (specify):
- 98 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.

**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.

Basis for Delta V Entry (cont'd)

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**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.

## LIST

The screenshot shows a software window titled "Exterior Vehicle Form, Case 2004-903-7025/ Vehicle #1". The window has a menu bar with options: Vehicle, Tire, Specifications, Fuel, Fire, Crush, CDC, EDR, Sketches, Log, and Review. Below the menu bar is a dropdown menu for "EDR Information obtained?" with the value "Yes - Data entered". Below that is a sub-menu with options: List, EDR, AirBag Deploy, Pre Crash, and Crash. The main area contains a table with two columns: "Deploy Status" and "CDC". The table has one row with the value "Deployment" in the "Deploy Status" column and "Event# 1- 99FLA" in the "CDC" column. At the bottom of the window are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red X icon).

Deploy Status	CDC
Deployment	Event# 1- 99FLA

EDR information will be entered whenever an EDR is read by the field researcher or by other personnel who provide information from the EDR to the researcher.

Information will be entered for as many events as the EDR has recorded. The event may be a deployment event, a near deployment event, or neither (just information from the latest ignition cycle).

ONE VALUE WILL BE TAKEN FOR EACH EDR/EVENT  
THERE MAY BE MORE THAN ONE EDR/EVENT PER EDR READING  
THERE MAY BE MORE THAN EDR/EVENT PER CDC/EVENT

**SEE THE  
EVENT DATA RECORDER DATA COLLECTION GUIDELINE  
FOR ADDITIONAL INSTRUCTIONS.**

**FOR DIRECT IMPORT OF EDR DATA SEE THE CDR-to-XML  
LIBRARY INSTALLATION & BASIC FUNCTIONS GUIDELINE**

EDR

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

EDR Information obtained ? Yes - Data entered

List | EDR | AirBag Deploy | Pre Crash | Crash

Identifiers

EDR Version	2.7	Ignition Cycle	
Lamp Status	Off	Event	12348
CDC	Event# 1- 99FLAW2	Investigation	12349
Deploy Status	Deployment		

Driver

Belt	Buckled	Passenger	
		Belt	Not Reported
Pretensioner	Not Reported ms	Seat	Not Reported
Seat Track Forward	Not Reported	Pretensioner	Not Reported ms
		Suppression Switch	Not Reported

Save Close

**EDR**

**Screen Name:** EDR information obtained?

**SAS Data Set:** *GV*

**SAS Variable:** *EDRINFO*

**Element Attributes:**

- 1 Yes – Data entered
- 2 EDR information not obtained – Vehicle make/model not supported by software, specify
- 3 EDR information not obtained – Vehicle not equipped with EDR
- 4 EDR information not obtained – Vehicle damage prevents accessing EDR data
- 5 EDR information not obtained – Permission refused to access/read EDR
- 6 EDR information not obtained – Unknown if vehicle equipped with EDR
- 7 EDR information not obtained – EDR submitted to manufacturer
- 7 [Vehicle not inspected]
- 8 [Not a CDS vehicle]
- 9 Unknown

**Source:** Researcher determined, vehicle inspection

**Remarks:**

**Yes – Data entered**

An attempt was made to read the EDR. (The minimum known information if an EDR is read by the researcher will be the EDR software version being used)

**EDR information not obtained – Vehicle make/model not supported by software, specify**

The researcher is not equipped to read the EDR for this vehicle make or model

**EDR information not obtained – Vehicle not equipped with EDR**

This vehicle is not equipped with an EDR

**EDR information not obtained – Vehicle damage prevents accessing EDR data**

The vehicle has been damaged so that;

-The electrical system is compromised so that the researcher cannot read information from the on-board diagnostic plug

AND

-Vehicle damage makes access to necessary connections to retrieve information from the EDR impossible.

EDR information obtained? (cont'd)

Page 2 of 2

PROVIDE PHOTO DOCUMENTATION OF THE LIMITING DAMAGE

**EDR information not obtained – Permission refused to access/read EDR**

The researcher was refused permission to access and/or read the information from the EDR

**EDR information not obtained – Information unknown**

Use this attribute if it is unknown if this vehicle is equipped with an EDR or the EDR has been harvested at the direction of the zone center.

**CDR/EDR VERSION NUMBER**

**Screen Name:** EDR Version

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *EDRVER*

**Element Attributes:**

Specify version of software being used  
Copy of EDR information provided by third party (specify)

**Source:** CDR program in the CDR File Information EDR/researcher

**Remarks:**

The minimum known information if an EDR is read by the researcher will be the EDR software version being used.

**Specify version of software being used**

Various versions of software for various makes/models of vehicles may be in use. Enter the version that was used to read the EDR in this car.

**Copy of EDR information provided by third party**

If the EDR was read by a third party (vehicle manufacturer, etc.) and only a hard copy is supplied indicate the source of the information.

**WARNING LAMP STATUS**

**Screen Name:** Lamp Status

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *LAMPSTAT*

**Element Attributes:**

- 1 On
- 2 Off
- 8 Not reported
- 9 Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

**On**

The EDR indicates that the supplemental restraint system, warning lamp is on.

**Off**

The EDR indicates that the supplemental restraint system warning lamp is off

**Not reported**

The information is not reported by the EDR

**Unknown**

The information is not known

**ACCIDENT EVENT SEQUENCE NUMBER**

**Screen Name:** CDC

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *EACCSEQ*

**Element Attributes:**

- Choose event number from drop down list
- 97 Event not related to this crash
- 98 Not reported
- 99 Unknown

**Source:** Researcher determined

**Remarks:**

**Choose event number from drop down list**

Choose from the list of events previously listed for this vehicle.

**Event not related to this crash**

If there is a recorded non deployment or deployment event not related to this crash.

**Unknown**

If a determination cannot be made as to which event the EDR data relates.

**TYPE OF EVENT**

**Screen Name:** Deploy Status

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *DPLYSTAT*

**Element Attributes:**

- 1 Non-Deployment
- 2 Deployment
- 8 Not reported

**Source:** Researcher determined

**Remarks:**

Choose attribute based upon EDR output.

**NUMBER OF IGNITION CYCLES AT EVENT OCCURRENCE**

**Screen Name:** Ignition Cycle Event

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *EVCYCLES*

**Element Attributes:**

	Enter the number of cycles
999998	Not reported
999999	Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

Identifies how many times the ignition cycle has been cycled on and off.

**NUMBER OF IGNITION CYCLES AT INVESTIGATION**

**Screen Name:** Ignition Cycle Investigation

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *INVCYCLE*

**Element Attributes:**

	Enter the number of cycles
999998	Not reported
999999	Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

The number of ignition cycles when the module was downloaded for this report.

**DRIVER'S BELT STATUS**

**Screen Name:** Driver Belt

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *DRVBELT*

**Element Attributes:**

- 1 Buckled
- 2 Unbuckled
- 8 Not reported
- 9 Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

Records if the driver's restraint buckle was engaged in the latch.

**TIME FOR DRIVER PRETENSIONER ACTUATION**

**Screen Name:** Pretensioner

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *DRPRTEN*

**Element Attributes:**

- Enter the time in milliseconds
- 85 Not deployed
- 86 Not reported
- 99 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 1-84, 85, 86, 99

**Remarks:**

Records the time in milliseconds after algorithm enabled that the Pretensioner actuated.

**DRIVER SEAT TRACK IN FORWARD POSITION**

**Screen Name:**        Seat Track Forward

**SAS Data Set:**        *EDRDATA*

**SAS Variable:**        *DRIVSEAT*

**Element Attributes:**

- 1     Yes
- 2     No
- 8     Not reported
- 9     Unknown

**Source:**        As recorded by the EDR from CDR program.

**Remarks:**

Records if the seat track adjustment was forward of a predetermined point in its travel.

**PASSENGER'S BELT STATUS**

**Screen Name:** Passenger Belt

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *PASBELT*

**Element Attributes:**

- 1 Buckled
- 2 Unbuckled
- 8 Not reported
- 9 Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

Records if the passenger's restraint buckle was engaged in the latch.

**PASSENGER'S SEAT WEIGHT SENSOR POSITION**

**Screen Name:** Passenger Seat

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *PASSEAT*

**Element Attributes:**

- 1 On
- 2 Off
- 8 Not reported
- 9 Unknown

**Source:** As recorded by the EDR from CDR program in Occupant Classification Status

**Value.**

**Remarks:**

IF THE VEHICLE WAS EQUIPPED WITH OCCUPANT WEIGHT SENSING TECHNOLOGIES, THE SYSTEM MAY RECORD THE DATA RELATIVE TO THIS VARIABLE.

**TIME FOR PASSENGER PRETENSIONER ACTUATION**

**Screen Name:** Passenger Pretensioner

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *PASPRTEN*

**Element Attributes:**

	Enter the time in milliseconds
85	Not deployed
86	Not reported
99	Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 1-84, 85, 86, 99

**Remarks :**

Records the time in milliseconds after algorithm enabled that the Pretensioner actuated.

**PASSENGER AIR BAG SUPPRESSION SWITCH POSITION**

**Screen Name:** Passenger Suppression Switch

**SAS Data Set:** *EDRDATA*

**SAS Variable:** *PSWSTAT*

**Element Attributes:**

- 1 Not suppressed
- 2 Suppressed
- 8 Not reported
- 9 Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

Documents the presence of a passenger's air bag cut off switch and its position.

AIR BAG DEPLOYMENT TIMES

The screenshot shows a software window titled "Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1". The window has a menu bar with options: Vehicle, Tire, Specifications, Fuel, Fire, Crush, CDC, EDR, Sketches, Log, and Review. Below the menu bar, there is a dropdown menu for "EDR Information obtained?" with the value "Yes - Data entered". A secondary menu bar includes "List", "EDR", "AirBag Deploy", "Pre Crash", and "Crash". The main content area is titled "Air Bag Deployment Times" and contains a table with the following data:

Type	Position	Stage 1 (ms)	Stage 2 (ms)
<input checked="" type="checkbox"/> Mid Instrument Panel	Driver	Unknown	

At the bottom of the window, there are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red X icon).

**AIR BAG DEPLOYMENT TIMES**

## AIR BAG LOCATION

Screen Name: Type

*SAS Data Set:* **EDRABAG***SAS Variable:* **EBAGLOC****Element Attributes:**

- |    |                         |
|----|-------------------------|
| 1  | Steering Wheel Hub      |
| 2  | Top Instrument Panel    |
| 3  | Mid Instrument Panel    |
| 4  | Bottom Instrument Panel |
| 5  | Seat Back               |
| 6  | Door                    |
| 7  | Roof Side Rail          |
| 98 | Other (specify)         |
| 99 | Unknown                 |

Source: EDR

## 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.

**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.

**AIR BAG DEPLOYMENT TIMES**

POSITION

**Screen Name:** Position

**SAS Data Set:** *EDRABAG*

**SAS Variable:** *POSITION*

**Element Attributes:**

- 1 Driver
- 2 Passenger

**Source:** EDR

**Remarks:**

**AIR BAG DEPLOYMENT TIMES**

**TIME FOR FIRST STAGE AIR BAG DEPLOYMENT**

**Screen Name:** First Stage

**SAS Data Set:** *EDRABAG*

**SAS Variable:** *STAGE1*

**Element Attributes:**

Enter the time in milliseconds  
Not Deployed  
Disposal  
999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 0-120, 999

**Remarks:**

This is the time in milliseconds after the algorithm enabled documenting when the air bag deployed. Vehicles that are equipped with multi-stage inflators will record the time after algorithm enabled when each stage fires or is disposed.

**AIR BAG DEPLOYMENT TIMES**

**TIME FOR SECOND STAGE AIR BAG DEPLOYMENT**

**Screen Name:** Second Stage

**SAS Data Set:** *EDRABAG*

**SAS Variable:** *STAGE2*

**Element Attributes:**

- Enter the time in milliseconds
- 995 [S]
- 996 Disposal
- 997 Not Deployed
- 999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 0-120, 996,997,999

**Remarks:**

This is the time in milliseconds after the algorithm enabled documenting when the air bag deployed. Vehicles that are equipped with multi-stage inflators will record the time after algorithm enabled when each stage fires or is disposed.

DATA

Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

EDR Information obtained ? Yes - Data entered

List | EDR | AirBag Deploy | Pre Crash | Crash

Data

Pre-Seconds	Speed (MPH)	Engine Speed (RPM)	Throttle %	Brake Switch Circuit Status
1	-5			
	-4			
	-3			
	-2			
	-1			

Deploy Status Deployment

Save Close

**NUMBER OF SECONDS PRIOR TO CRASH**

**Screen Name:** Pre-Seconds

**SAS Data Set:** *EDRPRECR*

**SAS Variable:** *PRESEC*

**Element Attributes:**

Enter / insert a new entry

**Source:** As recorded by the EDR from CDR program.

**Range:** -5,-4,-3,-2-,1

**Remarks :**

If recorded, there are five pre-crash speed readings at one second and in some instances 2 second intervals.

**CRASH VEHICLE SPEED READING (-5, -4, -3, -2, -1)**

**Screen Name:** Speed

**SAS Data Set:** *EDRPRECR*

**SAS Variable:** *SPEED*

**Element Attributes:**

Enter the pre-crash speed reading (mph)  
998 Not reported  
999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 0-120

**Remarks:**

If recorded, there are five pre-crash speed readings at one second and in some instances 2 second intervals.

**PRE-CRASH ENGINE SPEED READING (-5, -4, -3, -2, -1)**

**Screen Name:** Engine Speed

**SAS Data Set:** *EDRPRECR*

**SAS Variable:** *RPM*

**Element Attributes:**

- Enter the pre-crash engine speed reading (rpm)
- 9998 Not reported
- 9999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 1-6272 divisible by 64

**Remarks:**

If recorded, there are five pre-crash engine speed readings at one second and in some instances 2 second intervals.

**PRE-CRASH THROTTLE PERCENTAGE READING (-5, -4, -3, -2, -1)**

**Screen Name:** Throttle %

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

- Enter the pre-crash throttle percentage reading
- 9998 Not reported
- 9999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** 0-100%

**Remarks:**

If recorded, there are five pre-crash throttle percentage readings at one second and in some instances 2 second intervals.

**PRE-CRASH BRAKE STAT US (-5, -4, -3, -2, -1)**

**Screen Name:** Brake Switch Circuit Status

**SAS Data Set:** *EDRPRECR*

**SAS Variable:** *BRKSWTCH*

**Element Attributes:**

1	On
2	Off
8	Not reported
9	Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

If recorded, there are five pre-crash engine speed readings at one second and in some instances 2 second intervals.

DATA/LONGITUDINAL DELTA V

The screenshot shows a software window titled "Exterior Vehicle Form, Case 2004-903-702S/ Vehicle #1". The window has a menu bar with options: Vehicle, Tire, Specifications, Fuel, Fire, Crush, CDC, EDR, Sketches, Log, and Review. Below the menu bar, there is a dropdown menu for "EDR Information obtained ?" with the value "Yes - Data entered". Below this are tabs for "List", "EDR", "AirBag Deploy", "Pre Crash", and "Crash". The "Data" section is active, showing sub-tabs for "Longitudinal Delta V" and "Lateral Delta V". A table is displayed under "Longitudinal Delta V" with two columns: "Time (ms)" and "Delta-V (MPH)". The table contains three rows of data.

Time (ms)	Delta-V (MPH)
10	
20	
30	

At the bottom of the window, there are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red X icon).

**DATA/LONGITUDINAL DELTA V**

[NUMBER OF MILLISECONDS AFTER CRASH]

**Screen Name:** N/A

**SAS Data Set:** *EDRCRASH*

**SAS Variable:** *MSECONDS*

**Element Attributes:**

The unit of time for the delta V readings in milliseconds.

**Source:** As recorded by the EDR from CDR program.

**Range:** 10-300, by 10's

**Remarks:**

Edit/Insert a new reading at 10 millisecond intervals.

[DELTA V READING]

**Screen Name:** N/A

**SAS Data Set:** *EDRCRASH*

**SAS Variable:** *DELTA V*

**Element Attributes:**

The value of the delta V  
999 Unknown

**Source:** As recorded by the EDR from CDR program.

**Range:** -120 to -.1, 999. Add units in MPH

**Remarks:**

Enter only as many lines as times reported.

TIME FOR LATERAL DELTA V READING

**Screen Name:** Time

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Edit/Insert a new reading at 10 millisecond intervals

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

**DATA/LATERAL DELTA V**

LATERAL DELTA V READING

**Screen Name:** Delta-V

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Enter Lateral Delta V reading

Not reported

Unknown

**Source:** As recorded by the EDR from CDR program.

**Remarks:**

Insert the Delta V reading at 10 millisecond intervals.

**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.

- Outline the damage profile produced by the impact.
- Use cross hatches to indicate direct damage.
- 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.

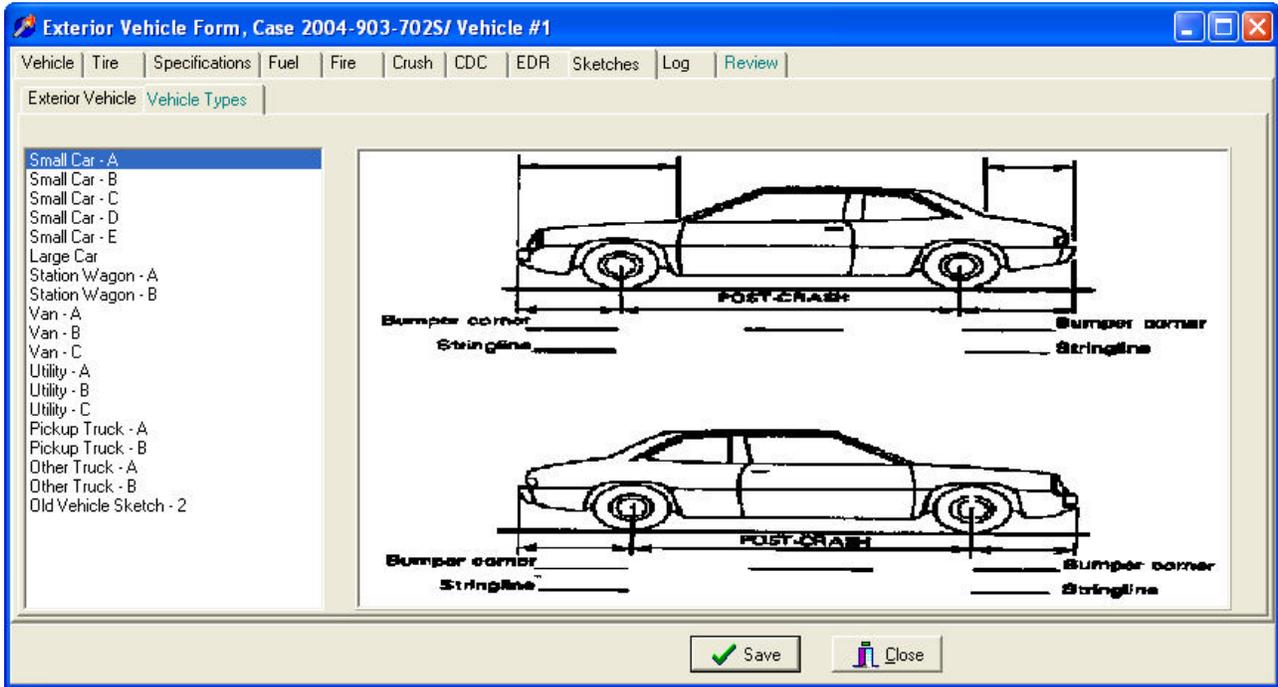
CDC extent zone measurements are required; although, only the measurements which pertain to the damaged plane are needed (*i.e.*, hood length for frontal, side extents for side impacts, etc.). Obtain all measurements which may be needed when questions arise regarding the damaged plane. If doubt exists 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"].

- Measure from the bottom of the bumper face (reinforcement bar) to the ground.
- Include a calibrated instrument (contour gauge rod or 1 meter scale) in the photographs of the vehicle's bumper height.

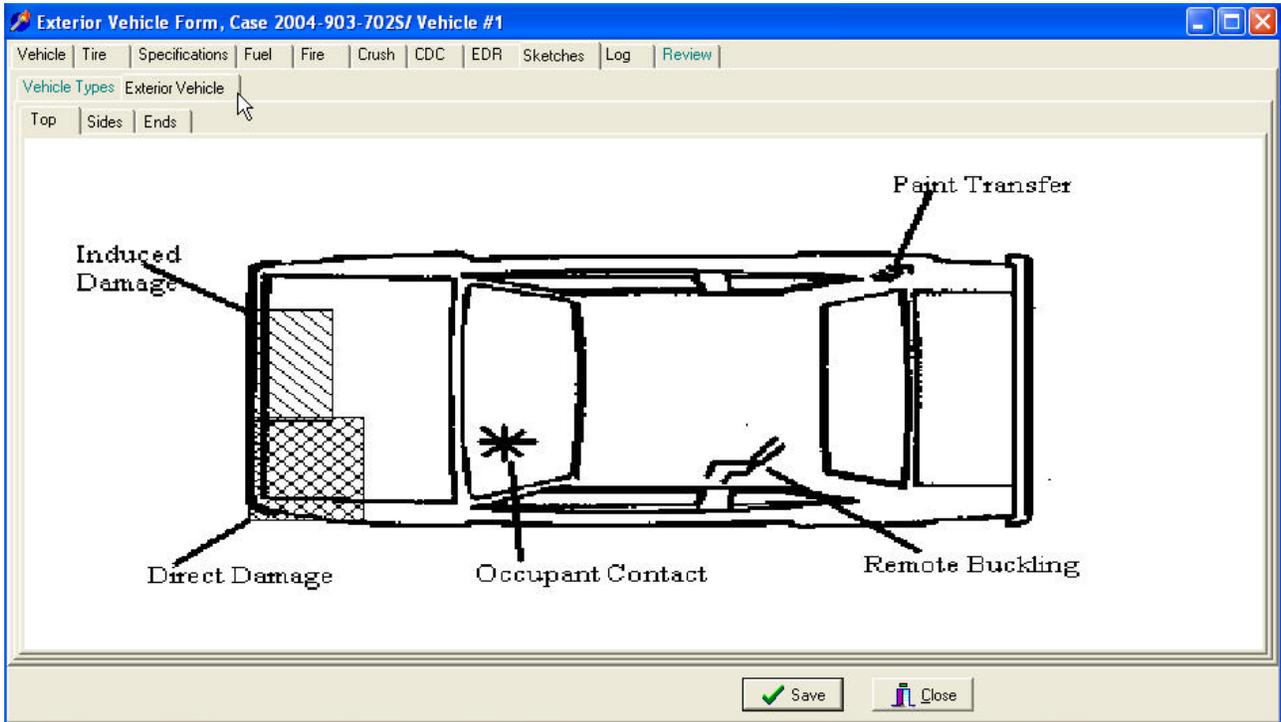
The following screens exemplify the procedures to complete the vehicle sketches.

VEHICLE TYPES



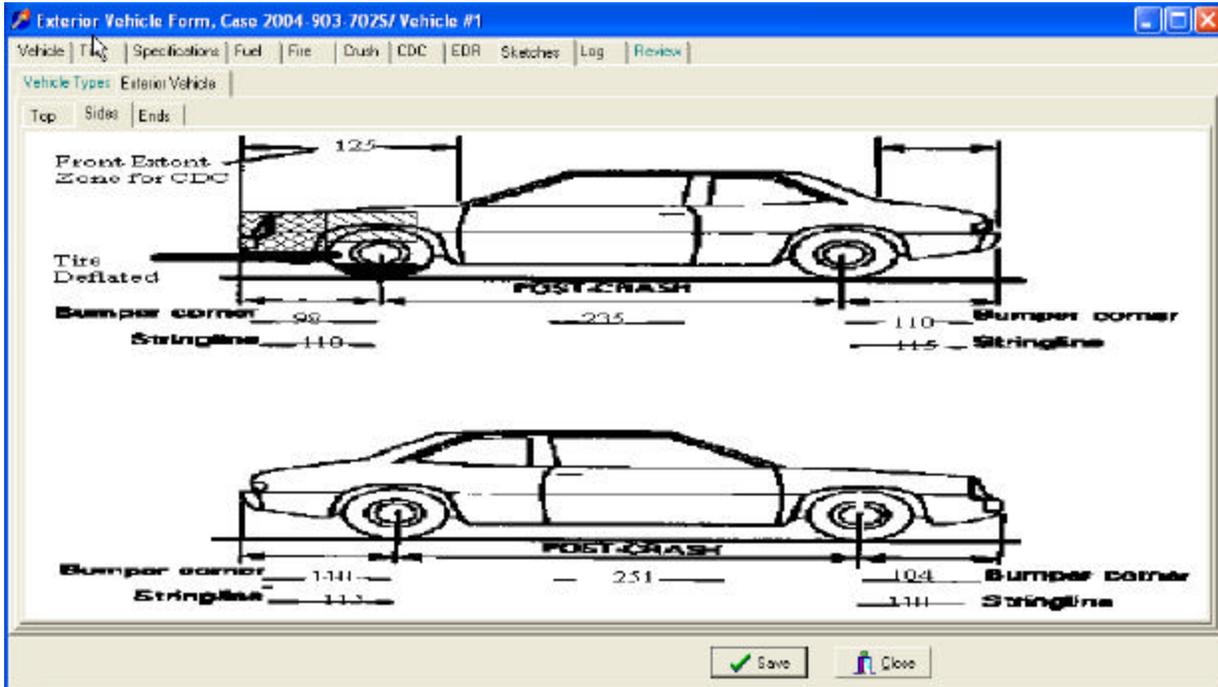
Select vehicle type from left side of screen and double click on type.

TOP VIEW

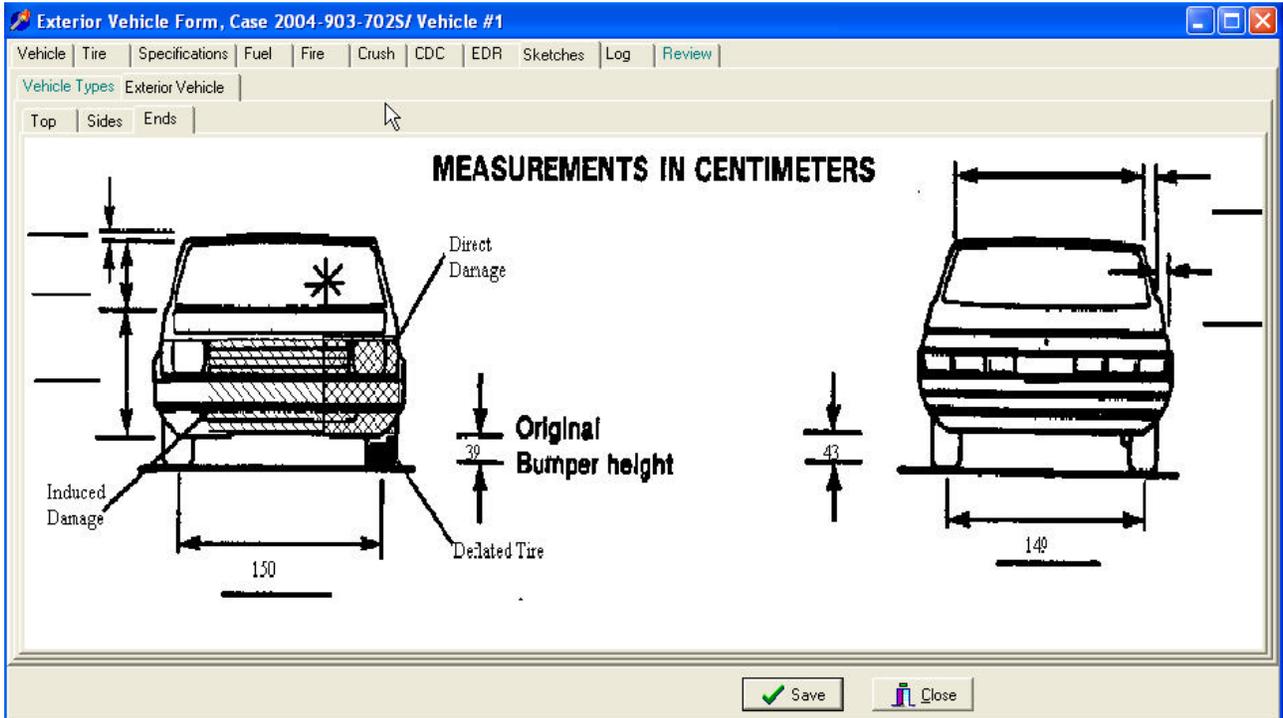


Next, select the End, Side or Top tab for completing the sketches. Then double click on the image to begin sketching the damage and documenting the required measurements.

SIDE VIEW



END VIEW



LOG

Exterior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

Applicable Precrash Measurements

Reference Line Placement

Impact Damage Documentation

Vehicle Damage Sketch

Exterior Slides Subject

Exterior Slides

Primary Error Source

Save Close

**LIST**

Exterior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

PSU Review | Zone Review

List | Detail

Form [dropdown] Tab [input] Veh# [input] Occ # [input]

Original [input] Suggested [input]

Comment [text area]

Save Close

DETAIL

Exterior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Vehicle | Tire | Specifications | Fuel | Fire | Crush | CDC | EDR | Sketches | Log | Review

PSU Review | Online Review

List | Detail

Form [dropdown] Tab [text] Veh # [text] Occ # [text]

Original [text] Final [text]

Reason [dropdown] Change [dropdown]

Comment [text area]

Table Column

Save Close

INTEGRITY

Interior Vehicle Form, Case 2004-903-7025/ Vehicle #1

integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

Passenger Compartment Integrity

No Integrity loss     Door/hatch (back door)     Side window

Windshield     Roof     Rear window (backlight)

Door (side)     Roof glass     Unknown

Location	Opening	Damage/Failure
LF		
RF		
LR		
RR		
TG/H		

Save Close

**[IS THERE PASSENGER COMPARTMENT INTEGRITY LOSS?]**

**Screen Name:** N/A

**SAS Data Set:** VI

**SAS Variable:** INTGLOSS

**Element Attributes:**

0	No integrity loss
1	Yes integrity loss
9	Unknown integrity loss

**Source:** Vehicle inspection.

**Remarks:****No integrity loss**

is selected when the doors, roof, and glazing (as listed below) remained intact during the impact sequence.

**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.

**PASSENGER COMPARTMENT INTEGRITY**

Page 1 of 3

**Screen Name:** Passenger Compartment Integrity**SAS Data Set:** *INTGRTY***SAS Variable:** *PASINTEG***Element Attributes:**

- 1 Windshield
- 2 Door (side)
- 3 Door/hatch (back door)
- 4 Roof
- 5 Roof glass
- 6 Side window
- 7 Rear window (backlight)

**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**.

**Windshield**

is selected when the glazing is either holed/slit or displaced sufficiently to allow an adult size head to pass through.

**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.

**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 frameless 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".

**DOOR, TAILGATE, OR HATCH LOCATION**

**Screen Name:** Location

**SAS Data Set:** *DOORS*

**SAS Variable:** *DLOCAT*

**Element Attributes:**

LF	Left Front=1
RF	Right Front=2
LR	Left Rear=3
RR	Right Rear=4
TG/H	Tail Gate / Hatch=5

**Source:** Vehicle inspection.

**Remarks:**

Information is precoded and a choice is made for filling in subsequent variables

**DOOR, TAILGATE, OR HATCH OPENING**

Page 1 of 2

Screen Name: Opening

SAS Data Set: **DOORS**SAS Variable: **DOPEN****Element Attributes:**

N/A	[No door/gate/hatch]
1	Door/gate/hatch remained closed and operational
2	Door/gate/hatch came open during collision
3	Door/gate/hatch jammed shut
8	Other (specify):
9	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:

Door/gate/hatch came open during collision  
Door/gate/hatch jammed shut,  
Other (specify):  
Door/gate/hatch remained closed and operational  
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 OEM 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, Tailgate, or Hatch Opening (cont'd)

Page 2 of 2

**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.

**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.

**DAMAGE/FAILURE ASSOCIATED WITH DOOR, TAILGATE, OR HATCH OPENING IN COLLISION**

Page 1 of 2

**Screen Name:** Damage/Failure**SAS Data Set:** *DOORS***SAS Variable:** *DFAILURE***Element Attributes:**

- |   |  |
|---|--|
|   | [No door/gate/hatch]   |
| 1 | [Door not opened/failure not assessed]   |
| 2 | Door operational (no damage)   |
| 3 | Latch/striker failure due to damage  |
| 4 | Hinge failure due to damage  |
| 5 | Door structure failure due to damage   |
| 6 | Door support ( <i>i.e.</i> , pillar, sill, roof side rail, etc.) failure due to damage |
| 7 | Latch/striker and hinge failure due to damage  |
| 8 | Other failure (specify):   |
| 9 | Unknown  |

**Source:** Vehicle inspection.**Remarks:**

This variable is designed to capture the reason a door opened during the collision sequence.

**[No door/gate/hatch]**

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 not opened]**

is automatically selected when:

- the door/tailgate/hatch did not open during the crash sequence or
- the door/tailgate/hatch is jammed shut.

**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.

**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.



**Glazing Type and Damage Overview**

Page 1 of 2

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**  
**Pre-crash 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	=	2 <sup>nd</sup> left rear window (adjacent to LR window)
RR	=	right rear window (adjacent to RF window)
RR2	=	2 <sup>nd</sup> 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

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**Glazing Type and Damage Overview (cont'd)**

Page 2 of 2

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.

**LOCATION OF WINDOW/WINDSHIELD GLAZING**

**Screen Name:** Location

**SAS Data Set:** *GLAZING*

**SAS Variable:** *GLOC*

**Element Attributes:**

- 1 windshield
- 2 left front window (driver's window)
- 3 right front window
- 4 left rear window (adjacent to LF window)
- 5 2<sup>nd</sup> left rear window (adjacent to LR window)
- 6 right rear window (adjacent to RF window)
- 7 2<sup>nd</sup> right rear window (adjacent to RR window)
- 8 backlight, tailgate / hatchback / liftgate window
- 9 left backlight (left side of a divided backlight, i.e., rear doors on some vans)
- 10 right backlight (right side of a divided backlight, i.e., rear doors on some vans)
- 11 sun roof, moon roof, "T" roof, etc.
- 98 other sidelights, door wing windows, and any other light not identified above

**Source:** Vehicle inspection.

**Remarks:**

Information is pre-coded and a choice is made for filling in subsequent variables.

**TYPE OF WINDOW/WINDSHIELD GLAZING**

**Screen Name:** Type

**SAS Data Set:** *GLAZING*

**SAS Variable:** *GLTYPE*

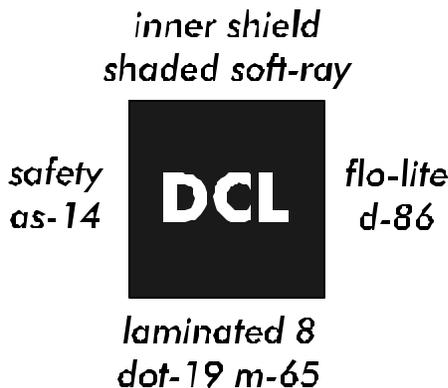
**Element Attributes:**

- NA No glazing
- 1 AS-1 - Laminated
- 2 AS-2 - Tempered
- 3 AS-3 - Tempered-tinted (original)
- 4 AS-2 - Tempered-with after market tint
- 5 AS-3 - Tempered-tinted (with additional after market tint)
- 6 AS-14 - Glass / Plastic (Anti-Lacerative) not plastic
- 7 Glazing removed prior to crash
- 8 Other (specify):
- 9 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)].

**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.

Type of Window/Windshield Glazing (cont'd)

Page 3 of 3

**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.

**WINDOW PRE-CRASH STATUS**

Page 1 of 2

**Screen Name:** Pre Crash Status**SAS Data Set:** *GLAZING***SAS Variable:** *GLPRCRSH***Element Attributes:**

	N/A [No glazing]
1	Fixed
2	Closed
3	Partially opened
4	Fully opened
7	Glazing removed prior to crash
9	Unknown

**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.

Window Pre-crash Status (cont'd)

Page 2 of 2

**Unknown**

is used in the following situation:

- Due to factors beyond the researcher's control, an adequate determination of glazing presence could not be made.

**GLAZING DAMAGE FROM IMPACT FORCES**

**Screen Name:** Impact Damage

**SAS Data Set:** *GLAZING*

**SAS Variable:** *GLIMPACT*

**Element Attributes:**

- NA [No glazing]
- 1 No glazing damage from impact forces
- 2 Glazing in place and cracked from impact forces
- 3 Glazing in place and holed from impact forces
- 4 Glazing out-of-place (cracked or not) and not holed from impact forces
- 5 Glazing out-of-place and holed from impact forces
- 6 Glazing disintegrated from impact forces
- 7 Glazing removed prior to crash
- 9 Unknown if damaged

**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.

**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.

**GLAZING DAMAGE FROM OCCUPANT CONTACT**

Page 1 of 2

**Screen Name:** Occupant Damage**SAS Data Set:** *GLAZING***SAS Variable:** *GLOCCUPT***Element Attributes:**

- |   |   |              |
|---|---|--------------|
|   | NA  | [No glazing] |
| 1 | No occupant contact   |              |
| 2 | Glazing contacted by occupant but no glazing damage   |              |
| 3 | Glazing in place and cracked by occupant contact  |              |
| 4 | Glazing in place and holed by occupant contact  |              |
| 5 | Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact |              |
| 6 | Glazing out-of-place by occupant contact and holed by occupant contact                      |              |
| 7 | Glazing removed prior to crash  |              |
| 8 | Glazing disintegrated by occupant contact   |              |
| 9 | Unknown if contacted by occupant  |              |

**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).

**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.

INTRUSIONS

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

Intrusions (DESC) | Detail | Sketch

Row	Position	Area	Intruded Component	Comparison	Intruded	Intrusion	Magnitude	Crush	
1	Front Seat	Left	Interior	Window frame	23	56	33	>= 30 to < 46 cms	Longit
2	Front Seat	Left	Interior	A (A1/A2)-pillar	23	44	21	>= 15 to < 30 cms	Longit
3	Other	Left	Exterior	Unknown exterior object	Measured	Measured	Measured	<= 2 cms	Longit

Insert Save Close

INTRUSION DETAIL

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

Intrusions (DESC) | Detail | Sketch

Row: Front Seat

Position: Left

Intrusion Area: Interior

Component: Window frame

Comparison: 23

Intruded: 56

Intrusion: 33

Magnitude: >= 30 to < 46 cms

Crush Direction: Longitudinal

Insert Save Close

**OCCUPANT AREA INTRUSION OVERVIEW**

Page 1 of 4

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:

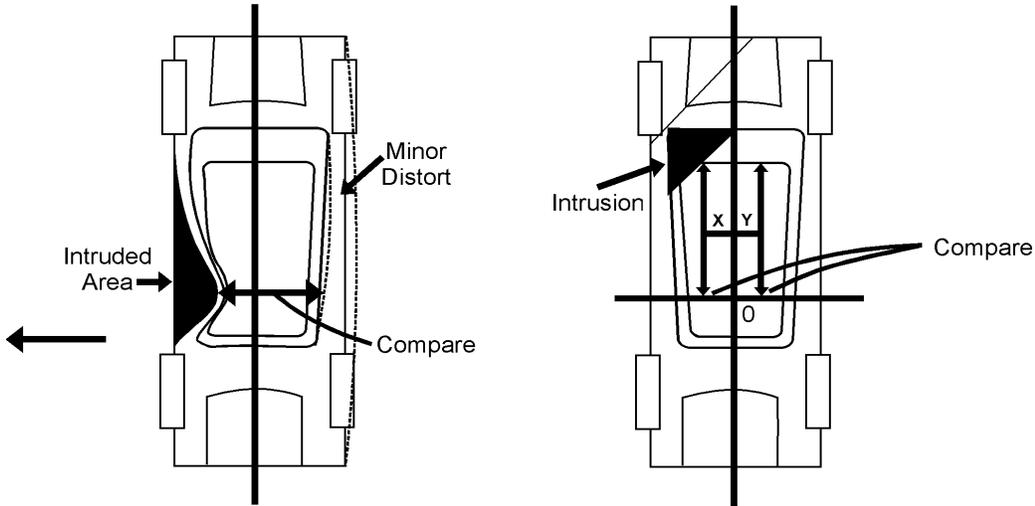
**Type A:** Intrusion which is limited to one part of the passenger compartment and where the other side of the vehicle remains relatively free of distortion. This is likely to be the case in the majority of crashes. In many cases it will be possible to obtain undeformed vehicle dimensions as the vehicle 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.

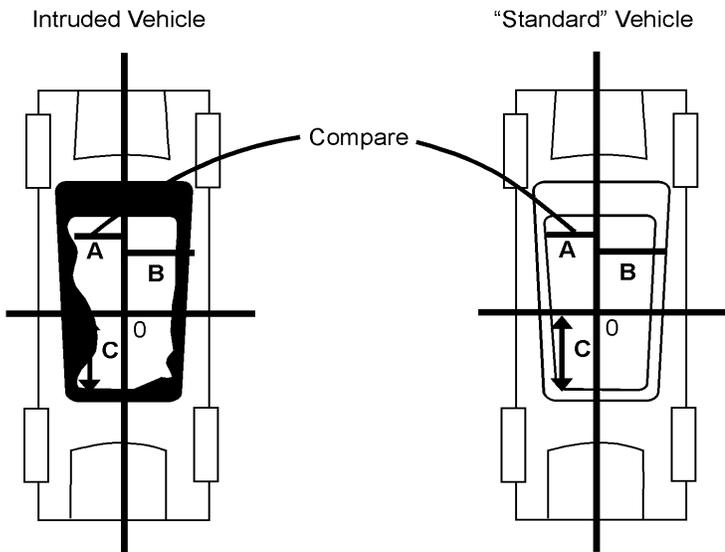
**FIGURE 1**

**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.

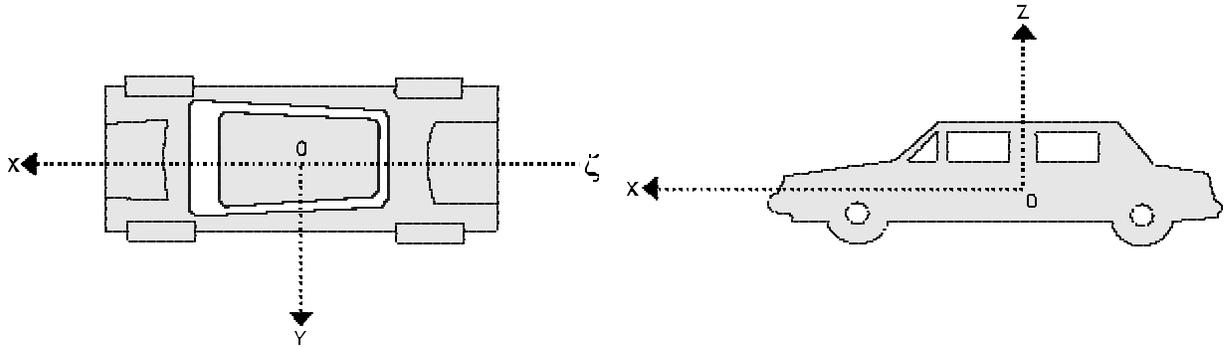
**TYPE A INTRUSION:** \_\_\_\_\_



**TYPE B INTRUSION:** \_\_\_\_\_



**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 Re searcher 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.

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.

**[INTRUSION NUMBER]**

**Screen Name:** N/A

**SAS Data Set:** *INTRSN*

**SAS Variable:** *INTNUM*

**Element Attributes:**

Automatically generated by data entry system, sequential numbers

**Source:** Vehicle inspection.

**Remarks:**

**ROW**

**Screen Name:** Row

**SAS Data Set:** N/A

**SAS Variable:** N/A

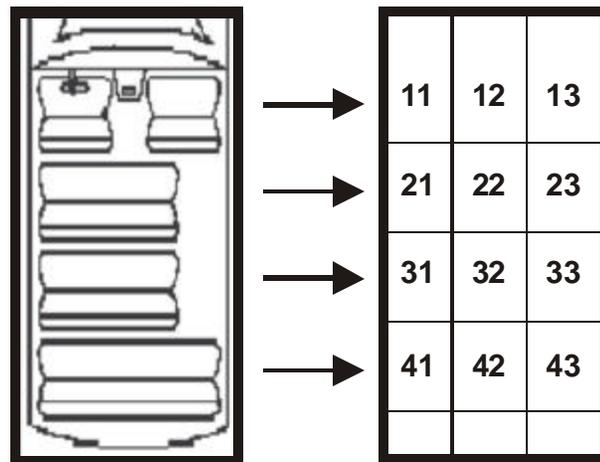
**Element Attributes:**

- Front Row
- Second Row
- Third Row
- Fourth Row
- Fifth 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.

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.

**POSITION**

**Screen Name:** Position

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Left  
Middle  
Right  
[Catastrophic]  
Unknown

**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).

**[INTRUSION LOCATION]**

Page 1 of 3

Screen Name:N/A

*SAS Data Set:*        *INTRSN**SAS Variable:*        *INLOC***Element Values:****Front Row**

11    Left  
12    Middle  
13    Right

**Second Row**

21    Left  
22    Middle  
23    Right

**Third Row**

31    Left  
32    Middle  
33    Right

**Fourth Row**

41    Left  
42    Middle  
43    Right

**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.

11	12	13
21	22	23
31	32	33
41	42	43
51	52	53

When the entire seat row is folded down or removed prior to the crash, this area is considered an **Other** enclosed area.

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.

**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.

**AREA**

**Screen Name:** Area

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**INTRUDED COMPONENT**

**Screen Name:** Intruded Component

**SAS Data Set:** *INTRSN*

**SAS Variable:** *INCOMP*

**Element Attributes:**

<b>Interior Components</b>		<b>Interior components cont'd</b>	
1	Steering assembly	20	Front seat back
2	Instrument panel left	21	Second seat back
3	Instrument panel center	22	Third seat back
4	Instrument panel right	23	Fourth seat back
5	Toe pan	24	Fifth seat back
6	A (A1/A2)-pillar	25	Seat cushion
7	B-pillar	26	Back door/panel ( <i>e.g.</i> , tailgate)
8	C-pillar	27	Other interior component (specify):
9	D-pillar		
10	Side panel - forward of the A1/A2-pillar	<b>Exterior Components</b>	
11	Door panel (side)	30	Hood
12	Side panel - rear of the B-pillar	31	Outside surface of this vehicle (specify):
13	Roof (or convertible top)	32	Other exterior object in the environment (specify):
14	Roof side rail	33	Unknown exterior object
15	Windshield	97	[Catastrophic]
16	Windshield header	98	Intrusion of unlisted component(s)
17	Window frame		
18	Floor pan (includes sill)		
19	Backlight header		

**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 cannot 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.

**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.

**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.

Intruded Component (cont'd)

Page 4 of 4

**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.

**COMPARISON VALUE (OF INTRUSION)**

**Screen Name:** Comparison

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**INTRUDED VALUE (OF INTRUSION)**

**Screen Name:**Intruded

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Attributes:**

Record to the nearest centimeter  
[Catastrophic]  
[Unknown]

**Range:**

**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.

**INTRUSION**

**Screen Name:** Intrusion

**SAS Data Set:** *INTRSN*

**SAS Variable:** *INMEAS*

**Element Attributes:**

Record to the nearest centimeter  
977 [Catastrophic]  
999 [Unknown]

**Source:** Vehicle inspection.

**Range:** 1-160, 997(catastrophic), 999 (unknown)

**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.

**MAGNITUDE OF INTRUSION**

**Screen Name:** Magnitude

**SAS Data Set:** *INTRSN*

**SAS Variable:** *INMAG*

**Element Attributes:**

0	<= 2 cm
1	>= 3 cm but < 8 cm
2	>= 8 cm but < 15 cm
3	>= 15 cm but < 30 cm
4	>= 30 cm but < 46 cm
5	>= 46 cm but < 61 cm
6	>=61 cm
7	[Catastrophic]
9	[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.

**CRUSH DIRECTION**

**Screen Name:** Crush Direction

**SAS Data Set:** *INTRSN*

**SAS Variable:** *CDRIR*

**Element Attributes:**

1	Vertical
2	Longitudinal
3	Lateral
7	[Catastrophic]
9	[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**

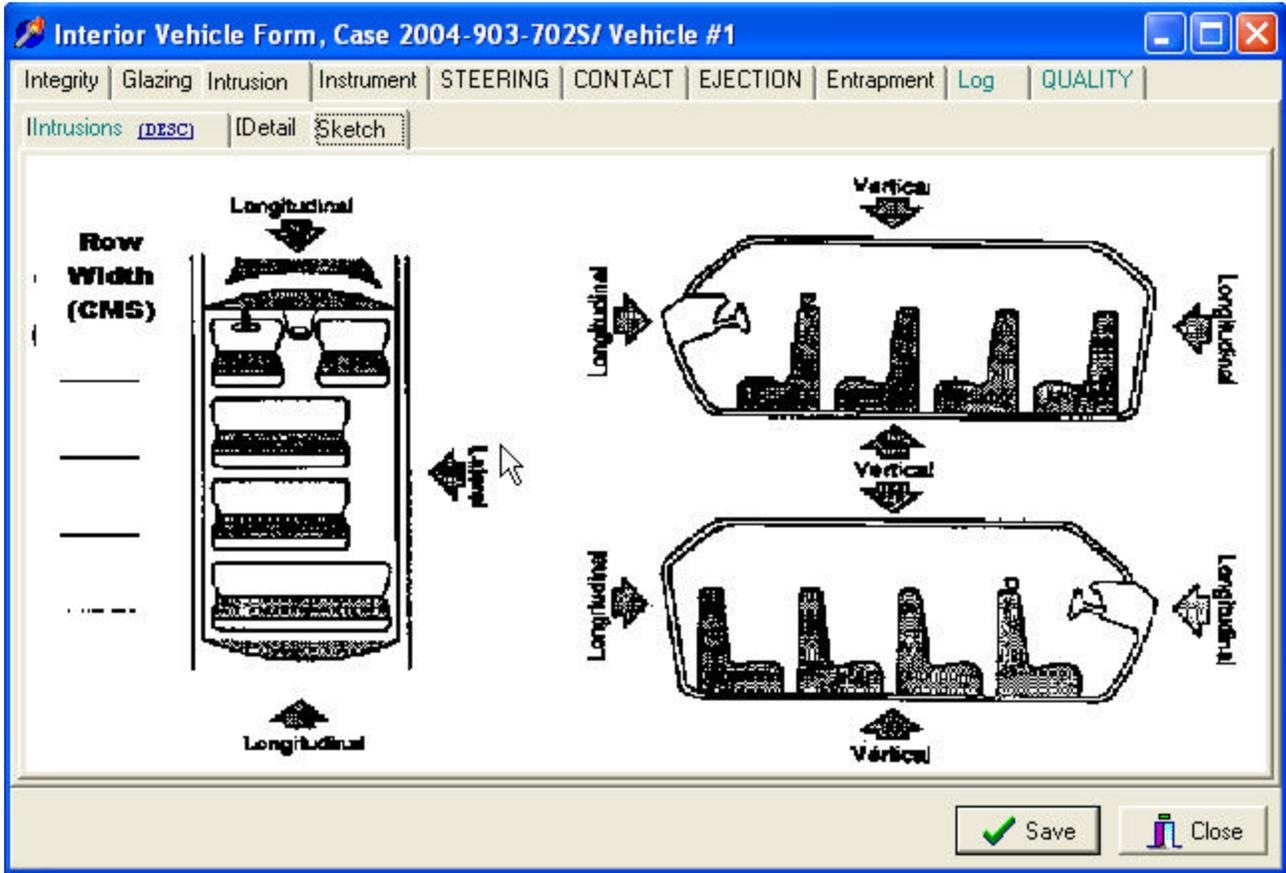
refers to components which are displaced either left or right within the passenger compartment.

**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.

INTRUSION/SKETCH

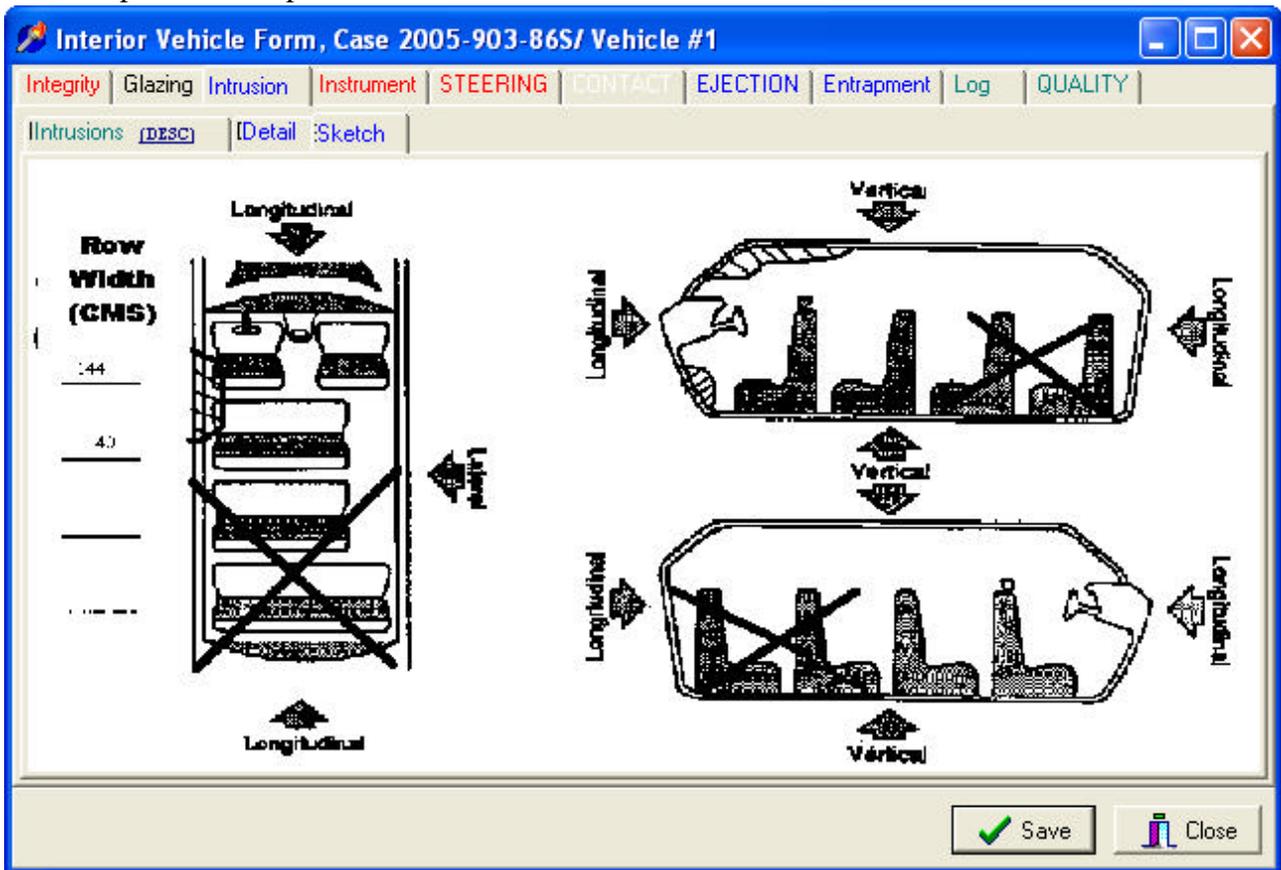


INTRUSION SKETCH COMPLETION

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:



INSTRUMENT

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | **STEERING** | CONTACT | EJECTION | Entrapment | Log | QUALITY

Odometer - Reading: 41843 km  
- Source: Vehicle Inspection

Damage from Occupant Contact: No  
Adjustable Pedal: Position Unknown

Adaptive Driving Equipment: Adaptive driving equipment installed, check all that apply

Knee Bolster Covering: Other (specify)  
Knee Bolsters deformed from Occupant Contact: No Deformation  
Glove Compartment Door: No - door did not open

Adaptive Equipment **Right Mouse Click on Check Box to View Specify**

<input type="checkbox"/> Hand Controls for braking/acceleration	<input type="checkbox"/> Replacement steering wheel (i.e. reduced diameter)	<input type="checkbox"/> Additional or relocated switches (specify)	<input type="checkbox"/> Pedal Extender
<input type="checkbox"/> Steering control devices	<input type="checkbox"/> Joy-stick steering controls	<input type="checkbox"/> Flared roof	<input type="checkbox"/> Unknown type of adaptive device
<input type="checkbox"/> Steering knob attached to steering wheel	<input type="checkbox"/> Wheelchair tie-downs	<input type="checkbox"/> Wall mounted head rest (used behind wheel chair)	
<input type="checkbox"/> Low effort power steering (unit or device)	<input type="checkbox"/> Modification to seat belts (specify)	<input type="checkbox"/> Other adaptive device (specify)	

Save Close

**ODOMETER READING**

**Screen Name:** Odometer Reading

**SAS Data Set:** VI

**SAS Variable:** *ODOMETER*

**Element Attributes:**

**Range:** 000,001 through 1,000,000  
Enter odometer reading  
Unknown Electric Odometer  
9999999 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-Electric Odometer**

Use if odometer is electronic and the vehicle does not have a power supply.

**Unknown**

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.

**ODOMETER SOURCE**

**Screen Name:** Odometer - - Source

**SAS Data Set:** VI

**SAS Variable:** *ODOMSRC*

**Element Attributes:**

0	[Unknown odometer reading]
1	Vehicle Inspection
2	Interview
3	Repair Facility
8	Other

**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**.

**INSTRUMENT PANEL DAMAGE FROM OCCUPANT CONTACT**

**Screen Name:**Damage from Occupant Contact

**SAS Data Set:** VI

**SAS Variable:** PANELDAM

**Element Attributes:**

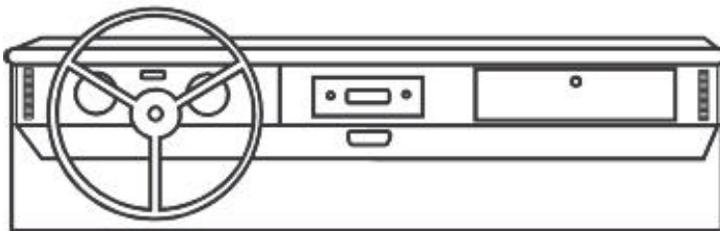
- 0 No
- 1 Yes
- 9 Unknown

**Source:** Vehicle inspection only.

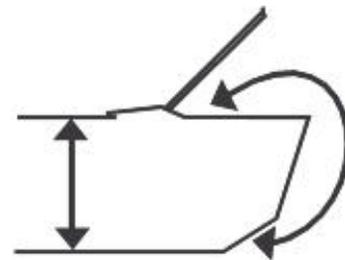
**Remarks:**

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.

Damage from Occupant Contact (cont'd)

Page 2 of 2

**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.

**TYPE OF KNEE BOLSTER COVERING**

**Screen Name:** Knee Bolster Covering

**SAS Data Set:** VI

**SAS Variable:** *BOLSTYPE*

**Element Attributes:**

- 0 No Knee Bolster
- 1 Padded
- 2 Rigid Plastic
- 8 Other (specify): \_\_\_\_\_
- 9 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.

**KNEE BOLSTERS DEFORMED FROM OCCUPANT CONTACT**

**Screen Name:** Knee Bolsters Deformed from Occupant Contact

**SAS Data Set:** VI

**SAS Variable:** *BOLSTDEF*

**Element Attributes:**

0	[No knee bolster]
1	No- deformation
2	Yes - deformation
9	Unknown

**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 a 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.

**DID GLOVE COMPARTMENT DOOR OPEN DURING COLLISION(S)?**

**Screen Name:** Glove Compartment Door

**SAS Data Set:** VI

**SAS Variable:** *GLOVOPEN*

**Element Attributes:**

0	No glove compartment door
1	No — door did not open
2	Yes — door opened
9	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)].

**ADJUSTABLE PEDALS**

**Screen Name:** Adjustable Pedal

**SAS Data Set:** VI

**SAS Variable:** *ADJPED*

**Element Attributes:**

- 1 No adjustable pedals
- 2 Full forward (toward toe pan)
- 3 Mid position
- 4 Full rearward (toward driver)
- 8 Position unknown
- 9 Unknown if adjustable pedals present

**Source:** Investigator determined — primary source is the vehicle inspection, secondary source is driver interview.

**Remarks:**

**ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT**

**Screen Name:** Adaptive Driving Equipment

**SAS Data Set:** VI

**SAS Variable:** ADAPTEQ

**Element Attributes:**

- 0 No adaptive driving equipment installed
- 1 Yes, adaptive driving equipment installed
- 9 Unknown if adaptive driving equipment installed

**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.

**Yes, adaptive driving 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.

**Unknown if adaptive device installed**

is used when it cannot be determined if any adaptive driving devices were installed in the vehicle at the time of the crash.

**ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT**

**Screen Name:** Adaptive Driving Equipment

**SAS Data Set:** *ADAPTEQ*

**SAS Variable:** *EQUIPTYP*

**Element Attributes:**

- 1 Hand controls for braking/acceleration
- 2 Steering control devices (attached to OEM steering wheel)
- 3 Steering knob attached to steering wheel
- 4 Low effort power steering (unit or device)
- 5 Replacement steering wheel (*i.e.* reduced diameter)
- 6 Joy-stick steering controls
- 7 Wheelchair tie-downs
- 8 Modifications to seat belts (specify)
- 9 Additional or relocated switches (specify)
- 10 Raised roof
- 11 Wall mounted head rest (used behind wheelchair)
- 12 Pedal extender
- 89 Other adaptive device (specify)
- 99 Unknown type of adaptive device

Unknown if adaptive driving equipment installed

**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).

**ADAPTIVE EQUIPMENT INSTALLED, CHECK ALL THAT APPLY**

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.

**Hand controls for braking / acceleration**

does not include normal cruise control.

Adaptive (Assistive) Driving Equipment (cont'd)

Page 2 of 2

**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".

**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 type of adaptive device**

is used when it is known there is an adaptive device for the driver, but the type of device is unknown

STEERING COLUMN

Interior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument: **STEERING** | CONTACT | EJECTION | Entrapment | Log | QUALITY

Steering Column | Worksheet | Drawing

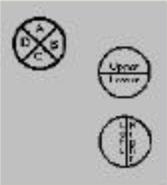
Column Type:

Tilt Adjustment:

Telescoping Adjustment:

Location of Rim/Spoke Deformation:

Rim/Spoke Deformation (cm):



Save Close

**STEERING COLUMN TYPE**

Page 1 of 2

**Screen Name:** Column Type**SAS Data Set:** VI**SAS Variable:** *COLUMTYP***Element Attributes:**

- |   |                              |
|---|------------------------------|
| 1 | Fixed column                 |
| 2 | Tilt column                  |
| 3 | Telescoping column           |
| 4 | Tilt and telescoping column  |
| 8 | Other column type (specify): |
| 9 | Unknown                      |

**Source:** Vehicle inspection.**Remarks:****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.

Column Type (cont'd)

Page 2 of 2

**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.

**TILT STEERING COLUMN ADJUSTMENT**

Page 1 of 2

**Screen Name:** Tilt Adjustment**SAS Data Set:** VI**SAS Variable:** COLMTILT**Element Attributes:**

0	[No tilt steering column]
1	Full up
2	Between full up and center
3	Center
4	Between center and full down
5	Full down
9	Unknown

**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.

Column Type (cont'd)

Page 2 of 2

**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.

**TELESCOPING STEERING COLUMN ADJUSTMENT**

Page 1 of 2

**Screen Name:** Telescoping Adjustment**SAS Data Set:** VI**SAS Variable:** COLMTELE**Element Attributes:**

0	[No telescoping steering column]
1	Full back
2	Between full back and midpoint
3	Midpoint
4	Between midpoint and full forward
5	Full forward
9	Unknown

**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.

**LOCATION OF RIM/SPOKE DEFORMATION**

**Screen Name:** Location of Rim / Spoke Deformation

**SAS Data Set:** VI

**SAS Variable:** RDEFLOC

**Element Attributes:**

0 No steering rim deformation

**Quarter Sections**

- 1 Section A
- 2 Section B
- 3 Section C
- 4 Section D

**Half Sections**

- 5 Upper half of rim/spoke
- 6 Lower half of rim/spoke
- 7 Left half of rim/spoke
- 8 Right half of rim/spoke
  
- 9 Complete steering wheel collapse
- 10 Undetermined location
- 99 Unknown

**Source:** Vehicle inspection.

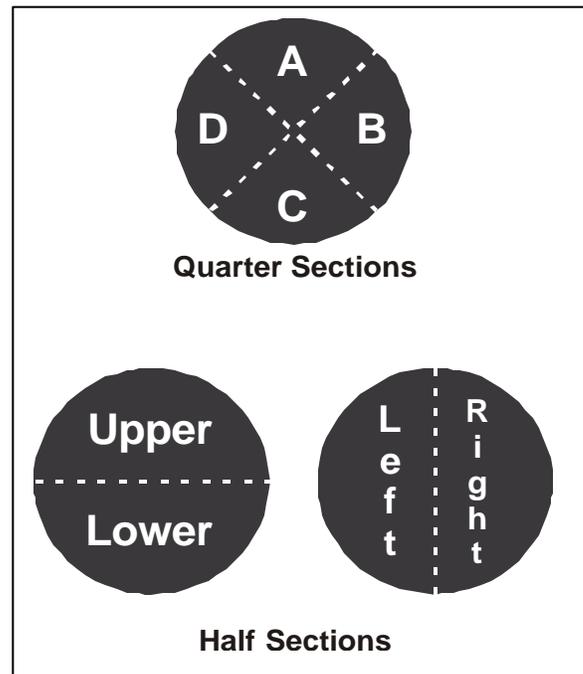
**Remarks:**

The variable **Rim / Spoke Deformation** must be coded with a value, in order to classify the **Location of Rim / Spoke Deformation**.

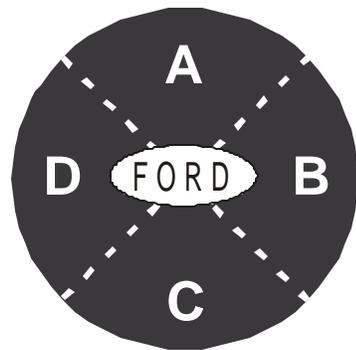
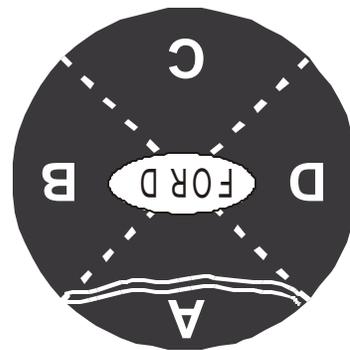
The steering wheel rim is divided into four quarter sections (A through D) and four half sections (upper half, lower half, left half, right half).

**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.



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.

**STEERING RIM/SPOKE DEFORMATION**

**Screen Name:** Rim /Spoke Deformation

**SAS Data Set:** VI

**SAS Variable:** RIMDEF

**Element Attributes:**

- Record actual measured deformation to the nearest centimeter
- 98 Indeterminate - Observed
- 99 Unknown

**Source:** Vehicle inspection.

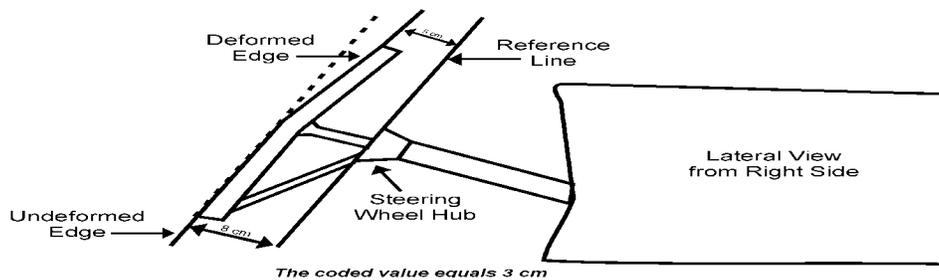
**Range:** 0-20, 98,99

**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.



**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.

Steering Rim / Spoke Deformation (cont'd)

Page 2 of 2

**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.

STEERING/WORKSHEET

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

Steering Column | Worksheet | Drawing

Comparison Value	Damage Value	Deformation
------------------	--------------	-------------

Save Close

**COMPARISON VALUE**

**Screen Name:** Comparison Value

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**DAMAGE VALUE**

**Screen Name:** Damage Value

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**DEFORMATION**

**Screen Name:** Deformation

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

No steering rim deformation  
Record actual measured deformation to the nearest centimeters.  
Actual measured value in centimeters

**Source:** Vehicle inspection.

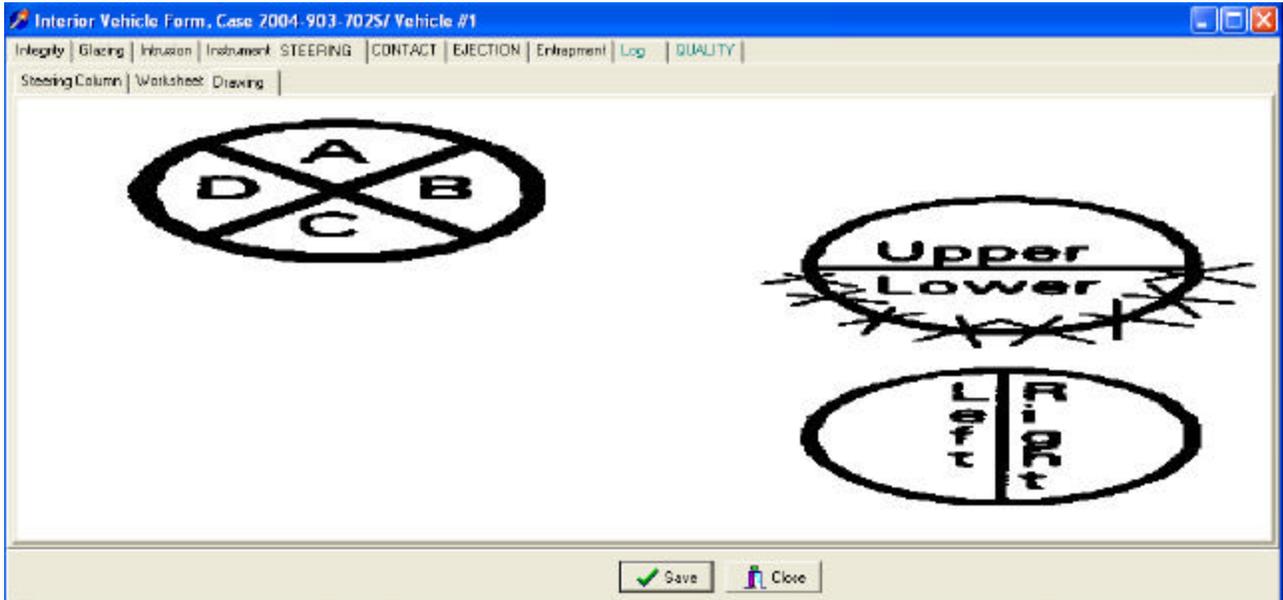
**Remarks:**

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.

STEERING/DRAWING



Instructions for completion of Steering Drawing Diagrams

The Steering Drawing Diagrams allows researchers to report data that are not encoded and might otherwise be omitted from the case. The intent is to capture deformation caused by occupant contact rather than induced damage.

The researcher should indicate on the drawings what portion of the rim/spoke was deformed. The drawings should reflect coded data in the Steering Column Tab/Location of Rim/Spoke Deformation.

CONTACT/LIST

Contact	Area	Component	Occ #	Body Region	Evidence	Confidence
A	Interior	Head restraint system	2	Back	Transfer (Specify)	Probable

CONTACT/CONTACT

Contact: A

Area: Interior

Component: Head restraint system

Occ #: 2

Body Region: Back

Evidence: Transfer (Specify)

Confidence: Probable

## **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)the image.

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.

**CONTACT**

**Screen Name:** Contact

**SAS Data Set:** *CONTACT*

**SAS Variable:** *REFID*

**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.

**CONTACT AREA LABEL****Screen Name:** Area**SAS Data Set:** *CONTACT***SAS Variable:** *CONTAREA***Element Attributes:**

- 1 Front
- 2 Left Side
- 3 Right Side
- 4 Interior
- 5 Air Bag
- 6 Roof
- 7 Floor
- 8 Rear
- 50 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.

**CONTACTED COMPONENT**

**Screen Name:** Component

**SAS Data Set:** *CONTACT*

**SAS Variable:** *CONTCOMP*

**Element Values:**

**FRONT**

- 1 Windshield
  - 2 Mirror
  - 3 Sunvisor
  - 4 Steering wheel rim
  - 5 Steering wheel hub/spoke
  - 6 Steering wheel rim/hub/spoke
  - 7 Steering column, transmission selector lever, other attachment
  - 8 Cellular telephone or CB radio
  - 9 Add on equipment (*e.g.*, tape deck, air conditioner)
  - 10 Left instrument panel and below
  - 11 Center instrument panel and below
  - 12 Right instrument panel and below
  - 13 Glove compartment door
  - 14 Knee bolster
  - 15 [Dr only] WS incl 1/+: fr hdr, A pill, instr pnl, mirror, or steering assembly
  - 16 [Pass only] WS incl 1/+: fr hdr, A pill, instr pnl, or mirror
  - 17 Windshield reinforced by exterior object (specify)
  - 19 Other front object (specify):
- 59 Lt side glass +: frame, win sill, A pill, B pill, or roof side rail
- 60 Other left side object (specify):

**LEFT SIDE**

- 51 Left side interior surface, excluding hardware or armrests
- 52 Left side hardware or armrest
- 53 Left A (A1/A2)-pillar
- 54 Left B-pillar
- 55 Other left pillar (specify):
- 56 Left side window glass
- 57 Left side window frame
- 58 Left side window sill

**Element Values:** (cont'd)**RIGHT SIDE**

- 101 Right side interior surface, excluding hardware or armrests
- 102 Right side hardware or armrest
- 103 Right A (A1/A2)-pillar
- 104 Right B-pillar
- 105 Other right pillar (specify):
- 106 Right side window glass
- 107 Right side window frame
- 108 Right side window sill
- 109 Rt side glass +: frame, win sill, A pill, B pill, or roof side rail
- 110 Other right side object (specify):

**INTERIOR**

- 151 Seat, back support
- 152 Belt restraint webbing/buckle
- 153 Belt restraint B-pillar or door frame attachment point
- 154 Other restraint system component (specify):
- 155 Head restraint system
- 160 Other occupants (specify):
- 161 Interior loose objects
- 162 Child safety seat (specify):
- 163 Other interior object (specify):
- 164 Center console first row
- 165 Center console second row
- 166 Center console other row
- 167 Fold down armrest first row
- 168 Fold down armrest second row
- 169 Fold down armrest other row
- 570 Same occupant contact (specify):
- 571 Interior loose object (specify):
- 572 Seat LATCH points for child restraints (after 1969)
- 575 Seatback trays (after 1969)

**Element Values:** (cont'd)**AIR BAG**

- 170 Air bag-driver side
- 175 Air bag compartment cover-driver side
- 180 Air bag-passenger side
- 185 Air bag compartment cover-passenger side
- 190 Other air bag (specify)
- 195 Other air bag compartment cover (specify)

**ROOF**

- 201 Front header
- 202 Rear header
- 203 Roof left side rail
- 204 Roof right side rail
- 205 Roof or convertible top
- 206 Roof maplight/console
- 207 Sunroof/components
- 208 Roll bar

**FLOOR**

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

**REAR**

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

**ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT**

- 401 Hand controls for braking /acceleration
- 402 Steering control devices (attached to OEM steering wheel)
- 403 Steering knob attached to steering wheel
- 404 Replacement steering wheel (*i.e.*,reduced diameter)
- 406 Joy stick steering controls
- 407 Wheelchair tie-downs
- 408 Modification to seat belts,(specify):
- 409 Additional or relocated switches, (specify):
- 410 Raised roof
- 411 Wall mounted head rest (used behind wheel chair)
- 412 Other adaptive device (specify):

**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.).

Contacted Component (cont'd)

Page 4 of 5

\* **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.

**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 safety seat**

Child restraint 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.

Select this component 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.)

**OCCUPANT NUMBER**

**Screen Name:** Occupant Number

**SAS Data Set:** *CONTACT*

**SAS Variable:** *OCCNO*

**Element Attributes:**

Select occupant number from drop down list

**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.

An occupant number must be selected, there is no unknown.

**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).

**BODY REGION**

**Screen Name:** Body Region

**SAS Data Set:** *CONTACT*

**SAS Variable:** *CONTREGN*

**Element Attributes:**

10	Abdomen	140	Knee – Left
15	Ankle – Left	145	Knee – Right
20	Ankle – Right	150	Knee – Unknown
22	Ankle - Unknown	155	Lower Arm – Left
25	Back	160	Lower Arm – Right
30	Buttock – Both	165	Lower Arm – Unknown
35	Buttock – Left	170	Lower Leg – Left
40	Buttock – Right	175	Lower Leg – Right
45	Buttock – Unknown	180	Lower Leg – Unknown
50	Chest	185	Neck
55	Elbow – Left	190	Shoulder – Left
60	Elbow – Right	195	Shoulder – Right
65	Elbow – Unknown	200	Shoulder – Unknown
70	Face	205	Thigh – Left
75	Flank – Left	210	Thigh – Right
80	Flank – Right	215	Thigh – Unknown
82	Flank - Unknown	220	Upper Arm – Left
85	Foot – Left	225	Upper Arm – Right
90	Foot – Right	230	Upper Arm – Unknown
95	Foot – Unknown	235	Upper Leg – Left
100	Genitals	240	Upper Leg – Right
105	Hand – Left	245	Upper Leg – Unknown
110	Hand – Right	250	Wrist – Left
115	Hand – Unknown	255	Wrist – Right
120	Head	260	Wrist – Unknown
125	Hip-Left	999	Unknown
130	Hip – Right		
135	Hip – Unknown		

Body Region (cont'd)

Page 2 of 2

**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.

**EVIDENCE**

**Screen Name:** Evidence

**SAS Data Set:** *CONTACT*

**SAS Variable:** *CONTEVID*

**Element Attributes:**

- 1 Bent
- 2 Cracked
- 3 Scuffed
- 4 Transfer (specify)
- 5 Deformed
- 6 Blood
- 7 Hair
- 8 Stretched
- 9 Scratched
- 10 Teeth marks
- 11 Imprint
- 12 Spider Web
- N/A Child Seat – No SAS Code
- N/A Moved – No SAS Code
- 96 Combination (specify)
- 98 Other (specify)

**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.**

**CONFIDENCE LEVEL OF OCCUPANT CONTACT**

**Screen Name:** Confidence

**SAS Data Set:** *CONTACT*

**SAS Variable:** *CONTCONF*

**Element Attributes:**

- |   |          |
|---|----------|
| 1 | Certain  |
| 2 | Probable |
| 3 | Possible |
| 9 | 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**.

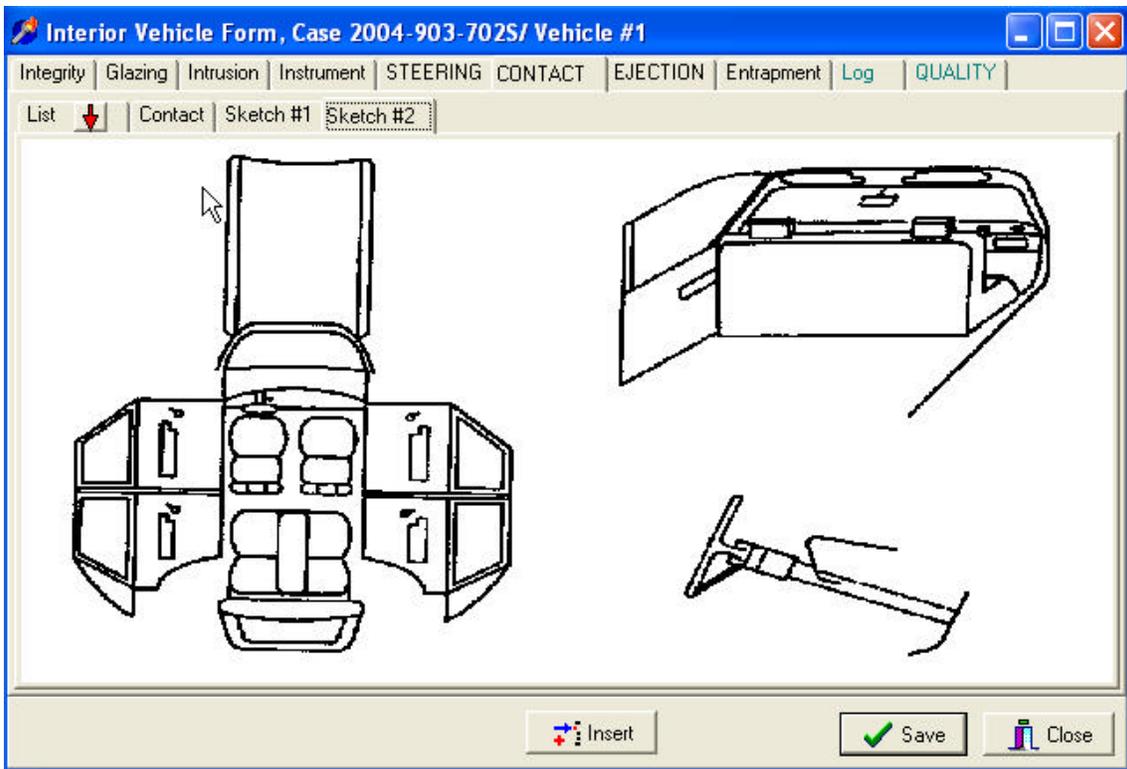
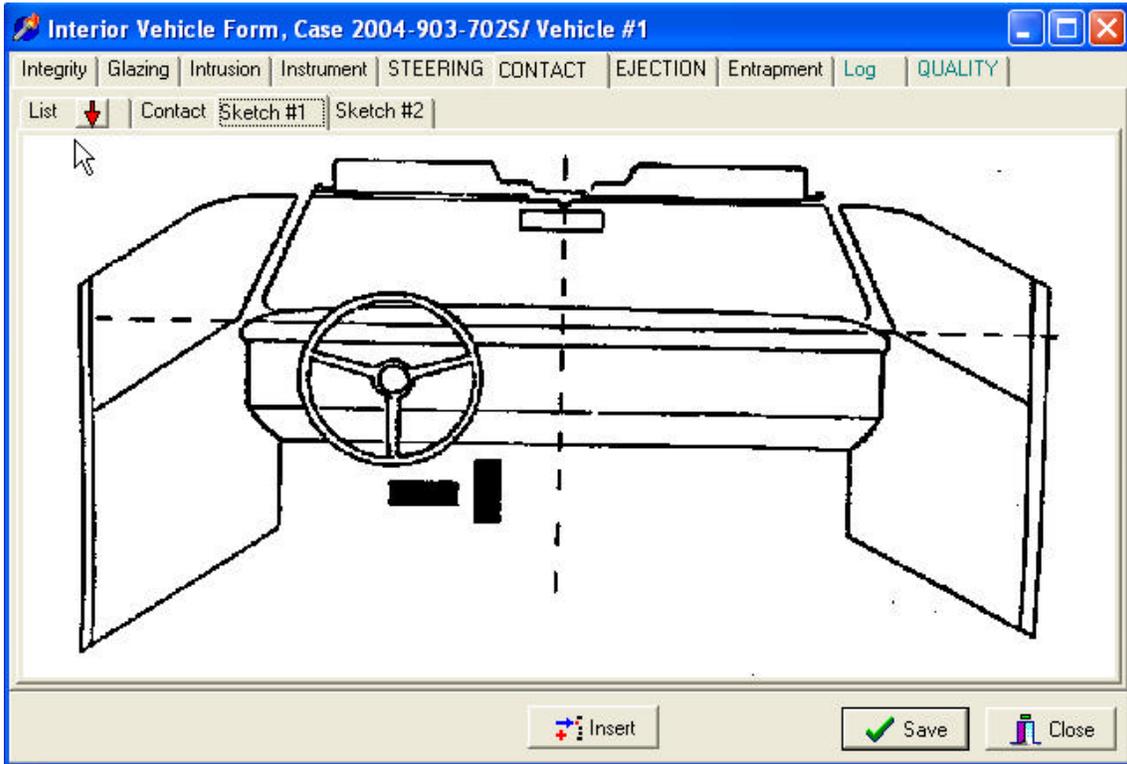
**Possible**

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.

CONTACT/SKETCH 1 AND SKETCH 2



**Instructions for Completion of Vehicle Interior Sketches**

Open up Sketch 1 and Sketch 2 (by double clicking) the image.

Leave the Sketches open or minimized for ease in navigating between the Detail Tab, and the Sketches.

**For each documented Contact Point:**

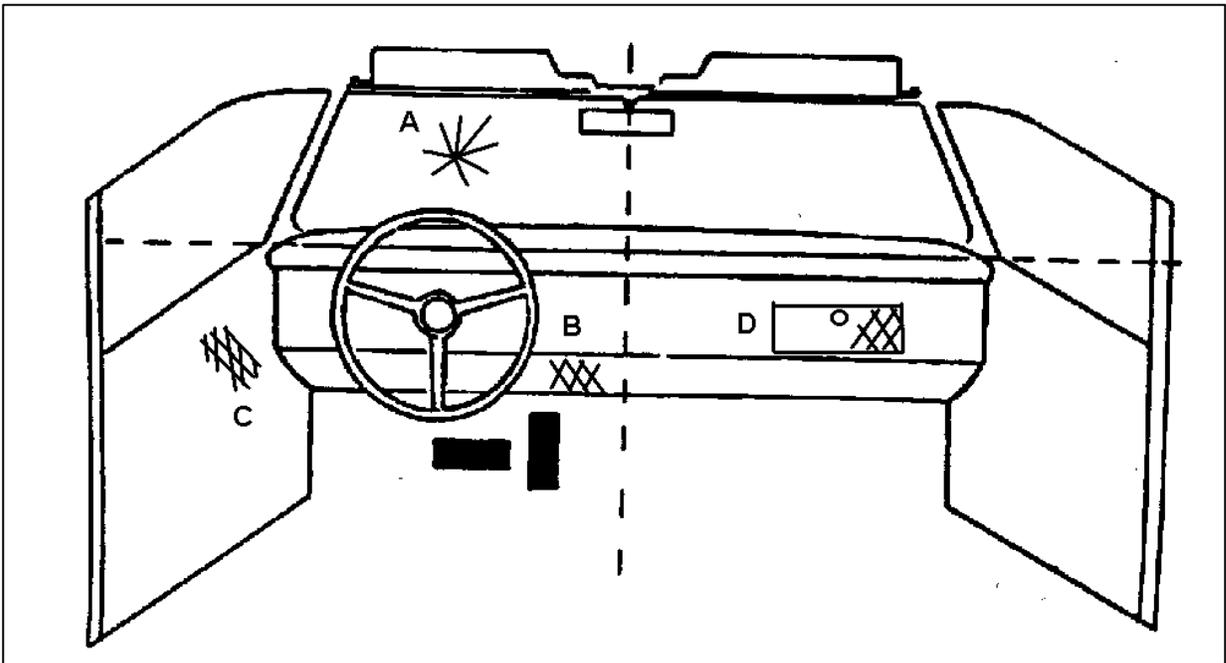
Sketch the damaged area on Sketches 1 and 2 (e.g., windshield, instrument panel, glove compartment, front seat back, etc.).

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 sketch is shown:

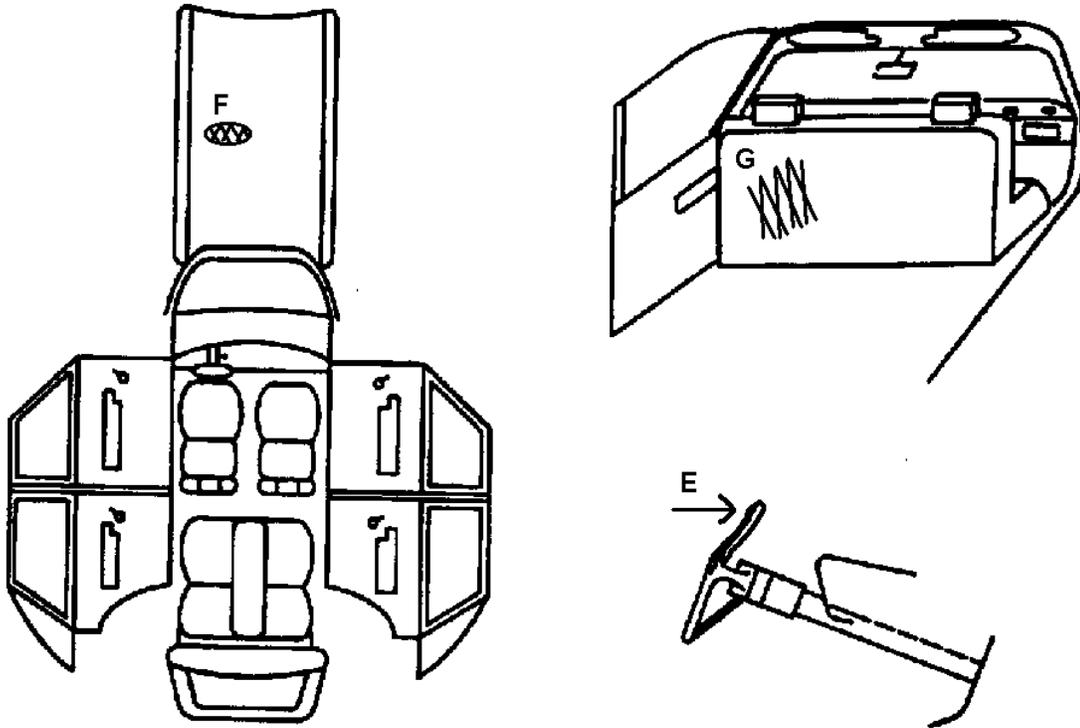
**Vehicle Interior / Contact / Sketch 1 Completed**



Instructions for Completion of Vehicle Interior Sketches (cont'd)

Page 2 of 2

**Vehicle Interior / Contact / Sketch 2 Completed**



## Ejection/Entrapment Overview

Page 1 of 2

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)

Page 2 of 2

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 technique was introduced in windshields. This type of window has 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.

EJECTION DETAIL/LIST

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

List | Detail

Type [ ]

Area [ ]

Medium [ ]

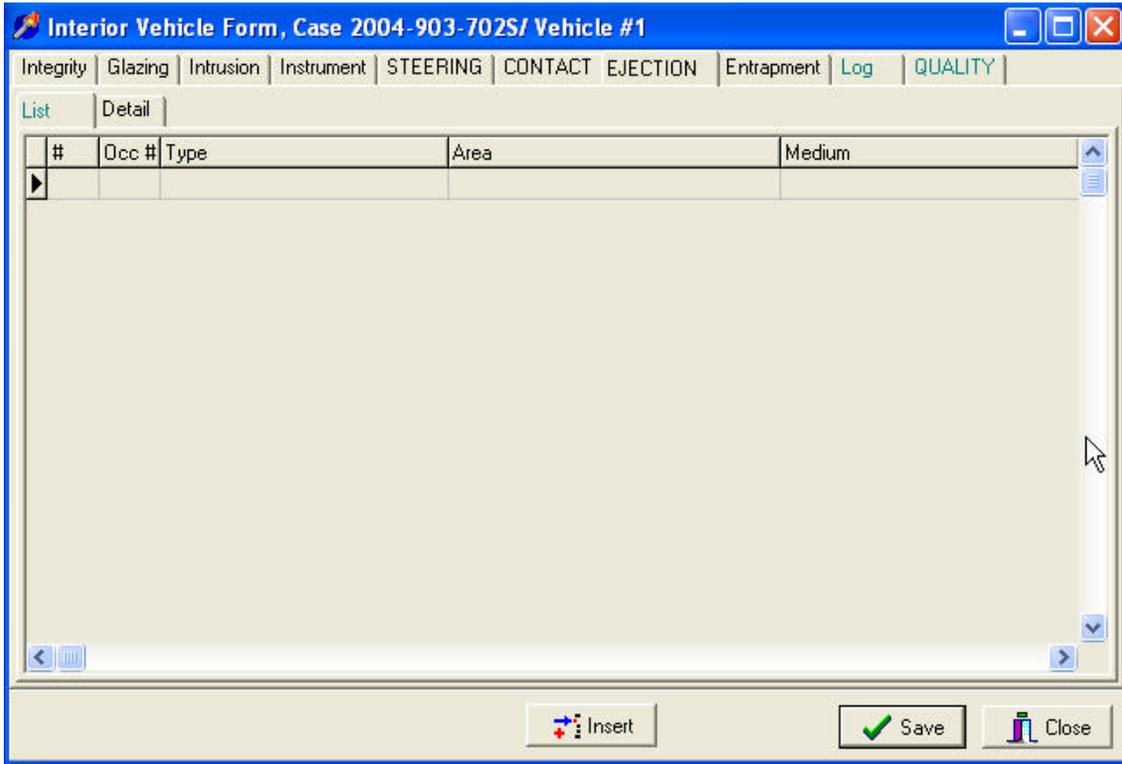
Medium Status [ ]

Ejection # [ 0 ] of 0

Prev Next

Insert Save Close

LIST



Ejection / List

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 and make any corrections.

DETAIL

Interior Vehicle Form, Case 2004-903-702S/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

List | Detail

Type

Area

Medium

Medium Status

Ejection #  of 0

Prev Next

Insert Save Close

**EJECTION NUMBER**

**Screen Name:** Ejection#

*SAS Data Set:* N/A

*SAS Variable:* N/A

**Element Value:**

Number as assigned

**Source:** Vehicle inspection

**Remarks:****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**”.

## EJECTION - TYPE

Page 1 of 2

**Screen Name:** Ejection -Type

**SAS Data Set:** *OA*

**SAS Variable:** *EJECTION*

**Element Value:**

0	No Ejection
1	Complete ejection
2	Partial ejection
3	Ejection, unknown degree
9	Unknown if ejected

**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 -Type (cont'd)

Page 2 of 2

**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.

**EJECTION AREA**

Page 1 of 2

**Screen Name:** Ejection—Area**SAS Data Set:** N/A**SAS Variable:** N/A**Element Attributes:**

0	[No ejection]
1	Windshield
2	Left front
3	Right front
4	Left rear
5	Right rear
6	Rear
7	Roof
89	[Unknown if ejected]
98	Other area (specify)
99	Unknown ejection area

**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 the variables, Ejection Medium, and Medium Status (Immediately Prior to Impact), should be selected when **Area** equals **Roof**.

Ejection Area (cont'd)

Page 2 of 2

<b>Ejection</b>	<b>Roof Type</b>	<b>Area</b>	<b>Ejection Medium</b>	<b>Medium Status</b>
Ejection	Hardtop, ripped open during crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, <u>attached</u> prior to crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, <u>detached</u> 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.

**EJECTION MEDIUM**

Page 1 of 2

**Screen Name:** Ejection—Medium**SAS Data Set:** N/A**SAS Variable:** N/A**Element Attributes:**

0	[No ejection]
1	Door/hatch/tailgate
2	Non-fixed roof structure
3	Fixed glazing
4	Non-fixed glazing (specify)
5	Integral structure
79	[Unknown ejection area]
89	[Unknown if ejected]
98	Other medium (specify)
99	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.

Ejection—Medium (cont'd)

Page 2 of 2

**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.

**EJECTION MEDIUM STATUS**

**Screen Name:** Ejection—Medium Status

**Element Attributes:**

0	[No ejection]
1	Open
2	Closed
3	[Integral Structure]
79	[Unknown ejection area]
89	[Unknown if ejected]
99	Unknown status of medium

**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.

## ENTRAPMENT

Interior Vehicle Form, Case 2004-903-7025/ Vehicle #1

Integrity | Glazing | Intrusion | Instrument | STEERING | CONTACT | EJECTION | Entrapment | Log | QUALITY

Save Close

Enter any observations or indications of possible entrapment or mobility restriction. Careful observation should be made of intruding vehicle components, jammed doors, crushed roof, or other mechanisms that might have restrained occupants or restricted or limited egress from the vehicle.

SEAT

< Right >					
	No Seat		No Seat	No Seat	No Cargo Area
		No Seat	No Seat	No Seat	
No Seat		No Seat	No Seat	No Seat	
		No Seat	No Seat	No Seat	

< Front >

Save Close

Select the available seats in this vehicle.

**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 Restraints and any Child restraint (infant, booster, convertible, 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.

Field Safety Notification should be submitted when there is a failure of a safety system.

**SEAT DEFINITION**

Safety Systems Form, Case 2005-903-865/ Vehicle #1

SEAT | RESTRAINTS | AIRBAG | CHILD SEAT | Log | QUALITY

Seat Definition | **First Row** | Second Row | Third Row | Fourth Row | Fifth Row

	Left	Center	Right
<b>Head Restraint</b>			
Type	<input type="text"/>	<input type="text"/>	<input type="text"/>
Damage	<input type="text"/>	<input type="text"/>	<input type="text"/>
Active	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Seat</b>			
Type	Bucket with folding back	<input type="text"/>	<input type="text"/>
Orientation	<input type="text"/>	<input type="text"/>	<input type="text"/>
Track	<input type="text"/>	<input type="text"/>	<input type="text"/>
Performance	<input type="text"/>	<input type="text"/>	<input type="text"/>
Integrated Restraints	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>LATCH</b>			
Anchor	No	<input type="text"/>	<input type="text"/>
Tether	No	<input type="text"/>	<input type="text"/>
<b>Seat Back</b>			
Prior	<input type="text"/>	<input type="text"/>	<input type="text"/>
Post	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>AB EVER Available</b>	Yes	<input type="text"/>	No

Save Close

**OCCUPANT'S SEAT POSITION**

**Screen Name:**        Seat Location Identification

**SAS Data Set:**        *OA*

**SAS Variable:**        *SEATPOS*

**Front Seat**

- 11 Left side
- 12 Middle
- 13 Right side

**Fourth Seat**

- 41 Left side
- 42 Middle
- 43 Right side
- 44 Far right side

**Second Seat**

- 21 Left side
- 22 Middle
- 23 Right side
- 24 Far right side

**Fifth Seat**

- 51 Left side
- 52 Middle
- 53 Right side
- 54 Far right side

**Third Seat**

- 31 Left side
- 32 Middle
- 33 Right side
- 34-Far right side

- 97 In or on unenclosed area
- Other enclosed area
- 99 Unknown seat location

**Source:**        Vehicle inspection

**Remarks:**

“Far right side” is only to be used if the seat has four seating positions.

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.

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.

Persons appended to the vehicle in motion are not considered to be occupants of the vehicle.

**Unenclosed Area****Other Seat**

is used for the sixth or higher numbered seat area (highly unlikely).

**HEAD RESTRAINT TYPE AT THIS OCCUPANT POSITION**

**Screen Name:** Head Restraint -Type

**SAS Data Set:** SEATLOC

**SAS Variable:** HEADTYPE

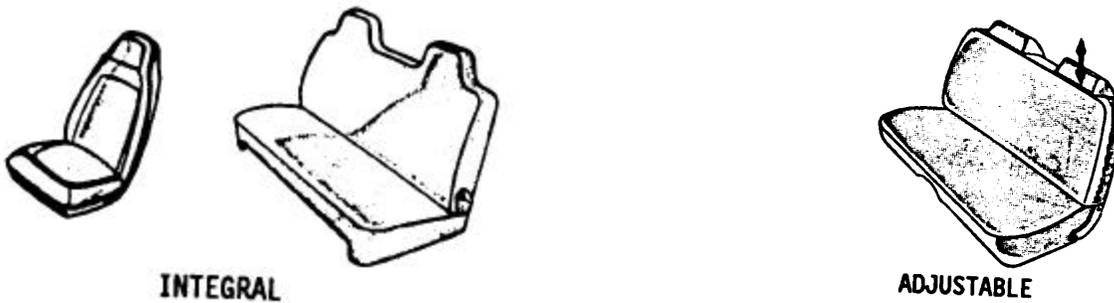
**Element Attributes:**

- 1 No head restraints
- 2 Integral
- 3 Adjustable
- 4 Add-on
- 8 Other (specify)
- 9 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.



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**

refers 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.

**Adjustable**

applies 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**

refers 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.

**HEAD RESTRAINT DAMAGE BY OCCUPANT AT THIS OCCUPANT POSITION**

**Screen Name:** Head Restraint – Damage

**SAS Data Set:** *SEATLOC*

**SAS Variable:** *HEADDAMG*

**Element Attributes:**

- 1 [No Head Restraints]
- 2 No damage
- 3 Damaged during crash
- 9 Unknown

**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.

**ACTIVE HEAD RESTRAINT**

**Screen Name:** Head Restraint - Active

**SAS Data Set:** SEATLOC

**SAS Variable:** HEADACT

**Element Attributes:**

- 1 [No Head Restraints]
- 2 No active head Present
- 3 Present
- 9 Unknown

**Source:** Vehicle Inspection, interview

**Remarks:**

There should be a label on the seat indicating the presence of the active head restraint.

## SEAT TYPE

Page 1 of 2

Screen Name: Seat – Type

SAS Data Set: SEATLOC

SAS Variable: SEATTYPE

## Element Attributes:

- 1 Bucket
- 2 Bucket with folding back
- 3 Bench
- 4 Bench with separate back cushions
- 5 Bench with folding back(s)
- 6 Split bench with separate back cushions
- 7 Split bench with folding back(s)
- 8 Pedestal (*i.e.*, column supported)
- 9 Box mounted seat (*i.e.*, van type)
- 10 Other seat type (specify)
- 99 Unknown Seat Type

Source: Vehicle inspection.

## Remarks:

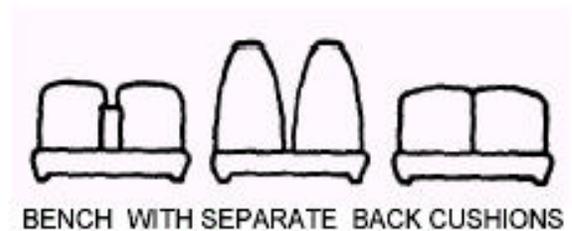
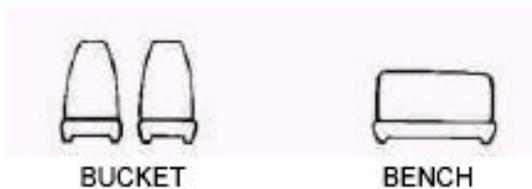
This variable assesses the type of seat present at this position.

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)**

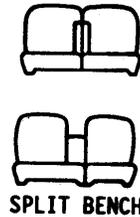
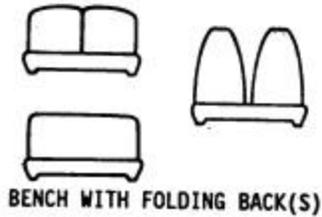
includes both swivel and non-swivel type pedestal seats. A pedestal seat can be differentiated from a bucket seat by the presence of a column supporting the pedestal seat.

Below are examples of some seats and appropriate attributes.



Seat Type (cont'd)

Page 2 of 2



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.

**SEAT ORIENTATION**

**Screen Name:** Seat – Orientation

**SAS Data Set:** *SEATLOC*

**SAS Variable:** *STORIENT*

**Range:****Element Attributes:**

- 1 Forward facing seat
- 2 Rear facing seat
- 3 Side facing seat (inward)
- 4 Side facing seat (outward)
- 8 Other (specify):
- 9 Unknown Orientation

**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.

**SEAT TRACK POSITION**

Page 1 of 2

**Screen Name:** Seat—Track**SAS Data Set:** SEATLOC**SAS Variable:** SEATRACK**Element Attributes:**

- 1 Non-adjustable seat track
- 2 Seat at forward most track position
- 3 Seat between forward most and middle track positions
- 4 Seat at middle track position
- 5 Seat between middle and rear most track position
- 6 Seat at rear most track position
- 9 Unknown Seat Track Position

**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.

Seat Track Position (cont'd)

Page 2 of 2

**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.

**SEAT PERFORMANCE**

Page 1 of 2

**Screen Name:** Seat—Performance**SAS Data Set:** *SEATLOC***SAS Variable:** *SEATPERF***Element Attributes:**

- 1 No seat performance failure(s)
- 2 Seat adjusters failed
- 3 Seat back folding locks or “seat back” failed (specify)
- 4 Seat tracks/anchors failed
- 5 Deformed by impact of occupant
- 6 Deformed by passenger compartment intrusion (specify)
- 7 Combination of above (specify)
- 8 Other (specify)
- 9 Unknown Seat Performance

**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

Seat Performance (cont'd)

Page 2 of 2

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.

**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.

**DOES THE SEAT HAVE INTEGRATED PASSENGER BELTS?**

**Screen Name:** Seat—Integrated Restraints

**SAS Data Set:** *SEATLOC*

**SAS Variable:** *INTGREST*

**Element Attributes:**

- |   |                       |
|---|-----------------------|
| 1 | No                    |
| 2 | Yes                   |
| 9 | Unknown if integrated |

**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”.

**LATCH LOWER ANCHOR AVAILABILITY**

**Screen Name:** LATCH Anchor

**SAS Data Set:** SEATLOC

**SAS Variable:** LATANCH

**Element Attributes:**

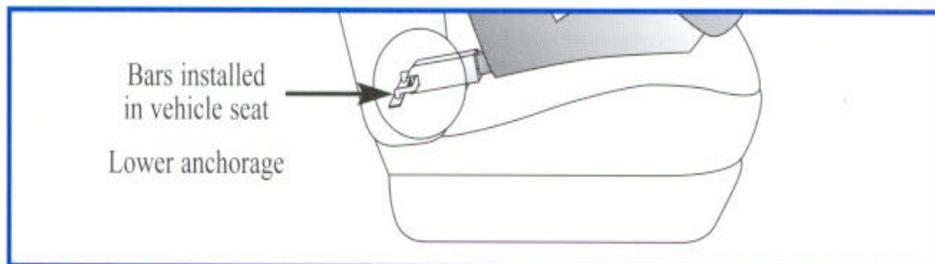
- 1 No
- 2 Yes
- 9 Unknown if anchor

**Source:** Interior Vehicle Inspection (and/or Interview)

**Remarks:**

Currently, some new passenger vehicles are equipped with lower child seat anchorage points between a vehicle's seat cushion and seat back. Together, the two lower anchorage points and top tether anchorage make the LATCH system. By September 1, 2002, this system will be required in two rear seating positions of all cars, minivans, and light trucks.

A lower anchorage is a small rod or bar located between a vehicle's seat cushion and seat back allowing a child safety seat to be attached or snapped into the vehicle instead of being held secure by the vehicle's belt system. By September 1, 2002, all child safety seats will have two attachments which will connect to the vehicle's lower anchorage attachment points. (Some child seat manufacturers have included lower anchorage points in year 2000 models.)



**SAFETY SYSTEMS FORM**  
**LATCH TETHER AVAILABILITY**

**SEAT/DEFINITION/ROW NUMBER**

**Screen Name:** LATCH Tether

**SAS Data Set:** SEATLOC

**SAS Variable:** LATTETH

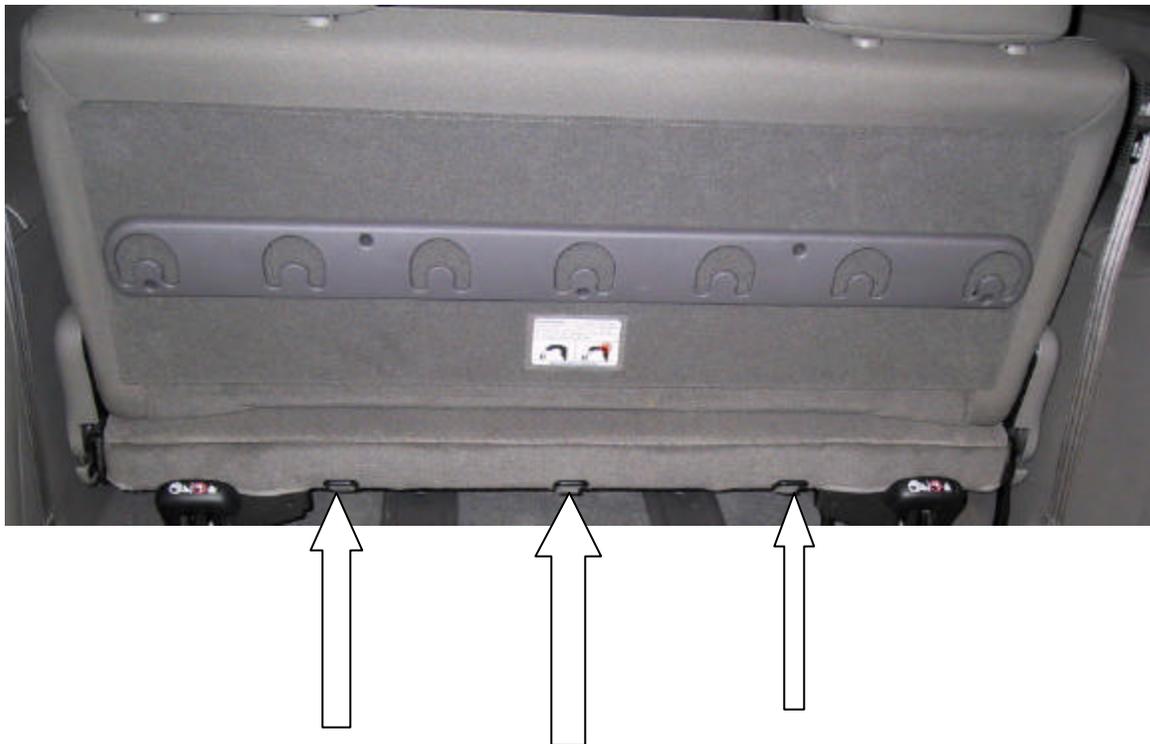
**Element Attributes:**

- 1 No
- 2 Yes
- 9 Unknown if tether

**Source:** Interior Vehicle Inspection (and/or Interview)

**Remarks:**

The tether anchor will found on the rear shelf area of the vehicle. It may be concealed by some sort of covering which can be removed or “flipped up”. In some vehicles, such as mini- vans and station wagons, the tether anchor may be found on the rear floor of the vehicle or on the back of the rear seat.



**SEAT BACK INCLINE PRIOR TO IMPACT**

**Screen Name:**           Seat Back -- Prior

**SAS Data Set:**         **SEATLOC**

**SAS Variable:**        **STPRINCL**

**Element Values:**

- 1     Not adjustable
- 2     Upright
- 3     Slightly reclined
- 4     Completely reclined
- 9     Unknown prior incline

**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.

**SEAT BACK INCLINE POSITION POST IMPACT**

**Screen Name:** Seat Back -- Post

**SAS Data Set:** *SEATLOC*

**SAS Variable:** *STPSINCL*

**Element Attributes:**

- 1 [Not adjustable]
  - 2 Moved to completely rearward position
  - 3 Moved to rearward midrange position
  - 4 Moved to slightly rearward position
  - 5 Retained pre-impact position
  - 6 Moved to upright position
  - 7 Moved to slightly forward position
  - 8 Moved to forward midrange position
  - 9 Move to complete forward position
- Unknown post incline

**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.

**AIR BAG EVER AVAILABLE**

**Screen Name:** Air Bag Ever Available

**SAS Data Set:** *SEATLOC*

**SAS Variable:** *BAGEVER*

**Element Attributes:**

0	No
1	Yes
9	Unknown

**Source:** Vehicle inspection

**Remarks:**

If this car was either manufactured with an air bag or one was retrofitted then indicate this information in the variable.

RESTRAINTS/MANUAL/BELT

Safety Systems Form, Case 2005-903-865/ Vehicle #1

SEAT | **RESTRAINTS** | AIRBAG | CHILD SEAT | Log | QUALITY

Manual | Automatic

First Row | Second Row | Third Row | Fourth Row | Fifth Row

Belt | Components

	Left	Center	Right
Availability	<input type="text"/>	<input type="text"/>	<input type="text"/>
Historical Use?	<input type="text"/>	<input type="text"/>	<input type="text"/>
Used in this crash?	<input type="text"/>	<input type="text"/>	<input type="text"/>
Failure	<input type="text"/>	<input type="text"/>	<input type="text"/>
Anchorage Adjustment	<input type="text"/>	<input type="text"/>	<input type="text"/>

Save Close

## MANUAL (ACTIVE) BELT SYSTEM AVAILABILITY

Page 1 of 2

Screen Name: Availability

SAS Data Set: SEATLOC

SAS Variable: ACTAVAIL

**Element Attributes:**

- 0 None available
- 1 Belt removed/destroyed
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt available - type unknown
- 6 Shoulder belt (lap belt destroyed/removed)
- 7 Lap belt (shoulder belt destroyed/removed)
- 8 Other belt (specify)
- 9 Unknown if available

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.

**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 positioned "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.

## HISTORICAL USE OF MANUAL (ACTIVE) BELT SYSTEM

Page 1 of 2

Screen Name: [Historical Use]

SAS Data Set: OA

SAS Variable: ACTHIST

## Element Attributes:

- [0 None used / not available / removed or destroyed]
- [1 Inoperative (specify)]
- [2 Shoulder belt]
- [3 Lap belt]
- [4 Lap and shoulder belt]
- [5 Belt used — type unknown]
- [8 Other belt used (specify)]
- [12 Shoulder with child safety seat]
- [13 Lap with child safety seat]
- [14 Lap and shoulder with child safety seat]
- [15 Belt used with child safety seat — type unknown]
- [18 Other belt used with child safety seat (specify)]
- [99 Unknown if belt used]

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.

**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.

**MANUAL (ACTIVE) BELT SYSTEM USED IN THIS CRASH?**

Page 1 of 2

Screen Name: Used in this crash?

SAS Data Set: SEATLOC

SAS Variable: ACTUSE

**Element Attributes:**

- 0 None used not available / removed or destroyed
- 1 Inoperative (specify)
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt used — type unknown
- 8 Other belt used (specify)
- 12 Shoulder belt with child safety seat
- 13 Lap belt with child safety seat
- 14 Lap and shoulder belt with child safety seat
- 15 Belt with child safety seat — type unknown
- 18 Other belt with child safety seat (specify)
- 99 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.

**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.

**MANUAL (ACTIVE) BELT FAILURE MODES DURING CRASH**

**Screen Name:** Failure

**SAS Data Set:** SEATLOC

**SAS Variable:** ACTFAIL

**Element Attributes:**

- 0 [None used / not available / removed or destroyed]
- 1 No manual belt failure(s)
- 2 Torn webbing (stretched webbing not included)
- 3 Broken buckle or latch plate
- 4 Upper anchorage separated
- 5 Other anchorage separated (specify)
- 6 Broken retractor
- 7 Combination of above (specify)
- 8 Other manual belt failure (specify)
- 9 Unknown if failed [unknown if available / unknown if used]

**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.

**MANUAL SHOULDER BELT UPPER ANCHORAGE ADJUSTMENT**

Page 1 of 2

**Screen Name:** Anchorage Adjustment**SAS Data Set:** SEATLOC**SAS Variable:** ACTANCH**Element Attributes:**

0	[No manual shoulder belt]
1	None for manual shoulder belt
2	In full up position
3	In mid position
4	In full down position
5	Position unknown
9	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. This distinguishes it from "Position unknown".

RESTRAINTS/MANUAL/COMPONENTS

Safety Systems Form, Case 2005-903-865/ Vehicle #1

SEAT | **RESTRAINTS** | AIRBAG | CHILD SEAT | Log | QUALITY

Manual | Automatic

First Row | **Second Row** | Third Row | Fourth Row | Fifth Row

Belt | Components

	Left	Center	Right
Pretensioner	<input type="text"/>	<input type="text"/>	<input type="text"/>
LatchPlate	<input type="text"/>	<input type="text"/>	<input type="text"/>
Belt Retractor	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Positioning Device</b>			
Presence	<input type="text"/>	<input type="text"/>	<input type="text"/>
Use	<input type="text"/>	<input type="text"/>	<input type="text"/>

Save Close

**PRETENSIONER PRESENCE/ACTUATION**

**Screen Name:** Pretensioner

**SAS Data Set:** SEATLOC, OA

**SAS Variable:** ACTPRET

**Element Attributes:**

- |   |  |
|---|--|
| 0 | Not equipped                               |
| 1 | Pretensioner not actuated                  |
| 2 | Retractor type actuated                    |
| 3 | Buckle type actuated (Specify Measurement) |
| 4 | Buckle type actuated measurement unknown   |
| 5 | Pretensioner present, Unknown if actuated  |
| 9 | Unknown if equipped                        |

**Source:** Vehicle Inspection

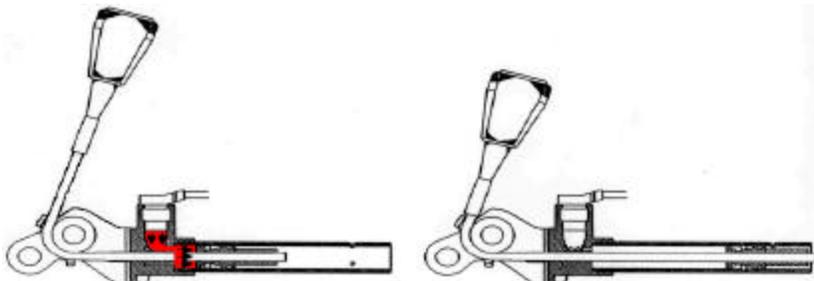
**Remarks:**

Can tighten the belt up to 15 cm.

When a collision occurs, a seat belt with a pretensioner detects the incident, or that they have been applied, and tightens the belt before the wearer is propelled forward. This holds the occupant more securely in the seat. Usually vehicles with air bags will have pretensioners, but they may be present in seating positions that do not have air bags ('80s Mercedes).

The seat belt pretensioners consist of a housing, an initiator, a canister of gas generating materials, a routing cable with a piston attached, and a piston tube. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, a microprocessor causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioners and shortens the seat belt pretensioner height, which removes all of the slack in the seat belts. The seat belt pretensioners will deploy immediately before the frontal inflator (air bag) modules deploy.

If a front air bag (instrument panel, steering wheel) deploys, the pretensioner will deploy. However, it is possible for the pretensioner to deploy without the air bag.



**LATCH PLATE TYPE**

Page 1 of 2

**Screen Name:** Latch Plate**SAS Data Set:** SEATLOC**SAS Variable:** ACTLPLAT**Element Attributes:**

0	Not used/not available
1	Sliding
2	Light weight locking/cinching
3	Locking
4	Switchable
5	Sewn On
9	Unknown Type

**Source:** Vehicle Inspection**Remarks:**

This variable is coded for all manual seat belts that are coded for any vehicle position.

**Sliding**

The webbing is threaded through a slot in the latch plate and there is no locking bar. The latch plate slides freely along the webbing, regardless of the angle. Allows the webbing to slip through unrestricted.

**Locking**

The webbing threads through a locking bar or an adjuster in the latch plate. Once it is tightened, the belt will not loosen until the plate is tilted and the belt is unbuckled.

**Lightweight locking/cinching**

The same as locking but with more moving parts. As long as the plate is parallel with the webbing the latch plate is locked.

**Switchable**

Switchable has a switch that locks the belt webbing by sliding a button.

**Sewn on**

If a sewn on latch plate is present, there will be a retractor for both the shoulder portion and the lap portion of the belt. Most likely the shoulder portion will be an ELR and the lap portion will be switchable.

**Unknown type**

is used when the type of latch plate is not determined.

Latch Plate Type cont'd



Sliding



Sliding



Lightweight locking/cinching



Lightweight locking/cinching



Locking



Locking



Switchable



Switchable



Sewn on



Sewn on

**BELT RETRACTOR TYPE**

Page 1 of 2

**Screen Name:** Belt Retractor**SAS Data Set:** SEATLOC**SAS Variable:** ACTBLRET**Element Attributes:**

- 0 None Present
- 1 Emergency Locking Retractor
- 2 Automatic Locking Retractor
- 3 Switchable Retractor in ELR Mode
- 4 Switchable Retractor in ALR Mode
- 5 Switchable Retractor in Unknown Mode
- 9 Unknown Type of Retractor

**Source:** Vehicle Inspection, interview**Remarks:**

This variable is coded for all manual seat belts that are coded for any vehicle position.

If a sewn on latch plate is present, there will most likely be a retractor for both the shoulder portion and the lap portion of the belt. Most likely the shoulder portion will be an ELR and the lap portion will be switchable from ELR to ALR. In this variable we are only interested in the retractor of the lap portion of the belt.

Another type of switchable retractor switches when the belt is pulled all the way out causing the retractor to switch to ALR mode.

Retractors wind up the loose webbing of the unused 3-point safety belt, take up the slack, and provides slight tension on belts that are in use. They are usually located out of sight at an anchor point. Check the vehicle owner's manual and also look for labels on the belt webbing to determine the retractor type.

**NOTE** that some newer vehicles have a switchable retractor that can be manually adjusted from ELR to ALR. Most of them can be switched by pulling the webbing all the way out of the retractor to activate the ALR. In some models, the retractors switch from ELR to ALR with the push of a button. Most switchable retractors have a label on the belt with instructions on how to switch it. Enter the information for the position of the retractor.

**Automatic locking retractor (ALR)**

The ALR locks in place after being pulled out and allowed to retract about ½" The belt cannot be extended unless it is first fully rewound. It is generally uncomfortable for adults to wear.

**Emergency locking retractor (ELR)**

The ELR allows the belt to be freely extended or rewound. It locks only when the vehicle slows, changes direction, or stops suddenly. Since the retractor rarely locks during normal driving, it provides more freedom and comfort to an adult driver than an ALR. Some ELRs are vehicle sensitive and lock in direct response to the deceleration of the vehicle. Other ELRs are webbing or belt-sensitive and temporarily lock in response to a quick jerk or pull on the belt. Some ELRs are both vehicle and belt sensitive. Some ELRs have a window shade tension reliever system designed to make 3-point belts more comfortable by allowing "slack" in the shoulder belt. Occupants using these belts "tug" on the shoulder belt to tighten it after they lean forward.

**Unknown**

is used when the type of retractor cannot be determined.

## SEAT BELT POSITIONING DEVICE PRESENCE

Page 1 of 2

Screen Name: Positioning Device Presence

SAS Data Set: SEATLOC

SAS Variable: IPOSPRES

## Element Attributes:

- 0 None present
- 1 Buckle Buddy – Shoulder Belt Adjuster
- 2 Sta-n-Place – Shoulder Belt Adjuster
- 3 Belt-A-Way – Shoulder Belt Adjuster
- 4 Shoulder Strap Adjuster – Shoulder Belt Adjuster
- 5 Child Protector – Lap and Shoulder Belt Adjuster
- 6 SafeFit – Shoulder Belt Adjuster
- 7 SafeFit Supreme - Shoulder Belt Adjuster
- 8 Seat Belt Adjuster – Shoulder Belt Adjuster
- 9 Klunk-Klip – Shoulder Belt Adjuster
- 10 Child Safer – Shoulder Belt Adjuster
- 11 Comfort Ride – Shoulder Belt Adjuster
- 12 Belt Buddy
- 97 OEM device
- 98 Other device (specify)
- 99 Unknown if device present

Source: Vehicle Inspection

## Remarks:

This variable is coded for any position containing a shoulder belt.

Aftermarket seat belt positioning devices are typically manufactured for use by small statured adults and children to adjust lap and shoulder belt fit and comfort.

These products are not considered “safety devices” and are not tested or regulated by NHTSA.



GM rear seat shoulder belt comfort guide



Belt buddy



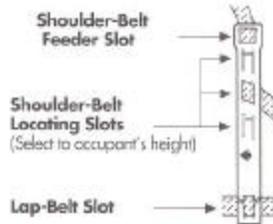
Buckle buddy



Shoulder strap adjusters



Shoulder strap adjusters



Child safer



Child safer



Child safer

**RESTRAINTS/AUTOMATIC**

**Safety Systems Form, Case 2004-903-702S/ Vehicle #1** [Minimize] [Maximize] [Close]

SEAT | RESTRAINTS | **AIRBAG** | CHILD SEAT | Log | QUALITY

Manual | Automatic

	Left	Right
Availability /Function	<input type="text"/>	<input type="text"/>
Used in this crash?	<input type="text" value="Not Equipped/Not Available/destroyed or rendered"/>	<input type="text" value="Not Equipped/Not Available/destroyed or rendered"/>
Motorized	<input type="text" value="Not Equipped/Not Available"/>	<input type="text" value="Not Equipped/Not Available"/>
Failure Modes	<input type="text" value="Not Equipped/Not Available/Not In Use"/>	<input type="text" value="Not Equipped/Not Available/Not In Use"/>

[Save] [Close]

**AUTOMATIC (PASSIVE) BELT SYSTEM AVAILABILITY/FUNCTION**

Page 1 of 3

**Screen Name:** Availability/Function**SAS Data Set:** SEATLOC**SAS Variable:** PASAVAIL**Element Attributes:**

- |   |   |
|---|---|
| 0 | Not equipped/not available                        |
| 1 | 2 point automatic belts                           |
| 2 | 3 point automatic belts                           |
| 3 | Automatic type unknown                            |
| 4 | Automatic belts destroyed or rendered inoperative |
| 9 | 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.

**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.

**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.**

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.

**AUTOMATIC (PASSIVE) BELT SYSTEM USE**

Page 1 of 2

**Screen Name:** Used in this crash?**SAS Data Set:** SEATLOC**SAS Variable:** PASSUSE**Element Attributes:**

- 0 Not equipped / not available / destroyed or rendered inoperative
- 1 Automatic belt in use
- 2 Not in use (manually disconnected, motorized track inoperative) (specify)
- 3 Automatic belt use unknown
- 4 Automatic belt used with child restraint
- 9 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 used with child restraint**

is used when the automatic belt is used to hold a child restraint in position.

**Automatic belt use unknown**

is used when the researcher is unable to determine if the automatic belt was in use.

**AUTOMATIC (PASSIVE) BELT SYSTEM TYPE**

**Screen Name:** Motorized

**SAS Data Set:** SEATLOC

**SAS Variable:** PASSTYPE

**Element Attributes:**

- 0 [Not equipped / not available / destroyed or rendered inoperative]
- 1 Non-motorized system
- 2 Motorized system
- 9 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.

## AUTOMATIC (PASSIVE) BELT FAILURE MODES DURING CRASH

Page 1 of 2

Screen Name: Failure Modes

SAS Data Set: SEATLOC

SAS Variable: PASSFAIL

**Element Attributes:**

- 0 Not equipped / not available
- 1 No automatic belt failure(s)
- 2 Torn webbing (stretched webbing not included)
- 3 Broken buckle or latchplate
- 4 Upper anchorage separated
- 5 Other anchorage separated (specify)
- 6 Broken retractor
- 7 Combination of above (specify)
- 8 Other automatic belt failure (specify)
- 9 Unknown

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.

AIR BAG

**Safety Systems Form, Case 2006-903-7025/ Vehicle #1**

SEAT | RESTRAINTS | AIRBAG | CHILD SEAT | Log | QUALITY

Airbag | Sketch #1 | Sketch #2 | Sketch #3

Function		Damage	
Location	Steering Wheel Hub	Flap open at tear pts?	
Status		Flap damaged?	
Type		Damage to the air bag?	
Redesigned Class		Source of damage	
Deployment			
Indications of failure			
Switch Type			
Switch Status			
		<b>Occupant</b>	
		Other contact	

Seat Location: 11 | Air Bag: 1 of 1 |  View Sketches

Save Close

**AIR BAG NUMBER FOR THIS VEHICLE**

**Screen Name:** Air Bag

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGNO*

**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.

**SEAT LOCATION FOR AIR BAG(S) DATA**

**Screen Name :** Seat Location

**SAS Data Set:** *BAGSEAT*

**SAS Variable:** *SEAT*

**Element Attributes:**

Seat Location (based on defined seats for this vehicle)

**Source:** Vehicle inspection

**Remarks:**

Select the seat location 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.

**DEPLOYMENT LOCATION OF AIR BAG**

Page 1 of 2

**Screen Name:** Function – Location**SAS Data Set:** *AIRBAG***SAS Variable:** *BAGLOC***Element Attributes:**

- 1 Steering Wheel Hub
- 2 Top Instrument Panel
- 3 Mid Instrument Panel
- 4 Bottom Instrument Panel
- 5 Seat Back
- 6 Door
- 7 Roof Side Rail
- 98 Other (specify)
- 99 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".

## Deployment Location of Air Bag (cont'd)

Page 2 of 2

**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.

**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.

**Unknown**

is used when the researcher is unable to determine the location of the air bag.

**AIR BAG STATUS**

**Screen Name:** Function -- Status

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFUNC*

**Element Attributes:**

- 1 Air Bag Available
- 2 Air bag disconnected (specify):
- 3 Air bag not reinstalled
- 9 Unknown status if available for this crash

**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.

**TYPE OF AIR BAG**

**Screen Name:** Function—Type

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGTYPE*

**Element Attributes:**

- 1 Original manufacturer install
- 2 Retrofitted Air Bag
- 3 Replacement Air Bag
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 99 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.

**REDESIGNED AIR BAG**

**Screen Name:** Function—Redesigned Class

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGREDES*

**Element Attributes:**

0	Not Redesigned
1	Redesigned
2	Advanced (specify)
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown class

**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. All available resources should be used to determine if it is a redesigned air bag.

**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.

## AIR BAG DEPLOYMENT

Page 1 of 2

Screen Name: Function—Deployment

SAS Data Set: AIRBAG

SAS Variable: BAGDEPLY

**Element Attributes:**

- |    |  |
|----|--|
| 1  | Deployed during crash (as a result of impact)  |
| 2  | Deployed inadvertently just prior to crash   |
| 3  | Deployed, details unknown  |
| 4  | Deployed as a result of a noncollision event during crash sequence (e.g., fire, explosion, electrical) |
| 7  | Nondeployed  |
| 70 | [No air bag available for this crash (disconnected/not reinstalled)]                                   |
| 79 | [Unknown status if air bag available for this crash]   |
| 99 | Unknown if deployed  |

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, 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.

**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.

**INDICATIONS OF AIR BAG FAILURE**

**Screen Name:** Function—Indications of Failure

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFAIL*

**Element Attributes:**

0	No
1	Yes (specify):
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown if air bag failed

**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 and then call your zone center for assistance.

**Unknown**

is used when it is not known if the bag failed

**TYPE OF CUTOFF SWITCH**

**Screen Name:** Function -- Switch Type

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *SWITCHTYP*

**Element Attributes:**

0	None present
1	Originally equipped
2	Retro fit
3	Switch present, type unknown
9	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.

**CUTOFF SWITCH POSITION STATUS**

**Screen Name:** Function—Switch Status

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *SWTCHSET*

**Element Attributes:**

0	Switch on/Automatic
1	Switch off
7	[None present]
8	[Unknown if switch present]
9	Switch status unknown

**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/Automatic**

is used when an air bag cutoff switch for this occupant position is present and is in the on position or the Automatic 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.

**DID AIR BAG MODULE COVER FLAP(S)/SEAMS OPEN AT DESIGNATED TEAR POINTS?**

**Screen Name:** Damage – Flap Open at Tear Points?

**SAS Data Set:** AIRBAG

**SAS Variable:** BAGFLOPN

**Element Attributes:**

0	No
1	Yes
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	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.

**WERE THE COVER FLAP(S) DAMAGED**

**Screen Name:** Damage—Flap Damaged

**SAS Data Set:** AIRBAG

**SAS Variable:** BAGFLDAM

**Element Attributes:**

0	No
1	Yes (specify)
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown if flaps damaged

**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.

**WAS THERE DAMAGE TO THE AIR BAG?**

Page 1 of 2

**Screen Name:** Damage—Damage to the Air Bag?**SAS Data Set:** AIRBAG**SAS Variable:** BAGDAMAG**Element Attributes:**

- |    |  |
|----|--|
| 0  | Not damaged  |
|    | <b>Yes — Air Bag Damaged</b>   |
| 1  | Ruptured   |
| 2  | Cut  |
| 3  | Torn   |
| 4  | Holed  |
| 5  | Burned   |
| 6  | Abraded  |
| 60 | [Air bag did not deploy]   |
| 69 | [Unknown if air bag deployed]  |
| 70 | [No air bag available for this crash (disconnected/not reinstalled)] |
| 79 | [Unknown status if air bag available for this crash]                 |
| 88 | Other damage (specify)   |
| 95 | Damaged, details unknown   |
| 99 | 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.

Was there damage to the air bag? (cont'd)

Page 2 of 2

**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.

**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 it cannot be determined if the air bag sustained damage.

**SOURCE OF AIR BAG DAMAGE**

Page 1 of 2

**Screen Name:** Damage—Source of Damage**SAS Data Set:** AIRBAG**SAS Variable:** BAGDAMSO**Element Attributes:**

- 1 Object worn by occupant (specify)
- 2 Object carried by occupant (specify)
- 3 Adaptive/assistive controls, (specify)
- 4 Cover flaps
- 5 Fire in vehicle
- 6 Thermal burns
- 7 Windshield
- 8 Rescue or emergency efforts
- 50 [Air Bag Not Damaged]
- 59 Deployed, unknown of damaged
- 60 [Air bag did not deploy]
- 69 [Unknown if air bag deployed]
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 88 Other damage source (specify)
- 99 Damaged unknown source

**Source:** Vehicle inspection**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.

**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.

**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.

**WAS THE AIR BAG IN THIS OCCUPANT'S POSITION CONTACTED BY ANOTHER OCCUPANT?**

**Screen Name:** Occupant – Other Contact

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGCONOT*

**Element Attributes:**

0	No
1	Yes (specify)
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	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:

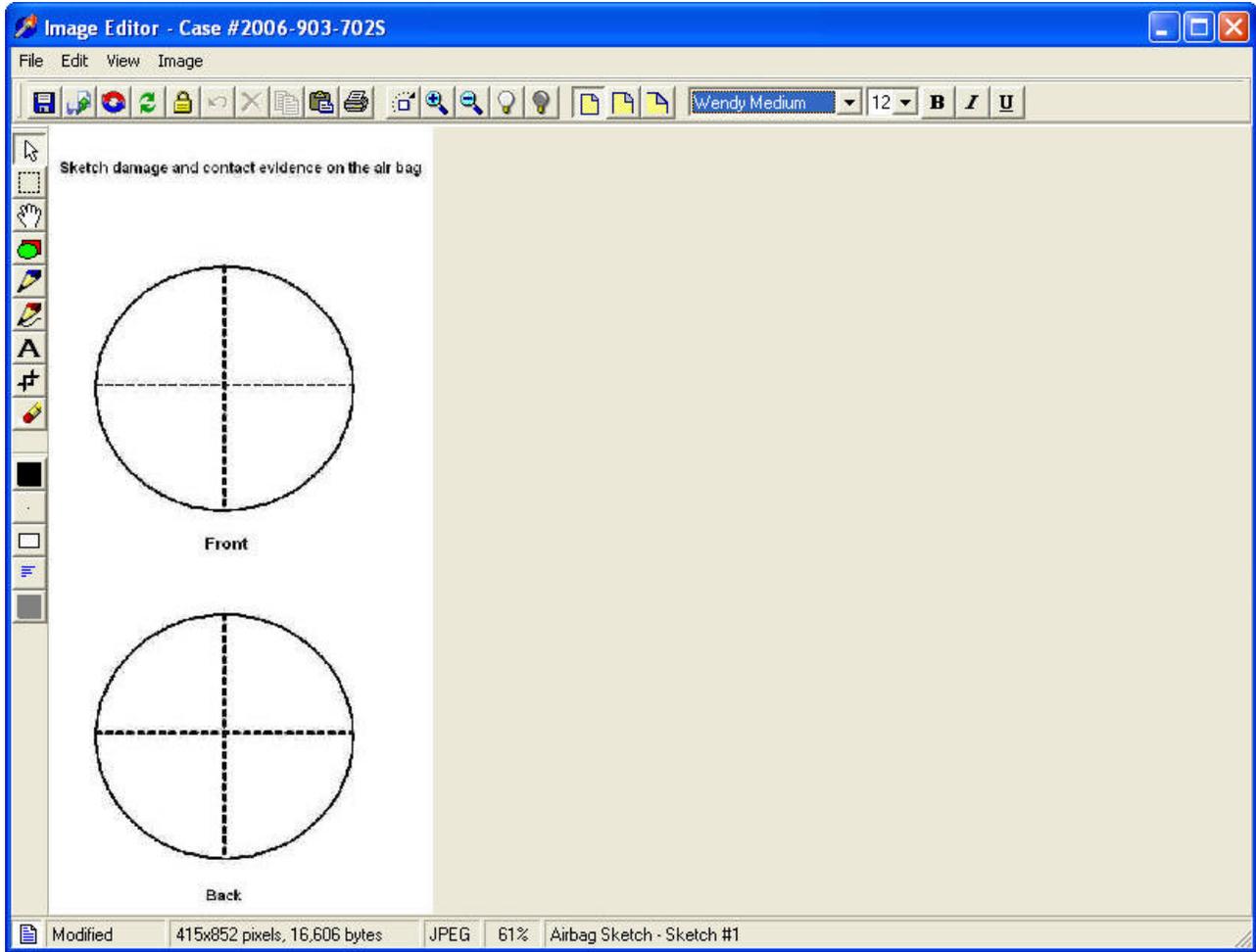
- when a driver contacts the passenger air bag and vice-versa,
- when the center front seat occupant strikes the outer seat position air bag, and
- when multiple occupants in the same seat position contact one air bag.

**Deployed, unknown if other occupant contact to air bag**

is used when it is not known if another occupant contacted the air bag.

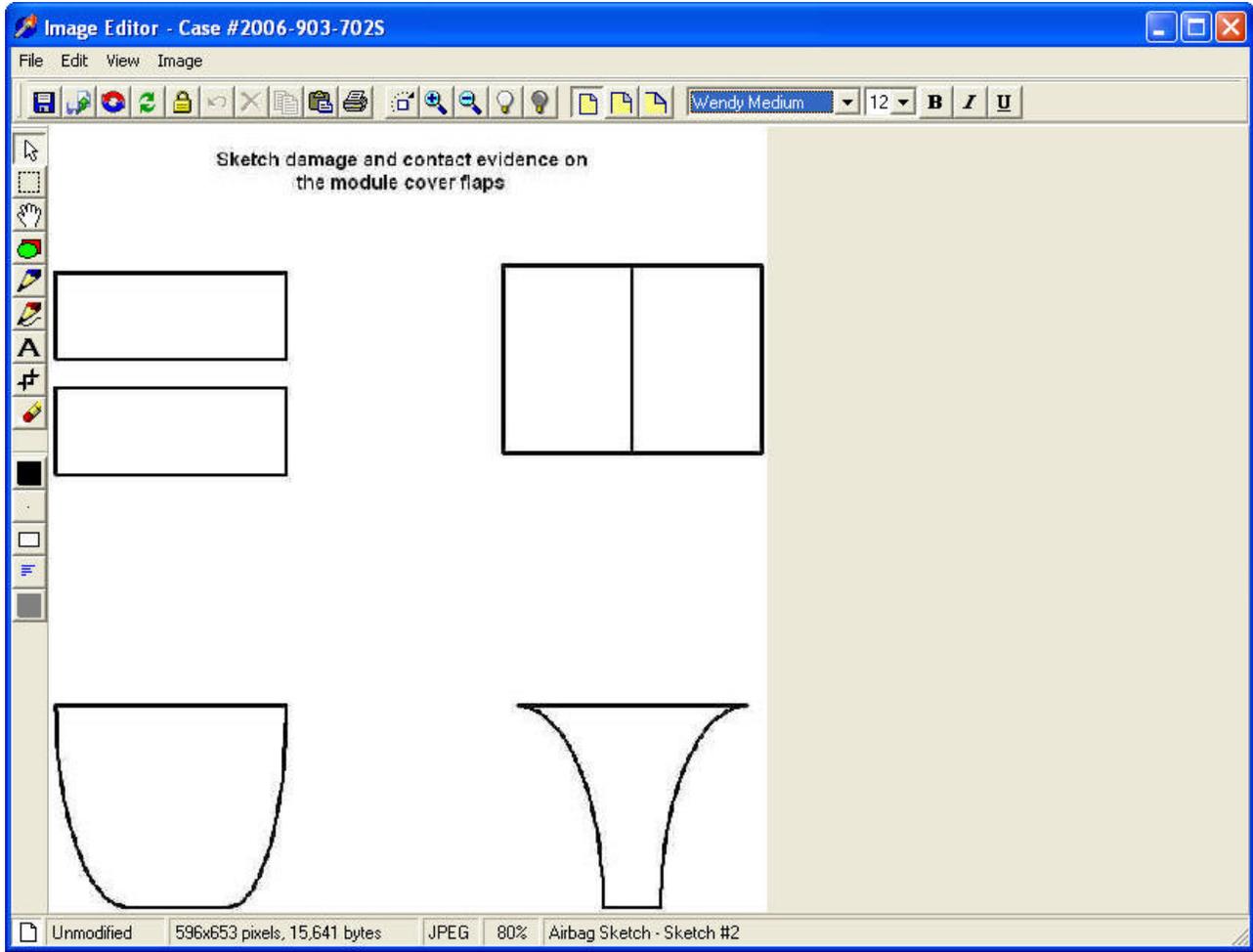
Air Bag/Sketches/Driver

Sketch 1: Damage and Contact Evidence on Driver Air Bag



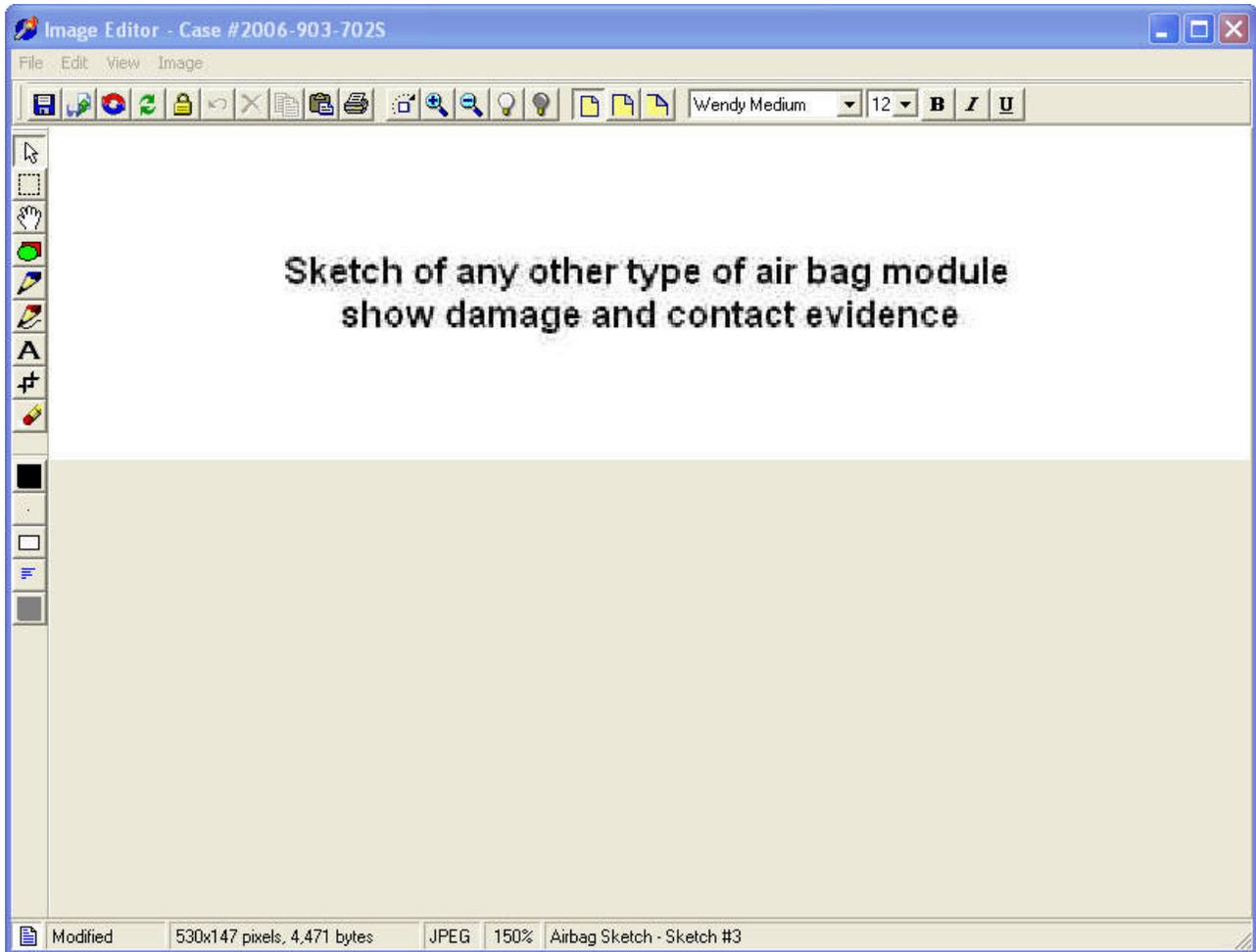
Air Bag/Sketches/Driver

Sketch 2: Driver Air Bag Module Cover Flap



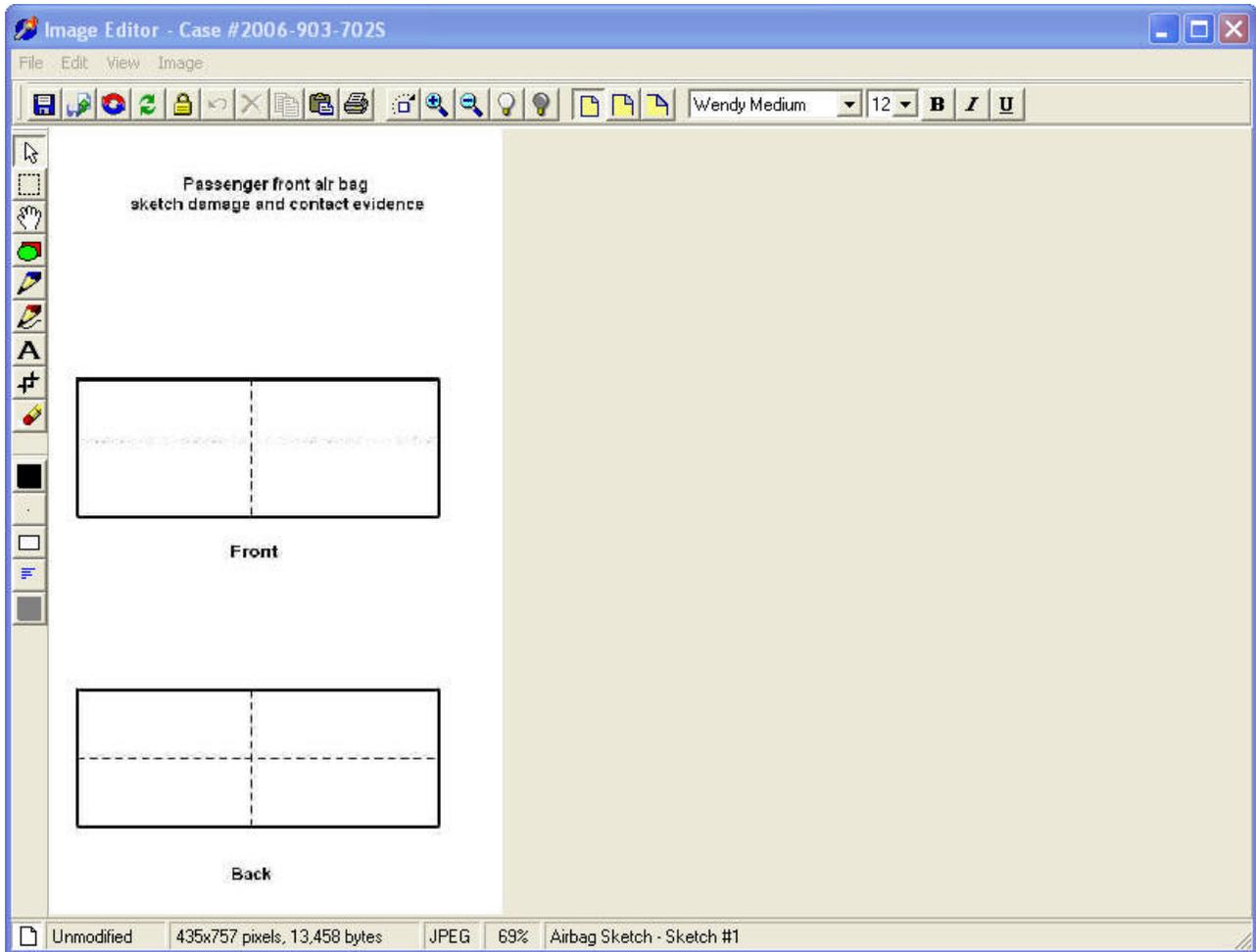
Air Bag/Sketches/Driver

Sketch 3: Sketch of Other Type of Air Bag Module



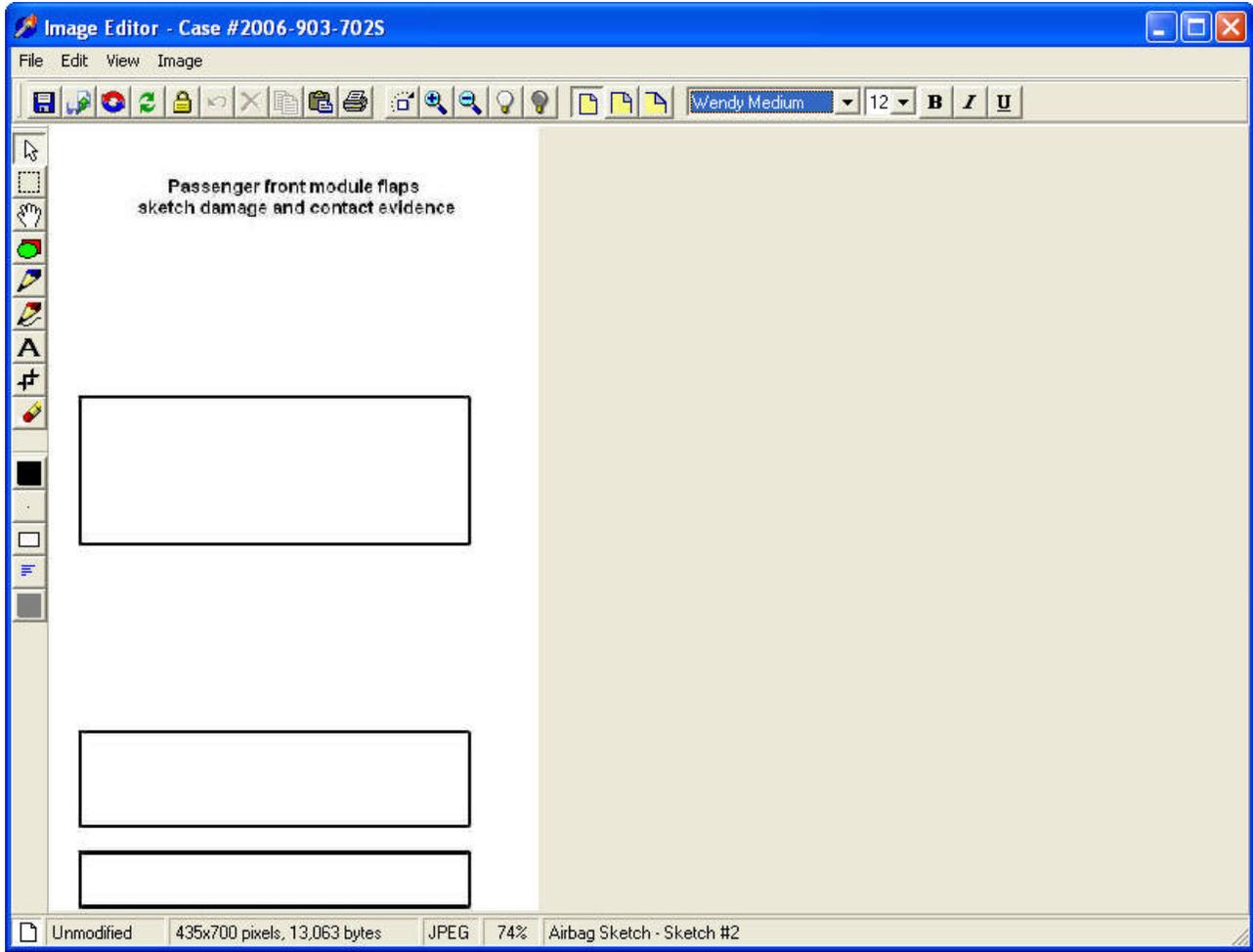
Air Bag/Sketches/Passenger

Sketch 1: Damage and Contact Evidence on Passenger Air Bag



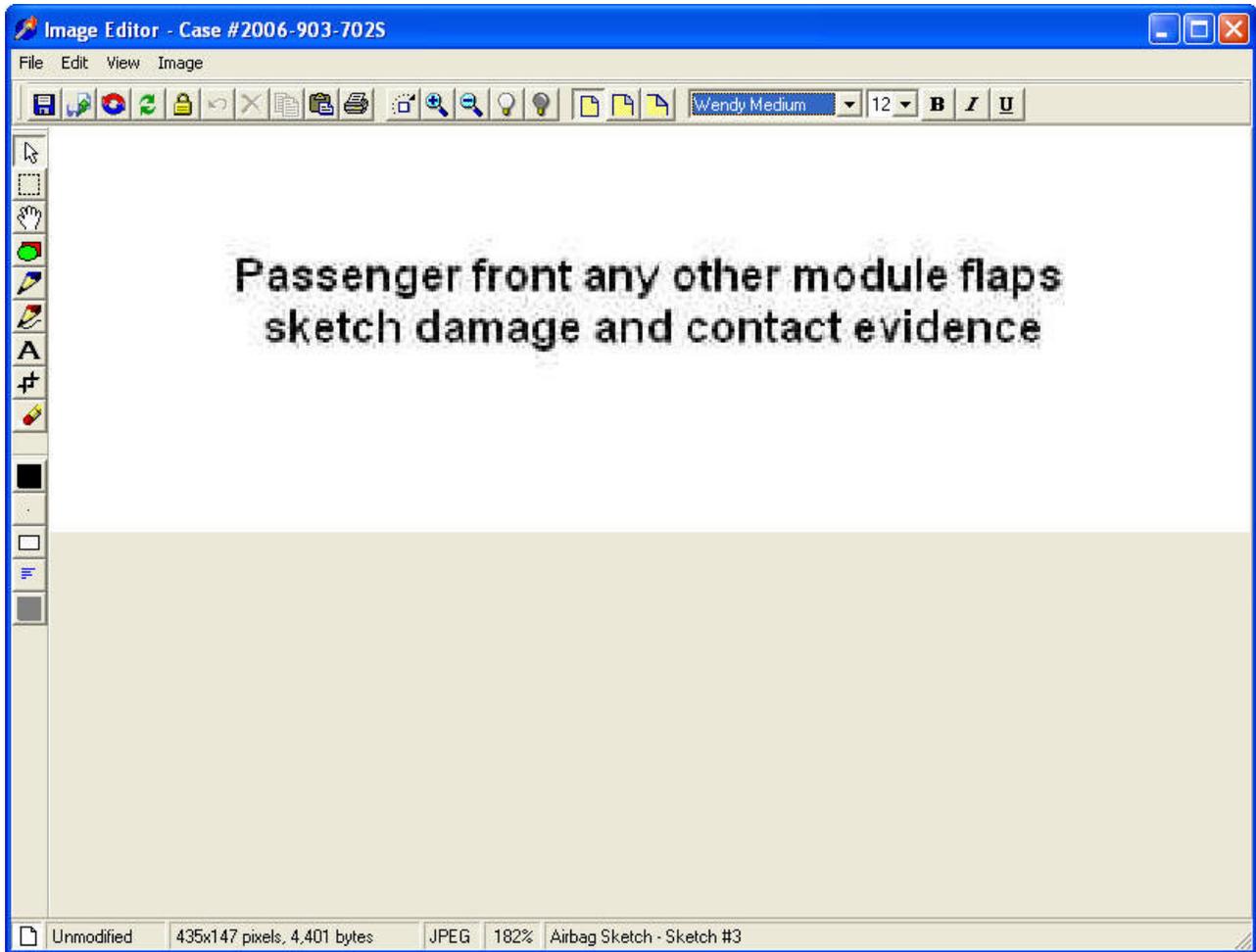
Air Bag/Sketches/Passenger

Sketch 2: Sketch Damage and Contact Evidence on Passenger Air Bag Module Cover Flap



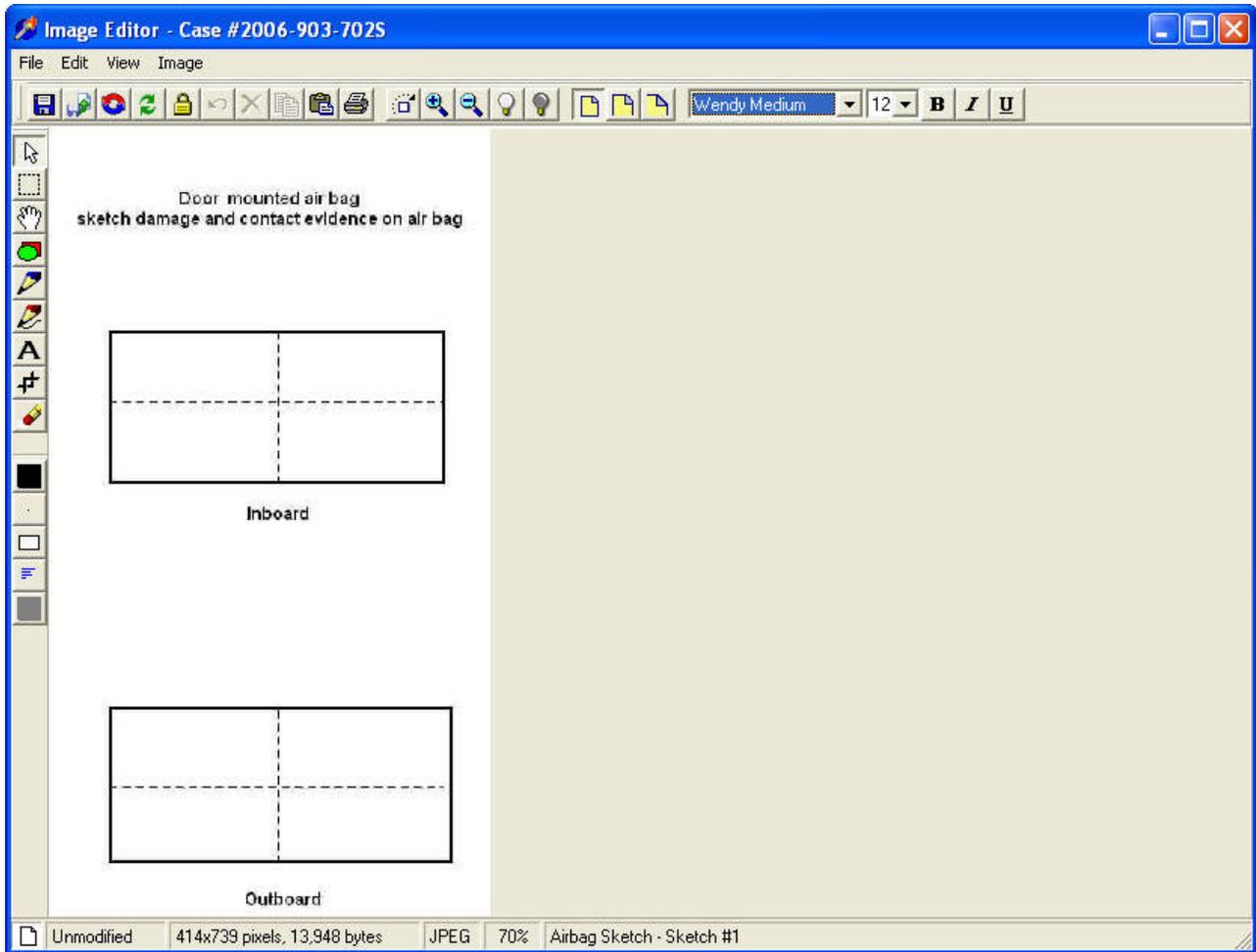
Air Bag/Sketches/Passenger

Sketch 3 Sketch any other Passenger Air Bag Module Flaps



Air Bag/Sketches/Door Mounted

Sketch 1: Damage and Contact Evidence on Door Mounted Bag

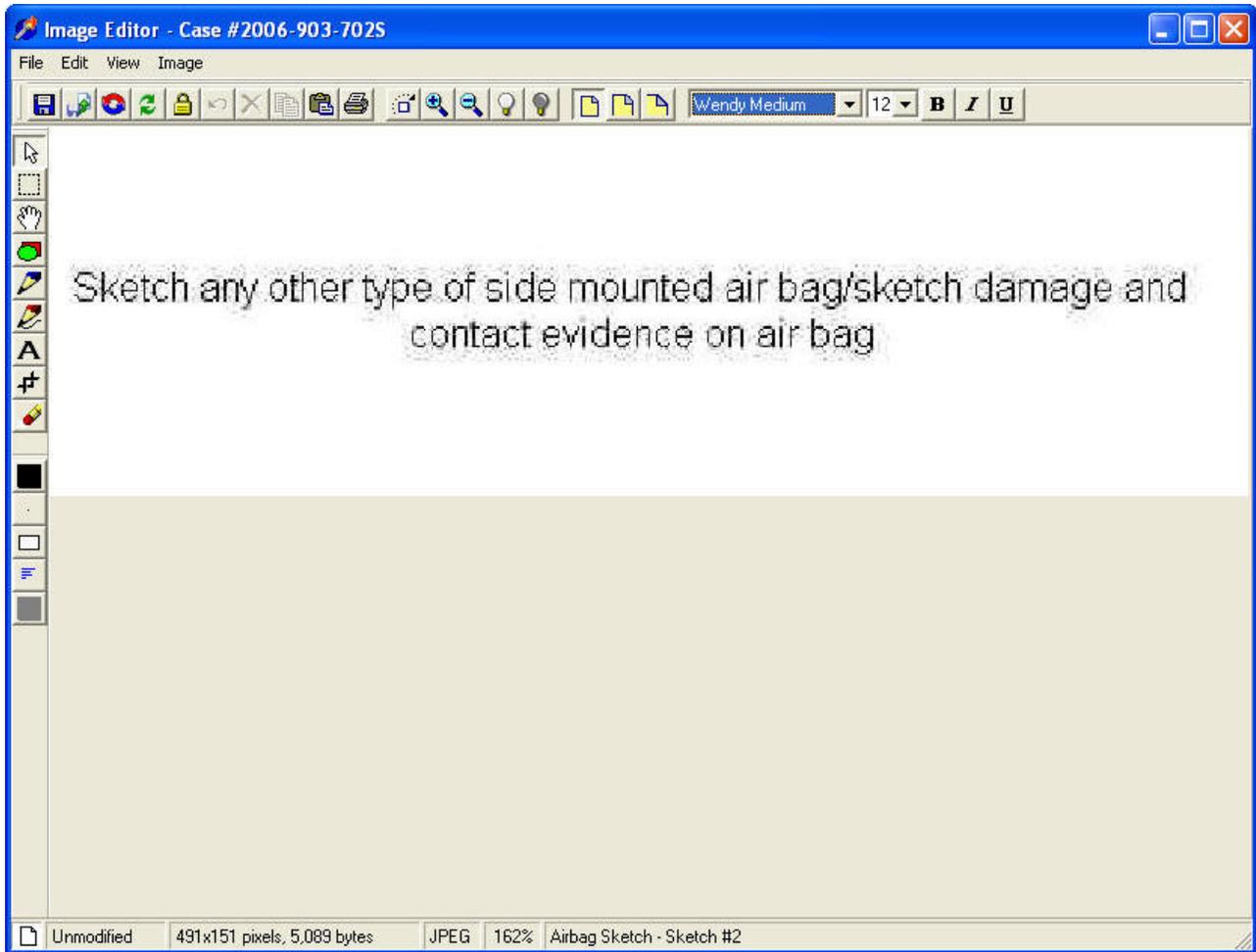


**SAFETY SYSTEM FORM**

**AIR BAG/SKETCHES**

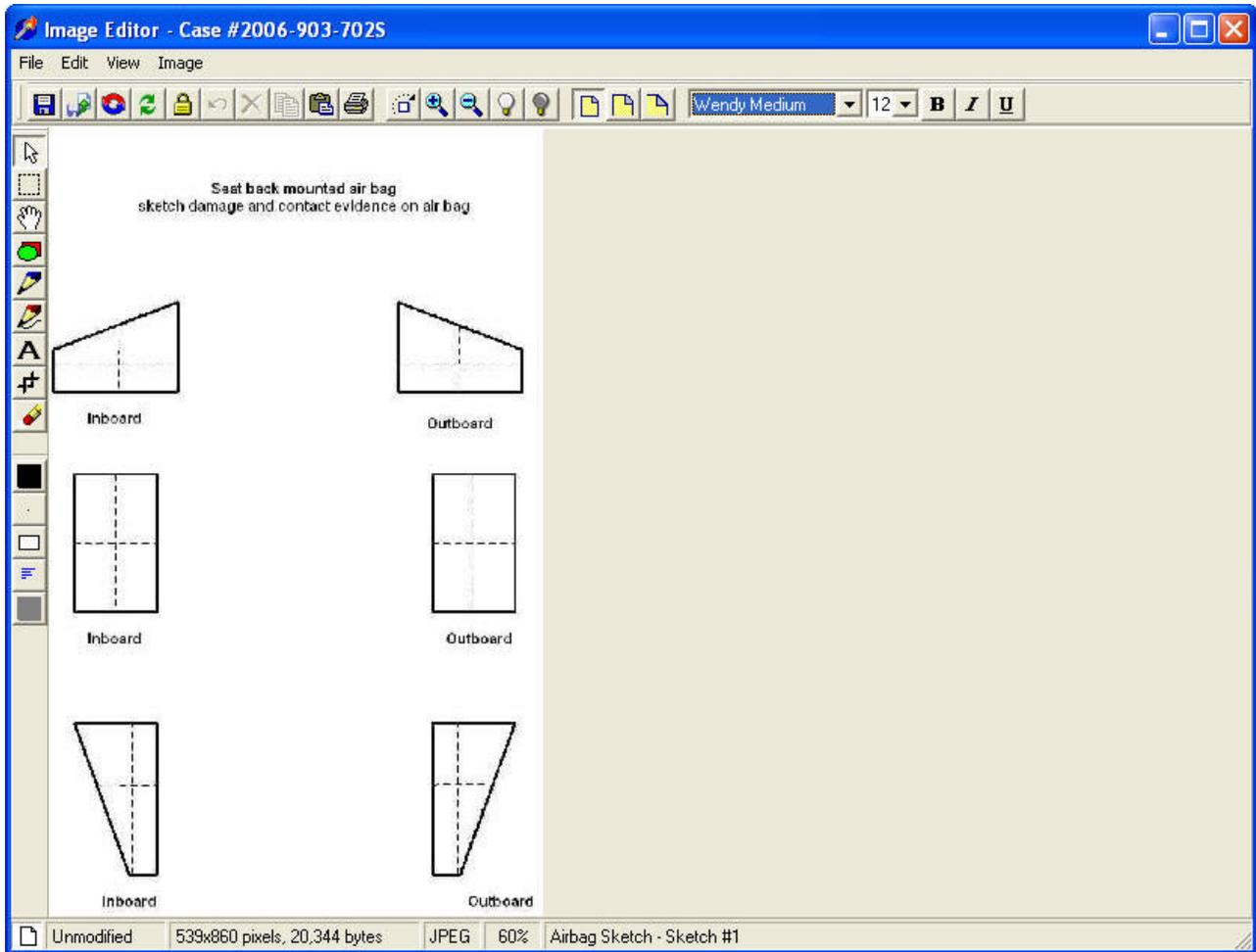
Air Bag/Sketches/Door Mounted

Sketch 2: Sketch any other Damage and Contact Evidence



Air Bag/Sketches/Seat Back Mounted

Sketch 1: Damage and Contact Evidence on Seat Back Mounted Bag

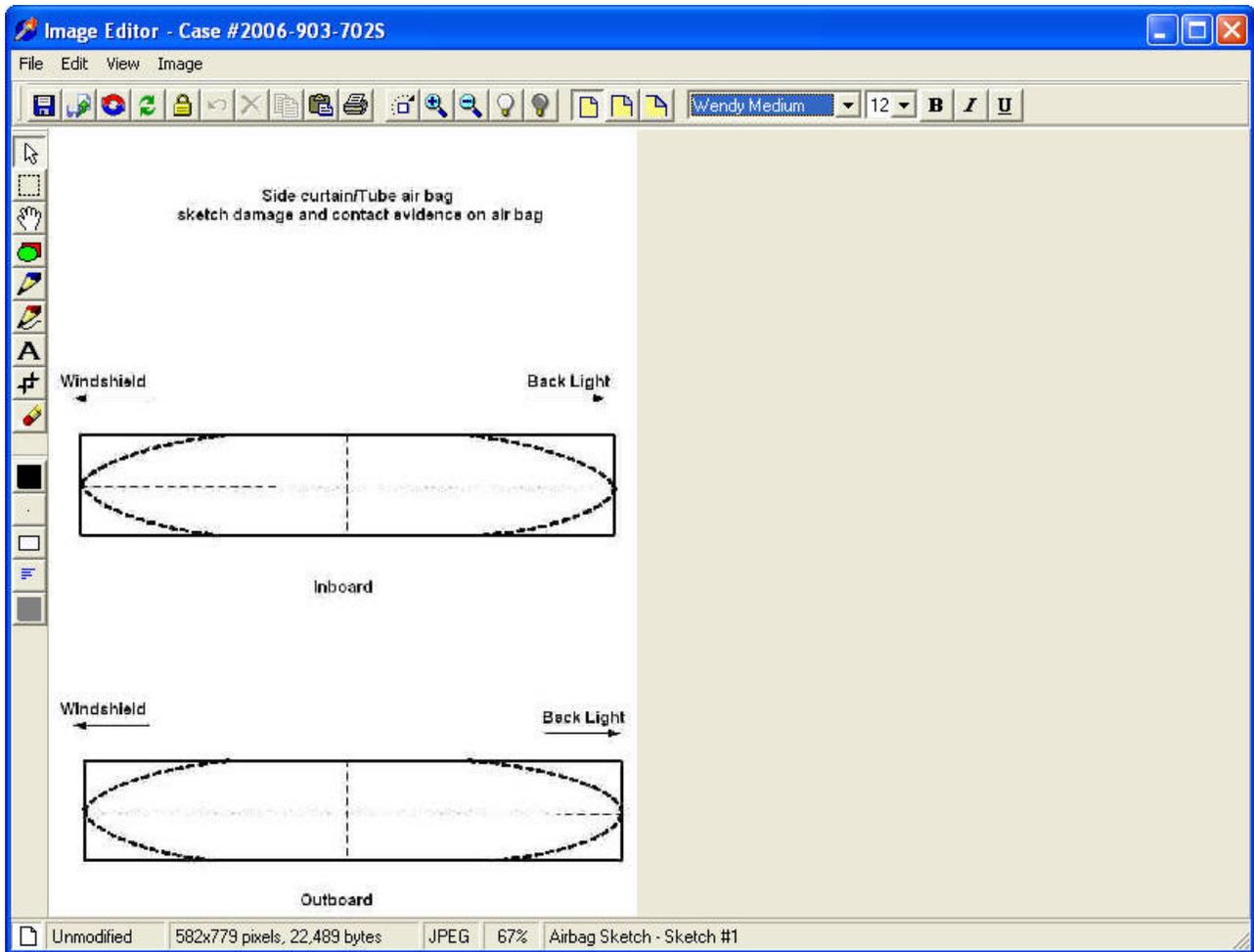


**SAFETY SYSTEM FORM**

**AIR BAG/SKETCHES**

Air Bag/Sketches/Side Curtain or Tube Style Air Bag

Sketch 1: Damage and Contact Evidence on Side Curtain/Tube Bag.

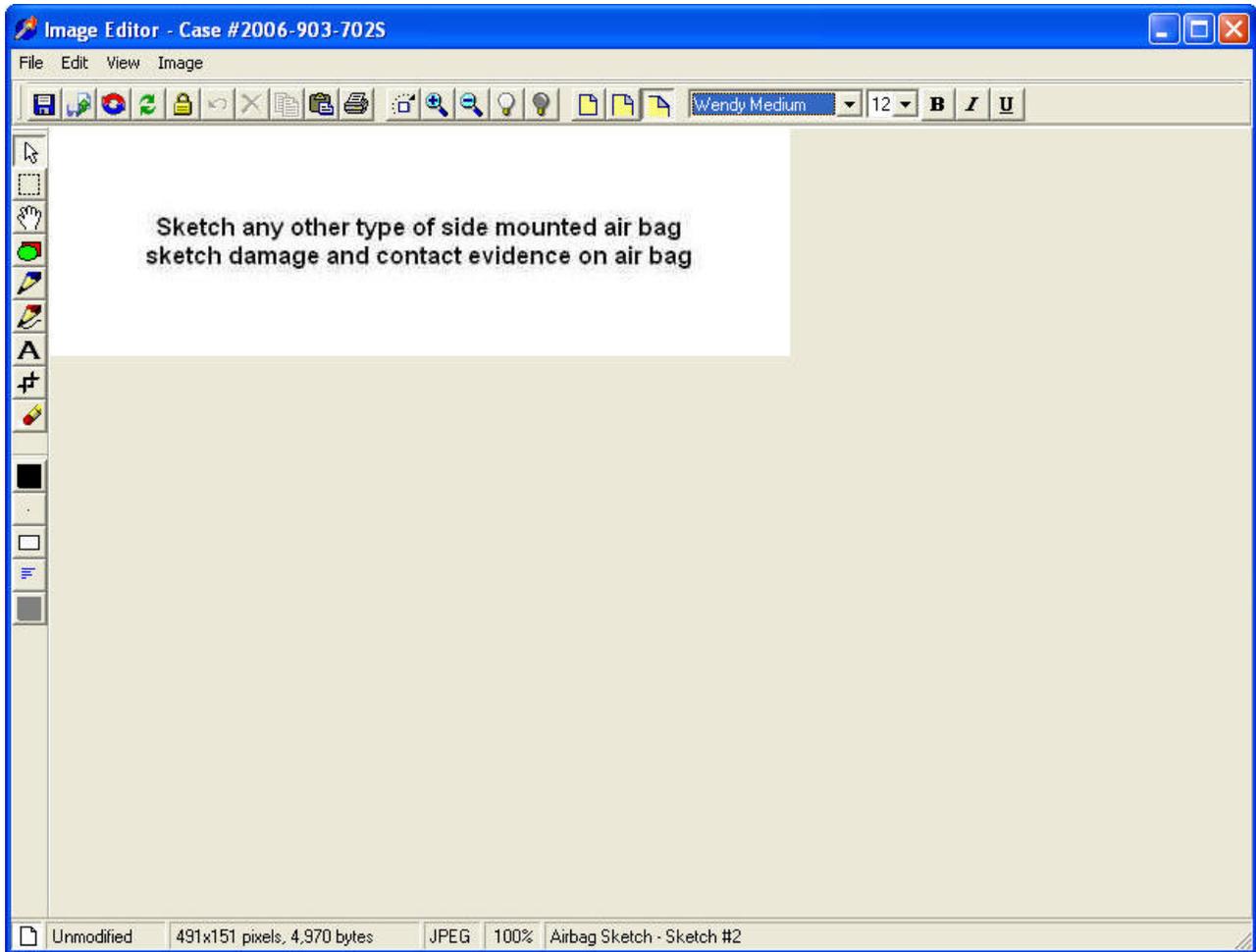


**SAFETY SYSTEM FORM**

**AIR BAG/SKETCHES**

Air Bag/Sketches/Side Curtain or Tube Style Air Bag

Sketch 2: Damage and Contact Evidence on Any other Side Curtain/Tube Bag.



**CHILD SEAT LIST**

Safety Systems Form, Case 2005-903-865/ Vehicle #1

SEAT | RESTRAINTS | AIRBAG | CHILD SEAT | Log | QUALITY

List | Detail

Make	Model	Occ #	Seat
All Our Kids	Other (Specify)		
Century Products	4400		

Save Close

**CHILD SEAT DETAIL**

Safety Systems Form, Case 2005-903-865/ Vehicle #1

SEAT | RESTRAINTS | AIRBAG | CHILD SEAT | Log | QUALITY

List | Detail

Make: All Our Kids | Occ #s: | Model: Other (Specify) | Date of Manufacture: | Model No: |

Design Feature Used	How Feature Used
Harness/ Shield	Orientation
Retainer Clip	
Tether	
LATCH	
	Belt Routing / Use
	Locking Clip Use

Seat Location: | Placement: | Child Position: |

Save Close

**[CHILD RESTRAINT NUMBER]**

**Screen Name:** N/A

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CHSEATNO*

**Element Attributes:**  
1, 2, 3, etc.,

**Source:** As created by the system.

**Remarks:**

**CHILD RESTRAINT MAKE****Screen Name:** Make**SAS Data Set:** *CHILDSEAT***SAS Variable:** *CHMAKE***Element Attributes:**

See appendix

**Source:** Vehicle inspection**Remarks:**

A child seat's manufacturer/make and model name may be difficult to determine unless the manufacturer/model name is stamped/sewn/molded into the child seat itself. Refer to the manufacturer's instruction booklet which accompanied the child seat, if available, for specific make and model of seat. The child seat should have a label permanently attached which identifies the seats date of manufacture and model number; although this information alone does not identify the specific make of seat, it may be useful if no other identifiers exist and should be coded under "other." The updated NASS-CDS attribute listing of child seat makes and models includes the majority of seats manufactured for use in the U.S. from 1985-2000, and provides attributes of each respective seat, e.g., harness design, weight and height recommendations, etc.

**Remarks:**

Interview Questions - Make of Child Seat

**CHILD RESTRAINT MODEL****Screen Name:** Model**SAS Data Set:** *CHILDSEAT***SAS Variable:** *CHMODEL***Element Attributes:**

See appendix

**Source:** Vehicle inspection

A child seats manufacturer/make and model name may be difficult to determine unless the manufacturer/model name is stamped/sewn/molded into the child seat itself. Refer to the manufacturer's instruction booklet which accompanied the child seat, if available, for specific make and model of seat. The child seat should have a label permanently attached which identifies the seat's date of manufacture and model number; although this information alone does not identify the specific make of seat, it may be useful if no other identifiers exist and should be coded under "other". The updated NASS-CDS attribute listing of child seat makes and models includes the majority of seats manufactured for use in the U.S. from 1985-2000, and provides attributes of each respective seat, e.g., harness design, weight and height recommendations, etc.

**CHILD RESTRAINT TYPE**

Page 1 of 6

**Screen Name:** Type**SAS Data Set:** *CHILDSEAT***SAS Variable:** *CHTYPE***Element Attributes:**

- 1 Infant seat (ISS)
- 2 Convertible seat (CSS)
- 3 Forward facing only (FSS)
- 4 Booster seat (BSS)
- 5 Booster/Forward facing seat (BSS/FSS)
- 6 Booster/Convertible facing seat (BSS/CSS)
- 7 Integrated seat (INT)
- 8 Harness (HSS)
- 9 Vest (VSS)
- 10 Special needs (SNSS)
- 98 Other (specify)
- 99 Unknown

**Source:** Vehicle inspection**Remarks:**

Refer to child seat listing for additional information regarding each respective seat in addition to Manufacturer' Instructions.

Once the child seat has been identified by make and model, the child seat TYPE will automatically be defined. However, this information can be determined by child seat examination and interview if no make or model information is available.

**Infant Seat (ISS)**

Designed and intended to be used rear facing only by newborns and infants weighing up to about 20 pounds. Typically equipped with a 3-point harness, two straps which cross over the infant's shoulders, connecting to a buckle on a piece of webbing or to a buckle recessed at the crotch area. Infant seats should recline at a 45-degree angle. Some infant seats have detachable bases which can be left secured in the vehicle, while the infant seat is removed, doubling as a carrier. When used as a child restraint the carrier-type infant seat's carrying handle should be folded back, in the down position.

Child Restraint Type cont'd

Page 2 of 6

Infant only seats are typically designed with 2 or 3 sets of harness strap slots in the back of the seat which allow for proper shoulder strap placement (below or at the infant's shoulders). Most harness adjustment mechanisms are behind the seat back and are typically affixed/locked by a metal bar, or clip-type lock. Most seats are equipped with a harness retainer clip which should be positioned at the infant's armpit level. Positioning of the harness retainer clip at armpit level keeps the shoulder straps positioned properly up on the infant's shoulders. The vehicle belt system (lap or lap portion of a lap/shoulder belt combination) must be used to secure the seat and/or its base to the vehicle.



Infant seat with base



Infant seat

**Convertible Seat (CSS)**

Designed and intended to be used either rear or forward facing for a child ranging from birth to approximately 40 pounds (this information will normally be found on the child seat labeling as well as in the manufacturer's instructions). All have a harness system to secure the child to the seat which consists of a 5-point harness, T-Shield or Tray-Shield. Most seats have 3 sets of harness slots, lowest and middle set of slots for rear facing only use positioning the straps below or at the infant's shoulder level and a top set of slots for use forward facing placing the straps above or at the child's shoulder level. Most have a harness retainer clip which helps position the shoulder straps up on the child's shoulders. Refer to manufacturers' instructions for proper use orientation according to the child's height and weight. When used rear facing the weight of the child ranges from birth to approximately 20 pounds (some convertible seats allow for heavier weight infants rear facing up to about 30 pounds). In the rear facing mode the seat is reclined at a 45-degree angle for infant use. When used forward facing the weight of the child normally ranges from 20 pounds to approximately 40 pounds. In the forward facing mode most seats are used fully upright, but some allow for a slight recline forward facing. Refer to manufacturers' instructions for proper use orientation according to the child's height and weight.

The vehicle belt system (lap or lap portion of a lap/shoulder belt combination) must be used to secure the child seat to the vehicle. In addition seats

Child Restraint Type cont'd

Page 3 of 6

manufactured after September 1, 1999, may come equipped with a top tether strap which anchors to the vehicle to help secure the child seat. Vehicles manufactured after September 1, 2000, or earlier models come equipped with a top tether anchorage. Refer to the child seat and vehicle owners manual for proper tether attachment and use.



Convertible seat with t shield



Convertible seat with tray shield



Convertible seat with 5 point harness

**Forward Facing Only Seat (FSS):**

A forward facing only seat is intended to be used by children who are over 1 year old and who weigh at least 20 pounds. The majority are recommended for use by children who weigh at least 20 pounds up to about 40 pounds, though some have a lower weight use recommendation of 30 pounds and upper weight limits above 40 pounds. These seats come equipped with a built-in harness or shield to restrain the child, and the seat must be secured to the vehicle seat with a lap and/or lap/shoulder belt combination. These seats are used with the child sitting in an upright position. These seats typically have 3 sets of harness slots in the back of the seat which allows for proper harness placement over the child's shoulders as the child grows. Harness straps should be at or above the child's shoulder level and since this type of seat is intended for forward facing use only, all sets of slots can be used.

The majority of these seats convert to belt-positioning boosters by removing the harness system after a child reaches 40 pounds. Always check manufacturer instructions for proper use recommendations

Child Restraint Type cont'd

Page 4 of 6

Backless boosters with shields are considered forward facing only seats and are not currently certified for use by children over 40 pounds.



Forward facing seat

### **Booster Seat (BSS) Belt-positioning**

Designed and intended as a forward facing platform which raises a child's sitting height, enabling them to use the adult lap and shoulder belt for restraint. Some belt-positioning booster seats come equipped with a harness which is used until the child reaches about 40 pounds. The seat is considered a forward facing only seat when used with the harness and must be secured with the vehicle belt system. Belt-positioning booster seats are primarily designed to "fill the gap" between a seat with a harness and the adult lap and shoulder belt used alone. Belt-positioning boosters should never be used with a lap belt only across the child.

Belt-positioning boosters come in high-back and backless models. High-back models which some compare to "portable mini bucket seats" provide head protection for the child when used in vehicle seats with low seat backs or no head restraints. Most high-back models have shoulder belt positioners on the sides of the seat which help position the shoulder belt across the child properly. Backless models provide a base which the child sits on to raise their sitting height, which then enables the adult lap and shoulder belt to fit properly. Some backless boosters have removable shields, e.g., shield boosters, which when used with the shield are considered forward facing only seats for children up to 40 pounds. Most backless boosters with shields convert to belt-positioning boosters by removing the shield and using the booster base with the adult lap and shoulder belt. Refer to the manufacturers' instructions for proper use according to the child's weight and height.

Child Restraint Type cont'd

Page 5 of 6



Belt positioning booster



Belt positioning booster



Belt positioning booster

Belt positioning  
booster with shield**Integrated Seat (INT) Built-In Child Restraint**

Built-into the vehicle seat, typically “camouflaged” within or under an adult seating position in the back seat. Designed for forward facing use only by children who weigh between 20 and 40 pounds and whose height ranges between 33 and 40 inches, typically a child at least 1 year old and over 20 pounds. The majority of these seats have a 5-pt harness system, e.g., one strap over each shoulder, one strap across each upper thigh and a strap with a buckle or recessed buckle in the crotch area. Some models convert into belt-positioning booster seats for use by children up to about 60 pounds after the child reaches 40 pounds and can no longer use the 5-pt harness system.

**Harness (HSS)**

Intended to be used forward facing for children, who have outgrown a child seat, typically over 40 pounds, age 5 and older who are passengers of vehicles with lap belts only in the rear seat. Typically a harness consists of two straps with bottom loops which rest across the child’s shoulders and chest connected at the top by a tether anchorage. The vehicle lap belt routes through the loop at the bottom of each strap, resting across the child’s lap/upper thigh area. Refer to the manufacturers’ instructions for proper restraint use and installation.

Child Restraint Type cont'd

Page 6 of 6

### **Vest (VSS)**

Designed for forward facing use only and generally intended for use by children weighing 25-40 pounds; however, some vests can be made according to chest and waist measurements (e.g., EZ-On Products) which can accommodate small children to adults. Some models have a 5-pt type harness system and some have adjustable zipper closures in the back which typically require a top tether/anchor strap to be used along with the vehicle belt system. Some vests such as those used on school buses when transporting children with special transportation needs may require its own "seat mount" belt system for proper use of the vest. Refer to the manufacturers' instructions for proper restraint use and installation.



Vest

### **Special Needs Safety Seat (SNSS)**

Designed and modified for children with special transportation needs who range from newborn to about 100 pounds. The majority of these devices are intended for forward facing use only, however some devices can be used rear and forward facing. All have a harness system to secure the child to the seat which may consist of a 3 or 5-point harness, T-shield, etc. Refer to manufacturers' instructions for proper restraint use and orientation.

### **Other** – Not meant for vehicle travel

Other items, other than a certified child restraint used to hold, adjust sitting height, or otherwise contain or position a child while in a motor vehicle. Defines a product for which no type, make or model could be identified through the listing of child restraints and/or manufacturers instructions dated 1996 and 1999, nor found in the typical examples: Infant carriers, phone books/books, restaurant-home style booster seat, portable crib/cradle/playpen, wood platform, plastic platform, cushion or pillow.

### **Unknown**

Is used when the type of child restraint is unknown.

**DATE OF MANUFACTURE**

**Screen Name:** Date of Manufacture

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *MANDATE*

**Element Attributes:**

MM/DD/YYYY

Indicate the date of manufacture as indicated on the child restraint

99/99/9999 Unknown date

**Source:** Vehicle inspection

**Remarks:**

Indicate the date of manufacture as indicated on the child restraint. This information can be used for recalls and for determining the model of the child seat if it is not known.

**MODEL NUMBER**

**Screen Name:** Model No

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *MODELNO*

**Element Attributes:**

Indicate the model number as indicated on the child restraint

**Source:** Vehicle inspection

**Remarks:**

Indicate the model number as indicated on the child restraint. This information can be used for recalls and for determining the model of the child seat if it is not known.

**CHILD RESTRAINT HARNESS/SHIELD DESIGN**

Page 1 of 2

**Screen Name:** Harness/Shield**SAS Data Set:** *CHILDSEAT***SAS Variable:** *HARDES***Element Attributes:**

0	Not designed with harness/shield (or No harness/shield available)
1	3-pt harness
2	5-pt harness
3	T-shield
4	Tray-shield
5	Shield
9	Unknown

**Source:** Vehicle inspection**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

Some seats can be purchased in different configurations. For these seats the make and model DO NOT uniquely define the harness/shield design.

A harness is a belt-type restraint integral to the child seat, for the specific purpose of holding the child in the seat.

**3-pt/V-Harness**

Two straps crossing both shoulders attached to a latch plate which typically inserts into a buckle on a piece of webbing or recessed at the crotch area, visually forming a V. Applicable to rear facing only infant seats

**5-pt Harness**

Two straps crossing both shoulders, two straps crossing each upper thigh and a strap between the legs (crotch strap). This type harness can be adjusted to fit a variety of infants rear facing and toddlers in forward facing orientations. Typically available in convertible seats, forward facing only seats and some infant only seats.

Child Restraint Harness/Shield Design cont'd

Page 2 of 2

**T-shield**

Secures two shoulder harness straps to a "T" shaped shield which is positioned in front of the torso and hips. Typically found in convertible and forward facing only seats.

**Tray-Shield**

Secures two shoulder harness straps to a broad padded tray positioned in front of the torso. The crotch strap may be separate or integral with the shield. Found on convertible and forward facing only seats.

**Shield**

(Typically shield-boosters) The over-body shield was designed for use in seating positions with lap belts only for children between 30-60 pounds. The shield is attached to a base which raises the child's sitting height and pre- 1996 models recommended use with the shield up to 60 pounds. Boosters with shields made after 1996 recommend an upper weight limit of 40 pounds. Most shield-boosters made after 1996 allow the 40 pound child to use the booster base with the shield removed, converting the seat to a belt-positioning booster. Found on forward facing only seats.

**CHILD RESTRAINT HARNESS RETAINER CLIP**

**Screen Name:** Retainer Clip

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CLIPDES*

**Element Attributes:**

- 0 Not designed with harness retainer clip (or No harness retainer clip available)
- 1 Designed with harness retainer clip (or Harness retainer clip available)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

A harness retainer clip is a plastic device/clip which is placed between the two shoulder harness straps, holding the two together for correct pre-crash positioning. The retainer clip should be threaded correctly and placed at armpit level to help keep the shoulder straps up-on the child's' shoulders.

**CHILD RESTRAINT TETHER DESIGN**

**Screen Name:** Tether

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *TETHDES*

**Element Attributes:**

- 0 Not designed with tether (or No tether available)
- 1 Designed with tether (or Tether available)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

Effective September 1999, the majority of child seats come equipped with top tethers. The top tether system is part of LATCH (Lower Anchors and Tethers for Children) and vehicles manufactured after September 1999 come equipped with a tether anchor for attaching the top tether of the child seat.

**CHILD RESTRAINT LATCH DESIGN****Screen Name:** LATCH**SAS Data Set:** *CHILDSEAT***SAS Variable:** *LATCHDES***Element Attributes:**

- 0 Not designed with LATCH (or LATCH not available)
- 1 Designed with LATCH (or LATCH available)
- 9 Unknown

**Source:** Vehicle inspection**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

LATCH (Lower Anchors and Tethers for Children). All child seats manufactured after September 1, 2002 will have two lower attachments which connect to anchorage points between a vehicles' seat back and bottom cushion for the majority of vehicles manufactured after September 1, 2002. Child seats with corresponding attachments can be attached to these lower anchorages instead of being held by the vehicle seat belt. Child seats manufactured after September 1, 2002 will still have designated vehicle belt paths for proper orientation to accommodate older vehicles.

**CHILD RESTRAINT USAGE ORIENTATION**

**Screen Name:** Orientation

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *ORIENT*

**Element Attributes:**

- 1 Rear facing
- 2 Forward facing
- 3 Supine
- 8 Other (specify)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The actual orientation of the child seat at the time of impact must be determined and coded.

**Rear Facing**

At the time of the crash the child seat was rear facing/facing the rear of the vehicle.

**Forward Facing**

At the time of the crash the child seat was facing forward/front of the vehicle.

**Supine**

At the time of the crash the child seat was laying flat.

**Other**

At the time of the crash the seat was facing other than the rear, supine or forward (e.g., sideways, on top of or underneath something.)

**Unknown**

A child seat is present but the orientation at the time of the crash is unknown.

**CHILD RESTRAINT HARNESS/SHIELD USE**

**Screen Name:** Harness/Shield

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *HARUSE*

**Element Attributes:**

- 0 Not designed with harness/shield
- 1 Harness/shield not used
- 2 Harness used - harness straps in top/highest slot
- 3 Harness used - harness straps in middle/bottom slot
- 4 Harness used - slots used unknown
- 5 Retrofitted with harness
- 6 Shield used
- 9 Unknown if harness/shield used

**Source:** Vehicle inspection

**Remarks:**

The actual child seat harness usage at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine the design of the seat, its respective harness design and use according to the weight/height of the child.

**CHILD RESTRAINT RETAINER CLIP USE**

**Screen Name:** Retainer Clip

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CLIPUSE*

**Element Attributes:**

- 0 Not designed with harness retainer clip
- 1 Harness retainer clip not used
- 2 Harness retainer clip used – below armpit level
- 3 Harness retainer clip used at armpit level
- 4 Harness retainer clip used – above armpit level
- 5 Harness retainer clip used – unknown level
- 6 Retrofitted with harness retainer clip
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The actual child seat harness retainer clip use at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine if the respective child seat comes equipped with a harness retainer clip.

**CHILD RESTRAINT TETHER USE**

**Screen Name:** Tether

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *TETHUSE*

**Element Attributes:**

- 0 Not designed with tether
- 1 Tether not used
- 2 OEM Tether used
- 3 After market (retrofitted) tether used
- 9 Unknown if tether Used

**Source:** Vehicle inspection

**Remarks:**

Refer to Manufacturers' Instructions for Child Safety Seats and Child Seat listing for applicability of tether.

**CHILD SEAT LATCH USE****Screen Name:** LATCH**SAS Data Set:** *CHILDSEAT***SAS Variable:** *LATCHUSE***Element Attributes:**

- 0 Not designed with LATCH lower anchors
- 1 LATCH lower anchors – not used
- 2 LATCH lower anchors used
- 3 After market (retrofitted) LATCH lower anchors used
- 9 Unknown

**Source:** Vehicle inspection**Remarks:**

The actual child seat LATCH usage at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine applicability of LATCH.

**BELT ROUTING/USE**

Page 1 of 2

**Screen Name:** Belt Routing/Use**SAS Data Set:** *CHILDSEAT***SAS Variable:** *BELTROUT***Element Attributes:**

- 0 No belt routing
- 1 No belt used
- 2 Belt routed through belt positioning slots/channels
- 3 Belt routed through forward facing slots/channels
- 4 Belt routed through rear facing slots/channels
- 5 Belt routed unconventionally (specify)
- 9 Unknown belt path

**Source:** Vehicle inspection**Remarks:****No belt used**

When no seat belt was used. No belt was used to either restrain the child or install the seat.

**Belt routed through belt positioning slots/channels**

The belt was routed through the belt positioning slots or channels built into the child restraint.

**Belt routed through forward facing slots/channels**

The belt was routed through the forward facing slots or channels built into the child restraint.

**Belt routed through rear facing slots/channels**

The belt was routed through the rear facing slots or channels built into the child restraint.

**Belt routed unconventionally (specify)**

The belt was routed unconventionally

**No belt routing**

The belt was not routed through any slots/channels in the seat (if they exist at all). The belt was used solely to restrain the child was sitting on/in the seat. This will be automatically filled in for Integrated child restraints.

Belt Routing/Use (cont'd)

Page 2 of 2

**Unknown belt path**

It is not known what path the belt took around the child/seat. If it is not known if a belt was used, indicate that on the belt availability/use variables and choose unknown belt path for this variable.

**USE OF LOCKING CLIP ON VEHICLE BELT**

Page 1 of 2

**Screen Name:** Locking Clip Use**SAS Data Set:** *CHILDSEAT***SAS Variable:** *LOCKCLIP***Element Attributes:**

0	None Present
1	Locking Clip Used on Lap and Shoulder Belt
2	Locking Clip Used on Lap Belt Only
3	Locking Clip Used on Shoulder Belt Only
8	Other (Specify)
9	Unknown

**Source:** Child Seat Inspection and Interview**Remarks:**

When found in vehicle, be sure to photograph. This variable is NOT ASSESSING the proper use of the locking clip, only identifying on what belt it is found.

A **locking clip** is typically provided by the child seat manufacturer and found clipped/fastened to a new child seat when purchased. A **locking clip** is used to lock an emergency locking retractor (ELR) lap and shoulder combination belt with a sliding latch plate. Some belts are labeled indicating the need for the locking clip, and vehicles requiring a locking clip provide information about its use in the owner manual.

**Locking clips** are used to shorten lap belts that have emergency locking retractors which do not switch or lock.

**None Present**

When there is no locking clip present on any seat belt.

**Locking Clip Used on Lap and Shoulder Belt**

When the lap and shoulder belts are threaded through the locking clip.

**Locking Clip Used on Lap Belt Only**

When the lap belt is threaded through the locking clip.

**Locking Clip Used on Shoulder Belt Only**

When the shoulder belt is threaded through the locking clip.

Use of Locking Clip on Vehicle Belt cont'd

Page 2 of 2

**Other (Specify)**

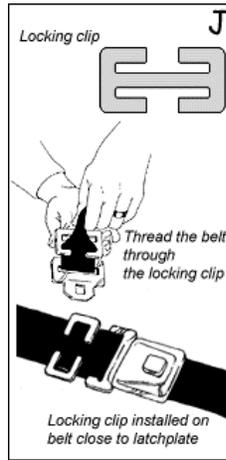
is used when the researcher determines a locking clip was used but not in a manner as stated above. Specify how the locking clip was used.

**Unknown**

is used when the researcher can not determine if a locking clip was used.



Locking clip on belt



Locking clip instructions



Locking clip belt



Locking clip in use

## SEAT LOCATION FOR CHILD RESTRAINT

Page 1 of 2

Screen Name: Seat Location

SAS Data Set: CHILDSEAT

SAS Variable: SEATPOS

Element Attributes: Seat Number

**Front Seat**11 Left side  
12 Middle  
13 Right side**Third Seat**31 Left side  
32 Middle  
33 Right side  
34 Other (specify)**Second Seat**21 Left side  
22 Middle  
23 Right side  
24 Other (specify)**Fourth Seat**41 Left side  
42 Middle  
43 Right side  
44 Other (specify)**Fifth Seat**51 Left side  
52 Middle  
53 Right side  
54 Other (specify)97 In or on unenclosed area  
98 Other enclosed area (specify)

Source: Vehicle Inspection

**Remarks:**

All child seats shall be coded as to whether or not the child seat is occupied or belted into the vehicle seat and its specific location in the vehicle, *if known*. ***When the Occupant Form is completed you will be indicating the location of the seat based upon all the information in the case.*** Select seating locations are defined in the Seat tab.

There are occasions when a child is sitting in a child seat, but the child seat is not restrained by the vehicle belt system or the child in the child seat is sitting on another occupants lap; and there are times when a child seat is restrained by the vehicle belt system, yet is not in use by a child at the time of a crash. Likewise there are occasions when a child seat is inside the vehicle not in use and not belted into the vehicle and is considered cargo, as a possible injury source, etc. Information will be collected on every child seat and its location (*if known*) at the time of a crash whether or not it is in use or restrained by the vehicle belt system at the time of the crash.

Seat Location (cont'd)

Page 2 of 2

The majority of child seats involved in crashes do not remain with the vehicle where it can be visually inspected; however, a child seat's location inside the vehicle can also be determined by interview. Some information can be collected from interviews with the driver/child seat installer, e.g., child seat location, type of belt/LATCH used to secure child seat, etc.

**CHILD RESTRAINT PLACEMENT**

**Screen Name:** Placement

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *PLCMNT*

**Element Attributes:**

- 1 Seat
- 2 Floor
- 3 Lap of other occupant
- 4 Console
- 8 Other (specify)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:****Seat**

Child restraint sitting on vehicle seat.

**Floor**

Child restraint sitting on vehicle floor.

**Lap of Occupant**

Child restraint sitting on lap of other occupant.

**Console**

Child restraint sitting on front, middle or rear console.

**Other**

Other position of child restraint (specify).

**Unknown**

Position of child restraint is not known.

**CHILD POSITION IN CHILD RESTRAINT**

Page 1 of 2

**Screen Name:** Child Position**SAS Data Set:** *CHILDSEAT***SAS Variable:** *POSTN***Element Attributes:**

0	Not occupied
1	Upright
2	Reclined/lying back
3	Supine, facing upwards
4	Slumped forward
5	Slumped to the Side
6	Kneeling
8	Other (specify)
9	Unknown

**Source:** Interview**Remarks:****Upright**

Child was sitting upright, facing forward.

**Reclined/Lying Back**

Child was reclined, between 90 and 45 degrees.

**Supine**

Child was laying flat, outstretched facing upwards.

**Slumped Forward**

Child was leaning forward from the waist up and their back was not against the back of the child restraint or vehicle seat in the case of a belt-positioning booster.

**Slumped to the Side**

Child was leaning to the side from the waist up and their back was not against the back of the child restraint or vehicle seat in the case of a belt-positioning booster.

**Kneeling**

Child was resting on their knees while in the child restraint.

**Other**

Any other position of child (specify).

Child Position (cont'd)

Page 2 of 2

**Not occupied**

When it is know that the seat was not occupied during the crash.

**Unknown**

Unknown position of child in restraint.

OCCUPANT

Occupant Form, Case #2006-903-702S/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Number

Age  years

Height  cm.

Weight  kg.

Sex

Fetal mortality

Role

Race/Ethnic Origin

Eye Wear

Child Seat Used

Police Reported  
Air Bag Avail/Function

**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.

**OCCUPANT NUMBER**

**Screen Name :** Number

**SAS Data Set:** *OA*

**SAS Variable:** *OCCNO*

**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.

**OCCUPANT'S AGE**

**Screen Name:** Age

**SAS Data Set:** OA

**SAS Variable:** AGEMONTH, AGEYEAR

**Element Attributes:**

Enter actual age in months if under 2 years, in years or months if older than 2 years.  
99 / 999 Unknown

**Range:** AGEMONTH:  
1-24, 36, 48 (multiples of 12 up to 1440) 9999  
AGEYEAR:  
999

**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 two years 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.**

**AGEMONTH** contains the age of the people two years and under and is expressed in months.  
**AGEYEAR** contains the age of the people two years and older and is expressed in years.

**OCCUPANT'S HEIGHT**

**Screen Name:** Height

**SAS Data Set:** OA

**SAS Variable:** *HEIGHT*

**Element Attributes:**

999 Entry defaults to inches, but may also be entered in centimeters  
Unknown

**Range:** 30 – 240-999

**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.**

**OCCUPANT'S WEIGHT**

**Screen Name:** Weight

**SAS Data Set:** OA

**SAS Variable:** *WEIGHT*

**Element Attributes:**

Entry defaults to pounds, but may also be entered in kilograms.  
9999 Unknown

**Range:** 2 – 225, 999

**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.

**OCCUPANT'S SEX**

**Screen Name:** Sex

**SAS Data Set:** OA

**SAS Variable:** SEX

**Element Attributes:**

- 1 Male
- 2 Female — Not reported pregnant
- 3 Female — pregnant - 1st trimester (1st-3rd month)
- 4 Female — pregnant - 2nd trimester (4th-6th month)
- 5 Female — pregnant - 3rd trimester (7th-9th month)
- 6 Female — pregnant - term unknown
- 9 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.

**WAS THERE ANY INDICATION THAT THIS PREGNANT OCCUPANT LOST THE FETUS?**

**Screen Name:** Fetal Mortality

**SAS Data Set:**

**SAS Variable:**

**Element Attributes:**

- No
- Yes
- [N/A]

**Source:** Primary source is the interview, secondary sources include police report and official records (*e.g.* medical records and autopsy reports).

**Remarks:**

A fetal fatality is used when fetal death occurs within 30 days of the crash. The death must have occurred as a consequence of the crash.

**No**

No is used for a no response and when not reported. If the researcher determines that it is unknown if there was a fetal fatality then the correct response is No.

**N/A**

Is a prefill when Sex is not equal to a female pregnant.

**OCCUPANT'S ROLE**

**Screen Name:**           Role

*SAS Data Set:*        **OA**

*SAS Variable:*       **ROLE**

**Element Attributes:**

- 1     Driver
- 2     Passenger
- 9     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.

**RACE/ETHNIC ORIGIN OF OCCUPANT**

**Screen Name:** Race/Ethnic Origin

**SAS Data Set:** OA

**SAS Variable:** RACE

**Element Attributes:**

- 1 White (non-Hispanic)
- 2 Black (non-Hispanic)
- 3 White (Hispanic)
- 4 Black (Hispanic)
- 5 American Indian, Eskimo or Aleut
- 6 Asian or Pacific Islander
- 8 Other (specify):
- 9 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**.

**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.

**OCCUPANT'S EYE WEAR**

**Screen Name:** Eye Wear

**SAS Data Set:** OA

**SAS Variable:** EYEWEAR

**Element Attributes:**

- 0 No
- 1 Eyeglasses/sunglasses
- 2 Contact lenses
- 3 Contact lenses with sunglasses
- 8 Other (specify)
- 9 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.

**POLICE REPORTED AIR BAG AVAILABILITY/FUNCTION**

**Screen Name:** Police Reported–Air Bag Avail/Function

**SAS Data Set:** *OA*

**SAS Variable:** *BAGAVRPT*

**Element Attributes:**

- 0 No air bag available
- 1 Police did not indicate air bag availability/function
- 2 Deployed
- 3 Not deployed
- 4 Unknown if deployed
- 9 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.

**POLICE REPORTED BELT USE**

**Screen Name:** Police Reported—Belt Use

**SAS Data Set:** *OA*

**SAS Variable:** *PARUSE*

**Element Attributes:**

- 0 None used
- 1 Police did not indicate belt use
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt used, type not specified
- 6 Child safety seat
- 7 Automatic belt
- 8 Other type belt, (specify)
- 9 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.

EJECTION LIST

#	Occ #	Type	Area	Medium
---	-------	------	------	--------

EJECTION DETAIL

Occupants

Type

Area

Medium

Medium Status

Ejection #  of 0

Prev. Next

**EJECTION / ENTRAPMENT OVERVIEW**

Page 1 of 3

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).

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 technique was introduced in windshields. This type of window has 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.

**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**.

## TYPE OF EJECTION

Page 1 of 2

Screen Name: Type

SAS Data Set: OA

SAS Variable: EJECTION

## Element Value:

- 0 No ejection
- 1 Complete ejection
- 2 Partial ejection
- 3 Ejection, unknown degree
- 9 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.

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)**].

Type of Ejection (cont'd)

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Police reported ejections may be used if there is no vehicle inspection or occupant interview, provided that the ejected occupant was in the seating compartment of the vehicle, and there is no evidence which contradicts the reported ejection.

**EJECTION AREA**

Page 1 of 2

**Screen Name:** Area**Element Attributes:**

0	[No ejection]
1	Windshield
2	Left front
3	Right front
4	Left rear
5	Right rear
6	Rear
7	Roof
89	[Unknown if ejected]
98	Other area ( <i>e.g.</i> , back of pickup, etc.) (specify)
99	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.

When **Ejection Area** equals **Roof**, follow examples illustrated below when selecting **Ejection Medium** and **Medium Status** (immediately prior to impact).

<b>Ejection</b>	<b>Roof Type</b>	<b>Area</b>	<b>Ejection Medium</b>	<b>Medium Status</b>
Ejection	Hardtop, ripped open during crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, <u>attached</u> prior to the crash	Roof	Integral Structure	Integral Structure
Ejection	Removable hardtop, <u>detached</u> 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.

**EJECTION MEDIUM**

Page 1 of 2

**Screen Name:** Medium**SAS Data Set:** *OA***SAS Variable:** *EJECTMED***Element Attributes:**

0	[No ejection]
1	Door/hatch/tailgate
2	Nonfixed roof structure
3	Fixed glazing
4	Nonfixed glazing (specify)
5	Integral structure
79	[Unknown ejection area]
89	[Unknown if ejected]
98	Other medium (specify)
99	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**

refers 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.

## EJECTION MEDIUM STAT US (IMMEDIATELY PRIOR TO IMPACT)

Page 1 of 2

**Screen Name:** Medium Status

**SAS Data Set:** OA

**SAS Variable:** MEDSTA

**Element Attributes:**

0	[No ejection]
1	Open
2	Closed
3	[Integral Structure]
79	[Unknown ejection area]
89	[Unknown if ejected]
99	Unknown status

**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.

EJECTION COMMENTS

The screenshot shows a software application window with a blue title bar. The title bar text is "Occupant Form, Case #2005-903-86S/Vehicle # 1/Occupant #2". The window contains a menu bar with the following items: "Occupant", "Ejection", "Entrapment", "SEAT", "AirBag", "CHILD SEAT", "SEAT BELT", "INJURY", "Injury Codes", "LOG", and "QUALITY". Below the menu bar is a tabbed interface with three tabs: "List", "Detail", and "Comments". The "Comments" tab is currently selected. The main content area is a large, empty white rectangular box with a vertical scrollbar on the right side. At the bottom of the window, there are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red 'X' icon).

This screen is for adding further annotations about any ejection.

ENTRAPMENT DETAILS

The screenshot shows a software window titled "Occupant Form, Case #2005-903-86S/Vehicle # 1/Occupant #2". The window has a blue title bar with standard minimize, maximize, and close buttons. Below the title bar is a navigation menu with tabs: "Occupant", "Ejection", "Entrapment", "SEAT", "AirBag", "CHILD SEAT", "SEAT BELT", "INJURY", "Injury Codes", "LOG", and "QUALITY". The "Entrapment" tab is currently selected. Below the navigation menu are two sub-tabs: "Details" (selected) and "Comment". The main content area contains three input fields: "Entrapment" (a dropdown menu), "Occupant Mobility" (a dropdown menu), and "Intrusions > 2cm" (a text box containing the number "3"). At the bottom right of the window are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red 'X' icon).

**ENTRAPMENT**

**Screen Name:** Entrapment

**SAS Data Set:** *OA*

**SAS Variable:** *ENTRAP*

**Element Attributes:**

- 0 Not entrapped/exit not inhibited
- 1 Entrapped/pinned — mechanically restrained
- 2 Could not exit vehicle due to jammed doors, fire, etc (specify)
- 9 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.

**OCCUPANT MOBILITY**

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**Screen Name:** Occupant Mobility**SAS Data Set:** *OA***SAS Variable:** *OCCMOBIL***Element Attributes:**

- 0 Occupant fatal before removed from vehicle
- 1 Removed from vehicle while unconscious or not oriented to time or place
- 2 Removed from vehicle due to perceived serious injuries
- 3 Exited from vehicle with some assistance
- 4 Exited from vehicle under own power
- 5 Occupant fully ejected
- 8 Removed from vehicle for other reasons (specify):
- 9 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.

**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.

ENTRAPMENT/COMMENT

This screen is for adding further annotations about any entrapment.

SEAT DEFINITION

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Definition | Attributes

Row 1 Location 3 Posture Normal Posture

UNKNOWN


Role Seat Type

Save Close

**OCCUPANT’S SEAT POSITION**

**Screen Name:** Seat Location Identification

**SAS Data Set:** OA

**SAS Variable:** SEATPOS

**Element Attributes:**

Front Seat  
11 Left side  
12 Middle  
13 Right side

Fourth Seat  
41 Left side  
42 Middle  
43 Right side  
44 Far right side

Second Seat  
21 Left side  
22 Middle  
23 Right side  
24 Far right side

Fifth Seat  
51 Left side  
52 Middle  
53 Right side  
54 Far right side

Third Seat  
31 Left side  
32 Middle  
33 Right side  
34 Far right side

Other or unknown seating  
97 Unenclosed area  
98 Other enclosed area  
99 Unknown seat location

**Source:** Interviewee, police report and vehicle inspection

**Remarks:**

SEATING POSITIONS INDICATE AREAS OF THE VEHICLE, AND MAY NOT INDICATE THE ACTUAL PRESENCE OF A SEAT.

Identify the seat location where this occupant was located. "Click" on the appropriate seat on the screen. “Far right side” is only to be used if the seat has four seating positions.

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.

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 sixth or higher numbered seat area. See below for clarification.

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.

Persons appended to the vehicle in motion are not considered to be occupants of the vehicle.

**Unenclosed Area**

includes those occupants riding on a fender, the boot of a convertible, the open cargo box on a light truck, etc.

To select "Unenclosed area", you must first "click on" the large area in the rear of the vehicle on the screen. Then using the variable **Seat Type**, you will select "In or on other Unenclosed area (specify)"

**Other Seat**

is used for anyone in the sixth or higher numbered seat area (highly unlikely). In addition, use this code when an occupant(s) is in an enclosed area where no defined seating exists.

To select "Other seat", you must first "click on" the large area in the rear of the vehicle on the screen. Then using the variable **Seat Type**, you will select "In other Enclosed area (specify)."

## OCCUPANT'S POSTURE

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Screen Name: Posture

SAS Data Set: OA

SAS Variable: **POSTURE**

## Element Attributes:

0	Normal posture
1	Kneeling or standing on seat
2	Lying on or across seat
3	Kneeling, standing or sitting in front of seat
4	Sitting sideways or turned to talk with another occupant or to look out a rear window
5	Sitting on a console
6	Lying back in a reclined seat position
7	Bracing with feet or hands on a surface in front of seat
8	In the lap of another occupant
9	Sharing a seat-sitting side by side another occupant
10	In a child restraint
88	Other posture (specify):
99	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.

**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'S ROLE**

**Screen Name:** Role

**SAS Data Set:** *OA*

**SAS Variable:** *ROLE*

**Element Attributes:**

1	Driver
2	Passenger
9	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.

SEAT ATTRIBUTES

Occupant Form, Case #2005-903-86S/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Definition | **Attributes**

**Head Restraint**  
Type: [Dropdown]  
Damage: [Dropdown]  
Active: [Dropdown]  
Seat Location: 13

**Seat**  
Type: [Dropdown]  
Orientation: [Dropdown]  
Track: [Dropdown]  
Performance: [Dropdown]  
Integrated Restraints: [Dropdown]

**LATCH**  
Anchor: [Dropdown]  
Tether: [Dropdown]

**Seat Back Position**  
Prior: [Dropdown]  
Post: [Dropdown]

**Child Seat Used**: Yes [Dropdown]      **Air Bag EVER Available**: No [Dropdown]

Save      Close

**Remarks:**

Attributes tab information will roll over from the completed Safety Systems Form except for Seat Back Position Post and Child Seat Used variables.

**HEAD RESTRAINT TYPE AT THIS OCCUPANT POSITION**

**Screen Name:** Head Restraint--Type

**SAS Data Set:** OA

**SAS Variable:** HEADTYPE

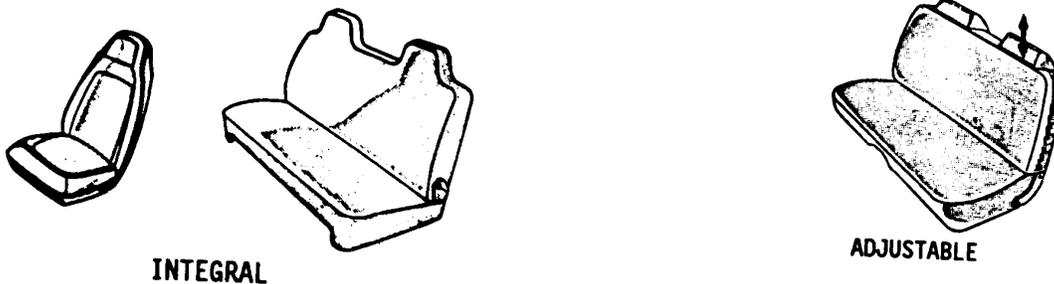
**Element Attributes:**

- 0 [Occupant not seated or no seat]
- 1 No head restraints
- 2 Integral
- 3 Adjustable
- 4 Add-on
- 8 Other (specify)
- 9 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.



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**

refers 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.

**Adjustable**

applies 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.

**HEAD RESTRAINT DAMAGE BY OCCUPANT AT THIS OCCUPANT POSITION**

**Screen Name:** Head Restraint—Damage

**SAS Data Set:** *OA*

**SAS Variable:** *HEADDAMG*

**Element Attributes:**

- 0 [Occupant not seated or no seat]
- 1 [No Head Restraints]
- 2 No damage
- 3 Damaged during crash
- 9 Unknown

**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.

**ACTIVE HEAD RESTRAINT**

**Screen Name:** Head Restraint - Active

**SAS Data Set:** *OA*

**SAS Variable:** *HEADACT*

**Element Attributes:**

0	[Occupant not seated or no seat]
1	None Present
2	Present
9	Unknown

**Source:** Vehicle Inspection, interview

**Remarks:**

There should be a label on the seat indicating the presence of the active head restraint.

**SEAT TYPE**

Page 1 of 2

**Screen Name:** Seat – Type**SAS Data Set:** *OA***SAS Variable:** *SEATTYPE***Element Attributes:**

- 0 Occupant not seated or no seat
- 1 Bucket
- 2 Bucket with folding back
- 3 Bench
- 4 Bench with separate back cushions
- 5 Bench with folding back(s)
- 6 Split bench with separate back cushions
- 7 Split bench with folding back(s)
- 8 Pedestal (*i.e.*, column supported)
- 9 Box mounted seat (*i.e.*, van type)
- 10 Other seat type (specify)
- 99 Unknown seat type / location

**Source:** Primary source is the vehicle inspection, secondary sources include: interviewee; police report, or official records (*i.e.*, medical).**Range:** 0-10, 99**Remarks:**

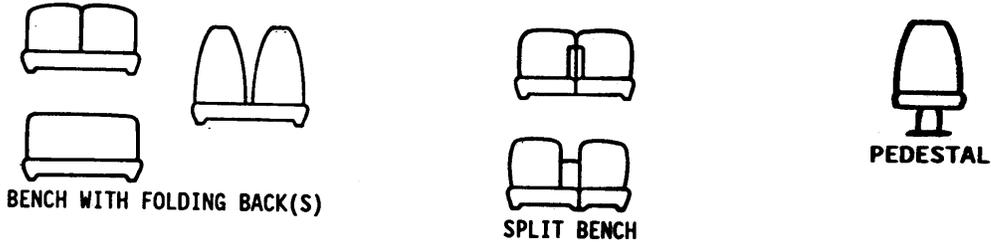
This variable assesses the type of seat present at this position.

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.



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.

**SEAT ORIENTATION**

**Screen Name:** Seat—Orientation

**SAS Data Set:** OA

**SAS Variable:** STORIENT

**Element Attributes:**

0	[Occupant not seated or no seat]
1	Forward facing seat
2	Rear facing seat
3	Side facing seat (inward)
4	Side facing seat (outward)
8	Other (specify):
9	Unknown

**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.

**SEAT TRACK POSITION**

Page 1 of 2

**Screen Name:** Seat—Track**SAS Data Set:** OA**SAS Variable:** SEATRACK**Element Attributes:**

- 0 [Occupant not seated or no seat]
- 1 Non-adjustable seat track
- 2 Seat at forward most track position
- 3 Seat between forward most and middle track positions
- 4 Seat at middle track position
- 5 Seat between middle and rear most track position
- 6 Seat at rear most track position
- 9 Unknown seat track position

**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 Track Position (cont'd)

Page 2 of 2

**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.

**SEAT PERFORMANCE**

Page 1 of 2

**Screen Name:** Seat—Performance**SAS Data Set:** OA**SAS Variable:** SEATPERF**Element Attributes:**

- |   |   |
|---|---|
| 0 | [Occupant not seated or no seat]                        |
| 1 | No seat performance failure(s)                          |
| 2 | Seat adjusters failed                                   |
| 3 | Seat back folding locks or "seat back" failed (specify) |
| 4 | Seat tracks/anchors failed                              |
| 5 | Deformed by impact of occupant                          |
| 6 | Deformed by passenger compartment intrusion (specify)   |
| 7 | Combination of above (specify)                          |
| 8 | Other (specify)   |
| 9 | Unknown   |

**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.

**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.

**SEAT LATCH ANCHOR AVAILABILITY**

**Screen Name:** LATCH - Anchor

**SAS Data Set:** OA

**SAS Variable:** LATANCH

**Element Values:**

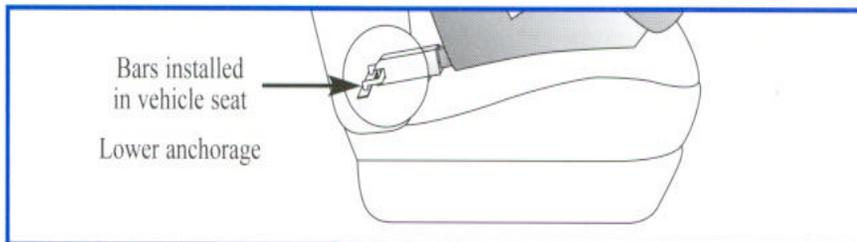
- 0 [No seat]
- 1 No
- 2 Yes
- 9 Unknown

**Source:** Researcher determined--driver/occupant interview and vehicle inspection

**Remarks:**

Currently, some new passenger vehicles are equipped with lower child seat anchorage points between a vehicle's seat cushion and seat back. Together, the two lower anchorage points and top tether anchorage make the LATCH system. By September 1, 2002, this system will be required in two rear seating positions of all cars, minivans, and light trucks.

A lower anchorage is a small rod or bar located between a vehicle's seat cushion and seat back allowing a child safety seat to be attached or snapped into the vehicle instead of being held secure by the vehicle's belt system. By September 1, 2002, all child safety seats will have two attachments which will connect to the vehicle's lower anchorage attachment points. (Some child seat manufacturers have included lower anchorage points in year 2000 models.)



Seat LATCH Anchor Availability (cont'd)

Page 2 of 2

**No**

is used when there is no LATCH lower anchor in is this seating position.

**Yes**

is used when a LATCH lower anchor is present for this seating position.

**SEAT LATCH TETHER AVAILABILITY**

**Screen Name:** LATCH - Tether

**SAS Data Set:** OA

**SAS Variable:** LATTETH

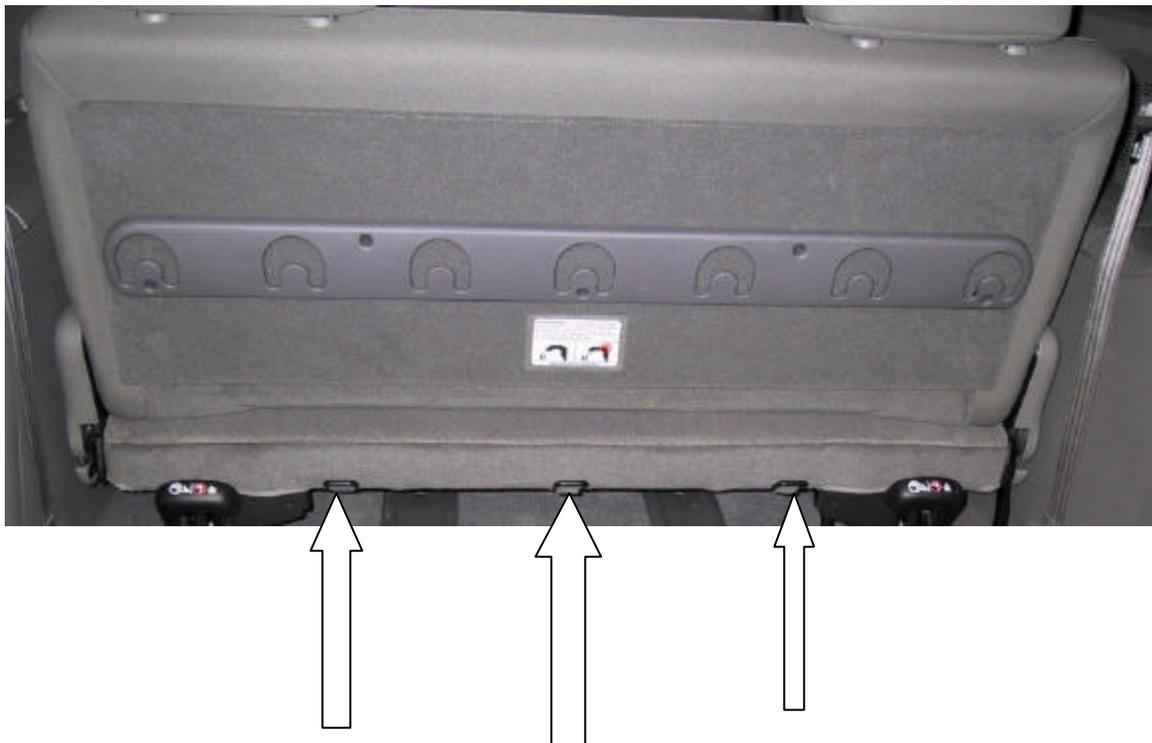
**Element Values:**

- 0 [No seat]
- 1 No
- 2 Yes
- 9 Unknown

**Source:** Researcher determined--driver/occupant interview and vehicle inspection

**Remarks:**

The tether anchor will found on the rear shelf area of the vehicle. It may be concealed by some sort of covering which can be removed or “flipped up”. In some vehicles, such as mini- vans and station wagons, the tether anchor may be found on the rear floor of the vehicle or on the back of the rear seat.



Seat LATCH Tether Availability (cont'd)

**No**

is used when there is no LATCH tether anchor for this seating position.

**Yes**

is used when a LATCH tether is present for this seating position.

**DOES THE SEAT HAVE INTEGRATED PASSENGER BELTS?**

**Screen Name:** Seat--Integrated Restraints

**SAS Data Set:** *OA*

**SAS Variable:** *INTGREST*

**Element Attributes:**

0	[Occupant not seated or no seat]
1	No
2	Yes
9	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**.

**SEAT BACK INCLINE PRIOR TO IMPACT**

**Screen Name:** Seat Back Position – Prior

**SAS Data Set:** *OA*

**SAS Variable:** *STPRINCL*

**Element Values:**

- 0 [Occupant not seated or no seat]
- 1 Not adjustable
- 2 Upright
- 3 Slightly reclined
- 4 Completely reclined
- 9 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 back 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.

**SEAT BACK INCLINE POSITION POST IMPACT**

**Screen Name:** Seat Back Position -- Post

**SAS Data Set:** OA

**SAS Variable:** STPSINCL

**Element Attributes:**

- 0 [Occupant not seated or no seat]
- 1 [Not adjustable]
- 2 Moved to completely rearward position
- 3 Moved to rearward midrange position
- 4 Moved to completely rearward position
- 5 Retained pre-impact position
- 6 Moved to upright position
- 7 Moved to slightly forward position
- 8 Moved to Forward midrange position
- 9 Complete forward position
- 99 Unknown

**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.

**CHILD SAFETY SEAT USED**

**Screen Name:** Child Seat Used

**SAS Data Set:** OA

**SAS Variable:** CHUSED

**Element Attributes:**

0 No  
1 Yes  
9 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.

**AIR BAG EVER AVAILABLE**

**Screen Name:** Air Bag Ever Available

**SAS Data Set:** *OA*

**SAS Variable:** *BAGEVER*

**Element Attributes:**

0	No
1	Yes
9	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 the availability or non-availability is coded on the **Air Bag Tab**.

AIR BAG FUNCTION

The screenshot shows a software window titled "Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2". The interface features a menu bar with tabs: Occupant, Ejection, Entrapment, SEAT, AirBag, CHILD SEAT, SEAT BELT, INJURY, Injury Codes, LOG, and QUALITY. Below the menu bar is a sub-menu bar with tabs: Function, Damage, Evaluation, Sketch 1, Sketch 2, Sketch 3, Sketch 4, Sketch 5, Sketch 6, and Sketch 7. The main area contains several dropdown menus for data entry:

- Location: Mid Instrument Panel
- Status: Airbag Available
- Type Of Air Bag: Orig. man. installed sys.
- Redesigned Class: Not Redesigned
- System Deployment: Deployed during crash (as a result of impact)
- Indications of Failure: No
- Switch Type: None present
- Switch Status: None present

At the bottom of the form, there is a "Seat Location" dropdown, "Air Bag 1 of 1", a checked "View Sketches" checkbox, and navigation arrows. The bottom right corner contains "Save" and "Close" buttons.

**Remarks:**

Airbag Function and Damage Tabs roll over from Safety Systems Air Bag Tabs. The Air Bag Evaluation Tab is completed in the Occupant Form.

When vehicle inspection is not completed and there is known air bag information from the interview, the air bag information is completed in the Occupant Form.

**AIR BAG NUMBER FOR THIS VEHICLE**

**Screen Name:** Air Bag

**SAS Data Set:** AIRBAG

**SAS Variable:** BAGNO

**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.

**LOCATION OF AIR BAG**

Page 1 of 2

**Screen Name:** Location**SAS Data Set:** *AIRBAG***SAS Variable:** *BAGLOC***Element Attributes:**

- 1 Steering Wheel Hub
- 2 Top Instrument Panel
- 3 Mid Instrument Panel
- 4 Bottom Instrument Panel
- 5 Seat Back
- 6 Door
- 7 Roof Side Rail
- 98 Other (specify)
- 99 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".

Deployment Location of Air Bag (cont'd)

Page 2 of 2

**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.

**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.

**AIR BAG STATUS**

**Screen Name:** Status

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFUNC*

**Element Attributes:**

- 1 Air Bag Available
- 2 Air bag disconnected (specify):
- 3 Air bag not reinstalled
- 9 Unknown status if available for this crash

**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.

**TYPE OF AIR BAG**

**Screen Name:** Type Of Air Bag

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGTYPE*

**Element Attributes:**

- 1 Original manufacturer install
- 2 Retrofitted Air Bag
- 3 Replacement Air Bag
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 99 Unknown Type

**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.

**REDESIGNED AIR BAG**

**Screen Name:** Redesigned Class

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGREDES*

**Element Attributes:**

0	Not Redesigned
1	Redesigned
2	Advanced (specify)
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown class

**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

**AIR BAG DEPLOYMENT**

Page 1 of 2

**Screen Name:** System Deployment**SAS Data Set:** AIRBAG**SAS Variable:** BAGDEPLY**Element Attributes:**

- 1 Deployed during crash (as a result of impact)
- 2 Deployed inadvertently just prior to crash
- 3 Deployed, detail unknown
- 4 Deployed as a result of a noncollision event during crash sequence (e.g., fire, explosion, electrical)
- 7 Nondeployed
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 99 Unknown if 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, the air bag deploys due to a vehicular fire, occurring as a result of:

- an impact
- or**
- a noncollision event

prior to any impacts to this vehicle.

**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.

**INDICATIONS OF AIR BAG FAILURE**

**Screen Name:** Indications of Failure

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFAIL*

**Element Attributes:**

0	No
1	Yes (specify):
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown if air bag failed

**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.

**TYPE OF CUTOFF SWITCH**

**Screen Name:** Switch Type

**SAS Data Set:** AIRBAG

**SAS Variable:** SWITCHTYP

**Element Attributes:**

0	None present
1	Originally equipped
2	Retro fit
3	Switch present, type unknown
9	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.

**CUTOFF SWITCH POSITION STATUS**

**Screen Name:** Switch Status

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *SWITCHSET*

**Element Attributes:**

0	Switch on/automatic
1	Switch off
7	[None present]
8	[Unknown if switch present]
9	Switch status unknown

**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/automatic**

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.

AIR BAG/DAMAGE

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Function | Damage | Evaluation | Sketch 1 | Sketch 2 | Sketch 3 | Sketch 4 | Sketch 5 | Sketch 6 | Sketch 7

Module Cover Flap Open At Tear Pts

Module Cover Flap Damaged

Damage to Air Bag

Source of Damage

Seat Location  Air Bag  of 1  View Sketches

**DID AIR BAG MODULE COVER FLAP(S)/SEAM(S) OPEN AT DESIGNATED TEAR POINTS?**

**Screen Name:** Module Cover Flap Open at Tear Pts?

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFLOPN*

**Element Attributes:**

0	No
1	Yes
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	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)/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.

**WERE THE COVER FLAP(S) DAMAGED**

**Screen Name:** Module Cover Flap Damaged

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGFLDAM*

**Element Attributes:**

0	No
1	Yes (specify)
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	Unknown if flaps damaged

**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.

**WAS THERE DAMAGE TO THE AIR BAG?**

Page 1 of 2

**Screen Name:** Damage to Air Bag?**SAS Data Set:** *AIRBAG***SAS Variable:** *BAGDAMAG***Element Attributes:**

0 Not damaged

**Yes — Air Bag Damaged**

1 Ruptured

2 Cut

3 Torn

4 Holed

5 Burned

6 Abraded

60 [Air bag did not deploy]

69 [Unknown if air bag deployed]

70 [No air bag available for this crash (disconnected/not reinstalled)]

79 [Unknown status if air bag available for this crash]

88 Other damage (specify)

95 Damaged, details unknown

99 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.

Was There Damage To The Air Bag? (cont'd)

Page 2 of 2

**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.

**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.

**SOURCE OF AIR BAG DAMAGE**

**Screen Name:** Source of Damage

**SAS Data Set:** AIRBAG

**SAS Variable:** BAGDAMSO

**Element Attributes:**

- 1 Object worn by occupant (specify)
- 2 Object carried by occupant (specify)
- 3 Adaptive/assistive controls, (specify)
- 4 Cover flaps
- 5 Fire in vehicle
- 6 Thermal burns
- 7 Windshield
- 8 Rescue or emergency efforts  
[Air Bag Not Damaged]
- 59 Deployed, unknown of damaged
- 60 [Air bag did not deploy]
- 69 [Unknown if air bag deployed]
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 88 Other damage source (specify)
- 99 Damaged unknown source

**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.

**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.

**OCCUPANT FORM**  
**AIR BAG/EVALUATION**

**AIR BAG/EVALUATION**

Occupant Form, Case #2005-903-86S/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Function | Damage | Evaluation | Sketch 1 | Sketch 2 | Sketch 3 | Sketch 4 | Sketch 5 | Sketch 6 | Sketch 7

Vehicle Previous Accidents

Prior Maintenance/Service

Event Number

DELTA V  PDOF  degrees CDC

Total	Longtdl	Lateral	Energy	Impact	Barrier	Estimated	Rank
<input type="text"/>							

CDC for Deployment Impact

Contacted Other Occupant

Seat Location  Air Bag  of 1  View Sketches

**HAD THE VEHICLE BEEN IN PREVIOUS CRASHES?**

**Screen Name:** Vehicle Previous Crashes

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *PREVACC*

**Element Attributes:**

- 1 No previous crashes
- 2 Previous crash(es) without deployment(s)
- 3 One previous crash with deployment
- 4 More than one previous crash with at least one deployment
- 8 Previous crashes, unknown deployment status
- 9 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.

**HAD ANY PRIOR MAINTENANCE/SERVICE BEEN PERFORMED ON THIS AIR BAG SYSTEM?**

**Screen Name:** Prior Maintenance/Service

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGMAINT*

**Element Attributes:**

- 1 No prior maintenance
- 2 Yes, prior maintenance (specify)
- 9 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.

**AIR BAG DEPLOYMENT ACCIDENT EVENT SEQUENCE NUMBER**

**Screen Name:** Event Number

**SAS Data Set:** AIRBAG

**SAS Variable:** BAGEVENT

**Element Attributes:**

- Event #
- 60 [Air bag did not deploy]
- 69 [Unknown if air bag deployed]
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 99 Deployed, unknown event

**Source:** Primary sources are the scene and vehicle inspections; secondary sources include the police report and the interviewee.

**Range:** 1-35, 60, 69, 70, 79, 99

**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.

**CDC FOR AIR BAG DEPLOYMENT IMPACT**

**Screen Name:** CDC For Deployment Impact

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGCDC*

**Element Attributes:**

- 1 Highest Delta V
- 2 Second highest Delta V
- 3 Other Delta V (specify)
- 60 [Air bag did not deploy]
- 69 [Unknown if air bag deployed]
- 70 [No air bag available for this crash (disconnected/not reinstalled)]
- 79 [Unknown status if air bag available for this crash]
- 99 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.

**WAS THE AIR BAG IN THIS OCCUPANT'S POSITION CONTACTED BY ANOTHER OCCUPANT?**

**Screen Name:** Contacted Other Occupant

**SAS Data Set:** *AIRBAG*

**SAS Variable:** *BAGCONOT*

**Element Attributes:**

0	No
1	Yes (specify)
60	[Air bag did not deploy]
69	[Unknown if air bag deployed]
70	[No air bag available for this crash (disconnected/not reinstalled)]
79	[Unknown status if air bag available for this crash]
99	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.

CHILD SEAT/LIST

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

List | Detail

Make	Model	Occ #	Seat
All Our Kids	Other (Specify)		
Century Products	4400		

Save Close

CHILD SEAT/DETAIL

Occupant Form, Case #2005-903-86S/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

List | Detail

Make: All Our Kids | Occ #s: | Model: Other (Specify) | Date of Manufacture: | Model No: | Type: |

Design Feature Used	Orientation	How Feature Used
Harness/ Shield		
Retainer Clip		
Tether		
LATCH		
	Belt Routing / Use	
	Locking Clip Use	

Seat Location: | Placement: | Child Position: |

Save | Close

**CHILD RESTRAINT OVERVIEW**

Page 1 of 2

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.

**[CHILD RESTRAINT NUMBER]**

**Screen Name:** N/A

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CHSEATNO*

**Element Attributes:**

1, 2, 3, etc.,

**Source:** As created by system

**Remarks:**

**CHILD RESTRAINT MAKE****Screen Name:** Make**SAS Data Set:** *CHILDSEAT***SAS Variable:** *CHMAKE***Element Attributes:**Refer to listing of child restraints  
Unknown make**Source:** Vehicle inspection, child seat inspection, and secondary source includes the interview**Remarks:**

A child seat's manufacturer/make and model name may be difficult to determine unless the manufacturer/model name is stamped/sewn/molded into the child seat itself. Refer to the manufacturer's instruction booklet which accompanied the child seat, if available, for specific make and model of seat. The child seat should have a label permanently attached which identifies the seats date of manufacture and model number; although this information alone does not identify the specific make of seat, it may be useful if no other identifiers exist and should be coded under "other." See appendix for list of makes.

**CHILD RESTRAINT MODEL**

**Screen Name:** Model

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CHMODEL*

**Element Attributes:**

Refer to listing of child restraints  
Unknown model

**Source:** Vehicle inspection

A child seats manufacturer/make and model name may be difficult to determine unless the manufacturer/model name is stamped/sewn/molded into the child seat itself. Refer to the manufacturer's instruction booklet which accompanied the child seat, if available, for specific make and model of seat. The child seat should have a label permanently attached which identifies the seat's date of manufacture and model number; although this information alone does not identify the specific make of seat, it may be useful if no other identifiers exist and should be coded under "other". See appendix for list of makes.

**CHILD RESTRAINT TYPE**

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Screen Name: Type

*SAS Data Set:* **CHILDSEAT***SAS Variable:* **CHTYPE****Element Attributes:**

- 1 Infant seat (ISS)
- 2 Convertible seat (CSS)
- 3 Forward facing only (FSS)
- 4 Booster seat (BSS)
- 5 Booster/Forward facing seat (BSS/FSS)
- 6 Booster/Convertible facing seat (BSS/CSS)
- 7 Integrated seat (INT)
- 8 Harness (HSS)
- 9 Vest (VSS)
- 10 Special needs (SNSS)
- 98 Other (specify)
- 99 Unknown

**Source:** Vehicle inspection**Remarks:**

Refer to child seat listing for additional information regarding each respective seat in addition to Manufacturer' Instructions.

Once the child seat has been identified by make and model, the child seat TYPE will automatically be defined. However, this information can be determined by child seat examination and interview if no make or model information is available.

**Infant Seat (ISS)**

Designed and intended to be used rear facing only by newborns and infants weighing up to about 20 pounds. Typically equipped with a 3-point harness, two straps which cross over the infant's shoulders, connecting to a buckle on a piece of webbing or to a buckle recessed at the crotch area. Infant seats should recline at a 45-degree angle. Some infant seats have detachable bases which can be left secured in the vehicle, while the infant seat is removed, doubling as a carrier. When used as a child restraint the carrier-type infant seat's carrying handle should be folded back, in the down position.

Infant only seats are typically designed with 2 or 3 sets of harness strap slots in the back of the seat which allow for proper shoulder strap placement (below or at the infant's shoulders). Most harness adjustment mechanisms are behind the seat back and are typically affixed/locked by a metal bar, or clip-type lock. Most seats are equipped with a harness retainer clip which should be positioned at the infant's armpit level. Positioning of the harness retainer clip at armpit level keeps the shoulder straps positioned properly up on the infant's shoulders. The vehicle belt system (lap or lap portion of a lap/shoulder belt combination) must be used to secure the seat and/or its base to the vehicle.



Infant seat with base



Infant seat

**Convertible Seat (CSS)**

Designed and intended to be used either rear or forward facing for a child ranging from birth to approximately 40 pounds (this information will normally be found on the child seat labeling as well as in the manufacturer's instructions). All have a harness system to secure the child to the seat which consists of a 5-point harness, T-Shield or Tray-Shield. Most seats have 3 sets of harness slots, lowest and middle set of slots for rear facing only use positioning the straps below or at the infant's shoulder level and a top set of slots for use forward facing placing the straps above or at the child's shoulder level. Most have a harness retainer clip which helps position the shoulder straps up on the child's shoulders. Refer to manufacturers' instructions for proper use orientation according to the child's height and weight. When used rear facing the weight of the child ranges from birth to approximately 20 pounds (some convertible seats allow for heavier weight infants rear facing up to about 30 pounds). In the rear facing mode the seat is reclined at a 45-degree angle for infant use. When used forward facing the weight of the child normally ranges from 20 pounds to approximately 40 pounds. In the forward facing mode most seats are used fully upright, but some allow for a slight recline forward facing. Refer to manufacturers' instructions for proper use orientation according to the child's height and weight.

The vehicle belt system (lap or lap portion of a lap/shoulder belt combination) must be used to secure the child seat to the vehicle. In addition seats manufactured after September 1, 1999, may come equipped with a top tether strap which anchors to the vehicle to help secure the child seat. Vehicles manufactured after September 1, 2000, or earlier models come equipped with a top tether anchorage. Refer to the child seat and vehicle owners manual for proper tether attachment and use.



Convertible seat with t shield



Convertible seat with tray shield



Convertible seat with 5 point harness

**Forward Facing Only Seat (FSS):**

A forward facing only seat is intended to be used by children who are over 1 year old and who weigh at least 20 pounds. The majority are recommended for use by children who weigh at least 20 pounds up to about 40 pounds, though some have a lower weight use recommendation of 30 pounds and upper weight limits above 40 pounds. These seats come equipped with a built-in harness or shield to restrain the child, and the seat must be secured to the vehicle seat with a lap and/or lap/shoulder belt combination. These seats are used with the child sitting in an upright position. These seats typically have 3 sets of harness slots in the back of the seat which allows for proper harness placement over the child's shoulders as the child grows. Harness straps should be at or above the child's shoulder level and since this type of seat is intended for forward facing use only, all sets of slots can be used.

The majority of these seats convert to belt-positioning boosters by removing the harness system after a child reaches 40 pounds. Always check manufacturer instructions for proper use recommendations

Backless boosters with shields are considered forward facing only seats and are not currently certified for use by children over 40 pounds.

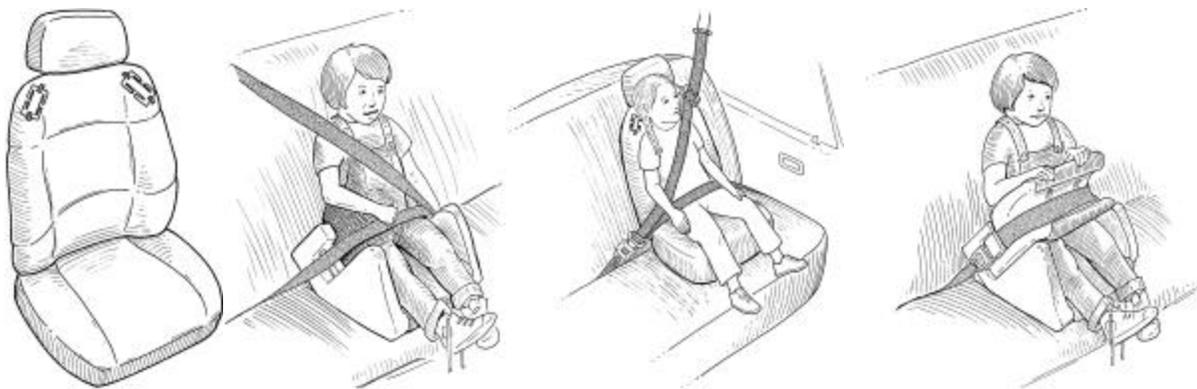


Forward facing seat

**Booster Seat (BSS) Belt-positioning**

Designed and intended as a forward facing platform which raises a child's sitting height, enabling them to use the adult lap and shoulder belt for restraint. Some belt-positioning booster seats come equipped with a harness which is used until the child reaches about 40 pounds. The seat is considered a forward facing only seat when used with the harness and must be secured with the vehicle belt system. Belt-positioning booster seats are primarily designed to "fill the gap" between a seat with a harness and the adult lap and shoulder belt used alone. Belt-positioning boosters should never be used with a lap belt only across the child.

Belt-positioning boosters come in high-back and backless models. High-back models which some compare to "portable mini bucket seats" provide head protection for the child when used in vehicle seats with low seat backs or no head restraints. Most high-back models have shoulder belt positioners on the sides of the seat which help position the shoulder belt across the child properly. Backless models provide a base which the child sits on to raise their sitting height, which then enables the adult lap and shoulder belt to fit properly. Some backless boosters have removable shields, e.g., shield boosters, which when used with the shield are considered forward facing only seats for children up to 40 pounds. Most backless boosters with shields convert to belt-positioning boosters by removing the shield and using the booster base with the adult lap and shoulder belt. Refer to the manufacturers' instructions for proper use according to the child's weight and height.



Belt positioning booster

Belt positioning booster

Belt positioning booster

Belt positioning booster with shield

**Integrated Seat (INT) Built-In Child Restraint**

Built-into the vehicle seat, typically "camouflaged" within or under an adult seating position in the back seat. Designed for forward facing use only by children who weigh between 20 and 40 pounds and whose height ranges between 33 and 40 inches, typically a child at least 1 year old and over 20 pounds. The majority of these seats have a 5-pt harness system, e.g., one strap over each shoulder, one strap across each upper thigh and a strap with a buckle or recessed buckle in the crotch area. Some models convert into belt-positioning booster seats for use by children up to about 60 pounds after the child reaches 40 pounds and can no longer use the 5-pt harness system.

**Harness (HSS)**

Intended to be used forward facing for children, who have outgrown a child seat, typically over 40 pounds, age 5 and older who are passengers of vehicles with lap belts only in the rear seat.

Typically a harness consists of two straps with bottom loops which rest across the child's shoulders and chest connected at the top by a tether anchorage. The vehicle lap belt routes through the loop at the bottom of each strap, resting across the child's lap/upper thigh area. Refer to the manufacturers' instructions for proper restraint use and installation.

**Vest (VSS)**

Designed for forward facing use only and generally intended for use by children weighing 25-40 pounds; however, some vests can be made according to chest and waist measurements (e.g., EZ-On Products) which can accommodate small children to adults. Some models have a 5-pt type harness system and some have adjustable zipper closures in the back which typically require a top tether/anchor strap to be used along with the vehicle belt system. Some vests such as those used on school buses when transporting children with special transportation needs may require its own "seat mount" belt system for proper use of the vest. Refer to the manufacturers' instructions for proper restraint use and installation.



Vest

**Special Needs Safety Seat (SNSS)**

Designed and modified for children with special transportation needs who range from newborn to about 100 pounds. The majority of these devices are intended for forward facing use only, however some devices can be used rear and forward facing. All have a harness system to secure the child to the seat which may consist of a 3 or 5-point harness, T-shield, etc. Refer to manufacturers' instructions for proper restraint use and orientation.

**Other** – Not meant for vehicle travel

Other items, other than a certified child restraint used to hold, adjust sitting height, or otherwise contain or position a child while in a motor vehicle. Defines a product for which no type, make or model could be identified through the listing of child restraints and/or manufacturers instructions dated 1996 and 1999, nor found in the typical examples: Infant carriers, phone books/books, restaurant-home style booster seat, portable crib/cradle/playpen, wood platform, plastic platform, cushion or pillow.

**Unknown**

is used when type of a child restraint is not known.

**DATE OF MANUFACTURE**

**Screen Name:** Date of Manufacture

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *MANDATE*

**Element Attributes:**

MM/DD/YYYY  
Indicate the date of manufacture as indicated on the child restraint  
99/99/9999 Unknown date

**Source:** Vehicle inspection

**Remarks:**

Indicate the date of manufacture as indicated on the child restraint. This information can be used for recalls and for determining the model of the child seat if it is not known.

**MODEL NUMBER**

**Screen Name:** Model No

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *MODELNO*

**Element Attributes:**

Indicate the model number as indicated on the child restraint

**Source:** Vehicle inspection

**Remarks:**

Indicate the model number as indicated on the child restraint. This information can be used for recalls and for determining the model of the child seat if it is not known.

**CHILD RESTRAINT HARNESS/SHIELD DESIGN**

Page 1 of 2

**Screen Name:** Harness/Shield**SAS Data Set:** *CHILDSEAT***SAS Variable:** *HARDES***Element Attributes:**

0	Not designed with harness/shield (or No harness/shield available)
1	3-pt harness
2	5-pt harness
3	T-shield
4	Tray-shield
5	Shield
9	Unknown

**Source:** Vehicle inspection**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

Some seats can be purchased in different configurations. For these seats the make and model DO NOT uniquely define the harness/shield design.

A harness is a belt-type restraint integral to the child seat, for the specific purpose of holding the child in the seat.

**3-pt/V-Harness**

Two straps crossing both shoulders attached to a latch plate which typically inserts into a buckle on a piece of webbing or recessed at the crotch area, visually forming a V. Applicable to rear facing only infant seats.

**5-pt Harness**

Two straps crossing both shoulders, two straps crossing each upper thigh and a strap between the legs (crotch strap). This type harness can be adjusted to fit a variety of infants rear facing and toddlers in forward facing orientations. Typically available in convertible seats, forward facing only seats and some infant only seats.

**T-shield**

Secures two shoulder harness straps to a “T” shaped shield which is positioned in front of the torso and hips. Typically found in convertible and forward facing only seats.

**Tray-Shield**

Secures two shoulder harness straps to a broad padded tray positioned in front of the torso. The crotch strap may be separate or integral with the shield. Found on convertible and forward facing only seats.

**Shield**

(Typically shield-boosters) The over-body shield was designed for use in seating positions with lap belts only for children between 30-60 pounds. The shield is attached to a base which raises the child's sitting height and pre- 1996 models recommended use with the shield up to 60 pounds. Boosters with shields made after 1996 recommend an upper weight limit of 40 pounds. Most shield-boosters made after 1996 allow the 40 pound child to use the booster base with the shield removed, converting the seat to a belt-positioning booster. Found on forward facing only seats.

**CHILD RESTRAINT HARNESS RETAINER CLIP**

**Screen Name:** Retainer Clip

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CLIPDES*

**Element Attributes:**

- 0 Not designed with harness retainer clip (or No harness retainer clip available)
- 1 Designed with harness retainer clip (or Harness retainer clip available)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

A harness retainer clip is a plastic device/clip which is placed between the two shoulder harness straps, holding the two together for correct pre-crash positioning. The retainer clip should be threaded correctly and placed at armpit level to help keep the shoulder straps up-on the child's shoulders.

**CHILD RESTRAINT TETHER DESIGN**

**Screen Name:** Tether

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *TETHDES*

**Element Attributes:**

- 0 Not designed with tether (or No tether available)
- 1 Designed with tether (or Tether available)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks :**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

Effective September 1999, the majority of child seats come equipped with top tethers. The top tether system is part of LATCH (Lower Anchors and Tethers for Children) and vehicles manufactured after September 1999 come equipped with a tether anchor for attaching the top tether of the child seat.

**CHILD RESTRAINT LATCH DESIGN****Screen Name:** LATCH**SAS Data Set:** *CHILDSEAT***SAS Variable:** *LATCHDES***Element Attributes:**

- 0 Not designed with LATCH (or LATCH available)
- 1 Designed with LATCH (or LATCH not available)
- 9 Unknown

**Source:** Vehicle inspection**Remarks:**

This variable indicates how the seat is designed to be used. It does not indicate either how it was used, or whether it was used properly.

LATCH (Lower Anchors and Tethers for Children). All child seats manufactured after September 1, 2002 will have two lower attachments which connect to anchorage points between a vehicles' seat back and bottom cushion for the majority of vehicles manufactured after September 1, 2002. Child seats with corresponding attachments can be attached to these lower anchorages instead of being held by the vehicle seat belt. Child seats manufactured after September 1, 2002 will still have designated vehicle belt paths for proper orientation to accommodate older vehicles.

**CHILD RESTRAINT USAGE ORIENTATION**

**Screen Name:** Orientation

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *ORIENT*

**Element Attributes:**

- 1 Rear facing
- 2 Forward facing
- 3 Supine
- 8 Other (specify)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The actual orientation of the child seat at the time of impact must be determined and coded.

**Rear Facing**

At the time of the crash the child seat was rear facing/facing the rear of the vehicle

**Forward Facing**

At the time of the crash the child seat was facing forward/front of the vehicle

**Supine**

At the time of the crash the child seat was laying flat

**Other**

At the time of the crash the seat was facing other than the rear, supine or forward (e.g., sideways, on top of or underneath something )

**Unknown**

A child seat is present but the orientation at the time of the crash is unknown

**CHILD RESTRAINT HARNESS/SHIELD USE**

**Screen Name:** Harness/Shield

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *HARUSE*

**Element Attributes:**

- 0 Not designed with harness/shield
- 1 Harness/shield not used
- 2 Harness used - harness straps in top/highest slot
- 3 Harness used - harness straps in middle/bottom slot
- 4 Harness used - slots used unknown
- 5 Retrofitted with harness
- 6 Shield used
- 9 Unknown if harness/shield used

**Source:** Vehicle inspection

**Remarks:**

The actual child seat harness usage at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine the design of the seat, its respective harness design and use according to the weight/height of the child.

**CHILD RESTRAINT RETAINER CLIP USE**

**Screen Name:** Retainer Clip

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *CLIPUSE*

**Element Attributes:**

- 0 Not designed with harness retainer clip
- 1 Harness retainer clip not used
- 2 Harness retainer clip used – below armpit level
- 3 Harness retainer clip used at armpit level
- 4 Harness retainer clip used – above armpit level
- 5 Harness retainer clip used – unknown level
- 6 Retrofitted with harness retainer clip
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The actual child seat harness retainer clip use at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine if the respective child seat comes equipped with a harness retainer clip.

**CHILD RESTRAINT TETHER USE**

**Screen Name:** Tether

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *TETHUSE*

**Element Attributes:**

- 0 Not designed with tether
- 1 Tether not used
- 2 OEM Tether used
- 3 After market (retrofitted) tether used
- 9 Unknown if tether Used

**Source:** Vehicle inspection

**Remarks:**

Refer to Manufacturers' Instructions for Child Safety Seats and Child Seat listing for applicability of tether.

**CHILD SEAT LATCH USE**

**Screen Name:** LATCH

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *LATCHUSE*

**Element Attributes:**

- 0 Not designed with LATCH lower anchors
- 1 LATCH lower anchors – not used
- 2 LATCH lower anchors used
- 3 After market (retrofitted) LATCH lower anchors used
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

The actual child seat LATCH usage at the time of the crash must be determined and coded.

Refer to the Manufacturers' Instructions for Child Safety Seats and the Child Seat List to determine applicability of LATCH.

**BELT ROUTING/USE**

**Screen Name:** Belt Routing/Use

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *BELTROUT*

**Element Attributes:**

- 0 No belt routing
- 1 No belt used
- 2 Belt routed through belt positioning slots/channels
- 3 Belt routed through forward facing slots/channels
- 4 Belt routed through rear facing slots/channels
- 5 Belt routed unconventionally (specify)
- 9 Unknown belt path

**Source:** Vehicle inspection

**Remarks:****No belt used**

When no seat belt was used. No belt was used to either restrain the child or install the seat.

**Belt routed through belt positioning slots/channels**

The belt was routed through the belt positioning slots or channels built into the child restraint.

**Belt routed through forward facing slots/channels**

The belt was routed through the forward facing slots or channels built into the child restraint

**Belt routed through rear facing slots/channels**

The belt was routed through the rear facing slots or channels built into the child restraint

**Belt routed unconventionally (specify)**

The belt was routed unconventionally

**No belt routing**

The belt was not routed through any slots/channels in the seat (if they exist at all). The belt was used solely to restrain the child was sitting on/in the seat. This will be automatically filled in for Integrated child restraints

**Unknown belt path**

It is not known what path the belt took around the child/seat. If it is not known if a belt was used indicate that on the belt availability/use variables and choose unknown belt path for this variable.

**USE OF LOCKING CLIP ON VEHICLE BELT**

**Screen Name:** Locking Clip Use

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *LOCKCLIP*

**Element Attributes:**

- 0 None Present
- 1 Locking Clip Used on Lap and Shoulder Belt
- 2 Locking Clip Used on Lap Belt Only
- 3 Locking Clip Used on Shoulder Belt Only
- 8 Other (Specify)
- 9 Unknown

**Source:** Child Seat Inspection and Interview

**Remarks:**

When found in a vehicle, be sure to photograph. This variable is NOT ASSESSING the proper use of the locking clip, only in identifying on what belt it is found.

A **locking clip** is typically provided by the child seat manufacturer and found clipped/fastened to a new child seat when purchased. A **locking clip** is used to lock an emergency locking retractor (ELR) lap and shoulder combination belt with a sliding latch plate. Some belts are labeled indicating the need for the locking clip, and vehicles requiring a locking clip provide information about its use in the owner manual.

**Locking clips**

are used to shorten lap belts that have emergency locking retractors which do not switch or lock.

**None Present**

When there is no locking clip present on any seat belt.

**Locking Clip Used on Lap and Shoulder Belt**

When the lap and shoulder belts are threaded through the locking clip.

**Locking Clip Used on Lap Belt Only**

When the lap belt is threaded through the locking clip.

**Locking Clip Used on Shoulder Belt Only**

When the shoulder belt is threaded through the locking clip.

**Other (Specify)**

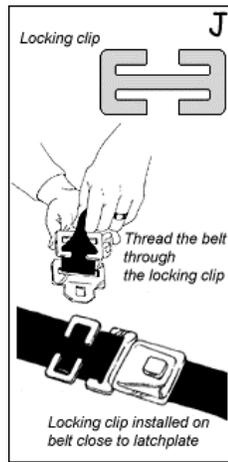
is used when the researcher determines a locking clip was used but not in a manner as stated above, (specify how the locking clip was used).

**Unknown**

is used when the researcher can not determine if a locking clip was used.



Locking clip on belt



Locking clip instructions



Locking clip on belt



Locking clip in use

## SEAT LOCATION FOR CHILD RESTRAINT

Page 1 of 2

Screen Name: Seat Location

SAS Data Set: CHILDSEAT

SAS Variable: SEATPOS

## Element Attributes:

Seat Number

## Front Seat

11 Left side  
 12 Middle  
 13 Right side

## Second Seat

21 Left side  
 22 Middle  
 23 Right side  
 24 Far right side

## Third Seat

31 Left side  
 32 Middle  
 33 Right side  
 34 Far right side

## Fourth Seat

41 Left side  
 42 Middle  
 43 Right side  
 44 Far right side

## Fifth Seat

51 Left side  
 52 Middle  
 53 Right side  
 54 Far right side

## Other or unknown seating

97 Unenclosed area  
 98 Other enclosed area  
 99 Unknown seat location

Source: Vehicle Inspection/interview

## Remarks:

See the variable **Occupant's Seat Position** for more detail on this variable.

All child seats shall be coded as to whether or not the child seat is occupied or belted into the vehicle seat and its specific location in the vehicle, *if known*. ***When the Occupant Form is completed you will be indicating the location of the seat based upon all the information in the case.*** Select seating locations are defined in the Seat tab.

There are occasions when a child is sitting in a child seat, but the child seat is not restrained by the vehicle belt system or the child in the child seat is sitting on another occupants lap; and there are times when a child seat is restrained by the vehicle belt system, yet is not in use by a child at the

time of a crash. Likewise there are occasions when a child seat is inside the vehicle not in use and not belted into the vehicle and is considered cargo, as a possible injury source, etc. Information will be collected on every child seat and its location (*if known*) at the time of a crash whether or not it is in use or restrained by the vehicle belt system at the time of the crash.

The majority of child seats involved in crashes do not remain with the vehicle where it can be visually inspected; however, a child seat's location inside the vehicle can also be determined by interview. Some information can be collected from interviews with the driver/child seat installer, e.g., child seat location, type of belt/LATCH used to secure child seat, etc.

**CHILD RESTRAINT PLACEMENT**

**Screen Name:** Placement

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *PLCMNT*

**Element Attributes:**

- 1 Seat
- 2 Floor
- 3 Lap of other occupant
- 4 Console
- 8 Other (specify)
- 9 Unknown

**Source:** Vehicle inspection

**Remarks:**

**Seat**

Child restraint sitting on vehicle seat.

**Floor**

Child restraint sitting on vehicle floor.

**Lap of Occupant**

Child restraint sitting on lap of other occupant.

**Console**

Child restraint sitting on front, middle or rear console.

**Other**

Other position of child restraint (specify).

**Unknown**

Position of child restraint is not known.

**CHILD POSITION IN CHILD RESTRAINT**

**Screen Name:** Child Position

**SAS Data Set:** *CHILDSEAT*

**SAS Variable:** *POSTN*

**Element Attributes:**

- 0 [Not occupied]
- 1 Upright
- 2 Reclined/lying back
- 3 Supine, facing upwards
- 4 Slumped forward
- 5 Slumped to the Side
- 6 Kneeling
- 8 Other (specify)
- 9 Unknown

**Source:** Interview

**Remarks:**

**Upright**

Child was sitting upright, facing forward.

**Reclined/Lying Back**

Child was reclined, between 90 and 45 degrees.

**Supine**

Child was laying flat, outstretched facing upwards

**Slumped Forward**

Child was leaning forward from the waist up and their back was not against the back of the child restraint or vehicle seat in the case of a belt-positioning booster.

**Slumped to the Side**

Child was leaning to the side from the waist up and their back was not against the back of the child restraint or vehicle seat in the case of a belt-positioning booster.

**Kneeling**

Child was resting on their knees while in the child restraint.

**Other**

Any other position of child (specify).

**Not occupied**

When it is know that the seat was not occupied during the crash.

**Unknown**

Unknown position of child in restraint.

MANUAL SEAT BELT

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Manual | Automatic

Belt | Components

**Vehicle Inspection**

Availability	<input type="text"/>	<input type="text"/>
Historical Use		<input type="text"/>
Used in this crash?	<input type="text"/>	<input type="text"/>
Position	<input type="text"/>	
Lap	<input type="text"/>	<input type="text"/>
Shoulder	<input type="text"/>	<input type="text"/>
Failure	<input type="text"/>	<input type="text"/>
Anchorage Adjustment	<input type="text"/>	<input type="text"/>
Source of Belt Use	<input type="text"/>	

Save Close

**MANUAL (ACTIVE) BELT SYSTEM AVAILABILITY**

**Screen Name:** Availability

**SAS Data Set:** OA

**SAS Variable:** MANAVAIL

**Element Attributes:**

- 0 None available
- 1 Belt removed/destroyed
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt available - type unknown
- 6 Shoulder belt (lap belt destroyed/removed)
- 7 Lap belt (shoulder belt destroyed/removed)
- 8 Other belt (specify)
- 9 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) or (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.

**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 an 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.

Manual (Active) Belt System Availability (cont'd)

Page 3 of 3

**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

**SAS Data Set:** SEATLOC

**SAS Variable:** ACTHIST

**Element Attributes:**

- 0 None used / not available / removed or destroyed
- 1 Inoperative (specify)
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt used — type unknown
- 8 Other belt used (specify)
- 12 Shoulder with child safety seat
- 13 Lap with child safety seat
- 14 Lap and shoulder with child safety seat
- 15 Belt used with child safety seat — type unknown
- 18 Other belt used with child safety seat (specify)
- 77 Vehicle not inspected
- 99 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.

**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.

**OCCUPANT FORM**  
**MANUAL (ACTIVE) BELT SYSTEM USED IN THIS CRASH?**

**SEAT BELT/MANUAL/BELT**

Page 1 of 3

**Screen Name:** Used in this crash?

**SAS Data Set:** *OA*

**SAS Variable:** *MANUSE*

**Element Attributes:**

- 0 None used not available / removed or destroyed
- 1 Inoperative (specify)
- 2 Shoulder belt
- 3 Lap belt
- 4 Lap and shoulder belt
- 5 Belt used — type unknown
- 8 Other belt used (specify)
- 12 Shoulder belt with child safety seat
- 13 Lap belt with child safety seat
- 14 Lap and shoulder belt with child safety seat
- 15 Belt with child safety seat — type unknown
- 18 Other belt with child safety seat (specify)
- 99 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.

**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.

**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 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.

**Lap and shoulder w/child safety seat**

is used when the vehicle's manual lap and 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.

**Belt with child safety seat — type unknown**

is used when the vehicle belt type is unknown, not the child safety seat type.

Manual (Active) Belt System Used in This Crash? (cont'd)

Page 3 of 3

**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.

**POSITION OF MANUAL BELT/LAP PORTION OF BELT**

Page 1 of 2

**Screen Name:** Lap**SAS Data Set:****SAS Variable:****Element Attributes:**

[Not equipped/not available/not used]

Manual lap belt/lap portion of belt snug and low across hips

Manual lap belt/lap portion of belt across abdomen

Manual lap belt/lap portion of belt low across hips with extra "slack room"

Manual lap belt/lap portion of belt across abdomen with extra "slack room"

Other position (specify)

Unknown lap belt position

**Source:** Interview and injuries**Remarks:**

If the manual lap belt is being used to install a child restraint than chose "Other position (specify)" and annotate. The routing of the manual lap belt/lap portion (if any) through the child restraint is indicated in the variable "Seat Belt Routing" on the Child Restraint Tab.

If one occupant is on another's lap then code the position of the lap belt/lap portion for the occupant that has contact with it. The other occupant will have a code of "Other position (specify)".

**Manual lap belt/lap portion of belt snug and low across hips**

the manual lap belt or lap portion of a 3 pt manual belt is snug and low across the hips so that it goes around the front of pelvis, with the webbing lying across the top of thighs

**Manual lap belt/lap portion of belt across abdomen**

the manual lap belt or lap portion of a 3 pt manual belt snug and is across the "belly" or abdomen

**Manual lap belt/lap portion of belt low across hips with extra "slack room"**

the manual lap belt or lap portion of a 3 pt manual belt is low across the hips so that it goes around the front of pelvis, with the webbing lying across the top of thighs and is not tight against the person, but has extra "slack room".

Position of manual belt/Lap portion of belt (cont'd)

Page 2 of 2

**Manual lap belt/lap portion of belt across abdomen with extra “slack room”**

the manual lap belt or lap portion of a 3 pt manual belt is across the “belly” or abdomen and is not tight against the person, but has extra “slack room”.

**Other use (specify)**

is used to document the use of the lap portion in a manner not identified in the above.

**Unknown manual lap belt/lap portion position**

is used if it cannot be determined the position of the manual belt/lap portion by the occupant at the time of the crash.

**POSITION OF MANUAL SHOULDER BELT/SHOULDER PORTION OF BELT**

**Screen Name:** Shoulder

**SAS Data Set:**

**SAS Variable:**

**Element Attributes:**

- [Not equipped/not available/not used]
- Manual shoulder belt/shoulder portion of belt snugly across the collarbone and over shoulder
- Manual shoulder belt/shoulder portion resting on neck
- Manual shoulder belt/shoulder portion on edge of shoulder
- Manual shoulder belt/shoulder portion under arm
- Manual shoulder belt/shoulder portion behind occupant's back or seat
- Manual shoulder belt/shoulder portion of belt across the collarbone and over shoulder with extra "slack room"
- Manual shoulder belt/shoulder portion resting on neck with extra "slack room"
- Manual shoulder belt/shoulder portion on edge of shoulder with extra "slack room"
- Manual shoulder belt/shoulder portion under arm with extra "slack room"
- Other position (specify)
- Unknown manual shoulder belt/shoulder portion belt position

**Source:** Interview and injures

**Remarks:**

If the manual shoulder belt is being used to install a child restraint than chose "Other position (specify)" and annotate. The routing of the manual lap belt/shoulder portion (if any) through the child restraint is indicated in the variable "Seat Belt Routing" on the Child Restraint Tab.

If one occupant is on another's lap then code the position of the shoulder belt/shoulder portion for the occupant that has contact with it. The other occupant will have a code of "Other position (specify)".

**Manual shoulder belt/shoulder portion of belt snugly across the collarbone and over shoulder**  
the manual shoulder belt or shoulder portion of a 3 pt manual belt fits snugly and is routed over the collarbone and over the shoulder

**Manual shoulder belt/shoulder portion resting on neck**  
the manual shoulder belt or shoulder portion of a 3 pt manual belt is routed such that it is rubbing against the neck.

**Manual shoulder belt/shoulder portion on edge of shoulder**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is worn on the edge of the shoulder

**Manual shoulder belt/shoulder portion under arm**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is placed under the arm.

**Manual shoulder belt/shoulder portion behind occupant's back or seat**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is placed behind the back of the occupant or behind the back of the seat

**Manual shoulder belt/shoulder portion of belt across the collarbone and over shoulder with extra "slack room"**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is routed over the collarbone and over the shoulder and is not tight against the person, but has extra "slack room".

**Manual shoulder belt/shoulder portion resting on neck with extra "slack room"**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is routed such that it is rubbing against the neck and is not tight against the person, but has extra "slack room".

**Manual shoulder belt/shoulder portion on edge of shoulder with extra "slack room"**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is worn on the edge of the shoulder and is not tight against the person, but has extra "slack room"

**Manual shoulder belt/shoulder portion under arm with extra "slack room"**

the manual shoulder belt or shoulder portion of a 3 pt manual belt is placed under the arm and is not tight against the person, but has extra "slack room".

**Other position (specify)**

is used to document the use of the shoulder portion in a manner not identified in the above.

**Unknown manual shoulder belt/shoulder portion belt position**

is used if it cannot be determined the position of the manual belt/shoulder portion by the occupant at the time of the crash.

**MANUAL (ACTIVE) BELT FAILURE MODES DURING CRASH**

**Screen Name:** Failure

**SAS Data Set:** OA

**SAS Variable:** MANFAIL

**Element Attributes:**

- 0 [None used / not available / removed or destroyed]
- 1 No manual belt failure(s)
- 2 Torn webbing (stretched webbing not included)
- 3 Broken buckle or latch plate
- 4 Upper anchorage separated
- 5 Other anchorage separated (specify)
- 6 Broken retractor
- 7 Combination of above (specify)
- 8 Other manual belt failure (specify)
- 9 Unknown

**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.

## MANUAL SHOULDER BELT UPPER ANCHORAGE ADJUSTMENT

Page 1 of 2

**Screen Name:** Anchorage Adjustment

**SAS Data Set:** OA

**SAS Variable:** MANANCH

**Element Attributes:**

0	[No manual shoulder belt]
1	None for manual shoulder belt
2	In full up position
3	In mid position
4	In full down position
5	Position unknown
9	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.

**SOURCE OF RESEARCHER'S DETERMINATION OF BELT USE**

**Screen Name:** Source of Belt Use

**SAS Data Set:** *OA*

**SAS Variable:** *MBELTSOU*

**Element Attributes:**

- 0 Not equipped/not available
- 1 Vehicle Inspection
- 2 Official Injury Data
- 3 Driver/occupant interview
- 8 Other (specify)
- 9 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**

**SEAT BELT/MANUAL/COMPONENTS**

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Manual | Automatic

Belt | Components

**Vehicle Inspection**

Pretensioner		
Latch Plate	<input type="text"/>	<input type="text"/>
Belt Retractor	<input type="text"/>	<input type="text"/>
Belt Positioning		
Presence	<input type="text"/>	<input type="text"/>
Use	<input type="text"/>	<input type="text"/>

Source of Belt Use

**Screen Name:** Pretensioner

**SAS Data Set:** OA

**SAS Variable:** ACTPRET

**Element Attributes:**

- 0 Not equipped
- 1 Pretensioner not actuated
- 2 Retractor type actuated
- 3 Buckle type actuated (Specify Measurement)
- 4 Buckle type actuated measurement unknown
- 5 Unknown if pretensioner actuated
- 7 Vehicle not inspected
- 9 Unknown if equipped

**Source:** Vehicle Inspection

**Remarks:**

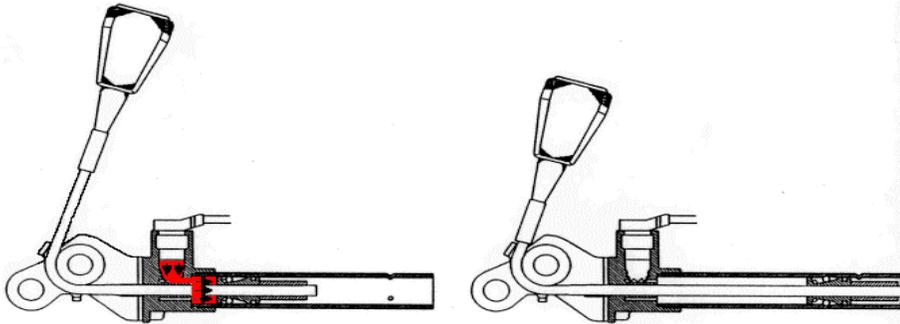
Can tighten the belt up to 15 cm.

When a collision occurs, a seat belt with a pretensioner detects the incident, or that the have been applied, and tightens the belt before the wearer is propelled forward. This holds the occupant more securely in the seat. Only vehicles with air bags will have pretensioners. They may be present in seating positions that do not have air bags ('80s Mercedes).

The seat belt pretensioners consist of a housing, an initiator, a canister of gas generating materials, a routing cable with a piston attached, and a piston tube. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, a microprocessor causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioners and shortens the seat belt pretensioner height, which removes all of the slack in the seat belts. The seat belt pretensioners will deploy immediately before the frontal inflator (air bag) modules deploy.

If a front air bag (instrument panel, steering wheel) deploys, the pretensioner will deploy. However, it is possible for the pretensioner to deploy without the air bag.

The diagram below shows a seat belt stalk mounted pretensioner.



**LATCH PLATE TYPE**

Page 1 of 2

**Screen Name:** Latch Plate**SAS Data Set:** *OA***SAS Variable:** *MANLPLAT***Element Attributes:**

0	Not used/not available
1	Sliding
2	Light weight locking/cinching
3	Locking
4	Switchable
5	Sewn On
9	Unknown Type

**Source:** Vehicle Inspection**Remarks:**

This variable is coded for all manual seat belts that are coded for any vehicle position.

**Sliding**

The webbing is threaded through a slot in the latch plate and there is no locking bar. The latch plate slides freely along the webbing, regardless of the angle. Allows the webbing to slip through unrestricted.

**Lightweight locking/cinching**

The same as locking but with more moving parts. As long as the plate is parallel with the webbing the latch plate is locked.

**Locking**

The webbing threads through a locking bar or an adjuster in the latch plate. Once it is tightened, the belt will not loosen until the plate is tilted and the belt is unbuckled.

**Switchable**

Switchable has a switch that locks the belt webbing by sliding a button.

**Sewn on**

If a sewn on latch plate is present, there will be a retractor for both the shoulder portion and the lap portion of the belt. Most likely the shoulder portion will be an ELR and the lap portion will be switchable.

**Unknown type**

Is used if the researcher is unable to determine the type of latch plate.

**OCCUPANT FORM**

**SEAT BELT/MANUAL/COMPONENTS**

Latch Plate Type cont'd

Page 2 of 2



Sliding



Sliding



Lightweight locking/cinching



Lightweight locking/cinching



Locking



Locking



Switchable



Switchable



Sewn on



Sewn on

**BELT RETRACTOR TYPE**

Page 1 of 2

**Screen Name:** Belt Retractor**SAS Data Set:** *OA***SAS Variable:** *MANBLRET***Element Attributes:**

- |   |                                      |
|---|--------------------------------------|
| 0 | None Present                         |
| 1 | Emergency Locking Retractor          |
| 2 | Automatic Locking Retractor          |
| 3 | Switchable Retractor in ELR Mode     |
| 4 | Switchable Retractor in ALR Mode     |
| 5 | Switchable Retractor in Unknown Mode |
| 9 | Unknown Type of Retractor            |

**Source:** Vehicle Inspection, interview**Remarks:**

This variable is coded for all manual seat belts that are coded for any vehicle position.

If a sewn on latch plate is present, there will most likely be a retractor for both the shoulder portion and the lap portion of the belt. Most likely the shoulder portion will be an ELR and the lap portion will be switchable from ELR to ALR. In this variable we are only interested in the retractor of the lap portion of the belt.

Retractors wind up the loose webbing of the unused 3-point safety belt, take up the slack, and provides slight tension on belts that are in use. They are usually located out of sight at an anchor point. Check the vehicle owner's manual and also look for labels on the belt webbing to determine the retractor type.

**NOTE** that some newer vehicles have a switchable retractor that can be manually adjusted from ELR to ALR. Most of them can be switched by pulling the webbing all the way out of the retractor to activate the ALR. In some models, the retractors switch from ELR to ALR with the push of a button. Most switchable retractors have a label on the belt with instructions on how to switch it. Enter the information for the position of the retractor.

**Automatic locking retractor (ALR)**

The ALR locks in place after being pulled out and allowed to retract about ½" The belt cannot be extended unless it is first fully rewound. It is generally uncomfortable for adults to wear.

**Emergency locking retractor (ELR)**

The ELR allows the belt to be freely extended or rewound. It locks only when the vehicle slows, changes direction, or stops suddenly. Since the retractor rarely locks during normal driving, it provides more freedom and comfort to an adult driver than an ALR. Some ELRs are vehicle sensitive and lock in direct response to the deceleration of the vehicle. Other ELRs are webbing

or belt-sensitive and temporarily lock in response to a quick jerk or pull on the belt. Some ELRs are both vehicle and belt sensitive. Some ELRs have a window shade tension reliever system designed to make 3-point belts more comfortable by allowing "slack" in the shoulder belt. Occupants using these belts "tug" on the shoulder belt to tighten it after they lean forward.

**Unknown**

is used when the type of retractor cannot be determined

**SEAT BELT POSITIONING DEVICE PRESENCE**

Page 1 of 2

**Screen Name:** Positioning Device Presence**SAS Data Set:** *OA***SAS Variable:** *POSPRES***Element Attributes:**

- 0 None present
- 1 Buckle Buddy – Shoulder Belt Adjuster
- 2 Sta-n-Place – Shoulder Belt Adjuster
- 3 Belt-A-Way – Shoulder Belt Adjuster
- 4 Shoulder Strap Adjuster – Shoulder Belt Adjuster
- 5 Child Protector – Lap and Shoulder Belt Adjuster
- 6 SafeFit – Shoulder Belt Adjuster
- 7 SafeFit Supreme - Shoulder Belt Adjuster
- 8 Seat Belt Adjuster – Shoulder Belt Adjuster
- 9 Klunk-Klip – Shoulder Belt Adjuster
- 10 Child Safer – Shoulder Belt Adjuster
- 11 Comfort Ride – Shoulder Belt Adjuster
- 12 Belt Buddy
- 97 OEM device
- 98 Other device (specify)
- 99 Unknown if device present

**Source:** Vehicle Inspection and/or interview. Refer to Make of Positioning Device list**Remarks:**

This variable is coded for any position containing a shoulder belt.

Aftermarket seat belt positioning devices are typically manufactured for use by small stature adults and children to adjust lap and shoulder belt fit and comfort.

These products are not considered “safety devices” and are not tested or regulated by NHTSA.

Examples of seat belt positioning devices:



GM rear seat shoulder belt comfort guide



Belt buddy



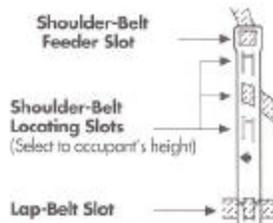
Buckle buddy



Shoulder strap adjusters



Shoulder strap adjusters



Child safer



Child safer



Child safer

**SEAT BELT POSITIONING DEVICE USE**

**Screen Name:** Position Device Use

**SAS Data Set:** *OA*

**SAS Variable:** *POSUSE*

**Element Attributes:**

- 0 [None present]
- 1 Device not used
- 2 Device used
- 9 Unknown if device used

**Source:** Vehicle Inspection, Interview

**Remarks:**

SEAT BELT/AUTOMATIC

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Manual | Automatic

Avail / Function	<input type="text"/>	<b>Vehicle Inspection</b>	<input type="text"/>
Used in this crash?	<input type="text"/>		<input type="text"/>
Motorized	<input type="text"/>		<input type="text"/>
Position	<input type="text"/>		
Lap	<input type="text"/>		
Shoulder	<input type="text"/>		
Failure	<input type="text"/>		<input type="text"/>
Source of Belt Use	<input type="text"/>		

**AUTOMATIC (PASSIVE) BELT SYSTEM AVAILABILITY/FUNCTION**

**Screen Name:** Availability / Function

**SAS Data Set:** OA

**SAS Variable:** ABELTAVL

**Element Attributes:**

- 0 Not equipped/not available
- 1 2 point automatic belts
- 2 3 point automatic belts
- 3 Automatic type unknown
- 4 Automatic belts destroyed or rendered inoperative
- 9 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.

**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.

### **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 the 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 an uninspected passenger vehicle(s) when it cannot be determined whether or not this occupant's seating position was equipped with an automatic belt system.

**AUTOMATIC (PASSIVE) BELT SYSTEM USE**

Page 1 of 2

**Screen Name:** Used in this crash?**SAS Data Set:** OA**SAS Variable:** ABELTUSE**Element Attributes:**

- 0 Not equipped/not available/destroyed or rendered inoperative
- 1 Automatic belt in use
- 2 Not in use (manually disconnected, motorized track inoperative) (specify)
- 3 Automatic belt use unknown
- 4 Automatic belt used with child restraint
- 9 Unknown if equipped/available

**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).

**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 used with child restraint**

is used when this automatic belt was used to anchor a child restraint in the seat at the time of the crash. The correctness of the use is not assessed on this variable.

**Automatic belt use unknown**

is used when the researcher is unable to determine if the automatic belt was in use.

**AUTOMATIC (PASSIVE) BELT SYSTEM TYPE**

**Screen Name:** Motorized

**SAS Data Set:** *OA*

**SAS Variable:** *ABELTYPE*

**Element Attributes:**

- 0 [Not equipped / not available / destroyed or rendered inoperative]
- 1 Non-motorized system
- 2 Motorized system
- 9 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.

**POSITION OF AUTOMATIC LAP BELT/LAP PORTION OF BELT**

Page 1 of 2

Screen Name: Position/Lap

*SAS Data Set:**SAS Variable:***Element Attributes:**

[Not equipped/not available/not used]

Lap portion of automatic belt snug and low across hips

Lap portion of automatic belt across abdomen

Lap portion of automatic belt used to install child restraint

Lap portion of automatic belt low across hips with extra "slack room"

Lap portion of automatic belt across abdomen with extra "slack room"

Other position (specify)

Unknown position of lap portion of automatic belt

**Source:** Interview and injures**Remarks:**

If the lap portion of an automatic 3 pt belt is being used with a child restraint then indicate how the lap portion is positioned on the child. If it is being used to install a child restraint than chose "Lap portion of automatic belt used to install child restraint". The routing of the lap portion of the automatic 3 pt belt (if any) through the child restraint is indicated in the variable "Seat Belt Routing" on the Child Restraint Tab.

If one occupant is on another's lap then code the position of the lap portion of the 3 pt automatic belt for the occupant that has contact with it. The other occupant will have a code of Other position (specify)".

**Lap portion of automatic belt snug and low across hips**

The lap portion of a 3 pt automatic belt is snug and low across the hips so that it goes around the front of pelvis, with the webbing lying across the top of thighs.

**Lap portion of automatic belt on abdomen**

The lap portion of a 3 pt automatic belt is across the "belly" or abdomen.

**Lap portion of automatic belt used to install child restraint**

The lap portion of a 3 pt automatic belt is being used to install a child restraint. The lap portion of a 3 pt automatic belt does not go across the child.

Position of automatic lap belt/Lap portion of belt (cont'd)

Page 2 of 2

**Lap portion of automatic belt low across hips with extra “slack room”**

The lap portion of a 3 pt automatic belt is low across the hips so that it goes around the front of pelvis, with the webbing lying across the top of thighs and is not tight against the person, but has extra “slack room”.

**Lap portion of automatic belt across abdomen with extra “slack room”**

The lap portion of a 3 pt automatic belt is across the “belly” or abdomen and is not tight against the person, but has extra “slack room”.

**Other use (specify)**

is used if the automatic lap belt is in any position other than what is described above. The researcher must specify how the belt was used.

**Unknown position of lap portion of automatic belt**

is used if the researcher is unable to determine the position of the automatic lap belt.

**POSITION OF AUTOMATIC SHOULDER BELT/SHOULDER PORTION OF BELT**

Page 1 of 2

**Screen Name:** Position/Shoulder**SAS Data Set:****SAS Variable:****Element Attributes:**

[Not equipped/not available/not used]

Automatic shoulder belt/shoulder portion of belt snugly across the collarbone and over shoulder

Automatic shoulder belt/shoulder portion resting on neck

Automatic shoulder belt/shoulder portion on edge of shoulder

Automatic shoulder belt/shoulder portion under arm

Automatic shoulder belt/shoulder portion behind occupant's back or seat

Automatic shoulder belt/shoulder portion used to install child restraint

Automatic shoulder belt/shoulder portion of belt across the collarbone and over shoulder with extra "slack room"

Automatic shoulder belt/shoulder portion resting on neck with extra "slack room"

Automatic shoulder belt/shoulder portion on edge of shoulder with extra "slack room"

Automatic shoulder belt/shoulder portion under arm with extra "slack room"

Other position (specify)

Unknown automatic shoulder belt/shoulder portion belt position

**Source:** Interview and injuries**Remarks:**

If the shoulder portion of a 3 pt automatic belt is being used with a child restraint then indicate how the shoulder portion is positioned on the child. The routing of the shoulder portion (if any) through the child restraint is indicated in the variable "Seat Belt Routing" on the Child Restraint Tab.

If one occupant is on another's lap then code the position of the shoulder portion for the occupant that has contact with it. The other occupant will have a code of "Other position (specify)".

**Automatic shoulder belt/shoulder portion snugly across the collarbone and over the shoulder**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt fits snugly and is routed over the collarbone and over the shoulder.

Position of automatic shoulder belt/shoulder portion of belt (cont'd)

Page 2 of 2

**Automatic shoulder belt/shoulder portion resting on neck**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is routed such that it is rubbing against the neck.

**Automatic shoulder belt/shoulder portion on edge of shoulder**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is worn on the edge of the shoulder.

**Automatic shoulder belt/shoulder portion under arm**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is placed under the arm.

**Automatic shoulder belt/shoulder portion behind occupant's back or seat**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is placed behind the back of the occupant or behind the back of the seat.

**Automatic shoulder belt/shoulder portion used to install child restraint**

The shoulder portion of a 3 pt automatic belt is being used to install a child restraint. The shoulder portion of a 3 pt automatic belt does not go across the child.

**Automatic shoulder belt/shoulder portion resting on neck with extra "slack room"**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is routed such that it is rubbing against the neck and is not tight against the person, but has extra "slack room".

**Automatic shoulder belt/shoulder portion on edge of shoulder with extra "slack room"**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is worn on the edge of the shoulder and is not tight against the person, but has extra "slack room".

**Automatic shoulder belt/shoulder portion under arm with extra "slack room"**

The automatic shoulder belt or shoulder portion of a 3 pt automatic belt is placed under the arm and is not tight against the person, but has extra "slack room".

**Other use (specify)**

is used if the automatic shoulder belt is in any position other than what is described above. The researcher must specify how the belt was used.

**Unknown position of automatic shoulder belt/shoulder portion**

is used if the researcher is unable to determine the position of the automatic shoulder belt.

**AUTOMATIC (PASSIVE) BELT FAILURE MODES DURING CRASH**

**Screen Name:** Failure

**SAS Data Set:** OA

**SAS Variable:** ABLTFAIL

**Element Attributes:**

- 0 [Not equipped / not available / destroyed or rendered inoperative]
- 1 No automatic belt failure(s)
- 2 Torn webbing (stretched webbing not included)
- 3 Broken buckle or latchplate
- 4 Upper anchorage separated
- 5 Other anchorage separated (specify)
- 6 Broken retractor
- 7 Combination of above (specify)
- 8 Other automatic belt failure (specify)
- 9 Unknown

**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.

**SOURCE OF RESEARCHER'S DETERMINATION OF AUTOMATIC BELT USE**

**Screen Name:** Source of Belt Use

**SAS Data Set:** *OA*

**SAS Variable:** *ABELTSOU*

**Element Attributes:**

- 0 Not equipped/available/destroyed/rendered inoperative
- 1 Vehicle Inspection
- 2 Official Injury Data
- 3 Driver/occupant interview
- 8 Other (specify)
- 9 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.

INJURY/PSU

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

PSU | Zone

PAR Severity

Mortality

Treatment

Initial Facility

Hospital Stay  days

Work Days Lost  days

**POLICE INJURY SEVERITY (POLICE RATING)**

Page 1 of 6

**Screen Name:** PAR Severity**SAS Data Set:** OA**SAS Variable:** INJSEV**Element Attributes:**

0	O — No injury
1	C — Possible injury
2	B — Nonincapacitating injury
3	A — Incapacitating injury
4	K — Killed
5	U — Injury, severity unknown
6	Died prior to crash
9	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".

**OCCUPANT FORM****INJURY/PSU**

Police Injury Severity (Police Rating) (cont'd)

Page 2 of 6

Not all states use the KABCOU scheme. Listed below, by state, are alternative schemes; a mapping to the NASS scheme is provided.

State	PAR Code/Definition			NASS Scheme/Code
<b>Alabama</b>	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
<b>Arizona</b>	1	=	No injury	O
	2	=	Possible injury	C
	3	=	Non-incapacitating injury	B
	4	=	Incapacitating injury	A
	5	=	Fatal	K
	6	=	Unknown	U
<b>California</b>	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
<b>Colorado*</b>	5	=	Fatal	K
	4	=	Evident - incapacitating	A
	3	=	Evident - non-incapacitating	B
	2	=	Possible injury	C
	1	=	No injury	O
<ul style="list-style-type: none"> <li>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".</li> </ul>				
<b>Florida</b>	1	=	No injury	O
	2	=	Possible injury	C
	3	=	Non-incapacitating injury	B
	4	=	Incapacitating injury	A
	5	=	Fatal (IN 30 Days) injury	K
	6	=	Non-Traffic fatality	U
	=	No set unknown code	?? U ??	

**OCCUPANT FORM**

**INJURY/PSU**

Police Injury Severity (Police Rating) (cont'd)

Page 3 of 6

NASS

State	PAR Code/Definition			Scheme/Code
Indiana	Nature of Most Severe Injury {21}	Location of Most Severe Injury {22}	Victim's Injury Status {23}	
	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

**OCCUPANT FORM**

**INJURY/PSU**

Police Injury Severity (Police Rating) (cont'd)

**NASS**

State	PAR Code/Definition			Scheme/Code
<b>Maryland</b>	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	
<b>Nebraska</b>	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

<b>New Jersey</b>	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

**OCCUPANT FORM****INJURY/PSU**

Police Injury Severity (Police Rating) (cont'd)

Page 5 of 6

**NASS**

State	PAR Code/Definition			Scheme/Code
New York	Location of Injury {14}	Type of Injury {15}	Victim's Status {16}	
	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

**OCCUPANT FORM**

**INJURY / PSU**

Police Injury Severity (Police Rating) (cont'd)

**NASS**

**Scheme/Code**

<b>State</b>	<b>PAR Code/Definition</b>			<b>Scheme/Code</b>
<b>Pennsylvania</b>	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
<b>Tennessee</b>	4	=	Fatal Injury	K
	3	=	Incapacitating injury	A
	2	=	Non-incapacitating injury	B
	1	=	Possible injury	C
	0	=	No injury	0
<b>Washington</b>	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

**MORTALITY**

**Screen Name:** Mortality

**SAS Data Set:** *OA*

**SAS Variable:** *MORTLTY*

**Element Attributes:**

- 0 Not Fatal
- 1 Fatal
- 2 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.

## TREATMENT

Page 1 of 2

Screen Name: Treatment

SAS Data Set: OA

SAS Variable: TRETMENT

## Element Attributes:

- 0 No treatment
- 1 Dead on Arrival (DOA) at hospital
- 2 Dead Prior To Admission
- 3 Hospitalized
- 4 Transported and released
- 5 Treatment at scene - non-transported
- 6 Treatment later
- 7 Transported to a medical facility - unknown if treated
- 8 Treatment - other (specify)
- 9 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.

**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.

## TYPE OF MEDICAL FACILITY (FOR INITIAL TREATMENT)

Page 1 of 2

**Screen Name:** Initial Facility**SAS Data Set:** OA**SAS Variable:** MEDFACIL**Element Attributes:**

- 0 Not treated at a medical facility
- 1 Trauma center
- 2 Hospital
- 3 Medical clinic
- 4 Physician's office
- 5 Treatment later at medical facility
- 8 Other (specify)
- 9 Unknown

**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.**

**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.

**HOSPITAL STAY**

Page 1 of 2

**Screen Name:** Hospital Stay**SAS Data Set:** *OA***SAS Variable:** *HOSPSTAY***Element Attributes:**

0	Not hospitalized Enter the number of days (up through 60)
61	61 days or more
99	Unknown

**Source:** Researcher determined — inputs include interviewee and medical reports.**Remarks:**

Official sources (if they exist) take precedence over interview data.

**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.

**WORKING DAYS LOST**

Page 1 of 2

**Screen Name:** Work Days Lost**SAS Data Set:** OA**SAS Variable:** *WORKDAYS***Element Attributes:**

0	No working days lost Enter the number of days (up through 60)
61	61 days or more
62	Fatally injured
97	Not working prior
99	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 (1/2) day or greater up to a whole day. Less than one-half day is excluded (rounded down).

Working Days Lost (cont'd)

Page 2 of 2

- 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.

**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.

INJURY-ZONE

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

PSU | Zone

Death - Date  Time

Time to Death  hrs. (NASS - Valid only within 30 days)

Num Injuries

GCS

Occupant Given Blood

ABG(HCO3)

Medically Reported Cause Of Death [Ctrl I = Insert Cause of Death](#)

Order	Injury
▶	

Save Close

**DEATH DATE**

**Screen Name:** Death - Date

**SAS Data Set:** N/A

**SAS Variable:** N/A

**Element Attributes:**

Enter Date of Death

**Source:** Zone Center determined from police report, hospital/medical records, autopsy report, or other official records for actual date of death for fatally injured occupants.

**Remarks:**

Enter the date that the occupant died.

**DEATH TIME**

**Screen Name:** Time

**SAS Data Set:** N/A

**SAS Variable:** N/A

**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.

**DEATH TIME**

**Screen Name:** Time to Death

**SAS Data Set:** *OA*

**SAS Variable:** *DEATH*

**Element Attributes:**

[0	Not Fatal]
[1-24	Hours to death]
[31-60	1 day to 30 days]
96	Fatal, ruled disease
99	Unknown

**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.

**Range:** 0, 1-24, 31-60, 96, 99

**Remarks:**

Enter date and time of death. 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.

**NUMBER OF INJURIES FOR THIS OCCUPANT**

**Screen Name:** Num Injuries

**SAS Data Set:** OA

**SAS Variable:** INJNUM

**Element Attributes:**

0 [No injuries]  
[The actual number of injuries recorded for this occupant will be rolled up]  
97 [Injured, severity unknown]  
99 [Unknown if injured]

**Source:** Zone Center determined — inputs include official medical records and interviewee data from the PSU and PAR (see limitations below).

**Range:** 0,1,95,97,99

**Remarks:**

The system rolls the number of injuries coded in the NASSINJURY program to the number of injuries variable.

No injuries are recorded by the system when no injuries have been coded in the NASSINJURY program.

**GLASGOW COMA SCALE (GCS) SCORE (AT MEDICAL FACILITY)**

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Screen Name: GCS

SAS Data Set: OA

SAS Variable: GLASGOW

**Element Attributes:**

0	Not injured
1	Injured — not treated at medical facility
2	No GCS Score at medical facility
3-15	Enter the actual value of the initial GCS Score recorded at medical facility
97	Injured, details Unknown
99	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 neurological 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:

- AxOx3 (alert and oriented times three)
- neurologically intact, normal, etc., or
- 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.

**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.

**Unknown if injured**

is used when the PAR injury severity is "C-injury" and there is no interview and it is unknown if the person received medical treatment.

**WAS THE OCCUPANT GIVEN BLOOD?**

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**Screen Name:** Occupant Given Blood?**SAS Data Set:** *OA***SAS Variable:** *BLOOD***Element Attributes:**

0	No — blood not given
1	1 unit given
2	2 units given
3	3 units given
4	4 units given
5	5 units given
6	6 units given
7	7 units given
8	8 units given
9	9 units given
10	10 or more units given
97	Blood given, # units unknown
99	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.

Was the Occupant Given Blood? (cont'd)

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**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:

- it is known that the occupant was injured and not given blood; or
- an occupant is transported and released *and* not subsequently hospitalized independent of whether the occupant's records are acquired.

**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:

- injured and treated at a medical facility but it cannot be determined if blood was given.
- hospitalized *and* the occupant's records are inconclusive regarding whether blood was given;
- 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
- hospitalized *or* taken to surgery *and* the medical records are pending.

**ARTERIAL BLOOD GASES -- ABG (HCO<sub>3</sub>)**

**Screen Name:** ABG (HCO<sub>3</sub>)

**SAS Data Set:** OA

**SAS Variable:** BICARB

**Element Attributes:**

- 0 Not injured
- 1 Injured, ABGs not measured or reported
- 2-50 ABG=2, 3, 4, , , . . . . , 50
- 96 ABGs reported, HCO<sub>3</sub> unknown
- 97 Injured, details unknown
- 99 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 <sub>2</sub>	90 to 95 mm Hg	Decreased	Altered	Normal or increased	Normal or decreased
PCO <sub>2</sub>	34 to 46 mm Hg	Increased	Decreased	Decreased	Increased
HCO <sub>3</sub>	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<sup>+</sup>) 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<sup>+</sup> concentration expressed in molarity pH 7 is neutral; above it alkalinity increases and below it acidity increases.

**PO<sub>2</sub>, pO<sub>2</sub>, Po<sub>2</sub>** oxygen partial pressure (tension).

**PCO<sub>2</sub>, pCO<sub>2</sub>, Pco<sub>2</sub>** carbon dioxide partial pressure or tension.

**HCO<sub>3</sub>** 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<sub>3</sub><sup>-</sup> 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.

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<sub>2</sub> = 25; PO<sub>2</sub> = 171 -- at 100 percent saturation

In this example, the measure desired is not reported; use ABGs reported, HCO<sub>3</sub> unknown. The measure of interest is the HCO<sub>3</sub> (also referred to as the **bicarbonate**). Researchers must look carefully at their reported ABGs to insure that the desired measure is being obtained. The closeness in range between the normal values of HCO<sub>3</sub> and PCO<sub>2</sub>, makes mistaking them easy. In general, when ABGs are reported as a set of three values, consider them to be the pH, PCO<sub>2</sub>, and PO<sub>2</sub>.

#### **Actual Values**

are used to report the measured HCO<sub>3</sub> (bicarbonate) value obtained for this occupant. If multiple ABG HCO<sub>3</sub> 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<sub>3</sub> unknown**

is used when ABG value(s) are reported in this occupant's medical records but the HCO<sub>3</sub> measure is unknown.

**1<sup>ST</sup>, 2<sup>ND</sup>, 3<sup>RD</sup>, 4<sup>TH</sup>, 5<sup>TH</sup> MEDICALLY REPORTED CAUSE OF DEATH**

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**Screen Name:** Medically Reported Cause of Death**SAS Data Set:** OA**SAS Variable:** DCAUSE1, DCAUSE2, DCAUSE3, DCAUSE4, DCAUSE5**Element Attributes:**

0	Not fatal Select the injuries which have been identified that reportedly contributed to this occupant's death
96	Mode of death given but specific injuries are not linked to cause of death (specify)
97	Other result (includes fatal ruled disease) (specify)
99	Unknown

**Source:** Zone Center determined from official records**Range:** 96,97,99**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 1<sup>st</sup> cause of death, and/or 2nd, and/or 3<sup>rd</sup> 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:

- 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.

- Within each AIS level, determine the contribution the specific injury had on the occupant's chance of survival.

**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**.

INJURIES LIST

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Injuries | Vital Signs | Mannequins

List | Detail

Num	AIS Code	Rank	Medical Record Type	Aspects	Injury Source	Confidence	Direction	Direct Intrusion
-----	----------	------	---------------------	---------	---------------	------------	-----------	------------------

Max AIS

Save Close

INJURIES DETAIL

Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Injuries | Vital Signs | Mannequins

List | Detail

NASS Code

Description

Aspect

Source

Area

Element

Confidence Level

Direct Intrusion

Indirect Intrusion

Air Bag Related

Direct/Indirect Injury

Rank

Save Close

**INJURY NUMBER**

**Screen Name:** N/A

**SAS Data Set:** *OI*

**SAS Variable:** *INJNO*

**Element Attributes:**

Sequential number assigned by system to each coded injury.

**Source:** EDS

**Remarks:**

**AIS CODE**

**Screen Name:** NASS Code

**SAS Data Set:** *OI*

**SAS Variable:** *AISCODE*

**Element Attributes:**  
7 digit numeric field describing injury

**Source:**

**Remarks:**

**INJURY RANK**

**Screen Name:** Rank

**SAS Data Set:** *OI*

**SAS Variable:** *RANK*

**Element Attributes:**

Rank of injury from highest to lowest as assigned by zone center

**Source:**

**Remarks:**

**MEDICAL RECORD TYPE**

**Screen Name:** Medical Record Type

**SAS Data Set:** *OI*

**SAS Variable:** *SOUDAT*

**Element Attributes:**

Enter the source of the injury information

- 1 Autopsy
- 2 Post ER medical report
- 3 Admission records
- 4 Discharge summary
- 5 Operative report
- 6 Radiographic
- 7 History/physical examination
- 8 ER records
- 9 Private physician
- 10 Lay coroner
- 11 EMS record
- 12 Interviewee
- 13 Police report
- 14 Other (specify)

**Source:** Element chosen

**Remarks:**

**Autopsy**

excludes records from lay, nonmedical personnel; they must be the result of an autopsy by a physician or other similarly qualified life scientist. Injuries from a non-invasive exam should not be grouped with those from a thorough autopsy report.

**Private physician**

refers to any physician (in private practice) who saw the injured person and who has records of that treatment (*i.e.*, other than hospital or autopsy records). Also included in this code are non-invasive (external) examinations conducted by a private physician or similarly qualified life scientist on a deceased victim and documented as other than a hospital record (*e.g.*, coroner's report).

**Lay coroner report**

is used if the injury data is contained in a report where a non-invasive examination of the deceased was performed a non-physician, or lay coroner.

**EMS record**

refers to a person certified by the state as trained in emergency medical service techniques. This code should not be used for ambulance attendants, police, or other personnel not trained in E.M.S. techniques.

**Interviewee**

refers to the person who was interviewed to get the information on this form (*not* necessarily the person described on this form). The interviewee is defined in a log variable.

**Other source**

is used when data are obtained from an unofficial source different from those explicitly listed above (*e.g.*, chiropractors).

**Police report**

can be used, but only when *no* other source of injury information is available.

**ASPECT****Screen Name:** N/A**SAS Data Set:** *OI***SAS Variable:** *ASPECT90***Element Attributes:**

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

**Source:** SOUDAT variable**Remarks:**

The 2000 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its aspect value and record it on the form.

**INJURY SOURCE**

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Screen Name: N/A

SAS Data Set: OI

SAS Variable: INJSOU

**Element Attributes:****Element Values:****FRONT**

- 1 Windshield
- 2 Mirror
- 3 Sunvisor
- 4 Steering wheel rim
- 5 Steering wheel hub/spoke
- 6 Steering wheel combination of codes 004 and 005)
- 7 Steering column, transmission selector lever, other attachment
- 8 Cellular telephone or CB radio
- 9 Add on equipment *e.g.*, tape deck, air conditioner)
- 10 Left instrument panel and below
- 11 Center instrument panel and below
- 12 Right instrument panel and below
- 13 Glove compartment door
- 14 Knee bolster
- 15 Windshield including one or more of the following: front header, A A1/A2)-pillar, instrument panel, mirror, or steering assembly driver side only)
- 16 Windshield including one or more of the following: front header, A A1/A2)-pillar, instrument panel, or mirror (passenger side only)
- 17 Windshield reinforced by exterior object (specify)
- 19 Other front object (specify):
- 20 Sunvisor reinforced by exterior object (specify)

**LEFT SIDE**

- 51 Left side interior surface, excluding hardware or armrests
- 52 Left side hardware or armrest
- 53 Left A (A1/A2)-pillar
- 54 Left B-pillar
- 55 Other left pillar (specify):
- 56 Left side window glass
- 57 Left side window frame
- 58 Left side window sill
- 59 Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
- 60 Other left side object (specify):

**RIGHT SIDE**

- 101 Right side interior surface, excluding hardware or armrests
- 102 Right side hardware or armrest
- 103 Right A (A1/A2)-pillar
- 104 Right B-pillar
- 105 Other right pillar (specify):
- 106 Right side window glass
- 107 Right side window frame
- 108 Right side window sill
- 109 Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
- 110 Other right side object (specify):

**INTERIOR**

- 151 Seat, back support
- 152 Belt restraint webbing/buckle
- 153 Belt restraint B-pillar or door frame attachment point
- 154 Other restraint system component (specify):
- 155 Head restraint system
- 160 Other occupants (specify):
- 161 Interior loose objects (specify)
- 162 Child safety seat (specify):
- 163 Other interior object (specify):
- 164 Center console first row
- 165 Center console second row
- 166 Center console other row
- 167 Fold down armrest first row
- 168 Fold down armrest second row
- 169 Fold down armrest other row
- 570 Same occupant contact (ex. knee)
- 572 Seat latch points for child restraints
- 573 Grab handles
- 574 Engine shroud/cover
- 575 Seatback trays

**ROOF**

- 201 Front header
- 202 Rear header
- 203 Roof left side rail
- 204 Roof right side rail
- 205 Roof or convertible top
- 206 Roof map light/console
- 207 Sunroof/components'
- 208 Roll bar

**FLOOR**

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

**REAR**

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

**AIR BAG**

- 320 Air bag
- 321 Air bag and eyewear
- 322 Air bag and jewelry
- 323 Air bag and object held
- 324 Air bag and object in mouth
- 325 Air bag compartment cover
- 326 Air bag compartment cover and eyewear
- 327 Air bag compartment cover and jewelry
- 328 Air bag compartment cover and object held
- 329 Air bag compartment cover and object in mouth

**ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT**

- 401 Hand controls for braking/acceleration
- 402 Steering control devices (attached to OEM steering wheel)
- 403 Steering knob attached to steering wheel
- 405 Replacement steering wheel (*i.e.*, reduced diameter)
- 406 Joy stick steering controls
- 407 Wheelchair tie-downs
- 408 Modification to seat belts,(specify):
- 409 Additional or relocated switches, (specify):
- 410 Raised roof
- 411 Wall mounted head rest (used behind wheel chair)
- 412 Other adaptive device (specify):

**EXTERIOR of OCCUPANT'S VEHICLE**

- 451 Hood
- 452 Outside hardware (*e.g.*, outside mirror, antenna)
- 453 Other exterior surface or tires (specify):
- 454 Unknown exterior objects

**EXTERIOR OF OTHER MOTOR VEHICLE**

- 501 Front bumper
- 502 Hood edge
- 503 Other front of vehicle (specify):
- 504 Hood
- 505 Hood ornament
- 506 Windshield, roof rail, A-pillar
- 507 Side surface
- 508 Side mirrors
- 509 Other side protrusions (specify):
- 510 Rear surface
- 511 Undercarriage
- 512 Tires and wheels
- 513 Other exterior of other motor vehicle (specify):
- 514 Unknown exterior of other motor vehicle

**OTHER VEHICLE OR OBJECT**

- 551 Ground
- 598 Other vehicle or object (specify):
- 599 Unknown vehicle or object

Injury Source (cont'd)

**NONCONTACT INJURY**

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

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**CONFIDENCE**

**Screen Name:** Confidence Level

**SAS Data Set:** *OI*

**SAS Variable:** *SOUCON*

**Element Attributes:**

1	Certain
2	Probable
3	Possible
9	Unknown

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

The intent of this variable is to give analysts an assessment of the injury coder's confidence in the injury source coded for a specific injury.

**Certain**

if there is no reasonable doubt in the mind of the injury coder, based on occupant location, crash dynamics, contact points, and injury mechanism.

**Probable**

in those situations where there is not a certainty based on the factors noted above for code "1" (Certain).

**Possible**

if there is no supporting physical evidence but all factors point to an area of the vehicle or an object as the injury source.

**Unknown**

if the injury source is **Injured, unknown source**.

**NASS CODE**

**Screen Name:** NASS Code

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

**Source:** Zone Center determined using the 2000 Injury Coding Manual.

**Remarks:**

NASSINJURY code entered in NASSINJURY program is based on AIS9-(update 98). A unique six digit numeric code including the AIS severity score for each injury.

**INJURY DESCRIPTION**

**Screen Name:** Description

**SAS Data Set:** *OI*

**SAS Variable:** *AISCODE*

**Element Attributes:**

Standardized word description of injury

**Source:** Zone Center determined--inputs include standardized injury description, interviewee, medical records, and PAR data.

**Remarks:**

**ASPECT**

**Screen Name:** Aspect

**SAS Data Set:** OI

**SAS Variable:** ASPECT90

**Element Attributes:**

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

**Source:** SOUDAT variable

**Remarks:**

The 2000 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its aspect value and record it on the form.

**SOURCE/AREA**

**Screen Name:**           Source/Area

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**SOURCE/ELEMENT**

**Screen Name:** Source/Element

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**SOURCE/CONFIDENCE LEVEL**

**Screen Name:** Source/Confidence Level

**SAS Data Set:**

**SAS Variable:**

**Element Attributes:**

- 1 Certain
- 2 Probable
- 3 Possible
- 9 Unknown

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

The intent of this variable is to give analysts an assessment of the injury coder's confidence in the injury source coded for a specific injury.

**Certain**

if there is no reasonable doubt in the mind of the injury coder, based on occupant location, crash dynamics, contact points, and injury mechanism.

**Probable**

in those situations where there is not a certainty based on the factors noted above for code "1" (Certain).

**Possible**

if there is no supporting physical evidence but all factors point to an area of the vehicle or an object as the injury source.

**Unknown**

if the injury source is **Injured, unknown source**

**DIRECT INTRUSION**

**Screen Name:** Direct Intrusion

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

- Not directly related to intrusion
- Select appropriate intrusion from list
- Unknown

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**INDIRECT INTRUSION**

**Screen Name:** Indirect Intrusion

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

Not directly related to intrusion  
Select appropriate intrusion from list  
Unknown

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**AIR BAG RELATED**

**Screen Name:** Air bag related

***SAS Data Set:***

***SAS Variable:***

**Element Attributes:**

Injury, not air bag related  
Select appropriate air bag location  
Injury, unknown source

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

**DIRECT/INDIRECT INJURY**

**Screen Name:** Direct/Indirect Injury

**SAS Data Set:** *OI*

**SAS Variable:** *DIRINJ*

**Element Attributes:**

- 1 Direct contact injury
- 2 Indirect contact injury
- 3 Noncontact injury
- 4 Air bag related injury
- 7 Injured, unknown source

**Source:** Zone Center determined--inputs include vehicle inspection, interviewee, and medical records.

**Remarks:**

The distinction between direct and indirect is covered in greater detail in NASS Injury Coding Procedures.

**Direct contact injury**

if the coded injury results from a force impacted directly on the injured Body Region by the component/object coded as the Injury Source (OI12 et al.).

The injury can not have been a result of the air bag system “flinging” the arm, head, hand, etc., into contact with the injury source that is being coded for this injury. If it has, code the injury as an air bag related injury (“4”).

**Indirect contact injury**

if the coded injury results from a force *transmitted* from the component/object coded as the Injury Source (OI12 et al.) through another Body Region to the injured Body Region (e.g., knee contacts dash, force transmitted through knee and femur causing a fractured pelvis).

If an occupant's Body Region (OI06 et al.) impacts an object producing an injury to the same Body Region, but the force was transmitted through the occupant's eyeglass, objects in the person's pocket, etc., code the injury as a direct contact ("1")

The injury can not have been a result of the air bag system “flinging” the arm, head, hand, etc., into contact with the injury source that is being coded for this injury. If it has, code the injury as an air bag related injury (“4”).

**Noncontact injury**

is used when the respective OI12 et al. equals **Fire in vehicle, Flying glass, Other noncontact injury source, or Air bag exhaust gases.**

**Air bag related injury**

is used when the air bag system “flings” the arm, head, hand, etc., into contact with the injury source that is being coded for this injury. If the injury is caused directly from contact with an air bag system component then choose **direct contact injury, or indirect contact injury.**

**Injured, unknown source**

is used whenever the Injury Source is coded **Injured, unknown source.**

**RANK**

**Screen Name:** Rank

*SAS Data Set:*

*SAS Variable:*

**Element Attributes:**

**Source:** Zone Center determined.

**Remarks:**

## OCCUPANT FORM

## INJURY CODES/INJURIES/VITAL SIGNS

The screenshot shows a software window titled "Occupant Form, Case #2005-903-90000S/Vehicle # 1/Occupant #1". The window has a menu bar with options: Occupant, Ejection, Entrapment, SEAT, AirBag, CHILD SEAT, SEAT BELT, INJURY, Injury Codes, LOG, and QUALITY. Below the menu bar are three tabs: Injuries, Vital Signs, and Mannequins. The "Vital Signs" tab is active, displaying a table with the following columns: Date, Time, Pulse, Systolic, Diastolic, Respiratory Rate, and Source. The table is currently empty. At the bottom of the window are two buttons: "Save" (with a green checkmark icon) and "Close" (with a red X icon).

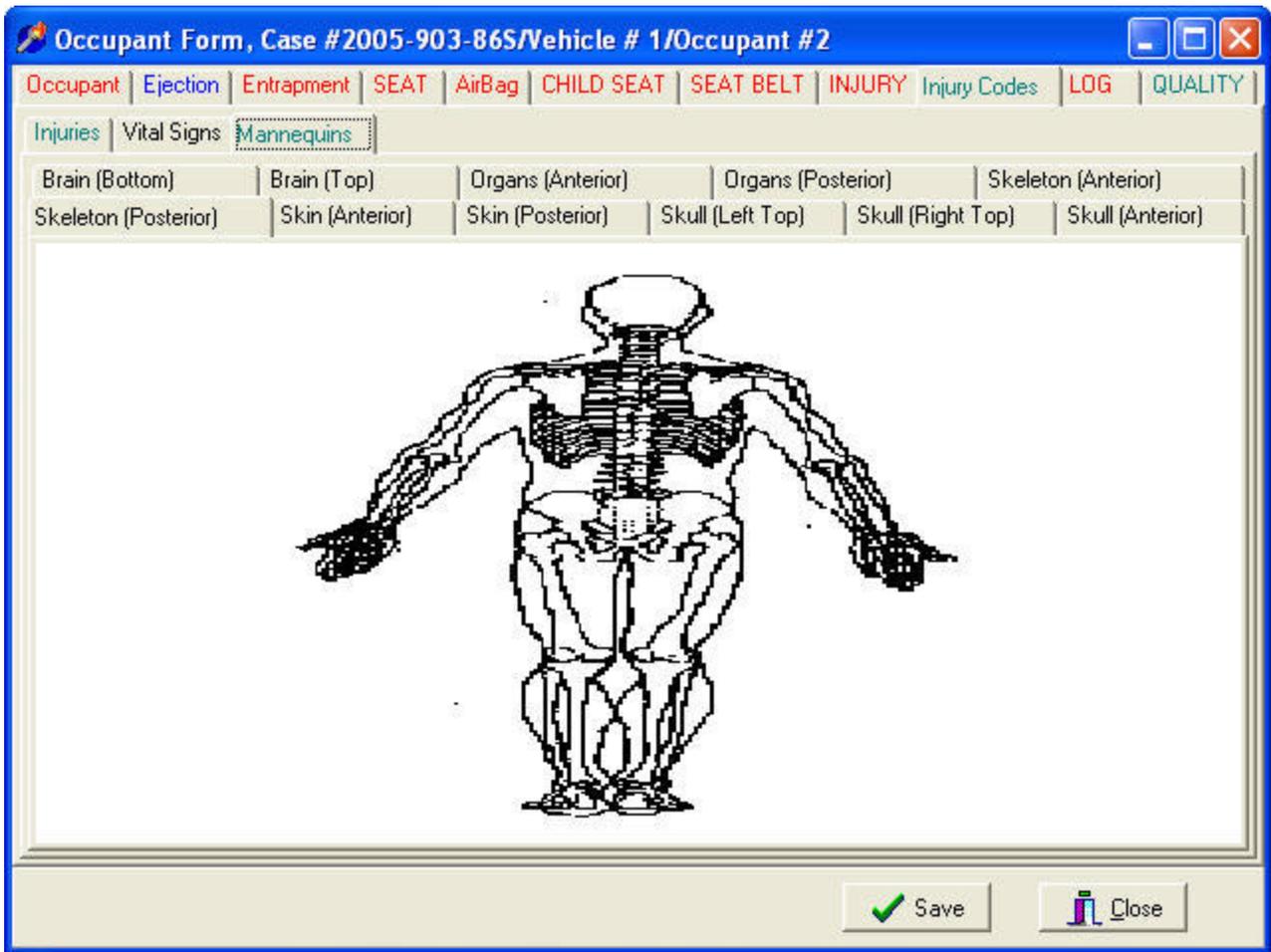
**VITAL SIGNS** data is rolled up from the EMS Form and medically reported vitals.

Only Zone Centers can edit medically reported vitals.

The date and time is recorded for each set of coded vital signs. Medically reported vital signs are coded a maximum of four times, taken at six hour intervals. During the first 24 hours of arrival at the medical facility, this period is measured from arrival at the emergency room and could include time spent in the emergency room and any hospital admission. If the date/time information is vague, the coder should use their judgment and code the first, second, third and last readings that appear on any record during this time.

After the 24 hours, the first vital sign data recorded for each day should be the vital signs recorded for the individual for that date. If no time or date appears on the medical record or if it is difficult to determine the exact date or time of any recorded vital sign, then code the vital sign but leave the date/time as "unknown".

**Note:** The system will only save one "unknown" time vitals were taken, regardless of the data source.



Only Zone Centers can insert/edit this data using the NASSINJURY program.

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

Interview | Medical

Interviewer [Dropdown]

Interviewee [Dropdown]

Last Interview Attempt

- Manner [Dropdown]

- Result [Dropdown]

Interview Date [N/A]

Save Close

**Note:** Information must be coded by the researcher. This data does not roll up from the Contact Log.

The screenshot shows a software window titled "Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2". The window has a blue title bar and standard Windows window controls (minimize, maximize, close). Below the title bar is a menu bar with the following items: "Occupant", "Ejection", "Entrapment", "SEAT", "AirBag", "CHILD SEAT", "SEAT BELT", "INJURY", "Injury Codes", "LOG", and "QUALITY". Below the menu bar are two tabs: "Interview" and "Medical", with "Medical" being the active tab. The main area of the form contains two fields: "Injured?" with a dropdown menu, and "Medical Facility" with a list box. The list box currently displays "Medical Facility" and has a small arrow icon on the left side. At the bottom right of the form are two buttons: "Save" with a green checkmark icon and "Close" with a red X icon.

**Note:** Medical Facility must be entered using the Edit/Insert.

LIST

Field	Original	Suggested
-------	----------	-----------

DETAIL

Form: [Form] Tab: [ ] Veh#: [1]

Original: [ ] Suggested: [ ]

Comment: [ ]

**OCCUPANT FORM**

**QUALITY/ZONE REVIEW**

**LIST**

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

PSU Review | Zone Review

List | Detail

Field	Original	Changed to
-------	----------	------------

Save Close

**DETAIL**

Occupant Form, Case #2005-903-865/Vehicle # 1/Occupant #2

Occupant | Ejection | Entrapment | SEAT | AirBag | CHILD SEAT | SEAT BELT | INJURY | Injury Codes | LOG | QUALITY

PSU Review | Zone Review

List | Detail

Form [dropdown] Tab [text] Veh # [text] Occ # [text]

Original [text] Final [text]

Reason [dropdown] Change [text]

Comment [text area]

Table Column

Save Close

**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 administer care or transport 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**.

VEHICLES

Emergency Medical Services (EMS)

Vehicles | Care | Vital Signs

Agency	Type	Mode	Notified	Arrived	Departed	Arvd Medical
--------	------	------	----------	---------	----------	--------------

Crash Date: 07/01/2005 at

Save Close

**[EMS UNIT NUMBER]**

**Screen Name:** N/A

**SAS Data Set:** *EMS*

**SAS Variable:** *EMSNO (EMS data set);*

*EMSNO1, EMSNO2, EMSNO3, EMSNO4 (OA data set)*

**Element Attributes:**

Derived number of EMS Unit

**Source:** Derived from entered data by the data entry system.

**Remarks:**

The number of the EMS unit. This is derived by the data entry system.

**RESPONDING AGENCY**

Page 1 of 2

**Screen Name:** Responding Agency**SAS Data Set:** *EMS***SAS Variable:** *EMSTYPE***Element Attributes:**

- 1 Fire Department
- 2 Rescue Squad
- 3 Police Department
- 4 Trauma Unit
- 5 Disaster Unit
- 6 Ambulance Service Unit
- 7 Hospital
- 8 Mortuaries/Funeral Home
- 98 Other, Specify
- 99 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.

Responding Agency (cont'd)

Page 2 of 2

**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**

**RESPONDING EMERGENCY VEHICLE TYPE**

**Screen Name:** Type of Vehicle

**SAS Data Set:** *EMS*

**SAS Variable:** *EMSVTYPE*

**Element Attributes:**

- |   |                      |
|---|----------------------|
| 1 | Ambulance            |
| 2 | Fire Truck/Apparatus |
| 8 | Other (specify)      |
| 9 | 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**

**TRANSPORTATION MODE**

**Screen Name:** Mode

**SAS Data Set:** EMS

**SAS Variable:** EMSMODE

**Element Attributes:**

- 1 Land
- 2 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**

**FIRST NOTIFICATION TIME**

Screen Name: Notified

*SAS Data Set:* EMS

*SAS Variable:* NOTTIME

**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

**FIRST ARRIVAL TIME**

**Screen Name:** Arrived

**SAS Data Set:** EMS

**SAS Variable:** ARRTIME

**Element Attributes:**

Enter the EMS arrival on scene 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.

**TIME OF DEPARTURE FROM THE SCENE**

**Screen Name:** Departed

**SAS Data Set:** EMS

**SAS Variable:** DEPTIME

**Element Attributes:**

Enter the EMS departure time in military time format.  
8886 Transport refused  
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.

**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** .

**9999 Unknown**

Use this attribute for instances where the time of departure cannot be determined from any source.

**ARRIVED AT MEDICAL FACILITY**

**Screen Name:** Arvd Medical

**SAS Data Set:** *EMS*

**SAS Variable:** *MEDTIME*

**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**

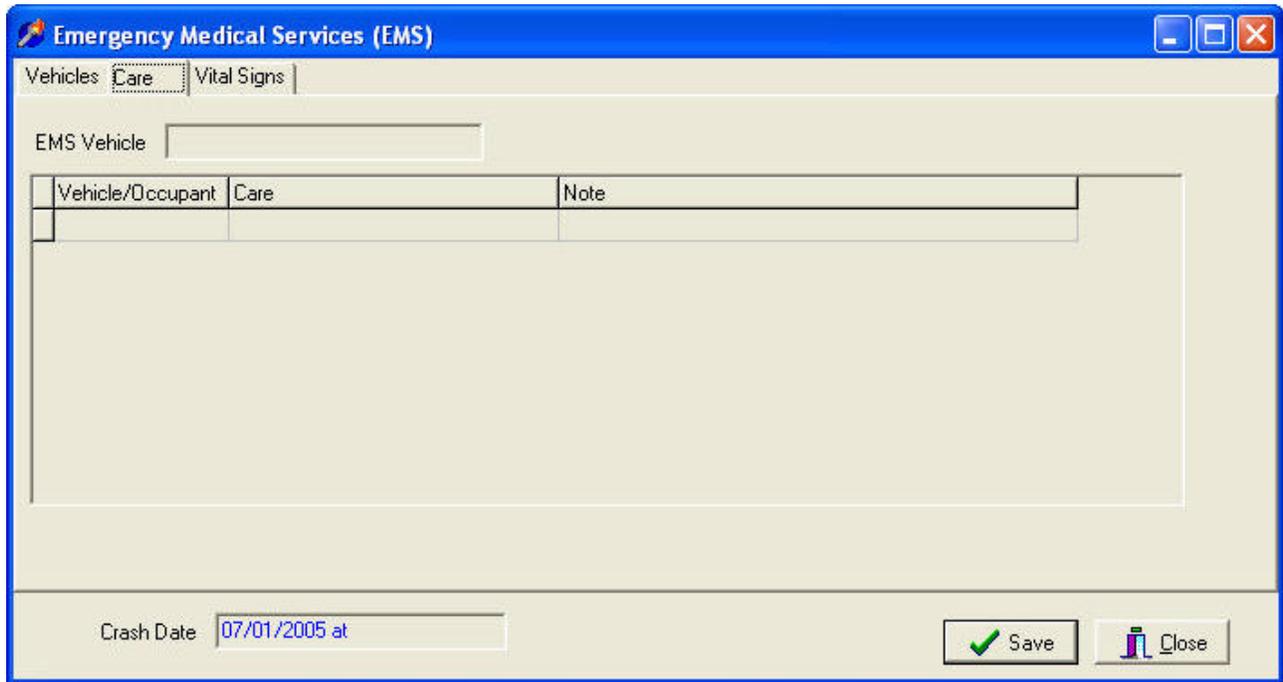
Units which just provide treatment at the crash site and do not transport occupants are entered as **Not applicable** .

Units which leave the scene and only transport occupant(s) to a transfer vehicle are entered as **Not applicable**.

**9999 Unknown**

Use this attribute for instances where the time of departure cannot be determined from any source.

EMS CARE



Emergency Medical Services (EMS)

Vehicles Care Vital Signs

EMS Vehicle

Vehicle/Occupant	Care	Note

Crash Date 07/01/2005 at

Save Close

**Note:** Select edit/insert from the main menu. A new screen appears (see below) from which you select Vehicle #, Occupant # and Care.

**VEHICLE #**

**Screen Name:**        Vehicle #

*SAS Data Set:*        *N/A*

*SAS Variable:*        *N/A*

**Element Attributes:**

Enter the vehicle # for the occupant being reported on

**Source:**    EMS records, Emergency room records, PAR

**Remarks:**

**OCCUPANT #**

**Screen Name:**        Occupant #

*SAS Data Set:*        *N/A*

*SAS Variable:*        *N/A*

**Element Attributes:**

Enter the occupant # for the occupant being reported on

**Source:**            EMS records, Emergency room records, PAR

**Remarks:**

**TYPE OF EMS CARE ADMINISTERED**

Screen Name: Type of Care

SAS Data Set: OA

SAS Variable: CARETYPE1, CARETYPE2, CARETYPE3, CARETYPE4

**Element Attributes:**

- 0 No Care Administered
- 1 Basic Life Support
- 2 Advanced Life Support
- 7 Care administered, type unknown
- 9 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.

VITAL SIGNS

Emergency Medical Services (EMS)

Vehicles | Care | Vital Signs

EMS Vehicle: Rescue Squad      Vehicle #: 1      Occupant #: 1

Date	Time	Pulse	Systolic	Diastolic	Respiratory Rate
	:				

Crash Date: 07/01/2005 at

Save      Close

**[VITAL SIGN NUMBER]**

**Screen Name:** N/A

**SAS Data Set:** *VSIGN*

**SAS Variable:** *VSIGNO*

**Element Attributes:**  
Sequentially numbered by system

**Source:** EMS and other medical records

**Remarks:**

**TIME OF READING**

**Screen Name:** Time

**SAS Data Set:** *VSIGN*

**SAS Variable:** *VTIME*

**Element Attributes:**

9999 Enter time, in military time format, for the vital signs reading that was taken  
Unknown

**Source:** EMS records

**Range:** 1-2400, 9999

**Remarks:**

Enter the time that the vital signs readings were taken.

**9999 Unknown**

Enter 9 in the first space of the variable, the program will fill in the remainder of the attribute.

**Note:** Only one vital sign with an unknown time can be entered into the electronic system.

**PULSE**

**Screen Name:** Pulse

**SAS Data Set:** VSIGN

**SAS Variable:** 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.

**[ELAPSED TIME SINCE CRASH OF VITAL TIME READING]**

**Screen Name:**

*SAS Data Set:*        *VSIGN*

*SAS Variable:*        *VTIME*

**Element Attributes:**

	Number of minutes since crash when vital sign reading is taken
9999	Unknown

**Source:** EMS records

**Range:**

**Remarks:**

Information is computed by the system relating to date and time of crash as compared to date and time of vital sign reading.

**SYSTOLIC BLOOD PRESSURE**

**Screen Name:** Systolic Systolic Blood Pressure

**SAS Data Set:** *VSIGN*

**SAS Variable:** *SYST*

**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.

**DIASTOLIC BLOOD PRESSURE**

**Screen Name:** Diastolic

**SAS Data Set:** VSIGN

**SAS Variable:** DIAST

**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.

**RESPIRATORY RATE**

**Screen Name:** Respiratory Rate

**SAS Data Set:** *VSIGN*

**SAS Variable:** *REPRATE*

**Element Attributes:**

- Enter the respiratory rate of the patient
- A Agonal
- U Unknown

**Source:** EMS records

**Range:** 0-98, 997, 999

**Remarks:**

Enter the recorded diastolic pressure value of the patient.

**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.

## **APPENDIX A**

### **Stiffness Values**

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>ACURA</b>						
INTEGRA	RS, LS, GS	1986		2	2	31
LEGEND		1986	1995	3	3	32
RL		1996		4	4	32
NSX	NTX-T	1991	2005	2	2	33
VIGOR		1992	1994	3	3	34
CL	Coupe	1996		3	3	35
TL		1996		4	4	35
MDX	Use 7 stiffness for front impacts, size value for side or rear impacts.	2001		3	7	421
TSX		2004		3	3	39
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
SLX	Use 7 stiffness for front impacts, size value for side or rear impacts.	1996		3	7	401
OTHER LIGHT TRUCK						498
UNKNOWN TYPE LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>ALFA ROMEO</b>						
SPIDER	All roadsters, Veloce, 1750/2000 roadsters	1933	1994	1	1	31
SPORTS SEDAN	All 4 door sedans; 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						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>AM GENERAL</b>						
DISPATCHER	Post Office (Jeep)	1965	1994	1	1	401
HUMMER1		1993		7	7	421
HUMMER2	Use 7 stiffness for front impacts, size value for side or rear impacts.	1996		6	7	
HUMMER3	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		4	7	402
DISPATCHER	DJ series Post Office Van	1965	1991	NA	NA	466
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY TRUCK	Military off-road	1965	1994	NA	NA	884
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
BUS - REAR ENGINE/FLAT FRONT	Transit	1965	1994	NA	NA	983
OTHER BUS						988
UNKNOWN BUS TYPE						989

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>AMC</b>						
RAMBLER/AMERICAN	Rogue, Scambler, 220, 440	1954	1969	3	3	1
REBEL/MATADOR	Barcelona, Classic, Brougham, 550, 660, 770, Marlin: WB=114"	0		4	4	2
	Matador: WB=115"	0	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	0		5	5	3
PACER	Limited, DL	1975	1980	2	2	4
AMX	2-seater only	1968	1970	2	2	5
JAVELIN	SST	0		2	2	6
	AMX	1971	1974	2	2	6
HORNET/CONCORD	Sportabout, limited, DL, SC-360, SST	0		2	2	7
	AMX	1975	1978	2	2	7
SPIRIT/GREMLIN	Limited, DL. Custom., X	0		2	2	8
	GT	1983		2	2	8
	AMX	1979		2	2	8
EAGLE	Concord based	1980	1987	3	3	9
EAGLE SX-4	Spirit/Gremilin based	1981	1984	2	2	10
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>ASTON MARTIN</b>						
LAGONDA		1968		per WB	= size	31
OTHER AUTOMOBILE						31
SALOON		1968		per WB	= size	31
UNKNOWN AUTOMOBILE						31
VANTAGE		1968		per WB	= size	31
VOLANTE		1968		per WB	= size	31
<b>AUDI</b>						
SUPER 90		1970	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		1974	1979	2	2	33
4000	Quattro, Coupe GT, CS, S	1980	1988	2	2	34
5000	Quattro, CS, S, Turbo	1978	1988	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	1993	2	2	39
S4/S6	S4	1993	1994	3	3	40
	S6	1995		3	3	40
CABRIOLET		1994		2	2	41
A4		1996		3	3	42

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
A3		1996		2	2	43
A8		1996		4	4	44
TT		2000		4	4	45
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
<b>AUSTIN / AUSTIN HEALEY</b>						
<hr/> MARINA	GT	0	1998	2	2	31
AMERICA		0	1998	1	1	32
HEALEY SPRITE		0	1998	1	1	33
HEALY 3000	Healy 100	0	1998	1	1	34
MINI		0	1998	1	1	35
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>AUTOCAR</b>						
<hr/> MEDIUM/HEAVY - CBE						801
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						801
MEDIUM/HEAVY - COE/HIGH ENTRY						801
MEDIUM/HEAVY - COE/LOW ENTRY						801
MEDIUM/HEAVY - OTHER						801
MEDIUM/HEAVY - UNKOWN ENGINE LOCATION						801
MEDIUM/HEAVY BASED MOTORHOME						801
MEDIUM/HEAVY - COE/LOW ENTRY						802
<b>AUTO-UNION-DKW</b>						
<hr/> MEDIUM/HEAVY - CBE						802
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						802
MEDIUM/HEAVY - COE/HIGH ENTRY						802
MEDIUM/HEAVY - OTHER						802
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						802
MEDIUM/HEAVY BASED MOTORHOME						802
<b>AVANTI</b>						
<hr/> OTHER AUTOMOBILE						1
UNKNOWN AUTOMOBILE						399
<b>BERTONE</b>						
<hr/> OTHER AUTOMOBILE						52

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>BMW</b>						
1600, 2002	Tii, 1800i, 200CS	0	1976	2	2	31
COUPE	2800CS, 3.0CS	1969	1976	3	3	32
BAVARIA SEDAN	2500, 2800	1969	1974	3	3	33
3 SERIES	318i, 318ti, 320i, 325e, 325es, 325i, 328, M3	1977		2	2	34
5 SERIES	525i (wagon), M5, 540iA, 540i	1993		3	3	35
	524i, 258i, 530i, 533i, 535i, TD	1975	1998	3	3	35
6 SERIES	630, 633, 635, csi, M6	1977		3	3	36
7 SERIES	733i, 435i, L7, 740i, 750iL	1978		3	3	37
8 SERIES	850, 840ci	1990	1997	3	3	38
X3	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		3	7	402
X5	Use 7 stiffness for front impacts, size value for side or rear impacts.	2000		4	7	401
Z3	M coupe (Brickland)	1996		2	2	39
Z4		2003		2	2	42
Z8		2001		2	2	40
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
UNKNOWN MOTORED CYCLE						799
UNKNOWN VEHICLE						999
<b>BRICKLIN</b>						
OTHER AUTOMOBILE						32
UNKNOWN AUTOMOBILE						32
<b>BROCKWAY</b>						
MEDIUM/HEAVY TRUCK BASED		0	1998			850
MOTORHOME						
MEDIUM/HEAVY - CBE		0	1998			881
MEDIUM/HEAVE - COE/LOW ENTRY		0	1998			882
<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE HIGH ENTRY		0	1998			883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION		0	1998			884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN		0	1998			890
MEDIUM/HEAVY - OTHER		0	1998			898
<b>BSA</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
OTHER MOTORED CYCLE						798
<b>BUICK</b>						
SPECIAL/SKYLARK (thru 1972)	GS, GS-350, GS-400, GS-455, GS California, Sport wagon, Custom	0	1972	4	4	1
LESABRE/CENTURION/WILDCAT	Wagon, Luxus, Invicta, Custom, Limited	1977	1985	4	4	2
	Wagon, Luxus, Invicta, Custom, Limited	0	1976	6	6	2
ELECTRA/ELECTRA 225/PARK AVENUE (1991-ON)		1985		4	4	3
	Limited, Park Avenue, Ultra	1977	1984	5	5	3
	Limited, Park Avenue, Ultra	0	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
CENTURY	Luxus, Custom	0	1977	4	4	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, Luxus, Gran National, GNX, T-Type	1978	1988	3	3	10
RAINER		2004		4	4	402
REATA		1989	1991	2	2	21
RENDEZVOUS	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		4	7	401
SKYHAWK		1982		2	2	12
	S-Type, Roadhawk, T-Type, GT	1975	1981	2	2	12
SKYLARK (1976-1985)		1980	1985	3	3	15
	S/R, S, Limited, Sport, T-Type	1976	1979	4	4	15
SOMERSET(1985-1987)/SKYLARK(1986-ON)		1986		3	3	18
TERRAZA	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		5	7	441
REGAL (FWD)	Limited	1988		3	3	20
REATA		1988	1991	2	2	21
OPEL KADETT		0	1975	2	2	31
OPEL MANTA	1900, Luxus, Rallye, Sports Coupe	0	1975	2	2	32
OPEL GT		0	1975	2	2	33
OPEL ISUZU	Deluxe, Sport	1976	1979	2	2	34
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>CADILLAC</b>						
DEVILLE/FLEETWOOD		0	1976	6	6	3
		1977	1996	5	5	3
LIMOUSINE	Fleetwood 75, Formal, DeVille-Based	0	1998	6	6	4

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
ELDORADO	Biarritz, El-doro, Touring Coupe	0	1978	6	6	5
	Biarritz, El-doro, Touring Coupe	1979	1985	4	4	5
COMMERCIAL SERIES	Ambulance/Hearse	0	1998	6	6	6
ALLANTE		1987		2	2	9
SEVILLE	Elegante	1976	1985	4	4	14
CIMARRON		1982	1988	2	2	16
CATERA	RWD	1997		3	3	17
ESCALADE	Use 7 stiffness for front impacts, size value for side or rear impacts.	1998		5	7	21
ESCALADE ESV	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		6	7	431
ESCALADE EXT		2002		8	8	480
CTS		2003		4	4	18
SRX	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		4	7	20
STS		2005		4	4	21
XLR		2004		3	3	19
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>CHECKER</b>						
AEROBUS		0	1982	per WB	= size	2
MARATHON		0	1982	per WB	= size	2
OTHER AUTOMOBILE		0	1982	per WB	= size	2
SUPERBA		0	1982	per WB	= size	2
TAXI		0	1982	per WB	= SIZE	2
UNKNOWN AUTOMOBILE		0	1982	per WB	= size	2
<b>CHEVROLET</b>						
AVALANCHE			2002	8	8	482
AVEO			2005	2	2	39
COBALT		2005		2	2	22
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	0	1976	6	6	2
	Biscayne, Belair, Super sport, Classic Classic Brougham, Townsman	0	1976	5	5	2
COLORADO			2004	8	8	473
CORVETTE	Stingray	1963	1998	2	2	4
	Stingray	53	1962	3	3	4
CORVAIR	Monza, Corsa, 500, Yenko	60	1969	NA	NA	6
EL CAMINO	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	59	1960	5	8	7
	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	1978	1998	3	8	7
	Royal Knight, SS (use 8 stiffness for end impacts, size value for side impacts)	1964	1977	4	8	7

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
EQUINOX	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		4	7	404
NOVA (-1979)	Chevy II, LN, LE, Concours SS-350/396, Rally	62	1979	4	4	8
CAMARO	SS, RS, LT, Berlinetta, IROC-Z, Z28	1967	98	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	1975	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		1980	1985	3	3	15
CAVALIER	CS, RS, Z24, LS	1982	1998	2	2	16
CELEBRITY	CS, Eurosport, VR	1982	1998	3	3	17
BERETTA/CORSICA		1988	1998	3	3	19
LUMINA		1990	1998	3	3	20
SPECTRUM		1985	1998	1	1	31
NOVA/GEO PRIZM		1985	1998	2	2	32
SPRINT/GEO SPRINT		1985	1998	1	1	33
GEO METRO	LSi, Xfi	1989	1998	1	1	34
GEO STORM	Gsi	1985	1998	1	1	35
MONTE CARLO (FWD ONLY)		1995	1998	3	3	36
MALIBU (1997-)		1997	1998	3	3	37
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
S-10 BLAZER, BLAZER		1995	1998	2	7	401
GEO TRACKER	Use 7 stiffness for front impacts, size value for side or rear impacts.	1989	1998	2	7	402
FULLSIZE BLAZER (K, Tahoe)	Tahoe (use 8 stiffness for end impacts, size value for side impacts)	1995	1998	3	8	421
	K-series, fullsized p/u based (use 8 stiffness for end impacts, size value for rear impacts)	1969	1994	3	8	421
SUBURBAN	(use 8 stiffness for end impacts, size value for side impacts)	0	1998	6	8	431
ASTRO VAN	Minivan (use 7 stiffness for end impacts, size value for side impacts)	1985	1998	7	7	441
LUMINA APV/VENTURE.	Venture, (use 7 s tiffness 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)	0	1998	7	7	461
P-SERIES VAN	(use 7 stiffness for end impacts, size value for side impacts)	0	1998	7	7	466
VAN DERIVATIVE	Hi-cube, Parcel Van (use 7 stiffness for end impacts, size value for side impacts)	0	1998	7	7	470
S-10/T-10	4 X 4 (use 8 stiffness for end impacts, size value for side impacts)	1982	1998	PER WB	8	471
LUV	Imported pickup (use 7 stiffness for end impacts, size value for side impacts)	0	1998	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)	0	1998	PER WB	8	481
SSR		2005		8	8	38
UPLANDER	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		7	7	444

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY CBE	C50/60/65; M60/65; H70/80/90; J70/80/90; Bison 90; all other CBE	0	1998	NA	NA	881
MEDIUM/HEAVY COE LOW ENTRY	T60/65 - all other COE low entry	0	1998	NA	NA	882
MEDIUM/HEAVY COE HIGH ENTRY	Titan 90, all other COE hight entry	0	1998	NA	NA	883
MEDIUM/HEAVY; UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY; UNKNOWN ENGINE LOCAITON	MKIII, 1500	0	1979	1	1	890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
BUS	S-60 series	0	1998	NA	NA	981
OTHER BUS						988
UNKNONW BUS TYPE						988
OTHER VEHICLE						998
UNKNOWN VEHICLE						999
<b>CHRYSLER</b>						
CROSSFIRE		2005		4	4	55
CORDOBA	Crown, 300, LS	1975	1983	4	4	9
NEW YORKER FIFTH AVENUE (1989)						10
NEWPORT						10
RAMPAGE 2.2 (CAR BASED PICKUP)	GT, Sport	1982	1984	2	2	13
NEW YORKER ('83-'1990)						14
NEW YORKER SALON						14
NEW YORKER/E CLASS/IMPERIAL/5TH AVENUE		1990	1993	3	3	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	0	1978	6	6	14
	Custom, Royal, Brougham, Town and Country	1982	1989	4	4	14
	300	0	1971	6	6	14
LASER		1984	1986	2	2	15
LEBARON		1982	98	2	2	16
	Medallion, Salon (RWD), Landau, LX	1977	1981	4	4	16
LEBARON GTS/GTC		1987	1998	2	2	17
INTREPID		1993	2003	4	4	18
TC (MASERATI SPORT)	Turbo Convertible	1988	1991	1	1	31
CONQUEST	TSI, Turbo	1987	1989	2	2	35
CONCORDE		1993	1998	4	4	41
LHS		1994	1998	4	4	42
PACIFICA		2004		4	4	54
PROWLER		2000	2002	4	4	53

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
PT CRUISER		2001		3	3	52
SEBRING		1995	1998	3	3	43
CIRRUS		1995	1998	3	3	44
300M		1999		4	4	51
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
TOWN AND COUNTRY	Minivan (use 7 stiffness for end impacts, size value for side impacts)	1990	1998	5	7	441
OTHER LIGHT TRUCK						498
<b>CITROEN</b>						
<hr/>						
OTHER AUTOMOBILE						33
UNKNOWN AUTOMOBILE						33
<b>CONSULIER</b>						
<hr/>						
OTHER AUTOMOBILE		0	1998	per WB	= size	398
UNKNOWN AUTOMOBILE		0	1998	per WB	= size	398
<b>DAEWOO</b>						
<hr/>						
LANOS		1999	2002	2	2	1
NUBIRA		1999	2002	2	2	2
LEGANZA		1999	2002	3	3	3
<b>DAIHATSU</b>						
<hr/>						
CHARADE		1990	1992	3	3	31
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
ROCKY	Use 7 stiffness for front impacts, size value for side or rear impacts.	1990	1992	1	7	401
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>DELOREAN</b>						
<hr/>						
OTHER AUTOMOBILE						34
UNKNOWN AUTOMOBILE						34
<b>DESOTO</b>						
<hr/>						
OTHER AUTOMOBILE		0	1998	per WB	= size	398
UNKNOWN AUTOMOBILE		0	1998	per WB	= size	398
<b>DESTA</b>						
<hr/>						
OTHER AUTOMOBILE						48
UNKNOWN AUTOMOBILE						48
<b>DIAMOND REO/REO</b>						
<hr/>						
MEDIUM/HEAVY TRUCK BASED		0	1998			850
MOTORHOME						
MEDIUM/HEAVY - CBE		0	1998			881
MEDIUM/HEAVY - COE/LOW ENTRY		0	1998			882

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE/HIGH ENTRY		0	1998			883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION		0	1998			884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						890
MEDIUM/HEAVY - OTHER		0	1998			898
<b>DIVCO</b>						
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
<b>DODGE</b>						
CHARGER		2006		6	6	24
DART	Custom, Swinger, Sport, GT, Demon, Special, Special Edition, 170, 270, 340, 360: WB=111"	1962	1976	4	4	1
	Custom, Swinger, Sport, GT, Demon, Special, Special Edition, 170, 270, 340, 360: WB=108"	1962	1976	3	3	1
CORONET/CHARGER/MAGNUM	Brougham, Custom, Superbee, Crestwood, Deluxe, XE, R/t, SE 440, 500, Police	0	1979	4	4	2
	Charger	0	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	0	1976	5	5	3
VIPER	RT/10, GTS	1992	98	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
MAGNUM		2005		6	6	21
MIRADA		1980	1983	4	4	9
ST REGIS	Police, Taxi	1979	1981	5	5	10
ARIES (K)		1981	1989	2	2	11
400		1983	1983	2	2	12
RAMPAGE 2.2, GT, SPORT						13

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
600		1983	1988	2	2	14
DAYTONA		1984	1994	2	2	15
LANCER		1985	1989	3	3	16
SHADOW		1987	98	2	2	17
DYNASTY		1988	98	3	3	18
SPIRIT		1989	1994	3	3	19
NEON		1994	98	3	3	20
CHALLENGER (ALL IMPORTED)	all imported	1978	1983	2	2	33
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	1986	2	2	35
STEALTH		1991	1998	2	2	39
MONACO		1990	1992	3	3	40
INTREPID		1993	1998	4	4	41
AVENGER		1995	1998	3	3	42
SPRINTER		2003		7	7	462
STRATUS		1995	1998	3	3	43
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
RAIDER	Sport (use 8 stiffness for end impacts, size value for side impacts)	1986	1998	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)	0	1998	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: WB=119" (use 7 stiffness for end impacts, size value for side impacts)	1984	1998	5	7	442
	Mini-Ram, SE, ES: 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 (use 7 stiffness for front impacts, size value for side or rear impacts)	0	1998	7	7	461
VAN DERIVATIVE	Kary Van (use 7 stiffness for end impacts, size value for side impacts)	0	1998	7	7	470
D50, COLT P/U, RAM 50/RAM 100	Ram 50/Ram 100 (use 8 stiffness for end impacts, size value for side impacts)	1983	1998	per WB	8	471
	D50, Colt P/U (use 8 stiffness for end impacts, size value for side impacts)	0	1982	per WB	8	471
DAKOTA	WB=124" (use 8 stiffness for end impacts, size value for side impacts)	1987	1998	6	8	472
	WB=112" (use 8 stiffness for end impacts, size value for side impacts)	1987	1998	3	8	472
D, W-SERIES PICKUP, W100- W350	Ram, Custom, Royal, Miser, D100-D350 (use 8 stiffness for end impacts, size value for side impacts)	0	1998	per WB	8	481
RAM	1500/2500/3500, P/U (use 8 stiffness for end impacts, size value for side impacts)	1994	1998	per WB	8	482

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
VIPER		1993		2	2	4
OTHER LIGHT TRUCK						498
MEDIUM/HEAVY: CBE						881
MEDIUM/HEAVY: COE LOW ENGRY						882
MEDIUM/HEAVY: COE HIGH ENTRY						883
MEDIUM/HEAVY: UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
MEDIUM BUS	not van based	0	98	NA	NA	981
OTHER BUS						988
UNKNOWN BUS TYPE						989
OTHER VEHICLE						998
UNKNOWN VEHICLE						999
<b>DUCATI</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
<b>EAGLE</b>						
SUMMIT	DL, LX, ES	1989	98	3	3	34
TALON	TSI	1990	98	2	2	37
PREMIER	LX, ES	1988	1992	3	3	40
VISION		1993		4	4	41
MEDALLION	DL, LX	1988	1990	3	3	44
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
SUMMIT WAGON	WB=99.2" (use 7 stiffness for end impacts, size value for side impacts)	1992	98	2	7	441
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>EXCALIBER</b>						
OTHER AUTOMOBILE		0	98	per WB	= size	398
UNKNOWN AUTOMOBILE		0	98	per WB	= size	398

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>FERRARI</b>						
<hr/>						
OTHER AUTOMOBILE						35
<b>FIAT</b>						
<hr/>						
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						398
UNKNOWN AUTOMOBILE						399
MEDIUM/HEAVY COE LOW ENTRY						882
MEDIUM/HEAVY COE HIGH ENTRY						883
MEDIUM/HEAVY COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNKNOWN MEDIUM/HEAVY TRUCK						899
UNKNOWN VEHICLE						999
<b>FORD</b>						
<hr/>						
FALCON	Sprint, GT, Futura	0	1970	4	3	1
FAIRLANE	Torino	0	1970	4	4	2
MUSTANG/MUSTANG II	Mach, Boss, Granada, Cobra	1965	1973	3	3	3
	Ghia, SVO, GT, LX, Shelby	1974	98	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	0	1977	5	5	6
RANCHERO	Flacon/Fairlane based	0	1971	3	3	7
	Torino/LTD II based	1972	1979	4	4	7
MAVERICK	Grabber	1970	1977	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

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
ESCORT/EXP		1981	1991	1	1	13
ESCAPE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2001		3	7	402
FIVE HUNDRED		2005		3	3	21
FREESTAR		2004		7	7	443
FREESTYLE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		5	7	22
TEMPO		1992		2	2	15
CROWN VICTORIA		1981	1989	4	4	16
TAURUS	Mt-5, L, GL, LX, SHO	1986	1989	3	3	17
PROBE	GL, LX, GT	1988		2	2	18
ENGLISH FORD	Cortina	0	1998	per WB	per WB	31
FIESTA	Sport, Ghia	1978	1980	1	1	32
FESTIVA		1988	1993	1	1	33
LASER		0	1998	per WB	per WB	34
CONTOUR		1994		3	3	35
ASPIRE	(use 9 stiffness for front impacts, size value for side or rear impacts)	1994		1	1	36
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
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)	0	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
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)	1994		5	7	442
E-SERIES VANS	Econoline, Clubwagon, Chateau, E150-E350 (use 7 stiffness for end impacts, size value for side impacts)	0		7	7	461
VAN DERIVATIVE	Parcel van (use 7 stiffness for end impacts, size value for side impacts)	0		7	7	470
RANGER	Supercab, 4X4, STX, Splash: WB=108" (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)	0	1998	7	7	472
F-SERIES PICKUP	F100-F350 (use 8 stiffness for end impacts, size value for side impacts)	0		per WB	8	481
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY CBE	F-5 through F-8, L-series, FT-series	0		NA	NA	881

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY COE LOW ENTRY	C/Ct series	0		NA	NA	882
MEDIUM/HEAVY COE HIGH ENTRY	C/CLT series	0		NA	NA	883
MEDIUM/HEAVY: UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
MEDIUM BUS	B-series (not van based)	0		NA	NA	981
OTHER BUS						988
UNKNOWN BUS TYPE						989
OTHER VEHICLE						998
UNKNOWN VEHICLE						999
<b>FREIGHTLINER/WHITE</b>						
MEDIUM/HEAVY TRUCK BASED MOTORHOME		0	1998			850
MEDIUM/HEAVY - CBE		0	1998			881
MEDIUM/HEAVY - COE/LOW ENTRY		0	1998			882
MEDIUM/HEAVY - COE/HIGH ENTRY		0	1998			883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION		0	1998			884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN		0	1998			890
MEDIUM/HEAVY - OTHER		0	1998			898
<b>FWD</b>						
MEDIUM/HEAVY TRUCK BASED MOTORHOME						850
MEDIUM/HEAVY - CBE						881
MEDIUM/HEAVY - COE/LOW ENTRY						882
MEDIUM/HEAVY - COE/HIGH ENTRY						883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						898

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>GMC</b>						
CABALLERO/SPRINT	Sierra Madre del Sur, SP (use 8 stiffness for end impacts, size value for side impacts)	0	1977	4	8	7
	Sierra Madre del Sur, SP (use 8 stiffness for end impacts, size value for side impacts)	1978		3	8	7
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
JIMMY/TYPHOON	S15 based (100.5" WB) (use 7 stiffness for end impacts, size value for side impacts)	1983		2	7	401
FULLSIZE JIMMY/YUKON	fullsize pickup based (use 8 stiffness for end impacts, size value for side impacts)	0		3	8	421
SUBURBAN	all models (use 8 stiffness for end impacts, size value for side impacts)	0		6	8	431
SAFARI (MINIVAN)	(use 7 stiffness for end impacts, size value for side impacts)	1986	1998	7	7	441
G-SERIES VAN	Rally Van, Vandura, G15-G35 (use 7 stiffness for end impacts, size value for side impacts)	0		7	7	461
P-SERIES VAN	(use 7 stiffness for end impacts, size value for side impacts)	0		TBD	TBD	466
VAN DERIVATIVE		1987	1987	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)	0		PER WB	8	481
CANYON		2004		8	8	472
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY CBE	W5000/6000/7000 series, Brigadier/General models	0		NA	NA	881
MEDIUM/HEAVY COE LOW ENTRY	W6000/W7000, all other COE, low entry	0		NA	NA	882
MEDIUM/HEAVY COE HIGH ENTRY	Astro 95, all other COE, high entry	0		NA	NA	883
MEDIUM/HEAVY: UNKNOWN ENGINE LOCATION		0		NA	NA	884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
MEDIUM BUS	B6000	0		NA	NA	981
OTHER BUS						988
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>GRUMMAN</b>						
LLV	Postal vehicles (see Chevrolet for VIN)	0	1998	NA	NA	441
STEP-IN VAN	Multi-stop, step van	0	1998	NA	NA	442
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY TRUCK - CBE						881
MEDIUM/HEAVY TRUCK - COE LOW ENTRY						882
MEDIUM/HEAVY TRUCK - COE HIGH ENTRY						883
MEDIUM/HEAVY TRUCK UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY TRUCK ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
BUS-FLAT FRONT, REAR ENGINE	Transit	0	1998	NA	NA	983
OTHER BUS						988
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
<b>HARLEY-DAVIDSON</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
<b>HILLMAN</b>						
UNKNOWN AUTOMOBILE						35
OTHER AUTOMOBILE						36
<b>HINO</b>						
MEDIUM/HEAVY - CBE						806
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						806
MEDIUM/HEAVY - COE/HIGH ENTRY						806
MEDIUM/HEAVY - COE/LOW						806

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						806
MEDIUM/HEAVY BASED MOTORHOME						806
<b>HONDA</b>						
CIVIC/CRX/DEL SOL	del Sol	1993	1998	1	1	31
	1300, 1500, CVCC, DX, EX, VX, CRX, S, Si, HF, 4WD Wagon	0		1	1	31
ACCORD		1982	1986	2	2	32
		1987		3	3	32
	LX, CVCC, SE-i, LX-i, EX, EX wagon	0	1981	1	1	32
PRELUDE		1984	1998	2	2	33
	Si	1980	1983	1	1	33
600	Coupe, Sedan	0	1998	1	1	34
ELEMENT	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	403
<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
FCX	Fuel Cell/Hydrogen	2002		2	2	38
INSIGHT		2001		2	2	37
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
PASSPORT	Use 7 stiffness for front impacts, size value for side or rear impacts.	1994		3	7	401
C-RV	Use 7 stiffness for front impacts, size value for side or rear impacts.	1997		3	7	402
ODYSSEY	Use 7 stiffness for front impacts, size value for side or rear impacts.	1995		4	7	441
PILOT	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	421
RIDGELINE	Use 8 stiffness for front impacts, size value for side or rear impacts.	2005		5	8	471
S2000		2000		2	2	35
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						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
UNKNOWN VEHICLE						999
<b>HUDSON</b>						
OTHER AUTOMOBILE		0	1998	per WB	= size	398
UNKNOWN AUTOMOBILE		0	1998	per WB	= size	398
<b>HYUNDAI</b>						
PONY		1984	1988	2	2	31
EXCEL	GL, GLS	1984	1994	1	1	32

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
SONATA		1989		3	3	33
SCOUPE		1991	1995	1	1	34
ELANTRA		1992		2	2	35
ACCENT		1995		1	1	36
TIBURON		1997		2	2	37
XG300/350		2001	2005	3	3	38
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
<b>IMPERIAL</b>						
IMPERIAL	Lebaron	0	1976	6	6	10
	Mark Croww, Frank Sinatra editions	1981	1983	4	4	10
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>INFINITI</b>						
M30		1990	1992	3	3	31
Q45		1990		4	4	32
G20		1991	1996	2	2	33
FX35/45	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		4	7	39
G35		2003		4	4	37
J30		1993	1998	3	3	34
I30		1996		3	3	35
I35		2002		4	4	36
M45		2003		3	3	38
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
QX4		1997		8	8	401
QX56	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		6	7	
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>INTERNATIONAL HARVESTER/NAVISTAR</b>						
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)	0	1998	per WB	8	421
TRAVELALL	1010-1210, 100-200 (use 8 stiffness for front and rear impacts, size value for side impacts)	0	1998	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)	0	1998	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)	0	1998	per WB	8	481
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
TRUCK BASED MOTORHOME						850
MEDIUM HEAVY - CBE	Loadstar/Fleetstar, Paystar, CBE Transtar, 4200, S-series Mixer	0	1998			881
MEDIUM/HEAVY - COE LOW ENTRY	CO, VCO, DCO, 190-1950, Cargostar, LFM, 5370 (Garbage)	0	1998			882

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE HIGH ENTRY	DCO, DCOT, UCO, VCOT, 405-series, COE Transtar, Unistar, Conco 707B, 9600	0	1998			883
MEDIUM/HEAVY: UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK UNK TYPE TRUCK (LIGHT/MED/HEAVY)	Fire Truck - R140-R306, CO 8190-	0	1998			898 899
UNKNOWN MEDIUM/HEAVY TRUCK						899
BUS BASED MOTOHOME CONVENTIONAL BUS	R153-1853 - Loadstar, 1603-1853	0	1998			950 981
BUS-FLAT FRONT, FRONT ENGINE	173FC, 183FC	0	1998			982
BUS-FLAT FRONT, REAR ENGINE OTHER BUS OTHER VEHICLE	183RE, 193RD-transit	0	1998			983 988 998
<b>ISUZU</b>						
I-MARK	S, RS, Turbo	1985	1989	1	1	31
IMPULSE	Turbo, RS	1984	1998	2	2	32
STYLUS		1990	1998	2	2	33
ASCENDER	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		6	7	421
AXIOM	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		3	7	405
i-280	Use 8 stiffness for frontal impacts, size value for all		2006	6	8	30
i-350	Use 8 stiffness for frontal impacts, size value for all		2006	4	8	30
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)	0	1995	3	8	471
	Hombre (use 8 stiffness for end impacts, size value for side impacts)	1996		3	8	471
MU-7	Use 7 stiffness for frontal impacts, size value for all		2007	4	7	15
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY - CBE						881
MEDIUM/HEAVY COE LOW ENTRY						882
MEDIUM/HEAVY COE HIGH ENTRY						883
MEDIUM/HEAVY COE UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK UNK TYPE TRUCK (LIGHT/MED/HEAVY)						898 899
UNKNOWN MEDIUM/HEAVY TRUCK						899
CONVENTIONAL FRONT ENGINE						981

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
FRONT ENGINE/FLAT FRONT						982
REAR ENGINE/FLAT FRONT						983
OTHER BUS						988
UNKNOWN BUS TYPE						989
<b><u>IVECO/MAGIRUS</u></b>						
MEDIUM/HEAVY BASED						850
MOTORHOME						881
MEDIUM/HEAVY - CBE						882
MEDIUM/HEAVY - COE/LOW ENTRY						883
MEDIUM/HEAVY - COE/HIGH ENTRY						884
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						890
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						898
MEDIUM/HEAVY - OTHER						898
<b><u>JAGUAR</u></b>						
XJ-S COUPE		1976		3	3	31
VANDEN PLAS		1999		5	5	32
XJ6/12 SEDAN/COUPE/XJ8/ XKE	L, XJ, C, 340/420 Sedan V12, Roadster, 120 2+2	0	1998	3	3	32
		0	1998	2	3	33
		0	1998	3	3	33
X100		1997	1998	TBD	TBD	34
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b><u>JEEP / KAISER-JEEP</u></b>						
CJ-2/CJ-3/CJ-4	Military: WB=81" (use 8 stiffness for end impacts, size value for side impacts)	0	1966	1	8	401
	Military: WB=81" (use 8 stiffness for end impacts, size value for side impacts)	0	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		1	8	402
	Scrambler, Bolde Eagle, Renegade, Laredo, Wrangler: WB=104" (use 8 stiffness for end impacts, size value for side impacts)	1967		3	8	402
YJ-SERIES	Wrangler (use 8 stiffness for end impacts, size value for side impacts)	1986		1	8	403
CHEROKEE / GRAND - 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	Wide Track, Chief, Commando, Jeepster (use 8 stiffness for end impacts, size value for side impacts)	0	1983	2	8	421
GRAND WAGONEER	Wagoneer (use 8 stiffness for end impacts, size value for side impacts)	1971	1991	3	8	431

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
	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)	0	1998	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
LIBERTY	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		3	7	405
COMMANDER	Use 7 stiffness for frontal impacts, size value for all	2006		3	7	14
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>JENSEN</b>						
HEALY		0	1998	per WB	= size	37
OTHER AUTOMOBILE						37
UNKNOWN AUTOMOBILE						37
<b>KAWASAKI</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						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
<b>KENWORTH</b>						
MEDIUM/HEAVY TRUCK BASED						850
MOTORHOME						881
MEDIUM/HEAVY - CBE						881
MEDIUM/HEAVY - COE/LOW ENTRY						882
MEDIUM/HEAVY - COE/HIGH ENTRY						883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						890
MEDIUM/HEAVY - OTHER						898
<b>KIA</b>						
SEPHIA		0		2	2	31
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
SPORTAGE	Use 7 stiffness for front impacts, size value for side or rear impacts.	1996		3	7	401
AMANTI		2004		3	3	35
OPTIMA		2001		3	3	34
RIO		2001		2	2	33
SEDONA	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		4	7	441

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
SORRENTO	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	402
SPECTRA		2002		2	2	32
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
<b>LADA</b>						
<hr/>						
OTHER AUTOMOBILE						53
UNKNOWN AUTOMOBILE						53
<b>LAMBORGHINI</b>						
<hr/>						
COUNTACH 5000S		0		per WB	= size	38
JALPA		0		per WB	= size	38
OTHER AUTOMOBILE						38
UNKNOWN AUTOMOBILE						38
<b>LANCIA</b>						
<hr/>						
BETA SEDAN-HPE		0	1980	2	2	31
BETA COUPE - ZAGATO		0	1982	1	1	32
SCORPION		0	1978	1	1	33
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>LAND ROVER</b>						
<hr/>						
DISCOVERY (LR)	(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)	0	1994	3	8	421
4.0 SE (RR)	(use 8 stiffness for end impacts, size value for side impacts)	1995	2002	3	8	422
DEFENDER 90 (LR)	(use 8 stiffness for end impacts, size value for side impacts)	1994	1997	1	8	422
FREELANDER	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002	2005	2	7	422
LR3	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		4	7	423
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>LEXUS</b>						
<hr/>						
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		1994		3	3	34
GX470	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		4	7	402
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
RX300	(use 8 stiffness for end impacts, size value for side impacts)	1999		3	8	401

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
LX 450/470	(use 8 stiffness for end impacts, size value for side impacts)	1996		3	8	421
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
<b>LINCOLN</b>						
CONTINENTAL/TOWN CAR	Continental	0	1979	6	6	1
	Continental	1980	1981	4	5	1
	Town Car	1982		4	5	1
MARK	VI	1980	1983	4	4	2
	VII	1993	1998	4	4	2
	LSC, all Signature/Designer Series	1971	1980	5	5	2
	I, II, III, IV, V	0	1970	4	4	2
	VII	1984	1998	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		4	4	12
AVIATOR	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003	2005	4	7	401
BLACKWOOD		2001	2004	8	8	481
MARK LT		2005		8	8	482
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
NAVIGATOR	(use 8 stiffness for end impacts, size value for side impacts)	1997		5	8	421
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>LOTUS</b>						
ESPRIT		0		per WB	= size	39
EUROPE		0		per WB	= size	39
OTHER AUTOMOBILE						39
UNKNOWN AUTOMOBILE						39
<b>MACK</b>						
MEDIUM/HEAVY BASED						850
MOTORHOME						881
MEDIUM/HEAVY - CBE						882
MEDIUM/HEAVY - COE/LOW ENTRY						883
MEDIUM/HEAVY - COE/HIGH ENTRY						884
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						890
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						898
MEDIUM/HEAVY - OTHER						898
<b>MARMON</b>						
MEDIUM/HEAVY - CBE						898
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						898
MEDIUM/HEAVY - COE/HIGH ENTRY						898

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE/LOW ENTRY						898
MEDIUM/HEAVY - OTHER						898
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						898
<b>MASERATI</b>						
BITURBO		0		per WB	= size	40
OTHER AUTOMOBILE						40
UNKNOWN AUTOMOBILE						40
<b>MAZDA</b>						
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/PROTEGE/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		0	1972	1	1	40
616/618		0	1972	2	2	41
1800		0	1972	2	2	42
929		1988	1996	3	3	43
MX-6	Turbo	1988		2	2	44
MIATA		1990		1	1	45
MX-3	GS	1992		1	1	46
MILLENNIA		1995		3	3	47
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
NAVAJO	(use 8 stiffness for end impacts, size value for side impacts)	1991	1994	3	8	401
MPV	(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)	0		PER WB	8	471
TRIBUTE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2001		3	7	402
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>MERCEDES BENZ</b>						
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)	0		3	3	31
230/280 SL	2 seater only	0		1	1	32
300/350/380/450/500SL/560SL	300/500 SL	1990	1994	2	2	33
	2 seater only	0	1994	2	2	33
350/380/420/450/560/ SLC		0		4	4	34
280/300SEL		0		4	4	35
380/420/450/500/560SEL/500SEC/560SEC/350SDL/300SDL		0		4	4	36
300 SE/380/450 SE	280 S, 300 SD Sedan/350 SD	0		4	4	37

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
600, 6.9 SEDAB	280 SE	1975		4	4	37
	Pullman	0		6	6	38
190	D, E, 2.3, 2,5	0		3	3	39
300	CE Cabriolet	1993		3	3	40
400/500 E	SE	1992		3	3	41
220/280 C		1997		3	3	42
S CLASS						43
SL CLASS						44
G CLASS	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		4	7	402
SLK						45
CL						46
CLK						47
E						48
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
M	(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						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVE - CBE						881
MEDIUM/HEAVY - COE LOW ENTRY						882
MEDIUM/HEAVY - COE HIGH ENTRY						883
MEDIUM/HEAVY; UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
MEDIUM BUS						981
OTHER BUS						988
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
<b>MERCURY</b>						
CYCLONE	GT, CJ, Spoiler	0	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		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"	0	1978	5	5	6
	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis	1979	1982	4	4	6

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
	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"	0	1978	6	6	6
COMET	Capri	1966	1967	4	4	8
	Caliente, GT, Voyager, 202	1971	1977	3	3	8
	Caliente, GT, Voyager, 202	62	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)		1981	1987	1	1	13
TOPAZ		1984		2	2	15
SABLE	LS, GS	1986	2005	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		1994		3	3	37
COUGAR						38
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
MOUNTAINEER	(use 7 stiffness for end impacts, size value for side impacts)	1996		.	7	401
VILLAGER	LS, GS (use 7 stiffness for end impacts, size value for side impacts)	1993		4	7	443
MARINER	Hybrid/Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		3	7	402
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>MERKUR</b>						
XR4Ti	Turbo	1985	1989	3	3	31
SCORPIO	Turbo	1987	1990	3	3	32
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>MG</b>						
MIDGET						31
MGB (1976 - 1979)		1976	1979	1	1	32
MGB ('67-'1975)	GT	1967	1975	1	1	33
MGA		0		1	1	34
TA/TC/TD/TF		0		1	1	35
MGC	GT	0	1969	1	1	36
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>MITSUBISHI</b>						
STARION	2+2, LE, Turbo	1983	1990	2	2	31

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
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	1985		3	3	34
MIRAGE	L, Turbo	1985		1	1	35
PRECIS						36
ECLIPSE		1990		2	2	37
SIGMA		1989	1990	3	3	38
3000GT	Spyder, VR-4	1991		2	2	39
DIAMANTE		1992		3	3	40
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
MONTERO	Sport (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		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)	0		3	8	471
ENDEAVOR	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		3	7	403
OUTLANDER	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	402
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY - COE LOW ENTRY	FUSO FE	0		NA	NA	882
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
CONVENTIONAL FRONT ENGINE						981
FRONT ENGINE/FLAT FRONT						982
REAR ENGINE/FLAT FRONT						983
OTHER BUS						988
UNKNOWN TYPE BUS						989
UNKNOWN VEHICLE						999
<b>MORRIS</b>						
MINOR		0	1998	per WB	= size	41
OTHER AUTOMOBILE						41
UNKNOWN AUTOMOBILE						41
<b>MOTO-GUZZI</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						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

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>NEOPLAN</b>						
BUS - CONVENTIONAL FRONT ENGINE						902
BUS - FRONT ENGINE/FLAT FRONT						902
BUS - REAR ENGINE/FLAT FRONT						902
BUS BASED MOTORHOME						902
OTHER BUS						902
<b>NISSAN / DATSUN</b>						
F10		1977	1978	1	1	31
200/240 SX		1984	1998	2	2	32
1200/210/B210	Honeybee	1971	1982	1	1	33
Z-CAR, ZX	240/260/280Z, 300 ZX, Turbo	1970		1	1	34
	2+2	1975	1978	3	3	34
	2+2	1979		2	2	34
310		1979	1982	1	1	35
510	PL	1978	1981	1	1	36
	PL	1968	1973	2	2	36
610	PL	1973	1976	2	2	37
710	PL	1974	1977	2	2	38
810/MAXIMA		1977		3	3	39
ROADSTER	SPL 311, SRL 311, 1600, 2000, convertible	0	1970	1	1	40
PL411, RL411		0	1967	1	1	41
STANZA	XE	1982	1992	2	2	42
SENTRA		1983		1	1	43
PULSAR	EXA	1986	1990	2	2	44
	NX	1983	1990	2	2	44
MICRA		1987		1	1	45
NX 1600/2000		1992		2	2	46
ALTIMA		1993	1999	2	2	47
MURANO	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		4	7	49
TITAN	Use 8 stiffness for front impacts, size value for side or rear impacts.	2004		6	8	473
XTERRA	Use 7 stiffness for front impacts, size value for side or rear impacts.	2000		3	7	402
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
PATHFINDER	ARMADA (use 8 stiffness for end impacts, size value for side impacts)	1986		5	8	401
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	(use 7 stiffness for end impacts, size value for side impacts)	1993		4	7	443
DATSUN/NISSAN PU/Frontier	PL620, King Cab, Hardbody (use 8 stiffness for end impacts, size value for side impacts)	1973		PER WB	8	471
OTHER LIGHT TRUCK	Patrol (1960) (use 8 stiffness for end impacts, size value for side impacts)	0		PER WB	8	498
UNKNOWN LIGHT TRUCK						499
MEDIUM/HEAVY COE HIGH ENTRY						883
OTHER MEDIUM/HEAVY TRUCK						898
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY						899

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>NORTON</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
<b>OLDSMOBILE</b>						
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	0	1977	4	4	1
	F85	0	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	0	1976	6	6	2
	Starfire	0	1966	6	6	2
NINETY-EIGHT	Regency, Luxury	1986		4	4	3
	Regency, Luxury	1977	1984	5	5	3
	Regency, Luxury	0	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	0	98	6	6	6
STARFIRE	SX, GT	1975	1980	2	2	12
OMEGA		1980	1985	3	3	15
	RWD	1975	1979	4	4	15
FIRENZA		1982	1988	2	2	16
CIERA		1982		3	3	17
CALAIS		1985	1991	3	3	18
CUTLASS (FWD)		1988		3	3	20
ACHIEVA		1992		3	3	21
AURORA		1994		4	4	22
INTRIGUE						23
ALERO						24
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
BRAVADA	(use 7 stiffness for end impacts, size value for side impacts)	1991	1994	2	7	401
SILHOUETTE	(use 7 stiffness for end impacts, size value for side impacts)	1990		3	7	441
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
OTHER VEHICLE						998
UNKNOWN VEHICLE						999
<b>OSHKOSH</b>						
MEDIUM/HEAVY - CBE						805
MEDIUM/HEAVY - COE/ENTRY						805
POSITION UNKNOWN						
MEDIUM/HEAVY - COE/HIGH						805
ENTRY						

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE/LOW ENTRY						805
MEDIUM/HEAVY - OTHER						805
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						805
<b>OTHER DOMESTIC MANUFACTURER</b>						
<hr/>						
OTHER AUTOMOBILE						398
UNKNOWN MAKE						399
OTHER LIGHT TRUCK						498
OTHER MEDIUM/HEAVY TRUCK						898
OTHER BUS						988
OTHER VEHICLE						998
<b>OTHER FOREIGN MANUFACTURER</b>						
<hr/>						
OTHER AUTOMOBILE						398
OTHER LIGHT TRUCK						498
OTHER MEDIUM/HEAVY TRUCK						898
OTHER BUS						988
OTHER VEHICLE						998
<b>OTHER MAKE</b>						
<hr/>						
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
<b>OTHER MAKE MOPED</b>						
<hr/>						
OTHER MOTORED CYCLE						798
UNKNOWN MOTORED CYCLE						799
<b>OTHER MAKE MOTORED CYCLE</b>						
<hr/>						
0-50cc		0				701
51-124cc		0				702
125-349cc		0				703
350-449cc		0				704
450-749cc		0				705
750c or greater		0				706
Unknown cc		0				709
<b>PETERBILT</b>						
<hr/>						
MEDIUM/HEAVY BASED MOTORHOME						850
MEDIUM/HEAVY - CBE						881
MEDIUM/HEAVY - COE/LOW ENTRY						882
MEDIUM/HEAVY - COE/HIGH ENTRY						883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						890
MEDIUM/HEAVY - OTHER						898

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>PEUGEOT</b>						
304		1971	1973	3	3	31
403		0	1967	3	3	32
404	Station Wagon	0	1970	4	4	33
		0	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		1989	1991	3	3	36
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (UNKNOWN CC)						709
UNKNOWN MOTORED CYCLE						799
UNKNOWN VEHICLE						999
<b>PLYMOUTH</b>						
VALIANT/DUSTER/SCAMP	100, 200, Brougham, Signet, Custom, Special, 340/360, Twister: WB=108"	0	1976	3	3	1
	100, 200, Brougham, Signet, Custom, Special, 340/360, Twister: WB=111"	0	1976	4	4	1
SATELLITE/BELVEDERE	Belveder I/II, GTX, Roadrunner, Sebring, Sebring Plus, Superbird, Brougham	0	1974	4	4	2
FURY	Roadrunner	1975	1975	5	5	3
	I, II, III	0	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		1985	1989	3	3	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	1981	1989	2	2	11
SCAMP (CAR BASED PICKUP)	GT, 2.2	1982	1984	2	2	13
SUNDANCE		1987		2	2	17
ACCLAIM		1989		3	3	19
NEON		1994		3	3	20
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		1996		3	3	38
PROWLER						39
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
TRAILDUSTER	(use 8 stiffness for end impacts, size value for side impacts)	0		3	8	421
COLT VISTA	4 X 4 (use 7 stiffness for end impacts, size value for side impacts)	1987		3	7	441
VOYAGER (MINIVAN)	SE, LX: WB=112" (use 7 stiffness for end impacts, size value for side impacts)	1984		4	7	442

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
	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)	0		per WB	8	471
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>PONTIAC</b>						
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	0	1973	4	4	1
BONNEVILLE/CATALINA/PARISIE NNE	Brougham, Gand Safari, Safari, Granville, 2+2 Executive, Starchief	0	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	2005	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		1980	1984	3	3	15
	LJ, SJ	1977	1979	4	4	15
J2000/SUNBIRD/SUNFIRE 6000		1984	1994	2	2	16
GRAND AM	SE, LE	1982		3	3	17
GRAND PRIX (FWD)		1980	1980	3	3	18
LEMANS (1988-on)		1988		3	3	20
TORRENT	SE, Tempest (Canadian)	1988		2	2	31
UNKNOWN AUTOMOBILE	Use 7 stiffness for frontal impacts, size value for all		2006	4	7	14
TRANS SPORT	(use 7 stiffness for end impacts, size value for side impacts)	1990		3	7	441
VIBE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	402
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>PORSCHE</b>						
911	L, S, E, T, SC, Carrera, Slopenose, Speedstar	0		1	1	31
	Panorama	1996		1	1	31
912	E, T	0	1969	1	1	32
914	S, 1.8, 2.0, 914/6	1970	1976	2	2	33
924	Turbo, S	1977	1988	1	1	34
928	S	1978		2	2	35
930	Turbo	1989	1994	1	1	36
944	Turbo, S	1983	1992	1	1	37
959		1989	1994	1	1	38
968		1992	1995	1	1	39
986 BOXSTER						40
CAYENNE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		3	7	421
OTHER AUTOMOBILE	Spyder, Speedster, 356	0		PER WB	PER WB	398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>RELIANT</b>						
OTHER AUTOMOBILE						49
UNKNOWN AUTOMOBILE						49
<b>RENAULT/AMC</b>						
LECAR	5	1976	1983	2	2	31
DAUPHINE/10/R-8/CARAVELLE		0	1971	1	1	32
12	R12L, R12TL	1972	1977	2	2	33
15	R14TL	1973	1976	2	2	34
16	R16	1969	1972	3	3	35
17	R17, Gordini Coupe, R17TL	1973	1980	2	2	36
R18I	Sportwagon	1981		2	2	37
FUEGO	TL, TS, GTL, GTS, Turbo	1982	1985	2	2	38
ALLIANCE/ENCORE/GTA, CONVERTIBLE	L, DL, Limited, X-37	1983		2	2	39
ALPINE	GT	1987		PER WB	PER WB	41
MEDALLION	DL, LX	1987	1987	3	3	44
PREMIER		1987	1987	3	3	45
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>ROLLS ROYCE/BENTLEY</b>						
CLOUD/SHADOW SERIES		0		per WB	= size	42
OTHER AUTOMOBILE						42
UNKNOWN AUTOMOBILE						42
<b>SAAB</b>						
99/99E/900	S, Turbo, Cabriolet	0		2	2	31
SONNETT	II, III, V-4	1968	1974	1	1	32
95/96/97		0	1973	2	2	33
9000, CS	CS	1993		3	3	34
	S, Trubo	1985		3	3	34
9 - 3						35
9 - 5						36
9-7X	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		4	7	401
OTHER AUTOMOBILE						398

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>SATURN</b>						
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		3	3	4
RELAY	Use 7 stiffness for front impacts, size value for side or rear impacts.	2005		5	7	441
VUE	Use 7 stiffness for front impacts, size value for side or rear impacts.	2002		3	7	401
OTHER AUTOMOBILE						398
OUTLOOK	Use 7 stiffness for frontal impacts, size value for all	2007			7	6
UNKNOWN VEHICLE						999
<b>SCANIA</b>						
MEDIUM/HEAVY - CBE						807
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						807
MEDIUM/HEAVY - COE/HIGH ENTRY						807
MEDIUM/HEAVY - COE/LOW ENTRY						807
MEDIUM/HEAVY - OTHER						807
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						807
MEDIUM/HEAVY BASED MOTORHOME						807
<b>SIMCA</b>						
OTHER AUTOMOBILE						44
UNKNOWN AUTOMOBILE						44
<b>STERLING</b>						
827S	Li	1986	1991	3	3	31
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999
<b>STERLING TRUCKS</b>						
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
<b>STUDEBAKER</b>						
CRUISER		0	1966	per WB	= size	1
GRAN TURISMO		0	1966	per WB	= size	1
HAWK		0	1966	per WB	= size	1
LARK		0	1966	per WB	= size	1
OTHER AUTOMOBILE						1
UNKNOWN AUTOMOBILE						1

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>STUTZ</b>						
OTHER AUTOMOBILE		0		per WB	= size	398
UNKNOWN AUTOMOBILE		0		per WB	= size	398
<b>SUBARU</b>						
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		1970	1971	2	2	32
360		1969	1970	1	1	33
LEGACY	Brighton, Outback, Outback II	1989		2	2	34
XT/XT6	4WD Turbo, convertible, DL	1986		2	2	35
JUSTY	DL, GL	1987	1994	1	1	36
SVX		1992		3	3	37
IMPREZA	Outback, Outback II	1993		2	2	38
BRAT DL, GL		1978		2	2	43
BAJA	Use 8 stiffness for front impacts, size value for side or rear impacts.	2003		3	8	44
B-9 TRIBECA	Use 7 stiffness for frontal impacts, size value for all	2006		3	7	14
UNKNOWN AUTOMOBILE						399
FORESTER	Use 7 stiffness for front impacts, size value for side or rear impacts.	1996		3	7	401
UNKNOWN VEHICLE						999
<b>SUNBEAM</b>						
OTHER AUTOMOBILE						45
UNKNOWN AUTOMOBILE						45
<b>SUZUKI</b>						
SA310	GLX	1986		1	1	31
SWIFT	GTi, GTX	1989		1	1	34
ESTEEM		1995		TBD	TBD	35
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
SAMURAI	Standard, Deluxe (use 8 stiffness for end impacts, size value for side impacts)	1985	1995	1	8	401
SIDEKICK/GRAND VITARA	Use 7 stiffness for front impacts, size value for side or rear impacts.	1996		2	7	402
X-90/VITARA	Use 7 stiffness for front impacts, size value for side or rear impacts.	1999		2	7	403
XL7	Use 7 stiffness for front impacts, size value for side or rear impacts.	2001		4	7	405
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						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

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
<b>TOYOTA</b>						
CORONA	Mark II, Custom, 1900, 2000, Deluxe	0	1982	2	2	31
COROLLA		1986		2	2	32
	1100, 1200, 1600, SR-5, LE, Deluxe, Custom	1969	1985	1	1	32
CELICA	1900, 2000, GT, ST	1972	2005	2	2	33
	GTS	1972	1993	2	2	33
SUPRA	Celica Supra, Soarer	1979		3	3	34
CRESSIDA		1978	1992	3	3	35
CROWN	2300, 2600	0	1971	3	3	36
CARINA	2000	1972	1973	2	2	37
TERCEL	Corolla Tercel, 4WD Wagon	1980		2	2	38
STARLET		1981	1984	1	1	39
CAMRY	LE, Deluxe, XLE, Coupe	1983		3	3	40
MR-2		1985	1995	1	1	41
PASEO		1992		1	1	42
AVALON		1995		3	3	43
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
4-RUNNER	(use 8 stiffness for end impacts, size value for side impacts)	1985		3	8	401
RAV-4		1996		TBD	TBD	402
LANDCRUISER	(use 8 stiffness for end impacts, size value for side impacts)	1976		3	8	421
MINVAN/PREVIEW	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						442
PICKUP	SR-5, Extra Cab, Sport, LN44, Chinook, Wonder Wagon (use 8 stiffness for end impacts, size value for side impacts)	1974		PER WB	8	471
TACOMA						472
T-100	(use 8 stiffness for end impacts, size value for side impacts)	1993		PER WB	8	481
HIGHLANDER	Use 7 stiffness for front impacts, size value for side or rear impacts.	2001		3	7	403
TUNDRA	Use 8 stiffness for front impacts, size value for side or rear impacts.	2000		6	8	482
FJ CRUISER	Use 7 stiffness for frontal impacts, size value for all	2007		3	7	14
UNKNOWN LIGHT TRUCK						499
UNKNOWN VEHICLE						999
<b>TRIUMPH</b>						
SPITFIRE	I, II, III, IV, 1500	0	1981	1	1	31
GT-6	MK3	1967	1973	1	1	32
TR4	TR2, TR3, TR4A	0	1968	1	1	33
TR6		1969	1976	1	1	34
TR7/8		1975	1981	1	1	35
HERALD	Vitesse	0		TBD	TBD	36
STAG		1971	1973	2	2	37
OTHER AUTOMOBILE	2000, 1200 series	0		PER WB	PER WB	398
UNKNOWN AUTOMOBILE						399
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						709
<b>TVR</b>						
<hr/>						
OTHER AUTOMOBILE						46
UNKNOWN AUTOMOBILE						46
<b>UNKNOWN DOMESTIC MANUFACTURER</b>						
<hr/>						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNKNOWN MEDIUM/HEAVY TRUCK						899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
<b>UNKNOWN FOREIGN MANUFACTURER</b>						
<hr/>						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNKNOWN MEDIUM/HEAVY TRUCK		1993		2	2	899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
<b>UNKNOWN MANUFACTURER</b>						
<hr/>						
UNKNOWN AUTOMOBILE						399
UNKNOWN LIGHT TRUCK						499
UNKNOWN MOTORED CYCLE						799
UNK TYPE TRUCK (LIGHT/MED/HEAVY)						899
UNKNOWN MEDIUM/HEAVY TRUCK						899
UNKNOWN BUS TYPE						989
UNKNOWN VEHICLE						999
<b>UNKNOWN MEDIUM/HEAVY TRUCKS AND BUSES MANUFACTURER</b>						
<hr/>						
Unknown medium/heavy truck		0				899
Unknown bus type		0				988
<b>VOLKSWAGEN</b>						
<hr/>						
KARMANN GHIA		0	1974	1	1	31
BEETLE 1300/1500	flat windshield, 94.5" WB	0	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	0	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	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

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
FOX	GL	1987		1	1	44
CORRADO		1989		2	2	45
PASSAT		1990		2	2	46
JETTA III		1993		2	2	47
GOLF III		1993		2	2	48
NEW BEETLE						49
TOUAREG	Use 7 stiffness for front impacts, size value for side or rear impacts.	2004		4	7	421
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
THE THING (181)		1973	1975	1	1	401
VANAGON/CAMPER	Bus, Kombi, Van (use 7 stiffness for end impacts, s ize value for side impacts)	0		1	7	441
EUROVAN	Use 7 stiffness for end impacts, size value for side impacts.	1992		7	7	442
OTHER LIGHT TRUCK						498
UNKNOWN LIGHT TRUCK						499
<b><u>VOLVO</u></b>						
122	S	0	1968	3	3	31
142/144/145	S, E, GL, GLS, De luxe	0	1974	3	3	32
164	S, E	1969	1975	3	3	33
240/242/244/245	DL, GL, GLE, GLT, Deluxe	1975		3	3	34
262/264/265	GL	1976	1982	3	3	35
1800	E, S, ES	0	1973	2	2	36
760/780	GLE, Turbo	1983	1990	3	3	38
	GLE, Turbo	1987	1992	3	3	38
740	GLE, GT, Turbo, GL	1986	1992	3	3	39
940	GLE, Turbo, SE	1991		3	3	40
960		1992		3	3	41
850	GLT, Wagon	1993		3	3	42
70 SERIES						43
90 SERIES						44
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
XC90	Use 7 stiffness for front impacts, size value for side or rear impacts.	2003		4	7	401
MEDIUM/HEAVY CBE						881
MEDIUM/HEAVY COE LOW ENTRY						882
MEDIUM/HEAVY COE HIGH ENTRY						883
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						884
MEDIUM/HEAVY: COE ENTRY POSITION UNKNOWN						890
OTHER MEDIUM/HEAVY TRUCK						898
UNKNOWN MEDIUM/HEAVY TRUCK						899
MEDIUM BUS						981
OTHER BUS						988
UNKNOWN TYPE BUS						989
UNKNOWN VEHICLE						999
<b><u>WARD LAFRANCE</u></b>						
MEDIUM/HEAVY - CBE						898
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						898
MEDIUM/HEAVY - COE/HIGH						898

<u>Model</u>	<u>Includes</u>	<u>Start</u>	<u>End</u>	<u>Size</u>	<u>Stiffness</u>	<u>Code</u>
MEDIUM/HEAVY - COE/LOW ENTRY						898
MEDIUM/HEAVY - OTHER						898
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						898
<b>WESTERN STAR</b>						
MEDIUM/HEAVY - CBE						804
MEDIUM/HEAVY - COE/ENTRY POSITION UNKNOWN						804
MEDIUM/HEAVY - COE/HIGH ENTRY						804
MEDIUM/HEAVY - COE/LOW ENTRY						804
MEDIUM/HEAVY - OTHER						804
MEDIUM/HEAVY - UNKNOWN ENGINE LOCATION						804
MEDIUM/HEAVY BASED MOTORHOME						804
<b>YAMAHA</b>						
MOTORCYCLE (000-050CC)						701
MOTORCYCLE (051-124CC)						702
MOTORCYCLE (125-349CC)						703
MOTORCYCLE (350-449CC)						704
MOTORCYCLE (450-749CC)						705
MOTORCYCLE (750CC-OVER)						706
MOTORCYCLE (UNKNOWN CC)						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
<b>YUGO</b>						
GV	GVX, Cabriolet	1986	1992	1	1	31
OTHER AUTOMOBILE						398
UNKNOWN AUTOMOBILE						399
UNKNOWN VEHICLE						999