NATIONAL AUTOMOTIVE SAMPLING SYSTEM

1997 CRASHWORTHINESS DATA SYSTEM

DATA COLLECTION, CODING, AND EDITING MANUAL

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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NASS CDS DATA COLLECTION, CODING, AND EDITING MANUAL

List of Data Collection, Coding, and Editing Manual Changes

Change Identifier		Effective		
Log No.	PMOD No.	Date	Nature of Change	Type of Change

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NASS CDS DATA COLLECTION, CODING, AND EDITING MANUAL

1.0 INTRODUCTION

1.1 Purpose of the Manual

In order to produce a national traffic crash data base for the evaluation of old and the development of new highway and vehicle safety standards and to identify highway safety needs, the National Automotive Sampling System (NASS) was created. The system consists of twenty-four teams of crash researchers situated throughout the country. At each Primary Sampling Unit (PSU) site the crash research team investigates a probability sample of police reported crashes involving passenger cars, light trucks, and vans which were towed, according to the police report, from the scene due to damage. This system has been termed the **Crashworthiness Data System (CDS)**.

Zone centers have been established to provide for the quality control of the CDS data collected and the technical management of the teams within their zone. Quality control is carried out through zone center site visits to the PSUs and through the review of crash case report materials received at the zone center. The zone centers provide quality control in the areas of sam pling, completeness of data, reliability, and validity of data. In addition, the zone centers provide annual team evaluations, training, extra PSU staff (when needed), and act as a communication link between the PSU teams and the staff of the National Center for Statistics and Analysis (NCSA).

The purpose of this manual is to provide PSU team members, zone centers, the Transportation Safety Institute (TSI) NASS Training Program Coordinator, and NCSA with a consistent, standardized set of instructions for sampling crashes and collecting, coding, and editing the data.

1.2 Overview

The manual includes seven substantive sections; each is summarized below.

Section 2.0 Description of the Sampling Frame describes, first, the procedure for determining whether or not the incident reported on a police crash report (PAR) qualifies for inclusion in the NASS, second, the variables used to classify the NASS qualifying sampled PARs, and third, which data collection forms are required to be submitted with a NASS CDS case. The PAR sampling strata for the CDS are defined in terms of the values of the these variables. In addition, the **General Estimates System (GES)** and its relationship to CDS is discussed.

Section 3.0 Overview of Sampling Activities describes the procedures for compiling the sampling frame list and selecting the crashes to be researched for the CDS and obtained for the GES. Detailed instructions for use of the automated system are found in the MDE User's Manual.

Section 4.0 Overview of Information to be Collected on Sampled CDS Crashes describes the forms which are to be filled out on each crash, the different records (e.g., injury records), photographs, and other information (e.g., SMASH runs) which make up a completed case report. Also discussed are the file structuring data items and forms which must be encoded before a case can qualify for submission. In addition, the NASS CDS criteria for acceptable data completion are presented.

Section 5.0 CDS Submission Instructions describes when, where, and how to submit case reports. It also describes the quality control procedures to be used at the PSU sites. In addition, MDE consistency checks and the procedures for deleting a case are discussed.

Section 6.0 GES Quality Control and Submission Instructions presents the quality control checklist and the instructions for submission of GES sampling materials.

Section 7.0 Coding Instructions provides the general instructions for col lecting and coding the data called for in the Case Summary Form and the field forms. Documentation for each data element includes variable name, element values (attributes), definitions (where needed), data sources, collection method, reference materials (if needed), and remarks.

The Appendices contain some of the necessary references, including: (1) the Uniform Symbols for Scene Marking, (2) the Uniform Symbols for Accident Dia gramming, and (3) the listing of Variable Computer Formats.

Other references to be used in NASS CDS not contained in this manual include: (1) the Fifth Edition of ANSI D16.1-1989; (2) the SMASH Manual; (3) SAE J224 MAR80; (4) 1993 NASS Injury Coding Manual (based on AIS-90); (5) NATB books (see variable GV08); (6) Passenger Car and Truck Investigators Manual (see variable GV08); (7) Branham Automobile Reference Book; (8) Diesel and Gasoline Truck Indices; (9) AAMA - Passenger Car Specifications (see variable GV19); (10) Microcomputer Data Entry User's Manual for the NASS; and (11) the NASS Accident Investigation Procedures Manual.

1.3 How to Use This Manual

This manual is designed to be updated periodically without the need for re placing the entire document. This will be accomplished by adding, deleting, and changing pages. Additions will be inserted in their proper location and will be identified by a different month and year. Pages which are changed will have the same month and year identifier.

When potential data encoding problems are detected in the NASS CDS Data Collection, Coding, and Editing Manual or interpretations of specific circum stances (including NASS CDS definitions) are required, the following proce dures, outlined by NCSA, will be followed:

(a) Potential problems that are identified at the team level will be sent to the cognizant zone center via the NASS CDS message system.

(b) The zone center will review the potential problem.

    (1)   If it is a misinterpretation of the manual, a clarification will b e provided by the cognizant zone center via the NASS CDS message system (with a telephone follow-up, if necessary).

      (2)   If the potential problem is determined to be valid, the cognizant zone center will broadcast the potential problem with a recommended solution to the other zone center for review and concur rence. The final recommended solution will be sent to NCSA by the cognizant zone center for review and approval. This includes all additions, deletions, modifications or substantive interpretations that redefine, broaden, or narrow the established definition of NASS CDS variables or attributes.

(c) Changes or interpretations which affect field data encoding and are approved by the NCSA will be given an effective implementation date and included in the NASS CDS Coding Manual.

The above procedures were not established to restrict team or zone center operations but to ensure that program objectives and goals are not inadver tently changed (i.e., a variable is redefined beyond its intended purpose). When defining variables, NCSA must consider their operational use within the restrictions of the data collection time frame and their intended purpose. Any diversions from these established procedures may destroy the data validity and/or result in serious analysis problems.

2.0 DESCRIPTION OF THE SAMPLING FRAME

2.1 Crashes Which Qualify for NASS

The procedures for properly developing the list of motor vehicle crashes within the study area which qualify for research are shown in **Figure 2-1** and described below.

Start with a Police Reported Incident--All incidents which meet the criteria of a motor vehicle traffic crash, ANSI D16.1-1989, Section 2.4.20 (see figure 2-6), and are (a) reported on the state crash form, or on local crash forms, (b) signed by a police officer, and (c) available through the police agency files, are to be considered for study. Other crash report forms, such as special driver report forms, that do not meet the requirements above are excluded from consideration.

Must Be Reported to the State--For an incident to qualify as a NASS crash, the police jurisdiction must send a copy of the PAR to the state for inclusion in the state crash statistics. If a report will not be included in the state file, then the incident is not to be included in the list.   If the researcher cannot determine whether or not an incident will be reported to the state, then he/she should include it in the list.

Must Involve a Harmful Event--If the incident does not involve property damage and/or personal injury, do not include it in the list. The presence of a Police Crash Report creates a   rebuttable presumption that a harmful event has occurred. It is the duty of the researcher to scrutinize any PAR which alleges the absence of a harmful event.

The Harmful Event Must Have Occurred as a Result of an   Crash--A crash involves at least one harmful event (ANSI D16.1 -1989, section 2.4.1); see figure 2-6) produced by an unstabilized situation (ANSI D16.1 -1989, section 2.4.4; see figure 2-6). There are four (4) ways in which a harmful event occurs that are not a result of a crash (ANSI 2.4.1). They are: (a) the harmful event results from a diseased condition, (b) the unstabilized situation was the result of deliber ate intent, (c) the unstabilized situation was the result of legal interven tion, or (d) the harmful event results from a cataclysm (ANSI D16.1 -1989, section 2.4.5, see figure 2-6).   To clarify the meaning of each of these **"intervening circumstances"**, consider the examples below.

Disease: Even if the unstabilized situation is initiated by a disease such as cerebral hemorrhage, heart attack, diabetic coma, or epileptic seizure, which affects the driver of a motor vehicle in -transport, any subsequent harmful event which occurs is considered a crash. This includes any nonvehicular damage that this vehicle causes. The disease itself is not a harmful event for our classification as a traffic crash.

Deliberate Intent: A harmful event which has been intentionally produced does not fall within the definition of an unstabilized situation and, thus, is not a crash.

A driver kills himself/herself (suicide) or **self-inflicts injury** by driving a motor vehicle: (1) against a fixed object, (2) into a body of water, or (3) otherwise misuses a motor vehicle in transport, and this intent is

FIGURE 2-1

WILL ACCIDENT BE REPORTED TO THE STATE ➤ **OUT**
NO

YES

WAS THERE A HARMFUL EVENT (2.4.1)
(property damage or personal injury)

Factors:
Injury (2.3.1)
Damage (2.3.7)

YES

rebuttal presumption ➤ **OUT**
NO

WAS THIS EVENT AN ACCIDENT (2.4.7)

Factor:
Unstabilized Situation (2.4.4)

YES

Intervening Circumstances:
Diseases (2.3.1) (without other harmful effects)
Deliberate Intent (2.4.2)
Legal Intervention (2.4.3)
Cataclysm (2.4.5)

DID THIS ACCIDENT INVOLVE A ➤ **UT**
MOTOR VEHICLE (2.4.7)
NO

YES

Factor:
In Motion or
On A Roadway
(2.2.26)

WAS AT LEAST ONE OF THE INVOLVED ➤ **UT**
MOTOR VEHICLES IN TRANSPORT (2.2.29)
NO

YES

Factors:
Control Lost on Highway
Harm Occur on Trafficway
(2.4.16)

DID THIS ACCIDENT OCCUR ON A TRAFFICWAY (2.2.1) ➤ **OUT**
NO

YES

MOTOR VEHICLE TRAFFIC ACCIDENT (2.4.20)

YES

STABILIZATION (2.4.4)

A motor vehicle traffic accident (MVTA) originates on a police accident report (PAR) filed with the state. It involves (a) a harmful event not directly resulting from a cataclysm, (b) produced by an unstabilized situation, (c) involving at least one motor vehicle, (d) in-transport (in motion or on a roadway) such that (e) the harmful event occurred on a trafficway or the unstabilized situation originated on a trafficway.

verified in some manner. Such intentional events are not motor vehicle crashes.   If during such intentional acts other injury or damage occurs that goes beyond the original intent, then these events are accidental and meet the specifications of a motor vehicle crash, unless the contrary can be clearly established.

Example 1: A driver who intends to commit suicide by driving head -on into another vehicle is involved in a crash, since any harmful event which results to the other vehicle or occupants goes beyond the original intent of the driver.

A person, having announced intent in some manner, causes death, injury, or damage by driving a motor vehicle against persons, motor or other road vehicles, or other property, with **homicidal**, **injury**, or **damage inflicting intent**; such intended acts are not motor vehicle crashes. If, in doing such intended acts, other injury or damage occurs that goes beyond the original intent (i.e., **unintended consequences**), these events are acci dental and meet the specifications of a motor vehicle crash, unless the contrary can be clearly established.

Example 2: A driver (not connected with a law enforcement agency) who intentionally rams another vehicle, intending to inflict harm upon the vehicle or its occupants, is not involved in a crash. In Example 1 above, if the driver intended to inflict harm upon the other vehicle or its occupants, as well as inflict harm upon himself/herself, then this also would not be a crash.

However, **malicious mischief**, such as throwing a rock toward a motor vehicle, dropping an object from an overpass, or rolling an object upon a trafficway, is not considered to be deliberate intent unless it is clear ly established that the act was directed toward a speci fied person or motor vehicle. This is defined in ANSI D16.1 -1989, section 2.4.2 (see figure 2-6).

For the purposes of NASS PAR listing (given limited information on a PAR), a first harmful event resulting from deliberate intent should not be classified as a NASS crash, except where a subsequent harm occurs to a different vehicle or person such that the harm was an unintended consequence of the original event.

When in doubt, follow the instructions for listing the crash contained in Section 3.0 of this manual and call your zone center for guidance.

Legal Intervention: Legal intervention is a type of deliberate intent involving intentional acts by a law enforcement agent, officer, or other official. If in doing such intended acts, injury or damage occurs that goes beyond the original intent, then the other events are accidental and meet the specifications of a motor vehicle crash, unless the contrary can be clearly established. The following are examples of legal inter vention and should not be clas sified as crashes:

(a)	A road block is set up to stop a lawbreaker, and the lawbreaker crashes into it, either intentionally or unintentionally.

(b)	A police unit cuts in front of another vehicle to force it to the curb or shoulder and, as a result, the two vehicles collide.

(c)   A vehicle loses control as a result of bullets fired into it from a police officer's gun, and crashes.

The following are examples of a crash:

(d)   A driver, other than a lawbreaker, crashes unintentionally into a roadblock.

(e)   A lawbreaker, while eluding the police, loses control of his vehicle and crashes into another vehicle.

(f) A police car skids and crashes while chasing a law violator.

If in (c) above, the vehicle had created a harmful event with another vehicle or person, then the presumed unintended consequences of the action would qualify this situation as a crash.

One example which has previously been encountered is as follows: A prisoner jumps out of a police car and is injured. An officer in another car who observes this event, writes a report. Is this a crash? Yes. Although the prisoner exited the car intentionally, the subsequent injury harmful event) occurred as an unintended consequence of the prisoner's escape attempt, thus constituting this event as a crash. It should be assumed that the injury was an unintended consequence of the prison er's action unless the contrary can be clearly established.

For the purposes of NASS PAR listing, the same guidance as given above applies.

Cataclysm: ANSI D16.1-1989 lists the following events as catastrophic: a cloudburst, cyclone, earthquake, flood, hurricane, lightning, tidal wave, torrential rain, tornado, or volcanic eruption. If any one of these events was on -going at the time of the crash and produced the unstabilized situation which led to the harm, then the event(s) is (are) not considered a crash. One key phrase is "on-going". Consider the following example: A motor vehicle in -transport was overwhelmed by a landslide or an avalanche which was a direct result of a cataclysm, such as an earthquake, torrential rain, etc. This circumstance would not be considered a crash. However, this exclusion would not apply if a cataclysm were not in existence at the time of the event; nor would this exclusion apply if the motor vehicle was unintentionally driven against any fallen materials covering a trafficway as a result of any landslide or avalanche. As this example points out, the catastrophic event "exclu sion" should occur very rarely.

Another key phrase is "produced the unstabilized situation". The situa tion in which a vehicle hydroplanes in a torrential rain and exits the roadway, striking another motor vehicle or object, would fit the criteria for a NASS crash, but the situation in which a cloudburst/torrential rain washes a roadway out from under a vehicle traveling on a roadway would be excluded from consideration as a NASS crash. (Remember, the cataclysm must be on -going at the time of the crash.)

For the purposes of NASS PAR listing, list any crashes which you be lieve should be excluded under the cataclysm exception. Confirm their exclusion by relating the events to your zone center before drawing the NASS CDS sample.

After a NASS CDS crash has been selected the crash can be dropped if either subsequent research or an official ruling (e.g., by the police, by a medical examiner, etc.) reveals that one of the exceptions (i.e., disease, deliberate intent, legal intervention, or cataclysm) applies. When dropping the crash, notify your zone center and follow the procedures outlined in Section 5.3.

<u>Must Involve A Motor Vehicle as Defined by ANSI</u>--If a police report does not involve at least one motor vehicle as defined by ANSI D16.1 -1989, section 2.2.7 (see figure 2-6), then it should be returned to the file and not included in the list which qualifies for inclusion.

Example: A bicycle which runs off the road and hits a tree is not a motor vehicle crash and should not be listed.

<u>Must Involve a Motor Vehicle in -Transport</u>--Use the ANSI D16.1-1989, section 2.2.29 (see figure 2-6) definition to determine if the motor vehicles in the crash are in -transport. There must be at least one motor vehicle in the crash in -transport for the crash to qualify. (NOTE: **Any driverless vehicle of which any portion is located on the roadway is considered as a vehicle in-transport**)

Example 1: A bicyclist running into a car which is parked off the roadway does not constitute a motor vehicle crash for this study and would be excluded. If a police report has been filled out on such an incident, return the police report to the file because it does not quali fy.

Example 2: Vehicles parked on roads of reduced width, such as result from snow accumulation and incomplete snow removal, are to be considered in -transport if any portion is on the roadway.

<u>Must Involve a Motor Vehicle In -Transport on a Trafficway</u>--Exclude crashes which occur in places other than a trafficway. Examples of places which are not on the trafficway include private driveways and parking lots (except entrances and roadways within parking lots which are customarily used to get from the entrance to a parking aisle). Review carefully the diagrams de-picting rural, urban, and divided trafficways in **Figures 2-2**, **2-3**, and **2-4**.

Example: An abandoned vehicle, a portion of which is on the roadway, is struck by a bicyclist, causing injury to the bicyclist. A police report is filled out by an investigating officer. Is this a motor vehicle crash? Yes it is, because there is a police reported incident involv ing a motor vehicle in -transport on a trafficway.

In each of these figures (**2-2**, **2-3**, and **2-4**) any harmful event: (1) resulting from an unstabilized situation, (2) involving an in -transport motor vehicle, and (3) which occurs between the two right-of-way lines, <u>occurred</u> on a trafficway. This means that "the harmful event" need not necessarily be the first harmful event; see the discussion of stabilization which follows. It is only necessary that "a harmful event" occur between the right -of-way lines. Further, any harmful event satisfying the conditions above which occurs on the "roadside" (**Figures 2-2** and **2-4**), in the "median" (**Figure 2-4**), or at or beyond the curbed area (**Figure 2-3**), qualifies as a NASS crash.

FIGURE 2-2

Example of a Rural Trafficway
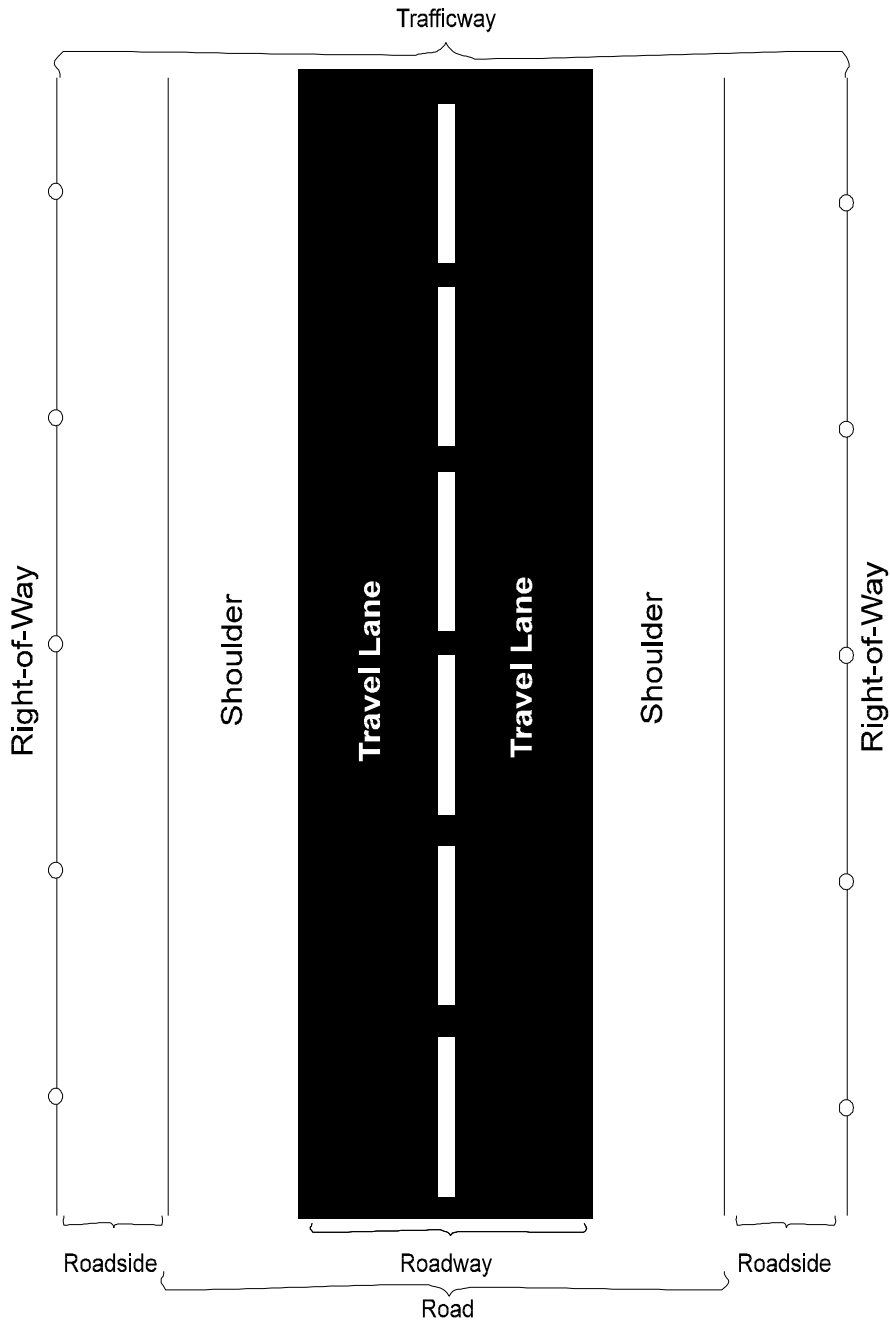
FIGURE 2-3

Example of an Urban Trafficway
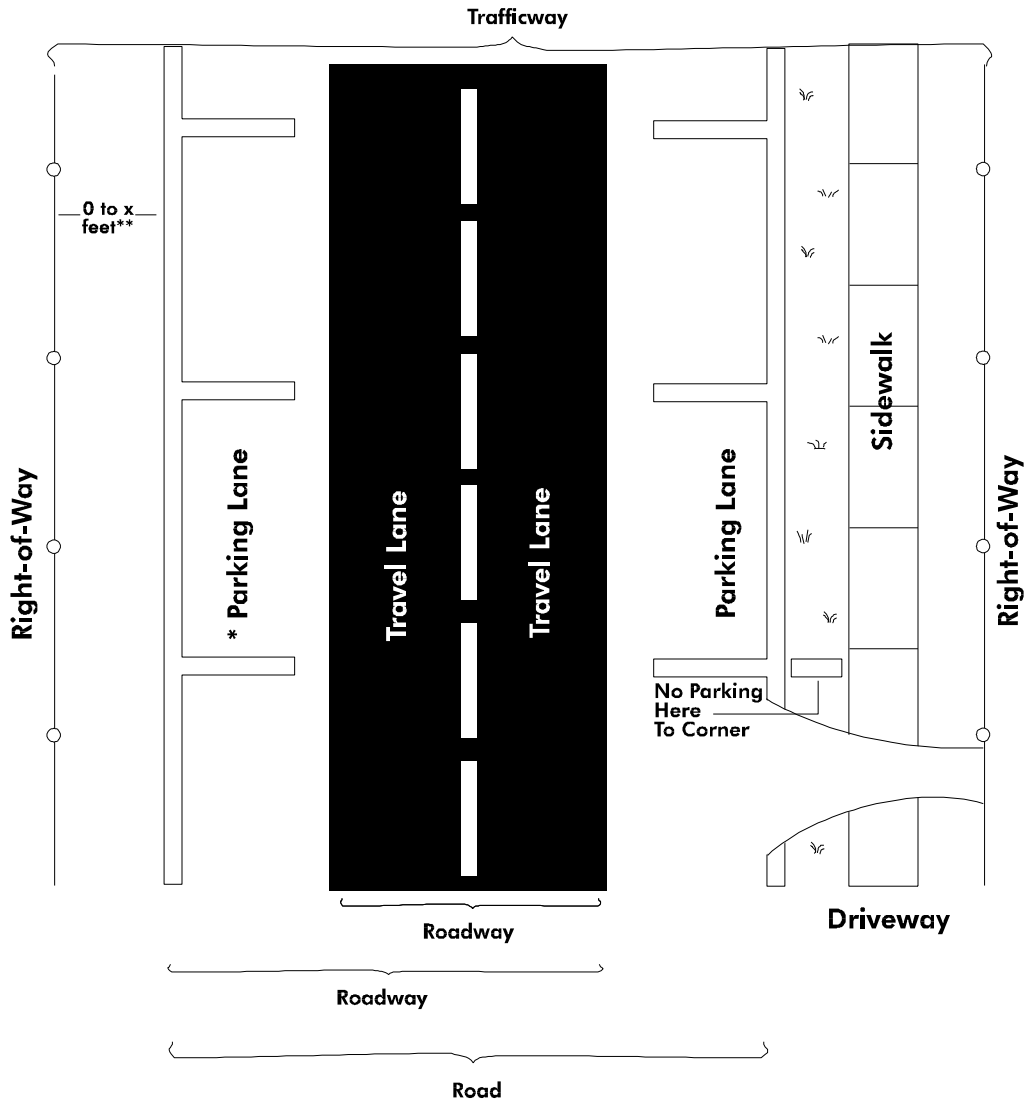
* No parking allowed 6 to 9 am or 3 to 60 pm

** The actual right-of-way in many cases will not be known. But it is clear that the trafficway always goes from curb to curb or from shoulder to shoulder.

FIGURE 2-4

Trafficway

Right-of-Way | Shoulder | Travel Lane | Travel Lane | Shoulder | Shoulder | Travel Lane | Travel Lane | Shoulder | Right-of-Way

Roadside | Roadway | Median | Roadway | Roadside

Road | Road
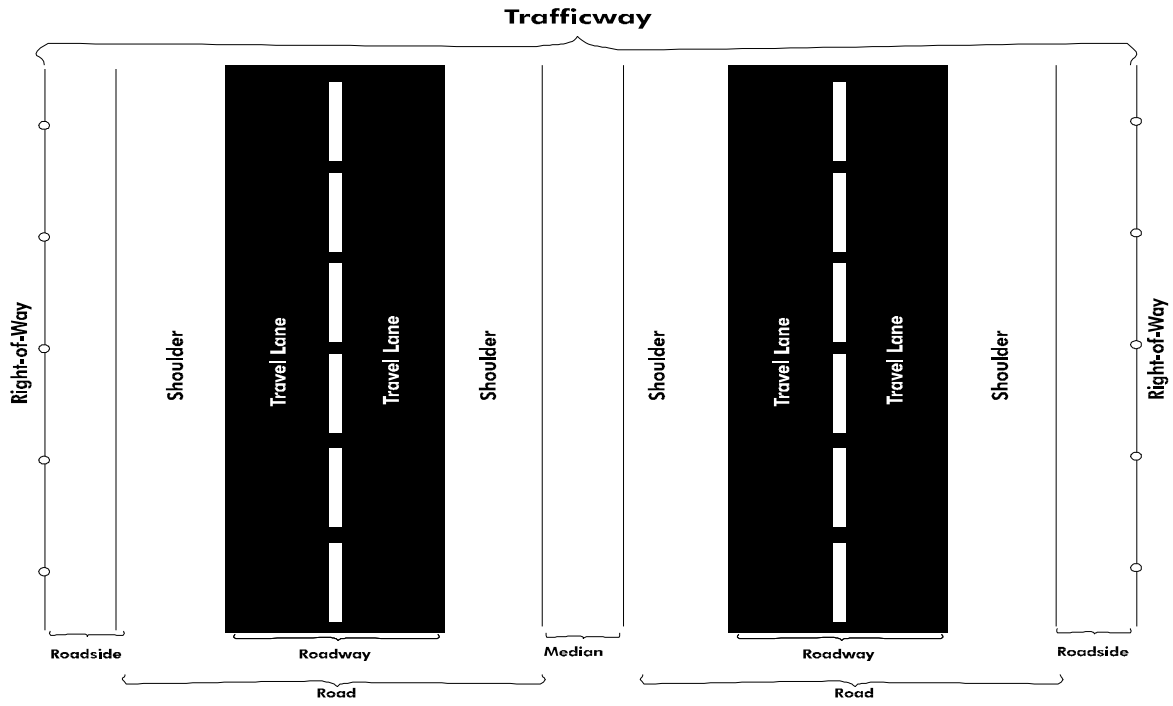
Example of a Divided Trafficway

Example: An in-transport motor vehicle entering or exiting the driveway (**Figure 2-3**) is involved in a harmful event between the right-of-way line and the beginning of the "road". Because the harmful event occurred on a **trafficway**, this police reported incident is a NASS crash.

A **driveway** is usually a private way providing access to property adjacent to a trafficway. An **alley** is an unnamed private way providing access, in general, to the rear of houses or buildings, some of which may be further served by a driveway.

Most driveways (but not all) and alleys are not trafficways in NASS. Examples of non-NASS trafficways are driveways to: (1) service stations, (2) residential dwellings, and (3) most apartment complexes, hotels, motels, and other commercial establishments.

As a **general rule**, assume sidewalks adjacent to roads are part of the public domain and thus are located within the right-of-way. This assumption also applies to utility poles located along a road.

Parking Lot Crashes

There are two types of land ways (ANSI 2.1.11) in parking lots: parking aisles and access roads. Parking aisles are used for the purpose of getting into and out of parking spaces. They provide no **direct access** to or from trafficways (ANSI 2.2.1) and are **not** trafficways. Access roads provide **direct** access to and from parking aisles and **no** direct access to parking spaces. Access roads **are** trafficways.

In order for a crash to qualify for the NASS CDS, it must involve a trafficway. Therefore, for crashes occurring in parking lots, code only those crashes occurring on access roads. **Do not** code crashes occurring in parking aisles or spaces. If the location of the crash cannot be determined from the PAR (scene diagram and narrative) then exclude the PAR from the listings.

FIGURE 2-5
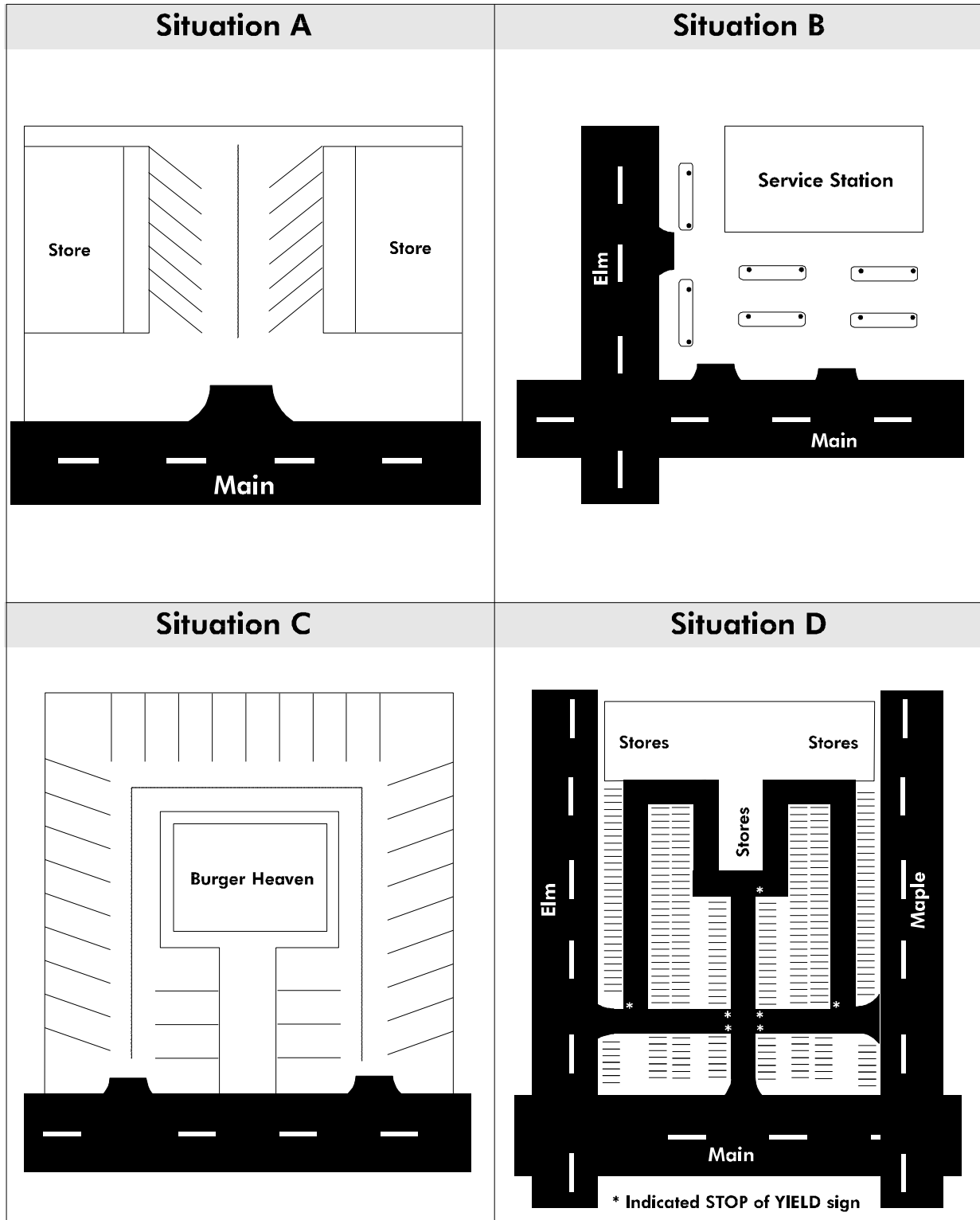
In summary, each of the preceding qualifiers are designed to focus your attention to the specific subset of transportation-related incidents characterized as "motor vehicle traffic crashes" (see **Figure 2-1**). In NASS, you research <u>Motor Vehicle Traffic Crashes (MVTCs)</u>. To put this subset of crashes which qualify for NASS in perspective, see **Figure 2-6**. This figure outlines the major definitional sections of ANSI D16.1 -1989 into meaningful groups and shows how the phenomenon of motor vehicle traffic crashes fits into the overall transportation crash picture. Accompanying **Figure 2-6** are the primary ANSI definitions of interest to NASS. **Figure 2-6** refers to these definitions. These definitions are provided here as both a reference source to you, the NASS researcher, as well as enabling you to understand the larger transportation crash picture to which ANSI refers. Be sure to remember the location in this manual of **Figures 2-1** and **2-6**; together, they can serve as a handy reference source to remind you of what constitutes a "NASS crash".

Figure 2-7 depicts the relationship between the ANSI definitions and NASS. Shown in this figure are the four types of transport crashes (ANSI D16.1- 1989, section 2.4.7, see figure 2-6): aircraft crashes, watercraft crashes, railway crashes, and road vehicle crashes. A priority scheme exists when a transport crash involves more than one type of transport vehicle. Any unstabilized situation that results from an aircraft is considered an aircraft crash. This means that if a plane crashes, impacting an intransport motor vehicle, any damage or injury in the motor vehicle is considered part of the aircraft crash and <u>is not</u> a road vehicle crash; thus, if the associated motor vehicle is listed on a PAR, that PAR cannot be sampled in NASS. Similarly, if the unstabilized situation is caused by a watercraft, then all resulting damage is considered part of the watercraft crash. Aircraft crashes take precedence over watercraft crashes. Aircraft and watercraft crashes take precedence over railway and road vehicle crashes. If a road vehicle and a railway vehicle impact, the crash is classified according to which transport vehicle type produced the unstabilized situation. An example of an unstabilized situation produced by a railway vehicle is a derailment. If after a derailment a railway vehicle impacts a road vehicle, then the crash is classified as a railway crash. The vast majority of motor vehicle -train impacts are the result of an unstabilized situation created by the motor vehicle. Specifically, any time a train is on its tracks and is impacted by a motor vehicle, then the crash should be considered a road vehicle crash.

Figure 2-7 expands upon the four cell road vehicle crash matrix presented in **Figure 2-6**. Three of the cells contain examples of crashes that are <u>not</u> MVTCs--Motor Vehicle Nontraffic Crashes, Other Road Vehicle Traffic Crash, and Other Road Vehicle Nontraffic Crash. As this figure depicts, motor vehicle traffic crashes represent the vast majority of road vehicle crashes. NASS researches motor vehicle traffic crashes--**except for those not reported to the State**. All reported MVTCs are part of the **GES**. MVTCs qualifying for the **CDS** are but a part of all MVTCs. The shaded area of the MVTC cell represents the three types of GES crashes that do not qualify for the CDS. The definition of NASS sampling and the respective CDS and GES strata are covered in Section 2.2.

FIGURE 2-6

Manual on Classification of Motor Vehicle Traffic Accidents -- 5th Edition ANSI D16.1-1989

	Section
Person	2.1.1
Property	2.1.2
Transport device	2.1.3
Animal	-.-.-
Transport vehicle	2.1.4
Aircraft	2.1.5
Watercraft	2.1.6
Land vehicle	2.2.4
Road vehicle	2.2.6
Motor vehicle	2.2.7
Other road vehicle	2.2.8
In-transport	2.2.29
Transport way	2.1.8
Airway	2.1.9
Waterway	2.1.10
Land way	2.1.11
Railway	2.2.3
Private way	2.2.2
Trafficway	2.2.1
Road	2.2.28
Shoulder	2.2.27
Roadway	2.2.26
Roadside	-.-.-
Median	-.-.-
Accidents	2.4
Harmful event	2.4.1
Injury	2.3.1
Damage	2.3.7
Unstabilized situation	2.4.4
Deliberate intent	2.4.2
Legal intervention	2.4.3
Cataclysm	2.4.5
Accident	2.4.6
Transport accident	2.4.7
Aircraft accident	2.4.8
Watercraft accident	2.4.9
Railway accident	2.4.11
Road vehicle accident	2.4.15
Motor vehicle accident	2.4.10
Other road vehicle accident	2.4.12
or	
Traffic Accident	2.4.16
	2.4.18
Nontraffic accident	2.4.17
	2.4.19

Motor Vehicle Traffic Accident

	Traffic Accident	Nontraffic Accident
Motor Vehicle	2.4.20	2.4.21
Other Road Vehicle	2.4.22	2.4.23

FIGURE 2-6 (Definitions)

ACCIDENT: (2.4.6)
An accident is an unstabilized situation which includes at least one harmful event.

AIRCRAFT: (2.1.5)
An aircraft is a transport vehicle designed primarily for, or in use for, moving persons or property through the air from one place to another. Inclusions: airplane, balloon, dirigible, glider, parachute, spacecraft, and others.

AIRCRAFT ACCIDENT: (2.4.8)
An aircraft accident is a transport accident that involves an aircraft in -transport.

AIRWAY: (2.1.9)
An airway is a transport way reserved primarily for use by aircraft taking off, in flight, or landing.

AT-GRADE INTERSECTION:(2.5.12)
An at-grade intersection is an intersection where all roadways cross or join at the sa me level.

AUTOMOBILE: (2.2.10)
An automobile is a motor vehicle other than a motorcycle consisting primarily of a transport device designed for carrying ten or fewer persons. Automobiles may be classified by size or weight, or both. Size classification is based on wheelbase. Weight classification is based on curb weight, the weight of an automobile with standard equipment and a full complement of fuel and other fluids, but with no load of persons or property. Before classification, wheelbase should be rounded to the nearest inch and curb weight should be rounded to the nearest 100 pounds.

Primary automobile size categories are: [THREE-CATEGORY SET: (3.10.2.1)]
Small	—	wheelbase 99 inches (2.51 meters) or less
Midsize	—	wheelbase 100 to 109 inches (2.54 to 2.77 meters)
Large	—	wheelbase 110 inches (2.79 meters) or more

Secondary automobile size categories are: [SEVEN-CATEGORY SET: (3.10.2.2)]
Ultrasmall	—	wheelbase 89 inches (2.26 meters) or less
Minicompact	—	wheelbase 90 to 94 inches (2.29 to 2.39 meters)
Subcompact	—	wheelbase 95 to 99 inches (2.41 to 2.51 meters)
Compact	—	wheelbase 100 to 104 inches (2.54 to 2.64 meters)
Intermediate	—	wheelbase 105 to 109 inches (2.67 to 2.77 meters)
Full-size	—	wheelbase 110 to 114 inches (2.79 to 2.90 meters)
Largest	—	wheelbase 115 inches (2.92 meters) or more

Primary automobile weight categories are: [THREE-CATEGORY SET: (3.11.2.1)]
Light	—	curb weight 2400 pounds (1089 kilograms) or less
Midweight	—	curb weight 2500 to 3400 pounds (1134 to 1542 kilograms)
Heavy	—	curb weight 3500 pounds (1588 kilograms) or more

Secondary automobile weight categories are: [SEVEN-CATEGORY SET: (3.11.2.2)]
A	—	curb weight 1400 pounds (635 kilograms) or less
B	—	curb weight 1500 to 1900 pounds (680 to 862 kilograms)
C	—	curb weight 2000 to 2400 pounds (907 to 1089 kilograms)
D	—	curb weight 2500 to 2900 pounds (1134 to 1315 kilograms)
E	—	curb weight 3000 to 3400 pounds (1361 to 1542 kilograms)
F	—	curb weight 3500 to 3900 pounds (1588 to 1769 kilograms)
G	—	curb weight 4000 pounds (1814 kilograms) or more

BUS: (2.2.11):
A bus is a motor vehicle consisting primarily of a transport device designed for carrying more than ten persons.

CATACLYSM: (2.4.5)
A cataclysm is an avalanche, cloudburst, cyclone, earthquake, flood, hurricane, landslide, lightning, tidal wave, tornado, torrential rain, or volcanic eruption.

CLASSIFICATION OF ROAD VEHICLES BY DAMAGE SEVERITY — MOTOR VEHICLESE: (3:2.2.1)
In order of precedence, motor vehicle categories by severity of damage are:
Disabling damage to motor vehicle
Functional damage to motor vehicle
Other motor vehicle damage
No damage to motor vehicle

COLLISION ACCIDENT: (2.6.2)
A collision accident is a road vehicle accident other than an overturning accident in which the first harmful event is a collision of a road vehicle in -transport with another road vehicle, other property or pedestrians (pedestrians or nonmotorists).

DAMAGE: (2.3.7)
Damage is harm to property that reduces the monetary value of that property. Inclusions: harm to wild animals, or birds, which have monetary value, and others. Exclusions: harm to wild animals, or birds, which have no monetary value. Harm to a snowbank unless, for example, additional snow -removal costs are incurred because of the harm. Mechanical failure during normal operation, such as tire blowout, broken fan belt, or broken axle, and others.

DELIBERATE INTENT: (2.4.2)
Deliberate intent is the classification given to the cause of an event which occurs when a person acts deliberately to cause the event or deliberately refrains from prudent acts which would prevent the occurrence of the event. Inclusions: suicide, self -inflicted injury, homicide, injury or damage purposely inflicted, and others. Exclusions: injury or damage beyond that which was intended, and others.
> *Examples:*
> 1. When a driver intentionally kills or injures himself with a motor vehicle, by driving it against a fixed object or into a body of water, for example, the driver's death or injury is a result of deliberate intent.
> 2. When a driver intentionally kills or injures another person with a motor vehicle, by running into a pedestrian, for example, the death or injury is a result of deliberate intent.
> 3. When a driver intentionally causes damage with a motor vehicle, by ramming another vehicle, for example, the damage is a result of deliberate intent.

DISABLING DAMAGE: (2.3.11)
Disabling damage is road vehicle damage which precludes departure of the vehicle from the scene of the accident in its usual operating manner by daylight after simple repairs. Inclusions: vehicles which could be driven but would be further damaged thereby, and others.
> *Exclusions*:
> Damage which can be remedied temporarily at the scene without special tools or parts other than tires;
> Tire disablement without other damage even if no spare tire is available;
> Headlamp or taillight damage, which would make night driving hazardous but would not affect daytime driving;
> Damage to turn signals, horn, or windshield wipers which makes them inoperative; and
> Others.

DRIVER: (2.2.32)
A driver is an occupant who is in actual physical control of a transport vehicle or, for an out -of-control vehicle, an occupant who was in control until control was lost.

DRIVEWAY ACCESS: (2.5.9)
A driveway access is a roadway providing access to property adjacent to a trafficway. Inclusions: entrances to gas stations and others. Exclusions: any area not within a trafficway.

FULL TRAILER: (2.2.16)
A full trailer is a trailer, other than a pole trailer, designed for carrying property and so constructed that no part of its weight rests upon or is carried by the towing road vehicle. An auxiliary undercarriage assembly, commonly known as a converter dolly and consisting of a chassis, fifth wheel and one or more towbars, is sometimes used to convert a semitrailer to a full trailer.

FUNCTIONAL DAMAGE: (2.3.12)
Functional damage is any road vehicle damage, other than disabling damage, which affects operation of the road vehicle or its parts.
> *Inclusions*:
> Doors, windows, hood, and trunk lids which will not operate properly;
> Broken glass which obscures vision;
> Any damage which would prevent the motor vehicle from passing an official motor vehicle inspection;
> Tire damage even though the tire may be changed at the scene;
> Bumpers which are loose; and
> Others.
> *Exclusions*:
> Dented or bent fenders, bumpers, grills, body panels, destroyed hubcaps, and others.

GRADE SEPARATION:(2.5.14)
A grade separation is a crossing at different levels of two trafficways, or a trafficway and a railway.

GROSS WEIGHT: (2.2.20)
Gross weight is the weight of a road vehicle including the weight of the road vehicle, its load of persons and property, and all added equipment.

GROSS VEHICLE WEIGHT RATING: (2.2.21)
A gross vehicle weight rating is (1) a value specified by the manufacturer for a single -unit truck, truck tractor or trailer, or (2) the sum of such values for the units which make up a truck combination. In the absence of a gross vehicle weight rating, an estimate of the gross weight of a fully loaded unit may be substituted for such a rating.

HARMFUL EVENT: (2.4.1)
A harmful event is an occurrence of injury or damage.
> ***Inclusions:***
> Injury or damage resulting when a driver dies or loses consciousness because of a disease condition such as a stroke, heart attack, diabetic coma, or epileptic seizure. In such a case the immediate effect of the disease, such as the driver's death or loss of consciousness, is not itself considered to be a harmful event.

HEAVY TRUCK: (2.2.24)
A heavy truck is a truck which has a gross vehicle weight rating of more than 26,000 pounds (11,793 kilograms).

INJURY: (2.3.1)
An injury is bodily harm to a person. Exclusions: effects of diseases, such as stroke, heart attack, diabetic coma, epileptic seizure, and others.

INTERSECTION: (2.5.10)
An intersection is an area which (1) contains a crossing or connection of two or more roadways not classified as driveway access and (2) is embraced within the prolongation of the lateral curb lines or, if none, the lateral boundary lines of the roadways. Where the distance along a roadway between two areas meeting these criteria is less than 10 meters (33 feet), the two areas and the roadway connecting them are considered to be parts of a single intersection.

IN-TRANSPORT: (2.2.29)
The term "in-transport" denotes the state or condition of a transport vehicle which is in-motion or within the portion of a transport way ordinarily used for travel by similar transport vehicles.

When applied to motor vehicles, "in-transport" means in-motion or on a roadway. Inclusions: motor vehicle in traffic on a highway, driverless motor vehicle in-motion, motionless motor vehicle abandoned on a roadway, disabled motor vehicle on a roadway, and others.

In roadway lanes used for travel during rush hours and parking during off-peak periods, a parked motor vehicle is in-transport during periods when parking is forbidden.

JACKKNIFE ACCIDENT: (2.6.4)
A jackknife accident is a noncollision accident in which the first harmful event results from unintended contact between any two units of a multiunit road vehicle such as a truck combination.

JUNCTION: (2.5.11)
A junction is either an intersection or the connection between a driveway access and a roadway other than a driveway access.

LAND VEHICLE: (2.1.7)
A land vehicle is a transport vehicle which is neither an aircraft nor a watercraft.

LAND WAY: (2.1.11)
A land way is the space within property lines or other boundary lines of any transport way that is neither an airway nor a waterway.

LARGE MOTORCYCLE: (2.2.9.2)
A large motorcycle is any motorcycle other than a motor-driven cycle.

LEGAL INTERVENTION: (2.4.3)
Legal intervention is a category of deliberate intent in which the person who acts or refrains from acting is a law-enforcing agent or other official.
> ***Examples:***
> 1. If a lawbreaker crashes either intentionally or unintentionally into a road block set up by police to stop him, the crash is considered a result of legal intervention. If a driver other than the lawbreaker crashes into the road block, the crash is not considered to be a result of legal intervention.
> 2. If a police car is intentionally driven into another vehicle, the crash is considered to result from legal intervention. If a lawbreaker being pursued by the police loses control of his vehicle and crashes, the crash is not considered to result from legal intervention unless the police intended that the lawbreaker crash.

LIGHT TRUCK: (2.2.22)
A light truck is a truck which has a gross vehicle weight rating of less than 10,000 pounds (4,536 kilograms).

MEDIUM TRUCK: 2.2.23)
A medium truck is a truck which has a gross vehicle weight rating of from 10,000 to 26,000 pounds (4,536 to 11,793 kilograms).

MOPED: (2.2.9.4)
A moped is a speed-limited motor-driven cycle which may be propelled by ped aling. Exclusions: motor scooters, motorized or motor-assisted bicycles, and others.

MOTORCYCLE: (2.2.9)
A motorcycle is any motor vehicle having a seat or saddle for the use of its operator and designed to travel on not more than three wheels in contact with the ground. Exclusions: construction, farm, or industrial machinery. Inclusions: large motorcycle, motor -driven cycle, speed-limited motor-driven cycle, moped, motor scooter, motorized or motor-assisted bicycle, and others.

MOTOR-DRIVEN CYCLE: (2.2.9.1)
A motor-driven cycle is any motorcycle having an engine with less than 150 cubic centimeters displacement or with five brake horsepower or less.

MOTOR VEHICLE: (2.2.7)
A motor vehicle is any motorized (mechanically or electrically powered) road vehicle not operated on rails.

MOTOR VEHICLE ACCIDENT: (2.4.10)
A motor vehicle accident is a transport accident that (1) involves a motor vehicle in -transport, (2) is not an aircraft accident or watercraft accident, and (3) does not include any harmful event involving a railway train in-transport prior to involvement of a motor vehicle in -transport.

MOTOR VEHICLE NONTRAFFIC ACCIDENT: (2.4.21)
A motor vehicle nontraffic accident is a motor vehicle accident which is a nontraffic accident.

MOTOR VEHICLE TRAFFIC ACCIDENT: (2.4.20)
A motor vehicle traffic accident is a motor vehicle accident which is a traffic accident.

NONCOLLISION ACCIDENT: (2.6.3)
A noncollision accident is any road vehicle accident other than a collision accident.
> ***Inclusions:***
> - overturning accident;
> - jackknife accident;
> - accidental poisoning from carbon monoxide generated by a road vehicle in -transport;
> - breakage of any part of a road vehicle in-transport, resulting in injury or in further property damage;
> - explosion of any part of a road vehicle in -transport;
> - fire starting in a road vehicle in -transport;
> - fall or jump from a road vehicle in -transport;
> - occupant hit by an object in, or thrown against some part of a road vehicle in -transport;
> - injury or damage from moving part of a road vehicle in -transport;
> - object falling from, or in, a road vehicle in -transport;
> - object falling on a road vehicle in -transport;
> - toxic or corrosive chemicals leaking out of a road vehicle in -transport;
> - injury or damage involving only the road vehicle that is of a noncollision nature, such as a bridge giving way under the weight of a road vehicle, striking holes or bumps on the surface of the trafficway, or driving into water, without overturning or collision;
> - and others.

NONCONTACT ROAD VEHICLES: (3.6.3)
A "phantom" or "noncontact" road vehicle, such as one which forces another off the road but is itself not damaged, is not counted as one of the road vehicles involved in an accident.

NONTRAFFIC ACCIDENT: (2.4.17)
A nontraffic accident is a road vehicle accident which is not a traffic accident.

OCCUPANT: (2.2.30)
An occupant is any person who is part of a transport vehicle.

OTHER ROAD VEHICLE: (2.2.8)
An other road vehicle is any road vehicle other than a motor vehicle. Inclusions: animal -drawn vehicle (any type), animal harnessed to a conveyance, animal carrying a person, street car, pedalcycle, and others.

OTHER-ROAD-VEHICLE ACCIDENT: (2.4.12)
An other-road-vehicle accident is a transport accident that (1) involves an other road vehicle in -transport and (2) is not an aircraft accident, watercraft accident, motor vehicle accident, or railway accident.

OTHER-ROAD-VEHICLE NONTRAFFIC ACCIDENT: (2.4.23)

An other-road-vehicle nontraffic accident is an other-road-vehicle accident which is a nontraffic accident.

OTHER-ROAD-VEHICLE TRAFFIC ACCIDENT: (2.4.22)
An other-road-vehicle traffic accident is an other-road-vehicle accident which is a traffic accident

OVERTURNING ACCIDENT: (2.6.1)
An overturning accident is a road vehicle accident in which the first harmful event is the overturning of a road vehicle.

PARKING LOT: (2.5.22)
A parking lot is an area used primarily for parking road vehicles. When paved and marked it commonly includes the following areas:
    (1)   ***Parking stalls*** — areas reserved primarily for parked road vehicles
    (2)   ***Parking lot aisles*** — areas used primarily for vehicular access to parking stalls. Parking lot aisles are not trafficways.
    (3)   ***Parking lot ways*** — land ways which are used primarily for vehicular circulation within parking lots and for vehicular access to parking lot aisles. Parking lot ways in parking lots open to the public are trafficways.

PASSENGER: (2.2.33)
A passenger is any occupant of a road vehicle other than its driver.

PEDALCYCLE: (2.2.25)
A pedalcycle is a nonmotorized other road vehicle propelled by pedaling. Inclusions: bicycle, tricycle, unicycle, pedalcar, and others.

PERSON: (2.1.1)
A person is any living human. Within the context of this manual, a fetus is considered to be part of a pregnant woman rather than a separate individual. After death, a human body is not considered to be a person.

POLE TRAILER: (2.2.14)
A pole trailer is a trailer designed to be attached to the towing road vehicle by means of a reach or pole, or by being boomed or otherwise secured to the towing road vehicle, and ordinarily used for carrying property of a long or irregular shape such as poles, pipes, or structural members that are generally capable of sustaining themselves as beams between the supporting connections.

PRIVATE WAY: (2.2.2)
A private way is any land way other than a trafficway. The space within a crossing of a private way and a trafficway shall be considered to be {a} trafficway.

PROPERTY: (2.1.2)
Property is any physical object other than a person. Inclusions: real property, personal property, animals — wild or domestic, signs, guardrails, impact attenuators, and others.

RAILWAY: (2.2.3)
A railway is any private way reserved primarily for land vehicles moving persons or property from one place to another on rails.

RAILWAY ACCIDENT: (2.4.11)
A railway accident is a transport accident that (1) involves a railway train in-transport and (2) is not an aircraft accident, watercraft accident or motor vehicle accident.

RAILWAY VEHICLE: (2.2.4)
A railway vehicle is any land vehicle that is (1) designed primarily for, or in use for, moving persons or property from one place to another on rails and (2) not in use on a land way other than a railway. Inclusions: street car on private way, and others. Exclusions: street car operating on trafficway and others.

ROAD: (2.2.28)
Road is that part of a trafficway which includes both the roadway and any shoulder alongside the roadway.

ROADWAY: (2.2.26)
A roadway is that part of a trafficway designed, improved, and ordinarily used for motor vehicle travel or, where various classes of motor vehicles travel or motor vehicles are segregated, that part of a trafficway used by a particular class. Separate roadways may be provided for northbound and southbound traffic or for trucks and automobiles. Exclusions: bridle paths, bicycle paths, and others.

ROAD VEHICLE: (2.2.6)
A road vehicle is any land vehicle other than a railway vehicle.

ROAD VEHICLE ACCIDENT: (2.4.15)
A road vehicle accident is a transport accident that is either a motor vehicle accident or an other-road-vehicle accident.

ROAD VEHICLE DAMAGE: (2.3.8)
Road vehicle damage is damage to a road vehicle. Inclusions: damage to any part of a road vehicle.
Exclusions: injury to any person, whether or not the person is part of the road vehicle.

ROAD VEHICLE NONTRAFFIC ACCIDENT: (2.4.19)
A road vehicle nontraffic accident is a nontraffic accident.

ROAD VEHICLE TRAFFIC ACCIDENT: (2.4.18)
A road vehicle traffic accident is a traffic accident.

RURAL AREA: (2.5.2)
A rural area is any area which is not within urban areas.

SEMITRAILER: (2.2.15)
A semitrailer is a trailer, other than a pole trailer, designed for carrying property and so constructed that part of
its weight rests upon or is carried by the towing road vehicle.

SHOULDER: (2.2.27)
A shoulder is 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.

SINGLE-UNIT TRUCK: (2.2.17)
A single-unit truck is a truck consisting primarily of a single motorized transport device. When connected to a
trailer, such a device may be part of a truck combination.

SPEED-LIMITED MOTOR-DRIVEN CYCLE: (2.2.9.3)
A speed-limited motor-driven cycle is any motor-driven cycle which:
> (1)   will not attain a speed of more than 30 miles per hour (48 kilometers per hour) in one mile
> (1.609 kilometers) from a standing start,
> (2)   has an engine with not more than 50 cubic centimeters displacement or with two brake
> horsepower or less, and
> (3)   has a power drive system which does not require its operator to shift gears.

TRAFFICWAY: (2.2.1)
A trafficway is any land way open to the public as a matter of right or custom for moving persons or property
from one place to another.
> *Inclusions:*
> Within areas with guarded entrances, such as military posts or private residential
> developments, land ways are trafficways if the guards customarily admit public traffic.
> *Exclusions:*
> A land way under construction is not a trafficway if traffic is prohibited from entering by signing
> or barriers which are in conformance with applicable standards. However, if any part of the
> land way is open to travel while the remainder is closed, that part which is open for traffic is a
> trafficway. Likewise, any temporary bypass of a construction site is a trafficway.
>
> A land way temporarily closed to travel and marked by signing or barriers which are in
> conformance with applicable standards is not a trafficway even though used by authorized
> vehicles, such as maintenance vehicles, or when intentionally or inadvertently used by
> unauthorized vehicles. A land way open only to local traffic is not considered closed.

TRAFFIC ACCIDENT: (2.4.16)
A traffic accident is a road vehicle accident in which (1) the unstabilized situation originates on a trafficway or
(2) a harmful event occurs on a trafficway.

TRAILER: (2.2.13)
A trailer is a road vehicle designed to be drawn by another road vehicle. Inclusions: pole trailer, semitrailer, full
trailer.

TRANSPORT ACCIDENT: (2.4.7)
A transport accident is an accident (1) that involves a transport vehicle in -transport, (2) in which the first
harmful event is not produced by the discharge of a firearm or explosive device, and (3) that does not directly
result from a cataclysm. Inclusions: motor vehicle driven into water after a bridge was washed out during a
hurricane or flood (cataclysm), motor vehicle driven into fall materials covering a roadway after a landslide or
avalanche (cataclysm), and others.

TRANSPORT DEVICE: (2.1.3)
A transport device is any device designed primarily for moving persons or property along with the device itself
from one place to another, except (1) a weapon, (2) a device used primarily within the confines of a building
and its premises, or (3) a human -powered nonmotorized device not propelled by pedaling.
> *Inclusions:*
> Airplane, helicopter, hovercraft, ship, submarine, train, boxcar, caboose, snowmobile,
> automobile, bus, truck, trailer, semitrailer, motorcycle, bicycle, moped, and others.

Exclusions:
> Devices not designed primarily for moving persons or property, such as construction machinery, farm or industrial machinery, snow plows, army tanks, etc.
> Devices which do not move from one place to another, such as pipelines, elevators, escalators, ski lifts, conveyor belt systems, etc.
> Weapons, such as guns, torpedoes, etc.
> Devices used primarily within buildings and their premises, such as fork lifts in factories or lumber yards, motorized baggage trucks in railroad stations, etc.
> Human -powered nonmotorized devices not propell ed by pedaling, such as skis, scooters, roller skates, baby carriages, etc.

TRANSPORT VEHICLE: (2.1.4)
A transport vehicle consists of one or more devices or animals and their load. Such devices or animals must include at least one of the following:

(1)   a transport device, or a unit made up of connected transport devices, while idle or in use for moving persons or property from one place to another,
(2)   an animal or team of animals while in use for moving persons or property other than the animal or team itself from one place to another, or
(3)   a movable device such as construction, farm, or industrial machinery outside the confines of a building and its premises while in use for moving persons, the device itself, or other property from one place to another.

If such a device or animal has a load, the load is part of the transport vehicle. Loads include:
> Persons or property upon, or set in motion by, the device or animal;
> Persons boarding or alighting from the device or animal;
> Persons or property attached to and in position to move with the device or animal.

If the load upon a transport device includes another transport device, the entire unit including the load is considered to be a single transport vehicle.
Inclusions:
(1)   **Transport Devices** — airplane towing a sailplane, tugboat pushing a barge, boxcar coupled to a caboose, truck tractor towing a semitrailer and a trailer, snowmobile towing a skier, automobile towing another automobile, and others;
(2)   *Animals* — horse and rider, dog team drawing a sled, team of horses drawing a sled, burro carrying a load of firewood, mule towing a boat on a canal, and others; and
(3)   **Other Movable Devices** — road grader while traveling under its own power from a maintenance depot to a working place, lawn mower while being ridden down a street under its own power, farm tractor while pulling a wagon loaded with corn from a field to a storage place, army tank while moving under its own power from a firing range to a motor pool, and others.
Exclusions:
(1)   **Transport Devices** — pickup truck while being used to power a saw, dump truck while spreading its load, tow truck while using its winch, jeep while pulling a device picking up golf balls, transit -mix concrete truck while discharging its load, dump truck while plowing snow, and others.

TRANSPORT WAY: (2.1.8)
A transport way is any way or place reserved or commonly used for the operation of transport vehicles.
Exclusions: hiking trail, sidewalk, footpath, and others.

TRUCK: (2.2.12)
A truck is a motor vehicle designed primarily for carrying property. Inclusions: single -unit truck, truck combination. Exclusions: truck tractor.

TRUCK COMBINATION: (2.2.19)
A truck combination is a truck consisting primarily of a transport device which is a single -unit truck or truck tractor together with one or more attached trailers. Inclusions: truck tractor with semitrailer, truck tractor with semitrailer and one or more full trailers, single -unit truck with one or more full trailers, and others.

TRUCK TRACTOR: (2.2.18)
A truck tractor is a motor vehicle consisting of a single motorized transport device designed primarily for drawing trailers.

UNSTABILIZED SITUATION: (2.4.4)
An unstabilized situation is a set of events not under human control. It originates when control is lost and terminates when control is regained or, in the absence of persons who are able to regain control, when all persons and property are at rest.
Exclusions: Sets of events which are the result of deliberate intent or legal intervention.

Examples:

1. If intentional acts cause injury or damage beyond that reasonably to be expected from the acts, the unexpected injury or damage is not the result of deliberate intent. There is, therefore, an unstabilized situation unless the contrary can be clearly established.

2. In a motor vehicle crash live electric wires fall on a motor vehicle, but there is no injury from the electric current while the occupants remain in the motor vehicle. The unstabilized situation ends with the occupants in a temporary position of safety. Any subsequent injury resulting from attempts by the occupants to leave the motor vehicle, or attempts by others to rescue the occupants, is a part of a new unstabilized situation.

3. In a motor vehicle crash the occupants of the motor vehicle are carried or thrown into water, but there is no injury from the submersion and the occupants reach a temporary position of safety. At this point the unstabilized situation has ended. Any subsequent injury from attempts by the occupants to reach shore, or from attempts by others to rescue the occupants is part of a new unstabilized situation.

4. In a motor vehicle crash objects are loosened but remain in place until all persons are removed from danger from objects that might fall or roll. No property damage would result if the objects fell or rolled. This ends the unstabilized situation. Any subsequent injury attributable to the fall or roll of the loosened objects is not part of the original unstabilized situation.

5. In a motor vehicle crash the motor vehicle catches on fire and is burning, but all occupants have been rescued and the fire is under control. No additional property damage is expected. This is the end of the unstabilized situation. If the heat of the fire ignites nearby combustible materials, any subsequent injury or damage from the induced ignition is not part of the original unstabilized situation.

6. In a motor vehicle crash an involved motor vehicle carrying explosive materials is stopped and occupants and bystanders are removed from the scene. At this point the unstabilized situation is ended. If the explosive materials detonate during later attempts to remove or salvage them, any injury or damage resulting from the explosion is not part of the original unstabilized situation.

URBAN AREA: (2.5.1)
An urban area is an area whose boundaries shall be those fixed by responsible state and local officials in cooperation with each other and approved by the Federal Highway Administration, U.S. Department of Transportation. Such boundaries are established in accordance with the provisions of Title 23 of the United States Code. Urban area boundary information is available from State highway or transportation departments. In the event that boundaries have not been fixed as above for any urban place designated by the Bureau of the Census having a population of 5,000 or more, the area within boundaries fixed by the Bureau of the Census shall be an urban area.

WATERCRAFT: (2.1.6)
A watercraft is a transport vehicle designed primarily for, or in use for, moving persons or property on or through, and supported by, water from one place to another.

WATERCRAFT ACCIDENT: (2.4.9)
A watercraft accident is a transport accident if (1) it involves a watercraft in -transport and (2) is not an aircraft accident.

WATERWAY: (2.1.10)
A waterway is a transport way reserved primarily for use by watercraft.

FIGURE 2-7

NASS ACCIDENT OVERVIEW

Aircraft Crashes
Watercraft Crashes
Railway Crashes
Road Vehicle Crashes

		Most Severe Police Reported Injury					
		TRANSPORTED				**NOT TRANSPORTED**	
	FATAL INJURY "K"	**SERIOUS INJURY "A"**			INJURED, OR UNKNOWN IF INJURED "B", "C", OR "U"	INJURED, NOT INJURED, OR UNKNOWN IF INJURED "A", "B", "C", "O", or "U"	
		Single CDS Applicable Vehicle	Multiple CDS Applicable Vehicles				
		TOWED		**AT LEAST 2 TOWED**	**ONLY 1 TOWED**	At Least One CDS Applicable Vehicle Towed	No CDS Applicable Vehicles Towed
		Hospitalized	Not Hospitalized	Hospitalized	Not Hospitalized			
INJURY IN TOWED, LMY, CDS APPLICABLE VEHICLE	A	J	C	J	C	E	G	Not In Scope See Table 2-2
INJURY NOT IN TOWED, LMY, CDS APPLICABLE VEHICLE	B	K	D	K	D	F	H	

NONTRAFFIC ACCIDENT

For example:

1. snowmobile hits tree in woods,
2. two cars impact in a service station
3. on-farm vehicular accident, or
4. golfer overturns golf cart near 13th green.

MOTOR VEHICLE

OTHER ROAD VEHICLE

For example: 1. pedacycle impacts parked (not in-transport) motor vehicle on road, 2. horse-drawn hay wagon loses a wheel ejecting and injuring wagon occupants, or 3. animal carrying a person bolts ejecting and injuring occupant.

For example: pedacycle impacts vehicle parked in parking stall in a parking lot.

Stabilization --At times, one police report will contain more than one accident. This will happen when events constituting an accident have stabilized (as defined in ANSI D16.1 -1989, section 2.4.4, see figure 2-6) and units involved in the first sequence are subsequently involved in another accident sequence which is recorded on the same police report. If more than one accident is recorded on a police report, based on the ANSI definition of stabilized, then use the following protocol to determine which of the crashes is to be listed and stratified.

First, identify all NASS crashes and exclude from consideration those that are not NASS crashes.

Second, three situations exist (identified below as A, B, and C). Identify the situation that is applicable to the PAR under consideration and follow the protocol provided.

Situation A:
If only one accident qualifies for the CDS (Strata A-K--see section 2.2 below) and one or more **GES** crashes not applicable to the CDS (see section 2.2 below) exist on the same PAR, choose the CDS accident.

Situation B:
If more than one accident qualifying for the CDS exists on the same PAR, follow steps (1) through (4) below to select the CDS accident to stratify. Ignore any GES crashes not applicable to the CDS which may also be on the PAR.

(1) If injury is involved and you can determine the relative degree of injury between crashes and one accident is of higher severity, then choose that accident.

(2) If injury is involved and you determine that the relative injury between crashes is approximately equal, then choose the first of the highest equal injury crashes.

(3) If injury is involved but you cannot determine the relative injury between crashes, then choose the first accident.

(4) If no injuries, then choose the first accident.

Situation C:
If no accident qualifying for the CDS exists on a PAR but more than one GES accident not applicable to the CDS exists on the PAR, then follow the criteria in (1) through (4) above to select the GES accident to stratify.

In those cases where an accident, by NASS criteria, other than the one reported on the PAR, is alluded to (e.g., in the narrative), there is a rebuttable presumption that this PAR is the only PAR that will be submitted to report both crashes. This presumption may be overridden if the researcher has knowledge of: (1) another PAR on file, (2) a statement in the narrative indicating that there is, or will be, another PAR, or (3) the dispatcher or other police personnel having knowledge of the crashes, indicates that there is, or will be, another report filed.

Example: The PAR narrative states: "Vehicle #1 had been struck by an unidentified vehicle that did not stop. As driver of Vehicle #1 opened door to get out, door caught rear wheels of trailer of Vehicle #2." There is no other mention of the unidentified vehicle which failed to stop anywhere else on the PAR. The PAR contains two separate crashes. The injury severity for both is "no injury"; therefore, the first is used for NASS CDS stratification purposes, independent of the police emphasis on the second.

However, caution must be exercised when separating crashes on a PAR. At times, it will appear that two distinct events of an accident sequence should be considered separately. According to ANSI D16.1-1989, section 2.4.4 (see figure 2-6), an unstabilization terminates "...when all persons and property are at rest..." "Property" can refer to the damaged vehicles, separated components of the vehicles, or cargo. Often the interviews will be the only source for determining whether or not stabilization occurred before the second event.

>   Example: Two vehicles collide in the eastbound lanes of a divided trafficway. Cargo from one vehicle spills into the westbound lanes and another vehicle is damaged. If it can be determined that stabilization never occurred (i.e., the cargo struck the vehicle, or the vehicle struck the moving cargo), the two harmful events would be considered one accident, and all three vehicles considered applicable to the NASS accident. If it should be discovered during the research that the cargo came to rest for a period of time prior to being struck by the third vehicle, then the events would be considered as two separate crashes.

2.1.1   Questions and Answers About Which Incidents Qualify for NASS

Please find below a list of questions aimed at helping researchers determine if an accident report qualifies for the NASS.

Question: If a motor vehicle in-transport hits a pothole, causing damage to a tire and wheel or to the exhaust system, is this incident eligible for NASS?

Answer: Yes, it is eligible for NASS. To be eligible, recall that, first, a police report must be filed and, second, that the criteria set forth in ANSI D16.1 -1989, section 2.3, have been met. In essence, these criteria mandate that the following occurs: (a) a harmful event (damage or injury), (b) involving a motor vehicle, (c) in -transport, and (d) that the unstabilized situation originated (i.e., control was lost) on a trafficway or the harmful event occurred on a trafficway. If the parties involved suffered damage to the wheels, suspension, exhaust system, or undercarriage of their vehicles, then you have a valid accident for NASS; however, ANSI D16.1 -1989, section 2.3.7 (see figure 2-6) specifically excludes damage from **mechanical failure** during normal operation. The intent is to exclude a "blow-out" incident where the driver brings the vehicle safely to the side of the road without incurring other damage. This exclusion was not meant to exclude an incident where a "blow-out" led to other vehicle damage (e.g., ran into a tree) while the driver was attempting to regain control.

Question: A man driving a motor home slams on his brakes to avoid another vehicle in his lane; he succeeds. However, his young daughter is thrown against the instrument panel and suffers injury. Is this a motor vehicle accident?

Answer: It is a motor vehicle traffic accident involving one vehicle. The other vehicle is not involved.

Question: A car loses control on a trafficway, leaves the trafficway, and does damage to a private lawn. There is no damage to the car and the driver is not hurt. Is this a traffic accident?

Answer: Yes! It would also be a traffic accident if the motor vehicle left the scene before the police arrived (i.e., a hit-and-run vehicle). In these situations, the determining factor is whether the police filed an accident report that was eventually reported to the state.

Question: A pulp wood truck is travelling down a public road with an insecure load; the load shifts and all of the wood falls off the truck. The wood bounces and rolls, and then strikes a fence on the side of the road, doing approximately $500 worth of damage to the fence. There is no damage to anything except the fence and no other vehicles are involved; however, there is a police report made out on the incident, which is eventually included in the state file. Does this incident qualify for NASS?

Answer: Yes this situation does qualify for NASS. The harmful event is the damage to the fence.

Question: A power line falls onto a motor vehicle in -transport, causing personal damage. Is this incident applicable for NASS? A tree falls onto a motor vehicle as it was driving down the road. Is this incident applicable for NASS.

Answer: Both of the above situations, plus many similar ones (e.g., rocks fell onto the vehicle), fall into the category of near cataclysmic events. ANSI D16.1 -1989, section 2.4.7 (see figure 2-6) excludes, from the definition of a transport accident, harmful events resulting from a cataclysm. To further define this exclusion, the cataclysm must have been on-going at the time the accident happened. Cataclysms are defined in ANSI D16.1 - 1989, section 2.4.5, (see figure 2-6). Therefore, to exclude the situation of an object (power line, rock, etc.) falling on a motor vehicle in -transport, the cataclysm which caused the object to fall must have been on -going at the time of the incident. In terms of the specific questions, they are NASS crashes.

Question: We have a rare situation where a bystander dropped his gun; it struck the ground and discharged. A bullet struck the windshield of a vehicle in -transport. Should this incident be listed as a motor vehicle accident?
Answer: No,this is a firearms accident. However, it is entirely possible that a firearms accident could trigger a traffic accident.

Question: A convertible is traveling with its top down, and occupants are riding on its boot. The vehicle swerves to avoid another vehicle; one of the occupants falls from the vehicle and is injured. Is this incident a NASS accident?

Answer: Yes, it is a noncollision (as defined in ANSI D16.1 -1989, section   2.6.3) type NASS accident.

Question: A tow truck is towing a pickup. The towed pickup truck looses an axle, which subsequently strikes a vehicle parked in a parking lot. Is this a NASS accident?

Answer: Yes it is. A motor vehicle in-transport loses part of its cargo (axle of pickup), which strikes (harmful event) a vehicle not in -transport.

Question: A motor vehicle, parked in a driveway, slipped out of gear, rolled down the drive, crossed the street, and struck a tree on the other side. Is this an applicable accident?

Answer: It depends on the location of the vehicle when control was lost and the location when the harm occurred. To be an applicable NASS accident, the control must have been lost on a trafficway or the harmful event must have occurred on a   trafficway. If the vehicle was up in its driveway (i.e., outside of the trafficway--it must be clearly beyond the curb, utility poles, or any sidewalk boarding the curb), then control was lost (i.e., control is assumed lost when the gears slipped) off a trafficway. If the tree that was struck was off the trafficway (same as above), then it is not an applicable NASS accident and whether the vehicle is on or off the roadway at impact is irrelevant. Given that you have to make a decision at the police station (must have a police report to start with), scrutinize the police report for any information which would help you in determining the locations of the key

elements. If the police report is uninformative concerning these key elements, include the accident for listing purposes. If selected in the NASS CDS sample, a review of the scene should determine whether or not the accident remains.

2.2 NASS PAR Sampling

Before a NASS accident, represented by a PAR, can be selected for research in either the **CDS** or the **GES (GENERAL ESTIMATES SYSTEM)** it must first be listed with all other qualifying PARs (the process of listing PARs is described in Section 3.2). From the listed PARs a CDS and a GES sample will be chosen.

To increase the efficiency of the samples, qualifying PARs are grouped into sampling Strata based on accident outcome, and the samples are selected. The selection of the PARs for investigation is done in two phases. The first phase uses information from the police accident report to first stratify the PARs and includes the five sampling variables listed in Section 2.2.1. The second phase uses hospital information to determine the second stratification for the PARs and is also explained in Section 2.2.1.

2.2.1 Sampling Variables

A document has been developed describing unique guidelines established for each PSU to assist it in determing the sampling variables. This document is located at each PSU, Zone Center, and NCSA. This documen t **must** be referred to when determining the sampling variables.

2.2.1.1 First Phase of Sampling

The first sampling phase involves classifying the accident by five different criteria: type of vehicle, tow status of vehicle, most severe police reported injury, disposition of the injured, and model year of the vehicle.

2.2.1.1.1 Type of Vehicle

The police report is used to determine the types of vehicles involved in the NASS accident. Vehicles are classified as either **"CDS applicable vehicles"**, **"Medium/heavy trucks"**, or as **"other vehicles"**. CDS applicable vehicles include the vehicle types: automobiles, automobile derivatives, utility vehicles, van based light trucks, and light conventional trucks where the qualifying trucks must have a gross vehicle weight rating (GVWR) of less than or equal to 4,536 kilograms. The exact distinction among a CDS applicable vehicle, a medium/heavy truck, and an other vehicle is defined in terms of the variable Body Type (GV07). **CDS applicable vehicles** are in-transport vehicles whose Body Type (GV07) equals: **"01" through "49"**. **Medium/heavy trucks** are in-transport vehicles whose Body Type (GV07) equals : **"60" through "79"**. **Other vehicles** are in-transport vehicles whose Body Type (GV07) equals: **"50" through "59" and "80" through "99"**. If there is no indication by the police officer of the type of vehicles involved in the NASS accident (e.g., a hit -and-run accident), then classify the vehicle as an unknown body type (GV07=**"99"**).

Where Body Type (**GV07**) is **known but not distinguishable** on the PAR for CDS applicable vehicle identification purposes (e.g., "passenger car", "truck", "van"), refer to your VIN reference materials to decode the VIN if the VIN is present, or refer to other sections (i.e., diagram, narrative, etc.) of the PAR that may provide identifying information. If the VIN is not present and GV07 is still unknown, then **consider, for sampling purposes**, the **GV07** code to be: **"09"** if the PAR only indicates that a passenger car was involved; **"29"** if the PAR only indicates that a van was involved; **"39"** if the PAR only indicates that a pickup was involved; **"48"** if the PAR indicates truck without reference to pickup or van and the GVWR is known to be less than 4,536 kilograms or **"49"** if the vehicle's Body Type (automobile, utility, van or light truck) is unknown but the GVWR is known to be less than 4,5 36 kilograms. **Consider the**

vehicle in question to be a CDS applicable vehicle. If the PAR indicates that the vehicle's Body Type is a truck but does not reference the GVWR, then consider the **GV07** code to be **"79"**, and consider the vehicle in question to be a non -CDS applicable vehicle (medium/heavy truck). If the body type is still not known and the PAR indicates truck assume that the truck is a heavy truck (GVWR>4536kg).

2.2.1.1.2 Tow status of the vehicles

A police report is used to determine if an in - transport vehicle involved in the NASS accident was towed due to damage from the accident scene. Any item on the PAR may be used to help determine tow status (e.g., damage severity, narrative). If no CDS applicable vehicle is indicated on the police report as towed due to damage from the accident scene, then the NASS accident is not of interest to the CDS, but is classified in the GES as either a X Stratum, Y Stratum or Z Stratum accident. However, there is an **exception**. Even if the police report indicates that an in -transport CDS applicable vehicle was towed from the scene due to damage <u>and</u> the only harmful event occurring to this vehicle is a   noncollision which resulted from a fire,
explosion, an intraunit damage (other than a jack knife), or a noncollision injury, then do not consider this vehicle as "towed due to damage" for CDS stratification purposes.

PARs may not identify with 100% certainty which towed vehicles were towed as a result of damage. If nothing on the PAR can be used to make this determination then assume that the towed vehicle was towed due to damage. If the PAR indicates a vehicle as towed due to damage and has also been described as "moved" (from final rest) and there is no indication that the vehicle has been driven then consider the vehicle as towed due to damage. If there is any positive indication that the vehicle has been driven from final rest then consider the vehicle as not towed.

2.2.1.1.3 Most severe police reported injury

The indication on the police report of injury severity, if any, to any person involved in the NASS accident is the most severe police reported injury. Each person's severity should be translated into the KABCO codes, if necessary (see explanation of variable OA34 of this manual).

For purposes of stratification, the CDS is only concerned with the most se verely injured occupant of any towed CDS applicable vehicle. The injury se verity to persons not in a towed CDS applicable vehicle is not considered. On the other hand, the GES is concerned with the most severely injured person in the NASS accident.

2.2.1.1.4 Disposition of the injured

The indication on the police report that at least one occupant not sustaining a "K" injury of a towed CDS applicable vehi cle went **directly from the accident scene** to a treatment facility (hospital, clinic, doctor's office, etc.) for treatment (e.g., not transported solely to have a blood alcohol test conducted) indicates the disposition of the injured. The means of transportation is not a consideration nor is the length of stay at the facility.

For purposes of stratification, the CDS is only concerned with the transportation of occupants of towed CDS applicable vehicles who did not sustain a "K" injury. The transportation of any one occupant of a towed CDS applicable vehicle, not sustaining a "K" injury, qualifies the NASS CDS accident as **"transported"**. The transportation or nontransportation of any person who: (1) sustained a "K" injury or (2) was not in a tow ed CDS applicable vehicle, is not considered. On the other hand, the GES does not consider the disposition of the injured for sampling purposes.

If the PAR does not indicate the disposition of the injured occupant(s) of the towed CDS applicable vehicle(s), then consider the NASS accident as having no transported occupants. However, if the PAR does state that an occupant was transported but does not specify which occupant, then assume that the occupant with the highest injury coded in the accident was transported.

2.2.1.1.5 Model Year of Vehicle

The indication on the PAR of the vehicle's production (model) year indicates the model year of the vehicle. The production year is not neces sarily the same as the actual calendar year in which the vehicle was produced. For purposes of CDS stratification, all in -transport vehicles are separated into either "late model year vehicles" or " nonlate model year vehicles". A late model year vehicle is one whose production year is the three previous years, the current year, and the following year. Any vehicle whose production year is before this is considered a nonlate model year vehicle. GES does not consider the model year of the vehicles.

If the police report indicates the production year for only one of multiple vehicles involved in the accident, then classify the accident based on that vehicle's information.

If there is no indication on the police report of the production year of the vehicle , then check: (1) The vehicle's Vehicle Identification Number ; and/or (2) for passive restraint availability information. Only one of these criteria need to be met for classifying as a late model year vehicle. If there is no indication on the police report specifying model year for any vehicle involved in the accident, then consider the model year as unknown and stratify the accident as not late model year.

2.2.1.2 Second Phase of Sampling

The second sampling phase involves classifying the accident by the hospitalization status of the involved persons.

Hospitalized Status

The determination that an occupant of a towed CDS applicable vehicle with a police reported injury of "A" (incapacitating injury) was transported to a treatment facility for treatment and was admitted overnight in a hospital indicates that the person was hospitalized. See OA37 (Hospital Stay) for definition of hospitalized. If the primary source, hospital, indicates the transported "A" injury occupant was admitted overnight, this will be accepted as hospitalized. Secondary sources of hospitalized status include the driver, other occupant, relative or close friend. PAR information can be used if the police officer indicates in the narrative that the transported "A" injury occupant was hospitalized overnight. Determination of hospitalization will be completed after PARs are stratified at the police agency. For CDS stratification, overnight hospitalized criteria needs to be met for only one transported "A" injury occupant in the towed CDS applicable vehicle. GES does not consider hospitalized status.

2.2.2   Sampling Strata

The ten PAR sampling Strata used by the CDS are listed below and shown in **Table 2-1**.

Stratum A-NASS crashes in which at least one occupant of a towed CDS applicable late model year vehicle had a police reported injury of "K" (fatal injury), where death occurred within 30 days of the accident date.

Stratum B-NASS crashes not qualifying for Stratum A in which at least one
occupant of a towed CDS applicable nonlate model year vehicle had a police
reported injury of "K" (fatal injury) , where death occurred within 30 days of the
accident date.

Stratum J-NASS crashes not qualifying for Strata A or B in which at least one
occupant of a towed CDS applicable late model year vehicle had a police
reported injury of "A" (incapacitating injury) AND was transported to a treatment
facility for treatment AND was admitted overnight to the hospital. If the accident
involved more than one CDS applicable vehicle, at least two CDS applicable
vehicles must be towed.

Stratum K-NASS crashes n ot qualifying for Strata A, B or J in which at least
one occupant of a towed CDS applicable nonlate model year vehicle had a
police reported injury of "A" (incapacitating injury) AND was transported to a
treatment facility for treatment AND was admitted overnight to the hospital. If the
accident involved more than one CDS applicable vehicle, at least two CDS
applicable vehicles must be towed.

Stratum C-NASS crashes not qualifying for Strata A, B, J or K in which at least
one occupant of a towed CDS applicable late model year vehicle had a police
reported injury of "A" (incapacitating injury) AND was transported to a treatment
facility for treatment. If the accident involved more than one CDS applicable
vehicle, then at least two CDS applicable vehicles must be towed.

Stratum D-NASS crashes not qualifying for Strata A, B, J, K, or C in which at
least one occupant of a towed CDS applicable nonlate model year vehicle had a
police reported injury of "A" (incapacitating injury) AND was transported to a
treatment facility for treatment. If the accident involved more than one CDS
applicable vehicle, then at least two CDS applicable vehicles must be towed.

Stratum E-NASS crashes not qualifying for Strata A, B, J, K, C or D in which
at least one occupant of a towed CDS applicable late model year vehicle was
transported to a treatment facility for treatment.

Stratum F-NASS crashes not qualifying for Strata A, B, J, K, C, D or E in
which at least one occupant of a towed CDS applicable nonlate model year vehicle
was transported to a treatment facility for treatment.

Stratum G-NASS crashes not qualifying for Strata A, B, J, K, C, D, E or F which
involve at least one CDS applicable late model year vehicle that was towed from
the scene.

TABLE 2-1
NASS CDS Strata

Late Model Year (LMY) Vehicle Involvement	FATAL INJURY	MOST SEVERE POLICE REPORTED INJURY							
		TRANSPORTED					NOT TRANSPORTED		
		Serious Injury "A"				Injury or Unknown If Injured "B", "C" or "U"	Injured, Not Injured or Unknwon, If Injured "A", "B", "C", "O" or "U"		
		Single CDS Applicable Vehicle	Multiple CDS Applicable Vehicle				At Least One CDS Applicable Vehicle Was Towed	No CDS Applicable Vehicles Were Towed	
		TOWED	AT LEAST TWO TOWED		ONLY ONE TOWED				
		HOSPITALIZED	NOT HOSPITALIZED	HOSPITALIZED	NOT HOSPITALIZED				
Injury in Towed, LMY, CDS Applicable Vehicle	A	J	C	J	C	E	G	NOT IN SCOPE	
Injury not in Towed, LMY, CDS Applicable Vehicle	B	K	D	K	D	F	H	See Table 2-2	

_____

Note: Late Model Year refers to the last four years and the current year.

TABLE 2-2
NASS GES Strata/Non-CDS Crashes

NO TOWED CDS APPLICABLE VEHICLES IN THIS ACCIDENT		
Most Severe Police Reported Injury to Any Occupant, Pedestrian, or Nonmotorist		
MEDIUM/HEAVY TRUCK	NO TRUCKS	OTHER
Towed Non-CDS Vehicle "OR" PAR Code of: "K", "A", "B", or "C" X	PAR Code of: "K", "A", or "B" Y	PAR Code of: "C", "U", or "O" Z

Stratum H-NASS crashes not qualifying for Strata A, B, J, K, C, D, E, F or G
            which involve at least one CDS applicable nonlate model year vehicle was towed
            from the scene.

All other NASS crashes that do not qualify for Strata A, B, J, K, C, D, E, F, G or H are further
separated for the purposes of the **General Estimates System (GES)** into either the X Stratum,
Y Stratum, or the Z Stratum. See **Table 2-2** below. **The GES includes all NASS crashes**.
The four main columns of the Stratification Record are: No Trucks (Strata A -K); Medium/Heavy
Trucks (Strata A-K, X); Other Injury (Stratum Y) and; Other (Stratum Z).

Be aware that all CDS applicable **crashes** are also GES applicable **crashes** while the
converse is not true (i.e., the majority of GES applicable **crashes** are not CDS applicable).
Non-CDS **crashes** are classified as follows:

X Stratum-NASS **crashes** not qualifying for the CDS Strata, involving at least
            one medium or heavy truck in which a non -CDS vehicle was towed due to
            damage, or at least one involved person had a police reported injury of "K" (fatal
            injury), "A" (incapacitating injury), "B" (nonincapacitating injury), or "C" (possible
            injury). Transported status is not a consideration.

Y Stratum-NASS **crashes** not qualifying for the CDS Strata or X Stratum in which
            none of the vehicles involved in the accident was a medium or heavy truck and at
            least one person involved in the accident had a police reported injury of "K" (fatal
            injury), "A" (incapacitating injury), or "B" (nonincapacitating evident injury).
            Transported status is not a consideration.

Z Stratum-NASS **crashes** not qualifying for the CDS Strata, X Stratum, or Y
            Stratum.

Notice that the ten CDS PAR sampling Strata are hierarchical.   PARs included in Stratum A
are not considered for Strata B, J, K, C, D, E, F, G, or H and so forth. Therefore, in reviewing
PARs for stratification, proceed as follows:

First, identify all in -transport CDS applicable vehicles in the NASS accident. If no in -transport
CDS applicable vehicles were present, then classify this NASS accident for GES purposes into
either the X Stratum, Y Stratum, or the Z Stratum.

Second, from among the CDS applicable vehicles present in the NASS accident, identify those the police accident report indicates were "towed" as a result of damage received in this NASS accident; however, exclude towed CDS applicable vehicles whose only event is a nonqualifying noncollision event. If no in-transport "towed" CDS applicable vehicles were present in this NASS accident, then classify this NASS accident for GES purposes into either the X Stratum, Y Stratum, or the Z Stratum.

Third, if at least one in-transport towed CDS applicable vehicle was present, then determine the most severe police reported injury to the occupant(s) of all towed CDS applicable vehicles present. If one or more occupants of a towed CDS applicable vehicle was killed ("K" injury), then classify this NASS accident in:
o   Stratum A if at least one of the killed persons was an occupant of a late model year vehicle; or
o   Stratum B if no killed person was an occupant of a late model year vehicle.

Fourth, if no occupant of a towed CDS applicable vehicle was killed, but at least one occupant of a towed CDS applicable vehicle received an "A" injury and was transported to a medical facility for treatment purposes, then determine if that transported "A" injured occupant was admitted overnight to a hospital.

If only one CDS applicable vehicle was present and it was towed due to damage and an occupant received an "A" injury and was transported and admitted overnight to a hospital, then classify this NASS accident in:
o   Stratum J if at least one of the hospitalized and transported "A" injured persons was an occupant of a late model year vehicle; or
o   Stratum K if no hospitalized and transported "A" injured person was an occupant of a late model year vehicle.

If two or more CDS applicable vehicles were present, then at least two must be towed due to damage. Therefore, if at least two CDS applicable vehicles were present and at least two were towed due to damage and one of the towed CDS applicable vehicles had an occupant who received an "A" injury and was transported and admitted overnight to a hospital, then classify the NASS accident in:
o   Stratum J if at least one of the hospitalized and transported "A" injured persons as an occupant of a late model year vehicle; or
o   Stratum K if no hospitalized and transported "A" injured person was an occupant of a late model year vehicle.

However, if two or more CDS applicable vehicles were present, but only one was towed due to damage and an occupant received an "A" injury and was transported and admitted overnight to a hospital, then classify this NASS accident in:
o   Stratum E if at least one of the hospitalized and transported "A" injured persons was an occupant of a late model year vehicle; or
o   Stratum F if no hospitalized and transported "A" injured person was an occupant of a late model year vehicle.

On the other hand, if no transported "A" injured occupant was admitted overnight to a hospital, then classify this NASS accident in:
o   Stratum C if at least one of the transported "A" injured persons was an occupant of a late model year vehicle; or
o   Stratum D if no transported "A" injured persons was an occupant of a late model year vehicle.

Fifth, if no transported "A" injured occupant of a towed CDS applicable vehicle was hospitalized, but at least one occupant of a towed CDS applicable vehicle received an "A" injury, then determine if one or more of those receiving an "A" injury was transported to a medical facility for treatment purposes. If only one CDS applicable vehicle was present and it was towed due to damage and an occupant received an "A" injury and was transported, then classify this NASS accident in:
- o Stratum C if at least one of the transported, "A" injured persons was an occupant of a late model year vehicle; or
- o Stratum D if no transported, "A" injured person was an occupant of a late model year vehicle.

If two or more CDS applicable vehicles were present, then at least two must be towed due to damage. Therefore, if at least two CDS applicable vehicles were present and at least two were towed due to damage and one of the towed CDS applicable vehicles had an occupant who received an "A" injury and was transported, then classify this NASS accident in:
- o Stratum C if at least one of the transported, "A" injured persons was an occupant of a late model year vehicle; or
- o Stratum D if no transported, "A" injured person was an occupant of a late model year vehicle.

However, if two or more CDS applicable vehicles were present, but only one was towed due to damage and an occupant received an "A" injury and was transported, then classify this NASS accident in:
- o Stratum E if at least one of the transported, "A" injured persons was an occupant of a late model year vehicle; or
- o Stratum F if no transported, "A" injured person was an occupant of a late model year vehicle.

On the other hand, if no "A" injured occupant was transported to a medical facility for treatment purposes, then classify this NASS accident in:
- o Stratum G if at least one of the "A" injured persons was an occupant of a late model year vehicle; or
- o Stratum H if no "A" injured person was an occupant of a late model year vehicle.

Sixth, if the most severe police reported injury to any occupant(s) of the towed CDS applicable vehicle(s) present was a "B", "C", or "U" injury, then determine if one or more of those receiving "B", "C", or "U" injuries was transported from the scene to a medical facility for treatment purposes. If at least one "B", "C", or "U" injured occupant was transported to a medical facility for treatment purposes, then classify this NASS accident in:
- o Stratum E if at least one of the transported, "B", "C", or "U" injured person s was an occupant of a late model year vehicle; or
- o Stratum F if no transported, "B", "C", or "U" injured person was an occupant of a late model year vehicle.

Seventh, if no "B", "C", or "U" injured occupant of a towed CDS applicable vehi cle was transported to a medical facility for treatment purposes, then classi fy this NASS accident in:
- o Stratum G if at least one of the "B", "C", or "U" injured persons was an occupant of a late model year vehicle; or
- o Stratum H if no "B", "C", or "U" injured per son was an occupant of a late model year vehicle.

Eighth, if the PAR indicates that no occupant of a towed CDS applicable vehi cle was injured (PAR "O" classification), then classify this NASS accident in:

- o Stratum G if there was at least one person who was an occupant of a late model year vehicle; or
- o Stratum H if no person was an occupant of a late model year vehicle.

The three non -CDS PAR sampling Strata (X Stratum, Y Stratum and Z Stratum) used by the GES are distinguished as follows.

- o Given that no in-transport towed CDS applicable vehicles are present in the NASS accident, determine if at least one medium or heavy truck was involved in the accident in which a non -CDS vehicle was towed or if any person in the accident received a "K" (fatal injury), "A" (incapacitating injury), or "B" (nonincapacitating evident injury), or "C" (possible injury) injury. If so, then classify this NASS accident in the X Stratum.

- o If no medium or heavy truck was involved in the accident but at least one person received a "K", "A", or "B" injury, then classify this NASS accident in the Y Stratum.

- o If no person received a "K", "A", or "B" injury, then classify this accident in the Z Stratum.

It does not matter for the purpose of distinguishing between the X Stratum, Y Stratum, and the Z Stratum whether any person was transported or the vehicles involved are either late model or non-late model year. Also, the tow status is not considered when distinguishing between the Y Stratum and the Z Stratum.

Figure 2-8 presents a flow chart of the NASS stratification.

Examples:

1. <u>NASS Accident:</u> A heavy truck (other vehicle: GV07=60 -79) and a motorcycle (other vehicle: GV07=80 -89) crash. The driver of the motorcycle is killed.
   <u>Stratification:</u> This is a "X Stratum" accident because it does not in volve a towed CDS applicable vehicle (i.e., GV07 must be "01" through "49"), and one of the non -CDS vehicles is a medium/heavy truck, and a PAR reported "K" injury occurred.

2. <u>NASS Accident:</u> A late model year CDS applicable vehicle and a motorcycle (other vehicle) crash. The CDS applicable vehicle is towed, the driver has an "A" injury, and was transported to a medical facility for treatment but not admitted. The motorcyclist is killed ("K" injury).

   <u>Stratification:</u> This is a Stratum "C" accident. It has one CDS applica ble vehicle, and the CDS applicable vehicle was towed. The most severe injury to an occupant of a towed CDS applicable vehicle is an "A" injury and the "A" injured occupant was transported but not hospitalized. The injured person was an occupant of a late model year CDS applicable vehicle. The injury to the motorcyclist is not considered.

3. <u>NASS Accident:</u> A CDS applicable vehicle rolls over ejecting and causing a "K" injury to one of the occupants; the nonlate model year vehicle is towed.

   <u>Stratification:</u> This is a Stratum "B" accident because it does have a towed CDS applicable vehicle, the most severely injured occupant of the vehicle receives a "K" injury, and the fatally injured person is not an occupant of a late model year CDS applicable vehicle.

4. <u>NASS Accident:</u> A CDS applicable vehicle and a bicycle crash. The bicy clist ejects shattering the vehicle's windshield. The nonlate model year CDS applicable vehicle is towed, but only minor injuries ("C" injuries) occur to the occupants. None of the occupants are transported. The bicyclist receives an incapacitating injury ("A" injury).

   <u>Stratification:</u> This is a Stratum "H" accident. There is one towed CDS applicable vehicle, but no one in a towed CDS applicable vehicle receives a "K" injury or is transported. The most severely injured person in the towed CDS applicable vehicle is not an occupant of a late model year vehicle. The incapacitating injury to the bicyclist does not affect the stratification. The only injuries that affect stratification are those suffered by occupants of towed CDS applicable vehicles.

5. <u>NASS Accident:</u> Two CDS applicable vehicles crash. Vehicle 1, which is a late model year vehicle, is towed, but none of the occupants are injured. Vehicle 2, which is not a late model year vehicle, is not towed; however, an unbelted infant hits the instrument panel and receives an "A" (incapacitating) injury.

   <u>Stratification:</u> This is a Stratum "G" accident. Stratification is determined first by the most severe injury to an occupant in a towed CDS applicable vehicle and second by the model year of the most severely injured occupant's vehicle. Vehicle model year and most severe police reported injury are <u>not</u> independent variables for stratification pur poses.

6. <u>NASS Accident:</u> A heavy truck and two CDS applicable vehicles crash. The heavy truck catches on fire and its occupant subsequently dies of burn injuries. Both   CDS applicable vehicles are towed. One CDS applica ble vehicle is a late model year vehicle, and its occupant receives a "C" injury. The other CDS applicable vehicle is not a late model year vehi cle, and its occupant receives a "B" injury. All occupants are transported for treatment.

   <u>Stratification:</u> This is a Stratum "E" accident involving a medium or heavy truck. The most severe injury to the occupant of the towed CDS applicable late model year vehicle determines the Stratum.

7. <u>NASS Accident:</u> The PAR lists a 1992 Dodge Van which was towed from the scene. The injury level box was coded as a "B" injury.
   <u>Stratification:</u> The correct strata should be "H". The PAR indicates a "Van" for which the current default coding is GV07="29", Unknown Van Type. The PAR did not indicate whether this vehicle was "towed due to damage" therefore the default assumption is to assume "towed due to damage".

8. <u>NASS Accident:</u> The PAR indicates a 1991 "Truck" which impacts a motorcycle. The driver receives a "C" injury, is not transported. Both vehicles were towed due to vehicle damage.
   <u>Stratification:</u> This case would be assigned an "X" stratum. The rule for a "truck", with no other details, is to default to "Medium/Heavy". Transport as a result of an injury is not considered in the "X" or "Y" stratum.

FIGURE 2-8
NASS Stratification

Is there at least 1 in-transport CDS applicable vehicle present? — NO → Was a medium or heavy truck involved in accident? — NO → Did the most severely injured person on the PAR receive a "K", "A", or "B" injury? — NO → Z Stratum

YES ↓

Was at least 1 in-transport CDS applicable vehicle reported on the PAR as being towed due to vehicle damage which did not result from a nonqualifying noncollision event? — NO → Was a non-CDS vehicle towed or did the most severely injured person on the PAR receive a "K", "A", "B", or "C" injury? — NO

NO ↓ (from "Did the most severely injured person...") → Y Stratum

YES ↓

Determine the most severe PAR injury to the occupant(s) of all in-transport towed CDS applicable vehicles

YES ↓ (from non-CDS vehicle box) → X Stratum

At least 1 occupant received a "K" injury — NO → No "K" injuries, but at least 1 occupant received an "A" injury and was transported — NO → No "K" injuries, but at least 1 occupant received an "A", "B", "C", or "U" injury — NO → No occupant was reported as injured

YES ↓

Were more than 1 CDS applicable vehicles involved in accident? — NO

YES ↓

Were more than 1 CDS applicable vehicles towed due to damage? — NO →

YES ↓

Was at least 1 "A" injured transported person an occupant of a late model year towed CDS applicable vehicle? — NO → Was at least 1 injured occupant transported to a medical facility for treatment purposes? — NO →

YES ↓   YES ↓

Stratum C   Was at least 1 transported person an occupant of a late model year vehicle?   Was at least 1 person an occupant of a late model year vehicle?

Was at least 1 "K" injured person an occupant of a late model year vehicle?

Hospitalized Occupant in LMY vehicle?   Stratum D

Hospitalized Occupant in non-LMY vehicle? — YES ↔ — Hospitalized?

Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?	Medium or Heavy Truck Involved?
M/H Truck Stratum A	M/H Truck Stratum E	M/H Truck Stratum J	M/H Truck Stratum C	M/H Truck Stratum K	M/H Truck Stratum D	M/H Truck Stratum E	M/H Truck Stratum F	M/H Truck Stratum G	M/H Truck Stratum H
No Trucks Stratum A	No Trucks Stratum B	No Trucks Stratum J	No Trucks Stratum C	No Trucks Stratum K	No Trucks Stratum D	No Trucks Stratum E	No Trucks Stratum F	No Trucks Stratum G	No Trucks Stratum H

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2.2.3 Questions and Answers Regarding First Stratification

The following questions are aimed at helping researchers to initially classify CDS crashes.

Question 1: When a hit-and-run crash occurs which involves a single in-transport vehicle, and no information is available about the hit-and-run vehicle or its occupant(s), how do you classify the crash on the stratification record?

Answer: Stratify the PAR as a Z Stratum crash since no information about the vehicle is known and no information about the occupant(s) is known.

Question 2: How do you stratify a vehicle not in-transport? The vehicle is unoccupied.

Answer: Vehicles not in-transport are not considered when determining the PAR sampling Stratum.

Question 3: It is, at times, difficult to determine whether or not a parked vehicle was on the roadway from simply reviewing a police crash report. Usually, the PAR merely states that the vehicle was parked. Unless one is familiar with the roadway, how do you determine if the vehicle was in-transport or not?

Answer: Vehicles which are legally parked are not in-transport. In certain situations illegally parked vehicles are in-transport; however, the fact that a vehicle was illegally parked when struck does not automatically make that vehicle in-transport.

The question of vehicles illegally parked beyond the end of legal parking (either implicit or explicit) near an intersection was considered. The resolution is that if a vehicle is illegally parked because of time, then the vehicle is **not in-transport**. If a vehicle is illegally parked because of location, then the vehicle is **in-transport**. One major exception is when time changes the character of the parking location. See **Figure 2-3**. If any part of a struck vehicle is beyond the end of legal parking, then this vehicle is in-transport. This means that any vehicle not authorized to be in a bus zone, fire hydrant zone, loading/unloading zone, NO PARKING area, or yellow curbed area is in-transport regardless of where that area is located (i.e., end of block or mid-block).

For CDS sampling purposes, the PAR scene sketch should be used in conjunction with the violations issued section to determine if a vehicle was illegally parked because of location.

Illegal parking includes any occupied vehicle which is stopped in an illegal location. Any vehicle entering or exiting one of the above mentioned areas (i.e., bus zone, fire hydrant zone, loading/unloading zone, NO PARKING zone, or yellow curbed area) is, of course, in-motion and thus in-transport.

Question 4: A vehicle had several persons riding on top of it. The police spotted the vehicle and started to give chase. The persons jumped off. In the process, one was injured. Is this person an occupant? What about the vehicle and its occupants?

Answer: The persons riding on the roof do not fit the appended to the vehicle for motion exclusion (e.g., person on a bicycle or skateboard who is holding onto the back of a vehicle for added motion) cited under variables OA04, Occupant Number, and OA10, Occupant's Seat Position; therefore, these persons are occupants of the in-transport vehicle. Regarding the injured person, if that injury (harmful event) occurred as a result of exiting from the vehicle, then stabilization did not occur for that person. Therefore, in addition to those in the vehicle, consider the person who

was injured while jumping from the vehicle as an occupant also. Since the police would not report the vehicle as towed due to damage, it makes no difference whether the vehicle was a CDS applicable vehicle or not. The Y Stratum or the Z Stratum would be assigned to this PAR depending upon the police report injury severity.

Question 6: A pickup truck was towing (pulling) a friend's passenger car to a service station. The car broke loose and impacted a tree. No damage oc curred to the pickup. How would you stratify for CDS purposes this NASS crash?

Answer: Any motor vehicle on a roadway is in -transport. An exception occurs where the vehicle is attached to another vehicle by means of **fixed linkage**. The critical issue is whether or not the vehicle being towed has any control over its movement. In this instance, the answer depends on how the car and truck were attached. If the car was attached by a tow bar or any other form of fixed linkage, then the car is considered a trailing unit and the tow status of that vehicle is not considered when stratifying. On the other hand, if the linkage was nonfixed (e.g., rope, chain, etc.), then the car was in -transport, and its police reported tow status is considered. A fixed linkage is defined as one which has the property 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. If the linkage was fixed this is a Y Stratum or a Z Stratum crash since the pickup would not be reported by the police as towed due to damage. If the linkage was nonfixed and if the car was reported by the police as towed due to damage, then the crash, during the first stratification, qualifies for CDS Strata A, B, C, D, E, F, G, or H.

Question 7: How do you stratify fatal occupants of CDS applicable vehicles for which the PAR includes the annotations "heart attack", "gunshot wound", or other disease or noncrash injury?

Answer: There must be medically supported or other positive information on the PAR which indicates that an occupant of a CDS applicable vehicle died of a disease or noncrash inflicted injury. If such information is present on the PAR, then consider this person's injury as Unknown ("U") for stratification purposes. Otherwise, consider that the occupant died due to crash inflicted injuries.

Question 8: The PAR states that two passenger cars collided and both were towed due to damage. Only one occupant of a towed late model year vehicle was injured with an "A" injury and only one occupant of a towed nonlate model year vehicle was injured with a "B" injury. The PAR states that one injured occupant was taken to a medical facility for treatment but does not identify which occupant was transported. How is the crash classified on the stratification record and are the injured occupants considered as not transported?

Answer: If the PAR states that an occupant was transported but does not specify which occupant, then assume that the occupant with the highest injury coded in the crash was transported. This crash involved two CDS applicable vehicles and both were towed due to damage. The default assumption is that the "A" injury occupant, who happened to be in the late model year vehicle, was transported from the scene. Therefore, the crash is stratified as a "C" stratum case.

2.2.4 Questions and Answers Regarding Second Stratification

The following questions are aimed at crashes initially stratified as strata "C" and "D" crashes and which may be reclassified by researchers as strata "J" and "K" crashes if the qualifications are met.

Question 1: The PAR reports a transported "A" injury occupant of a towed, late model year CDS vehicle. When you contact the hospital they inform you that they have "No Record" of this occupant. Should you pursue more information about this occupant?

  Answer: Yes, if the hospital has no information on file, then the occupant, driver, another occupant or relative/friend should be contacted to verify the level of treatment.

Question 2: Based on the PAR information the first stratification of the crash was "C". The hospital reported that no occupant was admitted overnight, but other sources of data indicate an occupant was admitted overnight. What source of information takes precedence?

  Answer The hospital information is the primary source. The secondary sources such as occupants of the vehicle, relatives or friends, should only be contacted and utilized if the "admitted overnight" information from a treatment facility cannot be determined in time for sampling.

Question 3: The PAR information has the transported, "A" injury occupant in a towed nonlate model year vehicle. However, during a nonhospital contact to determine the hospital treatment status you determined this occupant is in the other towed vehicle, a late model year vehicle. Should the Stratum be corrected for model year?

  Answer No, in this case a "D" stratum case would NOT be corrected to a "J" stratum case. The restratification is based on hospital or interviewee reported treatment status and not newly discovered vehicle information. In addition, a "D" stratum case cannot be corrected to a "C" stratum case and a "C" stratum case cannot be corrected to a "D" stratum case based on hospital information. See table 2-3 below.

Question 4: The PAR lists a towed late model year vehicle, with a transported occupant with an "A" injury. The hospital reports that this occupant was treated and released but was subsequently hospitalized overnight when a crash related injury was discovered two days after their release from the ER. Is this occupant considered as hospitalized for "J" stratum?

  Answer Yes, the definition for the hospitalized status is the same as the Occupant Assessment form variable OA63 (Hospital Stay).

TABLE 2-3

SECOND STRATUM	FIRST STRATUM C (Late model year CDS vehicle towed)
C	No one hospitalized
D	Not possible[1]
J	Late model year occupant hospitalized
K	Hospitalized occupant in nonlate model year vehicle only[2]
	FIRST STRATUM D (Nonlate model year CDS vehicle [only] towed)
C	Not possible[1]
D	No one hospitalized
J	Not possible[1]
K	Hospitalized occupant in nonlate model year vehicle only

[1] This situation could not occur due to hospitalized information alone. A PAR cannot be changed from a "C" stratum to a "D" stratum or from a "D" stratum to a "C" stratum unless the PAR information is changed by the police

[2] This situation occurs when the accident involved a towed late model year CDS vehicle and a towed nonlate model year CDS vehicle and only the nonlate model year vehicle had a hospitalized occupant

3.0 OVERVIEW OF SAMPLING ACTIVITIES

The procedure for selecting the NASS CDS crash sample consists of four tasks:

Task 1:   Contact sampled police jurisdictions on specified days to review the police crash reports.

Task 2:   At each jurisdiction, list an d stratify, using the NASS Stratification Record (SR), all PARs which qualify for NASS (CDS and GES). First, classify each into one of the four main columns on the NASS SR. Second, if the NASS crash is CDS applicable, then classify it into one of the eight CDS Sampling Strata (A through H). Strata J and K are determined in task 3 below.

Task 3:   Telephone hospitals or occupants to determine if transported "A" injury occupants of a CDS applicable vehicle in the C and D strata PARs were admitted overnight to the hospital, and restratify into strata J or K as necessary. This process should be completed by noon of the day following your designated contact date.

Task 4:   Using the Microcomputer Data Entry (MDE) system, enter the listed PARs (CDS and GES) into the NASS CDS Automated Case Selection Sys tem. The automated system will specify the sample of CDS crashes to be researched.

All teams will perform these tasks on one day each week. Section 3.2 below discusses these procedures.

3.1 Listing and Sampling Forms

The Contact Day Assignment Sheet (CDAS), and the PAR Stratification Record (SR), and the Hospital Work Sheet (HWS) are included as examples.

3.1.1 Contact Day Assignment Sheet (CDAS)

The Contact Day Assignment Sheet provided to your PSU is unique to your PSU. It specifies the dates on which the contacts are to be made and indicates the caseload for each contact day. The CDAS must be initialed by a COTR and by Sample Design staff from the Mathematical Analysis Division.

3.1.2 PAR Stratification Record (SR)

All teams will use the same PAR Stratification Record form (**Table 3-2**). Make photocopies as needed of the form provided. Instructions for completing the form are given in Section 3.2.2.

3.1.3 Hospital Work Sheet (HWS)

All teams will use the same Hospital Work Sheet (**Table 3-3**). For each PAR that was first stratified as a C or D stratum, a Hospital Work Sheet will be completed. Make photocopies as needed of the form provided. Instructions for completing the form are given in Section 3.2.3.

3.2 Listing and Sampling Instructions

3.2.1 Contacting Police Jurisdictions

Contact each of the jurisdictions on the day of the week specified. If a team wishes to change the contact day, it must notify both its respective zone center and COTR for ap proval to implement the change.

3.2.2 Completing the PAR Stratification Record

At each police jurisdiction, follow the guidelines in Section 2 (2.0 -2.2) to identify the PARs which qualify as NASS crashes and are to be listed. Complete the PAR Stratification Record as follows:

A. At the top of the SR enter the contact date and the name or initials of the team member making the visit.

B. GES Carryover:

On or before the first 1997 contact day, four random numbers, one for each main column, will be provided by NCSA for each sampled police jurisdiction (PJ). Enter the random numbers on the GES Carryover line for the appropriate main column. The random numbers constitute this jurisdiction's initial GES Carryover values and serve to ensure that all PARs have an equal chance of selection. On each subsequent   1997 contact day, the GES Carryover entered at the top of the SR will be equal to the last Line Number listed for that main column on the previous contact day.

C. GES Interval:

On or before the first 1997 contact day, a supply of Stratification Records will be provided. These Stratification Records will have the following information: (1) PSU Number, (2) PJ Number and Name, and (3) four GES Interval values, one for each main column. The GES Interval is used to indicate which   PARs are sampled. When the Line Number matches the GES Interval for that stratum, "highlight" that crash with a yellow marker and make the next line number, number 1. Line numbers will never exceed the GES Interval for that main column. The highlighted lines represent the sampled PARs for the GES.

Example: If the GES Interval for the "No Trucks" column is 4, then enter the line numbers: 1, 2, 3, 4*, 1, 2, 3, 4*, etc. Every time the line number 4 is recorded, that PAR is highlighted (*). If the GES Interval is 1, meaning every PAR in that column is sampled, highlight only the line numbers.

D. Line Number:

For each contact day the first line number entered for a main column will be   **one more** than the GES Carryover for that main column unless the GES Carryover is equal to the GES Interval in which case the first line number is: number 1. Except for the first 1997 contact day, the GES Carryover is equal to the last line number listed for that main column on the previous day or page.

Example: If the last line number used for the "No Trucks" column on the previous contact day is 3, the GES Carryover for the CDS column
on this day will be 3. The first NASS CDS crash listed for the CDS column this day will have a line number 4.

Similarly, within a single contact day, the GES Carryover is used from page to page and must be entered for all main columns when a new PAR SR is started. Verify the

carryover by checking the last line number on the previous page for that main column; these numbers must be the same.

In addition, record the GES Carryover number at the top of each main column on the page to be used for the next visit to that jurisdic tion.

E.   For each qualifying PAR:

First, identify all in-transport CDS applicable vehicles in the NASS crash. If no in-transport CDS applicable vehicles were present, then follow the procedures below in subsection "E. 2." and classify this NASS crash for GES purposes into either the X Stratum, Y Stratum, or the Z Stratum.

Second, from among the CDS applicable vehicles present in the NASS crash, identify those the police crash report indicates were "towed" as a result of damage received in this NASS crash; however, exclude towed CDS applicable vehicles whose only event is a nonqualifying noncollision event. If no in -transport "towed" CDS applicable vehicles were present in this NASS crash, then follow the procedures below in subsection "E. 2." and classify this NASS crash for GES purposes into either the X Stratum, Y Stratum, or the Z Stratum.

Third, if at least one in-transport, towed CDS applicable vehicle was present and a medium or heavy truck was not involved, then follow the procedures below in subsection "E. 1." and classify this NASS crash for CDS purposes into one of the A through K CDS Strata under "No Trucks" column.   If at least one in -transport, towed CDS applicable vehicle was present and a medium heavy truck was involved, then follow the procedures below in subsection "E.1." and classify this NASS crash for CDS purposes into one of the A through K CDS Strata under the "Medium or Heavy Truck" column.

1.   Determine the CDS sampling Stratum:

a.   Determine if at least one occupant of a towed CDS applicable late model year vehicle involved in the crash was killed ("K" injury),

(1)   If so, it belongs in Stratum A.
(2)   If not,

b.   Determine if at least one occupant of a towed CDS applicable   nonlate model year vehicle involved in the crash was killed ("K" injury),

(1)   If so, it belongs in Stra tum B.
(2)   If not,

c. Determine if at least one occupant of a towed CDS applicable late model year vehicle involved in the crash had an "A" injury,

    (1) If so, then determine if any "A" injured occupant was transported to a medical facility for treatment pur poses [go to (a) below],
    (2) If not, then proceed to E. 1. d. below,

        (a) If so, recall, first, how many CDS applicable vehicles were present in the crash and, second, how many towed CDS applicable vehicles were present.
        (b) If only one CDS applicable vehicle was present and it was towed, then it belongs in Stratum C.
        (c) If more than one CDS applicable vehicle was present and two or more CDS applicable vehicles were towed, then it belongs in Stratum C.
        (d) If more than one CDS a pplicable vehicle was present but only the late model year CDS applicable vehicle which contained the transported "A" injured occupant was towed, then it belongs in Stratum E.

d. Determine if at least one occupant of a towed CDS applicable nonlate model year vehicle involved in the crash had an "A" injury,

    (1) If so, then determine if any "A" injured occupant was transported to a medical facility for treatment purposes [go to (a) below],
    (2) If not, then proceed to E. 1. e. below,

        (a) If so, recall, first, how many CDS applicable vehicles were present in the crash and, second, how many towed CDS applicable vehicles were present.
        (b) If only one CDS applicable vehicle was present and it was towed, then it belongs in Stratum D.
        (c) If more than one CDS applicable vehicle was present and two or more CDS applicable vehicles were towed, then it belongs in Stratum D.
        (d) If more than one CDS applicable vehicle was present but only the nonlate model year CDS applicable vehicle which contained the transported "A" injured occupant was towed, then it belongs in Stratum F.

e. Determine if at least one injured ("B", "C", or "U") occu pant of a towed CDS applicable late model year vehicle involved in the crash was transported directly from the crash scene to a medical facility for treatment purposes,

    (1) If so, it belongs in Stratum E.
    (2) If not,

f. Determine if at least one injured ("B", "C", or "U") occupant of a towed CDS applicable nonlate model year vehicle involved in the crash was transported directly from the crash scene to a medical facility for treatment purposes,

    (1) If so, it belongs in Stratum F.
    (2) If not,

g. Determine if at least one towed CDS applicable late model year vehicle was involved in the crash,

(1) If so, it belongs in Stratum G.
(2) If not,

h. Determine if at least one towed CDS applicable nonlate model year vehicle was involved in the crash,

(1) If so, it belongs in Stratum H.
(2) If not, it belongs either in the X Stratum, Y Stratum (Non -CDS Injury Crashes), or the Z Stratum (Other Non -CDS Crashes).

2. Determine the non -CDS/GES sampling Stratum:

a. Determine if at least one medium or heavy truck was involved in the crash, AND either a non -CDS vehicle was towed OR at least one involved person received a "K", "A", "B", or "C" injury.

(1) If so, it belongs in the X Stratum.
(2) If not,

b. Determine if at least one involved person received a "K" (fatal injury), "A" (incapacitating injury), or "B" (nonincapacitating evident injury) injury.

(1) If so, it belongs in the Y Stratum.
(2) If not,

c. It belongs in the Z Stratum.

3. Enter the crash date, crash time, and PAR number in the "PAR Information" column for all qualifying NASS crashes that have accumulated since the last visit to the police jurisdiction.

a. If the PAR has been classified into stratum A through Stratum K, and a medium or heavy truck is NOT involved, then enter the stratum (A through K) on the line corresponding to the PAR information in column 1 (No Trucks/Strata A-K).

b. If the PAR has been classified into stratum A through Stratum K, and a medium or heavy truck is involved, then enter the stratum (A through K) on the line corresponding to the PAR information in column 2 (Medium or Heavy Truck/Strata A -K,X).

c. If the PAR has been classified into stratum X, then enter the stratum X on the line corresponding to the PAR information in column 2 (Medium or Heavy Truck/Strata A -K,X).

d. If the PAR has been classified into stratum Y, then enter the stratum Y on the line corresponding to the PAR information in column 3 (Other Injury/Stratum Y).

e. For PARs classified into stratum Z, enter the stratum Z on the line corresponding to the PAR information in column 4 (Other/Stratum Z).

When entering PARs on successive pages, be sure to enter the page number in the "Page ___ of ___ " field to keep pages in their proper sequence.

4.   After all PARs for that day have been listed, enter the **"line numbers"** for each of the four main columns, based on that main column's GES Carryover and GES Interval. Be sure to enter line numbers in a column only for lines which have entries in that column.

5.   Enter the "page" totals at the bottom of the page to indicate the total number of PARs listed for each stratum and for each main column on that page. After listing all the PARs for that day, sum the page totals to ensure that all PARs have been listed. Enter the "day" totals for each stratum and for each main column at the bottom of the last PAR SR used for that jurisdiction for that contact day.

F.   Completing the GES Sample:

All GES sampling is done manually. Obtain a copy of all sampled GES PARs before leaving the police jurisdiction. The sampled GES PARs are the highlighted lines identified as a part of the NASS PAR listing process described above. Thus, NASS CDS applicable crashes can be sampled independently in either the CDS or GES and may occasionally be selected in both systems.

3.2.3 Completing the Hospital Work Sheet

After completing the NASS CDS and GES PAR Stratification Record, the first stratification, at each police jurisdiction, return to the office and complete the Hospital Work Sheet (Table 3-3) as follows:

A.   Complete a separate "Hospital Work Sheet" (see Table 3-3) for each C stratum and D stratum PAR. Each "Hospital Work Sheet" contains information about only one crash, and each row of the form represents an attempt to determine hospitalization status. Each form can record nine attempts.

For a simple crash where you can easily determine hospitalization, only one form may be necessary. The upper right hand corner would then be filled out as "Page 1 of 1. Complicated crashes with multiple attempts to determine hospitalization may require more than one form. Number pages accordingly in the upper right hand corner.

C.   Fill in the header and PAR information sections of the Hospital Work Sheet.

1.   Fill in the PSU number, the jurisdiction from which the PAR was obtained, and the contact date.

2.   Fill in the information from the PAR (e.g., PAR number, crash da te and time).

3.   Fill in the First Stratum (Box A) with the original stratum of the PAR, stratum C or stratum D.

4.   The Second Stratum (Box B) records the outcome of your attempt to determine hospitalization. If no qualified occupant was hospitalized, the PAR's stratum does not change. If at least one qualified occupant is hospitalized, the PAR is restratified as stratum J if the occupant is in a late model year vehicle, or as stratum K if the occupant is in a nonlate model year vehicle. For those PARs that have been upgraded to a Final Stratum of "J" or "K", write the new stratum next to the original stratum on the "PAR Stratification Record".

Please note that a stratum "C" PAR <u>can</u> be restratified as a stratum "J" or "K" PAR, whereas a stratum "D" PAR can only be restratified as a stratum "K" PAR. There are no other options.

5. The Case Number (Box C) is completed only if the Automated Case Selection System selects this PAR for investigation.

6. Box D, Number of Qualified Occupant(s), is the total number of persons from the PAR that are transported, "A" injured occupants of towed CDS applicable vehicles.

D. Fill in the information on the qualified occupants to be contacted and record the contact attempts.

1. Box E (Number of Qualified Occupants w ith Hospitalization Status Determined) is a count of the people from Box D (Number of Qualified Occupants) for whom you were able to determine hospitalization, either "yes" or "no". See Section 3.4, Example 6 below for additional information affecting Box E.

2. Box F (Number of Qualified Occupants Whose Hospital Status Still Needed to be Determined) is the number of occupants from Box D (Number of Qualified Occupants) whose hospitalization status has not been determined, and whose hospitalized status could affect the Second Stratum. If you have all the hospitalization information necessary for the Second Stratum, Box F will be coded "0". Boxes E and F do not have to add up to Box D.

3. In column 1 (Qualified Occupant Name), record from the PAR the names of all transported, "A" injured occupants of towed CDS applicable vehicles. In addition, record each occupant's telephone number in column 2, the occupant's vehicle number in column 3, the person's occupant number in column 4 and, the code of the medical facility to which the occupant was transported in column 5. Each time you make or attempt to make a contact for an occupant, start a new line.

   The phone number is the phone number used on that contact. Suppose you called the hospital about Joe Smith, were unable to determine hospitalization, then tried to call Joe Smith at home. You will use two lines with the appropriate telephone number on each line.

4. Fill in column 6 (Date of attempt), column 7 (Time of Attempt), column 8 (Contact), and column 9 (Admitted?) as the contact attempts are made and the information is obtained.

Section 2.2 contains definitions of the ten PAR sampling strata used by the NASS CDS. The definitions, Figure 2-8, and Table 3-3 above are used to determine the Second Stratum (Box B).

If, after you have made all reasonable efforts to determine hospitalization with certainty and conflicting evidence on hospitalization status remains, code the information from available sources in the following order: (1) Hospital, (2) this occupant, (3) other occupant, (4) relative or friend, (5) Police (PAR or Officer), or (6) Other (e.g., EMS, newspapers).

Periodically, you will be required by your Zone Center to send **all PARs whose first stratum was "C" or "D"**, regardless of the second stratum, along with each PAR's Hospital Work Sheet to the Zone Center with your normal sampling materials.

3.2.4 The NASS CDS Automated Case Selection System (ACSS)

The NASS CDS Automated Case Selection System will be executed for each contact date listed on the Contact Day Assignment Sheet. The Microcomputer Data Entry User's Manual for NASS (1/96) includes instructions for using the ACSS. Any problems or difficulties that are not identified in the manual should be re ferred to your zone center.

The ACSS reports the selected CDS PARs on the NASS CDS Automated Case Selec tion System Report (ACSSR). See **Table 3-4** for an example of the ACSSR.

3.2.5 Special Instructions for Automated Sampling Procedures

Occasionally emergency conditions require special sampling procedures.   Hardware or software problems may prevent sampling for a short or even an extended period. Case load assignments can possibly generate problems too.   The infor mation below is intended to provide some guidance on how to cope with some of these situations. Remember, the basic sources for help are:

    o   Hotline - for hardware or software problems, and

    o   NASS CDS Sampling Coordinator - for case load or selection problems.

Condition A: Your micro-computer working and you have successfull y closed your PAR file, but

    Problem 1:   The mainframe doesn't answer when you try to connect:

    Action: Try two or three times to make a mainframe connection. Wait a short while (wait 15-20 minutes between calls) to allow temporary trouble to clear. If you are still unsuccessful, then call **Hotline**.

    Problem 2:   You have connected okay initially, but the connection is broken in the middle of the process:

    Action: Call **Hotline** immediately.

TABLE 3-4

NASS VER 8.00
AUTOMATED CASE
SELECTION   SYSTEM   REPORT

PSU:02 CONTACT DATE:03/20/96			LAST CASE NUMBER:069		
THE SAMPLE SELECTION PROGRAM EXECUTED SUCCESSFULLY.					
THE FOLLOWING PARS WERE SELECTED:					
Case Number	Police Jurisdiction	PAR Stratum	Crash Date	Crash Time	PAR Number
070J	4	J	03/18/96	01:00	5546

Problem 3:   The connection has apparently completed, but there is something missing or garbled in the output:

Action: Call **Hotline** immediately.

Condition B: Your micro-computer is not working.

Action: Call **Hotline** to get help for a local fix or to arrange for replacement. If the prognosis is for more than a day's delay, follow the mail -in procedure for Condition C.

Condition C: The prospect of an extended outage for either of the above conditions exists.

Action: Notify headquarters that an extended outage is in progress.

Action: Express mail or FAX a copy (keep your originals) of your Stratification Records to headquarters.

Action: Headquarters will do the sampling and tell the team by phone which PARs were selected.

Action: When your micro -computer is running again, send a message to hotline announcing that your team is back on line.

3.3 CDS Sampling Problems: How To Handle Them

The following section describes problems that sometimes arise in sampling and outlines ways to address them. A critical element in each case is time; that is, the longer the period between the occurrence of the problem and the implementation of some corrective action, the less likely are the Mathematical Analysis Division's (MAD) chances of resolving it. If a problem occurs which is not listed below, the researcher should inform his/her COTR or the MAD sampling design staff at once.

Problem 1:   A team lists and stratifies crashes correctly, but the PAR for the selected case is missing when the researcher returns to the police jurisdiction after sampling.

Action: After all attempts to locate the PAR have been exhausted unsuccessfully, call your zone center to have the case dropped. Follow the case deletion procedures in Section 5.3.

Problem 2:   A team does not find any CDS crashes to list.

Action: No CDS cases will be selected this day. However, the MDE must be entered to close the Listed Cases File, even though it will be empty, and a Mainframe connect must be made to receive the next contact date.

Problem 3:   A team cannot list and select on the designated contact date due to extreme weather conditions (in particular, snow hazards) or holiday.

Action: When circumstances are foreseen, make arrangements with MAD to visit the jurisdiction(s) either the day before or the day after. When circumstances are unforeseen and the jurisdictions can be visited prior to the next contact date, list and select on the first practical day. In either situation list only PARs with crash dates prior to or equal to the missed contact day. If the jurisdiction(s) cannot be visited before the next contact day, notify the MAD sample design staff immediately.

Problem 4:   Upon visiting the crash scene it is determined that the selected crash occurred outside of the PSU.

Action: If the crash occurred outside the boundaries of the PSU, the crash does not qualify for the CDS and shall be dropped. If the crash occurred within the PSU boundaries regardless which PJ worked the crash (sample or non-sample), the crash shall remain in the sample.

Problem 5:   A PAR meets all of the qualifications for the NASS CDS, but upon listing and/or selection it is determined that a police jurisdiction outside the PSU investigated the crash which occurred within the PSU boundaries.

Action: there are police jurisdictions which often help or assist a jurisdiction(s) within the PSU boundaries. These include State Police posts that are assigned to cover multiple counties which are outside the PSU boundary. As long as the crash occurred within the PSU boundaries, the crash shall remain in the system. If it is determined that the crash occurred outside the PSU boundaries, the crash shall be dropped.

Problem 6:   A team lists and properly selects a crash according to the information on the PAR. However, during the research it is determined that the case does not meet the criteria (i.e., Section 2.1 above) for crashes which qualify for NASS.

Action: If the incident is not a NASS crash, then follow the case deletion procedures (see Section 5.3).

Problem 7:   A team improperly lists and selects a crash according to the information on the PAR. During the research it is determined that the case does not meet the criteria for selection in the CDS.

Action: Using Table 3 -5 below, if cell i, iv, v, or vi applies, then drop the case and follow the case deletion procedures (see Section 5.3). If cell ii or iii applies, then code GV10, Police Reported Vehicle Disposition, equal to "1" (Towed due to vehicle damage) and EV31, Researcher's Assessment of Vehicle Disposition, equal to "0" (Not towed due to vehicle damage) or "9" (Unknown).

TABLE 3-5

CDS Sampling Problems: How To Handle Them PAR DISPOSITION VERSUS TEAM RESEARCH			
Basis for Team's Stratification	EV31--Research by the Team Indicates:		
	No CDS applicable vehicle in crash (GV07 $\geq$ 50)	At least one CDS applicable vehicle present	
		No CDS applicable vehicle involved in crash was towed	At least one towed CDS applicable vehicle involved, but none were towed due to damage
Correctly read PAR (GV07 < 50 and GV10=1)	D R O P i	D O N O T D R O P ii	D O N O T D R O P iii
Incorrectly read PAR (i.e., missed information present which would have changed their stratification)	D R O P iv	D R O P v	D R O P vi

It is extremely important, when problems 1 and 5 arise, that the zone center and Headquarters (COTR and MAD sample design staff) are notified immediately. Dropped cases are to be reported to headquarters at the end of each month, along with the reasons why they were dropped.

3.4 CDS Hospitalization Determination Examples

Below is a list of examples aimed at helping researchers determine if a C or D stratum PAR qualifies for restratifying as a J or K stratum PAR.

Example 1   There is one nonlate model year automobile and three qualified occupants. The Initial Stratum is "D". On your first telephone call about one of the occupants, you find she was hospitalized.

   Codes   Box D = 3; Box E = 1; Box F = 0; Box A = D; Box B = K

                  You were able to get the Final Stratum of "K", just by discovering one qualified occupant was hospitalized. Stop determining hospitalization for this PAR. Code "0" for Box F.

Example 2   There is one late model year car and three qualified occupants. The Initial Stratum is "C". You are able to determine that two qualified occupants were **not** hospitalized, but you could not get data on the third.

   Codes   Box D = 3; Box E = 2; Box F = 1; Box A = C; Box B = C

                  From the data you have been able to collect, the case must remain in Stratum "C". If you are unable to determine the third occupant's hospitalization status, then code "1" for Box F.

Example 3   There is one late model year automobile with two qualified occupants, and one nonlate model year automobile with three qualified occupants. The Initial Stratum is "C". You are able to find that one occupant of each vehicle was not hospitalized. One qualified occupant from the late model year automobile was hospitalized. You have determined the hospitalization status of three occupants.

   Codes   Box D = 5; Box E = 3; Box F = 0; Box A = C; Box B = J

                  Once you find one qualified occupant of a late model year vehicle was hospitalized, you have all the information you need to make the Final Stratum "J". Stop determining hospitalization for this PAR. Code "0" for Box F.

Example 4   There is a late model year light van with two qualified occupants, and a nonlate model year pick-up truck with three qualified occupants. The Initial Stratum is "C". You verify that neither of the occupants of the van was hospitalized. You determine one occupant of the pickup was not hospitalized and one was.

   Codes   Box D = 5; Box E = 4; Box F = 0; Box A = C; Box B = K

                  You have determined that at least one qualified occupant was hospitalized and the PAR gets a Final Stratum of "K". Therefore, code "0" for Box F.

Example 5   There is a late model year light van with two qualified occupants, and a nonlate model year pickup truck with three qualified occupants. The Initial Stratum is "C". Nobody from the van was hospitalized, but you are unable to

get hospitalization data about anybody from the pickup.

Codes   Box D = <u>5</u>; Box E = <u>2</u>; Box F = <u>3</u>; Box A = <u>C</u>; Box B = <u>C</u>

Since you were unable to determine if any of the qualified occupants of the pick-up were hospitalized, the Final Stratum remains a "C". Unknown information on the occupants of the pick-up hospitalization status cannot be used as input to restratify the PAR. Therefore, code "3" for Box F. See table 2-3.

Example 6   A nonlate model year automobile with two qualified occupants crashes into a tree. The Initial Stratum is "D". You discover one occupant was not hospitalized, but the other occupant died on the way to the hospital or in the emergency room. For some unknown reason, the police did not note the death on the PAR, which would have made the PAR a "B" stratum.

Codes   Box D = <u>2</u>; Box E = <u>2</u>; Box F = <u>0</u>; Box A = <u>D</u>; Box B = <u>K</u>

We count the fatality as hospitalized on the assumption that he is more seriously injured than a truly hospitalized patient. Therefore, the Final Stratum is "K". Code "0" for Box F.

You do not upgrade the Final Stratum to a "B". You begin the hospitalization search only for crashes classified as "C" or "D" from the information on the PAR. All these crashes have an Initial Stratum of "C" or "D", and a Final Stratum of "C", "D", "J", or "K".

Example 7   One late model year automobile with two qualified occupants collides with a nonlate model year automobile with two qualified occupants. The Initial Stratum is "C". You cannot determine hospitalization for either of the occupants in the late model year vehicle. You determine one occupant in the nonlate model year automobile was hospitalized and one was not.

Codes   Box D = <u>4</u>; Box E = <u>2</u>; Box F = <u>2</u>; Box A = <u>C</u>; Box B = <u>K</u>

Since you were able to discover one of the occupants from the nonlate model year vehicle was hospitalized, you encode the Final Stratum as "K".

Example 8   One late model year automobile with two qualified occupants collides with a nonlate model year automobile with two qualified occupants. The Initial Stratum is "C". You determine one occupant in the late model year vehicle was not hospitalized. You can not determine hospitalization for the other late model year automobile occupant. One occupant in the nonlate model year vehicle was hospitalized and one was not hospitalized.

Codes   Box D = <u>4</u>; Box E = <u>3</u>; Box F = <u>1</u>; Box A = <u>C</u>; Box B = <u>K</u>

Since you were unable to determine if the second occupant from the late model year vehicle was hospitalized, the Final Stratum is "K". Therefore, code "1" for Box F.

Example 9   A late model year automobile with a qualified occupant (driver only, no passengers) runs into a tree. The Initial Stratum is "C". You call the hospital for hospitalization data and you are told they are busy now, but will call you later. You call the occupant at home, and he tells you he was not hospitalized. Later, the hospital returns your call and says the occupant was hospitalized. It is now noon of the day after your assigned contact date and

you must stop hospitalization determination.

Codes   Box D = 1; Box E = 1; Box F = 0; Box A = C; Box B = J

We restratify the PAR as a "J". The rule is: If, after you have made all reasonable efforts to determine hospitalization for an occupant with certainty and conflicting evidence on hospitalization status remains, code the information from available sources in the following order: (1) Hospital, (2) this occupant, (3) other occupant, (4) relative or friend, (5) Police (PAR or Officer), or (6) Other (e.g., EMS, newspapers).

In summary, Box D will **always** be the **total** of all qualified occupants in the CDS vehicles. Box E is the number of qualified occupants whose hospitalization status has been determined. Whereas, Box F is the number of qualified occupants whose hospitalization status cannot be determined and whose outcome **could** change the Final Stratum of the PAR from a "C" or "D" to a "J" or "K".

Ask this question, "If I knew this occupant was hospitalized, would it change the stratum of the PAR?" If the answer is yes, this occupant should be counted in Box F.

3.5 Beginning of Year Sampling Instructions

At the beginning of a new calendar year, some crashes that occurred in the previous year will be listed at your police jurisdictions. It is important that the crashes in each calendar year be kept separate for sampling pur poses. Special instructions will be issued in December of each calendar year detailing how the separate sampling will be accomplished.

4.0 OVERVIEW OF COLLECTED INFORMATION ON SAMPLED CDS CRASHES

For each case sampled, include in the case report a copy of the police report, Case Summary Form, newspaper photos and articles, correspondence, collision diagram, collision measurement table, slides (including index), the applicable crashworthiness data system data collection forms with field logs and Case Review Form, medical injury records, reconstruction algorithm results, and MDE output.

4.1 Required Forms for CDS Cases

It is very important to remember that only the injuries to the occupants of towed CDS applicable vehicles and the model year of those occupants' vehicle(s) determine the Stratum. Also, once a NASS crash is selected for research as a CDS case all the CDS applicable vehicles, towed or nontowed, are candidates for a vehicle inspection. **Towed CDS applicable vehicles require both an exterior and an interior inspection. In addition, all drivers and occupants of towed CDS applicable vehicles are candidates for an interview. Table 4-1** is aimed at assisting researchers in form selection.

4.2 Sequencing of Case Materials

Case report forms and miscellaneous materials are to be sequenced in conformity with the guidelines depicted in **Figure 4-1**. There are eight distinct groupings which may exist with each case, and while the number of groupings may vary with each crash, it is important for the case reviewer (team or zone center) that the composition of the eight groups be maintained.

4.2.1 Police Crash Report

The **first** document is the police crash report. Attach relevant newspaper photos, police photos, news articles, misc., etc.

4.2.2 CDS Case Summary Form

The **second** group contains the CDS Case Summary Form and will appear in every case.

4.2.3 Accident Diagram, Measurement Table, Slides, and Slide Index

The **third** group contains the Accident Collision Diagram, Accident Collision Measurement Table, slides, and the slide index; thus, it provides the reviewer with a general overview of the case based upon the CDS research. This group should appear in every case.

4.2.4 Accident Form

Fourth, the Accident Form will appear in every case.

4.2.5 Vehicle, Occupant, and Interview Forms for each vehicle

The **fifth** group contains: [1] a General Vehicle (all vehicles) Form, [2] an Exterior Vehicle (inspected CDS applicable vehicles) Form, [3] an Inte rior Vehicle (inspected towed CDS applicable vehicles) Form, [4] an Interview Form, [5] the Occupant Assessment Forms--for only those occupants of in -transport towed

TABLE 4-1
REQUIRED FORMS FOR NASS CDS CASES

Each NASS CDS accident requires **one** Case Summary Form, **one** collision diagram, and one Accident Form. The remaining forms depend upon: (1) the type of vehicles involved in the accident, (2) their police reported tow status, and (3) the level of vehicle inspection. **For each vehicle** involved in the accident, select the table below which corresponds to the vehicle's tow and "CDS Applicable" status and determine the appropriate forms to submit.

IN-TRANSPORT TOWED CDS APPLICABLE VEHICLE						
	GENERAL VEHICLE	EXTERIOR VEHICLE	INTERIOR VEHICLE	INTERVIEW	OCCUPANT ASSESSMENT	OCCUPANT INJURY
Inspected	Yes	Yes	Yes	Yes[1]	Yes	Yes[2]
Not Inspected	Yes	No	No	Yes[1]	Yes	Yes[2]

IN-TRANSPORT NONTOWED CDS APPLICABLE VEHICLE						
	GENERAL VEHICLE	EXTERIOR VEHICLE	INTERIOR VEHICLE	INTERVIEW	OCCUPANT ASSESSMENT	OCCUPANT INJURY
Inspected	Yes	Yes[3]	No	No	No	No
Not Inspected	Yes	No	No	No	No	No

IN-TRANSPORT NON-CDS APPLICABLE VEHICLE						
	GENERAL VEHICLE	EXTERIOR VEHICLE	INTERIOR VEHICLE	INTERVIEW	OCCUPANT ASSESSMENT	OCCUPANT INJURY
No Inspection Required	Partial[4]	No	No	No	No	No

CDS Applicable Vehicle is defined by variable GV07, Body Type. GV07 must equal codes "01"-"49" (i.e., Automobiles, Automobile Derivatives, Utility Vehicles, Van Based Light Trucks, Light Conventional Trucks, and Other Light Trucks).

Non-CDS Applicable Vehicle is defined as GV07 not equal to codes "01"-"49" (i.e., GV07 greater than or equal to "50").

[1] Submit only when an interview is obtained
[2] If applicable
[3] Complete pages 1-3 of the Exterior Vehicle Form for CDS Applicable vehicles not in-transport (i.e., fo speed reconstruction purposes)
[4] Complete variables GV01 through GV36 (i.e., pages 1-4)

FIGURE 4-1
SEQUENCE OF CASE MATERIALS

Group I	Police Report Newspaper photos, articles, misc. other photos, etc.

Group II	Case Summary Form

Group III	Accident Collision Diagram Accident Collision Measurement Table Slide Index Slides

Group IV	Accident Form

Group V	General Vehicle Form * V1 Exterior Vehicle Form ** V1 Interior Vehicle Form*** V1 Interview Form Occupant Assessment Form+ 01, V1 Occupant Assessment Form+ 02, V1 Subsequent occupants this vehicle Subsequent vehicles, interviews, and occupants

Group VI	Envelope containing official injury documentation

Group IV	Reconstruction Program Summary Reconstruction Output (hard copy)

Group VII	CDS MDE Output (hard copy) PSU Case Review Form

*All in-transport motor vehicles
**All inspected in-transport CDS applicable vehicles
***All inspected in-transport towed CDS applicable vehicles
+Submitted only for all occupants of in-transport towed CDS applicable vehicles

CDS applicable vehicles, and [6] the Occupant Injury Forms (inserted by the Zone Center) --for all the "injured" occupants of in -transport towed CDS applicable vehicles.

The first form in this vehicle group is the General Vehicle Form; this form must always be present in this group. For "non-CDS applicable vehicles" this form will be the   only form present in this group.   The Vehicle Exterior Form appears next, if applicable.   This will be followed by the Vehicle Interior Form, if applicable.   The Interview Form follows the vehicle form(s).   This form contains the interview(s) obtained with the occupant(s) of all in -transport towed CDS applicable vehicles.

The final forms in this **fifth** group are the occupant forms, if applicable.   The occupant forms are only submitted for occupants of in -transport towed CDS applicable vehicles.   The first form is the Occupant Assessment Form.   Next comes the Occupant Injury Form (inserted by the Zone Center) which has any official injury documents identified, sequenced in order and stapled to the back of it.   All additional occupant forms will follow in numerical order [Occupant O2 (V1), Occupant O3 (V1), etc.].   The Occupant Injury Form is not submitted when any one of the following three injury conditions occurs.   First, the occupant sustained "No injury"; second, the occupant was injured but the severity is unknown (i.e., "Injured, unknown severity"). Third, the information source(s) does not know if the person was injured (i.e., "Unknown if injured").   The second condition means that the source(s) of injury information cannot identify any specific injury code from those listed in the 1993 NASS Injury Coding Manual.

At least one group of this type will appear in every CDS case.   Additional vehicles, interviews, and occupants --including their official injury documents, should be grouped in a similar manner.   Thus, each group may be thought to represent a vehicle and its occupant(s); and, each such group physically distinguishes one vehicle and its occupant(s) from any other.

4.2.6 Injury Information

The sixth group contains an envelop e containing official injury information, if present.

4.2.7 Reconstruction Information

The **seventh** group is composed of the reconstruction (SMASH) Program Summary and the Output (hard copy), assuming a reconstruction program has been exercised for the collision. Upon reviewing the above forms and having become familiar with the crash, the reviewer is then prepared to evaluate both the appropriateness of using the program and the viability of the various inputs on the program summary.   These two items, the summary and any output (always include the input data), should be bound together with a paper clip.

4.2.8 MDE Output and Case Review

The **eighth** group is composed of the Microcomputer Data Entry (MDE) output and the PSU Case Review Form.

4.3 Information Required on Field Forms (File Structuring Variables)

Case Identification Variables--When using the microcomputer data entry system to enter the field data, certain information is required on each field form (log data are not entered) before it will be accepted.   Every field form submitted must have a Primary Sampling Unit Number and a Case Number - Stratum.   Team members fill out the Primary Sampling Unit Number and Case Number - Stratum.

Accident Form--For each crash researched, one Accident Form must be filled out. The additional file structuring information needed on this form is the **Number of General Vehicle Forms Submitted**, **Date of Accident**, and **Number of Recorded Events in This Accident**.

General Vehicle Form--For each crash researched, at least one General Vehicle Form must be submitted. The additional file structuring information to be included on this form consists of the assigned **Vehicle Number**, **Body Type**, **Police Reported Vehicle Disposition**, **Number of Occupant Forms Submitted**, and **Type of Vehicle Inspection**.

Exterior Vehicle Form--When Exterior Vehicle Forms are filled out, **Vehicle Number** is required for file structuring purposes.

Interior Vehicle Form--When Interior Vehicle Forms are filled out, **Vehicle Number** is required for file structuring purposes.

Occupant Assessment Form--When Occupant Assessment Forms are filled out, **Vehicle Number**, **Occupant Number**, and **Number of Recorded Injuries For This Occupant** are required for file structuring purposes.

Occupant Injury Form--When Occupant Injury Forms are filled out, **Vehicle Number** and **Occupant Number** are required for file structuring purposes.

Treatment of Missing Data--The file (i.e., the computerized database file) structure used in the CDS minimizes the handling of missing data. For example, neither the Exterior Vehicle Form nor the Interior Vehicle Form are pres ent for non-CDS appli cable vehicles. The Interior Vehicle Form is absent for police reported nontowed CDS applicable vehicles. Further, neither form is present for uninspected towed CDS applicable vehicles. In addition, no occupant forms are required for occupants of other vehicles and nontowed CDS applicable vehicles. Finally, Occupant Injury Forms are inserted by the Zone Center when required--see the discussion above in Section 4.2, **fifth** group. However, when crash -involved vehicles or occupants cannot be fully inspected or interviewed and data items are missing, the appropriate form must be filled out with missing data codes and submitted with the case.

4.4 Update Procedures for Hard Copy Field Forms

Data elements which may be updated in the hard copy case report are restricted to certain variables which appear on either vehicle or occupant forms. Other data will not be updated if it is acquired after the initial submission of the case. Note, most variables may be updated before the case is forwarded to the zone center. An Update Form has been developed to keep the Zone Center informed of the status of medical records acquisitions. The Update Form is not included with the initial submission of the case; instead, it is retained at the PSU and partially filled out upon initial case submission. Subsequently, it is com pleted when the updated medical information arrives.

On the original case form, all data variables which the researcher intends to update should be coded with any available appropriate information or the code designating "Unknown". In addition, the variable number should be circled. This will "signal" that an attempt will be made to update that data variable. The type of injury information obtained should be entered on the front of the Update Form and any supporting documents attached to the back.

Zone Center Work Sheet --A Zone Center Work Sheet has been developed for those variables which are allowable hard copy update candidates. The Zone Center is to complete the required sections of the Work Sheet prior to completion of case quality review so that the subsequently acquired information may be associated with the right case and vehicle or occupant number.

Update Form--This form should be used when the researcher expects to receive medical data after the initial submission. The information in the Initial Submission column on this form is copied from the Occupant Assessment Log, prior to initial case submission, and allows the researcher to update variables OAL08, OAL09, OAL16, OAL17, OAL18, GV14, and GV16 based on subsequent receipt of official data (e.g., medical record). These data would be difficult to update without recorded knowledge regarding the initial coding.

Update Filing and Submission Instructions--The researcher must complete the Initial Submission column of the Status of Log Injury Information section on the Update Form, as required, prior to the initial submission. This allows the new information to be associated with the corresponding field form in the initial submission, and this also allows the new information to be combined with the existing information (e.g., using the NASS injury coding rules).

All Update Forms may then be stored in a three -ring binder. Each new addition of an Update Form may then be indexed by Case Number - Stratum, Vehicle Number, and Occupant Number. They may also be partially cross -indexed alphabetically based on the name of the driver or occupant. This will facilitate the processing of inquiries from Zone Centers as well as the submission of the Update Form when the official medical data are received.

The name of the individual, and any other descriptive information unique to the team which may identify the individual, should be sanitized from the Update Form and/or the attached medical reports after the information from the latter has been included on the Update Form.

Update Forms should be accumulated, packaged in an individual zone center approved size manila envelope (but not one envelope for each update) which identifies the PSU and is boldly marked: **UPDATES**, and sent to the zone center on a periodic basis according to the schedule in Section 5.2. If the updates are not obtainable by the due date, the reasons the updates could not be obtained are to be indicated on the Update Form and sent to the Zone Center. All updates or reasons the updates were not obtainable must be submitted to the zone center **within 84 days** of the date the case was sampled.

This eighty -four day time-frame is a guideline established in order to keep the processing of update records proceeding at an orderly pace. Sometimes medical records are not available within 84 days. A team can extend, with Zone Center permission, the length of time available to obtain a medical update. The exact length of the extension will depend upon the time of year the case was selected. Medicals from cases selected in January can be held open much longer than medicals from cases selected in December.   At issue from the Zone Center perspective is the total number of medical updates outstanding (i.e., effort required of Zone Center to finish processing the updates) and the likelihood of the   medicals being eventually obtained.

The Update Form, described above, will be attached by the Zone Center to the corresponding forms included in the initial submission to the zone center.

4.5 Potential Safety Problem Bulletin

All teams shall use **Figure 4-2**, to report any potential vehicle safety problems which they encounter. Submit bulletins to your Zone Center immediately after identification of a potential vehicle safety problem . Each team has been placed on the mailing list for reports of active defect investigations. Teams should become familiar with current investigations and be on the lookout for crashes which are relevant to these investigations; although, other defects or vehicle problems encountered are also of interest and should be reported. Attach a copy of the bulletin submitted to NHTSA to either the Exterior Vehicle Form or Interior Vehicle Form before submitting the case to your zone center. A list of potential safety problems of current interest to NHTSA is contained in **Table 4-2**. This list is provided for guidance and is not intended to be inclusive.

4.6 CDS Criteria for Acceptable Data Completion

See the Log Manual for a description of the acceptable data completion criteria.

FIGURE 4-2

POTENTIAL SAFETY PROBLEM BULLETIN

Reporting Date:_____

SEND TO: Jackie Scott   or   Paula Pitzer
             Calspan Corporation   KLD Associates, Inc.
             Post Office Box 400   8632 Frederickburg Road Suite, 126
             Buffalo, New York 14225   San Antonio, Texas 78240

SUBJECT:_____

_____

_____

IDENTIFICATION:

PSU:_____ CASE NO.:_____ CRASH DATE:_____

CRASH LOCATION:_____

INVESTIGATING POLICE AGENCY:_____

VEHICLE MODEL YEAR:_____ MAKE/MODEL:_____

VIN:_____ ODOMETER READING:_____

CRASH DESCRIPTION (include police report)

(continue on back)
_____

ITEM DESCRIPTION (include photograph if possible)

TABLE 4-2

OVERVIEW OF COLLECTED INFORMATION ON SAMPLED CDS CRASHES

SPECIFIC AREAS OF INTEREST TO NHTSA RULEMAKING

CRASH AVOIDANCE

1. Crashes involving vehicles driven by handicapped drivers.

2. Crashes involving vehicles equipped with adaptive aids.

3. Crashes in which failure of a multipiece rim (not a tire failure) caused or contributed to the severity of the crash.

4. Crashes involving malfunction of a speed governor or speed control unit.

5. Crashes where the driver reported confusion about the location of display or control elements of the vehicle.

6. Crashes where underinflation of tires caused or contributed to the severity of crash.

7. Crashes involving pedestrian and/or cyclist injured by impact with outside mirrors.

8. Crashes involving injury to motorcycle drivers due to impact with the motorcycle mirrors.

9. Crashes where driver reported that distortion of image in convex mirror confused him (especially late model GM cars).

10. Crashes where commercial vehicle drivers reported that they could not see car, pedestrian, or cycle in a specific blind spot (such as in the right front area of large truck-tractors).

11. Crashes where driver or a passenger car or light truck reported that they could not see because of an obstruction of view by some part of the vehicle (such as inside mirror or roof support pillar).

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

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

CRASHWORTHINESS

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

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

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

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

CORROSION

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

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

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

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

5.0 CDS SUBMISSION INSTRUCTIONS

5.1 Quality Control Checks for PSU Teams

Please find below a list of quality control checks to be made by PSU teams.

5.1.1 Quality Control Checks Prior to Microcomputer Data Entry

Each case should be reviewed by a person other than the originating researcher using the PSU Case Review Form prior to entering the case via MDE. This effort tends to minimize encoding errors resulting from values which are either illegal or legal but incorrect. The noncoded items in the case should also be checked. The primary researcher is to be informed (preferably in writing) of any problems detected during this review and that researcher is to assume the responsibility for their resolution. Some suggested areas where problems may occur are as follows:

☞ Has the case passed in-house review?

☞ Are all official records and slides present?

☞ Check slides and official records to make sure they correspond to the case submitted (slides and police report shouldn't be placed next to each other because the photocopied police report tends to "bleed" on the slide folders).

☞ Have portions of Update Forms been filled out where needed?

☞ Do the control charts properly reflect how much of the case report has been completed?

☞ Make sure medical reports are properly sanitized.

☞ Are all data collection forms present?

☞ Are the logs properly completed on the forms?

☞ Make sure case materials are sequenced properly and the case report envelope is stamped and properly identified.

☞ Check noncoded data for correctness and its interface with coded data.

☞ Check to make sure that the coded data are properly and legibly entered on the data collection forms.

☞ Have "+"s or "-"s been circled for GV60 and GV61 on the General Vehicle Form, fo r EV22 and EV25 on the Exterior Vehicle Form, and for OA39 on the Occupant Assessment Form?

5.1.2 Quality Control Checks Resulting from Microcomputer Data Entry

Inconsistencies, out -of-range values, and other error diagnostics encountered during the MD E are explained in CDS MDE error checks and tables. All errors detected by the computer edits are corrected by the PSU before the case is forwarded to the zone center--unless the zone center is notified and suggests shipment of an incompletely entered case. MDE intraform and interform checks

TABLE 5-1

MDE Checks: Format, Designations, and Tables

Digit Location:	1st	2nd	3rd	4th	5th	6th
	-------	-------	-------	-------	-------	-------
MDE Check Format:	Letter	Letter	Number	Number	Number	Number

L E T T E R S

Definition	IntraForm Designators
----------	--
A = Accident Form	AA = Accident intraform edit checks
G = General Vehicle Form	GG = General Vehicle intraform edit checks
E = Exterior Vehicle Form	EE = Exterior Vehicle intraform edit checks
C = Interior Vehicle Form	CC = Interior Vehicle intraform edit checks
H = Occupant Assessment Form	HH = Occupant Assessment intraform edit checks
T = Occupant Injury Form	TT = Occupant Injury intraform edit checks

InterForm Designators

AG   = Accident--General Vehicle interform edit checks
AE   = Accident--Exterior Vehicle interform edit checks
GE   = General Vehicle--Exterior Vehicle interform edit checks
GC   = General Vehicle--Interior Vehicle interform edit checks
EC   = Exterior Vehicle--Interior Vehicle interform edit checks
AH   = Accident--Occupant Assessment Interform edit checks
GH   = General Vehicle--Occupant Assessment interform edit checks
EH   = Exterior Vehicle--Occupant Assessment interform edit checks
CH   = Interior Vehicle--Occupant Assessment interform edit checks
AT   = Accident--Occupant Injury interform edit checks
GT   = General Vehicle--Occupant Injury interform edit checks
ET   = Exterior Vehicle--Occupant Injury interform edit checks
CT   = Interior Vehicle--Occupant Injury interform edit checks
HT   = Occupant Assessment--Occupant Injury interform edit checks
MM   = Multiple Forms (more than 2) interform edit checks

The above two letter designations denote that the interform consistency check is written solely or primarily between the two indicated forms.

TABLE 5-1 (Continued)

T A B L E S

Table	Variables Involved		MDE Check(s)
A1	OA05	Occupant's Age	HH002
	OA06	Occupant's Sex	
	OA07	Occupant's Height	
A2	OA06	Occupant's Sex	HH007
	OA07	Occupant's Height	
	OA08	Occupant's Weight	
A4	GV07	Body Type	GG008
	GV43	Vehicle Curb Weight	
A5	OI06	et al., Body Region	TT002
	OI07	et al., Type of Anatomic Structure	
	OI08	et al., Specific Anatomic Structure	
	OI09	et al., Level of Injury	
	OI10	et al., AIS Severity	
	OI11	et al., Aspect	
A6	GV60	Longitudinal Component of Delta V	GE017
	GV61	Lateral Component of Delta V	GE018
	EV06	1st C.D.C. - Direction of Force	
A7	GV05	Vehicle Make	GG005
	GV07	Body Type	
A11	GV36	Accident Type (pair check)	GG032
A12	GV04	Vehicle Model Year	GG092
	GV08	Vehicle Identification Number (check digit algorithm)	
A14	AC14	Class of Vehicle	AG027
	AC17	Contacted Class of Vehicle	AG028
	GV07	Body Type	
A15	IV48	Intruding Component	CT009
	OI11	Injury Source	
	OI14	Occupant Area Intrusion No.	
A16	AC15	General Area of Damage	AG047
	AC18	General Area of Damage	AG048
	GV36	Accident Type	

appear on the computer screen when they are tripped. MDE checks consist of two letters followed by four numbers. The fourth number is actually the line number within the check. When contacting your zone center regarding an MDE check, please reference the check according to its two letters and first three numbers. **Table 5-1** above explains the reference system used in the MDE checks. Eleven tables accompany the MDE checks. These tables are: A -1, A-2, A-4 through A -7, A-11, A-12, and A-14 through A-16. These tables are also discussed above.

5.1.3 Check to Make Sure Administrative Procedures Are Being Followed

☞ Are control charts and activity logs (when used) updated weekly?

☞ Are monthly reports and sampling materials sent to the zone center?

☞ Are manuals up -to-date and properly displayed?

☞ Are needed supplies in stock (e.g., film, etc.)?

5.1.4 Check Sampling Procedures

☞ Periodically review sampling procedures in team meetings.

☞ Document any problems in the monthly report.

5.1.5 Check Data Collection Procedures

☞ Periodically review procedures. Document when meetings are held and any problems discovered with the data collection procedures or forms. Indicate problems in the monthly report or over the Message System to your zone center. Keep a file of problems encountered and go over them with a zone center representative during the next zone center site visit.

5.1.6 Check to Make Sure Updates Are Being Processed Properly

☞ Are the medical update records filed by case number?

☞ Do zone center and PSU records agree (see zone center list of outstanding updates)?

5.1.7 Check Individual Effort and Accuracy in Collecting Evidence and Skill in Interpretation

☞ Discuss data collection procedures and efficient ways to execute them in team meetings. Discuss how much follow -up effort is needed for obtaining interviews and think about methods other than the phone and personal contact for obtaining more interviews (e.g., letters).

5.2 Case Submission

Cases shall be submitted to the zone centers on a weekly basis. The materials for each case are to be ordered in the recommended format discussed in Section 4.2; each case is to be packaged in a separate envelope with the appropriate identification and account of contents on the Administrative log. These procedures will provide uniformity across teams and, in turn, reduce the variation encountered by the zone center upon receipt of the cases. Furthermore, the weekly submission will minimize the peaks and valleys in the zone center case review workload.

Submission Schedule --Cases shall be submitted on a weekly basis according to the schedule (**Table 5-2**). Essentially, there will be at least one month to make the initial submission of any case. All cases are to be submitted within four weeks following the date on which they were sampled. This means that the maximum time available to submit a case will be twenty -eight

days from the date of sample. Interviews, vehicle inspections, and scenes not completed in the allowed time period will not be updated. **Table 5-3** contains the quarterly and annual file closeout schedules.

Those variables which are allowed updates, but have not been completed within the time available for the initial case submission, should be documented on the appropriate record and submitted as updates in accordance with the schedule. The update time schedule may be extended with prior approval of the zone center. See Section 4.4 (Update Procedures for Hard Copy Field Forms).

Cases which are completed (i.e., no updates needed) prior to elapsing of the available time period should be submitted on the next, earliest case submission.

Case Envelope --The standardized case envelope shall be 10 X 13 inches fiber paper (i.e., Tyvek). The case envelope belongs inside the shipping envelope. The Administrative log, **Table 5-4**, belongs on the case envelope. The PSU number, case number, accounting of case materials, and the status of the case at the time of submission, as shown in **Table 5-4**, are to be entered on the log. The log is to be positioned on the right -hand side of the envelope when the envelope is positioned with its flap on the underside and to the right.

This information helps the Zone Center effectively sort the case at the inception of the quality control process; the standardized envelopes will facilitate storage and retrieval.

All medical records for each case shall be submitted in a 9 X 12 manila envelope. A pre-printed Injury Information label, provided by NHTSA, shall be attached to the front of each envelope. The medical information will be used by the Zone Center to complete the injury coding for each occupant. After completion of injury coding, the Zone Center will keep the medical record envelopes in a separate file.

Case update records, submitted after initial case submission, shall be submitted in a 10 X 13 inch fiber paper envelope. Identify the PSU, and boldly mark the front of the envelope: UPDATES. The updates will be removed from the envelope and collated with the original forms in their respective cases by the zone center.

Case Slide Holders -- The slide holders shall be of sufficient quality to securely retain the slides when the holder is inverted or rotated for viewing.

Shipment of Cases--The envelopes containing the individual cases which are eligible for shipment, according to the schedule shown in **Table 5-2**, should be packaged in a box or other suitable container and mailed to the Zone Center. Do not use overnight or Express Mail services without prior approval of the COTR. The PSU should provide an acknowledgment of delivery card, return receipt, or similar confirmation to ensure the shipment was received by the Zone Center.

TABLE 5-2

CDS File Case Submission Schedule

CASES *SAMPLED* ON OR BEFORE	MUST BE *SUBMITTED* ON OR BEFORE (+4 WEEKS)	MUST BE *RECEIVED* ON OR BEFORE (+5 WEEKS)	MUST BE *REVIEWED* ON OR BEFORE (+7 WEEKS)	MUST *RECEIVE* UPDATES ON OR BEFORE (+12 WEEKS)
3-Jan-1997	31-Jan-1997	7-Feb-1997	21-Feb-1997	28-Mar-1997
10-Jan-1997	7-Feb-1997	14-Feb-1997	28-Feb-1997	4-Apr-1997
17-Jan-1997	14-Feb-1997	21-Feb-1997	7-Mar-1997	11-Apr-1997
24-Jan-1997	21-Feb-1997	28-Feb-1997	14-Mar-1997	18-Apr-1997
31-Jan-1997	28-Feb-1997	7-Mar-1997	21-Mar-1997	25-Apr-1997
7-Feb-1997	7-Mar-1997	14-Mar-1997	28-Mar-1997	2-May-1997
14-Feb-1997	14-Mar-1997	21-Mar-1997	4-Apr-1997	9-May-1997
21-Feb-1997	21-Mar-1997	28-Mar-1997	11-Apr-1997	16-May-1997
28-Feb-1997	28-Mar-1997	4-Apr-1997	18-Apr-1997	23-May-1997
7-Mar-1997	4-Apr-1997	11-Apr-1997	25-Apr-1997	30-May-1997
14-Mar-1997	11-Apr-1997	18-Apr-1997	2-May-1997	6-Jun-1997
21-Mar-1997	18-Apr-1997	25-Apr-1997	9-May-1997	13-Jun-1997
28-Mar-1997	25-Apr-1997	2-May-1997	16-May-1997	20-Jun-1997
4-Apr-1997	2-May-1997	9-May-1997	23-May-1997	27-Jun-1997
11-Apr-1997	9-May-1997	16-May-1997	30-May-1997	4-Jul-1997
18-Apr-1997	16-May-1997	23-May-1997	6-Jun-1997	11-Jul-1997
25-Apr-1997	23-May-1997	30-May-1997	13-Jun-1997	18-Jul-1997
2-May-1997	30-May-1997	6-Jun-1997	20-Jun-1997	25-Jul-1997
9-May-1997	6-Jun-1997	13-Jun-1997	27-Jun-1997	1-Aug-1997
16-May-1997	13-Jun-1997	20-Jun-1997	4-Jul-1997	8-Aug-1997
23-May-1997	20-Jun-1997	27-Jun-1997	11-Jul-1997	15-Aug-1997
30-May-1997	27-Jun-1997	4-Jul-1997	18-Jul-1997	22-Aug-1997
6-Jun-1997	4-Jul-1997	11-Jul-1997	25-Jul-1997	29-Aug-1997
13-Jun-1997	11-Jul-1997	18-Jul-1997	1-Aug-1997	5-Sep-1997
20-Jun-1997	18-Jul-1997	25-Jul-1997	8-Aug-1997	12-Sep-1997
27-Jun-1997	25-Jul-1997	1-Aug-1997	15-Aug-1997	19-Sep-1997
4-Jul-1997	1-Aug-1997	8-Aug-1997	22-Aug-1997	26-Sep-1997
11-Jul-1997	8-Aug-1997	15-Aug-1997	29-Aug-1997	3-Oct-1997
18-Jul-1997	15-Aug-1997	22-Aug-1997	5-Sep-1997	10-Oct-1997

TABLE 5-2 (Cont'd)

CDS File Case Submission Schedule

CASES *SAMPLED* ON OR BEFORE	MUST BE *SUBMITTED* ON OR BEFORE (+4 WEEKS)	MUST BE *RECEIVED* ON OR BEFORE (+5 WEEKS)	MUST BE *REVIEWED* ON OR BEFORE (+7 WEEKS)	MUST *RECEIVE* UPDATES ON OR BEFORE (+12 WEEKS)
25-Jul-1997	22-Aug-1997	29-Aug-1997	12-Sep-1997	17-Oct-1997
1-Aug-1997	29-Aug-1997	5-Sep-1997	19-Sep-1997	24-Oct-1997
8-Aug-1997	5-Sep-1997	12-Sep-1997	26-Sep-1997	31-Oct-1997
15-Aug-1997	12-Sep-1997	19-Sep-1997	3-Oct-1997	7-Nov-1997
22-Aug-1997	19-Sep-1997	26-Sep-1997	10-Oct-1997	14-Nov-1997
29-Aug-1997	26-Sep-1997	3-Oct-1997	17-Oct-1997	21-Nov-1997
5-Sep-1997	3-Oct-1997	10-Oct-1997	24-Oct-1997	28-Nov-1997
12-Sep-1997	10-Oct-1997	17-Oct-1997	31-Oct-1997	5-Dec-1997
19-Sep-1997	17-Oct-1997	24-Oct-1997	7-Nov-1997	12-Dec-1997
26-Sep-1997	24-Oct-1997	31-Oct-1997	14-Nov-1997	19-Dec-1997
3-Oct-1997	31-Oct-1997	7-Nov-1997	21-Nov-1997	26-Dec-1997
10-Oct-1997	7-Nov-1997	14-Nov-1997	28-Nov-1997	2-Jan-1998
17-Oct-1997	14-Nov-1997	21-Nov-1997	5-Dec-1997	9-Jan-1998
24-Oct-1997	21-Nov-1997	28-Nov-1997	12-Dec-1997	16-Jan-1998
31-Oct-1997	28-Nov-1997	5-Dec-1997	19-Dec-1997	23-Jan-1998
7-Nov-1997	5-Dec-1997	12-Dec-1997	26-Dec-1997	30-Jan-1998
14-Nov-1997	12-Dec-1997	19-Dec-1997	2-Jan-1998	6-Feb-1998
21-Nov-1997	19-Dec-1997	26-Dec-1997	9-Jan-1998	13-Feb-1998
28-Nov-1997	26-Dec-1997	2-Jan-1998	16-Jan-1998	20-Feb-1998
5-Dec-1997	2-Jan-1998	9-Jan-1998	23-Jan-1998	27-Feb-1998
12-Dec-1997	9-Jan-1998	16-Jan-1998	30-Jan-1998	6-Mar-1998
19-Dec-1997	16-Jan-1998	23-Jan-1998	6-Feb-1998	13-Mar-1998
26-Dec-1997	23-Jan-1998	30-Jan-1998	13-Feb-1998	20-Mar-1998
2-Jan-1998	30-Jan-1998	6-Feb-1998	20-Feb-1998	27-Mar-1998
9-Jan-1998	6-Feb-1998	13-Feb-1998	27-Feb-1998	3-Apr-1998
16-Jan-1998	13-Feb-1998	20-Feb-1998	6-Mar-1998	10-Apr-1998

TABLE 5-3

CDS File Closeout Schedule

CASES *SAMPLED* ON OR BEFORE	MUST BE *APPROVED* ON OR BEFORE (+13 WEEKS)	MUST BE *CLOSED OUT* ON OR BEFORE (+13 WEEKS)	QUARTERLY *REPORT DUE* ON OR BEFORE (+14 WEEKS)
3-Jan-1997	4-Apr-1997		
10-Jan-1997	11-Apr-1997		
17-Jan-1997	18-Apr-1997		
24-Jan-1997	25-Apr-1997		
31-Jan-1997	2-May-1997		
7-Feb-1997	9-May-1997		
14-Feb-1997	16-May-1997		
21-Feb-1997	23-May-1997		
28-Feb-1997	30-May-1997		
7-Mar-1997	6-Jun-1997		
14-Mar-1997	13-Jun-1997		
21-Mar-1997	20-Jun-1997	20-Jun-1997	27-Jun-1997
28-Mar-1997	27-Jun-1997	FIRST QTR	FIRST QTR
4-Apr-1997	4-Jul-1997		
11-Apr-1997	11-Jul-1997		
18-Apr-1997	18-Jul-1997		
25-Apr-1997	25-Jul-1997		
2-May-1997	1-Aug-1997		
9-May-1997	8-Aug-1997		
16-May-1997	15-Aug-1997		
23-May-1997	22-Aug-1997		
30-May-1997	29-Aug-1997		
6-Jun-1997	5-Sep-1997		
13-Jun-1997	12-Sep-1997		
20-Jun-1997	19-Sep-1997	19-Sep-1997	26-Sep-1997
27-Jun-1997	26-Sep-1997	SECOND QTR	SECOND QTR
4-Jul-1997	3-Oct-1997		
11-Jul-1997	10-Oct-1997		
18-Jul-1997	17-Oct-1997		
25-Jul-1997	24-Oct-1997		
1-Aug-1997	31-Oct-1997		

TABLE 5-3 (Cont'd)

CDS File Closeout Schedule

CASES *SAMPLED* ON OR BEFORE	MUST BE *APPROVED* ON OR BEFORE (+13 WEEKS)	MUST BE *CLOSED OUT* ON OR BEFORE (+13 WEEKS)	QUARTERLY *REPORT DUE* ON OR BEFORE (+14 WEEKS)
8-Aug-1997	7-Nov-1997		
15-Aug-1997	14-Nov-1997		
22-Aug-1997	21-Nov-1997		
29-Aug-1997	28-Nov-1997		
5-Sep-1997	5-Dec-1997		
12-Sep-1997	12-Dec-1997		
19-Sep-1997	19-Dec-1997	19-Dec-1997	26-Dec-1997
26-Sep-1997	26-Dec-1997	THIRD QTR	THIRD QTR
3-Oct-1997	2-Jan-1998		
10-Oct-1997	9-Jan-1998		
17-Oct-1997	16-Jan-1998		
24-Oct-1997	23-Jan-1998		
31-Oct-1997	30-Jan-1998		
7-Nov-1997	6-Feb-1998		
14-Nov-1997	13-Feb-1998		
21-Nov-1997	20-Feb-1998		
28-Nov-1997	27-Feb-1998		
5-Dec-1997	6-Mar-1998		
12-Dec-1997	13-Mar-1998		
19-Dec-1997	20-Mar-1998		
26-Dec-1997	27-Mar-1998		
2-Jan-1998	3-Apr-1998		
9-Jan-1998	10-Apr-1998		
16-Jan-1998	17-Apr-1998	17-Apr-1998	April 24, 1998
		FOURTH QTR	FOURTH QTR
1997 ANNUAL REPORT DUE May 29, 1998			

TABLE 5-4

CDS Nonsample Count Submission Schedule

PARs with CRASH DATES	COUNTS MUST BE SUBMITTED ON OR BEFORE	COUNTS MUST BE RECEIVED ON OR BEFORE	COUNTS MUST BE REVIEWED ON OR BEFORE	MAIL TO NHTSA/NCSA ON OR BEFORE
1997-01-01	1997-05-31	1997-06-07	1997-06-21	1997-06-30
to				
1997-03-31				
1997-04-01	1997-08-31	1997-09-07	1997-09-21	1997-09-29
to				
1997-06-30				
1997-07-01	1997-11-30	1997-12-07	1997-12-21	1997-12-30
to				
1997-09-30				
1997-10-01	1998-02-28	1998-03-07	1998-03-21	1998-04-01
to				
1997-12-31				

TABLE 5-5

U.S. DOT/NHTSA   NASS/CDS

ADMINISTRATIVE LOG-A

TO BE COMPLETED BY TEAM

1. PSU Number   __ __

2. Case Number—Stratum   __ __ __ __

3. Assigned Researcher Number   __

4. Status of Assigned Researcher   __
    (1) Researcher   (4) Former researcher
    (2) Novice   (5) Trainee
    (3) Probation   (9) Researcher assistant

5. Crash Date   __ __/__ __/__ __

6. Sample Date   __ __/__ __/__ __

7. Date Due at Zone Center   __ __/__ __/__ __

8. Special Studies Case   ____ ____ ____ ____ ____
                                                                 SS15 SS16 SS17 SS18 SS19

9. Jurisdiction   __ __

10. Number of Non-Towed CDS   __ __
    Applicable Vehicles

11. Number of Towed CDS Applicable Vehicles   __ __

12. Number of General Vehicle Forms Submitted   __ __

13. Number of Exterior Vehicle Forms Submitted   __ __

14. Number of Interior Vehicle Forms Submitted   __ __

15. Number of Occupant Assessment   __ __
    Forms Submitted

16. Injury Coding Required?   __
    (0) No
    (1) Yes

17. Number of Occupants With Official   __ __
    Medical Records Submitted

18. Reconstruction in Case   __
    (0) None
    (1) CRASH
    (2) OLDMISS
    (3) CRASH and OLDMISS
    (4) SMASH
    (5) SMASH and OLDMISS

19. Potential Safety Problem Bulletin   __
    (0) No
    (1) Submitted by PSU

    For Zone Center Use Only
    (2) Submitted by PSU and sent to NHTSA by ZC
    (3) Identified by ZC and sent to NHTSA
    (4) Submitted by PSU and not sent to NHTSA by ZC

HS Form 431C (1/96)

The addresses for the zone centers are as follows:

Zone Center #1   Kendra Perillo   **(716)-631-6991**
                    Calspan Corporation
                    Post Office Box 400   {U.S. mail}
                    Buffalo, New York 14225

                    4455 Genesee Street   {UPS, Federal
                    Cheektowaga, New York 14225 Express, etc.}

Zone Center #2   Paula Pitzer   **(210)-699-9065**
                    KLD Associates, Inc.
                    8632 Frederickburg Road Suite 126
                    San Antonio, Texas 78240

5.3 Case Deletion Procedures

PSUs

The following procedure for deleting cases should be adhered to for all CDS cases:

1. Call your zone center for approval. Request that the case be dropped and give the reason.

2. Send a follow-up message informing the zone center and NCSA (HDQ) of the case to be dropped. Include the following information in the message.

    a.   Case Number
    b.   Sample Date
    c.   Crash Date
    d.   Crash Time
    e.   PAR Number
    f.   Jurisdiction
    g.   Dropped Date (date Zone Center/HDQ gave approval)
    h.   Reason Dropped (list provided by COTR)
    I.   Team Stratification Error (Y-yes, N-no)
    j.   Dropped By (person who authorized dropping the case)

3. The case must be MDE'ed by the PSU and subsequently released to the zone center. To MDE the case, complete the **Accident Form** and one **General Vehicle Form**. This may differ from the actual structure of the case, but it is desired to minimize the number of forms required for the case to be released. To MDE the case, proceed as follows:

    a. Case and Form Selection
        (1)   On Main Menu: **Press F3**-Add or Change Case Data
        (2)   On Case Selection Menu: **Select Case Number** - **Press Enter**
        (3)   On MDE Menu: **Press F1**-MDE Add

b. Accident Form
    (1)   Complete data fields as follows:

Variable Number	Valid Codes
AC03	01
AC06	0
AC11	01
AC13-AC18	$ in first position of each variable with spaces in additional positions

    (2) **Press Enter**
    (3) **Press F3**
    (4) Intra Errors - **Press Enter**
    (5) Redisplay Accident Form(N)? - **Press Enter**
    (6) Display Next Form(Y)? - **Press Enter**

c. General Vehicle Form
    (1)   Complete data fields as follows:

Variable Number	Valid Codes
GV04-GV06	$ in first character position of each variable
GV07	99
GV08	$ in first character position
GV09	$ in first character position
GV10	0
GV11-GV36	$ in first character position of each variable with spaces in additional positions

    (2) **Press Enter**
    (3) Intra Errors - **Press Enter**
    (4) Redisplay General Vehicle Form(N)? - **Press Enter**
    (5) Inter Errors - **Press Enter**
    (6) The Case Is Now Complete - **Press Enter**
    (7) On MDE Menu: **Press Esc**
    (8) On Case Selection Menu - **Press ESC**

d. Release Case
    (1) On Main Menu: **Press F4**-Release Case
    (2) On Case Selection Menu: **Select Case Number** - **Press Enter**
    (3) On Error Summary Screen: **Press Enter**
        (NOTE: You will get some errors on your Error Summary Screen; ignore these and continue with procedure.)
    (4) Do you want to release case with errors?-**Enter Y** - **Press Enter**
    (5) Are you sure?-**Enter Y** - **Press Enter**
    (6) Make sure printer is on so that printout of case can be made

4.   Send the dropped hard copy case report to the zone center. Each dropped case is to be sent to the zone center in a separate standard envelope.

a. Label the outside of the envelope as follows:
    (1) Place the Administrative log and write in the PSU number and case number

    (2)   Write in large letters: **DROPPED** (under the Administrative log)
    (3)   Write the date the zone center approved to drop the case
    (4)   Write the person(s) who gave zone center approval to drop the case

  b. Place inside the envelope:
    (1)   PAR
    (2)   Accident Form
    (3)   General Vehicle Form
    (4)   MDE printout
    (5)   Any additional case related materials

Zone Centers

The case will be deleted from the zone center's active case file at a later date--after the zone center reviews the hard copy case report and agrees that the case should be dropped. Zone centers will list the case number and reason why the case was dropped in their month ly, quarterly, and annual reports.

NCSA - COTR

The COTR will:

1. Use the monthly report as a record for advising Crash Investigation Division (AID) of cases to be deleted from the file.

2. Determine the disposition of the dropped case report (e.g., shipped to NHTSA for review or destroyed at the zone center).

6.0 GES QUALITY CONTROL AND SUBMISSION INSTRUCTIONS

6.1 Quality Control Checklist for GES Sampling and Mailing

Complete the checklist shown in **Table 6-1** for each submission of GES PARs.

6.2 GES Submission Instructions

The following guidelines should be carefully reviewed and adhered to.

1. The contents of each envelope should include the following:

    (a) GES Sampled PAR Inventory (SPI) sheet(s);
    (b) Stratification Record(s) (SR) for each jurisdiction visited; and
    (c) Copy of each PAR highlighted on the Stratification Record.
    (d) One Quality Control Checklist (QCC)

2. Use only 10 x 13 inch Manila envelopes and write GES and your PSU number in the lower right-hand corner. Do not put submissions from more than one PSU in an envelope.

3. Address the envelope to your respective Zone Center:

Zone Center #1	Jackie Scott	**(716)-631-6991**
	Calspan Corporation	
	Post Office Box 400	
	Buffalo, New York 14225	

Zone Center #2	Paula Pitzer	**(210)-699-9065**
	KLD Associates, Inc.	
	8632 Frederickburg Road, Suite 126	
	San Antonio, Texas 78240	

4. Arrange the contents in the following manner.

    ☞ First should be the Sampled PAR Inventory sheets. The Sampled PAR Inventory sheet(s) should be ordered by PJ and column numbers;

    ☞ Next should be the Stratification Records for eac h jurisdiction followed by the PARs for that jurisdiction. Paper clip (**Do Not Staple) the SRs and PARs**;

    ☞ Sequence the PARS for each PJ by column number in the order they were selected.

NOTE: If a jurisdiction was visited more than once you will have   more than one set of Stratification Records for that jurisdiction. In this case group all the SRs for that jurisdiction together in order. Then place all the PARs for that jurisdiction together in order be neath them and paper clip them together.

GES Submission Contents

- SPI(s)

- SR(s)   Jurisdiction 1
- PAR(s)   Jurisdiction 1
  (sequence PARs by column number)

- SR(s)   Jurisdiction 2
- PAR(s)   Jurisdiction 2
  (sequence PARs by column number)
  - •
  - •
  - •
- QCC

---

5.   The Sampled PAR Inventory should reflect the contents of the envelope. The entries for each jurisdiction must match the PARs contained in the envelope for that jurisdiction.

Use the jurisdiction names used by NCSA rather than personal abbreviations which can be difficult to recognize.

6.   Have a second person look over the Stratification Record and Sampled PAR Inventory sheet to verify its accuracy. Fill out the Quality Control Checklist. It is important that these records leave your office completed correctly.

7.   Be sure that the PAR copies ar e legible. If you cannot read them, then the Zone Center and GES Data Entry and Quality Control Contractor cannot read them.

8.   Be sure to label each PAR with the PSU number, slash, PJ number, slash, and column number from the Stratification Record, for example: PSU6/PJ3/C2.

Do's and Don'ts for GES Submissions

1.   Do not include anything other than the Sampled PAR Inventory(s), the Stratifica tion Records, the PAR copies, and the Quality Control Checklist.

2.   Do not hold packages because one or two PARs are missing. If a PAR is not available at mailing, then you should notify the Zone Center and include a note in the submission.

TABLE 6-1

QUALITY CONTROL CHECKLIST

1. Verify that the sampling procedures were completed correctly.

    ( )   The line #'s are in sequence.

    ( )   The correct interval numbers have been used.

    ( )   The line #'s matching the interval numbers have been highlighted.

2. Verify that the correct PARs have been copied.

    ( )   Copies of all sampled PARs are present.

    ( )   All the pages for each sampled PAR have been copied.

    ( )   There are no nonsampled PARs.

    ( )   Each PAR has the PSU, PJ, and Column numbers, e.g., PSU3/PJ6/C1, in the upper righthand corner.

3. Verify that the Sampled PAR Inventory is correct.

    ( )   All header informatio n is complete.

    ( )   All sampled PARs have been listed.

4. Enclose a copy of this form with each submission to the Zone Center.

PSU #   _____

PSU Name   _____

Reviewer Name   _____

Form QCC:1/94

3. If, during your usual collection period, no PARs were sampled, send a message to the Zone Center. Continue to list and sample according to your normal schedule until your next planned mailing date. Assuming by this time you now have at least one sampled PAR, group all relevant materials (accumulated since the last mailing) together and mail to the Zone Center. During most of the year, this would be a rare occurrence. During the first few weeks of the new year, however, listing without sampling any PARs is fairly common.

4. If any item on the quality control checklist is not correct, that item must be corrected prior to sending the submission to the Zone Center. For example, if the line numbers are out of sequence on the SR, they must be corrected and the correct PARS must be sampled.

5. If you are a PSU responsible for an adjacent site, then treat it as a separate site and use its PSU number on all forms related to that PSU. Do not use your CDS PSU number on forms related to the adjacent site.

6. Do not put data for CDS and adjacent sites in the same 10 x 13 inch envelope. If you wish to mail them together, then follow the previous instructions for each site and place the two 10 x 13 inch envelopes inside a larger envelope and mail.

7. **Never send an envelope containing only PARs, without a written explanation.** Sometimes you may realize you have made a mistake after mailing a submission, such as omitting a PAR that should have been included or mailing an incorrect PAR. Then you should mail a separate envelope to the Zone Center including a note specifically describing the contents of the envelope. Be sure to indicate submission number, PSU number, and PJ number.

6.3 Sampled PAR Inventory
The Sampled PAR Inventory (SPI) replaces the package inventory. **Table 6-2** is an example of a completed SPI. In addition to the data previously recorded for each sampled PAR, the collector will record the PAR number, PAR date, and PAR time. The PSU number and PSU name are preprinted. The PAR number is usually assigned by the jurisdiction and is not preprinted. However, if only a preprinted number is available, use that as the PAR number. The submission number shall be "1" for each PSU's first submission for the year and shall continue in sequence until the last submission for the same year is made in the following January. The submission date shall be the date the submission is mailed to the Zone Center. The PAR collectors are to order the entries on the new SPI and order the sampled PARs by PJ and Column numbers.

6.4 Submission Schedule
PSUs are to follow the GES PAR Submission Schedule for submitting sampling materials to the Zone Centers for both their sites and their adjacent sites. Sampling material are to be submitted weekly according to the schedule (**Table 6-3**). Any delays in the schedule should be immediately reported to the Zone Center.

TABLE 6-2

GENERAL ESTIMATES SYSTEM
SAMPLED PAR INVENTORY

PSU #   _99_   PSU Name   _The NCSA Team_

Submission # _1_   Submission Date   _1/12/96_

Submission for Collection Period: 1/1/9 6   To   1/11/96

Line #	Police Jurisdiction (Number and Name)	Column	PAR Date	PAR Time	PAR Number
1	1 - TOTH PD	1	1/3/96	13:00	12345
2	1 - TOTH PD	2	1/12/96	00:30	13339
3	2 - EVANS PD	1	1/6/96	02:00	22348
4	2 - EVANS PD	4	1/10/96	18:00	12117
5	3 - REED COUNTY SHF	3	1/11/96	03:25	22999
6	3 - REED COUNTY SHF	3	1/2/96	13:25	22985
7	3 - REED COUNTY SHF	4	1/7/96	18:30	99987

Form SPI:1/96   Page _1_ of _1_

TABLE 6-3

GES PAR Submission Schedule

PARS SAMPLED BY PSU ON OR BEFORE	MUST BE SUBMITTED BY PSU ON OR BEFORE (+ 0 weeks)	MUST BE REVIEWED & FORWARDED BY ZONE CENTER ON OR BEFORE (+ 1 week)
3 January 1997	4 April 1997	10 January 1997
10 January 1997	11 April 1997	17 January 1997
17 January 1997	18 April 1997	24 January 1997
24 January 1997	25 April 1997	31 January 1997
31 January 1997	2 May 1997	7 February 1997
7 February 1997	9 May 1997	14 February 1997
14 February 1997	16 May 1997	21 February 1997
21 February 1997	23 May 1997	28 February 1997
28 February 1997	30 May 1997	7 March 1997
7 March 1997	6 June 1997	14 March 1997
14 March 1997	13 June 1997	21 March 1997
21 March 1997	20 June 1997	28 March 1997
28 March 1997	27 June 1997	4 April 1997
4 April 1997	4 July 1997	11 April 1997
11 April 1997	11 July 1997	18 April 1997
18 April 1997	18 July 1997	25 April 1997
25 April 1997	25 July 1997	2 May 1997
2 May 1997	1 August 1997	9 May 1997
9 May 1997	8 August 1997	16 May 1997
16 May 1997	15 August 1997	23 May 1997
23 May 1997	22 August 1997	30 May 1997
30 May 1997	29 August 1997	6 June 1997
6 June 1997	5 September 1997	13 June 1997
13 June 1997	12 September 1997	20 June 1997
20 June 1997	19 September 1997	27 June 1997
27 June 1997	26 September 1997	4 July 1997
4 July 1997	3 October 1997	11 July 1997
11 July 1997	10 October 1997	18 July 1997
18 July 1997	17 October 1997	25 July 1997

TABLE 6-3 (Cont'd

GES PAR Submission Schedule

PARS SAMPLED BY PSU ON OR BEFORE	MUST BE SUBMITTED BY PSU ON OR BEFORE (+ 0 weeks)	MUST BE REVIEWED & FORWARDED BY ZONE CENTER ON OR BEFORE (+ 1 week)
25 July 1997	24 October 1997	1 August 1997
1 August 1997	31 October 1997	8 August 1997
8 August 1997	7 November 1997	15 August 1997
15 August 1997	14 November 1997	22 August 1997
22 August 1997	21 November 1997	29 August 1997
29 August 1997	28 November 1997	5 September 1997
5 September 1997	5 December 1997	12 September 1997
12 September 1997	12 December 1997	19 September 1997
19 September 1997	19 December 1997	26 September 1997
26 September 1997	26 December 1997	3 October 1997
3 October 1997	2 January 1998	10 October 1997
10 October 1997	9 January 1998	17 October 1997
17 October 1997	16 January 1998	24 October 1997
24 October 1997	23 January 1998	31 October 1997
31 October 1997	30 January 1998	7 November 1997
7 November 1997	6 February 1998	14 November 1997
14 November 1997	13 February 1998	21 November 1997
21 November 1997	20 February 1998	28 November 1997
28 November 1997	27 February 1998	5 December 1997
5 December 1997	6 March 1998	12 December 1997
12 December 1997	13 March 1998	19 December 1997
19 December 1997	20 March 1998	26 December 1997
26 December 1997	27 March 1998	2 January 1998
2 January 1998	3 April 1998	9 January 1998
9 January 1998	10 April 1998	16 January 1998
16 January 1998	17 April 1998	23 January 1998
23 January 1998	24 April 1998	30 January 1998
30 January 1998	1 May 1998	6 February 1998
6 February 1998	8 May 1998	13 February 1998

7.0 CODING INSTRUCTIONS

This section provides the general instructions for collecting and coding the data called for in the field forms. Documentation for each data element includes variable name, element values (attributes), definitions where needed, data sources, collection methodology, reference materials (if needed), and remarks.

CASE SUMMARY FORM

The Case Summary Form is a noncoded description of the vehicle(s) and person(s) involved in the crash. Further, the crash sequence and case peculiarities (vehicle or environmental) are noted. The form is divided into four sections:

> **Identification**
> **A.** **Description of the Accident Sequence and Accident Peculiarities**
> **B.** **Vehicle Profiles**
> **C.** **Person Profiles**

Through this form, 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. The form should be typed. However, legible hand written print is acceptable. The form must be neat and legible. Subsection A, Description of the Accident Sequence and Accident Peculiarities, must be double spaced, if typed. No coded values (except where indicated below) should be used. The form provides a non-jargon account of the crash.

IDENTIFICATION:

> The header items are used to identify the PSU and case number. In addition, a general description of the crash type is provided. This section contains the following variables.
>
> **PSU:** Indicate the appropriate PSU number.
>
> **Case No.:**Indicate the case number and stratum for which the Case Summary Form is being completed.
>
> **Type of Accident:** Provide a general description of the crash configuration in terms common to the traffic safety community. The pattern to be used is as follows: **vehicle / vehicle - configuration**. Appropriate vehicle and configuration terms are listed below; however, additional terms can be used if warranted.

Vehicle	**Configuration**
car	ran-off-road
light truck	rollover on road
light van	rollover off road
straight truck	head-on
step van	obtuse angle
semi-tractor	right angle
tractor-trailer	acute angle
motorcycle	rear-end
bicycle	sideswipe opposing direction
train	sideswipe same direction
pedestrian	object on road
nonmotorist	non-impact
animal	
parked _____	
abandoned _____	
stalled _____	

Some examples of the Type of Accident pattern desired are as follows:

car - ran-off-road
car/car - right angle
car/light truck - head-on
car/parked car - rear-end
light van/motorcycle - obtuse angle
car/train - right angle
car/tractor-trailer - acute angle
light truck - object on-road
light truck - rollover off-road

If more than two vehicle are involved, indicate multiple vehicle - multiple impact and describe the sequence in the narrative.

Researchers should attempt to make the best possible fit of the existing responses. However, additional responses may be more appropriate.

A. DESCRIPTION OF THE ACCIDENT SEQUENCE AND ACCIDENT PECULIARITIES

This part of 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 traveling north and vehicle #2 was traveling east on an intersecting roadway. The front of vehicle #1 impacted the left 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).

B. VEHICLE PROFILES

All vehicles involved in the NASS CDS case should be documented in this section. This section contains the following variables.

Vehicle No.: See variable GV03.

Class of Vehicle: See variable AC14. Note that the written attribute (*e.g.*, "Compact", "Large pickup truck", etc.) should be used, not the code.

Year/Make/Model: See variables GV04-GV06. Provide the actual vehicle year, make, and model for each vehicle involved in the NASS CDS crash (*e.g.*, '87/Ford/Mustang). Do not use coded values.

Most Severe Damage: Indicate the following for the crash impact which caused the most damage to the vehicle.

Damage Plane: The plane first crossed in the impact (*i.e.*, **Front**, **Left, Right**, **Back**, **Top**, or **Undercarriage**).

Severity Description: A <u>gross</u> indication of the damage severity. The terms **light**, **moderate**, or **severe** are adequate. Light suggests that the vehicle generally would not require towing (even if this vehicle may have been towed). Moderate includes vehicles that would generally require towing. And have less than 60 cm of maximum crush. Severe includes towed vehicles with greater than 60 cm of maximum crush.

Component Failure: 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.). Refer to the "Problem Safety Bulletin", Section 4.5, Table 4-2, for an additional listing of component failures.

C. PERSON PROFILES

All persons involved in the NASS CDS case for whom an Occupant Assessment form was submitted should be noted in this section. This section contains the following variables.

Vehicle No: See variable GV03.

Person Role: Indicate if the person was the **driver** or a **passenger** in the vehicle. Write "driver" or "passenger"; do not use their coded values.

Seat Position: See variable OA10. Note that codes should not be used; instead, write "front left", "second middle", etc.

Restraint Use: Indicate the type of restraint "used" by the person (e.g., combinations of manual belts, automatic belts, air bags, and/or child seats).

Most Severe Injury (To Be Completed By Zone Center): The most severe (*i.e.*, highest AIS) injury to the person should be documented by noting the injury's **Body Region**, **Injury Type**, **AIS**, and **Injury Source** — see variables OI05-OI12. Use the coded value only for AIS. If more than one injury has the highest AIS, choose one with the highest order source of data (*i.e.*, autopsy over post-ER, post-ER over ER, etc.). If the person did not sustain an injury, write "**not injured**".

ACCIDENT FORM

1. Primary Sampling Unit Number ___ ___

2. Case Number - Stratum ___ ___ ___ ___ ___

IDENTIFICATION

3. Number of General Vehicle
   Forms Submitted ___ ___

4. Date of Accident (Month, Day, Year)

   ___ / ___ / **1 9 9 7**

5. Time of Accident ___ ___ ___ ___

   Code reported military time of accident.

   NOTE: Midnight = 2400
   Unknown = 9999

SPECIAL STUDIES - INDICATORS

Check (✓) each special study (SS15-SS18 below) that has been completed; code 1 for the checked special studies and 0 for the special studies not checked.

6. ___ SS15 Administrative Use ___

7. ___ SS16 Pedestrian Crash Data Study **0**
   (Data for this special study available in a separate file.)

8. ___ SS17 Impact Fires ___

9. ___ SS18 Unsafe Driver Actions ___

10. ___ SS19 Run Off Road ___

NUMBER OF EVENTS

11. Number of Recorded Events
    in This Accident ___ ___

    Code the number of events which occurred in this accident.

ACCIDENT EVENTS

For each event that occurred in the accident, code the lowest numbered vehicle in the left columns and the other involved vehicle or object in the right columns.

Accident Event Sequence Number	Vehicle Number	Class Of Vehicle	General Area of Damage	Vehicle Number or Object Contacted	Class Of Vehicle	General Area of Damage
12. **0 1**	13. ___ ___	14. ___ ___	15. ___	16. ___ ___	17. ___ ___	18. ___
19. **0 2**	20. ___ ___	21. ___ ___	22. ___	23. ___ ___	24. ___ ___	25. ___
26. **0 3**	27. ___ ___	28. ___ ___	29. ___	30. ___ ___	31. ___ ___	32. ___
33. **0 4**	34. ___ ___	35. ___ ___	36. ___	37. ___ ___	38. ___ ___	39. ___
40. **0 5**	41. ___ ___	42. ___ ___	43. ___	44. ___ ___	45. ___ ___	46. ___

IF GREATER THAN FIVE EVENTS, CONTINUE CODING ON THE ACCIDENT EVENT SUPPLEMENT

CODES FOR CLASS OF VEHICLE

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

CODES FOR GENERAL AREA OF DAMAGE (GAD)

CDS APPLICABLE AND OTHER VEHICLES	(0) Not a motor vehicle (N) Noncollision (F) Front	(R) Right side (L) Left side (B) Back	(T) Top (U) Undercarriage (9) Unknown

TDC APPLICABLE VEHICLES	(0) Not a motor vehicle (N) Noncollision (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 (9) Unknown

CODES FOR VEHICLE NUMBER OR OBJECT CONTACTED

(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 (≤ 10 cm in diameter)
- (42) Tree (> 10 cm in diameter)
- (43) Shrubbery or bush
- (44) Embankment
- (45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post
- (50) Pole or post (≤ 10 cm in diameter)
- (51) Pole or post (> 10 cm but ≤ 30 cm in diameter)
- (52) Pole or post (> 30 cm in diameter)
- (53) 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

_____
- (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

- (98) Other event (specify):

_____
- (99) Unknown event or object

AC01

Variable Name: Primary Sampling Unit Number

Element Values:

02
03
04
05
06
08
09
11
12
13
41
43
45
48
49
72
73
74
75
76
78
79
81
82

Source: Defined by NCSA.

Remarks:

See Analytical User's Manual for explanation of PSU numbers

Variable Name: Case Number - Stratum

Element Values:

     Range: Case Number: 001-499; 501-599; 601-699; 701-799
                    CDS Sampling Stratum — A, B, C, D, E, F, G, H, J, K

Source: Assigned by Automated Case Selection System

Remarks:

The Case Number — Stratum is assigned by the Automated Case Selection System and is composed of two parts: the first three digits are a number ranging from 001 to 499; the last digit is the letter identifying from which CDS sampling stratum the case was selected (A, B, C, D, E, F, G, H, J, K).

Except as noted below, no numbers will be skipped. If a case must be dropped, the number will not be reused.

Refer to section 2.2 of this manual for CDS stratification and case selection procedures. For GES stratification (strata X, Y, and Z) refer to section 2.2.2 of this manual.

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 501-799.

Variable Name: Number of General Vehicle Forms Submitted

Element Values:

Range: 01 through 30

Source: Researcher determined — inputs include police report, scene inspection, and interviews.

Remarks:

Each crash must have at least one **General Vehicle Form** submitted. The value recorded must equal the total number of General Vehicle Forms present in the case.

This variable is a file structuring variable.

A **General Vehicle Form** must be submitted 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, a form is required for both vehicles. If the linkage was fixed (see GV03, Vehicle Number, for a definition of "fixed linkage"), only the power unit would be considered in-transport and only one form required.

Hit-and-run crashes occasionally cause some confusion on this variable. A General Vehicle Form is filled out for each in-transport motor vehicle involved in the crash independent of the amount of information collected on the vehicles by the police. Parked vehicles may or may not require a form depending on whether or not they were in-transport. A thorough discussion of the sampling protocol for NASS is found in section 2.0 of the Introduction.

Variable Name: Date of Accident (Month, Day, Year)

Element Values:

Month

01	January	07	July
02	February	08	August
03	March	09	September
04	April	10	October
05	May	11	November
06	June	12	December

Day

Range: 01 through 31

Year

1997   1997 (precoded value)

Source: Police Report.

Remarks:

If the PAR indicates (usually a hit-and-run) that the crash occurred between some p.m. and a.m. time (*e.g.*, 8:00 p.m. and 6:00 a.m.) on either a preceding or following day, code the crash as occurring on the following day. If a range of days is indicated (*e.g.*, between Sunday and Friday), code the last date of the range (*e.g.*, Friday).

If the month and year of crash occurrence is unknown, code the contact date's month, day, and year.

AC05

Variable Name: Time of Accident

Element Values:

Code reported military time of crash.
For example: 1200 - Noon
                  2400 - Midnight
                  9999   Unknown

Source: Police report.

Remarks:

Code to the nearest minute (*e.g.*, 10:19 p.m. = 2219 hours). The time coded is taken from the "accident time" block on the PAR (usually at the top of the first page). If this block is left blank, then "9999" (Unknown) is coded.

If the block is coded "midnight" (*i.e.*, 12:00 a.m., 0000, or 2400) a determination must be made for sampling purposes as to whether the police consider this crash to be the first or last crash on the date indicated on the PAR. Because of variability among police jurisdictions in how they handle midnight, researchers must look at the PAR date, day-of-week, and PAR number (if available) or question police personnel and make a determination regarding whether the particular jurisdiction considers the crash being sampled to be the first or last crash on the date indicated on the PAR. Technically, midnight (*i.e.*, 12:00 a.m.) begins a new day, but not all jurisdictions treat midnight as such. If the jurisdiction considers the crash as the last (or one of the last) on the "date" indicated, code this variable as "2400" (Midnight); however, if the jurisdiction considers the crash as the first (or one of the first) on the "date" indicated, code this variable as "0001". Code "0000" is not allowed! Thus, 12:00 a.m. (0000, 2400) can be coded either "2400" or "0001" depending on how the particular jurisdiction handles midnight.

If the PAR indicates the crash occurred during some time interval of greater than one hour (*e.g.*, 8:00 p.m. to 6:00 a.m., or 8:00 a.m. to 5:00 p.m.), code "9999" (Unknown). However, if the interval was one hour or less, code the midpoint of the interval (*e.g.*, 8:00 p.m. to 9:00 p.m., code "2030").

AC06
AC07
AC08
AC09
AC10

Variable Name: SS15 - (Administrative Use)
SS16 - Pedestrian Crash Data Study
SS17 - Impact Fires
SS18 - Unsafe Driver Actions
SS19 - Run Off Road

Element Values:

0   No
1   Yes

Source: Special study procedures.

Remarks:

Code "0" (No) means there is no special study form included in the case.

Code "1" (Yes) means there is a special study form included in the case.

Definition of SS15(Administrative Use)

This variable is currently being used to identify cases investigated by hospital trauma sites.

Definition of SS16 (Pedestrian Crash Data Study)

- Criteria for Case Selection-Crashes involving NASS CDS applicable late model year vehicles that contact a pedestrian(s). The vehicle must be moving in a forward direction at the time of the crash. These crashes are to be investigated on-scene and entered into the MDE system as NASS special study cases. After automated data entry, these cases are to be forwarded to the Zone Center with your regular case submission.

- **Case meeting pedestrian study criteria and sampled at the following PSUs**
  41   Ft. Lauderdale and Hollywood, Florida
  49   Dallas, Texas
  72   Chicago, Illinois
  82   Seattle, Washington
       Buffalo, New York
       San Antonio, Texas

- **Case numbers shall be from 601-699**
- **The data base for this special study is separate from the CDS**
- This is pre-coded as 0 (zero)

Variable Name: Special Studies - Indicators

Definition of SS17 (Impact Fires)

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

- *Impact Fire cases selected within the CDS case sample*
  NASS CDS crashes involving a vehicle fire which resulted from an impact with another vehicle or object and the crashes are selected by the automated case selection system (ACSS) as regular CDS cases. **In addition, to qualify for the special study the burned vehicle must be inspected**. These crashes are to be investigated and entered into the MDE system as normal.

- *Impact Fires selected as a special study case (outside of the CDS sample)*
  NASS CDS crashes involving a vehicle fire that originated in a late model year (LMY) vehicle which resulted from an impact with another vehicle or object and the crashes are listed but *not selected* as part of the CDS case sample. **In addition, to qualify for the special study the burned vehicle must be inspected**. These crashes are to be investigated and entered into the MDE as NASS special study cases. After automated data entry, these cases are to be forwarded to the Zone Center with your regular case submission.

- *Case numbers shall be from 501-599*

Definition of SS18 (Unsafe Driver Actions)

The primary objective of this study is to determine what specific behaviors lead to crashes (particularly speed related crashes) and what specific situational and driver characteristics are associated with these behaviors. The study began as a pilot study at four NASS CDS PSUs in 1996. Expansion to additional NASS CDS PSUs will be determined by the outcome of the pilot study.

- *ALL Unsafe Driver Actions are cases selected within the CDS case sample and occurring at the following PSUs*

  Allegheny County, Pennsylvania (minus Pittsburgh City)
  Knox County, Tennessee
  Gilpin, Jefferson Counties, Colorado
  Seattle, Washington

Definition of SS19 (Run Off Road)

A study conducted in cooperation with the FHWA at specified PSUs to obtain additional data for the FHWA on specific run off road crashes that they have identified..

AC11

Variable Name: Number of Recorded Events in This Accident

Element Values:

> **Range:** 01-98
> Code the number of (qualifying) events which occurred in this crash.

Source: Researcher determined based on police report, scene investigation, and interviews

Remarks:

This variable is a file structuring variable.

Not all events are coded; code only "qualifying" events. A qualifying event is an "event" that involves at least one in-transport motor vehicle. The in- transport vehicle can be either CDS applicable or non-CDS applicable. If the in-transport vehicle is a CDS applicable vehicle, then it can be either a towed or a nontowed in-transport vehicle. Any event in the crash that does not involve an in-transport motor vehicle is to be dropped from the sequence and not reported on the NASS CDS forms. A further discussion concerning "events" and those which qualify follows in the Accident Events Overview.

Unknown is not a valid code for this variable. Researchers must determine the number of qualifying events.

ACCIDENT EVENTS OVERVIEW

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

A crash is considered applicable to the NASS CDS if one of its events resulted in harm (except for nonqualifying noncollision events; see Section 2.2.1 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 also included in these variables unless this noncollision event is the only event in the crash.

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.

Not in-transport vehicle (*e.g.*, parked 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 another not in-transport vehicle

Pedestrian, pedalcyclist, or other nonmotorist inter-impact.

The accident events variables are designed to provide a coded description of all qualifying events which occurred in the crash sequence. Events are encoded in chronological sequence. Two groups of variables are provided for each event. The first (or left) group always describes the in-transport motor vehicle with the lowest vehicle number in the event. The second group describes either the other in-transport vehicle or the object involved in the event with the in-transport motor vehicle described by the left group.

ACCIDENT EVENTS OVERVIEW (Cont'd)

With this coded chronological sequence of qualified crash events on 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 sizes or the types of objects the different classes of vehicles impact.

Complete these variables based upon an accurate and complete reconstruction of the vehicular 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 properly coded crash sequence follows for the crash described below.

> **Vehicle 1** (a compact passenger car) went out of control on a wet roadway and struck a median guardrail with its front. The vehicle was redirected by the guardrail and reentered the roadway, where it struck vehicle 2 (a large pickup truck) in the left side with its front. Vehicle 1 spun to a stop in the roadway, and the driver, due to the spinning, hit his head on the door pillar breaking his neck. Vehicle 2, out -of-control, ran off the roadway and struck a pedestrian with its front.

Accident Event Sequence Number	Vehicle Number	Class of Vehicle	General Area of Damage	Vehicle Number or Object Contacted	Class of Vehicle	General Area of Damage
12. 0 1	13. 0 1	14. 0 2	15. F	16. 5 6	17. 0 0	18. 0
19. 0 2	20. 0 1	21. 0 2	22. F	23. 0 2	24. 3 1	25. L
26. 0 3	27. 0 2	28. 3 1	29. F	30. 7 2	31. 0 0	32. 0
33. _ _	34. _ _	35. _ _	36. _	37. _ _	38. _ _	39. _

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.

Variable Name: Accident Event Sequence Number
(1st through 5th or higher)

Element Values:

Range: 01-98 — precoded values: 01 through 05

Source: Researcher Determined

Remarks:

This variable is precoded for events "01" through "05". If more than 5 events are involved, use the Accident Events Supplement.

The codes are for the chronological sequence of events in the crash.

Variable Name: Vehicle Number
(1st through 5th or higher)

Element Values:

Range: 01 through 30

Source: Researcher determined

Remarks:

Code assigned number. See variable GV03, Vehicle Number, for definitions of the attributes and coding conventions.

Variable Name: Class of Vehicle — 1st
                             (1st through 5th or higher)

Element Values:

01	Subcompact/mini (wheelbase < 254 cm)
02	Compact (wheelbase ≥ 254 but < 265 cm)
03	Intermediate (wheelbase ≥ 265 but < 278 cm)
04	Full size (wheelbase ≥ 278 but < 291 cm)
05	Largest (wheelbase ≥ 291 cm)
09	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 t ruck (≤ 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 ligh t 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/medi um/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.

Variable Name:　　Class of Vehicle
　　　　　　　　　　　1st (1st through 5th or higher) (Cont'd.)

Codes "01"　　rely on the guidelines for wheelbase alone. If one of these codes is
through "05"　used, then the vehicle's Body Type, GV07, must be coded as an
　　　　　　　automobile (codes "01"-"09") or automobile derivative (codes "10"-"13").

Code "09"　　(Unknown passenger car size) is used when it is known that a vehicle is a
　　　　　　　passenger car (codes "01" through "05"), but the wheelbase is unknown
　　　　　　　(*i.e.*, Original Wheelbase, EV28, equals "999").

Code "14"　　(Compact utility vehicle) refers to vehicles defined in code "14" (Compact
　　　　　　　utility) in variable GV07, Body Type. Use this code if the size of the utility
　　　　　　　vehicle is unknown.

Code "15"　　[Large utility vehicle ($\leq$ 4,536 kgs GVWR)] refers to vehicles defined in
　　　　　　　codes "15" (Large utility) in variable GV07, Body Type. Refers to fullsize
　　　　　　　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.

Code "16"　　(Utility station wagon ($\leq$ 4,536 kgs GVWR)] refers to vehicles defined in
　　　　　　　code "16" (utility station wagon) in GV07, Body Type. Refers primarily to a
　　　　　　　pickup truck based chassis enlarged to a station wagon.

Code "19"　　(Unknown Utility type) is defined in code "19" (Utility, unknown body type)
　　　　　　　in variable GV07, Body Type. This code is used when it is known that the
　　　　　　　vehicle is a utility vehicle, but there is insufficient data to determine the
　　　　　　　specific type.

Code "20"　　[Minivan ($\leq$ 4500 kgs. GVWR)] Refers to vehicles defined in code "20"
　　　　　　　(Minivan) in variable GV07, Body Type. Refers to down-sized passenger or
　　　　　　　cargo vans.

Code "21"　　[Large van ($\leq$ 4500 kgs. GVWR)] Refers to vehicles defined in code "21"
　　　　　　　(Large van) in variable GV07, Body Type. Refers to a standard size cargo
　　　　　　　or passenger van.

Code "24"　　[Van based school bus ($\leq$ 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 code 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
　　　　　　　code. Refers to vehicles defined in code "24" in variable GV07, Body Type.

Code "28"　　[Other van type ($\leq$ 4,536 kgs GVWR) Refers to vehicles defined in code
　　　　　　　"22" (Step van or walk-in van), code "23" (Van based motorhome), code
　　　　　　　"25" (Van based other bus) and code "28" (Other van type) in variable
　　　　　　　GV07, Body Type.

Variable Name: Class of Vehicle
1st (1st through 5th or higher) (Cont'd.)

Code "29"   [Unknown van type ($\leq$ 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 by code "29" in variable GV07, Body Type.

Code "30"   (Compact pickup truck) Refers to vehicles defined in code "30" (Compact pickup truck) in variable GV07, Body Type. Used to describe a pickup truck having a width of 178 centimeters of less.

Code "31"   (Large pickup truck) Refers to vehicles defined in code "31" (Large pickup truck) in variable GV07, Body Type. Used to describe a pickup truck having a width greater than 178 centimeters.

Code "38"   [Other pickup truck ($\leq$ 4500 kgs GVWR)] Refers to vehicles defined in code "32" (Pickup with slide-in camper) and code "33" (Convertible pickup) in variable GV07, Body Type.

Code "39"   [Unknown pickup truck ($\leq$ 4500 kgs GVWR)] Refers to vehicles defined in code "39" (Unknown pickup style light conventional truck type) in GV07, Body Type.

Code "45"   [Other light truck ($\leq$ 4500 kgs GVWR)] Refers to vehicles defined in codes "40" [Cab, chassis based (includes rescue vehicles, light stake, dump, and tow truck)], "41" (truck based panel), "42" [Light truck based motorhome (chassis mounted)], and "45" (Other light conventional truck type) in GV07, Body Type.

Code "48"   (Unknown light truck type) Refers to vehicles defined in code "48" (Unknown light truck type) in variable GV07, Body Type.

Code "49"   [Unknown light vehicle type (automobile, utility, van, or light truck)] Refers to vehicles defined in code "49" [Unknown light vehicle type (automobile, utility, van, or light truck)] in variable GV07, Body Type.

Code "50"   [School bus (exclu des van based) (> 4500 kgs GVWR) Refers to those vehicles described by code "50" [School bus (designed to carry students, not cross country or transit)] in variable GV07, Body Type.

Code "58"   [Other bus (>4,536 kgs GVWR) describes those vehicles included in code "58" (Other bus type (*e.g.*, transit, intercity, bus based motorhome) in variable GV07, Body Type.

Code "59"   (Unknown bus type) Refers to those vehicles described by code "59" (Unknown bus type) in variable GV07, Body Type.

Code "60"   [Truck (> 4,536 kgs GVWR)] is defined in variable GV07, Body Type, as coded "60" through "65".

Variable Name: Class of Vehicle — 1st (Cont'd.)
(1st through 5th or higher)

Code "67"   (Tractor without trailer) refers to code "67" (Truck-tractor with no cargo trailer) in variable GV07, Body Type.

Code "68"   [(Tractor-trailer(s)] is defined in codes "68", "69", and "70" in variable GV07, Body Type.

Code "78"   (Unknown medium/heavy truck type) is used when the only available information indicates a truck of medium/heavy size. Refer to code "78" in variable GV07, Body Type.

Code "79"   [Unknown truck type (light/medium/heavy)] Refers to those vehicles described by code "79" [Unknown truck type (light/medium/heavy) in variable GV07, Body Type.

Code "80"   (Motored cycle) refers to GV07, Body Type, codes "80" through "89".

Code "90"   (Other vehicle) refers to all vehicles described by codes "90", "91", "92", "93", or "97" in variable GV07, Body Type.

Code "99"   (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 code is equivalent to Body Type, GV07, code "99" (Unknown body type).

Variable Name: General Area of Damage — 1st
(1st through 5th or higher)

Element Values:

    N   Noncollision
    9   Unknown

CDC Applicable and Other Vehicles	*TDC Applicable Vehicles*

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

Source: Researcher determined.

Remarks:

Code "N"   (Noncollision) must be used whenever the corresponding Vehicle Number or Object Contacted (AC16 et al.) is coded "33"-"39". Since AC18 et al., General Area of Damage — 2nd, will also equal "N" when AC16 et al. equals "33"-"39", this variable (AC15 et al.) and AC18 et al. will be identically coded.

Code "9"   (Unknown) must be coded when the General Area of Damage — 1st (AC15 et al.) on a vehicle is not known from any reliable source. Note, for all vehicles the rules developed in SAE J224MAR80 and TDC guidelines for determining the plane of damage, should be used for completion of this variable.

For vehicles which are CDC applicable (*e.g.,* pickups, light vans, and passenger cars) the guidelines from J224MAR80 must be applied, and the codes provided under the "CDC Applicable and Other Vehicles" category must be used. This includes rollovers (*i.e.,* AC16 et al. = "31" and "32").

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

Variable Name: Vehicle Number or Object Contacted
                        (1st through 5th or higher)

Element Values:

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 (≤ 10 cm in diameter)
42   Tree (> 10 cm in diameter)
43   Shrubbery or bush
44   Embankment
45   Breakaway pole or post (any
      diameter)

Nonbreakaway Pole or Post
50   Pole or post (≤ 10 cm in
      diameter)
51   Pole or post (> 10 cm but ≤
      30 cm in diameter)
52   Pole or post (> 30 cm in
      diameter)
53   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

98   Other event (specify):
99   Unknown event or object

Source: Researcher determined.

Remarks:

Refer to variables GV03, Vehicle Number, and EV05, Object Contacted, for definitions of the attributes and coding conventions.

Variable Name: Class of Vehicle — 2nd
(1st through 5th or higher)

Element Values:

00	Not a motor vehicle
01	Subcompact/mini (wheelbase < 254 cm)
02	Compact (wheelbase ≥ 254 but < 265 cm)
03	Intermediate (wheelbase ≥ 265 but < 278 cm)
04	Full size (wheelbase ≥ 278 but < 291 cm)
05	Largest (wheelbase ≥ 291 cm)
09	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 truc k 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.

Variable Name: Class of Vehicle — 2nd (Cont'd.)
                         (1st through 5th or higher)

Code "00"   (Not a motor vehicle) is used when the object impacted by the crash involved vehicle is equal to "Vehicle Number or Object Contacted" (variables AC16 et al) codes "41" through "89".

Codes "01"   rely on the guidelines for wheelbase alone. If one of these codes is
through   used, then the vehicle's Body Type, GV07, must be coded as an
"05"   automobile (codes "01"-"09") or automobile derivative (codes "10"-"13").

Code "09"   (Unknown passenger car size) is used when it is known that a vehicle is a passenger car (codes "01" through "05"), but the wheelbase is unknown (*i.e.*, Original Wheelbase, EV28, equals "999").

Code "14"   (Compact utility vehicle) refers to vehicles defined in code "14" (Compact utility) in variable GV07, Body Type. Use this code if the size of the utility vehicle is unknown.

Code "15"   [Large utility vehicle ($\leq$ 4,536 kgs GVWR)] refers to vehicles defined in codes "15" (Large utility) in variable GV07, Body Type. Refers to fullsize 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.

Code "16"   (Utility station wagon ($\leq$ 4,536 kgs GVWR)] refers to vehicles defined in code "16" (utility station wagon) in GV07, Body Type. Refers primarily to a pickup truck based chassis enlarged to a station wagon.

Code "19"   (Unknown Utility type) is defined in code "19" (Utility, unknown body type) in variable GV07, Body Type. This code is used when it is known that the vehicle is a utility vehicle, but there is insufficient data to determine the specific type.

Code "20"   [Minivan ($\leq$ 4500 kgs. GVWR)] Refers to vehicles defined in code "20" (Minivan) in variable GV07, Body Type. Refers to down-sized passenger or cargo vans.

Code "21"   [Large van ($\leq$ 4500 kgs. GVWR)] Refers to vehicles defined in code "21" (Large van) in variable GV07, Body Type. Refers to a standard size cargo or passenger van.

Code "24"   [Van based school bus ($\leq$ 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 code regardless of whether the vehicle is owned by a school system or a private company. Van bases school buses converted for other uses (*e.g.*, church bus) also take this code. Refers to vehicles defined in code "24" in variable GV07, Body Type.

Variable Name: Class of Vehicle — 2nd (Cont'd.)
(1st through 5th or higher)

Code "28"   [Other van type (≤ 4,536 kgs GVWR) Refers to vehicles defined in code "22" (Step van or walk-in van), code "23" (Van based motorhome), "25" (Van based other bus), and code "28" (Other van type) in variable GV07, Body Type.

Code "29"   [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 by code "29" in variable GV07, Body Type.

Code "30"   (Compact pickup truck) Refers to vehicles defined in code "30" (Compact pickup truck) in variable GV07, Body Type. Used to describe a pickup truck having a width of 178 centimeters of less.

Code "31"   (Large pickup truck) Refers to vehicles defined in code "31" (Large pickup truck) in variable GV07, Body Type. Used to describe a pickup truck having a width greater than 178 centimeters.

Code "38"   [Other pickup truck (≤ 4500 kgs GVWR)] Refers to vehicles defined in code "32" (Pickup with slide-in camper) and code "33" (Convertible pickup) in variable GV07, Body Type.

Code "39"   [Unknown pickup truck (≤ 4500 kgs GVWR)] Refers to vehicles defined in code "39" (Unknown pickup style light conventional truck type) in GV07, Body Type.

Code "45"   [Other light truck (≤ 4500 kgs GVWR)] Refers to vehicles defined in codes "40" [Cab, chassis based (includes rescue vehicles, light stake, dump, and tow truck)], "41" (truck based panel), "42" [Light truck based motorhome (chassis mounted)], and "45" (Other light conventional truck type) in GV07, Body Type.

Code "48"   (Unknown light truck type) Refers to vehicles defined in code "48" (Unknown light truck type) in variable GV07, Body Type.

Code "49"   [Unknown light vehicle type (automobile, utility, van, or light truck)] Refers to vehicles defined in code "49" [Unknown light vehicle type (automobile, utility, van, or light truck)] in variable GV07, Body Type.

Code "50"   [School bus (excludes van based) (> 4500 kgs GVWR) Refers to those vehicles described by code "50" [School bus (designed to carry students, not cross country or transit)] in variable GV07, Body Type.

Code "58"   [Other bus (>4,536 kgs GVWR) describes those vehicles included in code "58" (Other bus type (*e.g.*, transit, intercity, bus based motorhome) in variable GV07, Body Type.

Variable Name: Class of Vehicle — 2nd (Cont'd.)
(1st through 5th or higher)

Code "59"   (Unknown bus type) Refers to those vehicles described by code "59" (Unknown bus type) in variable GV07, Body Type.

Code "60"   [Truck (> 4,536 kgs GVWR)] is defined in variable GV07, Body Type, as coded "60" through "65".

Code "67"   (Tractor without trailer) refers to code "67" (Truck-tractor with no cargo trailer) in variable GV07, Body Type.

Code "68"   [(Tractor-trailer(s)] is defined in codes "68", "69", and "70" in variable GV07, Body Type.

Code "78"   (Unknown medium/heavy truck type) is used when the only available information indicates a truck of medium/heavy size. Refer to code "78" in variable GV07, Body Type.

Code "79"   [Unknown truck type (light/medium/heavy)] Refers to those vehicles described by code "79" [Unknown truck type (light/medium/heavy) in variable GV07, Body Type.

Code "80"   (Motored cycle) refers to GV07, Body Type, codes "80" through "89".

Code "90"   (Other vehicle) refers to all vehicles described by codes "90", "91", "92", "93", or "97" in variable GV07, Body Type.

Code "99"   (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 code is equivalent to Body Type, GV07, code "99" (Unknown body type).

Variable Name: General Area of Damage — 2nd
                         (1st through 5th or higher)

Element Values:

    Ø   Not a motor vehicle
    N   Noncollision
    9   Unknown

CDC Applicable and Other Vehicles		*TDC Applicable Vehicles*	
F	Front	F	Front
R	Right side	R	Right side
L	Left side	L	Left side
B	Back	B	Back of unit with cargo area (rear of trailer or straight truck)
T	Top	D	Back (rear of tractor)
U	Undercarriage	C	Rear of cab
		V	Front of cargo area
		T	Top
		U	Undercarriage

Source: Researcher determined.

Remarks:

Code "0"   (Not a motor vehicle) for AC18 et al., when AC16 et al., Vehicle Number or Object Contacted, equals "41" through "89".

Code "N"   (Noncollision) must be used whenever the corresponding Vehicle Number or Object Contacted (AC16 et al.) is coded "31"-"39". Since AC15 et al., General Area of Damage — 1st, will also equal "N" when AC16 et al. equals "33"-"39", this variable (AC18 et al.) and AC15 et al. will be identically coded for the AC16 et al. values of "33"- "39". However, this code will be used on this variable when AC16 et al. equals "31" -"32" even though AC15 et al. will *not* take this code.

Code "9"   (Unknown) must be coded when the General Area of Damage — 1 st (AC15 et al.) on a vehicle is not known from any reliable source. Note, for <u>all</u> vehicles the rules developed in SAE J224MAR80 and the TDC guidelines, for determining the plane of damage, should be used for completion of this variable.

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

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

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

GENERAL VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number _____ _____

2. Case Number - Stratum _____ _____ _____ _____

3. Vehicle Number _____ _____

VEHICLE IDENTIFICATION

4. Vehicle Model Year _____ _____ _____ _____
   Code the model year
   (9999) Unknown

5. Vehicle Make (specify): _____ _____
   _____
   Applicable codes are found in your
   NASS Data Collection, Coding and
   Editing Manual.
   (99) Unknown

6. Vehicle Model (specify): _____ _____ _____
   _____
   Applicable codes are found in your
   NASS Data Collection, Coding and
   Editing Manual.
   (999) Unknown

7. Body Type _____ _____
   Note: Applicable codes may be found on
   the back of this page.

8. Vehicle Identification Number

   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
   Left justify; Slash zeros and letter Z (Ø andẐ)
   No VIN—Code all zeros
   Unknown—Code all nines

9. Vehicle Special Use (This Trip) _____
   (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
   (8) Other (specify): _____
   (9) Unknown

OFFICIAL RECORDS

10. Police Reported Vehicle Disposition _____
    (0) Not towed due to vehicle damage
    (1) Towed due to vehicle damage
    (9) Unknown

11. Police Reported Travel Speed _____ _____ _____
    Code to the nearest kmph (NOTE: 000 means
    less than 0.5 kmph)
    (160) 159.5 kmph and above
    (999) Unknown

    _____ mph X 1.6093 = _____ _____ _____ kmph

12. Speed Limit _____ _____ _____
    (000) No statutory limit
    Code posted or statutory speed limit in kmph
    (999) Unknown

    _____ mph X 1.6093 = _____ _____ _____ kmph

13. Police Reported Alcohol Presence For Driver _____
    (0) No alcohol present
    (1) Yes alcohol present
    (7) Not reported
    (8) No driver present
    (9) Unknown

14. Alcohol Test Result For Driver _____ _____
    Code actual value (decimal implied
    before first digit—0.xx)
    (95) Test refused
    (96) None given
    (97) AC test performed, results unknown
    (98) No driver present
    (99) Unknown

    Source: _____

15. Police Reported Other Drug Presence For _____
    Driver
    (0) No other drug(s) present
    (1) Yes other drug(s) present
    (7) Not reported
    (8) No driver present
    (9) Unknown

16. Other Drug Specimen Test Result For Driver _____
    (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

17. Driver's Zip Code _____ _____ _____ _____ _____

    (00001) Driver not a resident of U.S. or territories

    _____ Code actual 5-digit zip code
    (99998) No driver present
    (99999) Unknown

18. Driver's Race/Ethnic Origin _____
    (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

CODES FOR BODY TYPE

CDS APPLICABLE VEHICLES

Automobiles
(01) Convertible (excludes sun-roof, t-bar)
(02) 2-door sedan, hardtop, coupe
(03) 3-door/2-door hatchback
(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 (Jeep CJ-2 - CJ-7, Scrambler, Golden Eagle, Renegade, Laredo, Wrangler, Cherokee [84 and after], Dispatcher, Raider, Bronco II, Bronco [76 and before], Explorer, S-10 Blazer, Geo Tracker, Bravada, S-15 Jimmy, Thing, Pathfinder, Trooper, Trooper II, Rodeo, Amigo, Navajo, 4-Runner, Montero, Passport, Samurai, Sidekick, Rocky)
(15) Large utility (includes Jeep Cherokee [83 and before], Ramcharger, Trailduster, Bronco-fullsize [78 and after], fullsize Blazer, fullsize Jimmy, Hummer, Landcruiser, Rover, Scout, Yukon)
(16) Utility station wagon (Chevy Suburban, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)
(19) Utility, unknown body type

Van Based Light Trucks (≤ 4,536 kgs GVWR)
(20) Minivan (Town and Country, Caravan, Grand Caravan, Voyager, Grand Voyager, Mini-Ram, Vista, Aerostar, Windstar, Villager, Lumina APV, Trans Sport, Silhouette, Astro, Safari, Toyota Van, Toyota Minivan, Previa, Nissan Minivan, Quest, Mitsubishi Minivan, Expo Wagon, Vanagon/Camper.)
(21) Large van (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.)
(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 (D50, Colt P/U, Ram 50, Dakota, Arrow Pickup [foreign], Ranger, Courier, S-10 , T-10, LUV, S-15, T-15, Sonoma, Datsun/Nissan Pickup, P'up, Mazda Pickup, Toyota Pickup, Mitsubishi Pickup)
(31) Large Pickup (Jeep Pickup, Comanche, Ram Pickup, D100-D350, W100-W350, F100-F350, C10-C35, K10-K35, R10-R35, V10-V35, Silverado, Sierra, R100-R500, T100)
(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)

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 (8,845 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)
(78) Unknown medium/heavy truck type
(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, motorscooter) (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
(99) Unknown body type

PRECRASH ENVIRONMENTAL DATA

19. Relation To Interchange Or Junction   ____
    (0) Non-interchange area and non-junction
    (1) Interchange area related

    Non-Interchange junctions
    (2) Intersection related
    (3) Driveway, alley access related
    (4) Other junction (specify)

    (5) _____ Unknown type of junction

    (9) Unknown

20. Trafficway Flow   ____
    (0) Not physically divided (two way traffic)
    (1) Divided trafficway-median strip without
        positive barrier
    (2) Divided trafficway-median strip with positive
        barrier
    (3) One way traffic
    (9) Unknown

21. Number Of Travel Lanes   ____
    (1) One
    (2) Two
    (3) Three
    (4) Four
    (5) Five
    (6) Six
    (7) Seven or more
    (9) Unknown

22. Roadway Alignment   ____
    (1) Straight
    (2) Curve right
    (3) Curve left
    (9) Unknown

23. Roadway Profile   ____
    (1) Level
    (2) Uphill grade (>2%)
    (3) Hill crest
    (4) Downhill grade (>2%)
    (5) Sag
    (9) Unknown

24. Roadway Surface Type   ____
    (1) Concrete
    (2) Bituminous (asphalt)
    (3) Brick or block
    (4) Slag, gravel, or stone
    (5) Dirt
    (8) Other (specify): _____
    (9) Unknown

25. Roadway Surface Condition   ____
    (1) Dry
    (2) Wet
    (3) Snow or slush
    (4) Ice
    (5) Sand, dirt, or oil
    (8) Other (specify): _____
    (9) Unknown

26. Light Conditions   ____
    (1) Daylight
    (2) Dark
    (3) Dark, but lighted
    (4) Dawn
    (5) Dusk
    (9) Unknown

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

    _____
    (9) Unknown

28. Traffic Control Device   ____
    (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

29. Traffic Control Device Functioning   ____
    (0) No traffic control device
    (1) Traffic control device not functioning
        (specify):

    _____
    (2) Traffic control device functioning properly
    (9) Unknown

PRECRASH DRIVER RELATED DATA

30. Driver's Distraction/Inattention To Driving   ____ ____
    (Prior To Recognition Of Critical Event)
    (00) No driver present
    (01) Attentive or not distracted
    (02) Looked but did not see
    Distractions
    (03) By other occupant(s), (specify):
    (04) By moving object in vehicle (specify):
    (05) While talking or listening to cellular phone (specify location and type of phone): _____
    (06) While dialing cellular phone (specify location and type of phone): _____
    (07) While adjusting climate controls
    (08) While adjusting radio, cassette, CD (specify):
    (09) While using other device/controls integral to vehicle (specify): _____
    (10) While using or reaching for device/object brought into vehicle (specify): _____
    (11) Sleepy or fell asleep
    (12) Distracted by outside person, object, or event (specify): _____
    (13) Eating or drinking
    (14) Smoking related
    (97) Distracted/inattentive, details unknown
    (98) Other, distraction (specify): _____
    (99) Unknown

31. Pre-Event Movement (Prior to   ____ ____
    Recognition of Critical Event)
    (00) No driver present
    (01) Going straight
    (02) Decelerating in traffic lane
    (03) Accelerating in traffic lane
    (04) Starting in traffic lane
    (05) Stopped in traffic lane
    (06) Passing or overtaking another vehicle
    (07) Disabled or parked in travel lane
    (08) Leaving a parking position
    (09) 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
    (97) Other (specify): _____
    (99) Unknown

32. Critical Precrash Event   ____ ____
    THIS VEHICLE LOSS OF CONTROL DUE TO:
    (01) Blow out or flat tire
    (02) Stalled engine
    (03) Disabling vehicle failure (e.g., wheel fell off) (specify):
    (04) Non-disabling vehicle problem (e.g., hood flew up) (specify): _____
    (05) Poor road conditions (puddle, pot hole, ice, etc.) (specify): _____
    (06) Traveling too fast for conditions
    (08) Other cause of control loss (specify): _____
    (09) Unknown cause of control loss

THIS VEHICLE TRAVELLING
(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
(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, 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
(98) Other critical precrash event (specify): _____

(99) Unknown

33. Attempted Avoidance Maneuver _____ _____
   (00) No driver present
   (01) No avoidance maneuver
   (02) Braking (no lockup)
   (03) Braking (lockup)
   (04) Braking (lockup unknown)
   (05) Releasing brakes
   (06) Steering left
   (07) Steering right
   (08) Braking and steering left
   (09) Braking and steering right
   (10) Accelerating
   (11) Accelerating and steering left
   (12) Accelerating and steering right
   (98) Other action (specify):

   _____
   (99) Unknown

34. Pre-Impact Stability _____
   (0) No driver present
   (1) Tracking
   (2) Skidding longitudinally—rotation less than 30 degrees
   (3) Skidding laterally—clockwise rotation
   (4) Skidding laterally—counterclockwise rotation
   (7) Other vehicle loss-of-control (specify):

   _____
   (9) Precrash stability unknown

35. Pre-Impact Location _____
   (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

36. Accident Type _____ _____
   (Note: Applicable codes on back of this page)

   (00) No impact
       Code the number of the diagram that best describes the accident circumstance
   (98) Other accident type (specify):

   _____
   (99) Unknown

STOP HERE IF GV07 DOES NOT EQUAL 01 - 49

Category	Configuration	ACCIDENT TYPES (Includes Intent)				
I Single Driver	**A** Right Roadside Departure	01 DRIVE OFF ROAD	02 CONTROL/ TRACTION LOSS	03 AVOID COLLISION WITH VEH., PED., ANIM.	04 SPECIFICS OTHER	05 SPECIFICS UNKNOWN
	B Left Roadside Departure	06 DRIVE OFF ROAD	07 CONTROL/ TRACTION LOSS	08 AVOID COLLISION WITH VEH., PED., ANIM.	09 SPECIFICS OTHER	10 SPECIFICS UNKNOWN
	C Forward Impact	11 PARKED VEH.	12 STA. OBJECT	13 PEDESTRIAN/ ANIMAL	14 END DEPARTURE	15 SPECIFICS OTHER / 16 SPECIFICS UNKNOWN
II Same Trafficway Same Direction	**D** Rear-End	20 / 22 21 23 STOPPED 21, 22, 23	24 / 26 25 27 SLOWER 25, 26, 27	28 / 30 29 31 DECEL. 29, 30, 31	(EACH · 32) SPECIFICS OTHER	(EACH · 33) SPECIFICS UNKNOWN
	E Forward Impact	34 / 35 CONTROL/ TRACTION LOSS	36 / 37 CONTROL/ TRACTION LOSS	38 / 39 AVOID COLLISION WITH VEH.	40 / 41 AVOID COLLISION WITH OBJECT	(EACH · 42) SPECIFICS OTHER / (EACH · 43) SPECIFICS UNKNOWN
	F Sideswipe Angle	44 45 46 47		(EACH · 48) SPECIFICS OTHER		(EACH · 49) SPECIFICS UNKNOWN
III Same Trafficway Opposite Direction	**G** Head-On	50 51 LATERAL MOVE	(EACH · 52) SPECIFICS OTHER	(EACH · 53) SPECIFICS UNKNOWN		
	H Forward Impact	54 / 55 CONTROL/ TRACTION LOSS	56 / 57 CONTROL/ TRACTION LOSS	58 / 59 AVOID COLLISION WITH VEH.	60 / 61 AVOID COLLISION WITH OBJECT	(EACH · 62) SPECIFICS OTHER / (EACH · 63) SPECIFICS UNKNOWN
	I Sideswipe/ Angle	64 65 LATERAL MOVE	(EACH · 66) SPECIFICS OTHER	(EACH · 67) SPECIFICS UNKNOWN		
IV Change Trafficway Vehicle Turning	**J** Turn Across Path	68 69 INITIAL OPPOSITE DIRECTIONS	70 71 73 72 INITIAL SAME DIRECTIONS		(EACH · 74) SPECIFICS OTHER	(EACH · 75) SPECIFICS UNKNOWN
	K Turn Into Path	77 76 78 79 TURN INTO SAME DIRECTION	80 81 82 83 TURN INTO OPPOSITE DIRECTIONS		(EACH · 84) SPECIFICS OTHER	(EACH · 85) SPECIFICS UNKNOWN
V Intersecting Paths (Vehicle Damage)	**L** Straight Paths	87 86	88 89	(EACH · 90) SPECIFICS OTHER	(EACH · 91) SPECIFICS UNKNOWN	
VI Miscellaneous	**M** Backing Etc.	92 93 BACKING VEH. OTHER VEH. OR OBJECT	98 Other Accident Type 99 Unknown Accident Type 00 No Impact			

OCCUPANT RELATED

37. Driver Presence in Vehicle   ____
    (0) Driver not present
    (1) Driver present
    (9) Unknown

38. Number of Occupants This Vehicle   ____ ____
    (00-96) Code actual number of occupants
          for this vehicle
    (97) 97 or more
    (99) Unknown

39. Number of Occupant Forms Submitted   ____ ____

AIR BAG RELATED

40. Is this an AOPS Vehicle?   ____
    (0) No (includes unknown)
    (1) Yes - researcher determined
    (2) VIN determined air bag system
    (3) VIN determined automatic (passive) belts
    (4) VIN determined air bag and automatic
         (passive) belts

41. Air Bag(s) Deployment, First Seat Frontal   ____
    (0) Not equipped or not available
    (1) No air bags deployed

    Single Air Bag Vehicle
    (2) Driver air bag deployed
    (3) Driver air bag, unknown if deployed

    Multiple Air Bag Vehicle
    (4) Driver side only deployed
    (5) Passenger side only deployed
    (6) Driver and passenger side deployed
    (7) Driver and passenger side unknown if
         deployed
    (8) Air bag(s) deployed, details unknown
    (9) Unknown

42. Air Bag(s) Deployment, Other Than First   ____
    Seat Frontal
    (0) Not equipped with an "other" air bag
    (1) Deployed during accident (as a result of
         impact)
    (2) Deployed inadvertently just prior to accident
    (3) Deployed, details unknown
    (4) Deployed as a result of a noncollision event
         during accident sequence (e.g., fire,
         explosion, electrical)
    (5) Unknown if deployed
    (7) Nondeployed
    (9) Unknown

    Specify type of "other" air bag present: _____

    _____

VEHICLE WEIGHT ITEMS

43.   Vehicle Curb Weight   ____,____ ____ **0**
         ____ Code weight to nearest
           10 kilograms.
         (045) Less than 454 kilograms
         (612) 6,124 kilograms or more
         (999) Unknown
         ____ ___,___ ___ lbs X .4536 = ___,___ ___ ___ kgs

         Source:_____

44. Vehicle Cargo Weight   ____,____ ____ **0**
         ____ Code weight to nearest
           10 kilograms.
         (000) Less than 5 kilograms
         (454) 4,536 kilograms or more
         (999) Unknown
         ___ ___,___ ___ ___ lbs X .4536 = ___,___ ___ ___ kgs

    Source:_____

ROLLOVER DATA

45. Rollover   ____ ____
    (00) No rollover (no overturning)

    Rollover (primarily about the longitudinal axis)
    (01-16) Code the number of quarter turns
       (17) Rollover, 17 or more quarter turns
          (specify): _____
       (98) Rollover--end-over-end (i.e., primarily
          about the lateral axis)
       (99) Rollover (overturn), details unknown

46. Rollover Initiation Type   ____ ____
    (00) No rollover
    (01) Trip-over
    (02) Flip-over
    (03) Turn-over
    (04) Climb-over
    (05) Fall-over
    (06) Bounce-over
    (07) Collision with another vehicle
    (08) Other rollover initiation type specify):

    _____
    (98) Rollover--end-over-end
    (99) Unknown rollover initiation type

47. Location of Rollover Initiation   ____
    (0) No rollover
    (1) On roadway
    (2) On shoulder—paved
    (3) On shoulder—unpaved
    (4) On roadside or divided trafficway median
    (8) Rollover--end-over-end
    (9) Unknown

48. Rollover Initiation Object Contacted   ____ ____
    (Note: Applicable codes on back of page)

49. Location on Vehicle Where Initial Principal   ____
    Tripping Force Is Applied
    (0) No rollover
    (1) Wheels/tires
    (2) Side plane
    (3) End plane
    (4) Undercarriage
    (5) Other location on vehicle (specify):

    _____
    (6) Non-contact rollover forces (specify):

    _____
    (8) Rollover--end-over-end
    (9) Unknown

50. Direction of Initial Roll   ____
    (0) No rollover
    (1) Roll right - primarily about the longitudinal
         axis
    (2) Roll left - primarily about the longitudinal
         axis
    (8) Rollover--end-over-end
    (9) Unknown roll direction

CODES FOR ROLLOVER INITIATION OBJECT CONTACTED

(00) No rollover
(01-30) — Vehicle Number

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

Collision With Fixed Object
    (41) Tree (≤ 10 cm in diameter)
    (42) Tree (> 10 cm in diameter)
    (43) Shrubbery or bush
    (44) Embankment

    (45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post
    (50) Pole or post (≤ 10 cm in diameter)
    (51) Pole or post (> 10 cm but ≤ 30 cm in diameter)
    (52) Pole or post (> 30 cm in diameter)
    (53) 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
    (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

(98) Other event (specify):
_____
(99) Unknown event or object

OVERRIDE/UNDERRIDE (THIS VEHICLE)

51. Front Override/Underride (this Vehicle)   ____

52. Rear Override/Underride (this Vehicle)   ____
    (0) No override/underride, or not an end-to-end impact between two CDS applicable vehicles, and no medium/heavy truck or bus underride

Override (see specific CDC)
[Between 2 CDS applicable vehicles (Bodytype, GV07 = 1-49)]
    (1) 1st CDC
    (2) 2nd CDC
    (3) Other not automated CDC (specify):

    _____

Underride (see specific CDC)
[Between 2 CDS applicable vehicles (Bodytype, GV07 = 1-49)]
    (4) 1st CDC
    (5) 2nd CDC
    (6) Other not automated CDC (specify):

    _____

    (7) Medium/heavy truck or bus override (of any configuration)
    (9) Unknown

HEADING ANGLE AT IMPACT FOR HIGHEST DELTA V

    Values: (000)-(359) Code actual value
          (996) Non-horizontal impact
          (997) Noncollision
          (998) Impact with object
          (999) Unknown

53. Heading Angle For This Vehicle   ____ ____ ____

54. Heading Angle For Other Vehicle   ____ ____ ____

RECONSTRUCTION DATA

55. Towed Trailing Unit   ____
    (0) No towed unit
    (1) Yes—towed trailing unit
    (9) Unknown

56. Documentation of Trajectory Data for This Vehicle   ____
    (0) No
    (1) Yes

57. Post Collision Condition of Tree or Pole (For Highest Delta V)   ____
    (0) Not collision (for highest delta V) with tree or pole
    (1) Not damaged
    (2) Cracked/sheared
    (3) Tilted <45 degrees
    (4) Tilted ≥45 degrees
    (5) Uprooted tree
    (6) Separated pole from base
    (7) Pole replaced
    (8) Other (specify):

    _____
    (9) Unknown

ACCIDENT RECONSTRUCTION PROGRAMS HIGHEST DELTA V

58. Basis for Total (Resultant) Delta V (highest)   ____ ____

    (00) No vehicle inspection

Delta V Calculated
    (01) Reconstruction program-damage only routine
    (02) Reconstruction program-damage and trajectory routine
    (03) Missing vehicle algorithm

Delta V Not Calculated
    (04) At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions.

All vehicles within scope (CDC applicable) of reconstuction program but one of the collision conditions is beyond the scope of the reconstruction program or other acceptable reconstruction technique, regardless of adequacy of damage data.

    (05) Rollover
    (06) Other non-horizontal forces
    (07) Sideswipe type damage
    (08) Severe override
    (09) Yielding object
    (10) Overlapping damage
    (11) All vehicle and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available, (specify):

    _____

    _____

    (98) Other, (specify): _____

    _____

COMPUTER GENERATED CRASH SEVERITY

59. Total Delta V   Highest

     ___ ___ ___

_____ Nearest kmph (highest)

_____ Nearest kmph (secondary)

(NOTE: 000 means less than 0.5 kmph)
(160)   159.5 kmph and above
(999)   Unknown

60. Longitudinal Component of   +   Highest
Delta V   – ___ ___ ___

_____ Nearest kmph (highest)

_____ Nearest kmph (secondary)

(NOTE: _000 means greater than
−0.5 kmph and less than +0.5 kmph)
(±160) ±159.5 kmph and above
(_999) Unknown

61. Lateral Component of Delta V   +   Highest
                       – ___ ___ ___

_____ Nearest kmph (highest)

_____ Nearest kmph (secondary)

(NOTE: _000 means greater than −0.5 kmph and
less than +0.5 kmph)
(±160)   ±159.5 kmph and above
(_999)   Unknown

62. Energy Absorption   ___ ___ ___ , ___ 0 0   Highest

_____ Nearest 100 joules (highest)

_____ Nearest 100 joules (secondary)

(NOTE: 0000 means less than 50 joules)
(9997) 999,650 joules or more
(9999) Unknown

63. Impact Speed   Highest

     ___ ___ ___

_____ Nearest kmph (highest)

_____ Nearest kmph (secondary)

(NOTE: 000 means
less than 0.5 kmph)
(160)   159.5 kmph and above
(998)   Trajectory algorithm not run
(999)   Unknown

DELTA V CONFIDENCE LEVEL

64. Confidence In Reconstruction Program
Results (For Highest Delta V)   ___
(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

OTHER SPEED ESTIMATE

65. Barrier Equivalent Speed   Highest

     ___ ___ ___

_____ Nearest kmph (highest)

_____ Nearest kmph (secondary)

(NOTE: 000 means
less than 0.5 kmph)
(160)   159.5 kmph and above
(999)   Unknown

ESTIMATED DELTA V

66. Estimated Highest Delta V (Researcher
    Determined) _____
    (0) Reconstruction Delta V coded

    Estimated Delta V
    (1) Less than 10 kmph
    (2) ≥ 10 kmph but < 25 kmph
    (3) ≥ 25 kmph but < 40 kmph
    (4) ≥ 40 kmph but < 55 kmph
    (5) ≥ 55 kmph

    Other estimates of damage severity
    (6) Minor
    (7) Moderate
    (8) Severe

    (9) Unknown

INSPECTION TYPE

67. Type of Vehicle Inspection _____
    (0) No inspection
    (1) Vehicle fully repaired-no damage evident
    (2) Partial inspection (specify):
    _____
    (3) Complete inspection

DELTA V EVENT NUMBER

68. Delta V Event Number _____
    _____ Code the accident event sequence
    number that resulted in the Delta V that
    has been coded above for this vehicle
    (99) Unknown

*** IF THE CDS APPLICABLE VEHICLE WAS NOT INSPECTED (I.E., GV67 = 0), ***

DO NOT COMPLETE THE EXTERIOR AND INTERIOR VEHICLE FORMS

*** IF GV07 DOES NOT EQUAL 01-49, DO NOT COMPLETE ***

THE EXTERIOR VEHICLE, INTERIOR VEHICLE,

OCCUPANT ASSESSMENT, AND OCCUPANT INJURY FORMS.

Variable Name: Vehicle Number

Element Values:

Range: 01 through 30
                     Code the number assigned to this vehicle

Source: Investigator determined

Remarks:

Numbers assigned to vehicles ***must*** be consecutive starting with "01" and no numbers can be missing. Each in-transport motor vehicle must be assigned a unique number. Vehicle numbers are to be assigned consecutively according to the order NASS vehicles are listed on the PAR. If there are any NASS vehicles not listed on the PAR, then use the next consecutive number.

When one motor vehicle is towing another, the vehicle number or numbers assigned depends on the crash circumstances and the type of linkage between the vehicles. A fixed linkage is defined as one which has the property 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, assign a vehicle number to the power (*i.e.*, towing) unit only 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 require vehicle forms, and (3) will be considered as cargo associated with the power unit.

If the linkage between the units is nonfixed, each vehicle is considered to be in-transport, and a vehicle number is assigned only to the vehicle(s) involved in the crash sequence.

Do not assign a vehicle number to any struck motor vehicle ***not in-transport*** (*e.g.*, a vehicle parked off the roadway). Vehicle and occupant forms are not required for these vehicles. However, the vehicle is shown on the crash diagram and referred to as P-1, etc. Also, data which may be required to exercise the SMASH program are collected. The necessary data questions are located at the bottom of the second page of the SMASH Program Summary.

Variable Name: Vehicle Model Year

Element Values:

Range: 1900 through 1998
                        Code the model year

                        9999   Unknown

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

Remarks:

Code the model year for which the vehicle was manufactured.

Code "9999" (Unknown) if the vehicle model year cannot be determined.

GV05

Variable Name: Vehicle Make (specify):

Element Values:

Passenger Vehicles/Light Trucks (01-69)

	GV06 *Subpage*		GV06 Subpage
01 American Motors	1st	34 BMW	(24)
02 Jeep (includes Kaiser-Jeep)	(2)	35 Nissan/Datsun	(25)
		36 Fiat	(26)
03 AM General	(2)	37 Honda	(27)
06 Chrysler	(3)	38 Isuzu	(28)
07 Dodge	(4)	39 Jaguar	(29)
08 Imperial	(6)	40 Lancia	(29)
09 Plymouth	(7)	41 Mazda	(30)
10 Eagle	(8)	42 Mercedes Benz	(31)
12 Ford	(9)	43 MG	(32)
13 Lincoln	(11)	44 Peugeot	(32)
14 Mercury	(12)	45 Porsche	(33)
18 Buick	(13)	46 Renault	(33)
19 Cadillac	(14)	47 Saab	(34)
20 Chevrolet	(15)	48 Subaru	(34)
21 Oldsmobile	(17)	49 Toyota	(35)
22 Pontiac	(18)	50 Triumph	(36)
23 GMC	(19)	51 Volvo	(37)
24 Saturn	(20)	52 Mitsubishi	(38)
25 Grumman	(20)	53 Suzuki	(39)
29 Other domestic: GV06 =	(21)	54 Acura	(40)
001 - Studebaker/Avanti		55 Hyundai	(40)
002 - Checker		56 Merkur	(40)
398 - Other automobile		57 Yugo	(41)
(*i.e.*, DeSoto		58 Infiniti	(41)
Hudson, Packard)		59 Lexus	(41)
30 Volkswagen	(22)	60 Daihatsu	(42)
31 Alfa Romeo	(23)	61 Sterling	(42)
32 Audi	(23)	62 Land Rover	(42)
33 Austin/Austin Healey	(24)	63 KIA	(42)
		69 Other foreign	(43)

Motored Cycle/ATC/ATV (70-79)

	GV06 *Subpage*		GV06 *Subpage*
70 BSA	(44)	78 Other make moped	(44)
71 Ducati	(44)	79 Other Motored Cycle	(44)
72 Harley-Davidson	(44)	**Also see:**	
73 Kawasaki	(44)	[34] - BMW	(24)
74 Moto-Guzzi	(44)	[37] - Honda	(27)
75 Norton	(44)	[50] - Triumph	(36)
76 Yamaha	(44)	[53] - Suzuki	(39)

GV05

(2)

Medium/Heavy Trucks and Buses (80-89)

		GV06 *Subpage*		**Also see:**	**GV06** *Subpage*
80	Brockway	(46)		[03] AM General	(2)
81	Diamond Reo/Reo	(46)		[07] Dodge	(5)
82	Freightliner/White	(46)		[12] Ford	(10)
83	FWD	(46)		[20] Chevrolet	(16)
84	International	(45)		[23] GMC	(19)
	Harvester/Navistar			[25] Grumman	(20)
85	Kenworth	(46)		[35] Nissan/Datsun	(25)
86	Mack	(46)		[36] Fiat	(26)
87	Peterbilt	(46)		[38] Isuzu	(28)
88	Iveco/Magirus	(46)		[42] Mercedes Benz	(31)
98	Other Make GV06 =	(46)		[51] Volvo	(37)
	801 - Autocar			[52] Mitsubishi	(38)

801 - Autocar
802 - Auto-Union-DKW
803 - Divco
804 - Western Star
805 - Oshkosh
806 - Hino
807 - Scania
850 - Truck based
     motorhome
898 - Other truck (*e.g.*,
     Ward LaFrance,
     Marmon)

902 - NeoPlan (bus)
950 - Bus based
    motorhome
988 - Other bus
998 - Other vehicle (*i.e.*,
    farm vehicle,
    go-kart)
99   Unknown

Source: Vehicle inspection, police report, and interview

Remarks:

Write the Vehicle Make in the available space for ready visual reference.

> ***Code "99"***   (Unknown) is used for a "hit-and-run" vehicle unless reliable
> evidence indicates the vehicle's make.

GV06

Variable Name: Vehicle Model (specify):

Element Values:

MAKE "01"   **AMERICAN MOTORS***

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Rambler/American	Rogue, Scrambler, 220, 440	all	3	3
002	Rebel/Matador	Barcelona, Classic Brougham, 550, 660, 770Matador (-78), Marlin	all	114" WB = 4 118" WB = 5	4 5
003	Ambassador	Brougham, DPL, SST, DL, Limited, 880, 990	all	5	5
004	Pacer	Limited, DL	75-80	2	2
005	AMX	(2 seater only)	68-70	2	2
006	Javelin	SST, AMX (71-74)	all	2	2
007	Hornet/Concord	Sportabout, Limited, DL, SC-360, SST, AMX (75-78)	all	2	2
008	Spirit/Gremlin	Limited, DL, Custom, X, GT (83-on) AMX (79-on)	all	2	2
009	Eagle	Concord based	80-87	3	3
010	Eagle SX-4	Spirit/Gremlin based	81-84	2	2
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

* Alliance, Encore, Premier--See Renault - Make "46"

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "02"   JEEP (Includes KAISER-JEEP)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
401	CJ-2/CJ-3/CJ-4	Military	-66	81" WB = 1 101" WB = 2	7** 7**
402	CJ-5/CJ-6/CJ-7/CJ8	Scrambler, Golden Eagle, Renegade, Laredo, Wrangler	67-on	84" WB = 1 104" WB = 3	7**
403	YJ-series	Wrangler	86-on	1	7**
404	Cherokee	Limited, Loredo, Pioneer, Briarwood Grand	84-on 92-on	2 2	7** 7**
421	Cherokee	Wide Track, Chief, Commando, Jeepster	-83	2	7**
431	Grand Wagoneer	Custom, Brougham Limited, Wagoneer	71-91	2 3	7** 7**
481	Pickup	J-10, J-20, Honcho	all	per WB	7**
482	Comanche	Chief	86-92	111" WB = 3 119" WB = 4	7** 7**
498	Other light truck		-	-	-
499	Unknown light truck		-	-	-
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size value for side impacts.

MAKE "03"   AM GENERAL

CODE	MODEL	INCLUDES		YEAR	SIZE	STIFFNESS
401	Dispatcher	Post Office (Jeep)	all	1		1
421	Hummer			93-on	N/A	N/A
466	Dispatcher	DJ-series-Post Office Van		all	N/A	N/A
498	Other light truck			-	-	-
499	Unknown light truck			-	-	-
884	Medium/heavy truck	Military off-road		-	-	-
898	Other medium/heavy truck			-	-	-
899	Unknown medium/heavy truck			-	-	-
983	Bus-flat front, rear engine	Transit		all	N/A	N/A
988	Other bus			all	N/A	N/A
989	Unknown bus type			-	-	-
999	Unknown vehicle			-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "06"   **CHRYSLER**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
009	Cordoba	Crown, 300, LS	75-83	4	4
010	New Yorker/Newport/ 5th Avenue/Imperial (excludes all FWD)	Custom, Royal, Brougham, Town and Country, 300 (-71)	-78 79-81 82-89	6 5 4	6 5 4
014	New Yorker/E Class/ Imperial (90-93)/5th Avenue	FWD vehicles, Turbo	83-93	3	9***
015	Laser	Turbo, XE, XT	84-86	2	9***
016	LeBaron	Medallion, Salon (RWD), Landau, LX FWD except GTS or GTC Sport Coupe	77-81 82-on	4 2	4 9***
017	LeBaron GTS/GTC	GTS-Turbo GTC-Sport Coupe	85-on 87-on	3 2	9*** 9***
031	TC (Maserati Sport)	Turbo Convertible	88-91	1	1
035	Conquest	TSI, Turbo	87-89	2	2
037	Malibu (97-)		97-on	3	9***
041	Concorde		93-on	4	4
042	LHS	New Yorker (94-on)	94-on	4	9***
043	Sebring		95-on	3	3
044	Cirrus		95-on	3	9***
398	Other automobile		-	-	-
399	Unknown automobile				
441	Town and Country	Minivan	90-on	5	7**
498	Other light truck				
499	Unknown light truck				
999	Unknown vehicle		-	-	-

** Code 7 applies to front and rear impacts. Use size code for stiffness for side impacts.
*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "07"   **DODGE**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Dart	Custom, Swinger, Sport, GT, Demon, Special, Special Edition, 170, 270, 340, 360	62-70 71-76	111" WB = 4 108" WB = 3	4 3
002	Coronet/Charger (-78)/ Magnum	Brougham, Custom, Superbee, Crestwood, Deluxe, XE, R/T, SE 440, 500, Police	-79	4	4
003	Polara/Monaco Royal Monaco	Custom, Special, Crestwood, Brougham, Police, Taxi	-76 77-78	5 4	5 4
004	Viper	RT/10, GTS	92-on	2	2
005	Challenger	R/T, T/A, Rallye	70-74	3	3
006	Aspen	Custom, Special Edition, Police, R/T, Sport	76-80	113" WB = 4 109" WB = 3	3 3
007	Diplomat	Medallion, Salon, S	77-89	4	4
008	Omni/Charger (83 on)	024, DeTomaso, Miser, GLH, GLHS Shelby, Charger 2.2, America, Expo	78-90	2	2
009	Mirada		80-83	4	4
010	St. Regis	Police, Taxi	79-81	5	5
011	Aries (K)	Custom, SE, LE	81-89	2	9***
012	400	LS	82-83	2	9***
013	Rampage 2.2, GT, Sport (car based pickup)		82-84	2	2
014	600	ES, Turbo	83-88	2	9***
015	Daytona	Turbo Z, Shelby Z, Pacifica, C/S Competition, IROC R/T	84-94	2	9***
016	Lancer	Pacifica, Turbo, ES, Shelby	85-89	3	9***
017	Shadow	ES, Turbo	87-on	2	9***
018	Dynasty		88-on	3	9***
019	Spirit	ES, Shelby, R/T	89-94	3	9***
020	Neon	Expresso	94-on	3	9***
033	Challenger all imported		78-83	2	2
034	Colt (excludes Vista)	RS, Turbo, Custom, GTS, DL, E, Premier, Deluxe, Carousel, GT	74-76 77-80 80-94	2 <93" WB = 1 1	2 1
035	Conquest	Turbo	84-86	2	2

*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "07"   DODGE (Continued)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
039	Stealth		91-on	2	2
040	Monaco		90-92	3	3
041	Intrepid		93-on	4	4
042	Avenger		95-on	3	3
043	Stratus		95-on	3	9***
398	Other automobile		-	-	-
399	Unknown automobile				
401	Raider	Sport	86-on	1	8**
402	Durango		98-on	4	8**
421	Ramcharger		all	3	8**
441	Vista	4 x 4	84-91	3	7**
442	Caravan	Mini-Ram, 112 and 119 WB, SE, ES 84-on	112" WB = 4	7**	
			119" WB = 5	7**	
461	B-series vans	Sportsman, Royal, Maxiwagon, Ram B150-B350, Tradesman	all	7	7**
470	Van derivative	Kary Van	all	7	7**
471	D50, Colt P/U Ram 50/Ram 100		-82 / 83-on	per WB / per WB	8** / 8**
472	Dakota		87-on	112" WB = 3 / 124" WB = 6	8**
481	D, W-series pickup W100-W350	Ram, Custom, Royal, Miser, D100-D350,	all	per WB	8**
482	Ram	1500/2500/3500 P/U	94-on	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				

** Applies to front and rear impacts. Use size value for side impacts.
*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "07"   DODGE (Continued)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
881	Medium/Heavy: CBE		all	N/A	N/A
882	Medium/Heavy: COE low entry		all	N/A	N/A
883	Medium/Heavy: COE high entry		all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck		all	N/A	N/A
981	Medium bus (not van based)		all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Uknown bus type				
998	Other vehicle				
999	Unknown vehicle		-	-	-

MAKE "08"   IMPERIAL

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
010	Imperial	Lebaron Mark Cross, Frank Sinatra 81-83 editions	-76 4	6	6 4
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "09"   PLYMOUTH

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Valiant/Duster (-76)/ Scamp	100, 200, Brougham, Signet Custom, Special 340/360, 340, 360, Twister	-76	108" WB = 3 111" WB = 4 4	3
002	Satellite/Belvedere	Belvedere I/II, GTX, Roadrunner (-74), Sebring, Sebring Plus, Superbird, Brougham	-74	4	4
003	Fury	I, II, III, Roadrunner (75), -74 Salon, VIP, Sport, Suburban	5 75-78	5 4	5 4
004	Gran Fury	Sedan, Brougham, Custom Sport, Suburban 82-89	75-81 4	5 4	5
005	Barracuda	Formula, S, 340, AAR, `Cuda Gran Coupe	65-73	3	3
006	Volare	Custom, Premier, Roadrunner (76-on), Police	76-80 113" WB = 4	109" WB = 3 4	3
007	Caravelle	Turbo, SE	85-89	3	9***
008	Horizon	TC-3, Miser, Turismo 2.2, Custom, SE, Duster (85-on) America, Expo	78-90	2	2
011	Reliant (K)	SE, LE	81-89	2	9***
013	Scamp (car based pickup)	GT, 2.2	82-84	2	2
017	Sundance	Turbo	87-on	2	9***
019	Acclaim	LX, LE	89-on	3	9***
020	Neon	Expresso	94-on	3	9***
031	Cricket		71-72	2	2
032	Arrow	Fire Arrow, GS, GT	76-80	1	1
033	Sapparo	all imported	78-83	2	2
034	Champ/Colt (excludes Vista)	Turbo, Custom - Station Wagon (84-on)	79-94 84-94	1 103" WB = 3	1 2
035	Conquest	TSI	84-89	2	2
036	CHANGED TO CODE 037 IN 1990				
037	Laser	RS, Turbo	89-on	2	2
038	Breeze		96-on	3	9***
039	Prowler		96-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				

*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "09"   **PLYMOUTH (Continued)**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
421	Trailduster		all	3	8**
441	Vista	4 x 4	87-on	3	7**
442	Voyager (minivan)	SE, LX	84-on	112" WB = 4	7**
				119" WB = 5	7**
461	Van-fullsize (B-series)	Voyager, Sport, Premier	all	7	7**
471	Arrow pickup (foreign)		all	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck		-	-	-
999	Unknown vehicle		-	-	-

MAKE "10"   **EAGLE**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
034	Summit	DL, LX, ES	89-on	3	3
037	Talon	TSI	90-on	2	2
040	Premier	LX, ES	88-92	3	3
041	Vision		93-on	4	4
044	Medallion	DL, LX	88-90	3	3
398	Other automobile		88-on	-	-
399	Unknown automobile				
441	Summit Wagon		92-on	99.2" WB = 2	7**
498	Other light truck				
499	Unknown light truck				
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "12" FORD

CODE	MODEL	INCLUDES		YEAR	SIZE	STIFFNESS
001	Falcon	Sprint, GT, Futura		thru-70	4	3
002	Fairlane	Torino		thru 1970 thru-70	4	4
003	Mustang/Mustang II	Mach, Boss, Grande, Cobra Ghia, SVO, GT, LX, Shelby	74-on	65-73 2	3 2	3
004	Thunderbird (all sizes)	Landau, Heritage, Turbo coupe, Elan, Fila		72-76 58-71 77-79 55-57 80-88	5 4 4 3 3	6 4 4 3 3
		SC, Sport, LX	89-on	4		4
005	LTD II	S, Squire, Brougham		77-79	4	4
006	LTD/Custom/Galaxie (all sizes)	XL, Landau, Ranch Wagon, Country Squire, S, 500, Brougham, XL, GT	83-86	thru-77 78-82 3	5 4	5 4 3
007	Ranchero	Falcon/Fairlane based Torino/LTD II based	72-79	thru-71 4	3 4	3
008	Maverick	Grabber		70-77	3	3
009	Pinto	Pony, MPG, ESS		71-80	1	1-Front 2-Rear
010	Torino/Gran Torino/Elite	GT, Cobra, Sport, Squire, Brougham		71-76	4	4
011	Granada	ESS, Ghia		75-82	3	3
012	Fairmont	Futura, Sport Coupe		78-83	3	3
013	Escort/EXP	L, GL, GLX, SS, GT, LX		81-on	1	9***
015	Tempo	L, GL, GLX, Sport, 4 x 4		84-94	2	9***
016	Crown Victoria			81-on	4	4
017	Taurus	MT-5, L, GL, LX, SHO		86-on	3	3
018	Probe	GL, LX, GT		88-on	2	2
031	English Ford	Cortina			per WB	per WB
032	Fiesta	Sport, Ghia		78-80	1	1
033	Festiva			88-93	1	1
034	Laser			all	per WB	per WB
035	Contour			94-on	3	9***
036	Aspire			94-on	1	1
398	Other automobile			-	-	-
399	Unknown automobile			-	-	-

*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "12"   **FORD (Continued)**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
401	Bronco II/Bronco (-77)/ Explorer	Eddie Bauer, XL, XLT, Limited, Eddie Bauer	83-89 90-on	1	7**
421	Bronco-fullsize	Eddie Bauer, Custom, XL, XLT	78-on	3	8**
422	Expedition		97-on	TBD	TBD
441	Aerostar	XLT, Cargo Van	85-on	7	7**
442	Windstar		94-on	5	7**
461	E-series vans	Econoline, Clubwagon, Chateau, E150-E350	all	7	7**
470	Van derivative	Parcel van	all	7	7**
471	Ranger	Supercab, 4 x 4, STX, Splash	82-on	108" WB = 3 114" WB = 4	8** 8**
472	Courier	Imported pickup	all	7	7**
481	F-series pickup	F100-F350	all	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				
881	Medium/Heavy CBE	F-5 through F-8, L-series, FT-series	all	N/A	N/A
882	Medium/Heavy COE low entry	C/CT series	all	N/A	N/A
883	Medium/Heavy COE high entry	C/CLT series	all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		-	-	-
899	Unknown medium/heavy truck		-	-	-
981	Medium bus	B-series (not van based)	all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown bus type				
998	Other vehicle		-	-	-
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "13" **LINCOLN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Continental/Town Car	Continental (-81), Town Car (82-on)	thru-79	6	6
			80-on	4	5
002	Mark	I, II, III, IV, V	-70	4	4
		LSC, all Signature/Designer Series	71-80	5	5
		VI	80-83	4	4
		VII	84-on	3	3
		VIII	93-on	4	4
005	Continental (82 -on)	All Signature/Designer Series	82-87	4	5
			88-on	3	3
011	Versailles		77-80	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
421	Navigator		97-on	TBD	TBD
498	Other light truck				
499	Unknown light truck				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "14"   **MERCURY (MERKUR: See "56")**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
002	Cyclone	GT, CJ, Spoiler	thru-71	4	4
003	Capri-domestic	RS, Turbo, GS, Black Magic	79-86	2	2
004	Cougar/XR7	XR-7, RS, LS, GS, Eliminator, Bougham, Villager, (includes all body styles)	67-76	4	4
			77-79	114" WB = 4	4
				118" WB = 5	5
			80-88	3	3
			89-on	4	4
006	Marquis/Monterey	Marauder, X-100, Parklane, S-55, Custom, Brougham, Montclair, Grand Marquis	thru-78	121" WB = 5	5
				124" WB = 6	6
			79-82	4	4
			82-on	106" WB = 3	3
				114" WB = 4	4
008	Comet	Caliente, GT, Voyager, 202, Capri (66-67)	62-67	4	4
			71-77	3	3
009	Bobcat	Runabout, Villager	75-80	1	1-Front 2-Rear
010	Montego	Comet (68-70), GT, MX, Villager, Brougham	68-73	3	3
			72-76	114" WB = 3	3
				118" WB = 4	4
011	Monarch	Ghia	75-80	3	3
012	Zephyr	GS, Z-7	78-83	3	3
013	Lynx/LN-7 (82-83)	L, LS, GS, RS, XR-3	81-87	1	9***
015	Topaz	L, LS, GS, 4 x 4	84-on	2	9***
017	Sable	LS, GS	86-on	3	3
031	Capri - foreign	Capri II	70-77	2	2
		2 + 2	89-94	1	1
033	Pantera	deTomaso	72-74	2	2
036	Tracer	L, GL	88-on	1	1
037	Mystique		94-on	3	9***
398	Other automobile		-	-	-
399	Unknown automobile				
401	Mountaineer		96-on	3	7**
443	Villager	LS, GS	93-on	4	7**
498	Other light truck				
499	Unknown light truck				

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "14"   **MERCURY (MERKUR: See "56")**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.
***   Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "18"   **BUICK**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Special/Skylark	GS, GS-350, GS-400, GS-455, GS California, Sport wagon, Custom	thru 72	4	4
002	LeSabre/Centurion/ Wildcat	Wagon, Luxus, Invicta, Custom, Limited T-Type	-76 77-85 86-on	6 4 4	6 4 9***
003	Electra/Electra 225/ Park Avenue (91-on)	Limited, Park Avenue, Ultra	-76 77-84 85-on	6 5 4	6 5 9***
004	Roadmaster	Estate Wagon, Limited	91-96	4	4
005	Riviera	S-Type, T-Type	63-65 66-76 77-85 86-93 94-on	4 5 4 3 4	4 5 4 9*** 9***
007	Century	Luxus, T-Type, FWD (82-on) Custom, Regal (72-77)	thru 77 78-81 82-on	4 3 3	4 3 9***
008	Apollo/Skylark*	Skylark (75)*, S/R	73-76	4	4
010	Regal	Turbo, Luxus, Grand National, GNX, T-Type	78-88	3	3
012	Skyhawk	S-Type, Roadhawk, T-Type, GT	75-81 82-on	2 2	2 9***
015	Skylark (76-85)	(except 75), S/R, S, Limited, Sport, T-Type	76-79 80-85	4 3	4 9***
018	Somerset/Skylark**	Skylark (86-on)**, Somerset, GS Regal, Custom, Limited, T-Type	85-on	3	9***
020	Regal (FWD)	Limited	88-on	3	9***
021	Reatta		88-91	2	2
031	Opel Kadett		-75	2	2
032	Opel Manta	1900, Luxus, Rallye, Sports Coupe	-75	2	2
033	Opel GT		-75	2	2
034	Opel Isuzu	Deluxe, Sport	76-79	1	1
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

***   Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "19"   **CADILLAC**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
003	Deville/Fleetwood (except Limousine)	Coupe de Ville, Sedan de Ville, Fleetwood Bougham, Fleetwood 60 Special, d'Elegance	-76 RWD 77-96 FWD 85-on	6 5 4	6 5 9***
	Deville	Concourse	94-on	4	9***
004	Limousin e	Fleetwood 75, Formal DeVille-based	all	6	6
005	Eldorado	Biarritz, El-doro, Touring Coupe	-78 79-85 86-on	6 4 3	6 4 9***
006	Commercial Series	Ambulanc e/Hearse	all	6	6
009	Allante'		87-on	2	2
014	Seville	Elegante STS	76-85 86-on	4 3	4 9***
016	Cimarron	D'oro	82-88	2	9***
017	Catera	RWD	97-on	TBD	TBD
018	Escalade		98-on	5	8**
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size value for side impacts.
*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "20"   CHEVROLET

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Chevelle/Malibu	Classic, Concours, S-3, Laguna, Nomad, 300, Greenbriar, Estate, Deluxe, SS 396/454	64-77 78-83	4 3	4 3
002	Impala/Caprice	Biscayne, Belair, Super Sport, Classic, Classic Brougham, Townsman Brookwood, Kingswood	-76 77-on	5 St. Wgn.=6 4	5 6 4
004	Corvette	Stingray	53-62 63-on	3 2	3 2
006	Corvair	Monza, Corsa, 500, Yenko	60-69	N/A	N/A
007	El Camino	Royal Knight, SS	59-60 64-77 78-on	5 4 3	8** 8** 8**
008	Nova (-79)	Chevy II, LN, LE, Concours SS-350/396, Rally	62-79	4	4
009	Camaro	SS, RS, LT, Berlinetta, IROC-Z, Z28	67-on	3	3
010	Monte Carlo (RWD only)	LS, SS, Aerocoupe, Landau	70-77 78-88	4 3	4 3
011	Vega	GT, Cosworth	71-77	2	2
012	Monza	Spyder, 2 + 2, Towne Coupe	75-80	2	2
013	Chevette	S, Scooter, CS	76-87	2dr-1 4dr-2	1 2
015	Citation	X-11, Citation II	80-85	3	9***
016	Cavalier	CS, RS, Z24, LS	82-on	2	9***
017	Celebrity	CS, Eurosport, VR	82-on	3	9***
019	Beretta/Corsica	GT	88-on	3	9***
020	Lumina	Z-34, Euro	90-on	3	9***
031	Spectrum		85-on	1	1
032	Nova/Geo Prizm	CL, NUMMI-built vehicle	85-on	2	9***
033	Sprint/Geo Sprint		85-on	1	1
034	Geo Metro	LSi, Xfi	89-on	1	1
035	Geo Storm	Gsi	85-on	1	1
036	Monte Carlo (FWD only)	Z34	95-on	3	9***
037	Malibu		97-on	3	9***
398	Other automobile				

GV06
(17)

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "20"   **CHEVROLET**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS

399   Unknown automobile

 **   Applies to front and rear impacts. Use size value for side impacts.
***   Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "20"   **CHEVROLET (Continued)**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
401	S-10 Blazer Blazer	S-10 p/u based (100.5" WB)	83-94 95-on	2	7**
402	Geo Tracker	Lsi	89-on	2	8**
421	Fullsize Blazer	K-series, fullsized p/u based Tahoe	69-94 95-on	3	8**
431	Suburban	All models	all	6	8**
441	Astro Van	Minivan	85-on	7	7**
442	Lumina APV		90-on	3	7**
443	Ventura		97-on	TBD	TBD
461	G-series van	Beauville, Chevy Van, Sport Van, G10-G30, Express	all	7	7**
466	P-series van		all	7	7**
470	Van derivative	Hi-cube, Parcel Van	all	7	7**
471	S-10/T-10	4 X 4	82-on	per WB	8**
472	LUV	Imported pickup	all	7	7**
481	C, K, R, V-series pickup	C10-C30, K10-K30, R10-R30, V10-V30, Silverado, C-K 1500, 2500, 3500	all	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				
881	Medium/Heavy CBE	C50/60/65; M60/65; H70/80/90; J70/80/90; Bison 90; all other CBE	all	N/A	N/A
882	Medium/Heavy COE low entry	T60/65 - all other COE low entry	all	N/A	N/A
883	Medium/Heavy COE high entry	Titan 90, all other COE high entry	all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck				
981	Bus	S-60 series	all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown bus type				
998	Other vehicle				

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "20"   **CHEVROLET (Continued)**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
999	Unknown vehicle		- -	-	

** Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "21"   **OLDSMOBILE**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Cutlass (RWD-only)	Supreme, S, LS, Salon Brougham, Vista Cruiser, F85 (thru 72) Rallye 350, Hurst Olds, 442, Calais, Classic (88)	-77 78-88	4 3	4 3
002	Delta 88	Royale, Custom, Delta, Jetstar 88, Delmont 88, Starfire (thru 66), Custom Cruiser	-76 77-85 86-on	6 4 4	6 4 9***
003	Ninety-Eight	Regency, Luxury	-76 77-84 85-on	6 5 4	6 5 4
005	Toronado	XSR, Trofeo, Brougham Custom	66-78 79-85 86-92	5 4 3	5 4 3
006	Commercial Series	Ambulance/Hearse	all	6	6
012	Starfire	SX, GT	75-80	2	2
015	Omega	 X-body type	RWD 75-79 FWD 80-85	4 3	4 9
016	Firenza	S, LS, SX, Cruiser, GT	82-88	2	9***
017	Ciera	Cutlass Ciera, Brougham, ES	82-on	3	9***
018	Calais	GT, ES, 500	85-91	3	9***
020	Cutlass (FWD)	Supreme	88-on	3	9***
021	Achieva	SC	92-on	3	9***
022	Aurora		94-on	4	9***
023	Intrigue		97-on	3	9***
024	Alero		94-on	4	9***
398	Other automobile		-	-	-
399	Unknown automobile				
401	Bravada		91-on (no 1995)	2	7**
441	Silhouette		90-on	3	7**
498	Other light truck				
499	Unknown light truck				
998	Other vehicle				
999	Unknown vehicle		-	-	-

  **   Applies to front and rear impacts. Use size value for side impacts.
 ***   Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "22"   **PONTIAC**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Lemans/Tempest (thru 79)	Safari, T-37, Luxury, Grand Sport, GTO (-73), GT-37, Sprint, Judge Grand AM (73-75) Grand Lemans	thru 77 78-79	4 3	4 3
002	Bonneville/Catalina/	Brougham, Grand Safari, Safari, Grandville, 2+2 Executive, Starchief	-68 69-76 77-81 82-84	5 6 4 3	5 6 4 3
		SE, SSE, SSEi	87-on	4	4
	Parisienne		83-84	4	4
005	Fiero	2M4, 2M6, GT, SE	84-88	1	1
008	Ventura	II, SJ, Sprint, GTO (74on) Custom	71-77	4	4
009	Firebird/Trans AM	Esprit, Formula, GTA, Redbird, Yellowbird, Skybird, SE	67-81 82-on	3 2	3 2
010	Grand Prix (RWD)	J, LJ, SJ, Brougham, 2+2	63-72 73-77 78-87	5 4 3	5 4 3
011	Astre	Safari, SJ, Custom	75-77	2	2
012	Sunbird (thru 80)	Safari, Sport, Formula	76-80	2	2
013	T-1000/1000		81-87	2dr-1 4dr-2	1 2
015	Phoenix	LJ, SJ	77-79 80-84	4 3	4 9***
016	J2000/Sunbird Sunfire	Sunbird(84-on), LE, SE, GT, Convertible GT/SE	82-94 95-on	2	9***
017	6000	STE, SE, LE	82-on	3	9***
018	Grand AM	SE, LE	80 85-on	3 3	3 9***
020	Grand Prix (FWD)	SE, McLaren Turbo, GTP	88-on	3	9***
031	Lemans (88-on)	SE, Tempest (Canadian)	88-on	2	2
398	Other automobile		-	-	-
399	Unknown automobile				
441	Trans Sport		90-on	3	7**
498	Other light truck		-	-	-
499	Unknown light truck				
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size value for side impacts.
*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "23"   **GMC**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
007	Caballero/Sprint	Sierra Madre del Sur, SP	-77 / 78-on	4 / 3	8** / 8**
398	Other automobile		-	-	-
399	Unknown automobile				
401	Jimmy/Typhoon	S15 based (100.5" WB)	83-on	2	7**
421	Fullsize Jimmy/Yukon	fullsize pickup based	all	3	8**
431	Suburban	all models	all	6	8**
441	Safari (Minivan)		86-on	7	7**
461	G-series van	Rally Van, Vandura, G15-G35	all	7	7**
466	P-series van				
470	Van derivative	Hicube, parcel van, Value Van, Magna Van	all	7	7**
471	S15/T15/Sonoma	4 X 4, Cyclone	82-on	per WB	8**
481	C, K, R, V-series pickup	C15-C35, K15-K35, R15-R35, V15-V35, Sierra	all	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				
881	Medium/Heavy CBE	W5000/6000/7000 series, Brigadier/General models	all	N/A	N/A
882	Medium/Heavy COE low entry	W6000/W7000, all other COE, low entry	all	N/A	N/A
883	Medium/Heavy COE high entry	Astro 95, all other COE, high entry	all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck				
981	Bus	B6000	all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown bus type				
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "24"   **SATURN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	SL	SL1, SL2, SL3	91-98	3	3
002	SC	SC1, SC2	91-96	2	2
		Includes 3 door model	97-on	3	3
003	SW	SW1, SW2	93-on	3	3
004	EV	EV1 (electric vehicle)	97-on	TBD	TBD
398	Other automobile		-	-	-
399	Other automobile				
999	Unknown		-	-	-

MAKE "25"   **GRUMMAN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
441	LLV	Postal vehicle (See NATB Chevrolet for VIN)	all	N/A	N/A
442	Step-in van	Multi-stop, step van	all	N/A	N/A
498	Other light truck		-	-	-
499	Unknown light truck		-	-	-
881	Medium/heavy truck - CBE		-	-	-
882	Medium/heavy truck - COE low entry		-	-	-
883	Medium/heavy truck - COE high entry		-	-	-
884	Medium/heavy truck unknown engine location		-	-	-
890	Medium/heavy truck entry position unknown		-	-	-
898	Other medium/heavy - other		-	-	-
899	Unknown medium/heavy truck		-	-	-
983	Bus-flat front, rear engine	Transit	all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown type bus				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "29"   **OTHER DOMESTIC MANUFACTURERS**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
001	Studebaker	Lark, Gran Turismo, Hawk, Cruiser, all associated subseries	thru-66	per WB	= size
	Avanti		all	per WB	= size
002	Checker	Marathon, Superba, Taxi, Aerobus	thru-82	per WB	= size
398	Other make	Desoto, Excaliber, Stutz, Hudson, Packard, Consulier	all	per WB	= size
399	Unknown make				

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "30" **VOLKSWAGEN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Karmann Ghia		-74	1	1
032	Beetle 1300/1500	flat windshield, 94.5" WB	-77	1	1
033	Super Beetle	distinguished by curved windshield, 95.3" WB	71-80	2	1
034	411/412	Squareback/Fastback	71-74	2	1
035	Squareback/Fastback	Type 3, 1600	-74	1	1
036	Rabbit	L, GTI, Sport, LS, Custom, DL, Deluxe	75-84	1	1
037	Dasher		74-81	2	2
038	Scirocco	16V	75-88	1	1
040	Jetta	GL, GLI	81-92	2	2
041	Quantum	Synco	82-88	2	2
042	Golf	Synco, GTI, Cabriolet, GT, GL	85-92	2	1
043	Rabbit pickup	car/based pickup	80-83	1	1
044	Fox	GL	87-on	1	1
045	Corrado		89-on	2	2
046	Passat		90-on	2	2
047	Jetta III		93-on	2	2
048	Golf III		93-on	2	2
049	New Beetle		988-on	2	9***
398	Other automobile		-	-	-
399	Unknown automobile		-	-	-
401	The Thing (181)		73-75	1	1
441	Vanagon/Camper	Bus, Kombi, Van	-89	1	7**
442	Eurovan		92-on	7	7**
498	Other light truck		-	-	-
499	Unknown light truck				
998	Other vehicle				
999	Unknown vehicle		-	-	-

** Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "31"   ALFA ROMEO

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Spider	All roadsters, Veloce, 1750/2000 roadsters	all	1	1
032	Sports Sedan	All 4 door sedans; Milano (86), Giulia, Super, Berlina, Alfetta, 1750/2000 sedans	all	per WB	= size
033	Sprint Veloce	All 2-door coupes; Alfetta GT, 1750/2000 GTV, Sprint GT	all	per WB	= size
034	GTV-6		81-on	1	1
035	164		89-on	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

MAKE "32"   AUDI

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Super 90		70-72	2	2
032	100	S, LS, GL	70-77	3	3
		Quattro (89-on)	89-94	3	3
	A6		95-on		
033	Fox		74-79	2	2
034	4000	Quattro, Coupe GT, CS, S	80-88	2	2
035	5000	Quattro, CS, S, Turbo	78-88	3	3
036	80	Quattro	88-92	2	2
	90	Quattro	88-95	2	2
037	200	Quattro	89-92	3	3
038	V-8 Quattro		90-94	3	3
039	Coupe Quattro		90-93	2	2
040	S4		93-94	3	3
	S6		95-on		
041	Cabriolet		94-on	2	2
042	A4		96-on	TBD	TBD
043	A3		96-on	2	2
044	A8		96-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "33"   AUSTIN/AUSTIN HEALEY

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Marina	GT	all	2	2
032	America		all	1	1
033	Healey Sprite		all	1	1
034	Healy 3000	Healy 100	all	1	1
035	Mini	all		1	1
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

MAKE "34"   BMW

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	1600, 2002	Tii, 1800, 2000CS	-76	2	2
032	Coupe	2800CS, 3.0CS	69-76	3	3
033	Bavaria Sedan	2500, 2800	69-74	3	3
034	3-series	318i, 318ti, 320i, 325e, 325es, 325i, 328, M3	77-on	2	2
035	5-series	524i, 528i, 530i, 533i, 535i, TD 525i (wagon), M5, 540iA, 540i	75-on 93-on	3 3	3 3
036	6-series	630, 633, 635, csi, M6	77-on	3	3
037	7-series	733i, 735i, L7, 740i, 750iL	78-on	3	3
038	8-series	850, 840ci	90-on	per WB	per WB
039	Z3		96-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				

Motorcycles

701   0-50cc
702   51-124cc
703   125-349cc
704   350-449cc
705   450-749cc

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "34"   BMW

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS

Motorcycles

706	750cc-over
709	Unknown cc
799	Unknown motored cycle
999	Unknown vehicle

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "35"   **NISSAN/DATSUN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	F10	77-78	1	1	
032	200/240 SX		78-83	1	1
			84-on	2	2
033	1200/210/B210	Honeybee	71-82	1	1
034	Z-car, ZX	240/260/280Z, 300 ZX, Turbo	70-on	1	1
		2 + 2	75-78	3	3
		2 + 2	79-on	2	2
035	310		79-82	1	1
036	510	PL	68-73	2	2
			78-81	1	1
037	610	PL	73-76	2	2
038	710	PL	74-77	2	2
039	810/Maxima		77-on	3	3
040	Roadster	SPL 311, SRL 311, 1600, 2000, convertible	-70	1	1
041	PL411, RL411		-67	1	1
042	Stanza	XE	82-92	2	2
043	Sentra		83-on	1	1
044	Pulsar	NX, EXA (86-on	83-90	2	2
045	Micra		87-on	1	1
046	NX 1600/2000		92-on	2	2
047	Altima		93-on	2	2
398	Other automobile		-	-	-
399	Unknown automobile				
401	Pathfinder	MPV, 4 x 4	86-on	3	8**
441	Van XE, GXE		88-on	1	7**
442	Axxess		89-90	3	7**
443	Quest		93-on	4	7
471	Datsun/Nissan Pickup/ Frontier	PL620, King Cab, Hardbody	73-on 98-on	per WB	8**
498	Other light truck	Patrol (1960)	-	-	-
499	Unknown light truck				

**   Applies to front and rear impacts. Use size values for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "35"   NISSAN/DATSUN (Continued)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
883	Medium/Heavy COE high entry		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck				
999	Unknown vehicle		-	-	-

MAKE "36"   FIAT

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	124 (Coupe/Sedan)	Sport	67-75	1	1
032	124 Spider/Racer	Spider 2000/1500	68-83	1	1
033	Brava - 131		75-82	2	2
034	850 (Coupe/Spyder)		67-73	1	1
035	128		72-79	2	2
036	X-1/9		75-83	1	1
037	Strada		79-83	2	2
398	Other automobile	600, 1100	-	-	-
399	Unknown automobile				
882	Medium/Heavy COE low entry		all	N/A	N/A
883	Medium/Heavy COE high entry		all	N/A	N/A
890	Medium/heavy COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "37"   HONDA (ACURA: See "54")

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Civic/CRX	1300, 1500, CVCC, DX, EX, VX CRX, S, Si, HF, 4WD Wagon	all	1	1
	del Sol		93-on	1	1
032	Accord	LX, CVCC, SE-i, LX-i, EX, EX wagon 6-cylinder LX/EX	-81 82-86 87-on	1 2 3	1 9*** 9***
033	Prelude	Si	80-83 84-on	1 2	1 9***
034	600	Coupe, Sedan	all	1	1
398	Other automobile				
399	Unknown automobile				
401	Passport		94-on	3	8**
402	CRV		97-on	3	8**
441	Odyssey		95-on	per wb	per wb
498	Other light truck		-	-	-
499	Unknown light truck				

Motorcycle

701	0-50cc	
702	51-124cc	
703	125-349cc	
704	350-449cc	
705	450-749cc	
706	750cc or greater	
709	Unknown cc	

All Terrain Cycles/Vehicles

731	0-50cc	includes all ATCs/ATVs
732	51-124cc	designed solely for
733	125-249cc	off-road use.
734	350cc or greater	
739	Unknown cc	

799   Unknown motored cycle

| 999 | Unknown vehicle | | - | - | - |

**   Applies to front and rear impacts. Use size values for side impacts.
***   Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "38"   ISUZU

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	I-Mark	S, RS, Turbo	85-89	1	1
032	Impulse	Turbo, RS	84-on	2	2
033	Stylus		90-on	2	2
398	Other automobile		-	-	-
399	Unknown automobile				
401	Trooper/Trooper II	Deluxe, LS	84-on	2	7**
402	Rodeo		91-on	3	8**
403	Amigo		89-94	2	8**
441	Oasis		96-on	TBD	TBD
471	P'up (pickup) Hombre	4 x 4	Thru 95 96-on	3	8**
498	Other light truck		-	-	-
499	Unknown light truck				
881	Medium/Heavy - CBE		all	N/A	N/A
882	Medium/Heavy COE low entry		all	N/A	N/A
883	Medium/Heavy COE high entry		all	N/A	N/A
884	Medium/Heavy unknown engine lo cation		all	N/A	N/A
890	Medium/Heavy COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck				
981	Conventional front engine				
982	Front engine/flat front				
983	Rear engine/flat front				
988	Other bus				
989	Unknown bus type				
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "39"   JAGUAR

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	XJ-S Coupe		76-on	3	3
032	XJ6/12 Sedan/Coupe	L, XJ, C, 340/420 Sedan	all	3	3
033	XKE	V12, Roadster, 120	all	2	3
		2 + 2		3	3
034	X100		97-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

MAKE "40"   LANCIA

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Beta Sedan - HPE		-80	2	2
032	Beta Coupe - Zagato		-82	1	1
033	Scorpion		-78	1	1
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "41"   **MAZDA**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	RX2	72-74	2	2	
032	RX3	72-78	1	1	
033	RX4	74-78	2	2	
034	RX7 S, GS, GSL, SE	79-on	2	2	
035	GLC/Protege 323	DX, Protege (90-on)	77-on -94	1	1
036	Cosmo		76-78	2	2
037	626	GT, GS, GSL, SE	79-on	2	2
038	808		72-77	1	1
039	Mizer		76	1	1
040	R-100		-72	1	1
041	616/618		-72	2	2
042	1800		-72	2	2
043	929		88-96	3	3
044	MX-6	Turbo	88-on	2	2
045	Miata		90-on	1	1
046	MX-3	GS	92-on	1	1
047	Millenia		95-on	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
401	Navajo		91-on	3	8**
441	MPV		89-on	3	7**
471	Mazda pickup	B-2000, B-2200, B-2600, SE-5, LX, Cab Plus, B-4000	all 94-on	per WB per WB	8** 8**
498	Other light truck		-	-	-
499	Unknown light truck				
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "42"   **MERCEDES BENZ**

(Check "INCLUDES" comments carefully to determine proper code.)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	200/220/230/240/250/260/ 280/300/320	Sedan and 5 passenger "C" only, SE, CD, D, SD, TD, TE, CE, E. **DOES NOT** include **280 SE** (75 on), **300 SD** - see code 037	all	3	3
032	230/280 SL	2 seater only	all	1	1
033	300/350/380/450/500 SL/ 560 SL	2 seater only, 300/500 SL (90-on)	all	2	2
034	350/380/420/450/560 SLC		all	4	4
035	280/300 SEL		all	4	4
036	380/420/450/500/560 SEL and 500/560 SEC/350 SDL/ 300 SDL		all	4	4
037	300 SE/380/450 SE	280 S, 280 SE (75 on), 300 SD Sedan/350 SD	all	4	4
038	600, 6.9 Sedan	Pullman	all	6	6
039	190	D, E, 2.3, 2.5	all	3	3
040	300	CE Cabriolet	93-on	3	3
041	400/500 E	SE	92-on	3	3
042	220/280 C		94-on	3	3
043	S Class			per WB	WB
044	SL class		95-98	per WB	WB
045	SLK Class			1	1
046	CL Class			4	4
047	CLK Class			3	3
048	E Class			per WB	WB
398	Other automobile		-	-	-
399	Unknown automobile				
401	M		97-on	8	8**
470	Van derivative	Kurbstar	82-on	N/A	N/A
498	Other light truck		-	-	-
499	Unknown light truck				
881	Medium/Heavy - CBE		all	N/A	N/A
882	Medium/Heavy - COE low entry		all	N/A	N/A
883	Medium/Heavy - COE high entry		all	N/A	N/A

GV06

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "42"   MERCEDES BENZ

(Check "INCLUDES" comments c arefully to determine proper code.)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy		all	N/A	N/A
899	Unknown medium/he avy		-	-	-
981	Medium bus		all	N/A	N/A
988	Other bus		-	-	-
989	Unknown type bus				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "43"   **MG**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Midget	MKIII, 1500	-79	1	1
032	MGB		76-79	1	1
033	MGB	GT	67-75	1	1
034	MGA		all	1	1
035	TA/TC/TD/TF		all	1	1
036	MGC	GT	-69	1	1
398	Other automobile	Sport Sedan	-	-	-
399	Unknown automobi le				
999	Unknown vehicle		-	-	-

MAKE "44"   **PEUGEOT**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	304		71-73	3	3
032	403		-67	3	3
033	404		-70	3	3
		Station Wagon		4	4
034	504/505	STI, STX, Turbo, S, GL, GLS, Liberte	70-91	3	3
		Station Wagon		4	4
035	604	SL, D	77-84	3	3
036	405	Mi-16	89-91	3	9***
398	Other automobile		-	-	-
399	Unknown automobile				

Motorcycle

701   0- 50cc
702   51-124cc
709   Unknown cc
799   Unknown motored cycle

| 999 | Unknown vehicle | | - | - | - |

*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impact.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "45" PORSCHE

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	911	L, S, E, T, SC, Carrera, Slopenose, Speedster Panorama	all 96-on	1	1
032	912	E, T	-69	1	1
033	914	S, 1.8, 2.0, 914/6	70-76	2	2
034	924	Turbo, S	77-88	1	1
035	928	S	78-on	2	2
036	930	Turbo	79	1	1
037	944	Turbo, S	83-91	1	1
038	959		89-94	1	1
039			92-95	1	1
040	986		96-on	1	1
398	Other automobile	Spyder, Speedster, 356	-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

MAKE "46" RENAULT

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	LeCar	5	76-83	2	2
032	Dauphine/10/R -8/Caravelle	all models	thru-71	1	1
033	12	R12L, R12TL	72-77	2	2
034	15	R15TL	73-76	2	2
035	16	R16	69-72	3	3
036	17	R17, Gordini Coupe, R17TL	73-80	2	2
037	R18i	Sportwagon	81-on	2	2
038	Fuego	TL, TS, GTL, GTS, Turbo	82-85	2	2
039	Alliance/Encore GTA, Convertible	L, DL, Limited, X-37	83-on	2	2
041	Alpine	GT	87-on	per WB	per WB
044	Medallion	DL, LX	87-only	3	3
045	Premier		87-only	3	3
398	Other automobile		-	-	-

GV06
(39)

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "46"   RENAULT

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "47"   SAAB

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	99/99E/900	S, Turbo, Cabriolet	all	2	2
032	Sonnett	II, III, V4	68-74	1	1
033	95/96/97		-73	2	2
034	9000 CS	S, Turbo	85-on 93-on	3	3
398	Other automobile	Monte Carlo 850	-	-	-
399	Unknown auotmobile				
999	Unknown vehicle		-	-	-

MAKE "48"   SUBARU

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	DL/FE/G/GF/GL/GLF/STD/ Loyale	4 wheel drive, Turbo	72-89 90-94	per WB	= size
032	Star		70-71	2	2
033	360		69-70	1	1
034	Legacy	Brighton, Outback, Outback II	89-on	2	2
035	XT/XT6	4WD Turbo, convertible, DL	86-on	2	2
036	Justy	DL, GL	87-94	1	1
037	SVX		92-on	3	3
038	Impreza	Outback, Outback II	93-on	2	2
043	Brat DL, GL		78-on	2	2
398	Other automobile		-	-	-
399	Unknown automobile				
401	Forester		98-on	2	2
498	Other light truck		-	-	-
499	Unknown light truck				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "49"   **TOYOTA**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Corona	Mark II, Custom, 1900, 2000, Deluxe	-82	2	2
032	Corolla	1100, 1200, 1600, SR-5, LE, Deluxe, Custom, FX16	69-85 FWD 86-on	1 2	1 9***
033	Celica	1900, 2000, GT, ST, GTS (-93)	72-on	2	2
034	Supra	Celica Supra, Soarer	79-on	3	3
035	Cressida		78-92	3	3
036	Crown	2300, 2600	-71	3	3
037	Carina	2000	72-73	2	2
038	Tercel	Corolla Tercel, 4WD Wagon	80-on	2	2
039	Starlet		81-84	1	1
040	Camry	LE, Deluxe, XLE, Coupe	83-on	3	3
041	MR-2		85-95	1	1
042	Paseo		92-on	1	1
043	Avalon		95-on	3	3
398	Other automobile	2000 GT Coupe (1960s)	-	-	-
399	Unknown automobile				
401	4-Runner		85-on	3	8**
402	RAV-4		96-on	TBD	TBD
421	Landcruiser		76-on	3	8**
441	Minivan Previa	LE, Cargo	84-90 91-on	1 4	7** 7**
442	Sienna	CE. LE, XLE	98-on	4	7**
471	Pickup	SR-5, Extra Cab, Sport, LN44, Chinook, Wonder Wagon	74-on	per WB	8**
472	Tacoma		95-on	TBD	TBD
481	T-100		93-on	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				
999	Unknown vehicle		-	-	-

  ** Applies to front and rear impacts. Use size value for side impacts.
 *** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impact.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "50"   **TRIUMPH**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Spitfire	I, II, III, IV, 1500	-81	1	1
032	GT-6	MK3	67-73	1	1
033	TR4	TR2, TR3, TR4A	-68	1	1
034	TR6		69-76	1	1
035	TR7/8		75-81	1	1
036	Herald	Vitesse	-	-	-
037	Stag		71-73	2	2
398	Other automobile	2000, 1200 series	-	-	-
399	Unknown automobile				

Motorcycles

701	0- 50cc				
702	51-124cc				
703	125-349cc				
704	350-449cc				
705	450-749cc				
706	750cc or greater				
709	Unknown cc				
799	Unknown motored cycle				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "51" **VOLVO** (Includes Volvo/White and Volvo/GM Heavy Trucks)

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	122	S	-68	3	3
032	142/144/145	S, E, GL, GLS, Deluxe	-74	3	3
033	164	S, E	69-75	3	3
034	240/242/244/245	DL, GL, GLE, GLT, Deluxe	75-on	3	3
035	262/264/265	GL	76-82	3	3
036	1800	E, S, ES	-73	2	2
038	760	GLE, Turbo	83-90	3	3
	780		87-92	3	3
039	740	GLE, GT, Turbo, GL	86-92	3	3
040	940	GLE, Turbo, SE	91-on	3	3
041	960		92-on	3	3
042	850	GLT, Wagon	93-on	3	3
043	70 Series		98-on	TBD	TBD
044	90 Series		98-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
881	Medium/Heavy CBE		all	N/A	N/A
882	Medium/Heavy COE low entry		all	N/A	N/A
883	Medium/Heavy COE high entry		all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck		all	N/A	N/A
899	Unknown medium/heavy truck		-	-	-
981	Medium bus		all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown type bus				

999   Unknown vehicle   -   -   -

-             -   -

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Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "52"   **MITSUBISHI**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Starion	2 + 2, LE, Turbo	83-90	2	2
032	Tredia	L, LS, Turbo	83-88	2	2
033	Cordia	L, Turbo	83-88	2	2
034	Galant	ECS, Sigma (thru 88)	85-on	3	3
035	Mirage	L, Turbo	85-on	1	1
036	Precis		88-on	1	1
037	Eclipse		90-on	2	2
038	Sigma		89-90	3	3
039	3000GT	Spyder, VR-4	91-on	2	2
040	Diamante		92-on	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
401	Montero	Sport	85-on	1	8**
441	Minivan	LS	87-on	1	7**
442	Expo Wagon	LRV, Sport	92-95	99.2" WB = 2 107.1 WB = 3	7** 7**
471	Pickup	Mighty Max, SPX, 4 x 4	all	3	8**
498	Other light truck		-	-	-
499	Unknown light truck				
882	Medium/Heavy - COE low entry	FUSO FE	all	N/A	N/A
898	Other medium/heavy truck		-	-	-
899	Unknown medium/heavy truck				
981	Conventional front engine				
982	Front engine/flat front				
983	Rear engine/flat front				
988	Other bus				
989	Unknown type bus				
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "53"   **SUZUKI**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	SA310	GLX	86-on	1	1
034	Swift	GTi, GTX	89-on	1	1
035	Esteem		95-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
401	Samurai	Standard, Deluxe	85-95	1	8**
402	Sidekick	Sidekick Sport	89-on	2	8**
403	X-90		96-on	TBD	TBD
498	Other light truck		-	-	-
499	Unknown light truck				

Motorcycles

701	0- 50cc
702	51-124cc
703	125-349cc
704	350-449cc
705	450-749cc
706	750cc-over
709	Unknown cc

All Terrain Cycles/Vehicles

731	0- 50cc	includes all ATCs/ATVs
732	51-124cc	designed solely for
733	125-349cc	off-road use.
734	350cc or greater	
739	Unknown cc	

799   Unknown motored cycle

999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "54"   **ACURA**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Integra	RS, LS, GS	86-on	2	9***
032	Legend RL		86-95 96-on	3	9***
033	NSX TL	NSX-T 2.5, 3.2	91-95 96-on	per WB	per WB
034	Vigor		92-94	3	9***
035	CL	Coupe	96-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
401	SLX	96-on	TBD	TBD	
498	Other light truck				
499	Unknown type light truck				
999	Unknown vehicle		-	-	-

*** Code 9 applies only to frontal impacts. Use size code for stiffness for side or rear impact.

MAKE "55"   **HYUNDAI**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Pony		84-88	2	2
032	Excel	GL, GLS	84-94	1	1
033	Sonata		89-on	3	3
034	Scoupe		91-95	1	1
035	Elantra		92-on	2	2
036	Accent		95-on	1	1
037	Tiburon		97-on	TBD	TBD
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "56"   **MERKUR**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	XR4Ti	Turbo	85-89	3	3
032	Scorpio	Turbo	87-90	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "57"   **YUGO**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	GV	GVX, Cabriolet	86-92	1	1
398	Other automobile		-	-	-
399	Unknown automabile				
999	Unknown vehicle		-	-	-

MAKE "58"   **INFINITI**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	M30		90-92	3	3
032	Q45		90-on	4	4
033	G20		91-on	2	2
034	J30		93-on	3	3
035	I30		96-on	per WB	per WB
398	Other automobile		-	-	-
401	T30		97-on	TBD	TBD
498	Other light truck				
499	Unknown light truck				
399	Unknown a utomobile				
999	Unknown vehicle		-	-	-

MAKE "59"   **LEXUS**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	ES-250/ES-300		90-on	3	3
032	LS-400		90-on	4	4
033	SC-300/SC-400	2-door Coupe	92-on	3	3
034	GS-300		94-on	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
421	LX 450		96-on	3	8**
498	Other light truck				

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "59"   **LEXUS**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
499	Unknown light truck				
999	Unknown vehicle		-	-	-

**8   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "60"   DAIHATSU

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Charade		90-92	3	3
398	Other automobile		-	-	-
399	Unknown automobile				
401	Rocky		90-92		
498	Other light truck		-	-	-
499	Unknown light truck				
999	Unknown vehicle		-	-	-

MAKE "61"   STERLING

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	827S	Li	86-91	3	3
398	Other automobile		-	-	-
399	Unknown automobile		-	-	-
999	Unknown vehicle		-	-	-

MAKE "62"   LAND ROVER

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
401	Discovery (LR)		94-on	2	7**
422	Defender 90 (LR)		94-on	1	7**
421	County LWB (RR)		-94	3	7**
	Count Classic (RR)		94-on	2	7**
422	4.0 SE (RR)		95-on	3	7**
498	Other light truck				
499	Unknown light truck				
999	Unknown vehi cle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "63" **KIA**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Sephia		all	per WB	= size
398	Other automobile		-	-	-
399	Unknown automobile		-	-	-
401	Sportage		96-on	-	-
498	Other light truck				
499	Unknown light truck				
999	Unknown vehicle		-	-	-

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "69" **OTHER FOREIGN**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
031	Aston Martin	Lagonda, Vantage, Volante, Saloon	all	per WB	= size
032	Bricklin		all	per WB	= size
033	Citreon		all	per WB	= size
034	Delorean		all	per WB	= size
035	Ferrari		all	per WB	= size
036	Hillman		all	per WB	= size
037	Jensen	Healy	all	per WB	= size
038	Lamborghini	Countach 5000S, Jalpa	all	per WB	= size
039	Lotus	Europe, Esprit	all	per WB	= size
040	Maserati	Biturbo	all	per WB	= size
041	Morris	Minor	all	per WB	= size
042	Rolls Royce/Bentley	Cloud/shadow series	all	per WB	= size
044	Simca		all	per WB	= size
045	Sunbeam		all	per WB	= size
046	TVR		all	per WB	= size
048	Desta		all	per WB	= size
049	Reliant		all	per WB	= size
052	Bertone		all	per WB	= size
053	Lada		all	per WB	= size
398	Other make		all	per WB	= size
399	Unknown make				

Variable Name: Vehicle Model (specify): [cont'd.]

Vehicle Classification: Motored Cycle/ATC/ATV

Variable **GV05** Vehicle Make	M C	ATC	ATV	Code		Variable **GV06** Vehicle Model	Code
						Motored Cycles	
BMW	x			34		0-50cc	701
Honda	x	x	x	37		51-124cc	702
Peugeot	x			44		125-349cc	703
Triumph	x			50		350-449cc	704
Suzuki	x	x	x	53		450-749cc	705
BSA	x			70		750cc-or greater	706
Ducati	x			71		Unknown cc	709
Harley-Davidson	x			72			
Kawasaki	x	x	x	73		**All Terrain Cycles/Vehicles**	
Moto-Guzzi	x		x	74		0-50cc	731
Norton	x			75		51-124cc	732
Yamaha	x	x	x	76		125-349cc	733
Other make moped	x			78		350cc or greater	734
Other make motored cycle	x	x	x	79		Unknown cc	739
Unknown make				99		Other motored cycle	798
						Unknown motored cycle	799

Variable Name: Vehicle Model (specify): [cont'd.]

MAKE "84"   **INTERNATIONAL HARVESTER/NAVISTAR**

CODE	MODEL	INCLUDES	YEAR	SIZE	STIFFNESS
421	Scout	Scout II, Utility pickup, SS-2, Roadstar, 800 series, Traveler, Terra Traveltop	all	per WB	8**
431	Travelall	1010-1210, 100-200	all	per WB	8**
466	Multistop Van	Metro RM, 120-160, MS 1210, MS 1510	all	per WB	7**
481	Pickup	R-100-500, 900A-1500C/D, 1010-1510	all	per WB	8**
498	Other light truck		-	-	-
499	Unknown light truck				
850	Truck based motorhome		all	N/A	N/A
881	Medium Heavy - CBE	Loadstar/Fleetstar, Paystar, CBE Transtar, 4200, S-series Mixer	all	N/A	N/A
882	Medium/Heavy - COE low entry	CO, VCO, DCO, 190-1950, Cargostar, LFM, 5370 (Garbage)	all	N/A	N/A
883	Medium/Heavy - COE high entry	DCO, DCOT, UCO, VCOT, 405-series, COE Transtar, Unistar, Conco 707B, 9600	all	N/A	N/A
884	Medium/Heavy: Unknown engine location		all	N/A	N/A
890	Medium/Heavy: COE entry position unknown		all	N/A	N/A
898	Other medium/heavy truck	Fire truck - R140-R306, CO 8190	all	N/A	N/A
899	Unknown medium/heavy truck		-	-	-
950	Bus based motorhome		all	N/A	N/A
981	Conventional bus	R153-1853 - Loadstar, 1603-1853	all	N/A	N/A
982	Bus-flat front, front engine	173FC, 183FC	all	N/A	N/A
983	Bus-flat front, rear engine	183RE, 193RE-transit	all	N/A	N/A
988	Other bus		all	N/A	N/A
989	Unknown bus type				
998	Other vehicle		-	-	-
999	Unknown vehicle		-	-	-

**   Applies to front and rear impacts. Use size value for side impacts.

Variable Name: Vehicle Model (specify): [cont'd.]

Vehicle Classification: **Medium/Heavy Trucks and Buses**

Variable **GV05** Vehicle Make	Truck	Bus	Code	Variable **GV06** Vehicle Model	Code
AM General	x	x	03	M/H truck based motorhome	850
Dodge	x	x	07	Medium/Heavy - CBE	881
Ford	x	x	12	Medium/Heavy - COE/low entry	882
Chevrolet	x	x	20	Medium/Heavy - COE/high entry	883
GMC	x	x	23	Medium/Heavy - Unknown engine	884
Grumman	x	x	25	location	
Nissan/Datsun	x		35	Medium/Heavy - COE/entry	890
Fiat	x		36	position unknown	
Isuzu	x	x	38	Medium/Heavy - Other	898
Mercedes Benz	x	x	42	Unknown medium/heavy truck	899
Volvo	x	x	51		
Mitsubishi	x		52	Bus based motorhome	950
Brockway	x		80	Bus - conventional front	981
Diamond Reo/Reo	x		81	engine	
Freightliner/White	x		82	Bus - front engine/flat front	982
FWD	x		83	Bus - rear engine/flat front	983
International Har-			84	Other bus	988
vester/Navistar	x	x		Unknown bus type	989
Kenworth	x		85		
Mack	x		86	Unknown vehicle	999
Peterbilt	x		87		
Iveco/Magirus	x		88		
Other: (if code "98" is			98		
used for GV05, then GV06				Autocar	801
must be 801-807, 850, 898,				Auto-Union -DKW	802
902, 950, 988, or 998,				Divco	803
irrespective of Body Type)				Western Star	804
				Oshkosh	805
				Hino	806
				Scania	807
				Truck based motorhome	850
				Other truck: *e.g.*, Marmon,	898
				Ward LaFrance, (specify)	
				Neoplan (bus)	902
				Bus based motorhome	950
				Other bus	988
				Other vehicle	998

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Variable Name: Vehicle Model (specify): [cont'd.]

Source: Vehicle inspection, police report, and inter view.

Remarks:

For the purposes of the Model codes the following applies.

001 - 399 - Passenger vehicles
398 - Other automobile
399 - Unknown automobile

401 - 499 - Light trucks
401 - 420 Compact utilities
421 - 430 Large utilities
431 - 440 Utility station wagons
441 - 460 Minivans
461 - 470 Large vans (includes step vans, van derivatives)
471 - 480 Compact pickups
481 - 490 Large pickups
498 - Other light truck
499 - Unknown light truck

701 - 799 - Motored Cycles/ATCs/ATVs
(701 - 706 motorcycles/mopeds)
701   0-50cc
702   51-124cc
703   125-349cc
704   350-449cc
705   450-749cc
706   750cc or greater
709   Unknown cc

(731 - 739 ATCs/ATVs)
731   0-50cc
732   51-124cc
733   125-349cc
734   350cc or greater
739   Unknown cc

798 -   Other motored cycle
799 -   Unknown motored cycle

801 - 899 - Medium/heavy trucks
850   M/H truck based 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   Other medium/heavy truck
899   Unknown medium/heavy truck

Variable Name: Vehicle Model (specify) : [cont'd.]

Source: Vehicle inspection, police report, and interview.

Remarks:

901 - 989 -   Buses
        950   Bus based motorhome
        981   Conventional front engine
        982   Front engine/flat front
        983   Rear engine/flat front
        988   Other bus
        989   Unknown bus type

        998   Other vehicle (*i.e.*, farm vehicle, go-kart, etc.)
        999   Unknown vehicle

The stiffness codes assigned in GV06, Vehicle Model (specify):, are based upon either limited crash test data, wheelbase, or a correlation with vehicles currently listed in the CRASH3 manual. These assignments replace the vehicle assignments in "Table 8 -2 Vehicle Stiffness Categories" in the "CRASH3 User's Guide and Technical Manual".

Variable Name: Vehicle Model (specify): [cont'd.]

MODEL CODES VERSUS CLASS OF VEHICLE AND BODY TYPE

Model Codes	Class of Vehicle Codes		Body Type Codes
			AUTOMOBILES
001-399	01-09	1	Convertible
001-399	01-09	2	2-door sedan, hardtop, coupe
001-399	01-09	3	3-door/2-door hatchback
001-399	01-09	4	4-door sedan, hardtop
001-399	01-09	5	5-door/4-door hatchback
001-399	01-09	6	Station wagon
001-399	01-09	7	Hatchback, number of doors unknown
001-399	01-09	8	Other automobile type (specify):
001-399	01-09	9	Unknown automobile type
			AUTOMOBILE DERIVATIVES
001-399	01-09	10	Auto based pickup
001-399	01-09	11	Auto based panel
001-399	01-09	12	Large limousine -more than four side doors or stretched chassis
001-399	01-09	13	Three-wheel automobile or automobile derivative
			UTILITY VEHICLES (£4,536 KGS GVWR)
401-420, 498, 499	14	14	Compact utility
421-430, 498, 499	15	15	Large utility
431-440, 498, 499	16	16	Utility station wagon
401-420, 498, 499	19	19	Utility, unknown body type
			VAN BASED LIGHT TRUCKS (£4,536 KGS GVWR)
441-460, 498, 499	20	20	Minivan
461-470, 498, 499	21	21	Large van
461-470, 498, 499	28	22	Step van or walk-in van (<4,536 kgs GVWR)
461-470, 498, 499	28	23	Van based motorhome (< 4,536 kgs GVWR)
441-470, 498, 499	24	24	Van based school bus ($\leq$ 4,536 kgs GVWR)
441-470, 498, 499	28	25	Van based other bus ($\leq$ 4,536 kgs GVWR)
461-470, 498, 499	28	28	Other van type
499	29	29	Unknown van type
			LIGHT CONVENTIONAL TRUCKS (PICKUP STYLE CAB, £4,536 KGS GVWR)
471-480, 498, 499	30	30	Compact pickup
481-490, 498, 499	31	31	Large pickup
471-490, 498, 499	38	32	Pickup with slide-in camper
471-490, 498, 499	38	33	Convertible pickup
499	39	39	Unknown pickup style light conventional truck type

Variable Name: Vehicle Model (specify): [cont'd.]

MODEL CODES VERSUS CLASS OF VEHICLE AND BODY TYPE

Model Codes	Class of Vehicle Codes	Body Type Codes	
		OTHER LIGHT TRUCKS (£4,536 KGS GVWR)	
498	45	40	Cab chassis based
498	45	41	Truck based panel
498	45	42	Light truck based motorhome
498	45	45	Other light conventional truck type
499	48	48	Unknown light truck type
999	49	49	Unknown light vehicle type
		BUSES (EXCLUDES VAN BASED)	
981-983, 988, 989	50	50	School bus
950 ,981-983, 988, 989	58	58	Other bus type
981-983, 988, 989	59	59	Unknown bus type
		MEDIUM/HEAVY TRUCKS (> 4,536 KGS GVWR)	
881-890, 898, 899	60	60	Step van (> 4,536 kgs GVWR)
881-890, 898, 899	60	61	Single unit straight truck (4,536 kgs < GVWR ≤ 8,8845 kgs)
881-890, 898, 899	60	62	Single unit straight truck (8,8845 kgs < GVWR ≤ 11,793 kgs)
881-890, 898, 899	60	63	Single unit straight truck (> 11,793 kgs GVWR)
881-890, 898, 899	60	64	Single unit straight truck (GVWR unknown)
850	60	65	Medium/heavy truck based motorhome
881-890, 898, 899	67	67	Truck-tractor with no cargo trailer
881-890, 898, 899	68	68	Truck-tractor pulling one trailer
881-890, 898, 899	68	69	Truck-tractor pulling two or more trailers
881-890, 898, 899	68	70	Truck-tractor (unknown if pulling trailer)
899	78	78	Unknown medium/heavy truck type
899	79	79	Unknown truck type (light/medium/heavy)
		MOTORED CYCLES (DOES NOT INCLUDE ALL-TERRAIN VEHICLES/CYCLES)	
701-706, 709, 799	80	80	Motorcycle
701-706, 709, 799	80	81	Moped (motorized bicycle)
701-706, 709, 799	80	82	Three-wheel motorcycle or moped
798	80	88	Other motored cycle type (minibike, motorscooter)
799	80	89	Unknown motored cycle type
		OTHER VEHICLES	
731-734, 739, 799	90	90	ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
998	90	91	Snowmobile
998	90	92	Farm equipment other than trucks
998	90	93	Construction equipment other than trucks
998	90	97	Other vehicle type
999	99	99	Unknown body type

GV07

Variable Name: Body Type

Element Values:

CDS APPLICABLE VEHICLES

Automobiles
01   Convertible (excludes sun -roof, t-bar)
02   2-door sedan, hardtop, coupe
03   3-door/2-door hatchback
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 (Jeep CJ-2 - CJ-7, Scrambler, Golden Eagle, Renegade, Laredo, Wrangler, Cherokee [84 and after], Dispatcher, Raider, Bronco II, Bronco [76 and before], Explorer, S-10 Blazer, Geo Tracker, Bravada,   S-15 Jimmy, Thing, Pathfinder, Trooper, Trooper II, Rodeo, Amigo, Navajo, 4-Runner, Montero, Passport, Samurai, Sidekick, Rocky)
15   Large utility (includes Jeep Cherokee [83 and before], Ramcharger, Trailduster, Bronco-fullsize [78 and after], fullsize Blazer, fullsize Jimmy, Hummer, Landcruiser, Rover, Scout, Yukon)
16   Utility station wagon (Chevy Suburban, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)
19   Utility, unknown body type

Van Based Light Trucks (£4,536 kgs GVWR)
20   Minivan (Town and Country, Caravan, Grand Caravan, Voyager, Grand Voyager, Mini-Ram, Vista, Aerostar, Windstar, Villager, Lumina APV, Trans Sport, Silhouette, Astro, Safari, Toyota Van, Toyota Minivan, Previa, Nissan Minivan, Quest, Mitsubishi Minivan, Expo Wagon, Vanagon/Camper.)
21   Large van (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.)
22   Step van or walk-in van ($\leq$ 4,536 kgs GVWR)
23   Van based motorhome ($\leq$ 4,536 kgs GVWR)
24   Van based school bus ($\leq$ 4,536 kgs GVWR)
25   Van based other bus ($\leq$ 4,536 kgs GVWR)
28   Other van type (Hi-Cube Van, Kary) (specify):
29   Unknown van type

Variable Name: Body Type (cont'd.)

Light Conventional Trucks (Pickup style cab, £4,536 kgs GVWR)
30 Compact pickup (D50, Colt P/U, Ram 50, Dakota, Arrow Pickup [foreign], Ranger, Courier, S-10 , T-10, LUV, S-15, T-15, Sonoma, Datsun/Nissan Pickup, P'up, Mazda Pickup, Toyota Pickup, Mitsubishi Pickup)
31 Large Pickup (Jeep Pickup, Comanche, Ram Pickup, D100-D350, W100-W350, F100-F350, C10-C35, K10-K35, R10-R35, V10-V35, Silverado, Sierra, R100-R500, T100)
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 ve hicle type (automobile, utility, van, or light truck)

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 Unkno wn 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 ≤ 8,8845 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)
78 Unknown medium/heavy truck type
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, motorscooter) (specify):
89 Unknown motored cycle type

Variable Name: Body Type (cont'd.)

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
99   Unknown body type

Source: Vehicle inspection, police report, and interview.

Remarks:

Automobiles
Codes "01"-"09" are used to describe different types of passenger cars. These light vehicles referred to as automobiles, are designed primarily to transport passengers.

Code "01"   [Convertible (excludes sun -roof, t-bar)] refers to a passenger car equipped with a removable or retractable roof. To qualify for this code, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This code takes priority over 2-door (codes "02" and "03") or 4-door (codes "04" and "05") codes.

Code "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.

Code "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.

Code "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.

Code "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.

Variable Name: Body Type (cont'd.)

Code "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).

Code "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.

Code "08"   (Other automobile type) refers to any passenger car that cannot be described by elements "01" through "07" or "10" through "13".

Code "09"   (Unknown automobile type) is use d when it is known that the vehicle is a passenger car, but there is insufficient data to determine the type.

Automobile Derivatives

Codes "10"-"13" are used to describe certain passenger cars that have been modified to perform cargo-related tasks.

Code "10"   [Auto based pickup (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup)] refers to a passenger car based, pickup type vehicle. 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.

Code "11"   [Auto based panel (cargo station wagon, auto based ambulance/hearse)] refers an automotive station wagon that may have sheet metal rearward of the B-pillar rather than glass.

Code "12"   (Large limousine — more than four side doors or stretched chassis) refers to an automobile that has sections added within its wheelbase to increase length and passenger/cargo carrying capacity.

Code "13"   (Three-wheel automobile or automobile derivative) refers to three-wheel vehicles with an enclosed passenger compartment.

Utility Vehicles (£4,536 kgs GVWR)

Codes "14" - "19" are used to describe **multi-purpose vehicles** (MPV) that 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.

Variable Name: Body Type (cont'd.)

Code "14"   [Compact utility (Jeep CJ-2 - CJ-7, Scrambler, Golden Eagle, Renegade, Laredo, Wrangler, Cherokee [84 and after], Dispatcher, Raider, Bronco II, Bronco [76 and before], Explorer, S-10 Blazer, Geo Tracker, Bravada,   S-15 Jimmy, Thing, Pathfinder, Trooper, Trooper II, Rodeo, Amigo, Navajo, 4-Runner, Montero, Passport, Samurai, Sidekick, Rocky)] refers to a short wheelbase and narrow tracked multi-purpose vehicle designed to operate in rugged terrain.

Code "15"   [Large utility (includes Jeep Cherokee [83 and before], Ramcharger, Trailduster, Bronco-fullsize [78 and after], fullsize Blazer, fullsize Jimmy, Hummer, Landcruiser, Rover, Scout, Yukon)] refers to fullsize 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.

Code "16"   [Utility station wagon (Chevy Suburban, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)] refers primarily to a pickup truck based chassis enlarged to a station wagon.

Code "19"   (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 (AC14) is coded "14" (Compact utility vehicle).

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

Codes "20"-"29" are used to describe light trucks (≤ 4,536 kgs GVWR) that 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.

Code "20"   [Minivan (Town and Country, Caravan, Grand Caravan, Voyager, Grand Voyager, Mini-Ram, Vista, Aerostar, Windstar, Villager, Lumina APV, Trans Sport, Silhouette, Astro, Safari, Toyota Van, Toyota Minivan, Previa, Nissan Minivan, Quest, Mitsubishi Minivan, Expo Wagon, Vanagon/Camper.)] refers to down-sized cargo or passenger vans.

Code "21"   [Large van (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)] refers to a standard cargo or passenger van. These vans will generally have a larger capacity in both volume and GVWR.

Code "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.

Variable Name: Body Type (cont'd.)

Code "23"   [Van based motorhome ($\leq$ 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 codes "20" and "21", however, a frame mounted recreational unit is added behind the driver/cab area. This code takes priority over codes "20" and "21".

Code "24"   [Van based school bus ($\leq$ 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 code 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 code.

Code "25"   [Van based other bus ($\leq$ 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 code.

Code "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 codes "20" and "21" with a frame mounted cargo area unit added behind the driver/cab area, or if the van cannot be described in codes "20", "21", "22" or "23". Annotate the van type when using this code. This code takes priority over codes "20" and "21".

Code "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)

Codes "30"-"39" 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.

Code "30"   [Compact pickup (D50, Colt P/U, Ram 50, Dakota, Arrow Pickup [foreign], Ranger, Courier, S-10 , T-10, LUV, S-15, T-15, Sonoma, Datsun/Nissan Pickup, P'up, Mazda Pickup, Toyota Pickup, Mitsubishi Pickup)] is used to describe a pickup truck having a width of 178 centimeters or less.

Code "31"   [Large Pickup (Jeep Pickup, Comanche, Ram Pickup, D100-D350, W100-W350, F100-F350, C10-C35, K10-K35, R10-R35, V10-V35, Silverado, Sierra, R100-R500, T100)] is used to describe a pickup truck having a width of greater than 178 centimeters.

Variable Name: Body Type (cont'd.)

Code "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 code.

Code "33" (Convertible pickup) refers to a pickup truck equipped with a removable or retractable roof. To qualify for this code, the entire roof must open. Convertible roofs are generally fabric; however, removable hardtops are also included. This code takes priority over compact and large pickups (codes "30" and "31").

Code "39" (Unknown pickup style light conventional truck) is used when this vehicle qualifies for a code in the "30" to "33" range, but there is insufficient data to determine the specific code.

Other Light Trucks (£4,536 kgs. GVWR)

Codes "40"-"49" 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.

Code "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 (nonpickup) body attached to the frame. Included are pickup based ambulances and tow trucks.

Code "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.

Code "42" [Light truck based motorhome (chassis mounted)] is used to describe a frame mounted recreational unit attached to a light van or conventional chassis.

Code "45" (Other light conventional truck type) is used for light conventional trucks that cannot be described in codes "30"-"39" or "40"-"42".

Code "48" (Unkno wn 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 between codes "19", "29", "39", or "40"-"42".

Code "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 between codes "09", "10"-"13", "19", "29", "39", or "40"-"48".

Variable Name: Body Type (cont'd.)

Buses (Excludes Van Based)

Codes "50", "58", and "59" are defined as any medium/heavy motor vehicle designed primarily to transport large groups of passengers.

Code "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 code 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 code.

Code "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.

Code "59" (Unknown bus type) is used when it is known the transport device is a bus but there is insufficient data to choose between codes "50" and "58".

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

Codes "60"-"64" describe a single unit truck specifically designed for carrying cargo on the same chassis as the cab.

Codes "67"-"70" 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.

Code "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.

Code "61" [Single unit straight truck (4,536 kgs < GVWR $\leq$ 8,8845 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 8,8845 kilograms.

Code "62" [Single unit straight truck (8,8845 kgs < GVWR $\leq$ 11,793 kgs)] describes a non-articulated truck designed to carry cargo. The gross vehicle weight rating of the vehicle must exceed 8,8845 kilograms and be less than or equal to 11,793 kilograms.

Variable Name: Body Type (cont'd.)

Code "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 code if it is known that the GVWR of a single unit straight truck is greater then 4,536 kilograms but there is insufficient data to specify between codes "61" and "62".

Code "64" (Single unit straight truck, GVWR unknown) is used when the transport vehicle is a single unit straight truck but the GVWR is unknown.

Code "65" (Medium/heavy truck based motorhome) describes a recreational vehicle mounted on a single unit medium/heavy truck chassis.

Code "67" (Truck-tractor with no cargo trailer) describes a fifth wheel equipped tractor/trailer power unit with no trailer attached.

Code "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.

Code "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).

Code "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.

Code "78" (Unknown medium/heavy truck type) is used when the only available information indicates a truck of medium/heavy size.

Code "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)

Codes "80"-"89" define types of motored cycles.

Code "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 code.

Code "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.

Variable Name: Body Type (cont'd.)

Code "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.

Code "88" [Other motored cycle (minibike, motor scooter)] is used when the vehicle in question does not qualify for codes "80", "81", or "82" (*e.g.*, motor scooter).

Code "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

Codes "90" - "97" describe all motored vehicles that are designed primarily for off -road use.

Code "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).

Code "91" (Snowmobile) refers to a vehicle designed to be operated over snow propelled by an internal combustion engine.

Code "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.).

Code "93" (Construction equipme nt other than trucks) refers to construction equipment other than trucks propelled by an internal combustion engine (*e.g.*, bulldozer, roadgrader, etc.).

Code "97" (Other vehicle type) is used when the motorized vehicle in question does not qualify for code "90"-"93" (*e.g.*, go-kart, dune buggy, "kit" car, etc.).

Code "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 codes.

GV08

Variable Name: <u>V</u>ehicle <u>I</u>dentification <u>N</u>umber

Element Values:

Code the entire VIN, left justify
00000000000000000   No VIN
99999999999999999   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.*, nontow CDS applicable **and** CRASH is not applicable; or GV07, Body Type, equals "50"-"99").

Code and left justify 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"**.

Code "99999999999999999"   (Unknown) if the entire VIN is unknown or missing.

Code "00000000000000000"   if the vehicle is a type which has no VIN (*e.g.*, go kart).

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 and the VIN begins or ends with a script, "_ ", the "_ " is not coded. Proceed to the next character, as in the example below.

> **VIN:**   C 3 U 6 2 S 1 0 0 9 3 2 C
> **CODE:**   <u>3 U 6 2 S 1 0 0 9 3 2</u> _ _ _ _ _
>
> **NOTE:** Slash zeros "0", so that they are not confused with the alphabet character "O", as in DOT.

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:**   <u>S M E 3 0 7 6 4 2 1</u> _ _ _ _ _ _

If the state will not allow transmittal of the complete VIN, code all characters except the sequential production numbers. Code zeros (" 0") in place of the sequential numbers.

GV08
(2)

Variable Name: Vehicle Identification Number (cont'd.)

In those cases where the VIN does not match the references given below (*e.g.*, a character is missing or an invalid character is coded in a space), the encoded VIN must follow the correct format indicated by the references below and a note is made on the form indicating the discrepancy.

The location of the VIN will vary among, and within, vehicles. Reference sources which may prove helpful in locating the VIN include, but are not limited to:

(1) Passenger Vehicle Identification Manual

Manuals available from

National Insurance Crime Bureau
Operation Training & Prevention
10330 South Roberts Road
Palos, Illinois 60465-1997

(2) **Passenger Car and Truck-Accident**
Investigator's Manual
American Automobile Manufacturers Association (AAMA)
300 New Center Building
Detroit, Michigan 48202

(3) **Lee S. Cole**
Lee Books
Post Office Box 906
Novato, California 94948-0906
(415) 897-3550
(Vehicle Identification 1938-1968)
(Vehicle Identification 1968-1982)

(4) *N.A.D.A. Official Used Car Guide*
National Automobile Dealers Association
8400 Westpark Drive
McLean, Virginia 22102

Vehicles manufactured after September 1980 conform to Federal Motor Vehicle Safety Standard 115. This standard requires that: (1) each VIN have 17 characters, and (2) the VIN does not contain the letters "I", "O", or "Q". There are many other requirements, one of which is that the VIN pass a mathematical test; thus, the use of the **"check digit"**.

Each character in a VIN has a value, and each place has a weight. Each weight is multiplied by the value of the character in it; the products are summed and divided by eleven (11). The remainder (once converted from a decimal to an integer) must be the same as the value of the check digit character (the ninth one), except when the remainder is ten (10), in which case, the check digit character is "X".

Variable Name: Vehicle Identification Number (cont'd.)

VIN Place	Value Factor	Character Values				
1st	8	A-1	B-2	C-3	D-4	E-5
2nd	7					
3rd	6	F-6	G-7	H-8		J-1
4th	5					
5th	4	K-2	L-3	M-4	N-5	
6th	3					
7th	2	P-7		R-9	S-2	T-3
8th	10					
Check Digit	0	U-4	V-5	W-6	X-7	Y-8
10th	9					
11th	8	Z-9				
12th	7					
13th	6	0-0	1-1	2-2	3-3	4-4
14th	5					
15th	4	5-5	6-6	7-7	8-8	9-9
16th	3					
17th	2					

Example:

VIN Character	1	G	4	A	H	5	9	H	4	5	G	1	1	8	3	4	1	Sum
Assigned Value	1	7	4	1	8	5	9	8	4	5	7	1	1	8	3	4	1	
Weight Factor	8	7	6	5	4	3	2	10	0	9	8	7	6	5	4	3	2	
Product	8	49	24	5	32	15	18	80	0	45	56	7	6	40	12	12	2	411

Divide sum by eleven (11): 411/11 = 37.3636.... = 37 and 4/s.
Compare integer remainder to check digit: "4" equals "4".

Remainders of Eleven:

Decimal	Integer	Decimal	Integer	Decimal	Integer
.000000	0	.363636	4	.727272	8
.090909	1	.454545	5	.818181	9
.181818	2	.545454	6	.909090	X*
.272727	3	.636363	7		

* The character X is used instead of the integer ten (10) since the field is only one character wide.

GV09

Variable Name: Vehicle Special Use

Element Value:

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
8   Other (specify):
9   Unknown

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

Remarks:

Code "0"   (No special use) is used when no source indicates or implies that this vehicle was applicable to any of the special uses listed below.

Codes "1" (Taxi), "2" (Vehicle used as school bus), and "3" (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.

Code "1"   (*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**.

Code "2"   (*Vehicle used as school bus*) is used if this motor vehicle (GV07, Body Type, need not equal "50") 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.

Variable Name: Vehicle Special Use (cont'd.)

Code "3" (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.

Codes "4" (Military), "5" (Police), "6" (Ambulance), and "7" (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.

Code "4" (Military) is used for any vehicle which is owned by any of the Armed Forces regardless of body type. This code includes:

☞ military police vehicles;

☞ military ambulances;

☞ military hearses; and

☞ military fire vehicles

Code "5" (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.

Code "6" (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 code only when the vehicle is used as an ambulance.

Code "7" (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 code. Privately owned vehicles, which are not in authorized use, even if equipped with lights, do not qualify (*i.e.,* the volunteer firemen's vehicle).

Code "8" [Other (specify)] is used for any special use vehicle which is not identifiable above. This includes funeral hearses.

Code "9" (Unknown) is used when no information is available on the vehicle's special use for this trip (*i.e.*, a hit-and-run vehicle).

Variable Name: Police Reported Vehicle Disposition

Element Values:

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

Source: Police report.

Remarks:

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* 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 car is pushed (by hand or by another car) then consider the car 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 "0" (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 correct response for this variable is "1" (Towed due to vehicle damage).

Code "0" (Not towed due to vehicle damage) 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.

Variable Name: Police Reported Vehicle Disposition (cont'd.)

Code "1"   (Towed due to vehicle damage) 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 towing was due to crash-related disabling damage.

Code "9"   (Unknown) is used when the investigating officer reported that the disposition of the vehicle was unknown at the time the PAR was completed. Also, use this code 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 either "unknown" or "abandoned" for disposition, it can be **assumed** that the vehicle will eventually be towed from the scene. In these instances, code "1" (Towed due to vehicle damage).

Variable Name: Police Reported Travel Speed (kmph)

Element Values:

Range: 000 through 160, 999
                Code to the nearest kmph (**Note**: 000 means less than 0.5 kmph)

                160 159.5 kmph and above
                999 Unknown

Source: Police report only

Remarks:

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

Code to the nearest kmph, or if the travel speed is reported as a range, code the average. For example:

Reported Speed:	*50.2 kmph*	*50.5 kmph*	*55-60 kmph*
Code:	"50"	"51"	"58"

Code "000"   (000 kmph) is used if this vehicle is stopped or traveling less than 0.5 kmph.

Code "160"   (159.5 kmph and above) is used if this vehicle's speed is reported as equal to or exceeding 159.5 kmph.

Code "999"   (Unknown) is used if the estimated travel speed is unknown.

GV12

Variable Name: Speed Limit (kmph)

Element Values:

Range: 000 through 121, 999
             000   No statutory limit
             Code posted or statutory speed limit in kmph

             999   Unknown

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

Remarks:

Convert all speed limits from miles per hour (mph) to kilometers per hour (kmph). A conversion chart is provided below.

If the posted speed limit exceeds 121 kmph (75 mph) code 121 kmph.

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

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).

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.

Code "000"   (No statutory limit) is used on 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.).

Code "999"   (Unknow n) is used only in situations where a crash scene cannot be located. **Note**, speed limit must be identified for all known crash scene locations.

Miles Per Hour To Kilometers Per Hour Conversion

MPH	KMPH		MPH	KMPH
05	= 08		40	= 64
10	= 16		45	= 72
15	= 24		50	= 80
20	= 32		55	= 89
25	= 40		60	= 97
30	= 48		65	= 105
35	= 56		70	= 113
			75	= 121

GV13

Variable Name: Police Reported Alcohol Presence

Element Values:

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 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.

Code "0"   (No alcohol present) is used if the investigating officer's assessment (as reported on the police report) is that no alcohol was present in the driver.

Code "1"   (Yes alcohol present) is used 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 DUIL, (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 BAC test result (BAC > .00).

Code "7"   (Not reported) is used 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.

Code "8"   (No driver present) is used when an in-transport vehicle was involved in the crash but no driver was in the vehicle at the time.

Code "9"   (Unknown) is used 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 provision for the investigating officer to respond "unknown presence", then use this code. In addition, use this code 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.

Variable Name: Alcohol Test Result For Driver

Element Values:

Range: 00-49; 95-99 Code actual value (decimal implied before first digit–0.xx).
          95   Test refused
          96   None given
          97   AC test performed, results unknown
          98   No driver present
          99   Unknown

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

Remarks:

Blood-Alcohol Concentration measures, analytically, the mass of alcohol per unit volume of blood. In common practice, the alcohol content of blood is typically stated in terms of grams of ethanol per deciLiter of blood (g/dL) — expressed as a decimal. The standard measure is expressed as the number of **milligrams per deciliter** (tenth of a liter) (*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.

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

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

☞ no BAC test was required, code "96" (None given);

☞ a BAC test was required, but the precise level was not obtained, code "97" (AC test performed, results unknown); or

☞ a BAC test was required and the precise level was obtained, code the reported BAC from the subsequent test (codes "00"- "49").

If the BAC was given on the police report or subsequently added after the case was initiated, code the reported value. In essence, if any BAC is obtained, code the reported value. Use normal rounding rules (*i.e.*, the number five or greater is rounded upward, less than five is rounded down). For example, a BAC of 117 mg/dl is coded "12".

For drivers of nontowed CDS applicable and non -CDS applicable vehicles, use only PAR information when coding test results.

Codes "00"-"49" report the actual number value representing the fraction of alcohol present.

Variable Name: Alcohol Test Result For Driver (cont'd.)

Code "00"   is used when a test was performed, but no alcohol was detected.

Code "95"   (Test refused) is used when the person refuses to voluntarily take a BAC test, and no subsequent test is given. If the person refuses, but a test is performed, code the reported BAC or "97" (AC test performed, results unknown).

Code "96"   (None given) is used when no BAC test is administered.

Code "97"   (AC test performed, results unknown) is used only after all available sources have been exhausted. Verbal BACs obtained from *official* sources are acceptable if written approval (or approval via the message system) has been obtained from the zone center. Obtain BAC test results whenever possible.

Code "98"   (No driver present) is used when an in-transport vehicle was involved in the crash but no driver was in the vehicle at the time.

Code "99"   (Unknown) is used when it is not known if a test was administered.

OTHER DRUGS OVERVIEW

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

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

Variable Name: Police Reported Other Drug Presence For Driver

Element Values:

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 prescription and "over -the-counter" medications as well as "illicit" substances (*e.g.*, in most cases, marijuana, cocaine, heroin, etc. where usage has not been prescribed by a doctor). 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.

Code "0" [No other drug(s) present] is used if the investigating officer's assessment (as reported on the police report) is that no other drugs were present in the driver.

Code "1" [Yes other drug(s) present] is used 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.

Code "7" (Not reported) is used 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 code 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.

Code "8" (No driver present) is used when an in -transport vehicle was involved in the crash but no driver was in the vehicle at the time.

Code "9" (Unknown) is used if other drug presence is indicated as unknown. A growing number of police reports have blocks to check either positive or negative other drug presence. However, if a police report has provision for the investigating officer to respond "unknown presence", then use this code. In addition, use this code 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.

Variable Name: Other Drug Specimen Test Result for Driver

Element Values:

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.

Code "0" (No specimen test given) is used whenever there is no indication that any of the driver's specimens were tested for other drugs. Medicals routinely report blood chemistry/gases for patients. Do not confuse these routine medical specimen examination with a test for other drugs. In addition, use this code for hit-and-run drivers unless clear evidence to the contrary exists.

Code "1" [Drug(s) not found in specimen] is used 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".

Code "2" [Drug(s) found in specimen, specify] is used 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.

Code "3" (Specimen test given, results unknown or n ot obtained) is used 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.

Code "8" (No driver present) is used when an in-transport vehicle was involved in the cr ash but no driver was in the vehicle at the time.

Code "9" (Unknown if specimen test given) is used when it cannot be determined if the driver was administered a specimen test for other drugs. This code should also be used if it is known that the driver received treatment at a medical facility but the medical records have not been obtained.

GV17

Variable Name: Driver's ZIP Code

Element Values:

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

    99998   Driver not present
    00001   Driver not a resident of U.S. or territories
                Code actual 5-digit zip code
    99999   Unknown

       * Range is a compilation of Sections 6 and 12 of the 1991 National Five Digit Zip
Code & Post Office Directory, Volume 2 N-W

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

Remarks:

Prioritization of data sources:

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

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

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

Third, use interviewee data. When no address (*i.e.*, street number/name, city, state) is present
on the PAR, ask the interviewee the driver's ZIP code as a "specific question" during the
interview (page one of the Interview Form). If the interviewee does not known 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.

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 encode the ZIP code for the

Variable Name: Driver's ZIP Code (Cont'd.)

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

Code "00001"   (Driver not a resident of U.S. or territories) is used when the address found on the PAR or obtained 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.

Code "99998"   (Driver not present) is used when an in-transport vehicle was involved in the crash but no driver was in the vehicle at the time.

Code "99999"   (Unknown) is used whenever the ZIP cannot be determined. For example, use this code for "hit-and-run" drivers and for any driver's address that you discover is fictitious. In addition, use this code 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".

Variable Name: Driver's Race/Ethnic Origin

Element Values:

- (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:

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 code this variable Unknown, code "9".

If the PAR indicates White/Caucasian, Black/Negro, Hispanic/Spanish, or Other, then the PAR contains insufficient information to code 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.

Variable Name: Driver's Race/Ethnic Origin (Cont'd.)

When Hispanic origin is known but race is not and when race is known but Hispanic origin is not, code "9" (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 value.

Code "1"   [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.

Code "2"   [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.

Code "3"   [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.

Code "4"   [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.

Code "5"   (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 code.

Code "6"   (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.

Code "7"   (Other) is used for drivers who consider themselves to be of a race or ethnic origin not described above. Use this code 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.

Code "8"   (No driver present) is used when an in-transport vehicle was involved in the crash but no driver was in the vehicle at the time.

Code "9"   (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.

PRE-CRASH ENVIRONMENTAL DATA OVERVIEW

The pre-crash environmental variables are coded 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 [see GV30-GV36(3)].

GV19

Variable Name: Relation to Interchange or Junction

Element Values:

    0   Non-interchange area and non-junction
    1   Interchange area related

Non-Interchange junctions:

    2   Intersection related
    3   Driveway, alley access related
    4   Other junction (specify)
    5   Unknown type of junction
    9   Unknown

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

Remarks:

The element value selected is based on the characteristics of the vehicle's roadway environment just prior to the critical precrash event.

A junction is, in general, the area formed by the connection of two roadways. It includes: (1) all at-grade intersections (ANSI D16.1-1989 section 2.5.11, page 22, (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.

Variable Name: Relation To Interchange Or Junction (cont'd.)

**Is the pre-crash environment of the vehicle
related to or included in an interchange area or a junction?**

    NO   Code "(0)", Non-interchange area and non-junction
    Unknown   Code "(9)", Unknown

    YES   **Is the pre-crash environment of the vehicle interchange area related?**

        YES→ Code "(1)", Interchange area related

        NO→ **Is the pre-crash environment of the vehicle intersection area related?**

            YES→ Code "(2)", Intersection related

            NO   **Is the pre-crash environment of
the vehicle driveway alley
access related?**

                YES→   Code "(3)", Driveway alley access related

                NO   → **Is the pre-crash environment of the vehicle related
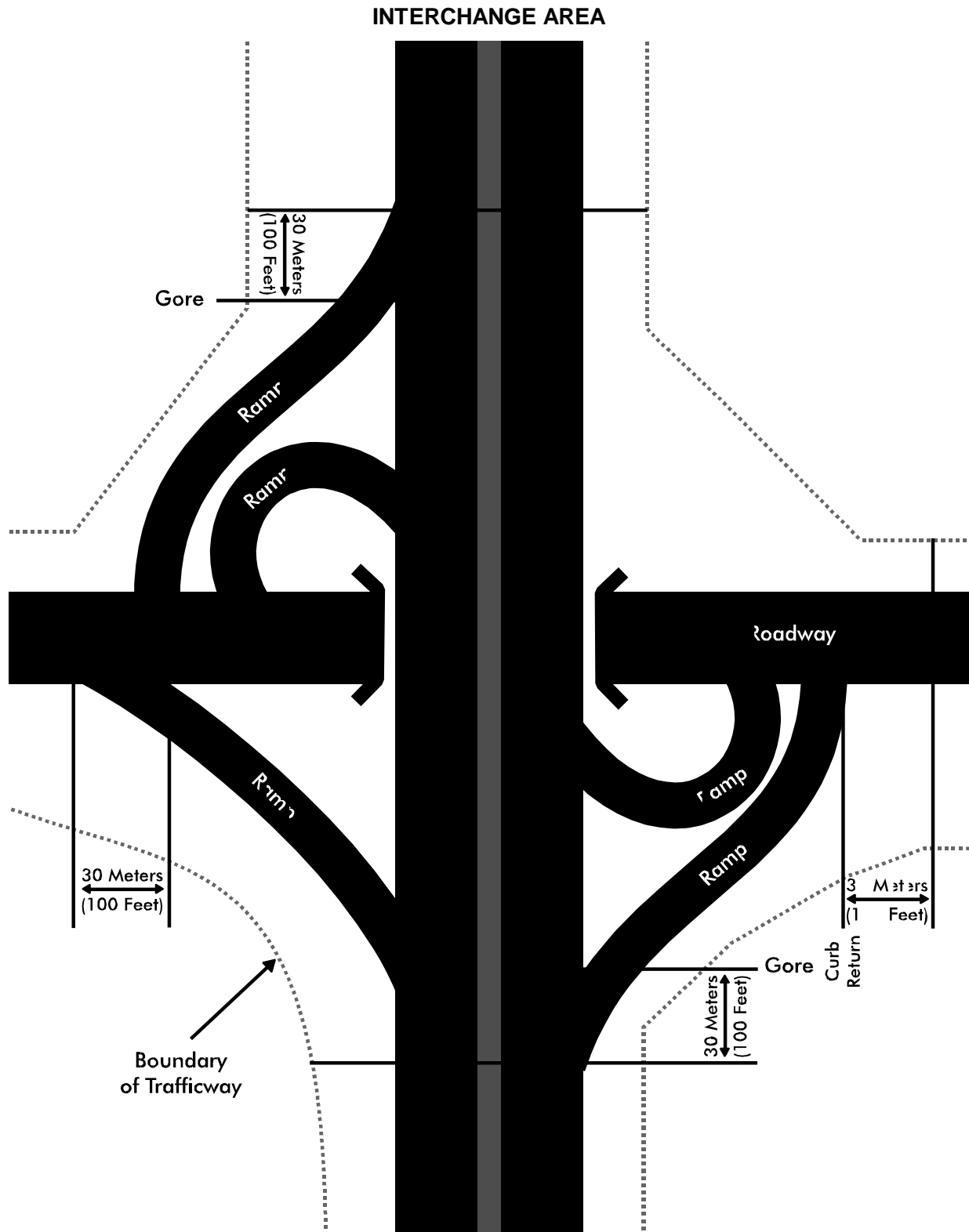to a known type of junction?**

                    YES→   Code "(4)", Other junction (specify)
                    NO   → Code "(5)", Unknown type of junction

Code "0"   (Non-interchange area and non-junction) is used when the vehicle's environment just prior to the critical precrash event does not occur within an interchange area or within a junction.

Code "1"   (Interchange area related) is used 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 (ANSI D16.1-1989, section 2.5.14) 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 1, on page (2).

Variable Name: Relation To Interchange Or Junction (cont'd.)

INTERCHANGE AREA

30 Meters
(100 Feet)

Gore

Ramp

Ramp

Ramp

Roadway

Ramp

Ramp

30 Meters
(100 Feet)

3 Meters
(1 Feet)

Gore

Curb Return

30 Meters
(100 Feet)

Boundary
of Trafficway

Variable Name: Relation To Interchange Or Junction (cont'd.)

Code "2" (Intersection related) is used 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 (for "traffic unit" see ANSI D16.1-1989, sections 2.2.37, 2.2.6, 2.1.7, and 2.1.4).

"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 a intersection related maneuver such as turning, then intersection related (code "2") must be coded. However, if the loss of control is unrelated to the intersection, then code non-interchange area and non-junction, "0".

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.

Code "2" (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 GV28, 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. It is one through which traffic passes 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.

Variable Name: Relation To Interchange Or Junction (cont'd.)

Code "3" (Driveway, alley access related) is used 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 code 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 (ANSI D16.1-1989 section 2.2.6) was entering or exiting from the driveway or alley. Do not use this code if the crash was precipitated by the action of a noncontact road vehicle or person.

Code "4" [Other junction (specify)] is used 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 code is used.

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

☞ A **channel** refers to any traffic lane that is directed into a path different than the through lanes by a traffic island. An **island** is defined as a raised or painted paved surface. The channel begins and ends at the extension of the island's lateral boundaries unless the channel is preceded or followed by an area of mergence or divergence (see below). Code "5" [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. Code "5" (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 code if the crash was precipitated by the actions of a noncontact road vehicle or person.

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

Variable Name: Relation To Interchange Or Junction (cont'd.)

Code "5"   (Unknown type of junction) is used 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.

Code "9"   (Unknown) is used when the environment of the vehicle just prior to the critical event is unknown.

Variable Name: Trafficway Flow

Element Values:

0   Not physically divided (two way traffic)
1   Divided trafficway-median strip without positive barrier
2   Divided trafficway-median strip with positive barrier
3   One way traffic
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, code the value 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, code the value 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, code 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 atrafficway where vehicles travel. A divided trafficway is composed of two or more roadways.

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

Code "0"   [Not physically divided (two way traffic)] can only be used 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. Two-way left turn lanes do not constitute a divided trafficway.

Code "1"   (Divided trafficway-median strip without positive barrier) is used 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. Painted paved flush areas must be 1.2 m in width to constitute a median strip.

Variable Name: Trafficway Flow (cont'd)

Code "2"   (Divided trafficway — median strip with positive barrier) is used 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 code.

Code "3"   (One way trafficway) is used primarily whenever the trafficway is undivided and traffic flows in one direction (*e.g.*, one-way streets). However, this code can also be used 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 code "3" (One way trafficway) should be used. Included in this code are entrance and exit ramps.

Code "9"   (Unknown) is used if cannot determined the trafficway flow (*e.g.*, ongoing construction and movable traffic barriers moved or removed since crash).

Variable Name: Number of Travel Lanes

Element Values:

    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 GV20. If traffic flows in both directions and is undivided, code the number of lanes in both directions. If the trafficway is divided into two or more roadways, code only the number of lanes for the roadway on which the vehicle under consideration was traveling.

If turn bays, acceleration, deceleration, or two-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, by their definition (see ANSI D16.1-1989, section 2.5.13), 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.

Variable Name: Number of Travel Lanes (cont'd.)

Only those lanes ordinarily used for motor vehicle travel should be considered when coding 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 coded 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 coded as follows: If it is possible to determine the number of lanes through either lane markings or observed or customary use, code the actual number of lanes present. If the number of lanes cannot be accurately established, use code "9" (unknown).

If the vehicle was on or in a driveway [see GV19, Relation to Junction, definitions for code "3" (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 (ANSI D16.1-1989, section 2.2.2), code the number of lanes for that vehicle.

GV22

Variable Name: Roadway Alignment

Element Values:

    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 value is determined from the same roadway which was used to determine GV20 (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.

Code "1"   (Straight) Refers to a roadway which has no perceptually determined curvature.

Code "2"   (Curve right) and "**3**" (Curve left) Refer to a perceptually determined curvature of
Code "3"   a roadway. The vehicle's direction of travel determines whether the curvature is right or left.

Variable Name: Roadway Profile

Element Values:

      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 value is determined from the same roadway which was used to determine GV20 (Trafficway Flow). A measurement of the area most representative of the pre-crash area for the vehicle is coded. To determine the grade, the vertical measurement is divided by the horizontal value; the result is a percentage value of the grade.

Code "1"   (Level) is used when the roadway surface tangent gradient is less than or equal to 2%. [*i.e.* vertical divided by horizontal (vertical ÷ horizontal)]

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

Code "3"   (Hillcrest) refers to a surface in vertical transition between two points of tangency.

Code "4"   [Downhill grade (> 2%)] is used when the roadway profile is downhill or negative, relative to the direction of travel for this vehicle.

Code "5"   (Sag) refers to a surface in vertical transition between two points of tangency.

GV24

Variable Name: Roadway Surface Type

Element Values:

  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 value is determined from the same roadway which was used to determine the GV20 (Trafficway Flow). If the lateral cross-section contains lanes of more than one surface type, code the surface type of the lane the driver's vehicle was traveling on just prior to this vehicle's critical pre-crash event.

Code "1"   (Concrete) is used 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.

Code "2"   [Bituminous (asphalt)] is used 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".

Code "3"   (Brick or block) is used when the road surface is constructed of paving stone (*e.g.* cobblestone, paving bricks, etc.).

Code "4"   (Slag, gravel or stone) is used when the road surface is constructed of a loose material primarily consisting of the elements of slag, gravel or stone.

Code "5"   (Dirt) is used when the improved road surface is made of a natural earthen surface.

GV25

Variable Name: Roadway Surface Condition

Element Values:

    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 value is based on the location which best represents the pre-crash environmental data. The element should be selected based on the same lanes used to select GV20 (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 pre-crash event.

Code "5"   (Sand, dirt or oil) is used when this element is present on another road surface. (*i.e.* a dirt road would not receive this code solely due to presence). If the sand, dirt or oil occurs in combination with moisture Codes "2" (Wet), "3" (Snow or Slush), or "4" (Ice), then code the moisture condition.

Variable Name: Light Conditions

Element Values:

      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 conditions at the time of the crash is coded based on ambient and artificial sources.

Code "2" (Dark) and code "**3**" (Dark, but lighted) include crashes occurring in tunnels or in
Code "3" underpasses.

Code "9" (Unknown) should be used when it cannot be reasonably determined what the light conditions were at the time of the crash.

GV27

Variable Name: Atmospheric Conditions

Element Values:

0   No adverse atmospheric-related driving conditions.
1   Rain
2   Sleet/hail
3   Snow
4   Fog
5   Rain and fog
6   Sleet and fog
7   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 coded with respect to the condition at the time of the crash. The element values are oriented toward precipitation, or particle dispersion, which may affect the driver's visual ability or the vehicle's controllability.

Code "0"   (No adverse atmospheric-related driving conditions) is coded when none of the conditions in codes "1" through "7" apply.

Code "1"   (Rain) is coded when the precipitation falling at the time of the crash is in the form of water droplets.

Code "2"   (Sleet/hail) is coded when the precipitation falling at the time of the crash is in the form of frozen or partially frozen raindrops.

Code "3"   (Snow) is coded when the precipitation falling at the time of the crash is in the form of translucent ice crystals originating in the upper atmosphere as frozen particles of water vapor. Accumulation is not necessary to code this attribute.

Code "4"   (Fog) is coded when condensed water vapor, in cloud like masses, is close to the ground limiting visibility at the time of the crash scene.

Code "7"   [Other (*e.g.*, smog, smoke, blowing sand or dust, etc.) specify:] is coded when the condition was present at the time of the crash. This code should not be used solely because of cloudy or overcast skies.

GV28

Variable Name: Traffic Control Device

Element Values:

    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 (GV20).
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).

According to ANSI D16-1978, (Manual on Uniform Traffic Control Devices) Part II, section 2A-7,
pages 2A-3,4, signs are classified functionally as follows:

   Regulatory signs   Give notice of traffic laws or regulations

   Warning signs   Call attention to conditions on, or adjacent to, a high way 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.

According to ANSI D6.1-1978, section 2A-10, pages 2A-4,5, 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

Variable Name: Traffic Control Device (cont'd.)

on or adjacent to the roadway or adjacent thereto. The *(vertical) rectangle*, ordinarily with the longer dimension vertical, is used for regulatory signs, with the exception of STOP signs and YIELD signs. The *(horizontal) rectangle*, ordinarily with the longer dimension horizontal is used for route markers and recreational area guide signs. The *pentagon*, point up, is used for School Advance and School Crossing signs. *Other* shapes are reserved for special purposes; for example, the shield or other characteristic design for route markers and crossbuck for railroad crossings.

According to ANSI D6.1-1978, section 2A-11, page 2A-5, signs can be distinguished by their color. The following general rules apply. *Red* is used as a background color on prohibitory type regulatory signs (*e.g.*, STOP, Do Not Enter, Wrong Way). It is also used as the circular outline and diagonal bar prohibitory symbol. *BLACK* may be used as a background (*e.g.*, ONE WAY); it is used as a message on white, yellow and orange signs. *WHITE* is used as the background for route markers, guide signs, and regulatory signs (except STOP). It is used as the legend for brown, green, blue, black and red signs. *Orange* is used only as a background color for construction and maintenance signs. *Yellow* is used as a background color for warning signs and for school signs. *Brown*, *green*, and *Blue* are used as a background color for guide signs.

Pavement markings are used to supplement the regulations or warnings of other devices such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. Pavement markings can convey warnings or information to the driver without diverting his attention form the roadway. **Pavement markings are not considered for coding this variable.**

Guide sign 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 code "0" (No traffic controls); otherwise, code the appropriate value. Statutory controls (*e.g.*, state law requires that when two drivers meet at an uncontrolled intersection, the one on the right has the right-of-way) should be coded as "0" (No traffic controls).

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. Non-junction crashes, traffic control devices should be coded based on their relationship to the crash circumstances and *not* be based merely on presence.

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 (GV21, Number of Travel Lanes) was chosen based on its through lanes or its channelized lanes.

Variable Name: Traffic Control Device (cont'd.)

The codes are prioritized in decreasing numerical value (*i.e.*, "1" takes precedence over "2", "2" over "3", etc.) This means that highway traffic signals take precedence over regulatory signs, school zone signs, and warning signs.

If a school guard, police officer, or other officially designated person controls both pedestrian and vehicular traffic, code "8" miscellaneous/other controls, including RR controls should be used. NOTE: The only exception to the prioritization rule is that any ***Officially-designated*** person (code "8") takes precedence over values "0" through "6".

Code "8" should also be used when the characteristics of the vehicle's roadway environment just prior to the critical precrash event is best represented by the area of a roadway and a railroad bed.

Code "1"   [Trafficway Traffic Control Signal (Not RR crossing)] is used 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 the amber 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 solar, electrical, or petroleum generated signal or device that controls traffic flow (*i.e.*, gas-powered directional signal to divert traffic for an impending lane closure).

NOTE: Regulatory signs which are ***enhanced*** by flashing lights should be coded to their regulatory design. (*i.e.*, a stop sign with a flashing light should be coded as a stop sign - disregard the flashing light).

GV28
(4)

Variable Name: Traffic Control Device (cont'd.)

Code "2"   (Stop sign) is used when a trafficway is controlled by an octagon-shaped sign, with white letters and border on a red background. The standard size is 30 x 30"; however, larger signs can be used for emphasis and smaller (24 x 24 inches) can be used on secondary roads with low approach speeds.

Code "3"   (Yield sign) is used 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. Each side is 36 inches long.

Code "4"   (School zone sign) is used 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 used only if the crash occurred during the time the sign was in effect. 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. See ANSI D6.1-1978, sections 7B-9 through 7B-13, pages 7B-2 through 7B-6 for examples of school zone signs.

Code "5"   [Other regulatory sign (Specify):] is used 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.) Refer to ANSI D6.1-1978 sections 2B-10 through 2B-44, pages 2B-6 through 2B-36.

Code "6"   [Warning sign (Not RR crossing)] is used 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.

Code "7"   (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.

Variable Name: Traffic Control Device (cont'd.)

Code "8"   [Miscellaneous/other controls including RR controls (Specify):] is used when the following are present:

☞ A construction warning sign is any black on orange diamond shaped sign. (See ANSI D6.1-1978 Part VI pages 6B-3 through 6B-13 for examples of construction warning signs.

☞ Railroad crossing controls are used when any gates, flashing lights, bells, crossbucks, 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 codes "1"-"6".

A traffic control that 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 should be coded "0" (No traffic controls). A traffic control that has just been installed but not yet activated should also be coded "0". However, a traffic control that is out (*e.g.* due to a power failure) and was related to the crash should be coded, unless a temporary control [*e.g.*, stop sign ("2"), police officer "8" etc.] has been inserted, in which case the temporary control should be coded.

GV29

Variable Name: Traffic Control Device Functioning

Element Values:

0   No traffic control device
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:

Code "0"   (No traffic control device) must be used when GV28 (Traffic control device) is coded "0" [No traffic control(s)].

Code "1"   [Traffic control device not functioning (specify)]: is used in the following situations:

☞   The traffic control device reported in GV28 was not operating.

☞   The traffic control device reported in GV28 has some function, but the function was improper, inadequate, or operating erratically. *e.g.*, signal works but cycle locked.

☞   The traffic control device was defaced, badly worn, rotated so it could not be seen, covered with snow, lying on ground, etc.

Code "2"   (Traffic control device functioning properly) is used when the traffic control device reported in GV28 was functioning as designed at the time of the crash.

Code "9"   (Unknown) is used when it cannot be determined the status of the traffic control device at the time of the crash.

PRECRASH DATA OVERVIEW

Coding of the precrash variables is completed for each of the in-transport vehicles in the crash. This means that the entire crash is first coded from the perspective of one vehicle, then coded from the perspective of a second vehicle, if any, and so forth. The precrash variables are:

GV30 Driver's Distraction/Inattention To Driving (Prior To Recognition Of Critical Event)
GV31 Pre-Event Movement (Prior to Recognition of Critical Event),
GV32 Critical Precrash Event,
GV33 Attempted Avoidance Maneuver,
GV34 Pre-Impact Stability
GV35 Pre-Impact Location
GV36 Accident Type

The precrash variables are designed to identify the following:

☞ what was this vehicle doing just prior to the critical precrash event,
☞ what made this vehicle's situation critical,
☞ what was the avoidance response, if any, to this critical situation, and
☞ what was the movement of the vehicle just prior to impact?

The most important determination that must be made for each in-transport vehicle is: what was this vehicle's Critical Precrash Event, GV32 (*i.e.*, what action by this vehicle, another vehicle, person, animal, or nonfixed object was critical to this vehicle's crash?). Once this determination is made, then determine the vehicle's avoidance response to the action which made this vehicle's involvement critical.

Attempted Avoidance Maneuver, GV33, is defined as movements/actions taken by the driver's vehicle, within a ***critical crash envelope***, in response to a Critical Precrash Event, GV32.

Do not consider culpability as a factor for determining precrash data. Many crash scenarios will suggest fault, but this is considered coincidental rather than by design.

Critical Crash Envelope

The critical crash envelope begins at the point where:

(1) the driver recognizes an impending danger (*e.g.*, deer runs into the roadway), or
(2) the vehicle is in an imminent path of collision with another vehicle, pedestrian, pedalcyclist, other nonmotorist, object, or animal.

PRECRASH DATA OVERVIEW (CONT'D)

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, GV32 (*e.g.*, A vehicle is traveling straight on a roadway; 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 coding 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, GV32, is coded 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 attempted to regain steering control; caused the vehicle to resume a tracking posture; or avoided the impacted vehicle, person, object, or animal; the Critical Precrash Event, GV32, is similarly coded 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, GV33, records the successful action taken to avoid the Critical Precrash Event, GV32.

Vehicles that are not involved in an impact with another vehicle, person, object, or animal in the sequence of accident events that defines the crash are not included in the Crashworthiness Data System; and therefore, automated, encoded data are not collected for these vehicles. However, these vehicles are included in the recording of nonautomated information contained on the Accident Collision Diagram.

PRECRASH DATA OVERVIEW (CONT'D)

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

Typical Order of a Single Critical Crash Envelope

GV30	GV31	GV32	GV33	GV34	GV35	EV05/EV13
Driver's Distraction/ Inattention To Driving	Pre-event Movement	Critical Precrash Event	Attempted Avoidance Maneuver	Pre-Impact Stability	Pre-Impact Location	Object Contacted (Impact)
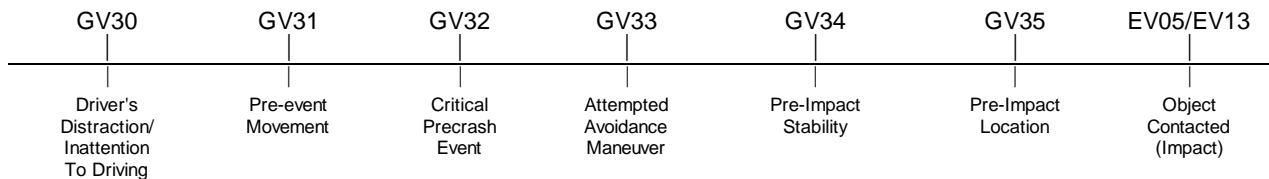
Multiple Critical Crash Envelopes

When crashes involve multiple critical crash envelopes, code only the final critical crash envelope. In this situation, encode the variable Pre-Event Movement ... , GV31, using code "17" (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 Multiple Critical Crash Envelopes

Prior Critical Crash Envelope   *Final Critical Crash Envelope*

GV30	GV31	GV32	GV33	GV34 (Successful Stable)	GV35 (Stable)		GV30	GV31	GV32	GV33	GV34	GV35	EV05/EV13
Driver's Distraction/Inattention To Driving	Pre-event Movement Event	Critical Precrash Maneuver	Attempted Avoidance	Pre-Impact Stability	Pre-Impact Location		Driver's Distraction/ Inattention To Driving	Pre-event Movement Event	Critical Precrash Maneuver	Attempted Avoidance	Pre-Impact Stability	Pre-Impact Location (Impact)	Object Contacted

DO NOT CODE   **CODE**

When there is doubt as to whether this vehicle had experienced multiple critical crash envelopes, code the Critical Precrash Event, GV32, to the vehicle, person, object, or animal which the driver successfully avoided. See Complex Single Critical Crash Envelope examples A and B above.
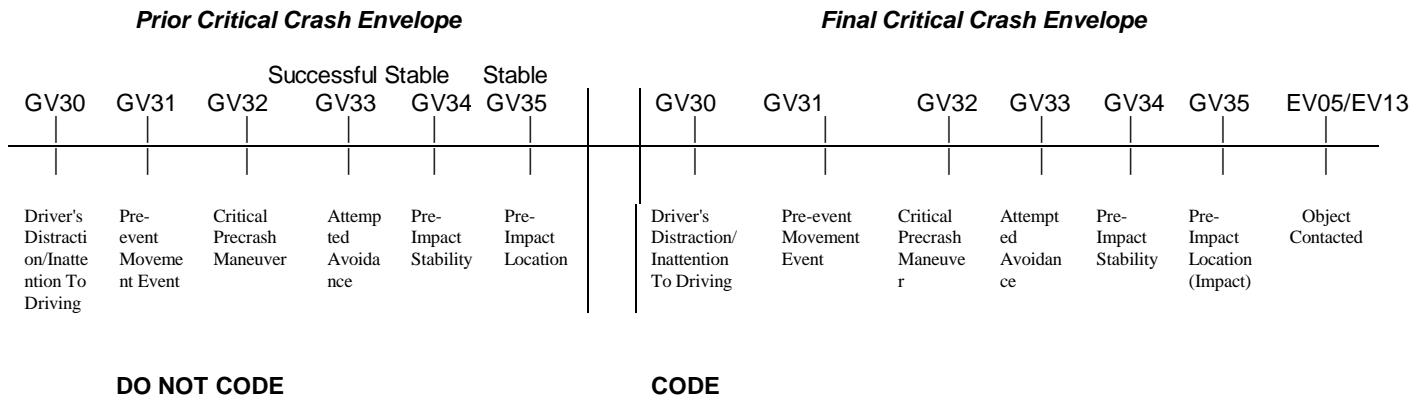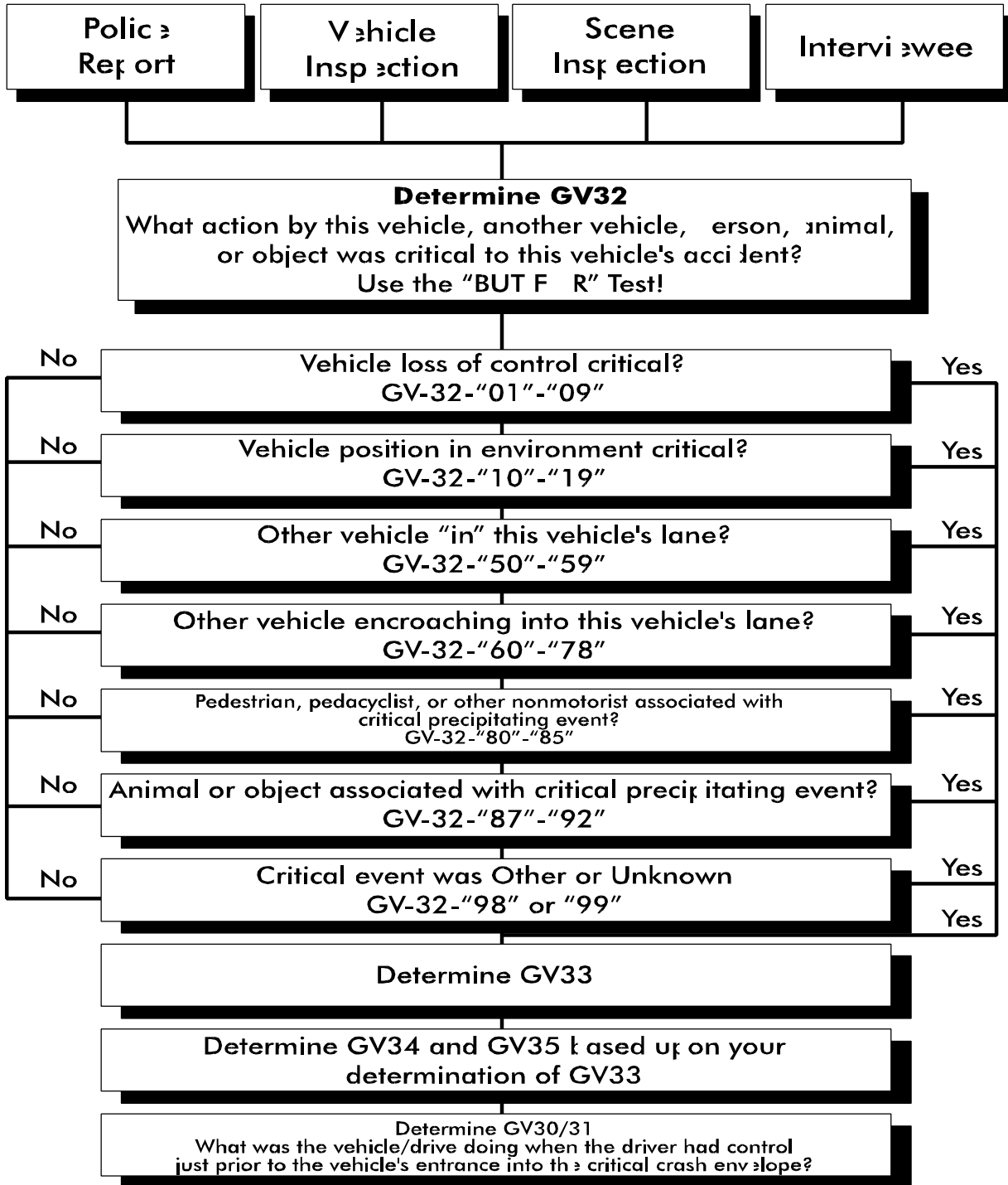
The pages that follow contain, first, a flowchart illustrating the proper method and protocol for determining the precrash variables, and second, seven examples of various accident event sequences which contain one or more critical crash envelopes.

PRECRASH DATA OVERVIEW (CONT'D)

Police Report	Vehicle Inspection	Scene Inspection	Interviewee

Determine GV32
What action by this vehicle, another vehicle, person, animal, or object was critical to this vehicle's accident?
Use the "BUT FOR" Test!

No — Vehicle loss of control critical?
GV-32-"01"-"09" — Yes

No — Vehicle position in environment critical?
GV-32-"10"-"19" — Yes

No — Other vehicle "in" this vehicle's lane?
GV-32-"50"-"59" — Yes

No — Other vehicle encroaching into this vehicle's lane?
GV-32-"60"-"78" — Yes

No — Pedestrian, pedacyclist, or other nonmotorist associated with critical precipitating event?
GV-32-"80"-"85" — Yes

No — Animal or object associated with critical precipitating event?
GV-32-"87"-"92" — Yes

No — Critical event was Other or Unknown
GV-32-"98" or "99" — Yes
Yes

Determine GV33

Determine GV34 and GV35 based upon your determination of GV33

Determine GV30/31
What was the vehicle/drive doing when the driver had control just prior to the vehicle's entrance into the critical crash envelope?

*** FOR EXAMPLE :**

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

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

PRECRASH DATA OVERVIEW (CONT'D)

Researcher Method for Determining Precrash Data — Continued

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 GV32, 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 Event, GV32.

   (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 GV33, Attempted Avoidance Maneuver.

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

3. Determine GV34, Pre-Impact Stability, and GV35, Pre-Impact Location

4. Determine GV30/GV31, 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 GENERAL RULES

1. GV33 (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 coding GV32 (Critical Precrash Event).

3. When you know what sub-group of the "Critical Precrash Event" applies but are unable to select a specific element, then default to one of the "other" or "unknown" codes (*i.e.*, "09", "19", "59", "78", "82", "85", "89", or "92") in that sub-group rather than using code "98" (Other critical precrash event).

4. If control is loss due to driver illness such as heart attacks, diabetic comas, etc., then GV32 (Critical Precrash Event) equals code "08" (Other cause of control loss).

5. In coding GV32 (Critical Precrash Event) 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 code the vehicle, object, pedestrian, or nonmotorist as what made it 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. If in coding GV32 (Critical Precrash Event) it 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 code both vehicles as being in an environmentally dangerous position, GV32 (Critical Precrash Event) equals code "17" [Crossing over (passing through) intersection].

7. In coding GV32 (Critical Precrash Event) for vehicles executing a left turn with the right-of-way, use code "62" (From opposite direction-over left lane line) or code "63" (From opposite direction-over right lane line).

8. In coding GV32 (Critical Precrash Event) "fixed" objects can not be in the roadway.

9. If a motor vehicle is stopped in a travel lane and is impacted by another motor vehicle ricocheting off a vehicle, then GV32 (Critical Precrash Event) for the ricocheting vehicle is coded as codes "51-59" (Other Motor Vehicle In Lane) or codes "60-78" (Other Motor Vehicle Encroaching Into Lane).

10. If there are no skid marks present at the scene and the PAR or interviewee doesn't indicate skidding and the vehicle did not rotate 30 degrees or more (either clockwise or counterclockwise), then code GV34 (Pre-Impact Stability) as "1" (Tracking).

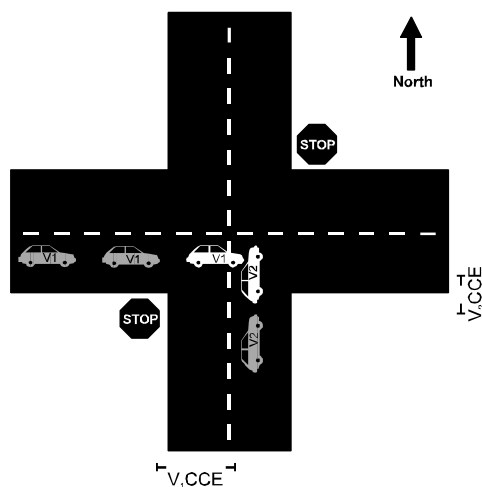## PRECRASH DATA OVERVIEW (CONT'D)

Example 1

Vehicle 2 is northbound and passing through an intersection on a roadway without a traffic control. The driver of vehicle 1 is dialing on a cellular phone. Vehicle 1 is eastbound on a crossing roadway with a stop sign but did see it or stop or slow down. Driver of Vehicle 2 was attentive but did not see Vehicle 1 approaching. Vehicle 1 crashes into the side of vehicle 2. Vehicle 1 braked (leaving skid marks) just prior to impact, without any steering.

		Vehicle 1		*Vehicle 2*
GV30	(06)	(Distracted) while dialing cellular phone	(02)	Looked but did not see
GV31	(01)	Going straight	(01)	Going straight
GV32	(17)	Crossing over (passing through) intersection	(66)	From crossing street across path
GV33	(03)	Braking (lockup)	(01)	No avoidance maneuver
GV34	(2)	Skidding longitudinally - rotation less than 30 degrees	(1)	Tracking
GV35	(1)	Stayed in original travel lane	(1)	Stayed in original travel lane

In this example, vehicle 1 has one *critical crash envelope* (V_1CCE) which begins at the point where driver 1 recognizes that vehicle 1 is in an imminent collision path with vehicle 2. Vehicle 1's critical crash envelope ends at the point of impact with vehicle 2.

Vehicle 2 has one *critical crash envelope* (V_2CCE). Although the driver of vehicle 2 did not recognize the danger, vehicle 2's critical crash envelope begins at the point where vehicle 2 is in an imminent path of collision with vehicle 1. Vehicle 2's critical crash envelope ends at the point of impact with vehicle 1.
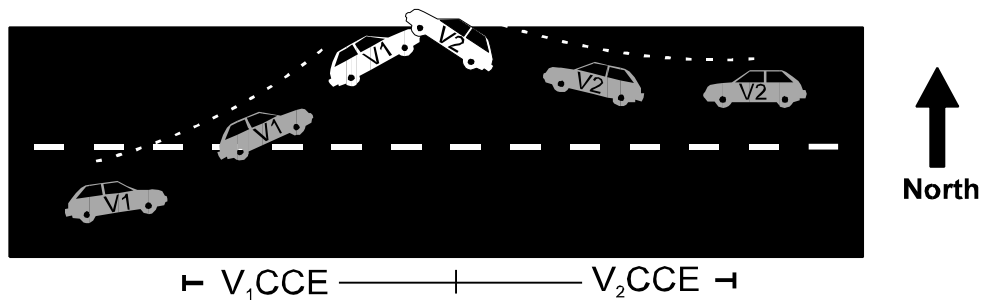
PRECRASH DATA OVERVIEW (CONT'D)

Example 2

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 falls asleep and crosses over the center line into the travel lane of vehicle 2. Vehicle 2 attempted to avoid vehicle 1 by steering right onto the shoulder and accelerating. Vehicle 1 impacted vehicle 2 in the side.

		Vehicle 1		*Vehicle 2*
GV30	(10)	Sleepy or fell asleep	(01)	Attentive or not distracted
GV31	(01)	Going straight	(01)	Going straight
GV32	(10)	Over the lane line on left side of travel lane	(62)	From opposite direction over left lane line
GV33	(01)	No avoidance maneuver	(12)	Accelerating and steering right
GV34	(1)	Tracking	(1)	Tracking
GV35	(2)	Stayed on roadway, but left original travel lane	(4)	Departed roadway

In this example, vehicle 1 has one *critical crash envelope* (V_1CCE) which begins at the point where vehicle 1 crosses over the lane line and ends at the point of impact with vehicle 2.

Vehicle 2 has one *critical crash envelope* (V_2CCE) which begins at the point where driver 2 recognizes vehicle 1 encroaching into his/her travel lane. Vehicle 2's critical crash envelope ends at the point of impact with vehicle 1.

$\vdash V_1CCE \longrightarrow \vdash \longrightarrow V_2CCE \dashv$

PRECRASH DATA OVERVIEW (CONT'D)

Example 3

Vehicle 1 is eastbound and passing through an intersection on a roadway without a traffic control. The noncontact vehicle (NCV) is northbound and stopped at the intersection on a crossing roadway with a stop sign. The noncontact vehicle turns right into the travel path of Vehicle 1. Vehicle 1 braked (without lockup) and steered left to avoid the noncontact vehicle. The driver of vehicle 1 successfully avoided the noncontact vehicle, maintained full control of vehicle 1, but consequently put vehicle 1 in the travel path of vehicle 2. Vehicle 2 attempted to avoid vehicle 1 by steering right and braking (with lockup). Vehicle 1 attempted to avoid vehicle 2 by steering right and braking (with lockup). Vehicle 1 and vehicle 2 crashed front left corner to front left corner.

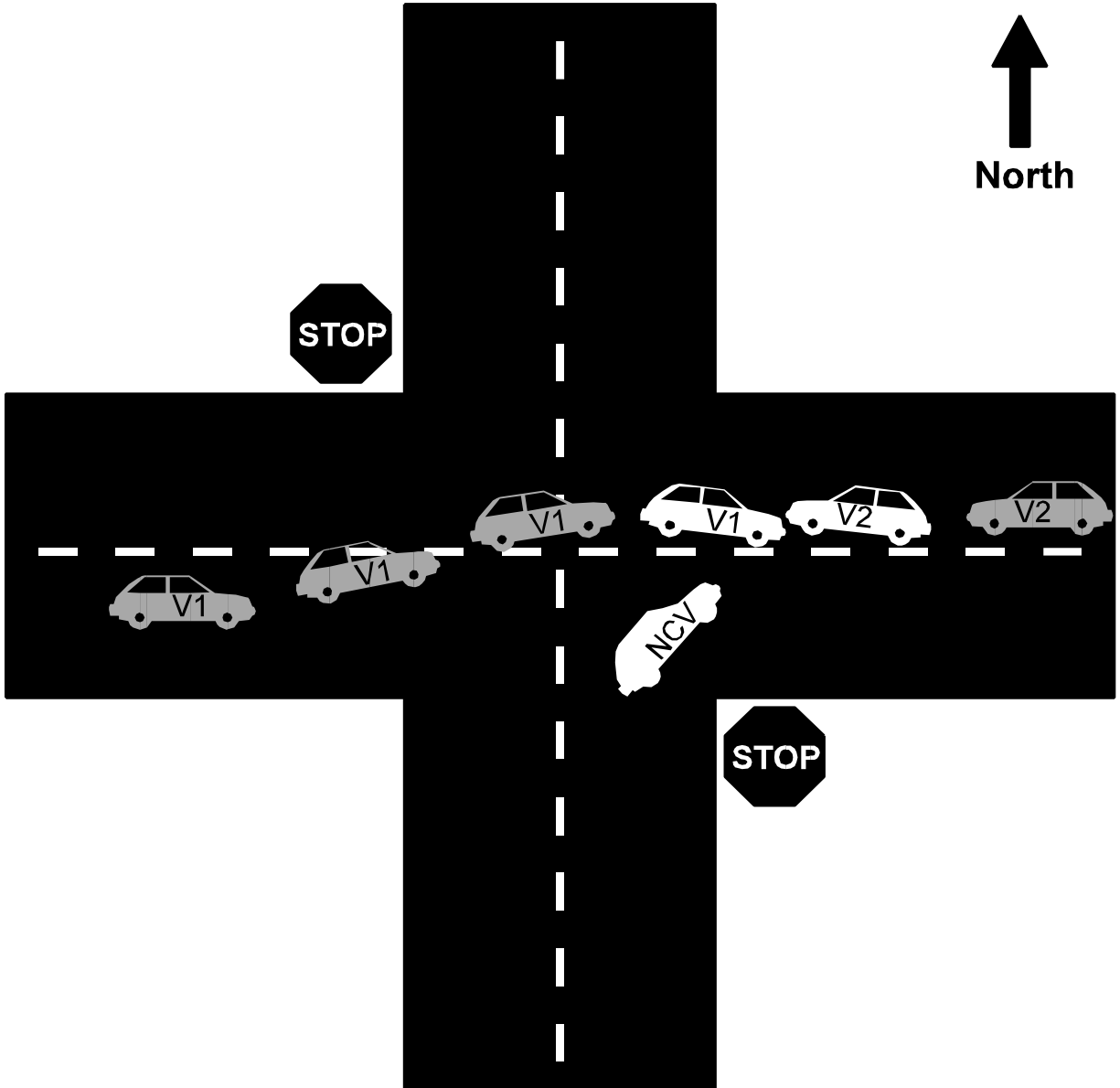|		*Vehicle 1*		*Vehicle 2*
GV30	(01)	Attentive or not distracted	(01)	Attentive or not distracted
GV31	(17)	Successful avoidance maneuver to a previous critical event	(01)	Going straight
GV32	(10)	Over the lane line on left side of travel lane	(54)	Traveling in opposite direction
GV33	(09)	Braking and steering right	(09)	Braking and steering right
GV34	(2)	Skidding longitudinally - rotation less than 30 degrees	(2)	Skidding longitudinally - rotation less than 30 degrees
GV35	(1)	Stayed in original travel lane	(1)	Stayed in original travel lane

In this example, vehicle 1 has two critical crash envelopes (V_1CCE_1 and V_1CCE_2). Vehicle 1's first **critical crash envelope** (V_1CCE_1) ends at the point where the driver of vehicle 1 made a successful avoidance maneuver and maintained full control of the vehicle. Vehicle 1's second **critical crash envelope** (V_1CCE_2) begins immediately following the successful avoidance maneuver and ends at the point of impact with vehicle 2. Code 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 accident events and is therefore not included in the Crashworthiness Data System. However, the noncontact vehicle must be shown on the Accident Collision Diagram.

PRECRASH DATA OVERVIEW (CONT'D)

Example 3 (Cont'd)

$$V_1 CCE_1 \quad V_1 CCE_2 \quad V_2 CCE$$
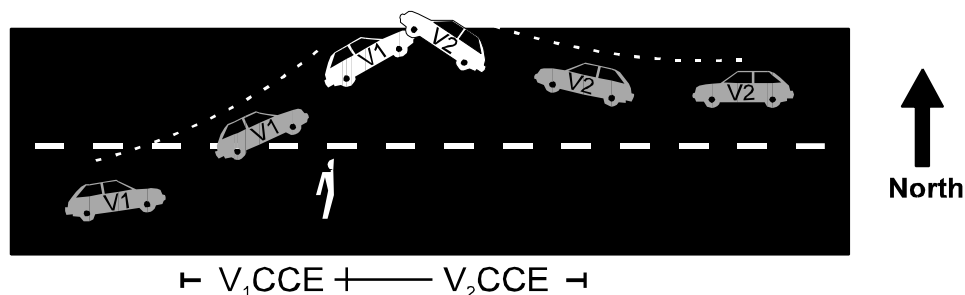
PRECRASH DATA OVERVIEW (CONT'D)

Example 4

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 brakes (without lockup) and steers left to avoid a pedestrian who darted into his/her travel lane. Vehicle 1 crosses over the center line into the travel path of vehicle 2. The driver of vehicle 2 was talking with a passenger and not paying close attention to driving and at the last second attempted to avoid vehicle 1 by braking and steering right onto the shoulder. Vehicle 2 skids and rotates clockwise about 45 degrees before it is impacted in the side by vehicle 1.

		Vehicle 1		*Vehicle 2*
GV30	(01)	Attentive or not object, or event	(03)	(Distracted) by other occupant
GV31	(01)	Going straight	(01)	Going straight
GV32	(80)	Pedestrian in roadway	(62)	From opposite direction over left lane line
GV33	(08)	Braking and steering left	(09)	Braking and steering right
GV34	(1)	Tracking	(3)	Skidding laterally - clockwise rotation
GV35	(2)	Stayed on roadway but left original travel lane	(1)	Stayed in original travel lane

In this example, vehicle 1 has one critical crash envelope (V$_1$CCE). Vehicle 1's critical crash envelope involved a successful avoidance of a pedestrian [*i.e.*, GV32 (Critical Precrash Event) equals code "80"] 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 coded as the action taken to avoid the pedestrian.

Vehicle 2 has one *critical crash envelope* (V$_2$CCE) 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.

$$\vdash V_1CCE \dashv\vdash\!\!\!\!—\!\!\!\!— V_2CCE \dashv$$
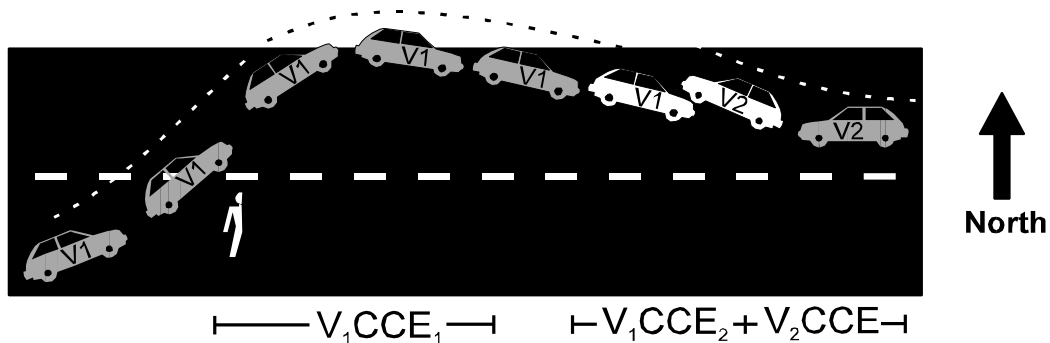
PRECRASH DATA OVERVIEW (CONT'D)

Example 5

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. The driver of vehicle 1 steers left to avoid a pedestrian who darted into his/her travel lane. Vehicle 1 crosses over the center line and the adjacent travel lane, departing the roadway. Then driver 1 reenters the roadway, in full control of the vehicle but traveling in the lane of opposing traffic. Vehicle 2 attempted to avoid vehicle 1 by steering right and braking (with skidding and clockwise rotation greater than 30 degrees). Vehicle 1 attempted to avoid vehicle 2 by steering right without braking. Vehicle 1 impacted vehicle 2 in the side.

		Vehicle 1		*Vehicle 2*
GV30	(01)	Attentive or not distracted	(01)	Attentive or not distracted
GV31	(17)	Successful avoidance maneuver to a previous critical event	(01)	Going straight
GV32	(10)	Over the lane line on left side of travel lane	(54)	Traveling in opposite direction
GV33	(07)	Steering right	(09)	Braking and steering right
GV34	(1)	Tracking	(3)	Skidding laterally - clockwise rotation
GV35	(1)	Stayed in original travel travel lane	(1)	Stayed in original travel lane

In this example, vehicle 1 has two critical crash envelopes (V_1CCE_1 and V_1CCE_2). Vehicle 1's first ***critical crash envelope*** (V_1CCE_1) 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. Code 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.

$$\vdash\!\!\!\!-\!\!\!\!-\!\!\!\!- V_1CCE_1 -\!\!\!\!\dashv \qquad \vdash V_1CCE_2 + V_2CCE\dashv$$

North

PRECRASH DATA OVERVIEW (CONT'D)

Example 6

Vehicle 1 and vehicle 2 are traveling in the same direction in adjacent lanes on a divided highway (with a painted median). While the driver of vehicle 1 was using an electric razor, the vehicle has a blow out, driver 1 loses control, crosses the left lane line and impacts the right rear of vehicle 2. Vehicle 2 is redirected across the painted median, skidding and rotating clockwise, and subsequently impacts vehicle 3. Vehicle 3 attempted to avoid vehicle 2 by steering right and accelerating.

		Vehicle 1		*Vehicle 2*
GV30	(09)	[Distracted] while using other device/object in vehicle	(01)	Attentive or not distracted
GV31	(01)	Going straight	(01)	Going straight
GV32	(01)	Blow out or flat tire	(61)	From adjacent lane (same direction) - over right lane line
GV33	(01)	No avoidance maneuver	(01)	No avoidance mane uver
GV34	(1)	Tracking	(1)	Tracking
GV35	(2)	Stayed on roadway, but left original travel lane	(1)	Stayed in original travel lane

		Vehicle 3
GV30	(01)	Attentive or not distracted
GV31	(01)	Going straight
GV32	(62)	From opposite direction - over left lane line
GV33	(12)	Accelerating and steering right
GV34	(1)	Tracking
GV35	(1)	Stayed in original travel lane

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 coded as the critical precrash event (GV32 equals 01).

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. Code 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.

PRECRASH DATA OVERVIEW (CONT'D)

Vehicle 3 has one critical crash envelope (V_3CCE) which begins when driver 3 recognizes and reacts to vehicle 2 which is in an imminent path of collision with vehicle 3 and ends at the point of impact with vehicle 2.

PRECRASH DATA OVERVIEW (CONT'D)

Example 6 (Cont'd)
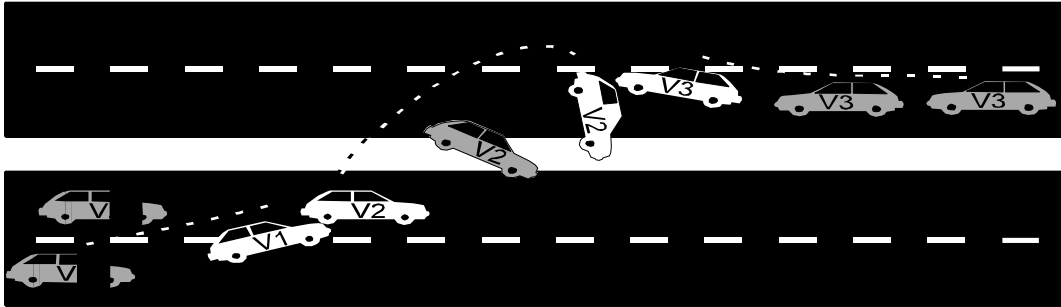
PRECRASH DATA OVERVIEW (CONT'D)
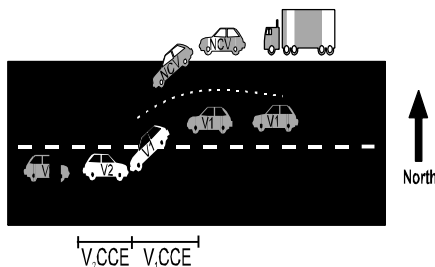
Example 7

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. A noncontact vehicle is parked in front of a noncontact truck-tractor (with a trailer) on the road shoulder and suddenly enters the roadway into vehicle 1's travel lane. The driver of vehicle 1 instantly brakes (with lockup) and steers left (with counterclockwise rotation) to avoid the noncontact vehicle. Vehicle 1 crosses over the center line and *immediately* impacts vehicle 2. Vehicle 2 had no avoidance maneuvers.

		Vehicle 1		*Vehicle 2*
GV30	(01)	Attentive or not distracted	(01)	Attentive or not distracted
GV31	(01)	Going straight	(01)	Going straight
GV32	(64)	From parking lane	(62)	From opposite direction over left lane line
GV33	(08)	Braking and steering left	(01)	No avoidance actions
GV34	(4)	Skidding laterally - counterclockwise rotation	(1)	Tracking
GV35	(2)	Stayed on roadway but left original travel lane	(1)	Stayed in original travel lane

In this example, vehicle 1 has one critical crash envelope (V_1CCE). Vehicle 1's critical crash envelope involved a successful avoidance of a noncontact vehicle and resulted in an *immediate* impact to vehicle 2. Vehicle 1's critical crash envelope was initiated by the noncontact vehicle, afterwards there was no opportunity for subsequent avoidance actions. Therefore, the encroachment of the noncontact vehicle into vehicle 1's travel lane is coded as the critical precrash event for vehicle 1. Vehicle 1's avoidance maneuver is coded as the action taken to avoid the noncontact vehicle.

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 accident events and are therefore not coded in the Crashworthiness Data System. However, the noncontact vehicle and truck must be shown on the Accident Collision diagram.

PRECRASH DATA OVERVIEW (CONT'D)

Example 8

Vehicle 1 and vehicle 2 are traveling in opposite directions on the same roadway. Emergency vehicles (with lights activated) are stopped next to a vehicle on the side of the road. The driver of vehicle 1 is looking at the activity going on to the left. Before he is able to react, the front of vehicle 1 contacts the front of vehicle 2. The driver of vehicle 2 also briefly noticed the emergency activity, however, he was attentive to the slowing traffic in front of him. The driver of vehicle 2 noticed vehicle 1 crossing the centerline and slammed on his brakes (with lockup) while attempting to turn to the right. The front of vehicle 1 contacted the front of vehicle 2 in vehicle 2's travel lane.

		Vehicle 1		*Vehicle 2*
GV30	(11)	Distracted by outside person, object, or event	(01)	Attentive or not distracted
GV31	(01)	Going straight	(01)	Going straight
GV32	(10)	Over the lane line on left side of travel lane	(54)	[Other motor vehicle in lane] Traveling in opposite direction
GV33	(01)	No avoidance maneuver	(09)	Braking and steering right
GV34	(1)	Tracking	(2)	Skidding longitudinally rotation less than 30 degrees
GV35	(2)	Stayed on roadway but left original travel lane	(1)	Stayed in original travel lane

GV30

Variable Name: Driver's Distraction/Inattention To Driving
                                (Prior To Recognition Of Critical Event)

Element Values:

00   No driver present
01   Attentive or not distracted
02   Looked but did not see

Distractions:
03   By other occupant(s), (specify):
04   By moving object in vehicle (specify):
05   While talking or listening to cellular phone (specify location and type of phone):
06   While dialing cellular phone (specify location and type of phone):
07   While adjusting climate controls
08   While adjusting radio, cassette, CD (specify):
09   While using other device/controls integral to vehicle (specify):
10   While using or reaching for device/object brought into vehicle (specify):
11   Sleepy or fell asleep
12   Distracted by outside person, object, or event (specify):
13   Eating or drinking (specify):
14   Smoking related (specify):
97   Distracted/inattentive, details unknown
98   Other, distraction (specify):
99   Unknown

Source: Researcher determined — inputs include intervi ews and police report.

Remarks:
Record the attribute which best describes this driver's attention 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 which best describes 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). If the
driver is distracted by multiple attributes code the lower numbered attribute. Intoxication is not
considered a distraction.

Code "00"   (No driver present) is used when there is no driver in this vehicle and GV37
                         (Driver Presence in Vehicle) is coded "0" (Driver not present).

Code "01"   (Attentive or not distracted) is used when the driver is known to have been
                         completely attentive to driving prior to realization of impending danger.

Code "02"   (Looked but did not see) is used when the driver is paying attention to driving, but
                         does not see the relevant vehicle, object, etc. This code 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 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 code "01"
                         (Attentive or not distracted).

Variable Name: Driver's Distraction/Attention to Driving (Prior to Recognition of Critical Event) (cont'd.)

Code "03"   [By other occupant (Specify):] is used 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 provided space*.

Code "04"   [By moving object in vehicle (Specify):] is used 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 provided space.*

Code "05"   [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.)

Code "06"   [While dialing cellular phone (specify location and type of phone)]. Specify the type of phone used (see above) and indicate where it is located (see above).

Code "07"   (While adjusting climate controls) is used when someone is distracted from the driving task while adjusting the air conditioner heater, etc.

Code "08"   [While adjusting radio, cassette, CD, (specify)] is used when someone is distracted from the driving task while adjusting or using the radio, cassette, CD which are mounted in the vehicle.

Code "09"   [While using other device/controls integral to vehicle, (specify)] is used 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 manual, adjusting seat (power or manual), adjusting steering wheel, and adjusting seat belt, etc. (OEM equipment).

Code "10"   [While using or reaching for device/object brought into vehicle (specify)] is used when the driver is distracted while using or reaching for a device in the vehicle including a radar detector, CBs, razors, portable CD players, headphones, cigarette lighter, etc. The use of another device to light a cigarette other than the vehicle's cigarette lighter should be coded under "13" smoking related.

Code "11"   (Sleepy or fell asleep) is used when the driver was sleeping or dozing prior to realization of impending danger or just prior to impact if realization did not occur.

Code "12"   [Distracted by outside person, object, or event (Specify):] is used 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 code for a person, object or event which the driver has recognized and for which the driver has taken some action (eg. avoiding a pedestrian on the roadway).*

GV30
(3)

Variable Name: Driver's Distraction/Attention to Driving (Prior to Recognition of Critical Event) (cont'd.)

Code "13" (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.)

Code "14" (Smoking related) is used when the driver is smoking or invol ved in an activity related to smoking, such as lighting his cigarette, putting his ashes in the ash tray, etc. The act of using the cigarette lighter of the vehicle, is coded under "09" (While using other device/object in vehicle). Any other method of lighting the cigarette would be coded "13" (Smoking related).

Code "97" (Distracted/inattentive, details unknown) is used when it is known that this driver was inattentive prior to realization of impending danger but details of the distraction are unknown.

Code "98" [Other distraction (Specify):] is used when details regarding this driver's inattention are known but none of the specified codes are applicable. The other distraction must be recorded in the provided space. This includes incapacitating illness.

Code "99" (Unknown) is used when it is unknown if this driver was fully attentive to driving prior to realization of impending danger. Use this code 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.

Variable Name: Pre-Event Movement (Prior to Recognition of Critical Event)

Element Values:

00	No driver present
01	Going straight
02	Decelerating in traffic lane
03	Accelerating in traffic lane
04	Starting in traffic lane
05	Stopped in traffic lane
06	Passing or overtaking another vehicle
07	Disabled or parked in travel lane
08	Leaving a parking position
09	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
97	Other (specify):
99	Unknown

Source: Researcher determined — inputs include 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 coded in GV33, Attempted Avoidance Maneuver.

Code "00"   (No driver present) is used if no driver was in the vehicle when the crash occurred.

Code "01"   (Going straight) is used when this vehicle's path of travel was straight ahead without any attempted or intended changes.

Code "02"   (Decelerating in traffic lane) is used when this vehicle was traveling straight ahead within the traffic lane and was decelerating.

Code "03"   (Accelerating in traffic lane) is used when this vehicle was traveling straight ahead within the traffic lane and was accelerating.

Code "04"   (Starting in traffic lane) is used 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).

Code "05"   (Stopped in traffic lane) is used when this vehicle was stopped momentarily, with the motor running within the traffic lane (*e.g.*, stopped for traffic signal).

Variable Name: Pre-Event Movement (Prior to Recognition of Critical Event)

Code "06"   (Passing or overtaking another vehicle) is used when this vehicle was traveling straight ahead and was in the process of passing or overtaking another vehicle on the left or right.

Code "07"   (Disabled or parked in travel lane) is used when this vehicle was parked in a travel lane (*e.g.*, double parked, disabled) with a driver present in the vehicle.

Code "08"   (Leaving a parking position) is used when this vehicle was entering the travel lane from a parking area adjacent to the traffic lanes.

Code "09"   (Entering a parking position) is used when this vehicle was leaving the travel lane to a parking area adjacent to the traffic lanes (*i.e.*, in the process of parking).

Code "10"   (Turning right) is used 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).

Code "11"   (Turning left) is used 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).

Code "12"   (Making a U-turn) is used when this vehicle was making a U-turn (*i.e.*, 180 degree directional change) on the roadway.

Code "13"   [Backing up (other than for parking position)] is used when this vehicle was traveling backwards within the trafficway. Do not use this code if the vehicle was backing into a parking space (See Code "09").

Code "14"   (Negotiating a curve) is used when this vehicle was continuing along a roadway that curved to the right or left.

Code "15"   (Changing lanes) is used when this vehicle was traveling straight ahead and changed travel lanes to the right or left while on the same roadway.

Code "16"   (Merging) is used when this vehicle was moving forward and merging from the left or right into a traffic lane (*e.g.*, roadway narrows, exit/entrance ramps).

Code "17"   (Successful avoidance maneuver to a previous critical event) is used when this vehicle responded to a previous critical event and successfully avoided an impact. However, this precipitated a subsequent critical crash envelope which resulted in this vehicle's first impact.

Code "97"   [Other (specify)] is used when this vehicle's pre-event movement is known but none of the specified codes are applicable.

Code "99"   (Unknown) is used when the vehicle's movement prior to the driver's realization of an impending critical event is unknown.

Variable Name: Critical Precrash Event

Element Values:

This Vehicle Loss of Control Due To:
01 Blow out or flat tire
02 Stalled engine
03 Disabling vehicle failure (*e.g.*, wheel fell off) (specify):
04 Non-disabling vehicle problem (*e.g.*, hood flew up) (specify)
05 Poor road conditions (puddle, pot hole, ice, etc.) (specify)
06 Traveling too fast for conditions
08 Other cause of control loss (specify)
09 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
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
98 Other critical precrash event (specify):
99 Unknown

Variable Name: Critical Precrash Event (Cont'd.)

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

Remarks:

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 GV33, 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.

Responses are grouped into six major categories and are prioritized as follows:

- ☞ This Vehicle Loss of Control Due To
- ☞ This Vehicle Traveling
- ☞ Other Motor Vehicle In Lane
- ☞ Other Motor Vehicle Encroaching Into Lane
- ☞ Pedestrian or Pedalcyclist, or Other Nonmotorist
- ☞ Object or Animal

Do not refer to culpability. Many accident scenarios will suggest fault, but this should be coincidental rather than by design. As an example, vehicle A was traveling too fast for conditions (code "06") when vehicle B crossed vehicle A's path from a driveway (code "71"). The situation which made the precrash event critical for vehicle A was vehicle B's movement across vehicle A's path and not vehicle A's speed.

This Vehicle Loss of Control Due To:

Codes "01"-"09" 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. When more than one condition applies and it cannot be determined which one had a greater effect, choose the lower element number (*i.e.*, code "01" takes priority over code "02").

Code "01" (Blow out or flat tire) is used when a vehicle in motion loses control as the result of a tire "air out".

Code "02" (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 code.

Variable Name: Critical Precrash Event (Cont'd.)

Code "03" [Disabling vehicle failure (*e.g.*, wheel fell off)] is used 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.

Code "04" [Non-disabling vehicle problem (*e.g.*, hood flew up)] is used 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.

Code "05" [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.

Code "06" (Traveling too fast for conditions) identifies this vehicle's movement rela tive 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 codes "10" - "13" may apply.

Code "08" (Other cause of control loss) is used when it was determined that this vehicle's loss of control was the primary reason which made the event critical and codes "01" - "06" do not adequately identify the control loss condition. The condition cited should be annotated in the space provided on the form.

Code "09" (Unknown cause of control loss) is used 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

Codes "10" - "19" identify situations where the critical factor leading to the collision involved the travel path of this vehicle.

Code "10" (Over the lane line on left side of travel lane) is used when this vehicle departs its lane to the left and is entering or had entered the adjoining lane or shoulder. To use this code, 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. The correct code for this vehicle would be "10" (Over the lane

Variable Name: Critical Precrash Event (Cont'd.)

line on left 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 left of the lead vehicle. If an animal runs into the roadway and is struck by this vehicle, then the correct choice would be code "87" (Animal in roadway).

Code "11"   (Over the lane line on right side of travel lane) is used when th is vehicle departs its lane to the right and is entering or had entered the adjoining lane or shoulder. To use this code, 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 code for this vehicle would be "11" (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 code "87" (Animal in roadway).

Code "12"   (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.

Code "13"   (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.

Code "14"   (End departure) is used when the vehicle departs the end of the road way (*e.g.*, "T" intersection).

Code "15"   (Turning left at intersection) is used when this vehicle attempts a left turn from its roadway to another roadway or driveway.

Code "16"   (Turning right at intersection) is used when this vehicle attempts a right tu rn from its roadway to another roadway or driveway.

Code "17"   [Crossing over (passing through) intersection] identifies this vehicle's travel as proceeding through the intersection without any planned turning.

Code "18"   (This vehicle decelerating) is use d when the vehicle is decelerating, or has just stopped and was immediately struck.

Code "19"   (Unknown travel direction) is used for those occasions where this vehicle's travel made the situation critical, but it is unknown which travel direction this vehicle was moving.

Variable Name: Critical Precrash Event (Cont'd.)

Other Motor Vehicle In Lane

Codes "50" - "59" identify situations where the critical factor leading to the collision involved the travel of the other vehicle in the same lane as this vehicle.

Code "50"   (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 code should not be used if the other vehicle just stopped and was immediately struck.

Code "51"   (Traveling in same direction with lower steady speed) is used 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

Code "52"   (Traveling in same direction while decelerating) is used when the other vehicle was the lead vehicle in the same travel lane, traveling in the same direction, and was decelerating.

Code "53"   (Traveling in same direction with higher speed) is used when the spee d of the other vehicle was higher than this vehicle or accelerating. The other vehicle must be overtaking this vehicle.

Code "54"   (Traveling in opposite direction) is used when the other vehicle was in this vehicle's travel lane and traveling head -on in the opposite direction of this vehicle.

Code "55"   (In crossover) is used 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".

Code "56"   (Backing) identifies a situation where the other vehicle was in the process of backing up while in this vehicle's travel lane.

Code "59"   (Unknown travel direction of other motor vehicle in lane) is used 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

Codes "60" - "78" 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.

Code "60"   [From adjacent lane (same direction)—over left lane line] is used 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).

Variable Name: Critical Precrash Event (Cont'd.)

Code "61"   [From adjacent lan e (same direction) — over right lane line] is used 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).

Code "62"   (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.

Code "63"   (From opposite direction — over right lane line) identif ies a situation where the other vehicle crosses the right lane line while traveling in the opposite direction from this vehicle.

Code "64"   (From parking lane) is used when the other vehicle was departing a parking lane and entering the travel lane of this vehicle.

Code "65"   (From crossing street, turning into same direction) is used 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 code for entrance ramps leading onto limited access highways.

Code "66"   (From crossing street, across path) is used when the other vehicle was continuing straight through the intersection and attempted to cross over this vehicle's roadway.

Code "67"   (From crossing street, turning into opposite direction) is used 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.

Code "68"   (From crossing street, intended path not known) is used 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.

Code "70"   (From driveway, turning into same direction) is used 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.

Code "71"   (From driveway, across path) is used when the other vehicle was entering this vehicle's roadway from a driveway and was continuing straight across to another driveway or roadway.

Code "72"   (From driveway, turning into opposite direction) is used 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.

Code "73"   (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.

Variable Name: Critical Precrash Event (Cont'd.)

Code "74"   (From entrance to limited access highway) is used 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.

Code "78"   (Encroachment by other vehicle — details unknown) is used 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

Codes "80" - "85" 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 pedalling (*e.g.*, baby carriage, skate board, roller blades, etc.).

Code "80"   (Pedestrian in roadway) is used when a pedestrian was present (*e.g.*, sitting, standing, walking, or running, etc.) in the roadway.

Code "81"   (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.

Code "82"   (Pedestrian — unknown location) is used when it was determined the presence or action of a pedestrian was the critical factor which lead to this vehicle's collision, but the location or action of the pedestrian was not known.

Code "83"   (Pedalcyclist or other nonmotorist in roadway) is used when a pedalcyclist or other nonmotorist was present in the roadway (irrespective of relative motion).

Code "84"   (Pedalcyclist or other nonmotorist approaching roadway) identifies situations where the pedalcyclist or other nonmotorist was within the trafficway and moving toward the roadway or attempting to enter the roadway, but was not on the roadway.

Code "85"   (Pedalcyclist or other nonmotorist — unknown location) is used 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.

Variable Name: Critical Precrash Event (Cont'd.)

Object or Animal

Codes "87" - "92" identify situations where the critical factor leading to the collision for this vehicle involved an object or animal.

Code "87"   (Animal in roadway) is used when an animal was present (*i.e.*, stationary or moving) in the roadway.

Code "88"   (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.

Code "89"   (Animal - unknown location) is used 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.

Code "90"   (Object in roadway) is used when an object was present in the roadway. An object is defined as being either fixed or nonfixed (refer to the object contacted codes listed under variable AC16 et al., Vehicle Number or Object Contacted, and EV05/EV13, ... C.D.C - Object Contacted).

Code "91"   (Object approaching roadway) identifies situations where an object was within the trafficway and moving toward the roadway, but not on the roadway.

Code "92"   (Object — unknown location) is used 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.

Code "98"   (Other critical precrash event) is used 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.

Code "99"   (Unknown) is used 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" code.

Variable Name: Critical Precrash Event (Cont'd.)

CODING GV31 AND GV32 FOR DIFFERENT REAR END COLLISION SITUATIONS

Two Vehicle Collisions

			Trailing Vehicle	Leading Vehicle
1)	Both vehicles in motion. Leading vehicle, traveling at steady speed, is struck from behind by trailing vehicle.	GV31 GV32	01 (Going straight) 51 (Other vehicle same direction with lower steady speed)	01 (Going straight) 53 (Other vehicle 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.	GV31 GV32	01 (Going straight) 52 (Other vehicle same direction while decelerating)	01 (Going straight) 18 (This vehicle decelerating)
3)	Both vehicles traveling at same speed. Lead vehicle stops and is immediately struck by trailing vehicle.	GV31 GV32	01 (Going straight) 52 (Other vehicle same direction while decelerating)	01 (Going straight) 53 (Other vehicle same direction with higher speed)
4)	Lead vehicle is stopped on roadway and is struck by a trailing vehicle.	GV31 GV32	01 (Going straight) 50 (Other vehicle is stopped in lane)	05 (Stopped in traffic) 53 (Other vehicle same direction with higher speed)
5)	Lead and trailing vehicle stopped on roadway. Lead vehicle backs into trailing vehicle.	GV31 GV32	05 (Stopped in traffic lane) 56 (Other vehicle in lane backing)	05 (Stopped in traffic lane) 50 (Other vehicle stopped)

Three Vehicle Collisions

			Trailing Vehicle	Middle Vehicle	Leading Vehicle
6)	Two vehicles stopped in traffic, struck by decelerating trailing vehicle	GV31 GV32	02 (Decelerating) 50 (Other vehicle stopped in lane)	05 (Stopped in traffic) 52 (Other vehicle same direction while decelerating)	05 (Stopped in traffic) 53 (Other vehicle same direction with higher speed)
7)	Lead vehicle stopped in traffic, middle vehicle decelerating, trailing vehicle strikes middle vehicle which strikes lead vehicle.	GV31 GV32	01 (Going straight) 52 (Other vehicle same direction while decelerating)	02 (Decelerating) 53 (Other vehicle same direction with higher speed)	05 (Stopped in traffic) 53 (Other vehicle same direction with higher speed)

GV33

Variable Name: Attempted Avoidance Maneuver

Element Values:

    00   No driver present
    01   No avoidance maneuver
    02   Braking (no lockup)
    03   Braking (lockup)
    04   Braking (lockup unknown)
    05   Releasing brakes
    06   Steering left
    07   Steering right
    08   Braking and steering left
    09   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 t he scene inspection.

Remarks:

Attempted avoidance maneuvers are movements/actions taken by the driver's vehicle, within a *critical crash envelope*, in response to a Critical Precrash Event, GV32. See the PRECRASH DATA OVERVIEW (precedes GV30, Driver's Distraction ...) 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. The following chronological illustration shows the placement of this variable within the precrash data variables.

Typical Order of a Single Critical Crash Envelope

GV30	GV31	GV32	GV33	GV34	GV35	EV05/EV13
Driver's Distraction/ Inattention To Driving	Pre-event Movement	Critical Precrash Event	Attempted Avoidance Maneuver	Pre-Impact Stability	Pre-Impact Location	Object Contacted (Impact)
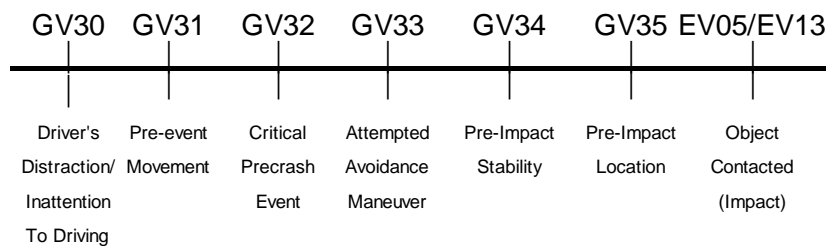
This variable may be coded independently: (1) of any maneuvers associated with this driver's Accident Type, GV36, and (2) this vehicle's first associated accident event.

Variable Name: Attempted Avoidance Maneuver (Cont'd)

Code the element value which best describes the actions taken by the driver's vehicle in response to the Critical Precrash Event, GV32, 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).

Code "00"   (No driver present) is used if no driver was in the vehicle when the crash occurred.

Code "01"   (No avoidance maneuver) is used whenever the driver did not attempt any evasive (pre-impact) maneuvers.

GV34

Variable Name: Pre-Impact Stability

Element Values:

0	No driver present
1	Tracking
2	Skidding longitudinally — rotation less than 30 degrees
3	Skidding laterally — clockwise rotation
4	Skidding laterally — counterclockwise rotation
7	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. 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 coded "7" (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.

Code "0"   (No driver present) is used when no driver was present in the vehicle at the time it was involved in the crash.

Code "1"   (Tracking) is used whenever 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.

Code "2"   (Skidding longitudinally — rotation less than 30 degrees) is coded whenever there is brake lockup or whenever skid 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 code.

Code "3"   (Skidding laterally — clockwise rotation) is used whenever the vehicle rotates clockwise, relative to the driver's seating position. The vehicle must rotate 30 degrees or more. This code also applies when the driver attempts a steering input (*i.e.*, swerves right), but the vehicle rotates clockwise.

GV34
(2)

Variable Name: Pre-Impact Stability

Code "4"   (Skidding laterally — counterclockwise rotation) is used whenever the vehicle rotates counterclockwise, relative to the driver's seating position. The vehicle must rotate 30 degrees or more. This code also applies when the driver attempts a steering input (*i.e.*, swerves left), but the vehicle rotates counterclockwise.

Code "7"   (Other vehicle loss-of-control) is used whenever a driver loses control of a vehicle prior to the critical event.

Code "9"   (Precrash stability unknown) is used whenever the stability of the vehicle cannot be determined.

GV35

Variable Name: Pre-Impact Location

Element Values:

> 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:

This variable reports the location of the vehicle for which the stability of the vehicle indicated in GV34, "Pre-Impact Stability" is coded. The responses for this variable must relate directly to the response coded for variable GV34.

Code "0"   (No driver present) is used when no driver was present in the vehicle at the time it was involved in the crash.

Code "1"   (Stayed in original travel lane) is used whenever the vehicle remained within the boundaries of its initial travel lane. The perimeter of the vehicle is to be considered when determining the vehicle's status within its travel lane.

Code "2"   (Stayed on roadway but left original travel lane) is coded whenever the "majority" of the vehicle departed its initial travel lane; however, the "majority" of the vehicle remained within the boundaries of the roadway (travel lanes). Refer to pages 10-12 of this manual to determine the proper boundaries. The perimeter of the vehicle is to be considered when determining the vehicles status within the roadway.

Code "3"   (Stayed on roadway, not known if left original travel lane) is coded whenever it cannot be ascertained whether the "majority" of the vehicle remained within its initial travel lane. To use this code, the "majority" of the vehicle must have remained within the boundaries of the roadway (See pages 10-12 of this manual).

Code "4"   (Departed roadway) is used whenever 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.

Code "5"   (Remained off roadway) is used whenever 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.

Variable Name: Pre-impact Location

Code "6"   (Returned to roadway) is used whenever the "majority" of the vehicle was on the roadway, went off the roadway and then returned to the roadway during precrash motion.

Code "7"   (Entered roadway) is coded whenever the vehicle was not previously on the roadway and then the majority of the vehicle enters the roadway during precrash motion.

Code "9"   (Unknown) is used whenever the precrash motion of the vehicle cannot be determined.

GV36

Variable Name: Accident Type

Element Values:

Range: 00-16, 20-93, 98, 99

> 00 No impact
> Code the number of the diagram that best describes the accident circumstance.
> 98 Other accident type (specify)
> 99 Unknown

Diagrams: See next page.

Source: Researcher determined — inputs include police report, scene inspection, v ehicle inspection, and interview.

Remarks:

This variable is 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. 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 collision.

To determine the proper accident type (AT), refer to Figure 1 and follow the three step decision process outlined below:

> *Step 1* - Determine the appropriate category.
> *Step 2* - Determine the appropriate configuration.
> *Step 3* - Determine the specific accident type (two digit codes).

The categories are divided into six sections and are described as follows:

> *Category I. Single Driver* — The first harmful event involves a collision between an in-transport vehicle and an object. 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 accident types in this category.

> *Category II. Same Trafficway, Same Direction* — The first harmful event occurred while both vehicles were traveling in the same direction on the same trafficway.

> *Category III. Same Trafficway, Opposite Direction* — The first harmful event occurred while both vehicles were traveling in opposite directions on the same trafficway.

Variable Name: Accident Type (cont'd.)

FIGURE 1

Category	Configuration	ACCIDENT TYPES (Includes Intent)

I Single Driver

A Right Roadside Departure — 01 DRIVE OFF ROAD — 02 CONTROL/TRACTION LOSS — 03 AVOID COLLISION WITH VEH., PED., ANIM. — 04 SPECIFICS OTHER — 05 SPECIFICS UNKNOWN

B Left Roadside Departure — 06 DRIVE OFF ROAD — 07 CONTROL/TRACTION LOSS — 08 AVOID COLLISION WITH VEH., PED., ANIM. — 09 SPECIFICS OTHER — 10 SPECIFICS UNKNOWN

C Forward Impact — 11 PARKED VEH. — 12 STA. OBJECT — 13 PEDESTRIAN/ANIMAL — 14 END DEPARTURE — 15 SPECIFICS OTHER — 16 SPECIFICS UNKNOWN

II Same Trafficway Same Direction

D Rear-End — 20, 22, 21, 23 STOPPED 21, 22, 23 — 24, 26, 25, 27 SLOWER 25, 26, 27 — 28, 30, 29, 31 DECEL. 29, 30, 31 — (EACH • 32) SPECIFICS OTHER — (EACH • 33) SPECIFICS UNKNOWN

E Forward Impact — 34, 35 CONTROL/TRACTION LOSS — 36, 37 CONTROL/TRACTION LOSS — 38, 39 AVOID COLLISION WITH VEH. — 40, 41 AVOID COLLISION WITH OBJECT — (EACH • 42) SPECIFICS OTHER — (EACH • 43) SPECIFICS UNKNOWN

F Sideswipe Angle — 44, 45, 46, 47 — (EACH • 48) SPECIFICS OTHER — (EACH • 49) SPECIFICS UNKNOWN

III Same Trafficway Opposite Direction

G Head-On — 50, 51 LATERAL MOVE — (EACH • 52) SPECIFICS OTHER — (EACH • 53) SPECIFICS UNKNOWN

H Forward Impact — 54, 55 CONTROL/TRACTION LOSS — 56, 57 CONTROL/TRACTION LOSS — 58, 59 AVOID COLLISION WITH VEH. — 60, 61 AVOID COLLISION WITH OBJECT — (EACH • 62) SPECIFICS OTHER — (EACH • 63) SPECIFICS UNKNOWN

I Sideswipe Angle — 64, 65 LATERAL MOVE — (EACH • 66) SPECIFICS OTHER — (EACH • 67) SPECIFICS UNKNOWN

IV Change Trafficway Vehicle Turning

J Turn Across Path — 68, 69 / 70 INITIAL OPPOSITE DIRECTIONS — 71, 72 INITIAL SAME DIRECTIONS — 73 — (EACH • 74) SPECIFICS OTHER — (EACH • 75) SPECIFICS UNKNOWN

K Turn Into Path — 76, 77, 78, 79 TURN INTO SAME DIRECTION — 80, 81, 82, 83 TURN INTO OPPOSITE DIRECTIONS — (EACH • 84) SPECIFICS OTHER — (EACH • 85) SPECIFICS UNKNOWN

V Intersecting Paths (Vehicle Damage)

L Straight Paths — 87, 88, 89 — (EACH • 90) SPECIFICS OTHER — (EACH • 91) SPECIFICS UNKNOWN

VI Miscellaneous

M Backing Etc. — 92 BACKING VEH. — 93 OTHER VEH. OR OBJECT — 98 Other Accident Type — 99 Unknown Accident Type — 00 No Impact

Variable Name: Accident Type (cont'd.)

Category IV. 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.

Category V. 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 accident typing.

Category VI. Miscellaneous — The first harmful event involves an accident type which cannot be described in Categories I-V and thus is included in this category.

Each category is further defined by an Accident Configuration(s). Configurations A through M are discussed below.

Category I.   **Single Driver**

Configurations A and B ... 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.

Configuration C. Forward Impact - The vehicle struck an object on the road or off the end of a trafficway while moving forward.

Category II.   **Same Trafficway, Same Direction**

Configuration D. 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 **Category IV**).

Configuration E. 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.

Configuration F. 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.

Variable Name: Accident Type (cont'd.)

Category III.   **Same Trafficway, Opposite Direction**

Configuration G. Head-On — The frontal area of one vehicle impacted the frontal area of another.

Configuration H. 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.

Configuration I. Sideswipe/Angle — The two vehicles are involved in a shallow, glancing impact involving the side of one or both vehicles.

Category IV.   **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**.

Configuration K. 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.

Category V.   **Intersecting Paths (Vehicle Damage)**

Configuration L. Straight Paths — The two vehicles were proceeding (or attempting to proceed) straight ahead.

Category VI.   **Miscellaneous**

Configuration M. 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 accident configuration which cannot be described in **Category I.** through **V.** is included here.

The *configurations* are delineated into specific accident types. These types can be identified by referring to the accident type diagram in Figure 1.

Variable Name: Accident Type (cont'd.)

The accident types in **Category I. (Single Driver)** involve an impact between a vehicle and an object. **Categories II.** through **VI.** identify specific collision combinations which must be coded in specified pairs (*i.e.*, the pair code defines the Accident Type). As an example, the combination "20" (Rear-end, stopped) and "32" (Rear-end, specifics other) or "20" (Rear-end, stopped) and "25" (Slower, straight ahead) are not valid since "20" (Rear-end, stopped) only has meaning when linked to codes "21"-"23" (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 "32" (Rear-end, specifics other) and "32".

In crashes involving more than two vehicles or in collision sequences involving a combination of vehicle-to-object-to-vehicle impacts, code the Accident Type for the vehicle(s) involved in the first harmful event. All other vehicles are coded "98" (Other accident type).

Keep in mind that *intended actions* play an important role in the coding scheme. For example, accident type "26" (Slower, turning left) is selected over type "25" (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 following accident types require clarification.

Code "00"   (No impact) identifies noncollision events (fire, immersion, etc.). Rollovers on the road should be coded "98" (Other accident type).

Codes "01"   (Right roadside departure, drive off road) and "06" (Left roadside departure, drive off road) are used when the vehicle departed the road under a controlled situation (*i.e.*, the driver was distracted, fell asleep, intentionally departed, etc.).

Codes "02"   (Right roadside departure, control/traction loss) and "07" (Left roadside departure, control/traction loss) are used if there is some evidence that the vehicle lost traction or in some other manner "got away" from the driver (*i.e.*, the vehicle spun off the road as a result of surface conditions, oversteer phenomena, locked brakes or mechanical malfunctions). If doubt exists, code "01" (Right roadside departure, drive off road) or "06" (Left roadside departure, drive off road) respectively.

Codes "03"   (Right roadside departure; avoid collision with vehicle, pedestrian, animal) **and** "08" (Left roadside departure; avoid collision with vehicle, pedestrian, animal) are used when the vehicle departed the road as a result of avoiding something in the road. "Phantom" situations are included here.

Variable Name: Accident Type (cont'd.)

Codes "03"   (Right roadside departure; avoid collision with vehicle, pedestrian, animal), "08" (Left roadside departure; avoid collision with vehicle, pedestrian, animal) **and** "13" (Forward impact, pedestrian/animal) include pedestrians, bicyclists, other cyclists and other nonmotorists.

Codes "04"   (Right roadside departure, specifics other) and "09" (Left roadside departure, specifics other) are used for any other stationary or nonstationary objects if the avoidance characteristics of codes "03" or "08" are present.

Codes "11"   (Forward impact, parked vehicle), "12" (Forward impact, stationary object), **and** "13" (Forward impact, pedestrian/animal) involve an impact with an object which can be located on either side of the road.

Code "12"   (Forward impact, stationary object) includes a hole in the road, an overhead object (*e.g.*, overpass) or an object projecting over the road edge (*e.g.*, support column of elevated railway).

Code "13"   (Forward impact, pedestrian/animal) is used when a pedestrian, nonmotorist, or animal is involved with the first harmful event. Vehicle plane of contact is not a consideration.

Code "15"   (Forward impact, specifics other) is used for impacted (striking or struck) trains and nonstationary objects on the road.

Codes "44"   (Sideswipe/Angle, straight ahead on left), "45" (Sideswipe/Angle, straight ahead on left/right), "46" (Sideswipe/Angle, changing lanes to the right), **and** "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", and (4) "46" and "47". When used as a 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.

GV36
(7)

Variable Name: Accident Type (cont'd.)

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 ("44"-"45", "46"-"45", "45"-"47", or "46"-"47") depending upon: (3) their positions (*i.e.*, left versus right) **and** (4) the intended lane of travel (straight ahead versus changing lanes) of their drivers.

Code "48"   (Sideswipe/Angle, specifics other) is used if one vehicle was behind the other prior to their **Category II, Configuration F** collision. 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 accident type).

Code "64"   (Sideswipe/Angle, lateral move — infringing vehic le) identifies the vehicle which infringed upon the other (code "65") in a **Category III, Configuration I** collision.

Codes "68"   through "85" (Turn Across Path and Turn Into Path) are used in Configurations J and K where the vehicle's action is the controlling factor, and the plane of contact is irrelevant.

Code "82"   (Left turn into opposite direction) 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 **Configuration L. Straight Paths**. The driver's intended path is the prime concern.

Codes "86"   through "89" (Straight Paths) must not be confused with accident types in **Configuration K. Turn Into Path**. For these codes the vehicles are proceeding (or attempting to proceed) straight ahead, usually at a junction.

Variable Name: Accident Type (cont'd.)

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

☞ rollovers on the road;

☞ 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 noncollision.

GV37

Variable Name: Driver Presence in Vehicle

Element Values:

Blank   (GV07 = 50-99)
0   Driver not present
1   Driver present
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.

Code "0"   (Driver not present) is used if no driver was physically in the vehicle at the time that it was involved in the crash. If no driver was present and this driver's vehicle was towed, then no Occupant Assessment Form or Occupant Injury Form are required for this driver.

Code "1"   (Driver present) includes those instances when this motor vehicle was a "hit-and-run" vehicle.

GV38

Variable Name: Number of Occupants This Vehicle

Element Values:

Range: 00 through 97, 99, Blank
Blank (GV07 = 50-99)
00-96 Code actual number of occupants for this vehicle
97 97 or more
99 Unknown

Source: Police report and interviewees

Remarks:

Code the actual number of persons (including the driver) that were occupants of this vehicle. The number of Occupant Assessment Forms submitted (GV39, Number of Occupant Forms Submitted) need not equal this value.

Code "99" (Unknown) is used when:

☞ the actual number of occupants is unknown, or

☞ this vehicle is a "hit-and-run" vehicle — unless reliable evidence clearly establishes the number of occupants present.

GV39

Variable Name: Number of Occupant Forms Submitted

Element Values:

Range: 00 through 30, Blank
Blank   (GV07 = 50-99)
00-3   Code actual number of Occu pant Assessment Forms submitted for this 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 applicable 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) is used in 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.

Variable Name: Is this an AOPS Vehicle?

Element Values:

> Blank (GV07 = 50-99)
> 0   No (includes unknown)
> 1   Yes - researcher determined
> 2   VIN determined air bag system
> 3   VIN determined automatic (passive) belts
> 4   VIN determined air bag and automatic (passive) belts

Source: Primary source is the vehicle inspection. For uninspected vehicles, the vehicle VIN and year/make/model may be used. The secondary sources are the interviewee, medical records, and police report.

Remarks:

This variable allows users to identify vehicles equipped with an automatic occupant protection system (AOPS). Automatic occupant protection systems include air bags or automatic (passive) belts. This variable is coded for all vehicle model years.

Code "0" [No (includes unknown)] is used when it is determined that this vehicle is not equipped with an AOPS. In addition, use this code when it is unknown if this vehicle had an AOPS.

Code "1" (Yes — researcher determined) is used when the vehicle inspection reveals the presence of an AOPS; or driver or other reliable interview information indicates that the vehicle is equipped with an AOPS.

Code "2" (VIN determined air bag system) is used when: (1) the vehicle is not inspected; (2) there is no interview or medical record information with positive indication of air bag presence or deployment; and (3) it can be determined from the VIN (or AOPS listing following variable OA34) that this vehicle was manufactured with an air bag system. Do not code availability (*i.e.*, OA30, Frontal Air Bag System Availability/ Function and OA32 Other Than First Seat Frontal Air Bag Availability/Function) based on this code.

Code "3" [VIN determined automatic (passive) belts] is used when: (1) the vehicle is not inspected; (2) there is no interview or medical record information with positive indication of automatic belt presence or use; and (3) it can be determined from the VIN (or AOPS listing following variable OA34) that this vehicle was manufactured with automatic (passive) belts. Do not code availability [*i.e.*, OA23, Automatic (Passive) Belt System Availability/Function] based on this code

Code "4" [VIN determined air bag and automatic (passive) belts] is used when: (1) the vehicle is not inspected; (2) there is no interview or medical record information with positive indication of the presence of an air bag system and automatic belts or deployment of an air bag and use of an automatic belt; and (3) it can be determined from the VIN (or AOPS listing following variable OA34) that this vehicle was manufactured with an air bag and automatic belts. Do not code availability (*i.e.*, OA23, OA30, and OA32) based on this code.

GV41

Variable Name: Air Bag(s) Deployment, First Seat Frontal

Element Values:

Blank (GV07 = 50-99)
0   Not equipped or not available
1   No air bags deployed
Single Air Bag Vehicle
2   Driver air bag deployed
3   Driver air bag, unknown if deployed
Multiple Air Bag Vehicle
4   Driver side only deployed
5   Passenger side only deployed
6   Driver and passenger side deployed
7   Driver and passenger side, unknown if deployed
8   Air bag(s) deployed, details unknown
9   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

First seat frontal air bags are for occupants seated in the front outboard positions in post-1971 passenger cars or 1991 or newer vans or 1993 or newer pickup trucks and utility vehicles. Thus, use code "0" (Not equipped/not available) for other vehicles.

Code "0"   (Not equipped or not available) is also used when the vehicle is a post-1971 passenger car or 1991 or newer van or 1993 or newer pickup and utility vehicle, but the vehicle was not equipped with an air bag.

Codes "1"   (No air bags deployed) is used when an air bag equipped vehicle has one or more impacts, and the air bag(s) did not inflate during the crash.

Code "2"   (Driver air bag deployed) is used when the vehicle is equipped with a driver air bag and the air bag deployed.

Code "3"   (Driver air bag, 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).

Code "4"   (Driver side only deployed) is used when it is known that the vehicle was equipped with driver and passenger side air bags, but only the driver side air bag deployed (for whatever reason).

Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal (cont'd.)

Code "5"   (Passenger side only deployed) is used when it is known that the vehicle was equipped with driver and passenger side air bags, but only the passenger side air bag deployed (for whatever reason).

Code "6"   (Driver and passenger side deployed) is used when it is known that the vehicle was equipped with driver and passenger side air bags and both the driver and passenger side air bags deployed.

Code "7"   (Driver and passenger side, unknown if deployed) is used when it is known that the vehicle was equipped with driver and passenger side air bags but the researcher is unable to determine if either of the air bags deployed.

Code "8"   [Air bag(s) deployed, details unknown] is used when it is known that the vehicle had a deployed air bag, but the researcher is unable to determine if more than one air bag deployed or if the deployed air bag was driver side or passenger side.

Code "9"   (Unknown) is used when it is unknown if an air bag was available.

Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal

Element Values:

Blank   (GV07 = 50-99)
0   Not equipped with an "other" air bag
1   Deployed during accident (as a result of impact)
2   Deployed inadvertently just prior to accident
3   Deployed, details unknown
4   Deployed as a result of a noncollision event during accident sequence
         (*e.g.*, fire, explosion, electrical)
5   Unknown if deployed
7   Nondeployed
9   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

"Other" air bags are for occupants in post-1994 passenger cars. Thus, if the vehicle is not a post-1994 passenger car, then use code "0" (Not equipped with an "other" air bag). These air bags are any air bag **other** than a frontal air bag in the front seat positions. They may include but not be limited to side air bags that are designed to deploy in a side impact and frontal air bags equipped in other than the front seat positions.

Code "0"   [Not equipped with an "other" air bag) is also used when the vehicle is a post-1994 passenger car but the vehicle was not equipped with an "other" air bag.

Code "1"   [Deployed during accident (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 deceleration of significant magnitude to cause inflation of the air bag. **Note**, an air bag is not designed to deploy in every collision.

Code "2"   (Deployed inadvertently just prior to accident) is used when an air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in a crash.

Code "3"   (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 Delta V of sufficient magnitude to cause inflation of the air bag.

Variable Name: "Other Than First Seat Frontal Air Bag(s)

Code "4" [Deployed as a result of a noncollision event during ac cident 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 (1) an impact or (2) a noncollision event prior to any impacts to this vehicle [*i.e.*, AC16, Vehicle Number or Object Contacted, equal to "33" (Fire or explosion)], takes this code.

Code "5" (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 not inspected and no interview was obtained and no mention of deployment is on the PAR or medical records and:

Code "7" (Nondeployed) is used when an air bag equipped vehicle has one or more impacts, and the air bag did not inflate during the crash.

Code "6" [Air bag deployed as a result of a noncollision event during accident sequence (*e.g.*, fire, explosion, electrical)] is used if the air bag deploys during a crash but not as a result of an impact.

Code "9" (Unknown) is used when it is unknown if an air bag was available.

GV43

Variable Name: Vehicle Curb Weight   (kg)

Element Values:

Range: 045 through 610, 999, Blank
              Blank   (GV07 = 50-99)
                  Code weight to the nearest 10 kilograms.
              045   Less than 450 kilograms
              610   6,100 kilograms or more
              999   Unknown

Source: Primary and secondary sources are listed below.

Remarks:

Code this vehicle's curb weight to the nearest 10 kilograms as in the examples.

Weight:	1,465 kilograms	**Weight:**	3,402 kilograms
Code:	"147"	**Code:**	"340"

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 on this variable to mean the same as that coded on GV07, Body Type.

If the vehicle model (GV06) 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 45 kilograms; 6 cyl. to 4 cyl. - subtract 34 kilograms.

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

The primary source for obtaining this vehicle's curb weight is the first source of reference material listed below; the next three sources are secondary.

Variable Name: Vehicle Curb Weight (cont'd.)

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

Annotate the source used in the space provided on the General Vehicle Form under this variable.

If variable GV55, Towed Trailing Unit, is coded "1" (Yes - towed trailing unit), then the weight of the trailer and its cargo is *not* coded here. Instead, it is coded under variable GV44, Vehicle Cargo Weight. For example, the weight of a boat trailer and its cargo are encoded on Vehicle Cargo Weight (GV44), distinct from the weight of the vehicle.

Code "999"   (Unknown) when the curb weight of this vehicle cannot be determined.

GV44

Variable Name: Vehicle Cargo Weight (kg)

Element Values:

Range: 000 through 450, 999, Blank
           Blank   (GV07 = 50-99)
                     Code weight to nearest 10 kilograms.
           000   Less than 5 kilograms
           450   4,500 kilograms or more
           999   Unknown

Source: Researcher determined — inputs include vehicle inspection and interviewees.

Remarks:

If variable GV55, Towed Trailing Unit, is coded "1" (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.

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 vehicles combined weight on the SMASH Program Summary Form, if used.

Code this vehicle's cargo weight to the nearest 10 kilograms as in the examples.

Weight:	81 kilograms	**Weight:**	1,465 kilograms
Code:	"008"	**Code:**	"147"

Code "000"   (Less than 5 kilograms) is used if the cargo weight is less than 5 kilograms.

Code "450"   (4,500 kilograms or more) is used if the cargo weight is 4,500 kilograms or more.

Code "999"   (Unknown) is used if the cargo weight is unknown.

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.

These variables are not coded for non-CDS applicable vehicles.

GV45

Variable Name: Rollover

Element Values:

      Blank (GV07 = 50-99)
      00   No rollover (no overturning)
      01-16 Code the number of quarter turns:
      17   Rollover, 17 or more quarter turns (specify):
      98   Rollover — end-over-end (*i.e.*, primarily about the lateral axis)
      99   Rollover (ove rturn), 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.

Code "00" [No rollover (no overturning)] if uncertainty exists concerning whether or not this vehicle rolled over. In addition, use this code if a trailer attached to the vehicle rolled over but the vehicle itself did not.

Codes "01-16" (Code the number of quarter turns:) are coded on the basis of the researcher's crash reconstruction. A "quarter turn" is defined as a rotation of 90 degrees about an axis of the vehicle; this does not include rotation about the vertical axis, commonly called yaw. Therefore, if a vehicle rolled longitudinally onto its roof (*i.e.*, side-to-side roll), then it rolled 180 degrees and is coded "02" quarter turns.

Code "17" [Rollover, 17 or more quarter turns (specify):] when the vehicle rolls 17 or more quarter turns and then specify the number of quarter turns involved.

Code "98" [Rollover — end-over-end (*i.e.*, primarily about the lateral axis)] is used when the rollover is mainly end-over-end. This code 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.

Code "99" [Rollover (overturn), details unknown] when it is known that the vehicle rolled over but the number of quarter turns and other rollover details cannot be determined.

Variable Name: Rollover Initiation Type

Element Values:

        Blank   (GV07 = 50-99)
        00   No rollover
        01   Trip-over
        02   Flip-over
        03   Turn-over
        04   Climb-over
        05   Fall-over
        06   Bounce-over
        07   Collision with another vehicle
        08   Other rollover initiation type (specify):
        98   Rollover — end-over-end
        99   Unknown rollover initiation type

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 "01" through "07" should be coded "98" (Other rollover initiation type).

Codes "01" through "07" below are used for rollovers initiated about the longitudinal axis. However, code "98" (Rollover end-over-end) is used when the rollover was initiated about the lateral axis (*i.e.*, end-over-end).

Code "00"   (No rollover) is used when variable GV45, Rollover, equals "00" [No rollover (no overturning)].

Code "01"   (Trip-over) is used 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.

Code "02"   (Flip-over) is used when the vehicle is rotated about its longitudinal axis by a ramp-like object such as a turned down guardrail or the back slope of a ditch. The vehicle may be in a yaw when it comes in contact with the ramp-like object. For example, if the vehicle traveling backwards climbs the down turned end of a guardrail and rolls over about its longitudinal axis, use this code. To use this code, 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.

Code "03"   (Turn-over) is used when centrifugal forces from a sharply turning or rotating vehicle produce a rollover when resisted by normal surface friction. This type of rollover is

Variable Name: Rollover Initiation Type (Cont'd.)

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 this code and code "01" (Trip-over) is that no furrowing, gouging, etc. occurs to the surface at the point of trip. In addition, see remarks for code "05" (Fall-over) below.

Code "04" (Climb-over) is used 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.

Code "05" (Fall-over) is used 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 code and code "03" (Turn-over) above involves the negative slope of the traversed surface. If the rotation and/or the surface friction causes the trip, then use code "03"; however, if the slope is so negative that a line straight downward through the vehicle's center-of-gravity (as shown in the illustration below) would fall outside the vehicle's track, then use this code. 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 code.
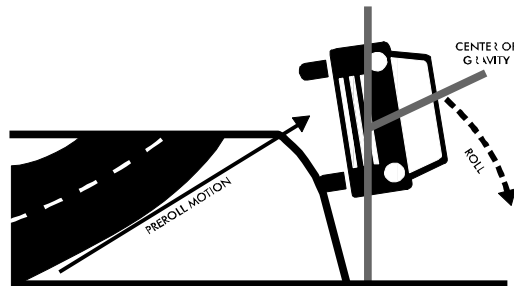
Code "06" (Bounce-over) is used when a vehicle deflects off of a fixed object (such as a guardrail, barrier, tree, or pole) such that the vehicle's rotation causes it to overturn. The deflection momentum contributes to a rollover. To use this code, the rollover must occur in close proximity to the object 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 codes "01" (Trip-over) or "03" (turn-over) would apply.

Variable Name: Rollover Initiation Type (Cont'd.)

Code "07" (Collision with another vehicle) is used when an im pact 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 codes "01" through "06" 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 code.

Code "08" (Other rollover initiation type) is used when this vehicle's rollover initiation type cannot be described in codes "01" through "07" above. Whenever this code is used, the researcher is required to **specify** the type of rollover which occurred.

Code "98" (Rollover — end-over-end) is used when the rollove r is predominantly end-over-end (*i.e.*, primarily about the lateral axis).

Code "99" (Unknown rollover initiation type) is used when variable GV45, Rollover, equals "99" [Rollover (overturn), details unknown]. In addition, use this code when the vehicle rolled over and the rollover initiation type cannot be determined.

Variable Name: Rollover Initiation Type (Cont'd.)

CODING GUIDE FOR ROLLOVER INITIATION TYPES

01 Trip-Over: Vehicle lateral motion is resisted by opposing force, inducing roll moment.
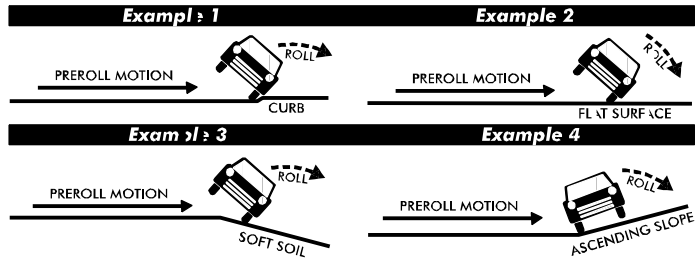
02 Flip-Over: Forward-moving vehicle is vigorously rotated about its longitudinal axis by ramp-like object such as a guardrail taper or ditch back slope.
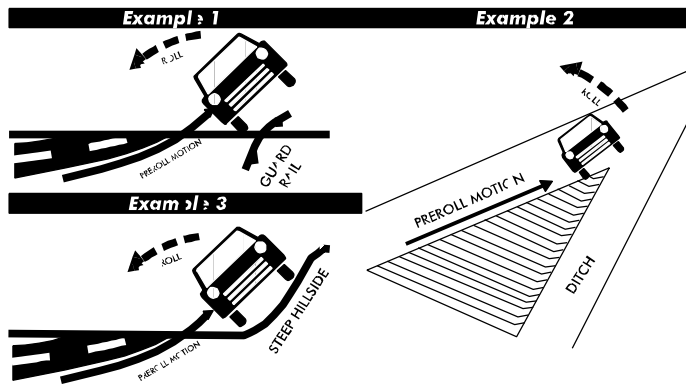
03 Turn Over: Centrifugal forces from a sharply turning or rotating vehicle produce a rollover moment when resisted by surface friction.
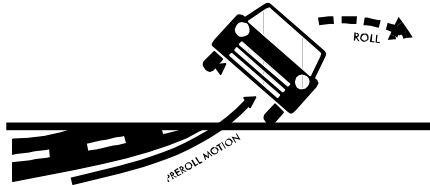
04 Climb-Over: Vehicle climbs up and over fixed object such as barrier.
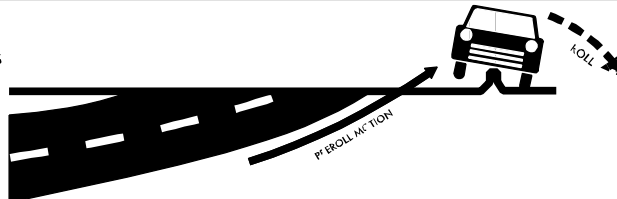
05 Fall-Over: Vehicle is tipped by slope so that its center of gravity is outboard of its wheels.
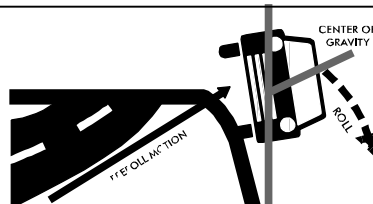
06 Bounce-Over: Any case where vehicle rebounds off fixed object (such as a guardrail), overturns as a consequence.
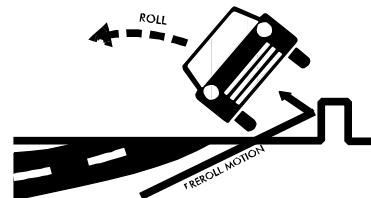
Variable Name: Location of Rollover Initiation

Element Values:

> Blank (GV07 = 50-99)
> 0 No rollover
> 1 On roadway
> 2 On shoulder — paved
> 3 On shoulder — unpaved
> 4 On roadside or divided trafficway median
> 8 Rollover — end-over-end
> 9 Unknown

Source: Researcher determined — primary source is the scene insp ection. 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 variable GV46, 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.

Code "0" (No rollover) is used when variable GV45, Rollover, equals "00" [No rollover (no overturning)].

Code "1" (On roadway) is used 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 "2" (On shoulder—paved), "3" (On shoulder—unpaved), or "4" (On roadside or divided trafficway median) as described below. For examples of roadways refer to pages 10-12 of the NASS CDS Data Collection, Coding and Editing Manual. 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.

Code "2" (On shoulder — paved) is used 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.

Code "3" (On shoulder — unpaved) is used 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.

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(2)

Variable Name: Location of Rollover Initiation (Cont'd.)

Code "4"   (On roadside or divided trafficway median) is used 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 code 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 code. If the roll is initiated by a fixed object (i.e., Objected Contacted, EV05/EV13, is code "41"-"60" or "62"-"68"), then use this code. 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 code "2" (On shoulder—paved).

Code "8"   (Rollover — End-over-end) is used when the rollover is predominantly about the lateral axis).

Code "9"   (Unknown) is used when variable GV45, Rollover, equals "99" [Rollover (overturn), details unknown]. In addition, use this code when the vehicle rolled over and the specific location of the rollover initiation cannot be determined.

Variable Name: Rollover Initiation Object Contacted

Element Values:

Blank	(GV07 = 50-99)	54	Concrete traffic barrier
00	No rollover	55	Impact attenuator
01-30	Vehicle number	56	Other traffic barrier (includes guardrail) (specify)

Noncollision
31	Turn-over — fall-over	57	Fence
32	No rollover impact initiation (end — over — end)	58	Wall
		59	Building
34	Jackknife	60	Ditch or culvert
		61	Ground

Collision With Fixed Object
		62	Fire hydrant
41	Tree (≤ 10 centimeters in diameter)	63	Curb
		64	Bridge
42	Tree (> 10 centimeters in diameter)	68	Other fixed object (specify):
		69	Unknown fixed object
43	Shrubbery or bush		
44	Embankment		*Collision with Nonfixed Object*
45	Breakaway pole or post (any diameter)	70	Passenger car, light truck, van or other vehicle not in-transport

Nonbreakaway Pole or Post
		71	Medium/heavy truck or bus not in-transport
50	Pole or post (≤ 10 centimeters in diameter)	76	Animal
		77	Train
51	Pole or post (> 10 centimeters but ≤ 30 centimeters diameter)	78	Trailer, disconnected in transport
		79	Object fell from vehicle in-transport
52	Pole or post (> 30 centimeters in diameter)	88	Other nonfixed object (specify):
		89	Unknown nonfixed object
53	Pole or post (diameter unknown)	98	Other event (specify):
		99	Unknown event or object

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

Remarks:

This variable is related to GV46, Rollover Initiation Type, and identifies the source of the force that acted upon the vehicle which resulted in the rollover. These codes are obtained from the CDC Object Contacted codes (EV05/EV13). If the rollover was initiated by an impact which was assigned a CDC, then the applicable EV05/EV13 element value will be encoded for this variable. If the rollover was not initiated by a CDC applicable impact, then it is unlikely that the same value will be encoded. 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 [(GV46 equals "01" (Trip-over)], then this variable is encoded "63" (Curb) even though the CDC Object Contacted (EV05/EV13) for the rollover would probably equal "31" (Overturn-

Variable Name: Rollover Initiation Object Contacted (cont'd.)

rollover). Similarly, if a vehicle vaults a longitudinal barrier [(GV46 equals "04" (Climb-over)], then this variable is coded "54" or "56", 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 code "61" (Ground) because the ground applied the force that acted as the tripping mechanism for the rollover.

Code "00" (No rollover) is used when variable GV45, Rollover, equals "00" [No rollover (no overturning)].

**Codes "01"
-"30"** (Vehicle number) are used to report the vehicle number of a vehicle that impacted this vehicle and caused the rollover to occur [*i.e.*, GV46 must equal "07" (Collision with another 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 codes 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.

Code "31" (Turn-over — fall-over) excludes end-over-end and is used when the vehicle roll is precipitated by centrifugal or gravitational forces and GV46, Rollover Initiation Type, has been coded "03" (Turn-over) or "05" (Fall-over).

Code "32" [No rollover impact initiation (end-over-end)] is only used when the rollover is predominantly about its lateral axis.

Code "34" (Jackknife) is used 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.*, $\geq$ 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 code. However, if a centrifugal force or tripping mechanism causes the vehicle to overturn with or without the trailer overturning, then use another code.

Code "41" [Tree ($\leq$ 10 centimeters in diameter)] is used 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.*, GV46 equals "01" (Trip-over), "02 " (Flip-over), or "06" (Bounce-over)]. Do not use this code when a vehicle impacts a tree and experiences a subsequent rollover due to centrifugal forces or other tripping mechanisms.

Variable Name: Rollover Initiation Object Contacted (cont'd.)

Code "42"   [Tree (> 10 centimeters in diameter)] is used 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.*, GV46   equals "01" (Trip-over), "02" (Flip-over), or "06" (Bounce-over)]. Do not use this code when a vehicle impacts a tree and experiences a subsequent rollover due to centrifugal forces or other tripping mechanisms.

Code "43"   (Shrubbery or bush) is used when a vehicle impacts shrubbery or bushes and the contacted object causes the vehicle to rollover [*i.e.*, GV46 equals "01" (Trip-over) or "02 " (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.

Code "44"   (Embankment) is coded 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.*, GV46   equals "02" (Flip-over) or "05" (Fall-over)]. Vehicles which dig into the surface of an embankment and rollover as a result of this tripping mechanism are captured in code "61" (Ground).

Code "45"   [Breakaway pole or post (any diameter)] is used 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. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "50"   [Pole or post ($\leq$ 10 centimeters in diameter)] is coded 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.*, GV46 equals "02" (Flip-over) or "06" (Bounce-over)]. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "51"   [Pole or post (> 10 centimeters but $\leq$ 30 centimeters in diameter)] is coded 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.*, GV46 equals "02" (Flip-over) or "06" (Bounce-over)]. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "52"   [Pole or post(> 30 centimeters in diameter)] is coded 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.*, GV46 equals "02" (Flip-over) or "06" (Bounce-over)]. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

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(4)

Variable Name: Rollover Initiation Object Contacted (cont'd.)

Code "53"   [Pole or post (diameter unknown)] is coded 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.*, GV46 equals "02" (Flip-over) or "06" (Bounce-over)]. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "54"   (Concrete traffic barrier) is coded whenever a vehicle impacts a concrete traffic barrier and that impact causes a rollover [*i.e.*, GV46 equals "02" (Flip-over), "04" (Climb-over), or "06" (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 (EV05/EV13) for examples and definitions of concrete traffic barriers.

Code "55"   (Impact Attenuator) is coded whenever a vehicle impacts a crash cushion (refer to variable Objected Contacted (EV05/EV13)) and that impact causes a rollover [*i.e.*, GV46 equals "02" (Flip-over) or "06" (Bounce-over)]. Rollovers which occur subsequent to the impact as a result of centrifugal force or other tripping mechanisms are not considered here.

Code "56"   (Other traffic barrier) is coded whenever a vehicle impacts a nonconcrete longitudinal barrier (*e.g.*, a guardrail) as defined in variable Objected Contacted (EV05/EV13) and that impact causes a rollover [*i.e.*, GV46 equals "02" (Flip-over), "04" (Climb-over), or "06" (Bounce-over)]. Rollovers which occur subsequent to the impact as a result of centrifugal force or other tripping mechanisms are not considered here.

Codes "57"   (Fence), **"58"** (Wall), and **"59"** (Building) are used whenever one of these objects is contacted and that impact causes a rollover [*i.e.*, GV46 equals "01" (Trip-over), "02" (Flip-over), "04" (Climb-over), or "06" (Bounce-over)]. Definitions of these objects are defined in variable Object Contacted (EV05/EV13). Rollovers which occur subsequent to the impact as a result of centrifugal impacts and tripping mechanisms are not considered for these codes.

Code "60"   (Ditch or Culvert) is used 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.*, GV46 equals "02" (Flip-over) or "05" (Fall-over)]. Refer to variable Objected Contacted (EV05/EV13) 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 code "61" (Ground).

Code "61"   (Ground) is used when a vehi cle rolls over as a result of contact with the ground [*i.e.*, GV46 equals "01" (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 code.

Variable Name: Rollover Initiation Object Contacted (cont'd.)

Code "62"   (Fire Hydrant) is used 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 code.

Code "63"   (Curb) includes both mountable and barrier curbs as described for variable Objected Contacted (EV05/EV13). 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 code. When a curb acts as a tripping mechanism, GV46 is coded "1" (Trip over).

Code "64"   (Bridge) is used whenever a vehicle impacts a bridge and that impact causes a rollover [*i.e.*, GV46 equals "02" (Flip-over), "04" (Climb-over), or "06" (Bounce-over)]. Refer to variable Objected Contacted (EV05/EV13) 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 code.

Code "68"   (Other fixed object) is used when a fixed object, other than those identified in codes "41" through "64", is impacted and that impact causes a rollover. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "69"   (Unknown fixed object) is used when an unknown fixed object is impacted and that impact causes a rollover. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "70"   (Passenger car, light truck, van, or other vehicle not in-transport) is used 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.*, GV46 equals "02" (Flip-over), "04" (Climb-over), or "06" (Bounce-over)]. Vehicles which rotate and rollover as a result of centrifugal forces or other tripping mechanisms are not captured in this response.

Code "71"   (Medium/heavy truck or bus not in-transport) is used when a vehicle impacts a not-in-transport medium/heavy truck or bus and that impact causes the vehicle to rollover [*i.e.*, GV46 equals "02" (Flip-over), "04" (Climb-over), or "06" (Bounce-over)]. Vehicles which rotate and rollover as a result of centrifugal forces or other tripping mechanisms are not captured in this response.

Code "76"   (Animal) is used 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.

Variable Name: Rollover Initiation Object Contacted (cont'd.)

Code "77"   (Train) is coded when a vehicle is involved in a crash with a train and the impact causes the vehicle to rollover.

Code "78"   (Trailer, disconnected in transport) is used 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 code if the vehicle rolls over subsequent to an initial impact as centrifugal forces or tripping mechanisms take priority.

Code "79"   (Object fell from vehicle in-transport) is used 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 code if the vehicle rolls over subsequent to an initial impact as centrifugal forces or tripping mechanisms take priority.

Code "88"   (Other nonfixed object) is used when a nonfixed object, other than those described in codes "71", "76", "77", or "78" is impacted and that impact causes a rollover. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "89"   (Unknown nonfixed object) is used when an unknown nonfixed object is impacted and that impact causes a rollover. Do not use this code if a vehicle rolls over subsequent to the impact as a result of centrifugal forces or other tripping mechanisms.

Code "98"   (Other event) is used when circumstances exist that cannot be captured in the element values above (*e.g.*, loadshift, high winds).

Code "99"   (Unknown object) is used when variable GV45, Rollover, equals "99" [Rollover (overturn), details unknown]. In addition, use this code if a vehicle rolled over and the cause of the rollover (tripping mechanism) cannot be determined.

Variable Name: Location on Vehicle Where Initial Principal Tripping Force is Applied

Element Values:

Blank   (GV07 = 50-99)
0   No rollover
1   Wheels/tires
2   Side plane
3   End plane
4   Undercarriage
5   Other location on vehicle (specify):
6   Non-contact rollover forces (specify):
8   Rollover — 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.

Code "0"   (No rollover) is used when variable GV45, Rollover, equals "00" [No rollover (no overturning)].

Code "1"   (Wheels/Tires) is used 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.

Code "2"   (Side plane) is used whenever the side plane other than the wheels and tires is contacted and that contact initiates the rollover.

Code "3"   (End plane) is used whenever the end plane of the vehicle is contacted and sustained the rollover initiating force. For example, a vehicle was traveling at a high rate of speed when it impacted a concrete median barrier [*i.e.*, GV48, Rollover Initiation Object Contacted, equals "54" (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 code.

Code "4"   (Undercarriage) is used when the rollover was caused by a force acting primarily through the undercarriage plane. For example, a vehicle strikes a guardrail { *i.e.*, GV48 equals "56" [Other traffic barrier (includes guardrail)]} with its front right. The vehicle climbs up and over the guardrail and rolls over; therefore use this code.

Variable Name: Location on Vehicle Where Initial Principal Tripping Force is Applied (Cont'd.)

Code "5" (Other location on vehicle) is used when the tripping force is applied at a location that cannot be captured in element values "0" through "4" or "8". This code should be rarely used and only after consultation with the zone center.

Code "6" (Non-contact rollover forces) is used when the vehicle roll is precipitated by centrifugal or gravitational forces [*i.e.*, GV46 equals "03" (Turn-over) or "05" (Fall-over)]. Specify the non-contact rollover force on the line provided.

Code "8" (Rollover — End-over-end) is used when the rollover is predominantly end-over-end (*i.e.*, primarily about the lateral axis).

Code "9" (Unknown) is used when variable GV45, Rollover, equals "99" [Rollover (overturn), details unknown]. In addition, use this code when the vehicle rolled over and the tripping point cannot be identified on the vehicle.

GV50

Variable Name: Direction of Initial Roll

Element Values:

       Blank (GV07 = 50-99)
       0   No rollover
       1   Roll right — primarily about the longitudinal axis
       2   Roll left — primarily about the longitudinal axis
       8   Rollover — 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.

Code "0"   (No rollover) is used when variable GV45, Rollover, equals "00" [No rollover (no overturning)].

Code "1"   (Roll right — primarily about the longitudinal axi s) is used when the vehicle rolls over with the right side leading, a clockwise rollover from the driver's view.

Code "2"   (Roll left — primarily about the longitudinal axis) is used when the vehicle rolls over with the left side leading, a counterclockwise rollover from the driver's view.

Code "8"   (Rollover — End-over-end) is used when the rollover is predominantly end-over-end (*i.e.*, primarily about the lateral axis).

Code "9"   (Unknown roll direction) is used when variable GV45, Rollover, equals "99" [Rollover (overturn), details unknown]. In addition, use this code when the vehicle was not inspected, or when the vehicle was inspected, but there is minimal physical evidence indicating the direction of roll.

Variable Name: Front Override/Underride (this vehicle)
Rear Override/Underride (this vehicle)

Element Values:

Blank (GV07 = 50-99)
0   No override/underride, or not an end-to-end impact between two CDS applicable vehicles, and no medium/heavy truck or bus   underride
Override (see specific CDC)
[Between 2 CDS applicable vehicles (Bodytype, GV07=1-49)]
1   1st CDC
2   2nd CDC
3   Other not automated CDC (specify):
Underride (see specific CDC)
[Between 2 CDS applicable vehicles (Bodytype, GV07=1-49)]
4   1st CDC
5   2nd CDC
6   Other not automated CDC (Specify):
7   Medium/heavy truck or bus override (of any configuration)
9   Unknown

Source: Vehicle inspection (with exceptions as noted).

Remarks:

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 SMASH purposes).

These variables are intended to capture those instances where there is an uneven damage pattern caused by uneven amounts of crush in different vertical zones of the front and/or rear planes of the vehicle. Because of the different crush stiffnesses 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 those variables an impact with a not-in-transport vehicle (either CDC applicable or a medium/heavy truck) is considered a vehicle -to-vehicle impact and not a vehicle -to-object impact.

GV51, Front Override/Underride (this vehicle), specifies the override/underride result to the vehicle which sustained the frontal impact. Similarly, GV52, Rear Override/Underride (this vehicle), encodes either override or underride to the vehicle which sustained the rear 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.)

Variable Name: Front Override/Underride (this vehicle) [cont'd.]

Rear Override/Underride (this vehicle) [cont'd.]

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.

VEHICLE #1   **VEHICLE #2**

OVERRIDE   *UNDERRIDE*
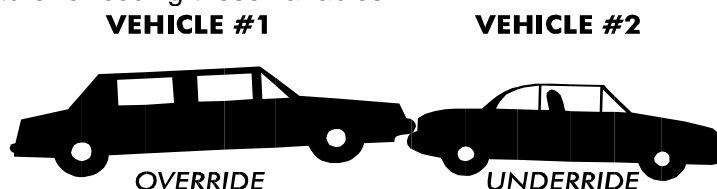
SITUATION A

GV51	*GV52*	
"1"-"3"	"0"	(VEH. #1)
"0"	"4"-"6"	(VEH. #2)

VEHICLE #1   **VEHICLE #2**

UNDERRIDE   *OVERRIDE*
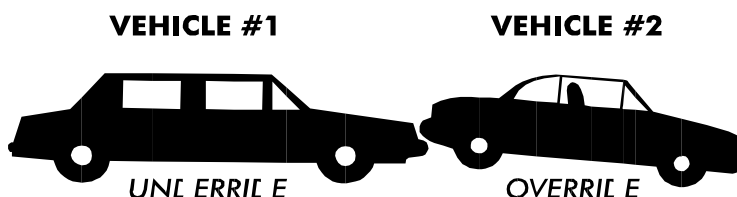
SITUATION B

GV51	*GV52*	
"4"-"6"	"0"	(VEH. #1)
"0"	"1"-"3"	(VEH. #2)

As indicated in **Situation A**, the trunk area of Vehicle #2 is damaged (*i.e.*, "crushed") while the rear bumper is relatively undisturbed. Hence, the uneven damage pattern. Conversely, the front of Vehicle #1 is "crushed" at bumper height only, or is crushed *uniformly* at the bumper and grille levels (*i.e.*, an "even" damage pattern). Even though Vehicle #1 may not exhibit the uneven damage pattern, it would still receive an applicable override code due to the resultant underride damage to Vehicle #2.

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 (Vehicle #1) may be crushed 2" rearward and the grille area may be crushed 6" rearward. While the averaging technique rule for SMASH does not apply for the different levels of crush, the impact may in fact meet the configuration rule for the override/underride variables.

When override/underride are applicable, these variables are coded based upon the corresponding CDC. Elements "1" and "4" (1st CDC) are used when EV06 - EV11, represents the override or underride damage. Elements "2" and "5" (2nd CDC) are used when EV14 -EV19 represents the override/underride damage. Elements "3" and "6" (Other not automated CDC) are used when the override/underride appears on the CDC Worksheet (**Page 3** of the Exterior Vehicle Form) but is not coded in variables EV06 -EV11 or EV14-EV19, Collision Deformation Classification.

Variable Name: Front Override/Underride (this vehicle) [cont'd.]
                     Rear Override/Underride (this vehicle) [cont'd.]

Code "0"   (No override/underride, or not an end-to-end impact) when:

☞ both vehicles are inspected and no override/underride occurred for the end-to-end impact between 2 CDS applicable vehicles ***OR***

☞ no medium/heavy truck or bus override/underride

**Codes "1"
 through "6"**   are used to record ***this CDS applicable vehicle's involvement with another CDS applicable vehicle in an end-to-end impact*** resulting in this vehicle either overriding or underriding the other involved CDS applicable vehicle.

**Code "1",
"2", or "3"**   [Override (see specific CDC)] when:

☞ this inspected vehicle is involved in an override situation, ***and***

☞ its CDC is entered in: EV06-EV11 (code "1"), EV14-EV19 (code "2"), or on the CDC Worksheet only [**Page 3** of the Exterior Vehicle Form (code "3")].

**Code "4",
"5", or "6"**   [Underride (see specific CDC)] when:

☞ this inspected vehicle is involved in an underride situation, ***and***

☞ its CDC is entered in: EV6-EV11 (code "4"), EV14-EV19 (code "5"), or on the CDC Worksheet only [**Page 3** of the Exterior Vehicle Form (code "6")].

Code "7"   (Medium/heavy truck or bus override) is used if this inspected CDS applicable vehicle's front or rear bumper was underneath (*i.e.*, underride) a medium/heavy truck or bus (GV07 = 50, 58, 59, 60-79) such that an uneven crush pattern resulted to this CDS applicable vehicle's: (1) bumper/grille area (or bumper/"trunk" area), and/or (2) the above-bumper (front or rear) and greenhouse areas. An end-to-end impact between the CDS applicable vehicle and the medium/heavy truck or bus is not necessary.

Code "9"   (Unknown) is used when:

☞ this CDS applicable vehicle was involved in an end-to-end impact configuration with another CDS applicable vehicle or with any impact with a medium/heavy truck or bus ***and:*** (1) it was ***not*** inspected, ***or*** (2) it was repaired; ***or***

☞ ***this*** vehicle is inspected but the researcher cannot determine that an override/underride occurred for this vehicle for the end-to-end impact, and the other vehicle is ***not*** inspected; ***or***

☞ the vehicle-to-vehicle impact configuration type is unknown.

Variable Name: Heading Angle for This Vehicle
Heading Angle for Other Vehicle

Element Values:

Blank   (GV07 = 50-99)
000-359 Code actual value

996   Non-horizontal impact
997   Noncollision
998   Impact with object
999   Unknown

Source: Scene diagram.

Remarks:

GV53, Heading Angle for This Vehicle, records the heading angle for this vehicle's highest delta V when this impact was with another vehicle. Variable GV54, Heading Angle for Other Vehicle, records the corresponding angle for the other vehicle. Note, for these variables, parked vehicles are considered other 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.
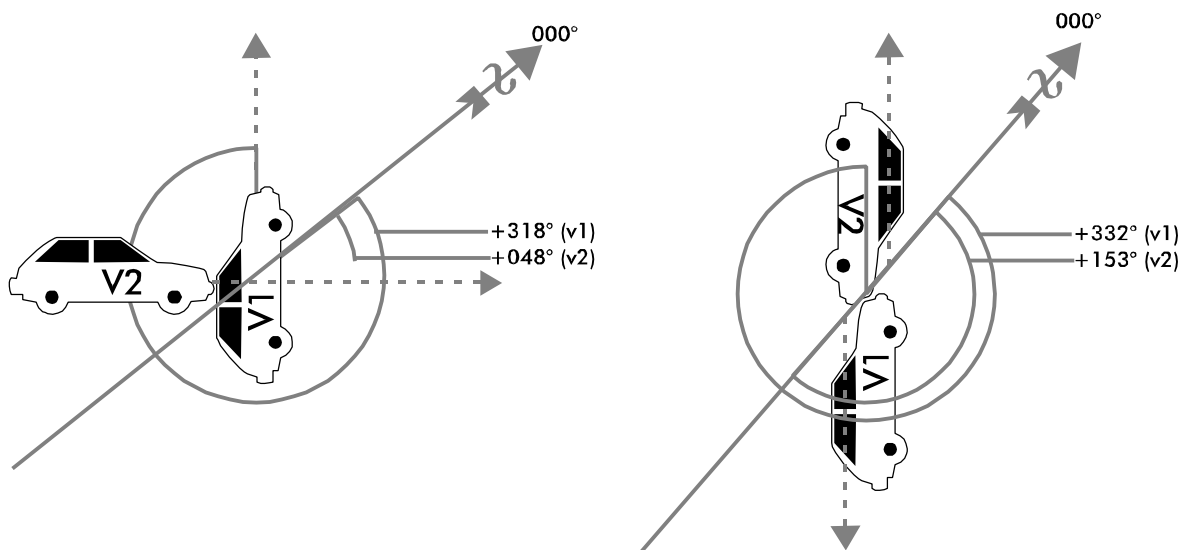
Variable Name: Heading Angle for This Vehicle (cont'd.)
Heading Angle for Other Vehicle (cont'd.)

Code "996"   (Non-horizontal impact) is used for *both* variables when the Highest Delta V for this vehicle involves a non-horizontal impact.

Code "997"   (Noncollision) is used for *both* variables when the Highest Delta V for this vehicle involves a noncollision event. See object contacted codes "31" through "39" for variable AC16 et al., Vehicle Number or Object Contacted, for identification of noncollision events (*e.g.*, rollover). Rollovers, though involving non-horizontal forces, are to be coded under noncollision.

Code "998"   (Impact with object) is used for *both* variables when a collision with an object (EV05, Object Contacted, equals "41"-"69" or "72"-"98") results in this vehicle's highest delta V.

Code "999"   (Unknown) is used *only* for vehicle-to-vehicle collisions and for *both* variables when either vehicle's impact position cannot be approximated on the scene diagram.

GV55

Variable Name: Towed Trailing Unit

Element Values:

       Blank   (GV07 = 50-99)
       0   No towed unit
       1   Yes — towed trailing unit
       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 coded "1" (Yes — towed trailing unit), then enter the weight of the trailer as well as any cargo it may be carrying in variable GV44, Vehicle Cargo Weight.

Code "0"   (No towed unit) is used when a trailing unit is not being towed by this CDS applicable vehicle.

Code "1"   (Yes — towed trailing unit) is used when a trailing unit is being towed by this CDS applicable vehicle.

Code "9"   (Unkno wn) is used when it is uncertain whether code "0" or "1" applies.

GV56

Variable Name: Documentation of Trajectory Data for This Vehicle

Element Values:

>   Blank   (GV07 = 50-99)
>   0   No
>   1   Yes

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

The purpose of this variable is to assess the availability of crash induced physical evidence for impact and final rest, including multiple impacts.

Code "0"   (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 (EV06-EV11, Collision Deformation Classification).

Code "1"   (Yes) is used 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 SMASH 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" ("1") 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 nonhorizontal and/or rollover type collision is the highest delta V impact for this vehicle, code "Yes" ("1") 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. Approximated does not mean guesstimated.

Variable Name: Post Collision Condition of Tree or Pole
(for Highest Delta V)

Element Values:

Blank   (GV07 = 50-99)
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   Separated pole from base
7   Pole replaced
8   Other (specify):
9   Unknown

Source: Scene inspection and PAR.

Remarks:

Codes "1"   through "8" are used when EV05, Object Contacted, is encoded "41" [Tree ($\leq$ 10 centimeters in diameter)], "42" [Tree (> 10 centimeters in diameter)], "45" [Breakaway pole or post (any diameter)], or "50"-"53" (Nonbreakaway Pole or Post).

Code "0"   [Not collision (for highest delta V) with tree or pole] is used when the EV05, Object Contacted, that produced this vehicle"s highest delta V is not a tree or pole (*e.g.*, vehicle-to-vehicle collision).

Code "1"   (Not damaged) is used when the tree or pole has no visible damage or minor surface damage.

Code "2"   (Cracked/sheared) describes a pole or tree that 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 code takes precedence over codes "3" (Tilted < 45 degrees), "4" (Tilted $\geq$ 45 degrees), and "5" (Uprooted tree). Fallen limbs do not constitute "cracked" for a tree; the assessment is made at the tree's trunk. This code *does not* describe metal breakaway poles sheared at their base [see code "6" (Separated pole from base)].

Code "3"   (Tilted < 45 degrees) describes a 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 code "2" (Cracked/sheared).

Code "4"   (Tilted $\geq$ 45 degrees) describes a 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 code "2" (Cracked/sheared).

Code "5"   (Uprooted tree) describes a tree that was completely or partially torn out of the ground; the tree trunk remained intact; however, the root system was pulled from the soil.

Variable Name: Post Collision Condition of Tree or Pole
(for Highest Delta V) [cont'd.]

Code "6"   (Separated pole from base) describes a breakaway pole that has sheared or separated at the point where it was designed to do so.

Code "7"   (Pole replaced) is used when a replacement pole has been installed and insufficient data exist to categorize the damage to the original pole. This code takes precedence over code "9" (Unknown).

Code "8"   (Other) describes pole or tree damage that cannot be captured by the preceding codes.

Code "9"   (Unknown) is used when no data can be obtained regarding the pole or tree.

DELTA V, BARRIER EQUIVALENT AND SPEED ESTIMATE
DECISION RULES

1. First, use the SMASH program Damage or Damage & Trajectory routines, if applicable (GV58=01 or 02), and code the reconstruction variables GV59-62 as calculated by the program, Impact Speed GV63 as calculated by the Damage and Trajectory routine only (i.e., GV58=02), GV63=998 when GV58=01 or 03 and GV63 = unknown for all other situations. Code GV58 and GV64 as appropriate. Code Barrier Equivalent speed, GV65, as calculated by the program. Code the Estimated Highest Delta V, GV66=0.

2. If you have one known vehicle and one partially known vehicle (e.g., known CDC but not crush profile) use the SMASH damage routine. If the results look reasonable code GV58=03, GV59-63=calculated results, GV64=1-4, GV65= calculated results and the Estimated Highest Delta V, GV66=0. If the results **don't** look reasonable type in "MISSING" in place of the partially known vehicle's CDC and use the missing vehicle option. If these results look reasonable code them in the same manner as with the CDC run above.

3. For car/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 SMASH damage routine and treat the object as a rigid barrier. If the results look reasonable code GV58=4,6 or 9, GV59-63=as unknown, GV64=0 and code

GV65 **Barrier Equivalent Speed = calculated result for Total Delta V**. Code GV66=0.

4. For car/car or car/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 SMASH damage routine to get an estimated Delta V. For these impacts, code GV58="11", GV59-GV63 & GV65 as unknown, GV64="0" and code GV66 =1-5 based on the calculated results .

5. For cases where there are two or more significant impacts with overlapping or masking of damage such that individual crush profiles cannot be obtained code GV58="10", GV59-GV63 & 65 as unknown, GV64="0", and GV66= Minor, Moderate, or Severe based on what was considered to be the most severe impact.

   NOTE: For car/carimpacts where one car is known and the other has masked damage as described above, treat the masked vehicle as a missing vehicle and use missing vehicle optionwhen applicable.

6. For sideswipe, severe override/underride, undercarriage, non-horizontal and rollover type impacts code GV58=5-8, GV59-63 & 65 as unknown, GV64=0 and GV66 as "Minor", "Moderate" or "Severe".

7. Definitions for Minor, Moderate, or Severe:

   Rollover — damage assessment priority shall be given to passenger compartment.

   ### Top Plane
   Code 6   (Minor) is coded when there is surface scratching or dents; includes CDC extent zones 1 and 2.

   Code 7   (Moderate) is coded when the passenger compartment crush extends into CDC extent zone 3.

   Code 8   (Severe) is coded when the passenger compartment crush is greater than CDC extent zone 3.

   ### Side Plane
   Code 6   (Minor) is coded when there is surface scratching or dents with no passenger compartment intrusion.

   Code 7   (Moderate) is coded when there is 25 cm (10 inches) or less passenger compartment intrusion.

   Code 8   (Severe) is coded when there is greater than 25 cm (10 inches) passenger compartment intrusion.

Swiping Type Impacts
   Code 6   (Minor) is coded when there is minor crush that does not result in passenger compartment intrusion.

   Code 7   (Moderate) is coded when the crush extends beyond the side door impact protection (*i.e.*, door beam) that can result in up to 25cm (10 inches) passenger compartment intrusion.

   Code 8   (Severe) is coded when the crush results in greater than 25 cm (10 inches) passenger compartment intrusion.

Severe Override/underride Impacts

Code 6 (Minor) is coded when only the hood/trunk and top of fenders are involved and there is no passenger compartment intrusion.

Code 7 (Moderate) is coded when only the hood/trunk and top of fenders are involved and there is minimal passenger compartment intrusion.

Code 8 (Severe) is coded when only the hood/trunk and top of fenders are involved and there is major passenger compartment intrusion.

Undercarriage Impacts

Code 6 (Minor) is coded when it is a swiping type impact with surface scratching or dents.

Code 7 (Moderate) is coded when modest crush or bending occurs.

Code 8 (Severe) is coded when significant crush or bending occurs.

Overlapping (Masked) Impacts

Code 6 (Minor) is coded when the crush attributed to the most severe impact (via estimate) is less than 10 cm.

Code 7 (Moderate) is coded when the crush attributed to the most severe impact (via estimate) is 10cm-35cm.

Code 8 (Severe) is coded when the crush attributed to the most severe impact (via estimate) is greater than 35cm.

Other Non-Horizontal Impacts

Code 6 (Minor) is coded when the crush is less than 10 cm.

Code 7 (Moderate) is coded when the crush is 10cm-35cm.

Code 8 (Severe) is coded when the crush is greater than 35cm.

8. If no vehicle inspections were obtained, then code 63, 65 & 66 as unknown and GV64=0

SMASH

The SMASH program is designed to handle a single two dimensional vehicle to vehicle or vehicle to large object that resembles a barrier collision, an instantaneous (80 to 150 milliseconds) common velocity must be obtained, the stiffness parameters match the vehicle size and stiffness model, and the crush information must be known. Because of these assumptions, the following collisions cannot be run on SMASH.

- ☞ rollovers
- ☞ yielding fixed objects
- ☞ Stiffness altered (e.g., snowplow blade, excessive corrosion, non-OEM bumpers).
- ☞ sideswipes
- ☞ nonhorizontal forces
- ☞ severe override/underride
- ☞ undercarriage damage
- ☞ collisions with moving trains/large trucks
- ☞ collisions with animals/pedestrians/cyclists
- ☞ insufficient data (vehicle inspection required: see SMASH Missing Vehicle)
- ☞ multiple impacts to the same area.

Damage Algorithm (SMASH)

The damage algorithm is the most often used portion of SMASHPC. This subroutine can be used when scene data are not available to generate a speed change. Because the delta V is based entirely on vehicle deformation, care must be taken to provide accurate information.

Shown on the next page in **Example A** is an output from a damage only run. The detailed output printout is obtained by selecting **OUTPUT** from the main menu, **DETAIL** from the output menu, and **PRINTER** from the submenu. Next, select **GRAPHICS** from the main menu, **SHOW DAMAGE** from the submenu, and press **P** on the keyboard.

Example A

SUMMARY OF SMASH RESULTS USING DAMAGE

	SPEED CHANGE (DAMAGE)	
VEHICLE #1		
TOTAL	29 KMPH (18 MPH)	
LONGITUDINAL	-29 KMPH (-18 MPH)	
LATITUDINAL	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)	
LATITUDINAL	0 KMPH (0 MPH)	
PDOF ANGLE	-180 DEGREES	
ENERGY DISSIPATED = 64964 JOULES (47908 FT-LB)		

Trajectory Algorithm (SMASH)

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 (*e.g.*, head-on, rear-end)] collisions or a Conservation of Linear Momentum solution in angular collisions. 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 (SMASH)

1. The axial collision solution is used when the initial velocity vectors are wit hin ten degrees of parallel. Examples of use in SMASH 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 show impact speed (spinout and damage). These results are not coded. The program produces only one estimate [SPEED CHANGE (DAMAGE)] of delta V, which should be coded, if reasonable.

Example B

SUMMARY OF SMASH RESULTS USING DAMAGE

PSU99 CASE # 001B	85 OLDS 98 AND 85 OLDS FIRENZA		Head on
	SPEED CHANGE (DAMAGE)	IMPACT SPEED (DAMAGE AND SPINOUT)	

VEHICLE #1

TOTAL	41 KMPH (26 MPH)	44 KMPH (28 MPH)	
LONGITUDINAL	-41 KMPH (-25 MPH)	44 KMPH (28 MPH)	
LATITUDINAL	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)	
LATITUDINAL	9 KMPH (6 MPH)	0 KMPH (0 MPH)	
PDOF ANGLE	-10 DEGREES		
ENERGY DISSIPATED = 116586 JOULES (85978 FT-LB)			

DAMAGE DATA		
	VEHICLE #1	**VEHICLE #2**
SIZE CATEGORY	4	2
STIFFNESS CATEGORY	9	9
VEHICLE WEIGHT	1497 KGS (3300 LBS)	1161 KGS (2560 LBS)
CDC	12FDEW3	12FDEW3
PDOF ANGLE	-10 DEGREES	-10 DEGREES
CRUSH LENGTH	178 CM. (70 IN.)	152 CM. (60 IN.)
C1 (POINT 1)	66 CM. (26 IN.)	76 CM. (30 IN.)
C2 (POINT 2)	56 CM. (22 IN.)	71 CM. (28 IN.)
C3 (POINT 3)	51 CM. (20 IN.)	61 CM. (24 IN.)
C4 (POINT 4)	43 CM. (17 IN.)	46 CM. (18 IN.)
C5 (POINT 5)	25 CM. (10 IN.)	15 CM. (6 IN.)
C6 (POINT 6)	0 CM. (0 IN.)	0 CM. (0 IN.)
D (CRUSH OFFSET)	0 CM. (0 IN.)	0 CM. (0 IN.)

2. The conservation of linear momentum solut ion is used for angle collisions (greater than ten degrees from parallel). The execution of the reconstruction program produces two independent estimates of delta V. The two results will seldom be precisely equal. The total, longitudinal, and lateral delta Vs associated with speed change " *damage*" and **"linear momentum and trajectory**" are each compared. Experience indicates that a satisfactory agreement exists between two estimates when their delta V components differ by no more than 4 kmph or ten (10) percent, whichever is greater, and the angles are within the same o'clock direction. Be sure, when comparing delta Vs, to compare the V_1 total delta V due to "damage" with the V_1 total delta V due to "linear momentum and spinout". Likewise, make the same comparison for V_1 longitudinal delta V, etc. When the agreement is not satisfactory, the data associated with each option should be reviewed for accuracy.

Example C

SUMMARY OF SMASH RESULTS USING TRAJECTORY

PSU 99 Case No. 103D	85 Olds 98 and 85 Olds Firenza				Angle	
	SPEED CHANGE (DAMAGE)		SPEED CHANGE (LINEAR MOMENTUM AND TRAJECTORY)		IMPACT SPEED (LINEAR MOMENTUM AND TRAJECTORY)	
VEHICLE #1						
TOTAL	27 KMPH	(17 MPH)	29 KMPH	(18 MPH)	41KMPH	(25 MPH)
LONGITUDINAL	-21 KMPH	(-13 MPH)	-23 KMPH	(-14 MPH)	41 KMPH	(25 MPH)
LATITUDINAL	17 KMPH	(11 MPH)	18 KMPH	(11 MPH)	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)						

Shown above in **Examples B and C** are portions of the detailed output printout from one axial (**Example B**) and one angular (**Example C**) damage and trajectory run. The Total, Longitudinal, and Lateral speed changes of LINEAR MOMENTUM AND TRAJECTORY are each compared to the DAMAGE results. 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 results encoded in variables GV59 -GV63 (... Delta V) on the General Vehicle Form. If agreement cannot be reached between the two methods, the case is flagged for special review by the zone center.

GV58-GV63

(5)

SMASH MISSING VEHICLE

When the SMASH Missing Vehicle Program is applicable, the SMASH Program Summary form should be completed by the researcher and submitted with the case report.

This program is designed to handle vehicle -to-vehicle impacts when data on one of the vehicle's are missing.

Since the SMASH algorithm is based on the SMASH program the same basic SMASH assumptions must not be violated. Due to violations in the basic SMASH assumptions or the collision condition being outside of the scope of the Missing Vehicle Algorithm, the following collision types are *not* applicable to the Missing Vehicle Algorithm.

- ☞ Side-to-side collisions
- ☞ Sideswipe
- ☞ Severe underride/override
- ☞ Nonhorizontal force
- ☞ Undercarriage damage
- ☞ Collisions with vehicles "out of sc ope" (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. Approximate "D" dimension
3. Curb weight ($\pm$ 90 kilograms)
4. Heading angle at impact (approximate)
5. Area of damage (third character of CDC — "Area of Deformation")

Warnings:

(1) When using The Missing Vehicle Algorithm algorithm for pickups and vans, you must know additional information for a valid run.
    a. Wheelbase [to determine size and stiffness (side impacts)]
    b. Curb weight ($\pm$ 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 Missing Vehicle Algorithm 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.

GV58-GV63

(6)

Table Of Weights To Be Used For Known Occupants With Unknown Weight

For known occupants with unknown weights, use the occupant's age or age group in the table below to determine the appropriate weight to add.*

(All Weights Are In Kilograms)

Age	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Male	8	12	14	16	18	20	22	25	28	30	35	37	43	49
Female	7	11	13	15	17	19	21	24	28	30	34	40	45	49

Age	14	15	16	17	18	19		20-24	25-34	35-44	45-54	55-64	65-97
Male	56	60	64	66	70	69		72	78	80	79	78	74
Female	53	54	56	59	57	57		58	61	64	66	65	65

Age Group	Child (0-12)	Adolescent (13-17)	Adult (18-97)
Male	23**	61**	77
Female	23***	54**	63

Sources of Information:

National Center for Health Statistics, M. F. Najjar and M. Rowland: Anthropometric Reference Data and Prevalence of Overweight: United States, 1976-1980. *Vital and Health Statistics.* Series 11, Number 238. DHHS Publication Number (PHS)87-1688. Public Health Service. Washington. U.S. Government Printing Office, October 1987. Data are from Tables 3-5, 12-14, and 18 on pages 14-16, 23-25, and 29; the original data are based on 50th percentile rounded to the nearest pound. All weights were subsequently converted to kilograms.

** Originally based on 6 and 7 year olds rounded to the nearest 5 pounds. All weights were subsequently converted to kilograms.

*** Originally based on 15 year olds rounded to the nearest 5 pounds. All weights were subsequently converted to kilograms.

Variable Name: Basis for Total (Resultant) Delta V (highest)

Element Values:

> Blank (GV07 = 50-99)
> 00 No vehicle inspection
>
> **Delta V Calculated**:
> 01 Reconstruction program - damage only routine
> 02 Reconstruction program - damage and trajectory routine
> 03 Missing vehicle algorithm
>
> **Delta V Not Calculated**
> 04 At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions. All vehicles within scope (CDC applicable) of reconstruction program but one of the collision conditions is beyond the scope of the reconstruction program or other acceptable reconstruction techniques, regardless of the adequacy of damage data.
> 05 Rollover
> 06 Other non-horizonal forces
> 07 Sideswipe type damage
> 08 Severe override
> 09 Yielding object
> 10 Overlapping damage
> 11 All vehicle and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available (specify):
> 98 Other (specify):

Source: Researcher determined — inputs include SMASH output (if applicable), vehicle inspection, scene inspection, police report, and photographs.

Remarks:

This variable is used to indicate: (1) which reconstruction program or routine was used to compute this vehicle's highest delta V [results encoded in GV59-63 (. . . Delta V)], or (2) the reason a reconstruction program was not applied to the most severe impact.

Code "00" (No vehicle inspection) means that no vehicle inspection was obtained.

Code "01" (Reconstruction program - damage only routine) means the reconstruction output (encoded in GV59-GV62) is based upon vehicle damage only.

Variable Name: Basis for Total (Resultant) Delta V (highest) (cont'd.)

Code "02" (Reconstruction program — damage and trajecto ry routine) means that the SMASH output (encoded in GV59-GV63) is based on trajectory evidence documented at the scene, in addition to vehicle damage.

Code "03" (Missing vehicle algorithm) 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 SMASH Missing Vehicle algorithm. These results will be coded by the zone center.

Code "04" (At least one vehicle ... is beyond the scope ....) means that one of the vehicles (which may be *this* vehicle) involved in this vehicle's most severe collision 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 CDC is not applicable for an acceptable reconstruction program.

Code "05" (Rollover) means that the involved vehicle fits the vehicle parameters for an acceptable reconstruction program; however, the rollover collision is beyond the scope of the program.

Code "06" (Other non-horizontal force) means that the involved vehicle fits the vehicle parameter for an acceptable reconstruction program; however, the other non-horizontal force is beyond the scope of the program [*e.g.*, non rollover with Direction of Force (EV06) coded 00].

Code "07" (Sideswipe type damage) means that the involved vehicle fits the vehicle parameters for an acceptable reconstruction program; however, the sideswipe type of collision is beyond the scope of the program.

Code "08" (Severe override) means that the involved vehicle fits the vehicle parameters for an acceptable reconstruction program; however, the severe override type of collision is beyond the scope of the program.

Code "09" (Yielding object) means that the involved vehicle fits the vehicle parameters for an acceptable reconstruction program; however, the collision with a yielding object (*e.g.*, sheared utility pole) is beyond the scope of the program.

Code "10" (Overlapping damage) means that the involved vehicle fits the vehicle parameters for an acceptable reconstruction program; however, collisions involving overlapping damage (*i.e.*, multiple impacts in the same area) are beyond the scope of the program.

Code "11" [... insufficient data available (specify):] means that the involved vehicles and the collision type are applicable for an acceptable reconstruction program ("01" through "03" above), but due to insufficient data on one (or both) of the vehicles (or object), an acceptable reconstruction program ("01" through "03" above) cannot be used.

Code "98" [Other (specify):] means that Delta V could not be calculated for a reason not identified in codes "04"-"11". The reason must be specified on the line provided.

Variable Name: Total Delta V (kmph)

Element Values:

Range: 000 through 160, 999, Blank
            Blank   (GV07 = 50-99)
            Nearest kmph
            000   Less than 0.5 kmph
            160   159.5 kmph and above
            999   Unknown

Source: Reconstruction program.

Remarks:

Code the Total Delta V from the results generated by the reconstruction program for this vehicle's most severe impact. This delta V must be for the same impact coded in Highest Delta V (EV04-EV11, Collision Deformation Classification).

Code "999"   (Unknown) is used when the results for the most severe impact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12 -EV19, Collision Deformation Classification), then enter the Total Delta V as shown in the results on the General Vehicle Form in the space available in the secondary (noncoded) column.

Variable Name: Longitudinal Component of Delta V (kmph)

Element Values:

Range: -160 to -001, _000, +001 to +160, _999, Blank
                     Blank   (GV07 = 50-99)
                     Nearest kmph
                     _000   Greater than -0.5 kmph and less than +0.5 kmph
                     +160   ≥159.5 kmph and above
                     _999   Unknown

Source: Reconstruction program.

Remarks:

Code the Longitudinal Component of Delta V from the results generated by the reconstruction program for this vehicle's most severe impact. This delta V must be for the same impact coded in the Highest Delta V (EV04 -EV11, Collision Deformation Classification).

A plus (+) or minus (-) sign must be circled when encoding a value from a reconstruction program. Codes " 000" (Greater than -0.5 kmph and less than +0.5 kmph) and " 999" (Unknown) do not require a sign to be circled.

Code "999"   (Unknown) is used when the results for the most severe i mpact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12 -EV19, Collision Deformation Classification), then enter the Longitudinal Component of Delta V as shown in the results on the General Vehicle Form in the space available in the secondary (noncoded) column.

Variable Name: Lateral Component of Delta V   (kmph)

Element Values:

Range: -160 to -001, _000, +001 to +160, _999, Blank
                   Blank   (GV07 = 50-99)
                   Nearest kmph
                   _000   Greater than -0.5 kmph and less than +0.5 kmph
                   ±160   ≥159.5 kmph and above
                   _999   Unknown

Source: Reconstruction program.

Remarks:

Code the Lateral Component of Delta V from the results generated by the reconstruction program for this vehicle's most severe impact. This delta V must be for the same impact coded in Highest Delta V (EV04 -EV11, Collision Deformation Classification).

A plus (+) or minus (-) sign must be circled when encoding a value from a reconstruction program. Codes " 000" (Greater than -0.5 kmph and less than +0.5 kmph) and " 999" (Unknown) do not require a sign to be circled.

Code "_999"   (Unknown) is used when the results for the most severe impact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12 -EV19, Collision Deformation Classification), then enter the Lateral Component of Delta V as shown in the results on the General Vehicle Form in the space available in the secondary (noncoded) column.

Variable Name: Energy Absorption

Element Values:

Range: 0000 through 9997, 9999, Blank
Blank   (GV07 = 50-99)
Nearest 100 joules
0000   Less than 50 joules
9997   999,650 joules or more
9999   Unknown

Source: Reconstruction program.

Remarks:

Code the Energy Absorption from the results generated by the reconstruction program for this vehicle's most severe impact. This amount of energy must be for the same impact coded in Highest Delta V (EV04-EV11, Collision Deformation Classification).

Code "9997"   (999,650 joules or more) if the reconstruction program is used and the amount of energy absorbed equals or exceeds 999,650 joules.

Code "9999"   (Unknown) is used when the results for the most severe impact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12 -EV19, Collision Deformation Classification), then enter the Energy Absorption as shown in the results on the General Vehicle Form in the space available in the secondary (noncoded) column.

Variable Name: Impact Speed

Element Values:

Range: __000, 001 to 160, 998, 999, Blank
Blank (GV07 = 50-99)
Nearest kmph
000   less than 0.5 kmph
160   ≥ 159.0 kmph and above
998   Trajectory algorithm not run
999   Unknown

Source: Reconstruction program — damage and trajectory routine

Remarks:

Code the Impact Speed from the results generated by the damage and trajectory reconstruction program for this vehicle's most severe impact. This amount of energy must be for the same impact coded in Highest Delta V (EV04-EV11, Collision Deformation Classification).

Code "998"   (Trajectory algorithm not run) is used when the trajectory algorithm of the reconstruction program is not run. This includes collisions for which a damage only reconstruction or the Missing Vehicle Algorithm reconstruction is applicable. Code "998" only when GV58 [Basis for Total (Resultant) Delta V (highest)] is equal to "1" or "3".

Code "999"   (Unknown) is used when the results for the most severe impact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12-EV19, Collision Deformation Classification), then enter the impact speed as shown in the results on the General Vehicle Form in the space available in the secondary (non-coded) column.

Variable Name: Confidence in Reconstruction Program Results
(for Highest Delta V)

Element Values:

Blank   (GV07 = 50-99)
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

Source: Researcher determined from reconst ruction program results, vehicle inspection, scene inspection, and injury data.

Remarks:

Determine the quality of this vehicle's reconstruction program by evaluating the results of the reconstruction program and the data used to create those results for the Highest Delta V (EV04-EV11, Collision Deformation Classification). The vehicle inspection, scene inspection, and the injury information must all be reviewed for this determination.

Code "0"   (No reconstruction) is used if no reconstruction program was used to determine the Highest Delta V (EV04-EV11, Collision Deformation Classification).

Code "1"   (Collision fits model - results appear reasonable) is used if the results of the reconstruction in comparison to the actual collision are believed to be within an acceptable range for the Highest Delta V (EV04-EV11, Collision Deformation Classification).

Code "2"   (Collision fits model - results appear high) is used if the results of the reconstruction in comparison to the actual collision appear to over represent the Highest Delta V (EV04-EV11, Collision Deformation Classification) for this vehicle. For example, vehicle damage is minor (bumper stroke only), and the total delta V is 25 kmph.

Code "3"   (Collision fits model - results appear low) is used if the results of the reconstruction in comparison to the actual collision appear to under represent the Highest Delta V (EV04-EV11, Collision Deformation Classification) for this vehicle. 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.

Code "4"   (Borderline reconstruction - results appear reasonable) is used if the results of the reconstruction in comparison to the actual collision are within an acceptable range for the Highest Delta V (EV04- EV11, Collision Deformation Classification) for this vehicle; however, some collision conditions were borderline for reconstruction.

Use this code for all *uninspected* vehicles whose delta V is determined by the SMASH Missing Vehicle.

Variable Name: Barrier Equivalent Speed

Element Values:

Range: 000, 001 to 160, 999, Blank
Blank (GV07 = 50-99)
Nearest kmph
000 less than 0.5 kmph
160 ≥ 159.0 kmph and above
999 Unknown

Source: Reconstruction program.

Remarks:

Code the Barrier Equivalent speed from the SMASH results for this vehicle's most severe impact. This speed must be for the same impact coded in Highest Delta V (EV04-EV11, Collision Deformation Classification).

To generate Barrier Equivalent speed, GV65, SMASH program is utilized. . For these runs treat stuck object as an immovable barrier. Code the total Delta V as the Barrier Equivalent Speed.

For car/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 SMASH program and treat the object as a rigid barrier and code GV65, Barrier Equivalent Speed = the total Delta V calculated by the program.

Code "999" (Unknown) is used when the results for the most severe impact are unobtainable. If the CDC associated with the reconstruction program was only entered in Second Highest Delta V (EV12-EV19, Collision Deformation Classification), then enter the Barrier Equivalent Speed as shown in the results on the General Vehicle Form in the space available in the secondary (noncoded) column.

Variable Name: Estimated Highest Delta V (Researcher Determined)

Element Values:

> **Blank (GV07 = 50-99)**
> 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
> 9   Unknown

Source: Researcher determined.

Remarks:

The purpose of this variable is to record an estimate of the Delta V for those situations where a reconstruction program (including the Barrier Equivalent Speed) cannot be utilized (*e.g.*, overlapping damage, crush profile not measured, severe underride/override, swiping, or rollover type impacts)

For car/car or car/object impacts where a crush profile is roughly estimated or you only have a CDC (*e.g.*, partially repaired vehicle, only have photos of the damage, etc.), use the SMASH program to get an estimated Delta V. Code GV66 based on the program results.

For cases where there are two or more significant impacts with overlapping or masking of damage such that individual crush profiles cannot be obtained code GV66=Minor, Moderate, or Severe based on what was considered to be the most severe impact.

Rollover — damage assessment priority shall be given to passenger compartment.

Top Plane
Code 6   (Minor) is coded when there is surface scratching or dents; includes CDC extent zones 1 and 2.

Code 7   (Moderate) is coded when the passenger compartment crush extends into CDC extent zone 3.

Code 8   (Severe) is coded when the passenger compartment crush is greater than CDC extent zone 3.

Variable Name: Estimated Highest Delta V (Researcher Determined) (cont'd)

Side Plane
Code 6   (Minor) is coded when there is surface scratching or dents with no passenger compartment intrusion.

Code 7   (Moderate) is coded when there is 25 cm (10 inches) or less passenger compartment intrusion.

Code 8   (Severe) is coded when there is greater than 25 cm (10 inches) passenger compartment intrusion.

Swiping Type Impacts
Code 6   (Minor) is coded when there is minor crush that does not result in passenger compartment intrusion.

Code 7   (Moderate) is coded when the crush extends beyond the side door impact protection (*i.e.*, door beam) that can result in up to 25cm (10 inches) passenger compartment intrusion.

Code 8   (Severe) is coded when the crush results in greater than 25 cm (10 inches) passenger compartment intrusion.

Severe Override/underride Impacts
Code 6   (Minor) is coded when only the hood/trunk and top of fenders are involved and there is no passenger compartment intrusion.

Code 7   (Moderate) is coded when only the hood/trunk and top of fenders are involved and there is minimal passenger compartment intrusion.

Code 8   (Severe) is coded when only the hood/trunk and top of fenders are involved and there is major passenger compartment intrusion.

Undercarriage Impacts
Code 6   (Minor) is coded when there is a swiping type impact with surface scratching or dents.

Code 7   (Moderate) is coded when modest crush or bending occurs.

Code 8   (Severe) is coded when severe crush or bending occurs .

Overlapping (Masked) Impacts
Code 6   (Minor) is coded when the crush attributed to the most severe impact (via estimate) is less than 10 cm.

Code 7   (Moderate) is coded when the crush attributed to the most severe impact (via estimate) is 10cm-35cm .

Code 8   (Severe) is coded when the crush attributed to the most severe impact (via estimate) is greater than 35cm .

Other Non-Horizontal Impacts

Code 6   (Minor) is coded when the crush is less than 10 cm (4 in).

Code 7   (Moderate) is coded when the crush is 10cm-35cm.

Code 8   (Severe) is coded when the crush is greater than 35cm.

If no vehicle inspections were obtained, then code GV 59-63, 65 & 66 as unknown and GV64=0.

If a reconstruction program is utilized to calculate the highest delta V for this vehicle use code "0" (Reconstruction delta V coded).

Variable Name: Type of Vehicle Inspection

Element Values:

>   Blank (GV07 = 50-99)
>   0   No inspection
>   1   Vehicle fully repaired — no damage evident
>   2   Partial inspection (specify):
>   3   Complete inspection

Source: Researcher determined.

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

Code "0"   (No inspection) is used when neither a complete nor a partial inspection of this vehicle was obtained, irrespective of the reason (*e.g.*, refusal, not required, etc.)

Code "1"   (Vehicle fully repaired — no damage evident) is used when a vehicle is inspected, but is completely repaired and no exterior or interior damage data is available.

Code "2"   (Partial inspection) is used when any phase of the inspection is not completed. This code includes inspection of partially or entirely repaired vehicles and non-towed CDS applicable vehicles when no Interior Vehicle Forms are required.

Code "3"   (Complete inspection) is used when both the exterior and the interior of the unrepaired vehicle were inspected and all applicable measurements and photographs were obtained.

Variable Name: Delta V Event Number

Element Values:

>   Blank (GV07 = 50-99)
>   Code the accident event sequence number that resulted in the Delta V that has
>   been coded above for this vehicle
>
>   99   Unknown

Source: Researcher determined.

Remarks: Indicate the accident event number for the event that resulted in the Delta V that
                has been coded. An event number must be coded if GV66 (Estimated Highest
                Delta V) has been coded with "0" (Reconstruction Delta V coded), "1", "2", "3", "4",
                "5" (Estimated Delta V), or "6", "7", or "8" (Other estimates of damage severity). If
                a Delta V, or its estimate is known, than the event resulting in the Delta V is
                known or presumed.

Code "99"   (Unknown) is used when there is no indication of De lta V coded. (See remarks,
                above.)

EXTERIOR VEHICLE FORM

1. Primary Sampling Unit Number ___ ___

2. Case Number - Stratum ___ ___ ___ ___

3. Vehicle Number ___ ___

VEHICLE IDENTIFICATION

VIN ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Model Year ___ ___

Vehicle Make (specify): _____

Vehicle Model (specify): _____

LOCATOR

Locate the end of the damage with respect to the vehicle's damaged center point or bumper corner for end impacts or an undamaged axle for side impacts.

Specific Impact No.	Location of Direct Damage	Location of Field L	Location of Max Crush

CRUSH PROFILE IN CENTIMETERS

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

Specific Impact Number	Plane of Impact C-Measurements	Direct Damage Width (CDC)	Direct Damage Max Crush	Field L	C_1	C_2	C_3	C_4	C_5	C_6	$\pm D$

HS Form 435A (Rev. 1/1997)

ORIGINAL SPECIFICATIONS WORK SHEET

Wheelbase	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Overall Length	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Maximum Width	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Curb Weight	__ __,__ __ __ pounds	x .4536	=	__,__ __ __ kg
Average Track	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Front Overhang	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Rear Overhang	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Undeformed End Width	__ __ __.__ inches	x 2.54	=	__ __ __ cm
Engine Size: cyl./displ.	__ __ __ __ cc	x .001	=	__.__ L
	__ __ __ CID	x .0164	=	__.__ L

VEHICLE DAMAGE SKETCH

TIRE—WHEEL DAMAGE

a. Rotation physically restricted   b. Tire deflated

RF ____	RF ____
LF ____	LF ____
RR ____	RR ____
LR ____	LR ____

(1) Yes (2) No (8) NA (9) Unk.

TYPE OF TRANSMISSION

☐ Manual   ☐ Automatic

END SHIFT ≥ 10 CM
☐ Yes   ☐ No

ORIGINAL SPECIFICATIONS

Wheelbase	_____	cm
Overall Length	_____	cm
Maximum Width	_____	cm
Curb Weight	_____	kg
Average Track	_____	cm
Front Overhang	_____	cm
Rear Overhang	_____	cm
Undeformed End Width	_____	cm
Engine Size: cyl./displ.	_____	L

WHEEL STEER ANGLES

(For locked front wheels or displaced rear axles only)

RF	±	_____	°
LF	±	_____	°
RR	±	_____	°
LR	±	_____	°

Within ± 5 degrees

DRIVE WHEELS

☐ FWD ☐ RWD ☐ 4WD

Approximate
Cargo Weight _____ kg

MEASUREMENTS IN CENTIMETERS
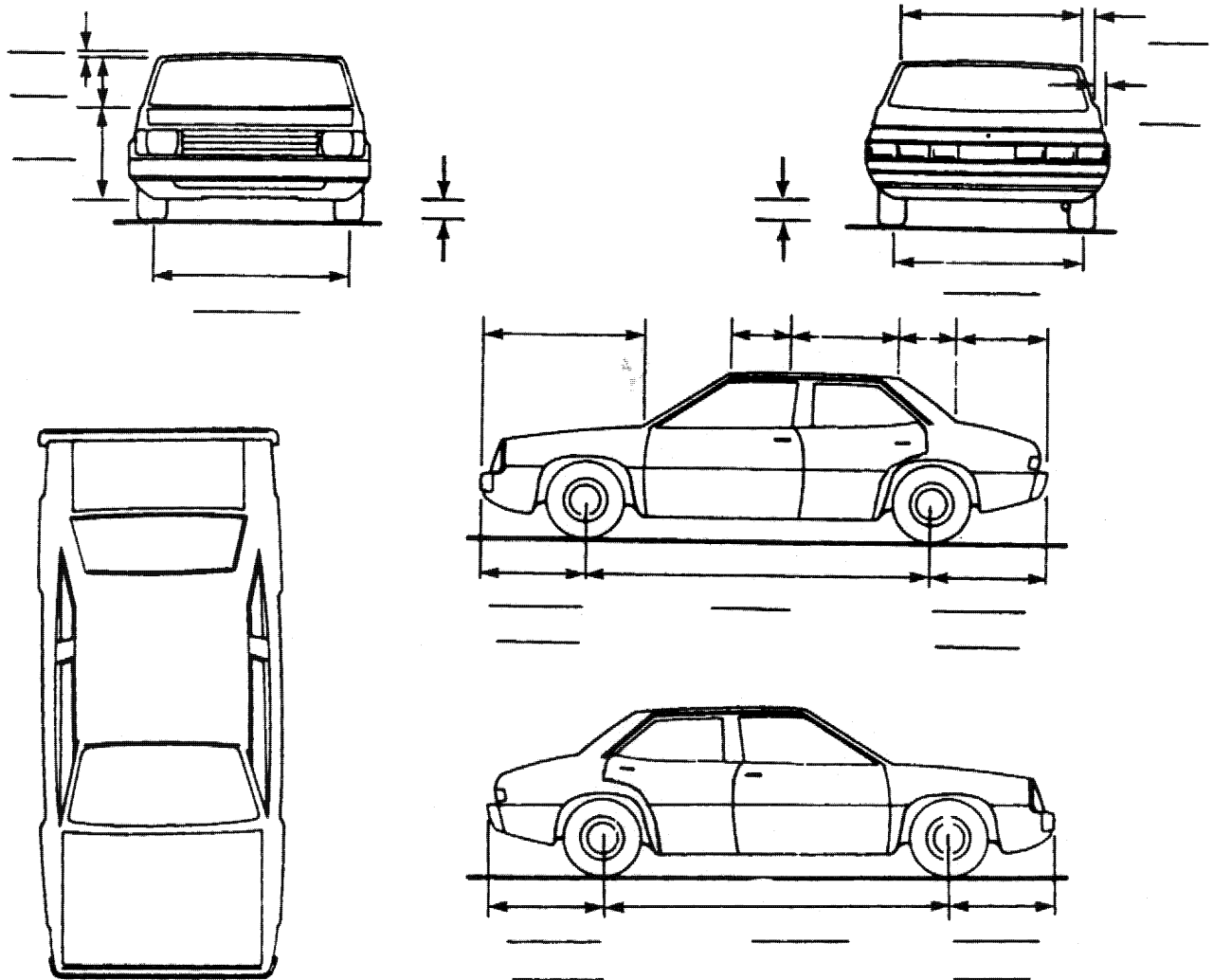
NOTES: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewalls, etc.). If pulling trailer, sketch type of trailer and damage received on the back of this page.

Annotate any damage caused by extrication such as component removal by torching, prying, or hydraulic shears.

CDC WORKSHEET

CODES FOR OBJECT CONTACTED

(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 (≤ 10 cm in diameter)
- (42) Tree (> 10 cm in diameter)
- (43) Shrubbery or bush
- (44) Embankment
- (45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post
- (50) Pole or post (≤ 10 cm in diameter)
- (51) Pole or post (> 10 cm but ≤ 30 cm in diameter)
- (52) Pole or post (> 30 cm in diameter)
- (53) 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
- (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
- (98) Other event (specify): _____
- (99) Unknown event or object

DEFORMATION CLASSIFICATION BY EVENT NUMBER

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force (degrees)	Incremental Value of Shift	(3) Deformation Location	(4) Specific Longitudinal or Lateral Location	(5) Specific Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___
__ __	___	___	___	___	___	___	___	___

COLLISION DEFORMATION CLASSIFICATION

HIGHEST DELTA "V"

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force	(3) Deformation Location	(4) Longitudinal or Lateral Location	(5) Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
4.___ ___	5.___ ___	6.___ ___	7.___	8.___	9.___	10.___	11.___ ___

Second Highest Delta "V"

12.___ ___	13.___ ___	14.___ ___	15.___	16.___	17.___	18.___	19.___ ___

CRUSH PROFILE IN CENTIMETERS

The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. (ALL MEASUREMENTS ARE IN CENTIMETERS.)

HIGHEST DELTA "V"

20. L	21. C_1	C_2	C_3	C_4	C_5	C_6	22. $\pm D$
							$+$
__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	$-$ __ __ __

Second Highest Delta "V"

23. L	24. C_1	C_2	C_3	C_4	C_5	C_6	25. $\pm D$
							$+$
__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	__ __ __	$-$ __ __ __

---

26. Undeformed End Width
    (Coded when highest severity impact is an end plane impact.)   ___ ___ ___
    _____ Code to the nearest centimeter
    (250) 250 centimeters or more
    (998) No highest severity end plane impact
    (999) Unknown

27. Direct Damage Width
    (For highest severity impact)   ___ ___ ___
    _____ Code to the nearest centimeter
    (250) 250 centimeters or more
    (999) Unknown

28. Original Wheelbase
    _____ Code to the nearest centimeter   ___ ___ ___
    (650) 650 centimeters or more
    (999) Unknown
    ___ ___ ___ . ___ inches X 2.54 = ___ ___ ___ centimeters

29. Original Average Track Width
    _____ Code to the nearest centimeter   ___ ___ ___
    (185) 185 centimeters or more
    (999) Unknown
    ___ ___ ___ . ___ inches X 2.54 = ___ ___ ___ centimeters

30. Are CDCs Documented but Not Coded on The Automated File?   ____
    (0) No
    (1) Yes

31. Researcher's Assessment of Vehicle Disposition   ____
    (0) Not towed due to vehicle damage
    (1) Towed due to vehicle damage
    (9) Unknown

32. Is This A Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?   ____
    (0) No post manufacturer modifications
    (1) Yes - post manufacturer modifications (specify): _____
    _____
    _____
    (Include photograph of CERTIFICATION PLACARD in case report)
    (9) Unknown if vehicle is modified

FIRE OCCURRENCE

33. Fire Occurrence   ____
    (0) No fire

    Yes, fire occurred
    (1) Minor
    (2) Major
    (9) Unknown

34. Origin of Fire   ____
    (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):
    _____
    (9) Unknown

FUEL SYSTEM

35. Location of Fuel Tank-1 Filler Cap   ____

36. Location of Fuel Tank-2 Filler Cap   ____
    (0) No fuel tank
    (1) On back plane
    (2) Aft of center of the rear wheels (rear axle) on left side plane
    (3) Aft of center of the rear wheels (rear axle) on right side plane
    (4) Forward of center of the rear wheels (rear axle) on left side plane
    (5) Forward of center of the rear wheels (rear axle) on right side plane
    (6) Over the center of the rear wheels (rear axle) on left side plane
    (7) Over the center of the rear wheels (rear axle) on right side plane
    (8) Other (specify):_____
    (9) Unknown

37. Type of Fuel Tank-1   ____

38. Type of Fuel Tank-2   ____
    (0) No fuel tank (electrical vehicle)
    (1) Metallic
    (2) Non-metallic
    (9) Unknown

39. Location of Fuel Tank-1   ____

40. Location of Fuel Tank-2   ____
    (0) No fuel tank
    (1) Aft of center of the rear wheels (rear axle) centered
    (2) Aft of center of the rear wheels (rear axle) left side
    (3) Aft of center of the rear wheels (rear axle) right side
    (4) Forward of center of the rear wheels (rear axle) centered
    (5) Forward of center of the rear wheels (rear axle) left side
    (6) Forward of center of the rear wheels (rear axle) right side
    (7) Over center of the rear wheels (rear axle)
    (8) Other (specify):_____
    (9) Unknown

41. Damage to Fuel Tank-1   ____

42. Damage to Fuel Tank-2   ____
    (0) No fuel tank
    (1) No damage to fuel 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

43. Leakage Location of Fuel System-1   ____

44. Leakage Location of Fuel System-2   ____
    (0)   No fuel tank
    (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

45. Fuel Type-1   ____ ____

46. Fuel Type-2   ____ ____

    Single Fuel Type
    (00) No fuel tank
    (01) Gasoline
    (02) Diesel
    (03) CNG (Compressed Natural Gas)
    (04) LPG (Liquid Petroleum Gas) also
          known as Propane
    (05) LNG (Liquid Natural Gas)
    (06) Methanol (M100 or M85)
    (07) Ethanol (E100 or E85)
    (08) Other (Hydrogen or others) (specify):

    _____

    Electric Powered or Electric/Solar
    Powered Vehicles
    (10) Lead Acid Battery
    (11) Nickel-Iron Battery
    (12) Nickel-Cadmium Battery
    (13) Sodium Metal Chloride Battery
    (14) Sodium Sulfur Battery
    (18) Other (Specify):_____

    (98) Other Hybrid (specify):

    _____

    (99) Unknown fuel type

47. Is This Vehicle Equipped With More Than   ____
    Two Fuel Tanks?
    (0)   No (one or two tanks only)

    Yes - More Than Two Tanks
    (1)   Yes -- <u>no damage</u> to any tank or filler
          cap and <u>no fuel system leakage</u>
    (2)   Yes -- <u>no damage</u> to any tank or filler
          cap but <u>there is fuel system leakage</u>
          (specify leakage location):
          _____
    (3)   Yes -- <u>damage</u> to an additional tank or
          filler cap and <u>there is fuel system leakage</u>
          (specify the following):
          Type of tank _____
          Tank location _____
          Filler cap location _____
          Tank damage _____
          Location of leakage _____
          Type of fuel _____
    (9)   Unknown if more than two tanks

COMMENTS

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

*** STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT TOWED ***

(GV10=0)

DO NOT COMPLETE THE INTERIOR VEHICLE FORM.

INSTRUCTIONS FOR COMPLETION
OF CDS APPLICABLE FIELD MEASUREMENTS PAGE
(***Note***: *All Measurements Are In Metric Dimensions*)

The first page of the **Exterior Vehicle Form** is designed to be a comprehensive data collection tool arranged in a format to allow sufficient space for documenting vehicle damage profiles and associated relevant measurements. The established protocol for obtaining crush data is defined in the *NASS Vehicle Measurement Techniques (July 1989).* The procedures for recording that data in a format that will maintain system-wide consistency are included in the following remarks.

Side or End Damage

Undeformed end width is measured and recorded whenever an end plane is involved.

End shift at frame (CDC) is assessed to determine whether sufficient end shift or bowing exists to necessitate incrementing the direction of force. Remember, end shift of ten centimeters or more must be present on: both frame rails to allow for incrementation to the left or right, or at least one frame rail for vertical incrementation. If neither frame rail has end shift, this should be annotated on the form.

Locator

Locate end of damage with respect to the post crash centerline of the end plane or, for side impacts, to an undamaged axle. Spaces are provided to record the "Location of Direct Damage", "Location of Field L", and "Location of Maximum Crush" measurements with respect to the vehicle post crash center or bumper corner for end impacts and an undamaged axle for side impacts. These required measurements are used to assist with CDC assignments (direct) and to determine the "D" dimension if not directly measured. The following examples include the data that are required.

Direct Damage

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

Field L

☞ Entire end plane involved, or
☞ C_1 is 102 centimeters forward of the rear axle

Maximum Crush

☞ located 15 centimeters left of post crash center of the end plane, or
☞ located at C_3, 51 centimeters forward of the rear axle
☞ located 5 centimeters forward of the rear axle

These data are required for each impact. A space is provided to indicate the "Specific Impact Number". If there are more impacts than spaces, the data are listed on the back of the first page of the Exterior Vehicle Form.

(2)

Crush Profile

Several data elements are required to properly complete the crush profile data portion of the first page of the Exterior Vehicle Form. These data are grouped together as they are generally obtained during the vehicle inspection. Each column (or associated group of columns) is explained as below.

INSTRUCTIONS FOR COMPLETION
OF CDS APPLICABLE FIELD MEASUREMENTS PAGE

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

Plane of C-Measurements contains the annotation of the plane at which the crush profile is documented (*i.e.*, bumper, grille, sill, mid-door). This column is annotated **"average"** when used to indicate the resultant profile from an underride -type impact.

Direct Damage: Width contains the indication of the length of direct damage as measured on the vehicle.

Direct Damage: Max Crush contains the measured maximum crush for the profile being documented. Recall that maximum crush is determined after free space is subtracted. Indicate the free space at Max Crush in the space below the measurement. Use a third line to indicate the resultant maximum crush.

Field L contains the recorded Field L as obtained during the vehicle inspection. 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.

C1-C6 contains the recorded 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. A third line is used to record the resultant crush profile.

± D contains the recorded "D" dimension. The data obtained for the direct damage width is used to calculate "D"; indicate whether "D" is a positive or negative value.

If the spaces provided are not sufficient for the number of impacts which require documentation, include the additional data on the back of the first page of the Exterior Vehicle Form.

In the following example, a crush profile for a frontal bumper underride impact is displayed. This example is used as a guideline when completing the first page of the Exterior Vehicle Form.

INSTRUCTIONS FOR COMPLETION
OF CDS APPLICABLE FIELD MEASUREMENTS PAGE

| Specific Impact Number | Plane of C-Measurements | Direct Damage | | Field L | C_1 | C_2 | C_3 | C_4 | C_5 | C_6 | =D |
		Width (CDC)	Max Crush								
1	GRILLE	48	74	137	74	53	36	28	18	15	0
	– FREESPACE		15		15	11	10	10	11	15	
	RESULTANT		58		58	42	25	18	6	0	0
1	BUMPER	48	23	142	23	15	11	5	5	3	0
	– FREESPACE		5		5	3	1	1	3	5	
	RESULTANT		18		18	13	10	4	3	0	0
①	BUMPER	48	38	142	38	27	18	11	3	0	0
	– FREESPACE										
	RESULTANT										

INSTRUCTIONS FOR COMPLETION OF VEHICLE DAMAGE SKETCH

Exterior Vehicle Form **Page 2** (and associated **Pages 2B-2I**) 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.

The following sketch exemplifies these procedures on the overhead profile.

(2)
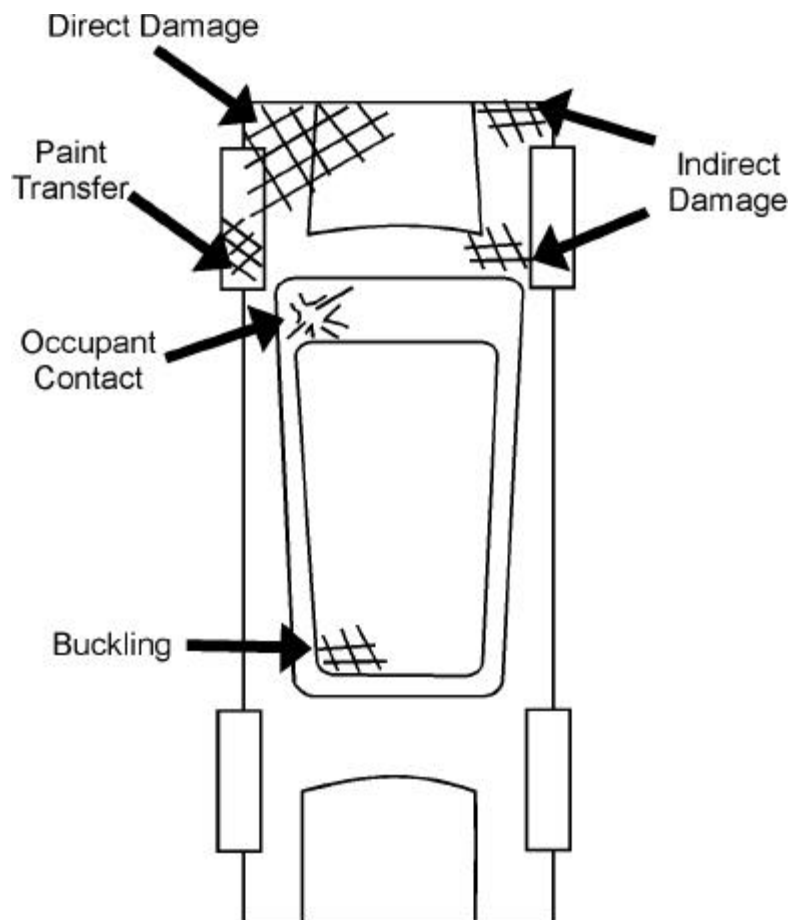
INSTRUCTIONS FOR COMPLETION OF VEHICLE DAMAGE SKETCH

Although researchers are reporting a vehicle's crash related damage, other damage may be observed which existed prior to the crash. These damaged areas, in addition to any towing related damage, are indicated and annotated accordingly.

Relevant measurements are required on the Vehicle Damage Sketch page in order to support other coded and noncoded data elements. Wheelbase and overhang measurements are necessary to provide relative measurements in support of documented crush profiles. Wheelbase and overhang are required from both sides of the vehicle for all vehicles inspected.

Extent zone measurements are also required; although, only the measurements which pertain to the damage 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 frontal 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 noncoded 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 example below provides wheel base, overhang, and extent zone data for a frontal impact.

Bumper corner [100 cm] [251 cm]   [99 cm] **Bumper corner**

Stringline [86 cm]   [104 cm] **Stringline**
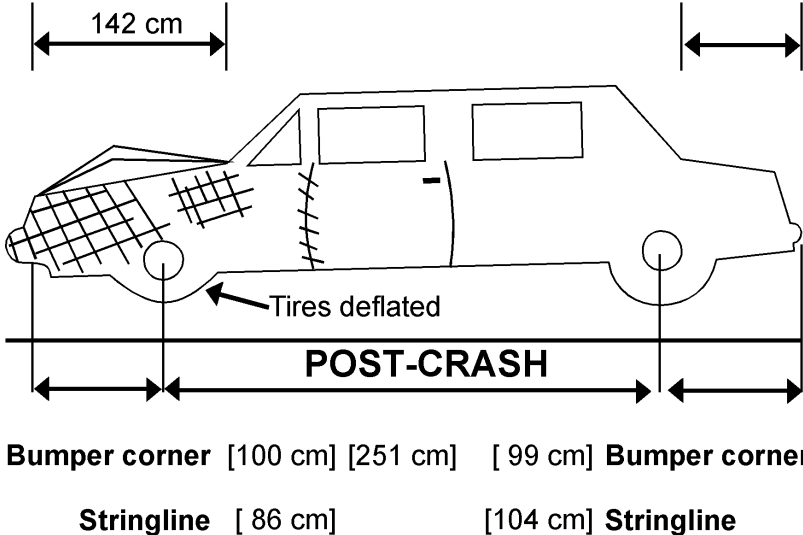
Additional data required on the Vehicle Damage Sketch page includes.

☞ Original dimensions including: wheelbase, overall length, maximum width, curb weight, average track, and overhangs

INSTRUCTIONS FOR COMPLETION OF VEHICLE DAMAGE SKETCH

☞ The engine displacement (*i.e.*, 5.0 L) and number of cylinders (*i.e.*, 4, 6, V6, or V8)

☞ The transmission type: automatic or manual (3, 4, 5 speed, etc.)

☞ The drive wheels: front wheel drive, rear wheel drive, or four wheel drive

☞ Approximate cargo weight

☞ End shift at frame (CDC): is assessed to determine whether sufficient end shift or bowing exists to necessitate incrementing the direction of force. Remember, end shift of ten centimeters or more must be present on: both frame rails to allow for incrementation to the left or right, or at least one frame rail for vertical incrementation. If neither frame rail has end shift, this should be annotated on the form.

EV04
EV12

Variable Name: 1st C.D.C. — Accident Event Sequence Number
2nd C.D.C. — Accident Event Sequence Number

Element Values:

Blank No event or not CDC applicable
01-98 Code the sequence number of the event selected for inclusion in the adjacent variables (*i.e.,* Object Contacted, EV05 and EV13; and CDCs, EV06-EV11 and EV14-EV19).

Source: Primary sources are the scene and vehicle inspections; secondary sources include the police report and interviewee.

Remarks:

In crashes involving multiple events, the events are numbered in sequence by chronology in reference to the entire sequence. This total accident event sequence number is coded adjacent (EV04 or EV12) to the CDC that was produced during this event. For example, three cars are waiting at a red light. A pickup truck rear ends the third car in line and pushes it into the second car which in turn is pushed into the first car. The sequential event numbers in this crash would be as follows.

Event number 1 — pickup vs. 3rd car
Event number 2 — 3rd car vs. 2nd car
Event number 3 — 2nd car vs. 1st car

Do not forget that the numbers are actually encoded in accordance with CDC prioritization. Refer to the Overview section of the CDC Related Remarks (variables EV06-EV11, EV14-EV19 page 2) entitled "CDC Ranking" for comments on selecting the events to be encoded in the CDC variables.

Code "Blank" (No event or not CDC applicable) is used when there is not an event or when an event exists but is not CDC applicable.

Variable Name: 1st C.D.C.   - Object Contacted
                2nd C.D.C.   - Object Contacted

Element Values:

Blank   No event or not CDC applicable
01-30   Vehicle Number: If the object contacted by the vehicle under consideration was a motor vehicle in-transport, code the Vehicle Number assigned to that vehicle.

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)

Nonbreakaway Pole or Post
50   Pole or post ($\leq$ 10 cm in diameter)
51   Pole or post (> 10 cm but $\leq$ 30 cm in diameter)
52   Pole or post (> 30 cm in diameter)
53   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

98   Other event (specify):
99   Unknown event or object

  * **These codes are not valid for use on the Exterior Vehicle Form, but they are retained for use on the Accident Form.**

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

Variable Name: 1st C.D.C.   - Object Contacted (cont'd.)
                            2nd C.D.C.   - Object Contacted (cont'd.)

Remarks:

Code the appropriate object contacted for each event only if the event is CDC applicable. Events in which there is not a corresponding CDC (*i.e.*, fire, explosion, other intraunit damage, or a noncollision injury), are identified on the Accident Form only. The object contacted codes are the same as those listed in the Accident Form under variable AC16, et.al., Vehicle Number or Object Contacted.

The coding priority of object contacted elements is based upon the highest and second highest delta V impacts. Refer to the overview of the "CDC Related Remarks" (EV06-EV11, EV14-EV19).

Code "Blank"   (No event or not CDC applicable) is used when there is not an event or when an event exists but is not CDC applicable.

Noncollision events are crash circumstances which result in nonimpact related damage or harm.

Code "31"   [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 Accident Form (AC12 -AC18, AC19-AC25, etc.). It is assumed a rollover will generally involve contact with the road surface or ground. In this situation, the object contacted is encoded "31" (Overturn - rollover) and not code "61" (Ground). In the event another object in the environment is contacted during the rollover sequence, the rollover event is listed on the Accident Form, but may not be encoded in the CDC variables on the Exterior Vehicle Form (EV04 -EV11, EV12-EV19), unless the rollover is applicable to CDC.

Code "32"   (Rollover — end-over-end) is used whenever a vehicle rolls over or overturns primarily about the lateral axis of the vehicle.

Code "33"   (Fire or explosion) is not to be used on the Exterior Vehicle Form because no delta V is associated with a fire or explosion and the consequences are outside the scope of CDC. Therefore, this code is not used in variables EV06-EV11 or EV14-EV19, Collision Deformation Classification. If an impact causes a fire or explosion, then the impact is encoded as one event on the Accident Form in variables AC16, et al., Vehicle Number or Object Contacted, and on the Exterior Vehicle Form in variables EV06-EV11 or EV14-EV19, Collision Deformation Classification; whereas, the fire or explosion is encoded as another event only on the Accident Form.

Code "33"   **(Fire or explosion) is not to be used on the Exterior Vehicle Form.**

Code "34"   (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.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "35"   (Other intraunit damage) refers to situations where damage to the towing unit is caused by the trailing unit, but a jackknife did not occur. This event is outside the scope of the CDC and is not encoded in variables EV04 -EV11 or EV14-EV19, Collision Deformation Classification.

Codes "35"   **(Other intraunit damage) and "36" (Noncollision injury) are not to be used on the Exterior Vehicle Form.**

Code "36"   (Noncollision injury) refers to situations where an occupant, of a vehicle not involved in an impact, sustains an injury. This includes "falling from vehicle". This event is outside the scope of CDC and is not encoded in variables EV04-EV19, Collision Deformation Classification.

Code "38"   (Other noncollision) is used only in consultation with the zone center. If this event is outside the scope of CDC, it is not encoded in variables EV04-EV19, Collision Deformation Classification.

Code "39"   (Noncollision — details unknown) is used when it is known that the event was a noncollision but specifics are not known. If this event is outside the scope of CDC, it is not encoded in variables EV04- EV19, Collision Deformation Classification.

Codes "41"   [Tree ($\leq$ 10 centimeters in diameter)] and "42" [Tree (> 10 centimeters in diameter)] refer to the diameter of the tree measured on the horizontal plane at the point of impact.

Code "43"   (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.

Code "44"   (Embankment) is used only when damage or injury results from impacting the embankment.

Codes "45"   [Breakaway pole or post (any diameter)] and "50" through "53" (Pole or post ....) 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 codes. 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 codes.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

The following diagrams indicate the proper measurement for determining the "diameter" for use in coding pole/post attributes "45" [Breakaway pole or post (any diameter)] and "50" through "53" (Pole or post ....).
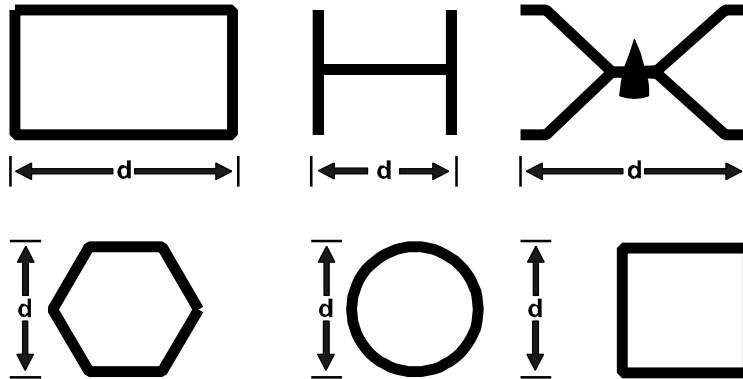
Code "45"	[Breakaway pole or post (any diameter)] refers to a pole or post which is mounted on a base designed to readily disengage or fracture from an impacting vehicle above a predetermined force level. A pole or post fitted with such a device is a breakaway pole or post; otherwise, it is a nonbreakaway pole. Common types of breakaway bases are illustrated on the following pages.
Code "50"	[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.
Code "51"	[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.
Code "52"	[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.
Code "53"	(Pole, post — diameter unknown) is used for any pole or post, not on a breakaway base, of unknown diameter.

When a vehicle impacts a fixed object whose object contacted code is "41" - "43", "45", or "50"-"53" 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 code for the object in its dislodged or airborne state is the same as when the object was initially impacted (*i.e.*, "41"-"43", "45", "50"-"53").

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Sign
Support

Upper
Base
Plate

Upper
Base
Plate

Lower
Base

Lower
Base

Sign
Support

Upper
Base
Plate
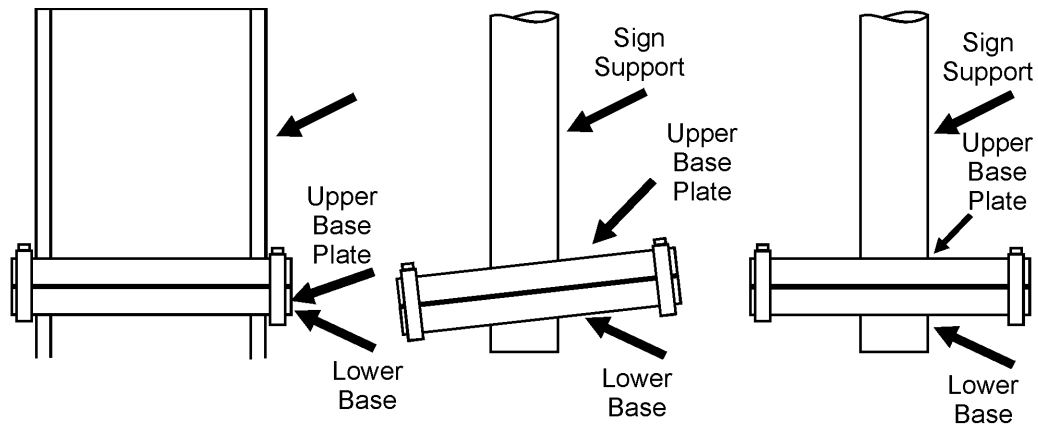
Lower
Base

Base Plate
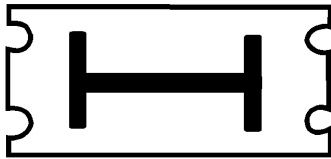
HORIZONTAL
SLIP BASE

Base Plate

INCLINED
SLIP BASE

Base Plate

TRIANGULAR
SLIP BASE

Aluminum
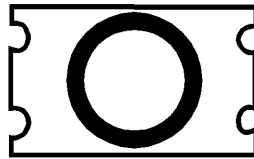
Pipe
Sign
Support
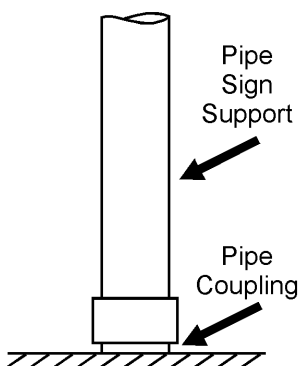
Pipe
Coupling

Concrete Base

PIPE WITH
PIPE COUPLING

Pipe
Sign
Support

Cut in
Pipe
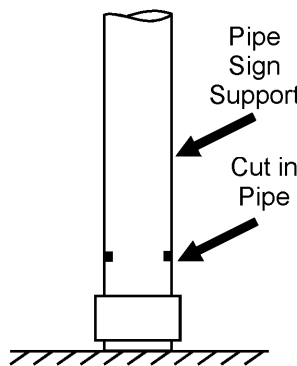
Concrete Base

BASE BENDING

Upper
Base
Plate

Lower
Base
Plate

Sign
Support

Frangible
Coupling

Concrete Base

OTHER

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Luminaire Support

Shoe Base (Cast Aluminum)

3"

Concrete Base

Luminaire Support

Cast Aluminum Insert

6"

Concrete Base

CAST ALUMINUM SHOE BASE/INSERT (FRANGIBLE)

Luminaire Support

Transformer Base (Cast Aluminum)

Concrete Base

Luminaire Support

Transformer Base (Steel)

Spot Welds

Concrete Base

Transformer Base (Stainless Steel)

Luminaire Support

Rivets

Concrete Base

Upper Base Plate

Luminaire Support

Necked Down Section

Notched Belt

Concrete Base

NOTCHED BOLT INSERT

Upper Base Plate

Luminaire Support

Concrete Base

Base Plate

TRIANGULAR SLIP BASE

Upper Base Plate

Luminaire Support

Lower Base Plate

Frangible Coupling

Concrete Base

FLUTED ALUMINUM BREAKAWAY COUPLING

EV05

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "54" (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 code "58" (Wall). Below are a few of the common designs of concrete traffic barriers.
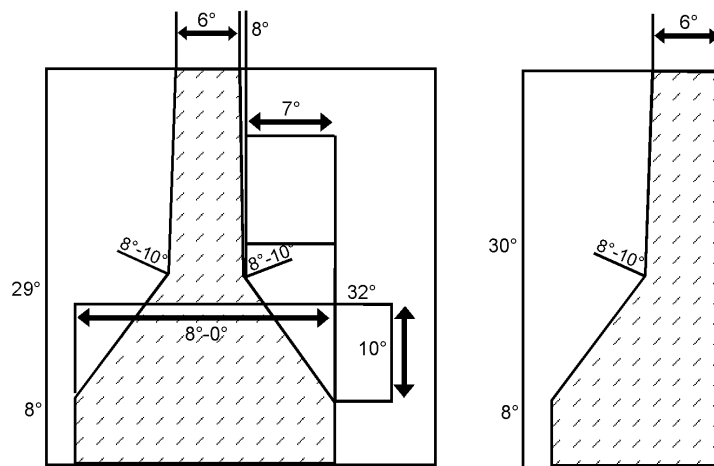
**(Footing & Reinforcing Varies)
MB 5
Concrete Median Barrier**

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

**Concrete
Safety
Shape**

Code "55" (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. Some common types are shown on continuation pages **(12)** and **(13)**.

Code "56" (Other traffic barrier) refers to any longitudinal barrier not constructed of concrete. This includes all permanent guardrails and median barriers not on a bridge.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "57"   (Fence) includes both the fence material and the support posts.

Code "58"   (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 code with "Fence" (code "57") or "Building" (code "59"). In most instances a wall will be backfilled with soil and will act as a vertically faced embankment.

Code "59"   (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.

Code "60"   (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" (code "56"). 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, code the impact with the struck side as an "Embankment" (code "44"). Substantial means that an embankment existed had the ditch not been present.

Code "61"   (Ground) refers to an impact with the ground. Collisions which may be classified using this code 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.

Code "62"   (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 fireplugs or fire standpipes in some areas.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "63" (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. Some typical highway curbs are illustrated in the diagrams below. Note that the dimensions are typical dimensions and may differ from the installations observed in the field.

Barrier Curbs
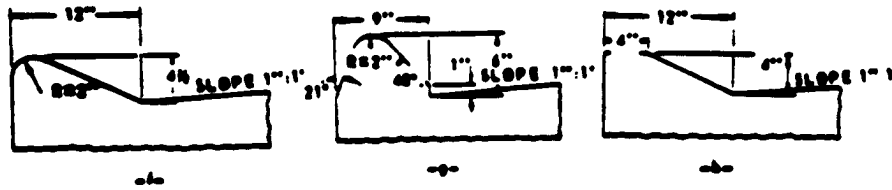
Mountable Curbs
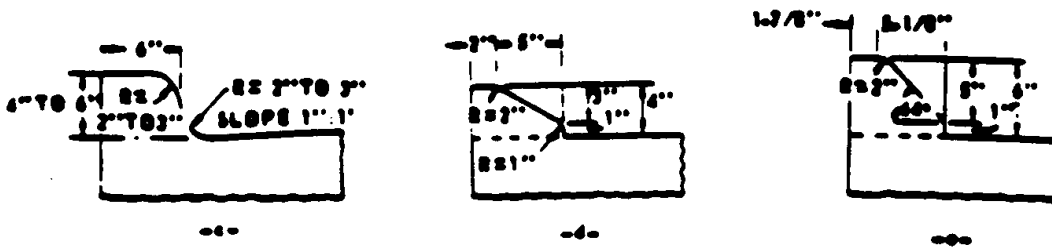
Typical Highway Curbs

Code "64" (Bridge) encompasses all structural members of an ov erpass structure used for vehicular or pedestrian traffic. This code includes guardrails, permanent concrete barriers, bridge rail/walls, bridge piers, bridge abutments, bridge parapet ends, wing walls associated with bridge abutments, and support columns. See continuation page **(14)** for a descriptive drawing.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "68"   (Other fixed object) is used for any other object of sufficient mass or anchored such that it is not readily movable; compare with code "88" (Other nonfixed object). Examples include large boulders, large logs (fallen trees), etc.

Code "69"   (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.

Code "70"   (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).

Code "71"   (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).

Code "72"   (Pedestrian) is defined as any person who is on a trafficway or on a sidewalk or path contiguous with a trafficway, 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.

Code "73"   (Cyclist or cycle) refers to any occupant of a pedalcycle (see ANSI D16.1-1989, section 2.2.25, page 22), the cycle, or both. This includes those cyclists who hold onto a motor vehicle in motion.

Code "74"   (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 code 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 code "76" (Animal)]. This code 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 code "70" (Passenger car, light truck, van, or other vehicle not in transport) and code "71" (Medium/heavy truck or bus not in-transport)].

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

Code "75" (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 code for an occupant who falls from a vehicle and is subsequently run over before stabilization occurred. In addition, use this code for any motorcyclist who separates from his/her motorcycle during impact and subsequently impacts a motor vehicle before stabilization occurred.

Code "76" (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; code "76" (Animal);
☞ (2) the conveyance, or to the person, or to both the conveyance and the person, code "74" (Other nonmotorist or conveyance).

Code "77" (Train) refers to any railway train, moving or not moving.

Code "78" (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.

Code "79" (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 coded in "78" above.
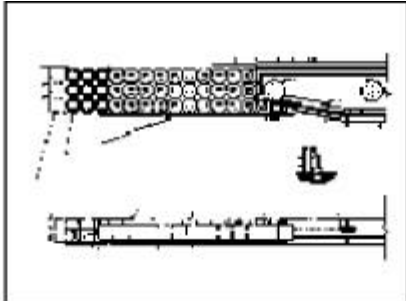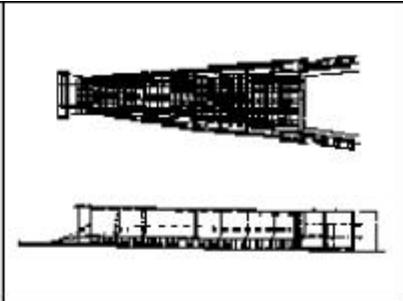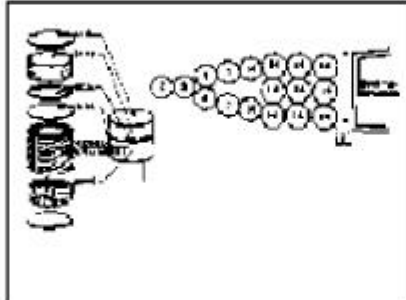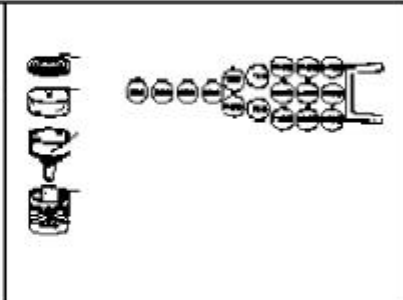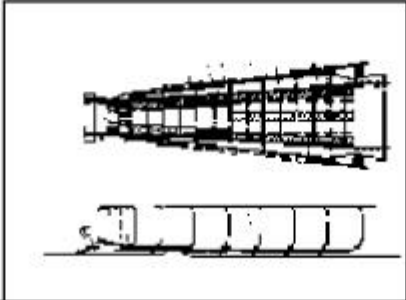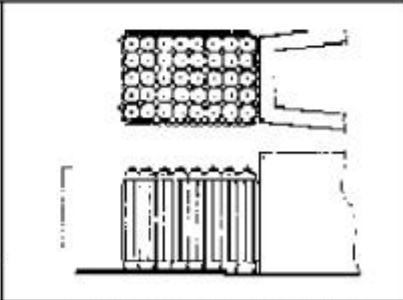
Code "88" (Other nonfixed object) refers to any moveable object that is either readily moveable or is moving and is not specifically named above. Examples include trash cans, grocery carts, unoccupied pedalcycles, small boulders, sheared poles, etc.

Code "98" (Other event) is used when an event occurs which cannot be classified using one of the existing codes or definitions. A complete description should be given as well as describing the event on the Case Summary Form.

Code "99" (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 code it.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)

SYSTEM	C₁ STEEL DRUMS	C₂ HI-DRO CELL SANDWICH
BARRIER DESCRIPTION	55 gallon tight head drum arranged in modular clusters. Fender panels or "fish scales" fastened to sides for side impact redirection. ¾" cable used to secure drums for side impacts. "U" belt chairs used to ensure uniform sliding of drums.	8" diameter, polyvinyl chloride plastic cells filled with water. Fender panels (fish scales) are provided for redirection.

SYSTEM	C₃ FITCH INERTIAL BARRIER	C₄ ENERGITE INERTIAL BARRIER
BARRIER DESCRIPTION	Specifically manufactured plastic containers (36" in diameter and height) filled with sand. Standard weights are 200, 400, 700, 1400, and 2100 lbs. Volume and density of sand may vary.	Specially manufactured plastic containers filled with sand. Standard size of container is 36" diameter top, 32" diameter base, and 36¾" height. Standard weights of modules are 200, 400, 700, and 1400 lbs.

SYSTEM	C₅ HI-DRI CELL SANDWICH	C₆ HI-DRO CELL CLUSTER
BARRIER DESCRIPTION	Multi-cell cartridges are arranged in a cluster along with fender panels (fish scales) to provide capabilities for head-on and side impacts.	6" diameter, polyvinyl chloridge plastic cells arranged in a cluster and filled with water.

Variable Name: 1st C.D.C. — Object Contacted (cont'd.)
2nd C.D.C. — Object Contacted (cont'd.)
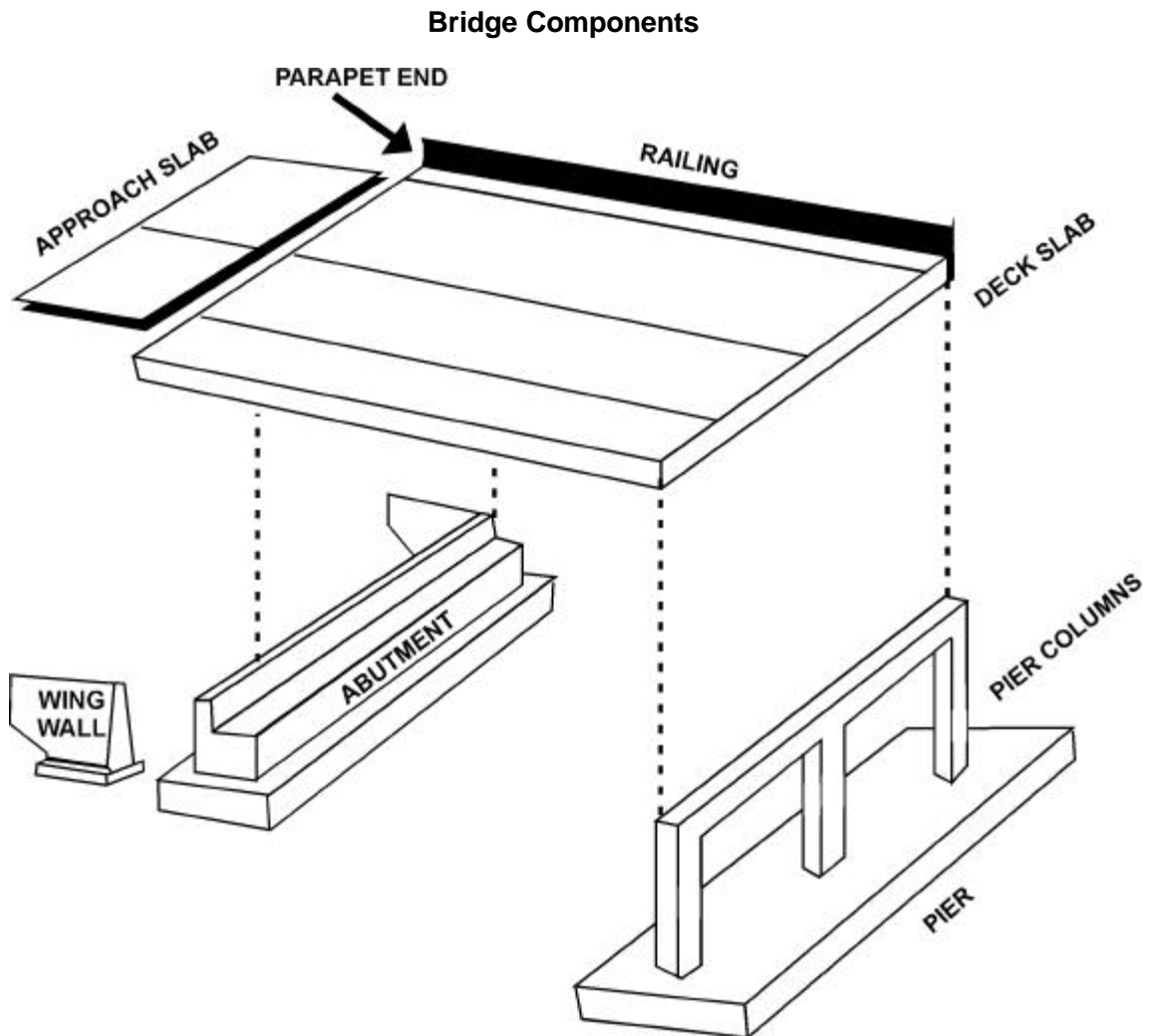
Bridge Components

* Individual components of a bridge collectively become the bridge.

CDC RELATED REMARKS

Direct Damage

The CDC generated for a particular impact is based upon damage resulting from *direct* contact only; it does not include *induced* damage. All CDCs are based entirely upon the procedures in SAE J224 MAR80.

A change has been made starting with the 1997 file that permits partial CDCs to be entered. However each CDC must have at least the General Area of Deformation coded.

Events which are outside the scope of CDC are <u>not</u> listed on the Exterior Vehicle Form in variables EV04-EV19. These events include: fire, intraunit damage caused by cargo shift, noncollision injury, etc.

Intraunit Damage

Intraunit *direct* damage caused by a jackknife can generate a CDC for the power (*i.e.*, towing) unit *only*. The towed unit (if towed by a fixed linkage) is considered cargo, and even if that unit is another vehicle, a CDC is *not* applicable for any damage it may sustain. If the impact is to the cargo unit only and *induced* damage is incurred by the power unit, no CDC is generated for the *induced* damage to the power unit. If a trailer disconnects and subsequently causes direct damage to the power unit, then no CDC is generated for that damage because code "35" (Other intraunit damage) cannot be coded for Object Contacted, EV05/EV13. If, during an impact, cargo located in the trailing unit or in the bed of a pickup truck causes direct damage to the power unit or pickup truck respectively, then no CDC is generated for that damage. When intraunit direct damage caused by a jackknife exists, an Accident Event Sequence Number, EV04/EV12, is assigned and the Object Contacted, EV05/EV13, is equal to the Vehicle Number, EV03.

Add-on Components

Add-on components (*e.g.*, snow plow blade, pickup cap, etc.) are considered cargo, and a CDC is not generated for direct damage sustained by the add-on component.

Overlapping Damage

During some crash sequences, a vehicle will sustain "overlapping damage" (*i.e.*, multiple impacts in the same area of the vehicle). If the direct damage caused by each object contacted cannot be separated and described with individual CDCs, then one CDC is generated to describe <u>all</u> of the damage and this CDC is encoded in variables EV06-EV11.

CDC RELATED REMARKS (Continued)

Next, researchers must choose the object which caused most of the damage and enter: (1) the object's element number (*i.e.*, "01"-"88") in variable EV05, 1st C.D.C. - Object Contacted, and (2) the event number in variable EV04, 1st C.D.C — Accident Event Sequence Number. Finally, the object which caused the second greatest amount of damage is encoded in variable EV13, 2nd C.D.C. — Object Contacted; its event sequence number is encoded in EV12, 2nd C.D.C. — Accident Event Sequence Number, and an unknown CDC (99 -9999-99) is entered in variables EV14-EV19.

Verbal Descriptions

Verbal descriptions by drivers, occupants, or owners may *not* form the basis for a CDC *except* in *pedestrian crashes* or *very minor crashes* (no residual damage); *the vehicle must have been inspected*. In cases involving no residual damage and where the vehicle is involved with another vehicle or object, that other vehicle or object must be inspected.

Additional Information

Refer to the document entitled: "Collision Deformation Classification/Tru ck Deformation Classification Advanced Reference Module", for more detailed discussions regarding CDC guidelines.

Single Impact/Event

If the vehicle sustained only one impact/event, the corresponding CDC (*i.e.*, documented or unknown) is entered in EV06 -EV11 and variables EV12 -EV19 are left **"blank"**.

Multiple Impacts/Events

If the vehicle is involved in multiple impacts/events, the corresponding CDCs are ranked in order of highest delta V [*i.e.*, greatest change in velocity experienced by the occupant(s) in the vehicle is usually the "most severe" impact]. If the SMASH program is applicable for every impact, the resultant delta Vs determine the CDC ranking. If SMASH is not applicable for every impact sustained by the vehicle, the CDC ranking must still reflect the greatest change in velocity as determined by the researcher.

All entries selected for coding in variables EV06 -EV11 and EV14-EV19 must have encoded a corresponding event sequence number (EV04 and EV12) and object contacted (EV05 and EV13).

Variable Name: 1st C.D.C. — Direction of Force
2nd C.D.C. — Direction of Force

Element Values:

Range: Blank, 00-12, 20-32, 40-52, 60-72, 80-92, 99

Blank	No C.D.C.		
00	Nonhorizontal force	07	7 o'clock
01	1 o'clock	08	8 o'clock
02	2 o'clock	09	9 o'clock
03	3 o'clock	10	10 o'clock
04	4 o'clock	11	11 o'clock
05	5 o'clock	12	12 o'clock
06	6 o'clock	99	Unknown

Incremental Values for Above Force Directions

00	No shift
20	End shift vertical--up; top shift--forward
40	End shift vertical--down; top shift--rearward
60	End or top shift lateral--right
80	End or top shift lateral--left

Source: Restricted to vehicle inspection or photographs.

Remarks:

Code the principal direction of force incremented to indicate: (1) vertical or lateral shifting of vehicle basic end structures which occurred during horizontal force application, or (2) longitudinal or lateral shifting to the top structure resulting from nonhorizontal force application to the top. In other words, the combined value (Direction of Force + Incremental Value of Shift) is coded under this variable.

Code "00" (Nonhorizontal Force) (plus any Incremental Value of Shift for a top structure impact) any time a vehicle becomes inverted and impacts any object or vehicle while inverted. In addition, use this code in any other circumstance which is consistent with the directions contained in SAE J224 MAR80.

An estimated CDC is indicated for each impact (**Page 3**, Exterior Vehicle Form). In this estimate, write the direction of principal force in increments of ten degrees rather than in clock positions. Thus, if the direction appeared to be approximately ten degrees to the right of straight-ahead, indicate "010". If the direction of force appeared to be ten degrees left of straight-ahead, indicate "-010" (or "350"). The final coding of the CDC on **Page 4** (Exterior Vehicle Form) reflects the direction of force in clock positions. For example if the principal direction of force (PDOF) is closest to ten degrees to the right of straight-ahead, "010" ["-005" ("355") to "025"], then the estimated Direction of Force is coded according to the clock direction--either "12" or "01" as determined by examining all available

Variable Name: 1st C.D.C. — Direction of Force (cont'd.)
2nd C.D.C. — Direction of Force (cont'd.)

inputs to ensure accuracy for force assignments. If, upon examining all the available inputs, the researcher believes the PDOF is more likely to be within +015 to +025 and classifies the clock direction (EV06 or EV14) as "01", then **Page 3** (Direction of Force) still reflects the original value: "010".

When occasional differences which seem to be inconsistent (*e.g.*, PDOF = 010° and clock position = 01) are encountered, they actually reflect the investigative method; therefore, reconcile the differences by reviewing the entire case and any CRASH output to determine if the difference is reasonable. This procedure allows the zone center reviewer to appreciate what the researcher thought the PDOF (**Page 3**) was, to the closest 10 degrees, based upon examination of that vehicle alone, while the clock position representing the force on **Page 4** reflects the final determination after examining all sources (vehicles, objects contacted, scene evidence, CRASH program, etc.). In other words, it is not necessary for the force directions on **Page 4** and the PDOFs on **Page 3** to be compatible. However, any force direction on the final CRASH output must be compatible with the force direction coded in variable EV06 or EV14.

Refer to the document entitled: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No event or not CDC applicable) is used when there is not an event or when an event exists but is not CDC applicable.

Variable Name: 1st C.D.C. — Deformation Location
                     2nd C.D.C. — Deformation Location

Element Values:

Blank	No C.D.C.
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 document entitled: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No C.D.C.) is used when there is not an event or when an event exists but is not CDC applicable.

Variable Name: 1st C.D.C. — Specific Longitudinal or Lateral Location
2nd C.D.C. — Specific Longitudinal or Lateral Location

Element Values:

Blank   No C.D.C.

Horizontal Impacts		**Top or Undercarriage**	
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 (C + R)		
9	Unknown		

Source: Restricted to vehicle inspection or photographs.

Remarks:

Element values **"F"**, **"P"**, **"B"**, **"Y"**, **"Z"**, and **"D"** must be used for vehicles with top or undercarriage deformation ("T" or "U" in variable EV07 and/or EV15).

Refer to the document entitled: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No C.D.C.) is used when there is not an event or when an event e xits but is not CDC applicable.

Variable Name: 1st C.D.C. — Specific Vertical or Lateral Location
2nd C.D.C. — Specific Vertical or Lateral Location

Element Values:

Blank   No C.D.C.

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: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No C.D.C.) is used when there is not an event or when an event exists but is not CDC applicable.

Variable Name: 1st C.D.C. — Type of Damage Distribution
                            2nd C.D.C. — Type of Damage Distribution

Element Values:

Blank	No C.D.C.
W	Wide impact area
N	Narrow impact area
S	Sideswipe
O	Rollover (includes side)
A	Overhanging structure
E	Corner
K	Conversion in impact type
U	No residual deformation
9	Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Refer to the document entitled: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No C.D.C.) is used when there is not an event or when an event exists but is not CDC applicable.

Note: When recording a **"K"** conversion impact type on the Exterior Vehicle form, page 4, variables EV04-EV19 (Highest and Second Highest Delta V), follow the procedures below:

1. **The "K" conversion is the only impact** — Code the first half of the **"K"** conversion in variables EV04-EV11 (highest delta V); and code the second half of the **"K"** conversion in variables EV12 -EV19 (second highest delta V).

2. **There are two or more impacts including a "K" conversion. The "K" conversion is the Highest or Second Highest Delta V** — Code only the first half of the **"K"** conversion as the highest or second highest delta V (which -so-ever is appropriate). The other CDC row is coded with the appropriate highest or second highest delta V.

Variable Name: 1st C.D.C. — Deformation Extent Guide
                       2nd C.D.C. — Deformation Extent Guide

Element Values:

Blank	No C.D.C.
01	One
02	Two
03	Three
04	Four
05	Five
06	Six
07	Seven
08	Eight
09	Nine
99	Unknown

Source: Restricted to vehicle inspection or photographs.

Remarks:

Extent zone is coded from direct damage only, even when a body panel is torn loose from the vehicle frame due to impact; consider body panels torn loose from the frame as not representative of residual crush.

When you average two crush profiles, use the largest maximum crush for your extent zone (*i.e.*, do not use the averaged maximum crush).

Refer to the document entitled: "Collision Deformation Classification Training Program: Intermediate Level — Training/Reference Module", for detailed definitions of the element values as well as instruction on proper usage. This document is based upon SAE J224 MAR80.

See the discussion in CDC Related Remarks (EV06 -EV11, EV14-EV19) for coding clarifications and procedures.

Code "Blank"   (No C.D.C.) is used when there is not an event or when an event exists but is not CDC applicable.

CRUSH PROFILE OVERVIEW

For the section entitled "Crush Profile", code the CDC associated damage dimensions for the Highest Delta "V" CDC (EV4 -EV11) and the Second Highest Delta "V" (EV12 -EV19). The encoded "L", "C"s and "D" values must be the actual data set used in the reconstruction program (*i.e.*, CRASH or OLDMIS).

If the damage measurements are known, code the appropriate measurements to the nearest centimeter regardless of whether a reconstruction algorithm was completed. If only two or four C-values are collected (rare occasions), then leave the remaining C -value fields blank.

END DAMAGE MEASUREMENT PROTOCOL
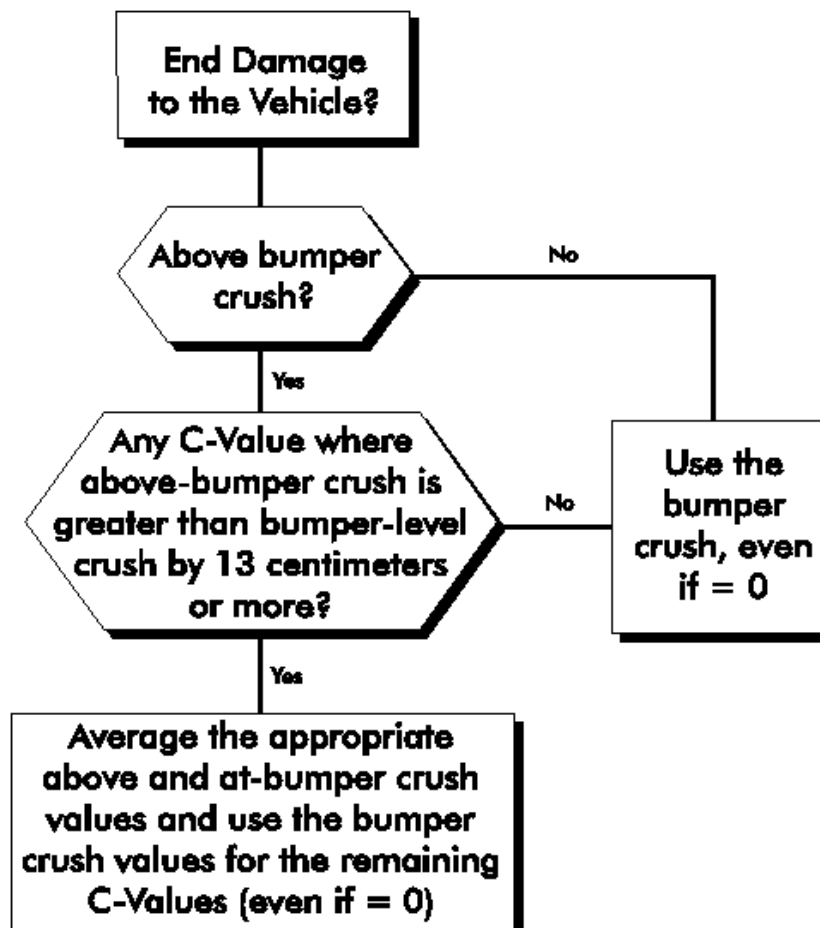
CRUSH PROFILE OVERVIEW

SIDE PLANE DAMAGE MEASUREMENT PROTOCOL

Side Damage to the Vehicle?

Complete Latch, Pillar, or Hinge Failure (Separation)? — No → Use the max crush level values

Yes

Any C-Value location where maximum crush is greater than sill crush by 13 cm or more? — No → Use the max crush level values

Yes

Average the C-Values which have a greater than or equal to 13 cm difference between the sill and max crush levels (even if the sill measurement = 0) and use the max crush values for the remaining C locations.

Variable Name: 1st Crush Profile — L
2nd Crush Profile — L

Element Values:

Range: 001 through 650 centimeters, Blank
Code measured value to the nearest centimeter.
Blank   No crush profile for most severe impact(s)
650   650cm or greater

Source: Vehicle inspection.

Remarks:

These variables are the "L" dimensions normally used in the CRASH3 (or OLDMIS) input for the highest (EV04-EV11) and second high est (EV12-EV19) delta V impacts sustained by the vehicle. The damage measurements associated with one of these CDCs may be encoded regardless of the use of a reconstruction program (*e.g.*, when the assumptions of the reconstruction program are not valid).

Code "Blank"   [No crush profile for most severe impact(s)] when a reconstruction program is used but no value is entered into the reconstruction program or the measurement is unknown (*i.e.*, CDC only run or OLDMISS where this vehicle's data are missing).

Variable Name: 1st Crush Profile — C1-C6
                     2nd Crush Profile — C1-C6

Element Values:

Range: 000 through 250, Blank
                 Code measured value to the nearest centimeter.
                 Blank   No crush profile for most severe impact(s)
                 250   250 centimeters or greater

Source: Vehicle inspection.

Remarks:

The damage measurements associated with a priority (*i.e.*, 1st or 2nd highest) CDC are coded regardless of the use of a reconstruction program. Code the obtained C -values for each impact (highest two delta V impacts) to the nearest centimeter in the space provided.

If a reconstruction program is used, the encoded values of "C" (*i.e.*, C1, C2, C3, C4, C5, and C6) must be the same as the C-values used in the reconstruction program, and they may differ from C-measurement s made in the field (*e.g.*, averaged measurements for override).

Code "Blank" [No crush profile for most severe impact(s)] when a reconstruction program is used but no value is entered into the reconstruction program or the measurements are unknown (*i.e.*, CDC only run or OLDMISS where this vehicle's data are missing).

Code "250"   if there is 250 centimeters or more of crush.

Variable Name: 1st Crush Profile — D
                     2nd Crush Profile — D

Element Values:

Range: -300 to -001, _000, +001 to +300 centimeters, Blank
                  Code measured value to the nearest centimeter.
                  Blank   No crush profile for most severe impact(s)
                  _000   Greater than -0.5 and less than +0.5 centimeters
                  ±300   300cm or greater

Source: Vehicle inspection.

Remarks:

The damage measurement associated with a priority (*i.e.*, 1st or 2nd highest) CDC is coded regardless of the use of a reconstruction program. Encode the measurement normally used in the computer program.

Code "_000" if the measured or calculated "D" value for the particular crus h profile is "0" (*i.e.*, greater than -0.5 and less than +0.5) centimeters; otherwise, code the value to the nearest centimeter.

Code "Blank" [No crush profile for most severe impact(s)] when a reconstruction program is used but no value is entered into the reconstruction program or the measurement is unknown (*i.e.*, CDC only run or OLDMISS where this vehicle's data are missing).

Variable Name::   Undeformed End Width (Coded when highest severity impact is an end plane impact)

Element Values::

        100-249   Code measured value to the nearest centimeter
        250   250 centimeters or more
        998   No highest severity end plane impact
        999   Unknown

Source: Vehicle inspection, secondary source materials are listed in variable GV43 vehicle curb weight.

Remarks:

The undeformed end width dimension is an original undamaged dimension of the end-plane contacted. If the value is not retrievable from the case vehicle, original specification sources or an exemplar vehicle must be utilized.

This value is the measured distance laterally between the apex of both bumper corners.

Code "998"   (No highest severity end-plane impact) is used when no impact(s) to the vehicle involve an end plane.

        Code "998" (No highest severity end-plane impact when there is no end plane impact to the vehicle, or the end plane impact is no the highest severity impact (coded in EV04-EV11).

Variable Name: Direct Damage Width (For highest severity impact)

Element Values:

000-249   Code measured value to the nearest centimeter
250   250 centimeters or more
999   Unknown

Source: Vehicle inspection.

Remarks:

The direct damage width is measured and recorded on the crush profile page.

This variable is coded irrespective of the plane of the vehicle that is struck.

Code "999"   (Unknown) is used when the direct damage width cannot be determined.

EV28

Variable Name: Original Wheelbase

Element Values:

Range: 100-650, 999
          Code to the nearest centimeter.
          650   650 centimeters or more
          999   Unknown

Source: Primary and secondary source materials ar e listed in variable GV43, Vehicle Curb Weight.

Remarks:

The wheelbase dimension is obtained from source materials and not from vehicle measurements. This dimension is encoded to the nearest centimeter.

Code "999"   (Unknown) is used when this vehicle's original specification is not available.

Variable Name: Original Average Track Width

Element Values:

Range: 100 - 185, 999
                100-184   Code to the nearest centimeter
                185   185 Centimeters or more
                999   Unknown

Source: Vehicle inspection, secondary so urce materials are listed in variable GV43 vehicle curb weight.

Remarks:

The average track width dimension is measured as close as possible to pre-crash conditions. [This value is *not* always the original specification value (*e.g.*, when post manufacture oversize tires are put on the vehicle.).] Measure both undamaged widths on the vehicle and encode 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, and there does not appear to be significant post-manufacture modifications, encode the value based on original specifications or an undamaged axle.

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.

Code "999"   (Unknown) is used in the following situations:

☞ The axles are significantly damaged and there are no specifications available for this vehicle.

☞ The axles are significantly damaged **and** there was post-manufacture modifications that would alter the track width.

☞ The measurements were not obtained fr om the vehicle and there are no specifications available.

EV30

Variable Name: Are CDCs Documented but Not Coded on the Automated File?

Element Values:

0   No
1   Yes

Remarks:

A CDC must be known in its entirety to be considered "documented". An unknown (*i.e.*, 99-9999-99) CDC is *not* a "documented" CDC, nor is a partial CDC (*e.g.*, 12-F9EN-99).

Code "1"   (Yes) if any "documented" CDC is written on the "CDC Worksheet" (**Page 3** of the Exterior Vehicle Form), and it is *not* coded in variables EV06-EV11 or EV14-EV19 (Collision Deformation Classification); otherwise, code this variable "0" (No).

Variable Name: Researcher's Assessment of Vehicle Disposition

Element Values:

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

Source: Primary source is the vehicle; secondary source is interviewee(s).

Remarks:

Whereas variable GV10, Police Reported Vehicle Disposition, reports this vehicle's manner of leaving the scene based *solely* on the police report data, determine this variable (EV31) based on vehicle inspection (which is supplemented by interview data for a repaired vehicle).

"Towing" is defined identically to the definition in variable GV10 (*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"**.

A police officer may categorize damage such as broken headlights, broken taillights, flat or restricted tires, etc., as**"disabling"**, when, in fact, the vehicle is capable of being driven from the scene. Therefore, when the PAR indicates it was towed due to damage, use the following guideline.

Determine the severity of the damage during the vehicle's inspection. Code "0" (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.

Code this variable independently of variable GV10, Police Reported Vehicle Disposition. The tow status reported here is determined primarily during vehicle inspection; however, if the vehicle was repaired, then code this variable based on input from an interviewee. **Under no circumstance should the PAR be used as a source for coding this variable.**

Annotate the reason for the encoded choice in the blank space at the bottom of **Page 4** of the Exterior Vehicle Form. For example, a researcher selects code "0" (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".

Code "0" (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).

Variable Name:　　Researcher's Assessment of Vehicle Disposition (cont'd.)

Code "1"　　(Towed due to vehicle damage) when the vehicle sustained damage from the crash such that towing was required.

Code "9"　　(Unknown) when:

☞ the vehicle was towed from the scene but the reason for the towing cannot be determined, or

☞ the disposition of the vehicle from the scene cannot be determined.

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

Element Values:

0	No post manufacturer modifications	
1	Yes — post manufacturer modifications (specify)	
	(Include photograph of CERTIFICATION PLACARD in case report)	
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)."**

EV32
(2)

Variable Name: Is This a Multi-Stage Manufactured Vehicle And/Or
                  A Certified Altered Vehicle? (cont'd.)

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

Code "0"   (No post manufacturer modifications) is used when this vehicl e 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!

Code "1"   (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 altered certified 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.

A slide (photo) of the certification label(s) is essential and must be included with the case. Refer to the following illustrations for examples of certifying labels.

EV32
(3)

Variable Name: Is This a Multi-Stage Manufactured Vehicle And/Or
A Certified Altered Vehicle? (cont'd.)

Code "9" (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.

Variable Name: Fire Occurrence

Element Values:

0	No fire
	Yes, fire occurred
1	Minor
2	Major
9	Unknown

Source: Primary source is the vehicle inspection; secondary sources include the interviewee(s), police crash report, and occupant medical records.

Remarks:

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 coded on the Accident Form.

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.

Code "0"   (No fire) is used when no fire occurred to this vehicle during the crash sequence or before crash circumstances stabilized.

Code "1"   (Minor) is a general term used to describe the degree of fire involvement and is used in the following situations:

☞ Engine compartment only fi re

☞ Trunk compartment only fire

☞ Partial passenger compartment only fire

☞ Undercarriage only fire

☞ Tire(s) only fire

☞ The vehicle sustained fire damage and the extent of the fire damage could not be determined during vehicle inspection.

Variable Name: Fire Occurrence (cont'd.)

Code "2"   (Major) identifies those situations where the vehicle experienced a greater fire involvement than defined under Code "1" 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).

Code "9"   (Unknown) is used if a fire occurred in this crash, but it cannot be determined if this vehicle sustained a fire.

Variable Name: Origin of Fire

Element Values:

0	No fire
1	Vehicle exterior (front, side, back, top)
2	Exhaust system
3	Fuel tank (and other fuel retention system parts)
4	Engine com partment
5	Cargo/trunk compartment
6	Instrument panel
7	Passenger compartment area
8	Other location (specify):
9	Unknown

Source: Primary source is the vehicle inspection; secondary sources include the interviewee(s), and police crash report.

Remarks:

This variable identifies the location of fire initiation and should not be confused with magnitude of fire. As an example, if the vehicle appeared totally "burnt", code "7" (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.

Code "0"   (No fire) is used when no fire occurred to this vehicle during the crash sequence or before crash circumstances stabilized.

Code "1"   [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.

Code "2"   (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.

Code "3"   [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 code 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).

Variable Name: Origin of Fire

Do not use code "3" if fuel leakage occurs and is ignited in this vehicle's engine compartment [*i.e.*, use code "4" (Engine compartment)]. If fuel leakage occurs in the fuel tank area and spills onto and is ignited by hot exhaust system components, then use code "2" (Exhaust system).

Code "4" (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.

Code "5" (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.

Code "6" (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 (refer to Figure 1 and 2 under variable IV93 for panel illustrations).

Code "7" (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.

Code "8" (Other location) is used when codes "1"-"7" above do not apply and a fire was involved. Included in this code are fires occurring with wheels or brakes.

EV34
(3)

Variable Name: Origin of Fire

Code "9"   (Unknown) is used in the following situations:

☞ 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.

Variable Name: Location of Fuel Tank — 1 Filler Cap
Location of Fuel Tank — 2 Filler Cap

Element Values:

0	No fuel tank
1	On back plane
2	Aft of center of the rear wheels (rear axle) on left side plane
3	Aft of center of the rear wheels (rear axle) on right side plane
4	Forward of center of the rear wheels (rear axle) on left side plane
5	Forward of center of the rear wheels (rear axle) on right side plane
6	Over the center of the rear wheels (rear axle) on left side plane
7	Over the center of the rear wheels (rear axle) on right side plane
8	Other (specify):
9	Unknown

Source: Vehicle Inspection.

Remarks:

These variables identify the location(s) of the fuel tank filler cap in its original undamaged position on the vehicle. Code the first and second fuel tank filler cap locations beginning from left to right or front to back. If the vehicle is equipped with only one filler cap use EV35 to specify the fuel tank filler cap location and use code "0" for variable EV36.

Be sure to photograph the tank and surrounding area. Refer to the NASS Photography Guideline for a detailed description of the required photographs.

Code "0"   (No fuel tank) is used in variable EV36 to indicate that only one fuel tank is present.

For an electrical vehicle which uses a fossil or grain fuel back-up system, EV35 is coded "0" (No fuel tank) and EV36 is classified under codes "1" through "9" below.

When the vehicle is powered solely by electrical means, both variables EV35 and EV36 are coded "0" (No fuel tank).

Code "1"   (On back plane) is used when the fuel tank filler cap is located behind the center of the rear wheels (rear axle) on the back plane.

Code "2"   [Aft of center of the rear wheels (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.

Code "3"   [Aft of center of the rear wheels (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.

Variable Name: Location of Fuel Tank —1 Filler Cap
                      Location of Fuel Tank —2 Filler Cap

Code "4"   [Forward of center of the rear wheels (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.

Code "5"   [Forward of center of the rear wheels (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.

Code "6"   [Over the center of the rear wheels (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 code takes precedence over codes "1"-"5".

Code "7"   [Over the center of the rear wheels (rear axle) on right side plane] is used when any part of the filler cap is located over the center of the rear wheels (rear axle) on the right side plane. This code takes precedence over codes "1"-"5".

Code "8"   [Other (specify)] is used when the fuel tank filler cap is in a location other than as specified in choices "1" through "7" above. The location is specified in the space provided.

Code "9"   (Unknown) is used w hen:

    ☞ The vehicle was totally destroyed, or

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

Variable Name: Type of Fuel Tank — 1
                     Type of Fuel Tank —2

Element Values:

> 0   No fuel tank (elect rical vehicle)
> 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. Some vehicles may be equipped with reserve fuel tanks (*i.e.*, more than one tank 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.).

Code "0"   [No fuel tank (electrical vehicle)] is used for both variables EV37 and EV38 when the vehicle is powered solely by electrical means.

> For an electrical vehicle which uses a fossil or grain fuel back-up system, EV37 is coded "0" [No fuel tank (electrical vehicle)] and EV38, the tank for the back-up fuel system, is classified under codes "1", "2" or "9" below.

Code "1"   (Metallic) is used for fuel tanks made from metal. This would include steel, aluminum (alloys), stainless steel, etc.

Code "2"   (Non-metallic) is used for fuel tanks which are made from plastic. Plastic tanks are composed of high density polyethylene (HDPE).

Code "9"   (Unknown) is be used as follows:

> ☞   researcher could not make a determination due to inaccessibility,

> ☞   vehicle was dismantled during inspection and the fuel tank(s) was not available, or

> ☞   the type of tank material could not be determined,

The following information has been compiled from discussions with automobile manufacturers, service and parts representatives and the National Automotive History Collection. In coding variable EV37, this information should be confirmed by visual and/or mechanical means.

Variable Name: Type of Fuel Tank — 1 (Cont'd.)
                          Type of Fuel Tank — 2 (Cont'd.)

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

Variable Name: Type of Fuel Tank — 1 (Cont'd.)
Type of Fuel Tank — 2 (Cont'd.)

Dodge
Caravan Wagon		HDPE in optional 20 gallon tank
Sportsman	(1980)	Optional tank was HDPE
	(88-on)	HDPE
Ram Wagon	(1980)	Optional tank was HDPE
	(88-on)	HDPE
Tradesman	(1980)	Optional tank was HDPE
	(88-on)	HDPE
Ram Van	(1980)	Optional tank was HDPE
	(88-on)	HDPE
Ram PU (80-on)		HDPE
Power Ram PU (80-on)		HDPE
Ramcharger (80-on)		HDPE
Dakota (86-on) HDPE		
Monaco		HDPE

Eagle
Premier (88-on)   HDPE

Jeep
CJ5 (83-91)	Optional tank was HDPE
CJ7 (81-86)	Optional tank was HDPE
CJ8 (81-86)/Scrambler	Optional tank was HDPE
Wrangler (87-on)	Optional tank (22 gal) was HDPE
Cherokee (80-on)	HDPE-some have steel tanks
Wagoneer (80-on)	HDPE
J10, J20 PU (80-on)	HDPE
Grand Wagoneer (84-on)	HDPE

(4) *Peugeot*
505	HDPE
Station Wagon	HDPE
Sedan	HDPE

(5) *Volkswagen*
Golf (85-86, 89-on)	HDPE
Jetta (90-on)	HDPE
Passat (92-on)	HDPE
Corrado (89-on)	HDPE

(6) *Volvo*
700 Series (85-on) HDPE

(7) *Saab*
All Models (80-on) HDPE

Variable Name: Type of Fuel Tank-1 (Cont'd.)
Type of Fuel Tank-2 (Cont'd.)

(8) **Merkur**

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
Audi	Jaguar	Rolls Royce
Bentley	Lexus	Sterling
BMW	Lincoln	Subaru
Cadillac	Lotus	Suzuki
Geo	Mazda	Toyota
Honda	Mercedes Benz	Yugo
Hyundai	Nissan	

Variable Name: Location of Fuel Tank — 1
Location of Fuel Tank — 2

Element Values:

0	No fuel tank
1	Aft of center of the rear wheels (rear axle) centered
2	Aft of center of the rear wheels (rear axle) left side
3	Aft of center of the rear wheels (rear axle) right side
4	Forward of center of the rear wheels (rear axle) centered
5	Forward of center of the rear wheels (rear axle) left side
6	Forward of center of the rear wheels (rear axle) right side
7	Over center of the rear wheels (rear axle)
8	Other (specify):
9	Unknown

Source: Vehicle Inspection.

Remarks:

These variables identify the location(s) of this vehicle's fuel tank(s). Code the first and second fuel tank locations beginning from left to right in side mounted fuel tanks or front to back in fore and aft mounted fuel tanks. If the vehicle is equipped with only one fuel tank, use EV39 to specify that fuel tank's location and code "0" for EV40.

Be sure to photograph the tank and surrounding area. Refer to the NASS Photography Guideline for a detailed description of the required photographs.

Code "0" (No fuel tank) is used in variable EV40 to indicate that only one fuel tank is present.

For an electrical vehicle which uses a fossil or grain fuel back-up system, EV39 is coded "0" (No fuel tank) and EV40 is classified under codes "1" through "9" below.

When the vehicle is powered solely by electrical means, both variables EV39 and EV40 are coded "0" (No fuel tank).

Code "1" [Aft of center of the rear wheels (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 third of the vehicle (*e.g.*, between the frame rails if present).

Code "2" [Aft of center of the rear wheels (rear axle) left side] is used to identify fuel tanks located in back of the center of the rear wheels (rear axle) and in the left third of the vehicle (*e.g.*, between the frame rails and the outer body surface).

Code "3" [Aft of center of the rear wheels (rear axle) right side] is used to identify fuel tanks located in back of the center of the rear wheels (rear axle) and in the right third of the vehicle (*e.g.*, between the frame rails and the outer body surface).

EV39
EV40
(2)

Variable Name: Location of Fuel Tank — 1 (Cont'd)
Location of Fuel Tank — 2 (Cont'd)

Code "4" [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 third of the vehicle.

Code "5" [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 third of the vehicle.

Code "6" [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 third of the vehicle.

Code "7" [Over center of the rear wheels (rear axle)] is used when any part of the fuel tank is located over the center of the rear wheels (rear axle). This code takes priority over codes 1-6.

Code "8" [Other (specify)] is used when the fuel tank is in a location other than as specified in codes "1" through "7" above. Included in this code are fuel tanks located inside the passenger compartment, trunk, cargo area, pickup bed, etc. The location is specified in the space provided.

Code "9" (Unknown) is used when:

☞ The vehicle was totally destroyed, or

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

Variable Name: Damage to Fuel Tank — 1
Damage to Fuel Tank — 2

Element Values:

0	No fuel tank
1	No damage to fuel 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, code the damage that resulted in a fuel system integrity loss. If there were multiple types of integrity loss then select the first code which applies from the following prioritized list: codes "3", "4", "5", "6", "7", and "8". If there are multiple forms of damage and no fuel system integrity loss, then code according to the following prioritized list: Codes "2", "6", and "8".

Be sure to photograph the tank and surrounding area. Refer to the NASS Photography Guideline for a detailed description of the required photographs.

Code the first and second tank locations beginning from left to right side mounted tanks or front to back in forward and rearward mounted tanks. If the vehicle is equipped with only one fuel tank, use EV41 to specify the damage to the fuel tank and use code "0" for variable EV42.

In addition, annotate the pre-crash condition of the fuel tank on page 6 of the Exterior Vehicle Form in the area set aside for notes (*i.e.* corroded, leaking, etc).

Code "0"   (No fuel tank) is used in variable EV42 to indicate that only one fuel tank is present.

For an electrical vehicle which uses a fossil or grain fuel back-up system, EV41 is coded "0" (No fuel tank) and EV42 is classified under codes "1" through "9" below.

When the vehicle is powered solely by electrical means, both variables EV41 and EV42 are coded "0" (No fuel tank).

Variable Name: Damage to Fuel Tank — 1 (Cont'd)
                            Damage to Fuel Tank — 2 (Cont'd)

Code "1"   (No damage to fuel tank) is used when the fuel tank is <u>not</u> damaged during the sequence of crash events.

Code "2"   (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.

Code "3"   (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) which experience integrity loss are ***not*** coded here .

Code "4"   (Punctured) is used when the fuel tank was punctured, perforated or pierced during the collision sequence.

Code "5"   [Lacerated (ripped)] is used when the fuel tank was lacerated, cut, sliced, ripped or torn during the collision sequence.

Code "6"   [Abraded (scraped)] is used when the fuel tank was abraded or scraped during the collision sequence.

Code "7"   (Filler neck separation from the fuel tank) is used when the filler neck was separated from the fuel tank during the collision sequence.

Code "8"   [Other damage (specify) is used when damage to the fuel tank can <u>not</u> be described in codes "1"-"9".

Code "9"   (Unknown) is used when:

        ☞   The vehicle was totally destroyed, or

        ☞   the fuel tank damage can not be determined.

Variable Name: Leakage Location of Fuel System — 1
                        Leakage Location of Fuel System — 2

Element Values:

        0   No fuel tank
        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, code the leakage that resulted in a fire. If there are multiple areas of leakage and no fire, then code the most severe area of leakage. If the severity can not be determined, then use codes "2" through "8" in the priority listed.

Be sure to photograph the area of leakage and surrounding area(s). Refer to the NASS Photography Guideline for a detailed description of the required photographs.

Code the first and second location(s) of fuel system leakage beginning from left to right in side mounted fuel tanks or front to back in fore and aft mounted fuel tanks. If the vehicle is equipped with only one fuel tank, use EV43 to specify the location of the fuel system and use code "0" for variable EV44.

If the fuel system was leaking prior to the collision, (*i.e.*, corrosion to tank, loose fuel line, etc.) annotate the information in the notes section on page 6 of the Exterior Vehicle Form.

Code "0"   (No fuel tank) is used in variable EV44 to indicate that only one fuel tank is present.

                For an electrical vehicle which uses a fossil or grain fuel back-up system, EV43 is coded "0" (No fuel tank) and EV44 is classified under codes "1" through "9" below.

                When the vehicle is powered solely by electrical means, both variables EV43 and EV44 are coded "0" (No fuel tank).

EV43
EV44
(2)

Variable Name: Leakage Location of Fuel System — 1 (Cont'd)
                           Leakage Location of Fuel System — 2 (Cont'd)

Code "1"   (No fuel leakage) is used when there has been no loss in fuel retention.

Code "2"   (Tank) is used when the fuel tank was leaking as a result of an impact during the crash sequence. Also use this code when leakage occurs as a result of all the filler neck separating from the fuel tank.

Code "3"   (Filler Neck) is used when the filler neck is the source of fuel leakage as a result of an impact during the crash sequence.

Code "4"   (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.

Code "5"   (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. If the vehicle is equipped with more than one fuel system line, pump or filter, code the location of the leakage to the applicable system. If the fuel systems are interconnected, code the first system that applies.

Code "6"   (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.

Code "8"   [Other (specify)] is used when fuel was leaking, as a result of the crash, from other than the sources specified in codes "2" through "6" above.

Code "9"   (Unknown) is used when:

      ☞   The vehicle was totally destroyed in the crash and it cannot be determined if the fuel system experienced any leakage, or

      ☞   The source of the fuel system leakage could not be determined.

Variable Name: Fuel Type — 1
                       Fuel Type — 2

Element Values:

Single Fuel Type
00   No fuel tank
01   Gasoline
02   Diesel
03   CNG (Compressed Natural Gas)
04   LPG (Liquid Petroleum Gas) also known as Propane
05   LNG (Liquid Natural Gas)
06   Methanol (M100 or M85)
07   Ethanol (E100 or E85)
08   Other (Hydrogen or others) (specify):

Electric Powered or Electric/Solar Powered Vehicles
10   Lead Acid Battery
11   Nickel-Iron Battery
12   Nickel-Cadmium Battery
13   Sodium Metal Chloride Battery
14   Sodium Sulfur Battery
18   Other (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.

Code "98"   [Other hybrid (specify)] is used when the vehicle is powered by an alternative energy source such as a "flywheel" technology.

Code "99"   (Unknown fuel type) is used when:

☞   The vehicle was totally destroyed, or

☞   The fuel type can not be determined.

EV47

Variable Name: Is This Vehicle Equipped With More Than Two Fuel Tanks?

Element Values:

0   No (one or two tanks only)

Yes — More Than Two Tanks
1   Yes —- *damage to any* tank or filler cap and no *fuel system leakage*
2   Yes —- *no* damage to any tank or filler cap but there *is fuel system leakage* (specify leakage location):
3   Yes — *damage* to an additional tank or filler cap and there *is fuel system leakage*(specify the following):
    Type of tank
    Tank location
    Filler cap location
    Tank damage
    Location of leakage
    Type of fuel
9   Unknown if more than two tanks

Source: Vehicle Inspection.

Remarks:

Some vehicles may be equipped with more than two fuel tanks.

Code "0"   [No (one or two tanks only)] is used when a vehicle is not equipped with more than two fuel tanks.

Code "1"   (Yes —- *no damage* to any tank or filler cap and *no fuel system* leakage) is used when a vehicle is equipped with more than two fuel tanks and there is no damage to any tank or filler cap and no fuel system leakage.

Code "2"   [Yes —- *no damage* to any tank or filler cap but there *is fuel system leakage*) (specify leakage location)] is used when a vehicle is equipped with more than two fuel tanks and there is no damage to any tank or filler cap but fuel was leaking from the fuel system.

Code "3"   [Yes —- *damage* to an additional tank or filler cap and *there is fuel system leakage* (specify the following)] is used when a vehicle is equipped with more than two fuel tanks and there is damage to at least one additional tank or filler cap and fuel was leaking from the fuel system. Specify the location of the fuel tank, filler cap, type of tank, damage, leakage and type of fuel.

Code "9"   (Unknown if more than two tanks) is used when:

☞ The vehicle was totally destroyed, or

☞ the researcher is unable to determine if the vehicle is equipped with more than two fuel

INTERIOR VEHICLE FORM

1. Primary Sampling Unit Number ___ ___

2. Case Number - Stratum ___ ___ ___ ___

3. Vehicle Number ___ ___

INTEGRITY

4. Passenger Compartment Integrity ___ ___
   (00) No integrity loss

   Yes, Integrity Was Lost Through
   (01) Windshield
   (02) Door (side)
   (03) Door/hatch (back door)
   (04) Roof
   (05) Roof glass
   (06) Side window
   (07) Rear window (backlight)
   (08) Roof and roof glass
   (09) Windshield and door (side)
   (10) Windshield and roof
   (11) Side and rear window (side window and backlight)
   (12) Windshield and side window
   (13) Door and side window
   (98) Other combination of above (specify):

   _____
   (99) Unknown

Door, Tailgate or Hatch Opening

5. LF___ 6. RF___ 7. LR___ 8. RR___ 9. TG/H___

   (0) 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

Damage/Failure Associated with Door, Tailgate or Hatch Opening in Collision. If IV05-IV09 ≠ 2, Then code Ø

10. LF___ 11. RF___ 12. LR___ 13. RR___ 14. TG/H___

   (0) No door/gate/hatch or door not opened

   Door, Tailgate or Hatch Came Open During Collision
   (1) Door operational (no damage)
   (2) Latch/striker failure due to damage
   (3) Hinge failure due to damage
   (4) Door structure failure due to damage
   (5) Door support (i.e., pillar, sill, roof side rail, etc.) failure due to damage
   (6) Latch/striker and hinge failure due to damage
   (8) Other failure (specify):

   _____
   (9) Unknown

GLAZING

Type of Window/Windshield Glazing

15. WS___ 16. LF___ 17. RF___ 18. LR___ 19. RR___

20. BL___ 21. Roof___ 22. Other___

   (0) 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
   (7) Glazing removed prior to accident
   (8) Other (specify):

   _____
   (9) Unknown

Window Precrash Glazing Status

23. WS___ 24. LF___ 25. RF___ 26. LR___ 27. RR___

28. BL___ 29. Roof___ 30. Other___

   (0) No glazing
   (1) Fixed
   (2) Closed
   (3) Partially opened
   (4) Fully opened
   (7) Glazing removed prior to accident
   (9) Unknown

Glazing Damage from Impact Forces

31. WS___ 32. LF___ 33. RF___ 34. LR___ 35. RR___

36. BL___ 37. Roof___ 38. Other___

   (0) 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 accident
   (9) Unknown if damaged

Glazing Damage from Occupant Contact

39. WS___ 40. LF___ 41. RF___ 42. LR___ 43. RR___

44. BL___ 45. Roof___ 46. Other___

   (0) No glazing
   (1) No occupant contact to glazing
   (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 accident
   (8) Glazing disintegrated by occupant contact
   (9) Unknown if contacted by occupant

INTRUSION WORKSHEET
NOTE: SKETCH INTRUDED AREAS

Row Width (cm)

Longitudinal

Lateral

Longitudinal

Vertical

Longitudinal

Longitudinal

Vertical

Longitudinal

Longitudinal

Vertical
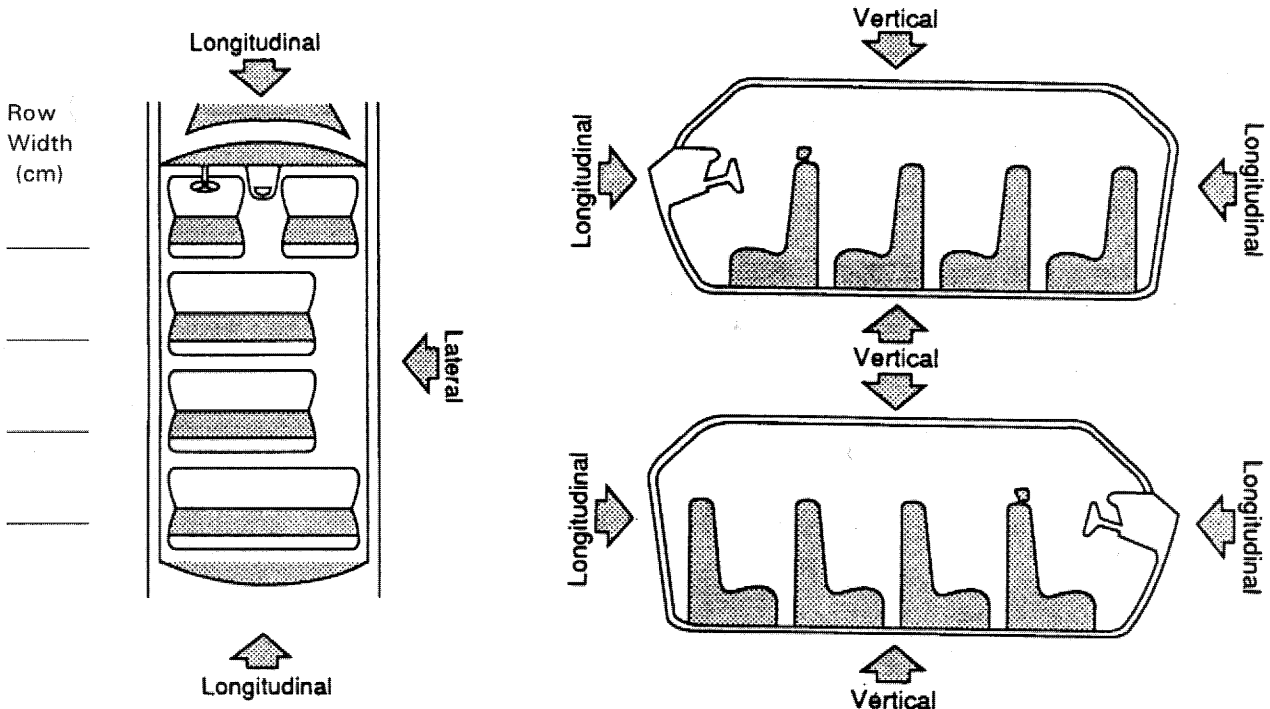
LOCATION OF INTRUSION	INTRUDED COMPONENT	COMPARISON VALUE	—	INTRUDED VALUE (All Measurements Are In Centimeters)	=	INTRUSION	DOMINANT CRUSH DIRECTION
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		
			—		=		

Document no more than the 15 most severe intrusions

OCCUPANT AREA INTRUSION

Note: If no intrusions, leave variables IV47-IV86 blank.

	Location of Intrusion	Intruding Component	Magnitude of Intrusion	Dominant Crush Direction
1st	47.___ ___	48.___ ___	49.___	50.___
2nd	51.___ ___	52.___ ___	53.___	54.___
3rd	55.___ ___	56.___ ___	57.___	58.___
4th	59.___ ___	60.___ ___	61.___	62.___
5th	63.___ ___	64.___ ___	65.___	66.___
6th	67.___ ___	68.___ ___	69.___	70.___
7th	71.___ ___	72.___ ___	73.___	74.___
8th	75.___ ___	76.___ ___	77.___	78.___
9th	79.___ ___	80.___ ___	81.___	82.___
10th	83.___ ___	84.___ ___	85.___	86.___

INTRUDING COMPONENT

Interior Components
- (01) Steering assembly
- (02) Instrument panel left
- (03) Instrument panel center
- (04) Instrument panel right
- (05) Toe pan
- (06) A (A1/A2)-pillar
- (07) B-pillar
- (08) C-pillar
- (09) D-pillar
- (10) Side panel - forward of the A1/A2-pillar
- (11) Door panel (side)
- (12) Side panel - rear of the B-pillar
- (13) Roof (or convertible top)
- (14) Roof side rail
- (15) Windshield
- (16) Windshield header
- (17) Window frame
- (18) Floor pan (includes sill)
- (19) Backlight header
- (20) Front seat back
- (21) Second seat back
- (22) Third seat back
- (23) Fourth seat back
- (24) Fifth seat back
- (25) Seat cushion
- (26) Back door/panel (e.g., tailgate)
- (27) Other interior component (specify):

  _____

Exterior Components
- (30) Hood
- (31) Outside surface of this vehicle (specify):

  _____
- (32) Other exterior object in the environment (specify):_____
- (33) Unknown exterior object
- (97) Catastrophic
- (98) Intrusion of unlisted component(s) (specify):_____
- (99) Unknown

LOCATION OF INTRUSION

Front Seat
- (11) Left
- (12) Middle
- (13) Right

Second Seat
- (21) Left
- (22) Middle
- (23) Right

Third Seat
- (31) Left
- (32) Middle
- (33) Right

Fourth Seat
- (41) Left
- (42) Middle
- (43) Right

- (97) Catastrophic
- (98) Other enclosed area (specify)
- (99) _____ Unknown

MAGNITUDE OF INTRUSION
- (1) ≥ 3 centimeters but < 8 centimeters
- (2) ≥ 8 centimeters but < 15 centimeters
- (3) ≥ 15 centimeters but < 30 centimeters
- (4) ≥ 30 centimeters but < 46 centimeters
- (5) ≥ 46 centimeters but < 61 centimeters
- (6) ≥ 61 centimeters
- (7) Catastrophic
- (9) Unknown

DOMINANT CRUSH DIRECTION
- (1) Vertical
- (2) Longitudinal
- (3) Lateral
- (7) Catastrophic
- (9) Unknown

STEERING RIM/SPOKE DEFORMATION

(All Measurements Are in Centimeters)

COMPARISON VALUE	—	DAMAGE VALUE	=	DEFORMATION
	—		=	
	—		=	
	—		=	
	—		=	

STEERING COLUMN

87. Steering Column Type ____
    (1) Fixed column
    (2) Tilt column
    (3) Telescoping column
    (4) Tilt and telescoping column
    (8) Other column type (specify):

    _____

    (9) Unknown

88. Tilt Steering Column Adjustment ____
    (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

89. Telescoping Steering Column Adjustment ____
    (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

90. Steering Rim/Spoke Deformation ____ ____
    ____ Code actual measured
    deformation to the nearest centimeter
    (00) No steering rim deformation
    (01-14) Actual measured value in centimeters
    (15) 15 centimeters or more
    (98) Observed deformation cannot be measured
    (99) Unknown

91. Location of Steering Rim/Spoke ____ ____
    Deformation
    (00) No steering rim deformation

    Quarter Sections
    (01) Section A
    (02) Section B
    (03) Section C
    (04) Section D

    Half Sections
    (05) Upper half of rim/spoke
    (06) Lower half of rim/spoke
    (07) Left half of rim/spoke
    (08) Right half of rim/spoke

    (09) Complete steering wheel collapse
    (10) Undetermined location
    (99) Unknown
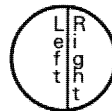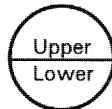
INSTRUMENT PANEL

92. Odometer Reading ____ ____ ____ ,000

    ____ kilometers
    ____ Code to the nearest 1,000 kilometers
    (000) No odometer
    (001) Less than 1,500 kilometers
    (500) 499,500 kilometers or more
    (999) Unknown
    __ __ __ , __ __ __ miles X 1.6093 = __ __ __ , __ __ __ kilometers

    Source: _____

93. Instrument Panel Damage from
    Occupant Contact?
    (0) No ____
    (1) Yes
    (9) Unknown

94. Type of Knee Bolster Covering ____
    (0) No knee bolster
    (1) Padded
    (2) Rigid plastic
    (8) Other (specify): _____
    (9) Unknown

95. Knee Bolsters Deformed from
    Occupant Contact?
    (0) No knee bolster ____
    (1) No deformation
    (2) Yes - deformation
    (9) Unknown

96. Did Glove Compartment Door Open
    During Collision(s)?
    (0) No glove compartment door ____
    (1) No - door did not open
    (2) Yes - door opened
    (9) Unknown

97. Adaptive (Assistive) Driving Equipment ____
    (0) No adaptive driving equipment
    (1) Adaptive driving equipment installed
        (Check all that apply.)
        [ ] Hand controls for braking/acceleration
        [ ] Steering control devices (attached to OEM
            steering wheel
        [ ] Steering knob attached to steering wheel
        [ ] Low effort power steering (unit or device)
        [ ] Replacement steering wheel (i.e., reduced
            diameter)
        [ ] Joy-stick steering controls
        [ ] Wheelchair tie-downs
        [ ] Modification to seat belts (specify):

        _____
        [ ] Additional or relocated switches (specify):

        _____
        [ ] Raised roof
        [ ] Wall-mounted head rest (used behind
            wheelchair)
        [ ] Other adaptive device (specify):

        _____

    (9) Unknown

IV04

Variable Name: Passenger Compartment Integrity

Element Values:

    00   No integrity loss

    Yes, Integrity Was Lost Through:
01	Windshield
02	Door (side)
03	Door/hatch (back door)
04	Roof
05	Roof glass
06	Side window
07	Rear window (backlight)
08	Roof and roof glass
09	Windshield and door (side)
10	Windshield and roof
11	Side and rear window (side window and backlight)
12	Windshield and side window
13	Door and side window
98	Other combination of above (specify):
99	Unknown

Source: Vehicle inspection.

Remarks:

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. 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 IV05 -IV09 (Door, Tailgate Or Hatch Opening) code "8" (Other).

Code "00"   (No integrity loss) is encoded when the doors, roof, and glazing (as listed below) remained intact during the impact sequence.

Variable Name: Passenger Compartment Integrity (cont'd.)

Code "01"   (Windshield) is encoded when the glazing is either holed/slit or displaced sufficiently to allow an adult size head to pass through.

Code "02"   [Door (side)] refers to the door structure and excludes glazing areas. All side doors, whether hinged or sliding are considered here.

Code "03"   [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 entirely made of glazing material and secured with a latching mechanism, only the latching mechanism should be considered for this code. Integrity loss through shattered or displaced rear window glazing is identified in code "07" (Rear window).

Code "04"   (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.

Code "05"   (Roof glass) reports glazing material in the roof structure which is broken or displaced.

Code "06"   (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 coded as integrity loss.

Code "07"   [Rear window (backlight)] includes backlights, hatchbacks/tailgates/ liftbacks, and rear door glazing which were broken or displaced.

Code "08"   (Roof and roof glass) is coded when each specific component experiences integrity loss.

Code "09"   [Windshield and door (side)] identifies integrity loss through windshield glazing and side door structure, but excludes sidelight glazing.

Code "10"   (Windshield and roof) refers to integrity loss of the windshield glazing and roof structure. Windshield and roof glass is included in Code "98" (Other combination of above).

Code "11"   [Side and rear window (side window and backlight)] identifies integrity loss to glazing areas on either side of the vehicle in combination with hatchback/tailgate/liftback and rear door glazing.

Variable Name: Passenger Compartment Integrity (cont'd.)

Code "12"   (Windshield and side window) refers to integrity loss of the windshield glazing (see code "01") in combination with glazing on either side of the vehicle (see code "06").

Code "13"   (Door and side window) refers to integrity loss of the door structure (see code "02") in combination with glazing on either side of the vehicle (see code "06").

Code "98"   (Other combination of above) includes any combination of codes "01" - "07" above which are *not* listed in elements "08" -"13". Integrity loss in areas *not identified* by elements "01" -"07" (*e.g.*, floor) is not considered for this variable.

Code "99"   (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.

DOOR, TAILGATE, OR HATCH OPENING OVERVIEW

It is the intent of variables IV05-IV09 to capture whether a passenger compartment door, tailgate, or hatch opened or remained closed during the crash sequence. Variables IV10 -IV14 only document reasons for why doors came open during the crash.

The areas of interest include the left front, right front, left rear, right rear, and tailgate/hatch doors (*i.e.*, LF, RF, LR, RR, 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 conjunct ion 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 variables IV15 -IV46) 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 encoded under variables IV09 and IV14, ... - TG/H.

Variable Name: Door, Tailgate Or Hatch Opening — LF
                         Door, Tailgate Or Hatch Opening — RF
                         Door, Tailgate Or Hatch Opening — LR
                         Door, Tailgate Or Hatch Opening — RR
                         Door, Tailgate Or Hatch Opening — TG/H

Element Values:

        0 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. Where multiple doors cover a single opening, and the disposition of each door was different, select the code for the door which is first identified in the following priority list: "2" (... came open during collision), "3" (... jammed shut), "8" (Other), "1" (... remained closed and operational), and "9" (Unknown). As an example, if one door came open and the other was jammed shut, the proper code would be "2" (... came open during collision). Gaps caused by body deformation are not coded as door opening events. These gaps will be encoded in variable IV04, Passenger Compartment Integrity.

Code "0"   (No door/gate/hatch) is used when no door, tailgate, or hatch exists in the appropriate area (*i.e.*, LF, RF, LR, RR, TG/H).

Code "1"   (Door/gate/hatch remained closed and operational) for any door, tailgate, or hatch which did not open during the crash sequence and remained operational.

Code "2"   (Door/gate/hatch came open during collision) is coded when the door assembly opened during the crash sequence, irrespective of the cause. Further, the magnitude of the opening created is inconsequential when encoding this value. Note, if this code is used then the matching area in variables IV10 -IV14 must not equal "0". 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.

Variable Name: Door, Tailgate Or Hatch Opening — LF (cont'd.)
Door, Tailgate Or Hatch Opening — RF (cont'd.)
Door, Tailgate Or Hatch Opening — LR (cont'd.)
Door, Tailgate Or Hatch Opening — RR (cont'd.)
Door, Tailgate Or Hatch Opening — TG/H (cont'd.)

Code "3"   (Door/gate/hatch jammed shut) is used 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 coded 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.

Code "8"   (Other) is used for those situations which cannot be identified with elements "0"-"3". Doors which are open prior to the crash take this code (*e.g.*, hatchbacks open for cargo reasons, ventilation, etc.).

Code "9"   (Unknown) is used when the researcher could not make a performance assessment of the door, tailgate or hatch.

<div align="right">
IV10
IV11
IV12
IV13
IV14
</div>

Variable Name: Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LF
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RF
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LR
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RR
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — TG/H

Element Values:

   0   No door/gate/hatch or door not opened

Door, Tailgate, or Hatch Came Open During Collision
1   Door operational (no damage)
2   Latch/striker failure due to damage
3   Hinge failure due to damage
4   Door structure failure due to damage
5   Door support (*i.e.*, pillar, sill, roof side rail, etc.) failure due to damage
6   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 as identified by code "2" (Door/gate/hatch came open during collision) in variables IV05 -IV09, respectively.

Code "0"   (No door/gate/hatch or door not opened) is used when no door, tailgate, or hatch exists or the door/tailgate/hatch did not open during the crash sequence. This code is also used when the door/tailgate/hatch is jammed shut. Doors which were open prior to the crash (hatchbacks open for cargo reasons, ventilation, etc.) also take this code.

Code "1"   [Door operational (no damage)] is used when the door, tailgate, or hatch opened during the crash sequence, but the unit was undamaged and remained operational.

Variable Name: Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LF (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RF (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LR (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RR (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — TG/H (cont'd.)

Code "2"   (Latch/striker failure due to damage) is used 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.

Code "3"   (Hinge failure due to damage) is used 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.

Code "4"   (Door structure failure due to damage) is used 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.

Code "5"   [Door support (*i.e.*, pillar, sill, roof side rail, etc.) failure due to damage] is used 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. Code "6" (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.

Code "6"   (Latch/striker and hinge failure due to damage) is used when both a latch/striker and hinge failure exists. 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).

Code "8"   (Other failure) is used to indicate that an opening exists which cannot be described with codes "1"-"6" above. This includes vehicles with a canvas roof and door structure (*i.e.*, Jeeps, etc.).

IV10
IV11
IV12
IV13
IV14
(3)

Variable Name: Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LF (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RF (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — LR (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — RR (cont'd.)
Damage/Failure Associated with Door, Tailgate,
Or Hatch Opening In Collision — TG/H (cont'd.)

Code "9"   (Unknown) is used when it cannot be determined which code (elements "1" -"8") applies.

GLAZING TYPE AND DAMAGE OVERVIEW

Glazing is defined for these variables as a covering for openings in the vehicle's structure which has the ability to allow light to pass. The areas of interest include: the windshield, sidelight windows, backlight (hatchback, tailgate, liftback, rear window), and roof. Composition of glazing materials in use today include: glass, plastic, and glass-plastic.

The potential for occupant ejection is a major concern of rulemakers at NHTSA. Variables IV15-IV46 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.

Current use of glass-plastic (such as Inner Shield, Securiflex, etc.) involves a plastic anti-lacerative layer applied to the inner surface of windshields. Recently, Federal Motor Vehicle Safety Standard 205 was modified to allow voluntary (not compulsory) installation of this type of glazing. 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. It should be noted that future considerations and uses of glass -plastic involve the side, rear, and roof glazing areas.

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 of Window/Windshield Glazing (IV15 -IV22)
☞   Window Precrash Glazing Status (IV23-IV30)
☞   Glazing Damage from Impact Forces (IV31 -IV38)
☞   Glazing Damage from Occupant Contact (IV39 -IV46)

These sections are further divided into eight specific areas of interest.

☞ WS   =   windshield
☞ LF   =   left front window (driver's window)
☞ RF   =   right front window
☞ LR   =   left rear window (adjacent to LF window)
☞ RR =   right rear window (adjacent to RF window)
☞ BL   =   backlight, tailgate/hatchback/liftgate window
☞ Roof =   sun roof, moon roof, "T" roof, etc.
☞ Other =   other sidelights, door wing windows, and any other light not identified above

The "other" category (as noted) encompasses areas where glazing may be directly contacted by occupants or damaged from impact forces and not identified by a specific location. This would include wing windows located in door areas. In the event more than one "other" area was involved, select the area with the highest priority number as ranked in variables IV31-IV46. When more than one glazing has the highest priority code, 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 on the form..

Variable Name: Type of Window/Windshield Glazing — WS
Type of Window/Windshield Glazing — LF
Type of Window/Windshield Glazing — RF
Type of Window/Windshield Glazing — LR
Type of Window/Windshield Glazing — RR
Type of Window/Windshield Glazing — BL
Type of Window/Windshield Glazing — Roof
Type of Window/Windshield Glazing — Other

Element Values:

0   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
7   Glazing removed prior to accident
8   Other (specify):
9   Unknown

Source: Vehicle inspection.

Remarks:

inner shield
shaded soft-ray

safety **DCL** *flo-lite*
as-14   *d-86*

laminated 8
dot-19 m-65
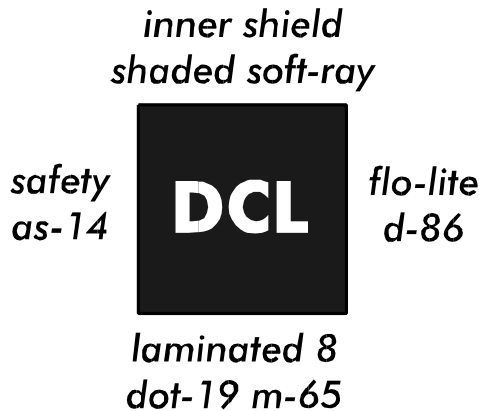
Glazing types are identified by unique AS (American Standard) numbers which are etched in the glazing surface. The AS numbers are generally grouped with other glazing information and together make up an informational symbol referred to as a "water mark" (see diagram below).

<div align="right">

IV15
IV16
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IV20
IV21
IV22
(2)

</div>

Variable Name: Type of Window/Windshield Glazing — WS (cont'd.)
Type of Window/Windshield Glazing — LF (cont'd.)
Type of Window/Windshield Glazing — RF (cont'd.)
Type of Window/Windshield Glazing — LR (cont'd.)
Type of Window/Windshield Glazing — RR (cont'd.)
Type of Window/Windshield Glazing — BL (cont'd.)
Type of Window/Windshield Glazing — Roof (cont'd.)
Type of Window/Windshield Glazing — Other (cont'd.)

The following codes record information for specific areas identified in variable groups IV31-IV38, Glazing Damage from Impact Forces, and IV39 -IV46, Glazing Damage from Occupant Contact.

Code "0"   (No glazing) is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Codes "1"-"6", or "8" are used whether or not the glazing area was identified as damaged from impact forces or direct occupant contact in variable groups IV31 -IV38 and IV39-IV46. When all side and rear windows have been broken out, examine the window track or frame for remnants of broken glass. If such glass is present and the remnants are small clear granules (or cracked in granule size pieces), then it is permissible to code "2" (AS -2 — Tempered). If these remnants are tinted, then it is permissible to code "3" [AS-3 — Tempered – tinted (original)]. If these remnants have any plastic tint shield clinging to them, then it is permissible to code "4" (AS-2 — Tempered – with after market tint) or "5" [AS-3 — Tempered – tinted (with additional after market tint)].

Code "1"   (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.

Code "2"   (AS-2 — Tempered) refers to glass which is designed to break into small glass granules when damaged.

Code "3"   [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 under code "5".

Code "4"   (AS-2 — Tempered – with after market tint) refers to AS-2 glazing which has an aftermarket plastic tint shield applied.

Code "5"   [AS-3 — Tempered – tinted (with additional after market tint)] refers to AS-3 glazing which has an additional aftermarket plastic tint shield applied.

IV15
IV16
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IV20
IV21
IV22
(3)

Variable Name: Type of Window/Windshield Glazing — WS (cont'd.)
Type of Window/Windshield Glazing — LF (cont'd.)
Type of Window/Windshield Glazing — RF (cont'd.)
Type of Window/Windshield Glazing — LR (cont'd.)
Type of Window/Windshield Glazing — RR (cont'd.)
Type of Window/Windshield Glazing — BL (cont'd.)
Type of Window/Windshield Glazing — Roof (cont'd.)
Type of Window/Windshield Glazing — Other (cont'd.)

Code "6"   (AS-14 — Glass/Plastic) refers to glazing which uses plastic on its inner surface. This is used in anti-lacerative windshields (*i.e.*, Inner Shield, Securiflex, etc.).

Code "7"   (Glazing removed prior to accident) includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Code "8"   (Other) 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 space provided. This includes plastic (AS-11C), and bullet proof (AS-10).

Code "9"   (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.

IV23
IV24
IV25
IV26
IV27
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IV29
IV30

Variable Name: Window Pre-crash Status — WS
Window Pre-crash Status — LF
Window Pre-crash Status — RF
Window Pre-crash Status — LR
Window Pre-crash Status — RR
Window Pre-crash Status — BL
Window Pre-crash Status — Roof
Window Pre-crash Status — Other

Element Values:

0   No glazing
1   Fixed
2   Closed
3   Partially opened
4   Fully opened
7   Glazing removed prior to accident
9   Unknown

Source: Vehicle inspection with verification from interview, if possible.

Remarks:

These variables record the operational modes of the glazing prior to the crash.

Code "0"   (No glazing) is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Code "1"   (Fixed) identifies glazing which is not designed to open (*e.g.* windshields, etc.).

Code "2"   (Closed) refers to any operable glazing which was fully closed (*i.e.*, no air gaps).

Code "3"   (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 code the placement of the window in relationship to the opening and not by window design limitations.

Code "4"   (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 code).

IV23
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IV27
IV28
IV29
IV30
(2)

Variable Name: Window Pre-crash Status — WS (cont'd.)
Window Pre-crash Status — LF (cont'd.)
Window Pre-crash Status — RF (cont'd.)
Window Pre-crash Status — LR (cont'd.)
Window Pre-crash Status — RR (cont'd.)
Window Pre-crash Status — BL (cont'd.)
Window Pre-crash Status — Roof (cont'd.)
Window Pre-crash Status — Other (cont'd.)

Code "7"   (Glazing removed prior to accident) includes sun roofs, "T" tops, etc. which were removed from their respective areas prior to the crash.

Code "9"   (Unknown) is used in the following situations.

☞ Due to factors beyond the researcher's control, an adequate deter mination of glazing presence could not be made.

☞ A reasonable determination of the glazing pre -crash status could not be determined.

<div align="right">
IV31
IV32
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IV37
IV38
</div>

Variable Name: Glazing Damage From Impact Forces — WS
Glazing Damage From Impact Forces — LF
Glazing Damage From Impact Forces — RF
Glazing Damage From Impact Forces — LR
Glazing Damage From Impact Forces — RR
Glazing Damage From Impact Forces — BL
Glazing Damage From Impact Forces — Roof
Glazing Damage From Impact Forces — Other

Element Values:

0   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 accident
9   Unknown if damaged

Source: Vehicle inspection.

Remarks:

These variables identify 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 variables IV39-IV46, Glazing Damage From Occupant Contact.

Code "0"   (No glazing) is used for specific areas where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Code "1"   (No glazing damage from impact forces) is used when there was no damage to the glazing. Glazing damage for these variables is defined as cracking, holed, out-of-place or disintegrated. Glazing which is scratched is considered not damaged.

Code "2"   (Glazing in place and cracked from impact forces) is used 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.

IV31
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IV37
IV38
(2)

Variable Name: Glazing Damage From Impact Forces — WS (cont'd.)
                    Glazing Damage From Impact Forces — LF (cont'd.)
                    Glazing Damage From Impact Forces — RF (cont'd.)
                    Glazing Damage From Impact Forces — LR (cont'd.)
                    Glazing Damage From Impact Forces — RR (cont'd.)
                    Glazing Damage From Impact Forces — BL (cont'd.)
                    Glazing Damage From Impact Forces — Roof (cont'd.)
                    Glazing Damage From Impact Forces — Other (cont'd.)

Code "3"   (Glazing in place and holed from impact forces) is used 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. 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.

Code "4"   [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 code. 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 under code "6" (Glazing disintegrated from impact forces).

Code "5"   (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 a hole or slit in the glazing which is large enough in size to allow passage of an adult head.

Code "6"   (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.

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IV31
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IV35
IV36
IV37
IV38
(3)
</div>

Variable Name: Glazing Damage From Impact Forces — WS (cont'd.)
Glazing Damage From Impact Forces — LF (cont'd.)
Glazing Damage From Impact Forces — RF (cont'd.)
Glazing Damage From Impact Forces — LR (cont'd.)
Glazing Damage From Impact Forces — RR (cont'd.)
Glazing Damage From Impact Forces — BL (cont'd.)
Glazing Damage From Impact Forces — Roof (cont'd.)
Glazing Damage From Impact Forces — Other (cont'd.)

Code "7" (Glazing removed prior to accident) 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 assessed under codes "0"-"6" above and are not considered in this element.

Code "9" (Unknown if damaged) is used in the following situations.

☞ retracted into vehicle body panels (*i.e.*, fully open) is assessed under codes "0"-"6" above and are not considered in this element 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 code a known value for damaged glazing.

IV39
IV40
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IV43
IV44
IV45
IV46

Variable Name: Glazing Damage from Occupant Contact — WS
Glazing Damage from Occupant Contact — LF
Glazing Damage from Occupant Contact — RF
Glazing Damage from Occupant Contact — LR
Glazing Damage from Occupant Contact — RR
Glazing Damage from Occupant Contact — BL
Glazing Damage from Occupant Contact — Roof
Glazing Damage from Occupant Contact — Other

Element Values:

0   No glazing
1   No occupant contact to glazing
2   Glazing contacted by occupant but no glazing damage
3   Glazing in pl ace 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 accident
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 codes are arranged in an increasing number priority scheme [*i.e.*, code "4" (Glazing in place and holed by occupant contact) takes precedence over code "3" (Glazing in place and cracked by occupant contact), etc.].

Code "0"   (No glazing) is used for specific area s where the body structure was not designed to accept glazing (*i.e.*, solid roof structure, etc.).

Code "1"   (No occupant contact to glazing) is used when there are no direct occupant contacts detected to the glazing.

Code "2"   (Glazing contacted by occupa nt but no glazing damage) is used when an occupant directly contacted the glazing, but the contact did not result in glazing damage.

IV39
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IV43
IV44
IV45
IV46
(2)

Variable Name: Glazing Damage from Occupant Contact — WS (cont'd.)
Glazing Damage from Occupant Contact — LF (cont'd.)
Glazing Damage from Occupant Contact — RF (cont'd.)
Glazing Damage from Occupant Contact — LR (cont'd.)
Glazing Damage from Occupant Contact — RR (cont'd.)
Glazing Damage from Occupant Contact — BL (cont'd.)
Glazing Damage from Occupant Contact — Roof (cont'd.)
Glazing Damage from Occupant Contact — Other (cont'd.)

Code "3"   (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.

Code "4"   (Glazing in place and holed by occupant contact) is used 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.

Code "5"   [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 take this code. 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 under code "6" (Glazing disintegrated by occupant contact).

Code "6"   (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.

Code "7"   (Glazing removed prior to accident) 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 assessed under codes "0"-"6"and "8" above and are not considered in this element.

<div align="right">
IV39
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IV43
IV44
IV45
IV46
(3)
</div>

Variable Name: Glazing Damage from Occupant Contact — WS (cont'd.)
                    Glazing Damage from Occupant Contact — LF (cont'd.)
                    Glazing Damage from Occupant Contact — RF (cont'd.)
                    Glazing Damage from Occupant Contact — LR (cont'd.)
                    Glazing Damage from Occupant Contact — RR (cont'd.)
                    Glazing Damage from Occupant Contact — BL (cont'd.)
                    Glazing Damage from Occupant Contact — Roof (cont'd.)
                    Glazing Damage from Occupant Contact — Other (cont'd.)

Code "8"   (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.

Code "9"   (Unknown if contacted by occupant) is used 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.

IV47-IV86

OCCUPANT AREA INTRUSION OVERVIEW

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:

Minor Distort

Intrusion

X Y

Compare

Intruded Area

Compare

0

TYPE B INTRUSION:

Intruded Vehicle

"Standard" Vehicle

Compare

A

B

0

C

A

B

0

C
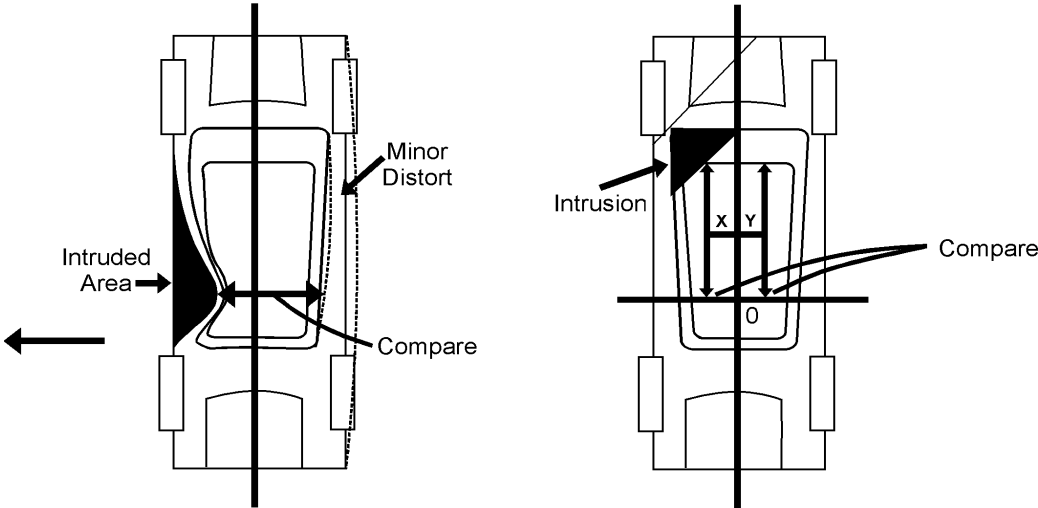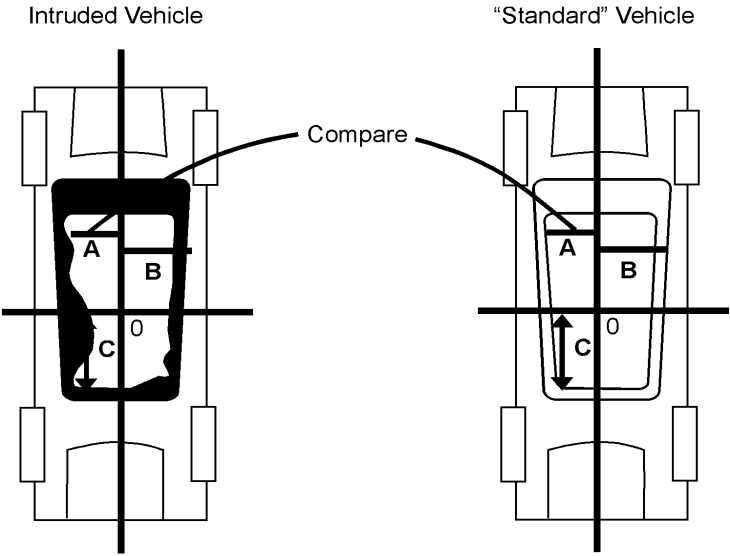
FIGURE 2
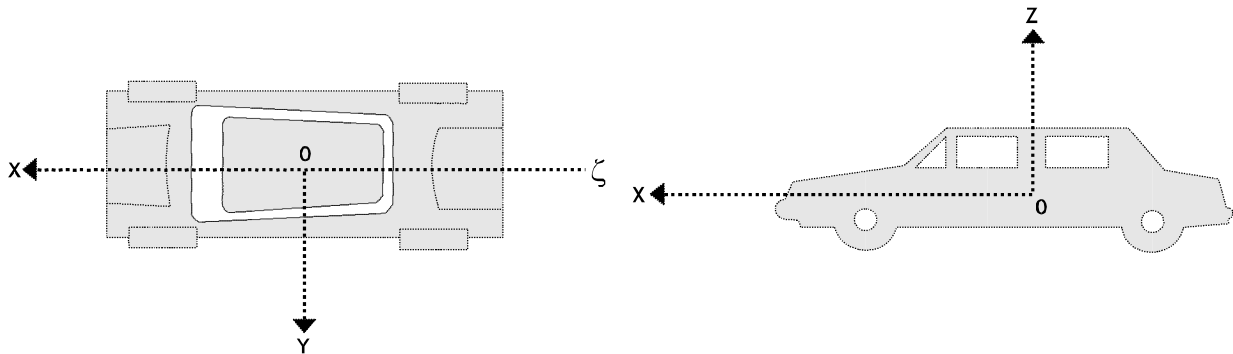
The x-axis is on the longitudinal centerline of the vehicle. This could be set up along the transmission drive shaft tunnel for a rear wheel drive vehicle or along a centerline which is equidistant from the sides of the vehicle in a front wheel drive vehicle.

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 (IV50 et al.) as determined from the Magnitude of Intrusion (IV49 et al.). This component must *not* be coded as having greater than one Dominant Crush Direction in any specific sector.

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.

Code the ten most severe intrusions in descending order, beginning with the most severe, then the second most severe component, etc. If there is no intrusion, variables IV47 -IV50 should be left **"blank"**. If there are less than ten intruding components, the lines following the last encoded intrusion should be left **"blank"**.

Displacement of less than three centimeters is not coded as an intrusion.

A passenger compartment that has been damaged catastrophically is encoded as "97", "97", "7", "7" in variables IV47 -IV50.

Variable Name: Location of Intrusion
(1st through 10th)

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

97   Catastrophic
98   Other enclosed area (specify):
99   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.

	Row 1	**Row 2**	**Row 3**	**Row 4**		
	13	23	33	43		
<|	12	22	32	42	98	**Other Enclosed Area**
	11	21	31	41		
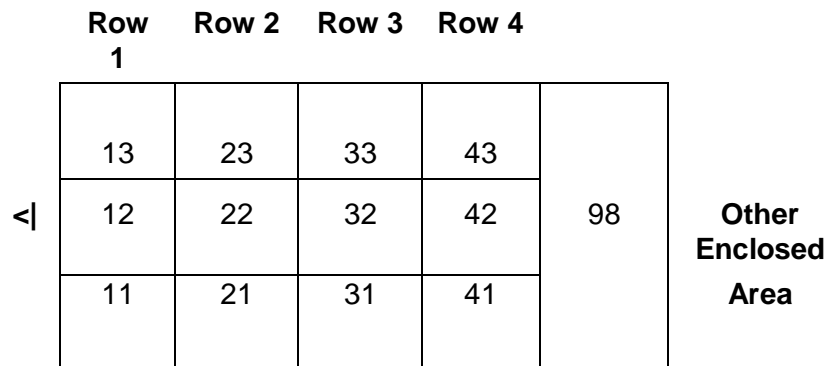
Variable Name: Location of Intrusion (cont'd.)
(1st through 10th)

Front Row, Second Row, Third Row, Fourth Row are identified by the presence of an installed seat. Each row is equally divided into three sectors. As an example, the Front Row is divided into sectors 11, 12, 13 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. When the entire seat row is folded down or removed prior to the crash, this area is considered an "Other enclosed area" (code "98").

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 code "98" (Other enclosed area).

☞ 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 (*i.e.*, "21", "22", "23"). Otherwise, this area is assessed under code "98" (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 a crash should be encoded as an "Other enclosed area" (code "98"); 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" (code "98").

Variable Name: Location of Intrusion (cont'd.)
 (1st through 10th)

Code "11"   (Left) is defined as the left sector of the Front Row. The lateral dimension of this area is mathematically determined by dividing the original wall -to-wall dimension by three.

Code "12"   (Middle) is defined as the center sector of the Front Row.

Code "13"   (Right) is defined as the right sector of the Front Row.

Code "21"   (Left) is defined as the left sector of the Second Row. The lateral dimension of this sector is mathematically determined by dividing the original wall -to-wall dimension by three.

Code "22"   (Middle) is defined as the center sector of the Second Row.

Code "23"   (Right) is defined as the right sector of the Second Row.

Code "31"   (Left) is defined as the left sector of the Third Row. The lateral dimension of this sector is mathematically determined by dividing the original wall -to-wall dimension by three.

Code "32"   (Middle) is defined as the center sector of the Third Row.

Code "33"   (Right) is defined as the right sector of the Third Row.

Code "41"   (Left) is defined as the left sector of the Fourth Row. The lateral dimension of this sector is mathematically determined by dividing the original wall -to-wall dimension by three.

Code "42"   (Middle) is defined as the center sector of the Fourth Row.

Code "43"   (Right) is defined as the right sector of the Fourth Row.

Code "97"   (Catastrophic) is coded 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.

Code "98"   (Other enclosed area) 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 mid 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.

Code "99"   (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.

Variable Name: Intruding Components
                    (1st through 10th)

Element Values:

Interior Components
01   Steering assembly
02   Instrument panel left
03   Instrument panel center
04   Instrument panel right
05   Toe pan
06   A (A1/A2)-pillar
07   B-pillar
08   C-pillar
09   D-pillar
10   Side panel - forward of the A1/A2-pillar
11   Door panel (side)
12   Side panel - rear of the B-pillar
13   Roof (or convertible top)
14   Roof side rail
15   Windshield
16   Windshield header
17   Window frame
18   Floor pan (includes sill)
19   Backlight header
20   Front seat back
21   Second seat back
22   Third seat back
23   Fourth seat back
24   Fifth seat back
25   Seat cushion
26   Back door/panel (*e.g.*, tailgate)
27   Other interior component (specify):

Exterior Components
30   Hood
31   Outside surface of this vehicle (specify):
32   Other exterior object in the environment (specify):
33   Unknown exterior object
97   Catastrophic
98   Intrusion of unlisted component(s)
99   Unknown

Source: Vehicle inspection.

Remarks:

Code "01"   (Steering assembly) consists of the entire steering column which includes the
               steering rim, hub, and spokes.

Variable Name: Intruding Components (cont'd.)
(1st through 10th)

Code "02"   (Instrument panel left) refers to the left side of the panel. This should correlate with the same lateral dimension generated for the sector space "11" (Front Seat ? Left) in variables IV47 et al., Location of Intrusion.

Code "03"   (Instrument panel center) refers to the center third area of the instrument panel. This should correlate with the same lateral dimension generated for the sector space "12" (Front Seat ? Middle) in variables IV47 et al., Location of Intrusion.

Code "04"   (Instrument panel right) refers to the right side of the instrument panel. This should correlate with the same lateral dimension generated for the sector space "13" (Front Seat ? Right) in variables IV47 et al., Location of Intrusion.

Code "05"   (Toe pan) refers to the front portion of the floor that angles up to meet the dash panel.

Code "06"   [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.

Code "07"   (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.

Code "08"   (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.

Code "09"   (D-pillar) refers to the upper and lower portion of the rearward most structural post, 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.

Code "10"   [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 code "06" for A2 definition.

Variable Name: Intruding Components (cont'd.)
                     (1st through 10th)

Code "11"   [Door panel (side)] refers to the side interior surface and related components of a door.

Code "12"   [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.

Code "13"   [Roof (or convertible top)] refers to the top structural member of the greenhouse supported by the side pillars, windshield header and backlight header.

Code "14"   (Roof side rail) refers to the longitudinal horizontal stiffeners located along the edge of the roof.

Code "15"   (Windshield) refers to the lateral glazing located at the forward most surface of the greenhouse.

Code "16"   (Windshield header) refers to the front forward lateral edge of the roof directly above the windshield.

Code "17"   (Window frame) refers to the longitudinal frame that encloses the side window glazings and composes that portion of the door above the window sill.

Code "18"   [Floor pan (includes sill)] refers to the floor of the vehicle. This includes the lower portion of the passenger compartment (*e.g.*, door sills).

Code "19"   (Backlight header) refers to the rear most lateral edge of the roof directly above the backlight.

Code "20"   (Front seat back) refers to the back support of the front seat.

Code "21"   (Second seat back) refers to the back support of the second seat.

Code "22"   (Third seat back) refers to the back support of the third seat.

Code "23"   (Fourth seat back) refers to the back support of the fourth seat.

Code "24"   (Fifth seat back) refers to the back support of the fifth seat.

Variable Name: Intruding Components (cont'd.)
                     (1st through 10th)

Code "25"   (Seat cushion) refers to the horizontal portion of the seat assembly that was designed for seating.

Code "26"   [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.

Code "27"   (Other interior component) refers to any interior component that may intrude into an occupant seating position.

Code "30"   (Hood) refers to the horizontal structure covering the front compartment of the vehicle located forward of the windshield.

Code "31"   (Outside surface of this vehicle) is used 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.).

Code "32"   (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.

Code "33"   (Unknown exterior object) is used if there is evidence that an object intruded but it's unknown what that object was.

Code "97"   (Catastrophic) is coded 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.

Code "98"   [Intrusion of unlisted component(s)] is used if there is intrusion of any component not listed above.

Code "99"   (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.

Variable Name: Magnitude of Intrusion

Element Values:

1	$\geq$	3	centimeters but < 8 centimeters
2	$\geq$	8	centimeters but < 15 centimeters
3	$\geq$	15	centimeters but < 30 centimeters
4	$\geq$	30	centimeters but < 46 centimeters
5	$\geq$	46	centimeters but < 61 centimeters
6	$\geq$	61	centimeters
7			Catastrophic
9			Unknown

Source: Vehicle inspection.

The extent of component intrusion into a row sector is identified by ranges listed in codes "1"-"6". It should be noted the beginning value of a range should not exceed the pre -impact dimension of that sector. For example, the left front door intruded laterally through sector 11 and continued 25 centimeters into sector 12 [see IV47 et al., code "11" (Front Seat - Left) and code "12" (Front Seat - Middle)]. If each sector had a pre-impact dimension of fifty centimeters, then for sector 11 code "5" ($\geq$ 46 centimeters but < 61 centimeters) and for sector 12 code "3" ($\exists$ 15 centimeters but < 30 centimeters).

As described in the intrusion overview, intrusions are listed in order of severity (*i.e.*, code "6" takes priority over code "5", etc.) with only the ten highest intrusions encoded. Although sector 12 was encoded as the second highest intrusion in the simplistic example listed above, there may be situations where sector 12 would not be captured due to higher intrusion magnitudes in other sectors.

If the magnitude cannot be measured, but can be visibly seen, estimate the magnitude of the intrusion. If the estimated measurement is in the gray area between ranges, then default to the lower range. For example, if a measurement looks like it might be about fourteen or fifteen centimeters, then select the lower code, code "2" ($\geq$ 8 centimeters but < 15 centimeters).

To determine sector dimensions, refer to the measurement techniques outlined in the intrusion overview and variables IV47 et al., Location of Intrusion.

Code "6"   ($\geq$ 61 centimeters) is used when an intrusion in a sector equals or exceeds sixty-one centimeters.

Code "7"   (Catastrophic) is coded 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.

Code "9"   (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 the intrusion.

IV50
et al.

Variable Name: Dominant Crush Direction

Element Values:

1	Vertical
2	Longitudinal
3	Lateral
7	Catastrophic
9	Unknown

Source: Vehicle inspection.

Remarks:

This variable assesses the direction of displacement for the component identified in variables IV47 et al. The direction of movement is determined independently from the PDOF applied to the vehicle.

Code "1"   (Vertical) refers to components which intrude into the passenger compartment from either an upward or downward direction.

Code "2"   (Longitudinal) refers to components which move forward or rearward into the passenger compartment.

Code "3"   (Lateral) refers to components which are displaced either left or right within the passenger compartment.

Code "7"   (Catastrophic) is coded 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.

Code "9"   (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.

IV87-IV93

STEERING COLUMN OVERVIEW

Variables IV87-IV91 identify specific areas of interest involving the steering column and steering rim/spokes. Information obtained from these components is crucial to the understanding of injury causation.

The researcher is required to identify steering column types and analyze steering rim/spokes (treated as one group) for steering column deformation.

Variable Name: Steering Column Type

Element Values:

        1   Fixed column
        2   Tilt column
        3   Telescoping column
        4   Tilt and telescoping column
        8   Other column type (specify):
        9   Unknown

Source: Vehicle inspection.

Code "1" (Fixed column) refers to a standard nonadjustable steering column.

Code "2" (Tilt column) refers to a steering column designed to allow the steer ing 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.

Code "3" (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 retightening the ring locks the column at the desired adjustment.

Code "4" (Tilt and telescoping column) refers to a column that has both the tilt wheel and adjustable length features.

Code "8" (Other column type) includes steering columns which cannot be described by elements "1"-"4". This would include swing away columns, etc.

Variable Name: Tilt Steering Column Adjustment

Element Values:

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 dr iver interview.

Remarks:

This variable is used to describe the pre-impact tilt position of adjustable steering columns.

Code "0"   (No tilt steering column) is used when the steering column does not have an adjustment to move the steering column/wheel vertically (raise and lower).

Code "1"   (Full up) refers to a vertically adjustable steering column that was in its highest possible position at the time of the crash.

Code "2"   (Between full up and center) refers to a vertically adjustable steering column th at was somewhere between full up and the center position at the time of the crash.

Code "3"   (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.

Code "4"   (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.

Code "5"   (Full down) refers to a vertically adjustable steering column that in its lowest possible position at the time of the crash.

Code "9"   (Unknown) is used 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 adjustable steering column.

Variable Name: Telescoping Steering Column Adjustment

Element Values:

0	No telescoping steering column
1	Full back
2	Between full back and midpoint
3	Midpoint
4	Between midpoint and full for ward
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.

Code "0"   (No telescoping steering column) is used when the steering column does not have an adjustment to move the steering column/wheel longitudinally (forward and backward).

Code "1"   (Full back) refers to a longitudinally adjustable steering column that w as in its rearward most position (toward the rear of the vehicle) at the time of the crash.

Code "2"   (Between full back and midpoint) refers to a longitudinally adjustable steering column that was somewhere between the full back position and the center position at the time of the crash.

Code "3"   (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.

Code "4"   (Between midpoint and full forwar d) refers to a longitudinally adjustable steering column that was somewhere between the center position and the full forward position at the time of the crash.

Code "5"   (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.

Code "9"   (Unknown) is used 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.

IV90

Variable Name: Steering Rim/Spoke Deformation

Element Values:

00	No steering rim deformation
	Code actual measured deformation to the nearest centimeters.
01-14	Actual measured va lue in centimeters
15	15 centimeters or more
98	Observed deformation cannot be measured
99	Unknown

Source: Vehicle inspection.

Remarks:

The intent is to capture deformation caused by occupant contact rather than induced damage.

The center of the steering wheel hub is the reference plane for determining magnitude of deformation. A measurement is taken from this reference plane to that area of the rim which has the greatest deformation. This measurement should be referenced to an undisplaced area of the rim or compared to the rim of a similar undamaged vehicle.

The following diagram illustrates this measurement procedure. The undeformed edge is 8 centimeters from the reference line. The deformed edge is 5 centimeters from the reference line. Therefore, 3 centimeters of deformation occurred.

The coded value equals 3 cm
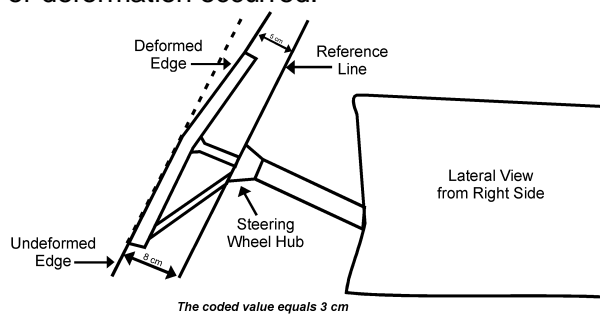
Code "00" (No steering rim deformation) is used when there was no deformation caused by occupant contact of the rim or spokes. Check your observation by placing a flat object (*i.e.*, clipboard) across the plane of the steering rim prior to selecting this code.

Code "01" is used when the deformation is greater than zero but less than 1.5 centimeters.

Code "15" (15 centimeters or more) is used when deformation equals or exceeds 14.5 centimeters.

Code "98" (Observed deformation cannot be measured) is used when the situation does not permit the direct measurement of a deformed rim.

Code "99" (Unknown) is used 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.

Variable Name: Location of Steering Rim/Spoke Deformation

Element Values:

        00   No steering rim deformation

        Quarter Sections
        01   Section A
        02   Section B
        03   Section C
        04   Section D

        Half Sections
        05   Upper half of rim/spoke
        06   Lower half of rim/spoke
        07   Left half of rim/spoke
        08   Right half of rim/spoke

        09   Complete steering wheel collapse
        10   Undetermined location
        99   Unknown

Source: Vehicle inspection.

Remarks:
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.
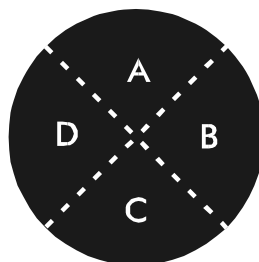
Quarter Sections
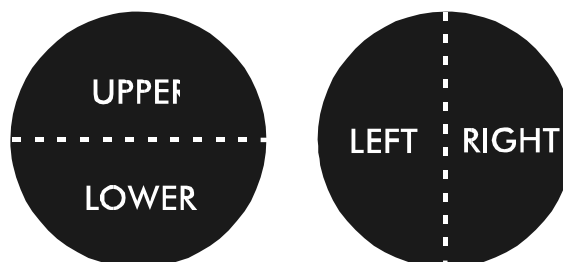
Half Sections

Variable Name: Location of Steering Rim/Spoke Deformation (cont'd.)

Evaluate the deformation of the rim with respect to the wheel design and not the wheel position observed during the vehicle inspection. For example, if the designed top section was deformed and rotated to the bottom position, then the correct response for this variable is "01" (Section A); see below.
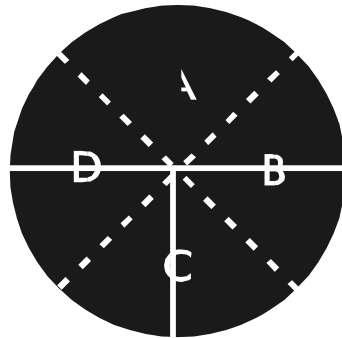
Straight Ahead Position   Post-impact Position
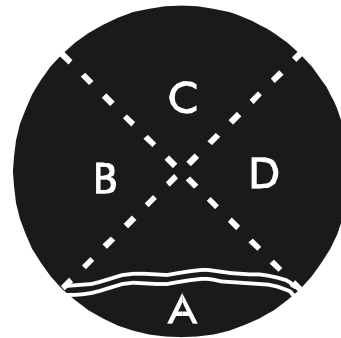
When evaluating which quarter or half to encode, place primary emphasis upon downward deflection since the coding captures occupant caused deformation. When two half sections are deformed, select the half with the greatest deformation.

Code "09"   (Complete steering wheel collapse) is used in the event two half sections are deformed axially downward, beyond the hub.

Code "10"   (Undetermined location) is used 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.

Code "99"   (Unknown) is used 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.

Variable Name: Odometer Reading   (Kilometers)

Element Values:

Range: 000, 001 through 500, 999

Kilometers — Code to the nearest 1,000 kilometers
000   No odometer
001   Less than 1,500 kilometers
500   499,500 kilometers or more
999   Unknown

Source: Primary source is the vehicle inspection.

Remarks:

This variable measures the distance the vehicle has traveled as indicated on the odometer. However, in cases where it is known that the odometer was working but had turned over (*i.e.*, recycled) the coded value represents the total distance traveled by the vehicle rather than the reading on the odometer. Annotate the source of information when it is determined that the odometer had turned over.

Code to the nearest 1,000 kilometers as in the examples below.

Kilometers:	12,498	**Kilometers:**	29,418
Code:	"012"	**Code:**	"029"
Kilometers:	12,502	**Kilometers:**	237,673
Code:	"013"	**Code:**	"238"

Code "000"   (No odometer) is used for vehicles manufactured without an odometer.

Code "001"   (Less than 1,500 kilometers) if the ***vehicle's odometer reading is less than 1,500 kilometers.***

Code "999"   (Unknown) is used when:

☞ it is known that the odometer was disconnected or broken before the collision;

☞ the vehicle is equipped with an electronic instrument cluster and an analog "back-up" odometer is not present; or

☞ the vehicle's odometer reading is unknown.

Variable Name: Instrument Panel Damage from Occupant Contact?

Element Values:

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.

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.
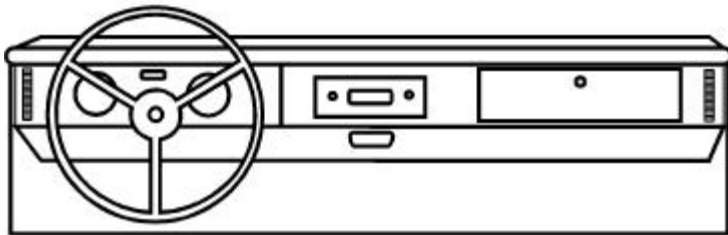
FIGURE 1
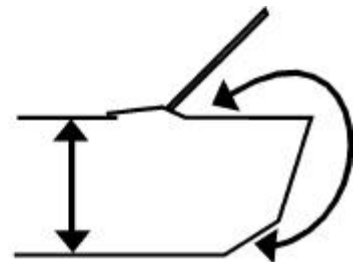
FIGURE 2

Code "0" (No) is used when the instrument panel was not damaged by occupant contact.

Code "1" (Yes) is used when the instrument panel was damaged by occupant contact.

Code "9" (Unknown) is used when the instrument pa nel is under repair or replaced.

Variable Name: Type of Knee Bolster Covering

Element Values:

    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. The vertical profile will be different than a "normal" lower instrument panel. The most obvious of this device is the "parcel tray" type of bolster in the VW Rabbit which was equipped with the two point shoulder belt that was anchored in the top of the door frame and at the console. The more recent vehicles have bolsters which are not so obvious. Generally, presence of an airbag or a two point automatic belt system would be a solid indicator of bolster presence. When in doubt, and in the presence of the either an airbag or two point belt, code for a bolster.

Code "0" (No knee bolster) is used when no knee bolster is present.

Code "1" (Padded) refers to a knee bolster which is covered with a soft, pliable or padded surface.

Code "2" (Rigid plastic) refers to a knee bolster that is either constructed of or covered by a hard, rigid plastic surface.

Code "8" (Other) is used when a knee bolster is present but it is constructed of or covered by some other material such as metal.

Code "9" (Unknown) is used 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.

Variable Name: Knee Bolsters Deformed from Occupant Co ntact?

Element Values:

> 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 Volkswagon 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. The diagram below illustrates the location of the knee bolster in relation to the vehicle occupant in the *Volkswagon Rabbit*.]

Right Side Lateral View
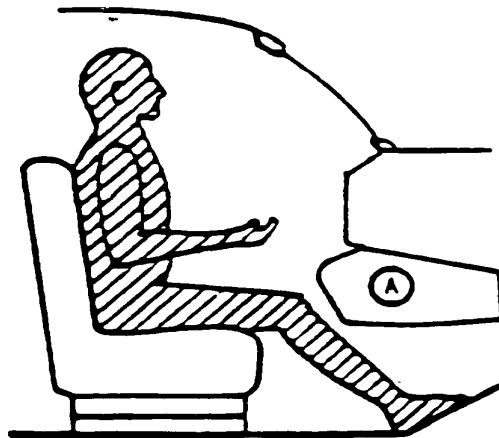
A=Knee Bolster in *Volkswago Rabbit*

This variable reports deformation (indentation) of the knee bolster as a result of occupant contact and not as a result of impact related damage.

Variable Name: Knee Bolsters Deformed from Occupant Contact? (cont'd.)

Code "0"   (No knee bolster) is used when no knee bolster is present.

Code "1"   (No deformation) is used when a knee bolster is present but is not deformed by occupant contact.

Code "2"   (Yes — deformation) is used 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 page, Points of Occupant Contact page, and highlighted in the photographs.

Code "9"   (Unknown) is used when knee bolster deformation is present but it is unknown if it was occupant caused.

Variable Name: Did Glove Compartment Door Open During Collision(s)?

Element Values:

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 a crash. The primary objective is to determine whether the door latch mechanism released during a collision(s).

Code "0"   (No glove compartment door) is used when no glove compartment door is available (*i.e.*, vans).

Code "1"   (No — door did not open) is used 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).

Code "2"   (Yes — door opened) is used when the door opened because the latch mechanism released. Reasons may include: occupant contact, shifting or buckling of vehicle components, or impact forces.

Code "9"   (Unknown) is used 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)].

Variable Name: Adaptive (Assistive) Driving Equipment

Element Values:

      0   No adaptive driving equipment
      1   Adaptive driving equipment installed
          Check all that apply
    [ ] Hand controls for braking/acceleration
    [ ] Steering control devices (attached to OEM steering wheel)
    [ ] Steering knob attached to steering wheel
    [ ] Low effort power steering (unit or device)
    [ ] Replacement steering wheel (*i.e.* reduced diameter)
    [ ] Joy-stick steering controls
    [ ] Wheelchair tie-downs
    [ ] Modifications to seat belts (specify)
    [ ] Additional or relocated switches (specify)
    [ ] Raised roof
    [ ] Wall mounted head rest (used behind wheelchair)
    [ ] Other adaptive device (specify)

      9   Unknown

Source: Investigator determined — primary source is the vehicle inspection, secondary source is driver interview.

Remarks: Adaptive driving equipment is defined as equipment whose primary purpose is to assist persons with disabilities in the operation of a vehicle. This variable is designed to capture those vehicles that have this type of after-market adaptive driving equipment installed. Use of the equipment at the time of the crash is irrelevant. Be alert for evidence of equipment that may have been removed between the time of the crash and the time of inspection.

Code "0"   (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.

Code "1"   (Adaptive equipment installed) is used when it is determined that adaptive equipment was present in the vehicle at the time of the crash. Use of the equipment at the time of the crash is not to be considered. The researcher should identify all adaptive equipment present and mark the checklist for each item found.
-   "Hand controls for braking/acceleration" does not include normal cruise control
-   "Steering control devices (attached to OEM steering wheel)"
-   "Steering knob attached to steering wheel" may be identified as a "suicide knob" but code anyway.

Variable Name: Adaptive (Assistive) Driving Equipment (Cont'd)

- "Low effort power steering (unit or device)" can possibly be identified by looking under the hood for an enhanced pump.
- "Replacement steering wheel (i.e. reduced diameter)"
- "Joy-stick steering controls"
- "Wheelchair tie-downs"
- "Modifications to seat belts (specify)"
- "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)"
- "Other adaptive device (specify)" should be specified and sketch if possible

Code "9"   (Unknown) is used when it cannot be determined if any adaptive driving devices were installed in the vehicle at the time of the crash.

**INSTRUCTIONS FOR COMPLETION OF VEHICLE INTERIOR SKETCHES
AND POINTS OF OCCUPANT CONTACT PAGES**

The VEHICLE INTERIOR SKETCHES page and corresponding POINTS 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.

☞ Sketch the damaged area on the instrument panel outline (*e.g.*, radio, glove compartment, damage to instrument panel structure).

☞ Annotate the contacted area with a letter (begin with A) and list on the Points of Occupant Contact page.

☞ In the column adjacent to the respective letter, identify the interior component contacted. Specify the number of the contacting occupant if it can be determined.

☞ Identify the type of evidence present (*i.e.*, scuff, tissue transfer, tooth, etc.) in the "Supporting Physical Evidence" column.

☞ Specify the level of confidence which you feel best represents your conclusion using the scale of: **1** (Certain), **2** (Probable), **3** (Possible), or **4** (Unknown).

☞ Within the vehicle, highlight the contact with yellow (or similar) tape for photographic purposes.

☞ Annotate the area through which the occupant was ejected or the area in which the occupant was entrapped.

An example of a completed Vehicle Interior Sketches (**Page 4**) and Points of Occupant Contact (**Page 5**) page follow. If sufficient space is not available to identify all contacts, use the back of the **Page 4**.

INSTRUCTIONS FOR COMPLETION OF VEHICLE INTERIOR SKETCHES AND POINTS OF OCCUPANT CONTACT PAGES

(2)

National Accident Sampling System-Crashworthiness Data System: Interior Vehicle Form

Page 4

VEHICLE INTERIOR SKETCHES

Note area of ejection/entrapment

Instrument Panel

Dashpanel

Sketch windshield contact(s) and the damaged area(s) on the instrument panel outline (e.g., radio, glove compartment, damage to instrument panel structure.
Cross hatch contact points, draw spider webs or use other annotation as may be appropriate.
Annotate the contacted area with a letter (begin with A) and list on the Points of Occupant Contact page.

INSTRUCTIONS FOR COMPLETION OF VEHICLE INTERIOR SKETCHES (3)
AND POINTS OF OCCUPANT CONTACT PAGES

National Accident Sampling System-Crashworthiness Data System: Interior Vehicle Form   Page 5

POINTS OF OCCUPANT CONTACT

Contact	Interior Component Contacted	Occupant No. If Known	Body Region If Known	Supporting Physical Evidence	Confidence Level of Contact Point
A	01	1	head	dark hair, windshield contact	1
B	09	1	hand	deformation, tissue transfer	1
C	09	1	L. knee	Plastic cracked, denim scuff	1
D	20	1	shoulder	deformed outward	1
E	06	1	chest	rim deformed, hub on floor	1
F	15	2	head	mirror cracked, contacted windshield	1
G	10	2	unknown	control knob missing	2
H	12	2	knees	Plastic door shattered	1
I	40	3	Torso	deformed forward, scuff, torn	1
J	54	3	head	hair lodged in roof covering	1
K	30	3	unknown	door handle missing	3
L	40	3	——	blood deposit, probable FRP = 3	2
M					
N					

CODES FOR INTERIOR COMPONENTS

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

_____

LEFT SIDE
(20) Left side interior surface, excluding hardware or armrests
(21) Left side hardware or armrest
(22) Left A (A1/A2)-pillar

(23) Left B-pillar
(24) Other left pillar (specify):

_____

(25) Left side window glass or frame
(26) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(27) Other left side object (specify):

_____

(28) Left side window sill

RIGHT SIDE
(30) Right side interior surface, excluding hardware or armrests
(31) Right side hardware or armrest
(32) Right A (A1/A2)-pillar
(33) Right B-pillar
(34) Other right pillar (specify):

_____

(35) Right side window glass or frame
(36) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B pillar, or roof side rail.
(37) Other right side object (specify):

_____

(38) Right side window sill

INTERIOR
(40) Seat, back support
(41) Belt restraint webbing/buckle
(42) Belt restraint B-pillar attachment point
(43) Other restraint system component (specify):_____
(44) Head restraint system
(45) Air bag (use codes "16" and "17" for injuries sustained from air bag compartment covers)

(46) Other occupants (specify):

_____

(47) Interior loose objects
(48) Child safety seat (specify):

_____

(49) Other interior object (specify):

_____

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

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

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

_____

CONFIDENCE LEVEL OF CONTACT POINT

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

MANUAL RESTRAINTS

Restraint usage data, recorded on the noncoded section of the Interior Vehicle Form under the title "MANUAL RESTRAINTS", 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. 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 accident" is *not* generally determined on the Interior Vehicle Form. 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 Form.

CHILD SAFETY SEAT FIELD ASSESSMENT

For each child safety seat present in the vehicle, assign (unless you have knowledge regarding what the occupant's number is) the seat a temporary occupant number. Determine the correct answer for each of the six row variables present on the reverse side of **Page 11**. Due to the transient nature of child safety seats, annotate questions regarding its position for use during the interview. From this data, the actual position of the child safety seat at the time of the crash and the occupant's correct number can be determined for the inclusion on the Occupant Assessment Form.

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

OCCUPANT ASSESSMENT FORM

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

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number   ___ ___

2. Case Number - Stratum   ___ ___ ___ ___

3. Vehicle Number   ___ ___

4. Occupant Number   ___ ___

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age   ___ ___
   Code actual age at time of accident.
   (00) Less than one year old (specify by month):

   _____
   (97) 97 years and older
   (99) Unknown

6. Occupant's Sex   ___
   (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

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

   ___ ___ inches X 2.54 = ___ ___ ___ centimeters

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

   ___ ___ ___ pounds X .4536 = ___ ___ ___ kilograms

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

OCCUPANT'S SEATING

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

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

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

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

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

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

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

    _____
    (9) Unknown

HS Form 433A (1/1997)   This report is authorized by P.L. 89-563, Title 1, Section 106, 108, and 112. While you are not required to
respond, your cooperation is needed to make the results of this data collection effort comprehensive, accurate, and
timely.

EJECTION/ENTRAPMENT

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

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

14. Ejection Medium   ____
    (0) No ejection
    (1) Door/hatch/tailgate
    (2) Nonfixed roof structure
    (3) Fixed glazing
    (4) Nonfixed glazing (specify):

    _____
    (5) Integral structure
    (8) Other medium (specify):

    _____
    (9) Unknown

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

16. Entrapment   ____
    (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

17. Occupant Mobility   ____
    (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 vehicle with some assistance
    (4) Exited vehicle under own power
    (5) Occupant fully ejected
    (8) Removed from vehicle for other reasons
        (specify): _____
    (9) Unknown

BELT SYSTEM FUNCTION

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

   Integral Belt Partially Destroyed
   (6) Shoulder belt (lap belt destroyed/removed)
   (7) Lap belt (shoulder belt destroyed/removed)
   (8) Other belt (specify): _____

   (9) Unknown

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

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

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

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

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

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

   (9) Unknown

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

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

   (8) Other manual belt failure (specify): _____

   (9) Unknown

22. Manual Shoulder Belt Upper Anchorage Adjustment ____
   (0) No manual shoulder belt
   (1) No upper anchorage adjustment for manual shoulder belt

   Adjustable shoulder Belt Upper Anchorage
   (2) In full up position
   (3) In mid position
   (4) In full down position
   (5) Position unknown
   (9) Unknown if position has adjustable upper anchorage adjustment

23. Automatic (Passive) Belt System Availability/ Function ____
   (0) Not equipped/not available
   (1) 2 point automatic belts
   (2) 3 point automatic belts
   (3) Automatic belts - type unknown
   Non-functional
   (4) Automatic belts destroyed or rendered inoperative
   (9) Unknown

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

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

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

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

   (8) Other improper use of automatic belt system (specify): _____
   (9) Unknown

27. Automatic (Passive) Belt Failure Modes During Accident ____
   (0) Not equipped/not available/not in use
   (1) No automatic belt failure(s)
   (2) Torn webbing (stretched webbing not included)
   (3) Broken buckle or latchplate
   (4) Upper anchorage separated
   (5) Other anchorage separated (specify): _____

   (6) Broken retractor
   (7) Combination of above (specify): _____
   (8) Other automatic belt failure (specify): _____

   (9) Unknown

POLICE REPORTED RESTRAINT USE

28. Police Reported Belt Use   ____
    (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"

29. Police Reported Air Bag Availability/Function   ____
    (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"

Check the Primary Source Used In Determining
Belt Use.

[ ] Vehicle inspection
[ ] Official injury data
[ ] Driver/occupant interview
[ ] Other (specify):
     _____
[ ] Unknown if belt used

_____

_____

_____

_____

AIR BAG SYSTEM FUNCTION

30. Frontal Air Bag System   ____
    Availability/Function
    (This Occupant
    Position)
    (0) Not equipped/not available
    (1) Air bag

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

    _____
    (3) Air bag not reinstalled
    (9) Unknown

31. Frontal Air Bag System Deployment   ____
    (This Occupant Position)
    (0) Not equipped/not available
    (1) Deployed during accident (as a result of
         impact)
    (2) Deployed inadvertently just prior to
         accident
    (3) Deployed, details unknown
    (4) Deployed as a result of a noncollision event
         during accident sequence (e.g., fire,
         explosion, electrical)
    (5) Unknown if deployed
    (7) Nondeployed
    (9) Unknown

32. Other Than First Seat Frontal Air Bag   ____
    Availability/Function
    (This Occupant Position)
    (0) Not equipped/not available
    (1) Air bag

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

    _____
    (3) Air bag not reinstalled
    (9) Unknown
    Specify type of "other" air bag present:

    _____

33. Air Bag(s) Deployment, Other Than First   ____
    Seat Frontal (This Occupant Position)
    (0) Not equipped with an "other" air bag
    (1) Deployed during accident (as a result of
         impact)
    (2) Deployed inadvertently just prior to
         accident
    (3) Deployed, details unknown
    (4) Deployed as a result of a noncollision event
         during accident sequence (e.g., fire,
         explosion, electrical)
    (5) Unknown if deployed
    (7) Nondeployed
    (9) Unknown

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

    _____
    (9) Unknown

FIRST SEAT FRONTAL AIR BAG SYSTEM EVALUATION

35. Had Vehicle Been in Previous Accident(s)? ____
    (0) Not equipped/not available
    (1) No previous accidents

    Yes
    (2) Previous accident(s) without deployment(s)
    (3) One previous accident with deployment
    (4) More than one previous accident with at least one deployment
    (8) Previous accidents, unknown deployment status
    (9) Unknown

36. Type of Air Bag ____
    (0) Not equipped/not available
    (1) Original manufacturer installed system
    (2) Retrofitted air bag
    (3) Replacement air bag
    (8) Unknown type of air bag
    (9) Unknown

37. Had Any Prior Maintenance/Service Been Performed On This Air Bag System? ____
    (0) Not equipped/not available
    (1) No prior maintenance
    (2) Yes, prior maintenance (specify):

    _____
    (9) Unknown

38. Air Bag Deployment Accident Event ____ ____
    Sequence Number
    (00) Not equipped/not available
    _____ Code the accident event sequence number that initiated the air bag deployment
    (96) Deployed, unknown event
    (97) Not deployed
    (98) Unknown if deployed
    (99) Unknown

39. CDC For Air Bag Deployment Impact ____
    (0) Not equipped/not available
    (1) Highest delta V
    (2) Second highest delta V
    (3) Other non-coded delta V (specify):

    _____
    (6) Deployed, unknown event
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

40. Longitudinal Component of   +
    Delta V For Air Bag   – ____ ____ ____
    Deployment Impact
    (_000) Not equipped/not available
            Code the value of the delta V for the impact that initiated the air bag deployment
    (_996) Deployment, unknown longitudinal Delta V
    (_997) Not deployed
    (_998) Unknown if deployed
    (_999) Unknown

41. Did Air Bag Module Cover Flap(s) Open At ____
    Designated Tear Points?
    (0) Not equipped/not available
    (1) No
    (2) Yes
    (3) Deployed, unknown if flap(s) opened at designated tear points
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

42. Were Air Bag Module Cover Flap(s) Damaged? ____
    (0) Not equipped/not available
    (1) No
    (2) Yes (specify): _____
    (3) Deployed, unknown if air bag module cover flap(s) damaged
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

43. Was There Damage To The Air Bag? ____ ____
    (00) Not equipped/not available
    (01) Not damaged

    Yes - Air Bag Damage
    (02) Ruptured
    (03) Cut
    (04) Torn
    (05) Holed
    (06) Burned
    (07) Abraded
    (88) Other damage (specify):

    _____
    (95) Damaged, details unknown
    (96) Deployed, unknown if damaged
    (97) Not deployed
    (98) Unknown if deployed
    (99) Unknown

FIRST SEAT FRONTAL AIR BAG SYSTEM EVALUATION *continued*

44. Source of Air Bag Damage   ___ ___
    (00) Not equipped/not available
    (01) Not damaged
    (02) Object worn by occupant, (specify):
    _____
    (03) Object carried by occupant, (specify):
    _____
    (04) Adaptive/assistive controls, (specify):
    _____
    (05) Fire in vehicle
    (06) Thermal burns
    (07) Rescue or emergency efforts
    (88) Other damage source (specify):
    _____
    (95) Damaged, unknown source
    (96) Deployed, unknown if damaged
    (97) Not deployed
    (98) Unknown if deployed
    (99) Unknown

45. Was The Air Bag Tethered?   ___
    (0) Not equipped/not available
    (1) No
    (2) Yes (specify number of tether straps):
    _____
    (3) Deployed, unknown if tethered
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

46. Did The Air Bag Have Vent Ports?   ___
    (0) Not equipped/not available
    (1) No
    (2) Yes (specify number of vent ports):
    _____
    (3) Deployed, unknown if vent ports present
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

47. Was the Air Bag in this Occupant's Position   ___
    Contacted by Another Occupant?
    (0) Not equipped/not available
    (1) No
    (2) Yes (specify):
    _____
    (3) Deployed, unknown if other occupant contact
        to air bag
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

48. Was This Occupant Wearing Eye-wear?   ___
    (0) Not air bag equipped/air bag not available
    (1) No
    (2) Eyeglasses/sunglasses
    (3) Contact lenses
    (4) Deployed, unknown if eyewear worn
    (7) Not deployed
    (8) Unknown if deployed
    (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION

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

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

51. Seat Orientation (this Occupant Position)   ___
    (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

52. Seat Track Adjusted Position Prior To Impact   ___
    (0) Occupant not seated or no seat
    (1) Non-adjustable seat track

    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
        positions
    (6) Seat at rear most track position
    (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION *continued*

53. Seat Back Incline Prior and Post Impact   ____ ____
    (00) Occupant not seated or no seat
    (01) Not adjustable

    Upright prior to impact
    (11) Moved to completely rearward position
    (12) Moved to rearward midrange position
    (13) Moved to slightly rearward position
    (14) Retained pre-impact position
    (15) Moved to slightly forward position
    (16) Moved to forward midrange position
    (17) Moved to completely forward position

    Slightly reclined prior to impact
    (21) Moved to completely rearward position
    (22) Moved to rearward midrange position
    (23) Retained pre-impact position
    (24) Moved to upright position
    (25) Moved to slightly forward position
    (26) Moved to forward midrange position
    (27) Moved to completely forward position

    Completely reclined prior to impact
    (31) Retained pre-impact position
    (32) Moved to rearward midrange position
    (33) Moved to slightly rearward position
    (34) Moved to upright position
    (35) Moved to slightly forward position
    (36) Moved to forward midrange position
    (37) Moved to completely forward position

    (99) Unknown

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

    (7) Combination of above (specify):_____

    (8) Other (specify): _____
    (9) Unknown

CHILD SAFETY SEAT

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

    _____
    (998) Unknown make/model
    (999) Unknown if child safety seat used

56. Type of Child Safety Seat   ___
    (0) No child safety seat
    (1) Infant seat
    (2) Toddler seat
    (3) Convertible seat
    (4) Booster seat - with shield
    (5) Booster seat - without shield
    (7) Other type child safety seat (specify):

    _____
    (8) Unknown child safety seat type
    (9) Unknown if child safety seat used

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

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

    _____
    (09) Unknown orientation

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

    _____
    (19) Unknown orientation

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

    _____
    (29) Unknown orientation

    (99) Unknown if child safety seat used

58. Child Safety Seat Harness Usage   ___ ___

59. Child Safety Seat Shield Usage   ___ ___

60. Child Safety Seat Tether Usage   ___ ___

    Note: Options below applicable to
    Variables OA58-OA60.
    (00) No child safety seat

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

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

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

    (99) Unknown if child safety seat used

INJURY CONSEQUENCES

61. Injury Severity (Police Rating)   ____

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

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

    _____

    Nonfatal
    (3) Hospitalization
    (4) Transported and released
    (5) Treatment at scene - nontransported
    (6) Treatment later
    (7) Treatment - other (specify):
    _____
    (8) Transported to a medical facility-unknown if
        treated
    (9) Unknown

63. Type Of Medical Facility (for Initial Treatment)____
    (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

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

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

STOP WORK HERE

VARIABLES 66-74

TO BE CODED BY THE ZONE CENTER

TO BE CODED BY THE ZONE CENTER

INJURY CONSEQUENCES

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

67. 1st Medically Reported Cause of Death   ____ ____

68. 2nd Medically Reported Cause of Death   ____ ____

69. 3rd Medically Reported Cause of Death   ____ ____
    ____Code the Occupant Injury from line
    number(s) for the medically reported
    injury(s) which reportedly contributed to
    this occupant's death
    (00) Not fatal or no additional causes
    (96) Mode of death given but specific
          injuries are not linked to cause
          of death. (specify):

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

    (99) Unknown

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

TRAUMA DATA

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

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

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

BELT USE DETERMINATION

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

Variable Name: Vehicle Number

Element Values:

Range: 01 through 30

Source: Researcher assigned.

Remarks:

Code the Vehicle Number for the vehicle, in or on which, this occupant was riding (*i.e.*, as a driver or as a passenger — in or on the vehicle). See GV03, Vehicle Number.

Assume that only one occupant is in a hit-and-run vehicle (unless reliable evidence to the contrary exists), and assume this person is the driver.

This variable is a file structuring variable.

Variable Name: Occupant Number

Element Values:

Range: 01 through 30

Source: Researcher assigned.

Remarks:

Occupant numbers must be assigned sequentially, beginning in the enclosed area with "01". No numbers may be skipped. Assign numbers left to right and front to back among occupants.

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.

Drivers do not have to be coded "01" (*e.g.*, right hand drive vehicles containing left front occupant). However, code the assumed driver of a hit-and- run vehicle as "01".

An occupant on or in the lap of another person should be assigned a number one higher than the person whose lap they were on or in.

Occupants sharing a seating position should be assigned numbers using the guidelines stated in the first paragraph above.

This variable is a file structuring variable.

OCCUPANT'S CHARACTERISTICS OVERVIEW

The Occupant's characteristics section of the Occupant Assessment Form consists of two areas, physical characteristics, and role/position. These two areas provide a coded sketch of the occupant. Physical characteristics are noted in the variables OA06 (Occupant's Sex), OA07 (Occupant's Height), and OA08 (Occupant's Weight). The demographics of the occupant are completed by the variable OA05 (Occupant's Age). Position and function of the occupant are also critical bits of information in the overall picture of the crash. These are provided by the variables OA10 (Occupant's Seating Position), OA09 (Occupant's Role), and OA11 (Occupant's Posture).

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 FMVSS's which apply.

OA05

Variable Name: Occupant's Age

Element Values:

Range: 00-97, 99
00   Less than one year old
97   97 years and older
99   Unknown

Source: Primary source is interviewee; secondary sources include police reports and other official records (*i.e.*, medical records).

Remarks:

The occupant's age at the time of the crash is recorded with respect to the occupant's last birthday.

If you are unable to obtain the age of a driver, request a driver's license record. This action must be discussed and a policy determined with your zone center and COTR. Licensing file data takes precedence over police or interview data.

Variable Name: Occupant's Sex

Range: 1 - 6, 9

Element Values:

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:

Code "1"   (Male) consists of men and boys.

Code "2"   (Female — Not reported pregnant) consists of women and girls; who are reported as not pregnant at the time of the crash. This code includes any females for whom pregnancy status is unknown.

Code "3"   [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.

Code "4"   [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.

Code "5"   [(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 under this code.

Code "6"   (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.

Code "9"   (Unknown) is used when the gender of the occupant cannot be determined.

Variable Name: Occupant's Height

Element Values:

Range: 030 through 22 0 centimeters
                  999   Unknown

Source: Researcher determined--inputs include interviewee or official records (*e.g.*, medical).

Remarks:

Code actual height to nearest centimeter.

Code "220"   (220 centimeters) is used for any occupant whose height equals or exceeds 219.5 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.

                      Conversion: 1 inch = 2.54 centimeters

OA08

Variable Name: Occupant's Weight

Element Values:

Range: 002 through 150 kilograms
999 Unknown

Source: Researcher determined--inputs include interviewee or official records (*e.g.*, medical).

Remarks:

Code actual weight to nearest kilogram.

Code "150" (150 kilograms) is used for any occupant whose weight equals or exceeds 149.5 kilograms.

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.

Conversion: 1 pound = .4536 kilograms

Variable Name: Occupant's Role

Element Values:

> 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.

Variable Name: Occupant's Seat Position

Element Values:

Front Seat
11   Left side
12   Middle
13   Right side
14   Other (specify)
15   On or in the lap of
      another occupant

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

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

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

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

Source: Primary source is interviewee; secondary source is police report.

Remarks:

Seat position is coded by the location of the occupant in relation to the seat row and the forward longitudinal axis of the vehicle.

Only one person may be assigned seating positions "11" through "13", "21" through "23", "31" through "33", and "41" through "43". When two or more persons are occupying the same seating location (*e.g.*, sitting side-by-side), assign the seat position as follows:

☞   first, to the occupant who is using the manual and/or automatic belt;

If more than one occupant is using the manual and/or automatic belt or if no occupant is using a manual and/or automatic belt, then

☞   second, to the oldest occupant.

In seat rows designed for only two passengers, use codes "11", "13", "21", "23", "31", "33", "41", "43", or "98".

Code "11" (Front Seat — Left side) should be assigned to the assumed driver of a hit-and-run vehicle unless evidence indicates a different position for the person or persons.

Variable Name: Occupant's Seat Position (cont'd.)

Codes "14", "24",
"34", "44",   (... - Other) and "98" (Other seat) can be used in a variety of occupant seating situations. Some example situations are:
☞ occupant between two bucket seats
☞ occupant on the floor [*i.e.*, in front of a designated seat (*e.g.*, sitting, standing, etc.)];
☞ occupant lying across one or more seating positions; and
☞ occupant sitting side-by-side of another occupant in the same; seating position — only one can be assigned the seating position;

If an occupant is standing or kneeling in a designated seating position, the occupant is assigned that seating position with exceptions as noted above. That the occupant is not correctly seated is captured in variable OA11 (Occupant's Posture).

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, code "14" (Front Seat — Other) is used. This situation could occur because of vehicle design or seat removal. The same logic applies to other seat areas. A person in the fourth seat row but not in a seat is coded "44" (Fourth Seat — Other), and the actual position described.

Codes "15", "25",
"35", "45"   (... - On or in the lap of another occupant) and "98" (Other seat) are used whenever an occupant(s) is sitting, standing, etc. in or in the lap of another occupant.

Code "97"   (In or on unenclosed area) includes those occupants riding on a fender, the boot of a convertible, the open cargo box on a light truck, etc.

Code"98"   (Other seat) is used for anyone in the fifth or higher numbered seat area. In addition, use this code when an occupant(s) is in an enclosed area where no defined seating exists. Further, if an occupant(s) is using a fold-down type seat in its folded down position, then use this code.

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. The diagram below illustrates the intended seat positions for areas of a vehicle.

For rearward facing seats use the basic idea described above in the previous paragraph to describe the occupant's seat position. The fact that the seat does not face forward is addressed in OA11, Occupant's Posture.

Using the diagram below, coding for seat positions "11", "13", "21", "22", "23", "31", "41", and "98" are self-explanatory. For someone seated in the far right third of the offset seat in row three, the proper code is "32" (Third Seat — Middle). A person in the center of that same seat (*i.e.*, row three) is coded "34" (Third Seat — Other).

Variable Name: Occupant's Seat Position (cont'd.)

RIGHT

13	23	
		33
(14)	22	(34)
		31
11	21	
ROW 1	ROW 2	ROW 3

LEFT

RIGHT

13	23	(34)	(44)	98
(14)	22	32	42	98
		(34)	(44)	
11	21	31	41	98
ROW 1	ROW 2	ROW 3	ROW 4	ROW 5

LEFT
RIGHT

13	(24)	33
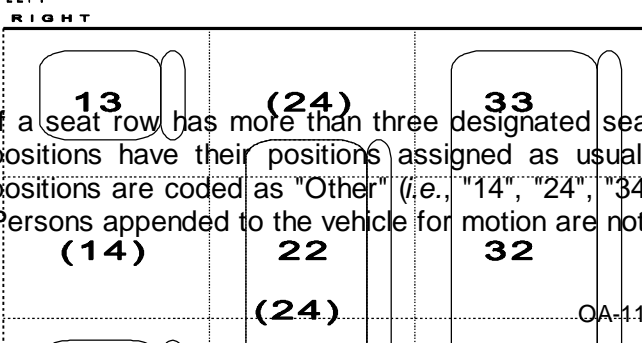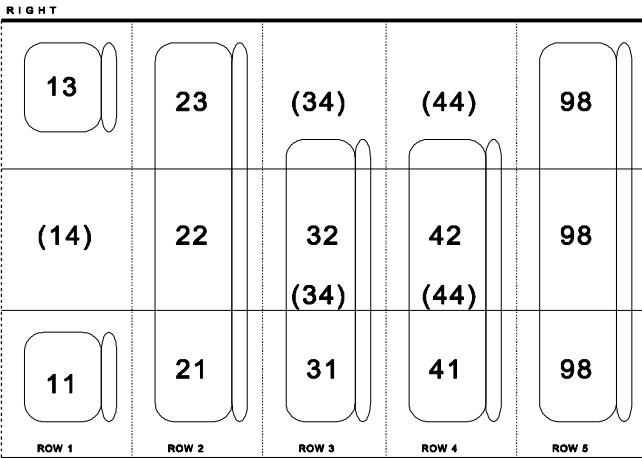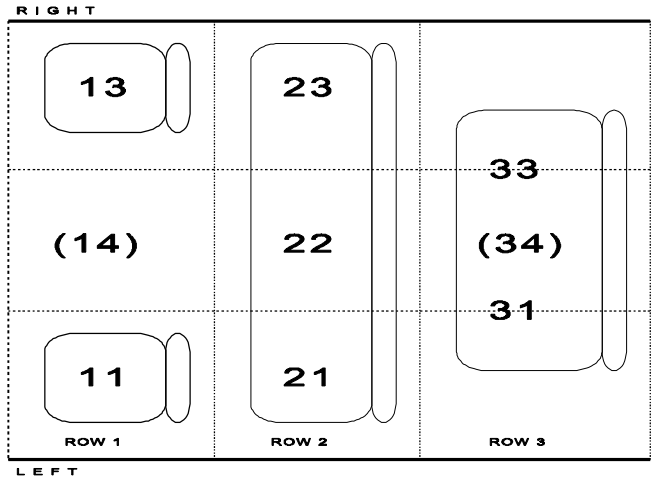
If a seat row has more than three designated seat positions, the occupants in the left and right positions have their positions assigned as usual (*e.g.*, "31" and "33"), while the two center positions are coded as "Other" (*i.e.*, "14", "24", "34", "44", or "98") depending upon the seat row. Persons appended to the vehicle for motion are not considered to be occupants of the vehicle.

13	23	33
(14)	22	32
	(24)	

OA-11

(14)	(24)	32

OA11

Variable Name: Occupant's Posture

Element Values:

0   Normal posture

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

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 code 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 code "8" (Other abnormal posture) is used.

Code "1"   (Kneeling or standing on seat) is used whenever an occupant is not seated but is kneeling or standing on seat.

Code "2"   (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.

Code "3"   (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.

Code "4"   (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.

Variable Name: Occupant's Posture (Cont'd)

Code "5" (Sitting on a console) is used whenever an occupant is not in a seated position but is sitting on a console.

Code "6" (Lying back in a reclined seat position) is used whenever an occupant in a seated position has reclined the seat back rearward and is lying back in the seat.

Code "7" (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 seating position just prior to the collision.

Code "8" (Other abnormal posture) includes but is not limited to:

- ☞ being in an unenclosed area,
- ☞ sitting normally in a designed rearward or side-facing seat except for occupants correctly seated in child safety seats,
- ☞ being in an enclosed area that does not have designated seating positions,
- ☞ Incorrectly seated in a child safety seat
- ☞ leaning over in the seat,
- ☞ sitting on another occupant's lap
- ☞ etc.
- ☞ Sitting side-by-side of another occupant in same seating position.

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.

Code "9" (Unknown) if the occupant's posture cannot be determined.

EJECTION/ENTRAPMENT OVERVIEW

Variables in this section provide a coded assessment of the occurrence of entrapment or ejection of this occupant. There is one variable which addresses entrapment OA16, Entrapment. It is a presence or absence variable. There is no further assessment of entrapment in a coded format. Ejection has a more complete coded description regarding (a) occurrence, OA12, Ejection, (b) route of ejection, OA13, Ejection Area, (c) type of opening the occupant was ejected through, OA14, Ejection Medium, and (d) condition of the opening prior to impact OA15, Medium Status (Immediately Prior to Impact). All of the variables in this section are considered final assessments which are coded at the end of all field research and interviewing. Much of the information regarding them will come from the 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.

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, new glazing techniques are being introduced in windshields and some side windows. These new types of window have a plastic layer on the interior surface of the window. Tests have shown a reduction in lacerative injuries which was the primary objective but also an increased resistance to ejection through the window. Further study of real world performance is needed to provide an accurate evaluation of this secondary benefit.

Gathering the data, which will allow the researcher to accurately code 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 coded. 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.

Coding OA12-OA17 Special Conditions

Ejection and Entrapment

Using the guidelines given below, OA12 -OA17 may be coded 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 code "9" (Unknown).

1. For occupants of hit-and-run towed CDS applicable vehicles, OA12-OA17 may be coded "0" (Not entrapped/No ejection).

2. For other towed CDS applicable vehicles:

    (a) OA12-OA15 (ejection variables) may be coded "0" (No ejection) ***if the PAR specifically so states for a given occupant***. For all other occupants about whom the PAR is silent, code "9" (Unknown).

    If the PAR indicates that an occupant is ejected, this is sufficient to code OA12 "1" (Complete ejection) or "2" (Partial ejection) if the PAR so states. If complete versus partial ejection is not stated on the PAR, then code OA12 equal "3" (Ejection, unknown degree) may be used.

    Note, however, that OA13-OA15 can be coded only if the PAR provides sufficient detail.

    (b) OA16 (Entrapment) may be coded "0" (Not entrapped) ***if the PAR specifically so states for a given occupant***. For all other occupants about whom the PAR is silent, code "9" (Unknown).

    Recall, however, that if the PAR states that an occupant is entrapped, this is ***not sufficient*** to code Entrapment (because PAR definition of entrapment is different from NASS definition). Unless Entrapment is verified through other sources, OA16 must be coded "9" (Unknown).

    (c) OA17 (Occupant Mobility) should be coded appropriately; all codes are valid and are hierarchical.

Variable Name: 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:

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 encoded.

Code "0"   (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).

Code "1"   (Complete ejection) refers to a situation where the occupant's body is entirely outside the vehicle but may be in contact with the vehicle.

Code "2"   (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 coded as "1" (Complete ejection)].

Police reported ejections may be coded if there is no vehicle inspection or occupant interview, provided that the ejectee was in the seating compartment of the vehicle, and there is no evidence which contradicts the reported ejection.

Variable Name: Ejection Area

Element Values:

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

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

Code "0"   (No ejection) applies to persons who are not ejected, or to persons riding on fenders.

Code "6"   (Rear) is restricted to persons riding in a passenger compartment, who are ejected through the rear window, tailgate (*e.g.*, station wagon), hatchback, etc.

Code "7"   (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 variables 0A14, Ejection Medium, and 0A15, Medium Status (Immediately Prior to Impact), should be coded when OA13 equals **7** (Roof).

0A12	Roof Type	0A13	0A14	0A15
Ejection 1-3	Hardtop, ripped open during crash	7	5	3
Ejection 1-3	Removable hardtop, detached prior to crash	7	2	1
	Convertible, in down or open position			
Ejection 1-3	Convertible, in closed position	7	2	1
Ejection 1-3	Sun or t-bar, ripped open during crash	7	2	2
Ejection 1-3	Sun or t-bar, open/removed prior to crash	7	2	2
Ejection 1-3	Sun or t-bar, closed prior to crash	7	2	1
Ejection 1-3		7	2	2

Variable Name: Ejection Area (cont'd.)

Codes "1"
through "7"   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 code "8" (Other area).

Code "8"   (Other area) also applies to persons riding on open tailgates.

Code "9"   (Unknown) if the sole source for the ejection is the police report, unless the PAR provides a clear, distinguishable avenue of occupant ejection.

OA14

Variable Name: Ejection Medium

Element Values:

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

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

Code "0"   (No ejection) applies to persons who are not ejected, or to persons riding on fenders.

Code "1"   (Door/hatch/tailgate) includes any door, hatch, or tailgate that is opened during the course of the impact sequence.

Code "2"   (Nonfixed roof structure) applies only to convertible, sun roofs, t- bar roofs, and removable hardtops when detached.

Codes "3"   (Fixed glazing) and "4" (Nonfixed glazing) refer to any glazing in the vehicle.

Code "5"   (Integral structure) includes removable hardtops when attached to the vehicle.

Code "8"   (Other medium) applies to persons riding in pickup beds, on open tailgates, and for other situations which cannot be classified in codes "1" through "5". In addition, use this code when someone is ejected from a trailer, add-on camper, etc.

Code "9"   (Unknown) if the sole source for the ejection is the police report, unless the PAR provides a clear, distinguishable avenue of occupant ejection.

Variable Name: Medium Status (Immediately Prior to Impact)

Element Values:

0	No ejection
1	Open
2	Closed
3	Integral structure
9	Unknown

Source: Researcher determined — inputs include the vehicle inspection, interviewee, and the police report.

Remarks:

This variable is a description of the status of the area through which an occupant was ejected.

Code "0" (No ejection) applies to persons who are not ejected, or to persons riding on fenders.

Code "1" (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.

Codes "1" (Open) and "2" (Closed) refer to the status of the medium immediately prior to the impact.

Code "2" (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 coded 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 code "3" (Integral structure) should be used. This code is also used for fixed glazings such as windshields and backlights which are in place prior to the collision.

Code "2" (Closed) also refers to a door that is closed, but when damaged, experiences latch and/or hinge failure causing the door to open.

Code "3" (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.

Code "9" (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.

Variable Name: Entrapment

Range: 0 - 2, 9

Element Values:

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:

Code "0"   (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.

Code "1"   (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.

Code "2"   (Could not exit vehicle due to jammed doors, fire, etc. (specify):) is used when this occupant could not exit the vehicle due to jammed doors, roof collapse, etc. This occupant, however could move about within the vehicle.

Code "9"   (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. This code should be used rarely.

Variable Name: Occupant's Mobility

Range: 0 - 5, 8, 9

Element Values:

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: Investigator determined — inputs include PAR, fire and or EMS personnel/records, medical records, witnesses, and interviewees.

Remarks: This variable is to be coded hierarchically, that is, if codes 1 and 2 both apply then code 1.

Code "0"   (Occupant fatal before removed from vehicle) is used when it can be determined that the occupant was deceased prior to removal from the vehicle.

Code "1"   (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.

Code "2"   (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.

Code "3"   (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.

Code "4"   (Exited the vehicle under own power) is used when the occupant was able to exit the vehicle without assistance from another person.

Code "5"   (Occupant fully ejected) is used when the occupant was completely ejected from the vehicle. Only use this code when OA12 = 1.

Code "8"   [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.

OA17
(2)

Variable Name: Occupant's Mobility (Cont'd)

Code "9"   (Unknown) is used when the researcher cannot reasonably determi ne the manner of exit by the vehicle occupant.

RESTRAINT SYSTEM AND SEATS OVERVIEW

Variables in this section are designed to describe the availability, function, and use of restraint systems, seats, and head restraints. The variables are grouped by area assessed. Variables OA18 through OA22 are concerned with the active belts; OA23 through OA27 report about automatic belts; OA28-OA29 refer to police reported restraint use; OA30 through OA48 describe air bags; and OA49 through OA54 assess head restraint, seat type, and seat performance.

Active belts are the keystone to occupant protection during collisions. Restraint presence has been mandated by law since the 1968 model year. Manual (Active) Belt System Availability (OA18) describes the type of restraint that this occupant had the opportunity to use. The use of the restraint is then coded in OA19, Manual (Active) Belt System Use. Correct use has become a very large issue since many of the torso restraints are reportedly uncomfortable to wear especially for shorter persons. This information is captured in OA20, Proper Use of Manual (Active) Belts. Failure of the system, while rare, occurs often enough to be of interest to the rule making section of the NHTSA. Failures are coded in OA21, Manual (Active) Failure Modes During Accident.

Passive restraint systems are being installed in an increasing range of vehicles. The description of the passive restraint system is split into "automatic belt" variables (OA23-OA27) and "air bag" variables (OA30-OA48). For automatic belt type passive restraint systems, their availability and function is coded in variable OA23, Automatic (Passive) Belt System Availability/Function. The use of the passive belts is then coded in OA24, Automatic (Passive) Belt System Use. The type of passive belt system (*i.e.*, motorized versus nonmotorized) is described in OA25, Automatic (Passive) Belt System Type, and the properness of the passive belt use is described in OA26, Proper Use of Automatic (Passive) Belt System. Finally, OA27, Automatic (Passive) Belt Failure Modes During Accident, describes any failures associated with the automatic belt. For air bag passive restraint systems, their availability and function is coded in variable OA30, Frontal Air Bag System Availability/Function (This Occupant Position) and OA32, Other Than First Seat Frontal Air Bag Availability/Function (This Occupant Position). The deployment status of the air bags is described in OA31, Frontal Air Bag System Deployment (This Occupant Position), OA33, Air Bag(s) Deployment, Other Than First Seat Frontal (This Occupant Position), and OA34, Are There Indications of Air Bag System Failure? Note: air bags are assumed not to be present unless there is a positive indication of air bag presence.

The accuracy of "restraint use", when the PAR is the only source of data, has long been a concern. Since the PAR has been used in the past as a source of data, the police assessment is now coded as separate variables OA28, Police Reported Belt Use and OA29, Police Reported Air Bag Availability/Function.

Head restraint type and performance are coded in a single variable OA49, Head Restraint Type/Damage by Occupant at This Occupant Position. Protection of the occupant from neck and back injuries has long been a concern, especially in rear -end impacts. FMVSS 202 (Head Restraints) specifies the requirements for head restraints.

Seat type and performance, which are delineated by FMVSS 207 (Seating Systems), have received increased attention in recent years because of the potential for significantly more severe injuries when the seat fails. This information is captured in variables OA50, Seat Type (This Occupant Position), and OA54, Seat Performance (This Occupant Position) variables OA50, Seat Type (This Occupant Position), and OA54, Seat Performance (This Occupant Position).

From a historical standpoint, these variables (OA18 through OA54) have received more attention from the NHTSA, automakers, and the general public than any other injury reduction area. Much controversy has resulted over the introduction and mandating of passive restraint systems, laws requiring use of active restraints, and what is seen as government interference in the private lives of persons. Despite all the uproar and protests, the facts remain that if any form of restraint is used properly, the number of injuries and their severity will be reduced. Passive restraints, which have an increasing presence in the crash picture today, are some of the most effective occupant protection devices available. Evaluation of the effectiveness of both active and passive systems has long been a priority of the crash research effort of the NHTSA. Problems with systems and failures many times receive an inordinate amount of attention compared to the success rate. It becomes important to all concerned that the performance be evaluated in an objective manner and problems which deter use, such as active torso restraints being uncomfortable, be thoroughly documented.

Less attention is paid to the head restraint and seat performance issue, but it is no less important in the overall injury picture. Neck and back injuries are some of the most common and most debilitating that occur in motor vehicle crashes. No accurate assessment of the societal loss due to reduced or poor productivity of occupants related to neck and back injuries has been made. Many times a person with this type of injury does not miss any days of work but is at a reduced level of productivity and has to undergo therapy or treatment for a long period of time. Head restraint design and performance is critical to reduction of trauma to the neck and back.

Seat performance, especially the seat back, is critical to injury reduction in the more severe collisions. Deformation limits of the seat back are covered by specifications in FMVSS 207. These limits are responsible for injury reduction in that the seat back must contain the occupant, either from the front or the back, while absorbing energy from the impact. It is also critical that the adjusters and seat tracks not fail since failure can cause more severe injuries than would otherwise be expected. Increased injury severity has been reported with seat failure even when the occupant is belted.

Analysts consider these variables to be key areas of interest. Correlations between these variables and the injury coding variables are of particular interest. The most common comparisons are, of course, restraint usage versus injury severity, restraint availability versus use, and passive versus active availability. The more detailed analyses involve three -way comparisons (e,g. restraint use versus injury severity versus delta V). Injury severity is less when the occupant is restrained as delta V increases until the delta V reaches a certain level. At this juncture the injury severity for belted occupants becomes the same as for unrestrained ones.

The uses for the data from these variables are too numerous to list, but they are varied and relate to all other forms and areas of data in the case. The researcher should remember that these variables are not coded only from one source of data. The primary source is the vehicle inspection; it is supported by interviewee and injury data. Inspection of the vehicle should be very detailed, and the researcher should examine closely for all possible clues and evidence. Obvious belt use indicated by stretched or frayed webbing is the easiest to find. Also, a deformed seat back or headrest would indicate damage by one of the occupants. Less obvious are signs of regular use such as a lack of dust around the buckle area or slightly frayed areas on the belt, close to the tongue, indicating frequent adjustment.

Indicators which support the assumption of belt use are a low number of minor injuries and no knee contusions or facial lacerations. Probing questions in the interview will aid the researcher in assessing use. Proper use can be elicited by asking questions about the comfort of the belt and location on the body (*e.g.*, "Where was lap portion of belt, low on the hips, waistline, etc.?").

Seat type/performance and head restraint type/performance should be assessed primarily from the vehicle inspection. At times it is possible to get this information from other sources such as the interviewee, but anything beyond the interviewee is almost impossible. Many times deformation of the seat back can be visually observed. The obvious time to expect that type of damage is when the vehicle has sustained a rear impact. Seat back deformation also occurs with frontal impacts and unrestrained rear occupants. It is important to remember that many seat backs are now adjustable, especially bucket seats, and just because a seat appears to be out of correct vertical alignment does not indicate seat back damage.

Head restraint damage is fairly obvious since the restraint should follow the line of the seat back. If it deviates significantly from that line then there is a presumption of damage, and a careful examination should be conducted.

All of the above mentioned variables require expertise and concern with detail. Researchers should realize that the most obvious choice is sometimes not the best assessment. Careful thought and weighing of numerous factors are required in this area to obtain the best possible assessment.

Starting in 1995 we have added detailed information on the functioning of the air bag system in the vehicle. This includes information on prior crashes (OA35), the type of air bag (OA36) and prior maintenance/service (OA37). The performance of the air bag in the current crash is detailed with information on impacts and severity (OA38-OA40). Information on the air bag module cover flap is included (OA41-OA42). Damage to the air bag is included (OA43-OA44). We now collect data on whether the air bag is tethered (OA45) and if it has vent ports (OA46). Possible injury mechanisms involving the air bag are also included (OA47-OA48).

Variable Name: Manual (Active) Belt System Availability
                       (for This Occupant's Seating Position)

Element Values:

0	Not available
1	Belt removed/destroyed
2	Shoulder belt
3	Lap belt
4	Lap and shoulder belt
5	Belt available - type unknown

Integral Belt Partially Destroyed

6	Shoulder belt (lap belt destroyed/removed)
7	Lap belt (shoulder belt destroyed/removed)

8	Other belt (specify)
9	Unknown

Source: Researcher determined — Primary source is the vehicle inspection; secondary sources include the interview, medical records, and police report. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR "narrative" must clearly state that the manual belt system was used or available. An indication of usage or availability in a "restraint system" block is, by itself, not usable.

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 occupant's seating position. Select the manual 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 manual belt system. Any occupant who is using a belt restraint system, or portion thereof, must by default have that system available to them. The correctness and/or appropriateness of the use is considered in OA20, Proper Use of Manual (Active) Belts.

Certain occupant seating situations involve abnormal posture. Examples are:

☞ occupant on the floor [*i.e.*, in front of a designated seat (*e.g.*, sitting, standing, etc.) or standing in the door entrance area];
☞ occupant lying across one or more seating positions;
☞ occupant sitting side-by-side of another occupant in the same seating position, since only one can be assigned to the seating position — see OA10, Occupant's Seat Position;
☞ occupant standing or kneeling in a designated seating position; and
☞ occupant in or on the lap of another occupant (*e.g.*, sitting, standing, kneeling, etc.).

Variable Name: Manual (Active) Belt System Availability [cont'd.]

Occupant on the floor: For this situation use code "0" (Not available). These occupants are not in a designated seating position and do not have a manual belt available.

Occupant lying across one or more seating positions: For an occupant lying across multiple seating positions, OA10 (Occupant's Seat Position) must equal code "14", "24", "34", or "44". These occupants can be using a manual belt: If they are, then code availability based upon the belt used. Do not confuse this situation with occupants lying against a door or side panel or against another occupant. Persons in this latter category are still considered to be occupying a single occupant seating position.

Occupant sitting side-by-side of another occupant in the same seating position: These occupants (*i.e.*, OA10 equal "14", "24", "34", "44") do not have a manual belt available unless such a person is sharing the use of a manual belt (*i.e.*, two or more persons sitting side-by-side using the same manual belt should have the same restraint available for each occupant).

Occupant standing or kneeling in a designated seating position: These occupants have manual belts available to them for use. Availability is assessed for these occupants based on the occupant's assigned seating position.

Occupant in or on the lap of another occupant: These occupants do not have a manual belt available unless such a person is sharing the use of a manual belt (*i.e.*, two or more persons sitting in front of one another or on top of one another using the same manual belt).

Code "0" (Not available) indicates: (1) that at the time of the crash the designated seating position that the occupant was in, was not equipped with a manufacture installed or post manufacture installed manual belt (lap, shoulder, or lap and shoulder); (2) the occupant was not in a designated seating position (*e.g.*, on the floor); (3) the occupant was not the person assigned the designated seating position and was not using a manual belt (*e.g.*, sitting side-by-side); or (4) the seat position that the occupant was in was equipped only with an automatic (passive) belt system.

Researchers must determine the type of manual belt available at this occupant's seating position — nonintegral versus integral and, for integral systems, continuous loop versus noncontinuous loop.

Variable Name: Manual (Active) Belt System Availability [cont'd.]

Integral Manual Belt System:

Integral manual belt systems are lap and shoulder belt combinations that have the shoulder belt permanently attached to the lap belt. Continuous loop integral manual belt systems are one continuous belt, with a sliding buckle, that functions as both a shoulder belt and a lap belt. If the manual belt system is integral and of the continuous loop design, and if any portion of the belt is removed or destroyed, then the entire system must be considered as removed or destroyed. Use code "1" (Belt removed/destroyed) in this situation. However, if the system is integral, but uses a noncontinuous loop design, then, depending upon the design, consideration must be given as to what portion was removed or destroyed. For example, if the shoulder belt has been cut leaving only a functional lap belt portion, then use code "7" [Lap belt (shoulder belt destroyed\removed)].

Built-in Child Safety Seat System:

A built-in child safety seat is an occupant seating concept that makes the child seat and the seating position integral with each other. The seats are designed as alternatives for existing toddler or booster seats. They are not intended as infant seats. These seats must be pulled or folded out of the existing seat back. If the built-in child safety seat was not put into its proper position, then ignore its existence and record only the manual belt system available. If the seat has been properly positioned, then identify and encode the type of manual belt system that is used in conjunction with the built-in child safety seat. If the built-in child safety seat is "self-contained" (*i.e.*, does not use any part of the regular existing manual belt system available at the occupant seating position), then use code "8" (Other belt).

Code "1" (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 code the type of manual belt available on this variable and use code "01" (Inoperative) for OA19, Manual (Active) Belt System Use.

Nonintegral Manual Belt System:

Nonintegral manual belt systems are lap and shoulder belt combinations where the shoulder belt has to be integrated (*e.g.*, by buckling) with the existing lap belt. Either the shoulder belt portion or the lap belt portion of a nonintegral manual belt system can be removed or destroyed. If a portion of a belt has been removed or destroyed, then the remaining portion is available. For example, some older vehicles (1968 -1975) have had the separate shoulder belt removed leaving only the lap belt in the vehicle. In this situation, only the lap belt is available. The fact that the separate shoulder belt was removed or destroyed cannot be captured in this variable. If a portion of a nonintegral system has been rendered inoperative, then both portions are to be considered as available. For example, if the separate shoulder belt is tied so that it can no longer be integrated with the lap belt which was in use, then code lap and shoulder belt available (code "4") on this variable and lap belt (code "03") on OA19, Manual (Active) Belt System Use.

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.

Variable Name: Manual (Active) Belt System Availability [cont'd.]

Code "2" (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).

Code "3" (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.

Code "4" (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.

Code "5" (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 code.

Code "6" [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.

Code "7" [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.

Code "8" (Other belt) is used when the belt system is nonstandard or cannot be described with other codes. Specify (write out) the type of manual belt (*e.g.*, 5 point competition harness, 4 inch wide webbing, etc.). In addition, use this code if a properly position "self-contained" built-in child safety seat was available at this occupant's seating position. Other child restraints are not recorded here, use variables OA55 through OA60.

Code "9" (Unknown) is used when it cannot be determined whether or not manual belts were available for this occupant's seat position.

Variable Name: Manual (Active) Belt System Use

Element Values:

00	None used, not available, or belt removed/destroyed
01	Inoperative (specify)
02	Shoulder belt
03	Lap belt
04	Lap and shoulder belt
05	Belt used — type unknown
08	Other belt used (specify)
12	Shoulder belt used with child safety seat
13	Lap belt used with child safety seat
14	Lap and shoulder belt used with child safety seat
15	Belt used with child safety seat — type unknown
18	Other belt used with child safety seat (specify)
99	Unknown if belt used

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview and medical records. **NOTE**: Do not use the police crash report as a source for coding this variable.

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 [see variable OA20, Proper Use of Manual (Active) Belts]. This variable only identifies manual belt usage; do not consider the presence and use of a passive belt system.

Code "00"   (None used, not available, or belt removed/destroyed) is used when: (1) OA18 , Manual (Active) Belt System Availability, is coded "0" (Not available); (2) OA18 is coded "1" (Belt removed/destroyed); or (3) a manual belt was available (*i.e.*, OA18=2-8) but not worn.

Code "01"   (Inoperative) includes belts which are knotted, jammed, tucked behind the seat, or in any other fashion rendered unusable. In addition, use this code 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 coded "00" (None used, not available, or belt removed/destroyed).

Code "02"   (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.

Variable Name: Manual (Active) Belt System Use [cont'd.]

Code "03"   (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 [see OA23, Automatic (Passive) Belt System Availability/Function, and OA24, Automatic (Passive) Belt System Use]. For manual and automatic belt combinations, use this code for the manual lap belt usage, and encode the information about the two -point passive shoulder belt in variables OA23 and OA24.

Code "04"   (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 code. Improper use of the belt is assessed in variable OA20 [Proper Use of Manual (Active) Belts].

Code "05"   (Belt used — type unknown) is used when there is no vehicle inspection or interview, and information from medical records indicates that a manual belt was used but the type of manual belt system cannot be determined.

Codes "12"
through "18"   (... with child seat) are used when the vehicle's manual belt system anchors a child safety seat to the vehicle. These codes do not refer to the belts which are part of the child seat itself.

Code "15"   (Belt used with child safety seat — type unknown) is used when the vehicle belt type is unknown not the child safety seat type.

Code "99"   (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.

       Note, the presence of an air bag system (OA30 through OA48) does not mean that there are no active belts present. In fact, most if not all air-bag-equipped vehicles also have some manual belt system installed in the seat positions protected by the air bag(s).

Variable Name: Proper Use of Manual (Active) Belts

Element Values:

0	None used or not available
1	Belt used properly
2	Belt used properly with child seat

Belt Used Improperly

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

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR "narrative" must clearly state that the manual belt system was used properly or improperly.

Remarks:

This variable must be assessed by the researcher using all available data. An improperly used manual belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure which is addressed in variable OA21, Manual (Active) Belt Failure Modes During Accident. If there is an improperly used belt and/or a belt system failure, they should be noted on the Case Summary Form.

Code "2"   (Belt used properly with child seat) is to be indicated only when the safety seat is installed so as to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the manual seat belts) and is occupied by a child.

Code "4"   (Shoulder belt worn behind back or seat) is used when an occupant has an integral lap and shoulder belt but is only "encompassed" by the lap portion (*e.g.*, having the manual shoulder belt behind his or her back).

Code "5"   (Belt worn around more than one person) is used when more than one occupant is sharing the same manual belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another.

Code "6"   (Lap belt worn on abdomen) is used when the manual lap belt, or lap belt portion of a manual system, is worn above the occupant's pelvic bones.

Variable Name: Proper Use of Manual (Active) Belts (cont'd.)

Code "7"   (Lap belt or lap and shoulder belt used improperly with ch ild safety seat) is used when a child safety seat is not installed according to the manufacturer's directions and is occupied by a child. Specify how the manual belt was used improperly.

Code "8"   [Other improper use of manual belt (system)] is used to describe any improper use of the manual belt system which is not listed above. For example, use this code when a manual shoulder belt is worn on the outside of an occupant's arm (*i.e.*, humeral area) as opposed to under the arm (code "3") or on top of the shoulder/clavicle (code "1").

Code "9"   (Unknown) is used:

      ☞   when it is not known whether the manual belts used were used properly or improperly (*i.e.*, no interview was conducted and no other information is present that identifies proper or improper use of the manual belts), and

      ☞   when a child safety seat is occupied by a child, but it is unknown if the seat was installed (using either the manufacturer's or the vehicle's manual belts) according to the manufacturer's directions.

OA21

Variable Name: Manual (Active) Belt Failure Modes During Accident

Element Values:

    0   No manual belt used or not available
    1   No manual belt failure(s)
    2   Torn webbing (stretched webbing not included)
    3   Broken buckle or latchplate
    4   Upper anchorage separated
    5   Other anchorage separated (specify)
    6   Broken retractor
    7   Combination of abo ve (specify)
    8   Other manual belt failure (specify)
    9   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources may include interviewee and police report if a vehicle inspection is obtained.

Remarks:

If any component of the manual belt system fails during the impact as a result of occupant loading, the failure is encoded on this variable. The failure is also recorded on the Case Summary Form and documented with photographs and diagrams as needed.

Code "0"   (No ma nual belt used or not available) is used when OA19, Manual (Active) Belt System Use, equals "00" (None used, not available, or belt removed/destroyed), or "01" (Inoperative).

Code "1"   [No manual belt failure(s)] is used when there is no physical evidence from the vehicle inspection to indicate that a failure occurred.

**Codes "2"
through "6"**   are used to indicate the specific failure of the restraint system. Select the code 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). If a failure occurs, a complete and documented description of the failed component and the way it failed must accompany the case. Include photographs of the failed component(s).

Code "7"   (Combination of above) is used when any combination of codes "2" -"6" above occurs and describes multiple manual belt failure modes. Manual belt failure modes which are not described in codes "2"-"6" are reported in code "8" below. Manual belt failures listed in codes "2"-"6" take priority over code "8".

Code "8"   (Other manual belt failure) is used when the only manual belt failure(s) which occur are not described in codes "2"-"6" above.

Code "9"   (Unknown) is used when OA19, Manual (Active) Belt System Use, equals "99" (Unknown if belt used) or when there is no vehicle inspection.

Variable Name: Manual Shoulder Belt Upper Anchorage Adjustment

Range: 0 - 5, 9

Element Values:

>   0   No manual shoulder belt
>   1   No upper anchorage adjustment for manual shoulder belt
>
>   **Adjustable Shoulder Belt Upper Anchorage**
>   2   In full up position
>   3   In mid position
>   4   In full down position
>   5   Position unknown
>   9   Unknown if position has adjustable shoulder belt anchorage

Source: Researcher determined; inputs include vehicle inspection and occupant interview.

Remarks: Code this variable regardless of manual shoulder belt usage.

Code "0"   (No manual shoulder belt) is used when the vehicle was not equipped with a manual shoulder belt at the time of the crash.

Code "1"   (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.

Code "2"   (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).

Code "3"   (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).

Code "4"   (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).

Code "5"   (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.

Code "9"   (Unknown if position has adjustable manual shoulder belt upper anchorage) is used when it cannot be determined if the manual shoulder belt was equipped with an adjustable upper anchorage device.

OA23

Variable Name: Automatic (Passive) Belt System Availability/Function

Element Values:

0 Not equipped/not available
1 2 point automatic belts
2 3 point automatic belts
3 Automatic belts - type unknown

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

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include medical records, the interview, and police report. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR "narrative" must clearly state that the automatic belt system was used or available. An indication of usage or availability in a "restraint system" block is, by itself, not usable.

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 [code "1" (2 point automatic belts)], while others are designed with a lap and torso belt [code "2" (3 point automatic belts)]. A clue for proper system identification involves the egress issue. If you are sitting in the occupant's position and all belts are attached and you open the door, then determine if you *have to* detach any belt in order to exit the vehicle. Belts which do not require detaching are automatic belts. Note! The ease of egress is not considered because many automatic belt systems may appear cumbersome.

Availability is assessed based on the occupant's seating position. Select the automatic belt system which was available for use, if so desired, by the occupant relative to the occupant's seating position in the vehicle. Availability is also determined by presence, functional status, and use of the automatic belt system. Any occupant who is using a belt restraint system, or portion thereof, must by default have that system available to them. The correctness and/or appropriateness of the use is considered in OA26, Proper Use of Automatic (Passive) Belt System.

Variable Name: Automatic (Passive) Belt System Availability/Function [cont'd.]

Certain occupant seating situations involve abnormal posture. Examples are:

☞ occupant on the floor [*i.e.*, in front of a designated seat (*e.g.*, sitting, standing, etc.)];
☞ occupant lying across one or more seating positions;
☞ occupant sitting side-by-side of another occupant in the same seating position, since only one can be assigned to the seating position — see OA10, Occupant's Seat Position;
☞ occupant standing or kneeling in a designated seating position); and
☞ occupant in or on the lap of another occupant (*e.g.*, sitting, standing, kneeling, etc.).

Occupant on the floor: For this situation use code "0" (Not equipped/not available). These occupants are not in a designated seating position and do not have an automatic belt available.

Occupant lying across one or more seating positions: For an occupant lying across multiple seating positions, OA10 (Occupant's Seat Position) must equal code "14", "24", "34", or "44". These occupants can be using an automatic belt: If they are, then code availability based upon the belt used. Do not confuse this situation with occupants lying against a door or side panel or against another occupant. Persons in this latter category are still considered to be occupying a single occupant seating position.

Occupant sitting side-by-side of another occupant in the same seating position: These occupants (*i.e.*, OA10 equal "14", "24", "34", "44") do not have an automatic belt available unless such a person is sharing the use of an automatic belt (*i.e.*, two or more persons sitting side-by-side using the same automatic belt should have the same restraint available for ea ch occupant).

Occupant standing or kneeling in a designated seating position: These occupants have automatic belts available to them for use. Availability is assessed for these occupants based on the occupant's assigned seating position.

Occupant in or on the lap of another occupant: These occupants do not have an automatic belt available unless such a person is sharing the use of an automatic belt (*i.e.*, two or more persons sitting in front of one another or on top of one another using the same automatic belt).

Code "0"   (Not equipped/not available) indicates: (1) that at the time of the crash the designated seating position that the occupant was in, was not equipped with a manufacture installed or post manufacture installed automatic belt (2 point or 3 point); (2) the occupant was not in a designated seat position (*e.g.*, on the floor); (3) 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 (4) the seat position that the occupant was in was equipped only with a manual (active) belt system.

Variable Name: Automatic (Passive) Belt System Availability/Function [cont'd.]

Code "1"   (2 point automatic belts) is used when a torso belt is anchored along the in board 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.

Code "2"   (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 late model General Motors cars). 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 code --the system is automatic.

Code "3"   (Automatic belts — type unknown) is used when (1) no vehicle inspection occurs and the occupant's seating position is known to have automatic belts (*e.g.*, from the VIN-GV08) but the type (2 point versus 3 point) is unknown, or (2) 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, if the type of automatic belt system is undeterminable, then it is assumed that the system is functional (*i.e.*, code "3" takes precedence over code "4" below).

Code "4"   (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 code for belts which are extremely deteriorated from aging. Do not use this code for motorized belt tracks which are mechanically or electrically inoperative.

Belts which are knotted, buckled at the rear of the seat (bench or bucket), etc., are available if they were otherwise operative.

Code "9"   (Unknown) is used for front outboard seat occupants of uninspected passenger vehicles (GV07="01"-"09", "12", "20") where it cannot be determined from any secondary source whether or not this occupant's seating position was equipped with an automatic belt system.

Variable Name: Automatic (Passive) Belt System Use

Element Values:

        0   Not equipped/not available/destroyed or rendered inoperative
        1   Automatic belt in use
        2   Automatic belt not in use (manually disconnected, motorized track inoperative) (specify)
        3   Automatic belt use unknown
        9   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview and medical records. **NOTE**: Do not use the police crash report as a source for coding this variable.

Remarks:

Code "0"   (Not equipped/not available/destroyed or rendered inoperative) is used when OA23, Automatic (Passive) Belt System Availability/Function, is coded "0" (Not equipped/not available) or OA23 is coded "4" (Automatic belts destroyed or rendered inoperative).

Code "1"   (Automatic belt in use) is used when OA23, Automatic (Passive) Belt System Availability/Function, equals "1" (2 point automatic belts), "2" (3 point automatic belts), or "3" (Automatic belts - type unknown) **and** this occupant was using the automatic belt. The correctness of the use is not assessed on this variable [see variable OA26, Proper Use of Automatic (Passive) Belt System].

Code "2"   [Automatic belt not in use (manually disconnected, motorized track inoperativ e)] is used when the automatic belt's latch plate/buckle was detached at the time of the crash. For example, this code is used to capture disconnected 3-point, door mounted automatic belts (*i.e.*, 1987 and newer General Motors vehicles) which can be used similar to an active lap and shoulder belt system.

        This code 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 code "1" (Automatic belt in use). On the other hand, if it was detached, then use code "2" [Automatic belt not in use (manually disconnected, motorized track inoperative)].

Variable Name: Automatic (Passive) Belt System Use [cont'd.]

For motorized belts, this variables 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 code "1" (Automatic belt in use). If the motorized belt system was not locked in the restrained position or the belt was detached, then used code "2" [Automatic belt not in use (manually disconnected, motorized track inoperative)].

Code "3"   (Automatic belt use unknown) is used when OA23, Automatic (Passive) Belt System Availability/Function, equals "1" (2 point automatic belts), "2" (3 point automatic belts), or "3" (Automatic belts — type unknown) **and** the researcher is unable to determine if the automatic belt was in use.

Code "9"   (Unknown) is used when it cannot be determined from any source whether or not this occupant's seating position was equipped with an automatic belt system [*i.e.*, OA23 equals "9" (Unknown)].

Variable Name: Automatic (Passive) Belt System Type

Element Values:

0	Not equipped/not available
1	Non-motorized system
2	Motorized system
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR "narrative" must clearly state what type of automatic belt system was used.

Remarks:

Code "0"   (Not equipped/not available) is used when OA23, Automatic (Passive) Belt System Availability/Function, is coded "0" (Not equipped/not available). If the automatic belt system was not functioning [*i.e.*, OA23 equals "4" (Automatic belts destroyed or rendered inoperative)], then indicate the mechanization of the system by using code "1" (Non-motorized system) or "2" (Motorized system) below.

Code "1"   (Non-motorized system) is used when the automatic belt system available to this occupant does not require a motor for operation.

Code "2"   (Motorized system) is used when the automatic belt system available to this occupant requires a motor for operation.

Vehicles manufactured with automatic (passive) belts can be verified through their Vehicle Identification Number (VIN; *i.e.*, GV08). To assist in this verification a table appears after variable OA34 of the Occupant Assessment Form and is entitled: Vehicles Manufactured With Automatic (Passive) Restraint Systems. This table is a comprehensive list of vehicular passive restraint type by specific vehicle year, make, model, and VIN character identification.

Code "9"   (Unknown) is used when it cannot be determined from any source whether or not this occupant's seating position was equipped with an automatic belt system [*i.e.*, OA23 equals "9" (Unknown)]. In addition, use this code when it is known that an automatic belt is available but the type (non-motorized or motorized) cannot be determined.

Variable Name: Proper Use of Automatic (Passive) Belt System

Element Values:

0   Not equipped/not available/not used
1   Automatic belt used prope rly
2   Automatic belt used properly with child safety seat

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

Source: Researcher determined —   primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR "narrative" must clearly state that the automatic belt system was used properly or improperly.

Remarks:

This variable must be assessed by the researcher using all available data. An improperly used automatic belt can cause a large variety of injuries by itself or, depending upon the way it is improperly used, it can allow other injuries to occur which might not have happened if the restraint was properly used. In severe cases an improperly worn belt can be the cause of death. An improperly used belt can also lead to belt failure which is addressed in variable OA27, Automatic (Passive) Belt Failure Modes During Accident. If there is an improperly used belt and/or a belt system failure, they should be noted on the Case Summary Form.

Code "0"   (Not equipped/not available/not used) is used when OA23, Automatic (Passive) Belt System Availability/Function, is coded "0" (Not equipped/not available), OA23 is coded "4" (Automatic belts destroyed or rendered inoperative), or OA24, Automatic (Passive) Belt System Use, is coded "2" [Automatic belt not in use (manually disconnected, motorized track inoperative)]. In other words, in order to assess the properness of use, the automatic belt must be available, functional, and in use [*i.e.*, OA24 equals "1" (Automatic belt in use)].

Code"2"   (Automatic belt used properly with child safety seat) is to be indicated only when the child safety seat is installed so as to comply with the manufacturer's directions (*i.e.*, seat must be integrated with the vehicle via the automatic seat belts) and is occupied by a child.

Variable Name: Proper Use of Automatic (Passive) Belt System [cont'd.]

Code "4" (Automatic shoulder belt worn behind back) is used:

☞ when an occupant has a three point automatic belt but is only "encompassed" by the lap portion (*i.e.*, having the automatic torso belt behind the occupant's back), or

☞ when an occupant has a two point automatic belt and is not "encompassed" by the torso portion (*i.e.*, the automatic torso belt is attached and is behind the occupant's back).

Code "5" (Automatic belt worn around more than one person) is used when more than one occupant is sharing the same automatic belt. Occupants may be sitting side-by-side, in front of one another, or on top of one another. If the occupants are using a three point automatic belt such that the torso portion is worn behind one or more of the occupants backs while the lap portion encompasses their hips, then use this code.

Code "6" (Lap portion of automatic belt worn on abdomen) is used when the lap belt portion of a three point automatic belt system is worn above the occupant's pelvic bones.

Code "7" (Automatic lap and shoulder belt or automatic shoulder belt used imprope rly with child safety seat) is used when a child safety seat is not installed according to the manufacturer's directions and is occupied by a child. Specify how the automatic belt was used improperly.

Code "8" (Other improper use of automatic belt system) is used to describe any improper use of the automatic belt system which is not listed above. This includes when an automatic shoulder belt is worn on the outside of an occupant's arm as opposed to under the arm or on top of the shoulder.

Code "9" (Unknow n)is used:

☞ when it cannot be determined from any source whether or not this occupant's seating position was equipped with an automatic belt system [*i.e.*, OA23 equals "9" (Unknown)],

☞ when it is known that an automatic belt is available but the type cannot be determined--two point versus three point automatic belt [*i.e.*, OA23 equals "3" (Automatic belts - type unknown),

☞ when it is not known whether the automatic belts used were used properly or improperly (*i.e.*, no interview was conducted and no other information is present that identifies proper or improper use of the automatic belts), and

☞ when a child safety seat is occupied by a child, but it is unknown if the seat was installed (using either the manufacturer's or the vehicle's automatic belts) according to the manufacturer's directions.

Variable Name: Automatic (Passive) Belt Failure Modes During Accident

Element Values:

0	Not equipped/not available/not in use
1	No automatic belt failure(s)
2	Torn webbing (stretched webbing not included)
3	Broken buckle or latchplate
4	Upper anchorage separated
5	Other anchorage separated (specify)
6	Broken retractor
7	Combination of above (specify)
8	Other automatic belt failure (specify)
9	Unknown

Source: Researcher determined — primary source is the vehicle in spection; additional input may include the interview and police report if a vehicle inspection is obtained.

Remarks:

If any component of the automatic belt system fails during the impact, the failure is encoded in this variable. The failure is also recorded on the Case Summary Form and documented with photographs and diagrams as needed. Automatic belt system failures, unlike manual belt system failures, are not limited to those that resulted from occupant loading.

Code "0"   (Not equipped/not available/not in use) is used when OA26, Proper Use of Automatic (Passive) Belt System, equals "0" (Not equipped/not available/not used). In other words, in order to assess the failure modes, the automatic belt must be available, functional, and in use [*i.e.*, OA24 equals "1" (Automatic belt in use)].

Code "1"   [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.

Codes "2-6"   are used to indicate the specific failure of the restraint system. Select the code 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). If a failure occurs, a complete and documented description of the failed component and the way it failed must accompany the case. Include photographs of the failed component(s).

Code "7"   (Combination of above) is used when any combination of codes "2"-"6" above occurs and describes multiple automatic belt failure modes. Automatic belt failures which are not described in codes "2"-"6" are reported in code "8" below. Automatic belt failures listed in codes "2"-"6" take priority over code "8".

Variable Name: Automatic (Passive) Belt Failure Modes During Accident [cont'd.]

Code "8"   (Other automatic belt failure) is used when the only automatic belt failure(s) which occur are not described in codes "2"-"6" above.

Code "9"   (Unknown) is used:

☞ when there is no vehicle inspection,

☞ when it cannot be determined from any source whether or not this occupant's seating position was equipped with an automatic belt system [*i.e.*, OA24, Automatic (Passive) Belt System Use, equals "9" (Unknown)], or

☞ when it is known that an automatic belt is available and functional but it cannot be determined whether or not the automatic belt was in use [*i.e.*, OA24 equals "3" (Automatic belt use unknown)].

Variable Name: Police Reported Belt Use

Element Values:

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 encodes what was documented on the PAR regarding occupant use of available vehicle restraints (*i.e.*, manual belts, child safety seat, or automatic restraints). Code the first attribute which applies.

Code "1"   (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.

Code "5"   (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.

Variable Name: Police Reported Air Bag Availability/Function

Element Values:

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 encodes what was documented on the PAR regarding the availability and functioning of any air bag system.

Code "1"   (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.

Variable Name: Frontal Air Bag System Availability/Function
(This Occupant Position)

Element Values:

0	Not equipped/not available
1	Air bag

Non-functional

2	Air bag disconnected (specify):
3	Air bag not reinstalled
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. NOTE: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that the vehicle is airbag equipped and/or deployed ("narrative" or "restraint system" block).

Remarks:

Air bags are assumed not to be present (*i.e.*, Code "0", Not equipped/not available) unless there is a positive indication of air bag presence.

Variable Name: Frontal Air Bag System Availability/Function (cont'd.)
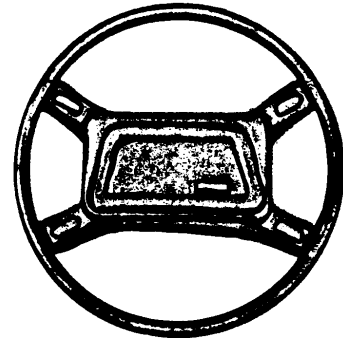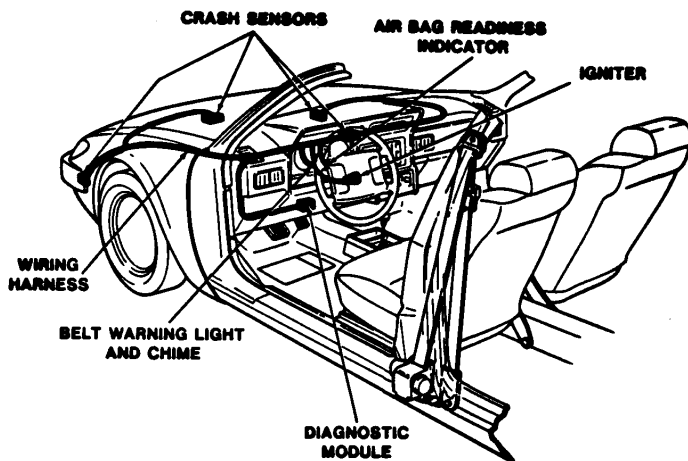
AIR BAG STEERING WHEEL

FORD AIR BAG

This variable is to be coded for frontal air bags only. These are air bags that are designed to protect an occupant in a frontal collision. If the occupant's seating position is equipped with another type of air bag (*i.e.*, a side air bag), then this will be coded under variable OA32, Other Than First Seat Frontal Air Bag Availability/Function.

This variable only codes those frontal air bags that are present in the first seat of the vehicle. Thus use code "0", Not equipped/not available when an occupant's seating position is different or if the air bag is not a frontal air bag.

Code "0" (Not equipped/not available) is used w hen the vehicle is not equipped with an air bag for the occupant's seating position. Because some newer vehicles (1984 and newer cars, 1991 or newer vans and 1994 or newer pickups and utility vehicles) are equipped with first seat frontal seat air bags, information must be obtained from a valid source prior to using this code.

Code "1" (Air bag) is used when the vehicle is equipped with an air bag for the occupant's seating position. Use caution when determining whether the air bag system is a "driver-only" or a "driver and passenger" design. Deployment of the air bag system has no bearing on the coding of this variable; refer to OA31, Frontal Air Bag System Deployment.

If the occupant's vehicle is not inspected and is a 1984 or newer car, 1991 or newer van, or 1994 or newer pickup/utility vehicle and information from interview or medical sources indicates that the vehicle was equipped with an air bag, but its function is unknown, then use this code (*i.e.*, the default assumption is that the air bag is functional).

Code "2" (Air bag disconnected) is used when any component of the air bag system for this occupant's position was rendered inoperative prior to the collision (*e.g.*, fuse removed).

Variable Name: Frontal Air Bag System Availability/Function (cont'd.)

Code "3"   (Air bag not reinstalled) is used when the air bag for this occupant's seating position was not replaced, or the system was not reactivated subsequent to a deployment prior to the crash being researched.

Code "9"   (Unknown) is used for front outboard seat occupants of uninspected 1984 or newer vehicles where data from another valid source cannot be obtained to ascertain the presence or absence of an air bag system.

Certain occupant seating situations involve abnormal posture. Examples are:

☞ occupant on the floor [*i.e.*, in front of a designated seat (*e.g.*, sitting, standing, etc.)];

☞ occupant lying across one or more seating positions;

☞ occupant sitting side-by-side of another occupant in the same seating position, since only one can be assigned to the seating position--see OA10, Occupant's Seat Position;

☞ occupant standing or kneeling in a designated seating position; and

☞ occupant in or on the lap of another occupant (*e.g.*, sitting, standing, kneeling, etc.).

Unlike belts (*i.e.*, manual or automatic), air bags are less adaptable to occupants who are not sitting in the designated occupant seating positions. Whereas a belt can be extended (within certain limits) to accommodate multiple occupants, a fully deployed air bag is engineered for a specific area. A belt will provide some protection even for multiple occupants (assuming the lap portion is across the pelvic bones and/or the shoulder portion is across the clavicle). However, an air bag could be extremely dangerous for some occupants in seating situations which involve abnormal posture (*e.g.*, occupant standing in front of the right-front seating position, occupant in or on the lap). Therefore, for this variable, air bags are only available to the occupants sitting in the front outboard seating positions (*i.e.*, OA10 equals "11" and/or "13"). Thus, use code "0" (Not equipped/not available) when an occupant's seating position (OA10) is "14" (... - Other) or "15" (...- On or in the lap of another occupant).

Some vehicles come equipped with a right-front passenger air bag and a front bench seat. In some vehicles the right-front air bag is big enough to cover the center front person [OA10="12" (Front Seat - Middle)]; however, the air bag was not engineered to provide protection to this occupant seating position. Therefore, occupants in the center front position, do not have an air bag available to them.

Variable Name: Frontal Air Bag System Deployment
(This Occupant Position)

Element Values:

0	Not equipped/not availabl e
1	Deployed during accident (as a result of impact)
2	Deployed inadvertently just prior to accident
3	Deployed, detail unknown
4	Deployed as a result of a noncollision event during accident sequence (*e.g.*, fire, explosion, electrical)
5	Unknown if deploye d
7	Nondeployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the, interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

This variable refers only to a frontal air bag system that is present in the first seat of a car. A frontal air bag is designed to protect an occupant during a frontal type impact (*i.e.* a longitudinal deceleration).

Air bags are for occupants seated in the front outboard positions in post-1983 vehicles. Thus, if the vehicle is not a post-1983 passenger car, 1991 or newer van or 1994 or newer pickup or utility vehicle or the occupant is not in a front outboard seating position (OA10, Occupant's Seat Position, equals "11" or "13"), then use code "0" (Not equipped/not available).

Code "0"   (Not equipped/not available) is also used when the occupant is seated in a front outboard seating position in a post-1983 vehicle but the vehicle was not equipped with an air bag [*i.e.*, OA30, Frontal Air Bag System Availability/Function, equals "0" (Not equipped/not available)].

Code "1"   [Deployed during accident (as a result of impact)] is used when the vehicle is equipped with an air bag [OA30 equals "1" (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.

Variable Name: Frontal Air Bag System Deployment (cont'd.)

Code "2"   (Deployed inadverten tly just prior to accident) is used when an air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in a crash.

Code "3"   (Deployed, accident 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 longitudinal deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag.

Code "4"   [Deployed as a result of a noncollision event during accident 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 (1) an impact or (2) a noncollision event prior to any impacts to this vehicle [*i.e.*, AC16, Vehicle Number or Object Contacted, equal to "33" (Fire or explosion)], takes this code.

Code "5"   (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 not inspected and no interview was obtained and no mention of deployment is on the PAR or medical records and:

☞ it is known (*e.g.*, from the VIN--GV08) that the vehicle was air bag equipped, then code "5" (Unknown if deployed) for the applicable front outboard seat occupants of post-1983 vehicles and code "0" (Not equipped/not available) for all other occupants.

☞ it is unknown whether the vehicle wa s air bag equipped, then code "9" (Unknown) for front outboard seat occupants of post -1983 vehicles and code "0" (Not equipped/not available) for non -front outboard seat occupants and occupants of all other CDS applicable vehicles.

Code "7"   (Nondeployed) is used when an air bag equipped vehicle has one or more impacts, and the air bag did not inflate during the crash.

Code "9"   (Unknown) is used when it is unknown if an air bag was available.

Variable Name: Other Than First Seat Frontal Air Bag Availability/Function
(This Occupant Position)

Element Values:

        0   Not equipped/not available
        1   Air bag

        Non-functional
        2   Air bag disconnected (specify):
        3   Air bag not reinstalled
        9   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the, interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR (1) must clearly indicate that an "other" air bag deployed either in the "narrative" or in a "restraint system" block or (2) the "narrative" must clearly state that the car was equipped with an "other" air bag. For air bag systems, an indication of availability in a "restraint system" block is, by itself, not usable.

Remarks:

"Other" air bags are for occupants in post-1994 passenger cars. These air bags are any air bag **other** than a frontal air bag. They may include but not be limited to side air bags that are designed to deploy in a side impact. Air bags are assumed not to be present (*i.e.*, Code "0", Not equipped/not available unless there is a positive indication of air bag presence.

This variable is to be coded for air bags other than first seat frontal.

Code "0"   (Not equipped/not available) is used when the vehicle is not equipped with an "other" air bag for the occupant's seating position. Use this code for all for all occupants of 1994 or older vehicles, and for vehicle body types not using "other" air bags irrespective of the model year.

Code "1"   (Air bag) is used when the vehicle is equipped with an "other" air bag for the occupant's seating position. Deployment of the air bag system has no bearing on the coding of this variable; refer to OA33, Air Bag(s) Deployment, Other Than First Seat Frontal.

Code "2"   (Air bag disconnected) is used when any component of the "other" air bag system for this occupant's position was rendered inoperative prior to the collision.

Code "3"   (Air bag not reinstalled) is used when the "other" air bag for this occupant's seating position was not replaced, or the system was not reactivated subsequent to a deployment prior to the crash being researched.

(2)

Variable Name: Other Than First Seat Frontal Air Bag Availability/Function
(This Occupant Position) (Cont'd)

Code "9"   (Unknown) is used for front outboard seat occupants of uninspected 1995 or newer vehicles where data from another valid source cannot be obtained to ascertain the presence or absence of an "other" air bag system.

Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal
(This Occupant Position)

Element Values:

0	Not equipped with an "other" air bag
1	Deployed during accident (as a result of impact)
2	Deployed inadvertently just prior to accident
3	Deployed, detail unknown
4	Deployed as a result of a noncollision event during accident sequence (*e.g.*, fire, explosion, electrical)
5	Unknown if deployed
7	Nondeployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondar y sources include the, interview, police report, and medical records. **NOTE**: The use of the police report is limited. If there is no vehicle inspection and the only secondary source is the PAR, then the PAR must clearly indicate that an "other" air bag deployed.

Remarks:

"Other" air bags are for occupants in post-1994 passenger cars. Thus, if the vehicle is not a post-1994 passenger car, then use code "0" (Not equipped with an "other" air bag). These air bags are any air bag **other** than a frontal air bag in the front seat positions. They may include but not be limited to side air bags that are designed to deploy in a side impact and frontal air bags equipped in other than the front seat positions.

Code "0"   (Not equipped with an "other" air bag) is used when the vehicle is a post-1994 vehicle but the vehicle was not equipped with an "other" air bag.

Code "1"   [Deployed during accident (as a result of impact)] is used when the vehicle is equipped with an "other" air bag [OA32 equals "1" (Air bag)] and the air bag deployed as a result of an impact which produced a 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.

Code "2"   (Deployed inadvertently just prior to accident) is used when an "other" air bag deploys without an impact having caused its deployment, and the vehicle is subsequently involved in a crash.

Variable Name: Air Bag(s) Deployment, Other Than First Seat Frontal

Code "3"   (Deployed, accident details unknown) is used when the researcher cannot determine if the "other" air bag deployed (1) prior to the crash or (2) during the crash as a result of an impact which produced a deceleration through the vehicle of sufficient magnitude to cause inflation of the air bag.

Code "4"   [Deployed as a result of a noncollision event during accident sequence (*e.g.,* fire, explosion, electrical)] is used if the "other" air bag deploys during a crash but not as a result of an impact.

Code "5"   (Unknow n if deployed) is used when it is known that the vehicle was equipped with an "other" air bag but the researcher is unable to determine if the air bag deployed (for whatever reason).

Code "7"   (Nondeployed) is used when an "other" air bag equipped vehicle has one or more impacts, and the air bag did not inflate during the crash.

Code "9"   (Unknown) is used when it is unknown if an "other" air bag was available.

OA34

Variable Name: Are There Indications of Air Bag System Failure?

Element Values:

0	Not equipped/not available
1	No
2	Yes (specify):
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary sources include the interview, police report, and medical records. **NOTE**: The use of all secondary sources is limited. If there is no vehicle inspection, then the secondary sources are limited to the reporting of "no failure". If the only secondary source is the PAR and no failure is alleged, then the PAR must clearly indicate that an air bag deployed either in the "narrative" or in a "restraint system" block.

Remarks:

This variable flags "indications of air bag failures". "Indications of air bag failure" means that something abnormal has occurred to the air bag system. It may not necessarily mean that the air bag system was defective. 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 slides and notes, then call your zone center for assistance.

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.

Code "0"   (Not equipped/not available) is used whenever OA30, Frontal Air Bag System Availability/Function and OA32, Other Than First Seat Frontal Air Bag Availability/Function, 7 equals "0" (Not equipped/not available), "2" (Air bag disconnected), or "3" (Air bag not reinstalled) because this variable only focuses upon indications of failures in functioning air bag systems.

Code "1"   (No) is used whenever the vehicle is known to be air bag e quipped [*i.e.*, OA30 or OA32 equals "1" (Air bag)] and no indications of air bag failure are suspected. Use this code when an air bag did not deploy [*i.e.*, OA31, Frontal Air Bag System Deployment OA33, Air Bag(s) Deployment, Other Than First Seat Frontal, equals "7" (Nondeployed)] and no failure is suspected and the vehicle inspection indicates that the deceleration sustained by the vehicle was near or below the *deployment threshold*. In addition, use this code when the vehicle is not inspected but is known to be air bag equipped (*e.g.*, VIN--GV08) and secondary sources make no allegation of "failure" (*e.g.*, interviewee does not say "the bag did not work").

Code "2"   (Yes) is used whenever an indication of air bag failure is suspected and specify the failure.

Code "9"   (Unknown) is used whenever OA31 or OA33 equals "5" (Unknown if deployed) or "9" (Unknown).

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Non-Motorized Place	VIN Model Code	VIN Place	VIN Restraint Code
Acura	Legend LS	1987 to 1989	54-032	Standard			4-6	KA3,4	8 6
(Honda)	Integra	1990	54-031			Yes	4-6	DA9,DB1	8 4-6
	Legend (all)	1990	54-032	Standard			4-6	KA3,4	8 3-7
	Integra	1991	54-031			Yes	4-6	DA9,DB1	8 4-6,7,9
	Legend	1991	54-032	Standard			4-6	KA7,8	8 3,5,6
	NSX	1991	54-033	Standard			4-6	NA1	8 5,6
	Integra	1992 to 1993	54-031			Yes	4-6	DA9,DB1, DB2	8 4-8
	Integra	1994	54-031		Standard	Yes	4-6	DA9,DB1, DB2	8 ???
	Legend	1992	54-032	Standard			4-6	KA7,8	8 3
	: L,LS	1992	54-032		Standard		4-6	KA7,8	8 5-7
		1993 to 1994	54-032		Standard		4-6	KA7,8	8 3,5-7
	NSX	1992	54-033	Standard			4-6	NA1	8 5,6
		1993 to 1994	54-033		Standard		4-6	NA1	8 5,6
	Vigor	1992	54-034	Standard			4-6	CC2	8 4,5
	: LS	1993	54-034	Standard			4-6	CC2	8 4
	: GS	1993	54-034		Standard		4-6	CC2	8 6
		1994	54-034		Standard		4-6	CC2	8 6
Alfa Romeo	Spider	1991 to 1993	31-031	Standard			4-5	BB,BC	? ?
	164	1991 to 1993	31-035	Standard			4-5	EA	? ?
Aston Martin	Virage	1993	69-031	Standard			5-6	AM	7 2
Audi	80	1990	32-036	Standard			4,7-8	E,F..8A	6 1
	90	1990	32-036	Standard			4,7-8	G,H..8A	6 1
	100	1990	32-032	Standard			4,7-8	B,C..44	6 1
	200	1990	32-037	Standard			4,7-8	F,G,H..44	6 1
	Coupe Quattro	1990	32-039	Standard			4,7-8	?..8B	6 1
	V8	1990	32-038	Standard			4,7-8	K..44	6 1
	80	1991 to 1992	32-036	Standard			4,7-8	E,F..8A	6 2
	90	1991 to 1992	32-036	Standard			4,7-8	G,H..8A	6 2
	100	1991 to 1992	32-032	Standard			4,7-8	B,C..44	6 2
	200	1991 to 1992	32-037	Standard			4,7-8	F,G,H..44	6 2
	Coupe Quattro	1991 to 1992	32-039	Standard			4,7-8	G..8B	6 2
	V8	1991 to 1992	32-038	Standard			4,7-8	K..4C	6 2
	90	1992 to 1993	32-036	Standard			4,7-8	B,D,E..8C	6 5
		1994	32-036		Standard		4,7-8	B,D,E..8C	6 8
	100	1992 to 1994	32-032		Standard		4,7-8	A,B,D-F ..4A	6 8
	Cabriolet	1994	32-041		Standard		4,7-8	???	6 8
	S4 Quattro	1992 to 1994	32-039		Standard		4,7-8	H..4C	6 8
	V8 Quattro	1992 to 1994	32-038		Standard		4,7-8	B..4C	6 8
Bentley	All	1988 to 1989	69-042			??Yes??	2-3	CB	8 B
(Rolls	All	1990 to 1993	69-042	Standard			2-3	CB	8 D
Royce)	All	1994	69-042		Standard		2-3	CB	8 ?????
BMW	735i	1987	34-037	Option			4-5	FH	8 1
	635CSi	1988 to 1989	34-036	Standard			4-5	EC	8 1
	735i	1988 to 1989	34-037	Standard			4-5	GB,GC	8 1
	318i	1991 to 1993	34-034	Standard			4-5	AF,AJ,BA	8 1
		1994	34-034		Standard		4-5	AF,AJ,BA	8 ?????

10th Character = Year: A-1980 B=1981 C=1982 D=1983 E=1984 F=1985 G=1986 H=1987 J=1988 K=1989
L=1990 M=1991 N=1992 P=1993 R=1994 S=1995 T=1996 W=1998 X=1999

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Non-Motorized Place	VIN CHARACTER IDENTIFIER Model Code	Place	Restraint Code
BMW (Cont'd)	325i	1990 to 1994	34-034	Standard			4-5	AA,AB,AD, AE,BB	8	1
	M3	1990 to 1993	34-034	Standard			4-5	AK	8	1
	525i	1990 to 1993	34-035	Standard			4-5	HC	8	1
		1994	34-035		Standard		4-5	HC	8	???
	530i	1994	34-035		Standard		4-5	???	8	???
	535i	1990 to 1993	34-035	Standard			4-5	HD	8	1
	540i	1994	34-035		Standard		4-5	???	8	???
	M5	1992 to 1993	34-035	Standard			4-5	H0	8	1
	735i	1990 to 1992	34-037	Standard			4-5	GB,GC	8	1
	740i	1993 to 1994	34-037		Standard		4-5	GB,GC	8	1
	750i	1990 to 1992	34-037	Standard			4-7	GC83	8	1
		1993 to 1994	34-037		Standard		4-7	GC83	8	1
	850i	1991 to 1992	34-038	Standard			4-5	EG	8	1
		1993 to 1993	34-038		Standard		4-5	EG	8	1
Buick	LeSabre	1974 to 1975	18-002		Option		2	N,P		
		1976	18-002		Option		2	P		
	Electra	1974	18-003		Option		2	T,V,X		
		1975 to 1976	18-003		Option		2	V,X		
	Riviera	1974	18-005		Option		2	Y		
		1975 to 1976	18-005		Option		2	Z		
	Century SW	1990 to 1992	18-007			Yes	4-5	AH,AL	7	4
	Century	1992	18-007			Yes	4-5	AG	7	4
		1993	18-007	Option		Yes	4-5	AG,H,L	7	3,4
	Special	1994	18-007	Standard			4-5	??	7	3
	Electra	1990	18-003			Yes	4-5	CF,CX	7	4
	LeSabre	1990 to 1991	18-002			Yes	4-5	BR,HP,HR	7	4
		1992 to 1993	18-002	Standard			4-5	HP,HR	7	3
		1994	18-002		Standard		4-5	HP,HR	7	2
	Park Avenue	1991 to 1993	18-003	Standard			4-5	CU,CW	7	3
		1994	18-003		Standard		4-5	CU,CW	7	2
	Reatta	1990 to 1991	18-021	Standard			4-5	EC	7	3
	Regal	1990 to 1991	18-020			Yes	4-5	WB,WD	7	4
		1992 to 1993	18-020			Yes	4-5	WB,D,F	7	4
	Custom	1994	18-020		Standard		4-5	WB	7	3
	Riviera	1990 to 1993	18-005	Standard			4-5	EZ	7	3
	Roadmaster	1992 to 1993	18-004	Standard			4-5	BN,BR,BT	7	3
		1994	18-004		Standard		4-5	BN,BR,BT	7	2
	Skyhawk	1991	18-012			Yes	4-5	JE,JS	7	4
	Skylark	1990 to 1991	18-018			Yes	4-5	NC,ND,NJ, NM,NV	7	4
		1992 to 1993	18-018			Yes	4-5	NJ,NM	7	4
	Custom	1994	18-018	Standard			4-5	NJ	7	3
Cadillac	DeVille	1974 to 1976	19-003		Option		2	D		
	Eldorado	1974 to 1976	19-005		Option		2	L		
	Allante	1990 to 1993	19-009	Standard			4-5	VR,VS	7	3
	DeVille --2 dr	1990 to 1993	19-003	Standard			4-5	CD	7	3
	Eldorado	1990 to 1992	19-005	Standard			4-5	EL	7	3
		1993 to 1994	19-005		Standard		4-5	EL	7	2
	DeV Fleetwood-- 4 dr/Sixty	1990	19-003	Standard			4-5	CB,CS	7	3
		1991 to 1992	19-003	Standard			4-5	CB,CG	7	3
	DeVille--4 dr/ Sixty Touring	1993	19-003	Standard			4-5	CB,CT	7	3
		1994	19-003		Standard		4-5	CB,CT	7	2

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Non-Motorized Place	VIN Model Code	Place	Restraint Code	
Cadillac (Cont'd)	DeV Fleetwood Brougham - RWD	1990 to 1992	19-003			Yes	4-5	DW	7	4
		1993 to 1994	19-003		Standard		4-5	DW	7	2
	Seville	1990 to 1992	19-014	Standard			4-5	KS,KY	7	3
		1993 to 1994	19-014		Standard		4-5	KS,KY	7	2
Chevrolet	Impala	1973	20-002		Option		2	L		
	Astro: 4x2	1994	20-441	Standard			3,5-7	N.M15	N/A	N/A
	4X4	1994	20-441	Standard			3,5-7	N.L15	N/A	N/A
	Beretta	1990	20-019				4-5	LV,LW,LZ	7	4
		1991 to 1993	20-019	Standard			4-5	LV,LW,LZ	7	3
	Camaro	1990 to 1993	20-009	Standard			4-5	FP	7	3
		1994	20-009		Standard		4-5	FP	7	2
	Caprice	1990	20-002			Yes	4-5	BL,BN,BU	7	4
		1991 to 1993	20-002	Standard			4-5	BL,BN	7	3
		1994	20-002		Standard		4-5	BL,BN	7	2
	Cavalier	1990 to 1994	20-016			Yes	4-5	JC,JF	7	4
	Celebrity	1990	20-017			Yes	4-5	AW	7	4
	Corsica	1990	20-019			Yes	4-5	LT,LZ	7	4
		1991 to 1993	20-019	Standard			4-5	LT	7	3
	Corvette	1990 to 1993	20-004	Standard			4-5	YY,YZ	7	3
		1994	20-004		Standard		4-5	YY,YZ	7	2
	Geo Metro Hthbk	1990 to 1993	20-034			Yes	4-5	MR,MS	7	4
	Conv	1990 to 1993	20-034	Standard			4-5	MR	7	3
	Geo Prizm	1990 to 1992	20-032		Yes		4-5	SK,SL	7	4
		1993	20-032	Standard			4-5	SK	7	3
	,Gsi	1994	20-032		Standard		4-5	SK	7	2
	Geo Sprint	1990 to 1992	20-033			Yes	4-5	MT	7	4
	Geo Storm	1990 to 1993	20-035	Standard			4-5	RF,RT	7	3
	Lumina	1990	20-020			Yes	4-5	WL,WN	7	4
		1991 to 1994	20-020			Yes	4-5	WL,WN,WP	7	4
	Lumina APV	1994	20-442	Standard			3,5,7	N.U06	N/A	N/A
	Van, G-series	1994	20-461	Standard			3,5	N.G	N/A	N/A
Chrysler	New Yorker-RWD 5th Avenue	1988	06-010	Option*			5	F	4	X
	Lebaron	1988	06-017	Option*			5	J	4	X,Y
	GTS	1988	06-017	Option*			5	H	4	X,Y
	New Yorker-RWD 5th Avenue	1989	06-010	Standard			5	M	4	X
	Lebaron	1989	06-017	Standard			5	J	4	X,Y
	GTS	1989	06-017	Standard			5	H	4	X,Y
	Concorde	1993 to 1994	06-041		Standard		5	L	4	E
	Lebaron GTS,C	1990 to 1992	06-017	Standard			5	J	4	X,Y
	Lebaron	1990 to 1991	06-016	Standard			5	A	4	X,Y
		1992 to 1993	06-016	Standard			5	A,U	4	X,Y
	, 2-dr	1994	06-016	Standard			5	U	4	E
	New Yorker-FWD Imperial	1990 to 1991	06-014	Standard			5	Y	4	X
		1992 to 1993	06-014	Standard			5	V	4	X
	New Yorker-FWD 5th Avenue	1990 to 1991	06-010	Standard			5	Y	4	X
		1992 to 1993	06-010	Standard			5	V	4	X
	New Yorker-FWD Salon,Landau	1990 to 1993	06-014	Standard			5	C	4	X

* Air bag became standard equipment in mid-year.

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized	PASSIVE BELT Non-Motorized Place	VIN Model Code	VIN Place	Restraint Code	
Chrysler	New Yorker-LHS	1994	06-042		Standard			5	???	4	E
(Cont'd)	TC	1990	06-031	Standard				6	1	7	X
		1991	06-031	Standard				6	1	7	2
	Town & Country										
	4x2 :	1992 to 1993	06-441	Standard				5-6	H5	N/AN/A	
		1994	06-441		Standard			5-6	H5	N/AN/A	
	4x4	1992 to 1993	06-441	Standard				5-6	K5	N/AN/A	
		1994	06-441		Standard			5-6	K5	N/AN/A	
Daihatsu	Charade-										
	hatchbk	1988 to 1989	60-031			Yes		4-5	FG,JG	7	2
		1990 to 1992	60-031			Yes		4-5	FG,JG	7	1,2
	-sedan	1990 to 1992	60-031				Yes	4-5	EG,HG	7	1,2
Dodge	Diplomat	1988	07-007	Option*				5	G	4	X,Y
	Daytona	1988	07-015	Option*				5	A	4	X,Y
	Diplomat	1989	07-007	Standard				5	M	4	X,Y
	Daytona	1989	07-015	Standard				5	G	4	X,Y
	Caravan:										
	4x2	1992 to 1993	07-442	Standard				5-6	H2,H4,4,5	N/A	N/A
		1994	07-442		Standard			5-6	H2,H4,4,5	N/AN/A	
	4x4	1992 to 1993	07-442	Standard				5-6	K4,5	N/A	N/A
		1994	07-442		Standard			5-6	K4,5	N/AN/A	
	Colt Hatchback	1989 to 1992	09-034			Yes		5	U	4	C
	2,4 dr	1993	09-034			Yes		5	A	4	C
	Vista SW	1991	09-441				Yes	5	G	4	C
		1992 to 1993	09-441				Yes	5	V,W,B,C	4	C
	Daytona	1990 to 1991	07-015	Standard				5	G	4	X,Y
		1992 to 1993	07-015	Standard				5	W	4	X
	Dynasty	1990 to 1993	07-018	Standard				5	C,N	4	X,Y
	Intrepid	1993 to 1994	07-041		Standard			5	D	4	E
	Monaco	1990 to 1992	07-040			Yes		5	B	4	C
	Neon	1995	07-020		Standard			5	???	4	E
	Omni	1990	07-008	Standard				5	L	4	X,Y
	Shadow	1990 to 1994	07-017	Standard				5	P	4	X,Y
	Spirit	1990 to 1994	07-019	Standard				5	A	4	X,Y
	Stealth	1991 to 1993	07-039	Standard				5	D,E	4	X,Y
		1993	07-039	Standard				5	M,N	4	X
		1994	07-039		Standard			5	M,N	4	E
	Vipor	1992 to 1993	07-004			Yes		5	R	4	C
		1994	07-004	Standard				5	R	4	X
Eagle	Premier	1990 to 1992	10-040			Yes		5	B	4	C
	Summit	1990 to 1992	10-034			Yes		5	U	4	C
		1993	10-034			Yes		5	A,B,C	4	C
		1994	10-034	Standard				5	A,B,C	4	X
	Talon	1991 to 1992	10-037			Yes		5	S,T	4	C
		1993	10-037			Yes		5	F,G	4	C
		1994	10-037	Standard				5	F,G	4	X
	Vision	1993 to 1994	10-041		Standard			5	D	4	E
Ford	Escort	1988	12-013			Yes		6-7	88-98	4	P
		1989	12-013			Yes		6-7	90-98	4	P
	Festiva	1988	12-033			Yes		6-7	06-13	4	P
		1989	12-033			Yes		6-7	06,07	4	P
	Tempo	1985 to 1986	12-015	Option				6-7	18-23	4	C
		1987 to 1989	12-015	Option				6-7	30-39	4	C

* Air bag became standard equipment in mid-year.

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                   L-1990   M-1991   N-1992   P-1993   R-1994   S-1995   T-1996   W-1998   X-1999

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEARCODE:	NASS MAKE/MODE Only	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Motorized	PASSIVE BELT Non-Motorized	VIN CHARACTER IDENTIFIER Model Code	Place	Restraint Code
Ford	Aerostar: 4x2	1992 to 1994	12-441	Standard				5-7	A11,A31	N/A N/A
(Cont'd)	:4x4	1992 to 1994	12-441	Standard				5-7	A21,A41	N/A N/A
	Aspire	1994	12-036		Standard			6-7	???	4 L
	Bronco	1994	12-421	Standard				5-7	U15	N/A N/A
	Club Wagon XL,									
	E-150	1992 to 1994	12-441	Standard				5-7	E11	N/A N/A
	E-350	1992 to 1994	12-441	Standard				5-7	E31	N/A N/A
	E-350 Super	1992 to 1994	12-441	Standard				5-7	S31	N/A N/A
	Contour	1995	12-035		Standard			6-7	???	4 L
	Crown Victoria:	1990 to 1991	12-016	Standard				6-7	76-79	4 C
	station wagon									
	Crown Victoria	1990 to 1991	12-016	Standard				6-7	72-74	4 C
		1992	12-016	Standard	Option			6-7	72-75	4 C,L
		1993 to 1994	12-016		Standard			6-7	72-74	4 L
	Econoline Van,									
	E-150	1993 to 1994	12-441	Standard				5-7	E14	N/A N/A
	E-250	1993 to 1994	12-441	Standard				5-7	E24,S24	N/A N/A
	Escort	1990	12-013				Yes	6-7	10-15,& 90-98	4 P
		1991	12-013				Yes	6-7	10-15	4 P
		1992 to 1993	12-013				Yes	6-7	10-16	4 P
		1994	12-013	Standard				6-7	10-16	4 C
	Festiva	1990 to 1993	12-033				Yes	6-7	05-07	4 P
		1994	12-033		Standard			6-7	05-07	4 L
	Mustang	1990 to 1993	12-003	Standard				6-7	40-45	4 C
		1994			Standard			6-7	40-45	4 L
	Probe	1990 to 1992	S12-018				Yes	6-7	20-22	4 P
		1993	12-018	Standard				6-7	20-22	4 C
		1994	12-018		Standard			6-7	20,22	4 L
	Taurus	1990 to 1991	12-017	Standard				6-7	50-58	4 C
		1992	12-017	Standard	Option			6-7	50-58	4 C,L
		1993	12-017	Standard	Option~			6-7	52-58	4 C,L
		1994	12-017		Standard			6-7	52-58	4 L
	Tempo	1990 to 1991	12-015	Option			Yes	6-7	30-39	4 C,P
		1992	12-015	Option			Yes	6-7	31-38	4 C,P
		1993 to 1994	12-015	Option				6-7	31-37	4 C,P
	Thunderbird	1990 to 1992	12-004				Yes	6-7	60-64	4 P
		1993	12-004				Yes	6-7	62-64	4 P
		1994	12-004		Standard			6-7	62,64	4 L
GMC	Safari: 4x2	1994	23-441	Standard				3,5-7	K.M15	N/A N/A
	4x4	1994	23-441	Standard				3,5-7	K.L15	N/A N/A
	Van, G-series	1994	23-461	Std/Opt				3,5	K.G	N/A N/A
Honda	Accord	1987	37-032			Yes		4-6	CA5	8 8
		1988	37-032			Yes		4-6	CA5,CA6	8 6,8
		1989	37-032			Yes		4-6	CA5,CA6	8 4,6,8
		1990	37-032			Yes		4-6	CB7	8 4,5,6
		1991	37-032			Yes		4-6	CB7	8 4,5,6,8
	wagon	1991	37-032	Standard				4-6	CB9	8 5,6
	Civic CRX	1989 to 1991	37-031				Yes	4-6	ED8,ED9	8 6
	hatchback	1990 to 1991	37-031				Yes	4-6	ED6,ED7	8 4,5,6
	sedan	1990 to 1991	37-031			Yes		4-6	ED3,ED4	8 4,5,6
	wagon	1990 to 1991	37-031			Yes		4-6	EE2,EE4	8 4,5
	Prelude	1988-1989	37-033				Yes	4-6	BA4	8 2,3,4
		1990	37-033				Yes	4-6	BA4	8 1-5
		1991	37-033				Yes	4-6	BA4	8 2-6

* Air bag is optional in the U.S. but standard equipment in Canada.

10th Character = Year: A-1980 B=1981 C=1982 D=1983 E=1984 F=1985 G=1986 H=1987 J=1988 K=1989
L=1990 M=1991 N=1992 P=1993 R=1994 S=1995 T=1996 W=1998 X=1999

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

Vehicle Make	Vehicle Model	Vehicle Model Year Code	NASS Make/Mode	Air Bag	Passive Belt			VIN Character Identifier			
				Driver Only	Driver & Passenger	Motorized	Non-Motorized	Non-Place	Model Code	Place	Restraint Code
Honda (Cont'd)	Accord	1992 to 1993	37-032	Standard				4-6	CB7	8	4,5,7
	SE	1993	37-032		Standard			4-6	?CB7?	8	???
	wagon	1992 to 1993	37-032	Standard				4-6	CB9	8	5,7
		1994	37-032		Standard			4-6	CB9	8	5,7
	Civic HB:C,D,VX	1992	37-031			Yes		4-6	EH2	8	4,5,6
		1993	37-031	Standard				4-6	EH2	8	5,6,7
	HB:Si	1992	37-031			Yes		4-6	EH3	8	8
		1993	37-031	Standard				4-6	EH3	8	8
	HB:	1994	37-031		Standard			4-6	EH2,3	8	???
	SD:D,LX	1992	37-031			Yes		4-6	EG8	8	4,5
		1993	37-031	Standard				4-6	EG8	8	4,5
	SD:EX	1992	37-031			Yes		4-6	EH9	8	9
		1993	37-031	Standard				4-6	EH9	8	9
	SD:	1994	37-031		Standard			4-6	EG8,EH9	8	???
	Coupe DX	1993	37-031	Standard				4-6	EJ2	8	4
	Coupe EX	1993	37-031	Standard				4-6	EJ1	8	5
		1994	37-031		Standard			4-6	EJ1	8	6
	DelSol S	1993	37-031	Standard				4-6	EG1	8	4
		1994	37-031		Standard			4-6	EG1	8	???
	DelSol Si	1993	37-031	Standard				4-6	EH6	8	6
		1994	37-031		Standard			4-6	EH6	8	???
	Prelude S	1992 to 1993	37-033	Standard				4-6	BA8	8	4
	Si	1992 to 1993	37-033	Standard				4-6	BB2	8	5
	Si Vtec	1993	37-033		Standard			4-6	BB2	8	7
	Si	1994	37-033		Standard			4-6	BA8,BB1,2	8	???
	Si 4WS	1992 to 1993	37-033		Standard			4-6	BB2	8	6
Hyundai	Excel	1987 to 1989	55-032			Yes		4-5	LA,LD	7	2
		1990 to 1993	55-032			Yes		4-5	VA,VD	7	2
	Sonata	1989 to 1993	55-033			Yes		4-5	BF	7	2
		1994	55-033		Standard			4-5	BF	7	???
	Scoupe	1991 to 1993	55-034			Yes		4-5	VE	7	2
	Elantra	1992 to 1993	55-035				Yes	4-5	JF	7	2
Infiniti (Nissan)	M30	1990 to 1992	58-031	Standard				5	F	8	C
	Q45	1990 to 1993	58-032	Standard				5	G	8	C
		1994	58-032		Standard			5	G	8	D
	G20	1991 to 1993	58-033			Yes		5	P	8	P
		1994	58-033		Standard			5	P	8	D
	J30	1993 to 1994	58-034		Standard			5	Y	8	D
Isuzu	Impulse	1988-1989	38-032			Yes		4-5	BR	4	B
		1988-1989	38-032	Option				4-5	CR	4	C
		1990 to 1993	38-032	Standard				6	2,4	7	3
	I-Mark	1989	38-031			Yes		4-5	RT	7	4
	Stylus	1990 to 1993	38-033	Standard				6	5	7	3
Jaguar	XJ6	1990 to 1992	39-032			Yes		4	F	5	Y
		1993	39-032	Standard				4	F	5	W
		1994	39-032		Standard			4	F	5	?W?
	XJ-S	1990	39-031	Standard				4	N,T	5	W
		1991 to 1993	39-031	Standard				4	T	5	W
		1994	39-031		Standard			4	T	5	?W?
Jeep	Grand Cherokee: 4x4	1993 to 1994	02-404	Standard				5-6	Z7	N/A	N/A
	Grand Wagoneer: 4x4	1993	02-431	Standard				5-6	Z8	N/A	N/A

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEARCODE:	NASS MAKE/MODE Only	AIR BAG Driver Only	Driver & Passenger	PASSIVE BELT Motorized	Non-Motorized	Non-Place	VIN Model Code	Place	Restraint Place	Code
Lexus	ES-250	1990 to 1991	59-031	Standard					5-6	V2	8	T
(Toyota)	ES-300	1992 to 1993	59-031	Standard					5-6	K1	8	T
		1994	59-031		Standard				5-6	K1	8	E
	LS-400	1990 to 1992	59-032	Standard					5-6	F1	8	E
		1993 to 1994	59-032		Standard				5-6	F1	8	E
	GS-300	1994	59-034		Standard				5-6	???	8	E
	SC-400/SC-300	1992	59-033	Standard					5-6	Z3	8	C
		1993 to 1994	59-033		Standard				5-6	Z3	8	C
Lincoln	Continental	1988	13-005		Standard				6-7	97,98	4	C
		1989	13-005		Standard				6-7	97,98	4	L
		1990	13-005		Standard+				6-7	97,98	4	C,L
	Mark VII	1990	13-002	Standard					6-7	92,93	4	C
	Town Car	1990	13-001		Standard+				6-7	81-83	4	C,L
	Continental	1991	13-005	Standard	Option+				6-7	97,98	4	C,L
	Mark VII	1991	13-002	Standard					6-7	92,93	4	C
	Town Car	1991	13-001	Standard	Option+				6-7	81-83	4	C,L
	Continental	1992 to 1993	13-005		Standard				6-7	97,98	4	L
	Mark VII	1992	13-002	Standard					6-7	92,93	4	C
	Mark VIII	1993 to 1994	13-002		Standard				6-7	91	4	L
	Town Car	1992 to 1994	13-001		Standard				6-7	81-83	4	L
Lotus	Esprit turbo	1990 to 1993	69-039	Standard					4	F	8	B
		1994	69-039	Standard					4	F	8	??
Maserati	228,430, Spyder	1990 to 1991	69-040			Yes			4	A-H	7	2
Mazda	323	1990 to 1993	41-035			Yes			4-7	BG23	8	
	626 Hatchback	1990 to 1991	41-037			Yes			4-7	GD24	8	
	Sedan	1990 to 1992	41-037			Yes			4-7	GD22	8	No
	Sedan	1993	41-037	Standard					4-7	GD22	8	
	Sedan	1994	41-037		Standard				4-7	GE22	8	
	929	1990 to 1991	41-043			Yes			4-7	HC22	8	
		1992	41-043	Standard	Option				4-7	HD46	8	
		1993 to 1994	41-043		Standard				4-7	HD46	8	
Discern-	MPV (Wagon)	1993	41-441	Option*					4-6	LV5	N/A	
		1994	41-441	Standard					4-6	LV5	N/A	
	MX-3	1992 to 1993	41-046			Yes			4-7	EC43	8	
		1994	41-046		Standard				4-7	EC43	8	
	MX-5 Miata	1990 to 1993	41-045	Standard					4-7	NA35	8	ible
		1994	41-045		Standard				4-7	NA35	8	
	MX-6	1990 to 1992	41-044			Yes			4-7	GD31	8	
		1993	41-044	Standard					4-7	GE31	8	
		1994	41-044		Standard				4-7	GE31	8	
	Protégé	1990 to 1993	41-035			Yes			4-7	BG22	8	
	RX-7 hardtop	1990 to 1991	41-034			Yes			4-7	FC33	8	Pattern
	convertble	1990 to 1991	41-034	Standard					4-7	FC35	8	
	hardtop	1993 to 1994	41-034	Standard					4-7	FD33	8	
Mercedes Benz	500SEC	1984	42-036	Option					4-7	CA44	8	B
	SEL	1984	42-036	Option					4-7	CA37	8	B
	300SD	1984	42-037	Option					4-7	CB20	8	B
	380SE	1984	42-037	Option					4-7	CA32	8	B
	190E	1984	42-039	Option					4-7	DA24	8	B
	D	1984	42-039	Option					4-7	DB22	8	B
	500SEC	1985	42-036	Option					4-7	CA44	8	B,D
	SEL	1985	42-036	Option					4-7	CA37	8	B,D

* Air bag became standard equipment in mid-year.

+ Due to a production plant fire, Lincoln right-front passenger air bags were not available for many 1990 and 1991 model year vehicles. The passenger air bag is considered an option on 1991 model year vehicles but was not available until fall of 1991.

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L=1990   M=1991   N=1992   P=1993   R=1994   S=1995   T=1996   W=1998   X=1999

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR CODE:	NASS MAKE/MODE Only	AIR BAG Driver	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Motorized	PASSIVE BELT Non-Place	VIN Model Code	VIN Place	VIN Restraint Code
Mercedes	300SD	1985	42-037	Option				4-7 CB20	8	B,D
Benz	380SE	1985	42-037	Option				4-7 CA32	8	B,D
(Cont'd)	190E	1985	42-039	Option				4-7 DA24	8	B,D
	D	1985	42-039	Option				4-7 DB22	8	B,D
	190E - 2.3	1986 to 1988	42-039	Standard				4-7 DA28	8	D
	E - 2.3-16	1986 to 1987	42-039	Standard				4-7 DA34	8	D
	E - 2.6	1986 to 1989	42-039	Standard				4-7 DA29	8	D
	D - 2.5	1986 to 1989	42-039	Standard				4-7 DB26	8	D
	D - 2.5 T	1987	42-039	Standard				4-7 DB28	8	D
	260E	1987 to 1989	42-031	Standard				4-7 EA26	8	D
	300CE	1988 to 1989	42-031	Standard				4-7 EA50	8	D
	D - 2.5 T	1989	42-031	Standard				4-7 EB28	8	D
	DT	1987	42-035	Standard				4-7 EB33	8	D
	E	1986 to 1989	42-031	Standard				4-7 EA30	8	D
	SDL	1987	42-037	Standard				4-7 CB25	8	D
	SE	1989	42-037	Standard				4-7 CA24	8	D
	SEL	1988 to 1989	42-035	Standard				4-7 CA25	8	D
	TDT	1987	42-035	Standard				4-7 EB93	8	D
	TE	1988 to 1989	42-031	Standard				4-7 EA90	8	D
	SD	1989	42-031	Standard				4-7 CB34	8	D
	SDL	1989	42-031	Standard				4-7 CB35	8	D
	420SEL	1986 to 1988	42-036	Standard				4-7 CA35	8	D
	560SEC	1986 to 1988	42-036	Standard				4-7 CA45	8	D
	SEL	1986 to 1988	42-036	Standard				4-7 CA39	8	D
	SL	1986 to 1988:	42-036	Standard				4-7 BA48	8	D
Mercedes	190E - 2.6	1990 to 1991	42-039	Standard				4-7 DA29	8	D
Benz++	300CE	1990 to 1991	42-031	Standard	Option			4-7 EA51	8	D,E
	D - 2.5 T	1990 to 1991	42-031	Standard	Option			4-7 EB28	8	D,E
	E	1990 to 1991	42-031	Standard	Option			4-7 EA30	8	D,E
	E - 2.6	1990 to 1991	42-031	Standard	Option			4-7 EA26	8	D,E
	E - 4-Matic	1990 to 1991	42-031	Standard	Option			4-7 ED30	8	D,E
	SE	1990 to 1991	42-037	Standard	Option			4-7 CA24	8	D,E
	SEL	1990 to 1991	42-035	Standard	Option			4-7 CA25	8	D,E
	SL	1990 to 1991	42-033		Standard			4-7 FA61	8	E
	TE	1990 to 1991	42-031	Standard	Option			4-7 EA90	8	D,E
	TE -4-Matic	1990 to 1991	42-031	Standard	Option			4-7 ED90	8	D,E
	350SD	1990 to 1991	42-031	Standard	Option			4-7 CB34	8	D,E
	SDL	1990 to 1991	42-031	Standard	Option			4-7 CB35	8	D,E
	420SEL	1990 to 1991	42-036		Standard			4-7 CA35	8	E
	500SL	1990 to 1991	42-033		Standard			4-7 FA66	8	E
	560SEC	1990 to 1991	42-036		Standard			4-7 CA45	8	E
	SEL	1990 to 1991	42-036		Standard			4-7 CA39	8	E
Mercedes	190E - 2.3	1992	42-039	Standard				4-7 DA28	8	D
Benz	E - 2.6	1992	42-039	Standard				4-7 DA29	8	D
	300CE	1992	42-040	Standard	Option			4-7 EA51	8	D,E
	CE Conv	1992	42-040	Standard	Option			4-7 EA66	8	D,E
	D - 2.5 T	1992	42-031	Standard	Option			4-7 EB28	8	D,E
	E	1992	42-031	Standard	Option			4-7 EA30	8	D,E
	E - 2.8	1992	42-031	Standard	Option			4-7 EA28	8	D,E
	E - 4-Matic	1992	42-031	Standard	Option			4-7 ED32	8	D,E
	E - 4-Matic	1992	42-031	Standard	Option			4-7 ED30	8	D,E
	SD	1992	42-031		Standard			4-7 GA34	8	E
	SE	1992	42-037		Standard			4-7 CA24	8	E
	SEL	1992	42-035	Standard	Option			4-7 CA25	8	D,E
	SL	1992	42-033		Standard			4-7 FA61	8	E

++ Mercedes Benz offers: (1) only a standard driver side air bag in the 190 class vehicles, (2) standard driver and passenger air bags for their models equipped with a V8 or a roadster (i.e., SL), and (3) standard driver and optional passenger air bags for models equipped with 6-cylinder engines (excluding the roadsters).

10th Character = Year: A-1980 B=1981 C=1982 D=1983 E=1984 F=1985 G=1986 H=1987 J=1988 K=1989
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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	PASSIVE BELT Driver & Passenger	VIN CHARACTER IDENTIFIER Motorized Non-Motorized Place	Model Code	Place	Restraint Code
Mercedes	TE	1992	42-031	Standard	Option		4-7	EA90	8	D,E
Benz	TE - 4-Matic	1992	42-031	Standard	Option		4-7	ED90	8	D,E
(Cont'd)	350SD	1992	42-031		Standard		4-7	CB34	8	E
	SDL	1992	42-031	Standard	Option		4-7	CB35	8	D,E
	400E	1992	42-041		Standard		4-7	EA34	8	E
	420SEL	1992	42-036		Standard		4-7	CA35	8	E
	500E	1992	42-042		Standard		4-7	EA36	8	E
	SEC	1992	42-036		Standard		4-7	GA70	8	E
	SEL	1992	42-036		Standard		4-7	GA51	8	E
	SL	1992	42-033		Standard		4-7	FA67	8	E
	560SEC	1992	42-036		Standard		4-7	CA45	8	E
	SEL	1992	42-036		Standard		4-7	CA39	8	E
	600SEC	1992	42-038		Standard		4-7	GA76	8	E
	SEL	1992	42-038		Standard		4-7	GA57	8	E
	SL	1992	42-038		Standard		4-7	FA76	8	E
Mercedes	190E - 2.3	1993	42-039	Standard			4-7	DA28	8	D
Benz	E - 2.6	1993	42-039	Standard			4-7	DA29	8	D
	220C	1993	42-031		Standard		4-7	???	8	E
	280C	1994	42-031		Standard		4-7	???	8	E
	300CE	1993 to 1994	42-040		Standard		4-7	EA52	8	E
CE Conv		1993 to 1994	42-040		Standard		4-7	EA66	8	E
	D - 2.5 T	1993 to 1994	42-031		Standard		4-7	EB28	8	E
	E	1993 to 1994	42-031		Standard		4-7	EA30	8	E
	E - 2.8	1993 to 1994	42-031		Standard		4-7	EA28	8	E
	E - 4-Matic	1993 to 1994	42-031		Standard		4-7	ED30,EA32	8	E
	SD	1993 to 1994	42-037		Standard		4-7	GA34	8	E
	SE	1993 to 1994	42-037		Standard		4-7	CA24	8	E
	SL	1993 to 1994	42-033		Standard		4-7	FA61	8	E
	TE	1993 to 1994	42-031		Standard		4-7	EA90	8	E
	TE - 4-Matic	1993 to 1994	42-031		Standard		4-7	ED90	8	E
	400E	1993 to 1994	42-041		Standard		4-7	EA34	8	E
	SEL	1993 to 1994	42-041		Standard		4-7	EA34	8	E
	500E	1993 to 1994	42-042		Standard		4-7	EA36	8	E
	SEC	1993 to 1994	42-036		Standard		4-7	GA70	8	E
	SEL	1993 to 1994	42-038		Standard		4-7	GA51	8	E
	SL	1993 to 1994	42-033		Standard		4-7	FA66	8	E
	600SEC	1993 to 1994	42-038		Standard		4-7	GA76	8	E
	SEL	1993 to 1994	42-038		Standard		4-7	GA57	8	E
	SL	1993 to 1994	42-033		Standard		4-7	FA76	8	E
Mercury	Topaz	1985 to 1986	14-015	Option			6	71-76	4	C
		1987 to 1989	14-015	Option			6	30-38	4	C
	Capri	1991 to 1993	14-031	Standard			6-7	01,03	4	C
		1994	14-031		Standard		6-7	01,03	4	L
	Cougar	1990 to 1993	14-004			Yes	6-7	60,62	4	P
		1994	14-004		Standard		6-7	62	4	L
	Grand Marquis:									
	SW	1990 to 1991	14-006	Standard			6-7	78,79	4	C
	Grand Marquis:	1990 to 1991	14-006	Standard			6-7	74,75	4	C
		1992 to 1994	14-006		Standard		6-7	74,75	4	L
	Mystique	1995	14-037		Standard		6-7	???	4	L
	Sable	1990 to 1991	14-017	Standard			6-7	50-58	4	C
		1992	14-017	Standard	Option		6-7	50-58	4	C,L
		1993 to 1994	14-017		Standard		6-7	50-58	4	L
	Topaz	1990 to 1994	14-015	Option		Yes	6-7	30-38	4	C,P
	Tracer	1991 to 1993	14-036			Yes	6-7	10-15	4	P

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG / PASSIVE BELT Driver Only	Driver & Passenger	Motorized	Non-Motorized	Model Code	Place	Restraint Code	
Mercury (Cont'd)	Villager	1993	14-443			Yes		5-7	V11	N/A	N/A
		1994	14-443	Option*		Yes		5-7	V11	N/A	N/A
Mitsubishi	Diamante	1992 to 1993	52-040	Standard				5	C	4	X
		1994	52-040		Standard			5	C,P	4	B
	Eclipse	1990 to 1992	52-037			Yes		5	S,T	4	C
		1993	52-037			Yes		5	F,G	4	C
	Expo	1992	52-041			Yes		5	V,W,Y,Z	4	C
		1993	52-041			Yes		5	B,C,D,E	4	C
	Galant	1990 to 1992	52-034			Yes		5	R,X	4	C
		1993	52-034			Yes		5	H	4	C
		1994	52-034		Standard			5	H	4	B
	Mirage	1990 to 1992	52-035			Yes		5	U	4	C
		1993	52-035			Yes		5	A	4	C
	Montero	1994	52-401	Standard				5	R	N/A	N/A
	Precis	1990 to 1993	52-036				Yes	3-5	HVD	7	2
	Sigma	1990	52-038	Standard				5	B	4	X
	Starion	1990	52-031			Yes		5	C	4	C
	3000 GT	1991 to 1992	52-039	Standard				5	D,E	4	X
		1993	52-039	Standard				5	M,N	4	X
		1994	52-039		Standard			5	M,N	4	B
Nissan	240SX	1990 to 1993	35-032				Yes	5	S	8	A
	300ZX	1990	35-034				Yes	5	Z	8	A
		1991	35-034	Option			Yes	5	Z	8	A,H
		1992 to 1994	35-034	Standard				5	Z	8	C,F
	Altima	1993	35-047	Standard				5	U	8	C,F
		1994	35-047		Standard			5	U	8	???
	Axxess	1990 to 1991	35-442			Yes		5	M	8	B
	Maxima	1990 to 1991	35-039			Yes		5	J	8	B
		1992	35-039	Option			Yes	5	J	8	A,H
		1993 to 1994	35-039	Standard				5	J	8	C,F
	NX Coupe	1991 to 1994	35-044	Standard				3-5	1.B	8	C,F
	Pulsar	1990	35-044	Option			Yes	5	N	8	A,H
	Quest	1993	35-443			Yes		5-7	N11	N/A	N/A
		1994	35-443	Option*		Yes		5-7	N11	N/A	N/A
	Sentra	1990 to 1992	35-043				Yes	3-5	4.B	8	A
		1993	35-043	Option			Yes	3-5	4.B	8	A,H
	Stanza	1990 to 1992	35-042			Yes		5	U	8	P
Oldsmobile	Delta 88	1974 to 1976	21-002		Option			2	L,N		
	Ninety-Eight	1974	21-003		Option			2	T,V,X		
		1975 to 1976	21-003		Option			2	V,X		
	Toronado	1974	21-005		Option			2	U,W,Y		
		1975 to 1976	21-005		Option			2	U,W,Y,Z		
	Achieva	1992 to 1993	21-021				Yes	4-5	NF,NL	7	4
	S	1994	21-021	Standard				4-5	NF	7	3
	Aurora	1994	21-022	Standard				4-5	???	7	3
	Custom Cruiser	1990	21-002				Yes	4-5	BP	7	4
		1991 to 1992	21-002	Standard				4-5	BP	7	3
	Cutlass Calais	1990 to 1991	21-018				Yes	4-5	NF,NK, NL,NT	7	4
	Cutlass Ciera	1990	21-017				Yes	4-5	AJ,AM,AS	7	4
		1991 to 1992	21-017				Yes	4-5	AJ,AL,AM	7	4
		1993	21-017	Option			Yes	4-5	AJ,AG,AM	7	3,4
		1994	21-017	Standard				4-5	AJ,AG	7	3

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L=1990 M=1991 N=1992 P=1993 R=1994 S=1995 T=1996 W=1998 X=1999

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	PASSIVE BELT Driver & Passenger	Motorized Non-Motorized Place	VIN CHARACTER IDENTIFIER Model Code	Place	Restraint Code	
Oldmobile Cutlass Supreme										
(Cont'd)		1990 to 1991	21-020			Yes	4-5	WH,WR,WS,WT	7	4
		1992 to 1993	21-020			Yes	4-5	WH,WR,WT	7	4
	Supreme S	1994	21-020	Standard			4-5	???	7	3
	Delta 88 Royale	1987 to 1991	21-002	Option		Yes	4-5	HN,HY	7	3,4
		1992 to 1993	21-002	Standard			4-5	HN,HY	7	3
		1994	21-020		Standard		4-5	HN,HY	7	2
	98 Regency	1990	21-003	Option		Yes	4-5	CW,CX	7	3,4
		1991 to 1993	21-003	Standard			4-5	CW,CX	7	3
		1994	21-003		Standard		4-5	CW,CX	7	2
	98 Touring sedn	1990	21-003			Yes	4-5	CV	7	4
		1991 to 1993	21-003	Standard			4-5	CV	7	3
		1994	21-003		Standard		4-5	CV	7	2
	Silhouette	1994	21-441	Standard			3,5-7	H,U06	N/A	N/A
	Toronado	1990	21-005			Yes	4-5	EV,EZ	7	4
		1991 to 1992	21-005	Standard			4-5	EV,EZ	7	3
Peugeot	405	1990 to 1991	44-036		Yes		4	D,E	7	3
	505	1990 to 1991	44-034			Yes	4	B,C	7	2
Plymouth	Gran Fury	1988	09-004	Option*			5	B	4	X,Y
		1989	09-004	Standard			5	B	4	X,Y
	Acclaim	1990 to 1993	09-019	Standard			5	A	4	X,Y
	Colt Hatchback	1989	09-034		Yes		5	U	4	C
		1991 to 1992	09-034		Yes		5	???	4	C
	2,4 dr	1993	09-034		Yes		5	A	4	C
	2,4 dr	1994	09-034	Standard			5	A	4	X
	Vista SW	1991	09-441			Yes	5	G,H	4	C
		1992	09-441			Yes	5	V	4	C
		1993	09-441			Yes	5	B,C	4	C
	Horizon	1990	09-008	Standard			5	L	4	X,Y
	Laser	1990 to 1991	09-037		Yes		5	S	4	C
		1992	09-037		Yes		5	S,T	4	C
		1993	09-037		Yes		5	F,G	4	C
	Neon	1995	09-020		Standard		5	???	4	E
	Sundance	1990 to 1993	09-017	Standard			5	P	4	X,Y
	Voyager:									
	4x2	1992 to 1993	09-442	Standard			5-6	H2,4,5	N/A	N/A
		1994	09-442		Standard		5-6	H2,4,5	N/A	N/A
	4x4	1992 to 1993	09-442	Standard			5-6	K4,5	N/A	N/A
		1994	09-442		Standard		5-6	K4,5	N/A	N/A
Pontiac	6000	1990 to 1991	22-017			Yes	4-5	AF,AJ	7	4
	Bonneville	1990 to 1991	22-002			Yes	4-5	HX,HY,HZ	7	4
	,SE	1992 to 1993	22-002	Standard			4-5	HX	7	3
	,SSE	1992 to 1993	22-002	Standard	Option		4-5	HZ	7	2,3
	,SSEi	1992 to 1993	22-002		Standard		4-5	HY	7	2
		1994	22-002		Standard		4-5	HX,HY,HZ	7	2
	Firebird	1990 to 1992	22-009	Standard			4-5	FS,FW	7	3
		1993	22-009	Standard			4-5	FS,FV	7	3
		1994	22-009		Standard		4-5	FS,FV	7	2
	Firefly	1990	22-398			Yes	4-5	MR,MT	7	4
		1991 to 1993	22-398			Yes	4-5	MR	7	4
	Grand Am	1990	22-018			Yes	4-5	NE,NW	7	4
		1991	22-018			Yes	4-5	NE,NG,NW	7	4
		1992 to 1993	22-018			Yes	4-5	NE,NW	7	4
		1994	22-018				4-5	NE,NW	7	3

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	L=1990	M=1991	N=1992	P=1993	R=1994	S=1995	T=1996	W=1998	X=1999	

1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	Driver & Passenger	PASSIVE BELT Motorized	Non-Motorized	VIN CHARACTER IDENTIFIER Model Code	Place	Restraint Code
Pontiac (Cont'd)	Grand Prix	1990 to 1991	22-020				Yes	4-5	WJ,WP,WT	7	4
		1992 to 1993	22-020				Yes	4-5	WH,WJ, WP,WT	7	4
		1994	22-020		Standard			4-5	WH,WJ, WP,WT	7	2
	LeMans	1990 to 1991	22-031			Yes		4-5	TN,TR, TS,TX	7	4
		1992 to 1993	22-031			Yes		4-5	TN,TX	7	4
	Sunbird	1990	22-016				Yes	4-5	JB,JD,JU	7	4
		1991	22-016				Yes	4-5	JB,JC, JD,JU	7	4
		1992 to 1994	22-016				Yes	4-5	JB,JC,JD	7	4
	Trans Sport	1994	22-441	Standard				3,5,7	M.U06	N/A	N/A
Porsche	944	1987	45-037		Option			7-8	94	6	2
	S	1987	45-037		Option			7-8	94	6	2
	Turbo	1987	45-037		Standard			7-8	95	6	2
	944	1988 to 1989	45-037		Option			7-8	94	6	2
	S	1988 to 1989	45-037		Standard			7-8	94	6	2
	Turbo	1988 to 1989	45-037		Standard			7-8	95	6	2
	911	1990 to 1991	45-031		Standard			7-8	96	6	2
		1992	45-031		Standard			12-13	41-48	6	2
		1993 to 1994	45-031		Standard			12-13	41-46	6	2
	928	1990 to 1991	45-035		Standard			7-8	92	6	2
		1992 to 1994	45-035		Standard			12-13	81	6	2
	944	1990 to 1991	45-037		Standard			7-8	94	6	2
	968	1992 to 1993	45-039		Standard			12-13	82,84	6	2
Rolls Royce	All	1989	69-042				??Yes??	2-3	CA	8	B
	All	1990 to 1993	69-042	Standard				2-3	CA	8	???
	All	1994	69-042		Standard			2-3	CA	8	???
Saab	9000 Turbo	1988 to 1989	47-034	Option				4	C	5	L
	900 series	1990 to 1993	47-031	Standard				4	A	5	J,K,L
		1994	47-031		Standard			4	A	5	???
	9000 series	1990 to 1993	47-034	Standard				4	C	5	J,K,L
		1994	47-034		Standard			4	C	5	???
Saturn	SC - 2dr	1991	24-002				Yes	4-5	ZB,G,H	7	4
		1992	24-002	Standard			Yes	4-5	ZB,G,H	7	5
		1993	24-002	Standard				4-5	ZB,ZE,ZF, ZG,ZH	7	5
	SL1	1991	24-001				Yes	4-5	ZB,F,G,H	7	4
		1992 to 1993	24-001	Standard			Yes	4-5	ZB,F,G,H	7	5
	SL2	1991	24-001				Yes	4-5	ZD,J,K	7	4
		1992 to 1993	24-001	Standard			Yes	4-5	ZD,J,K	7	5
	SL3	1993	24-001	Standard			Yes	4-5	ZL,ZM	7	5
	SW1	1993	24-003	Standard			Yes	4-5	ZG,ZH	7	5
	SW2	1993	24-003	Standard				4-5	ZJ,ZK	7	5
Sterling	827s	1990 to 1991	61-031				Yes	6	4,8	7	3
Subaru	Impreza	1993	48-038	Option*				4-5	???	8	3
		1994	48-038		Standard			4-5	???	8	???
	Justy	1990	48-036				Yes	4-5	KA,KD,KG	8	2
		1991 to 1993	48-036				Yes	4-5	KA,KD	8	2

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized	PASSIVE BELT Non-Motorized Place	VIN CHARACTER IDENTIFIER Code	Place	Restraint Code
Subaru (Cont'd)	Legacy	1990	48-034			Yes		4-5	BC,BF,BJ 8	2
		1991	48-034	Option**		Yes		4-5	BC,BJ 8	2,3
		1992	48-034	Option		Yes		4-5	BC,BJ 8	2,3
		1993	48-034	Standard		Yes		4-5	BC,BJ 8	3
	Loyale	1990	48-031			Yes		4-5	AC,AK,AN 8	2
		1991 to 1993	48-031			Yes		4-5	AC,AN 8	2
	SVX	1992 to 1993	48-037	Standard		Yes		4-5	CX 8	3
		1994	48-037		Standard			4-5	CX 8	???
	XT, XT6	1990 to 1991	48-035			Yes		4-5	AX 8	2
Suzuki	Swift	1990	53-034				Yes	4	A 5	C,D
		1991 to 1993	53-034				Yes	4	A 5	C,D,E
Toyota	Camry	1987	49-040			Yes		5	V 8	
		1988-1989	49-040			Yes		5	V 8	8th
	Cressida	1981-1986	49-035			Yes		5	X 8	
		1987	49-035			Yes		5	X 8	column
		1988-1989	49-035			Yes		5	X 8	reports
	Camry	1990 to 1991	49-040			Yes		5	V 8	
		1992 to 1993	49-040	Standard				5	K 8	Body
		1994	49-040		Standard			5	K 8	
	Celica	1990 to 1993	49-033	Standard				5	T 8	
		1994	49-033		Standard			5	T 8	
	Corolla	1990 to 1992	49-032				Yes	5	E 8	Type
		1993	49-032	Standard				5	E 8	
		1994	49-032		Standard			5	E 8	
	Cressida	1990 to 1992	49-035			Yes		5	X 8	rather
	MR2	1991 to 1993	49-041	Standard				5	W 8	
		1994	49-041		Standard			5	W 8	
	Paseo	1992	49-042				Yes	5	L 8	than
		1993 to 1994	49-042	Standard				5	L 8	
	Previa	1991 to 1993	49-441	Standard				4,5	AC 8	Restraint
		1994	49-441		Standard			4,5	AC 8	
	Supra	1990 to 1993	49-034	Standard				5	A 8	
		1994	49-034	Standard				5	A 8	
	Tercel	1990 to 1992	49-038				Yes	5	L 8	System
		1993 to 1994	49-038	Standard				5	L 8	
Volkswagen	Golf/GTI	1985-1989	30-042				Yes	7-8	17 6	9
	Rabbit	1981-1984	30-036				Yes	7-8	17 6	9
	Cabriolet	1990 to 1993	30-042	Standard				7-8	15 6	5
	Corrado	1990 to 1993	30-045			Yes		7-8	50 6	4
	Fox	1990 to 1993	30-044				Yes	7-8	30 6	2
	Golf/GTI	1990 to 1992	30-042				Yes	7-8	1G 6	2
		1993	30-042				Yes	7-8	1H 6	2
		1994	30-042		Standard			7-8	1H 6	8
	Golf III	1994	30-048		Option**	Yes		7-8	1H 6	2,8
	Jetta	1990 to 1991	30-040				Yes	7-8	1G 6	2
		1992 to 1993	30-040				Yes	7-8	1H 6	2
	Jetta III	1993	30-040		Option**	Yes		7-8	1H 6	2,8
	Passat	1990 to 1993	30-046			Yes		7-8	31 6	4

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1994 and Older Vehicles Manufactured with Automatic (Passive) Restraint Systems — Cont.

VEHICLE MAKE	VEHICLE MODEL	VEHICLE MODEL YEAR	NASS MAKE/MODE CODE:	AIR BAG Driver Only	AIR BAG Driver & Passenger	PASSIVE BELT Motorized Non-Motorized Place	VIN CHARACTER IDENTIFIER Model Code	Place	Restraint Code	
Volvo	740	1987	51-039	Option			4	F	5	A
	760	1987	51-038	Option*			4	G	5	A
	780	1987	51-038	Option*			4	H	5	A
	740 GLE	1988 to 1989	51-039	Option			4	F	5	A
	Turbo	1988 to 1989	51-039	Standard			4	F	5	A
	760	1988 to 1989	51-038	Standard			4	G	5	A
	780	1988 to 1989	51-038	Standard			4	H	5	A
	240 series	1990 to 1991	51-034	Standard			4	A	5	A
		1992 to 1993	51-034	Standard			4	A	5	S,W
	740 series	1990 to 1992	51-039	Standard			4	F	5	A
	760 series	1990	51-038	Standard			4	G	5	A
	780 Coupe	1990 to 1992	51-038	Standard			4	H	5	A
	850 series	1993	51-042		Standard		4	L	5	S
		1994	51-042		Standard		4	L	5	S,W
	940 series	1991	51-040	Standard			4	J	5	A
		1992 to 1993	51-040	Standard			4	J	5	S,W
		1994	51-040		Standard		4	J	5	S,W
	960 series	1991	51-041	Standard			4	K	5	A
		1992 to 1994	51-041		Standard		4	K	5	S,W
Yugo	GV series	1990 to 1992	57-031			Yes	5	A-C,E	8	2

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Variable Name: Had Vehicle Been in Previous Accident(s)

Range: 0 - 4, 8, 9

Element Values:

0	Not equipped/not available
1	No previous accidents

Yes

2	Previous accident(s) without deployment(s)
3	One previous accident with deployment
4	More than one previous accident with at least one deployment
8	Previous accidents, unknown deployment
9	Unknown

Source: Researcher determined — primary source is the interview, secondary source may include a repair facility.

Remarks:

This variable refers only to first seat frontal air bags.

Code "0" (Not equipped/not available) is used when no airbag is available for this occupant position because one was never installed. The remaining air bag variables (OA35-OA48) should also be coded "0".

Code "1" (No previous accidents) is used for vehicles which are equipped with an airbag for this occupant position and have not been involved in any previous crashes.

Code "2" [Previous accident(s) without deployment(s)] is used when it can be determined that the vehicle had been in previous accident(s) which did not involve an airbag deployment for this occupant position.

Code "3" (One previous accident 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.

Code "4" (More than one previous accident 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.

Code "8" (Previous accidents, 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.

(2)

Variable Name: Had Vehicle Been in Previous Accident(s) (Cont'd.)

Code "9"   (Unknown) is used when it cannot be determined if the vehicle had been in previous accident(s) and/or the air bag deployment status for this occupant position cannot be determined.

Variable Name: Type of Air Bag

Range: 0 - 3, 8, 9

Element Values:

0	Not equipped/not available
1	Original manufacturer installed system
2	Retrofitted air bag
3	Replacement air bag
8	Unknow n type of air bag
9	Unknown

Source: Researcher determined — primary source is the interview, secondary sources may include the repair facility and/or documents found in the vehicle.

Remarks:

This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/Not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Also included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1"   (Original manufacturer installed system) 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).

Code "2"   (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 code 3 (Replacement air bag). Replacement retrofit air bags are also included in this category.

Code "3"   (Replacement air bag) is used when it can be determined that the vehicle wa s equipped with an OEM air bag system for this seating position and that this system had been replaced due to a previous deployment.

Code "8"   (Unknown type of air bag) is used when it can be determined that the vehicle had an air bag system for this seating position but the type of air bag cannot be determined.

Code "9"   (Unknown) is used when it cannot be determined if the vehicle was equipped with an air bag system for this seating position or it cannot be determined what type of system (original, retrofit, or replacement) is in the vehicle.

Variable Name: Had Any Prior Maintenance/Service Been Performed On This Air Bag System?

Range: 0 - 2, 9

Element Values:

0	Not equipped/not available
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 occupant position of this occupant.

This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/not available) is used when it can be determined that the vehicle was never equipped with an air bag system.

Code "1"   (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.

Code "2"   (Yes, prior maintenance) 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.

Code "9"   (Unknown) is used when it cannot be determined if the vehicle w as equipped with an air bag system or if it cannot be determined if the vehicle's air bag system had previous maintenance/service.

Variable Name: Air Bag Deployment Accident Event Sequence Number

Range: 00 - 99

Element Values:

      00   Not equipped/not available
      01-95 Code the accident event sequence number that is directly related to the deployment of this vehicle's air bag
      96   Deployed, unknown event
      97   Not deployed
      98   Unknown if deployed
      99   Unknown

Source Primary sources are the scene and vehicle inspections; secondary sources include the police report and the interviewee.

Remarks:

This variable refers only to first seat frontal air bags.

Code "00" (Not equipped/Not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Also included under this code are those vehicles that had a previous crash with deployment and had not replaced the air bag for this occupant position.

Code "01-95" Code the event number associated with air bag deployment for this occupant position. Refer to variable AC12 et. al. on the Accident Form.

Code "96" (Deployed, unknown event) is used when the air bag for this occupant position deployed, but the event associated with the deployment cannot be determined.

Code "97" (Not deployed) is used when it can be determined that the vehicle is equipped with an air bag system for this occupant position but it did not deploy during any event in this crash.

Code "98" (Unknown if deployed) is used when it can be determined that the vehicle was equipped with an air bag system for this occupant position but the researcher cannot determine whether or not the air bag deployed during this crash.

Code "99" (Unknown) is used when it cannot be determined if the vehicle had an air bag system for this occupant position.

Variable Name: CDC For Air Bag Deployment Impact

Range: 0 - 3, 6 - 9

Element Values:

0	Not equipped/Not available
1	Highest delta V
2	Second highest delta V
3	Other non-coded delta V (specify)
6	Deployed, unknown event
7	Not deployed
8	Unknown if deployed
9	Unknown

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.

This variable refers only to first seat frontal air bags.

Code "0" (Not equipped/Not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Also included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1" (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.

Code "2" (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.

Code "3" (Other non-coded 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.

Variable Name: CDC For Air Bag Deployment Impact (cont'd.)

Code "6"   (Deployed, unknown event) is used when the air bag for this occupant position deployed, but the event associated with the deployment cannot be determined.

Code "7"   (Not deployed) is used when it is determined that this vehicle was equipped with an air bag for this occupant position but that it did not deploy during any event of this crash.

Code "8"   (Unknown if deployed) is used when it is determined that this vehicle was equipped with an air bag but it cannot be determined if the air bag deployed or not during any event of this crash.

Code "9"   (Unknown) is used when it cannot be determined if the vehicle was equipped with an air bag.

Variable Name: Longitudinal Component of Delta V For Air Bag Deployment Impact (cont' d.)

Range: -160 to -001, +000, +001 to +160, _996-_999, Blank

Element Values:

_000	Not equipped/Not available
_001-_159	Code the value of the Delta V for the impact that initiated the air bag deployment
±160 ≥159.5	kmph and above
_996	Deployment, unknown longitudinal Delta V
_997	Not deployed
_998	Unknown if deployed
_999	Unknown

Source: Longitudinal delta V output from reconstruction algorithm or OLDMISS computer runs.

Remarks:

This variable refers only to first seat frontal air bags.

Code "_000"   (Not equipped/Not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and had not replaced the air bag for this occupant position. If the longitudinal Delta V equals 0 (zero) kmph then code the value as -001.

Code "_001-_159"   Code the longitudinal delta V value from the computer generated algorithm for the associated impact-event that caused this air bag deployment. It is assumed that the delta V is negative. If it is not, please notify your Zone Center immediately.

Code "±160   kmph and above is used when the computer generated algorithm output for the associated impact event exceeds 159.5 kmph

Code "_996"   (Deployment, unknown longitudinal Delta V) is used when an impact that caused the air bag deployment could not be applied to the SMASH programs. The researcher must specify the reason why the algorithms could not be used, for example, multiple impacts to the same area, altered damage, non -horizontal impacts, rollover, etc. Also use this code at initial submission when the zone center will be running the OLDMISS program.

Code "_997"   (Not deployed) is used when it is determined that this vehicle was equipped with an air bag system but no event within this crash caused the air bag to deploy.

Code "_998"   (Unknown if deployed) is used when it is determined that this occupant position is equipped with an air bag system but it cannot be determined if the air bag deployed in this crash.

OA40
(2)

Variable Name: Longitudinal Component of Delta V For Air Bag Deployment Impact

Code "_999" (Unknown) is used when it cannot be determined whether or not this occupant position was equipped with an air bag.

Variable Name: Did Air Bag Module Cover Flap(s) Open at Designated Tear Points?

Range: 0 - 3, 7-9

Element Values:

> 0   Not equipped/not available
> 1   No
> 2   Yes
> 3   Deployed, unknown if flap(s) opened at designated tear points
> 7   Not deployed
> 8   Unknown if deployed
> 9   Unknown

Source: Researcher determined — primary source is the vehicle inspection, secondary source is the interview

Remarks:

This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1"   (No) is used when the vehicle has a deployed air bag at this occupant position and it can be determined that the module cover flap(s) opened somewhere other than their designated tear points. 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. A non-linear tear in the flap is an indication that the flap opened irregularly, not at the designated tear point.

Code "2"   (Yes) is used when the vehicle has a deployed air bag at this occupant position and it can be determined that the module cover flap(s) 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.

Code "3"   [Deployed, unknown if flap(s) opened at designated tear points] is used when it can be determined that the air bag for this occupant position deployed, but it cannot be determined if the air bag flap(s) opened at the designated tear points. Use this code when the interview is the only source of information.

Variable Name: Did Air Bag Module Cover Flap(s) Open at Designated Tear Points? Cont'd

Code "7" (Not deployed) is used when it can be determined that this o ccupant position was equipped with an air bag system and the air bag did not deploy during this crash.

Code "8" (Unknown if deployed) is used when it can be determined that this occupant position was equipped with an air bag system but it cannot be determined whether or not the air bag deployed in this crash.

Code "9" (Unknown) is used when it cannot be determined whether or not this occupant position was equipped with an air bag.

Variable Name: Were Air Bag Module Cover Flap(s) Damaged?

Range: 0 - 3, 7 - 9

Element Values:
0	Not equipped/not available
1	No
2	Yes (specify)
3	Deployed, unknown if air bag module cover flap(s) damaged
7	Not deployed
8	Unknown if deployed
9	Unknown

Source: Researcher determined — primary source is vehicle inspection ; secondary source is the interview.

Remarks:
This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Also included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1"   (No) is used when it can be determined that the vehicle was equipped with an air bag for this occupant position which deployed and no damage was present on the air bag module cover flap(s). Normal separation/tearing at the designated tear points does not constitute damage.

Code "2"   (Yes — specify) is used when it can be determined that the vehicle was equipped with an air bag for this occupant position which deployed and the air bag module cover flap(s) sustained damage. Normal separation/tearing at the designated tear points does not constitute damage. Damage can be cuts, tears, holes, burns, abrasions, etc.. The researcher must specify the type of damage that is being reported.

Code "3"   [Deployed, unknown if air bag module flap(s) damaged] is used when it can be determined that the air bag for this occupant position deployed, but it cannot be determined if the air bag flap(s) sustained damage. Use this code when the interview is the only source of information.

Code "7"   (Not deployed) is used when it can be determined that the vehicle was equipped with an air bag for this occupant position which did not deploy during this crash.

Code "8"   (Unknown if deployed) is used when it can be determined that the vehicle was equipped with an air bag for this occupant position but the researcher cannot determine whether or not this air bag deployed.

Code "9"   (Unknown) is used when it cannot be determined for this occupant if the vehicle was equipped with an air bag.

Variable Name: Was There Damage To The Air Bag?

Range: 00 - 07, 88, 95 - 99

Element Values:

    00   Not equipped/not available
    01   Not damaged

    Yes — Air Bag Damaged
    02   Ruptured
    03   Cut
    04   Torn
    05   Holed
    06   Burned
    07   Abraded
    88   Other damage (specify)
    95   Damaged, details unknown
    96   Deployed, unknown if damaged
    97   Not deployed
    98   Unknown if deployed
    99   Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary source may include the interview.

Remarks:

This variable refers only to first seat frontal air bags.

Code "00"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "01"   (Not damaged) is used when it can be determined that the vehicle was equipped with an air bag which deployed but no damage to the air bag for this occupant position was sustained.

Code "02"   (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.

Code "03"   (Cut) describes openings in the air bag which are generally linear and have smooth edges.

Code "04"   (Torn) describes openings which have ragged edges but which are generall y linear in appearance.

Variable Name: Was There Damage To The Air Bag? (cont'd.)

Code "05"   (Holed) describes damage which is circular in appearance with or without ragged edges.

Code "06"   (Burned) describes damage resulting from heat whic h scorches, melts or burns the bag.

Code "07"   (Abraded) is a pattern of damage to the surface of the bag that appears as a fraying of the surface threads.

Code "88"   [Other damage (specify)] is used to describe damage which is not captured in any of the codes above.

Code "95"   (Damaged, details unknown) is used when it is known that the air bag sustained damage, but the type of damage cannot be determined.

Code "96"   (Deployed, unknown if damaged) is used when it can be determined that the air bag for this occupant position deployed, but it cannot be determined if the air bag sustained damage. Use this code when the interview is the only source of information.

Code "97"   (Not deployed) is used when there is a functional air bag present in this occupant position but it did not deploy.

Code "98"   (Unknown if deployed) is used when there is no knowledge of the post-impact status of the air bag for this occupant position.

Code "99"   (Unknown) is used when it cannot be determined if this occupant position was equipped with an air bag.

OA44

Variable Name: Source of Air Bag Damage

Range: 00 - 07, 88, 95 - 99

Element Values:

00	Not equipped/not available
01	Not damaged

Yes — Damaged

02	Object worn by occupant
03	Object carried by occupant
04	Adaptive/assistive controls, specify
05	Fire in vehicle
06	Thermal burns
07	Rescue or emergency efforts
88	Other damage source (specify)
95	Damaged, unknown source
96	Deployed, unknown if damaged
97	Not deployed
98	Unknown if deployed
99	Unknown

Source: Researcher determined — primary source is the vehicle inspection; secondary source includes the interview.

Remarks:

This is a hierarchical variable, that is, if more than one element applies, then code the lowest numbered element that applies.

This variable refers only to first seat frontal air bags.

Code "00"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "01"   (Not damaged) is used when it can be determined that the vehicle was equipped with an air bag for this occupant position which deployed but no damage was sustained to the air bag itself [i.e., OA43 (Was there damage to the air bag?) is coded "01" (Not damaged)].

Code "02"   (Object worn by occupant) is coded when the object is fastened, attached, or worn by the occupant.

Code "03"   (Object carried by occupant) is used when the object is held in the mouth, the hand(s), arm(s), etc., by the occupant.

Variable Name: Source Of Air Bag Damage (cont'd.)

Code "04"   (Adaptive/assistive controls) is used when adaptive/assistive controls (see variable IV97) damages the airbag for this occupant position.

Code "05"   (Fire in vehicle) is used when there was a fire in the occupant compartment which damaged the air bag.

Code "06"   (Thermal burns) is used when the air bag is burned or scorched by the inflator or chemicals.

Code "07"   (Rescue or emergency efforts) is used when the bag is damaged by extrication of the occupant or is damaged by other emergency efforts.

Code "88"   (Other damage source) is used whenever there is damage to the air bag and it cannot be fit into any of the categories above.

Code "95"   (Damaged unknown source) is used when their is damage to the air bag, but the source of the damage cannot be determined.

Code "96"   (Deployed, unknown if damaged) is used when it is known that the air bag for this occupant position deployed but it is not known if it was damaged. Use this code if the interview is the only source of information.

Code "97"   (Not deployed) is used whenever there is no deployment, whatever the reason.

Code "98"   (Unknown if deploye d) is used in the instances where there is no information concerning the post impact status of the air bag.

Code "99"   (Unknown) is used in the cases where there is no information about the presence or absence of an air bag.

Variable Name: Was The Air Bag Tethered?

Range: 0 - 3, 7 - 9

Element Values:

0	Not equipped/not available
1	No
2	Yes(specify number of tether straps)
3	Deployed, unknown if tethered
7	Not deployed
8	Unknown if deployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection with the secondary source the interview.

Remarks:

This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1"   (No) is coded when there are no tethers present on air bag.

Code "2"   [Yes, (specify number of tether straps)] is coded when the air bag has tethers. Their number should be specified on the form.

Code "3"   (Deployed, unknown if tethered) is coded when it is known that the air bag for this occupant position deployed, but it is not known if the air bag was tethered. Use this code if the only source of information is the interview.

Code "7"   (Not deployed) should be coded if the air bag for this occupant position did not deploy.

Code "8"   (Unknown if deployed) is used whenever there is no information regarding the post impact status of the air bag.

Code "9"   (Unknown) is used when it cannot be determined whether or not the vehicle was equipped with an air bag for this occupant position.

Variable Name: Did The Air Bag Have Vent Ports?

Range: 0 - 3, 7 - 9

Element Values:

0	Not equipped/not available
1	No
2	Yes, (specify the number of vent ports)
3	Deployed, unknown if vent ports present
7	Not deployed
8	Unknown if deployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection and a secondary source is the interview.

Remarks:

This variable refers only to first seat frontal air bags.

Code "0"   (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and the air bag for this occupant position was not replaced.

Code "1"   (No) is coded when no vent ports are present.

Code "2"   (Yes) is coded when vent ports are present. They should be counted and the number entered on the form.

Code "3"   (Deployed, unknown if vent ports present) is coded when it is known that the air bag for this occupant position deployed, but it is not known if the air bag had vent ports. Use this code when the only source of information is the interview.

Code "7"   (Not deployed) is used whenever there is no deployment of the air bag for this occupant position.

Code "8"   (Unknown if deployed) is used if there is no information about the post crash status of the air bag.

Code "9"   (Unknown) is used whenever there is no information about the presence or absence of an air bag.

Variable Name: Was The Air Bag in This Occupant's Position Contacted by Another Occupant?

Range: 0 - 3, 7 - 9

Element Values:

0	Not equipped/not available
1	No
2	Yes (specify)
3	Deployed, unknown if other occupant contact to air bag
7	Not deployed
8	Unknown if deployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection and a secondary source is the interview.

Remarks:

This variable refers only to first seat frontal air bags.

Code "0" (Not equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and had not replaced the air bag for this occupant position.

Code "1" (No) is coded when there is no contact to the air bag for this occupant position by any occupant other than the occupant in this occupant position.

Code "2" (Yes) is coded when an occupant other than the one coded on this form contacted the bag for this occupant position. Describe the type of contact.

Code "3" (Deployed, unknown if other occupant contact to air bag) is coded when it is known that the air bag for this occupant position deployed, but it is not known if another occupant contacted the air bag.

Code "7" (Not deployed) is used whenever there is no deployment of the air bag for this crash.

Code "8" (Unknown if deployed) is coded if there is no information about the post crash status of the air bag.

Code "9" (Unknown) is used whenever there is no information about the prese nce or absence of an air bag.

Variable Name: Was this Occupant Wearing Eyewear?

Range: 0 - 4, 7 - 9

Element Values:

0	Not air bag equipped/not available
1	No
2	Eyeglasses/sunglasses
3	Contact lenses
4	Deployed, unknown if eyewear worn
7	Not deployed
8	Unknown if deployed
9	Unknown

Source: Researcher determined — primary source is the vehicle inspection and a secondary source is the interview.

Remarks:
This variable refers only to first seat frontal air bags.

Code "0"   (Not air bag equipped/not available) is used when it is determined that the vehicle is not equipped with a functional air bag system for this occupant position. Included under this code are those vehicles that had a previous crash with deployment and had not replaced the air bag for this occupant position.

Code "1"   (No) is coded when no eyeglasses/sunglasses or contact lenses were worn by this occupant.

Code "2"   (Eyeglasses/sunglasses) is coded if this occupant was wearing eyeglasses or sunglasses at the time of impact.

Code "3"   (Contact lenses) is coded if this occupant was wearing contact lenses at the time of impact.

Code "4"   (Deployed, unknown if eyewear worn) is coded if it is known that the air bag for this occupant position deployed, but it is not known if the occupant in this position was wearing eyewear.

Code "7"   (Not deployed) is coded when there is no deployment of the airbag for this crash.

Code "8"   (Unknown if deployed) is used if there is no information about the post crash status of the air bag.

Code "9"   (Unknown) is used whenever there is no information about the presence or absence of an air bag.

Variable Name: Head Restraint Type/Damage by Occupant at This Occupant Position

Element Values:

0	No head restraints	
1	Integral —	no damage
2	Integral —	damaged during accident
3	Adjustable —	no damage
4	Adjustable —	damaged during accident
5	Add-on —	no damage
6	Add-on —	damaged during accident
8	Other (specify)	
9	Unknown	

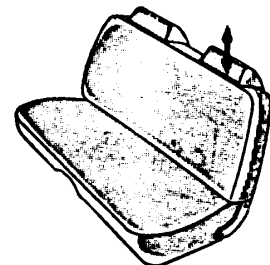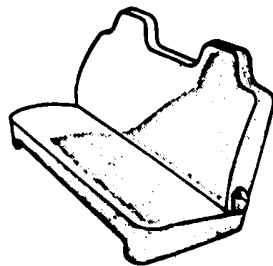**Source:**   Vehicle inspection.

Remarks:

Many passenger cars have head restraints for the front outboard seat positions. The head restraints can be of any design but must meet the requirements of FMVSS 202 (Head Restraints). Some examples of head restraint styles are shown below.

INTEGRAL

(Codes 1 or 2)

ADJUSTABLE

(Codes 3 or 4)

Any damage to a head restraint caused by the occupant in the seat position having the head restraint should have codes "2", "4", or "6" (... - damaged during accident) assigned.

Code "0"   (No head restraints) is used when (1) no head restraint is available for this occupant's seating position, or (2) this occupant was not seated or no seat was available. In addition, use this code when there had been a head restraint but it had been removed prior to the crash.

Code "1"   (Integral — no damage) and code "2" (Integral - damaged during accident) refer to head restraints which are a continuous part of the seat back structure or those which are a separate structure but are not vertically adjustable.

Variable Name: Head Restraint Type/Damage By Occupant At This Occupant
Position (cont'd.)

Code "3"   (Adjustable — no damage) and code "4" (Adjustab le — damaged during accident)
apply to:

☞ head restraints which can be moved vertically to accommodate occupants of
varying heights, and

☞ head restraints which have a fixed outer framework and a separate center
section which is adjustable vertically.

Code "5"   (Add-on — no damage) and code "6" (Add -on - damaged during accident) refer to
clamp -on, strap-on, or even bolt-on head restraints on a vehicle not originally
equipped with head restraints. These two codes should be infrequently used.

Code "9"   (Unk nown) is used when: (1) there is no vehicle inspection, (2) the type of head
restraint cannot be determined, or (3) it is unknown if damage to the restraint was
caused by an occupant in the appropriate seat position.

Note: 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 coded regardless of the
height of the restraint.

Certain occupant seating situations involve abnormal posture. Examples are:

☞ occupant on the floor [*i.e.*, in front of a designated seat (*e.g.*, sitting, standing,
etc.)];
☞ occupant lying across one or more seating positions;
☞ occupant sitting side-by-side of another occupant in the same seating position,
since only one can be assigned to the seating position --see OA10, Occupant's
Seat Position;
☞ occupant standing or kneeling in a designated seating position; and
☞ occupant in or on the lap of another occupant (*e.g.*, sitting, standing, kneeling,
etc.).

Variable Name: Seat Type (This Occupant Position)

Element Values:

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

Source: Vehicle inspection.

Remarks:

This variable assesses the type of seat occupied by this occupant.

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.

Code "00" (Occupant not seated or no seat) is used when it is determined that a person is not on a seat based on interviewee or PAR information obtained in variable OA10, Occupant's Seat Position.
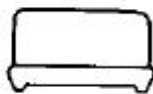
Code "08" [Pedestal (*i.e.*, column supported) includes both swivel and non -swivel type pedestal seats. A pedestal seat can be differentiated from a bucket seat by the presence of a column supporting the pedestal seat.

Below are examples of some seats and appropriate codes.
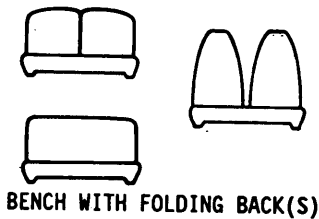

BUCKET

(Codes 01 or 02)
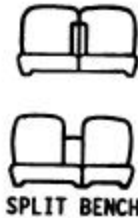
BENCH

(Code 03)

BENCH WITH
SEPARATE BACK
CUSHIONS

(Codes 04)

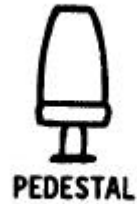**Variable Name:**   Seat Type (This Occupant Position) (cont'd.)

BENCH WITH FOLDING BACK(S)	SPLIT BENCH	PEDESTAL
(Code 05)	(Code 06 or 07)	(Code 08)

The term "folding back(s)" as used in codes "02", "05", and "07" refers to seat backs which fold forward to allow easier access to the area behind the seat. Seats which recline rearward are not considered to be folding backs. The seat back for the occupant in that seat position is the determining factor for folding back presence. If the seat back does not fold at that position do not use codes "02", "05", and "07". 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 coded "05" [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 code is "05" [Bench with folding back(s)]. The fact that the seat cushion may also fold is not considered.

If the occupant was in a seat position with the seat folded prior to the crash (*i.e.*, second seat area of a station wagon, etc.), then the proper code would be "00" (Occupant not seated or no seat).

Code "09" [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 (*i.e.*, "08") which require a single post support column.

Code "99" (Unknown) is used when (1) it is unknown from the interview and PAR information if the person is seated and (2) there is no vehicle inspection or the seat type cannot be determined. However, if the occupant was not seated, then use code "00" (Occupant not seated or no seat).

Variable Name: Seat Orientation (this Occupant Position)

Range: 0-4, 8, 9

Element Values:

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: Vehicle inspect ion.

Remarks:

Code "0"   (Occupant not seated or no seat) is used when it is determined that a person is not on a seat based on interviewee or PAR information obtained in variable OA10, Occupant's Seat Position.

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 are coded "1" (Forward facing seat), and reversible seats (*e.g.*, some stationwagons or vans) are coded according to their orientation at the time of impact [*i.e.*, "1" (Forward facing seat) or "2" (Rear facing seat)].

Seats which recline and are reclined at the time of the crash are coded according to their orientation when in the non -reclined position.

Code "1"   (Forward facing seat) is used when the seat is oriented towards the front plane of the vehicle.

Code "2"   (Rear facing seat) is used when the seat is oriented towards the rear plane of the vehicle.

Code "3"   [Side facing seat (inward)] is used when the seat is oriented towards either the right or left planes of the vehicle and faces inward.

Code "4"   [Side facing seat (outward)] is used when the seat is oriented towards either the right or left planes of the vehicle and faces outward.

Code "8"   (Other) is used when a seat is oriented such that codes "1" through "4" above do not apply.

Code "9"   (Unknown) is used when (1) it is unknown from the interview and PAR information if the person is seated and (2) there is no vehicle inspection or the seat orientation cannot be determined. However, if the occupant was not seated, then use code "0" (Occupant not seated or no seat).

Variable Name: Seat Track Adjusted Position Prior to Impact

Range: 0 - 6, 9

Element Values:

>   0   Occupant not seated or no seat
>   1   Non-adjustabl e seat track
>
>   **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   Unknow n

Source: Researcher determined — inputs include the vehicle inspection with interviewee as confirming or secondary source.

Remarks:

The researcher should attempt to determine the seat position at impact. This will generally come from a combination of sources as opposed to just from the vehicle inspection. 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 is electric with no distinct track positions, attempt to determine the relative position of the seat and code accordingly.

Code "0"   (Occupant not seated or no seat) — Use this code if the occupant was not sitting or there was no seat position available.

Code "1"   (Non-adjustable seat track) — Use this c ode for seats that cannot be moved longitudinally.

Adjustable Seat Track

Code "2"   (Seat at forward most track position) — Use this code if the seat is at the forward limit of the track.

Code "3"   (Seat between forward most and middle track position) — Use this code if the seat is at any position between the most forward and middle seat positions.

Code "4"   (Seat at middle track position) — Use this code if the seat is in the position mid-range between the forward and rear most track position.

Variable Name: Seat Track Adjusted Position Prior to Impact (cont'd)

Code "5"   (Seat between middle and rear most track position) — Use this code if the seat is at any position between the middle and rearmost track position.

Code "6"   (Seat at rear most track position) — Use this code if the seat is at the rear limit of the track.

Code "9"   (Unknown) — Use this code if the seat position at impact cannot be determined from any source.

Variable Name: Seat back Incline Prior and Post Impact

Range: 00 - 01, 11-17, 21-27, 31-37, 99

Element Values:

00   Occupant not seated or no seat
01   Not adjustable

Upright prior to impact
11   Moved to completely rearward position
12   Moved to rearward midrange position
13   Moved to slightly rearward position
14   Retained pre-impact position
15   Moved to slightly forward position
16   Moved to forward midrange position
17   Moved to completely forward position

Slightly reclined prior to impact
21   Moved to completely rearward position
22   Moved to rearward midrange position
23   Retained pre-impact position
24   Moved to upright position
25   Moved to slightly forward position
26   Moved to forward midrange position
27   Moved to completely forward position

Completely reclined prior to impact
31   Retained pre-impact position
32   Moved to rearward midrange position
33   Moved to slightly rearward position
34   Moved to upright position
35   Moved to slightly forward position
36   Moved to forward midrange position
37   Moved to completely forward position

99   Unknown

Source: Researcher determined — vehicle inspection with driver/occupant interview as corroboration.

Remarks:

This variable is for adjustable (reclining) seat backs only. Find the sub-header that describes the backrest position prior to impact. From the codes beneath the proper sub-heading, choose the variable that describes the seat position post-impact. The post-impact movement is determined by comparing the final seat back angle to a seat in its pre-impact position. this comparison will reveal if the final position is forward, midrange or rearward. Choose the variable that describes the direction of motion the seat back traveled (*i.e.*, forward or rearward) to get from its pre-impact to post-impact location.

Variable Name: Seat Back Incline Position Prior and Post Impact (cont'd)

Code "00" (Occupant not seated or no seat) is used if this occupant was not seated or reclined (*e.g.* laying across) in the seat in the manner for which it was designed or there was no seat available for this occupant.

Code "01" (Seat back not adjustable) is used for seating positions where there is a seat back which is fixed in position.

Code "12" (Moved to rearward midrange position) is used when the seat back was deformed from pre-impact upright position rearward to the approximate middle of the distance from upright position to completely rearward

Code "13" (Moved to slightly rearward position) is used when the seat back was deformed from pre-impact upright position rearward a perceptible distance.

Code "14" (Retained pre-impact position) is used when the seat back was not moved by impact forces or occupant contact and is in the precrash position.

Code "15" (Moved to slightly forward position) is used when the seat back was deformed from pre-impact upright position forward a perceptible amount by impact forces or occupant contact.

Code "16" (Moved to forward mid-range position) is used when the seat back was deformed from pre-impact upright position forward to the approximate middle of the distance from upright position to completely forward

Code "17" (Moved to completely forward position) is used when the seat back was deformed from pre-impact upright position forward to the limit of its range of movement.

Code "21 (Moved to completely rearward position) is used when the seat back was deformed from pre-impact slightly reclined position rearward to the limit of its range of movement.

Code "22" (Moved to rearward midrange position) is used when the seat back was deformed from pre-impact slightly reclined position rearward to the approximate middle of the distance from upright position to completely rearward

Code "23" (Retained pre-impact position) is used when the seat back was not moved by impact forces or occupant contact and is in the precrash position.

Code "24" (Moved to upright position) is used when the seat back moved from pre-impact slightly reclined position forward to upright position.

Variable Name: Seat Back Incline Position Prior and Post Impact (cont'd)

Code "25"   (Moved to slightly forward position) is used when the seat back was deformed from pre-impact slightly reclined position to a slightly forward position by impact forces or occupant contact.

Code "26"   (Moved to forward mid-range position) is used when the seat back was deformed from pre-impact slightly reclined position forward to the approximate middle of the distance from upright position to completely forward.

Code "27"   (Moved to completely forward position) is used when the seat back was deformed from pre-impact slightly reclined position forward to the limit of its range of movement.

Code "31   (Retained pre-impact position) is used when the seat back was not moved by impact forces or occupant contact and is in the precrash position.

Code "32"   (Moved to rearward midrange position) is used when the seat back was deformed from pre-impact completely reclined position forward to the approximate middle of the distance from upright position to completely rearward

Code "33"   (Moved to slightly rearward position) is used when the seat back was deformed from pre-impact completely reclined position forward to a slightly rearward position.

Code "34"   (Moved to upright position) is used when the seat back moved from pre-impact completely reclined position forward to upright position.

Code "35"   (Moved to slightly forward position) is used when the seat back was deformed from pre-impact completely reclined position forward to a slightly forward position.

Code "36"   (Moved to forward mid-range position) is used when the seat back was deformed from pre-impact completely reclined position forward to the approximate middle of the distance from upright position to completely forward

Code "37"   (Moved to completely forward position) is used when the seat back was deformed from pre-impact completely reclined position forward to the limit of its range of movement.

Code "99"   (Unknown) is used when the post crash seat back position could not be determined from any source.
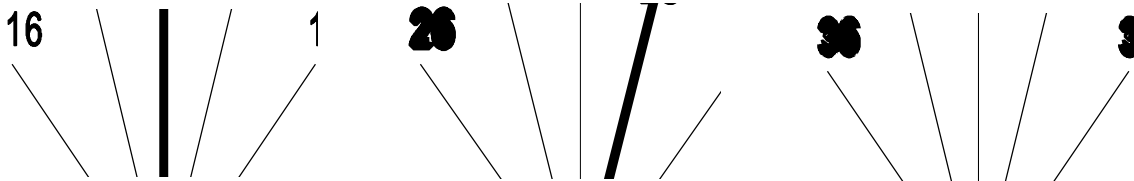
Coding diagrams for Seat Back Incline Position Prior and Post Impact

OA54

Variable Name: Seat Performance (This Occupant Position)

Element Values:

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: Vehicle inspection.

Remarks:
This variable assesses the performance of the seat occupied by this occupant. The codes are indications of whether the seat failed or was deformed in any way. Select the code 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.

Code "0"   (Occupant not seated or no seat) is used when it is determined that a person is not on a seat based on interviewee or PAR information obtained in variable OA10, Occupant's Seat Position.

Code "1"   [No seat performance failure(s)] is used if the seat was not deformed or no portion of the seat structure failed during the crash.

Code "2"   (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 code 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 code "3" below.

This code should be used when multiple adjuster failures have been detected. Be sure to include supportive written and photographic docu mentation to support all failures.

Variable Name: Seat Performance (This Occupant Position)

Code "3" (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. These seat back types are commonly found on two door vehicles where access to rear seating positions is obtained by folding the seat back forward.

"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 code, the seat must have failed while moving forward during the collision as a result of occupant loading.

Code "4" (Seat tracks/anchors failed) is used if the seat separates, to any degree, from a seat track during the crash. In addition, use this code 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 code 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.

Code "5" (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 code "7" (Combination of above).

Code "6" (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.

Code "7" (Combination of above) is used when any combination of codes "2"-"6" above occurs and describes multiple seat failures or deformations. Seat failures or deformations which are not described in codes "2"-"6" are reported in code "8" below. Seat failures or deformations listed in codes "2"-"6" take priority over code "8".

Code "8" (Other) is used when the only seat failure(s) or deformation(s) which occur are not described in codes "2"-"6" above (*e.g.*, impact forces).

Code "9" (Unknown) is used when (1) it is unknown from the interview and PAR information if the person is seated and (2) there is no vehicle inspection or the researcher is unable to determine if the seat was deformed or failed in the crash. However, if the occupant was not seated, then use code "0" (Occupant not seated or no seat).

CHILD RESTRAINT OVERVIEW

These variables are designed to capture a description of child restraints used in all the towed CDS applicable vehicles involved in the crash. Information about the seat is of two types: characteristics and usage. Characteristics are described in OA55, Child Safety Seat Make/Model and OA56, Type of Child Safety Seat. Usage of the seat is coded in OA57, Child Safety Seat Orientation and OA58-OA60, Child Safety Seat Harness/Shield/Tether 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 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.

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.

Beginning with the 1993 data collection year, the posture of occupants in child safety seats will not be considered abnormal for the presence of any child safety seat when the child was correctly seated in the seat as designed. In prior data collections years the posture of the occupant in a child safety seat was always considered abnormal because of the low frequency of usage of child safety seats. Most states now have laws that require the use of child safety seats for infants and children. This has resulted in a significant increase in child safety seat use. See variable OA11 (Occupant's Posture) for instructions for coding posture for occupants of child safety seats.

OA55

Variable Name: Child Safety Seat Make/Model

Element Values:

Model Code	Make/Model	Includes	Manufacturer
000	No child safety seat		
	Infant Safety Seats		
101	GM Love Seat		Century Products
* 102	Century Infant Car Seat	560, 565, 570 (discontinued)	Century Products[1]
103	Century Infant Love Seat		Century/Chrysler
104	Cuddle Shuttle		Collier-Keyworth
* 105	Cosco TLC		Cosco
106	Trav-L-Ette		Cosco/Peterson
107	Cosco First Ride		Cosco/Peterson
108	Evenflo Infant Car Seat		Evenflo
* 109	Dyn-O-Mite		Evenflo[2]
110	Infant Carrier		Ford
111	Snug Seat		Graco
* 112	Rock 'N Ride		Kolcraft
113	Swinger		Romer/KFS
114	Rockit Seat 640	639, 640	Strolee
* 115	Joy Ride		Evenflo
* 116	Cosco Dream Ride		Cosco
* 117	Travel Tandem		Evenflo
* 118	Fisher-Price Infant Seat		Fisher-Price
* 119	Gerry Guard with Glide		Gerico, Inc.
* 120	Safeline Sit'n'Stroll		Unknown
* 121	Century Infant Car Seat	580 (discontinued), 590	Century Products[1]
	Convertible Safety Seats		
201	Century Safety Car Seat	100	Century Products
202	Century Safety Car Seat	200	Century Products
203	Century Safety Car Seat	300	Century Products
204	Century Safety Car Seat	400, XL	Century Products
* 205	Century S.T.E. Car Seat	1000	Century Products
* 206	Century S.T.E. Car Seat	2000	Century Products
* 207	Century S.T.E. Car Seat	3000, 3500 Premier	Century Products
208	Child Love Seat	GM Child Love Seat	Century Products
209	Safe & Sound	II	Collier-Keyworth
210	Roundtripper		Collier-Keyworth
211	Voyager		Collier-Keyworth
* 212	Cosco Soft Shield	Auto Trac, Autotrac	Cosco
213	Cosco Safe & Easy		Cosco
214	Cosco Safe & Snug		Cosco
* 215	5 Pt/Commuter (discontinued)	Luxury 5-Pt	Cosco
216	Explorer		Cosco
217	Safe-T-Seat		Cosco[3]
218	Safe-T-Shield		Cosco/Peterson
219	Safe-T-Mate		Cosco/Peterson
220	Peterson Safety Shield		Cosco/Peterson

Variable Name: Child Safety Seat Make/Model (cont'd.)

Model Code	Make/Model	Includes	Manufacturer
Convertible Safety Seats (cont'd)			
221	Evenflo Convertible		Evenflo
* 222	Seven Year Car Seat	Evenflo	
223	Bobby Mac	Deluxe II, Champion Super, Lite	Evenflo[2]
* 224	One-Step		Evenflo[2]
* 225	Fisher-Price Car Seat	Fisher-Price	
* 226	Gerry Guardian	633 (discontinued), 643 653, 655	Gerico, Inc.
227	Little Trav'ler	310, 315	Graco
228	GT 100		Graco
229	Teddy Tot Astroseat	9100/9300 Series	International
230	Hi-Rider XL	"7"	Kolcraft
231	Redi-Rider		Kolcraft
232	Quikstep		Kolcraft
233	Ultra Ride		Kolcraft
* 234	Nissan Safety Seat	Infant/Child	Nissan
235	Pride-Ride	820 & 830 series	Pride-Trimble
236	Kantwet Care Seat		Questor/Kantwet
237	Kantwet Safe Guard		Questor/Kantwet
238	Peggy		Romer/KFS
239	Tip-up		Romer/KFS
240	Wee Care	500 Series	Strolee
241	Wee Care	600 Series	Strolee
242	GT	2000, 3000	Strolee
243	Quick Click		Strolee
244	Volvo Child Seat		Volvo
245	Child Cushion		Volvo
246	Welsh Travel Tot		Welsh
247	Perfect F.I.T.T.		Kolcraft
* 248	Ultra	I, II, V	Evenflo
* 249	Baby Sitter	Wonda Chair	Babyhood
* 250	Century S.T.E. Car Seat	5000, 5500 Premier	Century Products
* 251	Gerry Guardian	654	Gerico, Inc.
* 252	Auto-Mate	Dial-A-Fit	Kolcraft
* 253	Playskool Carseat		Kolcraft
254	Prodigy Kiwi	Kiwi Plus	Prodigy
255	Prodigy Shuttle		Prodigy
* 256	Renolux GT 2000		Renolux
* 257	Renolux GT 5000	4000 (discontinued) 7000	Renolux
* 258	Comfort Rule		Cosco
* 259	Champion	Scout	Evenflo
* 260	Traveler 700		Kolcraft
* 261	Premier	V	Evenflo
* 262	Gerry Guard SecureLock		Gerico, Inc.
* 263	Ronolux	Turn-a-Tot	Ronolux

Variable Name: Child Safety Seat Make/Model (cont'd.)

	Model Code	Make/Model	Includes	Manufacturer
	Booster Safety Seats			
*	301	Century Commander		Century Products
	302	Safe-T-Rider	II, Deluxe	Century Products
	303	Co-Pilot	II	Collier-Keyworth
*	304	Cosco Explorer	I	Cosco
	305	Travel Hi-Lo	Deluxe High Back	Cosco/Peterson
*	306	Evenflo Booster		Evenflo
	307	Wings	by Bobby Mac	Evenflo[2]
	308	Tot Guard		Ford
	309	Gerry Voyager		Gerico, Inc.
	310	Teddy Tot Astrorider	6000 Series	International
*	311	Tot Rider Quick Step	XL	Kolcraft
	312	Flip N' Go	II	Kolcraft
	313	#812		Pride-Trimble
	314	Click 'N Go	890 Series	Pride-Trimble
	315	Vario		Romer/KFS
	316	Wee Care Booster Seat	600 Series	Strolee
	317	Quick Click 605 Booster		Strolee
	318	Cosco Auto Booster		Cosco
*	319	Sightseer		Evenflo
*	320	Century CR-3		Century Products
*	321	Gerry DoubleGuard		Gerico, Inc.
	322	Century Breverra		Century Products
	Special Needs Safety Seats			
**	401	Swinger Infant Car Bed	Carry Cot	Shinn & Assoc.[4]
**	402	Britax		Shinn & Assoc.[4]
**	403	E-Z-On Vest	101-TCXS, 101-TC, 102-TC (8 sizes)	E-Z On Products[5]
**	404	Carrie Car Seat System	(3 sizes): 20-40 lbs; 30-60 lbs; & 50-100 lbs	Tumble Forms
**	405	Modified E-Z-On Vest	101M	E-Z On Products
**	406	Travel Chair		Ortho-Kinetics
**	407	Preemie Bunting		Koziatek & Assoc.
**	408	SPELCAST		Koziatek & Assoc.
**	409	Columbia Orthopedic Seat		Columbia Medical
**	410	Kidster	(3 sizes)	Gunnell
**	411	Snug Seat		Snug Seat
**	412	900 Series Transporter		Safety Rehab
	Harnesses			
*	501	Little Cargo Auto Vest	(Harness only)	New Harness
	950	Built-in child safety seat		
	997	Other make/model (specify)		
	998	Unknown make/model		
	999	Unknown if child safety seat used		

Variable Name: Child Safety Seat Make/Model (cont'd)

* All of these models are cur rently listed by the American Academy of Pediatrics in their publication entitled: *1992 Family Shopping Guide to Car Seats.*

** All of these models are cited on page 4 of *Safe Ride News, Spring 1989*, published by the American Academy of Pediatrics.

1 Gerber Furniture Group now owns Century Products.
2 This Evenflo model was formerly produced by Questor/Kantwet.
3 This Cosco model was formerly produced by Cosco/Peterson.
4 These models were formerly produced by Evenflo
5 These models were formerly produced by Rupert.

Source: Researcher determined — inputs include vehicle inspection, interviewee, and police report.

Remarks:

Code "000" (No child safety seat) is used when (1) this person is not an infant or child (*i.e.*, less than 23 kilograms and less than 102 centimeters or less than six years old if height and weight not known), or (2) this person is an infant or child, but was not using an infant or child seat.

Codes "001"
through "998" (*i.e.*, child safety seat make/model codes) are used when this person is an infant or child and is using a child safety seat. If a qualifying infant or child was using a child safety seat, then document the make/model from the list provided above and code the make/model's number.

If height and weight information is absent, then use age to establish if this person should be classified as an infant or child. Persons six years of age and older are not classified as infants or children; thus, use code "000" (No child safety seat).

If this person is an infant or child and was an occupant of a hit-and-run vehicle, then code this variable from available information. If age, height, or weight information is unavailable on this hit-and-run occupant, then use code "000" (No child safety seat).

Code "950" (Built-in child safety seat) is used when a qualifying child is using a child safety seat which has been integrated into the child's seating position. Built-in child safety seats are currently designed as alternatives to existing toddler or booster seats (*i.e.*, OA56, Type of Child Safety Seat, codes "2", "4", or "5"). They are not intended as infant seats. These seats must be pulled or folded out of the existing seat back in order to be used. If the built-in child safety seat was not put into its proper position, then code "000" (No child safety seat).

Variable Name: Child Safety Seat Make/Model (cont'd)

Code "997"   (Other make/model) is used when a qualifying infant or child is using a non-built-in child safety seat but the make/model (which is known) is not listed above.

Code "998"   (Unknown make/model) is used when a qualifying infant or child is using a non-built-in child safety seat but the make/model is not known.

Code "999"   (Unknown if child safety seat used) is used when it is unknown if the person under consideration is an infant or child, or it is unknown if this person was using a child safety seat.

Variable Name: Type of Child Safety Seat

**Range:**   0-5, 7-9

Element Values:

0	No child safety seat
1	Infant seat
2	Toddler seat
3	Convertible seat
4	Booster seat — with shield
5	Booster seat — without shield
7	Other type child safety seat (specify)
8	Unknown child safety seat type
9	Unknown if child safety seat used

Source: Researcher determined — inputs include vehicle inspection, interviewee, and police report.

Remarks:

Code "0"   (No child safety seat) is used when (1) this person is not an infant or child (*i.e.*, less than 23 kilograms and less than 102 centimeters or less than six years old if height and weight not known), or (2) this person is an infant or child, but was not using an infant or child seat.

Use the person's age (*i.e.*, less than six versus six and older) to determine if this person is an infant or child when height and weight information is absent. Child carriers that are not designed as safety seats are to be classified as "No child safety seat". Examples of these child carriers are shown below.
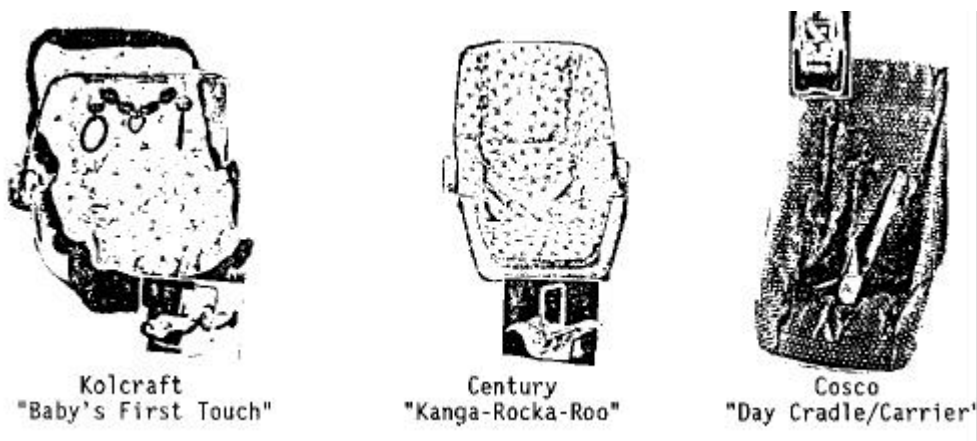
Kolcraft
"Baby's First Touch"

Century
"Kanga-Rocka-Roo"

Cosco
"Day Cradle/Carrier"

If this person is an infant or child and was an occupant of a hit-and-run vehicle, then code this variable from available information. If age, height, or weight information is unavailable on this hit-and-run occupant, then use code "0" (No child safety seat).

Variable Name: Type of Child Safety Seat (cont'd.)

Code "1"   (Infant seat) is used when the seat is designed to only face the rear of the vehicle and the maximum capacity is 8-9 kilograms (this information will usually be found on the manufacturer's label). Infant safety seats are equipped with a five-point harness (straps) to secure the infant to the safety seat and use the vehicle's safety belt system (*i.e.*, manual or automatic) to secure the seat to the vehicle. The five-point infant seat system includes a pair of straps that go over the infant's shoulders, a crotch strap, and the vehicle's belts as lap belts to secure the seat to the vehicle. The seat is tub-shaped and cradles the baby in a generally reclined position. Examples are shown below.

Cosco/Peterson
"First Ride"

Questor
"Dyn-o-mite"
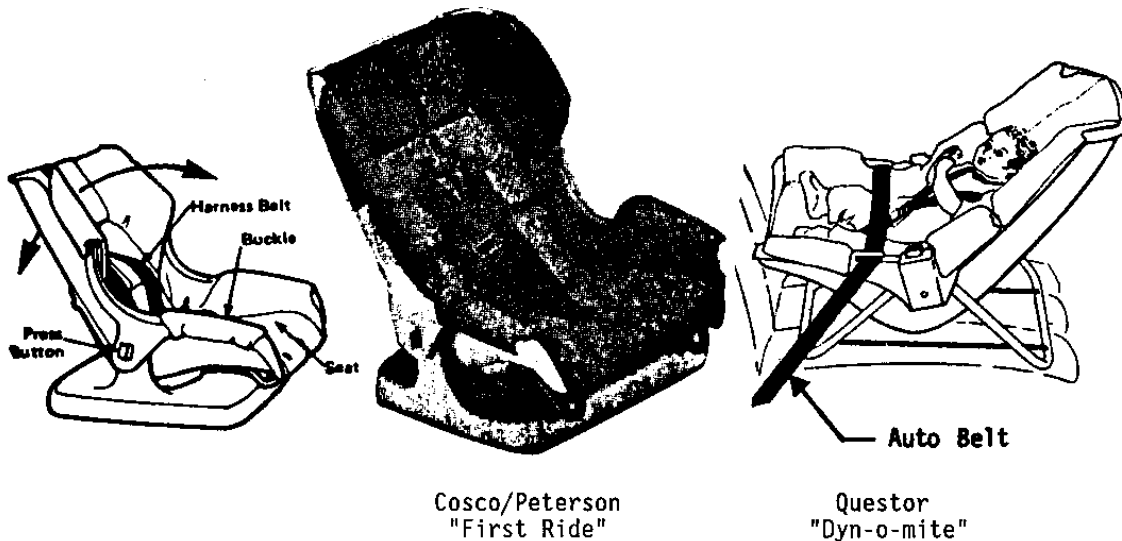
Code "2"   (Toddler seat) is used when the seat is designed to **only** face the front of the vehicle and to carry a child weighing approximately 9-23 kilograms (this information will usually be found on the manufacturer's label). The toddler seat may also be referred to as a "child seat". Most have a five-point harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which **must** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in a generally upright sitting position, although some seats have multiple positions. Examples are shown below.

Shield Type   Harness Type
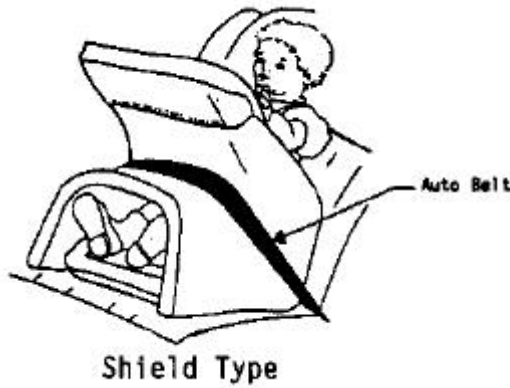
Variable Name: Type of Child Safety Seat (cont'd.)

Code "3"   (Convertible seat) is used when the seat is designed to face the **front or rear** of the vehicle and to carry a child ranging from birth to approximately 23 kilograms (this information will usually be found on the manufacturer's label).   Most have a harness system (straps) to secure the child to the seat. All models secure the safety seat to the vehicle with the vehicle's safety belts (*i.e.*, manual or automatic) and, in addition, some models have a tether strap which **must** be attached to the rear manual safety belt or deck lid to prevent tipping forward. The child is restrained by a shield, a harness, or a combination of the two in either a generally reclined rearward facing position (for small infants --birth to 9 kilograms) or a generally upright forward sitting position (for larger children --9-23 kilograms). Examples are shown below:
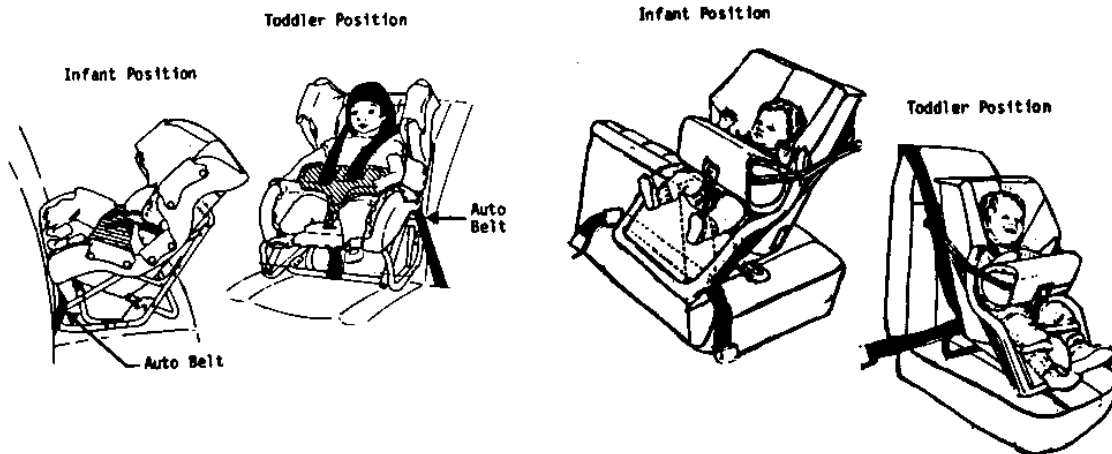
Harness Type   Combination Harness and Shield
Century "200"   Type Cosco/Peterson "SAFE & SNUG"

Variable Name: Type of Child Safety Seat (cont'd.)

Code "4"　　(Booster seat — with shield) is used when the seat is designed as a forward facing platform without a back (except for one Cosco/Peterson model which has a back) and adjusts to children up to 27 kilograms. This booster seat has a shield. The booster seat restrains the child in a raised upright sitting position with either a harness or shield. Booster seats are designed primarily to fill the gap between when a child outgrows the standard child safety seat and when the child can use the adult belt (*i.e.,* manual or automatic) and still see out the window. Some models can also be used for smaller children, as small as 9 kilograms. Examples of booster seats are shown below.

Harness Types

Strolee
"Wee Care"

Century
"Safe-T-Rider"

Shield Type

Collier-Keyworth
"Co-Pilot"

Auto Belt
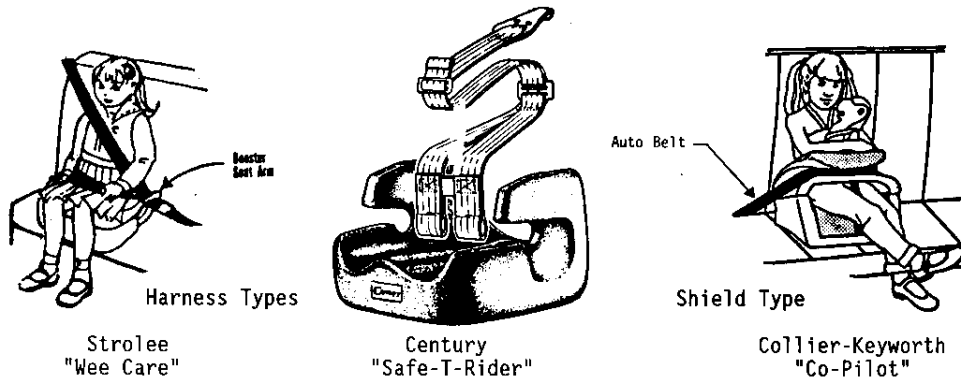
Used with Lap Belt and Harness

Auto Belt

Some of the above infant, child, convertible and booster seats require a tether. When a tether-required seat is placed in the vehicle's front seat, the tether should run over the top of the seat and attach to a rear manual seat belt or possibly to one of the anchors for a front seat belt (*i.e.,* manual or automatic). When a tether-required seat is placed in the vehicle's rear seat, the tether should run over the top of the rear seat and attach to an anchor on the rear window shelf or possibly pass through the rear window shelf and attach to one of the anchors for a rear manual seat belt.

Code "5"　　(Booster seat — without shield) is used when the seat is designed as a forward facing platform without a back (except for one Cosco/Peterson model which has a back) and adjusts to children up to 27 kilograms. This booster seat does not have a shield.

Variable Name: Type of Child Safety Seat (cont'd.)

Code "7"   (Other type child safety seat) is used when the infant or child safety seat cannot be described by codes "1" through "5" above. Specify the type.

Code "8"   (Unknown child safety seat) is used when a child safety seat is in use but the type of child safety seat is unknown.

Code "9"   (Unknown if child safety seat used) is used when it is unknown if the person under consideration is an infant or child, or it is unknown if this person was using a child safety seat.

Variable Name: Child Safety Seat Orientation

Element Values:

00 No child safety seat

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

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

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

99 Unknown if child safety seat used

Source: Researcher determined — inputs include vehicle inspection, interviewee, and police report.

Remarks:

Code "00" (No child safety seat) is used when (1) this person is not an infant or child (*i.e.*, less than 23 kilograms and less than 102 centimeters or less than six years old if height and weight not known), or (2) this person is an infant or child, but was not using an infant or child seat.

If height and weight information is absent, then use age to establish if this person should be classified as an infant or child. Persons six years of age and older are not classified as an infant or child; thus, use code "00" (No child safety seat).

If this person is an infant or child and was an occupant of a hit-and-run vehicle, then code this variable from available information. If age, height, or weight information is unavailable on this hit-and-run occupant, then use code "00" (No child safety seat).

The researcher must determine from the seat, using the Child Safety Seat Identification Guide, the designed orientation for this person's weight or age. Next, the actual orientation of the seat at-impact must be determined to obtain the correct code.

Variable Name: Child Safety Seat Orientation (cont'd)

For example, a one and one -half year old child whose weight is 8 kilograms was sitting in a forward facing Century 300 child safety seat. The correct code based upon the Child Safety Seat Identification Guide is "02" (Forward facing). At this age and weight the convertible seat should be rear facing but was forward facing.

Before using any code the researcher must carefully review the subcategories and choose the appropriate code based on designed orientation at the occupant's age and weight.

**Code "01",
"11", or "21"** (Rear facing) or "02", "12", or "22" (Forward facing) if at the time of the crash the seat was facing the rear of the vehicle or the front of the vehicle, respectively. Do not code with respect to the vehicle's direction of travel (*e.g.*, backing vehicle).

**Code "08",
"18", or "28"** (Other orientation) if the seat was facing other than rear or forward at the time of the crash (*e.g.*, on the floor, sideways, on top of or underneath something).

**Code "09",
"19", or "29"** (Unknown orientation) is used when a child safety seat is in use but the orientation at the time of the crash is unknown (*e.g.*, at the time of vehicle inspection the child safety seat is not present or is unattached and there is no information from an interview or the PAR).

Code "99" (Unknown if child safety seat used) is used when it is unkno wn if the person under consideration is an infant or child, or it is unknown if this person was using a child safety seat.

Variable Name: Child Safety Seat Harness Usage
Child Safety Seat Shield Usage
Child Safety Seat Tether Usage

Element Values:

00   No child safety seat

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

Designed with Harness/Shield/Tether
11   Harness/shield/tether not used
12   Harness/shield/tether used
19   Unknown if harness/shield/tether used

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

99   Unknown if child safety seat used

Source: Researcher determined — inputs include vehicle inspection, interviewee, and police report.

Remarks:

Code "00"   (No child safety seat) is used when (1) this person is not an infant or child (*i.e.*, less than 23 kilograms and less than 102 centimeters or less than six years old if height and weight not known), or (2) this person is an infant or child, but was not using an infant or child seat. If height and weight information is absent, then use age to establish if this person should be classified as an infant or child. Persons six years of age and older are not classified as an infant or child; thus, use code "00" (No child safety seat).

If this person is an infant or child and was an occupant of a hit-and-run vehicle, then code this variable from available information. If age, height, or weight information is unavailable on this hit-and-run occupant, then use code "00" (No chi ld safety seat). The design of each child safety seat must be assessed regarding harness, shield, and tether use.

Refer to the Child Safety Seat Identification Guide to ascertain the design of the seat and the applicability of the harness, shield, and tether to each seat individually.

<div align="right">
OA58
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OA60
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</div>

An "after market" harness/shield/tether is one added by the user to a child safety seat not originally designed to use the device.

Code "99"   (Unknown if child safety seat used) is used when it is unk nown if the person under consideration is an infant or child, or it is unknown if this person was using a child safety seat.

INJURY/CONSEQUENCES OVERVIEW

These variables are grouped into two areas. First, how severely was this occupant injured, and second, what were the injury consequences for this occupant. Variables which address the first area are OA61, Injury Severity (Police Rating), OA70, Number of Recorded Injuries for This Occupant, and OA62, Treatment -Mortality. The second area is addressed by the variables OA62, Treatment-Mortality, OA63, Type of Medical Facility (for Initial Treatment), OA64, Hospital Stay, OA65, Working Days Lost, and OA66, Time to Death. Treatment — Mortality (OA62) addresses both areas because of its format.

Variables OA67 through OA69, Medically Reported Cause of Death, indicate which of the recorded injuries on the Occupant Injury Form, reported by a physician or lay coroner, were the causes of death.

Treatment and delivery of care for minor to moderately injured crash victims has improved and is being provided in areas where it was not available previously. The long term results of trauma continue to be lessened through this improved care delivery and treatment system. Availability of care has increased due to competition in the medical industry. Neighborhood clinics have become prevalent in all areas, especially in some of the smaller rural communities. This expansion of care has not been fully documented for the motor vehicle crash picture and leaves the injury assessment area with some data loss. Persons that formerly went to the emergency room of the local hospital to see their family doctor, now may go to the neighborhood minor emergency medical clinic. This change is also somewhat a result of the improved protection for occupants from injuries caused by vehicle interiors during crashes.

Another factor that is changing rapidly is the length of time spent in a hospital. The current emphasis is to get the patient out of the hospital as quickly as possible and into a home environment for convalescence. For this reason the overall days lost are changing.

All of these changes are a direct reflection of changes in societal costs, both in terms of direct cost (*e.g.*, injury and treatment) and indirect costs (*e.g.*, lost productivity due to days lost while the vehicle is repaired). Since this is a rapidly changing picture, more documentation needs to be provided for good analysis.

Coding these variables is based primarily on medical records. There are only two variables which do not come from an official record, and they are Working Days Lost (OA65) and Type of Medical Facility (for Initial Treatment) (OA63). Sometimes no records are available, for example, when a treatment facility will not provide records, or when there was no treatment. In the case of no records, interviewee data are the primary source for all variables except the Injury Severity (Police Rating) (OA61), Time to Death (OA66), and Medically Reported Cause of Death (OA67 - OA69).

In summary, information from these variables forms the basis for analysis of occupant injury severity and injury consequences. Most of the information comes from official records, and the rest is completed by interviewee information. Perseverance in pursuit of this information will result in a high completion rate for these variables.

Variable Name: Injury Severity (Police Rating)

Element Values:

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

Source: Police report.

Remarks:

Code 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 (code "3"). Later the person dies (code "4"), 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" (code "3"), nonincapacitating -evident injuries are classified as "B" (code "2"), and possible injuries are "C" (code "1"). Property damage only is classified as "O" (code "0").

Code "5"   (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.

Code "6"   (Died prior to accident) 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 code "0" (O - No injury). If the PAR is "blank" and the person was not present during the police investigation, then code "9" (Unknown).

Not all states use the KABCOU scheme. Listed below, by state, are alternative schemes; a mapping to the NASS scheme is provided.

Variable Name: Injury Severity (Police Rating) [cont'd.]

State	PAR Code/Definition			NASS Scheme/Code		
Alabama	K	=	Killed	K	-	4
	A	=	Visible or carried from scene	A	-	3
	B	=	Bruise/abrasion/swelling	B	-	2
	C	=	No visibility - has pain/faint	C	-	1
	Blank	=	No documentation of driver or			
			occupant injury	Blank	-	0
		=	No set unknown code		-	9
Arizona	1	=	No injury	0	-	0
	2	=	Possible injury	C	-	1
	3	=	Nonincapacitating injury	B	-	2
	4	=	Incapacitating injury	A	-	3
	5	=	Fatal	K	-	4
	6	=	Unknown	U	-	9
California	1	=	Fatal	K	-	4
	2	=	Severe wound/distorted member	A	-	3
	3	=	Other visible injury	B	-	2
	4	=	Complaint of pain	C	-	1
	Blank	=	Occupant present	0	-	0
	Blank	=	Occupant not present		-	9
Colorado*	5	=	Fatal	K	-	4
	4	=	Evident - incapacitating	A	-	3
	3	=	Evident - nonincapacitating	B	-	2
	2	=	Possible injury	C	-	1
	1	=	No injury	0	-	0

*   There is a box at the top of the PAR indicating number of persons injured. If this box is marked 0 and the injury code is left "blank", assume "No injury". If the box is marked 1 (or more) pertaining to the vehicle occupants in question and the injury code is "blank", assume "Injured, severity unknown". If "blanks" are present in both the persons injured box and the injury code box, assume "Unknown".

State	PAR Code/Definition			NASS Scheme/Code		
Florida	1	=	No Injury	0	-	0
	2	=	Possible Injury	C	-	1
	3	=	Nonincapacitating Injury	B	-	2
	4	=	Incapacitating Injury	A	-	3
	5	=	Fatal (IN 90 Days) Injury	K	-	4
	6	=	Non-Traffic Fatality	U	-	9
		=	No set unknown code		-	9

Variable Name: Injury Severity (Police Rating) [cont'd.]

State	PAR Code/Definition			NASS 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 - 4
	1-11 Any Entry	1-12 Any Entry	2 Semiconscious 3 Incoherent 4 Unconscious	A - 3
	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
	3 Minor Burn 6 Minor Bleed 10 Complaint of Pain 11 None Visible	3 Eye	1 Conscious 5 Shock 7 Refused Med	A - 3
	3 Minor Burn 6 Minor Bleed	1-2, 4-12 (Any EXCEPT Eye)	1 Conscious 5 Shock 7 Refused Med	B - 2
	5 Abrasion 9 Contusion/ Bruise	1-12 Any Entry	1 Conscious 5 Shock 7 Refused Med	B - 2
	10 Complaint of 11 None Visible	1-2, 4-12 (Any EXCEPT Eye)	1 Conscious 5 Shock 7 Refused Med	C - 1
	11 None Visible	Blank or Slashed	1 Conscious	0 - 0
	Blank or Slashed	Blank or Slashed	Blank or Slashed	0 - 0
	Unknown	Unknown	Unknown	U - 9

Variable Name: Injury Severity (Police Rating) [cont'd.]

State	PAR Code/Definition		NASS Scheme/Code
Maryland	5 =	Fatal	K - 4
	4 =	Incapacitating	A - 3
	3 =	Nonincapacitating	B - 2
	2 =	Possible injury	C - 1
	1 =	No injury/Damage only	0 - 0
	Blank =	No documentation of driver or occupants on front of PAR	
Nebraska	1 =	Fatal	K - 4
	2 =	Incapacitating injury	A - 3
	3 =	Nonincapacitating injury	B - 2
	4 =	Possible injury	C - 1
	0 =	No injury	0 - 0
	Blank =	Occupant present	0 - 0
	Blank =	Occupant not present	- 9

New Jersey	Location of Injury	Type of Injury	Victim's Condition	
	Any entry	Any entry	Killed	K - 4
	Any entry	Any entry	Incapacitated	A - 3
	Any entry	amputation, concussion, internal, fracture/dislocation	Moderate injury complaint of pain	A - 3
	Eye	burn, bleeding, complaint of pain	Moderate injury Complaint of pain	A - 3
	Any entry	bleeding, contusion, bruise, abrasion	Moderate injury	B - 2
	Any entry (except eye)	complaint of pain	Complaint of pain	C - 1
	-	-	-	0 - 0
	U	U	U	U - 9

Variable Name: Injury Severity (Police Rating) [cont'd.]

State	PAR Code/Definition			NASS 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 - 4
	1-12 Any entry	1-13 Any entry	2 Unconscious, 3 Semi-conscious, 4 Incoherent	A - 3
	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
	3 Eye	4 Minor Bleeding, 6 Minor Burn, 12 Complaint of Pain	5 Shock, 6 Conscious	A - 3
	All but eye 1, 2, 4-12	4 Minor Bleeding, 6 Minor Burn	5 Shock, 6 Conscious	B - 2
	1-12 Any entry	10 Contusions - Bruise, 11 Abrasion	5 Shock, 6 Conscious	B - 2
	All but eye 1, 2, 4-12	12 Complaint of Pain	5 Shock, 6 Conscious	C - 1
	-	13 None Visible	6 Conscious	0 - 0
	X	X	X	9

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Variable Name: Injury Severity (Police Rating) [cont'd.]

State	PAR Code/Definition		NASS Scheme/Code
Pennsylvania	0 - 0	=	No injury	0

State			PAR Code/Definition	NASS Scheme/Code
	1	=	Death	K - 4
	2	=	Major injury	A - 3
	3	=	Moderate injury or	A - 3
	4	=	Minor injury [and] Type of Apparent Injury - amputation - broken bone(s) - distorted member - other incapacitating injury	A - 3
	3	=	Moderate injury or	B - 2
	4	=	Minor injury [and] Type of Apparent Injury - abrasions/bruises - burns - bleeding wound - concussion - other non-incapacitating injury	B - 2
	3	=	Moderate injury [and] Type of Apparent Injury - Unknown	B - 2
	3	=	Moderate injury or	C - 1
	4	=	Minor injury [and] Type of Apparent Injury - complaint of pain - limping - swelling	C - 1
	4	=	Minor injury [and] Type of Apparent Injury - Unknown	C - 1
	9	=	Unknown if injured [and] Type of Apparent Injury - Complaint of pain	C - 1
	9	=	Unknown if injured [and] Type of Apparent Injury - Unknown	U - 9
Tennessee	4	=	Fatal Injury	K - 4
	3	=	Incapacitating Injury	A - 3
	2	=	Nonincapacitating Injury	B - 2
	1	=	Possible Injury	C - 1
	0	=	No Injury	0 - 0
Washington	1	=	No injury	0 - 0
	2	=	Dead at scene	K - 4
	3	=	Dead on arrival	K - 4
	4	=	Died in hospital	K - 4
	5	=	Disabling injury	A - 3
	6	=	Nondisabling injury	B - 2
	7	=	Possible injury	C - 1
	Blank	=	Unknown	- 9

Variable Name: Treatment — Mortality

Element Values:

        0   No treatment
        1   Fatal
        2   Fatal — ruled disease

        Nonfatal
        3   Hospitalized
        4   Transported and released
        5   Treatment at scene — nontransported
        6   Treatment later
        7   Treatment — other (specify)
        8   Transported to a medical facility-unknown if treated
        9   Unknown

Source: Researcher determined — inputs include interviewee, police report, and medical records.

Remarks:

Official sources (if they exist) take precedence over interview data.

Code "0" (No treatment) includes persons transported to a hospital but who refuse treatment. As long as there was transportation directly from the scene, a refusal of treatment will not, on its own, affect the stratification of the case.

Code "1" (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 code.

Code "2" (Fatal — ruled disease) 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.)

Code "2" (Fatal — ruled disease) is used additionally 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.

Code "3" (Hospitalized) is used when hospitalization occurs as a result of injury (need *not* be taken directly to a hospital). See Hospital Stay (0A63) for hospitalization criteria. Also use this code if a person is treated and released then subsequently hospitalized as a result of injuries sustained in the crash.

Variable Name: Treatment — Mortality (cont'd.)

Code "4"   (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.

Code "5"   (Treatment at scene — nontransported) 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.

Code "6"   (Treatment later) includes only professional treatment (*e.g.*, doctor, clinic, hospital, etc.) where the person (1) did not go directly from the scene to treatment, and (2) 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 code.

Code"7"   (Treatment — other) includes nonprofessional treatment such as first aid, self-treatment, etc., not at the scene of the crash. If this code is used, then OA63, Type of Medical Facility (for Initial Treatment), must be coded "0" (Not treated at a medical facility).

Code "8"   (Transported to a medical facility-unknown i f 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 to be coded as either "4" (Transported and released) or "6" (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.

Variable Name: Type of Medical Facility (for Initial Treatment)

Element Values:

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 coding scheme. Teams must communicate their list to their respective zone center.

Code "0"   (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 code 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, then use one of the following codes. 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, code the facilities classification from one of the codes below.

Code "1"   (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 code "1" (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.

Variable Name: Type of Medical Facility (for Initial Treatment) [cont'd.]

Code "2" (Hospital) is used for all "hospitals" which do not fall into the definition of a Level I or Level II Trauma Center as defined.

Code "3" (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 code 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 code is "8" (Other).

Code "4" (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 codes "1" (Trauma center), "2" (Hospital), or "3" (Medical clinic).

Code "5" (Treatment later at medical facility) is used when a person's initial treatment by a health care professional (*i.e.*, doctor) took place ***more than one hour*** after the crash. In addition, use this code when OA61, Treatment -Mortality, is coded "6" (Treatment later).

Code "8" (Other) is used when a health care provider's facility is used for the initial treatment, and the facility does not qualify for one of the codes "1" (Trauma center), "2" (Hospital), "3" (Medical clinic), or "4" (Physician's office) above.

Code "9" (Unknown) is used when it is unknown w hat type of initial treatment facility was used or when it is unknown if treatment of any kind was obtained.

OA64

Variable Name: Hospital Stay

Element Values:

Range: 00-61, 99

00   Not hospitalized
Code the number of days (up through 60) that the occupant stayed in the hospital
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.

Code "00"   (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 code if fatal at scene, pronounced dead on arrival, or survival does not extend beyond the emergency room.

The basis for the number of days coded 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, use code "01". 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). Code "01" is used because the person was hospitalized [OA62, Treatment - Mortality, equals "3" (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 code "01" is used 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 code "00" (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, then use code "04".

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.

Variable Name: Working Days Lost

Element Values:

Range: 00-62, 97, 99

00 No working days lost
Code the number of days (up through 60) that the occupant lost from work due to the accident
61 61 days or more
62 Fatally injured
97 Not working prior to accident
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 not included [code "97" (Not working prior to accident)].

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, indicate on the form if the person works less than full-time but greater than four hours per day by annotating "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 code "99" (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.

Code "62" (Fatally injured) is used if a person is "fatal — ruled disease" or expires within thirty (30) days following the crash. Use this code regardless of whether or not the person missed any working days.

Code "97" (Not working prior to accident) is used when a person is not employed, not a full-time college student, or works less than four hours per day. This code includes all persons (except fatals) who do not qualify to lose working days.

Variable Name: Working Days Lost (cont'd.)

If the reported work days lost includes a fraction, round one-half (½) day or greater up to a whole day. Less than one-half day is excluded (rounded down).

If someone loses their job as a result of the crash, then count only the work days lost between the crash and the date of termination, inclusive.

Do not include days lost by persons who were not directly involved in the crash but who lost days because of it (*e.g.*, husband who was not in crash but stayed home to take care of wife who was injured and required assistance).

If an involved person changes their work schedule as a result of a crash (*e.g.*, to take care of someone injured in the crash), then the work time, which was given up as a result of the crash, shall not be considered as lost.

If no interview is obtained, assume that persons over 65 or under 17 are not employed full -time; for these persons code "97" (Not working prior to accident) is used unless the person is fatally injured [codes "1" (Fatal) or "2" (Fatal — ruled disease) for 0A62, Treatment — Mortality].

Emergency Response Information

EMS (Emergency Medical Service) personnel are integral to the survivability of the people involved in traffic crashes. The following non-coded variables attempt to collect some basic information on their involvement with CDS crashes.

The EMS personnel may arrive by both road and air vehicles. Note the notification and scene arrival time information on the first vehicle arriving at the scene and the departure and treatment center arrival times for the last transporting vehicle (the vehicle that arrived at the treatment facility).

Information on the type of EMS will be coded for the first arriving and last transporting vehicles. Information on the EMS care administered on-scene and during transport will be coded for the same vehicles.

CODE THE VARIABLES BELOW FOR BOTH THE FIRST UNIT AT SCENE AND THE LAST UNIT TRANSPORTING

EMS Notification

(1) Not notified   ROAD VEHICLE
(2) Notified
(9) Unknown   AIR VEHICLE

EMS Notification Time (first unit)   _____ _____ _____
(9999) Unknown   ROAD VEHICLE

                                      _____ _____ _____
                                      AIR VEHICLE

EMS Arrival Time (first unit)   _____ _____ _____
(9998) EMS canceled or did   ROAD VEHICLE
not arrive
(9999) Unknown   _____ _____ _____
                                      AIR VEHICLE

CODE THE VARIABLES ABOVE FOR THE FIRST ARRIVING EMS UNIT

EMS Departure Time To   _____ _____ _____
Treatment Facility (transporting unit)   ROAD VEHICLE
(9997) EMS arrived, provided
treatment, but did not   _____ _____ _____
transport   AIR VEHICLE
(9998) EMS arrived, but was
not used
(9999) Unknown

EMS Arrival Time At   _____ _____ _____
Treatment Facility   ROAD VEHICLE
(9999) Unknown
                              _____ _____ _____
                              AIR VEHICLE

CODE THE VARIABLES ABOVE FOR THE LAST TRANSPORTING UNIT THAT TRANSPORTED OCCUPANT TO TREATMENT FACILITY

EMS Type

                                        FIRST   TRANSPORTING
                                        UNIT   UNIT

(01) Fire department   _____   _____
(02) Rescue squad   ROAD VEHICLE
(03) Police department
(04) Trauma unit   _____   _____
(05) Disaster unit   AIR VEHICLE
(06) Ambulance service unit
(07) Hospital
(08) Mortuaries/funeral homes
(98) Other, specify: _____
(99) Unknown

EMS Care   DURING
(01) No care administered   ON-SCENE   TRANSPORT
(02) First aid
(03) Resuscitation   _____   _____
(04) CPR   ROAD VEHICLE
(05) Emergency cardiac care
(06) Life support system monitoring (blood pressure, pulse rate,   _____   _____
respiration, EKG)   AIR VEHICLE
(07) Emergency burn care
(08) Combination of above, specify: _____
(98) Other, specify: _____
(99) Unknown

Variable Name: EMS Notification

Element Values:

      1   Not notified
      2   Notified
      9   Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate whether an EMS was notified to come to the crash scene. This is for the first arriving EMS units (not the transporting units, though they may be the same ones). The notification can be made by any source (police, involved persons, witnesses, etc.) Indicate the appropriate vehicle category a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded once per occupant for either a road vehicle or an air vehicle.

"Code 1" (Not notified) is used when no EMS unit of any type is notified to come to the scene of the crash.

Variable Name: EMS Notification Time

Element Values:

Code the EMS notification time in military time format.

BLANK   No EMS notified
9999   Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the time that the EMS unit was notified to come to the crash scene. This is for the same vehicle coded for EMS notification. Indicate the appropriate vehicle category as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded once per occupant for either a road vehicle or an air vehicle.

Variable Name: EMS Arrival Time

Element Values:

Code the EMS notification time in military time format.

BLANK   Relevant type of vehicle not notified
9998   EMS canceled or did not arrive
9999   Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the time that the EMS unit stops physical motion at the scene (last place that the unit or vehicle stops prior to assessing the patient).   This refers to the physical motion of the responding EMS vehicle. If an individual EMT arrives at the scene by private vehicle, that is NOT the value that this variable addresses. This is for the same vehicle coded for EMS notification. Indicate the appropriate vehicle category as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded once per occupant for either a road vehicle or an air vehicle.

Variable Name: EMS Departure Time To Treatment Facility

Element Values:

Code the EMS notification time in military time format.

BLANK   Relevant type of vehicle not notified
9997   EMS arrived, provided treatment, but did not transport
9998   EMS arrived, but was not used
9999   Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the time that the EMS unit begins physical motion to the transport facility. This is for the last transporting unit that transported the occupant to the treatment facility (this is not necessarily the same unit as the first arriving units). Indicate the appropriate vehicle category as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded once per occupant for either a road vehicle or an air vehicle.

Variable Name: EMS Arrival Time At Treatment Facility

Element Values:

Code the EMS notification time in military time format.

BLANK Relevant type of vehicle not notified
9999 Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the time that the EMS unit arrives at the treatment facility. This is for the same vehicle coded for EMS Departure Time to Treatment Facility. Indicate the appropriate vehicle category as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded once per occupant for either a road vehicle or an air vehicle.

Variable Name: EMS Type

Element Values:

BLANK Relevant type of vehicle not notified
01 Fire department
02 Rescue squad
03 Police department
04 Trauma unit
05 Disaster Unit
06 Ambulance service unit
07 Hospital
08 Mortuaries/funeral homes
98 Other, specify
99 Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the appropriate vehicle EMS type and category for the first arriving unit that examined/treated this person and the last unit that transported this person to the treatment facility (they may be the same), as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded twice per occupant for at-scene and during transport for either a road vehicle or an air vehicle.

Variable Name: EMS Care (on scene or during transport)

Element Values:

BLANK	Relevant vehicle not notified
01	No care administered
02	First aid
03	Resuscitation
04	CPR
05	Emergency cardiac care
06	Life support system monitoring (blood pressure, pulse rate, respiration, EKG)
07	Emergency burn care
08	Combination of above, specify
98	Other, specify
99	Unknown

Source: PAR, Emergency room records, interviewee

Remarks:

Indicate the type of care administered by the EMS unit coded for EMS type at the scene and during transport.. Indicate the appropriate vehicle category treating on-scene and/or during transport as a road/ground vehicle, or an air/rotor craft/fixed wing vehicle. If the category cannot be identified, assume it is a ground vehicle.

This variable is coded twice per occupant for at-scene and during transport for either a road vehicle or an air vehicle.

Variable Name: Time to Death

Element Values:

Range: 00 through 24, 31 through 60, 96, 99

> 00 Not fatal
> 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.

Remarks:

Code "00"   (Not fatal) identifies (from any source) all occupants who are not fatally injured (*i.e.*, death does not occur, or death does not occur within thirty days of the accident). Occupants of hit-and-run vehicles are assumed not killed.

Record the time-to-death of all occupants who die within thirty days of the crash unless their death meets the criteria of code "96" (Fatal - ruled disease).

Code "01"   identifies occupants who die within (less than) one and a half hours of the time of the crash.

Codes "02"   through "24" identify occupants who die in the period of time between one and a half hours from the time of the crash to twenty-four hours after the crash. Code the time between crash and death to the nearest hour except for code "24" which is used only for the period between twenty-three and a half hours after the crash and twenty-four hours after the crash.

Codes "31"   through "60" identify occupants who die in the period of time between greater than twenty-four hours after the crash and thirty days after the crash (24 hours and one minute is coded as "31" while 24 hours is coded as "24"). (**NOTE:** One day = "31", two days = "32", ..., twentynine days = "59", and thirty days = "60".) The number of days is rounded off to the nearest whole day except for code "60" which is used for the period between twenty- nine days and twelve hours and thirty days after the crash.

Code "96"   (Fatal — ruled disease) 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.)

Variable Name: Time to Death (cont'd.)

Code "96" (Fatal — ruled disease) is used additionally 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.

Code "99" (Unknown) is used when the length of time between the time of the crash and the time the person was pronounced dead by a qualifying person (coroner, state medical examiner, etc.) is unknown. Do not code "01" unless the length of time is known to be less than one and one -half hours. Autopsy reports do not always specify time to death; thus, emergency room records must always be sought even when it is known that an autopsy report can be obtained.

The exact time period which applies to each code is shown in the table below.

Code	Time period in hours				Code	Time period in days			
01	0	-	< 1	½	31	> 1	-	< 1	½
02	1 ½	-	< 2	½	32	1 ½	-	< 2	½
03	2 ½	-	< 3	½	33	2 ½	-	< 3	½
04	3 ½	-	< 4	½	34	3 ½	-	< 4	½
05	4 ½	-	< 5	½	35	4 ½	-	< 5	½
06	5 ½	-	< 6	½	36	5 ½	-	< 6	½
07	6 ½	-	< 7	½	37	6 ½	-	< 7	½
08	7 ½	-	< 8	½	38	7 ½	-	< 8	½
09	8 ½	-	< 9	½	39	8 ½	-	< 9	½
10	9 ½	-	< 10	½	40	9 ½	-	< 10	½
11	10 ½	-	< 11	½	41	10 ½	-	< 11	½
12	11 ½	-	< 12	½	42	11 ½	-	< 12	½
13	12 ½	-	< 13	½	43	12 ½	-	< 13	½
14	13 ½	-	< 14	½	44	13 ½	-	< 14	½
15	14 ½	-	< 15	½	45	14 ½	-	< 15	½
16	15 ½	-	< 16	½	46	15 ½	-	< 16	½
17	16 ½	-	< 17	½	47	16 ½	-	< 17	½
18	17 ½	-	< 18	½	48	17 ½	-	< 18	½
19	18 ½	-	< 19	½	49	18 ½	-	< 19	½
20	19 ½	-	< 20	½	50	19 ½	-	< 20	½
21	20 ½	-	< 21	½	51	20 ½	-	< 21	½
22	21 ½	-	< 22	½	52	21 ½	-	< 22	½
23	22 ½	-	< 23	½	53	22 ½	-	< 23	½
24	23 ½	-	24		54	23 ½	-	< 24	½
					55	24 ½	-	< 25	½
					56	25 ½	-	< 26	½
					57	26 ½	-	< 27	½
					58	27 ½	-	< 28	½
					59	28 ½	-	< 29	½
					60	29 ½	-	30	

Variable Name: 1st Medically Reported Cause of Death
2nd Medically Reported Cause of Death
3rd Medically Reported Cause of Death

Element Values:

00   Not fatal or no additional causes
Code the Occupant Injury from line number(s) for the medically reported injury(s)
which 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) (sp ecify)
99   Unknown

Source: Zone Center determined from official records

Remarks:

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 coded. If the occupant was not fatally injured, then these variables must all be coded "00" (Not fatal or no additional causes). 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 code OA67 as "99" (Unknown) and OA68 and OA69 as "00" (Not fatal or no additional causes). 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 code OA67, and/or OA68, and/or OA69 with an appropriate coded injury row(s).

Code the row number(s) of the injury(s), from the Occupant Injury Form, which caused the death. If only one injury is reported as, or determined to be, the cause of death, code that injury row's number for OA67 and code OA68 and OA69 as "00" (Not fatal or no additional causes). The same logic applies if two injuries are reported.

Code up to three specific injuries detailed in a medically reported "cause of death" statement.

OA67
OA68
OA69
(2)

Variable Name: 1st Medically Reported Cause of Death
2nd Medically Reported Cause of Death
3rd Medically Reported Cause of 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.

Code "96"   (Mode of death given but specific injuries are not linked to cause of death) is used when it is determined that the occupant qualifies for code "1" (Fatal) in variable OA62, Treatment — 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 code is also used when the cause of death is reported from complications or consequences of injuries.

Code "97"   (Other result) is used when it is determined that the occupant qualifies for code "2" (Fatal-ruled disease) in variable OA62, Treatment — Mortality.

If no cause of death is directly from an injury and there is no officially reported mode of death, then encode OA67 as "97" (Other result) and OA68 and OA69 as "00" (Not fatal or no additional causes).

Variable Name: Number of Recorded Injuries for This Occupant

Element Values:

Range: 00-96, 97, 99

00   No recorded injuries
Code the actual number of injuries recorded for this occupant
97   Injured, details unknown
99   Unknown if injured

Source: Zone Center determined — inputs include official medical records and interviewee data from the PSU.

Remarks:

The Zone Center will record this occupant's total number of coded injury rows that were recorded on the Occupant Injury Form.

Code "00"   (No recorded injuries) is used when the occupant is uninjured.

Code "97"   (Injured, details unknown) is used when the occupant is injured but the details are unknown. This means that the source(s) of injury information does not have sufficient injury detail to allow for the coding of injury data on the Occupant Injury Form.

Code "99"   (Unknown if injured) is used when it is unknown if the occupant was injured.

If "00", "97", or "99" is coded, then the Occupant Injury Form is not used.

Variable Name: Glasgow Coma Scale (GCS) Score (at Medical Facility)

Element Values:

    00   Not injured
    01   Injured — not treated at medical facility
    02   No GCS Score at medical facility
    03-15 Code the actual value of the initial GCS Score recorded at medical facility
    97   Injured, details unknown
    99   Unknown if injured

Source: Zone Center determined from official medical records.

Remarks:

Code "00"   (Not injured) is used when the occupant sustained no injuries as a result of the crash. Use this code whenever OA70, Number of Recorded Injuries for This Occupant, equals "00" (No recorded injuries).

Code "01"   (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 code 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.

Code "02"   (No GCS Score at medical facility) is used when the occupant was injured (*i.e.*, OA70, Number of Recorded Injuries for This Occupant, equals "01" through "96") <u>and</u> received professional medical treatment but no Glasgow Coma Scale Score was assessed or recorded at a medical facility. Use this code 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 (*i.e.*, codes "03" through "15") at the medical facility.

    If a person was treated at a medical facility and their medical records are pending, then use this code.

**Codes "03"
 through "15"**   report the actual value of the *initial* GCS score obtained at a medical facility [*i.e.*, OA63 , Type of Medical Facility (for Initial Treatment), equals "1" through "8"]. The Glasgow Coma Scale assesses three neurologic functions: **eye opening**, **motor response**, and **verbal response**. The GCS value can often be found in medical records by looking for the abbreviation " **GCS**". The number following the abbreviation is the score unless the value is less than "03" or greater than "15". It is not uncommon to find the GCS Score accompanied by information about eye pupil size and motor strength.

Variable Name: Glasgow Coma Scale (GCS) Score [Cont'd.]

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 coded in the following order:

(a)   code the GCS Score from the medical record with the earliest time to hospital treatment (*i.e.*, code ER record over discharge summary)

(b)   code 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, code the lowest GCS Score.

Code "15"   is encoded 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.

Code "97"   (Injured, details unknown) is used when the occupant is injured but the details are unknown. Use this code whenever OA70 Number of Recorded Injuries for This Occupant, equals "97" (Injured, details unknown).

Code "99"   (Unknown if injured) is used when it is unknown if the occupant was injured. Use this code whenever OA70, Number of Recorded Injuries for This Occupant, equals "99" (Unknown if injured).

Variable Name: Was the Occupant Given Blood?

Element Values:

1   No — blood not given
2   Yes — blood given (specify units)
9   Unknown if blood given

Source: Zone Center determined from official medical records or Emergen cy Medical
               Service (EMS) reports.

Remarks:

In general, blood consists of red blood cells (erythrocytes), white blood cells (leukocytes) and platelets (thrombocytes) suspended in plasma. In a transfusion, blood can be given in four separate forms: whole blood, packed red blood cells, plasma, or platelets; or in a combination of these forms.

Whole blood is blood from which none of the elements have been removed.

Packed red blood cells are whole blood from which plasma has been removed.

Plasma is the fluid (pale yellow liquid) of the blood in which the particulate components are suspended. Plasma is often given to burn patients.

Platelets are known for their role in blood coagulation. Platelets are often given when blood clotting is desired.

Code "1"   (No — blood not given) is used whenever OA71, Glasgow Coma Scale (GCS)
              Score equals "00" (Not injured) or "01" (Injured - not treated at medical facility) or
              it is known that the person did not receive any professional treatment. In addition,
              use this code when:

              ☞ it is known that the occupant was injured and not given blood; or

              ☞ an occupant is transported and released **and** not subsequently hospitalized
                  [*i.e.*, OA62, Treatment — Mortality, equals "4" (Transported and released) or
                  "6" (Treatment later)], independent of whether the occupant's records are
                  acquired.

Code "2"   (Yes — blood given) is used 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, write down the number of units of blood given. Do not specify
              the type of blood transfusion.

Variable Name: Was the Occupant Given Blood?

Code "9"   (Unknown if blood given) is used whenever OA70, Number of Recorded Injuries for This Occupant, equals "97" (Injured, details unknown) or "99" (Unknown if injured). In addition, use this code when the occupant is:

☞ injured and treated at a medical facility [*i.e.*, OA71, Glasgow Coma Scale (GCS) Score equals "02" through "15"] 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.

Variable Name: Arterial Blood Gases (ABG) - HCO_3

Element Values:

Range: 00-50, 96, 97, 99
  00   Not injured
  01   Injured, ABGs not measured or reported
  02-50 Code the actual value of the HCO_3
  96   ABGs reported, HCO_3 unknown
  97   Injured, details unknown
  99   Unknown if injured

Source: Zone Center determined from official medical records.

Remarks:

The table below presents the normal measures of arterial blood gases followed by the definitions of these measures and other keywords.

Arterial Blood Gases (ABGs)

Measure	Normal	Respiratory acidosis	Respiratory alkalosis	Metabolic acidosis	Metabolic alkalosis
pH	7.35 to 7.45	Normal or decreased	Increased	Decreased	Increased
PO_2	90 to 95 mm Hg	Decreased	Altered	Normal or increased	Normal or decreased
PCO_2	34 to 46 mm Hg	Increased	Decreased	Decreased	Increased
HCO_3	24 to 26 mEq/L	Increased	Decreased	Decreased	Increased
RR	10/min to 20/min	Irregular	Altered	Increased	Decreased

Definitions of Measures

pH   — the symbol relating the hydrogen ion (H^+) concentration or activity of a solution to that of a given standard solution. Numerically the pH is approximately equal to the negative logarithm of H^+ concentration expressed in molarity. **pH** 7 is neutral; above it alkalinity increases and below it acidity increases.

Variable Name: Arterial Blood Gases (ABGs) — HCO_3 (Cont'd.)

PO_2, pO_2, Po_2 oxygen partial pressure (tension).

PCO_2, pCO_2, Pco_2   carbondioxide partial pressure or tension.

HCO_3   bicarbonate radical.

RR   respiratory rate.

Alphabetical Definitions of Keywords

acidosis   (as"i-do/sis) — a pathologic condition resulting from accumulation of acid or depletion of the alkaline reserve (bicarbonate content) in the blood and body tissues, and characterized by an increase in hydrogen ion concentration (decrease in pH). **metabolic a**. — a disturbance in which the acid-base status of the body shifts toward the acid side because of loss of base or retention of noncarbonic, or fixed (nonvolatile), acids; called also nonrespiratory a. **respiratory a.** — a state due to excess retention of carbon dioxide in the body; called also hypercapnic a.

alkali   (al/kah-li) — any of a class of compounds which form soluble soaps with fatty acids ... and form soluble carbonates.

alkalosis   (al"kah-lo/sis) — a pathologic condition resulting from accumulation of base, or from loss of acid without comparable loss of base in the body fluids, and characterized by decrease in hydrogen ion concentration (increase in pH). **metabolic a.** — a disturbance in which the acid-base status of the body shifts toward the alkaline side because of retention of base or loss of noncarbonic, or fixed (nonvolatile), acids. **respiratory a**. — a state due to excess loss of carbon dioxide from the body.

anion   (an/i-on) — an ion carrying a negative charge owing to a surplus of electrons.

bicarbonate   (bi-kar/bo-na⁻t) — any salt containing the HCO_3^- anion. **blood b**. — the bicarbonate of the blood, an index of the alkali reserve.

ion   (i/on) — an atom or radical having a charge of positive (cation) or negative (anion) electricity owing to the loss (positive) or gain (negative) of one or more electrons.

mEq/L   milliequivalent per liter: a milliequivalent is the number of grams of a solute contained in one milliliter of a normal solution; therefore, the normal range for the bicarbonate of blood is 0.024–0.026 grams per milliliter. Thus, for a thousand milliliters, the normal values become 24 to 26 grams.

Variable Name: Arterial Blood Gases (ABGs) - HCO_3 (Cont'd.)

Medical records often provide ABG information in a condensed format. For example, a medical record presented the ABG information as follows.

ABG: 7.56 / 25 / 171 / 100 %

This equates to: pH = 7.56; PCO_2 = 25; PO_2 = 171 -- at 100 percent saturation

In this example, the measure desired is not reported; use code "96" (ABGs reported, HCO_3 unknown). The measure of interest is the HCO_3 (also referred to as the **bicarbonate**). Researchers must look carefully at their reported ABGs to insure that the desire measure is being obtained. The closeness in range between the normal values of HCO_3 and PCO_2, makes mistaking them easy. In general, when ABGs are reported as a set of three values, consider them to be the pH, PO_2, and PCO_2.

Code "00" (Not injured) is used when the occupant sustained no injuries as a result of the crash. Use this code whenever OA70, Number of Recorded Injuries for This Occupant, equals "00" (No recorded injuries).

Code "01" (Injured, ABGs not measured or reported) is used when:

the occupant is injured (*i.e.*, OA70 , Number of Recorded Injuries for This Occupant, equals "01" -"96") *and*

(1) was not treated at a medical facility [*i.e.*, OA71 , Glasgow Coma Scale Score, equals "01" (Injured - not treated at medical facility)], or

(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.

**Codes "02"
through "50"** are used to report the measured HCO_3 (bicarbonate) value obtained for this occupant. If multiple ABG HCO_3 values are reported, code the lowest value.

Code "96" (ABGs reported, HCO_3 unknown) is used when ABG value(s) are reported in this occupant's medical records but the HCO_3 measure is unknown.

Code "97" (Injured, details unknown) is used when the occupant is injured but the details are unknown. Use this code whenever OA70, Number of Recorded Injuries for This Occupant, equals "97" (Injured, details unknown).

Code "99" (Unknown if injured) is used when it is unknown if the occupant was injured. Use this code whenever OA70, Number of Recorded Injuries for This Occupant, equals "99" (Unknown if injured).

OA74

Variable Name: Primary Source of Belt Use Determination

Element Values:

0	Not equipped/not available/destroyed or rendered inoperative
1	Vehicle inspection
2	Official injury data
3	Driver/occupant interview
8	Other (specify):
9	Unknown if belt used

Source: Researcher determined.

This variable is designed to provide the users with the primary source of information used by the researcher in determining if the vehicle occupants were restrained. Note: Do not use the police crash report as a source for coding this variable. If multiple sources of information are available, select codes in the order listed. Priority is given to the lower numbered code.

Code "0" (Not equipped/not available/destroyed or rendered inoperative) is used when the researcher determines from the vehicle inspection, interview, or medical sources that: (1) at the time of the crash the designated seating position, that the occupant was in, was not equipped with a manufacture installed or post manufacture installed manual or automatic belt (lap, shoulder, or lap and shoulder); (2) the occupant was not in a designated seating position (*e.g.*, on the floor); (3) the occupant was not the person assigned the designated seating position and was not using a manual or automatic belt (*e.g.*, sitting side-by-side); or (4) the manual or automatic belt, initially installed at this occupant's seating position, was subsequently removed, destroyed, or rendered inoperative (*e.g.*, unbolted, cutout, etc.).

Code "1" (Vehicle inspection) is used when conclusive evidence from the vehicle inspection indicates that the occupant was or was not restrained by a manual or automatic belt at the time of the crash.

Code "2" (Official injury data) is used when information (*e.g.*, injury patterns) from an autopsy report or hospital medical record indicates that the occupant was or was not restrained by a manual or automatic belt at the time of the crash. Code "1" above takes precedence over this code.

Code "3" (Driver/occupant interview) is used when the researcher is confident that reliable information from the driver or occupant interview indicates that the occupant was or was not restrained by a manual or automatic belt at the time of the crash. Codes "1" and "2" above take precedence over this code.

Code "8" [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. Codes "1", "2", and "3" above take precedence over this code.

Code "9" (Unknown if belt used) is used when the researcher is not able to determine from available information if the occupant was or was not restrained by a manual or automatic belt at the time of the crash. This includes hit-and-run crashes. Codes

"1", "2", "3", and "8" above take precedence over this code.

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

OCCUPANT INJURY FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number ___ ___

2. Case Number - Stratum ___ ___ ___ ___

3. Vehicle Number ___ ___

4. Occupant Number ___ ___

INJURY DATA

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

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

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

OCCUPANT INJURY CLASSIFICATION

Body Region

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

Type of Anatomic Structure

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

Specific Anatomic Structure

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

The exceptions to this rule apply to:

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

Head - LOC
(02) Length of LOC

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

(10) Concussion

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

Level of Injury

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

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

Abbreviated Injury Scale

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

Aspect

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

SOURCE OF INJURY DATA

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

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

INJURY SOURCE CONFIDENCE LEVEL

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

DIRECT/INDIRECT INJURY

(1) Direct contact injury
(2) Indirect contact injury
(3) Noncontact injury
(4) Air bag related injury
(7) Injured, unknown source

FRONT

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

LEFT SIDE

(051) Left side interior surface, excluding hardware or armrests
(052) Left side hardware or armrest
(053) Left A (A1/A2)-pillar
(054) Left B-pillar
(055) Other left pillar (specify):
_____
(056) Left side window glass
(057) Left side window frame
(058) Left side window sill
(059) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(060) Other left side object (specify):
_____

RIGHT SIDE

(101) Right side interior surface, excluding hardware or armrests
(102) Right side hardware or armrest
(103) Right A (A1/A2)-pillar
(104) Right B-pillar
(105) Other right pillar (specify):
_____
(106) Right side window glass
(107) Right side window frame
(108) Right side window sill
(109) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(110) Other right side object (specify):
_____

INTERIOR

(151) Seat, back support
(152) Belt restraint webbing/buckle
(153) Belt restraint B-pillar or door frame attachment point
(154) Other restraint system component (specify):
_____
(155) Head restraint system
(160) Other occupants (specify):
_____
(161) Interior loose objects
(162) Child safety seat (specify):
_____
(163) Other interior object (specify):
_____

AIR BAG

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

ROOF

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

FLOOR

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

REAR

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

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT

(401) Hand controls for braking/acceleration
(402) Steering control devices (attached to OEM steering wheel)
(403) Steering knob attached to steering wheel
(405) Replacement steering wheel (i.e., reduced diameter)
(406) Joy stick steering controls
(407) Wheelchair tie-downs
(408) Modification to seat belts, (specify):
_____
(409) Additional or relocated switches, (specify):
_____
(410) Raised roof
(411) Wall mounted head rest (used behind wheel chair)
(412) Other adaptive device (specify):
_____
_____

EXTERIOR of OCCUPANT'S VEHICLE

(451) Hood
(452) Outside hardware (e.g., outside mirror, antenna)
(453) Other exterior surface or tires (specify):
_____
_____
(454) Unknown exterior objects

EXTERIOR OF OTHER MOTOR VEHICLE

(501) Front bumper
(502) Hood edge
(503) Other front of vehicle (specify):
_____
(504) Hood
(505) Hood ornament
(506) Windshield, roof rail, A-pillar
(507) Side surface
(508) Side mirrors
(509) Other side protrusions (specify):
_____
(510) Rear surface
(511) Undercarriage
(512) Tires and wheels
(513) Other exterior of other motor vehicle (specify):
_____
(514) Unknown exterior of other motor vehicle

OTHER VEHICLE OR OBJECT IN THE ENVIRONMENT

(551) Ground
(598) Other vehicle or object (specify):
_____
(599) Unknown vehicle or object

NONCONTACT INJURY

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

INJURY DATA OVERVIEW

The Occupant Injury Form is a complete coded reduction of all injuries sustained by each injured occupant of a towed CDS applicable vehicle. The injuries are reported using a series of numeric codes to form a description of the injury, its severity, and associated information. The associated information includes the source of the injury data, the source of the injury, the confidence the Zone Center coder has in assigning that particular injury source, the directness of the injury as a result of a remotely applied force, and the relatedness of the injury to a vehicle intrusion. These data are grouped by columns and titles as seen on the form. The variable numbers are consecutive, and there is no theoretical upper limit to the number of injuries that can be coded.

Historically, injury information has provided a measure of the severity of the crash from the occupant's frame of reference. Beginning in 1993 the NASS CDS adopted the Association for the Advancement of Automotive Medicine's (AAAM) Abbreviated Injury Scale 1990 Revision (AIS 90), with a minor modification to include the injury aspect. The 1993 NASS CDS version of AIS 90 describes an injury and its severity based on an 8 digit numeric coding system. It includes the Body Region, Type of Anatomic Structure, Specific Anatomic Structure, Level of Injury, AIS Severity, and Aspect. This provides a complete coded description of the injury in an analyzable format that is widely accepted and can be compared against other injury assessment studies.

In past crash research, injury information by itself was often used as a measurement scale but still was incomplete in that the mechanism causing the injury was unknown. To rectify this situation, the early NASS included variables to report the object which caused the injury and later added variables to report whether the object intruded into the occupant's seating position and whether or not the injury was caused by direct contact with the object. Since the codes for these variables are based at times on less than concrete evidence, it was necessary to evaluate the reliability of the data by adding a variable for confidence level.

The availability of reliable injury information has long been a concern. In many of the prior crash research studies, injury data were accepted only from a medically qualified source such as a hospital or a physician. Problems in acquiring the injury information from official medical sources have led to allowing the researcher to obtain injury descriptions from the occupant or selected surrogates (*e.g.* Interviewee injury information). In allowing interviewee injury information, it is necessary to segregate the data by source since interviewee information are known to be less than totally reliable at times. The variable "Source of Injury Data" answers this need.

The addition of these associated variables to the coded injuries (AIS 90) has created a data base which can be analyzed for direct evaluation of some of the Federal Motor Vehicle Safety Standards (FMVSS). These standards came into being because of concerns about the injuries sustained in crashes in the early 1960's. Areas such as driver education and training and driver licensing criteria were found to be an inefficient means of reducing injuries to crash victims on the highways. This left occupant protection and injury reduction as the areas in which to focus. Attention was focused on the vehicle. Hard, unforgiving interior surfaces were removed; steering columns were

INJURY DATA OVERVIEW – Cont.

designed to collapse into the engine compartment rather than impale the driver, and many of the projecting knobs and other surfaces were rounded, moved, or softened. Vehicles were designed to absorb the impact forces rather than transfer the force to the occupants. Many other improvements in overall vehicle design have taken place to satisfy the requirements specified by the FMVSS. These improvements were implemented by the automobile manufacturers and are monitored and tested by NHTSA. Much of the monitoring now comes from analyzing data provided by real world experience. All the standards can be evaluated to some extent using data from these variables.

Analysts may use these data to identify the injury severity levels of crashes, search for particular injury sources, determine direct versus indirect injury mechanism ratios, relate percentage of injuries by Body Region, Type of Anatomic Structure, Specific Anatomic Structure, Level of Injury, AIS severity level, and Aspect, and compare many other data combinations. These relationships can be determined by using the data from these variables. Comparisons with other variable groups can also be used to explore additional relationships. For example, comparisons of restraint use versus type of injuries (Type of Anatomic structure, Specific Anatomic structure, AIS level, etc) should show a direct correlation between restraint use and injury reduction. If such a correlation is not demonstrated, further exploration into the data and possibly additional detailed analyses are needed. Addition of delta V (change in velocity) levels to the comparison might show that at some speeds (*e.g.* very low and very high), the injury levels are the same regardless of restraint use. To continue the analyses, type of injury would be examined in the areas where AIS levels are the same. Also, the number of injuries would be a relevant data item for inclusion in the comparison.

All of the above mentioned comparisons and analyses are just a few examples of the uses for the data that are encoded here. For the Zone Center, these variables, for the most part, represent a distillation of several data sources. The injuries are coded from information found on the medical records, supplemented by the interviewee descriptions. The Injury Source and Occupant Area Intrusion Number will be obtained from the inspection of the vehicle interior. Injury Source Confidence Level and Direct/Indirect Injury are based on the Zone Center's assessment of all available information. The Zone Center's determination of injury source is derived primarily from vehicle data, occupant kinematics, interview data and official medical records.

INJURY DATA OVERVIEW – Cont.

Official Injury Data Documentation on Diagrams
Specific Medical Record Data Used in Coding AIS 90

The injury data from official medical records should be indicated on the appropriate diagram. There are three Official Injury Data diagrams. The first, for soft tissue injuries, is on **Page 3** of the Occupant Injury Form. The second, on **Page 4**, is for skeletal injuries; the third, on the reverse of **Page 3**, is for injuries to internal organs. Injuries should be clearly and precisely located on the diagrams, and the medical record classification of the injury and its extent should be completely annotated. All data used to code the AIS 90 version of injuries [*e.g.*, size of lacerations, the first observed level of consciousness by a medical authority, loss of consciousness, size of hematoma or hemothorax (in "cc"s of blood), etc.] should be written on the diagram.

OI05 et al.-OI14 et al.
(4)

INJURY DATA OVERVIEW

NASS CDS Injury Information Coding

With the implementation of the 1993 data collection year, the Zone Centers began coding all NASS CDS injury information. In support of this effort, the NASS CDS Primary Sampling Units (PSU) are required to follow the protocol outlined below:

- Review all sources of crash information (*i.e.*, police reports, newspapers, medical records, interview information, etc.) that will support injury coding and extract and code useful data on demographics and crash circumstances, including occupant information, restraint data, alcohol and injury consequences;

- Obtain and complete the interview injury information on the Interview Form mannequin;

- Obtain and submit any official medical records as initial or update submissions (see procedure on next page);

- Continuously track the acquisition of medical records and report any significant delays to the Zone Center;

- Immediately report any changes in hospital cooperation which affect timeliness of submission and/or quality of data to the Zone Center and COTR.

- Thoroughly examine and document the interior and exterior of the vehicle for occupant contact points.

- Complete the Vehicle Interior Sketch on page 4 of the Interior Vehicle Form. Be sure to note areas of ejection and/or entrapment.

- Obtain all required photographs for case documentation and submission (see NASS Vehicle Photography Guideline requirements).

- Contact points must be highlighted with incremented tape.

- Document up to fifteen (ten are coded) most severe intrusions on the Intrusion Work Sheet on the back of page 1 of the Interior Vehicle Form.

- Intruded areas must be sketched.

- All areas where an occupant contact is known or suspected must be annotated.

OI05 et al.-OI14 et al.
(5)

INJURY DATA OVERVIEW – Cont.

PSU Procedure For Submission of Official Injury Information

With the implementation of the 1993 data collection year, the Zone Centers began coding all NASS CDS injury information. In support of this effort, the NASS CDS Primary Sampling Units (PSU) are required to submit all official injury information following the protocol outlined below:

Initial Submissions of Official Injury Records:

- The team shall print the following information on each official injury record:

   PSU and Case Number,
   Vehicle Number, and
   Occupant Number.

- The teams shall enclose all of the official injury information record(s) in a 9 x 12 inch manila envelope for *each* case.

- The team shall include the following information for each official injury record on the envelope. A pre-printed label (see Figure 1 on next page) will be provided by Headquarters. One Label per injured occupant shall be completed.

   PSU and Case Number,
   Vehicle Number,
   Occupant Number, and
   Type of Medical(s) enclosed.

- The envelope shall then be included with the casework after the last Occupant Assessment Form(s).

- Administrative Log-A variable ADL16 (Injury Coding Required?) must be coded as "1" (Yes).

- Occupant Assessment Log variable OAL14 (Was This Occupant Injured?) must be coded as "1" (Yes).

Update Submissions

If an official injury information record was submitted with the initial submission then complete the following:

- The team shall print the following information on each official injury record:

   PSU and Case Number,
   Vehicle Number, and
   Occupant Number.

MEDICAL ENVELOPE INJURY LABEL

U.S. DOT/NHTSA   NASS/CDS

INJURY INFORMATION

TO BE COMPLETED BY TEAM

1. PSU Number   ___ ___

2. Case Number—Stratum   ___ ___ ___ ___

3. Vehicle Number   ___ ___

4. Occupant Number   ___ ___

5. Type of Medical Information

   Official

   a. Autopsy (invasive examination)   ____
   b. Post-ER medical record which
      includes information about death
      based on non-invasive examination   ____
   c. Admission record/summary or
      admission/discharge face sheet   ____
   d. Discharge summary   ____
   e. Operative report   ____
   f. Radiographic record(s) (X-ray, CT scan)   ____
   g. History and physical examination
      and/or consultation records   ____
   h. Emergency room records (includes nurses'
      notes)   ____
   j. Private physician   ____

   Unofficial

   k. Lay Coroner   ____
   l. EMS record   ____

HS Form 431G (1/96)

FIGURE 1

PSU

For code "5", check each type of document included with your initial case submission.

Zone Center

Add check marks as needed to reflect additional types of medical records obtained through the update process.

OI05 et al.-OI14 et al.
(7)

INJURY DATA OVERVIEW – Cont.

PSU Procedure For Submission of Official Injury Information (Continued)

Update Submissions (Continued)

- The official injury information record(s) shall be attached to the back of a completed Update Form (HS Form 433C). These updates shall be submitted in accordance with procedures listed in section 5.2 (Case Submission — Case Envelope). See page 81, paragraph 7.

If an official injury information record was *not* submitted with the initial submission then complete the following:

- The team shall print the following information on each official injury record:

  PSU and Case Number,
  Vehicle Number, and
  Occupant Number.

- The teams shall enclose all of the official injury information record(s) in a 9 x 12 inch manila envelope for *each* case.

- The team shall include the following information for each official injury record on the envelope. A pre-printed label will be provided by Headquarters. One label per injured occupant shall be used.

  PSU and Case Number,
  Vehicle Number,
  Occupant Number, and
  Type of Medical(s) enclosed.

- The envelope containing the official injury information record(s) for this case shall be attached to the back of a completed Update Form(s) (HS Form 433C). These update envelopes shall be combined with all other updates and submitted in accordance with procedures listed in section 5.2 (Case Submission — Case Envelope). See page 81, paragraph 8.

INJURY DATA OVERVIEW – Cont.

NASS CDS PSU Official Medical Record Acquisition Procedure

The procedure that shall be followed by NASS CDS PSUs for obtaining official medical records from medical facilities for injured crash victims are as follows:

1. Review the PAR for occupant injury status to determine the vehicle occupants for which an official medical record should be obtained.

2. Request official medical records within two days of the sample date for each injured occupant of a CDS applicable vehicle where a patient release form is not required.

3. Review the injury information on the Interview Form obtai ned from interviewees and other unofficial sources to ascertain if any occupant of a CDS applicable vehicle received treatment from a medical facility or physician, including follow-up treatment. Ensure that official injury records have been requested or obtained. Obtain a signed medical release form if required.

4. Verify that the facility listed by the interviewee is consistent with the facility from which records were originally requested.

5. Review the official medical record to determine if all appli cable records are obtained (*i.e.*, a Discharge Summary is required for admitted occupants). If required, request additional records immediately.

6. For teams that transcribe medical data, if the official medical record indicates a possible injury source (*i.e.*, specific vehicle component or other object), the researcher must ensure that the data is part of the injury documentation.

NASS CDS Official Medical Record Coding Procedure

1. Review the official medical record for information such as names, addr esses, and phone numbers that will help in contacting occupants or locating vehicles.

2. Review the official medical record for information to code the alcohol and drug variables.

3. Review the official medical record obtained to determine the treatment level or mortality of this occupant.

OI05 et al.-OI14 et al.
(9)

INJURY DATA OVERVIEW – Cont.

NASS Zone Center Injury Coding Overview

The Zone Centers are required to follow the protocol outlined below for completion of injury information coding.

- All injury information will be coded by Zone Center personnel and selected qualified PSU researchers trained in AIS 90 coding procedures. Qualified PSU researchers are selected for injury coding at the discretion of their respective Zone Center with COTR approval;

- No Zone Center Team Coordinator shall code more than 50% of their assigned team cases;

- Injury mechanisms shall be assigned by team coordinators or other senior case reviewers;

- Zone Centers shall code the following Occupant Assessment Form variables:

  OA66 Time to Death;
  OA67-69 Medically Reported Cause(s) of Death;
  OA70 Number of Recorded Injuries for this Occupant;
  OA71 Glasgow Coma Scale (GCS) Score;
  OA72 Was the Occupant given Blood?, and;
  OA73 Arterial Blood Gases (ABG) - HCO_3.

- If all of the applicable injury Information is submitted with the case then the injury information shall be added to a case within 30 days of the date the hard copy is received at the Zone Center. Injury information submitted as an "update" shall be coded within 2 weeks of receipt, and;

- The Zone Center shall be responsible for identification of cases with injury information and log data record keeping.

NASS Zone Center Quality Assurance Measures:

- An in-house review of injury information coded by the Zone Center injury staff (including coordinators) shall be made by an expert injury coding reviewer on 10% of cases coded, and;

- A sample of approved cases will be selected by NCSA to be shipped to the Field Operations Branch for review and evaluation. This includes copying and submitting cases to the other Zone Center for comparison coding. The final coding of each of the Zone Centers will be analyzed by the staff of the Field Operations Branch. Coding inconsistencies will then be discussed with the two Zone Centers and corrective measures taken if appropriate.

- OI05 et al.-OI14 et al.
(10)

INJURY DATA OVERVIEW – Cont.

NASS Zone Center Injury Coding Procedures

The procedure that shall be followed by NASS Zone Centers in performing the injury coding tasks are as follows:

1. Determine if the official medical record(s) obtained are appropriate for this occupant. Correct or update the Occupant Assessment Log Form.

2. Review the official medical records to identify NASS codable injuries as defined in the *NASS Injury Coding Manual* Highlight or underline these injuries.

3. Review the Interview Form for injury data from interviewees and other unofficial sources to ascertain NASS codable injuries. Verify that all required information is transcribed onto the unofficial data mannequin. Make corrections as needed.

4. Combine and review the official and unofficial injury information to determine which injuries should be coded on the Occupant Injury Form.

Occupant Injury Form
5. List the NASS codable injuries on the "Official Mannequin" of the Occupant Injury Form. Include all the information required to meet the NASS standard specified in the Documentation of Official Data on Mannequin.

6. Code all the injuries on the Occupant Injury Form using the most current ver sion of the *NASS Injury Coding Manual* as the primary source.

7. Determine the injury source mechanisms for all injuries. Evaluate the vehicle inspection information, including the PDOF, the interior vehicle damage sketches, the occupant contact points, the restraint information, and the photographic documentation to identify injury mechanisms for each injury. Make corrections as needed.

8. Determine and code the confidence level of the injury source for each line of injury coded.

OI05 et al.-OI14 et al.
(11)

INJURY DATA OVERVIEW – Cont.

NASS Zone Center Injury Coding Procedures (Continued)

Interior Vehicle Form
9.   Verify the accuracy of the coded occupant area intrusions. Make corrections as needed and complete the appropriate Interior Vehicle Log variables.

10.   Determine if an injury resulted from an intruded component. Compare the injury and injury source to the "Occupant Area Intrusion" and the "Intrusion Work Sheet" of the Interior Vehicle Form.

Occupant Injury Form
11.   Code the "Occupant Area Intrusion Number" from the "Occupant Area Intrusion" information on the Interior Vehicle Form.

12.   Complete the Occupant Injury Log information.

13.   Check all updatable variables and recode based on injury information reviewed.

Variable Name: Source of Injury Data
   (1st through 10th or higher)

Element Values:

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

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

Source: Element chosen

Remarks:

Code "1"   (Autopsy records with or without hospital/medical records) excludes records from lay, nonmedical personnel; they must be the result of an autopsy by a physician or other similarly qualified life scientist. A non-invasive external examination by a physician, though, should be coded either "2" (Hospital medical records other than emergency room) or "4" (Private physician, walk-in or emergency clinic) since it is generally a superficial listing of external injuries and possible internal injuries; therefore, injuries from a non-invasive exam should not be grouped with those from a thorough autopsy report.

Code "2"   [Hospital/medical records other than emergency room (*e.g.*, discharge summary)] is used whenever the injury is listed on the official post-emergency room records of a hospital or medical facility. If the injury was also listed on a facility's associated emergency room records, then the "2" code takes precedence. If the injury is also contained in an autopsy record --where the autopsy was performed by a physician or similarly qualified life scientist --then, code "1" (Autopsy records with or without hospital/medical records) takes precedence. However, this code includes non-invasive (external) examinations conducted by a physician on a deceased victim and documented as a hospital or medical examiner's record.

Code "3"   [Emergency room records only (including associated x-rays or other lab reports)] is used when the injury only appears on a facility's emergency room record or on records that were completed in support of the person's examination in an emergency room. For example, an x-ray report that was completed because the emergency room physician requested it as a part of his/her examination would be included under this code. This code should not be used if the injury is subsequently listed on a post-emergency room record in a medical autopsy.

Variable Name: Source of Injury Data
(1st through 10th or higher)

If both types of records (emergency room and post-emergency room) refer to the same injury, code "2" [Hospital/medical records other than emergency room (*e.g.*, discharge summary)] is used as the code even if the detail provided on the emergency room records exceeds the detail provided on the post-emergency room records.

Code "4"   (Private physician, walk-in or emergency clinic) 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).

In summary, examinations of deceased persons are distinguished first by qualifications of examiner [official (codes "1", "2", and "4") versus unofficial (code "5")], second by the type of examination [autopsy (code "1") versus non - invasive (codes "2" or "4")], and third by type of examination record [hospital (code "2") versus other than hospital (code "4")].

Code "5"   (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.

Code "6"   (E.M.S. personnel) 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.

Code "7"   (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.

Code "8"   (Other source) is used when data are obtained from an unofficial source different from those explicitly listed above (*e.g.*, chiropractors).

Code "9"   (Police) can be used, but only when ***no*** other source of injury information is available.

Variable Name: Body Region
(1st through 10th or higher)

Element Values:

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its body region and record it on the form.

Variable Name: Type of Anatomic Structure
                                (1st through 10th or higher)

Element Values:

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its type of anatomic structure and record it on the form.

Variable Name: Specific Anatomic Structure
(1st through 10th or higher)

Element Values:

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

Head – LOC
02   Length of LOC
04, 06, 08 Level of Consciousness
10   Concussion

Spine
02   Cervical
04   Thoracic
06   Lumbar

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its specific anatomic structure and record it on the form.

Variable Name: Level of Injury
(1st through 10th or higher)

Element Values:

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

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its level of injury and record it on the form.

Variable Name: Abbreviated Injury Scale
(1st through 10th or higher)

Element Values:

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 NASS Injury Coding Manual contains a listing of most injuries. Use the manual to code, for each injury, its A.I.S. value and record it on the form.

Variable Name: Aspect
(1st through 10th or higher)

Element Values:

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

Source: Variables OI05 et al., respectively

Remarks:

The 1993 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.

Variable Name: Injury Source
(1st through 10th or higher)

Element Values:

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

LEFT SIDE
(051)   Left side interior surface, excluding hardware or armrests
(052)   Left side hardware or armrest
(053)   Left A (A1/A2)-pillar
(054)   Left B-pillar
(055)   Other left pillar (specify):
(056)   Left side window glass
(057)   Left side window frame
(058)   Left side window sill
(059)   Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(060)   Other left side object (specify):

RIGHT SIDE
(101)   Right side interior surface, excluding hardware or armrests
(102)   Right side hardware or armrest
(103)   Right A (A1/A2)-pillar
(104)   Right B-pillar
(105)   Other right pillar (specify):
(106)   Right side window glass
(107)   Right side window frame
(108)   Right side window sill
(109)   Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
(110)   Other right side object (specify):

Variable Name: Injury Source (cont'd.)
(1st through 10th or higher)

INTERIOR
(151)   Seat, back support
(152)   Belt restraint webbing/buckle
(153)   Belt restraint B-pillar or door frame attachment point
(154)   Other restraint system component (specify):
(155)   Head restraint system
(160)   Other occupants (specify):
(161)   Interior loose objects
(162)   Child safety seat (specify):
(163)   Other interior object (specify):

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

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

Variable Name: Injury Source (cont'd.)
(1st through 10th or higher)

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

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

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT
(401)   Hand controls for braking/acceleration
(402)   Steering control devices (attached to OEM steering wheel)
(403)   Steering knob attached to steering wheel
(405)   Replacement steering wheel (*i.e*., reduced diameter)
(406)   Joy stick steering controls
(407)   Wheelchair tie-downs
(408)   Modification to seat belts,(specify):
(409)   Additional or relocated switches, (specify):
(410)   Raised roof
(411)   Wall mounted head rest (used behind wheel chair)
(412)   Other adaptive device (specify):

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

EXTERIOR OF OTHER MOTOR VEHICLE
(501)   Front bumper
(502)   Hood edge
(503)   Other front of vehicle (specify):
(504)   Hood
(505)   Hood ornament
(506)   Windshield, roof rail, A-pillar
(507)   Side surface
(508)   Side mirrors
(509)   Other side protrusions (specify):
(510)   Rear surface
(511)   Undercarriage
(512)   Tires and wheels
(513)   Other exterior of other motor vehicle (specify):
(514)   Unknown exterior of other motor vehicle

Variable Name: Injury Source (cont'd.)
                        (1st through 10th or higher)

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

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

Source: Zone Center determined --inputs include vehicle inspection, inte rviewee, and medical records.

Remarks:

Code "006"   (Combination of rim and hub/spokes) when there is an unspecified steering wheel injury source.

Code "015"   [Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, mirror, or steering assembly (driver side only)] should be used 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.

Variable Name: Injury Source (cont'd.)
(1st through 10th or higher)

Code "016"   [Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, or mirror (passenger side only)] should be used 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.

Code "17"   (Windshield reinforced by exterior object) is used when, for example, an occupant contacts a windshield which has been reinforced by the hood of the occupant's vehicle.

**Codes "059"
and "109"**   [Left (Right) side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail] apply when there is a simultaneous or continuous contact by a single Body Region of an occupant to the appropriate side window glass and at least one of the listed components. The window sill consists, for this element, of the upper portion of the side interior surface immediately adjacent to the bottom of the side window opening.

Child restraining devices have caused confusion when they are the source of the injury. The child restraint (*i.e.*, infant/child seat, booster seat, etc.) is considered to be an integral restraint (*e.g.*, the whole seat is the restraint). When the restraint is used by an infant or child it should be coded as one unit. In the CDS the analyst is concerned with the complete seat and its performance.

Code "162"   (Child safety seat) if contact with a child safety seat occurs from either (a) an infant or child restrained by the child safety seat or (b) any passenger including an infant or child who contacts a child safety seat but is not restrained by that seat.

When any body member of an infant or child restrained by child safety seat contacts an interior object other than the child safety seat, then code the appropriate interior object (*i.e.*, Seat, back support - code "151"; Head restraint system - code "155" etc.)

Code "598"   (Other vehicle or object) if an occupant of a vehicle in-transport impacts a parked (not in-transport) vehicle.

Code "601"   (Fire in vehicle) is used for injuries which resulted from heat or flame from fire. The origin of the fire is unimportant.

OI12
et al.
(6)

Variable Name: Injury Source (cont'd.)
(1st through 10th or higher)

Code "602"   (Flying glass) is used for injuries which resulted from interior flying glass. Interior flying glass refers to the occupant being injured by glass which has already fractured due to an impact to the vehicle containing the glazing before the occupant's kinematics allowed the person to physically come into contact with the glazing. The flying glass may or may not be airborne when it injures the occupant. This does not refer to an occupant injury caused by glazing which shattered upon being impacted by the occupant.

Code "603"   (Other noncontact injury source) is used for injuries which resulted from impact force (no contact), battery acid, etc. For a more detailed discussion see the NASS Injury Coding Procedures.

Code "604"   (Air bag exhaust gases) is used for injuries which resulted from burns sustained from gases released from an air bag during its inflation process at the time of the crash.

Use **Pages 8-10** of the Interview Form to record the interviewee reported injury source evidence and pages four and five of the Vehicle Interior Form to record the physical injury source evidence. The researcher should record only those contact mechanisms which can be documented by some physical evidence (*e.g.*, scuffs, hair, smudges, dents, cracks, etc.).

The element values encoded can be based on physical evidence, occupant kinematics, and interviewee information. Although physical evidence is preferred, it does not have to be present to support a contact mechanism.

 * **Note**:   Whenever an "other" code (*i.e.*, "019", "055", "060", "105", "110", "154", "160", "163", "190", "195", "303", "412", "453", "503", "509", "513", "598", and "603") is encoded as injury source, clearly identify, in the space provided next to each code on the reverse side of **Page 2** of the Occupant Injury Form, a description of the "other" source.

Variable Name: Injury Source Confidence Level
(1st through 10th or higher)

Element Values:

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.

Code "1"   (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.

Code "2"   (Probable) in those situations where there is not a certainty based on the factors noted above for code "1" (Certain).

Code "3"   (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.

Code "9"   (Unknown) if the injury source is "697" (Injured, unknown source).

Variable Name: Direct/Indirect Injury
                      (1st through 10th or higher)

Element Value:

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.

Code "1"   (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 inury 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").

Code "2"   (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 inury 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").

Code "3"   (Noncontact injury) is used when the respective 0I12 et al. equals "601" (Fire in vehicle), "602" (Flying glass), "603" (Other noncontact injury source), or "604" (Air bag exhaust gases).

Code "4"   (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 inury is caused directly from contact with an air bag system component (codes

170-195) then choose direct contact injury ("1"), or indirect contact injury ("2").

Code "7"   (Injured, unknown source) is used whenever the Injury Source is coded "697" (Injured, unknown source).

OI15
et al.

Variable Name: Occupant Area Intrusion Number
(1st through 10th or higher)

Element Values:

Range: 00-10, 97, 99
00 No intrusion or injury not associated with a documented intrusion
97 Injury associated with a noncoded intrusion
99 Unknown

Source: Zone Center determined --inputs include vehicle inspection, interviewee, and medical records.

Remarks:

Code "00"   (No intrusion or injury not associated with a documented intrusion) when the Injury Source (OI12 et al.) is not caused by an intruding component or when there are no intrusions coded on the Interior Vehicle Form (IV47 -IV86). For example, use this code if the injury source is unknown but no intrusions were coded.

Code "97"   (Injury associated with a noncoded intrusion) applies when the injury source is an intruding component but this intrusion was not coded on the Interior Vehicle Form because it (1) was not one of the ten most severe, (2) could not be or was not measured.

Code "99"   (Unknown) when the injury source, OI12 et al., is coded unknown ***and*** at least one intrusion is present (*i.e.*, IV47 et al is ***not*** coded "blank"). If the rare situation exists where an injury coder cannot say what the injury source is, but can say definitely that none of the intruding components could possibly have produced the injury, then code "00" (No intrusion or injury not associated with an intrusion). In addition, use this code when the vehicle is not inspected or when the vehicle had been repaired prior to inspection.

For all other situations, code the row number of the intruding component which caused the injury. The Intruding Component (VI48 et al.) should be the same or a part of the injury source (OI12 et al.) coded for this injury row (*i.e.*, 1st through 10th or higher).

UPDATE FORM

An Update Form shall be placed in a notebook or file for all occupants whose drug information and/or medical(s) cannot be obtained prior to initial submission. The Update Forms may be filed by case number and occupant number or by the occupant's name (*i.e.,* last name, first name, middle initial); in either case, a cross reference shall be maintained.

The driver/occupant's name and address or other pertinent information must be legibly written in the upper right-hand corner of the form. Sanitize this information prior to submitting the Update Form. Normally, only one Update Form will be submitted per occupant. However, on those occasions when more than one Update Form will be submitted for a given occupant, insert a new Update Form in the notebook or file being careful to record on the new form the most recent updated log information about the occupant.

Status of Log Injury Information

This section records the ***most current*** log status information pertaining to this occupant. The variables and element values are identical to: (1) OAL08 (Date Official Medical Data Requested); (2) OAL09 (Date Official Medical Data Obtained) (3) OAL16 (Injury Treatment Status); (4) OAL17 (Injury information); and (5) OAL18 (Medical Facility Code), where the status of the occupant's Injury Information was initially indicated [*e.g.,* "08" (To be updated)]. Also included are alcohol test results and drug test type for drivers. The variables and elements are identical to: (1) GV14 (Alcohol Test Results for Driver) and (2) GV16 (Other Drug Specimen Test Type for Driver). Complete this form each time an Update Form is submitted for an occupant.

Two columns are provided. The column entitled "Initial Submission" contains the data submitted either (1) initially on the Occupant Assessment Form Log or (2) subsequently on a previous update for this occupant. Data in the column entitled "Updated Information" reports the most current correct log information for this occupant. For each updatable log variable, record its current value under the column entitled "Initial Submission". Leave the "Updated Information" column ***"blank"*** for any variable whose element value remains the same. This procedure will help to highlight data changes that must be made by the Zone Center.

For example, suppose that a driver was hospitalized and subsequently died. Although you learned about the occupant's death, you were not able to acquire any of his medical records in time for initial submission. Subsequently, you acquire and submit the driver's Emergency Room records believing these to be the only records that you were going to acquire. Later, you are able to obtain his autopsy. Complete the "Updated Information" column and submit the Update Form and acquired autopsy records to the Zone Center.

INTERVIEW FORM

Before completing the Interview Form make sure that the interviewee(s) have been clearly identified, including their relationship to the vehicle's driver. For example, "driver" is sufficient. On the other hand, "other occupant" needs further clarification if three or more persons were present in the vehicle. In general, if a surrogate is used, then both name and relationship must be indicated.

The Interview Form is designed to obtain crash, vehicle, and occupant data in an efficient and organized manner. The interviewer is encouraged to use this form as a guide for conducting the interview. It is understood that this interview structure may not meet the style of every NASS interviewer or attempt to meet all contingencies presented by interviewees. The interviewer will have the option of asking questions in a different order to successfully complete the requirements of the interview. However, this form should be followed in the order presented when possible to avoid overlooking data items.

The Interview form has space to record information for three occupants. If additional occupants are present, use the Occupant Data Questions Supplement form to record their information.

In the event interview data are not obtained for any vehicle occupant, submit only the "Contact Log" with case materials. Do not include a blank Interview Form (A) or Occupant Data Questions Supplement Form for this vehicle.

INTERVIEW FORM (A)

Driver's Description of Accident Events

Let the Driver (or interviewee) tell you what happened. Refrain from interrupting the interviewee's train of thought. Let the interviewee finish, then return with follow-up questions to areas of the crash sequence that are unclear.

Write legibly. Record faithfully the interviewee's response even when it disagrees with information and/or evidence that you have already acquired (*e.g.*, from the vehicle and/or scene inspection).

Query the interviewee on all crashworthiness issues. If this interviewee's vehicle was involved in the crash sequence in a manner which makes it applicable to the trajectory algorithm of the CRASHPC program, then interview so that particular attention is paid to crash details which would help you identify both its impact and final rest locations. Although it is desirable to locate both impact and final rest exactly, it is not necessary. The reasonable approximation of these locations based on crash dynamics and scene evidence enables you to run the trajectory algorithm and compare the results with those obtained through the damage algorithm of the CRASHPC program. Interviewee(s) many times know their pre-impact location, intended movements, and pre-crash avoidance behavior and can sometimes locate their vehicle at final rest relative to fixed objects in the environment (*e.g.*, curb, tree, pole, etc.). Police measurements can also be used to approximate the vehicle's final rest position.

INTERVIEW FORM (A) (Cont'd.)

Immediately following the interview, summarize on Interview Form (A) interviewee comments obtained over the course of the interview which were not provided during the initial uninterrupted statement and were not part of the itemized questions. Sufficient space has been provided under the Driver's Description of Accident Events section to accommodate additional writing. If additional space is required, then copy and use as many Interview Form (A) face sheets as required.

Occupant's Description of Accident Events

Space is provided to record statements obtained from the occupant or other interviewee(s). As noted by the layout of the Interview Form (A) face sheet, more emphasis is placed upon statements obtained from the driver. The researcher should record as much information from the occupant as possible when the driver is not readily available. However, an appointment should be made to contact the driver for a follow-up interview.

Accident Diagram

Although the use of this diagram is optional, it can be of particular help during an in-person interview. Oftentimes the researcher has visited the scene prior to conducting the interview. Using your knowledge of the scene, you can pre-sketch the scene on this page. During the interview, you may confirm with the interviewee the accuracy of your sketch while simultaneously refreshing the interviewee's recollection of the scene by means of your visual aid. In addition, you may also assist the interviewee in recalling and reporting the crash sequence by using miniature vehicles (*e.g.*, matchbox) on the sketch. Have the interviewee describe or show you how the vehicle(s) moved during the crash. This technique may sometimes reveal new insights into the crash dynamics. In addition, you may be able to obtain a good locational fix regarding the vehicle's final rest position. The ability to visualize the process may stimulate recollection.

INTERVIEW FORM
Specific Questions

This section of the Interview Form is divided into the following five subsections:

☞ Crash Data Information
☞ Vehicle Information
☞ Occupant Data Questions
☞ Restraint Information
☞ Ejection, Entrapment, Mobility Information
☞ Air Bag Information
☞ Child Safety Seat Information
☞ Injury Information

Each subsection contains structured questions with check boxes provided. The intent of this design is to reduce time required to write out responses and to establish a method for obtaining a large volume of data.

The interviewer should be knowledgeable of crash circumstances and review the Interview Form prior to conducting the interview to ensure documentation of all pertinent data. As a suggestion, the interviewer should mention the subsections listed above to help focus the interview and provide some insight to the interviewee as to the nature of interview.

The interviewer need not ask questions where information is already known prior to the interview attempt. This is especially true for vehicle related questions where information has already been collected during the vehicle inspection. Where uncertainty exits, default by asking the appropriate questions.

To assist the Zone Center during case review, please review and use the following list of abbreviation codes to clarify when information was either obtained from the vehicle inspection, scene inspection, or not obtained. These codes should be written next to the specific question.

VI = **Vehicle Inspection** [Indicates that a question (or series of questions) is/are not asked because the answer is known prior to the interview from the vehicle inspection.]

SI = **Scene Inspection** [Indicates that a question (or series of questions) is/are not asked because the answer is known prior to the interview from the scene inspection.]

R = **Refused** (Use this abbreviation if the interviewee refuses to answer this specific question.)

UNK = **Unknown** (Use this abbreviation when the interviewee does not know the answer and a check off box was not provided as a choice.)

INTERVIEW FORM (Cont'd.)

NA = **Not applicable** (Use this abbreviation if a specific question is not pertinent to the interview and no preceding question directs the interviewer around the question by means of a "Go to..." directive. Use with caution.)

T = **Terminated** (Use this abbreviation at the point where an interviewee abruptly ends the interview. Also annotate the remaining unanswered subsections with this code to indicate the interview had not progressed to these areas.)

Crash Data Information

The questions under this subsection attempt to define this vehicle's pre-impact trajectory to final rest position (*i.e.*, travel direction, speeds, control, avoidance, and impacted objects).

Vehicle Information

The main questions in this subsection which are specific to vehicle components. Questions concerning doors, glazing, glove box, cargo, and odometer are presented in a basic checkoff format with space provided for supplemental discussion.

Also included in the vehicle section are subsections which are specific to vehicle rollovers and fires. Rollover questions describing the location, cause, direction of roll, and quarter turns are presented in a basic checkoff format. Fire questions describing the origin of the fire, electrical or fuel system involvement, and the part of the fuel system where the fire may have originated are presented in a basic checkoff format. Space is provided for comments.

Occupant Data Questions

The main questions under this subsection which attempt to determine the number of occupants, occupant characteristics, posture, seat track position, and cellular phone use.

Restraint Information

The main questions in this subsection are specific for both manual and automatic seat belt systems. The information is designed to capture usage along with "proper" usage of the belt system. The information is presented in a basic kickoff format with space provided for supplemental discussion.

Ejection, Entrapment, Mobility Information

The main questions under this section focus on the degree of ejection or entrapment of the occupant during the collision. the mobility information describes the extent of help (if any) needed by the occupant in exiting the vehicle.

Air Bag Information

The main questions in this subsection are specific to vehicles equipped with air bags. Air bag information captures previous deployments (or nondeployments), maintenance/service, inflation, and the use of eye wear for the person protected by the air bag. The information is presented in a basic kickoff format with space provided for supplemental discussion.

Child Safety Seat Information

The main questions in this subsection are specific to vehicles which had an occupant in a child safety seat. the information captures the type of seat, direction it was facing at the time of the crash, seat belt usage, and harness/shield/tether usage. The information is presented in a basic kickoff format with space provided for supplemental discussion.

Injury Information

The main questions under this subsection relate to injuries and medical treatment. The injury questions are designed to probe for specific types of injuries. It is imperative the interviewer probe extensively using these questions to obtain the best injury description possible. Additionally, extra care should be exercised in recording specific injury detail on the mannequin page. This includes thoroughly labeling body parts with the respective lesion and linking this information via arrow lines to the specific area on the mannequin (*e.g.*, abrasion of the left index finger, etc.).

The interviewer is reminded to ask if the interviewee received follow-up treatment and to identify the care giver. Medical records from follow-up treatment are needed to determine if the occupant sustained injuries in the crash which were not previously identified in medical reports.

Question "7f" concerning a signed patient release form is designed to remind the interviewer to present (or mail) this form in the following situations:

☞ Medical facility treating the occupant requires a release in order to obtain "any" medical records

☞ Medical facility treating occupant will only provide partial medical records (*e.g.*, emergency room record only) without a signed patient release form.

☞ Treated by a private physician

☞ Uncertainty exists whether the person was treated at the stated medical facility

This question does not have to be asked if it is clear the only treatment received was provided by a medical facility which does not required a signed patient release form (*i.e.*, write NA).

Occupant Data Questions Supplement

This subsection should be completed for each additional occupant in the vehicle. With the exception of the first two questions in this subsection, all questions from the Occupant Data and Occupant Injury subsections were duplicated in this Supplement.

x

APPENDICES

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UNIFORM SYMBOLS FOR SCENE MARKING

- Mark to show beginning of rear skidmarks. Arrow shows direction of travel. Number indicates identity of vehicle involved.

- Mark to show beginning of front skidmarks. Arrow shows direction of travel. Number indicates identity of vehicle involved.

- Position of rear wheels at impact; | Notes end of post -impact skid

- Position of front wheels at impact; | Notes end of post -impact skid.

- Rear wheel at final position

- Front wheel at final position

- Position of impac t point   1-First impact
                                          2-Second impact

- Indicative mark for scratches

- Indicative mark for gouges

 - Indicative mark for scuffs
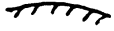
 - Indicative mark for centripetal curve scuffs

 - Indicative mark for rotating tire print

 - Indicative mark for puddle (liquids)

 - Indicative mark for puddle with run -off

(Initials--**G** for gasoline; **M** for motor oil; **R** for radiator coolant; **T** for transmission oil; **B** for battery acid; **F** for brake fluid; **W** for water; and **H** for blood--to be inserted inside the circles for further identification).

 - Indicative mark for debris; Arrow to show direction of force

 - Male body (arrow pointing toward feet)

 - Female body (cross indicating direction of feet)

UNIFORM SYMBOLS FOR CRASH DIAGRAMMING

Vehicle and Pedestrian Symbols
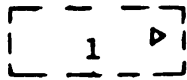
Automobile (pre-impact or at-impact position)
Exception: draw **solid** outline if stopped
at-impact.
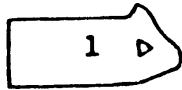
Automobile (final rest position) --showing
damaged area

Automobile (final position on its top)

Automobile (final position on its left side)
(reverse for right side)
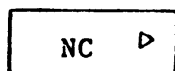
Automobile involved in the crash as a temporary
environmental factor, but not physically involved
in the collision. (Noncontact Unit)

Parked automobile not struck (give it a number if it was struck)
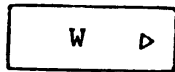
Vehicle in which a witness was an occupant
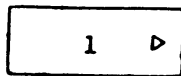
Truck (Panel, Van, Dump, etc.)

Truck tractor and semi-trailer

Utility trailer
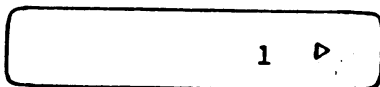
Bus or streetcar

Motorcyclist: bicyclist (handlebars are curve d opposite the direction of travel)
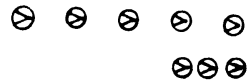
Pedestrian [pointer oriented to show direction of movement and dot spacing to show rate of movement (*i.e.,* 1 meter apart walking and 2 meters apart running)]

Final position of body

Pedestrian who wit nessed crash

All symbols referring to colliding vehicles (plus Noncontact, Witness and Parked vehicles) are to have a broken outline if they are moving at the point in which they are depicted; the outline should be solid if the vehicle is stopped where depicted, or at final rest. Be careful to insure proper placement (location) or orientation on the diagram.

Scene Road Marking

⊕

Point of impact
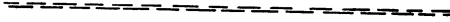
Skidmarks
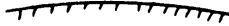
Centripetal curve scuffs
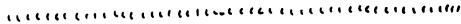
Tire scuff marks

Rotating tire print

Gouges

Scratches

Liquids (puddle and run -off)

Debris (funnel out away from point of impact to show direction of force)

Any other crash-induced markings, components from vehicles, etc. should be   shown in their approximate location and a reasonable likeness sketched on the diagram. However, do not clutter diagram; make an additional diagram, if necessary.

Topographical Highway & Environment Symbols

Pavement edge

Shoulder edge line (non -formal)
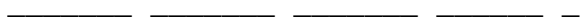
Shoulder edge line (formal)

Broken center or lane lines (4.6 meters long - 7.6 meters apart)

Broken center line with No -Passing line
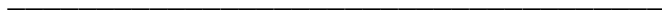
Double yellow center lines

Concrete // Grass

Raised island and Grass median
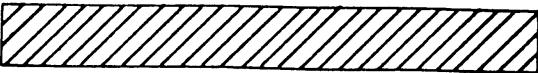
Painted median

Curb

Paved shoulders with diagonal lines

Turn arrows

Wall

Bridge abutment and railing

Guardrail
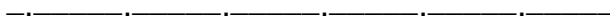
Fence
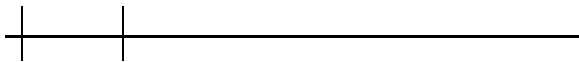
Railroad tracks
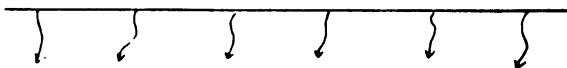
Embankment (arrows show "DOWN")

Shrubbery   -   hedges

Topographical Highway & Environmental Symbols (Cont'd.)

Trees (draw trunk and perimeter of foliage to approximate size)

Traffic signal
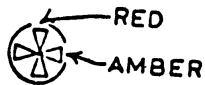
Flashing light

Traffic signs back to back

Sign (indicate words or symbols)

Street light and pole (arm length may change with scene)

Street light without arm

Topographical Highway & Environmental Symbols (Cont'd.)

Public utility pole

Building

Fire Hydrant

Street Sign

Delineator post

All crosswalks, road surface symbols and other relevant markings should be depicted and drawn to approximate scale on the diagram as much as possible.

NASS CDS VARIABLE COMPUTER FORMATS
Accident Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	AC01	PSU	Numeric	2
Case Number - Stratum	AC02	CASEID	Alphanumeric	4
Number of General Vehicle Forms Submitted	AC03	VEHFORMS	Numeric	2
Date of Accident	AC04	ACCDATE	Numeric	6
Time of Accident	AC05	ACCTIME	Numeric	4
SS15 Trauma Studies (Administrative Use)	AC06	ADMINSS	Numeric	1
SS16 Pedestrian Crash Data Study	AC07	PEDSTUDY	Numeric	1
SS17 Impact Fires	AC08	FIRESTDY	Numeric	1
SS18 Unsafe Driver Actions	AC09	DRVRACT	Numeric	1
SS19 Not used	AC10		Numeric	1
Number of Recorded Events in This Accident	AC11	EVENTS	Numeric	2
1st Accident Event Sequence Number	AC12	ACCSEQ	Numeric	2
1st Vehicle Number	AC13	VEHNUM	Numeric	2
1st Class of Vehicle--1st	AC14	CLASS1	Numeric	2
1st General Area of Damage--1st	AC15	GADEV1	Alphanumeric	1
1st Vehicle Number or Object Contacted	AC16	OBJCONT	Numeric	2
1st Class of Vehicle--2nd	AC17	CLASS2	Numeric	2
1st General Area of Damage--2nd	AC18	GADEV2	Alphanumeric	1
2nd Accident Event Sequence Number	AC19	ACCSEQ	Numeric	2
2nd Vehicle Number	AC20	VEHNUM	Numeric	2
2nd Class of Vehicle--1st	AC21	CLASS1	Numeric	2
2nd General Area of Damage--1st	AC22	GADEV1	Alphanumeric	1
2nd Vehicle Number or Object Contacted	AC23	OBJCONT	Numeric	2
2nd Class of Vehicle--2nd	AC24	CLASS2	Numeric	2
2nd General Area of Damage--2nd	AC25	GADEV2	Alphanumeric	1
3rd Accident Event Sequence Number	AC26	ACCSEQ	Numeric	2
3rd Vehicle Number	AC27	VEHNUM	Numeric	2
3rd Class of Vehicle--1st	AC28	CLASS1	Numeric	2
3rd General Area of Damage--1st	AC29	GADEV1	Alphanumeric	1
3rd Vehicle Number or Object Contacted	AC30	OBJCONT	Numeric	2
3rd Class of Vehicle--2nd	AC31	CLASS2	Numeric	2
3rd General Area of Damage--2nd	AC32	GADEV2	Alphanumeric	1
4th Accident Event Sequence Number	AC33	ACCSEQ	Numeric	2
4th Vehicle Number	AC34	VEHNUM	Numeric	2
4th Class of Vehicle--1st	AC35	CLASS1	Numeric	2
4th General Area of Damage--1st	AC36	GADEV1	Alphanumeric	1
4th Vehicle Number or Object Contacted	AC37	OBJCONT	Numeric	2
4th Class of Vehicle--2nd	AC38	CLASS2	Numeric	2
4th General Area of Damage--2nd	AC39	GADEV2	Alphanumeric	1
5th Accident Event Sequence Number	AC40	ACCSEQ	Numeric	2
5th Vehicle Number	AC41	VEHNUM	Numeric	2
5th Class of Vehicle--1st	AC42	CLASS1	Numeric	2
5th General Area of Damage--1st	AC43	GADEV1	Alphanumeric	1
5th Vehicle Number or Object Contacted	AC44	OBJCONT	Numeric	2
5th Class of Vehicle--2nd	AC45	CLASS2	Numeric	2
5th General Area of Damage--2nd	AC46	GADEV2	Alphanumeric	1

Accident Form (Continued)

(Accident Form Supplement)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
6th Accident Event Sequence Number	AC47	ACCSEQ	Numeric	2
6th Vehicle Number	AC48	VEHNUM	Numeric	2
6th Class of Vehicle--1st	AC49	CLASS1	Numeric	2
6th General Area of Damage--1st	AC50	GADEV1	Alphanumeric	1
6th Vehicle Number or Object Contacted	AC51	OBJCONT	Numeric	2
6th Class of Vehicle--2nd	AC52	CLASS2	Numeric	2
6th General Area of Damage--2nd	AC53	GADEV2	Alphanumeric	1
7th Accident Event Sequence Number	AC54	ACCSEQ	Numeric	2
7th Vehicle Number	AC55	VEHNUM	Numeric	2
7th Class of Vehicle--1st	AC56	CLASS1	Numeric	2
7th General Area of Damage--1st	AC57	GADEV1	Alphanumeric	1
7th Vehicle Number or Object Contacted	AC58	OBJCONT	Numeric	2
7th Class of Vehicle--2nd	AC59	CLASS2	Numeric	2
7th General Area of Damage--2nd	AC60	GADEV2	Alphanumeric	1
8th Accident Event Sequence Number	AC61	ACCSEQ	Numeric	2
8th Vehicle Number	AC62	VEHNUM	Numeric	2
8th Class of Vehicle--1st	AC63	CLASS1	Numeric	2
8th General Area of Damage--1st	AC64	GADEV1	Alphanumeric	1
8th Vehicle Number or Object Contacted	AC65	OBJCONT	Numeric	2
8th Class of Vehicle--2nd	AC66	CLASS2	Numeric	2
8th General Area of Damage--2nd	AC67	GADEV2	Alphanumeric	1
9th Accident Event Sequence Number	AC68	ACCSEQ	Numeric	2
9th Vehicle Number	AC69	VEHNUM	Numeric	2
9th Class of Vehicle--1st	AC70	CLASS1	Numeric	2
9th General Area of Damage--1st	AC71	GADEV1	Alphanumeric	1
9th Vehicle Number or Object Contacted	AC72	OBJCONT	Numeric	2
9th Class of Vehicle--2nd	AC73	CLASS2	Numeric	2
9th General Area of Damage--2nd	AC74	GADEV2	Alphanumeric	1
10th Accident Event Sequence Number	AC75	ACCSEQ	Numeric	2
10th Vehicle Number	AC76	VEHNUM	Numeric	2
10th Class of Vehicle--1st	AC77	CLASS1	Numeric	2
10th General Area of Damage--1st	AC78	GADEV1	Alphanumeric	1
10th Vehicle Number or Object Contacted	AC79	OBJCONT	Numeric	2
10th Class of Vehicle--2nd	AC80	CLASS2	Numeric	2
10th General Area of Damage--2nd	AC81	GADEV2	Alphanumeric	1

General Vehicle Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	GV01	PSU	Numeric	2
Case Number - Stratum	GV02	CASEID	Alphanumeric	4
Vehicle Number	GV03	VEHNO	Numeric	2
Vehicle Model Year	GV04	MODELYR	Numeric	2
Vehicle Make	GV05	MAKE	Numeric	2
Vehicle Model	GV06	MODEL	Numeric	3
Body Type	GV07	BODYTYPE	Numeric	2
Vehicle Identification Number	GV08	VIN	Alphanumeric	17
Vehicle Special Use (This Trip)	GV09	VEHUSE	Numeric	1
Police Reported Vehicle Disposition	GV10	TOWPAR	Numeric	1
Police Reported Travel Speed	GV11	TRAVELSP	Numeric	2
Speed Limit	GV12	SPLIMIT	Numeric	2
Police Reported Alcohol Presence For Driver	GV13	DRINKING	Numeric	1
Alcohol Test Result For Driver	GV14	ALCTEST	Numeric	2
Police Reported Other Drug Presence For Driver	GV15	DRUGS	Numeric	1
Other Drug Specimen Test Result For Driver	GV16	SPECOTH	Numeric	1
Driver's Zip Code	GV17	DRZIP	Numeric	5
Driver's Race/Ethnic Origin	GV18	DRRACE	Numeric	1
Relation To Interchange Or Junction	GV19	RELINTER	Numeric	1
Trafficway Flow	GV20	TRAFFLOW	Numeric	1
Number Of Travel Lanes	GV21	LANES	Numeric	1
Roadway Alignment	GV22	ALIGNMNT	Numeric	1
Roadway Profile	GV23	PROFILE	Numeric	1
Roadway Surface Type	GV24	SURTYPE	Numeric	1
Roadway Surface Condition	GV25	SURCOND	Numeric	1
Light Conditions	GV26	LGTCOND	Numeric	1
Atmospheric Conditions	GV27	WEATHER	Numeric	1
Traffic Control Device	GV28	TRAFCONT	Numeric	1
Traffic Control Device Functioning	GV29	TRCTLFCT	Numeric	1
Driver's Distraction/Inattention to Driving	GV30	DRIVDIST	Numeric	2
Pre-Event Movement (Prior to Recognition of Critical Event)	GV31	PREMOVE	Numeric	2
Critical Precrash Event	GV32	PREEVENT	Numeric	2
Attempted Avoidance Maneuver	GV33	MANEUVER	Numeric	2
Pre-Impact Stability	GV34	PREISTAB	Numeric	1
Pre-Impact Location	GV35	PREILOC	Numeric	1
Accident Type	GV36	ACCTYPE	Numeric	2
Driver Presence in Vehicle	GV37	DRPRES	Numeric	1
Number of Occupants This Vehicle	GV38	OCUPANTS	Numeric	2
Number of Occupant Forms Submitted	GV39	OCCFORMS	Numeric	2
Is This an AOPS Vehicle?	GV40	AOPSVEH	Numeric	1
Air Bag(s) Deployment, First Seat Frontal	GV41	BAGDEPFV	Numeric	1
Air Bag(s) Deployment, Other Than First Seat Frontal	GV42	BAGDEPOV	Numeric	1
Vehicle Curb Weight	GV43	CURBWGT	Numeric	3
Vehicle Cargo Weight	GV44	CARGOWGT	Numeric	3
Rollover	GV45	ROLLOVER	Numeric	2
Rollover Initiation Type	GV46	ROLINTYP	Numeric	1
Location of Rollover Initiation	GV47	ROLINLOC	Numeric	1
Rollover Initiation Object Contacted	GV48	ROLLOBJ	Numeric	2
Location on Vehicle Where Initial Principal Tripping Force Is Applied	GV49	TRIPLOC	Numeric	1
Direction of Initial Roll	GV50	ROLINDIR	Numeric	1
Front Override/Underride (this vehicle)	GV51	FOVERIDE	Numeric	1
Rear Override/Underride (this vehicle)	GV52	ROVERIDE	Numeric	1
Heading Angle for This Vehicle	GV53	ANGTHIS	Numeric	3
Heading Angle for Other Vehicle	GV54	ANGOTHER	Numeric	3

General Vehicle Form (Continued)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Towed Trailing Unit	GV55	TOWHITCH	Numeric	1
Documentation of Trajectory Data for This Vehicle	GV56	DOCTRAJ	Numeric	1
Post Collision Condition of Tree or Pole (for Highest Delta V)	GV57	CONDTREE	Numeric	1
Basis for Total (Resultant) Delta V (highest)	GV58	DVBASIS	Numeric	2
Total Delta V	GV59	DVTOTAL	Numeric	2
Longitudinal Component of Delta V	GV60	DVLONG	Numeric	3
Lateral Component of Delta V	GV61	DVLAT	Numeric	3
Energy Absorption	GV62	ENERGY	Numeric	4
Impact Speed	GV63	IMPACTSP	Numeric	3
Confidence In Reconstruction Program Results(for Highest Delta V)	GV64	DVCONFID	Numeric	1
Barrier Equivalent Speed	GV65	BAREQSP	Numeric	3
Estimated Highest Delta V (Researcher Determined)	GV66	DVEST	Numeric	1
Type of Vehicle Inspection	GV67	INSPTYPE	Numeric	1
Delta V Event Number	GV68	ACESEQDV	Numeric	2

Exterior Vehicle Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	EV01	PSU	Numeric	2
Case Number - Stratum	EV02	CASEID	Alphanumeric	4
Vehicle Number	EV03	VEHNO	Numeric	2
1st C.D.C. - Accident Event Sequence Number	EV04	ACCSEQ1	Numeric	2
1st C.D.C. - Object Contacted	EV05	OBJCONT1	Numeric	2
1st C.D.C. - Direction of Force	EV06	DOF1	Numeric	2
1st C.D.C. - Deformation Location	EV07	GAD1	Alphanumeric	1
1st C.D.C. - Specific Longitudinal or Lateral Location	EV08	SHL1	Alphanumeric	1
1st C.D.C. - Specific Vertical or Lateral Location	EV09	SVL1	Alphanumeric	1
1st C.D.C. - Type of Damage Distribution	EV10	TDD1	Alphanumeric	1
1st C.D.C. - Deformation Extent	EV11	EXTENT1	Numeric	2
2nd C.D.C. - Accident Event Sequence Number	EV12	ACCSEQ2	Numeric	2
2nd C.D.C. - Object Contacted	EV13	OBJCONT2	Numeric	2
2nd C.D.C. - Direction of Force	EV14	DOF2	Numeric	2
2nd C.D.C. - Deformation Location	EV15	GAD2	Alphanumeric	1
2nd C.D.C. - Specific Longitudinal or Lateral Location	EV16	SHL2	Alphanumeric	1
2nd C.D.C. - Specific Vertical or Lateral Location	EV17	SVL2	Alphanumeric	1
2nd C.D.C. - Type of Damage Distribution	EV18	TDD2	Alphanumeric	1
2nd C.D.C. - Deformation Extent	EV19	EXTENT2	Numeric	2
1st Crush Profile - L	EV20	DVL	Numeric	3
1st Crush Profile - C1-C6	EV21	DVC	Numeric	12
1st Crush Profile - D	EV22	DVD	Numeric	4
2nd Crush Profile - L	EV23	SDVL	Numeric	3
2nd Crush Profile - C1-C6	EV24	SDVC	Numeric	12
2nd Crush Profile - D	EV25	SDVD	Numeric	4
Undeformed End Width	EV26	UNDENDW	Numeric	3
Direct Damage Width	EV27	DIRDAMW	Numeric	3
Original Wheelbase	EV28	WHEELBAS	Numeric	3
Original Average Track Width	EV29	ORIGAVTW	Numeric	3
Are CDCs Documented but Not Coded on The Automated File?	EV30	DOCCDC	Numeric	1
Researcher's Assessment of Vehicle Disposition	EV31	TOWRES	Numeric	1
Is This A Multi-Stage Manufactured Vehicle And/Or A Certified Altered Vehicle?	EV32	ALTVEH	Numeric	1
Fire Occurrence	EV33	FIRE	Numeric	1
Origin of Fire	EV34	FIREORIG	Numeric	1
Location of Fuel Tank-1 Filler Cap	EV35	FUELCAP1	Numeric	1
Location of Fuel Tank-2 Filler Cap	EV36	FUELCAP2	Numeric	1
Type of Fuel Tank-1	EV37	FUELTNK1	Numeric	1
Type of Fuel Tank-2	EV38	FUELTNK2	Numeric	1
Location of Fuel Tank-1	EV39	FUELLOC1	Numeric	1
Location of Fuel Tank-2	EV40	FUELLOC2	Numeric	1
Damage to Fuel Tank-1	EV41	FUELDAM1	Numeric	1
Damage to Fuel Tank-2	EV42	FUELDAM2	Numeric	1
Leakage Location of Fuel System-1	EV43	FUELEAK1	Numeric	1
Leakage Location of Fuel System-2	EV44	FUELEAK2	Numeric	1
Fuel Type-1	EV45	FUELTYP1	Numeric	2
Fuel Type-2	EV46	FUELTYP2	Numeric	2
Is This Vehicle Equipped With More Than Two Fuel Tanks?	EV47	FUELGT2	Numeric	1

Interior Vehicle Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	IV01	PSU	Numeric	2
Case Number - Stratum	IV02	CASEID	Alphanumeric	4
Vehicle Number	IV03	VEHNO	Numeric	2
Passenger Compartment Integrity	IV04	PASINTEG	Numeric	2
Door, Tailgate or Hatch Opening - LF	IV05	OPENJF	Numeric	1
Door, Tailgate or Hatch Opening - RF	IV06	OPENRF	Numeric	1
Door, Tailgate or Hatch Opening - LR	IV07	OPENLR	Numeric	1
Door, Tailgate or Hatch Opening - RR	IV08	OPENRR	Numeric	1
Door, Tailgate or Hatch Opening - TG/H	IV09	OPENTG	Numeric	1
Damage/Failure Associated With D/TG/H Opening In Collision - LF	IV10	FAILLF	Numeric	1
Damage/Failure Associated With D/TG/H Opening In Collision - RF	IV11	FAILRF	Numeric	1
Damage/Failure Associated With D/TG/H Opening In Collision - LR	IV12	FAILLR	Numeric	1
Damage/Failure Associated With D/TG/H Opening In Collision - RR	IV13	FAILRR	Numeric	1
Damage/Failure Associated With D/TG/H Opening In Collision - TG/H	IV14	FAILTG	Numeric	1
Type of Window/Windshield Glazing - WS	IV15	GLTYPWS	Numeric	1
Type of Window/Windshield Glazing - LF	IV16	GLTYPLF	Numeric	1
Type of Window/Windshield Glazing - RF	IV17	GLTYPRF	Numeric	1
Type of Window/Windshield Glazing - LR	IV18	GLTYPLR	Numeric	1
Type of Window/Windshield Glazing - RR	IV19	GLTYPRR	Numeric	1
Type of Window/Windshield Glazing - BL	IV20	GLTYPBL	Numeric	1
Type of Window/Windshield Glazing - Roof	IV21	GLTYPRUF	Numeric	1
Type of Window/Windshield Glazing - Other	IV22	GLTYPOTH	Numeric	1
Window Precrash Glazing Status - WS	IV23	GLPREWS	Numeric	1
Window Precrash Glazing Status - LF	IV24	GLPRELF	Numeric	1
Window Precrash Glazing Status - RF	IV25	GLPRERF	Numeric	1
Window Precrash Glazing Status - LR	IV26	GLPRELR	Numeric	1
Window Precrash Glazing Status - RR	IV27	GLPRERR	Numeric	1
Window Precrash Glazing Status - BL	IV28	GLPREBL	Numeric	1
Window Precrash Glazing Status - Roof	IV29	GLPRERUF	Numeric	1
Window Precrash Glazing Status - Other	IV30	GLPREOTH	Numeric	1
Glazing Damage from Impact Forces - WS	IV31	GLIMPWS	Numeric	1
Glazing Damage from Impact Forces - LF	IV32	GLIMPLF	Numeric	1
Glazing Damage from Impact Forces - RF	IV33	GLIMPRF	Numeric	1
Glazing Damage from Impact Forces - LR	IV34	GLIMPLR	Numeric	1
Glazing Damage from Impact Forces - RR	IV35	GLIMPRR	Numeric	1
Glazing Damage from Impact Forces - BL	IV36	GLIMPBL	Numeric	1
Glazing Damage from Impact Forces - Roof	IV37	GLIMPRUF	Numeric	1
Glazing Damage from Impact Forces - Other	IV38	GLIMPOTH	Numeric	1
Glazing Damage from Occupant Contact - WS	IV39	GLOCCWS	Numeric	1
Glazing Damage from Occupant Contact - LF	IV40	GLOCCLF	Numeric	1
Glazing Damage from Occupant Contact - RF	IV41	GLOCCRF	Numeric	1
Glazing Damage from Occupant Contact - LR	IV42	GLOCCLR	Numeric	1
Glazing Damage from Occupant Contact - RR	IV43	GLOCCRR	Numeric	1
Glazing Damage from Occupant Contact - BL	IV44	GLOCCBL	Numeric	1
Glazing Damage from Occupant Contact - Roof	IV45	GLOCCRUF	Numeric	1
Glazing Damage from Occupant Contact - Other	IV46	GLOCCOTH	Numeric	1
1st Location of Intrusion	IV47	INLOC1	Numeric	2
1st Intruding Component	IV48	INCOMP1	Numeric	2
1st Magnitude of Intrusion	IV49	INMAG1	Numeric	1
1st Dominant Crush Direction	IV50	CDRIR1	Numeric	1
2nd Location of Intrusion	IV51	INLOC2	Numeric	2
2nd Intruding Component	IV52	INCOMP2	Numeric	2
2nd Magnitude of Intrusion	IV53	INMAG2	Numeric	1
2nd Dominant Crush Direction	IV54	CDRIR2	Numeric	1
3rd Location of Intrusion	IV55	INLOC3	Numeric	2

Interior Vehicle Form (Continued)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
3rd Intruding Component	IV56	INCOMP3	Numeric	2
3rd Magnitude of Intrusion	IV57	INMAG3	Numeric	1
3rd Dominant Crush Direction	IV58	CDRIR3	Numeric	1
4th Location of Intrusion	IV59	INLOC4	Numeric	2
4th Intruding Component	IV60	INCOMP4	Numeric	2
4th Magnitude of Intrusion	IV61	INMAG4	Numeric	1
4th Dominant Crush Direction	IV62	CDRIR4	Numeric	1
5th Location of Intrusion	IV63	INLOC5	Numeric	2
5th Intruding Component	IV64	INCOMP5	Numeric	2
5th Magnitude of Intrusion	IV65	INMAG5	Numeric	1
5th Dominant Crush Direction	IV66	CDRIR5	Numeric	1
6th Location of Intrusion	IV67	INLOC6	Numeric	2
6th Intruding Component	IV68	INCOMP6	Numeric	2
6th Magnitude of Intrusion	IV69	INMAG6	Numeric	1
6th Dominant Crush Direction	IV70	CDRIR6	Numeric	1
7th Location of Intrusion	IV71	INLOC7	Numeric	2
7th Intruding Component	IV72	INCOMP7	Numeric	2
7th Magnitude of Intrusion	IV73	INMAG7	Numeric	1
7th Dominant Crush Direction	IV74	CDRIR7	Numeric	1
8th Location of Intrusion	IV75	INLOC8	Numeric	2
8th Intruding Component	IV76	INCOMP8	Numeric	2
8th Magnitude of Intrusion	IV77	INMAG8	Numeric	1
8th Dominant Crush Direction	IV78	CDRIR8	Numeric	1
9th Location of Intrusion	IV79	INLOC9	Numeric	2
9th Intruding Component	IV80	INCOMP9	Numeric	2
9th Magnitude of Intrusion	IV81	INMAG9	Numeric	1
9th Dominant Crush Direction	IV82	CDRIR9	Numeric	1
10th Location of Intrusion	IV83	INLOC10	Numeric	2
10th Intruding Component	IV84	INCOMP10	Numeric	2
10th Magnitude of Intrusion	IV85	INMAG10	Numeric	1
10th Dominant Crush Direction	IV86	CDRIR10	Numeric	1
Steering Column Type	IV87	COLUMTYP	Numeric	1
Tilt Steering Column Adjustment	IV88	COLMTILT	Numeric	1
Telescoping Steering Column Adjustment	IV89	COLMTELE	Numeric	1
Steering Rim/Spoke Deformation	IV90	RIMDEF	Numeric	2
Location of Steering Rim/Spoke Deformation	IV91	RDEFLOC	Numeric	2
Odometer Reading	IV92	ODOMETER	Numeric	3
Instrument Panel Damage from Occupant Contact?	IV93	PANELDAM	Numeric	1
Type of Knee Bolster Covering	IV94	BOLSTYPE	Numeric	1
Knee Bolsters Deformed from Occupant Contact?	IV95	BOLSTDEF	Numeric	1
Did Glove Compartment Door Opened During Collision(s)?	IV96	GLOVOPEN	Numeric	1
Adaptive (Assistive) Driving Equipment	IV97	ADAPTEQ	Numeric	1

Occupant Assessment Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	OA01	PSU	Numeric	2
Case Number - Stratum	OA02	CASEID	Alphanumeric	4
Vehicle Number	OA03	VEHNO	Numeric	2
Occupant Number	OA04	OCCNO	Numeric	2
Occupant's Age	OA05	AGE	Numeric	2
Occupant's Sex	OA06	SEX	Numeric	1
Occupant's Height	OA07	HEIGHT	Numeric	2
Occupant's Weight	OA08	WEIGHT	Numeric	3
Occupant's Role	OA09	ROLE	Numeric	1
Occupant's Seat Position	OA10	SEATPOS	Numeric	2
Occupant's Posture	OA11	POSTURE	Numeric	1
Ejection	OA12	EJECTION	Numeric	1
Ejection Area	OA13	EJCTAREA	Numeric	1
Ejection Medium	OA14	EJCTMED	Numeric	1
Medium Status (Immediately Prior to Impact)	OA15	MEDSTA	Numeric	1
Entrapment	OA16	ENTRAP	Numeric	1
Occupant Mobility	OA17	OCCMOBIL	Numeric	1
Manual (Active) Belt System Availability	OA18	MANAVAIL	Numeric	1
Manual (Active) Belt System Use	OA19	MANUSE	Numeric	2
Proper Use of Manual (Active) Belts	OA20	MANPROPR	Numeric	1
Manual (Active) Belt Failure Modes During Impact	OA21	MANFAIL	Numeric	1
Shoulder Belt Upper Anchorage Adjustment	OA22	BELTANCH	Numeric	1
Automatic (Passive) Belt System Availability/Function	OA23	ABELTAVL	Numeric	1
Automatic (Passive) Belt System Use	OA24	ABELTUSE	Numeric	1
Automatic (Passive) Belt System Type	OA25	ABELTYPE	Numeric	1
Proper Use of Automatic (Passive) Belt System	OA26	ABLTPROP	Numeric	1
Automatic (Passive) Belt Failure Modes During Accident	OA27	ABLTFAIL	Numeric	1
Police Reported Belt Use	OA28	PARUSE	Numeric	1
Police Reported Air Bag Availability/Function	OA29	BAGAVRPT	Numeric	1
Frontal Air Bag System Availability/Function	OA30	BAGAVAIL	Numeric	1
Frontal Air Bag System Deployment	OA31	BAGDEPLY	Numeric	1
Other Than Frist Seat Frontal Air Bag Availabilty/Function	OA32	BAGAVOTH	Numeric	1
Air Bag(s) Deployment, Other Than First Seat Frontal	OA33	BAGDEPOT	Numeric	1
Are There Indications of Air Bag System Failure?	OA34	BAGFAIL	Numeric	1
Had Vehicle Been in Previous Accident(s)	OA35	PREVACC	Numeric	1
Type of Air Bag	OA36	BAGTYPE	Numeric	1
Had Any Prior Maintenance/Service Been Performed On This Air Bag System?	OA37	BAGMAINT	Numeric	1
Air Bag Deployment Accident Event Sequence Number	OA38	BAGEVENT	Numeric	2
CDC For Air Bag Deployment Impact	OA39	BAGCDC	Numeric	1
Longitudinal Component of Delta V For Air Bag Deployment Impact	OA40	DVBAG	Numeric	4
Did Air Bag Module Cover Flap(s) Open At Designated Tear Points?	OA41	BAGFLOPN	Numeric	1
Were Air Bag Module Cover Flap(s) Damaged?	OA42	BAGFLDAM	Numeric	1
Was There Damage To The Air Bag?	OA43	BAGDAMAG	Numeric	2
Source of Air Bag Damage	OA44	BAGDAMSO	Numeric	2
Was The Air Bag Tethered?	OA45	BAGTETHR	Numeric	1
Did The Air Bag Have Vent Ports?	OA46	BAGVENTS	Numeric	1
Was the Air Bag in this Occupant's Position Contacted By Another Occupant	OA47	BAGCONOT	Numeric	1
Was This Occupant Wearing Eye-wear?	OA48	EYEWEAR	Numeric	1
Head Restraint Type/Damage by Occupant at This Occupant Position	OA49	HEADREST	Numeric	2
Seat Type (This Occupant Position)	OA50	SEATTYPE	Numeric	1
Seat Orientation (this Occupant Position)	OA51	STORIENT	Numeric	1
Seat Track Adjusted Position Prior to Impact	OA52	SEATRACK	Numeric	2
Seat Back Incline Prior and Post Impact	OA53	STBACINC	Numeric	1
Seat Performance (This Occupant Position)	OA54	SEATPERF	Numeric	3
Child Safety Seat Make/Model	OA55	CHMAKE	Numeric	1
Type of Child Safety Seat	OA56	CHTYPE	Numeric	2
Child Safety Seat Orientation	OA57	CHORIENT	Numeric	2
Child Safety Seat Harness Usage	OA58	CHHARNES	Numeric	2
Child Safety Seat Shield Usage	OA59	CHSHIELD	Numeric	2
Child Safety Seat Tether Usage	OA60	CHTETHER	Numeric	1
Injury Severity (Police Rating)	OA61	INJSEV	Numeric	1
Treatment - Mortality	OA62	TREATMNT	Numeric	1
Type Of Medical Facility (for Initial Treatment)	OA63	MEDFACIL	Numeric	2
Hospital Stay	OA64	HOSPSTAY	Numeric	2

Occupant Assessment Form (Continued)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Working Days Lost	OA65	WORKDAYS	Numeric	2
Time to Death	OA66	DEATH	Numeric	2
1st Medically Reported Cause of Death	OA67	CAUSE1	Numeric	2
2nd Medically Reported Cause of Death	OA68	CAUSE2	Numeric	2
3rd Medically Reported Cause of Death	OA69	CAUSE3	Numeric	2
Number of Recorded Injuries for This Occupant	OA70	INJNUM	Numeric	2
Glasgow Coma Scale (GCS) Score (at Medical Facility)	OA71	GLASGOW	Numeric	1
Was the Occupant Given Blood?	OA73	BICARB	Numeric	1
Primary Source of Belt Use Determination	OA74	BELTSOU	Numeric	1

Occupant Injury Form

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
Primary Sampling Unit Number	OI01	PSU	Numeric	2
Case Number - Stratum	OI02	CASEID	Alphanumeric	4
Vehicle Number	OI03	VEHNO	Numeric	2
Occupant Number	OI04	OCCNO	Numeric	2
1st Source of Injury Data	OI05	SOUDAT	Numeric	1
1st Body Region	OI06	REGION90	Numeric	1
1st Type of Anatomic Structure	OI07	STRUTYPE	Numeric	1
1st Specific Anatomic Structure	OI08	STRUSPEC	Numeric	2
1st Level of Injury	OI09	INJLEVEL	Numeric	2
1st Abbreviated Injury Scale Severity	OI10	AIS	Numeric	1
1st Aspect	OI11	ASPECT90	Numeric	1
1st Injury Source	OI12	INJSOU	Numeric	2
1st Injury Source Confidence Level	OI13	SOUCON	Numeric	1
1st Direct/Indirect Injury	OI14	DIRINJ	Numeric	1
1st Occupant Area Intrusion Number	OI15	INTRUNO	Numeric	2
2nd Source of Injury Data	OI16	SOUDAT	Numeric	1
2nd Body Region	OI17	REGION90	Numeric	1
2nd Type of Anatomic Structure	OI18	STRUTYPE	Numeric	1
2nd Specific Anatomic Structure	OI19	STRUSPEC	Numeric	2
2nd Level of Injury	OI20	INJLEVEL	Numeric	2
2nd Abbreviated Injury Scale Severity	OI21	AIS	Numeric	1
2nd Aspect	OI22	ASPECT90	Numeric	1
2nd Injury Source	OI23	INJSOU	Numeric	2
2nd Injury Source Confidence Level	OI24	SOUCON	Numeric	1
2nd Direct/Indirect Injury	OI25	DIRINJ	Numeric	1
2nd Occupant Area Intrusion Number	OI26	INTRUNO	Numeric	2
3rd Source of Injury Data	OI27	SOUDAT	Numeric	1
3rd Body Region	OI28	REGION90	Numeric	1
3rd Type of Anatomic Structure	OI29	STRUTYPE	Numeric	1
3rd Specific Anatomic Structure	OI30	STRUSPEC	Numeric	2
3rd Level of Injury	OI31	INJLEVEL	Numeric	2
3rd Abbreviated Injury Scale Severity	OI32	AIS	Numeric	1
3rd Aspect	OI33	ASPECT90	Numeric	1
3rd Injury Source	OI34	INJSOU	Numeric	2
3rd Injury Source Confidence Level	OI35	SOUCON	Numeric	1
3rd Direct/Indirect Injury	OI36	DIRINJ	Numeric	1
3rd Occupant Area Intrusion Number	OI37	INTRUNO	Numeric	2
4th Source of Injury Data	OI38	SOUDAT	Numeric	1
4th Body Region	OI39	REGION90	Numeric	1
4th Type of Anatomic Structure	OI40	STRUTYPE	Numeric	1
4th Specific Anatomic Structure	OI41	STRUSPEC	Numeric	2
4th Level of Injury	OI42	INJLEVEL	Numeric	2
4th Abbreviated Injury Scale Severity	OI43	AIS	Numeric	1
4th Aspect	OI44	ASPECT90	Numeric	1
4th Injury Source	OI45	INJSOU	Numeric	2
4th Injury Source Confidence Level	OI46	SOUCON	Numeric	1
4th Direct/Indirect Injury	OI47	DIRINJ	Numeric	1
4th Occupant Area Intrusion Number	OI48	INTRUNO	Numeric	2
5th Source of Injury Data	OI49	SOUDAT	Numeric	1
5th Body Region	OI50	REGION90	Numeric	1
5th Type of Anatomic Structure	OI51	STRUTYPE	Numeric	1
5th Specific Anatomic Structure	OI52	STRUSPEC	Numeric	2
5th Level of Injury	OI53	INJLEVEL	Numeric	2
5th Abbreviated Injury Scale Severity	OI54	AIS	Numeric	1
5th Aspect	OI55	ASPECT90	Numeric	1
5th Injury Source	OI56	INJSOU	Numeric	2

Occupant Injury Form (Continued)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
5th Injury Source Confidence Level	OI57	SOUCON	Numeric	1
5th Direct/Indirect Injury	OI58	DIRINJ	Numeric	1
5th Occupant Area Intrusion Number	OI59	INTRUNO	Numeric	2
6th Source of Injury Data	OI60	SOUDAT	Numeric	1
6th Body Region	OI61	REGION90	Numeric	1
6th Type of Anatomic Structure	OI62	STRUTYPE	Numeric	1
6th Specific Anatomic Structure	OI63	STRUSPEC	Numeric	2
6th Level of Injury	OI64	INJLEVEL	Numeric	2
6th Abbreviated Injury Scale Severity	OI65	AIS	Numeric	1
6th Aspect	OI66	ASPECT90	Numeric	1
6th Injury Source	OI67	INJSOU	Numeric	2
6th Injury Source Confidence Level	OI68	SOUCON	Numeric	1
6th Direct/Indirect Injury	OI69	DIRINJ	Numeric	1
6th Occupant Area Intrusion Number	OI70	INTRUNO	Numeric	2
7th Source of Injury Data	OI71	SOUDAT	Numeric	1
7th Body Region	OI72	REGION90	Numeric	1
7th Type of Anatomic Structure	OI73	STRUTYPE	Numeric	1
7th Specific Anatomic Structure	OI74	STRUSPEC	Numeric	2
7th Level of Injury	OI75	INJLEVEL	Numeric	2
7th Abbreviated Injury Scale Severity	OI76	AIS	Numeric	1
7th Aspect	OI77	ASPECT90	Numeric	1
7th Injury Source	OI78	INJSOU	Numeric	2
7th Injury Source Confidence Level	OI79	SOUCON	Numeric	1
7th Direct/Indirect Injury	OI80	DIRINJ	Numeric	1
7th Occupant Area Intrusion Number	OI81	INTRUNO	Numeric	2
8th Source of Injury Data	OI82	SOUDAT	Numeric	1
8th Body Region	OI83	REGION90	Numeric	1
8th Type of Anatomic Structure	OI84	STRUTYPE	Numeric	1
8th Specific Anatomic Structure	OI85	STRUSPEC	Numeric	2
8th Level of Injury	OI86	INJLEVEL	Numeric	2
8th Abbreviated Injury Scale Severity	OI87	AIS	Numeric	1
8th Aspect	OI88	ASPECT90	Numeric	1
8th Injury Source	OI89	INJSOU	Numeric	2
8th Injury Source Confidence Level	OI90	SOUCON	Numeric	1
8th Direct/Indirect Injury	OI91	DIRINJ	Numeric	1
8th Occupant Area Intrusion Number	OI92	INTRUNO	Numeric	2
9th Source of Injury Data	OI93	SOUDAT	Numeric	1
9th Body Region	OI94	REGION90	Numeric	1
9th Type of Anatomic Structure	OI95	STRUTYPE	Numeric	1
9th Specific Anatomic Structure	OI96	STRUSPEC	Numeric	2
9th Level of Injury	OI97	INJLEVEL	Numeric	2
9th Abbreviated Injury Scale Severity	OI98	AIS	Numeric	1
9th Aspect	OI99	ASPECT90	Numeric	1
9th Injury Source	OI100	INJSOU	Numeric	2
9th Injury Source Confidence Level	OI101	SOUCON	Numeric	1
9th Direct/Indirect Injury	OI102	DIRINJ	Numeric	1
9th Occupant Area Intrusion Number	OI103	INTRUNO	Numeric	2
10th Source of Injury Data	OI104	SOUDAT	Numeric	1
10th Body Region	OI105	REGION90	Numeric	1
10th Type of Anatomic Structure	OI106	STRUTYPE	Numeric	1
10th Specific Anatomic Structure	OI107	STRUSPEC	Numeric	2
10th Level of Injury	OI108	INJLEVEL	Numeric	2
10th Abbreviated Injury Scale Severity	OI109	AIS	Numeric	1
10th Aspect	OI110	ASPECT90	Numeric	1
10th Injury Source	OI111	INJSOU	Numeric	2

Occupant Injury Form (Continued)

NAME	VARIABLE IDENTIFIER	SAS VARIABLE NAME	VARIABLE TYPE	VAR COL LEN
10th Injury Source Confidence Level	OI112	SOUCON	Numeric	1
10th Direct/Indirect Injury	OI113	DIRINJ	Numeric	1
10th Occupant Area Intrusion Number	OI114	INTRUNO	Numeric	2

APPENDIX
VALUE TABLES

VERSION 8.0

TABLE A1
OCCUPANT AGE, SEX, HEIGHT
(CONSISTENCY CHECK: HH002)
(VERSION: 8.0)

AGE (OA05)	SEX (OA06)	HEIGHT (OA07)	CHANGE VERSION
0	1	038-099, 999	7.2
1	1	061-104, 999	7.2
2	1	071-112, 999	7.2
3	1	079-122, 999	7.2
4	1	084-130, 999	7.2
5	1	085-135, 999	7.2
6	1	097-140, 999	7.2
7	1	102-147, 999	7.2
8	1	104-157, 999	7.2
9	1	112-157, 999	7.2
10	1	117-168, 999	7.2
11	1	119-175, 999	7.2
12	1	124-178, 999	7.2
13	1	130-185, 999	7.2
14	1	140-196, 999	7.2
15	1	147-196, 999	7.2
16	1	150-201, 999	7.2
17-97	1	145-203, 999	7.2
0	2-6	036-091, 999	8.0
1	2-6	058-102, 999	8.0
2	2-6	069-112, 999	8.0
3	2-6	076-119, 999	8.0
4	2-6	081-127, 999	8.0
5	2-6	089-135, 999	8.0
6	2-6	097-142, 999	8.0
7	2-6	099-150, 999	8.0
8	2-6	107-155, 999	8.0
9	2-6	109-160, 999	8.0
10	2-6	117-168, 999	8.0
11	2-6	122-178, 999	8.0
12	2-6	130-180, 999	8.0
13	2-6	135-185, 999	8.0
14-97	2-6	135-188, 999	8.0

TABLE A2
OCCUPANT AGE, SEX, WEIGHT
(CONSISTENCY CHECK: HH007)
(VERSION: 8.0)

AGE (OA05)	SEX (OA06)	WEIGHT (OA08)	CHANGE VERSION
0	1	003-016, 999	7.2
1	1	005-019, 999	7.2
2	1	006-021, 999	7.2
3	1	008-024, 999	7.2
4	1	010-027, 999	7.2
5	1	011-030, 999	7.2
6	1	014-035, 999	7.2
7	1	015-039, 999	7.2
8	1	016-044, 999	7.2
9	1	020-048, 999	7.2
10	1	023-058, 999	7.2
11	1	022-066, 999	7.2
12	1	026-073, 999	7.2
13	1	031-075, 999	7.2
14	1	036-082, 999	7.2
15	1	041-086, 999	7.2
16	1	047-096, 999	7.2
18-97	1	049-110, 999	7.2
0	2-6	002-015, 999	8.0
1	2-6	004-018, 999	8.0
2	2-6	006-021, 999	8.0
3	2-6	007-023, 999	8.0
4	2-6	009-026, 999	8.0
5	2-6	010-031, 999	8.0
6	2-6	012-034, 999	8.0
7	2-6	015-039, 999	8.0
8	2-6	017-041, 999	8.0
9	2-6	018-053, 999	8.0
10	2-6	021-054, 999	8.0
11	2-6	025-065, 999	8.0
12	2-6	028-069, 999	8.0
13	2-6	031-081, 999	8.0
14	2-6	035-080, 999	8.0
15-97	2-6	039-104, 999	8.0

TABLE A4
BODY TYPE
BY
VEHICLE CURB WEIGHT
(CONSISTENCY CHECK: GG008)
(VERSION: 8.0)

BODY TYPE (GV07)	ACCEPTABLE RANGE FOR VEHICLE CURB WEIGHT (GV43)	CHANGE VERSION
01-10	054-272, 999	
11	091-272, 999	
12	181-363, 999	
14	068-227, 999	
15	113-272, 999	
16	136-318, 999	
20	091-227, 999	
21, 22, 28, 29	091-272, 999	
30	091-204, 999	
31	113-249, 999	
33	091-204, 999	
39	091-272, 999	
40-42, 45, 48, 49	091-454, 999	

TABLE A5
NASS VALID OIC COMBINATIONS
(CONSISTENCY CHECK: TT002)
(VERSION: 7.1)
For valid combinations of Body Region, Type of Structure,
Specific Structure, Level of Injury, A.I.S. Severity and Aspect,
See the current Injury Coding Manual.

TABLE A-6
1ST DIRECTION OF FORCE(EV06) BY
ARCTANGENT(LATERAL DELTA V[GV61]/LONGITUDINAL DELTA V[GV60])
(CONSISTENCY CHECKS: GE017,GE018)
(VERSION: 8.0)

If	EV06	then	arctan(GV61/GV60) in degrees		and	arctan(GV61/GV60) in degrees		CHANGE VERSION
	06		GT	- 22.5		LT	22.5	
	07		GT	7.5		LT	52.5	
	08		GT	37.5		LT	82.5	
	09		GT	67.5		LT	112.5	
	10		GT	97.5		LT	142.5	
	11		GT	127.5		LT	172.5	
	12		GT	157.5		LT	202.5	
	01		GT	187.5		LT	232.5	
	02		GT	217.5		LT	262.5	
	03		GT	247.5		LT	292.5	
	04		GT	277.5		LT	322.5	
	05		GT	307.5		LT	352.5	

TABLE A-7
VEHICLE MAKE BY
BODY TYPE
(CONSISTENCY CHECK: GG005)
(VERSION: 7.1)
Acceptable Combinations)

MAKE (GV05)	BODY TYPE (GV07)	VERSION
01	01-09, 99	
02	14-16, 19, 31, 32, 39, 45, 48, 49,	7.2
	99	7.2
03	14, 15, 19, 21, 22, 28, 41, 45, 48,	7.2
	49, 58-60, 63, 78, 99	7.2
06	01-09, 20, 29, 99	7.2
07	01-12, 14-16, 19-25, 28-33, 39-42,	7.2
	45, 48-50, 58-79, 99	7.2
08	01, 02, 04, 08, 09, 12, 99	7.2
09	01-12, 15, 16, 19-21, 23, 28-30, 32,	7.2
	33, 39, 42, 45, 48, 49, 99	7.2
10	02-05, 07-09, 20, 99	7.2
12	01-16, 19-25, 28-33, 39-42, 45, 48-50,	7.2
	58-79, 92, 93, 97, 99	7.2
13	01, 02, 04, 08, 09, 11, 12, 99	7.2
14	01-09, 11, 12, 20, 99	7.2
18	01-09, 11, 12, 99	7.2
19	01-09, 11, 12, 99	7.2
20	01-16, 19-25, 28-33, 39-42, 45,	7.2
	48-50, 58-79, 99	7.2
21	01-09, 11, 12, 14, 20, 29, 99	7.2
22	01-09, 11, 12, 20, 29, 99	7.2
23	10, 11, 14-16, 19-25, 28-33, 39-42,	7.2
	45, 48-50, 58-79, 99	7.2
24	01-09, 99	7.2
25	22, 29, 49-79, 99	7.2
30	01-10, 14, 19, 20, 28, 29, 99	7.2
31	01-05, 07-09, 99	7.2
32	01-09, 99	7.2
33	01-05, 07-09, 99	7.2
34	01, 02, 04, 08, 09, 80, 89, 99	7.2
35	01-09, 14, 19, 20, 29, 30, 32, 33, 39,	7.2
	40, 42, 45, 48, 49, 63, 78, 79, 99	7.2
36	01-09, 61-64, 67-78, 99	7.2
37	01-09, 14, 20, 29, 80-90, 99	8.0
38	01-09, 14, 30, 32, 33, 39, 40, 42, 45,	7.2
	48, 49, 58, 61-64, 78, 79, 99	7.2
39	01, 02, 04, 08, 09, 99	7.2
40	01-04, 07-09, 99	7.2
41	01-09, 14, 19, 20, 29, 30, 32, 33, 39,	7.2
	40, 42, 45, 48, 49, 99	7.2
42	01, 02, 04, 06, 08, 09, 12, 28, 29,	7.2
	58, 59, 61-64, 67-79, 93, 97, 99	7.2

MAKE (GV05)	BODY TYPE (GV07)	VERSION
43	01, 02, 08, 09, 99	7.2
44	04-09, 81, 99	7.2
45	01-03, 07-09, 99	7.2
46	01-09, 99	7.2
47	01-09, 99	7.2
48	01-10, 99	7.2
49	01-09, 14, 15, 19, 20, 30-33,	7.2
	39, 40, 42, 45, 48, 49, 99	7.2
50	01, 02, 04, 08, 09, 80, 82, 89, 99	7.2
51	02, 04, 06, 08, 09, 58, 59, 61-64,	7.2
	78, 99	7.2
52	02-09, 14, 19, 20, 28-30, 32, 33, 39,	7.2
	40, 42, 45, 48, 49, 61-64, 78, 79, 99	7.2
53	01-09, 14, 19, 80-82, 88-90, 99	7.2
54	01-05, 07-09, 99	7.2
55	02-05, 07-09, 99	7.2
56	01-05, 07-09, 99	7.2
57	01, 03, 07-09, 99	7.2
58	02, 04, 09, 99	7.2
59	02, 04, 09, 99	7.2
60	03, 04, 09, 14, 19, 99	7.2
61	02, 04, 05, 09, 99	7.2
62	14, 19, 99	8.0
63	02-04, 09, 14, 19, 99	8.0
70	80, 88, 89, 99	7.2
71	80, 88, 89, 99	7.2
72	80, 88, 89, 99	7.2
73	80-82, 88-90, 99	7.2
74	80, 88, 89, 99	7.2
75	80, 88, 89, 99	7.2
76	80-82, 88-90, 97, 99	7.2
78	81	7.2
79	80-82, 88, 89	7.2
80	61-64, 67-78, 99	7.2
81	61-64, 67-78, 99	7.2
82	61-64, 67-78, 99	7.2
83	63, 67-78, 99	7.2
84	15, 16, 19, 22, 24, 25, 31, 32, 39-42,	7.2
	45, 48-50, 58-79, 92, 93, 97, 99	7.2
85	61-64, 67-78, 99	7.2
86	61-64, 67-78, 99	7.2
87	61-64, 67-78, 99	7.2
88	61-64, 67-78, 99	7.2

TABLE 11
ACCIDENT TYPE PAIRS
(CONSISTENCY CHECK: GG032)
(VERSION: 8.0)

ONE ACCIDENT TYPE (GV36[m])	OTHER ACCIDENT TYPE (GV36[n])	CHANGE VERSION
20	21, 22, 23	
24	25, 26, 27	
28	29, 30, 31	
32	32	
33	33	
34	35	
36	37	
38	39	
40	41	
42	42	
43	43	
44	45	
46	45, 47	
47	45, 46	
48	48	
49	49	
50	51	
52	52	
53	53	
54	55	
56	57	
58	59	
60	61	
62	62	
63	63	
64	65	
66	66	
67	67	
68	69	
70	71	
72	73	
74	74	
75	75	
76	77	
78	79	
80	81	
82	83	
84	84	
85	85	
86	87	
88	89	
90	90	
91	91	

TABLE 12
VIN CHECK DIGIT ALGORITHM
(CONSISTENCY CHECK: GG092)
(VERSION: 7.1)

THE CHECK DIGIT ALGORITHM APPLIES TO MODEL YEAR 1981 OR LATER VEHICLES WITH 17 DIGIT VINS. EACH NUMBER OR LETTER IN THE VIN HAS A VALUE AMD EACH PLACE OR POSITION HAS A WEIGHT. EACH WEIGHT IS MULTIPLIED BY THE VALUE OF THE NUMBER OR LETTER IN THAT VIN POSITION. THE TOTALS IN EACH VIN POSITION ARE THEN ADDED TOGETHER AND THE GRAND TOTAL IS DIVIDED BY 11. THE REMAINDER MUST BE THE SAME AS THE NUMBER APPEARING IN THE CHECK DIGIT(THE NINTH VIN POSITION). WHEN THE REMAINDER IS 10, THE CHECK DIGIT WILL CONTAIN AN 'X'.

CHARACTER	VALUE		POSITION	WEIGHT
A	1		1	8
B	2		2	7
C	3		3	6
D	4		4	5
E	5		5	4
F	6		6	3
G	7		7	2
H	8		8	10
J	1		9	0
K	2		10	9
L	3		11	8
M	4		12	7
N	5		13	6
P	7		14	5
R	9		15	4
S	2		16	3
T	3		17	2
U	4			
V	5			
W	6			
X	7			
Y	8			
Z	9			
0	0			
1	1			
2	2			
3	3			
4	4			
5	5			
6	6			
7	7			
8	8			
9	9			

TABLE A-13
BODY REGION, TYPE OF STRUCTURE, SPECIFIC STRUCTURE, AIS SEVERITY
(CONSISTENCY CHECKS: HT036, HT037, HT038)
(VERSION: 7.2)

BODY REGION (OI06)	TYPE OF STRUCTURE (OI07)	SPECIFIC STRUCTURE (OI08)	A.I.S. SEVERITY (OI10)	CHANGE VERSION
1	1	30		7.2
1	2			7.2
1	4			7.2
1	5	02		7.2
1	5	04	>=3	7.2
1	6		>=3	7.2
3	1	10		7.2
3	2	02		7.2
3	2	04,06,08,10	3	7.2
3	4	02,06	>=3	7.2
4	1	30		7.2
4	2		>=3	7.2
4	4		3-6	7.2
4	5		>=3	7.2
5	2		>=3	7.2
5	4		>=3	7.2
6	4		>=3	7.2
6	5		3	7.2
7	1	30		7.2
8	1	10		7.2
8	1	30		7.2
8	5	18	3	7.2
8	5	26	>=3	7.2
9	1		>=3	7.2
9	9			7.2

TABLE A-14
VEHICLE CLASS AND CONTACTED CLASS BY
BODY TYPE
(CONSISTENCY CHECKS: AG027, AG028)
(VERSION: 8.0)

VEHICLE CLASS (AC14)[n] CONTACTED CLASS (AC17)[n]	BODY TYPE (GV07)	CHANGE VERSION
01-09	01-13	
14	14	8.0
15	15	8.0
16	16	8.0
19	19	8.0
20	20	8.0
21	21	8.0
24	24	8.0
28	22, 23, 25, 28	8.0
29	29	8.0
30	30	8.0
31	31	8.0
38	32, 33	8.0
39	39	8.0
45	40, 41, 42, 45	8.0
48	48	8.0
49	49	8.0
50	50	8.0
58	58	8.0
59	59	8.0
60	60, 61, 62, 63, 64, 65	8.0
67	67	8.0
68	68, 69, 70	8.0
78	78	8.0
79	79	8.0
80	80, 81, 82, 88, 89	8.0
90	90, 91, 92, 93, 97	8.0
99	99	8.0

TABLE A-15
INTRUDING COMPONENT BY
INJURY SOURCE
(CONSISTENCY CHECK: CT009)
(VERSION: 8.1)

INTRUDING COMPONENT (IV48)[n]	INJURY SOURCE (OI12)[n]	CHANGE VERSION
01	004, 005, 006, 007, 015, 401-409, 412	8.0
02	008, 009, 010, 014, 015, 253, 401, 409, 412	8.0
03	008, 009, 011, 014, 401, 409, 412	8.0
04	008, 009, 012, 013, 014, 016	8.0
05	251, 254	8.0
06	015, 016, 053, 059, 103, 109, 407, 411, 412	8.0
07	054, 059, 104, 109, 153, 407, 411, 412	8.0
08	055, 105, 407, 411, 412	8.0
09	055, 105, 407, 411, 412	8.0
10	051, 101	8.0
11	051, 052, 058, 059, 101, 102, 108, 109	8.0
12	051, 052, 101, 102	8.0
13	205, 410	8.0
14	059, 109, 203, 204	8.0
15	001, 002, 015, 016, 017	8.0
16	015, 016, 017, 201	8.0
17	056, 057, 059, 106, 107, 109	8.0
18	251, 252	8.0
19	202, 301	8.1
20	151, 155, 412	8.0
21	151, 155, 412	8.0
22	151	8.0
23	151	8.0
24	151	8.0
25	151	8.0
26	302, 303	8.0
27	019, 055, 060, 105, 110, 163, 252, 303, 412	8.0
30	451	8.0
31	452, 453	8.0
32	501-513, 598	8.0
33	514	8.0
98	019, 060, 110, 163, 195, 303, 412	8.0

TABLE A-16
ACCIDENT TYPE BY
DAMAGE AREA or CONTACTED AREA
(CONSISTENCY CHECKS: AG047 & AG048)
(VERSION: 7.1)

ACCIDENT TYPE (GV36)	DAMAGE AREA (AC15) CONTACTED AREA (AC18)	CHANGE VERSION
20, 24, 28, 34, 36, 38, 40, 50, 51, 54-61, 86, or 88	F, V	
21-23, 25-27, 29-31, 35, 37, 39, or 41	B, D, C	
87	R	
89	L	
OTHERS	ANY	

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