MULTIDISCIPLINARY ACCIDENT INVESTIGATION REPORT AUTOMATION AND UTILIZATION

1973 Final Report

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16. Abstract

This is the final report of the 1973 Multidisciplinary Accident Investigation (MDAI) Report Automation and Utilization contract. It contains a summary of contract accomplishments and a discussion of data preparation, data system and utilization of the data. Appendices include a list of all contract documentation, accident and injury causation coding systems and an index of all automated MDAI case reports.

Over 6,000 clinical accident investigations have been conducted to-date (December 1973). These reports sponsored by the National Highway Traffic Safety Administration, the Motor Vehicle Manufacturers Association, and the Canadian Department of Transportation, are being edited and processed into a common data base. All sponsors are also being provided direct access to the data base through the University of Michigan's time-shared computer system via remote batch and interactive terminals. The data base contains data recorded on an annotated "Collision Performance and Injury Report."

The NHTSA has sponsored the automation of the MDAI reports, the documentation of the MDAI report editing procedures, the development of accident and injury causation coding systems, the addition of new data bank variables and a unique feature of the 1973 contract--the active involvement of NHTSA data users.

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PROGRAM SUMMARY

BACKGROUND

The National Highway Traffic Safety Administration (NHTSA) and formerly the National Highway Safety Bureau, have sponsored over 1,700 in-depth or multidisciplinary accident investigations (MDAI) over a period of more than five years.

The Canadian Department of Transportation also sponsors a series of MDAI teams throughout Canada and the Motor Vehicle Manufacturers Association (formerly Automobile Manufacturers Association) sponsores clinical investigations of traffic accident crash and injury factors. Altogether more than 6,000 Level III (in-depth, clinical) accident investigations have been conducted as of December 1973.

Since 1969 HSRI has been engaged in the effort of editing the case reports, placing the information into digital form and making it accessible for retrieval or statistical analysis by computer techniques. Case reports from all sponsors are processed into a common data base that is then made available to all sponsors for direct analysis through the use of the Institute's Statistical Research System.

The NHTSA contract for Multidisciplinary Accident Investigation Report Automation and Utilization (DOT-HS-031-3-589) provides for processing MDAI cases sponsored by NHTSA into the common data base in a manner that controls for data quality. NHTSA remote computer terminal access is then provided to the common data base of Level III cases from all sponsors as well as access to over 100 other Level I or police accident data files.

The unique feature of the 1973 MDAI Report Automation and Utilization contract was the active involvement of data system users. Under the alert and vigilant guidance of the contract technical manager, we sat down with data users with real problems in order to determine how the MDAI data system could be best utilized and adapted to their advantage. The remainder

of this section covers the accomplishments achieved under each of nine tasks. The next three sections discuss, in turn, data preparation and quality control, data system and data utilization. The final section contains the conclusions and recommendations.

CONTRACT ACCOMPLISHMENTS

The following will be a brief task-by-task review of 1973 accomplishments. Each area of contract activity will then be discussed more fully in subsequent sections. A complete compilation of all contract reports and documentation submitted to NHTSA is listed in Appendix A. The 1973 contract provided for nine specific tasks:

Task	Short Title
1	Case Processing
2	Quality Control
3	Editing Documentation
4	Accident Causation
5	File Utilization
6	User Products
7	OSIRIS Implementation
8	Special Files
9	New Variables

Tasks 1, 2, 3 - Data Preparation and Quality Control

The first three tasks cover the processing of MDAI cases into computer storage. From January 1973 through October (the last 1973 computer file update), 151 MDAI case vehicles were added to the computer file. Activity on this task was lower than anticipated due to delays in Task 9 (New Variables). A total of 4,201 case vehicles from all sponsors are currently (October 1973) in computer storage and available to NHTSA.

Case processing was interlinked with Task 9 (New Variables) so that cases processed after the first two months of the contract would include the new variables. Subsequent

delays in the selection of new variables produced a reduction in the number of cases processed. This did not severely impact the release of new MDAI cases by NHTSA because generally a second copy of the case documentation is forwarded to HSRI for processing. During this same period, 1,228 clinical cases from other sponsors were added to the CPIR data bank. Thus during the contract period, the number of case vehicles available for NHTSA analytical purposes increased 49 percent, from 2,822 to 4,201 cases.

Quality control was insured by adequate training of data editors, complete key verification of keypunched data, and computer checking of data inconsistencies. Feedback to field MDAI teams was provided in the form of individual case critiques; presentations on February 5, 1973 and November 27, 1973 to MDAI training courses at the University of Southern California (USC); and by documentation of the editing process and reference information. Update sheets to the 1972 edition of the editing manual were provided in July and the entire manual was updated and reissued December 1973.

Tasks 4, 9 - New Data Elements

The addition of new variables was a unique aspect of the 1973 contract as covered by Tasks 4 (Accident Causation) and 9 (New Variables). The rationale for adding new variables was to achieve a better balance between the needs of the data users and what the teams are already reporting. The intent was to code the results of existing investigative efforts rather than to think up new items for the field teams to investigate. A large proportion of the field investigative effort is expended in documenting pre-crash factors yet the vast majority of data coded into computer storage is crash-phase vehicle damage and injury production. The objective was to bring a better balance to the coded variables by adding new variables that reflected items currently reported by MDAI teams and items of interest to data file users.

An accident causation analysis system for coding and processing accident factors was developed. A preliminary code structure was submitted in February and a preliminary coding form was submitted in June. These were refined, documented and presented as Appendix C to this report.

The Occupant Injury Classification (OIC) system developed during the 1972 MDAI Report Automation contract was refined and updated twice in 1973. The OIC procedure was presented to the NATO-CCMS Accident Investigation Final Workshop in Brussels, Belgium, June 28-29 (Appendix D) and to the SAE Accident Investigation Practices Subcommittee meeting November 14 in Oklahoma City (1,2)*. The OIC was also presented at the two USC training courses in February and November.

Several coding forms were developed for recording the new variables independently of the existing forms. The Damage Analysis Supplement (DAS) and Occupant Supplement (OS) for recording Occupant Injury Classification data are both one page forms of primary importance that should be ultimately prepared by MDAI field teams. The other pre-crash data forms are still in the prototype stage requiring further testing and refinement prior to their general application.

Tasks 5, 6 - Utilization

A major emphasis in 1973 was the utilization of the already existing MDAI data system as provided for in Task 5 (File Utilization) and Task 6 (User Products). The file utilization Task 5 called for providing NHTSA with documentation, training, and access to the HSRI accident data analysis system** as well as some system enhancements. The user products Task 6 involved actively communicating with data users concerning their specific data needs.

During 1973, documentation on 36 new files was distributed

*Numbers cite references in Reference Section.

**Actual NHTSA computer funds for executing the analysis programs were contracted separately from Task 5.

to NHTSA users. Currently over 100 documented accident data files are being made available to NHTSA. Thirteen NHTSA staff attended a successful user training session with 40 attendees at HSRI on May 10-11. An earlier oral presentation was presented at NHTSA on January 22. The NHTSA computer users have utilized the data system for over two hours per day in 1973 and over sixty percent of the utilization was of accident files other than the MDAI/CPIR data.

System enhancement included a keyword data access system, an alphabetic data set list program and a procedure for sorting data listings. The keyword Automated Data Access and Analysis System (ADAAS) was installed in the first month of the contract. In a recent check, ADAAS was utilized by NHTSA users 84 times during October 1973. An alphabetic data set list program that translates number codes to alphabetic code value definitions before printing out a case and a procedure for sorting the output of a data set list program were both developed and provided.

The active utilization of the existing accident data analysis system to develop sixteen user products in response to specific and real user's needs was undoubtedly the most significant and unique aspect of the 1973 contract. A considerable amount of the contractual emphasis was placed on Task 6.

The only reason an information system is developed is to provide information products that will assist the user in his decision making process. A sizeable investment has been committed to developing the in-depth accident investigation data resources over the past five years. In 1973 ,the Office of Accident Investigation and Data Analysis undertook this task in order to emphasize the critical role of the "user" in the existing data system. The benefits of the task were realized through direct interaction with users in order to provide tangible analysis products in response to specific user requests.

Besides being the ultimate justification for a data system,

users also provide the feedback loop essential to successful evaluation towards a more responsive system. Active involvement of the user provided exposure to the capabilities and limitations of the existing accident data analysis system. This experience establishes a realistic base upon which the user can construct future requests and suggestions for future system enhancements (from new variables to new analytical methodologies). The experience also provides the data system managers and data analysts with a deeper understanding of users decision making problems.

Tasks 7, 8 - OSIRIS and Special Files

Tasks 6 and 7 were to be executed at the discretion of NHTSA. No activity was performed on either Task.

Task 9 - New Variables

The discussion of new variables was covered in conjunction with Task 4 above.

SECTION 2
DISCUSSION OF DATA PREPARATION

The data preparation process is considered in three different dimensions--namely case processing, quality control and documentation. The processing of MDAI cases follows the routine steps of logging, xeroxing, editing, coding, second editing, keypunching, computer case checking, analysis file updates and the correction of cases already in computer storage.

CASE PROCESSING

The steps involved in case processing are detailed in the "MDAI Report Automation Editing Manual and Reference Information" (3). Basically, the MDAI field teams submit their case documentation to NHTSA along with sets of 35mm slides. Copies of the original documentation and a set of 35mm slides are transmitted to HSRI by NHTSA where its arrival is recorded in a computer based log of cases to be processed and cases returned. Copies are made of the computer forms for use by the data editors who review all the case documentation in order to insure the validity of the data to be keypunched. Over 30 pages of forms are verified. Additional pages of supplementary forms are also coded from the original documentation (Appendix B).

The coding of additional data elements from the existing MDAI documentation was a unique aspect of this years' program. Prior to 1973, the vast majority of the data placed in computer storage was related to only the crash phase (e.g., collision performance and injury), yet the MDAI teams expended considerable effort in investigating and documenting pre-crash factors. It was also realized that each computer record acts as the primary surrogate by which each case is represented and retrieved. Any gap in that representation jeopardizes the full utilization of each case. Thus, a special task was initiated to identify new data elements that were regularly reported by MDAI teams, that were readily coded and that were meaningful for later utilization. The data element selection process was conducted in

close coordination with NHTSA staff. While schedule slippages in the completion of the data element selection process delayed and reduced the total number of cases processed, the resulting forms provide for improved crash and injury recording as well as considerably more human and environmental pre-crash data.

Four new supplements were created: Accident, Traffic Unit, Damage Analysis and Occupant supplements. The accident supplement records those elements common to all traffic units, such as the weather. This supplement is also used to record accident causation factors according to a newly developed scheme (Appendix C) based in part upon earlier work done by Indiana University (4,5). The data on this accident form are automatically duplicated for each traffic unit. The traffic unit supplement is used to record data elements unique to each driver, case vehicle, or environment from the point of view of each driver's approach path. The damage analysis supplement records for each case vehicle, the Collision Damage Classification (CDC/VDI), the corresponding crash event, speed, configuration, crush, and other vehicle damage. These are the same data currently reported but coded in a more usable format. The occupant supplement records several new and expanded data elements as well as providing for coding the Occupant Injury Classification (OIC) developed under NHTSA sponsorship. The OIC was presented to the NATO/CCMS Final Accident Investigation Workshop in Brussels, on June 28-29 (Appendix D). In response to comments and coding experience the OIC was updated from an applications point of view. The OIC application procedure was presented to the SAE Subcommittee on Accident Investigation Practices, November 14, in Oklahoma City and then placed in the Editing Manual documentation (3). The damage analysis and occupant supplements have been documented and tested sufficiently to permit immediate application by the MDAI field teams in 1974.

Each of the four supplements are now being coded by HSRI from the original MDAI team documentation. The entire edited case and added coding is second edited or re-edited by a second staff person prior to keypunching and key verification. The

cards are then read into HSRI's PDP 11/45 for checking, formatting and accumulation. Quarterly, the compiled cases are built in the Level III or in-depth data analysis files (Section 3). The last file update performed in October 1973 resulted in a data base of 4,201 case vehicle clinical investigations. Of these, 1,297 were MDAI case vehicles that were distributed by team as displayed in Table 1. A list of each MDAI case vehicle, with a DOT-HS publication number cross index is included in Appendix E and F.

TABLE 1

Processed MDAI Case Vehicles Distributed by Teams

TEAM	NUMBER CASE VEHICLES
AA - Ann Arbor, HSRI	121
BA - Baylor College of Medicine	68
BC - Boston University	33
CB - Calspan III B	134
GI - Georgia Institute of Technology	71
IU - Indiana University	25
MI - University of Miami	102
ML - Maryland Medical/Legal Foundation	61
NM - University of New Mexico	75
OS - Ohio State University	30
RT - Research Triangle Institute	76
RU - University of Rochester	52
SC - University of Southern California	65
SI - Stanford Research Institute (2)	7
SR - Stanford Research Institute (1)	7
SU - Stanford University	38
SW - Southwest Research Institute	190
TR - Trauma Research Group, UCLA	69
UK - University of Kentucky	4
UO - University of Oklahoma	4
UU - University of Utah	18
TOTAL	1297

QUALITY CONTROL AND DOCUMENTATION

Quality control is one of the critical elements of the MDAI data management program. The computer forms become the primary surrogate for each MDAI case. While data file errors can be corrected, they may never be detected. For example, once a Volkswagen is incorrectly coded as an Opel it may be permanently lost to anyone subsequently conducting a study of Volkswagens. A lot of field investigative effort can be "misplaced" by a few coding errors. While it may be better to process ten cases correctly rather than a hundred of questionable quality, a dilemma immediately arises between getting the job done vs. doing it right. In light of this, a number of quality control steps are followed in an attempt to ensure the quality of the resulting automated data base. These steps were instituted with two goals in sight: (1) Institute a sufficient number of steps so that there are checks on the checks and, (2) Institute a program of field team feedback in order to perfect the quality of the coding as originally submitted.

Specifically the following steps were performed with the guidance and approval of the NHTSA contract technical manager:

1. All the editing criteria, corrections and interpretations of questions have been expanded and improved from 1972. The resulting editing manual increases inter-editor consistency and has greatly aided the training of new editors. The documentation provided in the 1973 MDAI data automation program has also been widely utilized by the MDAI field teams. Comments from each of the teams and by NHTSA staff have been incorporated in the 1974 MDAI Report Automation Editing Manual and Reference Information (3). This updated documentation should continue to reduce the variance with which the field data have been recorded.

2. In order to maintain and ensure the quality of the data editing process itself, several procedures were followed: (a) all MDAI case editing was reviewed by a second staff member and major differences resolved, (b) new data editors

were not permitted to process full MDAI cases until adequately trained on other clinical accident investigation data, and finally, (c) data editors receive some field training in the original preparation of data forms by assisting experienced field investigators. This field experience proved to be particularly valuable and should be emphasized in any future MDAI report automation programs.

3. All keypunched data were one hundred percent key verified. Also any keypunch errors discovered in subsequent quality control steps were checked against the source document and arrangements were made for corrections by the keypunch staff. All keypunching and verifying was performed by HSRI staff with an average of four years experience with CPIR computer forms.

4. A package of pre-build programs performs over 400 checks for invalid codes and internal data inconsistencies such as rear door damage on two-door cars. The IBM 1800 program documented in the 1973 MDAI Report Automation Program Review (6) was converted to the Institute's new PDP 11/45 computer with some enhancement. Basic pre-build programs were also written to process the accident, traffic unit, damage analysis and occupant supplements. Further data checks should be added to each of supplement processor programs.

5. The pre-build data checking programs produce weekly error comment lists that are reviewed with the original coding and documentation. Either the keypunched cards are corrected or the data are corrected in subsequent file processing steps.

6. Four times a year the cases compiled by the pre-build programs are used to update the data analysis files available to users. The new data are file built and univariate or one-way frequency distributions are computed for each numeric variable in the new data. This printout is reviewed for

wild codes and unusual distributions before the new data are added to the existing data base.

7. Data corrections continue to be made to the existing computer data base, in response to comments received by all the data analysts and file users. This form of feedback from file users is encouraged as a means of either educating the user or correcting the data file. In contrast to most accident data files where data are stored once-and-forever, the records in the MDAI file are subject to a continual correction process.

8. Three forms of feedback are also provided for the MDAI field teams. The editing manual and reference information compiled in item one above has been provided to each team and updated to reflect their comments. Secondly, individual case critiques have been prepared and supplied to each team's contract technical manager. The content, utility and team response to these case critiques should be reviewed in subsequent MDAI report automation projects. The third element of team feedback is in the form of two training seminar and/or discussion sessions to introduce MDAI field investigators to how the case documentation is processed, stored and used. A detailed presentation of the Occupant Injury Classification procedure was also provided as part of two MDAI training programs conducted by the University of Southern California on February 5 and November 27, 1973.

In summary, the goal or objective of the quality control task has been to provide a relatively noise free communications channel between the collision event and the data analyst.

There are many reasons that errors and unknown values occur in the data file. They can be due to weaknesses in the original investigations, the case documentation, the basic reference information provided to the teams and data editors, and in the data editing and processing itself. The approach taken

has been to provide for communication with field teams in order to continually improve the quality of the original data reporting, a series of checks in the report automation process, and finally, communication with data analysts in order to provide user understanding and continual improvement of data file quality.

SECTION 3
DISCUSSION OF DATA SYSTEM

This section describes the accident data system provided to the National Highway Traffic Safety Administration as part of the MDAI report automation and utilization program. The description of the overall system is followed by a more detailed description of the MDAI data bank itself.

ACCIDENT DATA SYSTEM

As part of this contract, NHTSA has been provided with access to a data system that contains over a hundred accident data files, as listed in Appendix G. Table 2 is a summary of these data files. Figure 1 displays circles that locate the sources of Level I or police accident data and dots that locate the Level III or clinical investigation teams in the United States and Canada.

Access to the accident data system is provided through the University's Michigan Terminal System (MTS), a time-shared IBM 360/67 computer. The community of data users includes the NHTSA staff, six of the field MDAI teams* and the automobile industry analysts. Users access the data system via interactive terminals (e.g., teletypes) from the privacy of their own office. Remote batch terminals are also operating from NHTSA and Southwest Research Institute.

Documentation of the contents of each data file was provided in the form of complete sets of computer codebooks. The code values and code definitions used for each variable or data element are displayed in the codebooks along with the frequency of usage for each code value. Codebooks for 42 new or updated files were provided during 1973.

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*Calspan, HSRI, Indiana University, Southwest Research Institute, Stanford Research Institute and University of Southern California

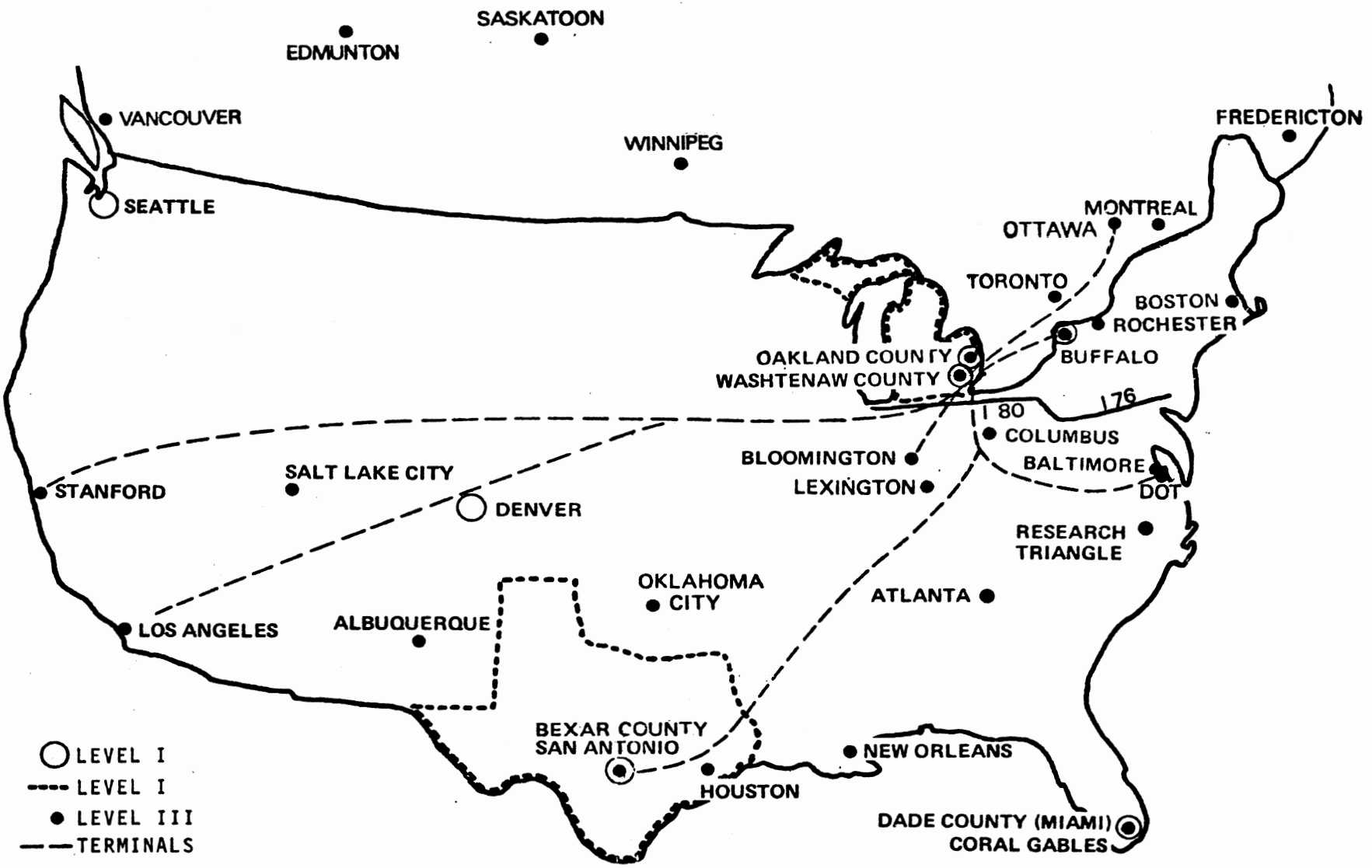

FIGURE 1
Sources of Data and Remote Terminal Users

TABLE 2

Summary of Files Presently Available in the Data System

SOURCE	DATA LEVEL I (Police)	II	III (MDAI)
MDAI Teams			X
Michigan			
Washtenaw County (68-72)	X		X
Oakland County (68-72)	X		X
Texas			
Bexar County (69-72)	X		X
New York			
Calspan (70-72)	X	X	X
Florida			
Dade County (69-72)	X		X
Washington			
Seattle (69-72)	X		
Colorado			
Denver (69-72)	X		

In order to readily analyze these files, a fairly extensive package of statistical analysis tools have also been made available in the HSRI Statistical Research System (SRS) (7). The more commonly used analysis programs and data files were made accessible through a keyword processing program that does not require the analyst to learn how data files are stored or how programs are loaded for execution.

While computerized storage and analysis is the only practical method of handling large data bases, it does introduce several difficulties for the user, who, in most situations is not experienced in computer operations. Thus, the minute attention to detail required to operate computers tend to repel many potential users who are unaccustomed to this detail in human relationships. Computers are designed for detailed tasks,

however, and there is no reason that they should not be given the tasks of doing the operations that are difficult for the novice. The goal of the keyword Automated Data Access and Analysis System (ADAAS) is therefore clear: use of the computer itself to perform most of the detailed operations necessary to carry out an analysis task using the HSRI accident files. In implementing this goal, however, it is difficult to allow for all the possible manipulations that can be performed with MTS and SRS. Consequently, ADAAS is presently designed to handle the routine operations normally encountered; the user is still encouraged to use the full capabilities of SRS to carry out more sophisticated analysis operations.

The five basic ADAAS programs (Table 3) provide for (1) data set listing cases of interest (case retrieval), (2) bargraphs, (3) univariate or one-way frequency and percentage distributions, (4) analysis of variance, and (5) bivariate or two-way tables that compare any two variables and tables. The data set list program was modified to provide for the translation of numeric codes, in the MDAI file, into alphabetic equivalents. This automatic interpretation of code values has considerably enhanced the readibility of computer listings of MDAI cases. A procedure has also been provided for sorting or arranging the case listings in any user specified sequence, e.g., by vehicle make or model.

Thus, it can be seen that the HSRI accident data system is itself comprised of four major systems:

1. MTS - The Michigan Terminal System

   MTS is the controlling operating system for all tasks done at the University of Michigan Computing Center.

2. ADAAS - The Automated Data Access & Analysis System

   ADAAS is a sublevel operating system (within MTS) to supervise the tasks required for accessing the HSRI accident data files.

3. SRS - The Statistical Research System

   SRS is a package of analysis programs called by ADAAS to provide for analysis of the accident data.

TABLE 3

Analysis Functions Available in the ADAAS System

FUNCTION	DESCRIPTION	EXAMPLE
Data Set List	List the values of any selected variables for any chosen subset of the data file.	List case number, age and sex of driver, and severity of injury for all cases involving Fords damaged in the front and with a reported impact speed greater than 20 miles per hour
Bargraph	Print a pictorial display (bargraph) for any variable and for any subset of the data	Two bargraphs showing the number of head-on and the number of rear-end accidents by hour of the day.
Univariate	Tabulate the distribution of the number of cases at each level of some variable for any chosen subset, and also present the mean, standard deviation, and kurtosis.	Print the number of drivers in each age group for drivers involved in accidents during hours of darkness, and also print the average age and its standard deviation.
Analysis of Variance	Calculate the average value of some dependent variable for each level of another variable, and display this mean, the standard deviation, and several statistics showing significance of the association.	Display the average age of female drivers for each day for the week; then display similar tables for cases in which the driver was drinking or not drinking.
Bivariate	Tabulate a two-way table for any two variables and for any subset; present associated statistics when desired.	Display the number of accidents by severity and by day of the week; include also the row and column percentages with missing data excluded.

4. HSRI Accident Files

   An extensive set of accident data files maintained by HSRI. Data from country-wide sources and from a variety of investigative levels are incorporated.

It would be convenient (especially for the novice user) if the entire operation appeared homogeneous. To as large a degree as possible this has been accomplished: however, there are still many situations in which the division between systems becomes evident. To understand what is happening in these situations it is useful for the user to have an appreciation of the role of each system in the overall operation. Consequently a descriptive Data Users Operating Manual (8) has been prepared that provides a detailed description of the data file structure and contents, the Michigan Terminal System, the keyword access system (ADAAS) and the operation of the basic analysis programs. Further specifics on the data system can be found in the users manual (8). The remainder of this section will discuss the contents of the data files constructed and maintained under the MDAI report automation and utilization program.

MDAI DATA BANK

The primary MDAI file contains data recorded on an annotated CPIR Revision 3 plus eight supplementary pages. Several other special files have also been built and maintained from data recorded on the NHTSA Vehicle Condition and Maintenance Report (VCMR) and the accident, traffic unit, damage analysis and occupant supplements (Appendix B). Computer codebooks have been submitted separately for the special files. A discussion of the primary CPIR file organization and contents precedes a description of the special files.

CPIR FILE CONTENTS

Over 800 different variables (items of information) are recorded in the master file for each case. The majority of these items are taken from the Collision Performance and Injury

Report (CPIR), Long Form, submitted with each case (9). Because the primary emphasis of this form was to record vehicle crash damage and concurrent injury details, a number of additional pre-crash and administrative variables have been coded by the editors onto a second (supplementary) form.

Once the master file is created, three "working" or "analysis" files are created--centered respectively on the vehicle, the occupant, and the injury. The vehicle file contains one logical record for each case vehicle investigated; thus, if two vehicles involved in one head-on collision were reported on two CPIR forms, two computer records would be stored. The occupant file contains one record for each case vehicle occupant, whether injured or not. Finally, the injury file contains one record for each reported injury sustained by an occupant. A complete set of univariate descriptive statistics for each variable in the working files is provided to the data users.

The data file contains all the case vehicle passenger cars and light trucks investigated by both the NHTSA- and MVMA-sponsored teams, and from the teams sponsored by the Canadian Department of Transport. Large trucks, buses, motorcycles and pedestrians are not included as a "case vehicle" but may be noted as an "other vehicle"*.

As noted in the previous section, many new variables have been added as well as new cases. Thus the data file content has grown in width as well as length. In fact, the MDAI file can be considered a library of variables as well as a collection of MDAI case reports.

Vehicle File Contents

There are 576 variables or items of information stored for

*A separate summary file of large trucks, buses, motorcycles and pedestrians reported by Level III teams was initiated under separate sponsorship and made available to NHTSA in 1973.

each of the investigated MDAI case vehicles. These variables can be grouped under the following topics:

Case Identification
Environment
Vehicle Malfunctions
Collision Description
Other Vehicle Description
Case Vehicle:
  Description
  Damage, Exterior
  Damage, Interior
Case Vehicle Driver
Crash, Post-Crash
Pre-Crash
Program Matrix Cells
Occupant Summary

1. Accident Factors

The vehicle file contains the variables that describe the accident (the "Accident Factors"). There is no "accident file" as such. The individual vehicles involved in any one multiple-vehicle "accident" would each constitute a case vehicle, and the environmental conditions common to all case vehicles for an accident would be identical. This situation can be identified because the team case number will be common to both records, but the vehicle number will increment by 1 for each case vehicle stored. (Note, however, that some environmental variables, such as the road alignment, may be different for different case vehicles in the same collision.)

Accident Factors

Identification
  Date
  Time
  Case Number
  Publication Number
Location
Environment
Pre-Crash Factors
  Case Vehicle
  Emergency Services
Team Recommendations (Matrix Cells)

2. Vehicle Malfunction

Vehicle mechanical malfunctions are coded only for the case vehicle. If the "other vehicle" had a tire blow-out but was not investigated as a case vehicle, the malfunction would not be recorded. To be coded, a malfunction must be suspected or alleged to have contributed to the accident. (For example, if a brake failure contributed to the severity of an accident that could not have been avoided even with good brakes, a malfunction is recorded.) The following broad categories of vehicle malfunction are used:

Vehicle Malfunction
Brake System
Exhaust System
Suspension System
Tires
Electrical System
Throttle Controls
Driver Controls
Power Train
Fuel System
Visibility Items
Other: _____
Unknown

3. Collision Description

The collision description is coded from the point of view of the case vehicle. Generally all the configuration questions are independent of each other and are coded in combinations. Thus, if a case vehicle sideswipes a truck, strikes a guard-rail, and then rolls over in the same accident, all three events are recorded. This convention contrasts to the usual Level I or police accident data where only one event is coded per accident.

For those interested in analyzing the collision configuration variables, some words of caution are in order. The sequence of events is not coded, i.e., if both a sideswipe and a head-on are coded, either may have preceded the other. The reported impact speed is, by convention, that of the first impact --and this is not necessarily the most damaging impact.

Collision Description

Collision Configuration
  Vehicle to Object
  Rollover
  Ran-Off-Roadway
  Vehicle to Vehicle
  Other
Number of Vehicles
Objects Contacted
Case/Other Vehicle Speeds
Direction of Rollover
Total Energy Available

Because of the necessity for adequate collision damage data, a Damage Analysis Supplement was implemented in 1973 that relates speeds, configurations, object contacted and inches of crush directly with the VDI/CDC. The Damage Analysis Supplement data are described later in the section.

4. Vehicle Damage

The vehicle file contains a very extensive description of the damage sustained by the case vehicle. Thirty-eight variables describe the overall vehicle damage in terms of cost, Vehicle Damage Index or Collision Deformation Classification, and sheet metal damage/crush (10). Case vehicle exterior damage is described as seen by walking around the vehicle counterclockwise: wheel and tires, front exterior, left exterior, rear exterior, right exterior. The descriptions of fire are included with exterior damage.

Exterior Damage

Cost
Vehicle Damage Indexes (CDC's)
Sheet Metal Damage/Crush
Wheels and Tires
Front Exterior:
  Hood
  Engine/Transmission Mounts
  Steering Flexible Coupling
  Telescoping Unit
Fire
Left Exterior:
  Pillars (A,B,C,D)
  Roof Side Rail

Exterior Damage (Continued)

- Body Mount
- Doors

Rear Exterior:

- Fuel Tank/Lines
- Trailer and Hitch
- Tailgate
- Trunk Lid
- Backlight Header

Right Exterior:

- (like Left Exterior)

The case vehicle interior damage topics include the steering wheel, steering column, windshield, instrument panel, seats, and side interiors as outlined below:

Interior Damage

- Steering Wheel
- Steering Wheel EA Device
- Steering Column Features
- Column Movement
- Column EA Devices
- Column Rotation
- Compartment Deformation
- Windshield Performance
- Front Interior (Panel)
  - Damage and Occ. Contacts
- Seats
  - Adjustors
  - Head Restraints
  - Rear Seats
- Windows
- Left/Right Side
  - Damage and Occ. Contacts
- Roof

5. Vehicle Driver

The vehicle file is also logically the driver file, as there is only one driver per case vehicle. It should be noted that all drivers in a particular accident will be represented only if all vehicles are investigated (i.e., become case vehicles). For example, if a drunk driver in an old car runs a stop signal, and old cars are not investigated, he may not be represented in the data bank.

Driver Factors

Impairment
Driver Education
Driver's Record
Trip Plan
Route Familiarity
Psychological
Physiological
Pharmacological

6. Occupant Summary

The last vehicle file variables summarize the occupant information for the case vehicle. These summary variables are created automatically during the file building process, to provide the analyst the facility for occupant information on a vehicle-to-vehicle basis. For example, one may ask "what is the distribution of injury severity for the right front occupant in vehicles with a driver fatality?" Occupancy, Overall Injury Severity (AIS), and Restraint Usage are recorded for five summary seat positions (11). The Overall Case Vehicle Injury Severity (AIS) is summarized by recording the highest overall injury severity sustained by any one case vehicle occupant. This is a useful variable for splitting the file into three broad categories: property damage (AIS=0), injury producing (AIS=1-5) and fatality producing (AIS=6-10).

Occupant File Contents

There are 60 additional variables coded for each of the MDAI case vehicle occupants. Each occupant is recorded whether injured or not, and each occupant record repeats the first 576 vehicle variables for each occupant in the case vehicle. Thus, a case vehicle with three occupants would be processed into three occupant records, each containing identical information for the first 576 variables. One occupant record is processed for unoccupied case vehicles with the Occupant Number coded as (00), and the other variables as "unknown". The occupant variables can be grouped as follows:

Occupant File

Occupant Number
Seating
Age, Weight & Height
Restraint System
Areas Contacted
Ejection
Injury
Injury, Details

Occupant Age, Weight and Height are automatically provided with bracketed ranges (e.g., 5-year, 25-lb., 6-inch ranges) during the file build process, although the analyst can transform each variable into other ranges at the time of analysis.

Occupant injury severity (tissue damage) is recorded according to the American Medical Association's Abbreviated Injury Scale (AIS) (11). The occupant file user should note that fatal categories do not match the definition of fatality used in Level I or mass accident data. The police will code a traffic fatality six months to a year after the collision. In the AIS, only occupants who die within 24 hours are coded as fatalities. Fatalities after 24 hours are coded as "Critical, survival uncertain". In order to record the true number of occupant fatalities, the "Treatment" question in the original CPIR has been expanded to "Treatment/Mortality", and a "Fatal after 24 hours" category has been added.

Injury File Contents

There are 10 variables coded for each injury sustained by a case vehicle occupant. For each injury an occupant receives, one injury record is stored with the first 636 variables repeated and 10 new injury variables, as below:

Injury File

Body Region
Total Number of Injuries to Occupant
Total Number of Injuries to Body Region
Injury Number Counter
  Occupant Injury Counter
  Region Injury Counter

Injury File (Continued)

Overall Body Region AIS
Injury Description
  Injury Diagnosis
  Injury Severity (AIS)
Areas Contacted

The injury file contains one record for each specific injury coded on the CPIR occupant injury detail page. For each injury, the corresponding Body Region and Injury Type/Diagnosis is recorded as outlined below. The overall injury severity and four contact areas for the injured region are also recorded.

Body Region Codes

(12) Internal Organs
(13) Brain
(14) Face
(15) Head
(16) Neck
(17) Shoulder Girdle
(18) Right Upper Limb
(19) Left Upper Limb
(20) Chest and Upper Back
(21) Lower Back
(22) Abdomen
(23) Pelvic Girdle
(24) Right Lower Limb
(25) Left Lower Limb
(26) Whole Body
(00) Not Applicable

Injury Types

(1) Fracture
(2) Laceration
(3) Contusion
(4) Pain
(5) Abrasion
(6) Concussion
(7) Burn
(8) Hemorrhage
(9) Other
(0) Not Applicable

Some cautions must be observed when applying the injury file to problems of injury causation. First, no record is stored of which area of contact caused a specific injury, particularly if there was more than one injury to a body region. Second, two distinct injuries of the same type (e.g., two independently caused facial lacerations) are coded as one injury. Third, the categories of Internal Organs and Brain are not truly "geographical" regions of the body. This sometimes produces inconsistent coding of internal injuries, such as heart trauma. These inconsistencies result from the form in which the data have been reported, rather than from any limitations of the file construction.

Because of the necessity for adequate injury causation data, an Occupant Injury Classification (OIC) scheme was developed as part of the 1972 MDAI Report Automation contract and implemented as part of the Occupant Supplement file described later in this section.

SPECIAL MDAI FILES

Three other special or supplementary MDAI data forms are processed independently into separate computer files as described in the remainder of this section. The three special MDAI files are the:

1. NHBA Vehicle Condition and Maintenance Report File
2. Damage Analysis Supplement File
3. Occupant Supplement File (includes Occupant Injury Classification data).

Vehicle Condition and Maintenance Report File

The Vehicle Condition and Maintenance Report (VCMR) file contains one logical record for each case vehicle reported on a NHTSA Vehicle Condition and Maintenance Report form by the MDAI teams. A subset of the Collision Performance and Injury Report (CPIR) Revision 3 variables were merged automatically with each VCMR form processed in order to describe the case vehicle and other pre-crash variables. Hence, the VCMR file can be considered as an in-depth pre-crash accident factors file.

The first 220 variables were merged directly from the CPIR Revision 3 file and include data elements as outlined below:

Accident Identification
Accident Environmental Factors
Vehicle Malfunctions
Collision Configuration, Objects Contacted, Speeds
Case Vehicle Identification
Case Vehicle Damage
Case Vehicle Equipment, Fire
Driver Factors
Team Conclusions/Recommendations

The remaining eighty variables record the NHTSA Vehicle Condition and Maintenance Report form data elements. The content of these elements are outlined below:

Tires:

Tread, Inflation, Damage, Wear, Repair, Defects

Steering and Suspension:

Freeplay, Modifications, Degradation

Exhaust:

Defects

Drive Train:

Modifications, Defects

Brakes:

Fluid Level, Contamination, Leakage

General Information:

Switch Position, Windshield Wipers and Arms

Glass:

Position (open/closed), Condition (Dirt, Crack, etc.)

Maintenance and Inspection:

Lubrication and Inspection Stickers

Damage Analysis Supplement File

The case vehicle Damage Analysis Supplement (DAS) file is designed to give a more complete view of the damage incurred by the case vehicle. It consists of three parts: the Damage Analysis, the Sequence of Crash Events, and the Side Door Beam Information. The purpose is to record new information about the damage to the case vehicle and restructure information already coded in the CPIR form into a format that will more specifically detail the manner in which the damage occurred. As noted earlier, the CPIR form does not relate speeds, objects contacted, or other vehicle CDC/VDI with the case vehicle CDC/VDI's. Thus, although investigated, no record is stored of the circumstances in which case vehicle damage (CDC/VDI's) occurred.

The Damage Analysis portion of the file represents a

reorganization of damage information for the "case vehicle" and the associated "other vehicle" which allows for a direct comparison of concurrent damage between the two vehicles. The Collision Deformation Classification (CDC), Inches Crush, Configuration, Crash Event Number, and Impact Speed for the primary and secondary deformation of the "case vehicle" are recorded, along with the corresponding CDC, crush and speed for the "other vehicle". Provision for a Tertiary Collision Deformation Classification for the case vehicle has also been included. For multiple vehicle collisions the "other vehicle" is changed to be the one connected with each of the case vehicle impacts.

The Sequence of Events is recorded in the second set of variables. It is a chronological ordering of vehicle maneuvers and crash events that best describe the collision for the case vehicle, beginning with the first injury or damage-producing event. With each event there is an entry for the specific vahicle or object associated with that event. These events are numbered, enabling the specific deformations (and their associated Collision Deformation classifications) to be related to the appropriate event in the collision sequence. This identifies the nature of the damage and circumstances producing that damage.

The third set of variables is concerned with the side structure performance of the case vehicle. It provides information for analysis of direct damage to the side structure with and without door beams. It also includes information which relates the damage to the CDC's.

Occupant Supplement File

The case vehicle Occupant Supplement (OS) file is designed to record 17 additional data elements (variables) for each occupant as well as provide for the recording of injury causation using an expanded list of contact area codes and the Occupant Injury Classification (OIC) coding system. The 17 additional occupant questions expanded upon several CPIR questions and

provide for additional information as outlined below:

Posture
Non-Impact Medical Condition
Occupant Alcohol Involvement
Seat Belt Buzzer
Ignition Interlock
Passive Restraint
Restraint System Malfunction
Restraint System Effectiveness
Treatment/Mortality
EMS Contributory
Autopsy Performed
Police Injury Severity
Ten Occupant Contact Areas
Highest Injury Severity (AIS) for each Body Region
Highest Injury Severity (AIS) for each Lesion Type
Highest Injury Severity (AIS) for each Body System/Organ

The OS occupant variables can be used for analysis by setting the injury and OIC counter variables equal to 0 and 1 in a filter. This restricts the OS file to one record per occupant. Appropriate CPIR data variables for the corresponding OS coded cases will be merged with the above outlined data in future OS file updates. These merged variables will include selected accident, case vehicle, and case vehicle occupant data elements.

The next set of variables record the specific injuries and contact points for each occupant injury. Each injury is described in terms of (1) four contact areas in rank order of confidence, (2) one primary Occupant Injury Classification, and (3) two associated OIC's that describe the lesions associated with each "blow" to a body region. Up to fifteen injuries are recorded per occupant. Analysis of occupant injuries can be performed by subsetting the OIC counter to 0 or 1, thus providing one injury record per injury.

The final set of variables records the individual Occupant Injury Classification (OIC) codes (1,2). Up to three OIC's can be recorded for each injury: a primary OIC and an optional two associated OIC's.

The OIC itself consists of four letters that record Body

Region, Aspect (area of body region), Lesion/Diagnosis, and Body System/Organ; followed by the 0 to 6 AIS injury severity digit. Each OIC is stored in its natural form as well as in a recoded form in which each letter is translated to a numeric equivalent for analysis purposes.

SECTION 4

DISCUSSION OF DATA UTILIZATION

The whole reason anyone collects, stores, retrieves and synthesizes information is to provide a user with products that will aid his decision making process. All too frequently either information users receive only empty promises or, conversely, large files of information are compiled with limited utilization planning. Such information system defects are not justified simply because of their common occurrence.

Rather than promise results from non-existent systems or build an ineffectively utilized accident data bank, the National Highway Traffic Safety Administration undertook, in 1973, an effort to emphasize the relationship of the "user" as the critical component of an existing accident data system. This was done by simply providing the user with tangible accident information in response to specific user stated requests. As a result, all elements of the system benefited, including the data collectors, analysts, and users.

INTERACTION WITH DATA USERS

The utility of any information or data system is ultimately judged by its ability to satisfy users' needs. Users provide the data manager with the primary feedback loop essential to control the system; indeed the effectiveness of a data system should be expected to be enhanced by use.

While this point may be obvious, the user is often disregarded as noted by Alan Rees:

> "The information retrieval field has been plagued for many years by busy people spending large sums of money, designing or attempting to design phantom systems for non-existent people in hypothetical situations with unknown needs. It is not surprising that large numbers of theorists, hardware peddlers and promoters have ignored the user with the result that the needs of users are conspicuously absent in many discussions on system design and operation." (12)

It is possible to conduct user surveys via interviews and questionnaires in order to determine "user needs" as part of the information/data system design process. While helpful for for planning guidelines, the results of extensive user surveys are of limited value in detailed systems design because the respondent cannot easily define specific needs which he has never experienced. He, typically, is not even in a position to know what could be made available.

Many examples of data system development without regard to user requirements and of large scale user surveys based on phantom systems exist, even in the field of highway safety. This problem is particularly acute for accident data systems, where considerable effort and resources are expended compiling data files, with only limited results of value to users.

One ideal way to involve users in the development and evolution of a data system is to work with them in an attempt to help resolve some real problems, using an operational data file and data analysis system. For the purposes of this study, the in-depth Multidisciplinary Accident Investigation (MDAI) data file and the Highway Safety Research Institute Statistical Research System data analysis facility (as described in earlier sections) were utilized in order to exploit data systems currently available. Because of limited resources only a restricted range of users were included in the study. While limited in these respects the concepts expressed are equally applicable to other accident data systems and user communities.

We all have problems. There is no lack of questions to be answered. The dilemma for the user is knowing what resources are available and how to address each information or data resource. One of these resources is the data system used in this study. The products of this study were therefore only intended to help illuminate specific problems and assist the user formulating his next step. While essential, accident data systems are only one of many tools available to problem solvers.

The problem of what to expect from an accident data system and how to approach it are formidable to the novice user. Not uncommonly the novice user of data will expect the data system to respond with "go/no-go" decisions or to answer general questions such as "Is driver education good?" or "Are cars safer this year?" A key consideration, then, was the development of realistic expectations on the part of the users, that the data products are not necessarily all conclusive, e.g., they do not, generally, lead directly to standards writing. Just as in conducting a literature search, there is no guarantee at the outset that a conclusive answer will be found. Generally though, some new insight to the problem is almost always gained.

A frank revelation of just what the data system could and could not be expected to produce also provided a base line from which users could express their thoughts on how the system should be improved to be more responsive to their requirements. Suggestions ranged from the addition of new data elements to entirely new data collection procedures, and from the improvement of printout formats to entirely new analysis procedures.

The dilemma of how the user should approach and address the data system was more formidable. How does a safety engineer talk with a statistician? Just about as well as people talk with pets. Each group has its own language and interests. Typically the engineer either avoids the data analyst (knowing he does not understand statisticians) or he unilaterally prepares a problem statement (thinking he understands statisticians) only to have the statistician return in six to twelve months with an elegant exposition on the wrong problem or on a problem that has since changed.

The dilemma is readily resolved by a few Dr. Doolittles who can talk to the animals and people. In other words, what is required is an intermediary between the engineer and statistician. In this study, engineers with a background in the

data bank and analysis system filled the role. The following briefly outlines the procedures and steps used.

An accident data workshop was conducted for all interested staff. The emphasis was on what the data system could and could not provide and on how one conducts data analysis by use of examples. Subsequent face-to-face meetings were conducted with each of a limited number of users with specific problems of immediate interest. Each of these meetings were attended by the requestor, analysts, and contract technical manager.

The purpose of these initial meetings was to develop written problem statements that were responsive to the users needs, that could be analyzed using existing system capabilities, and that would serve to exemplify a variety of analysis methodologies. These sometimes lengthy meetings also resulted in a fuller understanding of the user's immediate and long range problems by the analysts. The finished problem statements then, represented a good understanding by all parties of what was required. Again because of the limited resources, only a few problems were ultimately selected and placed in a priority ranking by the users.

The approach taken was to step through the analysis. In other words, cut-and-try a piece, review it, and try again. Interim results, frequently in computer printout form, were reviewed with each requestor so he could see if the analysis was proceeding in an appropriate direction and so he could begin to anticipate the final results. In this way the requestor continued to play an active role, even during the data analysis phase.

It can be observed that utilization of accident data is quite unlike information retrieved from published literature. (The exception is the number of urban vs. rural accidents, etc. published annually by many organizations.) Accident data are a different domain of information which is utilized with a different "language". What this study has established is that,

with a proper mix of expertise and interest, information products can be synthesized from existing accident data systems in response to specific user requests. Moreover, only with this intimate user interaction can data systems continue to move towards more user responsive postures, and users develop a fuller understanding of just what they should expect from a data system. Even for those products that were inconclusive, (e.g., due to lack of sufficient data) both the user and data manager benefitted from the educational experience.

ANALYSIS METHODOLOGY

Both the accident data and the analytical tools used for manipulating the data are considered here as part of the analysis methodology. The HSRI accident data files and statistical analysis tools described in the previous section will now be discussed from the application point of view, i.e., how one can utilize the existing system in a beneficial manner. A discussion of the application of MDAI and police reported accident data precedes an outline of the analysis tools used.

Because of the problems in drawing statistical inferences from existing accident data, a constant vigilance and questioning attitude was maintained before accepting any computer printouts as "truth". We learned from the analysis by trying and closely examining the results at each step. Briefly, then, the approach taken for this study was to exploit the data bank, while taking account of the limitations of the information. This principle was central to analysis methodology.

Application of Accident Data

Given that one has a representative sample of traffic collisions it is a fairly straightforward matter, through statistical analysis to determine relationships in the sample that apply to the entire population of accidents. Unfortunately, no detailed random sample of vehicle crashes exists. Two kinds of accident data do exist. Essentially, the analyst is faced with either a large number of reports with little detail

or a small detailed set from a poorly defined sample.

While police accident reports are collected in large quantities, they lack the detail or resolution necessary to aid a safety engineer's evaluation of specific safety features. Compilations of police reports at best only represent the geographical area in which they were collected, because of the significant variances in the level of reporting (e.g., towaways, vs. $200 damage) and in the uncertain interpretation of reported variables (e.g., variations in the use of the A, B, and C injury categories*). Thus, even if every police jurisdiction were to agree to use a "national" accident report, the compiled results would still fail to be representative or contain sufficient detail to resolve many of the outstanding accident and injury causation questions.

The other source of accident data is a limited collection of unrepresentative but very detailed reports prepared by a number of in-depth accident investigation teams. The clinical (sometimes called Level III) investigations are documented with full written descriptions, 35mm slides, Collision Performance and Injury Report (CPIR) Revision 3 data forms and certain other supplementary data forms. These reports provide a level of detail not available elsewhere.

It is conceivable that a valid national accident sample could be established by adjusting the number, location and sampling procedures of the in-depth investigation teams in order to provide representativeness as well as the already existing precision of measurement required for drawing national inferences. Because the existing in-depth data base is not a designed sample, it is not representative of the nation. As such it is not possible to validly determine how frequently any particular collision event occurs. While rollovers, restraint system usage, and head fractures are accurately reported, the

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*The percentage of "A" injuries (relatively serious) in police reports varies from 65% in Virginia, to 28% in North Carolina, and 12% in Oklahoma.

aggregation of all in-depth reports will not reveal national frequency of any of these events. The same holds for pre-crash accident causation factors.

There has been a fair amount of criticism and even hesitance in the application of the Multidisciplinary Accident Investigation (MDAI) files because they do not contain a cross-section of typical accidents. As noted above, there are difficult, if not unsolvable, problems in deriving national statistical inferences from the existing MDAI files.

While this prognosis may seem bleak, the MDAI files are a resource of accident data reported accurately to a level of detail not available elsewhere. It is possible to cautiously perform analysis with the existing in-depth accident data file particularly concerning the interaction of crash phase variables such as vehicle damage and injury causation.

In an ideal world each user request could be satisfied by a data collection protocol and sampling plan specific to the stated problem. Similarly, the ideal librarian should compile a technically annotated bibliography for each user request. While both techniques can produce good results, they are not always the most appropriate or timely approaches. The approach taken in this analysis was to consider the MDAI files as an existing library of accident cases and data elements collected with the general subject interests of NHTSA in mind. Thus for this project, the MDAI data was considered as having been collected in a manner similar to that of the librarian who acquires books of interest and indexes them before a user requests a book on that specific subject.

Application of Analysis Tools

Three basic analysis techniques were used: clinical case retrieval, descriptive statistics and inferential statistics. With the first technique, the MDAI computer file was used like a highly detailed library card catalog of over four thousand reports. The computer was used to identify specific MDAI

cases of anecdotal interest, which were subsequently retrieved in their original hard copy form for further clinical analysis. In fact, the most frequently performed MDAI file operation is case retrieval.

In order to conduct a clinical study of rib fracture, for example, the original case documentation may be pulled and reviewed. While the data bank only records "rib fracture", the original report documents which rib(s) fractured. One could, for example, then study whether there is a differential effect (i.e., which ribs fracture) for steering wheel vs. side door contact.

The second technique applied was descriptive statistics. Basically descriptive statistics are the computation of the frequency and/or percentage distributions of selected data variables (data elements). The most common form is the two-way table or bivariate that compares two variables. For example, a table of vehicle manufacturer vs. vehicle model year would display the number of vehicles by model year for each vehicle manufacturer in the data file. The analysis involves selecting the variables of interest (e.g., manufacture, model year) and the subset of accident cases that best represents what is desired (e.g., American made passenger cars). Using subsets of the in-depth file, it is also possible to make guarded inferences about the frequency of events. Descriptive statistics simply describe the population of specific sets of data being analyzed.

The third methodology involved inferential statistics. With inferential statistics one attempts to determine the possible significance of the relationship between the dependent variable and the independent variable(s) being tested. The Chi-square statistic was used, while other studies entailed the use of the regression and analysis-of-variance techniques.

For inferential purposes, the file of in-depth investigations can be considered like a collection of results from engineering experiments conducted to learn the functional

relationship between the variables. The case selection interest is in having a sufficient number of cases at each level of the independent variable. The approach, then, is to explore the data in terms of relationships between or among variables, and the degree to which changes in one variable affects levels of other variables. It is possible to review the relationship of, for example, restraint system usage and head fractures.

USER OUTPUT DOCUMENTATION

A total of sixteen topics were studied for three offices of Motor Vehicle Programs. The short titles of the sixteen studies are listed in Table 4. The output from each study was documented as a memorandum from the NHTSA Office of Accident Investigation and Data Analysis (OAIDA) for internal distribution.

TABLE 4

Short Titles of Sixteen Study Topics

1	Side Impact Collision
2	Shoulder Harnesses
3	Collision Speeds by Configuration
4	Ejection Portals
5	Door Jamming
6	Hood-Windshield Penetration
7	Steering Column EA Devices
8	Seat Damage
9	Child Restraints
10	CO and Sleepy Drivers
11	Short Driver Visibility
12	Brake Malfunctions
13	Parked Car Involvement
14	Tinted Windshield Involvement
15	Vehicle Handling
16	Vehicle Defects

The documentation outline for each study was identical. The first page (Figure 2) identified the contract number, contract task, NHTSA requestor, NHTSA coordinating analyst, HSRI consultants and sufficient space for the signatures of three reviewers and the contract technical manager. The next three pages briefly outlined the MDAI report automation and utilization project as it related to this task including a list of all sixteen topics. Following this standardized introduction each topic was documented using the same outline -- Problem Statement, Approach Outline, Conclusions (e.g., what was learned), Summary Findings (e.g., numerical results) and Technical Discussion. This presentation outline permitted the reader to go as deep into the study as desired. The Conclusions were restricted in size, while the final Technical Discussion detailed the data files, variables and analysis programs used at each step of the analysis. Sufficient detail was provided to permit other analysts to repeat the methodology on similar problems in the future. Because all sixteen studies are now in a NHTSA review and evaluation process, presentation of the specific problem statements, conclusions, summary findings, analytical procedures is inappropriate in this report. All questions regarding the content of these studies should be referred to NHTSA as they are responsible for dissemination.

SUMMARY

The purpose of any information or data system is to provide a user with products that will enhance his decision making. Unfortunately, accident data systems can usually be characterized as "much-in" and "little-out", i.e., large data files are created at great expense with limited thought or resources expended on utilization. The user community, besides being the ultimate justification for a data system, also provides the feedback loop essential to successful evolution of a more responsive system.

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CHILD SEATS

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June 1, 1973

TO: Distribution

FROM: Contract Technical Manager
National Highway Traffic Safety Administration
Contract DOT-HS-031-3-589

SUBJECT: Child Seats (CW-9)
Data User Products (Task 6)
Multidisciplinary Accident Investigation
Report Automation and Utilization

During early 1973 the above contract was awarded to the University of Michigan, Highway Safety Research Institute (HSRI). The contract included a provision for data analysis and development of a limited number of data file user output products. The products were to be developed using only those computer analysis programs and accident data files currently available to the NHTSA, Office of Accident Investigation and Data Analysis.

Participants:

NHTSA Requestor - J. Medlin
NHTSA Coordinating Analyst - R. Harding
HSRI Consultants - J. Marsh, B. Goldin

Reviewers:

_____

_____

_____

Contract Technical Manager: _____

FIGURE 2

Sample First Page of Study Documentation

This section discusses an effort to actively involve the user by simply attempting to respond to a specific set of problem statements. Due to restricted resources, only a limited number of requests were accepted using the existing Multidisciplinary Accident Investigation (MDAI) data and NHTSA available analysis systems. The concepts and approaches apply equally well to all accident data systems.

The utility of the multidisciplinary accident investigation data have been widely criticised during the past few years especially in the areas of accident causation and national inferences. While much of the criticism may be justified, it tends to overshadow the benefits that can be derived from the existing resources of data. The MDAI files contain a wide variety of accident types, reported accurately by dedicated professionals to a level of detail not available elsewhere. This study has actively utilized these files, while taking into account the limitations of the information.

Data utilization was accomplished by sitting down together with the analysts and data users, jointly developing problem statements, exercising the data analysis system, closely examining and questioning the resulting printouts, sharing the interim results with the data user, following by repeated rounds of analysis and examining results. The final step was a complete documentation of conclusions, summary of findings, and the details of each analytical step.

Benefits were derived in the areas of data design, data analysis, and data collection and management. Beyond receiving analysis products of immediate interest, data users were exposed to the capabilities and limitations of existing accident data analysis facilities. Several methodologies and specific analysis techniques were exemplified and documented for future NHTSA application to problems requiring similar approaches. Finally, the utilization of MDAI data has benefited the collection and management of the data, by providing the feedback necessary for the development of a user responsive system

Hence, it is practical, with a proper mix of expertise, to responsively assist decision makers with information products synthesized from existing accident data systems, while simultaneously deriving feedback information essential to successful system evolution.

SECTION 5
CONCLUSIONS AND RECOMMENDATIONS

As noted earlier, the unique feature of the 1973 MDAI Report Automation and Utilization contract was the active involvement of NHTSA data system users. Both the users and the data system itself benefited from this interaction. The 1973 contract also resulted in the establishment of some new data variables and further refinement of other data variables as a result of data user feedback and feedback from the field accident investigation teams.

Based upon the 1973 contract activity, seven conclusions and recommendations have been made as listed below. They are organized according to the structure of the contract statement or work and are not ranked in any order of importance or significance.

1. Data Preparation and Quality Control
2. Damage Analysis Supplement
3. Occupant Injury Classification and Occupant Supplement
4. Accident Causation Analysis System
5. Accident and Traffic Unit Supplements
6. File Utilization (file access, documentation, etc.)
7. Data Utilization (direct user interaction)

1. DATA PREPARATION AND QUALITY CONTROL

Recommendations:

A. One emphasis of the 1974 MDAI Report Automation contract should be to complete the backlog and to continue processing cases at a rate equal to their production as outlined in the following recommendations.

B. All new cases (not previously released or disseminated by NHTSA) forwarded to the contractor by October 31, 1974 should be edited, returned to NHTSA, and placed into computer storage by the end of 1974. All old cases (previously

published by NHTSA) with CPIR forms should also be completed in 1974. Old cases without CPIRs should be processed as appropriate and as time permits.

C. Cases should be processed in three phases. The first phase should be a summary or compendium of every traffic unit ever investigated by an MDAI team. The traffic unit compendium coding should be completed the day each new case arrives, thus providing an inventory of all traffic units (including large trucks, buses, motorcycles and pedestrians) and a log of cases to be processed in phase two.

The second phase should include fully processing the annotated CPIR, with damage analysis and occupant supplements. Completion of this phase would update the existing analysis files and return the case to NHTSA.

The third phase should involve the coding of accident causal factors, and the longer accident and traffic unit supplements on a sample or lower priority basis, as prescribed by NHTSA.

D. New or added variables should continue to be added during 1974, but in a way that will not impede or delay the second phase (annotated) CPIR processing. Any new variables could be handled independently of phase two processing either as part of phase three or entirely separate.

E. Quality control should continue to be insured as detailed in the 1973 MDAI Report Automation contract.

F. Individual case critiques should continue to be provided to each team contract technical manager in an informal format. In order to conserve processing time and not critique "dead" cases, case critiques should only be provided for those cases returned to NHTSA within one year after original team submission of the case to NHTSA.

G. The documentation of the editing process, the interpretation of the variables and the reference information should

continue to be revised and expanded, particularly in response to field team supplied comments and reference data.

2. DAMAGE ANALYSIS SUPPLEMENT

As described previously, the Damage Analysis Supplement (DAS) records vehicle damage, collision configuration, speeds, etc. in a manner that permits these elements to be analyzed in direct relationship to each other. Most of the DAS data elements are commonly reported by the MDAI teams in the CPIR Revision 3 report form. Unfortunately, the CPIR does not generally permit relating the case vehicle primary VDI/CDC with first damage, speeds, other vehicle VDI/CDC, or the collision configuration--even though this information is known to the field investigator.

The Damage Analysis Supplement is used for each MDAI case processed. Computer file build programs have been implemented and codebooks documenting the DAS file have been provided to NHTSA.

Recommendations:

A. The one sheet Damage Analysis Supplement should be used for all MDAI team reported case vehicles involved in collisions after January 1, 1974. For now, the DAS could be used as an addition to the annotated CPIR Revision 3, at least until a new integrated reporting form is prepared.

B. The field teams and file analysts should be encouraged to submit comments and criticisms either to HSRI or to their contract technical managers. Documentation of the DAS is stored in a random access computer file and should be periodically updated and distributed.

3. OCCUPANT INJURY CLASSIFICATION AND OCCUPANT SUPPLEMENT

The Occupant Injury Classification was developed as part of a previous 1972 NHTSA contract, because of the necessity for adequate injury causation data recording. Since its first

presentation to the American Association for Automotive Medicine in November 1972, it has been used on a trial basis by many of the in-depth investigation teams. As a result of their many excellent comments and criticisms, the OIC has been refined to the point documented for the SAE Subcommittee on Accident Investigation Practices in November 1973. No further comments have been received either directly or via the team sponsors regarding the utility of the OIC.

A coding form for recording the OIC and occupant contact points was developed and utilized during 1973. This Occupant Supplement also records a few other key occupant data elements. It is being used for all MDAI case processing. Computer file build programs and documenting codebooks have also been prepared.

The utility of the OIC for detailed analysis of injury causation was demonstrated by a study of rollover injuries (13). The earlier CPIR injury recording methods do not permit relating specific injuries to specific contact points. The Occupant Supplement coding form (with the OIC) permits, for example, the analyst to determine the severity of head injury from contact with the roof in rollover collisions. This could not have been done from CPIR injury data.

Thus, the Occupant Injury Classification system is now documented and operational for field, computer processing and analysis purposes.

Recommendations:

A. The one-sheet Occupant Supplement, with the Occupant Injury Classification, should be used for all MDAI team reported case vehicle occupants involved in collisions after January 1, 1974. For now the Occupant Supplement could be used as an addition to the existing CPIR occupant and injury pages, at least until a new integrated reporting form is prepared.

B. Field teams and analysts could continue to be

encouraged to submit OIC comments and criticisms either to HSRI or to their sponsors. Documentation of the Occupant Supplement and Occupant Injury Classification system is stored in a random access computer file and should be periodically updated and distributed.

4. ACCIDENT CAUSATION ANALYSIS SYSTEM

Two goals were set for the accident causation analysis system development. The first phase or goal was to develop a reporting protocol for recording causal factors in current field investigations using existing systems and knowledge. The phase one system has been created--including coding forms, instructions, and a full categorized list of causal factors based largely upon the Indiana University structure of causal factors.

The second phase or goal was the broader one of considering accident causation mechanisms from a longer term, more generalized point of view. Several different avenues of exploration exist, one of which is detailed in Appendix C.

Recommendations:

A. While the phase one system is developed to the point of immediate application, it should now be subjected to the trial-by-fire, i.e., trial application by the MDAI teams. A shakedown period is needed to ensure that any major bugs are discovered and resolved. A few cases were coded by HSRI, but a more complete sample of documented MDAI cases should also be coded on a trial basis. Based on these two experiences, the system should be revised or polished before final approval and adoption, or the phase one system could be dropped based upon the trial experience and the results of the phase two efforts.

B. While the study of accident causation commands a large share of the highway safety spotlight, the science of accident causation factors seriously lags behind the science

of injury causation factors, for example. Either as part of future MDAI Report Automation contracts or as a separately funded program, the NHTSA Accident Investigation Division should maintain an active program on the practices and methodology of studying and reporting accident causation mechanisms, including the continued development of systematic causal frameworks.

5. ACCIDENT AND TRAFFIC UNIT SUPPLEMENTS

The accident and traffic unit supplements represent a fairly extensive catalog of new data elements not covered by the CPIR Revision 3 form. The data elements generally record pre-crash and environmental factors that are already reported by most MDAI teams. The data elements were selected through an NHTSA staff review process and therefore reflect NHTSA interests and priorities.

While both supplements are coded as part of the MDAI report automation process and are built into computer analysis files, complete documentation of the coding interpretations and computer codebooks have not been prepared. Refinements of code value definitions continue to be made. While they do work, the accident and traffic supplements have not reached a field team operational state.

Recommendations:

A. While many excellent additional pre-crash and environmental data elements are included on these supplements, they should not be distributed to MDAI field teams for trial application until they are more operational.

B. A new Collision Analysis Report (CAR) should be developed that includes the basic contents of the accident and traffic unit analysis supplements plus updated CPIR data elements. This modular form would then be supplied to the MDAI field teams for trial comments on its application in Level III investigative reporting.

C. The coding of the Accident and Traffic Unit Supplements (ATUS) should be placed on a second priority basis (phase three), to the processing of the annotated CPIR with damage and occupant sheets (phase two). The ATUS need more coding exercise but should not impact the timely processing of the basic MDAI data.

6. FILE UTILIZATION (ACCESS, DOCUMENTATION, TRAINING)

During 1973, the file utilization task provided NHTSA with documentation, training and access to the HSRI accident data analysis system, as well as some system enhancements.

Recommendations:

A. Documentation, training and access to the data system should be continued.

B. Keyword access to special purpose programs and improved programs for listing subsets of the data bank with selected numeric variables translated to alphabetic code value definitions should be provided.

C. A computer program for producing an alphabetic index for data file codebooks should be developed and implemented.

7. DATA UTILIZATION (DIRECT USER INTERACTION)

As noted earlier, a major emphasis in 1973 was the utilization of the already existing MDAI data system in response to specific user requests. Although difficult to measure on a ruler, benefits from this activity accrued in the areas of data system design, data utilization, data analysis, and data collection and management.

In the process of conducting the sixteen studies, as described in Section 4, several general observations were made. (1) There are an undetermined number of NHTSA "users" who could or should benefit from the analysis of existing NHTSA accident data files. (2) These "users" do not know of existing NHTSA

accident data facilities, or if they do, they have a very limited understanding of what an accident data system can and can not do for them. (3) There also is a "language" or communications difficulty between the users and the data system staff, e.g., not always having a comprehensive understanding of the "user's problem" or situation. (This observation in no way implies that the data products staff does not provide competent and responsive results to user documented requests.) Finally, that (4) it is possible with contract technical manager leadership to accomplish effective data utilization by sitting down together as analyst and user, jointly developing problem statements, exercising the data analysis system, closely examining and questioning the resulting printouts, sharing the interim results with the data user, followed by repeated rounds of analysis and examining results, and finally by complete documentation of conclusions, summary findings, and the details of each analytical step.

Beyond receiving information of immediate interest, data users were exposed to the capabilities and limitations of existing accident data analysis facilities. Similarly, the analysts were exposed to the user's problems. The documentation of the analysis techniques provides for ready NHTSA application to problems requiring similar approaches or to problems that seem to reoccur every few years. This interaction with the user ultimately benefits the data system itself by providing the feedback necessary for the continued evolution towards a more user responsive system.

Recommendations:

A. The NHTSA should continue an active program of user-analyst interaction, with an even wider audience. Regardless of who conducts the analysis or monitors the resulting products, a generally acceptable procedure or protocol should be quickly established and followed up by an aggresive and outreaching program to visit and work with data users in helping

to solve their specific problems.

B. Information products provided to users outside of the Office of Accident Investigation and Data Analysis (OAIDA) should be documented, whether performed under contract or by OAIDA staff. Some minimum required outline should be prescribed if none is dictated by problem or product itself. The outline used for this task was developed by the contract technical manager and was required for documenting the sixteen studies. This outline proved to be very acceptable for a wide variety of products and could be used as a starting point in establishing an OAIDA guideline.

REFERENCES

1. Un Procédé de Classification de Blessures des Voyageurs Incorporant l'Echelle de Blessures Abrégée (An Occupant Injury Classification Procedure Incorporating the Abbreviated Injury Scale), Joseph C. Marsh IV, presented to the NATO Committee on the Challenges of Modern Society, Road Safety Pilot Study, Final Accident Investigation Workshop, Brussels, Belgium, June 28-29, 1973.

2. Occupant Injury Classification Application Procedure, Joseph C. Marsh IV, HSRI, University of Michigan. Presented to SAE Accident Investigation Practices Subcommittee, Oklahoma City, November, 1973.

3. Multidisciplinary Accident Investigation Report Automation and Utilization, 1973 Editing Manual and Reference Information, Joseph C. Marsh IV, S. O. Vanek, and S. E. Tolkin, Highway Safety Research Institute, Contract No. DOT-HS-031-3-589, December, 1973.

4. A Study to Determine the Relationship Between Vehicle Defects and Crashes. J. R. Treat, K. B. Joscelyn, Indiana University, Institute for Research in Public Safety. Interim Report No. DOT-HS-034-2-263-71-A, November, 1971.

5. A Study to Determine the Relationship Between Vehicle Defects and Crashes. Volume I: Study Findings Part I, Regarding Accident Causes. Institute for Research in Public Safety, Indiana University, Final Report DOT-HS-034-2-263-UDP-72-1, November, 1972.

6. Multidisciplinary Accident Investigation Report Automation. Final Report, Joseph C. Marsh and J. O'Day, Highway Safety Research Institute, for National Highway Traffic Safety Administration, Contract No. DOT-HS-031-1-37. October, 1972. Volume I: Program Review [DOT/HS 800 767]

7. The Statistical Research System, D. E. Wood and C. D. Hafner, Highway Safety Research Institute, The University of Michigan, Ann Arbor, 1972.

8. Multidisciplinary Accident Investigation Report Automation and Utilization, Data Users Operating Manual, John A. Green and Barbara C. Brown, December, 1973.

9. Collision Performance and Injury Report Long Form Revision Number 3, General Motors Corporation, Safety Research and Development Laboratory, General Motors Proving Ground, 1969.

10. Collision Deformation Classification. SAE J224a. Recommended Practice. Society of Automotive Engineers, New York. 5 pages. 1972.

11. "Rating the Severity of Tissue Damage, I. The Abbreviated Scale," Committee on Medical Aspects of Automotive Safety, Journal American Medical Association, Volume 215, Number 2, p. 277-280. January 11, 1971.

12. "Information Needs and Patterns of Usage", Alan M. Rees, Western Reserve University, Cleveland, Information Retrieval in Action, 1963, p. 17-23.

13. Injury Causation in Rollover Accidents, D. Huelke, J. C. Marsh IV, L. DiMento, H. Sherman, W. Ballard, presented to the 17th Conference of the American Association for Automotive Medicine, November 15-17, 1973.

APPENDIX A

CONTRACT REPORTS AND DOCUMENTATION

The following itemizes the reports and other documentation prepared and submitted as part of the 1973 MDAI Report Automation and Utilization Program.

The appendix is organized into seven sections as follows:

A. Contract Reports
B. Accident and Injury Causation
C. Coding Forms for New Data Elements
D. Files Built and Maintained
E. Data File Access Documentation
F. Data File Analysis Programs
G. Data Users Products

A. CONTRACT REPORTS

1. "Multidisciplinary Accident Investigation Report Automation and Utilization 1973 Final Report", on Contract DOT-HS-031-3-589, December 1973.

2. Monthly Progress Reports

3. "Multidisciplinary Accident Investigation Report Automation and Utilization, 1973 Editing Manual and Reference Information", December 1973. Update sheets for 1972 edition were also provided in July 1973.

B. ACCIDENT AND INJURY CAUSATION

1. Preliminary List of Accident Causation Factors--Attachment E of Second Monthly Progress Report, covering the month of February 1973, March 9, 1973.

2. Accident Causal Analysis System--in Appendix C of 1973 Final Report.

3. "An Occupant Injury Classification Procedure Incorporating the Abbreviated Injury Scale", presented to NATO/CCMS Final Accident Investigation Workshop on June 28-29, 1973 (in Appendix D of 1973 Final Report)

4. "Occupant Injury Classification Application Procedure", presented to SAE Subcommittee on Accident Investigation Practices on October 14, 1973 (in MDAI Report Automation and Utilization, 1973 Editing Manual and Reference Information, December 1973.

5. "Vehicle Occupant Injury Classification" in September 1973 issue of HIT-LAB Reports, Volume 4, Number 1.

C. CODING FORMS FOR NEW DATA ELEMENTS

1. Damage Analysis Supplement for recording CDC/VDI, speeds, configurations, crush, object contacted--in 1973 Final Report, Appendix B and 1973 Editing Manual and Reference Information.

2. Occupant Supplement for recording several new occupant variables and the Occupant Injury Classification codes--in same location as above.

3. Prototype Accident and Traffic Unit Supplements currently used to code data from existing original MDAI case documentation--in December 28 memo to Contract Technical Manager.

D. FILES BUILT AND MAINTAINED

Documentation for each of these files was submitted separately in the form of a computer-produced code book that documents the frequency and definition of each code value.

1. Collision Performance and Injury Report, Revision 3 includes GM CPIR data plus certain supplementary variables. Contains 1, 297 NHTSA case vehicles out of 4,201 as of October 1973. Complete CPIR code books were provided in April and October 1973.

2. NHTSA Vehicle Condition and Maintenance Report (VCMR) contains 88 data elements that detail the condition of the case vehicle prior to impact. The VCMR form contains no details that identify the vehicle (e.g., make/model) or other pre-crash data elements. Therefore 220 vehicle identification and all other pre-crash data elements from the primary MDAI file were merged with the VCMR data. The merged file contains 401 case vehicles.

3. Damage Analysis Supplement File records the case vehicle Collision Damage Classification (CDC/VDI) and the concurrent speeds, configuration, crush, object contacted and other vehicle CDC/VDI. The sequence of collision events and objects struck along with side door guard beam data are also recorded. The file contains 252 case vehicles.

4. Occupant Supplement and Injury File records seventeen new and revised occupant data elements. Primarily the Occupant Supplement is used for recording occupant contact areas and injuries according to the Occupant Injury Classification Procedure. Each OIC and injury is recorded in separate logical records.

5. The 1971 Texas Vehicle Defects file contains a record of vehicles involved in accidents in which at least one of the vehicles was recorded as defective on the police report. The file is utilized by the OAIDA Mathematical Analysis Division in response to requests from the Office of Defects Investigations and contains 20,474 vehicles.

E. DATA FILE ACCESS DOCUMENTATION

1. Washtenaw County, Michigan
   a. Four and one-half years (December 1968-June 1972) -1/26/73
   b. Four years (1969-1972) -5/15/73
   c. Four and one-half years (1969-June 1973) -11/15/73
2. Oakland County, Michigan
   a. One-half year (through June 1972) -1/26/73
   b. 1972 accidents -7/20/73
   c. 1971 supplementary variables -11/15/73
3. Denver County, Colorado
   a. 1971 accidents -5/14/73
   b. 1972 accidents -7/20/73
4. Texas
   a. 1971 accidents, vehicle -5/14/73
   b. 1972 accidents, vehicle -7/20/73
5. New York (Calspan)
   a. Level II (Oct. 1970-Dec. 1971) Accident, Vehicle, Occupant -7/20/73
   b. Level II (1972) -7/20/73
   c. Level II (1/2 1973) -11/15/73
6. Dade County, Florida
   a. 1972 accidents -7/20/73
7. King County (Seattle) Washington
   a. 1972 accidents -7/20/73

8. Level III

   a. Truck/Bus/Motorcycle/Pedestrian (TBMP) -11/15/73

F. DATA FILE ANALYSIS PROGRAMS

1. Keyword access to all files and five basic programs was initiated in March 1973. The Automated Data Access and Analysis System (ADAAS) is documented in the MDAI Report Automation and Utilization, Data Users Operating Manual, December 1973.

2. A procedure for sorting data set listings into a user specified sequence was provided, May 9-11, during SPAD training session.

3. A program for an alphabetic data set listing numeric code values translated into alphabetic definitions is documented in the MDAI Report Automation and Utilization, Data Users Operating Manual, December 1973.

G. DATA USER PRODUCTS

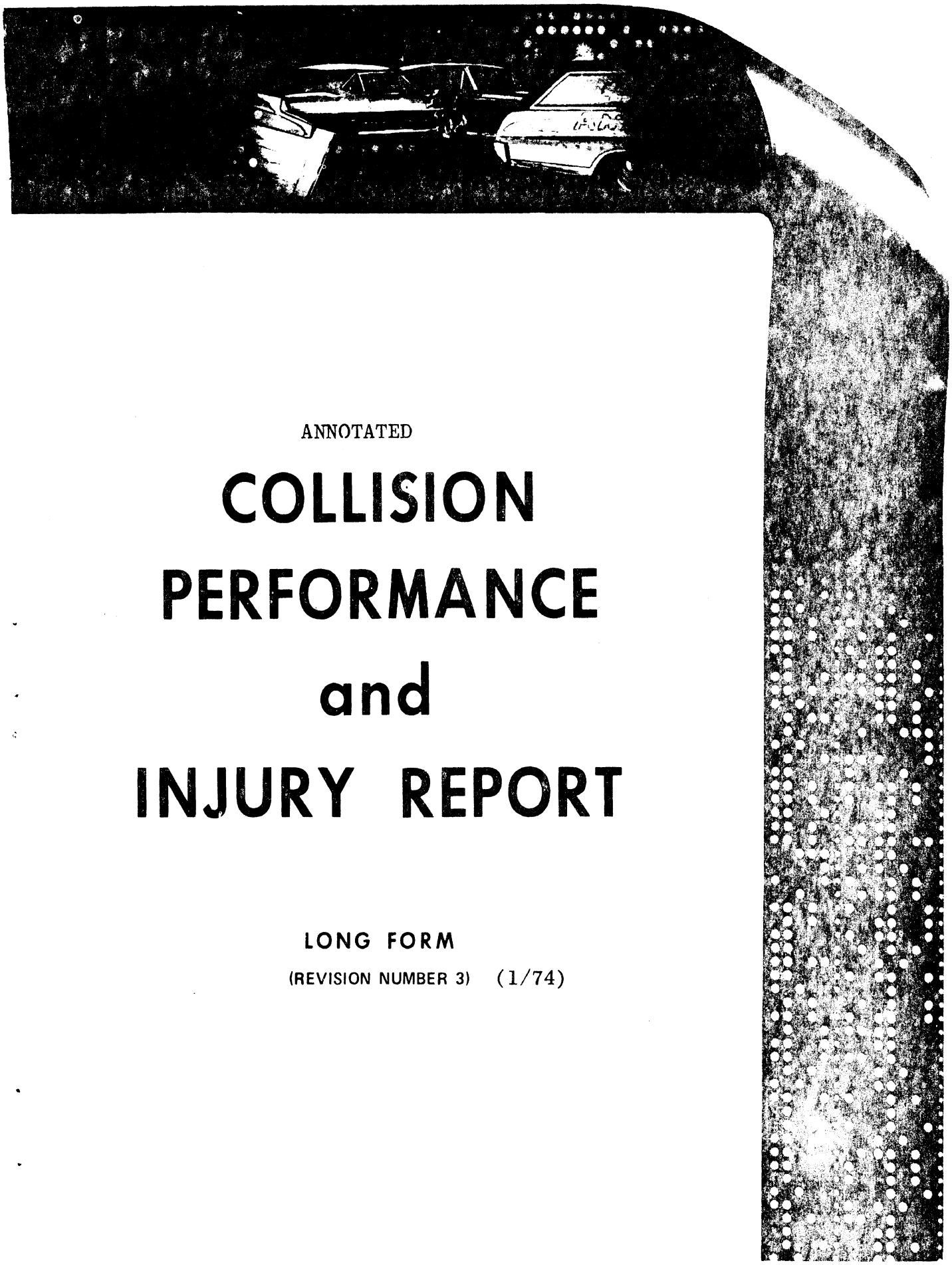
1. A total of sixteen data user products were prepared for three offices of Motor Vehicle Programs. Over 300 pages of documentation were submitted. The products were documented as memorandum from the NHTSA Office of Accident Investigation and Data Analysis (OAIDA) for internal NHTSA distribution. All questions regarding these user products should be referred to NHTSA as they are responsible for the dissemination of the analysis output.

APPENDIX B

MDAI DATA/FORMS

This appendix contains the Annotated "Collision Performance and Injury Report" (CPIR) Long Form Revision 3 with supplement pages and NHTSA Vehicle Condition and Maintenance Report as currently used by MDAI field teams in 1973 for reporting data to be automated.

Also included in the Annotated CPIR are the Damage Analysis Supplement and the Occupant Supplement with provision for recording the Occupant Injury Classification (OIC). Both of these forms have been test coded, have operational computer file build code books and editing criteria in the Editing Manual and Reference Information. (While coding forms for new accident, causation and pre-crash traffic unit data are now being coded from existing documentation, they have been submitted separately as prototypes.)



ANNOTATED

COLLISION PERFORMANCE and INJURY REPORT

LONG FORM

(REVISION NUMBER 3) (1/74)

GM
PG2070

(THIS FORM REPLACED PG2002 IN SEPTEMBER 1969)

FORM VERSION NUMBER 3 (1)

REPORT NUMBER ___ (2 3 4 5 6 7 8 9)

CARD NUMBER 0 1 (10 11)

DATE OF COLLISION MO. ___ / DAY ___ / YR. ___ (12 13 / 14 15 / 16 17)

(99/99/99) Unknown

TIME OF COLLISION _____ AM PM

DATE OF FIELD INVESTIGATION _____

INVESTIGATOR _____

CIRCLE PHOTO RECORDS MADE:
SLIDES NEGATIVES POLAROIDS

LOCATION WHERE VEHICLE WAS EVALUATED:

_____

REPORT PREPARED BY _____

KEYPUNCH ONLY:
DATE REC'D.

PUNCHED

VERIFIED

LOCATION

	PUNCH CODE	CARD COL.
STATE: _____ (CODE TO BE INSERTED BY ANALYSIS GROUP)	— —	18-19
CITY, TOWNSHIP, ETC.: _____		
AREA (1) URBAN (2) RURAL (0) UNKNOWN	—	20
LOCALITY (1) MANUFACTURING OR INDUSTRIAL (2) SHOPPING OR BUSINESS (3) APARTMENTS (4) SCHOOL OR PLAYGROUND (5) RESIDENTIAL (6) FARM (7) UNDEVELOPED (0) UNKNOWN	—	21

ENVIRONMENTAL CONDITIONS

LIMITED ACCESS HIGHWAY (1) YES (2) NO (0) UNKNOWN	—	22
ROAD TOTAL TRAFFIC LANES (1) 1-Lane (2) 2-Lane Case Vehicle (3) 3-Lane (4) 4 or More Lanes (5) 4 or More Lanes Divided (6) Parking Lot, Driveway (7) Other, e.g. RR Tracks, Ramps (0) Unknown	—	23
OTHER ROAD TOTAL TRAFFIC LANES (IF AT INTERSECTION) CHOOSE FROM ABOVE LIST OR (9) NOT APPLICABLE	—	24
TYPE OF ROAD SURFACE (1) Asphalt, Bituminous Concrete (2) CONCRETE (3) GRAVEL (4) MORE THAN ONE TYPE (5) OTHER: _____ (0) UNKNOWN	—	25

Case Vehicle ONLY

	PUNCH CODE	CARD COL.
ROAD ALIGNMENT VERTICAL PLANE (1) LEVEL (2) CREST OF HILL (3) SLOPE- 2% grade (4) BOTTOM OF HILL (0) UNKNOWN	—	26
HORIZONTAL PLANE (1) STRAIGHT (2) CURVE (0) UNKNOWN	—	27
SURFACE COVERING (01) DRY WATER (02) DAMP (03) WET (04) PUDDLED (05) UNKNOWN AMOUNT SNOW (06) LOOSE (07) PACKED (08) CONDITION UNKNOWN (09) ICE (10) SLUSH (11) SPILLED GRAVEL (12) OTHER: _____ (00) UNKNOWN	— —	28-29
PRECIPITATION (1) NONE (2) RAIN (3) SNOW (4) HAIL (5) SLEET (6) OTHER: _____ (0) UNKNOWN	—	30
RATE OF PRECIPITATION (3) NOT APPLICABLE (4) LIGHT, MIST (5) MODERATE (6) HEAVY (0) UNKNOWN	—	31
SURFACE SLIPPERY (1) YES (2) NO (0) UNKNOWN	—	32

COLLISION DESCRIPTION

ENVIRONMENTAL CONDITIONS

	PUNCH CODE	CARD COL.
SPEED LIMIT (1) 5-25 MPH (2) 26-30 (3) 31-35 (4) 36-40 (5) 41-45 (6) 46-55 (7) 56-65 (8) 66-75 (9) OVER 75 MPH (0) UNKNOWN	____	33
ROAD DEFECTS (not design deficiencies) (1) YES (2) NO (0) UNKNOWN	____	34
TEMPERATURE, F (1) BELOW ZERO (2) 0-19 (3) 20-29 (4) 30-34 (5) 35-39 (6) 40-59 (7) 60-79 (8) 80-99 (9) 100 OR OVER (0) UNKNOWN	____	35
CROSSWIND (1) NONE (2) LIGHT (3) STRONG (4) STRONG & GUSTY (0) UNKNOWN	____	36
TIME OF DAY (1) DAY (2) NIGHT (3) DUSK (4) DAWN (0) UNKNOWN	____	37
VISIBILITY LIMITATION (for accident) (1) None (2) Cloudy - Dark (3) Fog (4) Smoke (5) Windshield Condition (6) Glare (7) Other: _____ (8) Rain (9) Snow (0) Unknown	____	38
VISIBILITY OBSTRUCTION (for accident) (1) None (2) Building (3) Sign (4) Bushes (5) Tree (6) Hill or Curve in Road (7) Other: _____ (8) Vehicle in Transport (9) Parked Vehicle (0) Unknown	____	39

POSSIBLE MECHANICAL MALFUNCTION

INVESTIGATION OF THE POSSIBILITY OF MECHANICAL MALFUNCTION

THIS SECTION SHOULD BE FILLED OUT IF A MECHANICAL MALFUNCTION IS RECOGNIZED, OR SUSPECTED BY THE INVESTIGATOR OR WAS ALLEGED TO HAVE CONTRIBUTED TO THE ACCIDENT INVOLVING THIS VEHICLE. SUPPORT ANY ITEMS CHECKED OR NOTATED BY COMMENTS.

CHECK ITEMS INVOLVED:

- ☐ BRAKE SYSTEM
- ☐ EXHAUST SYSTEM
- ☐ STEERING SYSTEM
- ☐ SUSPENSION SYSTEM
- ☐ TIRES
- ☐ ELECTRICAL SYSTEM
- ☐ THROTTLE CONTROLS
- ☐ DRIVER CONTROLS
- ☐ POWER TRAIN
- ☐ FUEL SYSTEM
- ☐ VISIBILITY ITEMS
- ☐ OTHER: _____

	PUNCH CODE	CARD COL.
NUMBER OF ITEMS INVOLVED	____	40
WAS COMMENT ABOUT MECHANICAL MALFUNCTION MADE BY ANY PERSON(s)? (1) YES (2) NO	____	41

IF "YES", GIVE COMMENT(s) AND NAME(s) AND ADDRESS(es) OF PERSON(s):

POSSIBLE MECHANICAL MALFUNCTION

COMMENTS AND OBSERVATIONS OF INVESTIGATOR ABOUT THE POSSIBILITY OF MECHANICAL MALFUNCTIONS:

INVESTIGATOR: _____

DATE OF INVESTIGATION: _____

DATE OF REPORT: _____

GENERAL INFORMATION

IMPAIRMENT

COLLISION TYPE

COLLISION CONFIGURATION (of case vehicle)

	PUNCH CODE	CARD COL.
VEHICLE TO OBJECT (1,2,0)*	___	42
ROLLOVER (1,2,0)* (90° or more)	___	43
RAN OFF THE ROADWAY (1,2,0)* (Before first impact)	___	44
VEHICLE TO VEHICLE (1) Yes, Configuration unknown (2) No (3) Head-on (F to F) (4) Intersection type L (5) Side-swipe (6) Rear-impact (F and B) (7) Other: _____ (8) Intersection type T (0) Unknown	___	45
VEHICLE TO STOPPED VEHICLE (1,2,0)* (Either vehicle)	___	46
VEHICLE TO MOVING VEHICLE (1,2,0)*	___	47
OTHER (1,2,0)*: _____	___	48
VEHICLES INVOLVED TOTAL NUMBER (INCLUDING CASE VEHICLE) In Accident	___	49

OBJECTS CONTACTED

ENTER OBJECTS IN ORDER OF CONTACT DURING COLLISION

	PUNCH CODE	CARD COL.
(02) None (00) Unknown Object (03) Other Automobile (04) Ground (rollover only) (05) Guardrail (06) Bridge (rail) (07) Sign (08) Ditch (09) Embankment (snowbank) (10) Culvert (11) Fence (12) Pole or Tree (13) Pedestrian (14) Large Animal (15) Motorcycle (16) Large Truck - Type Unknown (see 20-25) below (17) Train or Bus (18) Pedacycle (bicycle+) (19) Building (20) Light truck/pickup truck (22) Tractor without Trailor (23) Van delivery truck (24) Straight truck (25) Tractor-trailor combination (26) Multi-purpose vehicle (jeep) (40) Object disengaging from other vehicle (i.e., loose tire, box (50) Hydrants, short posts, stumps (51) Mailbox (rural), small posts/trees (52) Pier, Pillar (e.g., bridge support) (53) Retaining wall, abutment Highway Fixtures: (54) Impact attenuator (55) Breakaway Fixtures (99) Other:	___ ___	50-51
	___ ___	52-53
	___ ___	54-55
	___ ___	56-57

CASE VEHICLE DRIVER'S ABILITY TO DRIVE IMPAIRED BY

(CHOOSE NO MORE THAN TWO)

	PUNCH CODE	CARD COL.
(00) UNKNOWN (02) NONE (03) DRINKING INVOLVED (Broad) (04) Drunk By Local Legal Standards (05) ASLEEP (06) FATIGUE (07) RECKLESSNESS (08) INATTENTION (09) LACK OF TRAINING (10) EMOTIONAL STATE (11) MEDICATION (12) Drugs (narcotic) (13) ILLNESS (or otherwise) (14) INFIRMITIES (15) PHYSICALLY HANDICAPPED (16) OTHER: _____	___ ___	58-59 60-61

SOURCE OF INFORMATION:

_____

_____

TRAFFIC VIOLATION

(EITHER DRIVER)

(1) YES
(2) NO
(0) UNKNOWN
DESCRIBE VIOLATION: _____

_____

Citation need not be issued, but only indicated.

	PUNCH CODE	CARD COL.
	___	62

LEGAL ACTION

WAS TRAFFIC VIOLATION CITATION ISSUED TO ANYONE? (1,2,0)*

IF "YES", CIRCLE VIOLATOR:

DRIVER OF CASE VEHICLE
DRIVER OF OTHER VEHICLE
PEDESTRIAN
OTHER: _____

_____

	PUNCH CODE	CARD COL.
	___	63

(Accident Point of View)

TYPE OF LOSS

	PUNCH CODE	CARD COL.
PERSONAL INJURY (1,2,0)*	___	64
PROPERTY DAMAGE (1,2,0)*	___	65

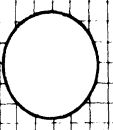
*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO

COLLISION SKETCH

Based on Information From _____

1. Draw heavy lines to show highway detail at the location of collison.
2. Give name of streets and highways and US, State and Interstate Route numbers, if any.
3. Identify all objects in sketch. Case vehicle should always be labeled "A". Time sequence numbers may be added (e.g., A1, A2).
4. Include dimensions when possible.

INDICATE NORTH BY ARROW



SEE NARRATIVE

DESCRIBE COLLISION EVENTS _____

INFORMATION SOURCES: _____

REPORTED BY: _____
(Attach Police Report)

COMMENTS _____

COLLISION SKETCH

SPEEDS

CASE VEHICLE	PUNCH CODE	CARD COL.
ESTIMATED SPEED* (MPH)		
PRIOR TO IMPACT ESTIMATED BY: _____	___ ___ ___	66-68
At FIRST Impact ESTIMATED BY: _____	___ ___ ___	69-71

OTHER VEHICLE	PUNCH CODE	CARD COL.
ESTIMATED SPEED* (MPH)		
PRIOR TO IMPACT ESTIMATED BY: _____	___ ___ ___	72-74
At FIRST Impact ESTIMATED BY: _____	___ ___ ___	75-77

*IF SPEEDS ARE UNKNOWN, ENTER 999: 888 for Other Vehicle Not Applicable

END OF CARD 01

OTHER VEHICLE

NOTE: A complete analysis of this accident requires that a minimum amount of information be obtained on the other vehicle(s) involved. Therefore, the information on this page should be completed even though a separate long form may be filled out on these other vehicles.

[redacted] FROM PRECEDING CARD 0 2 (10 11)

OTHER VEHICLE DESCRIPTION

VEHICLE IDENTIFICATION NUMBER

12	13	14	15	16	17	18	19	20	21	22	23	24

MAKE _____

MODEL _____

CODE TO BE INSERTED ___ ___ ___ ___ ___ (25 26 27 28 29)

MODEL YEAR 19 ___ ___ (30 31)

WEIGHT OF VEHICLE, LBS. ___ ___ ___ ___ (32 33 34 35)

ODOMETER READING (IF OVER 100,000: USE 99 999) ___ ___ ___ ___ ___• (36 37 38 39 40)

	PUNCH CODE	CARD COL.
BODY STYLE (Code Sun Roof as 1 to 5, not 6) (1) 2-Door Hardtop (no upper B pillar) (2) 2-Door Sedan or Coupe (any upper B) (3) 4-Door Hardtop (4) 4-Door Sedan (5) Station Wagon or Pickup Car (6) Convertible - soft or hard shell (7) Van (not walk-in) (8) Truck (9) Other (e.g. bus, jeep, train) (0) Unknown	___	41
ENGINE NUMBER OF CYLINDERS (Enter "0" if unknown)	___	42
HIGH PERFORMANCE (1,2,0)*	___	43
NUMBER OF OCCUPANTS	___ ___	44-45
VEHICLE LOADING (4) BELOW FULL RATED LOAD (5) NEAR FULL RATED LOAD (6) ABOVE FULL RATED LOAD (0) UNKNOWN	___	46

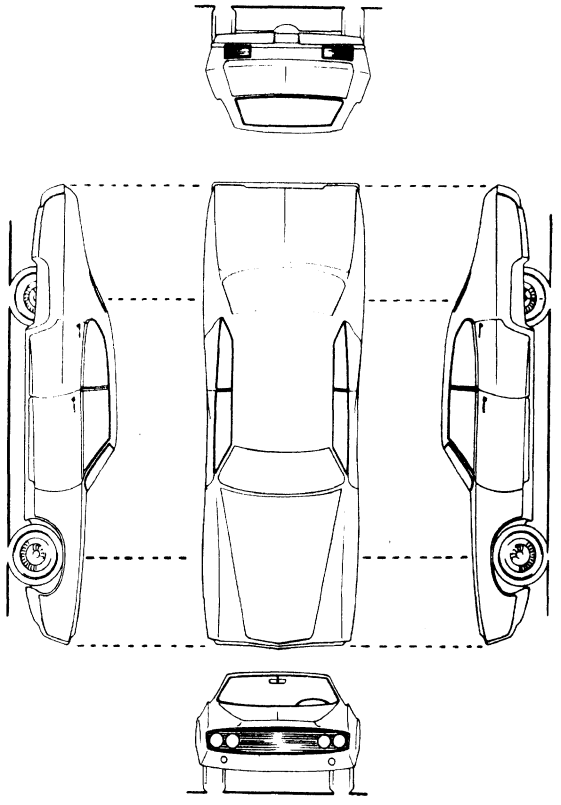
*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO
0 FOR UNKNOWN

DAMAGE INDEX (OTHER VEHICLE)

___ ___ — ___ ___ ___ ___ — ___ (47 48 49 50 51 52 53)

VEHICLE DAMAGE

(This space may be used to enter details and notes about the other vehicle. See page 9 for instructions.)



COMMENTS: _____

IF SEPARATE REPORT WAS MADE, GIVE REPORT NUMBER _____

END OF CARD 02

CASE VEHICLE

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 3 (11)

CASE VEHICLE DESCRIPTION

VEHICLE IDENTIFICATION NUMBER

12	13	14	15	16	17	18	19	20	21	22	23	24

MAKE _____

MODEL _____

CODE TO BE INSERTED

25 26 27 28 29

MODEL YEAR 19 __ (30) __ (31)

Shipping Weight (pounds) __ (32) __ (33) __ (34) __ (35)

ODOMETER READING (IF OVER 100,000: USE 99 999) __ (36) __ (37) __ (38) __ (39) __ (40)

	PUNCH CODE	CARD COL.
BODY STYLE (Code Sun Roof as 1 to 5, not 6) (1) 2-Door Hardtop (no upper B pillar) (2) 2-Door Sedan or Coupe (any upper B) (3) 4-Door Hardtop (4) 4-Door Sedan (5) Station Wagon or Pickup Car (6) Convertible - soft or hard shell (7) Van (not walk-in) (8) Truck (9) Other (e.g. bus, jeep, train) (0) Unknown	____	41
BODY STRUCTURE (1) BODY AND FRAME (2) UNITIZED (3) INTEGRAL - STUB FRAME (4) OTHER: _____ (0) UNKNOWN	____	42
ENGINE NUMBER OF CYLINDERS (Enter "0" if unknown)	____	43
HIGH PERFORMANCE (1,2,0)*	____	44
NUMBER OF OCCUPANTS (Enter 99 if unknown)	__ __	45-46

	PUNCH CODE	CARD COL.
VEHICLE LOADING (4) BELOW FULL RATED LOAD (5) NEAR FULL RATED LOAD (6) ABOVE FULL RATED LOAD (0) UNKNOWN	____	47
EQUIPMENT OPTIONS **TRANSMISSION** (4) AUTOMATIC + Semi Automatic (5) MANUAL (0) UNKNOWN	____	48
STEERING (4) POWER (5) MANUAL (0) UNKNOWN	____	49
BRAKES (4) POWER (5) MANUAL (0) UNKNOWN	____	50
BRAKES - TYPE (4) DRUM - ALL WHEELS (5) DISC - FRONT WHEELS (6) DISC - ALL WHEELS (0) UNKNOWN	____	51
BRAKE ANTI-LOCK DEVICE (2) NONE INSTALLED (4) TWO-WHEEL (5) FOUR-WHEEL (0) UNKNOWN	____	52
Top Position at Time of Collision (3) Solid Top - Not Applicable (4) Convertible Soft Top Up or Closed (5) Retracted Soft Top or Hard Shell Removed (6) Removable Hard Shell Installed (7) Sun Roof - Closed (8) Sun Roof - Open (0) Unknown	____	53

CASE VEHICLE REPAIR OR REPLACEMENT COST

Unknown (9999) $ __ (54) __ (55) __ (56) __ (57)

CASE VEHICLE DAMAGE INDEX

PRIMARY DAMAGE

__ (58) __ (59) __ (60) __ (61) __ (62) __ (63) __ (64)

SECONDARY DAMAGE

__ (65) __ (66) __ (67) __ (68) __ (69) __ (70) __ (71)

Unknown or None (99-0000-0)

END OF CARD 83

*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO
0 FOR UNKNOWN

EXTERIOR DAMAGE

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 4 (11)

SHEET METAL DAMAGE	PUNCH CODE	CARD COL.
FRONT (1,2,0)*	___	12
REAR (1,2,0)*	___	13
LEFT SIDE (1,2,0)*	___	14
RIGHT SIDE (1,2,0)*	___	15
ROOF (1,2,0)*	___	16
OTHER (1,2,0)*: _____	___	17
REMARKS: _____		

SHEET METAL CRUSH

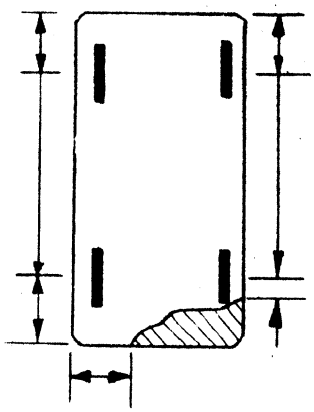
TO BE FILLED IN BY ANALYSIS GROUP. INSERT MAXIMUM CRUSH DIMENSION TO THE NEAREST INCH. DIMENSIONS MUST AGREE WITH DIAGRAMS ON FACING PAGE. (INSERT "99", IF UNKNOWN INSERT "98", IF 98 INCHES OR OVER)

FRONT (INCHES)	___ ___	18-19
REAR	___ ___	20-21
LEFT SIDE	___ ___	22-23
RIGHT SIDE	___ ___	24-25
ROOF	___ ___	26-27
OTHER:	___ ___	28-29

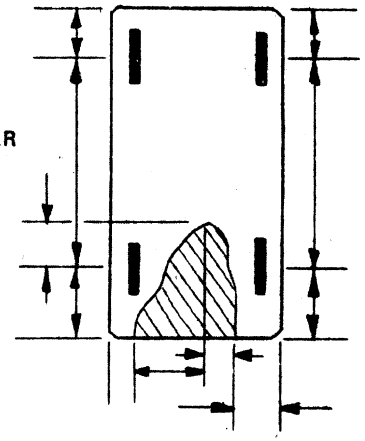
*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO
0 FOR UNKNOWN

EXAMPLES.

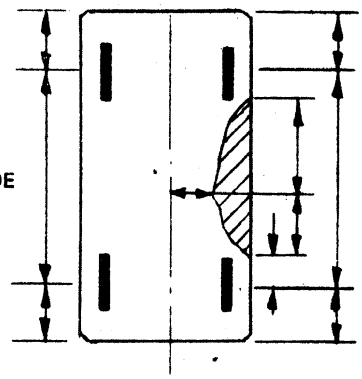
FRONT OR REAR



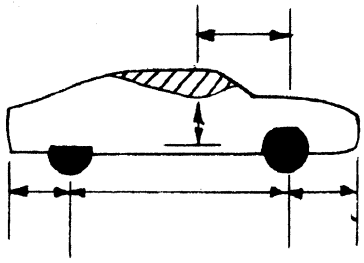
FRONT OR REAR



SIDE



ROOF
(REFERENCE TO TOP OF DOOR SILL OR WINDOW SILL)

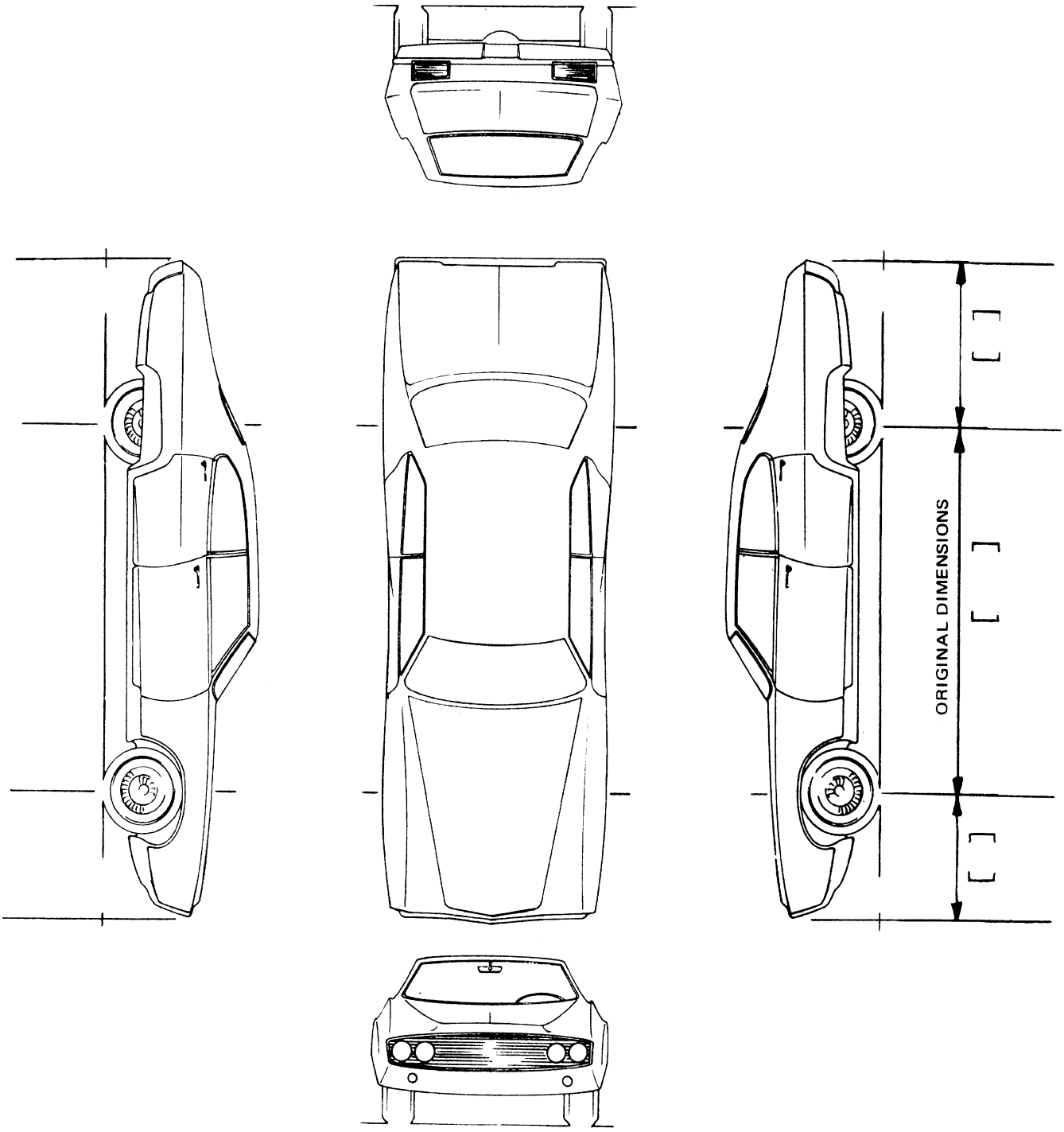


SHEET METAL

EXTERIOR DAMAGE

FIELD INVESTIGATOR INSTRUCTIONS:

1. Indicate crushed areas by outlining new perimeter of vehicle and shading the damaged areas on the large sketch below. Use as many sketches as ncessary to completely describe the damage.
2. Enter the dimensions on the sketch(es) measured to the point of maximum penetration by the object(s) contacted. Use the examples on the facing page as a guide.
3. Enter the three dimensions to the center of the wheels (wheelbase, front and rear overhangs) on both sides of the car.
4. Add other dimensions as necessary to completely describe the damage.



VEHICLE SKETCH

WHEELS AND TIRES

WHEELS	PUNCH CODE	CARD COL.
ORIGINAL EQUIPMENT TYPE		
FRONT (1,2,0)*	____	30
REAR (1,2,0)*	____	31
DAMAGED (1,2,0)*	____	32
DESCRIBE DAMAGE AND NON O.E. WHEELS		
_____		
_____		
_____		

TIRES		PUNCH CODE	CARD COL.
TREAD TYPE			
(4) REGULAR (5) NON-STUDDED SNOW (6) STUDDED SNOW (7) 'SLICK' (8) LEFT AND RIGHT SIDES DIFFERENT	FRONT	____	33
(9) OTHER: _____ (0) UNKNOWN	REAR	____	34
TREAD WEAR			
(4) LIGHT (5) MEDIUM (6) HEAVY (7) BALD (8) LEFT AND RIGHT SIDES DIFFERENT	FRONT	____	35
(9) OTHER: _____ (0) UNKNOWN	REAR	____	36
PROFILE			
(4) REGULAR 80,78 (5) WIDE OVAL 70,60,50 (6) LEFT AND RIGHT SIDES DIFFERENT	FRONT	____	37
(7) OTHER: _____ (0) UNKNOWN	REAR	____	38
CARCASS TYPE			
(4) BIAS PLY (5) BELTED-BIAS PLY (6) RADIAL PLY (7) LEFT AND RIGHT SIDES DIFFERENT	FRONT	____	39
(8) OTHER: _____ (0) UNKNOWN	REAR	____	40

TIRES (CONT'D.)

SIZE

FRONT { LEFT _____ / RIGHT _____

REAR { LEFT _____ / RIGHT _____

MANUFACTURER

FRONT { LEFT _____ / RIGHT _____

REAR { LEFT _____ / RIGHT _____

MODEL

FRONT { LEFT _____ / RIGHT _____

REAR { LEFT _____ / RIGHT _____

CODE

FRONT { LEFT _____ / RIGHT _____

REAR { LEFT _____ / RIGHT _____

LOAD RANGE

FRONT { LEFT _____ / RIGHT _____

REAR { LEFT _____ / RIGHT _____

*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO
0 FOR UNKNOWN

FRONT EXTERIOR

HOOD PERFORMANCE
(FRONT OF VEHICLE)

	PUNCH CODE	CARD COL.
HOOD LATCH(ES)		
RELEASED (1,2,3,0)*	___	41
DAMAGED (1,2,3,0)*	___	42
JAMMED (1,2,3,0)*	___	43
HOOD HINGES		
LEFT — DAMAGED (1,2,0)*	___	44
LEFT — SEPARATED (1,2,3,4,5,0)**	___	45
RIGHT — DAMAGED (1,2,0)*	___	46
RIGHT — SEPARATED (1,2,3,4,5,0)**	___	47
HOOD REMAINED ON VEHICLE (1,2,0)*	___	48
REAR EDGE OF HOOD		
ELEVATED (1,2,0)*	___	49
CONTACTED WINDSHIELD (1,2,0)*	___	50
PENETRATED WINDSHIELD (1,2,3,0)*	___	51
OPTIONAL HOOD INSTALLED (1,2,0)*	___	52
ENGINE OR TRANSMISSION MOUNT SEPARATION (1,2,0)*	___	53

STEERING COLUMN FLEXIBLE COUPLING

EQUIPPED (2) No → ___ 54

Yes
- (1) Type Unknown
- (6) Rag
- (7) Pot
- (8) Universal
- (9) Other

___ 55

(0) Unknown ___ 56

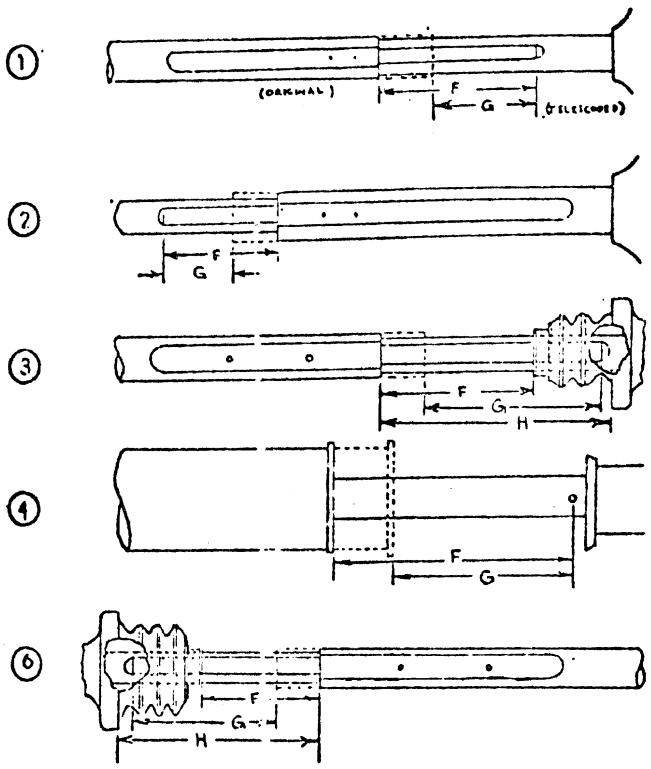
SEPARATED (1,2,3,4,5,0)**

OTHER DAMAGE (1,2,3,0)*

DESCRIBE: _____

ENGINE COMPARTMENT TELESCOPING UNIT

(SEE DRAWING ON PAGE 18 FOR LOCATION)



TYPE OF UNIT — PUNCH ___ 57

(5) None Installed
(1-6) See Sketch Above
(9) Others _____
(0) UNKNOWN

ORIGINAL LENGTH (See Table Above) (F) _____

TELESCOPED LENGTH (Measure, See Diagrams Above) (G) _____ IF NONE (888)

DIFFERENCE (F minus G) _____ 58-60

ENTER ONLY IF UNKNOWN tolerance ± 0.6

END OF CARD 04

*USE: 1=YES 3=NOT APPLICABLE 2=NO 0=UNKNOWN

**USE: 1=YES, TYPE UNKNOWN 2=NO 3=NOT APPLICABLE 4=PARTIAL SEPARATION 5=COMPLETE SEPARATION 0=UNKNOWN

FIRE

LEFT PILLARS

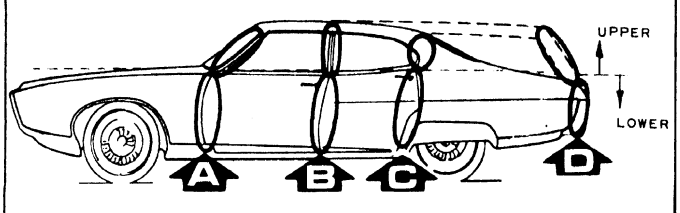
FIRE

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 5 (11)

	PUNCH CODE	CARD COL.
FIRE (Accident View Point) (1) - time unknown (2) No Fire (4) Pre-Crash Fire Start (5) At-Crash Fire Start (6) Post-Crash Fire Start (0) Unknown	____	12
EXTENT OF FIRE (to Case Vehicle) (3) No Fire, Not Applicable (4) Minor - easily extinguished (5) Major (e.g., entire interior or engine) (0) Unknown	____	13
FIRE ORIGIN (in Case Vehicle) (3) No Fire, Not Applicable (4) Engine Compartment (5) Passenger Compartment (6) Luggage Compartment (7) Fuel Tank, lines, filler (8) Other:_____ (0) Unknown	____	14

NOTES ABOUT FIRE: _____

LEFT PILLARS



LEFT EXTERIOR

LEFT PILLARS	PUNCH CODE	CARD COL.
If left pillars were not damaged or separated or left roof side rail was not damaged or buckled, place a "1" in code column.	____	15
A-PILLAR		
UPPER — DAMAGED (1,2,0)*	____	16
UPPER — SEPARATED (1,2,3,4,5,0)**	____	17
LOWER — DAMAGED (1,2,0)*	____	18
LOWER — SEPARATED (1,2,3,4,5,0)**	____	19
B-PILLAR (Also Rear Pillar on Pick-Up Truck, Corvette, '71 Camaro, '71 Firebird)		
UPPER — DAMAGED (1,2,3,0)*	____	20
UPPER — SEPARATED (1,2,3,4,5,0)**	____	21
LOWER — DAMAGED (1,2,0)*	____	22
LOWER — SEPARATED (1,2,3,4,5,0)**	____	23
C-PILLAR		
UPPER — DAMAGED (1,2,3,0)*	____	24
UPPER — SEPARATED (1,2,3,4,5,0)**	____	25
LOWER — DAMAGED (1,2,3,0)*	____	26
LOWER — SEPARATED (1,2,3,4,5,0)**	____	27
D-PILLAR (Station Wagon & Limousine)		
UPPER — DAMAGED (1,2,3,0)*	____	28
UPPER — SEPARATED (1,2,3,4,5,0)**	____	29
LOWER — DAMAGED (1,2,3,0)*	____	30
LOWER — SEPARATED (1,2,3,4,5,0)**	____	31
LEFT ROOF SIDE RAILS		
DAMAGED (1,2,3,0)*	____	32
BUCKLED (1,2,3,0)*	____	33

*USE: 1=YES 3=NOT APPLICABLE
2=NO 0=UNKNOWN

**USE: 1=YES, TYPE UNKNOWN 4=PARTIAL SEPARATION
2=NO 5=COMPLETE SEPARATION
3=NOT APPLICABLE 0=UNKNOWN

LEFT EXTERIOR

SIDE STRUCTURE – LEFT SIDE

	PUNCH CODE	CARD COL.
LEFT BODY MOUNT SEPARATION (1,2,3,0)* — Unitized	____	34
If door hinges and latches were not damaged and doors did not jam or open during collision, and continuity of the side structure was maintained, place a "1" in code column.	____	35
DOOR LATCHES — LEFT FRONT — DAMAGED (1,2,3,0)*	____	36
LEFT FRONT — RELEASED (1,2,3,0)*	____	37
LEFT REAR — DAMAGED (1,2,3,0)*	____	38
LEFT REAR — RELEASED (1,2,3,0)*	____	39
DOOR HINGES — LEFT FRONT — DAMAGED (1,2,3,0)*	____	40
LEFT FRONT — SEPARATED (1,2,3,4,5,0)**	____	41
LEFT REAR — DAMAGED (1,2,3,0)*	____	42
LEFT REAR — SEPARATED (1,2,3,4,5,0)**	____	43
CONTINUITY OF SIDE STRUCTURE MAINTAINED (1,2,3,0)*	____	44
i.e., Is Side Boundary Broken Not restricted to vehicles with reinforced side structure.		
DOORS OPENED DURING COLLISION — LEFT — FRONT (1,2,0)*	____	45
LEFT — REAR (1,2,3,0)*	____	46
DOORS JAMMED CLOSED — LEFT — FRONT (1,2,0)*	____	47
LEFT — REAR (1,2,3,0)*	____	48

REAR EXTERIOR

FUEL TANK AND LINES

	PUNCH CODE	CARD COL.
APPROXIMATE FUEL LEVEL AT TIME OF IMPACT (4) LESS THAN 1/2 (5) 1/2 OR MORE (0) UNKNOWN	____	49
TANK RETENTION (4) COMPLETE RETENTION (5) PARTIAL DISENGAGEMENT (6) COMPLETE DISENGAGEMENT (0) UNKNOWN	____	50
TANK DEFORMED (1,2,0)* includes neck	____	51
FUEL LEAKAGE PRESENT (1,2,0)*	____	52
LOCATION OF LEAKS — FROM THE TANK (1,2,3,0)*	____	53
FROM THE NECK (1,2,3,0)*	____	54
FROM THE LINES (1,2,3,0)*	____	55

TRAILER AND HITCH

(1) Yes, Type Unknown
(2) No
(3) Ball and Socket, Temporary Bumper (e.g., rental clamp-on)
(4) Ball and Socket, Bumper only (e.g., light truck)
(5) Ball and Socket - Frame Hitch (e.g., frame and bumper)
(6) Equalizing, load distributing
(7) Ring and Pintle (e.g., double tractor)
(8) Fifth Wheel (e.g., semi)
(9) Other (e.g., clevis and pin)
(0) Unknown

	____	56
TRAILER BEING TOWED (AT TIME OF COLLISION) (1) Yes, Type Unknown (2) No (hitch, no trailer) (3) Not Applicable (no hitch) (4) Travel Trailer/Camper (5) Mobile Home (6) Boat/Snowmobile/ATV Trailer (7) Rental/Cargo Trailer (8) Car (9) Other: _____ (0) Unknown	____	57

TRAILER

FUEL TANK

LEFT SIDE STRUCTURE

*USE: 1=YES 3=NOT APPLICABLE
2=NO 0=UNKNOWN

**USE: 1=YES, TYPE UNKNOWN 4=PARTIAL SEPARATION
2=NO 5=COMPLETE SEPARATION
3=NOT APPLICABLE 0=UNKNOWN

REAR EXTERIOR

TRUNK

TAILGATE

LUGGAGE AREA

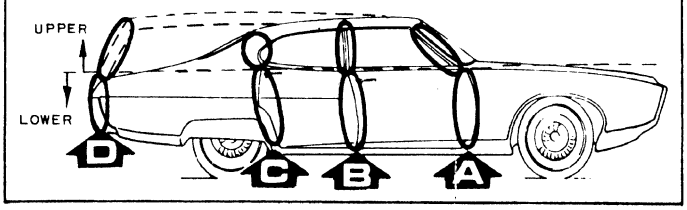
FILL IN TRUNK LID OR TAILGATE DETAILS AND REST OF PAGE.

	PUNCH CODE	CARD COL.
TAILGATE (HATCHBACK) PERFORMANCE Includes back doors of Vans		
LATCHES		
RELEASED (1,2,3,0)*	____	58
DAMAGED (1,2,3,0)*	____	59
LATCH OR TAILGATE JAMMED (1,2,3,0)*	____	60
HINGES OR TRACKS (CLAM SHELL)		
BOTTOM LEFT — DAMAGED (1,2,3,0)*	____	61
BOTTOM LEFT — SEPARATED (1,2,3,4,5,0)**	____	62
BOTTOM RIGHT — DAMAGED (1,2,3,0)*	____	63
BOTTOM RIGHT — SEPARATED (1,2,3,4,5,0)**	____	64
TOP LEFT — DAMAGED (1,2,3,0)*	____	65
TOP LEFT — SEPARATED (1,2,3,4,5,0)**	____	66
TOP RIGHT — DAMAGED (1,2,3,0)*	____	67
TOP RIGHT — SEPARATED (1,2,3,4,5,0)**	____	68
EQUIPPED WITH TWO-WAY TAILGATE (1,2,3,0)* (6) Disappearing Tailgate	____	69
TAILGATE ELECTRIC WINDOW OPERABLE (1,2,3,0)*	____	70
END OF CARD 05		

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 6 (11)

TRUNK LID PERFORMANCE (REAR OF VEHICLE)	PUNCH CODE	CARD COL.
LATCHES		
RELEASED (1,2,3,0)*	____	12
DAMAGED (1,2,3,0)*		13
LATCH OR LID JAMMED (1,2,3,0)*	____	14
HINGES		
LEFT — DAMAGED (1,2,3,0)*	____	15
LEFT — SEPARATED (1,2,3,4,5,0)**	____	16
RIGHT — DAMAGED (1,2,3,0)*	____	17
RIGHT — SEPARATED (1,2,3,4,5,0)**	____	18
TRUNK or LUGGAGE AREA (partitioned) DAMAGED (1,2,0)*	____	19
SPARE TIRE SEPARATION (1,2,0)* (4) for spare tire not initially attached	____	20
TRUNK - PASSENGER COMPARTMENT PARTITION DAMAGE (1,2,3,0)*	____	21
BACKLIGHT HEADER (REAR WINDOW TOP FRAME) BACKLIGHT HEADER DAMAGED OR BUCKLED (1,2,3,0)* convertible	____	22

RIGHT PILLARS



*USE: 1=YES 2=NO 3=NOT APPLICABLE 0=UNKNOWN

**USE: 1=YES, TYPE UNKNOWN 2=NO 3=NOT APPLICABLE 4=PARTIAL SEPARATION 5=COMPLETE SEPARATION 0=UNKNOWN

RIGHT EXTERIOR

RIGHT PILLARS

If right pillars were not damaged or separated or right roof side rail was not damaged or buckled, place a "1" in code column.

	PUNCH CODE	CARD COL.
	____	23

A-PILLARS

	PUNCH CODE	CARD COL.
UPPER — DAMAGED (1,2,0)*	____	24
UPPER — SEPARATED (1,2,3,4,5,0)**	____	25
LOWER — DAMAGED (1,2,0)*	____	26
LOWER — SEPARATED (1,2,3,4,5,0)**	____	27

B-PILLAR (ALSO REAR PILLAR ON PICK-UP TRUCK, CORVETTE, '71 CAMARO, '71 FIREBIRD)

	PUNCH CODE	CARD COL.
UPPER — DAMAGED (1,2,3,0)*	____	28
UPPER — SEPARATED (1,2,3,4,5,0)**	____	29
LOWER — DAMAGED (1,2,0)*	____	30
LOWER — SEPARATED (1,2,3,4,5,0)**	____	31

C-PILLAR

	PUNCH CODE	CARD COL.
UPPER — DAMAGED (1,2,3,0)*	____	32
UPPER — SEPARATED (1,2,3,4,5,0)**	____	33
LOWER — DAMAGED (1,2,3,0)*	____	34
LOWER — SEPARATED (1,2,3,4,5,0)**	____	35

D-PILLAR (STATION WAGON & LIMOUSINE)

	PUNCH CODE	CARD COL.
UPPER — DAMAGED (1,2,3,0)*	____	36
UPPER — SEPARATED (1,2,3,4,5,0)**	____	37
LOWER — DAMAGED (1,2,3,0)*	____	38
LOWER — SEPARATED (1,2,3,4,5,0)**	____	39

RIGHT ROOF SIDE RAILS

	PUNCH CODE	CARD COL.
DAMAGED (1,2,3,0)*	____	40
BUCKLED (1,2,3,0)*	____	41

WINDSHIELD HEADER

	PUNCH CODE	CARD COL.
DAMAGED OR BUCKLED (1,2,0)*	____	42

SIDE STRUCTURE – RIGHT SIDE

	PUNCH CODE	CARD COL.
RIGHT BODY MOUNT SEPARATION (1,2,3,0)* (Unitized)	____	43

If door hinges and latches were not damaged and doors did not jam or open during collision, and continuity of the side structure was maintained, place a "1" in code column.

	PUNCH CODE	CARD COL.
	____	44

DOOR LATCHES

	PUNCH CODE	CARD COL.
RIGHT FRONT — DAMAGED (1,2,3,0)*	____	45
RIGHT FRONT — RELEASED (1,2,3,0)*	____	46
RIGHT REAR — DAMAGED (1,2,3,0)*	____	47
RIGHT REAR — RELEASED (1,2,3,0)*	____	48

DOOR HINGES

	PUNCH CODE	CARD COL.
RIGHT FRONT — DAMAGED (1,2,3,0)*	____	49
RIGHT FRONT — SEPARATED (1,2,3,4,5,0)**	____	50
RIGHT REAR (Hinge or track) — DAMAGED (1,2,3,0)*	____	51
RIGHT REAR (Hinge or track) — SEPARATED (1,2,3,4,5,0)**	____	52

	PUNCH CODE	CARD COL.
CONTINUITY OF SIDE STRUCTURE MAINTAINED (1,2,3,0)*	____	53

i.e., Is Side Boundary Broken
Not restricted to vehicles with reinforced side structure.

DOORS OPENED DURING COLLISION

	PUNCH CODE	CARD COL.
RIGHT — FRONT (1,2,0)*	____	54
RIGHT — REAR (1,2,3,0)*	____	55

DOORS JAMMED CLOSED

	PUNCH CODE	CARD COL.
RIGHT — FRONT (1,2,0)*	____	56
RIGHT — REAR (1,2,3,0)*	____	57

*USE: 1-YES 3-NOT APPLICABLE 2-NO 0-UNKNOWN

**USE: 1-YES, TYPE UNKNOWN 2-NO 3-NOT APPLICABLE 4-PARTIAL SEPARATION 5-COMPLETE SEPARATION 0-UNKNOWN

RIGHT SIDE STRUCTURE

RIGHT PILLARS

STEERING WHEEL

STEERING WHEEL	PUNCH CODE	CARD COL.
GM only, others and unknown use (99).	___	58-59
NOTES ON NON-ORIGINAL EQUIPMENT STEERING WHEEL: _____ _____ _____		
STEERING WHEEL RIM		
DAMAGE (2) NONE (4) SLIGHTLY DEFORMED (5) SEVERELY BENT (6) BROKEN (0) UNKNOWN	___	60
OCCUPANT CONTACT (1,2,0)*	___	61
STEERING WHEEL SPOKES		
NUMBER OF SPOKES (ENTER "O" IF UNKNOWN)	___	62
DAMAGE (2) NONE (4) SLIGHTLY DEFORMED (5) SEVERELY BENT (6) BROKEN (0) UNKNOWN	___	63
OCCUPANT CONTACT (1,2,0)*	___	64
HORN RING, HORN BUTTON(S), OR SPOKE SHROUD		
DAMAGED (1,2,0)*	___	65
OCCUPANT CONTACT (1,2,0)*	___	66

STEERING WHEEL ENERGY ABSORBING DEVICE TABLE

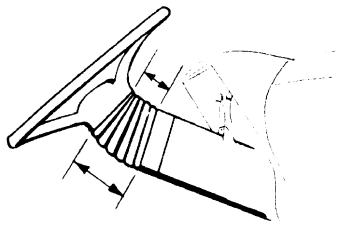
Corporation	Year	Make	Length
Chrysler	70	Barracuda Challenger	4.9"
Ford	70-72	Capri	6" total 3" external

STEERING WHEEL ENERGY ABSORBING DEVICE (SEE DRAWING ON PAGE 18 FOR LOCATION)	PUNCH CODE	CARD COL.
EQUIPPED (1,2,0)*	___	67

ENERGY ABSORBING DEVICE FINAL POSITION

MEASURE THE MINIMUM AND MAXIMUM OVERALL LENGTH OF THE ENERGY ABSORBING DEVICE (BETWEEN THE STEERING WHEEL AND STEERING COLUMN).

ENTER THESE LENGTHS BELOW

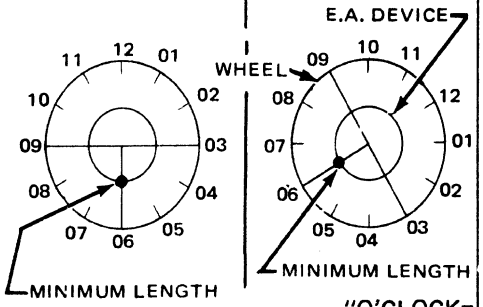


MAX. = _____ in.; MIN. = _____ in.

THE E.A. DEVICE ROTATES WITH THE STEERING WHEEL. WE WANT TO KNOW WHERE THIS MINIMUM LENGTH OCCURRED (AROUND THE CIRCUMFERENCE OF THE E.A. DEVICE) WITH RESPECT TO THE SPOKES. RECORD BELOW THE O'CLOCK POSITION AT WHICH THIS MINIMUM LENGTH WAS MEASURED.

EXAMPLES

O'CLOCK = 0 6 | O'CLOCK = 0 6



"O'CLOCK= ___ ___

(ENTER 00 IF UNKNOWN)

68 69

ENERGY ABSORBING DEVICE COMPRESSION

FOLLOWING TO BE FILLED IN BY ANALYSIS GROUP
(ENTER 99.9 IF UNKNOWN)

ORIGINAL LENGTH (H) _____ IN.
(SEE TABLE AT LEFT)

DAMAGED MAX. LENGTH (X) _____ IN.

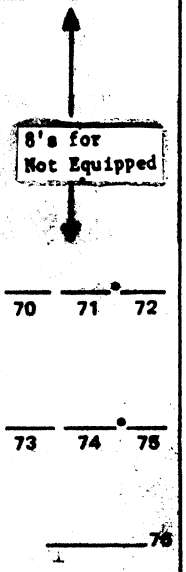
DIFFERENCE (H-X) _____ IN.

ORIGINAL LENGTH (H) _____ IN.
(SEE TABLE AT LEFT)

DAMAGED MIN. LENGTH (Y) _____ IN.

DIFFERENCE (H-Y) _____ IN.

DEVICE EXTENDED
(4) X GREATER THAN H
(5) X AND Y GREATER THAN H
(6) NEITHER
(0) UNKNOWN



END OF CARD 06

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

STEERING WHEEL AND COLUMN

DUPLICATE COLUMNS 1-8 FROM PRECEDING CARD — 9 (10) 7 (11)

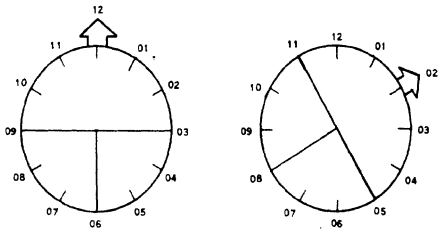
STEERING WHEEL POSITION AT TIME OF COLLISION

PUNCH CODE	CARD COL.

IN WHAT O'CLOCK POSITION WAS THE NORMAL TOP OF THE WHEEL POINTED WHEN THE COLLISION OCCURRED?

EXAMPLES

O'CLOCK = 1 2 O'CLOCK = 0 2



(NORMAL STRAIGHT AHEAD)

(00) UNKNOWN

O'CLOCK = ___ ___ — 12-13

STEERING WHEEL PAD

(LOAD DISTRIBUTING MATERIAL)

EQUIPPED (1,2,0)* ___ — 14

DEFORMED (1,2,3,0)* ___ — 15

(PUT NOTES ON FOLD-OUT FLY-LEAF)

TILT FEATURE

EQUIPPED (1,2,0)* ___ — 16

FINAL POSITION

(3) NOT APPLICABLE
(4) NORMAL
(5) TILTED UP
(6) TILTED DOWN
(0) UNKNOWN

___ — 17

TELESCOPING FEATURE

EQUIPPED (1,2,0)* ___ — 18

FINAL POSITION

(3) NOT APPLICABLE
(4) NORMAL
(5) ABOVE NORMAL
(6) BELOW NORMAL
(0) UNKNOWN

___ — 19

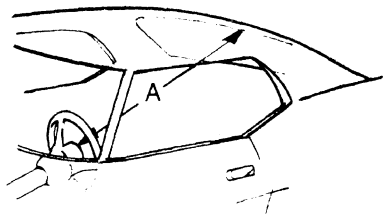
SWING-AWAY FEATURE

	PUNCH CODE	CARD COL.
EQUIPPED (1,2,0)*	___	20
FINAL POSITION (3) NOT APPLICABLE (4) NORMAL (5) RIGHT OF NORMAL (0) UNKNOWN	___	21

FINAL COLUMN POSITION

MEASURE THE DISTANCE FROM THE STEERING WHEEL CENTER TO THE TOP OF THE REAR WINDOW GLASS, DIRECTLY BEHIND THE HUB. ("A" IN SKETCH).

ENTER THIS DISTANCE IN BLANK "A".



A: _____ INCHES

COLUMN MOVEMENT

If top or rear window glass is displaced, then use (999)

(ENTER 99.9 IF UNKNOWN)

FROM A CORRESPONDING UNDAMAGED VEHICLE, MAKE A MEASUREMENT SIMILAR TO "A" ABOVE, AND RECORD IT IN BLANK "B". (PLACE TILT STEERING WHEEL IN MID-POSITION AND TELESCOPING COLUMNS IN FULL DOWN POSITION).

ORIGINAL DIMENSION (B) _____ IN.

DAMAGED VEHICLE DIMENSION (A) _____ IN.

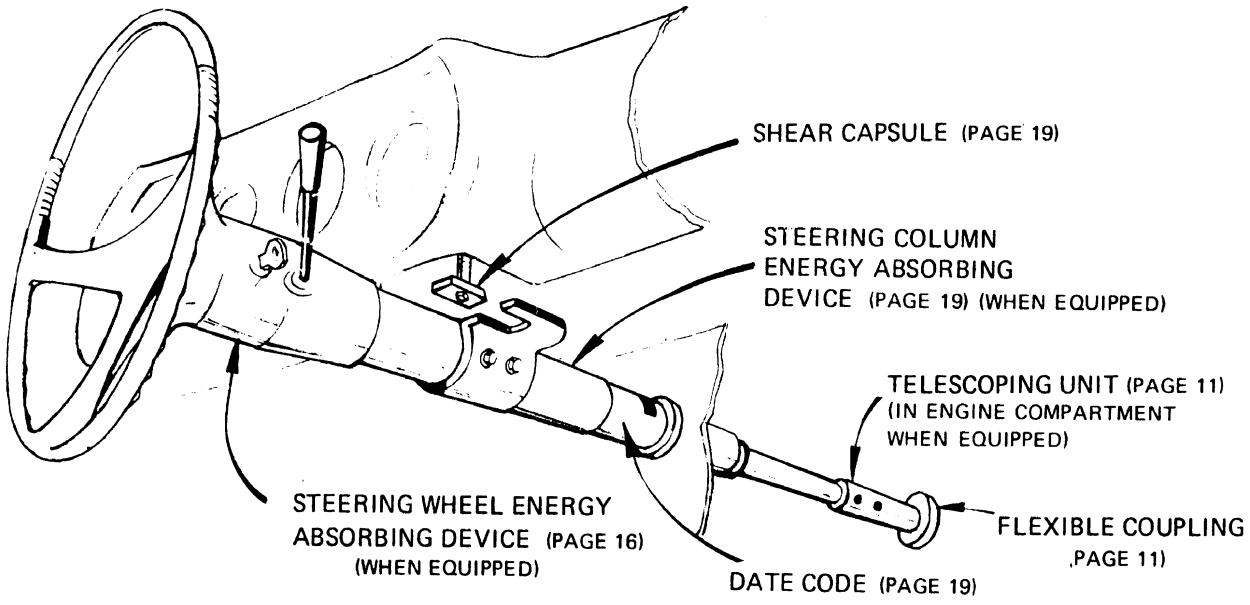
DIFFERENCE |A-B| _____ tolerance ± 1.0 — 23 24

DIRECTION OF MOTION

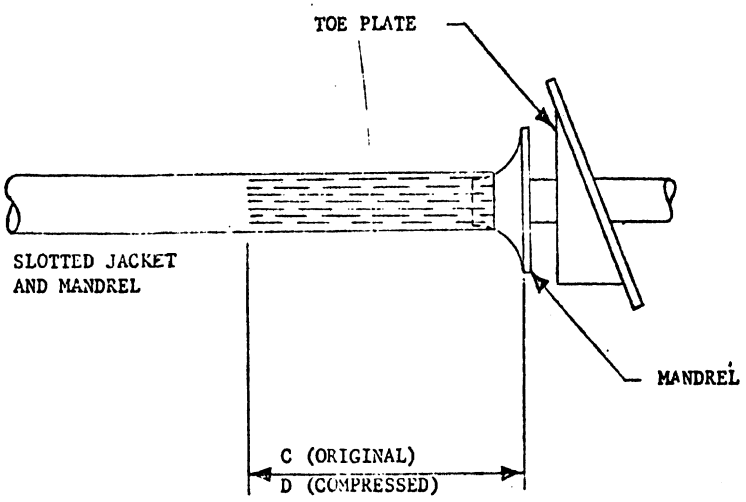
(4) FORWARD (A GREATER THAN B)
(5) REARWARD (A LESS THAN B)
(6) NEITHER
(0) UNKNOWN

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 2 FOR NO 3 FOR NOT APPLICABLE 0 FOR UNKNOWN

STEERING COLUMN (CONT'D.)



NEW (9) 1974 CHRYSLER CORPORATION ENERGY ABSORBING STEERING COLUMN

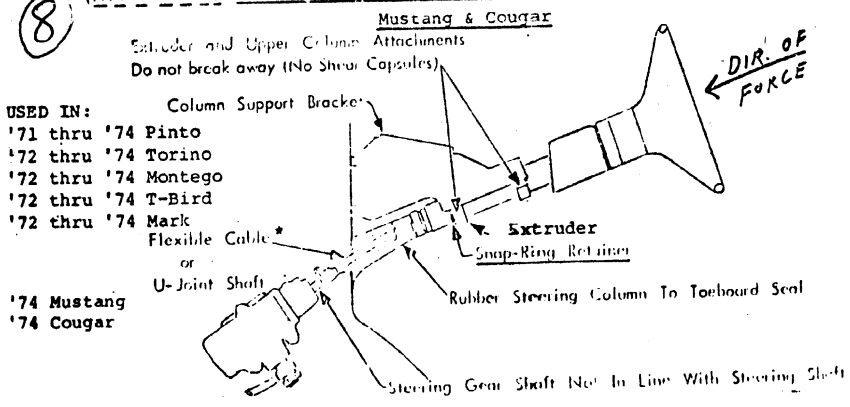


ALL MAKES EXCEPT BARRACUDA, CHALLENGER, AND COLT

ORIGINAL LENGTH C = 9.75 in.

FORD ENERGY ABSORBING "MINI" COLUMN

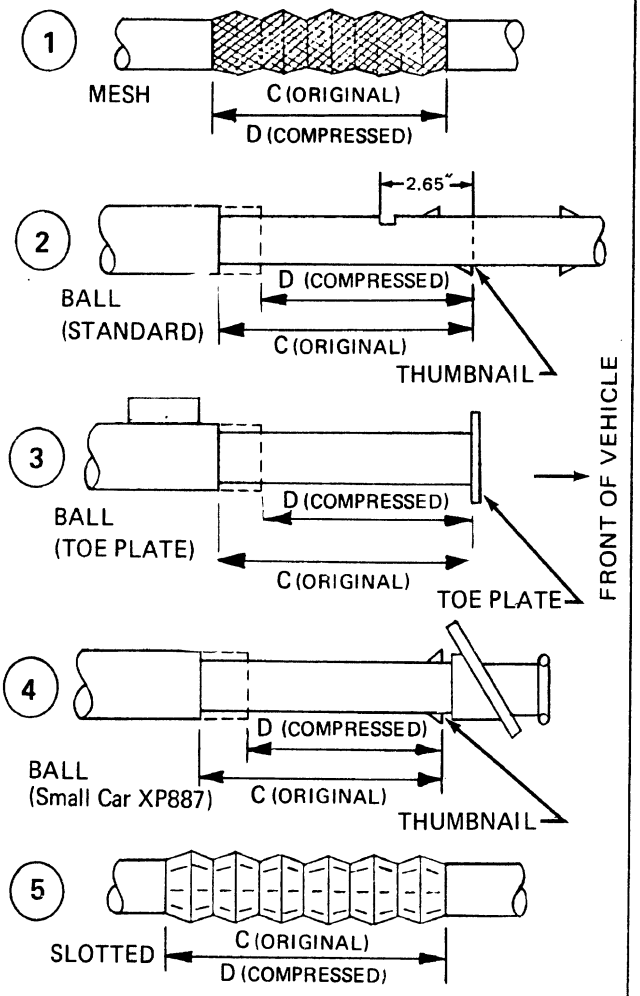
(8) (1971-74 PINTO; 1972-'74 TORINO, MONTEGO, T-BIRD, MARK IV & Mustang & Cougar)



USED IN:
'71 thru '74 Pinto
'72 thru '74 Torino
'72 thru '74 Montego
'72 thru '74 T-Bird
'72 thru '74 Mark
'74 Mustang
'74 Cougar

STEERING COLUMN (CONT'D.)

STEERING COLUMN ENERGY ABSORBING DEVICE SEE ALSO: page 18



STEERING COLUMN ENERGY ABSORBING DEVICE

TYPE OF DEVICE

PUNCH

(7) Not Equipped
(1) Mesh
(2) Ball (Standard)
(3) Ball (with Toe Plate)
(4) Ball (Vega)
(5) Slotted
(6) Other: _____ (e.g. Colt)
(8) Ford Mini-Column
(9) Chrysler Slotted Jacket and Mandrel (1974+)
(0) Unknown

26

(SEE DRAWING ON PAGE 18 FOR LOCATION)

ORIGINAL LENGTH
(See Table on Page 18) (C) _____

COMPRESSED LENGTH
(Measure, See Diagrams above) (D) _____

8's for Not Equipped

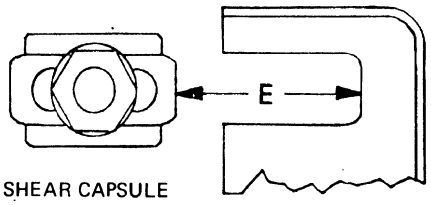
COMPRESSION (C minus D) _____
(ENTER 99.9 IF UNKNOWN)

27 28 29

NOTE: ALL DIMENSIONS IN PUNCH COLUMN SHOULD BE IN INCHES AND TENTHS.

SHEAR CAPSULE SEPARATION

(SEE DRAWING ON PAGE 18 FOR LOCATION)



SHEAR CAPSULE (FASTENED TO INSTRUMENT PANEL)

SHEAR CAPSULE BRACKET (FASTENED TO STEERING COLUMN)

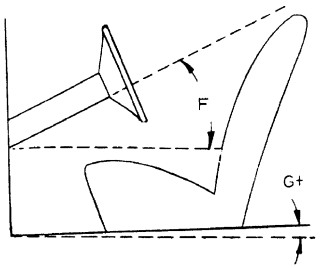
NOTE: WHEN CAPSULES HAVE SEPARATED IT MAY BE NECESSARY TO LIFT COLUMN ASSEMBLY INTO POSITION AGAINST INSTRUMENT PANEL BEFORE MEASURING.

SHEAR CAPSULE SEPARATION DISTANCE ('E' IN DIAGRAM ABOVE)
(ENTER 99.9 IF UNKNOWN)
888 if not equipped

PUNCH

30 31 32
tolerance + 0.1

STEERING COLUMN VERTICAL ANGLE



MEASURE THE ANGLE THE STEERING COLUMN MAKES WITH THE HORIZONTAL ('F' IN DIAGRAM ABOVE), AND THE ANGLE THE DOOR SILL MAKES WITH THE HORIZONTAL ('G' IN DIAGRAM) AND ENTER THEM BELOW. ANGLES WHICH TILT DOWN TOWARD THE FRONT OF THE CAR ARE POSITIVE.

(NOTE: LIFT COLUMN INTO POSITION FOR MEASUREMENT)

F: _____ DEGREES; G: _____ DEGREES

COLUMN VERTICAL ROTATION

PUNCH

FINAL COLUMN POSITION

COLUMN ANGLE (F) _____
(Relative to Ground)

VEHICLE ANGLE (G) _____

COLUMN ANGLE (F-G=H) _____
(Relative to Vehicle)

FROM A CORRESPONDING UNDAMAGED VEHICLE, MAKE A MEASUREMENT SIMILAR TO "H" ABOVE AND RECORD IT IN BLANK "J"

ORIGINAL DEMENSION (J) _____

DAMAGED VEHICLE DIMENSION (H) _____

Either + or -

COLUMN ROTATION (H-J) _____
(ENTER 99 IF UNKNOWN) tolerance ± 1°
98 Rotated - Unknown amount

33 34

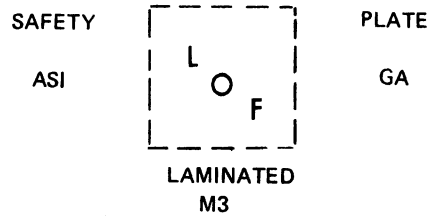
PASSENGER COMPARTMENT

GENERAL INFORMATION	PUNCH CODE	CARD COL.
PASSENGER COMPARTMENT REDUCED IN SIZE (1,2,0)*	____	35
EXTERNAL OBJECT INTRUSION (1,2,0)* DESCRIBE ON FOLD-OUT FLY-LEAF	____	36
INTERNAL LOOSE OBJECT (1,2,0)*	____	37
VERTICAL ROTATION OF INSTRUMENT PANEL (1,2,0)*	____	38
FIREWALL (COWL) DEFORMATION (1,2,0)*	____	39
FLOORPAN DEFORMATION (1,2,0)* (INCLUDING TOEPAN)	____	40
WINDSHIELD		
CRACKED (1,2,3,0)*	____	41
BROKEN (1,2,3,0)* (Plastic Interlayer Torn)	____	42
OCCUPANT CONTACT (1,2,3,0)*	____	43
CRACKED OR BROKEN BY OCCUPANT CONTACT (1,2,3,0)*	____	44
BOND SEPARATED (1,2,0)* (IF "YES", ESTIMATE PERCENT____)	____	45
WINDSHIELD CODE (YY) Unknown	__ __	46-47

WINDSHIELD MARK

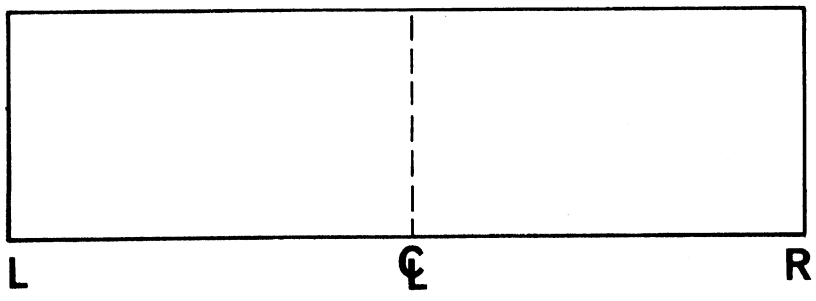
DRAW GLASS MANUFACTURER'S WINDSHIELD MARK WHICH IS LOCATED ALONG THE BOTTOM OF THE WINDSHIELD AT CENTER OR AT ONE CORNER.

EXAMPLE OF TYPICAL MARK:



MARK ON CASE VEHICLE:

LOCATE AREA OF WINDSHIELD INTEREST OR DAMAGE WITH DIMENSIONS (VERTICAL & HORIZONTAL) ON THIS DIAGRAM OF THE WINDSHIELD AS VIEWED FROM INSIDE.



*WHERE (1,2,3,0) IS INDICATED, USE 1 FOR YES 2 FOR NO 3 FOR NOT APPLICABLE 0 FOR UNKNOWN

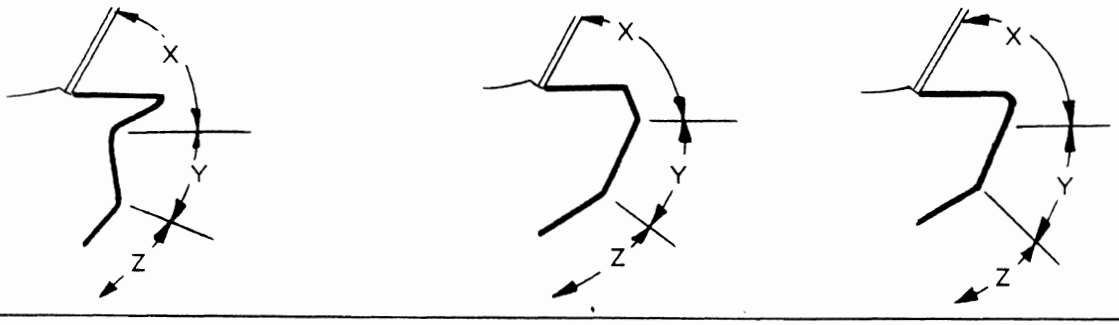
PASSENGER COMPARTMENT

NOTE: IF THERE WERE NO OCCUPANTS, CIRCLE THIS NOTE AND STOP HERE.

INSTRUMENT PANEL	EQUIPPED (1,2,0)* PUNCH CODE	EQUIPPED (1,2,0)* CARD COL.	DAMAGED (1,2,3,0)* PUNCH CODE	DAMAGED (1,2,3,0)* CARD COL.	OCCUPANT CONTACT (1,2,3,0)* PUNCH CODE	OCCUPANT CONTACT (1,2,3,0)* CARD COL.
UPPER PANEL ("X" IN DIAGRAMS)			___	48	___	49
MIDPANEL ("Y" IN DIAGRAMS)			___	50	___	51
LOWER PANEL ("Z" IN DIAGRAMS)			___	52	___	53
ASHTRAY			___	54	___	55
CONTROL KNOBS AND LEVERS			___	56	___	57
GLOVE COMPARTMENT AREA			___	58	___	59
INSTRUMENTS			___	60	___	61
PARKING BRAKE RELEASE OR BRACKET	___	62	___	63	___	64
AIR CONDITIONING OUTLETS OR UPPER VENTILATION OUTLETS	___	65	___	66	___	67
HEATER OR AIR CONDITIONING DUCTS	___	68	___	69	___	70
RADIO	___	71	___	72	___	73
OTHER: _____ (MORE THAN ONE ITEM MAY BE NOTED) e.g., package shelf, CB radio, tape deck			___	74	___	75

END OF CARD 07

TYPICAL PANEL DIAGRAMS



*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

PASSENGER COMPARTMENT

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD $\frac{0}{10}$ $\frac{9}{11}$

OTHER INTERIOR ITEMS (FRONT OF VEHICLE)

	EQUIPPED (1,2,0)*		DAMAGED (1,2,3,0)*		OCCUPANT CONTACT (1,2,3,0)*	
	PUNCH CODE	CARD COL.	PUNCH CODE	CARD COL.	PUNCH CODE	CARD COL.
FOOT CONTROLS			___	12	___	13
IGNITION KEYS			___	14	___	15
REAR VIEW MIRROR			___	16	___	17
SUNVISOR AND FITTINGS			___	18	___	19
WINDSHIELD TOP MOLDING			___	20	___	21
LEFT A–PILLAR (UPPER OR LOWER)			___	22	___	23
RIGHT A-PILLAR (UPPER OR LOWER)			___	24	___	25
CONSOLE	___	26	___	27	___	28
TRANSMISSION SELECTOR LEVER						
ON STEERING COLUMN	___	29	___	30	___	31
ON CONSOLE OR FLOOR	___	32	___	33	___	34

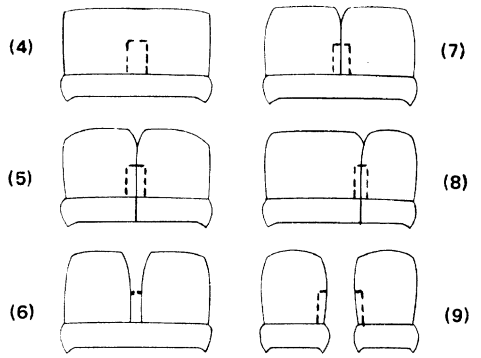
OTHER INTERIOR DAMAGE

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

PASSENGER COMPARTMENT (CONT'D.)

SEATS

TYPE OF FRONT SEAT



(0) UNKNOWN
3) Drivers Seat Only

PUNCH CODE: ____ CARD COL. 35

FOLDING BACKS (1,2,0)*

PUNCH CODE: ____ CARD COL. 36

DELUXE ACCESORIES
(1) Deluxe Accesories
(2) None
(4) Reclining Seatbacks
(0) Unknown

PUNCH CODE: ____ CARD COL. 37

TYPE OF SEAT ADJUSTERS

Driver's Side

(4) MANUAL
(5) POWER
(6) RIGID
(7) OTHER: _____
(0) UNKNOWN

PUNCH CODE: ____ CARD COL. 38

TYPE OF SEAT ADJUSTMENT

(3) NONE (NOT APPLICABLE)
(4) 2-WAY
(5) 4-WAY
(6) 6-WAY
(7) OTHER: _____
(0) UNKNOWN
(8) Swivel Seats

Driver's Side

PUNCH CODE: ____ CARD COL. 39

DAMAGE TO ADJUSTERS (1,2,0)*

Include Rigid

PUNCH CODE: ____ CARD COL. 40

TYPE OF DAMAGE TO ADJUSTERS

(CHOOSE TWO)

(2) None
(4) Chucking (some free play)
(5) Deformed and Released
(6) Separated
(0) Unknown

PUNCH CODE: ____ CARD COL. 41
PUNCH CODE: ____ CARD COL. 42

LOCATION OF SEPARATION

(3) NOT APPLICABLE
(4) AT FLOOR
(5) AT ADJUSTER
(6) AT SEAT
(0) UNKNOWN

PUNCH CODE: ____ CARD COL. 43

POSITION OF SEAT PRIOR TO CRASH

DRIVER S SEAT

(4) FORWARD
(5) MIDDLE
(6) REARWARD
(0) UNKNOWN

PUNCH CODE: ____ CARD COL. 44

RIGHT FRONT PASSENGER'S SEAT

(3) NOT APPLICABLE (No Seat)
(4) FORWARD
(5) MIDDLE
(6) REARWARD
(0) UNKNOWN

code the same if bench seat

PUNCH CODE: ____ CARD COL. 45

DAMAGE TO FRONT SEAT

BACKREST DAMAGE (1,2,0)*

PUNCH CODE: ____ CARD COL. 46

CUSHION DAMAGE (1,2,0)*

PUNCH CODE: ____ CARD COL. 47

CONTACTED BY REAR OCCUPANT (1,2,3,0)*

If no rear occupant

PUNCH CODE: ____ CARD COL. 48

SEAT CENTER ARMRESTS (FRONT)

EQUIPPED (1,2,0)*

PUNCH CODE: ____ CARD COL. 49

DAMAGED (1,2,3,0)*

PUNCH CODE: ____ CARD COL. 50

HEAD RESTRAINTS Driver's Side (FRONT)

EQUIPPED (1,2,0)*

Integral

PUNCH CODE: ____ CARD COL. 51

REMOVED PRIOR TO COLLISION (1,2,3,0)*

PUNCH CODE: ____ CARD COL. 52

RETAINED DURING COLLISION (,1,2,3,0)*

PUNCH CODE: ____ CARD COL. 53

DAMAGED (1,2,3,0)*

PUNCH CODE: ____ CARD COL. 54

OCCUPANT CONTACT (1,2,3,0)*

PUNCH CODE: ____ CARD COL. 55

HEAD RESTRAINT ADJUSTMENT AT TIME OF COLLISION

Driver's Side

(3) Not Applicable, None
(4) UP from seat top
(5) DOWN on seat top
(0) Unknown
(6) Integral

PUNCH CODE: ____ CARD COL. 56

SEATS

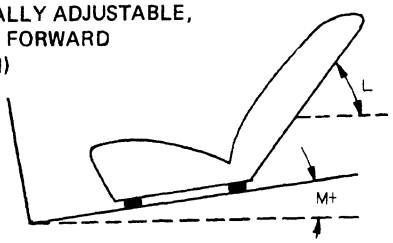
PASSENGER COMPARTMENT (CONT'D.)

SEATS (CONT'D)

	PUNCH CODE	CARD COL.
FRONT SEAT BACK LOCKS		
LEFT — EQUIPPED (1,2,3,0)*	____	57
LEFT — HELD (1,2,3,0)*	____	58
RIGHT — EQUIPPED (1,2,3,0)*	____	59
RIGHT — HELD (1,2,3,0)*	____	60

FRONT SEAT BACK ANGLE

MEASURE THE FRONT SEAT BACK ANGLE AT THE LEFT AND RIGHT SEAT BACK FRAMES. (IF SEAT BACK ANGLE IS NORMALLY ADJUSTABLE, MOVE TO FORWARD POSITION)



MEASURE THE ANGLE THE SEAT BACK MAKES WITH HORIZONTAL (L IN DIAGRAM), AND THE ANGLE THE DOOR SILL MAKES WITH HORIZONTAL (M IN DIAGRAM) AND ENTER BELOW.

LEFT SIDE	RIGHT SIDE
L ____ DEG. M ____ DEG.	L ____ DEG. M ____ DEG.

SEAT BACK ROTATION

	DEGREES LEFT	DEGREES RIGHT	PUNCH CODE	CARD COL.
FINAL SEAT ANGLE (ENTER 99 IF UNKNOWN)				
SEAT ANGLE (L) (Relative to Ground)	____	____		
VEHICLE ANGLE (M)	____	____		
SEAT ANGLE (L-M=P) (Relative to Vehicle)	____	____		
FROM A CORRESPONDING UNDAMAGED VEHICLE, MAKE A MEASUREMENT SIMILAR TO "P" ABOVE AND RECORD IT IN BLANK "R" BELOW.				
ORIGINAL ANGLE (R)	____	____	(98) Rotated - Unknown amount	
DAMAGED SEAT ANGLE (P)	____	____		
DIFFERENCE |R-P|	____	____		
tolerance ±2°				
LEFT SEAT ANGLE DIFFERENCE			____	61-62
RIGHT SEAT ANGLE DIFFERENCE			____	63-64

TYPE OF REAR SEAT

(2) NO SEAT
(4) NON-FOLDING
(5) FOLDING
(0) UNKNOWN

PUNCH CODE ____ CARD COL. 65

END OF CARD 08

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 9 (11)

DAMAGE TO REAR SEAT	PUNCH CODE	CARD COL.
BACKREST DAMAGED OR LOOSENED (1,2,3,0)*	____	12
CUSHION DAMAGED OR LOOSENED (1,2,3,0)*	____	13
SEAT CENTER ARMRESTS (REAR)		
EQUIPPED (1,2,3,0)*	____	14
DAMAGED (1,2,3,0)*	____	15
REAR SEAT BACK LOCKS		
LEFT OR CENTER — EQUIPPED (1,2,3,0)*	____	16
LEFT OR CENTER — HELD (1,2,3,0)*	____	17
RIGHT — EQUIPPED (1,2,3,0)*	____	18
RIGHT — HELD (1,2,3,0)*	____	19
THIRD SEAT		
EQUIPPED (1,2,0)*	____	20
BACKREST DAMAGED (1,2,3,0)*	____	21
CUSHION DAMAGED (1,2,3,0)*	____	22

BACKLIGHT (REAR WINDOW)

DAMAGED (1,2,3,0)*	____	23
OCCUPANT CONTACT (1,2,3,0)*	____	24

BACKLIGHT HEADER

DAMAGED (1,2,3,0)* convertible	____	25
OCCUPANT CONTACT (1,2,3,0)*	____	26

WINDOWS CLOSED AT TIME OF COLLISION

LEFT FRONT (1,2,3,0)*	____	27
LEFT REAR (1,2,3,0)*	____	28
RIGHT FRONT (1,2,3,0)*	____	29
RIGHT REAR (1,2,3,0)*	____	30
BACKLIGHT (1,2,3,0)*	____	31
ALL SIDE WINDOWS OPERABLE AFTER COLLISION (1,2,3,0)*	____	32
POWER SIDE WINDOWS EQUIPPED (1,2,0)* (PUT NOTES ON FOLD-OUT FLY-LEAF)	____	33

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE 2 FOR NO 0 FOR UNKNOWN

WINDOWS

SEATS

PASSENGER COMPARTMENT (CONT'D.)

LEFT SIDE INTERIOR

		DAMAGED (1,2,3,0)*		OCCUPANT CONTACT (1,2,3,0)*	
		PUNCH CODE	CARD COL.	PUNCH CODE	CARD COL.
FRONT	DOOR	____	34	____	35
	HARDWARE	____	36	____	37
	ARMREST	____	38	____	39
	GLASS	____	40	____	41
REAR	DOOR AREA	____	42	____	43
	HARDWARE	____	44	____	45
	ARMREST	____	46	____	47
	GLASS	____	48	____	49
ROOF SIDE RAIL		____	50	____	51
B-PILLAR (ALSO REAR PILLAR ON PICK-UP TRUCK, CORVETTE, '71 FIREBIRD & CAMARO)		____	52	____	53
C-PILLAR		____	54	____	55
D-PILLAR (REAR PILLAR ON STATION WAGONS & LIMOUSINES)		____	56	____	57
OTHER: _____		____	58	____	59

END OF CARD 09

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

PASSENGER COMPARTMENT (CONT'D.)

RIGHT SIDE INTERIOR

ROOF INTERIOR

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 1/10 0/11

RIGHT SIDE INTERIOR		DAMAGED (1,2,3,0)* PUNCH CODE	DAMAGED (1,2,3,0)* CARD COL.	OCCUPANT CONTACT (1,2,3,0)* PUNCH CODE	OCCUPANT CONTACT (1,2,3,0)* CARD COL.
FRONT	DOOR		12		13
	HARDWARE		14		15
	ARMREST		16		17
	GLASS		18		19
REAR	DOOR AREA		20		21
	HARDWARE		22		23
	ARMREST		24		25
	GLASS		26		27
ROOF SIDE RAIL			28		29
B-PILLAR (ALSO REAR PILLAR ON PICK-UP TRUCK, CORVETTE, '71 FIREBIRD & CAMARO)			30		31
C-PILLAR			32		33
D-PILLAR (REAR PILLAR ON STATION WAGONS & LIMOUSINES)			34		35
OTHER:			36		37
ROOF INTERIOR	HEADLINING		38		39
	Code (3), if top down or removed				
	ROOF STRUCTURE		40		41
					END OF CARD 10

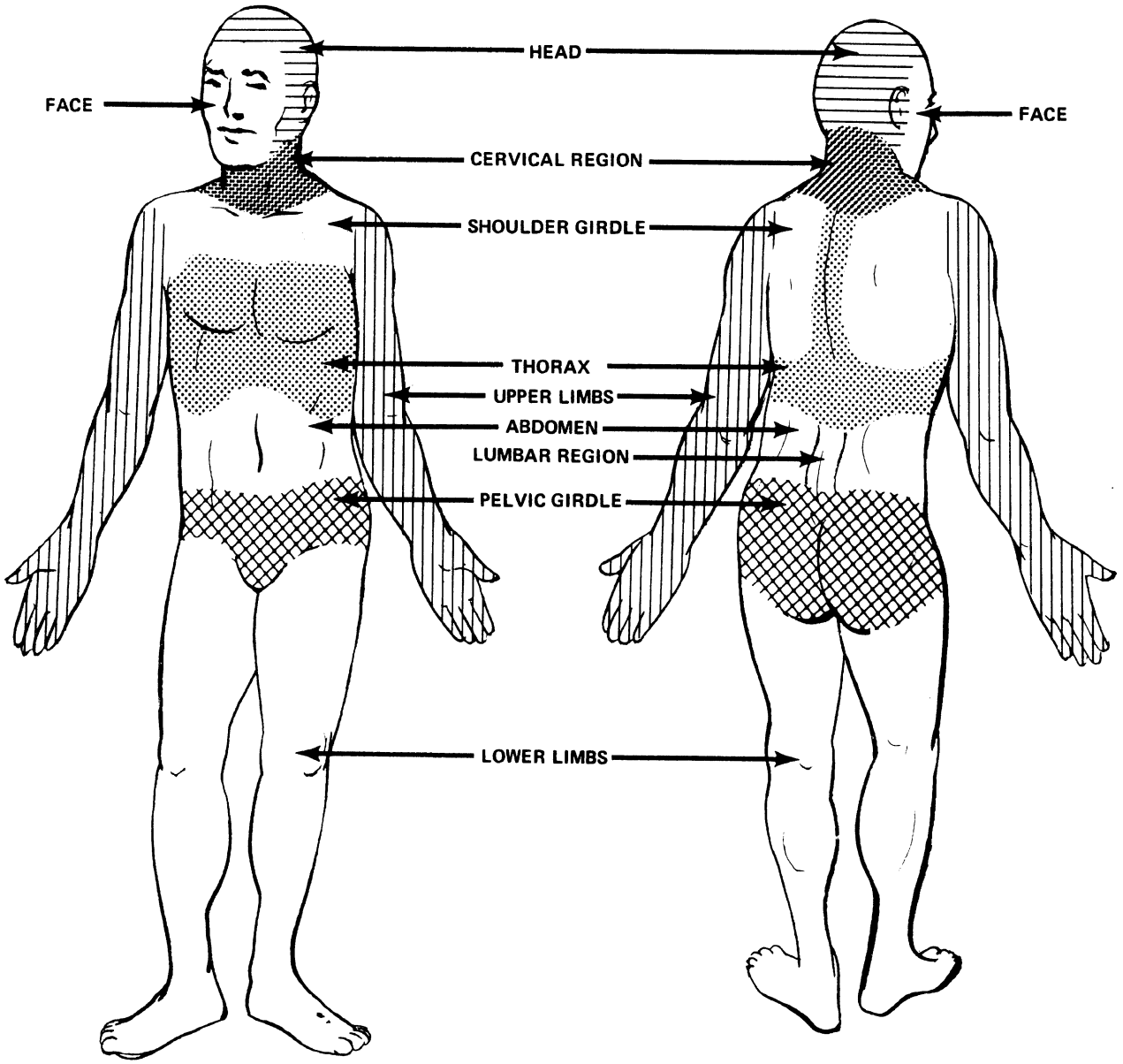
*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

OCCUPANT INFORMATION SECTION

1. THIS SECTION IS TO BE FILLED IN FOR EACH OCCUPANT, WHETHER INJURED OR NOT.

2. IF THERE ARE MORE THAN THREE OCCUPANTS, USE ADDITIONAL BLANK COPIES OF THIS FORM AND ATTACH OCCUPANT PAGES TO THIS REPORT.

3. THE FOLLOWING FIGURE IS AN EXPLANATION OF THE BODY REGIONS LISTED ON PAGES 31, 35 AND 39.



OCCUPANT INFORMATION

OCCUPANT

	PUNCH CODE	CARD COL.
[illegible] 10 11		
OCCUPANT NUMBER	— —	12-13
SEAT LOCATION (4) FRONT (5) REAR (6) THIRD (7) OTHER: _____ (0) UNKNOWN	—	14
POSITION ON SEAT (4) LEFT (5) LEFT CENTER (6) CENTER (7) RIGHT CENTER (8) RIGHT (9) ALL (Lying on seat) (0) UNKNOWN	—	15
POSTURE (1) SITTING ON SEAT (2) ON LAP OR IN ARMS (3) STANDING ON SEAT (4) STANDING ON FLOOR (5) IN BASSINET (6) IN CHILD SEAT (7) LYING ON SEAT (8) LYING OR SITTING ON FLOOR (9) EXTERNAL TO PASS. COMP. (0) UNKNOWN	—	16
AGE YEARS, OR	— —	17-18
MONTHS (INFANTS) to 24 months	— —	19-20
(ENTER "0"S IF UNKNOWN)		
WEIGHT, LBS. (ENTER "0"S, IF UNKNOWN)	— — —	21-23
HEIGHT, INCHES (ENTER "0"S, IF UNKNOWN)	— —	24-25
SEX (4) Male (5) Female (6) Large Animal (7) Pregnant Woman (0) Unknown	—	26

RESTRAINT SYSTEM	PUNCH CODE	CARD COL.
LAP BELT		
EQUIPPED FOR THIS POSITION (1,2,0)*	—	27
WORN BY OCCUPANT (1,2,3,0)*	—	28
WORN SNUGGLY (1,2,3,0)*	—	29
LOCKING RETRACTOR (1,2,3,0)*	—	30
UPPER TORSO RESTRAINT		
EQUIPPED FOR THIS POSITION (1,2,0)*	—	31
WORN BY OCCUPANT (1,2,3,0)*	—	32
WORN CORRECTLY (1,2,3,0)*	—	33
INERTIA REEL (1,2,3,0)*	—	34
IF ANY PART OF SYSTEM IS NOT ORIGINAL EQUIPMENT BY MANUFACTURER, DESCRIBE SYSTEM ON FOLD-OUT FLY-LEAF.		
LAP AND/OR (UPPER TORSO) RESTRAINT USAGE CODE	— —	[illegible]
IF THE LAP BELT WAS WORN, TRACE THE OUTLINE OF THE TAB END HARDWARE ON THE BACK COVER & LABEL IT. IF THE SHOULDER BELT WAS WORN TRACE THE OUTLINE OF THE TAB END HARDWARE ON THE BACK COVER & LABEL IT.		
TYPE OF SYSTEM USED (3) Not Applicable, Not Used (4) 3-point (5) 4-point (6) Other (Not 2-point) (0) Unknown	— —	37
CHILD RESTRAINT SYSTEM: NOTE MAKE AND MODEL NUMBER _____ _____		
CHILD RESTRAINT CODE	— —	[illegible]
	—	
	—	

*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES 3 FOR NOT APPLICABLE
2 FOR NO 0 FOR UNKNOWN

OCCUPANT INFORMATION

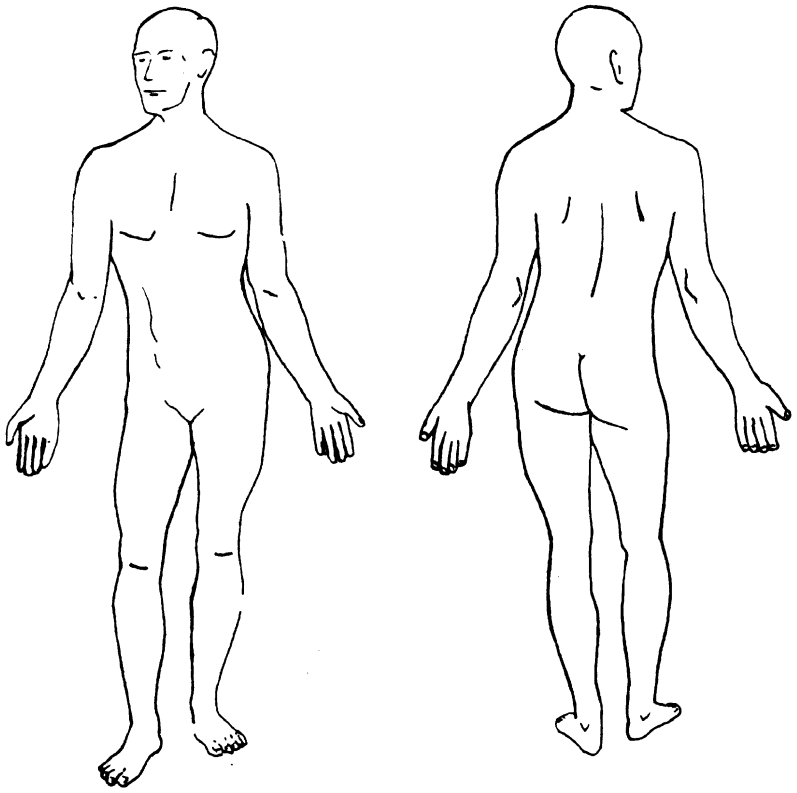
EJECTION	PUNCH CODE	CARD COL.
DEGREE OF EJECTION (2) NONE (4) PARTIAL (5) COMPLETE (0) UNKNOWN	____	42
AREA OF EJECTION (3) NOT APPLICABLE (1) WINDOW, LEFT SIDE (2) " , RIGHT SIDE (4) " , REAR (5) DOOR, LEFT SIDE (6) " , RIGHT SIDE (7) TAILGATE (8) WINDSHIELD (9) ROOF OR OPEN CONVERTIBLE (0) UNKNOWN	____	43
TREATMENT/MORTALITY (0) None (1) First Aid - On-scene or outpatient (2) Hospitalized - Observation under 24 hours (3) Hospitalized - Significant Treatment or over 24 hours (4) Fatal - Dead at Scene (5) Fatal - Dead on Arrival at Hospital (6) Fatal - Dead within 24 hours (7) Fatal - Dead 24 hours to 1 year (8) Fatal - Time of Death Unknown (9) Unknown	____	44
OVERALL SEVERITY OF INJURIES (SEE INSIDE OF BACK COVER) (00) NONE (01) MINOR (02) NON-DANGEROUS, MODERATE (03) NON-DANGEROUS, SEVERE (04) DANGEROUS, SERIOUS (05) DANGEROUS, CRITICAL (06) FATAL LESIONS IN 1 REGION (07) FATAL LESIONS IN 1 REGION (08) FATAL LESIONS IN 2 REGIONS (09) FATAL LESIONS IN 3 OR MORE REGIONS (98) INJURY UNKNOWN (99) INJURED, SEVERITY UNKNOWN (10) FATAL, details unknown	— —	45-46
	END OF CARD	

*HOSPITALIZED: INJURIES REQUIRING HOSPITAL RECUPERATION AND TREATMENT FOR A PERIOD OF AT LEAST ONE DAY. "HELD FOR OBSERVATION ONLY" IS NOT CONSIDERED "HOSPITALIZED" IN THIS DEFINITION.

CODES FOR AREAS OF OCCUPANT CONTACT

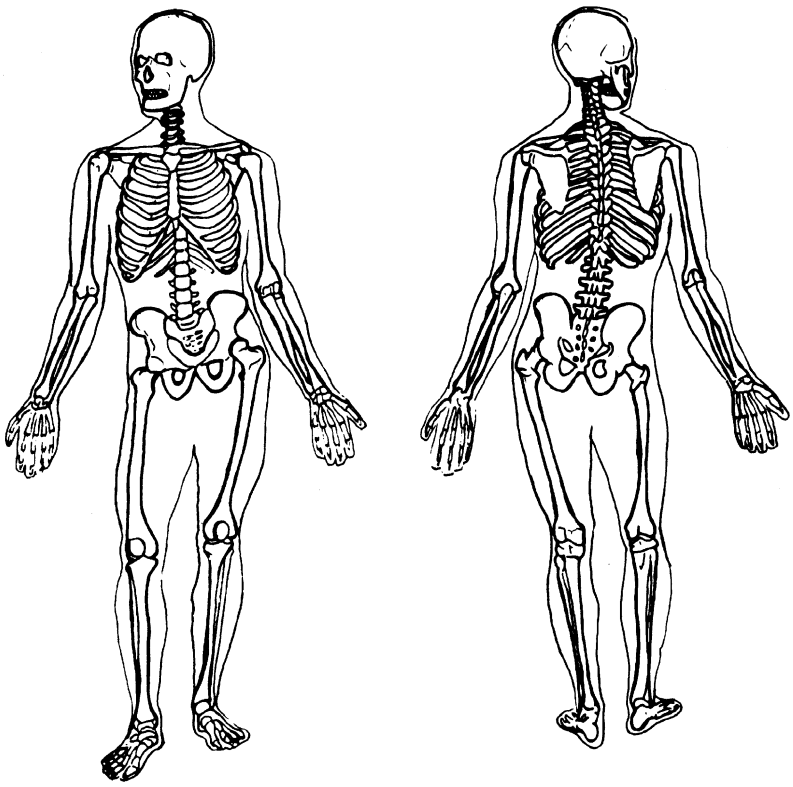
See Page 30A

INDICATE LOCATION OF INJURIES, INCLUDING MAJOR BRUISES



SOFT TISSUE INJURIES

OCCUPANT



SKELETAL INJURIES

Source of Information _____

OCCUPANT INJURY DETAIL

1. This page is only for the occupant just described.
2. Enter occupant number from page 28. (This refers only to the order in which occupant information is entered and is not related to seated position.)
3. Enter severity code (only one per box) for each type of injury to each body region. (Mark boxes with 1-6, X, Z only, as instructed inside back cover.)
4. Do not fill in the boxes where there was no injury.
5. If you are reasonably assured that one or more specific components or area(s) contacted by this occupant resulted in an associable injury, enter the proper code(s) in the starred (★) section. (See Page 29 for codes.)
6. Do not fill in the boxes where there was no contact.

DUPLICATE FROM PRECEDING CARD

1-9	CARD NUMBER 10-11	OCCUPANT NO. 12-13	BODY REGION	★ ENTER CODE(S) FOR AREA(S) OF POSSIBLE CONTACT 14-15	16-17	18-19	20-21	ENTER SEVERITY CODES: OVERALL INJURY TO BODY REGION 22	FRACTURE 23	LACERATION 24	CONTUSION 25	COMPLAINT OF PAIN 26	ABRASION 27	CONCUSSION 28	BURN 29	HEMORRHAGE 30	OTHER 31
	12		INTERNAL ORGANS														
	13		BRAIN														
	14		FACE														
	15		HEAD														
	16		NECK (CERVICAL REGION)														
	17		SHOULDER GIRDLE														
	18		RIGHT UPPER LIMB														
	19		LEFT UPPER LIMB														
	20		CHEST & UPPER BACK (THORAX)														
	21		LOWER BACK (LUMBAR REGION)														
	22		ABDOMEN														
	23		PELVIC GIRDLE														
	24		RIGHT LOWER LIMB														
	25		LEFT LOWER LIMB														
	26		WHOLE BODY														

OCCUPANT

KEYPUNCH NOTE: Each line represents one card. Punch only the lines with handwritten information.

FRONT OF PASSENGER COMPARTMENT

(12) WINDSHIELD
(05) INSTRUMENT PANEL (SPECIFIC AREA UNKNOWN)
(54) UPPER INSTRUMENT PANEL (X)
(55) MIDDLE INSTRUMENT PANEL (Y)
(56) LOWER INSTRUMENT PANEL (Z)
(57) BENEATH INSTRUMENT PANEL
(28) FOOT CONTROLS (INCLUDES PARKING BRAKE PEDAL)
(84) PARKING BRAKE HANDLE (IN FRONT)
(07) PARKING BRAKE HANDLE (LOCATION UNKNOWN)
(09) STEERING ASSEMBLY (SPECIFIC AREA UNKNOWN)
(65) STEERING WHEEL
(66) STEERING WHEEL COLUMN
(59) TRANSMISSION LEVER ON COLUMN
(11) TRANSMISSION SELECTOR LEVER (LOCATION UNKNOWN)
(67) IGNITION KEYS
(06) MIRRORS
(02) GLOVE COMPARTMENT AREA
(03) HARDWARE ITEMS (SPECIFIC ITEM UNKNOWN)
(81) ASHTRAY (INSTRUMENT PANEL)
(82) INSTRUMENTS
(83) CONTROL KNOBS AND LEVERS
(04) HEATER OR AC DUCTS
(01) AIR CONDITIONING OR VENTILATION OUTLETS
(08) RADIO
(58) ADD-ON TAPE DECK, RADIO, AIR CONDITIONER
(53) PARCEL TRAY
(86) VERTICAL CONSOLE

SIDES

(20) SURFACE OF SIDE INTERIORS
(19) HARDWARE
(13) ARMRESTS
(22) WINDOW GLASS
(21) WINDOW FRAMES
(14) A-PILLAR
(15) B-PILLAR
(16) C-PILLAR
(17) D-PILLAR

INTERIOR

(29) FRONT SEATBACKS
(33) RESTRAINT SYSTEM HARDWARE
(34) RESTRAINT SYSTEM WEBBING
(87) AIR CUSHION SKIN (AIRBAG)
(30) HEAD RESTRAINTS
(32) OTHER OCCUPANTS
(31) INTERIOR LOOSE OBJECT
(50) REAR SEAT CUSHION AND BACK
(51) FRONT SEAT CUSHION
(52) INTERNAL FLYING GLASS (FROM ANY SOURCE)
(89) UNDER SEAT BOTTOM
(40) FLOOR
(27) CONSOLE
(44) TRANSMISSION LEVER (ON FLOOR OR CONSOLE)
(85) PARKING BRAKE HANDLE (ON FLOOR OR CONSOLE)

ROOF

(26) ROOF SIDE RAILS
(10) SUNVISORS & FITTINGS AND/OR TOP MOULDING (HEADER)
(25) ROOF OR CONVERTIBLE TOP
(39) BACKLIGHT HEADER
(24) COAT HOOKS
(18) DOME LIGHT

REAR

(88) SURFACE OF REAR INTERIOR
(23) BACKLIGHT (REAR WINDOW)

EXTERIOR SURFACE OF CASE VEHICLE

(37) OUTSIDE SURFACE OF CASE VEHICLE (SPECIFIC AREA UNKNOWN)
(35) HOOD OF CASE VEHICLE
(60) EXTERIOR OF CASE VEHICLE HARDWARE (E.G., OUTSIDE MIRRORS, ANTENNA, TRIM, DOOR HANDLES, ETC.)
(62) EXTERIOR SIDE ROOF RAIL OF CASE VEHICLE
(63) TRUNK LID OF CASE VEHICLE
(64) TIRES OF CASE VEHICLE

BEYOND CASE VEHICLE BOUNDARY

(36) AREA EXTERIOR TO CAR (SPECIFIC AREA UNKNOWN)
(70) HOOD OF OTHER VEHICLE
(71) OTHER VEHICLE EXTERIOR HARDWARE (E.G., OUTSIDE MIRRORS, ANTENNA, TRIM, ORNAMENTS, DOOR HANDLES, ETC.)
(73) EXTERIOR SIDE ROOF RAIL OF OTHER VEHICLE
(74) HEADLIGHT OR FRONT GRILL OF OTHER VEHICLE
(75) TRUNK OF OTHER VEHICLE
(76) OUTSIDE SURFACE OF OTHER VEHICLE
(77) TIRES OF OTHER VEHICLE
(78) GROUND
(79) WATER
(80) EXTERIOR OBJECT (NOT VEHICLE, GROUND OR WATER): _____

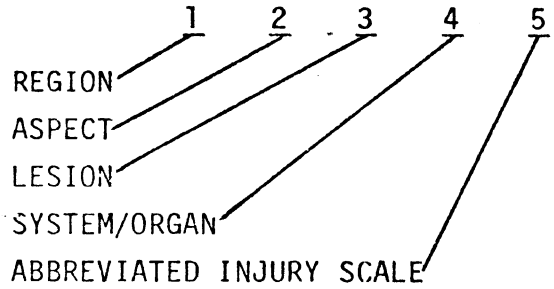
PENETRATING OBJECTS

(61) OTHER VEHICLE
(72) OBJECTS: _____

MISCELLANEOUS

(38) OTHER: _____
(98) IMPACT FORCE, "WHIPLASH", HYPEREXTENSION/COMPRESSION
(99) MISSING/NO CONTACT
(00) UNKNOWN AREA OF CONTACT

OCCUPANT INJURY
CLASSIFICATION
-OIC-



1 BODY REGION

- H HEAD - SKULL
- F FACE
- N NECK - CERVICAL SPINE
- S SHOULDER
- X UPPER EXTREMITIES (ARMS)
  - A ARM (UPPER)
  - E ELBOW
  - R FOREARM
  - W WRIST - HAND
- C CHEST
- M ABDOMEN
- B BACK - THORACOLUMBAR SPINE
- P PELVIC - HIP
- Y LOWER EXTREMITIES (LEGS)
  - T THIGH
  - K KNEE
  - L LEG (LOWER)
  - Q ANKLE - FOOT
- O WHOLE BODY
- U UNKNOWN, UNCLASSIFIED

2 ASPECT

- R RIGHT
- L LEFT
- B BILATERAL
- C CENTRAL
- A ANTERIOR/FRONT
- P POSTERIOR/BACK
- S SUPERIOR/UPPER
- I INFERIOR/LOWER
- W WHOLE REGION
- U UNKNOWN

3 LESION

- L LACERATION
- C CONTUSION
- A ABRASIONS
- F FRACTURES
- P PAIN
- K CONCUSSION
- H HEMORRHAGE
- V AVULSION
- R RUPTURE
- S SPRAINS
- D DISLOCATIONS
- N CRUSHING
- M AMPUTATION
- B BURN
- X ASPHYXIA
- O OTHER
- U UNKNOWN

4 SYSTEM/ORGAN

- S SKELETAL
  - V VERTEBRAE
  - J JOINTS
- D DIGESTIVE
  - L LIVER
- N NERVOUS SYSTEM
  - B BRAIN
  - C SPINAL CORD
  - E EYES, EARS
- CARDIOVASCULAR
  - A ARTERIES, VEINS
  - H HEART
  - Q SPLEEN
- G UROGENITAL
  - K KIDNEYS
- R RESPIRATORY
  - P PULMONARY, LUNGS
- M MUSCLES
- I INTEGUMENTARY
- U UNKNOWN, UNCLASSIFIED

5 AIS

- 0 NONE
- 1 MINOR
- 2 MODERATE
- 3 SEVERE
- 4 SERIOUS
- 5 CRITICAL
- 6 FATAL
- 9 UNKNOWN

OCCUPANT SUPPLEMENT

30C

7/1 CASE I.D. NUMBER 2 — — 4 — — — — — 9 CARD 8 0 / 10 OCCUPANT NUMBER 12 — —

Role of Individual at First Impact. (Note: Record Driver Information for Code 1 below)

(0) Unknown
(1) Motor Vehicle Driver
(2) Motor Vehicle Passenger (not driver)
(3) Not Applicable, No Occupant

14

Posture

(10) Sitting on Seat
(11) Sitting on Seat in Abnormal Position (e.g. Feet on Dash, Sideways, Etc.)
(12) Sitting on Console
(13) Sitting on Folded Seat-Back (e.g. Station Wagons)
(20) On Lap or in Arms
(30) Standing on Seat
(40) Standing on Floor
(50) In Bassinet
(60) In Child Seat
(65) In Child Harness
(70) Lying on Seat
(80) Lying or Sitting on Passenger Floor
(85) On Station Wagon Cargo Floor
(90) External to Passenger Compartment
(00) Unknown
(98) Other

15 — —

Non-Impact Medical Conditions For Each Occupant

(0) None
(1) Yes - Time and Type Unknown
(2) Pre-Crash Fatal (Clinical Death at Wheel)
(3) Pre-Crash Non-Fatal (Prior Injury, Stroke)
(4) Pregnant
(5) Post-Crash Fatal (Drowning)
(6) Post-Crash Non-Fatal Injury
(8) Other: _____
(9) Unknown

17

OCCUPANT ALCOHOL INVOLVEMENT

Occupant Alcohol Involvement/ Test

(0) Unknown (999 Below)
(1) No Test, Alcohol Not Suspected (000 Below)
(2) No Test, Alcohol Indicated & No Test Requested (999 Below)
(3) No Test, Test Requested & Refused (999 Below)
(4) No Test, Reason Unknown & Alcohol Indicated (999 Below)
(5) No Test, But Charged (DWI) Booked Drunk
(6) No Test, Fled Scene
(8) BAC Tested, Results Not Provided (999 Below)
(9) BAC Tested and Results Reported (BAC Below)

18

Occupant Blood Alcohol Level (MG %)

(999) Unknown, No Results
(000) No Drinking or "-Results"
_____ Record Actual MG %

19 — —

Occupant Alcohol Test

(1) Yes, Type Unknown
(2) None
(4) Urine
(5) Spinal
(6) Breath
(7) Blood
(8) Other: _____
(9) Several of Above
(0) Unknown

22

Seat Belt Buzzer/Interlock Equipped

(0) Unknown if Equipped
(1) Equipped, Type Unknown
(2) Not Equipped
(4) Non-Cycled Buzzer
(5) Ignition Interlock
(9) Other: _____

Seat Belt Buzzer Operational

(0) Unknown if Operational
(1) Yes, Operational
(2) Not Operational, Reason Unknown
(3) Not Applicable, Not Equipped

System Inhibited by:

(4) Fastening Belts Together (Behind Occupant, Behind Seat, Under Seat, in Front of Seat, Etc.)
(5) Disconnection, Removal, Intentional Destruction
(6) Fixing in Pulled-Out Position (Knotted, Taped, Twisted, Folded Back, Tucked into Seat, Hook to Upper Belt, Etc.)
(7) Temporarily Fixing (Sitting on Belt, Holding Onto Belt, Hook on Door, Etc.)
(8) Letting it Buzz
(9) Other: (Defective)

Ignition Interlock Operational (1,2,3,0)

23

Passive Restraint System Equipped

(1) Yes, Type Unknown
(2) No
(4) Air Bag
(9) Other: _____
(0) Unknown

Activated

(1) Yes
(2) No
(3) Inapplicable
(0) Unknown

24

Restraint System Malfunction or Separation

(1) Yes, Area Unknown
(2) No
(3) Not Applicable, No Restraints Equipped
(4) At Buckle
(5) In Webbing
(6) At Anchorage
(7) In Retractor
(0) Unknown Whether Malfunction Occurred

25

Investigator Judgement of Restraint System Effectiveness

(0) Unknown
(1) Reduced Injury Severity
(2) Could Have Reduced Severity if Worn
(3) No Opinion
(4) Could Not Have Reduced Severity if Worn
(5) Did Not Reduce Overall Severity
(6) Did Increase Overall Severity

26

27

28

29

2/12/74

CRASH OCCUPANT MEDICAL

Treatment/Mortality

(00) None
(01) First Aid at Scene
(02) Treated at Hospital/ Clinic But not Admitted
(03) Hospitalized (Observation less than 24 hrs
(04) Hospitalized For Over 24 Hours or Significant Treatment
(05) Fatal - Dead at Scene
(06) Fatal - DOA
(07) Fatal - Dead Within 24 Hours
(08) Fatal - Dead 24 Hours - 1 Year
(09) Fatal - Dead, Period Unknown
(99) Unknown

EMS Contributory to Severity (0,1,2)

Was Emergency Medical Services (EMS) contributory to injury severity or fatality, e.g., because of delays or due to improper/insufficient/no treatment on-scene or in-transport?

Autopsy Performed (0,1,2,3)

Overall Police Injury Severity (KABC)

(Note: Report Police Judgement)

(0) O,D No Injury
(1) C Possible Injury
(2) B Nonincapacitating Injury
(3) A Incapacitating Injury
(4) K Fatal Injury
(9) Unknown

30
32
33
34

OCCUPANT INJURY CLASSIFICATION

DUPLICATE FROM PRECEDING CARD

1-9	CARD NUMBER 10-11	OCCUPANT NO. 12-13	☆ ENTER CODE(S) FOR AREA(S) OF POSSIBLE CONTACT 14-15	16-17	18-19	20-21
	81					
	82					
	83					
	84					
	85					
	86					
	87					
	88					
	89					
	90					
	91					
	92					
	93					
	94					
	95					

PRIMARY OIC					ASSOCIATED OIC's															
BODY REGION	ASPECT	LESION	SYSTEM/ORGAN	SEVERITY	BODY REGION	ASPECT	LESION	SYSTEM/ORGAN	SEVERITY	BODY REGION	ASPECT	LESION	SYSTEM/ORGAN	SEVERITY						
22	23	24	25	26	27	28	29	30	31	32	33	34	35	36						

105

30D

CPIR Supplement 3/1

Report Number

1 2 3 - 4 5 6 7 8 - 9

Card Number 90 (10 11)

REPORTING DATA (99999) for Unknown

Date of Field Investigation

MO DAY YEAR

12 13 14 15 16 17

Date Submitted/Published
(inside title page)

18 19 20 21 22 23

Team case number

24 25 26 27 28 29 30 31 32 33 34

HSRI CPIR Editor

(1)	JD	(A)	DS	(J)	AT
(2)	PG	(B)	HS	(K)	BW
(3)	BB	(C)	DL	(L)	JS
(4)	BP	(D)	JA	(M)	JW
(5)	BG	(E)	JA	(N)	ST
(6)	SV	(F)	PJ	(P)	KF
(7)	PK	(G)	TM	(Q)	BP
(8)	JW	(H)	JD	(R)	PS
(9)	AM	(I)	GB	(S)	MH
(0)	Unknown			(T)	RC

35

Number of CASE VEHICLES reported in accident (Completed CPIRs) 36

Original Vehicle Report Form

(0) No Form (MDC)
(1) CPIR - R1
(2) CPIR - R2
(3) CPIR - R3
(4) NHTSA
(7) CPIR - Baylor
(8) UCLA - TRG
(5) Truck Form (1/74) 37

Recommendations/Conclusions

Matrix Cell			Number (9) for "9 or More"
	Human		38
1		Pre-Crash	___
2		Crash	___
3		Post-Crash	___
	Vehicle		
4		Pre-Crash	___
5		Crash	___
6		Post-Crash	___
	Environment		
7		Pre-Crash	___
8		Crash	___
9		Post-Crash	___

H S
47 48 49 50 51 52 53 54 55 56

P B
57 58 59 60 61 62 63 64 65 66

Other Vehicle CPIR Report No.
If 3 Case Vehicles, link 1 to 2, 2 to 3, and 3 to 1.

67 68 - 69 70 71 72 73 - 74

Date Edited

75 76 - 77 78 - 79 80

end of card 90

2nd edited by:

Date:

Duplicate Col 1-9 from Preceeding 9 1 10 11

32

SUPPORTING DATA

(1) Yes
(2) No
(3) Not applicable
(0) Unknown

	Code	Col.
Psychological Factors		
Psychological Review		12
Any Personal Interviews		13
Katz Adjustment Scales (KAS)		14
Michigan Alcoholism Screening Test (UM)		15
Driver's License Record (Previous Accidents)		16
Medical Factors(included)		
Medical Examiners/Autopsy		17
AFIP Medicolegal Autopsy		18
Toxicological/Alcohol Test Includes Breathalyzer Case Driver Only		19
Medical Report		20
Medical Summary/Diagram		21
X-Rays(taken or included)		22
Medical History		23
Accident Factors (included)		
Map Location		24
Collision Diagram/Sketch		25
Site Accident History		26
Narrative Description		27
Police Report		28
Who Estimated Speeds for Case Vehicle (0) No One (1) Investigator (2) Police (3) Driver (4) Witness/Passenger (8) Other:_____ (9) Unknown		
Prior to Impact		29
At Impact		30

	Code	Col.
Vehicle Factors		
NHTSA Vehicle Condition And Maintenance Report If (1) then 1		31
Mechanical Malfunction Inspection		32
Inspection Records		33
Registration Records		34
Sheet Metal Crush Diagram/Sketch		35
Inches, Coded		36
Measurements Taken		
Telescoping Unit		37
EA Steering Wheel		38
A (Column to Rear)		39
EA Steering Column		40
VIN Included		41
VDI Included		42
VM/M Code Included		43
Photographs (number)		
TOTAL= (B&W) Prints + (Color) Slides and		44 45 46 47
Site/Location Photos		48 49
TOTAL= Vehicle Exterior Photos + Vehicle Interior Photos + Autopsy/Medical Photos		50, 51 52, 53 54, 55
Total Number Photos		56, 57
(99 Unknown) (98) over 97		

HIT LAB NUMBER Washtenaw Co. Mi. Only

58 59 60 61 62 63 64

End of Card 91

Card 9 2 Continued

34

	Code	Col
PSYCHOLOGICAL FACTORS (Case Driver)		
Stress That Day		
(1) Argument with Relations or Friends.		
(2) Argument with Boss or Co-worker		
(3) Loss of Friend or Relative		
(4) Financial Difficulty		
(5) School Problems/ Work Problems		
(6) Legal/Police Problems		
(7) Social Agency/Consulor Problems		
(8) Other: _____		
(9) None		
(0) Unknown	—	49
Marital State		
(1) Single		
(2) Married		
(3) Common Law		
(4) Separated		
(5) Divorced		
(6) Widowed		
(0) Unknown	—	50
Occupation (1970 Census Users Guide) See Reference Manual		
(10) White Collar		
(11) Professional, Technical		
(12) Manager, Administrator (except Farm)		
(13) Sales workers		
(14) Clerical, kindred		
(20) Blue Collar		
(21) Craftsmen, kindred		
(22) Operatives, except transport		
(23) Transport equipment operatives (drivers)		
(24) Laborers, except farm		
(30) Farm Workers		
(31) Farmers, Farm managers		
(32) Farm laborers, Farm foreman		
(40) Service Workers		
(41) Service workers, except below		
(42) Private household workers		
(50) Housewife		
(60) Student		
(70) Military		
(80) Retired		
(90) Unemployed (over a month)		
(00) Unreported, Unknown	— —	51, 52

Note: If several jobs, use major time
If temp. unemployed, use last job

	Code	Co
PHYSIOLOGICAL FACTORS (Case Driver)		
Permanent Physiological Conditions		
(1) Infirmities (Arthritis, Senility, etc.)		
(2) Diabetes		
(3) Brain (Epilepsy, Stroke)		
(4) Cardio-Vascular (Heart failure, Angina, Infection)		
(5) Vision/Hearing Restricted		
(6) Respiratory Condition		
(7) Paralegic, amputee		
(8) Other: _____		
(9) None		
(0) Unknown	—	53
Transient Physiological Condition (Choose no more than two) See CPIR page 4		
(00) Unknown		
(02) None		
(03) Blackouts		
(04) Dozing		
(05) Fatigue		
(06) Drunk		
(07) Drinking Involved		
(08) Drug or Medication (See Pa S5)		
(09) Flu, Headcold, etc.		
(10) Fractured Member	— —	54, 5
(11) Menstrual Period		
(12) Pregnancy		
(13) Hangover		
(14) Not wearing corrective lenses	— —	56, 5
(99) Other: _____		
Non-Impact Medical Condition All Case Occupants Not Just Driver		
(0) None		
(1) Yes - Time and Type Unknown		
(2) Pre-Crash Fatal (Clinical Death at Wheel)		
(3) Pre-Crash Non-Fatal (Prior Injury, Stroke)		
(4) Pre-Crash Unknown Type		
(5) Post-Crash Fatal (Drowning)		
(6) Post-Crash Non-Fatal		
(7) Post-Crash Unknown Type		
(8) Other: _____		
(9) Unknown	—	58

Duplicate Col. 1-9 from Preceeding 9 2 (10 11)

CASE VEHICLE MALFUNCTION
From CPIR page 2
(1) yes
(2) no
(0) unknown

	Code	Col.
(01) Brake System		12
(02) Exhaust System		13
(03) Steering System		14
(04) Suspension System		15
(05) Tires		16
(06) Electrical System		17
(07) Throttle System		18
(08) Driver Controls		19
(09) Power Train		20
(10) Fuel System		21
(11) Visibility Items		22
(12) Other: _____		23
(13) Applicable, but unknown		24
Primary Item Noted Above (01 to 13) from above; (00) None; (99) Unknown		25,26
Had Routine Maintenance been Performed		27

CASE VEHICLE DRIVER'S RECORD

Driver Education
(1) None
(2) High school
(3) Commercial
(4) Informal
(5) Military
(6) Professional
(8) Other: _____
(9) Yes, Unknown source
(0) Unknown

	Code	Col.
		28

	Code	Col.
Number* of Previous Moving Violations		29
Number* of Previous Collisions		30
Number* of Previous License Suspensions		31

* Use (8) for "More than 7."
Use (9) for unknown.

CASE VEHICLE DRIVER'S TRIP PLAN

Origin
(1) Home
(2) Work
(3) Shopping
(4) Recreation
(5) Friend/Relatives
(6) Cocktail Lounge/ Bar/Wet Party
(7) Church
(8) School
(9) Other
(0) Unknown — Col. 32

Destination

Code as above — Col. 33

Route Familiarity (1,2,0) — Col. 34

Area Familiarity (1,2,0) — Col. 35

Route Useage
(1) Daily
(2) Weekly (1-4 times)
(3) Monthly (1-3 times)
(4) Quarterly (1-2 times)
(5) Annually (1-3 times)
(6) Less than annually
(7) Never
(0) Unknown — Col. 36

TIME (2400 hour clock) of:
(9999 Unknown)

Departure — Col. 37

Impact — Col. 41

Expected Arrival

From CPIR page 1

Card 92
Continued

Code	Col
—	59

Pharmacological Agents Noted
(noted, but not necessarily causal)

(1) Yes, Unknown or Other: _____
(2) None noted, No BA test, (000) Below
(3) Stimulants, Prescriptive/Narcotics (Amphetamines, cocaine, bennies)
(4) Stimulants, Over-the-Counter (Caffiene, 'no doz')
(5) Depressants, Prescriptive/Narcotics (Barbiturates, opiates, tranquilizers)
(6) Depressants, Over-the-Counter (Alcohol, sleeping compounds)
(7) Antihistamines
(8) Hallucinogens (LSD, DMT, mescaline, psilocybin)
(9) Marijuana
(0) Unknown

Blood Alcohol Level (MG %)

— — —
60 61 62

(999) Unknown, No Results
(000) No Drinking, or "—Results"

CRASH FACTORS

Inital Clock Direction of Rollover
(Case vehicle, horizontal clock)

(12) - - Over Front End
(09) - Over Left
(03) - Over Right
(06) - - Over Back End
(00) No Rollover
(98) Rollover, Direction Unknown
(99) Unknown if Rollover

Code	Col
— —	63,64

POST CRASH FACTORS

Case Vehicle, Final Location

(1) In Traffic Way
(2) On Shoulder
(3) Off-Road, Median
(4) Off-Road, Side
(5) In Water Way
(9) Other: _____
(0) Unknown

Code	Col
—	65

Case Vehicle, Final Attitude
O'Clock Position

(12) ——— Upright
(09) — (03) On Side
(06) ——— Inverted
(00) On End
(99) Unknown O'Clock

Code	Col
— —	66,67

Post Accident Factors:

	Code	Col
Fire Control used, if fire (1,2,0)	—	69
Extrication used (1,2,0)	—	69
Ambulance Service used (1,2,0)	—	70
Towing Service used (1,2,0)	—	71

Duplicate col 1-9 from preceeding 9 3
36 10 11

PRE CRASH PHASE
(Accident Viewpoint)

	Code	Col.
General Locality (1) Freeway (Limit Access) (2) Urban (3) Urban-Rural (House near road) (4) Rural (Fields) (9) Unknown	—	12
Particular Location (01) 1-Lane, Not Intersection (02) 2-Lane, Not Intersection (03) 3-Lane, Not Intersection (04) More than 3-Lane (05) Off Road (06) Intersection (07) Expressway (08) Interchange, Main Lanes (09) Interchange, Other Lanes (Ramps) (10) Bridges, Tunnels, Viaducts (11) Parking Lots (12) Driveways (99) Unknown	— —	13,14

Report Numbers of Vehicles Ranked in Order of Responsibility for Causing Collisions

NOTE→ All 0's for No Vehicle
All 8's for Non-Case Vehicle
All 9's for Unknown
Fill in all Responses

Most Responsible Vehicle

— — — — — — — — — —
15 16 17 18 19 20 21 22

Second Most Responsible Vehicle

— — — — — — — — — —
23 24 25 26 27 28 29 30

Third Most Responsible Vehicle

— — — — — — — — — —
31 32 33 34 35 36 37 38

	Code	Col.
Responsibility of Case Vehicle (1) Most Responsible (2) Second Most Responsible (3) Third Most Responsible ... Etc. (9) Missing Data	—	39

Total Energy Available

Total Energy for first collision. See Energy Table. Use 9999 for unknown.

— — • — —
40 41 42 43 (9998) for over 9997

PRE-CRASH MOVEMENT OF MOST RESPONSIBLE VEHICLE

	Code	Col.
Pre-Crash Basic Movement (1) Straight Ahead (2) Turning, Curve Following (3) U Turn (4) Reverse, Backing (5) Lane Changing (6) Parked, Stopped (7) Entering, Leaving Driveway (use 4 if backing) (8) Starting to Move (9) Unknown	—	44
Character of Movement (00) Straight Ahead (01) Straight Ahead, Road turned to left (02) Straight Ahead, Road turned to Right (03) Off RHS of Road (04) Off RHS of Lane (05) Off RHS, and back again (06) Veered Right (07) Turned Hard Right (08) Off LHS of Road (09) Off LHS of Lane (10) Off LHS, and back again (11) Veered Left (12) Turned Hard Left (13) Vehicle Stopped (14) Other (99) Unknown	— —	45,46
Primary Factor Responsible For Accident (1) Driver Omission or Unaware Error (2) Driver Commission or Aware Error (3) Vehicle Defect (4) Trafficway Defect (5) Ambience (9) Unknown	—	47

Card 93 Continued

st Responsible Vehicle:	Code	Col.
Primary Error (Pick first and second most significant)		
(00) No Error		
(01) Under Estimation		
(02) Falling Asleep, Blackout, Death-at-Wheel		
(03) Diverted Attention		
(04) Inexperienced Driving or Erratic Driving		
(05) Drunken Driving, Drinking Involved, or Narcotics or Medication		
(06) Right of Way		
(07) Turning Error		
(08) Signalling Error		
(09) Speeding		
(10) Overtaking		
(11) Following too Closely		
(12) Signs, Signals Disobeyed		
(13) Wrong Way into oncoming traffic		
(14) Lack of Lights	— —	48 49
(15) Lack of Brakes		
(16) Other:_____		
(17) Avoidance Maneuver		
(18) Over correction maneuver		
(99) Unknown	— —	50 51
Degree of Driver Attention		
(1) No Awareness (e.g. asleep)		
(2)		
(3)		
(4)		
(5) Complete Awareness of all Driving Tasks		
(9) Unknown	—	52
Driving Complexity		
(1) Complete Familiarity (e.g. Familiar Car, Frequent Route, and Unobstructed Open Country)		
(2)		
(3)		
(4)		
(5) Peak Complexity (e.g. Peak Hour Traffic and Unfamiliar Mid City)		
(9) Unknown	—	53

Avoidance Maneuvers

	Code	Col
(0) None		
(1) Braking		
(2) Steering		
(3) Braking and Steering		
(4) Acceleration		
(5) Acceleration and Steering		
(6) Brake Release		
(9) Unknown		
Most Responsible Vehicle	—	54
Second Most Responsible Vehicle	—	55
Vehicle Combination (e.g. 5,6 = Bus, Motorcycle)		
(0) No other Vehicles		
(1) Large Car (> 3800 lbs)		
(2) Medium Car (2800-3800 lbs)		
(3) Small Car (< 2800 lbs)		
(4) Truck (Includes Vans & Pickups)		
(5) Bus		
(6) Motorcycle		
(7) Utility or Jeep		
(8) Other:_____		
(9) Unknown		
Most Responsible Vehicle	—	56
Second Most Responsible Vehicle	—	57
Movement of Second Most Responsible Vehicle		
(0) No Second Vehicle		
(1) Straight Ahead		
(2) Left Turning		
(3) Right Turning		
(4) Stopped		
(5) Other:_____		
(9) Unknown	—	58
Hazardous Road Conditions (Rank by Significance) Cause Only		
(0) None		
(1) Surface Under Water		
(2) Surface Slippery (oil, ice, water, etc.)		
(3) Shoulders Slippery		
(4) Weather Obstructions (snow, fog, etc.)		
(5) Light (sun, headlight, etc.)		
(6) Obstacle on Road (e.g. car)		
(7) Road Construction, Repair or Disrepair		
(8) Other:_____		59
(9) Unknown		
	—	60

End of card 93

38

Revision 3

Report Number _ _ - _ _ _ _ - _ 9 4
2 3 4 5 6 7 8 9 10 11

Comments:

HSRI ANALYSIS

Not to be filled in by field investigator

Case Vehicle

MPH at Impact (999 Unknown) ___ 12 13 14

Primary Damage Index (99-0000-0 Unknown)

_ _ - _ _ _ _ - _
15 16 17 18 19 20 21

Secondary Damage Index

_ _ - _ _ _ _ - _
22 23 24 25 26 27 28

Sheet Metal Crush (98 if over 97 inches) (99 if unknown)

	Code	Col.
Front (Inches)	_ _	29, 30
Rear	_ _	31, 32
Left Side	_ _	33, 34
Right Side	_ _	35, 36
Roof	_ _	37, 38
Other	_ _	39, 40

Other Vehicle

MPH at Impact (888 for N/A) ___ 41 42 43

Damage Index (99-0000-0) Unknown, No damage, No Other Vehicle

_ _ - _ _ _ _ - _
44 45 46 47 48 49 50

CASE VEHICLE DAMAGE ANALYSIS SUPPLEMENT

7 _ _ - _ _ _ _ _ - _
1 2 4 9

	DAMAGE ANALYSIS, CASE VEHICLE	CONCURRENT DAMAGE, OTHER VEHICLE
Primary Deformation		
CDC (VDI) Card 4 5 (10)	_ - _ _ _ _ - _ (12, 14, 18)	_ - _ _ _ _ - _ (19)
[PERCENT CRUSH]	[_ _%] (26)	[_ _%] (28)
INCHES CRUSH (Match 1st CDC Letter)	_ _ (30)	_ _ (32)
CONFIGURATION	_ (34)	
CRASH EVENT NUMBER	_ (35)	
SPEED AT IMPACT, WITH ERROR	_ _ _ ± _ _ (36, 39)	_ _ _ ± _ _ (41, 44)
[BARRIER EQUIVALENT SPEED]	[_ _] (46)	[_ _] (48)
Secondary Deformation		
CDC (VDI)	_ - _ _ _ _ - _	_ - _ _ _ _ - _ (57)
[PERCENT CRUSH]	50 [_ _%] (64)	[_ _%] (66)
INCHES CRUSH (Match 1st CDC Letter)	_ _ (69)	_ _ (70)
CONFIGURATION Card 4 6 (10)	_ (12)	
CRASH EVENT NUMBER	_ (13)	
SPEED AT IMPACT, WITH ERROR	_ _ _ ± _ _ (14, 17)	_ _ _ ± _ _ (19, 22)
[BARRIER EQUIVALENT SPEED]	[_ _] (24)	[_ _] (26)
Tertiary Deformation		
CDC (VDI)	_ - _ _ _ _ - _ (28, 30, 34)	

Notes:
1. Bracketed Information is Optional; Blank=Unknown
2. 99-0000-0 = Unknown or No CDC
3. For Speeds, 9's = Unknown Speeds, 8's = N/A; No Other Vehicle
4. For Inches Crush, 9's = Unknown, 0's = No Crush or N/A--No Other Vehicle

2/12/74

SEQUENCE OF CRASH EVENTS — Code 5 pairs in sequence

40

	Crash Event	Vehicle or Object Contacted
Event #1	35 —	37 —
Event #2	39 —	— —
Event #3	43 —	— —
Event #4	47 —	— —
Event #5	51 —	— —

All Crash Events and involved Objects/Vehicles are coded beginning with the first damage or injury producing event. Then code each case vehicle event chronologically until the vehicle stops. Both series of Event and Vehicle/Object codes are pairs. No Event, No Object = (99), (99).

SIDE DOOR GUARD BEAM

Beam Present

(2) No Beam in Doors
(3) No Doors → SKIP REST OF PAGE — 55

YES: (1) Unknown Which Doors
(4) Front Door Only
(5) Front and Rear

(0) Unknown

Front or Rear Door Direct Damage

		Left	Right
(2) NO Direct Damage → SKIP REST OF PAGE			
(3) N/A, No Door			
YES: (1) CDC Unknown (4) Primary CDC (5) Secondary CDC (6) Tertiary CDC (9) Other or Minor	Front	56	57
	Rear	58	59
(0) Unknown			

Maximum Inches Crush (Doors)
(00) = No Crush or No Door

	Left	Right
Front	60 —	62 —
Rear	64 —	66 —

Beam Involvement

(2) No Involvement
(3) N/A, No Door or No Beam

YES: (1) Extent Unknown
(4) Beam Contact Only

DAMAGED (Bent or Dent)
(5) No Separation
(6) Unknown Separation

DAMAGED and SEPARATED
(7) Extent Unknown
(8) Partial Separation
(9) Complete Separation

	Left	Right
Front	68	69
Rear	70	71

(0) Unknown

Vehicle to Vehicle

(1) Both Moving
(2) Case Vehicle Stopped
(3) Other Vehicle Stopped

(0) Direction Unknown
(1) Same Direction: Struck Other Vehicle
(2) Same Direction: Struck By Other Vehicle
(3) Same Direction: Other, Unknown
(4) Opposite Direction: Struck Other Vehicle
(5) Opposite Direction: Struck By Other Vehicle
(6) Opposite Direction: Other, Unknown
(7) Angled (>15°): Struck Other Vehicle
(8) Angled (>15°): Struck By Other Vehicle
(9) Angled (>15°): Other, Unknown

Vehicle to Object

On-Roadway Object Collision
(4) Struck *:

Off-Roadway Object Collision
(5) Struck *:

(* = specific object struck, to be coded in the adjacent Object Contacted columns)

(0) And Other or Unknown
(1) And Deflected (or Rebounded)
(2) And Went Over *
(3) And Crashed Through *
(4) And Stopped
(5) And Rotated Around *
(6) And Was Impaled By *
(7) And Remained on Top of *
(8) From Behind

(7) Ran-Off/Re-Enter Roadway

(0) Other or Unknown Action
(1) Off Left Side, No Median
(2) Off Left Side, Into Median
(3) Off Right Side
(4) Off, Other or Unknown
(5) Re-Enter, Same Direction
(6) Re-Enter, Opposing Direction
(7) Re-Enter, Other or Unknown
(8) Crossed Median Into Opposing Lanes
(9) Crossed Centerline Into Opposing Lanes

(8) Miscellaneous Events

Case Vehicle:

Towed Vehicle:
Vehicle or Driver:

(0) Other, Unknown
(1) Overturns (>90°)
(2) Projected Into Air
(3) Went Up/Down Embankment
(4) Entered Body of Water
(5) Spins, Skids, Swerves Out-of-Control
(6) Struck by Falling, Protruding or Thrown-Up Object
(7) Stops Suddenly With Injury But No Collision
(8) Breaks Loose or Jacknifes
(9) Assaulted by Other Person With Weapon or Other Vehicle

(9) Concluding Event

(0) Other, Unknown
(1) Coasted to Rest
(2) Braked/Skidded/Spun to Rest
(3) Stopped Abruptly
(7) Under-Control, Pulled-Over
(8) Under-Control, Continued On

(00) Unknown (99) No Event

Vehicles/Objects Contacted (1/22/74)

01-39 Autos and Trucks
40-69 Other Vehicles
70-76 Pedestrians and On-Roadway Objects
80-97 Off-Roadway Objects
98 Other: _____
99 No Object
00 Unknown

Vehicles

01 Intermediate (GM A Body)
02 Standard/Full Size (B Body)
03 Luxury (C Body)
04 Limousine (D Body)
05 Personal Luxury (E Body)
06 Specialty/Pony (F Body)
07 Grand Prix (A-SP Body)
08 Compact (X Body & Y Body)
09 Sub-compact/Mini-Imported (VW)
10 Super Sport (Corvette)
17 Pickup-Car (Ranchero)
18 Sub-compact/Mini-USA (H Body)
19 European Sports Cars (MG)
20 Unknown Automobile Body

Size	Standard	Specialty	Sports
Mini	09,18	--	19
Compact	08	06	10
Intermediate	01,17	07	--
Standard	02	05	--
Luxury Sedan	03	--	--
Limousine	04	--	--

Multipurpose Passenger Vehicle

14 Utility (Jeep, Bronco)
15 Carryall/Panel Truck
16 Pickup-Camper (Canopy, Shell)
17 Pickup-Car (Ranchero)
21 Motor Home
22 Slide-in Camper
31 Chassis-Mounted Camper

Truck

11 Small Van (Econoline)
12 Pickup
13 Unknown Light Truck (<1½ Ton)
15 Carryall/Panel Truck
16 Pickup-Camper (Canopy, Shell)
22 Slide-in Camper
30 Unknown Truck Type
31 Chassis-Mounted Camper
33 Delivery Van (Walk-in)
34 Straight Truck
35 Truck-Tractor
36 Chassis-Cab
37 Unknown Heavy Truck (>1½ Ton)
38 Tractor + Semi-Trailer (Semi)
39 Truck (or Semi) + Full Trailer(s)

Bus

40 Unknown Bus Type
41 School Bus
42 Inter City (between)
43 Intra City (within)

Motorcycles

50 Unknown Motorcycle Type
51 1-75cc
52 76-125cc
53 126-250cc
54 251-500cc
55 501-750cc
56 751+cc
57 3-wheels (or with Sidecar)

Special Purpose Vehicles

60 Unknown/Other Special Vehicle
61 Snowmobile
62 ATV, All Terrain Vehicles
63 Amphibious Vehicle
64 Farm Vehicles
65 Construction Vehicles
66 Trailer-Private (camper)
67 Trailer-Commercial (cargo)
68 Train (Cars)
69 Locomotive, Switcher

Objects

70 Pedestrian
71 Bicyclist, Other Pedalcycle
72 Pedestrian Conveyance
(e.g. Person Riding Animal, Cart, etc.)
73 Large Animal
74 Fallen Objects such as Objects Dislodged from Other Vehicles, Fallen Trees, Rocks, etc.
75 Traffic Cones, Barrels, Construction Barriers
76 Construction or Emergency Equipment
77 Sign Posts, Utility Pole, Tree
78 Ditch
79 Embankment, Snowbank
80 Ground (Rollover Only)
81 Curb (Damage Producing Impacts Only)
82 Culvert
83 Fence
84 Hydrants, Short Posts, Stumps
85 Small Posts/Trees, Rural Mail Boxes, Delineators, Mile Markers
86 Building
87 Pier, Pillar (e.g. Bridge Support)
88 Abutment, Retaining Wall
89 Bridge Rail
90 Guard Rail, Leading Section
91 Guard Rail, Middle or Unknown Section
92 Guard Rail, Trailing Section
93 Guard Posts (Timber, Metal, Concrete)
94 Cable, Fence Barrier
95 Concrete Barrier (Median)
96 Impact Attenuator
97 Breakaway Fixtures

COMMENTS OR ADDITIONAL DESCRIPTION					OCC. NO. REF.	CARD NO. REF.	CARD COL. REF.
1-9	10-11	12	(NO MORE THAN 63 CHARACTERS INCLUDING BLANKS)	74	75-76	77-78	79-80

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

VEHICLE CONDITION AND MAINTENANCE REPORT

TIRES	LF	LR	RR	RF
REMAINING TREAD DEPTH (1/32 in.)				
INFLATION PRESSURE (PSIG)				
DAMAGED IN COLLISION (1,2,3,0)*				

EVIDENCE OF IRREGULAR TREAD WEAR (1,2,3,0)* DESCRIBE

LF
LR
RR
RF

EVIDENCE OF PREVIOUS TIRE REPAIR (1,2,3,0)* DESCRIBE

LF
LR
RR
RF

EVIDENCE OF PRECRASH TIRE DEFECTS (1,2,3,0)* DESCRIBE

LF
LR
RR
RF

STEERING AND SUSPENSION

STEERING WHEEL FREEPLAY IN DEGREES

(1) 0-10 (4) 30-40 (0) UNKNOWN
(2) 10-20 (5) 40-50
(3) 20-30 (6) 50

SUSPENSION MODIFICATIONS (1,2,3,0)* DESCRIBE — FRONT / REAL

SHOCK ABSORBER DEGRADATION (1,2,3,0)* DESCRIBE

LF
RF
RR
RF

EXHAUST

EXHAUST SYSTEM DEFECTS (1,2,3,0)* DESCRIBE

DRIVE TRAIN

ENGINE MODIFICATION (1,2,3,0)* DESCRIBE

EVIDENCE OF DEFECTS ASSOCIATED WITH THE ENGINE OR ENGINE-DRIVEN ACCESSORIES (1,2,3,0)* DESCRIBE

BRAKES

BRAKE FLUID LEVEL IN MASTER CYLINDER (Inches) — FRONT / REAR

(1) DRY TO 1/2 (4) 2 OR MORE
(2) 1/2 TO 1 (0) UNKNOWN
(3) 1 TO 2

BRAKE FLUID CONTAMINATION (1,2,3,0)*

FLUID LEAKAGE AROUND MASTER CYLINDER, HYDRAULIC TUBING, PROPORTIONING VALVE, OR BRAKE BACKING PLATES (1,2,3,0)*

DESCRIBE

AFTER APPLYING MODERATE FOOT PRESSURE TO BRAKE PEDAL FOR 1 MIN. DOES PEDAL MAINTAIN ITS POSITION? (1,2,3,0)*

GENERAL INFORMATION

SWITCH OR CONTROL POSITION AT TIME OF COLLISION

WINDSHIELD WIPERS		DEFROSTER	
HEADLIGHTS		RADIO	
PARKING LIGHTS		TAPE DECK	
HEATER		AIR CONDITIONER	

(1) ON (3) NOT APPLICABLE
(2) OFF (4) UNKNOWN

CONDITION OF WINDSHIELD WIPER BLADE — LEFT / RIGHT

(3) NOT EQUIPPED (6) SLIGHTLY DEGRADED
(4) BLADE MISSING (7) POOR
(5) GOOD (0) UNKNOWN

WINDSHIELD WIPER ARMS EQUIPPED WITH ANTI-WIND LIFT AIR FOILS (1,2,3,0)*

GLASS

POSITION OF MOVEABLE GLASS PANES

	LEFT	RIGHT
FRONT VENT		
FRONT DOOR		
REAR DOOR		
REAR QUARTER		
TAILGATE (Station Wagon)		

(3) NOT APPLICABLE (7) 3/4 OPEN
(4) CLOSED (8) OPEN
(5) 1/4 OPEN (0) UNKNOWN
(6) 1/2 OPEN

CONDITION OF GLASS (PRECRASH)

	LEFT	RIGHT
FRONT VENT		
FRONT DOOR		
REAR		
REAR QUARTER		

TAILGATE OR BACKLIGHT
CONDITION OF WINDSHIELD

(3) NOT APPLICABLE (7) CHIPPED OR PITTED
(4) CLEAN (8) CRACKED
(5) LIGHTLY SOILED (9) OBSTRUCTED
(6) HEAVILY SOILED (0) UNKNOWN

MAINTENANCE AND INSPECTION

LUBRICATION STICKER

MILEAGE	
DATE	
SERVICE PERFORMED	

INSPECTION STICKER

ISSUING AGENCY	
DATE	
SERIAL NO.	
STATION NO.	

NOTES

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*(1) Yes, (2) No, (3) Not applicable, (0) Unknown

APPENDIX C

ACCIDENT CAUSAL ANALYSIS SYSTEM

Contents

SECTION 1. INTRODUCTION

The fourth task of the 1973 MDAI Report Automation and Utilization contract called for a system of coding accident causal factors reported in MDAI cases to be developed based on materials compiled during work on the accident causation bibliography during the previous contract; scheme being developed by Indiana University; and material from the Accident Investigation Division, NHTSA. The scheme was to code specific causes individually, with a second later effort addressed to refinements, e.g. representations of the interrelationships between causal factors.

A detailed scheme for coding specific accident factors is presented following a discussion of the rationale used in developing the coding system. The system presented is intended as a prototype for field trial, comments and further refinement.

The interest in and need for accident causation studies remains high yet procedures for the systematic study of accident causation are still fairly weak. It is recommended that work towards developing systematic frameworks for studying pre-crash accident factors be continued, as an essential ingredient to any future study of the accident process.

Havelock* has asked both highway safety researchers and decision makers to name the highway safety activities they would most like to see supported by the "safety dollar" from a list of ten potential priority areas suggested. Researchers and decision makers agreed on the top priority item: "research on the causes of accidents". Accident causation was one of ten priority areas, yet received 25% of the vote.

While some may question whether detailed empirical or scientific studies of the accident causation process are practical, beneficial or profitable, the interest in studying the accident process is, indeed, broadly based. In practice, the systematic study of accident causation has not reached the level of maturity (and support) accorded the study of injury causation. This "lack of experience" may have obscured the potential benefits that might be realized.

The premise upon which this task was based is that any study of accident causation must rest on a solid and systematic framework that is directly susceptible to computer processing and statistical analysis. The diagrams and narratives currently used for recording accident descriptions do not permit the aggregation of each investigator's experience in a consistent manner for further empirical study. Thus, to date most accident causation studies have consisted of correlations between traffic unit demographics and

*Havelock, R., "A National Problem-Solving System: Highway Safety Researchers and Decision Makers." Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan. DOT Contract Number FH-11-6900. May, 1971, pp 103-106.

accident rates or of educated observations derived from a limited number of detailed clinical accident investigations.

It is obvious that before meaningful analysis of a large number of accidents can proceed some sort of organization must be imposed upon the data. Such systematic organizations tend to reduce accident information to common denomenators, and, as such, will ignore some details. However, in this area of chronic disorder, an orderly approach which is conducive to organized study is highly desirable. The schema described here is only suggestive--one step in an attempt to demonstrate potentially beneficial approaches to increased understanding of the accident generation process. The need for continued evolution is clear.

There are potential benefits in several areas. The first is a consistent accident description language. The very act of creating classes and code categories forces a thorough and consistent labeling and definition of each factor to be recorded. The resultant "language" greatly facilitates communications between all persons concerned with pre-crash accident factors. It encourages comprehensive and consistent consideration of the entire spectrum of pre-crash factors by the field accident investigator.

Secondly the "language" provides the interpretative framework required by the data analyst. The framework of accident factors should continually reflect our best understanding of the accident phenomena. Conversely the framework provides the analyst with the overview and observational power necessary to the understanding of large compilations of individual accident investigations, and hence is conducive to further consideration of the accident generation process itself. Thus the evolution of the accident factor coding framework is strongly interactive with the enhanced understanding of accident causation.

As a first step in this study an annotated bibliography of selected accident causation literature was compiled during the previous MDAI Report Automation Contract.* The 88 items cited were not an exhaustive survey of the literature, but rather a broad sampling of thoughts of those concerned with interpretation of accident causation. Many of the publications covered dealt with motor vehicle accidents specifically. While there was an abundance of publications concerned with case studies and specific causative mechanisms (e.g. alcohol) there appeared to be a pronounced lack of literature addressing the purely theoretical aspects of traffic accident causation. The bibliography was organized into categories based on these dichotomies of the literature.

Of the literature reviewed two sources provided the primary materials and guidance used: Perchonok of Calspan** and the Institute for Research in Public

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*"Selected Bibliography of Accident Causation Literature", Appendix C of "Multidisciplinary Accident Investigation Report Automation, Program Review," Highway Safety Research Institute, Contract DOT-HS-031-1-037, October 1972.

**Perchonok, K., "Accident Cause Analysis," Cornell Aeronautical Laboratory, Report No. ZM-5010-V-3, July 1972 (and other Perchonok reports).

Safety (IRPS) of Indiana University.* The rationale used was to integrate existing causal coding systems to a practical extent rather than to "reinvent the wheel." The conceptualization process was greatly simplified by the recent IRPS work in culling and implementing the more practical aspects of much of the previous work in accident causation.

*A Study to Determine the Relationship between Vehicle Defects and Crashes. Interim Report and Volumes 1-4, Institute for Research in Public Safety, Indiana University, Contract DOT-HS-034-2-263, November 1971 (Interim Report), November 1972 (Final Report: V 1-4).

SECTION 2. OVERVIEW OF CODING SYSTEM

Traffic Unit Involvement

The first section of the Accident Causal Analysis System was developed to code information identifying each traffic unit, describing its movements before and into the collision and making some assessment of the significance or role of human, vehicle, and environmental elements in the collision. Most of these data elements have been utilized previously in coding Level III accident data at the Highway Safety Research Institute. The coding for Major Assessment has been developed and used by Indiana University's Institute for Research in Public Safety for their Tri-Level Accident Investigation Program.

The first item in this section, Traffic Unit Number, identifies the position of each vehicle or pedestrian in the collision and is an adaptation of definitions developed by NHTSA and previously used by all individual MDAI teams. The traffic unit number also assigns the column for coding further data pertinent to that traffic unit. The Case Vehicle Number, as coded according to conventions used at HSRI for Level III data, identifies the individual investigation team, the case number, and the corresponding CPIR number of the traffic unit, if any. Traffic Unit Type describes the type of traffic unit. To determine Major Assessment, the individual factors coded for each traffic unit are referred to and the highest certainty level of Causal (Human, Vehicle, and Environment) and Severity Increasing (Human, Vehicle, and Environment) factors is selected as the major assessment. This in effect specifies the number of elements that had a role in the collision and gives some indication of their significance. The Traffic Unit Responsibility ranking orders each traffic unit according to whether it was the most responsible unit, the second most responsible unit, etc. Each traffic unit is considered according to the extent to which each unit, in the circumstances of the collision, obeyed traffic laws and "rules of the road", was aware of developing traffic situations and conditions, and continually took available and reasonable action to maintain safe traffic flow within the system. Primary Factor Responsible for Accident is a code which has previously been used at HSRI and which is continued in this system, and it simply defines which element had the primary role in causing the accident. Traffic Unit Movement is identified in three distinct phases: movement before the critical moment developed or was imminent, movement into the critical moment, and last minute evasive maneuvers.

Among the items previously coded for HSRI Level III data, minor re-arrangements or additions have been made in several cases. In general, however, the data items in this system are equitable to data items previously used, so that both groups of data can be utilized for analysis.

Individual Precrash Factor Coding

Individual precrash factors are the single events or conditions that contributed to the cause of the collision or increased its severity. This section lists and describes the individual factors. As many as thirty precrash factors can be coded for each collision. Traffic Unit Number is a coding of the number of the traffic unit for which the factor was relevant. Traffic Unit Factor Number indicates the number of factors listed per traffic unit, i.e. 1(st), 2(nd), 3(rd), etc. Factor Type identifies the factor as Human Direct, Human Condition or State, Vehicle, or Environment. Factor Code specifies the factor number indicated on the individual factor lists. There are provisions for coding factors known to be present but not specifically identified, such as when some factor reducing the coefficient of friction on the road surface is known to be present but the exact nature of that factor is not known. Factor Certainty is an estimate of the level of certainty that an individual event or condition was a factor related to the cause or the severity of an accident. This level of certainty can be definite, probable, or possible and is determined by assessing the probability of existence and involvement of the factor. To assess Factor Certainty a convention developed and used in accident research at the Institute for Research in Public Safety is followed. Due to the fact that two separate probabilities, existence and involvement, are combined in this judgment, the way to assess it is first to decide the probability of existence, and then, presuming existence, to decide the probability of involvement. These two judgments result in one of nine possible combinations of existence and involvement probabilities for a factor. A chart indicates the level of Factor Certainty most suitable for each of the nine possible combinations, and the appropriate level can be selected from this chart. For example, if a factor certainly existed and, presuming existence, probably was involved, the Factor Certainty judgment is probable. Or if a factor possibly existed and possibly was involved, then the Factor Certainty is possible and the factor may be deleted if it seems to be unduly speculative.

This technique is not to be confused with factor weighting techniques or factor significance assessments, which are evaluations of the degree to which an event or condition contributed to the occurrence or severity of a collision. Assessment of the degree of contribution of Causal Factors is provided for in the coding of Factor Significance.

To determine Factor Significance each event or condition is identified as being either Causal or Severity Increasing in the circumstances of the collision. A Causal Factor is defined as an event or condition necessary or sufficient for the accident's occurrence. A Severity Increasing Factor is an event or condition not necessary or sufficient to cause the accident itself but which has the effect of increasing the severity of the accident.* To further define the significance of Causal Factors to the occurrence of the collision one of the subcategories of Causal Factors may be coded instead of the main causal category. These subcategories are Sufficient, Sufficient or Contributory, and Contributory. Sufficient is defined as a factor which

*For further discussion of Factor Significance refer to A Study to Determine the Relationship between Vehicle Defects and Crashes, V. 1., Institute for Research in Public Safety, Indiana University, Report No. DOT-HS-034-2-263-VDP-72-1, pages 28-32.

operating alone caused the collision, Contributory applies to factors which, when operating in combination with other factors, explain the occurrence of the collision, and the subcategory Sufficient or Contributory is used with factors which are judged to be somewhere between these two definitions.

Individual Precrash Factor Lists

The four categories of individual factors from which the causal and severity increasing factors are selected are Human Conditions and States, Human Direct Causes, Vehicle Factors, and Environmental Factors. Each list is organized into up to four levels of subcategories of specific descriptions of factors. Provisions are made for indicating unspecified or unknown factors at different levels of the classification. Unspecified factors are those which are not listed, such as "Road Surface Low Coefficient of Friction", cause not listed; and unknown factors are those which are known to be present but are not specifically identifiable, such as "Brake System Failure", cause not identified. The advantage of the separate categorization of unspecified and unknown factors is that easy access is provided to unspecified factors so that they can be readily identified and added to the lists.

Human Conditions and States are those factors such as illness, fatigue, alcohol, and other circumstances which reduce the driver or pedestrian's capacity for safe travel. The main categories are Physiological Conditions, Ingestion or Inhalation of Pharmacological Agents, Psychological Conditions, and Experience/Exposure. The factors are derived primarily from those coded previously at the Highway Safety Research Institute for Level III MDAI data. In this classification only those conditions or states which are established as being relevant to the initiation or severity of the collision according to the procedure for determining Factor Certainty are included as factors. With this procedure, those instances of a condition which are known to exist but do not meet the Factor Certainty criteria for involvement are not coded.

The factor list and description of Human Direct Causes was developed in Indiana's Tri-Level accident research program. The factors are those which result from a partial or complete failure of the human information processing system. Examples are a driver who fails to observe a stop sign and travels into the intersection without awareness of the dangerous situation, or a driver who tailgates other vehicles, unmindful of the hazard that could rapidly develop if the vehicle ahead suddenly came to a stop. The main categories of Human Direct Causes are Critical Non-Performance, Non-Accident, Recognition, Decision, and Performance, and these categories are mutually exclusive in this classification. Two significant alterations that have been made in this system from that used by Indiana are that, for each Recognition error the source, cause, and type of error are coded, and more than one cause may be indicated for a Recognition error. Methods for coding are explained in detail in the factor description of Human Direct Causes.

The Vehicle Factors were also developed and used in Indiana's study, which emphasized the identification of vehicle defects in addition to developing quantification procedures and analysis techniques for accident data.[1] The

[1] A description of pass/fail criteria of vehicle components and systems, and procedures and areas of investigation in vehicle inspection are found in A Study to Determine the Relationship between Vehicle Defects and Crashes, Interim Report, Indiana University IRPS, Contract No. DOT-HS-034-2-263, November 1971, p. 140 ff and Appendix II.

most common vehicle defects found to be related to accident initiation and severity are of tires, braking systems, steering systems, lighting, and glazed surfaces or windows, and factors in these categories are listed in detail. Difficulties in the power train can result from quite a wide variety of problems, but because these difficulties are not often identified as accident causal factors they are not enumerated here. Problems with the engine or transmission that relate to collision initiation or severity are coded as "power train difficulties" and individual case studies can be referred to for identification of the source of the problems. Significant additions to the Indiana categories of Vehicle Factors are the categories Vehicle and Load Dimensions and Weight; Towing Attachments and Vehicle Age and Deterioration, which are included in J. Stannard Baker and Leroy R. Horn's An Inventory of Factors Suggested as Contributing to Traffic Accidents.

The list of Environmental Factors was compiled and categorized in the preparation of this causal analysis system. The main categories are organized by the type of driver or pedestrian problem peculiar to that heading, such as Control Hindrance or View Obstruction or by the particular environmental structure or feature involved for factors in that category, such as Intersections, Restraining Devices (median barriers, guardrails, etc.), or Signals. Ambient and maintenance conditions are not classified separately but are included among other main headings, e.g. "wet or snowy roads" are classified as Control Hindrances and "guardrails in need of repair" are categorized under Restraining Devices: Structure of Guardrails and Median Barriers. A number of sources were useful in compiling the environmental factors. The organization is similar in some respects to that used at Indiana for environmental factors, and all conditions identified as causal or severity increasing factors in Indiana's study of accidents are included in this list. Other sources used include Arthur D. Little, Inc., The State of the Art of Traffic Safety, a study which reviews and analyzes technical information and research in the field of traffic safety, and Highway Design and Operational Practices Related to Highway Safety, or "The Yellow Book", prepared by the AASHO Traffic Safety Committee to describe and define highway design standards and practices for state organizations and highway engineers. J.S. Baker and Leroy Horn's An Inventory of Factors Suggested as Contributing to Traffic Accidents was also a source of environmental factors. The organization of types of roadway signs is that delineated in The Manual on County Traffic Operations, prepared by the National Association of County Engineers. Dr. Donald Cortright, Professor of Civil Engineering at the University of Michigan, reviewed the final draft of environmental factors.

SECTION 3. CODING CONVENTIONS

Traffic Unit Involvement

Traffic Unit Number

1	2	3
Striking	1st Struck	2nd Struck

Traffic Unit (TU) number identifies each traffic unit according to its position in the collision. The following conventions are used in numbering traffic units:

a. Striking vehicle designated as #1
b. First vehicle struck is #2
c. Second vehicle struck is #3 (No more than three traffic units are coded)
d. Head-on collisions, vehicle in wrong lane is #1
e. Exact front corner to front corner, vehicle without right-of-way is #1
f. Pedestrian designated as 1st or 2nd struck

The traffic unit number is used to identify the traffic unit for the column of data recorded under the traffic unit number, e.g., all data relevant to Vehicle 1 are recorded in the first column of questions. The traffic units 1, 2, and 3 are not restricted to passenger cars and therefore may be different than the CPIR case vehicle numbers. Traffic units also include trucks, buses, motorcycles, bicycles, pedestrians. Only the first three involved traffic units are included.

Case Vehicle Number

One case vehicle number is coded for each traffic unit in its respective column as follows:

Team Identification	Case Number	CPIR Number
__ -	_____ -	_

The case vehicle numbers recorded here should match the corresponding CPIR case vehicle number, if any, for this traffic unit. If there is no CPIR then code "9" for CPIR number.

Traffic Unit Type

The following codes identify traffic unit type:

1. Large car (greater than 3800 lbs.)
2. Medium car (2800-3800 lbs.)
3. Small car (less than 2800 lbs.)
4. Truck (any size)

(Traffic Unit Type codes, cont'd)

5. Bus
6. Motorcycle
7. Utility or Jeep
8. Other:_____
9. No Vehicle
0. Unknown

Major Assessment

The Major Assessment is six values for each traffic unit that summarize the highest certainty level (Factor Certainty) for causal factors (human, vehicular, environmental) and for severity increasing factors (human, vehicular, environmental). No distinction between subcategories of causal factor roles (i.e. sufficient cause, sufficient or contributory cause, and contributory cause) is made. Also, no distinction is made between human direct causes and human conditions and states. In other words, the major assessment for all causal factors in an element (e.g. human causal factors) is determined. Code the highest certainty level for each element, or, if no factors exist, code "0". The coding format for major assessment is as follows:

C H___ (Causal Factors)
V___
E___

SI H___ (Severity Increasing Factors)
V___
E___

Traffic Unit Responsibility

Traffic flow depends on a system in which all traffic units make life-supporting responses within the system. This involves obeying traffic laws and "rules of the road", being aware of developing traffic situations or conditions, and continually taking action to maintain safe traffic flow within the system. A driver/vehicle unit is said to be responsible in an accident situation when, because of any factor, it does not continually take reasonable and available action to maintain safe traffic flow, or in that circumstance does not continually make life supporting responses to the system. Vehicle malfunctions or difficulties are included in this ranking. The rankings for responsibility are 1, 2, and 3. Rank 1 is assigned to the traffic unit most responsible, rank 2 to the next most responsible traffic unit, and rank 3 to the least most responsible traffic unit. In an unusual instance of a two-vehicle collision where one unit was most responsible and the other two vehicles each appear to be less but equally responsible, the most responsible unit is ranked 1 and the other two vehicles are ranked 2. In a three-vehicle collision where one unit was responsible and two vehicles were not in any way responsible, the unit that was responsible should be ranked 1 and the two units that were not responsible should both be ranked 2.

Primary Factor Responsible for Accident

This category identifies the one factor most responsible for the accident independent of traffic units. The codes are as follows:

1. Human
2. Vehicle
3. Road
4. Ambience
9. Unknown

Pre-Crash Movement

This category specifies the movement of each traffic unit before the critical moment, or before the moment the collision became imminent or unavoidable. The codes are as follows:

1. Straight ahead
2. Turning
   2.1. Turning, curve following
   2.2. Turning, at intersecting roadway
   2.3. U Turn
3. Reverse, backing
4. Lane changing
5. Parked, stopped
6. Rolling stop (i.e. incomplete stop at intersection)
7. Entering, leaving private driveway (use 3 if backing)
8. Starting to move
9. Other or unknown

Critical Phase Movement

The following codes are used to identify the single, most descriptive movement of each traffic unit that initiated the critical phase.

1. Straight ahead or turning at intersection or curve (code subcategories)
   1.1. Straight ahead
   1.2. Straight ahead, road turned to right
   1.3. Straight ahead, road turned to left
   1.4. Turning, at intersecting roadway
   1.5. Turning, curve following
2. Right (code subcategories)
   2.1. Off RHS of road
   2.2. Off RHS of lane

(Critical Phase Movement codes, cont'd)

2.3. Off RHS and back again
2.4. Veered right
2.5. Turned hard right

3. Left (code subcategories)
3.1. Off LHS of road
3.2. Off LHS of lane
3.3. Off LHS and back again
3.4. Veered left
3.5. Turned hard left

4. Vehicle stopped
5. Skidding (as most descriptive movement)
8. Other
9. Unknown

Avoidance Maneuvers

This category describes evasive maneuvers taken during the critical phase to avoid the accident. The following subcategories apply:

0. None
1. Braking
2. Steering
3. Braking and steering
4. Acceleration
5. Acceleration and steering
6. Brake release
9. Unknown

Individual Precrash Factors

The next two pages on the coding form provide for listing all the specific precrash factors involved in the collision. Each specific factor is recorded across one line of the coding form. Up to 30 factors may be recorded for one accident. Each factor is related to a specific traffic unit and is ranked by certainty, and significance or role. Each of these aspects is defined below. Leave unused lines on the form blank.

Traffic Unit Number

The number of the traffic unit (e.g. 1, 2, 3) as identified in item 1 on the previous page of the coding form.

Traffic Unit Factor Number

The sequential numbering of factors listed for each traffic unit, e.g., for traffic unit 1, factors 1, 2, 3, etc., and for traffic unit 2, factors 1, 2, 3, etc.

Factor Type

The four categories are identified as follows:

1. Human Conditions and States
2. Human Direct Causes
3. Vehicle
4. Environment

Factors pertaining to each category are found in the respective individual factor list.

Factor Code

The code number for each individual factor code is four value. Refer to the individual factor lists for the factors and their respective numbers. Each should be coded at the finest or most specific level of subcategory that is known to apply, and zeros should then be added if necessary to complete the four digit number.

Example:

Narrow Lane Width - 3.1.1.0.

where:

3. = Design Geometrics
1. = Roadway Width
1. = Narrow Lane Width
0. Completes four digit number

When coding a certain factor where not enough information is known to code a finer level subcategory that is available, then the most specific known subcategory should be coded, and zero added to indicate "unknown", and then a further zero added, if necessary, to complete the four digit number.

Example:

Wind - 2.6.0.0.

where:

2. = Control Hindrance
6. = Wind
0. = Unknown (direction and intensity)
0. Completes four digit number

Thus, the category "unknown" as so indicated, is distinct from the category "other", which refers to specific factors which are known but which are not included in the itemized factor list.

Factor Certainty

Factor certainty is a judgment of the relative degree of assurance (definite, probable, or possible) that something was or was not a Causal or Severity Increasing factor. This judgment is based on two relative considerations

or probabilities: whether the factor existed and whether it was involved. Factor certainty is determined with the following convention. First, the degree of assurance (definite, probable, possible) that the factor existed is determined; then, hypothesizing existence, the degree of assurance that it was involved (definite, probable, possible) is determined. The composite of these two evaluations generally results in the judgment of Factor Certainty indicated in the following chart:

Existence	Involvement	Factor Certainty
Certain	Certain	Certain
Certain	Probable	Probable
Certain	Possible	Possible
Probable	Certain	Probable
Probable	Probable	Probable*
Probable	Possible	Possible
Possible	Certain	Possible
Possible	Probable	Possible
Possible	Possible	Possible**

*May be frequently reduced to Possible

**If the factor is felt unduly speculative it will be deleted

Significance

Factor significance is indicated as being either Causal or Severity Increasing. Also, optional subcategories under Causal (1) are available in this classification: (2) Sufficient Cause, (3) Sufficient or Contributory Cause, or (4) Contributory Cause. That is, in coding factors determined to be Causal one may either code (1) Causal, or further define the factor by coding (2), (3), or (4). The following codes and definitions of Causal and Severity Increasing factors apply:

1. Causal Factor: A factor which was necessary or sufficient for the accident's occurrence, so that had the factor not been present in the accident sequence, the accident would not have occurred.

2. Sufficient Cause: Any factor that, acting alone, is both necessary and solely sufficient to cause the accident. Several sufficient factors may co-exist if they independently would cause the accident.

3. Sufficient or Contributory: A factor that is judged somewhere between sufficient and contributory.

4. Contributory: Contributory factors are defined as two or more factors acting jointly (simultaneously or sequentially) which were sufficient to explain the occurrence of the accident. These factors independently would not be sufficient to cause the accident.

5. Severity Increasing Factor: A factor which was not necessary or sufficient for the accident's occurrence, so that its removal would not have prevented the accident, but would have reduced the severity of the impact which resulted.

SECTION 4

CODING FORM

TRAFFIC UNIT INVOLVEMENT

TRAFFIC UNIT NUMBER	1 Striking	2 1st Struck	3 2nd Struck
REPORT NUMBER	__-_____-_		
(0's-No Vehicle) (8's-Non Case Vehicle) (9's-Pedestrian, Unknown)		__-_____-_	__-_____-_
TRAFFIC UNIT TYPE	___	___	___
MAJOR ASSESSMENT			
Causal Factors	H ___ V ___ E ___	H ___ V ___ E ___	H ___ V ___ E ___
Severity Increasing Factors	H ___ V ___ E ___	H ___ V ___ E ___	H ___ V ___ E ___
TRAFFIC UNIT RESPONSIBILITY	___	___	___
PRIMARY FACTOR RESPONSIBLE FOR ACCIDENT	___		
TRAFFIC UNIT MOVEMENT			
PRE-CRITICAL PHASE MOVEMENT	__ __	__ __	__ __
CRITICAL PHASE MOVEMENT	__ __	__ __	__ __
AVOIDANCE MANEUVERS	___	___	___

INDIVIDUAL PRECRASH FACTORS

Traffic Unit Number	Traffic Unit Factor Number	Factor Type 1 Human Conditions and States 2 Human Direct 3 Vehicle 4 Environment	Factor Code (see lists)	Factor Certainty 1 Certain 2 Probable 3 Possible	Factor Significance 1 Causal 2 Sufficient 3 Sufficient or Contributory 4 Contributory 6 Severity Increasing
Card 11					
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
Card 12					
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
Card 13					
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—

Traffic Unit Number	Traffic Unit Factor Number	Factor Type 1 Human Conditions and States 2 Human Direct 3 Vehicle 4 Environment	Factor Code (see lists)	Factor Certainty 1 Certain 2 Probable 3 Possible	Factor Significance 1 Causal 2 Sufficient 3 Sufficient or Contributory 4 Contributory 6 Severity Increasing
—	— —	—	— — — —	—	—
—	— —	—	— — — —	—	—
Card 14					
—	— —	—	— — — —	—	—
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SECTION 5. INDIVIDUAL FACTOR DESCRIPTION

HUMAN CONDITIONS AND STATES

This group of factors refers to those human conditions and states of varying duration which have a debilitating effect on the driver in the precrash situation. They decrease the ability of the driver to function effectively to avoid or reduce the severity of the accident. The main categories of human conditions and states are:

1. Physiological Conditions
2. Ingestion or Inhalation of Pharmacological Agents
3. Psychological Condition
4. Experience/Exposure

Only those factors which are thought to have had a direct influence on the accident situation are coded. If a condition exists but it is not felt to have had any effect on the driver's pre-crash actions which influence or contributed to the collision, the condition should not be coded.

The main categories of human conditions and states are defined and described as follows:

1. Physiological Conditions

   This category includes physiological illnesses or disabilities which were related to the driver's actions prior to the collision. These conditions may be permanent, such as cardiovascular conditions or vision restrictions, or temporary, such as colds or flu. If the condition is so severe that it results in a total disability of the driver to function in the accident situation, it is also coded as a Critical Non-Performance under Human Direct Factors. Physical disabilities resulting from ingestion of pharmacological agents are coded in the next main heading rather than in this category.

2. Ingestion or Inhalation of Pharmacological Agents

   This category describes pharmacological agents which effected the driver. Included are drug and alcohol consumption and inhalation of toxic gases.

3. Psychological Conditions

   This category includes factors which are primarily of psychological origin. The next-level categories in this heading are Psychological Stress in Life Events, Arguments, Situational Anxiety, Mental Deficiency, and Psychosis.

4. Experience/Exposure

   Included in this category are factors relating to driver experience with the skill of driving, the vehicle, and the roadway or area.

SECTION 6. INDIVIDUAL FACTOR LIST

HUMAN CONDITIONS AND STATES

1. Physiological Conditions
   1.1. Cardio-Vascular Condition (Heart Failure, Angina, Infarction)
   2. Brain (Epilepsy, Stroke)
   3. Respiratory Condition
   4. Vision/Hearing Restricted
   5. Not Wearing Corrective Lenses
   6. Loss of Consciousness (code subfactors)
      1.6.1. Blackout (Also code any known related condition, e.g. Diabetes, Alcohol)
      2. Dozing (Also code any known related condition)
   7. Fatigue
   8. Miscellaneous Physiological Conditions
      1.8.1. Paraplegic, Amputee, etc.
      2. Diabetes
      3. Transient Illness (Flu, Headcold, etc.)
      4. Pregnancy
      5. Infirmities (Arthritis, Senility)
      6. Digestive Disorders
   9. Other
2. Ingestion or Inhalation of Pharmacological Agents
   2.1. Alcohol (Code 2.1. when amount drunk or effect of consumption is not known.)
      2.1.1. Intoxicated, approximate BAC .10 and higher
      2. Impaired, approximate BAC .07 to .10
      3. Some or little impairment, approximate BAC .07 to .02
      4. Little if any impairment, BAC less than .02
   2.2. Drugs, other than alcohol
      2.2.1. Stimulants, Prescriptive/Narcotics (Amphetamines, Cocaine, Bennies)
      2. Stimulants, Over-the-Counter (Caffeine, No-Doz)
      3. Depressants, Prescriptive/Narcotics (Barbiturates, Opiates, Tranquilizers)
      4. Depressants, Over-the-Counter (Sleeping Compounds)
      5. Antihistamines
      6. Hallucinogens (LSD, DMT, Mescaline, Psilocybin)
   2.3. CO or Other Toxic Gas Inhalation
   2.9. Other
3. Psychological Condition
   3.1. Psychological Stress in Life Events
      3.1.1. Loss or Change in Family Constellation
      2. Loss or Change in Friendships

3. Marital/Sex Difficulties, Adjustments
4. School/Work Problems or Change in Responsibilities
5. Financial Difficulties or Change in Financial State
6. Legal, Police, Social Worker, Counselor Problems
7. Change in Residence or Living Conditions
8. Change in Personal Habits, e.g. Stopped Smoking
9. Outstanding Personal Failure or Achievement
9.8. Several of the Above
9.9. Other, Not Indicated Above

3.2. Arguments
3.2.1. Argument with Relations or Friends
2. Argument with Boss or Co-workers
9. Argument with Others (Sales Clerk)

3.3. Situational Anxiety
3.3.1. "In-Hurry", Pressured
2. Stress Response to Traffic Situation, e.g. pressure from other drivers
9. Other

3.4. Mental Deficiency
3.5. Psychosis (also code 3.1. Psychological Stress)
3.9. Other

4. Experience/Exposure
4.1. Driver Inexperience
2. Vehicle Unfamiliarity
3. Road/Area Over-Familiarity
4. Road/Area Unfamiliarity
9. Other

9. Other

SECTION 7. INDIVIDUAL FACTOR DESCRIPTION

HUMAN DIRECT FACTORS

This category refers to all human acts and failures to act in the minutes immediately preceding an accident, which increase the risk of collision beyond that which would have existed for a conscious driver driving to a high but reasonable standard of good defensive driving practice. Thus, the failure of a driver, engaged in animated conversation, to notice that the car in front of him has stopped, is categorized as a human causal factor for purposes of this study. However, the improper repair activities of a driver, which several minutes later result in a catastrophic brake failure, are not categorized as human causal factors for purposes of this study. That failure would be classified as a vehicular failure, though the human error involved would be noted in the case report on the accident.

The main categories of human direct causes are:

1. Critical Non-Performances
2. Non-Accident
3. Recognition Errors
4. Decision Errors
5. Critical Moment Performance Errors
6. Pedestrian Errors

For the purposes of this classification the main categories are intended to be mutually exclusive. The main categories are defined and described as follows:

1. Critical Non-Performances

   This refers to a situation where a driver loses consciousness, either in the sense of an acute illness such as heart failure or blacking-out, or falling asleep, and as a result is involved in an accident. These are termed critical non-performances in the sense that a catastrophic interruption in the driver's performance as an information-processor occurs, and he drops totally out of the information-processing system.

2. Non-Accident

   This refers to situations where collision is intentional. It thus includes both suicide attempts, and a situation where a driver, annoyed by the proximity of a following vehicle, slams on his brakes in anger, and as an inevitable result, is rear-ended.

3. Recognition Errors

   This category intends to include all situations where a conscious driver does not properly perceive, comprehend, and/or react to a situation requiring adjustment of speed or path of travel for safe completion of the driving task. Three separate subject categories are included in this section, and it is necessary to code each of the three subject areas to indicate a recognition error. One, Error in Recognition of, indicates the particular road feature, sign, etc, which was not recognized

adequately. Two, Reasons for Recognition Error, designates specific causes for the delay in recognition, e.g. inattention, internal distraction, etc. More than one Reason may be coded for each error. The third subject category, Type of Error, indicates the particular phase of information flow which was not completed, and these are identified as Perception, Comprehension, and Reaction Time. Thus, (1) a driver did not see a red light, (2) because of an internal distraction, and (3) this was an error in the perception phase.

3.1. Error in Recognition of:

This category applies to all recognition errors and specifies the particular road feature, traffic condition, etc. which was not recognized. A driver may fail or delay in recognition of traffic stopped or slowing ahead; the position of his car on the road; road features, such as oncoming curves, lane narrowings, etc.; road signs and signals providing driver information; cross-flowing traffic, such as merging or intersecting vehicles; or road conditions.

3.2. Reasons for Recognition Error

A specific reason should be coded for each recognition error if known. If the specific reason is not known, unknown should be coded. These reasons include inattention/preoccupation, external distraction, internal distraction, and improper lookout. More than one reason can occur in a given situation, i.e. a driver may be both preoccupied with thoughts and distracted by tuning the radio. When this occurs more than one reason should be coded.

3.2.1. Inattention, Preoccupation, Distracted by Thoughts: This category applies whenever a driver is delayed in the recognition of information needed to safely accomplish the driving task, because of having chosen to direct his attention elsewhere for some non-compelling reason. Specifically excluded from this category are cases where a circumstance or event tends to induce a shift away from the driving-task matters requiring attention. The category thus denotes wandering of the mind, or a state of being engrossed in thought in matters not of immediate importance to the driving task.

3.2.2. Internal Distraction: This category applies whenever a driver is delayed in the recognition of information needed to safely accomplish the driving task, because some event, activity, object, or person within his vehicle compelled or tended to induce the driver's shifting of attention away from the driving task; a radio might act as an object of special attention, tending to induce the driver to shift his attention from the driving task to adjustment of the radio. Conversation with a passenger which diverts attention from the driving task is considered an internal distraction.

Examples of events or activities which are ordinarily considered internal distractions include sudden or unusual events in the car such as loud noises, yells, a sick passenger, or a dropped cigarette, and mechanisms requiring driver-adjustment, such as radios, tape players, windows, and heaters.

Internal Distraction is distinguished from the Inattention/Preoccupation category, wherein a driver shifts his attention from the driving task, but no event, activity, or object compels or tends to induce such a shift. Driver-chosen mental activity falls under the inattention category, rather than internal distraction. Internal Distraction may however accompany other reasons for recognition errors.

3.2.3. External Distraction: This category applies whenever a driver is delayed in his recognition of information needed to safely accomplish the driving task, because an event, activity, object, or person outside his vehicle compelled or tended to induce a shifting of attention away from the driving task. For example, a pretty girl might tend to induce a driver to shift his attention; a sudden event outside the car, such as an explosion or screech of tires, might compel such a shift of attention.

Other examples of external distractions include the actions of other traffic; driver-selected outside activity such as looking for street signs, looking for house numbers, and examining particular pieces of property; activities of special interest, such as a fight, person in bikini, accident, or fire; or other sudden events such as loud noises, explosions, flashes of light, sudden screech of tires.

External Distraction may accompany but is distinguished from inattention/preoccupation, in which the driver shifts his attention from the driving task, but is not compelled or induced to by any event, activity, or object.

3.2.4. Inadequate or Improper Lookout: This category applies whenever a driver is delayed in his recognition of information needed to safely accomplish the driving task, because he encountered a situation requiring a distinct visual surveillance activity (for safe completion of the driving task), and either did not look or did look, but did so inadequately. Thus, included are both cases where a driver "looks but does not see," and the cases where a driver needed to look but did not even attempt to, as for example in pulling out to pass without first checking for traffic in the passing lane.

The improper lookout category frequently applies in situations where a driver is pulling out from a parking place; entering the travel lane from an intersecting street, alley, or driveway; or prior to changing lanes or passing.

Inadequate or improper lookout may accompany but is to be distinguished from the inattention, internal distraction, and external distraction categories.

3.3. Type of Error

This category indicates at what phase of the recognition process the error occurred. Perception, Comprehension, and Reaction are identified

as the three phases. An error of perception applies when the driver did not observe a road feature, vehicle, object, etc. that was within his field of view. A comprehension error is indicated when the driver adequately perceived the road feature, vehicle, etc. but delayed in comprehending or realizing the potential danger of the situation. When the driver perceived the environment adequately and fully comprehended the situation but delayed in taking available action to avert the danger, delayed reaction time is indicated. Where two or more phases are delayed, two or more of the above may be coded, and where the particular phase is not indicated, unknown should be coded.

4. Decision Errors

This refers to all situations where a driver is involved in an accident, or experiences an unnecessarily severe impact, because having received information indicating the need for a change in speed or path of travel, he chooses an improper course of action, or takes no action.

To a large extent, this top-level category is defined by the next-level (more specific) categories included under it. These are misjudgment, false assumption, improper maneuver, improper driving technique or practice, inadequately defensive driving technique, excessive speed or acceleration, inadequate signal, communications or lights, and improper evasive action.

4.1. Misjudgment

This category applies whenever a driver miscalculates the separation in time and space, or the closure rate, of his own vehicle with respect to other objects, and then acts to his detriment on the basis of this improper evaluation.

4.2. False Assumption

This category applies whenever a driver takes action, or fails to take action, based on a decision or opinion arrived at by assuming that to be true which in fact is not true. For example, if a driver pulls out in front of another driver who is signaling a turn, assuming that the other driver will turn before reaching his location, when in fact that driver has no intention of turning until he is past that location, the original driver's mistake is properly classified as a false assumption. In this instance, the false assumption category is to be distinguished from inadequately defensive driving technique, over which it takes precedence when the fact of a false assumption has been clearly established.

Additional examples of false assumption include assumptions that other drivers must stop or yield at intersections, when in fact they are not required to do so; that a vehicle is going to make a turning maneuver which it does not, and assuming that no traffic is coming when in fact there was traffic coming (as in the "good-Samaritan" situation).

4.3. Improper Maneuver

This category applies whenever a driver willfully chooses a vehicle path which is wrong, in the sense of being obviously calculated to

generate an exceedingly high risk of collision. Examples include turns from the wrong lane, preceding straight in a turn lane, driving the wrong way on a one-way street, or passing at an improper location, such as an intersection.

4.4. Improper Driving Technique or Practice

This category applies when a driver engages in the improper control of path or speed, in a manner which unduly increases the risk of accident-involvement, and involves practices which are (or might be) habitual to a particular driver (the risk involved not being fully appreciated). Examples include cresting hills while driving in the center of the road, tailgating, and stopping too far out into the road or intersection as a matter of choice.

This category is to be distinguished especially from improper maneuver, due to the similarity of these categories. In some cases the distinction between these categories is difficult, being one of degree rather than kind. The key distinction is that of driver recognition of risk, and hence likelihood of habitual reoccurrence; it is unlikely that a driver would habitually repeat what he realized to be an unnecessarily risky practice. Hence, for example, a turn from the middle lane of a one-way three-lane street would be classified as an improper maneuver; it is not likely that a driver will engage in this maneuver if he recognizes that traffic could be approaching from behind in the lanes that he crossed. However, for years a driver might crest hills on country roads driving in the center, or stop too rapidly to make turns, without accident involvement, and without realization of the risks involved. Such cases are categorized as improper driving techniques or practices.

4.5. Inadequately Defensive Driving Technique

This category applies whenever a driver unnecessarily places his vehicle in a position where there is a foreseeable and substantial risk of collision if another driver performs contrary to normal expectations, or places his vehicle in such a position without adequately checking to ensure that another driver is not engaged in such an unexpected action. Examples include entering an intersection on reliance that an oncoming vehicle will stop for its traffic signal, despite the fact that it has given no indication of slowing to do so. Another example would be crossing or entering a one-way street without looking for wrong-way traffic.

This category is to be distinguished from categories which are used when drivers place their vehicles in positions (or do so without adequately checking first) where they become subject to risks in the normal course and flow of traffic. The key distinction is that in this case, the risk is generated by the improper and ordinarily unexpected action of other traffic units.

4.6. Excessive Speed or Acceleration

Excessive Speed applies when a driver excessively increases the risk of accident involvement, by choosing to travel at too great a speed. The judgment that a vehicle's speed is excessive is necessarily a highly subjective one; an excessive speed is one greater than a person driving to a high, but reasonable standard of good defensive driving practice, would choose to travel under existing conditions.

It should be noted that the evaluation that speed is excessive is specifically not to be determined with reference to the prevailing speed limit. Prevailing speed limits are to be considered, but primarily in the context of determining the reasonable expectations of other drivers as to the speed of traffic likely to be encountered.

Excessive speed in this context may be excessive for the road design, regardless of its condition or prevailing traffic conditions; in light of traffic, pedestrians, or number of accesses; in light of prevailing weather conditions, or in light of combinations of these factors.

Excessive Acceleration refers to a situation where a driver accelerates so rapidly that his ability to maintain directional control is hindered to the point that control is lost. This subcategory is to be distinguished from excessive speed; it refers specifically to the situation where wheelspin or similar phenomena associated with rapid acceleration induce directional instability.

4.7. Inadequate Signal, Communications, or Lighting

This category applies whenever a signal would ordinarily be expected from a person driving at a standard of good defensive driving practice, and it is determined that had such a signal been given, it would have been receivable by other persons (drivers, pedestrians, etc.), so that the accident could have been prevented or its severity reduced. Included are all types of signals which communicate information between traffic units, including turn signals, indications of braking or slowing, or warning or alerting signals given by the honking of a horn. This category also applies to use of headlights, whenever a driver fails to turn on his headlights despite the fact that the sky has sufficiently darkened to substantially hinder his ability to see or be seen, and this fact is in turn related to the accident occurrence or severity.

4.8. Improper Evasive Action

This category refers to a situation where an alert driver, driving to a high but reasonable standard of good defensive driving practice, could by braking, steering, accelerating, or by engaging in combinations of these actions, have either avoided collision entirely or have significantly reduced the severity of the impact which resulted. This category does not apply merely because it is determined by

investigation that there was an evasive action which could have been taken successfully; it must also be an evasive action which was apparent or should have been apparent to the driver on the basis of information available to him, and which was reasonable, based on that information. It might not be reasonable, for example, to swerve into an opposing traffic lane and risk a head-on collision, even though it might later be determined by investigation that in fact no such collision would have occurred, and hence the accident could have been avoided by taking that chance.

An especially notable example of improper evasive action is the situation where a driver locks his brakes and is therefore unable to initiate an evasive steering action to avoid a car stopped ahead, where had the brakes not been locked it could easily have been accomplished.

5. Critical Moment Performance Errors

This category refers to situations where a driver properly perceives and comprehends information indicating the need for an adjustment in speed or path of travel, but commits driving errors which involve either impulsive improper actions (as in panic or freezing), or lack of adequate skills (as in over-compensation). These are to be distinguished from errors involving an improper choice of action from among available alternatives, which are termed decision errors.

To a large extent, this category grouping is defined by the next-level (more specific) categories which comprise it; these are over-compensation, panic or freezing, and inadequate directional control.

5.1. Overcompensation

This refers to situations where a driver improperly reacts to a situation impairing the maintenance of control over the vehicle. Such overcompensations include improper or excessive acceleration, braking, and/or steering inputs. This category is most typically applied when a driver allows his vehicle to deviate from its intended path, as in the case where he allows the right-side tires to drop off the pavement edge, and then looses control by attempting to regain the intended path in too abrupt a manner.

5.2. Panic or Freezing

This refers to the situation where a driver perceives the risk of collision, and as a result is unable or does not have the presence of mind to take any significant remedial action. He is either unable to estimate what remedial action is required, or realizing it, is unable to initiate the muscle responses necessary to cause that action to be taken.

This category also refers to situations where, in recognition of risk of collision or loss of control, a driver takes an impulsive, irrational action, which is obviously not calculated to reduce the risk. For example, preceding collision, such a driver might remove his hands from the wheel and throw them up in front of his face, in a situation where had he not panicked a reasonable evasive action would have been possible.

5.3. Inadequate Directional Control

This category refers to situations where a conscious driver does not maintain adequate control over the path of his vehicle, although such control would have easily been possible had appropriate steering inputs been applied. This does not apply to the situation where high lateral loads make continued control a delicate matter, and overtax the skills of the driver. Rather, these are situations where adequate lateral traction is available, so that had the driver adequately monitored information regarding the need for steering inputs, and then applied these inputs with skill reasonably expected from an ordinary driver, control could easily have been maintained.

This category is applied when a conscious driver fails to maintain directional control in a relatively untrying situation. Where there is information that the driver was distracted or was preoccupied, and hence did not notice the deviation of his vehicle from the intended path in sufficient time, those specific recognition categories would apply. However, where such information cannot be obtained, but it is known that the driver was conscious and should have easily been able to complete the necessary steering task, the inadequate directional control category applies.

6. Pedestrian Errors

This category applies whenever a pedestrian moves into a traffic lane at such a place and in such a manner as to create a high risk of contact from even lawfully and prudently driven vehicles. These thus represent cases where the pedestrian is culpable, without regard to whether a striking driver was at all blameworthy. Typically, such accidents have involved people running out into traffic, often without looking at all; many such pedestrians have been children.

SECTION 8. INDIVIDUAL FACTOR LIST

HUMAN DIRECT FACTORS

1. Critical Non-Performances
   1.1. Fatal
     2. Blackout
     3. Dozing
     9. Other, e.g. seizure
2. Non-Accident (Suicide attempts, intentional collisions)
3. Recognition Errors
   3.1. Error in Recognition of:
      3.1.1. Traffic Stopped, or Slowing Ahead
         2. Position of Car on Road
         3. Road Features, such as On-Coming Curves, Lane Narrowings, etc.
         4. Road Signs or Signals Providing Driver Information
         5. Cross-Flowing Traffic, such as Merging Traffic or Intersecting Traffic
         6. Road Conditions
         9. Other
   3.2. Reasons for Error or Delay in Recognition (if Unknown, code 3.2.0.)
      3.2.1. Inattention, Preoccupation, Distracted by Thoughts
      3.2.2. Internal Distraction
            3.2.2.1. Event in Car, Loud Noise, Yell, Scream, Sick Passenger
               2. Adjusting Radio or Tape Player
               3. Adjusting Windows, Vent, Heater, or Similar Control
               4. Conversation with Passenger
               5. Music or Radio Conversation
               9. Other
      3.2.3. External Distraction
            3.2.3.1. Other Traffic
               2. Driver-Selected Outside Activity; e.g. looking for house number, looking for street signs, examining particular property, etc.
               3. Activity of Interest; Fight, Girl in Bikini, Accident, Fire, etc.

4. Sudden Event; Loud Noise, Explosion, Flash of Light, Sudden Screech, etc.
5. Stopped Vehicle or Accident
9. Other

3.2.4. Inadequate or Improper Lookout

3.2.4.1. Pulling out from Parking Place
2. Entering Travel Lanes from Intersecting Street, Alley, Intersection, Driveway
3. Prior to Changing Lanes or Passing
9. Other

3.2.5. Errors or delays in recognition for other reasons

3.3. Type of Error (if Unknown, code 3.3.0.)

3.3.1. Perception (Information was perceivable, but delay in perception or failure to perceive, e.g. looked other direction, etc.)
2. Comprehension (Information was perceived, but remained unprocessed)
3. Delayed Reaction Time
4. Two or More of the Above

4. Decision Errors

4.1. Misjudgement (of Distance, Closure-rate, etc.)

4.2. False Assumption

4.2.1. Assumed other driver had to stop or yield at intersection
2. Assumed other driver would stop or yield at intersection without assuming traffic control
3. Assumed on-coming car would move left, or right, out of way
4. Assumed vehicle was going to make a turning maneuver, which it did not.
5. Assumed there was no traffic coming (or that traffic was stopped) when, in fact, there was traffic coming
9. Other

4.3. Improper Maneuver

4.3.1. Turned from wrong lane or position
2. Drove in wrong lane but correct direction (e.g. went straight in turn lane)
3. Passed at improper location
9. Other

4.4. Improper Driving Technique or Practice

4.4.1. Cresting hills, driving in center of road

2. Braking later than should have or at improper location

3. Stopping too far out in road or intersection

4. Driving excessively close to centerline or edge of road

5. Slowed too rapidly (e.g., slammed on brakes to make turn at last minute)

6. Tailgating

9. Other

4.5. Inadequately Defensive Driving Technique

4.5.1. Strategic Error--Should have positioned car differently in anticipation of possible problems

2. Strategic Error--Should have adjusted speed in anticipation of possible problems

3. Strategic Error--Should not have taken other driver's obedience of traffic sign for granted

9. Other

4.6. Excessive Speed or Acceleration

4.6.1. Excessive Speed

4.6.1.1. For road design--regardless of condition or traffic

2. Solely in light of traffic, pedestrians, number of accesses, etc.

3. Solely in light of weather conditions (including slick roads)

4. Due to combinations of above

4.6.2. Excessive Acceleration

4.7. Inadequate Signal, Communications, or Lights

4.7.1. Failure to signal for turn

2. Failure to use horn to warn

3. Failure to turn on headlights

9. Other

4.8. Improper Evasive Action

4.8.1. Locked brakes

2. Driver could have steered out of danger and did not (brakes not locked/could steer)

3. Driver could have accelerated out of danger and did not
9. Other

4.9. Other Decision Errors

5. Critical Moment Performance Errors

5.1. Overcompensation (Excessive acceleration, braking, and/or steering imputs)

2. Panic or Freezing (No significant remedial action taken)

3. Inadequate Directional Control

5.3.1. On curve--allowed car to enter opposing lane of travel

2. On straight--allowed car to enter opposing lane of travel

3. On straight--allowed car to go off road edge to right or left (not entering opposing lane of travel)

4. On curve--allowed car to go off road edge to right or left (not entering opposing lane of travel)

5. Other

5.9. Other Critical Moment Performance Errors

6. Pedestrian Errors

6.1. Pedestrian ran into traffic

2. Pedestrian jaywalking

9. Other

9. Other Human Causal Factors (Direct)

SECTION 9. INDIVIDUAL FACTOR DESCRIPTION

VEHICLE FACTORS

This refers to all vehicle-related deficiencies which result in an accident, or increase the severity of vehicle impact which results. Included are system failures, degradations, and worn components.

Included under this heading are visual limitations associated with the vehicle, including those caused by objects or substances in, attached to, or adhering to the vehicle.

1. Tires and Wheels

   This includes all causal failures and improper conditions associated with tires and wheels. Included are inadequate tread depths, blow-outs, mismatches of tire types and/or sizes, improper inflation, and wheel failures.

2. Brake System

   This includes all accidents resulting from the failure, or degraded or abnormal performance, of the braking system. This includes both gross failure of all or part of the braking system, delayed braking (as where pumping is required), brake imbalances (as where hard application causes a marked change in vehicle path), etc.

3. Steering System and Suspension Problems

   Subcategories of the steering system include all failures or degradations of the steering system whereby accurate steering control is negated or made grossly more difficult than ordinarily expected. Examples include excessive freeplay and freezing or locking of the steering gear.

   Subcategories of suspension problems include failures or degradations of shock absorbers, springs, bushings, locating links and arms, etc., which hinder vehicle control.

4. Power Train and Exhaust

   This includes any failure or substandard performance that is a factor in an accident, such as a sudden loss of power or the leakage of exhaust fumes into the driver compartment, with a consequent detrimental effect on driver behavior.

5. Communication System

   This includes all failures and degradations of systems by and through which drivers send and receive the information necessary for safe completion of the driving task. These systems thus include lights, glazed surfaces, windshield wipers, defrosters, horns, and radio or tape player volume.

6. Driver Seating and Controls

   This includes all instances where driver seat location failures and deficiencies impair the driver's ability to safely complete the driving task, as by limiting his ability to see and/or manipulate controls, as well as where difficulty is experienced with driver controls, such as when an accelerator pedal sticks.

7. Vehicle and Load Dimensions and Weight; Towing Attachments

   This includes all causal or severity increasing factors in accidents that pertain to vehicle or cargo length, width, or weight, and also to failures or deficiencies of towing or pushing equipment. Shifting loads and use of warning flags are included in this category.

8. Miscellaneous: Hood, Doors, Pre-crash Fires, Deterioration, Age

   All vehicular factors not categorized elsewhere are placed in this category. Under this heading are all failures in the integrity of body and doors which act to impede vehicle control and hence are precrash causative factors; fires occurring pre-crash as accident causal or severity increasing factors, and old, or generally decrepit vehicle parts or systems that contributed to accident causation or severity.

SECTION 10. INDIVIDUAL FACTOR LIST

VEHICLE FACTORS

1. Tires and Wheels
   - 1.1. Inflation
     - 1.1.1. Under-inflation
     - 2. Over-inflation
     - 3. Improper pressure distribution
   - 1.2. Inadequate tread depth
   - 3. Flat tire, blow-out; sudden failure
   - 4. Wheel broke off
   - 5. Grease seal leaked on brake lining
   - 6. Wheel drum not concentric
   - 7. Wheels not properly aligned
   - 8. No snow tires or chains
   - 9. Other
2. Brake System
   - 2.1. Total failure--front and rear
     - 2.1.1. Wheel cylinder failed
     - 2. Brake line failed
     - 3. Master cylinder defect
     - 4. Insufficient fluid level
     - 5. Adjustment mechanism loss or failure
     - 9. Other
   - 2.2. Failure-related front only
     - 2.2.1. Wheel cylinder failed
     - 2. Brake line failed
     - 3. Master cylinder defect
     - 4. Insufficient fluid level
     - 5. Adjustment mechanism loss or failure
     - 9. Other
   - 2.3. Failure-related rear only
     - 2.3.1. Wheel cylinder failed
     - 2. Brake line failed
     - 3. Master cylinder defect
     - 4. Insufficient fluid level
     - 5. Adjustment mechanism loss or failure
     - 9. Other

2.4. Total failure--unknown or unspecified as to portion affected
2.4.1. Wheel cylinder failed
2. Brake line failed
3. Master cylinder defect
4. Insufficient fluid level
5. Adjustment mechanism loss or failure
9. Other
2.5. Delayed braking response/pumping required
2.5.1. Required pumping due to improper adjustment
2. Other reasons
2.6. Imbalance (pulled left or right)
2.7. Brakes grabbed, locked prematurely, or were over-sensitive
2.7.1. Improper proportioning front-to-rear (e.g., rear wheel lock-up)
2. Brakes "grabbed", locked prematurely, or were over-sensitive, etc.
9. Other
2.8. Trailer brakes
2.8.1. Failure of trailer brakes
2. Insufficient trailer brakes
3. No individual brakes on trailer
9. Other
2.9. Other difficulties with brakes
3. Steering System and Suspension Problems
3.1. Steering System
3.1.1. Excessive freeplay
2. Binding (undue effort required)
3. Freezing or locking
9. Other
3.2. Suspension Problems
3.2.1. Shock absorber problems
3.2.1.1. Weak shock absorbers
2. Missing, broken, or other shock absorber problems
9. Other
3.2.2. Spring problems
3.2.2.1. Broken, missing, or defective springs
2. Raised rear-end

3.2.2.3. Spring imbalances (due to helper springs, overload springs, spring spacers, etc.)

9. Other

3.2.3. Other suspension problems

4. Power Train and Exhaust

4.1. Power train difficulties

4.1.1. Ran out of fuel

9. Other problems

4.2. Exhaust system (toxic fumes)

4.2.1. CO leaked into driver's compartment

9. Other problems

5. Communication Systems

5.1. Vehicle lights and signals

5.1.1. Headlamp problems

5.1.1.1. Inoperable headlamps

2. Mis-aimed headlamps

3. Dirt-obscured headlamps

4. Other

5.1.2. Inoperable taillights

3. Inoperable turn signals

4. Taillights or turn signals obscured by dirt, road grime, etc.

9. Other

5.2. Vehicle-related vision obstructions

5.2.1. Due to ice, snow, frost, water, or condensation on windows

2. Due to cracked or opaque windows (e.g., cardboard or stickers on windows)

3. Due to design or placement of windows

4. Due to objects in or attached to vehicle

5. Due to inoperative or deficient vision hardware

5.2.5.1. Inoperable or mis-aimed windshield washer

2. Inoperable or ineffective wiper

3. Inoperable or inadequate defroster

4. Absence or condition of mirrors

9. Other

5.2.6. Due to glare from sun or headlamps reflected off vehicle
7. Other vision problems, vehicle-related

5.3. Auditory Problems
5.3.1. Inoperative or weak horn
2. Excessive radio or tape player volume inside car
9. Other

5.9. Other vehicle related communications problems (i.e. in other systems)

6. Driver seating and controls
6.1. Driver controls
6.1.1. Steering wheel problem (e.g. spinner snagged clothing)
2. Brake pedal problem (e.g. pedal broke off)
3. Accelerator problem (e.g. stuck)
9. Other

6.2. Driver anthropometric
6.2.1. Seat loose or became detached
2. Driver not positioned to adequately reach controls
3. Driver not positioned to see adequately
9. Other

6.9. Other

7. Vehicle and Load Dimensions and Weight; Towing Attachments
7.1. Vehicle dimensions and weight
7.1.1. Vehicle too long (e.g. trailer too long, too many trailers)
2. Vehicle too wide (e.g. farm equipment too wide for one lane)
3. Vehicle weight poorly distributed
9. Other

7.2. Load dimensions and weight
7.2.1. Cargo too long (e.g. load projects and collides with other vehicle)
2. Cargo too wide (e.g. cargo too wide for one lane)
3. Load poorly distributed
4. Load shifts
5. No warning flags on oversize load
9. Other

7.3. Towing and pushing equipment
7.3.1. Towing connection failed
2. Pushing equipment separated from vehicle
3. Towing or pushing connection failed to provide sufficient stability
9. Other

8. Miscellaneous; Hood, Door, Fire, Deterioration

8.1. Hood flew up, door came open (precrash)

2. Vehicle caught fire (precrash)

8.2.1. Leaky carburetor contributed to fire

2. Leaky exhaust pipe contributed to fire

3. Faulty electrical system contributed to fire

8.3. Deterioration, Age

8.3.1. The age of the car (older cars are in poorer condition)

2. Car generally decrepit or deteriorated

3. Irreparable damage; previous accidents or breakdowns resulting in weakening of vehicle parts

9. Other Vehicle Factors

SECTION 11. INDIVIDUAL FACTOR DESCRIPTION

ENVIRONMENTAL FACTORS

Environmental factors are those conditions external to the driver/vehicle or pedestrian which increase the risk and severity of accident involvement unnecessarily or to an excessive extent. In assessing the environmental factors, an ideal norm is assumed, based on ideal ambient conditions and on published design and control standards in common usage. The main headings in this list are categorized by the particular types of problems that result from these factors, such as Control Hindrances or View Obstructions and by the type of environmental structure described in the category, such as Signs or Signals. For example, the largest category, Design Geometrics, is organized according to type of environmental structure and includes subcategories of specific environmental design features, such as Interchanges, Recovery Area, Roadway Width, etc. Ambient and maintenance conditions are organized under the particular types of problems engendered by the condition or the specific environmental feature involved rather than as separate categories. For example, snow and ice which causes the road surface to be slippery is classified as a Control Hindrance, and a broken guardrail is listed among guardrail factors in Restraining Devices, a next-level category of Design Geometrics. The main categories of Environmental factors are:

1. General Factors
2. Control Hindrances
3. Design Geometrics
4. Signing
5. Signals
6. Markings
7. Special Transitory Hazards
8. Environment Related Vision Obstructions or Hindrances

The environmental factors are non-overlapping. In some instances a particular environmental feature is relevant as a factor to several categories. For example, a roadway sign is relevant to signing in the sense of an informational device, but it may also be a factor as a view obstruction or as a hindrance to safe movement in the recovery area. In such cases, the environmental feature is described or listed in each of the relevant categories, i.e. a sign is described as a conveyer of information in the heading, Signing, as a view obstruction in Environment Related View Obstructions or Hindrances, and as a recovery area obstacle in Design Geometrics: Recovery Area. The other categories relevant to any feature and their locations are specified in the factor list, often alongside the main category. Thus, the main category, Signing, refers the coder also to signs as obstacles or as view obstructions.

The categories are defined and described as follows:

1. General

This category includes factors which apply to overall environmental conditions rather than to any one aspect of the environment. Such factors often have a general effect on driver behavior or responses. Among these factors are general conditions, such as Traffic density, Environmental overload, Roadway confuguration presented large area to scan, etc. which may make the driving task somewhat difficult for even an alert and responsive driver. The subcategory, Symbolism of vehicle types, refers to ideas or notions that a driver may associate with the use of specific types of vehicles, such as An ambulance makes its driver think speed is necessary, or A driver of a small car tends to take chances that drivers of large cars do not.

2. Control Hindrances

This category includes those factors which effect the directional stability and control of the vehicle. In some instances the safety of pedestrian travel also may be lessened by these conditions. Factors relevant to this category are low coefficient of friction of the road surface due to such reasons as surface wear, oil deposits, snow, ice, etc; road surfaces which are uneven, rough, or in other ways of poor riding quality; the alignment and quality of the shoulder surface; the slope of surfaces and banks in the recovery area; banked or crowned roadways; and wind, as a factor effecting directional stability and control.

3. Design Geometrics

Factors in this category relate to planning and design considerations of the roadway and roadside areas. These are factors which vary from ideal design practices, and each condition can substantially increase the risk of accident involvement and accident severity. The main subcategories under this heading are Roadway width, Grade or curve; Interchange design features; Intersections; Recovery area; Restraining devices; Bridge, tunnel, roadside structure, curb; and a Miscellaneous category which includes Drainage and Pedestrian facilities. Further description is thought to be useful for several of these categories. Recovery Area includes the next-level categories Shoulder, Median, Roadside, and Gore area and refers specifically to width and clearance in these areas. Channeling devices refers to the availability, design, and maintenance of median barriers, guardrails, as well as construction barriers. The category Pedestrian facilities includes provisions for overpasses and underpasses, sidewalks, and routing of after-school traffic.

4. Signing

Various road signing problems of availability, design or structure, and maintenance which can increase the risk of accident involvement for driver or pedestrian are described in this category.

5. Signals

This category includes the availability of traffic signals, appropriateness of signal types, and problems in signal design, timing, and maintenance.

6. Markings

The factors in this category refer to the availability and maintenance of roadway markings such as centerlines or road edge markings, and of object markings on physical obstructions in or near the roadway.

7. Special Transitory Problems

This category refers to transient hazards which increase the risk of an accident. Included are stopped vehicles, objects, and animals in the road, glare from headlights, and non-contact moving vehicles and drivers which cause problems. Examples of the latter kind include vehicles which force accident-involved vehicles off the road, and then continue without involvement. Since it cannot be determined what the nature of the human, vehicular, or environmental causes are which resulted in the errant behavior of the non-contact vehicle, it is desirable to view the actions of such a vehicle as transient environmental hazards for the involved driver who is the subject of the investigation; consistency can only be achieved in this manner.

8. Environment Related Vision Obstructions and Hindrances

This category includes those environmental factors which limit the visual field of the driver beyond the boundaries of the vehicle or of the pedestrian. The four next-level categories are Vision Obstructions, Low Visibility, Ambient Visibility Limitations, and Illumination Problems. Vision Obstructions include view limitations due to curves, dips, or hills in the roadway; roadside embankments and structures or trees and bushes which impede vision; traffic as a view obstruction; and dirt, mud, snow, or ice which obscures roadway features. Low visibility includes low visibility of motorcycles due to small size, and the blending of pedestrians, vehicles, etc. into the background due to a camouflage effect. Ambient visibility refers to atmospheric conditions such as rain, snow, fog, darkness, etc. that limit visibility. The subcategory Illumination problems specifies factors related to the use and adequacy of artificial lighting and to the provision of reflectorized markings.

SECTION 12. INDIVIDUAL FACTOR LIST

ENVIRONMENTAL FACTORS

1. General
   - 1.1. General traffic conditions
     - 1.1.1. High traffic density
     - 2. Traffic making frequent changes in velocity and track
     - 9. Other
   - 2. Environmental overload, complexity of traffic environment
   - 3. Ambient conditions such as temperature, dust, rain causing general driver discomfort
   - 4. Road under construction or repair
   - 5. Driver not acclimated to modernizations in roadway
   - 6. Road configuration presented large area to scan
   - 7. Monotonous road conditions
   - 8. Symbolism of vehicle types
     - 1.8.1. An ambulance makes its driver think speed is necessary
     - 2. Fire equipment can be expected to run red lights
     - 3. A customized car suggests that its driver may do risky things
     - 4. The big truck and trailer will block the road because of slow speed on an upgrade
     - 5. Post office trucks make the driver feel he can stop in crosswalks or intersections to pick up mail
     - 6. A motorcycle suggests that its driver may disobey traffic ordinances
     - 7. A driver of a small car will tend to take chances that drivers of large cars do not
     - 9. Other
   - 1.9. Other
2. Control Hindrances
   - 2.1. Road surface
     - 2.1.1. Road surface low coefficient of friction
       - 2.1.1.1. Due to traffic polishing
       - 2. Due to surface materials
       - 3. Due to oil deposits
       - 4. Due to water
       - 5. Due to snow
       - 6. Due to ice
       - 7. Due to salt slush
       - 9. Other
     - 2.1.2. Uneven road surface
       - 2.1.2.1. Poor riding quality; surface rough, bumpy
       - 2. Loose sand or gravel on road surface

2.1.2.3. Cracks, ruts, potholes, ravelled edges
4. Expansion joints raised above road surface
5. Lane joints open, rough, or uneven
9. Other

2.1.3. Dirt or gravel road

2.1.9. Other

2.2. Shoulder surface and alignments (see 3.5.1. for shoulder width)

2.2.1. Shoulder constructed of soft materials

2. Shoulder wet
3. Snow on shoulder
4. Ice on shoulder
5. Shoulder lower than pavement
6. Shoulder not aligned with ground
9. Other

2.3. Recovery area surface (see 3.5. Recovery Area for "width" and "obstacles")

2.3.1. Too much slope in recovery area

2.3.1.1. Excessive median slope
2. Excessive slope in gore area
3. Excessive slope on sides of road
9. Other

2.3.2. Hills, cuts, ditches in recovery area

2.3.9. Other

2.4. Roadway inadequately banked or unbanked

2.5. Excessive road crown

2.6. Wind

2.6.1. Moderate crosswind

2. Gusty crosswind
3. Strong crosswind
4. Moderate parallel wind
5. Gusty parallel wind
6. Strong parallel wind
9. Other

2.9. Other

3. Design Geometrics

3.1. Roadway width

3.1.1. Narrow lane width

2. Excessive lane width

3.1.3. Three lane road with high traffic volume

9. Other

3.2. Grade or curve (note: For grade or curve as view obstruction, code subfactor of 8. Environment Related Vision Obstructions; for Grade or Curve problems at interchanges, code subfactor of 3.3. Interchange Design Features)

3.2.1. Curve

2. Grade

3. Excessively winding, twisting roadway

4. Curve at end of long straight segment

5. Downgrade or upgrade curved

6. "At grade" railroad crossing

7. Truck lane needed on upgrade

8. Truck escape ramp needed on long, steep downgrade

9. Other

3.3. Interchange design features

3.3.1. Longitudinal inadequacies

3.3.1.1. Insufficient maneuvering distance between exit ramps

2. Insufficient maneuvering distance between entry terminal and exit

3. Entry lane too short to permit safe merging of traffic in interchange

9. Other

3.3.2. Transectional inadequacies

3.3.2.1. Exit and entry lanes too narrow for traffic volume

2. Exit ramp two lanes wide where leaves mainline, extra mainline lane not available

3. Entrance ramp two lanes wide at merge with mainline, extra mainline lane not available

4. Ramp shoulders too narrow

9. Other

3.3.3. Grade or curve inadequacies

3.3.3.1. Exit ramp leaves mainline where mainline curves left, rather than on tangent section

2. Entry ramp joins mainline at too great an angle

3.3.3.3. Exit ramp leaves mainline at too great an angle

4. Curve of ramp poorly designed (too sharp, not banked, compound "S" curve)

5. Entering ramp curve not fitted to roadway curve

6. Ramp gradient too steep

9. Other

3.3.4. Poor location of exit ramp terminal (i.e. in proximity of businesses or poor transition with adjoining roadway)

9. Other

3.4. Intersections

3.4.1. No traffic separation at busy intersection

2. Left turn lane or speed change lane needed at crossing

3. Left turn median lane too short to store volume of left-turning traffic

4. Traffic circle acts as hazard for high speed through traffic

5. Safe stopping sight distance to intersection inadequate

6. Turning radius too short, causing cars to change lanes

7. Inadequate channelization of traffic at oblique intersection, three-leg junctions, multi-leg intersections

8. Acceleration and deceleration lanes not long enough to accommodate vehicles at non access-controlled facilities

9. Other

3.5. Recovery Area - Shoulder, Median, Roadside, Gore Area (see 2.3. Recovery Area Surface for slopes, ditches, etc. as control hindrances; see 8. Environment Related Vision Obstructions, etc. for signs, structures, etc. as view obstructions.)

3.5.1. Shoulder

3.5.1.1. Shoulder too wide; over 6', used for overtaking

2. Shoulder too narrow (code 3.4.2.4. in case of ramp shoulders)

9. Other

3.5.2. Gore area

3.5.2.1. Unnecessary signing, light standards, or roadway structures in gore area

2. Signs without breakaway supports in gore area (distinct from 3.5.2.1. above, unnecessary signing)

3.5.2.3. Trees, brush, natural obstacles in gore area

9. Other

3.5.3. Median

3.5.3.1. No median provided

2. Median too narrow

3. Trees, brush, rock outcroppings in median

4. Signs without breakaway supports

5. Signs with breakaway supports

6. Obstructing bridge abutment

7. Obstructing culvert headwall

8. Debris in median

9. Other

3.5.4. Roadside area

3.5.4.1. No recovery area provided

2. Recovery area too narrow

3. Trees, brush, rock outcroppings in roadside area

4. Signs without breakaway supports

5. Signs with breakaway supports

6. Bridge abutment or culvert headwall

7. Utility pole

8. Pedestrian travel, footpaths

9. Other

3.5.9. Other

3.6. Restraining Devices

3.6.1. Availability of median barriers, guardrails, or construction barriers

3.6.1.1. No median barrier where needed (barrier desirable on lightly to moderately traveled divided highways with 20' or less median width; on heavily traveled highways with 30' or less median width)

2. No guardrail where one needed

3. Guardrail too short, i.e. not generously spanning escarpment, ending in advance of piers or other obstacles

4. Insufficient or improperly placed barriers channeling vehicles through construction area

9. Other

3.6.2. Structure of median barrier or guardrail

3.6.2.1. Type of median barrier inappropriate for location

2. Spacing of posts for guardrail used as median barrier too far apart (6'3" spacing desirable at high exposure locations)

3. Median barrier ends not buried or flared, or approach end of guardrail not flared away from roadway and anchored to ground

4. Guardrail end not secured to bridge paraput or other structure

5. Guardrail not blocked out or supported away from post to minimize pocketing

6. Guardrail too close to road edge (minimum of 2-3 feet beyond shoulder allowable, 12 to 13 feet desirable)

7. Curb in front of barrier or guardrail, causing vehicle to land on top of or hurdle installation (see also 3.7. Bridge, etc.; tunnel, roadside structure, curb)

8. Barrier or guardrail weak or broken

9. Other

3.7. Bridge, tunnel, roadside structure, curb

3.7.1. Bridge, tunnel, or underpass too narrow; width of or narrower than roadway

2. Lateral clearance at bridge abutment inadequate

3. Approach angle at bridge, tunnel, or underpass too acute for safe turn or adequate sight distance

4. Barrier curb too low

5. No barrier curb where needed

6. Barrier curb where not desirable, e.g. in front of guardrail

7. Safety walk over bridge; curb causes vehicle to bounce over paraput

9. Other

3.8. Miscellaneous

3.8.1. Drainage

3.8.1.1. Inadequate provisions for drainage

2. Drainage system blocked or clogged

9. Other

3.8.2. Inadequate pedestrian facilities (for pedestrian information facilities see 4. Signs, 5. Signals, 6. Markings)

3.8.2.1. No pedestrian underpass or overpass where needed

2. No sidewalks where needed

3. Inadequate routing or direction of school children and traffic in school area

9. Other

3.9. Other Design Geometric problems

4. Signing (see 3.5. Recovery Area for signs as obstacles and subcategories of 8. Environment Related Vision Obstructions, etc. for signs as view obstructions, dirt, snow obscured signs, and sign illumination or reflectorization)

4.1. No sign where needed

4.1.1. Regulatory signs

4.1.1.1. Right-of-way signs (yield, stop)

2. Speed (speed zone ahead, speed limit, end speed limit)

3. Movement (one way, do not pass, pass with care, keep right)

4. Parking signs

5. Pedestrian signs

9. Miscellaneous regulatory signs (other)

4.1.2. Warning signs

4.1.2.1. Alignment series (turn, curve, reverse curve)

2. Intersection series (approaching intersection: cross road, side road, etc.)

3. Channelization and pavement series (sudden change in width or condition of roadways; i.e. narrow bridge, divided highway, pavement ends, one-lane bridge)

4. School signs (at school grounds and school crossings)

5. Railroad crossing signs (railroad advance warning signs, railroad crossbuck signs)

9. Miscellaneous (other)

4.1.3. Guide signs

4.1.3.1. Route markers (to identify highways)

2. Destination and distance signs (city, town, mileage, identification of exit)

3. Information signs (scenic attractions, points of local interest, city and county lines, county police stations)

9. Miscellaneous (other)

4.1.9. Other

4.2. Signing inadequacies

4.2.1. Structure or maintenance of sign

4.2.1.1. Sign down

2. Sign leans

3. Sign turned, can't be read or easily misread

4. Sign too low, too high

9. Other

4.2.2. Location, prominence, confusion

4.2.2.1. Detraction because of unnecessary signing

2. Location of sign inadequate

3. Nonstandardized signing

4. Prominence of signing inadequate (sign size, letter size, differentiation between major and minor signs)

5. More information given than could be read and comprehended

6. Message unclear or easily misinterpreted

7. Signing not relatable to tour maps

9. Other

4.2.9. Other signing problems

5. Signals (see 3.5. for signal structures as obstacles and 8.1.8. for dirt, snow, etc. obscured signals)

5.1. Traffic signal needed

5.1.1. No signal where needed (minimum criteria of traffic volume, interruption of traffic volume, and accident experience justify signal device)

2. No left turn traffic signal where needed

3. No separate and distinct signal phase for urban pedestrian crossings

9. Other

5.2. Traffic signal where not needed

5.3. Signal inadequacies

5.3.1. Inadequate contrast between signal and other lights in vicinity

2. Signal as distraction

3. Traffic signal light too small or too dim

4. Traffic signal too low or too high

5. Cycle length too long or too short

6. Change in type of signal needed

7. Traffic signal not coordinated with railroad crossing signal

5.3.8. Traffic signal inoperative or down

9. Other

5.9. Other signal difficulties

6. Markings (see subcategories of 8. Environment Related Vision Obstructions, etc. for snow, ice, etc. obscured markings and reflectorized markings)

6.1. No markings

6.1.1. No centerline or lane marking

2. No stop line marking

3. No barrier line at no-passing zone

4. No crosswalk markings for pedestrians

5. No road edge markings

6. No pavement-width transition markings

7. No nose or funnel markings at exit or entry ramps

8. No object markings on physical obstructions in or near roadway

9. Other

6.2. Insufficient markings

6.2.1. Insufficient lane marking to warn vehicles of approaching exit from expressway or interchange

2. Insufficient lane marking to warn vehicles of approaching entry lane traffic

3. Inadequate channeling of traffic in advance of intersection or interchange

4. No passing lines not placed so as to allow safe sight distance for passing

9. Other

6.3. Markings worn or obscured

6.3.1. Markings worn away

2. Markings partially worn away

9. Other

6.9. Other marking problems

7. Special Transitory Hazards

7.1. Standing or overturned vehicle in road--previous accident

2. Standing vehicle in road--other

3. Driverless moving vehicle in road

4. Noncontact moving vehicle caused problem

5. Glare from headlights

6. Fallen stone, tree, object in road

7.7. Fallen load in road

7.8. Animal in road

7.8.1. Live animal

2. Dead animal

7.9. Other transitory hazards

8. Environment Related Vision Obstructions or Hindrances

8.1. Vision obstructions

8.1.1. Due to curve or grade (see next subcategory, 8.1.2. if at interchange)

8.1.1.1. Crossroad hidden by curve

2. Railroad crossing hidden by curve

3. Downhill passing sight distance restricted by overpass structure

4. Curve as view obstruction, other

5. Grade as view obstruction, other

8.1.2. Field of view limited at interchange

8.1.2.1. Exit ramp hidden by curve, overpass or other structure

2. Entrance ramp terminal hidden from mainline by curve, overpass or other structure

3. View of traffic from ramp terminal inadequate

9. Other

8.1.3. Roadside embankments, escarpments as view obstruction

4. Roadside structure as view obstruction

5. Brush, roadside growth, trees as view obstruction

6. Buildings as view obstruction

7. Traffic or pedestrians as view obstruction

8.1.7.1. Stopped or moving traffic

2. Parked vehicle

3. Pedestrians

8. Dirt, mud, snow, ice obscured features

8.1.8.1. Sign, signal, markings, other object obscured by dirt, mud, snow, ice, etc.

2. Traffic signal, lens, reflector, or bulb dirty

9. Other

8.2. Low visibility

8.2.1. Low visibility of motorcycle due to small size

2. Camouflage effect

8.2.2.1. Vehicle blends into background

2. Pedestrian blends into background

8.3. Ambient visibility limitations

8.3.1. Rain

2. Snow

3. Fog

4. Dusk

5. Darkness

6. Glare from sun

8.3.6.1. Direct

2. Reflected off roadside object (when reflected off vehicle, code as Vehicle Factor

7. Dust as visibility limitation

9. Other

8.4. Illumination problems

8.4.1. Artificial lighting needed

8.4.1.1. Lighting of sign

2. Lighting of curve

3. Lighting of intersection or interchange

4. Lighting of other portion of roadway

9. Other

8.4.2. Reflectorized markings needed on pavement

3. Reflectorized markings needed on roadside obstacle

4. Reflectorized lettering on sign needed

5. Illumination provided where not needed

6. Inadequacies in illumination

8.4.6.1. Placement, design, type of lighting inadequate

2. Transition zone needed for drivers passing into and out of lighted area

9. Other

8.4.9. Other illumination problems

8.9. Other environment related vision obstructions or hindrances

9. Other environmental factors

SECTION 13.

ACCIDENT CAUSAL ANALYSIS SYSTEM

PHASE TWO

In phase two, revisions of the Causal Analysis System developed in phase one are recommended. A number of revisions are suggested which should provide a means of more completely representing the interrelationship of factors. As interactions and interdependencies among factors are basic to the occurrence of the accident event, many revisions to be considered here are basic changes of the structure of the phase one system. A complete phase two system, including detailed coding procedures and instructions, has not been developed, but rather recommendations for refinements of the Accident Causal Analysis System are indicated for future considerations.

The purpose of an accident causal analysis system is to study causal factors in the accident event. Study of factors can be of two types: identification of significant factors associated with the event, and observation of the interrelationships between factors. Two types of descriptive data are coded in an analysis system. The first are data which identify and describe the event, e.g. roadway type, vehicle type, crucial event, etc. The second data which describes the individual factors which contributed to the occurrence of the event. The component factors in the event are analyzed and described according to their function in the event.

General Descriptive Data

Accident events occur in a variety of circumstances and are of different types. Due to the variety of accident events included in the study, additional data which are generally descriptive of the characteristics of the accident event are recommended for inclusion in phase two of the Accident Causal Analysis System. These are data which have been previously encoded at HSRI, e.g. in CPIR forms, however, in order that the system include all analysis data necessary for general analysis purposes, these additional data should be added to the descriptive data in phase one. The data include:

1. Basic identifying characteristics of Human and Environmental elements, e.g. driver age and sex, roadway type and special characteristics such as intersections or interchanges.

2. Crucial Event, e.g. left available path, rollover, etc.)

3. Accident and Injury Severity, e.g. VDI and average AIS per traffic unit.)

Individual Factor Description

In order to represent the interrelationship of factors in an analysis system there must be a description of all component factors of the event according to their function in the event. In phase one, some factor types are partially listed, factor components are unanalyzed, and categorization of some factors is inappropriate. These problems result in restrictions on the number of factors described and on the observation of interrelationships of factors. The following

are comments on the phase one organization of individual factors and suggested refinements of the system.

1. Factors in phase one are organized into Condition Factors and Direct Factors. Condition Factors are qualities of the human, vehicle, and environment which contribute to the collision. Direct Factors are actions or inactions of the human, vehicle, or environment which contribute to the collision. Condition Factors are described in all three elements; Direct factors are described only in the human element. In order to identify all causally related factors and represent interrelationships of factors, Direct Factors must be structured in the vehicular and environmental elements. Examples of Direct Factors in these elements are "vehicle braking efficiency reduced," "vehicle engine failed," "vehicle skidded on icy roadway," "reduced control of vehicle on soft shoulder". It may appear redundant to list Direct Factors in these elements. Vehicle and Environment Direct Factors can be predicted from Condition Factors; e.g. "reduced braking efficiency" (Direct Factor) predictably results from the Condition Factor, "worn brake linings", and "vehicle skidded on icy roadway" (Direct Factor) is the predictable outcome of the Condition Factor, "icy roadway". However, to identify and structure factors so as to represent interrelationship of factors in the event, it would be necessary to describe Direct Factors in these elements.

2. Human Direct Factors in phase one include two distinct types of factors. Direct Factors describe actions or inactions which contributed to the accident event. There are, however, two types of activity to be considered in the human element. These are thought (activity in the internal environment), and action (activity in the external environment). Thought and action are two distinct fields of activity and are the two components of Human Direct Factors. As the function of a causal analysis system is to analyze component factors in an event, thought and action should be organized into two separate categories. At present the phase one system lists some factors which describe thoughts, e.g. "misjudgment of closure rate," "assumed other vehicle had to stop,"; and other factors which consist of actions, e.g. "followed too closely," "speed too fast for traffic conditions".

It does not appear feasible to develop a Direct Factor List of thoughts that contribute to accidents. Such a list would be too broad in scope and most factors would be unidentifiable. For example, the thoughts causally related to a driver's action of exceeding the speed limit might be innumerable, many of them unrelated to the roadway environment, and many unidentifiable. Some semblance of thought factors could be structured by describing the manner in which the driver related to the roadway and traffic environment as a result of thoughts, e.g. "driver thought he would speed", "driver did not think to check for cross traffic", etc. However, listing of thought factors in this form is approximately the equivalent of listing Condition Factors, Driver Knowledge, discussed in #6.

It is reasonable, however, to construct a complete list of driver actions and inactions that were causally related to the collision event. Human Direct Factors could describe all driver actions or inactions in the external environment which were found to contribute to the collision. (See #3, organization of Human Direct Factors, #4, listing of Human Direct Factors.)

3. Individual factors in phase one Human Direct Factors are categorized in the main headings, Recognition Errors, Decision Errors, and Performance Errors. Recognition, decision, and performance come into play in the following way:

THOUGHT		ACTION
Recognition	Decision	Performance

The phases of recognition, decision, and performance span the two components of driver activity, thought and action. The following are examples of these three phases in individual driver errors:

"Driver failed to observe stop sign." (Recognition Error, phase one)

THOUGHT		ACTION
Did not recognize stop sign.	Decided to enter intersection. (Decision based on insufficient information.)	Drove into intersection without slowing or stopping, did not have right of way.

"Driver drove too fast for road or traffic conditions." (Decision Error, phase one)

THOUGHT		ACTION
Did not recognize safe speed for road or traffic conditions.	Decided to exceed safe speed for road or traffic conditions.	Drove at speed too fast for road and traffic conditions.

"Driver mistakingly used gas pedal instead of brake pedal." (Performance Error, J.S. Baker & L.R. Horn's "An Inventory of Factors Suggested as Contributing to Traffic Accidents".)

THOUGHT		ACTION
Did not recognize pedal position relative to foot position.	Decided to use gas pedal.(Decision based on insufficient information.)	Used gas pedal instead of brake pedal

Since insufficiencies in recognition, decision, and performance are phases of each individual driver error, driver errors should not be grouped in these categories. The recognition/decision/performance categories possibly were formulated on the mistaken principle that human errors result from some fault in the information processing system. Driver errors do not result from flaws in information processing, but from limitations of driver consciousness. The information processing system does not somehow misstep, but the product of the information processing system is according to the consciousness of the individual.

Human Direct Factors describing driver actions require broad and definitive category headings. Categories such as Speed, Direction, Control, etc. which describe specific driver functions might suffice.

4. Human Direct Factors in phase two should include a list of driver actions and inactions that is fairly complete and can be expanded as new factors are coded. The list of direct factors in phase one is not complete, though this is because it describes both thought and action factors in the same list.

5. Condition Factors in phase one do not include driver states of mind and driver stress factors that originate during the precrash phase. For example, "preoccupation" is a condition which develops from thinking about matters other than the driving task (direct factor). "Inattention" and "distraction" are also Condition Factors which develop from Direct Factors, however each of these states of mind are categorized as Direct Factors in the phase one organization. "Panic and Freezing" is categorized as a performance error among phase one Direct Factors. The stress that develops from hurried and unsettling thoughts and actions during the precrash phase is not coded as a Condition factor, though this type of stress is most likely a frequent severity increasing factor in collisions. These are examples of Condition Factors that develop during the precrash phase and should be added to the factor list.

6. Lack of knowledge and skill is causally related to virtually every collision event, however these factors of knowledge and skill are not included in phase one. Knowledge and skills develop from thought and action. Knowledge is continually developing and changing during the precrash phase, and levels of skill also fluctuate. Knowledge and skill may be lacking due to inadequate development during driver training and education or they may be lacking due to their not being consciously available to the driver at the time of the collision event. Whatever the reason, lack of knowledge or skill which contributes to a collision can be listed as a causal factor. Examples of knowledge factors are [lack of knowledge of...] "stop sign," "vehicle stopping or slowing ahead," "speed appropriate for traffic or road conditions," "closure rate of cross traffic," "intersecting vehicle without right of way". Factors of knowledge and skill lacking in the event that was reasonably possible for a normally conscious and functionning driver to employ can be coded as causal in the event.

Knowledge and skill factors are Condition Factors that are created from driver action.

7. Critical Non-Performances and Intentional Collisions are main headings of Human Direct Factors in phase one. No Direct Factors are described for these collisions. To achieve consistency in the description of data, individual Direct Factors should be described for these collisions. There is no reason to categorize critical non-performances and non-accidental collisions separately for individual factor analysis. It can be indicated in the General Descriptive Data that collisions were critical non-performances or non-accidental collisions.

Several sources in the accident causation literature posed the question of whether critical non-performances, suicides, and intentional collisions constituted traffic accidents. The definition of traffic accident used in this causal analysis system is a disruption of the traffic system which results in vehicle damage or bodily injury. By this definition, these types of collisions constitute traffic accidents.

The above points indicate ways or directions in which the causal structure could be modified to more clearly model factors in the accident event. This second phase has provided some further development of accident causation theory and contains several concepts and ideas, for consideration, which may be new or unfamiliar in the field. It is hoped that some of these basic concepts will provide some stepping stones for further consideration and evaluation of accident causation analysis systems.

SECTION 14.

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APPENDIX D

"An Occupant Injury Classification Procedure Incorporating the Abbreviated Injury Scale"

NOTE: As a result of subsequent comments and experience, significant improvements have been made to the OIC scheme and procedure. These refinements were presented to the SAE Subcommittee on Accident Investigation Practices in Oklahoma City on November 14, 1973. The OIC application procedure presented at that time is the one included in the 1973 Editing Manual and Reference Information and should be used for 1974 accident reports rather than the following documentation. This presentation emphasized the rationale for the OIC. The later documentation emphasizes the application.

An Occupant Injury Classification Procedure Incorporating the Abbreviated Injury Scale

Un Procédé de Classification de Blessures des Voyageurs Incorporant l'Échelle de Blessures Abrégée

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Road Safety Pilot Study

Accident Investigation Project
Final Accident Investigation Workshop

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ABSTRACT

A new procedure for classifying individual occupant injuries was derived from the NATO "Collision Analysis Report Form" that permits the correlation of injury sources (contact areas) and specific injuries. The Occupant Injury Classification (OIC) follows an approach similar to the Collision Deformation Classification (SAE J224a). Four dimensions or facets are described by letters: Body Region, Aspect, Lesion and Body System/Organ. The OIC is terminated with an Abbreviated Injury Scale (AIS) severity number.

The injuries of nearly 7,000 vehicle occupants have been reported on the existing "Collision Performance and Injury Report" by investigators in the United States and stored in time-shared computer files for analysis by remote terminals. This existing system of recording occupant injuries is described briefly as a basis for establishing the new Occupant Injury Classification.

RÉSUMÉ

Un nouveau procédé pour classifier les blessures individuelles des voyageurs a été dérivé de la "Fiche de Rapport pour l'Analyse des Collisions" de NATO (O.T.A.N.) qui permet la corrélation des sources blessure (zones de contact) et les blessures spécifiques. La Classification de Blessures des Voyageurs (OIC) suit une direction de travail semblable à celle de la Classification de Déformation de Collision (SAE J224a). Quatre dimensions ou aspects sont désignés par des lettres: Région Corporelle, Aspect, Lésion et Système Corporel/Organe. La OIC se termine par un chiffre de gravité de l'Échelle des Blessures Abrégée (AIS).

Les blessures de 7,000 environ voyageurs en voiture ont été rapportées dans "Le Rapport de la Performance de Collision et des Blessures" existant par des chercheurs à l'U.S.A. et ont été mises en mémoire dans les fichiers de calculateur à opération en parallèle pour l'analyse par des bornes de commande à distance. Ce système d'enregistrement des blessures des voyageurs existant est décrit brièvement comme base sur laquelle s'établit la nouvelle Classification des Blessures des Voyageurs.

An Occupant Injury Classification Procedure Incorporating the Abbreviated Injury Scale

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The reduction or prevention of occupant injury and mortality has been and will remain one of the primary thrusts of automobile safety. Research in crashworthiness, vehicle aggressivity, people packaging, occupant kinematics, and injury mechanics has resulted in vehicle design changes that reduce the severity and likelihood of occupant injury in automobile accidents. In order to confirm the success of design changes, document new accident injury patterns and provide guidelines for future research and design changes, over a dozen field accident investigation teams across North America conduct clinical accident investigations. The Motor Vehicle Manufacturers Association of the United States, Inc.* (MVMA), the Society of Automotive Engineers, Inc. (SAE), the U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) and the Canadian Ministère des Transports, Road and Motor Vehicle Traffic Safety Branch are sponsoring in total over two thousand in-depth investigations a year.

ACCIDENT REPORT AUTOMATION AND UTILIZATION

Over 5,000 clinical investigations had been conducted as of May 1973. In order to provide an interface between these field accident reports and the data analyst, the Highway Safety Research Institute (HSRI) has developed an extensive information bank of computerized accident data files, under the sponsorship of the automobile industry (MVMA) and government (NHTSA). The field accident investigation teams prepare written case reports with 35mm slides and the Collision Performance and Injury Report (CPIR) (1)**. After the cases are submitted to the various sponsors they are transmitted to the Institute (HSRI) for editing, keypunching and computer storage. The automated computer files now contain over 800 variables on 3,503 case vehicles and 5,755 case vehicle occupants. The original cases are then returned to the sponsors for their review, publication and distribution to government, industry and research organizations. A more complete review of the 1972 MDAI report automation program has been published elsewhere (2,3).

Presently, all sponsors are being provided direct and simultaneous access to the data base through The University of Michigan's time-shared computer system (IBM 360/67) via remote batch terminals and interactive terminals (e.g., teletypes). Access is also provided to the Institute's Statistical Research System (4) which contains a extensive set of generalized data analysis programs. Through this system, users are also supplied with access to over 70 other police accident data files (5). Figure 1 displays the sources of Level III MDAI data with dots and police data with circles. Computer terminal access (dashed lines) is provided to each of the MVMA member corporations, Canadian and U.S. Departments of Transportation, and to six of the MDAI field teams.

It is not sufficient to only investigate accidents and compile the results in a computer file. The ultimate justification for our investigative efforts is their utilization in solving real problems.

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*Formerly Automobile Manufacturers Association, Inc.

**Numbers in parenthesis designate references at end of paper.

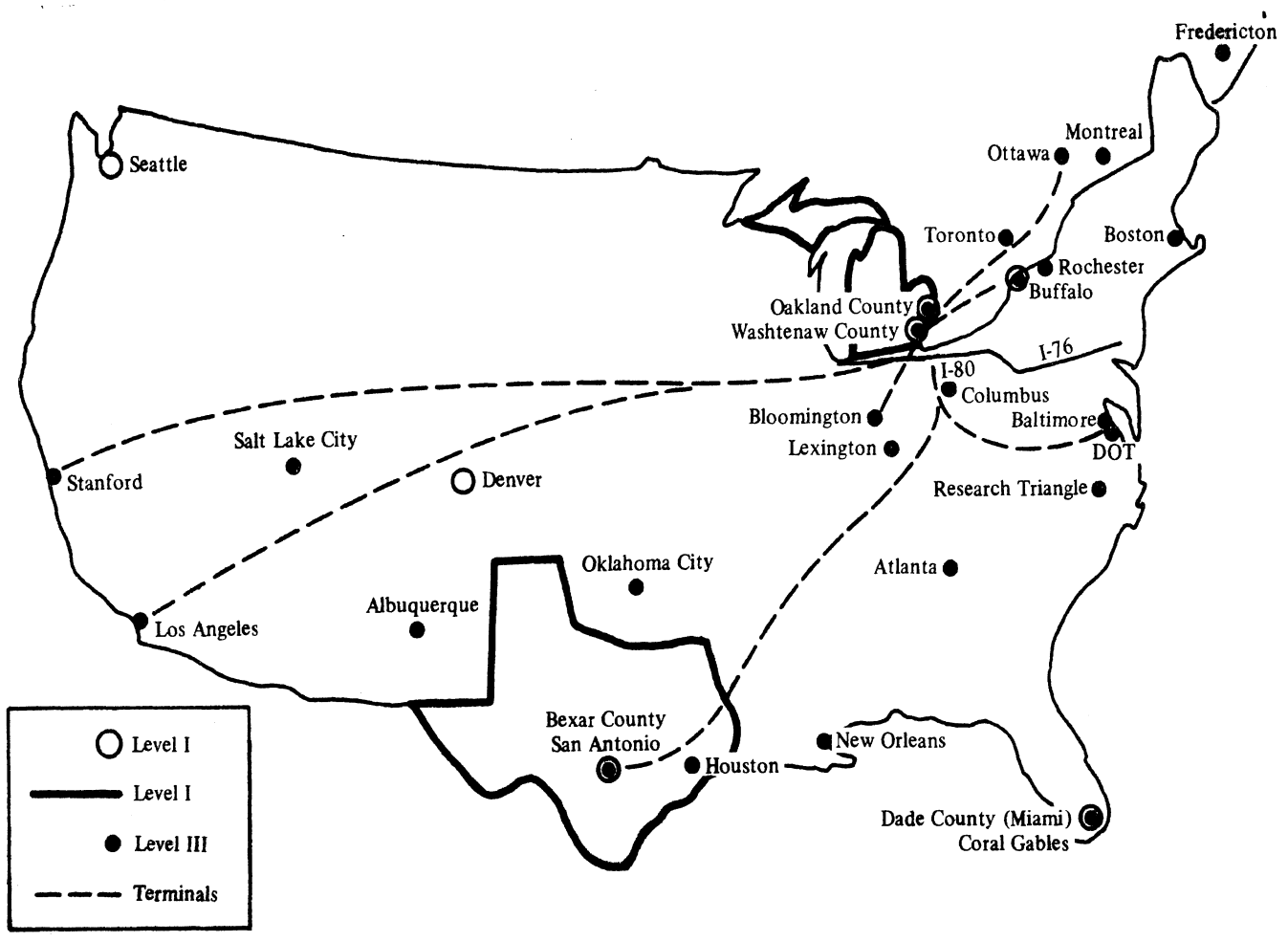

FIGURE 1
Map of Data Sources and Utilization

During the last year, the U.S. highway safety community has felt a particularly strong desire to make effective and rational use of the accident data collected to date. Partial evidence of this interest can be seen in the phenomenal growth in accident data file usage. For example, during November 1972, the MDAI case vehicle occupant file was accessed on the average of 6 times per working day from time-shared computer terminals.

There is sufficient data available now through such powerful computer programs that it is almost too easy to overwhelm yourself with "results" in the form of printouts. There is the even more real danger in accepting computer results as "truth". Conversely, one of the ways we can mature in our accident investigation and data analysis efforts is to cautiously try the system, i.e., collect and analyze accident data, questioning the results and trying again. The U.S. automobile industry and governmental agencies are now actively experiencing this healthy and sometimes painful interaction between the communities of accident investigators, data analysts and, the ultimate users, decision makers. This interaction is increasing the maturity with which each community is approaching their respective activities.

This increase in user exposure to accident data has brought into clearer focus several problems with the current methods for recording the results of clinical accident investigations for computer storage and analysis. One of these is the problem of: "What components cause injury?" One solution to this problem was first presented to American Association for Automotive Medicine (AAAM) at their Sixteenth Conference in October

1972 (6). Since the Occupant Injury Classification scheme* was first proposed to AAAM, experience has been gained while encoding several hundred cases using the OIC. This experience has permitted a more concise description of the Occupant Injury Classification procedure. The remainder of this paper will discuss each of these topics in turn:

(1) Rationale for Occupant Injury Classification Scheme
(2) Definition of Occupant Injury Classification Scheme
(3) Procedure for Occupant Injury Classification
(4) Refinements of 1972 OIC

RATIONALE FOR OCCUPANT INJURY CLASSIFICATION SCHEME

What components cause injury? This question is frequently asked yet always left unanswered. The adequate recording of occupant injury causation data is seen as possibly the most critical problem area remaining in answering this question. First, even sophisticated analysis of overall occupant injury levels can be misleading. Secondly, even when analysing specific injuries, the current Collision Performance and Injury Report form and the NATO Collision Analysis Report Form (7), besides being cumbersome to encode and analyze, has no provision for recording which area of contact or energy transfer caused a specific injury.

ROOF INJURY CAUSATION IN ROLLOVERS - It is possible, using an analysis of variance (ANOVA) program, to demonstrate a strong statistical association in rollovers between the extent of maximum roof crush and the overall occupant injury severity (8). Note how misleading this result could be. Figure 2** displays a statistical relationship, not necessarily a causal relationship.

It could be that the extent of roof crush is simply an indicator of accident severity and that injury severity increases with accident severity. Figure 3 shows that increased frontal crush in rollovers is significantly associated with increased AIS. Does this mean that increased frontal crush "causes" increased injury? Or in other words, should cars have stiff non-crushable front ends? Clearly not. It should be noted that because two variables are statistically associated, this in itself does not mean a causal relationship. Because roof crush is related to injury, this does not mean that roof crush causes injury.

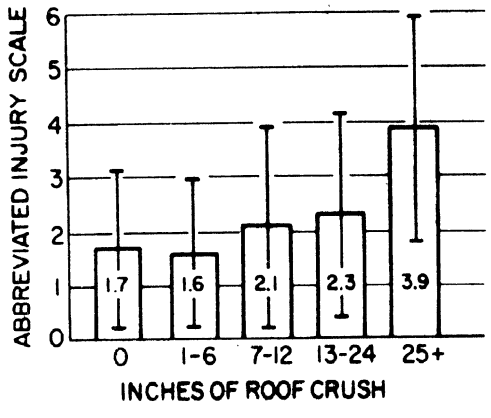

Fig. 2 - Average injury severity, rollovers (occupant not ejected)

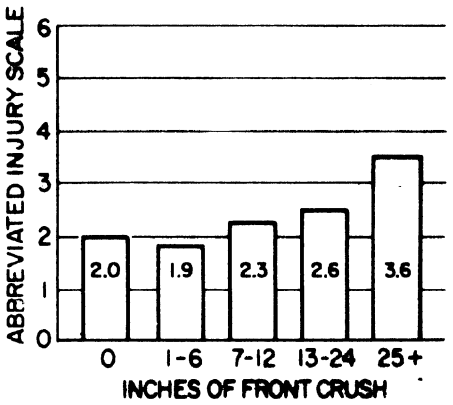

Fig. 3 - Average injury severity, rollovers (front crash)

*The Occupant Injury Classification described in this paper, was developed under NHTSA sponsorship (Contract # DOT-HS-031-1-037 and Contract # DOT-HS-031-3-589).

**The T-bars in Figure 2 show the first standard deviation for injuries in each roof crush increment.

The point to be made is that one must frequently look at specific injuries (e.g., head, neck) and what caused them (e.g., roof). While field investigators may determine this causal relationship, the current injury causation coding scheme prohibits analysis of injury causation.

CURRENT INJURY CAUSATION CODING SCHEME - The CPIR Revision 3 records occupant injury detail according to the scheme shown in Figure 4. Abbreviated Injury Scale (AIS) severity codes (9) are entered in the right hand side of the table (columns 23 to 31) to indicate the type of injury, severity and body region injured. The Overall Injury to Body Region is coded in Column 22 and is at least equal to the highest AIS to the right. For each body region sustaining an injury, at least one area of possible contact is being recorded in the left half of the table. A list of over forty areas of occupant contact is provided including, for example, (13) for "armrests" and (00) for "area contacted unknown". Up to four contact areas are recorded per body region.

There is no consistency to the order that the four objects are recorded. Five different sequences are currently used:

(1) Sequence contacted: first contact first
(2) Likelihood: definite, probable, possible
(3) Injury type: fracture contact before laceration contact
(4) Injury severity: worst injury producing contact first
(5) No order

In the course of preparing CPIR data for data processing and conducting analysis, several general observations were made:

(a) Frequently, essential injury details were documented, yet we had no way to code this information in the data files.

(b) Injury details that were coded (as described above) were cumbersome if not impossible to analyze using the computer storage format as defined.

The following specific observations of the Occupant Injury Detail page of Revision 3 CPIR and the NATO Collision Analysis Report Form (CARF) can be made:

(1) No provision is made to relate specific injuries to specific contact areas in one body region, e.g., no record is kept of which facial injury is related to which contact area.

(2) Two distinct injuries of the same type and in the same body region cannot be recorded independently, e.g., a facial laceration from the steering wheel and a second lateration from windshield contact must be recorded as one injury.

(3) No way is provided in the CPIR form to record the specific body organs or systems affected, except for Internal Organs (card 12) and Brain (card 13). Body regions are appropriately defined as "geographical" areas of the body (except cards 12 and 13 as noted). While lung and heart trauma are often specifically documented they cannot be distinguished in coding or later analysis.

(4) Recognizing the need for more body region detail, several new and proposed reporting forms have more than doubled the number of regions (Figure 5). But in the process, body regions and body organs have been mixed in one dimension of the table like "apples and oranges". No longer can chest region injuries be retrieved unless lung injury is also coded as chest trauma or

FIGURE 4

CPIR Injury Detail Page

	CARD NUMBER	OCCUPANT NO.	BODY REGION	★ ENTER CODE(S) FOR AREA(S) OF POSSIBLE CONTACT				ENTER SEVERITY CODES								
								OVERALL INJURY TO BODY REGION	FRACTURE	LACERATION	CONTUSION	COMPLAINT OF PAIN	ABRASION	CONCUSSION	BURN	HEMORRHAGE	OTHER
1-9	10-11	12 13		14 15	16 17	18 19	20 21	22	23	24	25	26	27	28	29	30	31
	12		INTERNAL ORGANS														
DUPLICATE FROM PRECEDING CARD	13		BRAIN														
	14		FACE														
	15		HEAD														
	16		NECK (CERVICAL REGION)														
	17		SHOULDER GIRDLE														
	18		RIGHT UPPER LIMB														
	19		LEFT UPPER LIMB														
	20		CHEST & UPPER BACK (THORAX)														
	21		LOWER BACK (LUMBAR REGION)														
	22		ABDOMEN														
	23		PELVIC GIRDLE														
	24		RIGHT LOWER LIMB														
	25		LEFT LOWER LIMB														
	26		WHOLE BODY														

FIGURE 5

NATO-CARF Injury Detail Page

OCCUPANT INFORMATION

	CARD NUMBER	OCCUPANT NO	BODY REGION	★ ENTER CODE(S) FOR AREA(S) OF POSSIBLE CONTACT				ENTER SEVERITY CODES										
								OVERALL INJURY TO REGION	CONCUSSION	LACERATION	ABRASION	BRUISE	SPRAIN/STRAIN	FRACTURE	DISLOCATION	AVULSION	HEMORRHAGE	BURN	OTHER COMPLAINTS OF PAIN
1-9	10-11	12-13		14-15	16-17	18-19	20-21	22	23	24	25	26	27	28	29	30	31	32	33	34
DUPLICATE FROM PRECEDING CARD	14		Scalp & Vault of Skull																	
	15		Brain & Base of Skull																	
	16		Face																	
	17		Neck																	
	18		Thoracic Spine																	
	19		Chest Wall																	
	20		(a) Lungs																	
	21		(b) Heart & Mediastinum																	
	22		Abdominal Wall																	
	23		(a) Liver																	
	24		(b) Spleen																	
	25		(c) Kidneys & Ureters																	
	26		(d) Other																	
	27		Lower Back																	
	28		R Shoulder & Arm																	
	29		R Elbow																	
	30		R Forearm																	
	31		R Wrist-Hand																	
	32		L Shoulder & Arm																	
	33		L Elbow																	
	34		L Forearm																	
	35		L Wrist, Hand																	
	36		Pelvis *																	
	37		R Hip & Thigh																	
	38		R Knee																	
	39		R Leg																	
	40		R Ankle, Foot																	
	41		L Hip & Thigh																	
	42		L Knee																	
	43		L Leg																	
	44		L Ankle, Foot																	
	45		Other																	

the analyst looks for each organ he considers as chest trauma. The same observation can be made of the CPIR Revision 3, where only internal injury and brain are provided. Both Body Region and Body System/Organ are essential but different dimensions of any injury coding scheme.

(5) Injury types/diagnosis and injury consequences are mixed in a similar fashion along the top of the right hand table. For example, hemorrhage can be a consequence of a laceration.

(6) Recording the correct AIS severity codes in the proper horizontal and vertical position can be cumbersome and error prone--particularly in the expanded version.

(7) Computer storage of all 210 boxes or cells (544 cells in expanded version) for every occupant is wasteful as every cell must be stored, injury or not. In the HSRI data files (9/73) each occupant received an average of 3.2 injuries (Table 1). Thus an average of 96.8 percent is blank storage.

Table 1 - Number of Injuries Per Occupant

Number CPIR Injuries	Number Occupants
0	1148
1	581
2	597
3	359
4	375
5	236
6	196
7	161
8	97
9	79
10	70
11	40
12	31
13	23
14	23
15-86	83
	4169

These observations provide insight into the current accident recording practices and act as the background for the proposed Occupant Injury Classification (OIC) scheme.

OCCUPANT INJURY CLASSIFICATION SCHEME

The Occupant Injury Classification is a scheme for recording specific occupant injuries in much the same manner as the Collision Deformation Classification (CDC), SAE J224a records vehicle damage (10). It is not a classification of overall occupant injury, but a scheme for recording each individual injury an occupant sustains. A series of independently defined classification facets are combined as a sequence of letters to describe an injury in terms of Body Region, Aspect, Lesion/Diagnosis and Body System/Organ. As with the CDC (or VDI) a numerical severity code terminates the OIC. The four main facets or dimensions of the OIC were developed directly from the CARF Occupant Injury Detail page. Instead of

recording AIS codes in a large table, the OIC records the "position in the table" along several dimensions. It is analogous to the difference between storing a map of the U.S.A. with a few points plotted, vs. simply storing the latitude and longitude of the few points. Figure 6 displays the proposed scheme using single letter codes.

In practice the accident investigator records one Occupant Injury Classification for each significant injury he decides to document. The areas of contact related to each OIC are also coded in order to record a complete picture of injury causation. A simple example preceeds a more detailed OIC discussion.

OIC EXAMPLE - To demonstrate the potential effectiveness of the proposed scheme, facial injuries are coded under the existing system and the proposed OIC.

(a) Laceration of left eye from contact with broken windshield, AIS-2.

(b) Several facial contusions from impact with instrument panel, AIS-1.

(c) Minor lip laceration from teeth during instrument panel contact, AIS-1.

Existing scheme:

Contact Areas	Region	Laceration	Contusions
Windshield, Instrument Panel, Other	Face	AIS-2	AIS-1

OIC scheme:

Contact Areas	Occupant Injury Classification	AIS
Windshield	Face: Left: Laceration: Nervous System-Eye	2
Instrument Panel	Face: Bilateral: Contusion: Integumentary	1
Instrument Panel/Other	Face: Inferior: Laceration: Digestive System	1

OIC scheme coded:

Contact Areas	OIC
12	FLLE-2
05	FBCI-1
05,38	FILD-1

Several observations can be made from the example. The existing scheme throws away much of what we often know (as outlined earlier). This contrasts with the proposed OIC scheme which permits the investigator to record his findings freely and transmit them to the data analyst. Second we have with 4 letters provided more injury location detail than in the current collision coding forms. The 4 letters encode much more information, yet are simple to record, read and remember. Any more detail would be too burdensome to work with.

A more detailed explanation of each facet of the OIC will help

clarify its potential application. This will be followed by a procedure for recording the OIC.

BODY REGIONS - Initially we started with the eleven body regions defined in the current CPIR Revision 3 (Figure 4). Since body regions were interpreted as subsets of the body's surface, Internal Organs and Brain were not included.

Body Regions in 1969 CPIR

H Head
F Face
N Neck
S Shoulder Girdle
U Upper Limb
T Thorax
B Lower Back, Lumbar
A Abdomen
P Pelvic Girdle
L Lower Limb
W Whole Body

The newer NATO Collision Analysis Report Form (Figure 5) expands the list to thirty-two body regions while dropping the "whole body" as a region. Many of these categories are organs, such as liver and spleen, not properly body regions. This expanded list confounds the concept of body region for field investigators and data analysts.

In order to provide for increased specificity in recording injuries and still conserve on coding and storage, two coordinate coding dimensions are provided: Body Region and Body System/Organs (discussed later) The expanded list of body regions in the NATO CARF was used as a foundation for the OIC (Figure 7). While similar to the NATO version, one significant difference occurs in the hip region. Only the pelvic bone, joint and associated tissue is included in the hip region (P). Internal organs in the pelvic structure are in the abdomen region (M).

OIC Body Region Codes

H Head (Skull, Scalp, Ears)
F Face (Forehead, Nose, Eyes, Mouth)
N Neck (Cervical Spine, C1-C7)
S Shoulder (Clavicle, Scapula, Joint)
A Arm *Upper)
E Elbow
R Forearm
W Wrist-Hand
B Back (Thoraco-Lumbar Spine, T1-T12, L1-L5)
C Chest
M Abdomen (below diaphragm)
P Pelvis
T Thigh (Femur)
K Knee
L Leg (below knee)
Q Ankle-Foot*
O Whole Body
X Extremeties (Arms, Legs)
Y Trunk (Chest, Abdomen, Legs)
U Unknown, Unclassifiable

---

*Note: The letter "A" was previously used for "Ankle-Foot". "Ankle-Foot" is now coded as "Q".

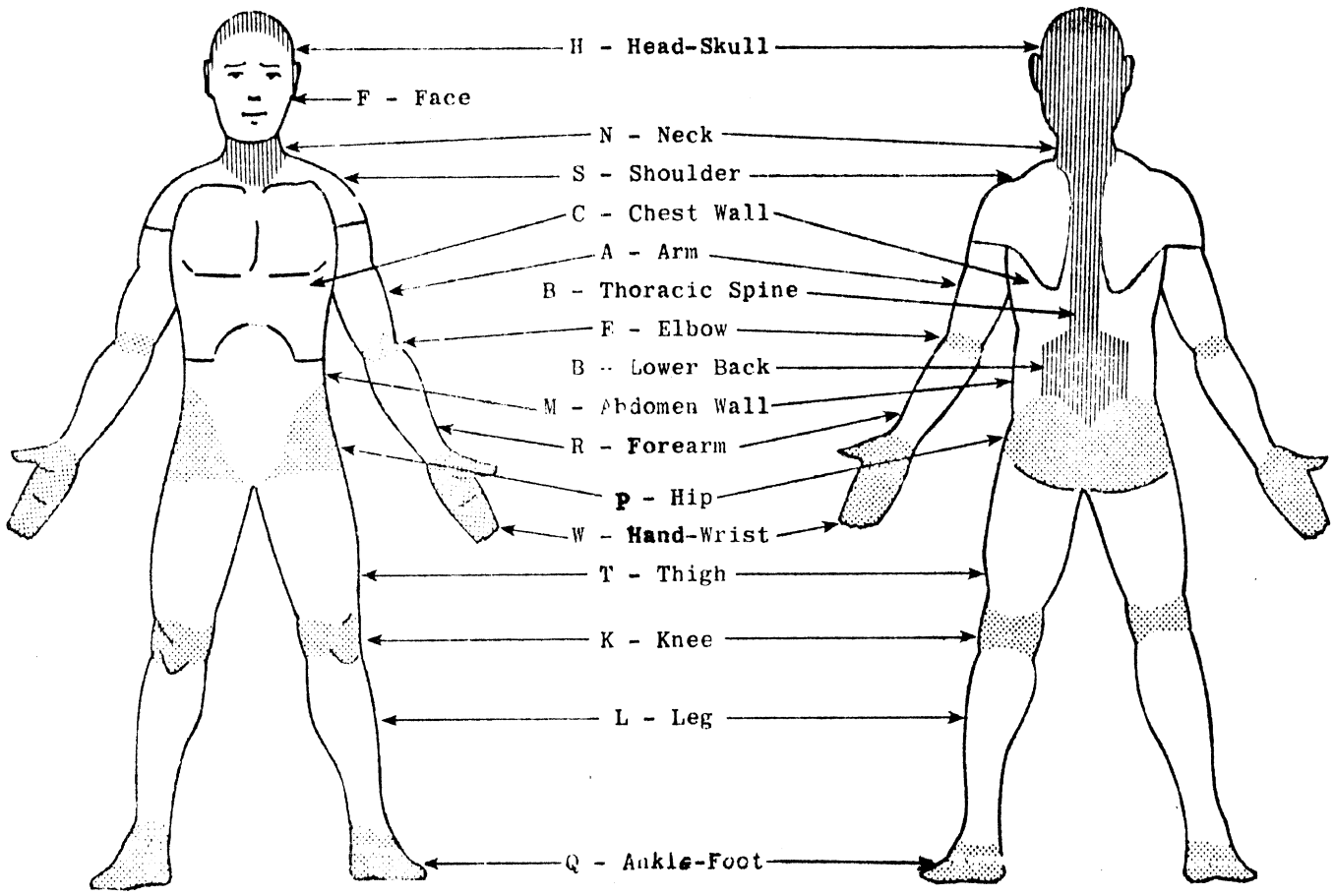

FIGURE 7 - OIC Body Regions

The broader regions (whole body, extremities and trunk) have been provided to aid the description of an injury occurrence that involves more than one region, such as a burn.

ASPECT - The aspect codes provide a fairly specific means of locating an injury in a body region, e.g., EP for Elbow Posterior. The coding of the arms and legs depends on the use of R and L for distinguishing which extremity region or both was injured. The use of any other aspect code implies that the same injury occurred to the same regions on both extremities. For example, if both knees were contused on the instrument panel, KB'' could be used to indicate the bilateral injury. Likewise, superior and inferior (S,I) are required for distinguishing between the thorax and lumbar spine regions. The aspect codes can find interesting uses with the broader region codes O, X and Y. For instance, XR could be used in classifying an injury sustained by both the right arm and leg from contact with side interior.

OIC Aspect Codes

R Right
L Left
B Bilateral
C Central
A Anterior/Ventral/Front

P Posterior/Dorsal/Back
S Superior/Cranial/Upper
I Inferior/Caudal/Lower
M Medial/Mesial/Midline
O Whole Region
U Unknown, Unclassifiable

Usually the desire to use two aspect codes can be resolved by selecting the more representative aspect--the one that best characterizes the injury. Thus, CS better describes the location of a four inch horizontal laceration in the upper left chest wall than CL.

The aspect code is the second letter of the OIC. It is a refinement of the first letter, i.e., a suffix to the body region. Therefore, it has meaning only in relationship to the body region to which it is applied. It cannot be used independent of the first letter for coding or analysis.

DIAGNOSIS OF LESION - The diagnosis of injury or lesion categories are basically the ones provided for in the expanded CARF injury detail page (Figure 5). The one significant addition is "asphyxia". While fairly rare, no provision exists currently for encoding this information when it occurs.

OIC Lesion Codes

F Fractures (all skeletal)
D Dislocations
L Lacerations (open wounds)
V Avulsion (torn away from)
R Rupture (herniation)
M Amputation
C Contusion (Bruise, Crushing)
Hematoma, Ecchymosis
A Abrasions (Superficial, Scratch, Blister)
K Concussion
B Burn
P Pain
S Sprain
H Hemorrhage*
X Asphyxia (Suffocation, Anoxia, Obstruction)
O Other
U Unknown

Although grossly simplified, this dimension of the OIC parallels the Morphology Index of the "Systematized Nomenclature of Pathology" (11). This facet is primarily intended to code diagnostic information concerning pathological changes and not the signs and symptoms. Pain is the one exception, as it is useful for encoding those painful but vague abnormalities that are not specifically diagnosed. While not emphasized in the OIC, the classification of signs and symptoms does play a significant role in recording a patient's medical history (12) and in emergency medical services.

Pathological changes due to impact take precedence over the consequences of the lesions. Two exceptions exist: asphyxia and hemorrhage, because of their potential for critical or fatal consequences. Through either mechanism a minor laceration, for instance, could result in fatal

*H - Hemorrhage is a new category.

consequences. Since hemorrhages are fairly common, H should be used conservatively, i.e., when the consequences of the subsequent hemorrhage are significantly more severe than the original injury. This situation occurs most frequently as a consequence of internal organ trauma.

BODY SYSTEMS/ORGANS - The fourth and final letter of the Occupant Injury Classification is the specific Body System or Organ affected. As with the other dimensions of the OIC the number of categories could be expanded by using more than one letter and at the risk of creating too intricate a scheme. Rather than list all the organs, the categories were based upon the major body systems. The combination of body system and body region categories work together to define specific tissue areas. For example, FILD-1, the Face Interior/Lower region and Digestive system combined infer "mouth". Similarly CRFS-3 (Chest Right Fracture Skeletal) indicates a simple rib fracture on the right side.

OIC	System/Organ
S	Skeletal, Bones, Ligaments
V	Vertebrae
J	Joints, Articulations
D	Digestive
L	Liver
N	Nervous System
B	Brain
C	Spinal Cord
E	Eyes, Ears
	Cardiovascular (Use A, H or Q)
A	Arteries, Veins*
H	Heart
Q	Spleen
U	Urogenital
K	Kidneys
R	Respiratory
P	Pulmonary, Lungs
M	Muscles
I	Integumentary (e.g., Skin, Hair)
U	Unknown, Unclassified

There are a number of specific organs of special interest to the automotive medicine and engineering professions. The organs of greatest interest are indicated in the NATO expansion of the CPIR occupant injury detail page (Figure 5): lungs, heart, liver, spleen and kidneys. These along with vertebrae, joints, spinal cord, arteries, veins, eyes and ears have been provided with specific codes.

ABBREVIATED INJURY SEVERITY - The Occupant Injury Classification is terminated with the Abbreviated Injury Scale (AIS) severity code in the same manner that the vehicle Collision Deformation Classification ends with a numeric extent code. The AIS has received wide acceptance and application. It provides a scaling of tissue damage that is consistent with the intent of the OIC. Because injuries to one body region are being coded, only severity codes 0 through 6 are used. This is the same convention currently used for encoding the CARF injury detail page (Figure 5).

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*A - Arteries, Veins is a new category.

Abbreviated Injury Severity

0 No Injury
1 Minor
2 Moderate
3 Serious
4 Severe
5 Critical
6 Fatal
8 Presence of Injury Unknown
9 Severity Unknown

The maturity of a science can, in part, be measured by its measures. The science of automotive medicine has progressed from the rough categories of K-fatal, A-bleeding, B-bruises, C-complaint of pain; through its rating scales of DeHaven, Nahum, GMC, States, McKay, Robertson, Campbell, Schwimmer, Wolf, Brass and AMA as reviewed in reference 9. With reasonable confidence and reliability injuries can now be placed into rank ordered categories of increasing severity. In fact, some consider the Abbreviated Injury Scale (AIS) as a continuous or interval scale, like temperature in Centigrade. Just the fact that this issue is debated, is a measure of the maturity of the science of automotive trauma.

While not part of the OIC development, the future evolution and sophistication of injury scaling cannot be overplayed. Attempts have been made to evolve ratio severity scales so that a level 4 severity is twice that of a level 2 severity (13). Perhaps current computer based AIS prediction models will help establish the reliability and validity of the AIS scale.

Another dimension of sophistication is manifested in the AMA Comprehensive Injury Scale (14), which separates the criteria used in injury scaling into five categories: energy dissipation, threat-to-life, permanent impairment, treatment period and incidence. The utilization of the CIS opens the door to a whole host of multivariate analysis, clustering techniques and multidimensional scaling methods and might even permit the analyst to synthesize his own injury scale base on the five components of the Comprehensive Injury Scale.

PROCEDURE FOR OCCUPANT INJURY CLASSIFICATION

The format for recording injuries is displayed in Figure 8. For each injury, 4 contact areas can be recorded (col. 14-21) in likelihood order: definite, probable, possible, using an expanded list of vehicle contact area codes (Figure 9). For each traumatic vehicle contact sustained by the occupant, 2 OIC's can be recorded. The first OIC (col. 22-26) is for primary injury and the second OIC (col. 27-31) is for an optional associated injury (defined later). Only those cards (lines) with encoded data are keypunched. Each occupant is coded on a separate form so that the injury card numbers (col. 10-11) start over for each new occupant number (col. 12-13). The computer will then format this information into one logical record per injury so analysis can be conducted on injury-by-injury basis.

While the valid combinations of OIC letters and injury severity codes are generally self defined, the chart in Figure 10 displays most of the valid combinations. The chart may be of assistance to the field data recorder and will be used later by the computer to aid in editing recorded OIC's. Note that pain (P) is to be used with muscles (M), not bones and that fracture (F) is permitted for internal solid organs such as the liver (L).

Case Report Number _ _ - _ _ _ _ _ - _

FIGURE 8. OCCUPANT INJURY CLASSIFICATION CODING FORM

	CARD NUMBER	OCCUPANT NO.	☆ ENTER CODE(S) FOR AREA(S) OF POSSIBLE CONTACT			
1-9	10-11	12-13	14-15	16 17	18 19	20 21
	12					
	13					
DUPLICATE	14					
	15					
	16					
	17					
FROM	18					
	19					
PRECEDING	20					
	21					
	22					
CARD	23					
	24					
	25					
	26					

BODY REGION	ASPECT	LESION	SYSTEM/ORGAN	SEVERITY
22	23	24	25	26

BODY REGION	ASPECT	LESION	SYSTEM/ORGAN	SEVERITY
27	28	29	30	31

FIGURE 9

CODES FOR AREAS OF
OCCUPANT CONTACT

FRONT OF PASSENGER COMPARTMENT

(05) Instrument Panel (Specific Area Unknown)
(54) Upper Instrument Panel (X)
(55) Middle Instrument Panel (Y)
(56) Lower Instrument Panel (Z)
(57) Beneath Instrument Panel
(58) Add-on Tape Deck, Radio, Air Conditioner, etc.
(09) Steering Assembly (Specific Area Unknown)
(65) Steering Wheel
(66) Steering Wheel Column

(12) Windshield
(02) Glove Compartment Area
(03) Hardware items (Specific Item Unknown)
(81) Ashtray (Instrument panel)
(82) Instruments
(83) Control Knobs and Levers
(04) Heater or AC Ducts
(01) Air conditioning or ventilation outlets
(06) Mirrors
(07) Parking Brake (Location Unknown)
(08) Radio
(10) Sunvisors & fittings and/or top molding (header)
(11) Transmission selector lever
(53) Parcel tray
(84) Parking brake in front

SIDES

(20) Surface of side interiors
(19) Hardware
(13) Armrests
(22) Window glass
(21) Window frames
(14) A-pillar
(15) B-pillar
(16) C-pillar
(17) D-pillar
(18) Courtesy lights

INTERIOR

(29) Front seatbacks
(33) Restraint system hardware
(34) Restraint system webbing
(30) Head restraints
(32) Other occupants
(31) Interior loose object
(50) Rear seat
(51) Front seat cushion
(52) Internal flying glass

ROOF

(26) Roof side rails
(10) Sunvisors & fittings and/or top molding (header)
(25) Roof or convertible top
(24) Coat hooks
(18) Courtesy light

FLOOR

(11) Transmission selector lever
(40) Floor
(28) Foot controls
(27) Console
(85) Parking brake, floor mounted

REAR

(23) Backlight (rear window)
(39) Backlight header

EXTERIOR SURFACE OF CASE VEHICLE

(37) Outside surface of case vehicle (specific area unknown)
(35) Hood of case vehicle
(60) Exterior case vehicle hardware e.g., outside mirrors, antenna, trim, door handles, etc.
(62) Exterior side roof rail of case vehicle
(63) Trunk lid of case vehicle
(64) Tires of case vehicle

BEYOND CASE VEHICLE BOUNDARY

(36) Area exterior to car (specific area unknown)
(70) Hood of other vehicle
(71) Other Vehicle exterior hardware (e.g., outside mirrors, antenna, trim, ornaments, door handles, etc.
(73) Exterior side roof rail of other vehicle
(74) Headlight or front grill of other vehicle
(75) Trunk of other vehicle
(76) Outside surface of other vehicle
(77) Tires of other vehicle

(78) Ground
(79) Water
(80) Exterior object (not vehicle, ground or water):

PENETRATING OBJECTS

(61) Other Vehicle
(72) Object: _____

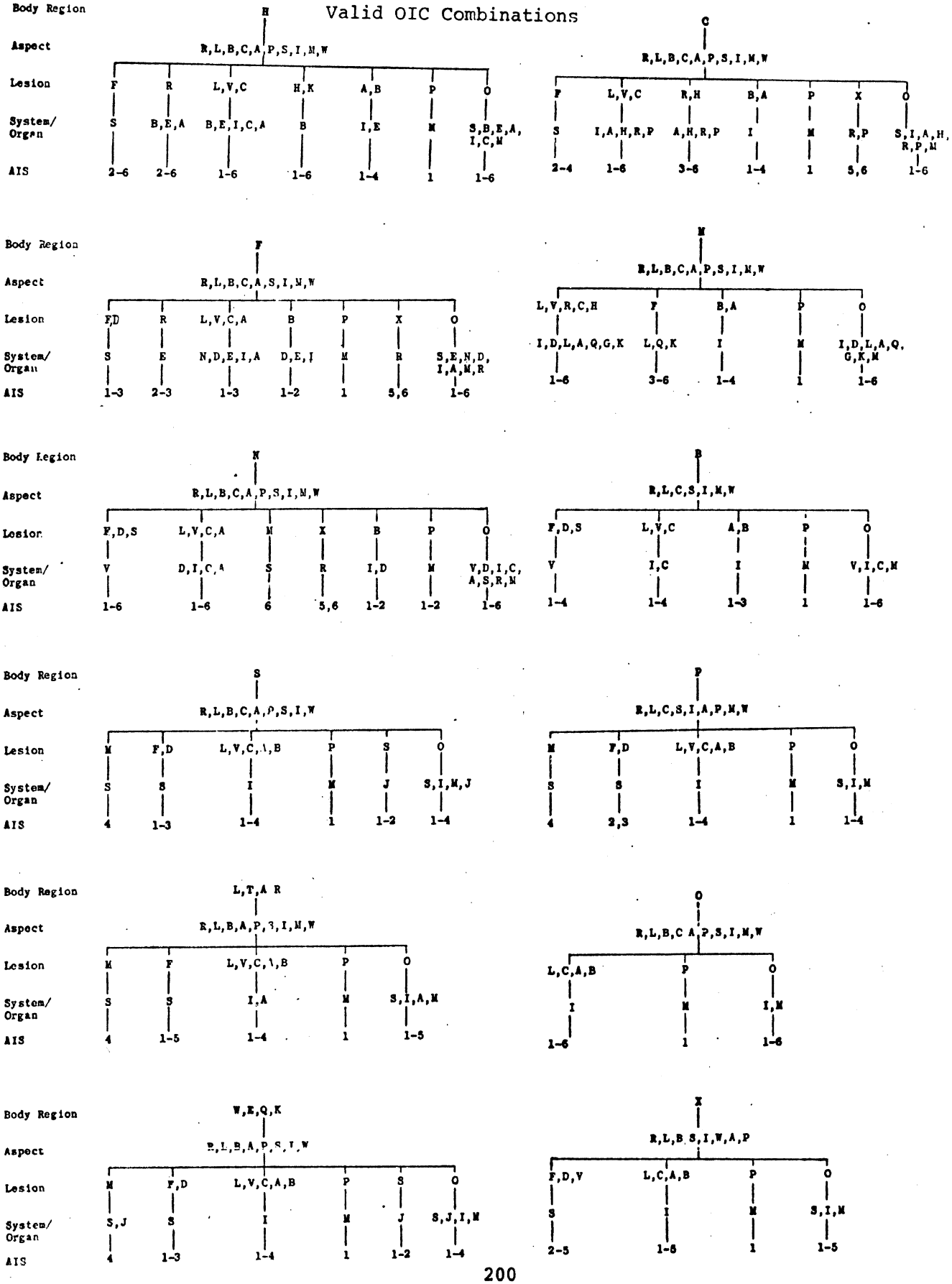
(38) Other: _____

(98) Impact force, "whiplash", hyper-extension/compression
(99) Missing data/No contact

(00) Unknown area of contact

FIGURE 10

Valid OIC Combinations



With a proper coding format, the OIC facilitates the description of many specific types of tissue damage and permits the recording of injury causation or injury sources on an injury-by-injury basis. The critical problem, then, is defining what an "injury" is. What level of detail should be recorded? An operational definition of an "injury" is needed to provide boundaries of the level of detail to be encoded. This is accomplished by default in the CARF form, as an injury is defined as one box in the CARF occupant injury detail table. For example, only one laceration per body region is permitted.

One body region can hit several different vehicle interior (or exterior) areas, causing distinct injuries. In order to link injuries with injury sources (contact areas), an OIC should be established for each separate injury to a body region due to distinct contact areas. A driver sustaining two facial lacerations, one from contact with the steering wheel and a second from the windshield, should have two separate Occupant Injury Classifications, each with a different associated contact area. Similarly a laceration in one area and contusion of a different area in the same body region from the same vehicle contact area can be considered as separate injuries.

The recording of two injuries in a single body area that resulted from one contact is a particular problem. Is the rib fracture and associated pneumothorax from steering column loading, one injury or two injuries? From an injury causation point of view only unique points of injury producing energy transfer should be recorded, but this approach might limit the recording of some significant traumatic conditions resulting from the dissipation of energy.

Campbell's Traumatic Tissue Damage Record (15) is in part "based upon the recognition that as the energy passes through various layers or structures it may leave some evidence of its effect in the tissue. Damage may therefore be described and assessed for all of the major tissues through which the force passes at whatever level they occur". To keep the number of details to be coded to a manageable level, he further suggests "that only the damage at greatest depth in the body needed to be described in any one particular injury".

This conceptualization of injury is the approach suggested for recording trauma with one exception--the injury classifier is permitted two OIC's for each force application or contact point (Figure 8). Three uses of the primary and associated OIC have been defined.

1. TWO LESIONS FROM ONE CONTACT - When there are two distinct lesions resulting from contact with one vehicle area, two OIC's can be recorded. The first OIC would be the diagnosis of damage at the deepest level or the most important deepest structure. The second OIC can be used to describe other associated traumatic conditions. Using the earlier example, the pheumothorax would receive the primary OIC and the rib fracture the associated OIC. Because contusions and abrasions frequently occur together (i.e., in one area of a body region from one vehicle contact area), they are most conveniently recorded on one line with contusions as the first OIC and abrasions as the second OIC.

2. INDIRECT OR INDUCED INJURY - Dr. Donald F. Huelke, Professor of Anatomy, University of Michigan, Medical School, proposed the concept of "induced injury" or indirect injury (16) through the following example, "a passenger strikes his forehead on the windshield and sustains a bump on the head. Obviously, the head bump is related to the windshield. But, in addition, he has pain in the neck. No specific car component was

struck thus this would be induced injury, just as we see induced damage to a car in areas not in the impact area. In addition, another example of induced injury would be a dislocated hip from striking the knee on the instrument panel."

A medical interpretation (17) could well consider that "all injury except skin injury is induced, i.e., is due to transmitted forces." The interpretation made in the OIC is that indirect injuries are injuries to one body region caused by a blow or contact in some other body region. In other words, indirect injuries occur when traumatic energy is transmitted through one body region to another region.

3. CONSEQUENCES - The critical and fatal consequences of primary trauma can be coded as associated injuries. Asphyxia (X) and hemorrhage (H) are the most common significant consequences. If, due to face trauma blood flow blocks off air flow, the resulting aspyxia would be coded (FIXR-6) as an associated trauma. A minor three inch wrist laceration (WRLI-1) could result in a fatality because of the associated hemorrhage of the lacerated ulna or radial artery (WRHA-6). Exterior hemorrhaging should not be coded unless it is of significant consequence. Internal hemorrhaging (e.g., subdural hematoma (HLHB-6), Hemothorax (CWHA-6), or hemoperitonum (MWHD-6) may have frequent application at the critical and fatal injury severity levels.

REFINEMENTS OF 1972 OIC

Since the concept of the Occupant Injury Classification scheme was presented in October 1972 (6), several hundred clinical accident investigations have been encoded using the OIC, both by the Highway Safety Research Institute and by many of the field MDAI teams. This experience has provided the opportunity to better define the procedure for using the OIC. Several significant changes have also been made to the original OIC categories as a result of the coding experience. Two body regions were divided and a new lesion and system/organ were added as described below.

1. Two body regions in the original OIC presented sufficient difficulty to dictate their change: shoulder-upper arm and hip-thigh. Shoulder joint, humerous and clavical fractures could not be distinguished. Fractures of the pelvis and femur were coded the same way although distinctly different injuries. Both regions were split to provide the needed resolution as follows:

S-Shoulder	P-Pelvic Girdle, Hip
A-Upper Arm*	T-Thigh, Upper Leg

The shoulder and arm are divided by a horizontal plane through the armpit. The pelvic or hip region includes the pelvic bones, femur ball-acetabulum socket, sacrum, as well as the posterior muscles (e.g., gluteus maximus). All the interior organs (e.g., genitals, bladder) remain part of the abdomen.

2. Hemorrhage (H) was cautiously added as a new lesion category. Hemorrhage has a necessary but limited coding application when used to indicate serious to fatal consequences of a primary trauma. It is coded as the associated (or second) injury.

3. Arteries and veins (A) was added as a new body system/organ category under the general grouping of cardiovascular. This addition provides for

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*Note: The letter "A" was previously used for "Ankle-Foot". "Ankle-Foot" is now coded as "Q".

ruptured aortas (CLRA) and other significant blood vessel trauma.

CONCLUSION

A strong interest exists in the rational utilization of accident data by decision makers. The files of clinical in-depth accident data provide a uniquely valuable resource, particularly in the area of injury causation. While both field investigators and data analysts place an emphasis on the need for accurate injury causation data, the current schemes for recording and processing injury data are cumbersome, if not prohibitive to utilize. A new Occupant Injury Classification scheme is proposed that will facilitate computer processing and permit the direct association of specific injuries with specific contact areas.

The Occupant Injury Classification (OIC) follows an approach similar to the SAE J224a Collision Deformation Classification (formerly VDI). It uses four letters to encode Body Region, Aspect, Lesion and Body System/ Organ, followed by a numeric Abbreviated Injury Severity (AIS) code.

From an injury causation point of view, only unique points of injury producing energy transfer should be recorded as injuries. Provision is made for recording both a primary and associated OIC for each energy transfer. Provision is also made for encoding four occupant contact points in the vehicle or exterior areas in order definite, probable, possible.

In this way the OIC, developed under National Highway Traffic Safety Administration sponsorship, can be used to link specific injuries to their causes in an easy and flexible manner. Your critical comments would be greatly appreciated.

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   - Volume 2: MDAI Data Analysis [DOT/HS 800 768]
   - Volume 3: Simplified Procedures for Analysis of Data [DOT/HS 800 769]
   - Volume 4: Univariate Frequency Distributions of MDAI Data [DOT/HS 800 770]
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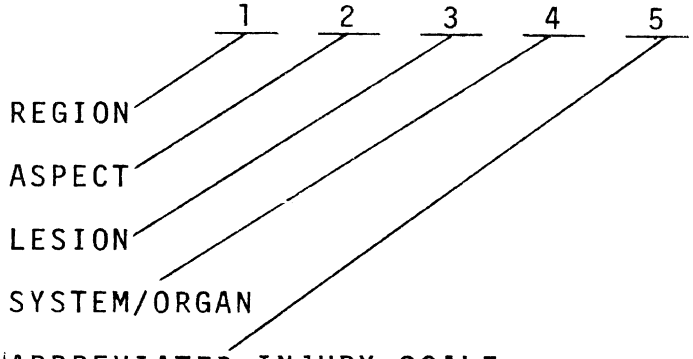
FIGURE 6. OCCUPANT INJURY CLASSIFICATION SUMMARY



1 BODY REGION

- H HEAD - SKULL
- F FACE
- N NECK - CERVICAL SPINE
- S SHOULDER
- A ARM (UPPER)
- E ELBOW
- R FOREARM
- W WRIST-HAND
- C CHEST
- M ABDOMEN
- B BACK - THORACOLUMBAR SPINE
- P PELVIC - HIP
- T THIGH
- K KNEE
- L LEG (LOWER)
- Q ANKLE - FOOT
- O WHOLE BODY
- X EXTREMITIES (ARMS-LEGS)
- Y TRUNK
- U UNKNOWN, UNCLASSIFIED

2 ASPECT

- R RIGHT
- L LEFT
- B BILATERAL
- C CENTRAL
- A ANTERIOR/FRONT
- P POSTERIOR/BACK
- S SUPERIOR/UPPER
- I INFERIOR/LOWER
- W WHOLE REGION
- U UNKNOWN

3 LESION

- F FRACTURES
- D DISLOCATIONS
- L LACERATION
- V AVULSION
- R RUPTURE
- M AMPUTATION
- C CONTUSION
- A ABRASIONS
- K CONCUSSION
- B BURN
- P PAIN
- X ASPHYXIA
- H HEMORRHAGE
- S SPRAINS
- O OTHER
- U UNKNOWN

4 SYSTEM/ORGAN

- S SKELETAL
- V VERTEBRAE
- J JOINTS
- D DIGESTIVE
- L LIVER
- N NERVOUS SYSTEM
- B BRAIN
- C SPINAL CORD
- E EYES, EARS
- CARDIOVASCULAR
- A ARTERIES, VEINS
- H HEART
- Q SPLEEN
- G UROGENITAL
- K KIDNEYS
- R RESPIRATORY
- P PULMONARY, LUNGS
- M MUSCLES
- I INTEGUMENTARY
- U UNKNOWN, UNCLASSIFIED

APPENDIX E

MDAI TEAM CASE VEHICLE CATALOG

The following pages list each MDAI case vehicle stored in the automated data files. The first three columns list the two letter team abbreviation, team accident report number, and case vehicle number. Only automobiles, pickups and small vans have been automated as case vehicles. The following additional data elements have also been listed for each case vehicle:

First Object Struck
Collision Configuration
Primary CDC/VDI
Overall Vehicle AIS
DOT HS Report Number

The teams can be identified as follows:

TEAM LETTERS	TEAM IDENTIFICATION
AA	Ann Arbor, HSRI
MVD, ME(BA)	Baylor College of Medicine
BU	Boston University
CAL	Calspan, Level III B
GIT	Georgia Institute of Technology
IU (MCR)	Indiana University
MI	University of Miami
MMF	Maryland Medical/Legal Foundation
UNM	University of New Mexico
OSU	Ohio State University
RTI	Research Triangle Institute
RAI (RU)	University of Rochester
USC	University of Southern California
SRI-2	Stanford Research Institute (2)
SRI	Stanford Research Institute (1)
SU	Stanford University
SWRI	Southwest Research Institute
UC(TR)	Trauma Research Group, UCLA
TU	Tulane University
KY(UK)	University Kentucky
UOK	University of Oklahoma
UTAH(UU)	University of Utah

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
AA 100(SPL)	1	OTHER CAR	HEAD-ON	11-FDEW-8	08	
AA 100(SPL)	2	OTHER CAR	HEAD-ON	11-FDEW-6	08	
AA 101	0	OTHER	VEH-OBJ	01-FLEE-2	00	
AA 105	0	OTHER CAR	REAR END	06-BDEW-2	01	
AA 115	0	DITCH	VEH-OBJ	12-FCEN-2	00	HS 601 075
AA 116	0	OTHER	TYPE L	10-LYAW-3	07	
AA 121	0	OTHER CAR	SIDE-SIDE	11-FLEE-3	00	
AA 122	0	PEDESTRIAN	VEH-OBJ	05-BLEN-1	00	
AA 125	0	GROUND	VEH-OBJ	00-RFEO-1	00	HS 601 074
AA 126	0	TRACT-TRAIL	SIDE-SIDE	08-LFMS-1	00	
AA 129	0	DITCH	VEH-OBJ	00-TYHO-4	05	
AA 130	0	DITCH	VEH-OBJ	00-FDEO-3	06	
AA 132	0	TRAIN,BUS	TYPE T	02-RDAW-3	04	
AA 133	0	TRAIN,BUS	TYPE L	00-RBAW-5	06	
AA 134	0	PEDESTRIAN	VEH-OBJ	12-FRMN-1	00	HS 601 069
AA 136	0	CULVERT	VEH-OBJ	11-FCEW-3	02	
A138-0UM550	0	POLE,TREE	VEH-OBJ	12-FYEW-6	07	
AA 139	0	TRACT-TRAIL	TYPE T	07-LYAW-9	06	
AA 140	0	OTHER CAR	HEAD-ON	12-FREW-5	04	
AA 143	1	OTHER CAR	REAR END	05-BZEW-4	09	
A143-2UM552	2	OTHER CAR	REAR END	12-FDEW-3	03	
AA 144	0	OTHER CAR	REAR END	06-BDEW-1	01	HS 601 061
AA 145	1	OTHER CAR	HEAD-ON	12-FDEW-2	02	HS 601 060
AA 145	2	OTHER CAR	HEAD-ON	12-FDEW-3	01	HS 601 060
AA 146	0	OTHER CAR	TYPE L	01-FZEW-2	01	
AA 147	0	OTHER CAR	SIDE-SIDE	11-LDHS-1	01	
AA 148	0	FENCE	VEH-OBJ	12-FDEW-2	02	HS 601 059
AA 149	1	OTHER CAR	HEAD-ON	12-FDEW-5	04	
AA 149	2	OTHER CAR	HEAD-ON	01-FDEW-4	05	
AA 149	3	OTHER CAR	TYPE L	12-FDEW-1	01	
AA 150	0	GROUND	VEH-OBJ	00-TPGO-2	00	HS 601 064
AA 151	0	OTHER CAR	TYPE L	10-LYAW-3	08	
A152-0UM563	0	OTHER CAR	HEAD-ON	12-FCEW-3	01	
AA 153	0	OTHER CAR	HEAD-ON	01-FREW-2	01	
AA 154	0	POLE,TREE	VEH-OBJ	01-FREN-2	02	
AA 155	0	POLE,TREE	VEH-OBJ	02-RFEN-3	06	
AA 156	0	GUARDRAIL	VEH-OBJ	10-LPLW-1	00	
AA 159	1	OTHER CAR	HEAD-ON	11-FLEE-7	03	
AA 159	2	OTHER CAR	HEAD-ON	11-FYEW-5	01	
A160-0UM569	0	OTHER CAR	TYPE L	11-LZAW-2	01	
AA 161	0	OTHER CAR	REAR END	06-BYEW-2	01	
AA 163	0	PEDESTRIAN	VEH-OBJ	12-FLMN-0	00	
A164-0UM583	0	TRAIN,BUS	TYPE L	02-RYMN-4	06	
A165-1UM589	1	OTHER CAR	TYPE L	02-RFEW-4	01	
AA 165	2	OTHER CAR	HEAD-ON	11-FDEW-5	06	
AA 166	1	OTHER CAR	TYPE T	11-FDEW-1	01	
AA 166	2	OTHER CAR	TYPE T	02-RPEW-2	00	
A169-1UM598	1	OTHER CAR	REAR END	12-FZEW-3	01	
AA 169	2	OTHER CAR	REAR END	06-BYEW-5	00	
AA 169	3	PEDESTRIAN	HEAD-ON	12-FDLW-1	00	
A172-0UM601	0	GUARDRAIL	VEH-OBJ	10-LPEN-4	03	
AA 173	0	GROUND	VEH-OBJ	00-TDAO-3	06	
AA 174	0	TRACT-TRAIL	HEAD-ON	12-FDEW-2	06	
A175-0UM605	0	POLE,TREE	VEH-OBJ	12-FREN-4	01	
AA 177	1	OTHER CAR	TYPE L	01-FZEW-1	01	
AA 177	2	OTHER CAR	TYPE L	00-LFEW-2	01	

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
A178-0UM612	0	GROUND	VEH-OBJ	00-TDAO-2	02	
A180-1UM616	1	OTHER CAR	HEAD-ON	12-FDEW-3	01	
A180-2UM617	2	OTHER CAR	HEAD-ON	12-FDEW-2	03	
A618-0UM618	0	EMBANKMENT	VEH-OBJ	12-FDEW-1	01	
A183-0UM619	0		HEAD-ON	01-FDEW-3	02	
AA 188	0	MOTORCYCLE	TYPE L	02-RBMW-2	01	
AA 189	0	ABUTMENT	VEH-OBJ	00-XDAO-2	06	
AA 191	0	MOTORCYCLE	HEAD-ON	11-FYEW-2	01	
AA 192	1	OTHER CAR	HEAD-ON	01-FZEW-1	01	
AA 192	2	OTHER CAR	HEAD-ON	11-FLEE-2	02	
AA 193	0	GROUND	VEH-OBJ	00-XDAO-3	02	
AA 194	1	OTHER CAR	SIDE-SIDE	01-RBMS-2	01	
AA 194	2	OTHER CAR	SIDE-SIDE	01-RBMS-2	00	
AA 195	0	PEDESTRIAN	VEH-OBJ	12-FRLN-0	00	
AA 196	1	OTHER CAR	HEAD-ON	11-FDEW-2	01	HS 0311135
AA 196	2	OTHER CAR	HEAD-ON	01-FZEW-1	01	HS 0311135
AA 197	0	MOTORCYCLE	HEAD-ON	01-FYEN-2	01	
A199-0UM628	0	TRACT-TRAIL	HEAD-ON	10-FYAW-5	07	
AA 200	1	OTHER CAR	HEAD-ON	01-FLEW-1	01	
AA 200	2	OTHER CAR	HEAD-ON	11-FLEE-5	01	
AA 201	0	PEDESTRIAN	VEH-OBJ	12-FRMN-0	00	
AA 202	1	OTHER CAR	TYPE T	02-FDEW-3	01	
A202-2UM632	2	OTHER CAR	TYPE T	11-LPAW-3	03	
A203-0UM633	0	MOTORCYCLE	TYPE T	09-LPAW-3	04	
AA 204	0	PEDESTRIAN	VEH-OBJ	12-FREN-0	00	
AA 205	0	GROUND	VEH-OBJ	00-UFXW-2	05	
A206-0UM635	0	ST TRUCK	TYPE L	10-FDEW-2	01	
AA302	1	OTHER CAR	TYPE L	11-FYEW-1	01	
AA 302	2	OTHER CAR	TYPE L	02-RFEW-3	01	
A303-1UM668	1	OTHER CAR	HEAD-ON	01-FDEW-4	03	
AA 303	2	OTHER CAR	HEAD-ON	11-FLAW-6	08	
AA 304	1	OTHER CAR	TYPE T	02-FREW-2	01	
AA 304	2	OTHER CAR	TYPE T	10-LPHW-3	02	
AA 305	0	BRIDGE RAIL	VEH-OBJ	01-FREW-5	07	
AA 306	1	OTHER CAR	TYPE T	11-FDAW-6	06	
AA 306	2	OTHER CAR	TYPE T	01-RDAW-8	08	
AA 307	0	MOTORCYCLE	REAR END	07-BCEN-1	00	
A308-1UM673	1	OTHER CAR	TYPE T	02-FZEW-2	01	
AA 308	2	VAN	TYPE T	11-LPAW-3	01	
AA 312	1	OTHER CAR	REAR END	12-FREW-2	01	
AA 312	2	OTHER CAR	REAR END	06-BLEE-5	01	
AA 314	1	OTHER CAR	HEAD-ON	12-FYEW-2	01	
AA 314	2	OTHER CAR	HEAD-ON	12-FYEW-1	01	
AA 315	0	PEDESTRIAN	VEH-OBJ	12-FLEN-0	00	
AA 318	1	OTHER CAR	TYPE T	02-FDEW-1	01	
AA 318	2	OTHER CAR	TYPE T	10-LZEW-2	05	
AA 319	1	OTHER CAR	TYPE T	02-FDEW-3	01	
AA 319	2	OTHER CAR	TYPE T	10-LYEW-2	01	
A321-0UM706	0	POLE, TREE	VEH-OBJ	12-FCEN-2	02	
AA 322	1	OTHER CAR	REAR END	12-FDEW-1	02	
AA 322	2	OTHER CAR	REAR END	06-BDEW-1	01	
AA 323	1	OTHER CAR	HEAD-ON	12-FDEW-4	10	
A323-2UM709	2	OTHER CAR	HEAD-ON	12-FDEW-4	06	
AA 324	0	PEDESTRIAN	VEH-OBJ	12-FLEN-0	00	
AA 325	0	SIGN	VEH-OBJ	12-FCEN-2	02	
AA 332	0	OTHER	VEH-OBJ	00-XDAO-3	10	

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
AA 333	0	GUARDRAIL	VEH-OBJ	05-BRAW-3	01	
AA 334	0	POLE,TREE	VEH-OBJ	02-RFEN-2	01	
AA 335	1	OTHER CAR	REAR END	12-FDEW-2	02	
AA 335	2	OTHER CAR	REAR END	06-BDEW-4	01	
AA 336	1	OTHER CAR	REAR END	12-FDEW-1	01	
AA 336	2	OTHER CAR	REAR END	07-BYEW-4	01	
AA 340	1	OTHER CAR	TYPE L	01-FZEW-2	01	
A340-2UM754	2	OTHER CAR	TYPE L	10-LFMW-2	01	
AA 341	1	PEDESTRIAN	VEH-OBJ	12-FRMN-0	00	
MVD 1	0	OTHER CAR	REAR END	12-FLEW-1	00	HS 600 121
MVD 2	0	OTHER CAR	REAR END	11-FRMW-1	00	HS 600 122
MVD 3	0	GROUND	VEH-OBJ	00-TDGO-3	06	HS 600 123
MVD 4	0	OTHER CAR	TYPE L	01-FREW-3	01	HS 600 124
MVD 5	0	OTHER CAR	TYPE L	02-RYEW-4	02	HS 600 125
MVD 6	0	OTHER	VEH-OBJ	12-FDMW-2	00	HS 600 126
MVD 7	2	OTHER CAR	TYPE L	02-RFEW-3	02	HS 600 127
MVD 8	1	OTHER CAR	TYPE L	11-FLEW-3	02	HS 600 128
MVD 9	0	OTHER CAR	TYPE L	11-FLMW-1	01	HS 600 129
MVD 10	0	OTHER CAR	REAR END	12-FDMW-2	01	HS 600 130
MVD 11	1	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 131
MVD 12	2	OTHER CAR	TYPE L	10-LYHW-4	01	HS 600 132
MVD 13	2	OTHER CAR	TYPE L	04-RYEW-3	01	HS 600 133
MVD 14	1	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 134
MVD 15	0	OTHER CAR	REAR END	12-FDMW-3	02	HS 600 135
MVD 16	0	OTHER CAR	REAR END	12-FDMW-1	00	HS 600 136
MVD 17	0	OTHER CAR	TYPE L	11-FDMW-2	00	HS 600 137
MVD 18	0	POLE,TREE	VEH-OBJ	02-RYAN-5	00	HS 600 138
MVD 19	0	OTHER CAR	TYPE L	02-FRMN-2	01	HS 600 139
MVD 20	0	OTHER CAR	TYPE L	10-LFMW-3	01	HS 600 047
MVD 21	0	TRAIN,BUS	TYPE L	11-FZMW-2	01	HS 600 046
MVD 22	0	ST TRUCK	TYPE L	10-LFAW-3	03	HS 600 057
MVD 23	0	OTHER CAR	REAR END	12-FDMW-1	00	HS 600 051
MVD 24	0	OTHER CAR	REAR END	11-FYEW-2	01	HS 600 077
MVD 25	0	GUARDRAIL	VEH-OBJ	10-LFEN-3	06	HS 600 078
MVD 26	0	OTHER CAR	HEAD-ON	12-FDMW-2	01	HS 600 079
MVD 27	0	OTHER CAR	REAR END	05-BYMW-3	00	HS 600 080
MVD 28	0	OTHER CAR	REAR END	01-FRMW-1	00	HS 600 140
MVD 29	0	OTHER CAR	TYPE L	11-RFMW-2	00	HS 600 081
MVD 30	0	OTHER CAR	REAR END	01-FREW-3	01	HS 600 082
4ME1	0	NO OBJECT	VEH-OBJ	00-TYH0-3	06	HS 600 271
4ME2	0	OTHER CAR	REAR END	07-BREW-3	01	HS 600 272
4ME3	0	OTHER CAR	REAR END	06-BDEW-2	00	HS 600 273
4ME4	0	GUARDRAIL	VEH-OBJ	11-LDEW-2	00	HS 600 274
4ME5	0	OTHER CAR	REAR END	06-BDEW-2	00	HS 600 275
4ME6	0	OTHER CAR	TYPE L	03-RPAW-4	01	HS 600 276
4ME7	0	OTHER CAR	TYPE L	03-RYEW-4	01	HS 600 277
4ME8	0	CULVERT	VEH-OBJ	01-FREW-3	02	HS 600 278
4ME9	0	DITCH	VEH-OBJ	10-LFMW-3	00	HS 600 279
4ME10	0	OTHER CAR	TYPE L	02-RFEW-3	01	HS 600 280
4ME12	0	OTHER CAR	REAR END	01-FREE-2	01	HS 600 378
4ME13	0	OTHER CAR	REAR END	12-FDEW-3	02	HS 600 379
4ME15	0	OTHER CAR	TYPE L	11-FLMW-1	01	HS 600 380
4ME16	0	GUARDRAIL	VEH-OBJ	12-FDEW-3	01	HS 600 381
4ME17	0	OTHER CAR	TYPE L	09-LFEW-3	00	HS 600 382
4ME18	0	OTHER CAR	TYPE L	09-LPMW-3	01	HS 600 383
4ME19	0	OTHER CAR	REAR END	12-FDEW-2	00	HS 600 384

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY COC/VDI	VEH AIS	DOT-HS REPORT NO.
4ME20	0	OTHER CAR	REAR END	12-FDEW-3	01	HS 600 385
4ME21	0	OTHER CAR	REAR END	12-FYMW-2	01	HS 600 386
4ME22	0	OTHER CAR	REAR END	06-BDEW-1	01	HS 600 387
4ME23	0	OTHER CAR	HEAD-ON	01-FLEE-2	01	HS 600 388
4ME24	0	OTHER CAR	TYPE L	09-LPMW-3	01	HS 600 389
4ME25	0	OTHER CAR	TYPE L	01-RFMW-2	00	HS 600 390
4ME26	0	OTHER CAR	SIDE-SIDE	12-LFEE-2	00	HS 600 391
4ME27	0	OTHER CAR	TYPE L	11-FREE-2	00	HS 600 392
4ME28	0	GUARDRAIL	VEH-OBJ	11-ULLW-2	00	HS 600 393
4ME29	0	OTHER CAR	TYPE L	12-FZEW-1	00	HS 600 394
4ME30	0	OTHER CAR	REAR END	12-FDMW-1	01	HS 600 395
4ME31	0	OTHER CAR	TYPE L	12-FZEW-2	01	HS 600 396
4ME32	0	OTHER CAR	SIDE-SIDE	01-RDMS-2	00	HS 600 397
4ME33	0	OTHER CAR	TYPE L	11-FYEW-2	01	HS 600 398
4ME34	0	OTHER CAR	TYPE L	02-RZES-2	00	HS 600 399
4ME35	0	OTHER CAR	TYPE L	12-FREW-2	00	HS 600 400
4ME36	0	OTHER CAR	TYPE L	03-RZMW-3	01	HS 600 401
4ME37	0	OTHER CAR	HEAD-ON	12-FZEW-4	03	HS 600 402
4ME38	0	OTHER CAR	TYPE L	10-FYEW-3	02	HS 600 403
4ME39	0	OTHER CAR	TYPE L	12-FDEW-2	00	HS 600 404
4ME40	0	OTHER CAR	TYPE L	10-LFHW-3	02	HS 600 405
BU 69 24	0	GROUND	VEH-OBJ	00-LDAO-2	07	HS 600 753
BU 69 25	0	POLE,TREE	VEH-OBJ	12-FCEW-6	05	
BU 70 11	0	SIGN	VEH-OBJ	12-FYGA-9	07	HS 600 809
BU 70 12	0	OTHER CAR	TYPE T	11-LYEW-5	09	
BU 70 13	0	POLE,TREE	VEH-OBJ	01-FCEN-2	03	
BU 70 14	1	OTHER CAR	HEAD-ON	11-FYEW-4	07	
BU 70 14	2	OTHER CAR	HEAD-ON	11-FYEW-4	03	
BU 70 15	0	POLE,TREE	VEH-OBJ	11-FYEN-5	07	HS 600 812
BU 70 16	0	GUARDRAIL	VEH-OBJ	00-XDAO-5	07	
BU 70 19	1	OTHER CAR	HEAD-ON	01-FLEW-4	06	
BU 70 19	2	OTHER CAR	HEAD-ON	11-FLEW-4	01	
BU 70 20	1	OTHER CAR	TYPE T	04-LYEW-3	09	
BU 70 20	2	OTHER CAR	SIDE-SIDE	11-LBES-2	00	
BU 70 21	0	POLE,TREE	VEH-OBJ	02-RPEN-4	07	
BU 70 22	1	OTHER CAR	TYPE T	02-RYEW-5	07	HS 600 815
BU 70 22	2	OTHER CAR	TYPE T	11-FDEW-3	01	HS 600 815
BU 70 23	0	POLE,TREE	VEH-OBJ	00-TYHN-2	06	
BU 70 24	1	OTHER CAR	HEAD-ON	01-FZEW-6	04	
BU 70 24	2	OTHER CAR	HEAD-ON	11-FDEW-3	09	
BU 70 25	0	POLE,TREE	VEH-OBJ	01-FREE-4	07	HS 600 816
BU 70 26	0	POLE,TREE	VEH-OBJ	01-RDES-3	08	
BU 70 27	0	BUILDING	VEH-OBJ	02-LFEW-3	07	HS 600 817
BU 70 28	0	EMBANKMENT	VEH-OBJ	04-LFES-2	08	HS 600 818
BU 70 29	0	OTHER CAR	TYPE T	12-FDHW-8	09	
BU 70 30	1	OTHER CAR	HEAD-ON	11-FLEW-4	06	
BU 70 30	2	OTHER CAR	HEAD-ON	11-FLEW-5	06	
BU 71 1	0	OTHER	VEH-OBJ	01-RDHW-1	06	
BU 71 2	0	GUARDRAIL	VEH-OBJ	01-UYXW-2	08	
BU 71 3	0	OTHER	VEH-OBJ	10-LPAN-9	08	
BU 71 5	0	FENCE	VEH-OBJ	00-TPGO-6	08	
BU 71 6	0	POLE,TREE	VEH-OBJ	12-FCAW-6	06	
BU 71 9	0	GUARDRAIL	VEH-OBJ	07-LDAW-3	08	
BU 71 13	0	POLE,TREE	VEH-OBJ	12-FDEW-5	07	
CAL-70-258	0	SMALL POST	VEH-OBJ	10-LPAN-3	01	HS 600 167
CAL-70-278	0	OTHER CAR	HEAD-ON	01-FLMW-2	00	HS 600 168

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
CAL-70-28B	0	POLE,TREE	VEH-OBJ	01-FLEN-5	02	HS 600 169
CAL-70-30B	0	OTHER CAR	TYPE L	10-FLMW-2	00	HS 600 720
CAL-70-31B	0	OTHER CAR	HEAD-ON	11-FLEW-2	00	HS 600 172
CAL-70-32B	0	OTHER CAR	REAR END	11-FRMW-1	01	HS 600 173
CAL-70-34B	0	OTHER CAR	TYPE L	02-RBEW-2	01	HS 600 175
CAL-70-35B	0	OTHER CAR	TYPE L	02-RYEW-4	00	HS 600 176
CAL-70-36B	0	SIGN	VEH-OBJ	12-UDXW-1	01	HS 600 177
CAL-70-37B	0	SIGN	VEH-OBJ	11-FCEW-5	06	HS 600 178
CAL-70-39B	1	OTHER CAR	TYPE L	11-LDES-3	01	HS 600 180
CAL-70-39B	2	OTHER CAR	TYPE L	10-LDEW-3	01	HS 600 180
CAL-70-40B	0	LIGHT TRUCK	REAR END	01-FLEN-2	01	HS 600 181
CAL-70-41B	0	OTHER CAR	TYPE L	09-LZMW-2	01	HS 600 182
CAL-70-43B	0	OTHER CAR	HEAD-ON	11-FDEW-3	01	HS 600 184
CAL-70-44B	0	OTHER CAR	TYPE L	12-FDEW-2	02	HS 600 298
CAL-70-46B	0	OTHER CAR	TYPE L	10-LYMW-3	03	HS 600 187
CAL-70-47B	0	GUARDRAIL	VEH-OBJ	01-FREN-5	01	HS 600 188
CAL-70-50B	0	SIGN	VEH-OBJ	04-XDAO-4	03	HS 600 189
CAL 70 53B	0	OTHER CAR	HEAD-ON	12-FLEW-6	05	HS 600 289
CAL-70-56B	0	OTHER CAR	TYPE L	02-RZEW-3	02	HS 600 290
CAL-70-57B	0	GUARDRAIL	VEH-OBJ	00-TPGO-5	04	HS 600 291
CAL-70-58B	0	OTHER CAR	REAR END	05-BLEW-2	01	HS 600 292
CAL-70-59B	0	EMBANKMENT	VEH-OBJ	04-RDAO-2	01	HS 600 293
CAL-70-60B	0	OTHER CAR	REAR END	12-FDMW-2	01	HS 600 294
CAL-70-62B	0	OTHER CAR	TYPE L	09-LFEW-3	01	HS 600 296
CAL-70-63B	0	OTHER CAR	TYPE L	11-FLEW-3	01	HS 600 408
CAL-70-64B	0	OTHER CAR	TYPE L	11-FLEW-3	01	HS 600 334
CAL-70-65B	0	SIGN	VEH-OBJ	01-FREW-2	01	HS 600 297
CAL-70-66B	0	OTHER CAR	REAR END	11-FREW-1	00	HS 600 335
CAL-70-67B	0	OTHER CAR	OTHER	05-BREW-4	01	HS 600 909
CAL-70-68B	0	OTHER CAR	TYPE L	02-RFMW-2	00	HS 600 298
CAL-70-69B	0	DITCH	VEH-OBJ	00-XDAO-1	01	HS 600 410
CAL-70-70B	0	DITCH	VEH-OBJ	06-BDAW-7	02	HS 600 411
CAL-70-71B	1	OTHER CAR	TYPE L	11-FLEW-3	01	HS 600 412
CAL-70-71B	2	OTHER CAR	TYPE L	12-FYEW-3	01	HS 600 412
CAL-70-72B	0	POLE,TREE	VEH-OBJ	12-FDEW-4	06	HS 600 413
CAL-70-73B	0	OTHER CAR	REAR END	01-FREE-4	00	HS 600 414
CAL-70-74B	0	OTHER CAR	TYPE L	11-FLEW-2	01	HS 600 415
CAL-70-83B	0	SIGN	VEH-OBJ	01-FREE-4	02	HS 600 417
CAL 70 95B	1	OTHER CAR	HEAD-ON	12-FDEW-3	07	
CAL 70 95B	2	OTHER CAR	HEAD-ON	12-FDEW-2	06	
CAL 70 111B	1	OTHER CAR	REAR END	12-FZEW-2	01	HS 600 985
CAL 70 111B	2	OTHER CAR	REAR END	07-BYEW-2	01	HS 600 985
CAL 70 115B	0	NO OBJECT	VEH-OBJ	00-XFLN-1	00	
CB7011A7114	1	OTHER CAR	TYPE L	11-FZEW-3	01	HS 600 720
CAL 71 1B	2	OTHER CAR	TYPE L	02-RYEW-3	03	HS 600 720
CAL 71 3B	1	OTHER CAR	REAR END	12-FREW-1	00	HS 600 721
CAL 71 3B	2	VAN	REAR END	05-BLEW-2	00	HS 600 721
CAL 71 4B	1	OTHER CAR	TYPE T	11-FLEE-2	03	
CAL 71 4B	2	OTHER CAR	TYPE T	04-RPMW-2	02	
CAL 71 5B	1	OTHER CAR	REAR END	06-BZEW-1	00	
CAL 71 5B	2	LIGHT TRUCK	REAR END	01-FZMW-2	01	
CAL 71 6B	0		REAR END	12-FDMW-2	01	HS 600 722
CAL 71 7B	1	OTHER CAR	REAR END	12-FZEW-2	01	HS 601 025
CAL 71 7B	2	OTHER CAR	REAR END	06-BYEW-3	02	HS 601 025
CAL 71 7B	3	OTHER CAR	REAR END	06-BDEW-1	01	HS 601 025
CAL 71 8B	1	OTHER CAR	HEAD-ON	01-FZEW-2	00	

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
CAL 71 88	2	OTHER CAR	HEAD-ON	12-FDEW-3	03	
CAL 71 98	0	POLE,TREE	VEH-OBJ	12-FCEN-2	01	
CAL 71 108	0	PIER,PILLAR	VEH-OBJ	11-FCEN-2	02	HS 601 024
CAL 71 118	0	TRACT-TRAIL	HEAD-ON	02-FZEW-2	03	HS 600 866
CAL 71 138	1	OTHER CAR	TYPE L	12-FCEN-2	00	HS 600 724
CAL 71 138	2	LIGHT TRUCK	TYPE L	10-LFEW-3	01	HS 600 724
CAL 71 148	1	OTHER CAR	REAR END	12-FDEW-1	01	HS 600 725
CAL 71 148	2	OTHER CAR	REAR END	06-BDEW-1	00	HS 600 725
CAL 71 168	1	OTHER CAR	TYPE L	01-FDEW-1	01	HS 600 726
CAL 71 168	2	MULTI-PURP	TYPE L	10-LYMW-2	01	HS 600 726
CAL 71 178	1	OTHER CAR	HEAD-ON	01-FYEW-2	01	
CAL 71 178	2	OTHER CAR	HEAD-ON	11-FLEW-2	00	
CAL 71 198	1	OTHER CAR	TYPE L	01-FZEW-1	01	
CAL 71 198	2	OTHER CAR	TYPE L	10-LFEW-1	00	
CAL 71 208	0	SIGN	VEH-OBJ	10-LFEN-2	00	
CAL 71 228	1	OTHER CAR	TYPE T	12-FDEW-5	02	
CAL 71 228	2	OTHER CAR	TYPE T	02-RPAW-4	07	
CAL 71 248	0	TRACT-TRAIL	TYPE T	11-LDAW-7	08	
CAL 71 258	1	OTHER CAR	TYPE T	11-FREN-1	00	HS 600 986
CAL 71 258	2	OTHER CAR	TYPE T	01-RPMW-2	00	HS 600 986
CAL 71 268	1	OTHER CAR	TYPE T	12-FYEW-2	02	
CAL 71 268	2	OTHER CAR	TYPE T	11-LYEW-2	02	
CAL 71 278	1	OTHER CAR	TYPE L	01-FLEW-2	00	HS 600 727
CAL 71 278	2	OTHER CAR	TYPE L	11-FLEE-2	00	HS 600 727
CAL 71 288	1	OTHER CAR	TYPE L	10-FZEW-2	01	
CAL 71 288	2	OTHER CAR	TYPE L	01-RFEW-2	01	
CAL 71 298	1	OTHER CAR	TYPE T	11-FDEW-2	01	
CAL 71 298	2	OTHER CAR	TYPE T	01-RDEW-3	01	
CAL 71 298	3	OTHER CAR	TYPE T	11-FLEW-1	01	
CAL 71 308	1	OTHER CAR	REAR END	11-FLEE-2	01	
CAL 71 308	2	OTHER CAR	REAR END	06-BREW-4	01	
CAL 71 318	1	OTHER CAR	REAR END	12-FDEW-1	00	
CAL 71 318	2	OTHER CAR	REAR END	06-BDEW-1	01	
CAL 71 318	3	OTHER CAR	REAR END	06-BCEW-1	00	
CAL 71 338	1	OTHER CAR	TYPE L	01-FZMW-1	01	
CAL 71 338	2	OTHER CAR	REAR END	08-LBEW-3	01	
CAL 71 348	1	OTHER CAR	TYPE T	11-FYEW-1	00	
CAL 71 348	2	OTHER CAR	TYPE T	02-RYEW-3	02	
CAL 71 358	1	OTHER CAR	TYPE L	12-FYEW-2	00	
CAL 71 358	2	OTHER CAR	TYPE L	10-LFEW-2	01	
CAL 71 388	0	TRACT-TRAIL	SIDE-SIDE	09-FYES-1	00	HS 600 870
CAL 71 398	1	OTHER CAR	REAR END	12-FYEW-1	01	
CAL 71 398	2	OTHER CAR	REAR END	06-BZEW-2	02	
CAL 71 408	1	OTHER CAR	REAR END	12-FYEW-2	00	HS 600 872
CAL 71 408	2	OTHER CAR	REAR END	06-BZEW-3	02	HS 600 872
CAL 71 418	1	OTHER CAR	TYPE T	11-FZEW-3	00	
CAL 71 418	2	OTHER CAR	TYPE T	02-RPEW-3	01	
CAL 71 428	0	SIGN	VEH-OBJ	00-XDAO-3	08	
CAL 71 438	1	OTHER CAR	SIDE-SIDE	01-FREE-1	00	
CAL 71 438	2	OTHER CAR	SIDE-SIDE	07-LFEW-1	00	
CAL 71 448	1	OTHER CAR	REAR END	01-FYEW-2	02	
CAL 71 448	2	OTHER CAR	REAR END	07-BREW-1	01	
CAL 71 478	1	TRACT-TRAIL	TYPE L	01-RZEW-3	01	
CAL 71 478	2	OTHER CAR	TYPE L	11-FYEW-1	01	
CAL 71 488	1	OTHER CAR	REAR END	12-FLEE-2	01	HS 600 987
CAL 71 488	2	OTHER CAR	REAR END	06-BREE-2	00	HS 600 987

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CAL 71 49B	0	POLE,TREE	VEH-OBJ	12-FCEN-2	02	
CAL 71 50B	1	OTHER CAR	REAR END	12-FDEW-1	00	
CAL 71 50B	2	OTHER CAR	REAR END	06-BDEW-2	01	
CAL 71 51B	0	SIGN	VEH-OBJ	01-RYES-2	01	HS 601 026
CAL 71 52B	1	OTHER CAR	TYPE T	0?-FREW-2	01	
CAL 71 52B	2	OTHER CAR	TYPE T	08-LYEW-2	01	
CAL 71 53B	1	OTHER CAR	SIDE-SIDE	02-FYEW-1	00	
CAL 71 53B	2	OTHER CAR	SIDE-SIDE	12-LDES-2	01	
CAL 71 54B	2	OTHER CAR	TYPE L	11-FLEE-1	00	
CAL 71 55B	1	OTHER CAR	HEAD-ON	02-FDEW-2	01	
CAL 71 55B	2	OTHER CAR	HEAD-ON	11-FLEW-5	03	
CAL 71 56B	1	OTHER CAR	TYPE T	02-FDEW-1	01	HS 600 913
CAL 71 56B	2	OTHER CAR	TYPE L	10-LYEW-2	02	HS 600 913
CAL 71 104B	1	OTHER CAR	TYPE L	01-FDEW-1	01	
CAL 71 104B	2	OTHER CAR	TYPE L	10-LZMW-2	01	
CAL 109	1	LIGHT TRUCK	SIDE-SIDE	01-FYEW-3	03	
CAL 109	2	OTHER CAR	SIDE-SIDE	12-FYEW-3	02	
CAL 71E 1B	1	OTHER CAR	TYPE L	01-FZEW-1	01	
CAL 71E 1B	2	OTHER CAR	TYPE L	10-LFEW-1	00	
CAL 72 38	0	VAN	TYPE L	09-LYEW-2	02	
GIT 46	0	SIGN	VEH-OBJ	01-FYEN-3	03	HS 600 017
GIT 47	0	OTHER CAR	TYPE L	03-RFEW-3	02	HS 600 009
GIT 48	1	OTHER CAR	HEAD-ON	01-FLEW-3	01	HS 600 014
GIT 48	2	OTHER CAR	HEAD-ON	11-FYEW-4	02	HS 600 014
GIT 49	0	OTHER CAR	HEAD-ON	11-FYEW-3	02	HS 600 005
GIT 50	0	TRACT-TRAIL	HEAD-ON	10-LPAW-9	09	HS 600 062
GIT 51	0	POLE,TREE	VEH-OBJ	03-TDAO-7	01	HS 600 021
GIT 52	0	POLE,TREE	VEH-OBJ	11-FLEN-4	01	HS 600 061
GIT 53	1	OTHER CAR	HEAD-ON	12-FLEE-3	00	HS 600 018
GIT 53	2	OTHER CAR	HEAD-ON	02-RYAW-5	05	HS 600 018
GIT 53	3	OTHER CAR	TYPE L	12-FZEW-6	05	
GIT 54	1	VAN	TYPE L	09-LYAW-5	04	HS 600 003
GIT 55	0	OTHER CAR	HEAD-ON	12-FCMW-4	03	HS 600 019
GIT 56	0	POLE,TREE	VEH-OBJ	12-FCEN-6	05	HS 600 007
GIT 57	0	POLE,TREE	VEH-OBJ	12-FZEN-3	02	HS 600 069
GIT 58	0		TYPE L	12-FDEW-3	03	HS 600 060
GIT 59	0	POLE,TREE	VEH-OBJ	12-FREN-5	06	HS 600 067
GIT 60	0	OTHER CAR	REAR END	11-LYMW-3	01	HS 600 029
GIT 61	0	OTHER	VEH-OBJ	12-FCAW-5	07	HS 600 030
GIT 62	0	CULVERT	VEH-OBJ	00-TDNO-6	01	HS 600 027
GIT 63	0	OTHER CAR	SIDE-SIDE	12-FCEN-2	00	HS 600 004
GIT 64	0	OTHER CAR	REAR END	02-RBEW-3	01	HS 600 071
GIT 65	0	OTHER CAR	HEAD-ON	11-FLEW-3	07	HS 600 073
GIT 66	0	GUARDRAIL	HEAD-ON	01-FREW-3	01	HS 600 005
GIT 67	0	SMALL POST	VEH-OBJ	12-FCEN-3	02	HS 600 146
GIT 68	0	OTHER CAR	TYPE L	02-FYEN-5	03	HS 600 192
GIT 69	0	GUARDRAIL	VEH-OBJ	11-FYAW-6	02	HS 600 147
GIT 70	0	POLE,TREE	VEH-OBJ	10-LFAW-7	04	HS 600 193
GIT 71	0	POLE,TREE	VEH-OBJ	02-RPAN-3	01	HS 600 299
GIT 72	0	OTHER CAR	TYPE L	00-TDGO-5	04	HS 600 410
GIT 74	0	VAN	TYPE L	12-FDEW-3	00	HS 600 419
GIT 76	0	POLE,TREE	VEH-OBJ	12-FCEN-2	01	HS 600 421
GIT 77	0	OTHER CAR	REAR END	06-BCMW-1	00	HS 600 422
GIT 79	1	OTHER CAR	HEAD-ON	12-FYEW-3	01	HS 600 423
GIT 79	2	OTHER CAR	HEAD-ON	11-FLEW-2	01	HS 600 423
GIT 96	1	OTHER CAR	TYPE T	10-FDEW-1	01	HS 600 819

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GIT 96	2	OTHER CAR	TYPE T	00-TPGO-3	01	HS 600 819
GIT 98	1	OTHER CAR	SIDE-SIDE	11-LFMS-1	00	HS 600 820
GIT 98	2	OTHER CAR	SIDE-SIDE	12-FREN-2	02	HS 600 820
GIT 99	1	OTHER CAR	TYPE L	01-FZEW-2	02	
GIT 99	2	OTHER CAR	TYPE L	10-LYMW-2	01	
GIT 260 100	1	OTHER CAR	TYPE T	10-FDEW-1	01	
GIT 260 100	2	OTHER CAR	TYPE T	02-RYMW-4	01	
GIT 260 101	0	MOTORCYCLE	TYPE T	02-RFEN-1	00	
GIT 260 102	1	OTHER CAR	TYPE L	10-LYEW-2	01	
GIT 260 102	2	OTHER CAR	TYPE L	01-FDEW-4	02	
GIT 260 103	0	GROUND	VEH-OBJ	00-XDAO-1	01	
GIT 260 104	1	OTHER CAR	REAR END	12-FDEW-2	00	
GIT 260 104	2	OTHER CAR	REAR END	06-BDEW-2	01	
GIT 260 105	1	OTHER CAR	TYPE T	11-FLEE-3	01	
GIT 260 105	2	OTHER CAR	TYPE T	10-LPEW-2	01	
GIT 260 106	1	OTHER CAR	REAR END	07-BYEW-4	00	HS 601 083
GIT 260 106	2	TRACT-TRAIL	REAR END	06-BREE-4	01	HS 601 083
GIT 260 107	0	OTHER CAR	TYPE L	11-FDEW-1	00	HS 601 082
GIT 260 108	1	OTHER CAR	TYPE T	11-FDEW-2	00	
GIT 260 108	2	OTHER CAR	TYPE T	02-RYEW-3	01	
GIT 109	1	OTHER CAR	HEAD-ON	12-FLEW-7	09	
GIT 109	2	OTHER CAR	HEAD-ON	12-FLEW-5	07	
GIT 109	3	OTHER CAR	HEAD-ON	11-FREW-2	00	
GIT 260 110	1	OTHER CAR	TYPE T	02-RYAW-3	02	HS 601 080
GIT 260 110	2	OTHER CAR	TYPE T	12-FDEW-2	01	HS 601 080
GIT 260 111	0	POLE,TREE	VEH-OBJ	01-FREN-3	00	
GIT 260 112	0	PIER,PILLAR	VEH-OBJ	02-FDEW-2	05	
GIT 260 113	0	PIER,PILLAR	VEH-OBJ	12-FCEW-5	07	
GIT 260 114	0	BRIDGE RAIL	VEH-OBJ	12-FLLE-1	00	
GIT260115	0	POLE,TREE	VEH-OBJ	12-FREE-2	04	
GIT 260 119	0	GROUND	VEH-OBJ	00-XDAO-3	01	
GIT 260 121	0	ST TRUCK	TYPE T	01-FDMA-3	01	
GIT 260 122	1	OTHER CAR	SIDE-SIDE	01-FYEW-5	06	
GIT 260 122	2	OTHER CAR	SIDE-SIDE	11-LDAS-2	01	
GIT 260 122	3	OTHER CAR	HEAD-ON	11-FLAW-6	08	
MCR 69 1	1	OTHER CAR	SIDE-SIDE	11-LYAS-4	07	HS 600 074
MCR 69 1	2	OTHER CAR	SIDE-SIDE	11-LYES-4	03	HS 600 074
MCR692	0	POLE,TREE	VEH-OBJ	03-RZAW-7	09	HS 600 064
MCR693	0	POLE,TREE	VEH-OBJ	02-RPAN-4	09	HS 600 066
MCR694	0	FENCE	VEH-OBJ	00-TDAO-6	03	HS 600 086
MCR695	0	OTHER CAR	TYPE L	03-RPMW-3	01	HS 600 194
MCR696	0	OTHER CAR	REAR END	06-BYEW-2	01	HS 600 087
MCR697	0	SIGN	VEH-OBJ	09-LPAN-5	06	HS 600 195
MCR698	0	OTHER	VEH-OBJ	02-FREN-4	03	HS 600 088
MCR699	0	BRIDGE RAIL	VEH-OBJ	10-LBEW-3	08	HS 600 196
MCR6912	0	OTHER CAR	REAR END	10-LPEW-3	01	HS 600 199
MCR6913	1	OTHER CAR	REAR END	11-FLEW-3	01	HS 600 200
MCR6913	2	OTHER CAR	REAR END	12-FREW-2	00	HS 600 200
MCR6914	0	POLE,TREE	VEH-OBJ	10-TDGO-4	01	HS 600 201
MCR6915	0	GROUND	VEH-OBJ	02-TPGO-1	01	HS 600 202
MCR 70 1	1	OTHER CAR	TYPE L	11-FDEW-2	01	HS 600 300
MCR 70 1	2	OTHER CAR	TYPE L	10-LYEW-4	03	HS 600 300
MCR 70 2	0	POLE,TREE	VEH-OBJ	00-TPGO-4	01	HS 600 203
MCR 70 3	0	OTHER CAR	HEAD-ON	12-FYMW-2	00	HS 600 301
MCR 70 5	0	EMBANKMENT	VEH-OBJ	06-BRLW-1	00	HS 600 303
MCR 70 6	0	EMBANKMENT	VEH-OBJ	08-TCGO-4	00	HS 600 204

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MCR 70 7	0	OTHER CAR	TYPE L	02-RPEW-3	04	HS 600 205
MCR 70 8	0	OTHER CAR	TYPE L	11-FYEW-2	02	HS 600 424
MCR 70 9	1	OTHER CAR	HEAD-ON	12-FDEW-5	09	HS 600 425
MCR 70 9	2	OTHER CAR	HEAD-ON	12-FDEW-4	04	HS 600 425
MI-697001	0	OTHER CAR	VEH-OBJ	1;-FYEW-3	02	HS 600 006
MI-697002	0		TYPE L	02-RYAW-5	07	HS 600 050
MI-697003	0	OTHER CAR	REAR END	03-RPAN-6	05	HS 600 089
MI-697004	0	DITCH	VEH-OBJ	00-LFEO-1	06	HS 600 090
MI-697005	1	OTHER CAR	TYPE L	09-RBEN-4	05	HS 600 212
MI-697005	2	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 212
MI-697006	1	OTHER CAR	TYPE L	12-FZAW-3	02	HS 600 213
MI-697006	2	OTHER CAR	TYPE L	01-FRMW-2	01	HS 600 213
MI-697006	3	OTHER CAR	TYPE L	02-RYAW-7	08	HS 600 213
MI-697007	0	OTHER CAR	TYPE L	12-FDEW-5	03	HS 600 214
MI-697008	1	OTHER CAR	TYPE T	10-LPEW-4	06	HS 600 091
MI-697008	2	OTHER CAR	TYPE T	12-FDAW-3	02	HS 600 091
MI-697009	0	OTHER	TYPE L	01-FREW-3	03	HS 600 215
MI-697010	1	OTHER CAR	REAR END	11-FDEW-3	01	HS 600 216
MI-697010	2	OTHER CAR	REAR END	06-BDMW-4	01	HS 600 216
MI-697011	0	DITCH	VEH-OBJ	01-XDAO-3	06	HS 600 217
MI-697018	1	OTHER CAR	TYPE L	12-FYMW-2	01	HS 600 219
MI-697018	2	OTHER CAR	TYPE L	09-LYAW-5	07	HS 600 219
MI-697019	1	OTHER CAR	HEAD-ON	11-FLAW-6	09	HS 600 220
MI-697019	2	OTHER CAR	HEAD-ON	01-FLEW-3	01	HS 600 220
MI-697020	0	MOTORCYCLE	TYPE L	03-RPMW-2	00	HS 600 221
MI-697021	0	TRAIN,BUS	TYPE L	03-RFMW-3	00	HS 600 222
MI-697022	1	OTHER CAR	TYPE L	03-RZMW-4	06	HS 600 092
MI-697022	2	OTHER CAR	TYPE L	12-FZMW-2	00	HS 600 092
MI-697023	0	MOTORCYCLE	REAR END	00-XDAO-3	01	HS 600 223
MI 697025	0	POLE,TREE	VEH-OBJ	10-LPAN-9	07	HS 600 160
MI-697026	0	VAN	TYPE L	12-FDMW-2	00	HS 600 225
MI-697027	1	OTHER CAR	TYPE L	12-FDAW-2	01	HS 600 226
MI-697027	2	OTHER CAR	TYPE L	09-LDAW-7	09	HS 600 226
MI-697029	0	OTHER	VEH-OBJ	00-TZGO-2	04	HS 600 227
MI-697031	0	GROUND	VEH-OBJ	00-TDAO-3	02	HS 600 228
MI-697032	1	OTHER CAR	REAR END	07-XDAW-8	06	HS 600 229
MI-697032	2	OTHER CAR	REAR END	07-LBMW-4	03	HS 600 229
MI-697032	3	OTHER CAR	REAR END	07-LBHN-3	00	HS 600 229
MI-697033	1	OTHER CAR	REAR END	07-BLMW-4	00	HS 600 230
MI-697033	2	OTHER CAR	REAR END	01-FRMW-3	01	HS 600 230
MI-697034	0	MOTORCYCLE	TYPE L	09-LPEW-5	06	HS 600 231
MI-697039	0	BUILDING	VEH-OBJ	01-RFMW-2	01	HS 600 232
MI-697041	0	POLE,TREE	VEH-OBJ	11-FLEW-4	06	HS 600 233
MIAMI-105	0	GROUND	VEH-OBJ	00-XDAO-1	06	HS 600 431
MIAMI-121	1	OTHER CAR	HEAD-ON	12-FDEW-5	07	HS 600 822
MIAMI-121	2	OTHER CAR	HEAD-ON	12-FDEW-3	05	HS 600 822
MIAMI72 201	0	OTHER	VEH-OBJ	01-FREE-1	01	HS 600 823
MIAMI72 202	0	SMALL POST	VEH-OBJ	12-FZEW-4	06	
MIAMI72 203	0	TRACT-TRAIL	TYPE T	04-RYAW-9	08	
MIAMI72 204	1	OTHER CAR	TYPE T	01-FDEW-2	01	
MIAMI72 204	2	OTHER CAR	TYPE T	10-LDAW-3	07	
MIAMI72 205	1	OTHER CAR	TYPE T	01-FREW-3	02	
MIAMI72 205	2	OTHER CAR	TYPE T	09-LYEW-3	07	
MIAMI72 206	1	OTHER CAR	TYPE T	01-FDEW-1	01	
MIAMI72 206	2	OTHER CAR	TYPE T	02-RBEW-4	03	
MIAMI72 207	1	OTHER CAR	TYPE T	11-FDMW-1	01	HS 600 825

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MIAMI72 207	2	OTHER CAR	TYPE T	02-RPMW-1	01	HS 600 825
MIAMI72 208	1	OTHER CAR	TYPE T	01-FDEW-1	02	HS 601 077
MIAMI72 208	2	OTHER CAR	TYPE T	10-LYMW-3	03	HS 601 077
MIAMI72 209	0	GUARDRAIL	VEH-OBJ	11-FLEW-4	08	HS 600 826
MIAMI72 211	0	POLE,TREE	VEH-OBJ	12-FCEN-4	09	
MIAMI72 212	1	OTHER CAR	SIDE-SIDE	11-FYEW-6	07	
MIAMI72 212	2	OTHER CAR	SIDE-SIDE	11-LYES-3	04	
MIAMI72 213	1	OTHER CAR	TYPE L	01-FDEW-1	01	
MIAMI72 213	2	OTHER CAR	TYPE L	10-LBEW-3	06	
MIAMI72 214	0	GROUND	VEH-OBJ	00-LDAO-1	01	
MIAMI72-215	1	OTHER CAR	REAR END	11-FYEW-2	98	
MIAMI72-215	2	OTHER CAR	REAR END	05-BYEW-3	02	
MIAMI 215	3	OTHER CAR	REAR END	11-FYEW-3	99	
MIAMI72 216	0	POLE,TREE	VEH-OBJ	01-RPAW-4	08	
MIAMI 213	0	POLE,TREE	VEH-OBJ	10-LYAW-3	06	
MIAMI72 218	0	OTHER	VEH-OBJ	00-TYGA-5	09	
MIAMI72 220	1	OTHER CAR	HEAD-ON	11-FYAW-6	04	HS 600 827
MIAMI72 220	2	OTHER CAR	HEAD-ON	01-FZEW-2	01	HS 600 827
MIAMI72 221	0	POLE,TREE	VEH-OBJ	10-LPAN-3	06	HS060 1 07
MIAMI72 222	0	TRACT-TRAIL	TYPE L	01-FZEW-4	04	
MIAMI72 223	0	MOTORCYCLE	HEAD-ON	01-FCEN-1	01	
MIAMI72 224	0	MOTORCYCLE	TYPE T	03-RZEW-3	00	
MIAMI72 225	1	OTHER CAR	TYPE T	11-FDEW-1	01	
MIAMI72 225	2	OTHER CAR	TYPE T	02-RYAW-3	01	
MIAMI72 226	0	PEDESTRIAN	VEH-OBJ	12-FCEN-1	00	
MIAMI72 227	1	OTHER CAR	SIDE-SIDE	03-RFMS-1	01	
MIAMI72 227	2	OTHER CAR	SIDE-SIDE	09-LFEW-2	01	
MIAMI72 228	0	OTHER	VEH-OBJ	12-UCXN-1	02	
MIAMI72 229	1	OTHER CAR	TYPE L	11-LZAW-3	02	
MIAMI72 229	2	OTHER CAR	TYPE L	11-FYEW-3	03	
MIAMI72 230	1	OTHER CAR	TYPE L	01-FDEW-1	98	
MIAMI72 230	2	OTHER CAR	TYPE L	10-LDAW-3	08	
MIAMI72 231	0	OTHER	HEAD-ON	11-FLEE-6	06	
MIAMI72 232	1	OTHER CAR	REAR END	12-FYEW-4	06	
MIAMI72 232	2	OTHER CAR	REAR END	06-BREW-3	01	
MIAMI72 233	0	OTHER CAR	TYPE L	02-RPAW-3	02	
MIAMI72 234	1	OTHER CAR	TYPE T	02-RPAW-6	02	
MIAMI72 234	2	OTHER CAR	TYPE T	11-FDAW-7	02	
MIAMI72 235	1	OTHER CAR	REAR END	01-FREE-3	01	
MIAMI72 235	2	OTHER CAR	REAR END	07-BLEE-3	00	
MIAMI72 236	0	PEDESTRIAN	VEH-OBJ	12-FRGN-1	00	
MIAMI72 237	0	POLE,TREE	VEH-OBJ	01-FREN-2	01	
MIAMI72 238	1	OTHER CAR	TYPE T	02-FDMS-1	01	
MIAMI72 238	2	OTHER CAR	TYPE T	11-LDMS-1	01	
MIAMI72 239	1	OTHER CAR	TYPE L	11-FLEW-2	02	
MIAMI72 239	2	OTHER CAR	TYPE L	05-RYAS-3	04	
MIAMI72 240	1	OTHER CAR	TYPE L	11-FLEE-2	01	
MIAMI72 240	2	OTHER CAR	TYPE L	02-RFEE-3	02	
MI 72306	1	OTHER CAR	TYPE T	11-FDEW-1	00	
MI 72306	2	OTHER CAR	TYPE T	02-RDEW-2	01	
MMF-69-38	1	OTHER CAR	HEAD-ON	12-FDEW-3	01	HS 600 206
MMF-69-38	2	OTHER CAR	HEAD-ON	11-FYEW-3	01	HS 600 206
MMF-69-39	0	OTHER CAR	HEAD-ON	12-FLEW-4	06	HS 600 336
MMF-69-46	0	POLE,TREE	VEH-OBJ	00-XDAO-3	06	HS 600 426
MMF-69-49	0	DITCH	VEH-OBJ	01-FZAW-6	09	HS 600 427
MMF-69-54	0	OTHER CAR	HEAD-ON	01-FZMW-2	01	HS 600 207

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MMF-69-55	0	OTHER CAR	HEAD-ON	10-FYAW-6	07	HS 600 337
MMF-69-58	0	OTHER	VEH-OBJ	04-RBAN-3	06	HS 600 288
MMF-69-59	0	SIGN	VEH-OBJ	02-RFEN-3	06	HS 600 428
MMF-70-1	0	EMBANKMENT	VEH-OBJ	01-PZAW-6	08	
MMF-70-2	0	POLE,TREE	VEH-OBJ	02-RYAW-6	08	
MMF 70 3	0	DITCH	VEH-OBJ	09-UDXW-2	09	HS 600 338
MMF-70-04	0	POLE,TREE	VEH-OBJ	12-FREN-2	01	HS 600 289
MMF-70-05	0	OTHER CAR	HEAD-ON	01-FREE-6	08	HS 600 210
MMF-70-06	0	GUARDRAIL	VEH-OBJ	00-XDAO-7	06	HS 600 339
MMF-70-07	0	POLE,TREE	VEH-OBJ	09-LPAN-6	01	HS 600 211
MMF-70-08	0	GROUND	VEH-OBJ	00-XDAO-2	06	HS 600 340
MMF-70-10	1	OTHER CAR	TYPE L	10-LZHW-9	09	HS 600 430
MMF-70-10	2	OTHER CAR	TYPE L	12-FDHW-5	02	HS 600 430
MMF-70-11	0	OTHER	VEH-OBJ	03-RPAN-5	08	
MMF-70-12	0	ABUTMENT	VEH-OBJ	12-FDAW-8	08	
MMF-70-14	0	POLE,TREE	VEH-OBJ	12-FDAW-6	07	
MMF-70-15	0	CULVERT	VEH-OBJ	01-FREE-2	01	
MMF-70-16	0	LIGHT TRUCK	TYPE L	12-FDEW-3	02	
MMF-70-18	1	OTHER CAR	TYPE L	01-FDEW-3	02	
MMF-70-18	2	OTHER CAR	TYPE L	00-LYEW-3	07	
MMF-70-19	1	OTHER CAR	TYPE L	12-FDEW-2	02	
MMF-70-19	2	OTHER CAR	TYPE L	04-RYAW-8	08	
MMF 71 3	1	OTHER CAR	HEAD-ON	01-FREW-3	08	
MMF 71 3	2	OTHER CAR	HEAD-ON	11-FLEW-2	01	
MMF 71 4	0	GROUND	VEH-OBJ	00-XDHO-4	07	
MMF 71 6	0	SIGN	VEH-OBJ	12-FCMN-1	07	
MMF 71 7	0	POLE,TREE	VEH-OBJ	01-FREE-3	01	
MMF 71 8	0	EMBANKMENT	VEH-OBJ	00-TPGO-3	06	
MMF 71 9	0	POLE,TREE	VEH-OBJ	01-FREN-3	01	HS 600 934
MMF 71 10	0	FENCE	VEH-OBJ	00-TPGO-3	01	
MMF 71 11	0	POLE,TREE	VEH-OBJ	01-FREN-2	01	
MMF 71 12	0	POLE,TREE	VEH-OBJ	10-LPAN-4	08	
MMF 71 13	0	POLE,TREE	VEH-OBJ	08-LPAN-7	08	
MMF 71 14	0	OTHER	VEH-OBJ	12-FREN-5	07	
MMF 71 15	1	OTHER CAR	TYPE T	04-RZEW-3	07	
MMF 71 15	2	OTHER CAR	TYPE T	11-FDEW-3	01	
MMF 71 16	0	BUILDING	VEH-OBJ	11-FZEW-3	01	
MMF 71 17	0	POLE,TREE	VEH-OBJ	11-FREN-1	01	
MMF 71 18	0	GROUND	VEH-OBJ	00-TDHO-4	06	
MMF 71 19	0	PIER,PILLAR	VEH-OBJ	12-FLEE-9	07	
MMF 71 20	0	OTHER CAR	SIDE-SIDE	08-LDAW-4	08	
MMF 71 22	0	MOTORCYCLE	OTHER	12-FDLW-1	01	HS 600 877
MMF 71 23	0	POLE,TREE	VEH-OBJ	08-LPAN-5	01	
MMF 71 24	0	FENCE	VEH-OBJ	01-FLEN-2	07	
MMF 71 25	0	GUARDRAIL	VEH-OBJ	09-LPAN-5	08	
MMF 71 26	1	OTHER CAR	REAR END	01-FREW-3	01	
MMF 71 26	2	OTHER CAR	REAR END	07-BLAW-8	99	
MMF 71 27	0	DITCH	VEH-OBJ	00-XDAO-5	04	
MMF 71 28	0	POLE,TREE	VEH-OBJ	12-FCEN-2	05	
MMF 71 29	0	GUARDRAIL	VEH-OBJ	00-FREO-5	07	
MMF 71 30	0	EMBANKMENT	TYPE T	11-LDAW-2	00	
MMF 71 31	0	OTHER CAR	TYPE T	01-FDEW-2	01	
MMF 71 32	0	GROUND	VEH-OBJ	00-TDGO-5	01	
MMF 72 3	0	TRACT-TRAIL	REAR END	12-FDHW-9	08	
MMF-72-7	0	OTHER	VEH-OBJ	11-UPXW-2	07	
UNM 01	0	OTHER CAR	TYPE L	02-RPMN-3	01	HS 600 837

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
UNM 02	0	EMBANKMENT	VEH-OBJ	09-TDGO-5	01	HS 600 093
UNM 03	0	OTHER CAR	TYPE L	02-TDGO-6	07	HS 600 094
UNM 04	0	VAN	SIDE-SIDE	07-BZEW-5	01	HS 600 095
UNM 05	0	TRACT-TRAIL	REAR END	11-FZAW-5	03	HS 600 235
UNM 06	0	OTHER CAR	REAR END	07-BCEW-3	01	HS 600 096
UNM 07	0	GUARDRAIL	VEH-OBJ	00-TPGO-4	01	HS 600 097
UNM 08	0	OTHER CAR	TYPE L	03-RYEW-3	04	HS 600 149
UNM 09	0	ANIMAL-BIG	VEH-OBJ	11-FLMW-1	06	HS 600 150
UNM 10	0	EMBANKMENT	VEH-OBJ	09-XDAO-3	01	HS 600 236
UNM 11	0	OTHER CAR	TYPE L	10-LBMW-2	01	HS 600 237
UNM 12	0	BRIDGE RAIL	VEH-OBJ	01-FLEN-3	08	HS 600 238
UNM 13	0	OTHER CAR	TYPE L	11-FYEW-3	00	HS 600 239
UNM 14	0	OTHER CAR	TYPE L	00-TDGO-6	05	HS 600 240
UNM 15	0	POLE,TREE	VEH-OBJ	11-FLEN-4	08	HS 600 241
UNM 16	0	BRIDGE RAIL	VEH-OBJ	12-FDAW-6	08	HS 600 242
UNM 17	0	OTHER CAR	TYPE L	11-FYEW-5	03	HS 600 243
UNM 19	1	OTHER CAR	REAR END	12-FDEW-3	01	HS 600 305
UNM 19	2	OTHER CAR	REAR END	06-BDMW-2	00	HS 600 305
UNM 20	0	BRIDGE RAIL	VEH-OBJ	02-RDAW-4	07	HS 600 306
UNM 21	1	OTHER CAR	TYPE L	11-FLEW-3	02	HS 600 307
UNM 21	2	OTHER CAR	TYPE L	01-FDEW-2	02	HS 600 307
UNM 22	0	OTHER CAR	TYPE L	03-RZEW-3	00	HS 600 308
UNM 23	0	OTHER CAR	TYPE L	11-FDEW-3	02	HS 600 309
UNM 24	0	POLE,TREE	VEH-OBJ	09-LPAN-4	01	HS 600 310
UNM 26	1	OTHER CAR	TYPE L	12-FDEW-3	02	HS 600 341
UNM 26	2	OTHER CAR	TYPE L	09-LPMW-3	02	HS 600 341
UNM 27	0	POLE,TREE	VEH-OBJ	12-FDEW-3	01	HS 600 312
UNM 29	0	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 342
UNM 30	0	OTHER CAR	TYPE L	10-LBHW-3	00	HS 600 314
UNM 32	1	OTHER CAR	REAR END	12-FDEW-3	03	HS 600 433
UNM 32	2	OTHER CAR	REAR END	06-BDMW-3	06	HS 600 433
UNM 33	0	OTHER CAR	TYPE L	04-RPMW-2	02	HS 600 434
UNM 34	0	TRACT-TRAIL	REAR END	01-FZEW-4	02	HS 600 435
UNM 39	1	OTHER CAR	REAR END	12-FYEW-2	01	HS 600 436
UNM 39	2	OTHER CAR	REAR END	09-BZEW-3	06	HS 600 436
UNM 56 1	1	OTHER CAR	TYPE L	12-FYEW-2	01	
UNM 56 2	2	OTHER CAR	TYPE L	09-LFEW-2	02	
UNM 63	1	OTHER CAR	TYPE L	11-FYMW-2	01	HS 600 880
UNM 63	2	OTHER CAR	TYPE L	02-RFEW-3	01	HS 600 880
UNM 64	0	POLE,TREE	VEH-OBJ	03-RPAW-5	05	HS 600 881
UNM 65	1	OTHER CAR	REAR END	12-FYEW-3	01	
UNM 65	2	OTHER CAR	REAR END	06-BZEW-5	01	
UNM 66	1	OTHER CAR	TYPE L	09-LFEE-5	01	HS 600 789
UNM 66	2	OTHER CAR	TYPE L	01-FREE-2	01	HS 600 789
UNM 67	1	OTHER CAR	TYPE L	11-FDEW-2	01	HS 600 829
UNM 67	2	OTHER CAR	TYPE L	02-RFEW-2	02	HS 600 829
UNM 68	2	OTHER CAR	TYPE T	00-TPGO-2	00	HS 600 790
UNM 69	1	OTHER CAR	SIDE-SIDE	10-FLEE-1	01	
UNM 69	2	OTHER CAR	TYPE T	04-RPEW-3	02	
UNM 70	0	MOTORCYCLE	REAR END	06-BREE-2	00	
UNM 71	1	OTHER CAR	TYPE T	11-FDEW-1	00	HS 600 773
UNM 71	2	OTHER CAR	TYPE T	02-RYEW-3	01	HS 600 773
UNM 72	0	OTHER CAR	TYPE T	00-LDAW-7	07	HS 600 830
UNM 73	1	OTHER CAR	TYPE L	11-FDEW-3	01	HS 600 774
UNM 73	2	OTHER CAR	TYPE L	01-RFEW-2	01	HS 600 774
UNM 74	0	EMBANKMENT	VEH-OBJ	01-FREW-2	02	HS 600 831

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
UNM 75	1	OTHER CAR	TYPE T	12-FDMW-1	01	
UNM 75	2	OTHER CAR	TYPE T	10-LYEW-3	02	
UNM 76	1	OTHER CAR	REAR END	12-FDEW-2	01	
UNM 76	2	OTHER CAR	REAR END	06-BDEW-4	01	
UNM 76	3	OTHER CAR	REAR END	05-BYEW-3	02	
UNM 77	1	OTHER CAR	REAR END	12-FZEW-1	01	
UNM 77	2	OTHER CAR	REAR END	06-BYEW-3	01	
UNM 78	1	OTHER CAR	REAR END	12-FDEW-2	01	
UNM 78	2	OTHER CAR	REAR END	06-BDEW-1	01	
UNM 79	0	TRACT-TRAIL	REAR END	01-FDAA-7	06	HS 600 914
UNM 80	0	GUARDRAIL	VEH-OBJ	00-TDHO-6	08	HS 600 915
UNM 81	1	OTHER CAR	TYPE T	01-FDEW-2	02	HS 600 835
UNM 81	2	OTHER CAR	TYPE T	09-LPMW-2	01	HS 600 835
UNM 82	0	IMPACT ATTN	VEH-OBJ	11-FREW-3	02	HS 600 791
UNM 83	0		TYPE T	02-RYHW-4	02	
UNM 84	0	POLE,TREE	VEH-OBJ	09-LBEN-3	01	
UNM 85	1	OTHER CAR	REAR END	12-FYEW-3	01	
UNM 85	2	OTHER CAR	REAR END	06-BDEW-4	09	
OSU 1	0	OTHER CAR	TYPE L	03-RYMW-2	01	HS 600 437
OSU 2	0	OTHER CAR	REAR END	07-BYMW-1	01	HS 600 835
OSU 3	0	OTHER CAR	TYPE L	11-LZMS-3	02	HS 600 839
OSU 4	0	OTHER CAR	REAR END	02-RYAW-4	08	HS 600 004
OSU 5	0	GROUND	VEH-OBJ	00-XDAO-3	01	HS 600 802
OSU 7	0	OTHER CAR	TYPE L	03-RYHW-3	06	HS 600 826
OSU 8	0	OTHER CAR	TYPE L	00-LBMW-3	03	HS 600 825
OSU 9	0	OTHER CAR	TYPE L	09-LPMW-3	02	HS 600 438
OSU 11	0	POLE,TREE	VEH-OBJ	02-RPAW-5	03	
OSU 12	0	OTHER CAR	TYPE L	10-LFEW-3	04	HS 600 439
OSU 13	0	OTHER CAR	TYPE L	11-FLEW-1	01	
OSU 14	0	LARGE TRUCK	SIDE-SIDE	00-LDAO-2	01	
OSU 15	0	POLE,TREE	VEH-OBJ	07-LZAW-4	06	
OSU 17	0	OTHER CAR	TYPE T	11-FDEW-1	02	
OSU 19	0	OTHER CAR	TYPE L	09-LFMW-3	02	
OSU 20	0	OTHER CAR	TYPE T	11-FDEW-1	01	
OSU 22	0	OTHER CAR	SIDE-SIDE	02-RYAW-5	06	
OSU 23	0	OTHER CAR	TYPE L	01-FZEW-2	00	
OSU 24	0	SIGN	VEH-OBJ	00-RDAO-1	00	
OSU 25	0	OTHER CAR	REAR END	01-FDEW-4	02	
OSU 27	0	TRAIN,BUS	TYPE T	09-LDAW-9	09	
OSU 29	0	GUARDRAIL	VEH-OBJ	09-LBEN-3	01	
OSU 30	0	OTHER CAR	REAR END	01-FREE-2	01	
OSU 31	0	TRACT-TRAIL	TYPE T	02-RFEW-4	03	
OSU 35	0	POLE,TREE	VEH-OBJ	05-RPAN-4	08	
OSU 39	1	OTHER CAR	HEAD-ON	12-FYAW-7	06	
OSU 39	2	OTHER CAR	HEAD-ON	12-FYAW-9	06	
OSU 47	0	DITCH	VEH-OBJ	00-UFXW-1	03	
OSU 51	0	OTHER CAR	TYPE T	01-FDEW-1	01	
OSU 53	0	VAN	TYPE T	02-RYMW-2	01	
RTI 1	0	DITCH	VEH-OBJ	12-FLMN-2	00	HS 600 838
RTI 2	0	OTHER CAR	REAR END	11-FYEW-3	02	HS 600 815
RTI 4	0	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 816
RTI 5	0	ST TRUCK	TYPE L	12-FDEW-3	01	HS 600 000
RTI 6	1	OTHER CAR	TYPE L	12-FDMW-2	01	HS 600 813
RTI 6	2	OTHER CAR	TYPE L	03-RZAW-4	02	HS 600 813
RTI 7	0	ST TRUCK	TYPE L	09-LPMW-3	04	HS 600 818
RTI 8	0	TRAIN,BUS	TYPE L	09-LDAW-6	00	HS 600 065

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
RTI 9	0	DITCH	VEH-OBJ	00-TDAO-3	05	HS 600 060
RTI 10	0	OTHER CAR	HEAD-ON	12-FDEW-6	08	HS 600 099
RTI 11	0	OTHER CAR	TYPE T	10-LPMW-2	02	HS 600 100
RTI 13	0	SMALL POST	VEH-OBJ	03-RZAW-3	01	HS 600 101
RTI 14	0	DITCH	VEH-OBJ	12-FRMN-2	01	HS 600 102
RTI 16	0	DITCH	VEH-OBJ	00-TDAO-2	00	HS 600 244
RTI 17	0	DITCH	VEH-OBJ	12-FCMN-3	01	HS 600 151
RTI 18	0	OTHER CAR	REAR END	01-FREW-3	01	HS 600 245
RTI 19	0	OTHER CAR	REAR END	12-FDMW-2	02	HS 600 440
RTI 20	0	OTHER CAR	HEAD-ON	11-FDEW-4	01	HS 600 316
RTI 21	1	OTHER CAR	TYPE L	11-FDMW-2	01	HS 600 317
RTI 21	2	OTHER CAR	TYPE L	04-RPMW-3	04	HS 600 317
RTI 23	0	TRACT-TRAIL	TYPE L	12-FRMW-3	01	HS 600 319
RTI 24	0	TRAIN,BUS	TYPE L	01-FDAW-5	06	HS 600 441
RTI 25	0	CULVERT	VEH-OBJ	00-TZHO-2	01	HS 600 343
RTI 27	0	DITCH	VEH-OBJ	00-FDEO-3	02	HS 600 320
RTI 28	0	OTHER CAR	REAR END	07-BLMW-2	01	HS 600 344
RTI 29	0	TRACT-TRAIL	TYPE L	09-LYAW-6	08	HS 600 321
RTI 30	0	TRAIN,BUS	TYPE L	12-FCEW-4	03	HS 600 322
RTI 32	0	DITCH	VEH-OBJ	00-XDAO-2	02	HS 600 442
RTI 48	0	EMBANKMENT	VEH-OBJ	00-FDEW-3	00	HS 601 001
RTI 095 49	1	OTHER CAR	TYPE L	11-FLEW-3	01	HS 601 002
RTI 095 49	2	OTHER CAR	TYPE L	02-RFEE-3	01	HS 601 002
RTI 095 51	1	OTHER CAR	HEAD-ON	01-FREW-2	01	
RTI 095 51	2	OTHER CAR	HEAD-ON	11-FYEW-3	01	
RTI 095 52	1	OTHER CAR	REAR END	11-FDEW-3	01	
RTI 095 52	2	OTHER CAR	REAR END	05-BREW-5	03	
RTI 095 54	0	EMBANKMENT	VEH-OBJ	00-TPGO-3	01	
RTI 095 56	1	OTHER CAR	TYPE T	01-FDEW-2	01	
RTI 095 56	2	OTHER CAR	TYPE T	10-LPEW-4	01	
RTI 095 57	0	GROUND	VEH-OBJ	00-TPGO-1	01	
RTI 095 58	0	OTHER	HEAD-ON	12-FCEN-2	01	
RTI 095 59	0	GROUND	VEH-OBJ	00-TPGO-2	00	
RTI 095 60	1	OTHER CAR	TYPE L	12-FDEW-4	03	
RTI 095 60	2	OTHER CAR	TYPE L	08-LFEW-3	01	
RTI 095 61	0	OTHER CAR	SIDE-SIDE	12-FREW-2	02	
RTI 095 62	0	ST TRUCK	TYPE L	04-RPAW-6	08	
RTI 095 64	0	POLE,TREE	VEH-OBJ	02-FREW-3	02	
RTI 095 65	1	OTHER CAR	REAR END	12-FDEW-1	01	
RTI 095 65	2	OTHER CAR	REAR END	06-BDEW-3	02	
RTI 095 66	0	DITCH	VEH-OBJ	00-TDAO-2	02	
RTI 095 67	2	OTHER CAR	TYPE T	02-RYEW-3	01	
RTI 095 69	1	OTHER CAR	TYPE L	10-LFEW-3	01	
RTI 095 69	2	OTHER CAR	TYPE L	01-FZEW-3	01	
RTI 095 70	1	OTHER CAR	TYPE L	10-FDEW-2	01	
RTI 095 70	2	OTHER CAR	TYPE L	01-RFEW-3	01	
RTI 095 71	1	OTHER CAR	SIDE-SIDE	12-FLEE-2	00	
RTI 095 71	2	OTHER CAR	SIDE-SIDE	11-LDMS-2	00	
RTI 095 72	0	EMBANKMENT	VEH-OBJ	00-XFEW-3	01	
RTI 095 73	0	MOTORCYCLE	TYPE T	02-RBEN-1	09	
RTI 095 74	0	POLE,TREE	VEH-OBJ	05-BCEN-3	01	
RTI 095 75	1	OTHER CAR	OTHER	11-FYEW-1	98	
RTI 095 75	2	OTHER CAR	SIDE-SIDE	00-TDAO-3	05	
RTI 095 75	3	OTHER CAR	HEAD-ON	01-FREE-2	01	
RTI 095 76	1	OTHER CAR	HEAD-ON	12-FYAW-6	02	
RTI 095 76	2	OTHER CAR	HEAD-ON	11-FYAW-6	08	

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIGURATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
RTI 095 77	0	DITCH	VEH-OBJ	00-RDAO-3	01	
RTI 095 78	0	POLE,TREE	VEH-OBJ	11-FREN-1	01	
RTI 095 79	1	OTHER CAR	REAR END	05-BDAW-4	01	
RTI 095 79	2	OTHER CAR	REAR END	01-FZEW-2	01	
RTI 095 80	1	OTHER CAR	REAR END	12-FDEW-1	02	
RTI 095 80	2	OTHER CAR	REAR END	06-BDEW-2	01	
RTI 095 81	1	LIGHT TRUCK	HEAD-ON	01-FLEE-2	01	
RTI 095 81	2	OTHER CAR	HEAD-ON	11-FLEE-1	01	
RTI 095 82	1	OTHER CAR	TYPE T	02-FDEW-1	00	
RTI 095 82	2	OTHER CAR	TYPE T	11-LDEW-2	01	
RTI 095 83	1	OTHER CAR	TYPE T	12-FDEW-2	02	
RTI 095 83	2	OTHER CAR	TYPE L	10-LYAW-3	02	
RAI 43	0	OTHER CAR	TYPE L	11-FREW-3	02	HS 600 734
RAI 46	0	OTHER CAR	HEAD-ON	01-FYEW-2	03	HS 600 775
RAI 65 66	1	OTHER CAR	TYPE L	10-LFEW-5	06	HS 600 792
RAI 65 66	2	OTHER CAR	TYPE L	11-FREE-4	02	HS 600 792
RAI 71	0	OTHER CAR	SIDE-SIDE	03-RYMS-2	00	
RAI 81	1	OTHER CAR	TYPE L	11-FDEW-3	03	HS 600 793
RAI 81	2	OTHER CAR	TYPE L	02-RYAW-3	04	HS 600 793
RAI 82	0	OTHER CAR	HEAD-ON	12-FYEW-3	06	HS 600 794
RAI 83	1	OTHER CAR	HEAD-ON	12-FDEW-4	03	HS 600 795
RAI 83	2	OTHER CAR	HEAD-ON	01-FZEW-5	04	HS 600 795
RAI 84	0	OTHER CAR	HEAD-ON	12-FLEE-1	01	
RAI 87	0	OTHER CAR	HEAD-ON	12-FYEW-2	02	
RAI 89	0	PIER,PILLAR	VEH-OBJ	11-FYAW-6	03	
RAI 90	0	POLE,TREE	VEH-OBJ	01-FREN-3	05	
RAI 102	0	POLE,TREE	VEH-OBJ	02-RFEW-9	03	HS 600 797
RAI 106	1	OTHER CAR	TYPE T	01-FYEW-3	04	
RAI 106	2	OTHER CAR	TYPE T	11-FYEW-2	02	
RAI 107	1	OTHER CAR	HEAD-ON	01-FZEW-3	02	
RAI 107	2	OTHER CAR	HEAD-ON	01-FZEW-3	05	
RAI 107	3	OTHER CAR	REAR END	12-FLEE-3	01	
RAI 110	0	OTHER CAR	TYPE T	12-FDEW-1	00	
RAI 111	1	OTHER CAR	TYPE T	12-FRMW-1	01	
RAI 111	2	OTHER CAR	TYPE T	00-LPMW-3	03	
RAI 112	1	OTHER CAR	TYPE L	11-FYEW-2	01	HS 600 884
RAI 112	2	OTHER CAR	TYPE L	02-RFEW-2	01	HS 600 884
RAI 113	0	FENCE	VEH-OBJ	12-FDEW-6	06	
RAI 116	1	OTHER CAR	TYPE T	12-FLEW-2	01	
RAI 116	2	OTHER CAR	TYPE T	03-RPEW-4	06	
RAI 117	1	VAN	TYPE L	12-FZEW-2	00	HS 600 885
RAI 117	2	OTHER CAR	TYPE L	02-RPEW-3	01	HS 600 885
RAI 119	1	OTHER CAR	TYPE L	02-RFEW-2	02	
RAI 119	2	LIGHT TRUCK	TYPE L	10-LPAW-3	09	
RAI 120	0	GUARDRAIL	VEH-OBJ	12-FCEW-3	01	
RAI 121	0	GUARDRAIL	VEH-OBJ	12-FLEN-4	02	
RAI 122	0	OTHER CAR	TYPE L	01-FLEE-1	00	
RAI 123	1	OTHER CAR	REAR END	12-FDEW-7	01	
RAI 123	2	OTHER CAR	REAR END	11-FLEW-2	03	
RAI 124	0	OTHER CAR	REAR END	06-BZMW-1	01	
RAI 125	0	OTHER CAR	REAR END	12-FYEW-2	00	
RAI 126	0	POLE,TREE	VEH-OBJ	12-ECEN-2	03	
RAI 127	1	OTHER CAR	REAR END	12-FDMW-1	01	HS 601 003
RAI 127	2	OTHER CAR	REAR END	06-BDMW-1	00	HS 601 003
RAI 128	0	OTHER CAR	TYPE L	05-RYEW-2	01	
RAI 131	1	OTHER CAR	TYPE T	02-RDAW-7	09	HS 600 886

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIGURATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
RAI 131	2	OTHER CAR	TYPE T	11-FDEW-3	02	HS 600 886
RAI 134	1	OTHER CAR	SIDE-SIDE	07-LFES-1	00	
RAI 134	2	OTHER CAR	SIDE-SIDE	01-RPMS-2	01	
RAI 137	1	OTHER CAR	TYPE L	01-FDEW-1	01	
RAI 137	2	OTHER CAR	TYPE L	10-LYEW-3	01	
RAI 138	1	OTHER CAR	TYPE T	01-FZEW-1	01	
RAI 138	2	OTHER CAR	TYPE T	00-LZEW-4	01	
RAI 139	0	ST TRUCK	SIDE-SIDE	11-FLEE-1	02	
USC 71 1	1	OTHER CAR	TYPE T	10-FDEW-2	01	
USC 71 1	2	OTHER CAR	TYPE T	01-RYEW-3	01	
USC 71 2	1	OTHER CAR	TYPE L	01-FDEW-1	01	
USC 71 2	2	OTHER CAR	TYPE L	10-LZEW-2	01	
USC 71 3	1	OTHER CAR	TYPE L	10-LFEE-2	01	
USC 71 3	2	OTHER CAR	TYPE L	02-LFEE-3	01	
USC 71 4	1	OTHER CAR	TYPE L	10-FDES-1	01	
USC 71 4	2	OTHER CAR	TYPE L	02-RPAW-3	01	
USC 71 5	1	OTHER CAR	SIDE-SIDE	10-LBEW-1	01	
USC 71 5	2	OTHER CAR	SIDE-SIDE	11-FLEE-2	03	
USC 71 6	0	OTHER	VEH-OBJ	02-RFLW-2	01	
USC 71 7	1	ST TRUCK	REAR END	07-BREE-6	01	
USC 71 7	2	OTHER CAR	REAR END	12-FCEN-2	01	
USC 71 8	0	POLE,TREE	VEH-OBJ	12-FLEW-3	02	HS 600 748
USC 71 9	0	OTHER	VEH-OBJ	12-FREN-1	02	
USC 71 11	0	GUARDRAIL	VEH-OBJ	12-FCEW-2	00	HS 600 808
USC 71 12	1	OTHER CAR	TYPE L	11-FYEW-2	01	
USC 71 12	2	OTHER CAR	TYPE L	01-RFEW-2	01	
USC 71 13	1	OTHER CAR	SIDE-SIDE	12-FLEN-1	00	
USC 71 13	2	OTHER CAR	SIDE-SIDE	11-LDMS-2	01	
USC 71 14	0	ABUTMENT	VEH-OBJ	11-FLEW-3	01	
USC 71 15	1	OTHER CAR	TYPE T	12-FZMW-1	00	
USC 71 15	2	OTHER CAR	TYPE T	00-TDAO-2	01	
USC 71 16	1	OTHER CAR	REAR END	12-FLMW-1	01	
USC 71 16	2	OTHER CAR	REAR END	06-BRMW-2	00	
USC 17	0	OTHER CAR	SIDE-SIDE	00-TPGW-3	03	
USC 18	1	OTHER CAR	TYPE L	02-FDEW-1	01	HS 600 962
USC 18	2	OTHER CAR	TYPE L	02-RYAW-3	01	HS 600 962
USC 19	1	OTHER CAR	REAR END	12-FZEW-2	01	HS 600 943
USC 19	2	OTHER CAR	REAR END	07-LBES-1	00	HS 600 943
USC 20	1	OTHER CAR	REAR END	12-FYEW-1	01	HS 600 961
USC 20	2	OTHER CAR	REAR END	06-BZEW-3	01	HS 600 961
USC 21	1	OTHER CAR	TYPE L	12-FDEW-6	02	HS 600 920
USC 21	2	OTHER CAR	TYPE L	09-LFEW-2	01	HS 600 920
USC 22	1	OTHER CAR	TYPE L	10-FLEE-2	01	HS 600 921
USC 22	2	OTHER CAR	TYPE L	02-RFEE-2	01	HS 600 921
USC 22	3	OTHER CAR	TYPE L	10-LPHW-1	01	HS 600 921
USC 23	0	MOTORCYCLE	REAR END	12-FCEN-3	00	
USC 24	1	OTHER CAR	REAR END	02-RFEW-2	01	
USC 24	2	OTHER CAR	TYPE L	12-FLEW-1	01	
USC 25	0	OTHER	VEH-OBJ	12-FDEW-2	02	
USC 26	1	OTHER CAR	SIDE-SIDE	12-FDEW-1	01	
USC 26	2	OTHER CAR	HEAD-ON	12-FDEW-1	00	
USC 27	1	OTHER CAR	TYPE L	01-FYEW-3	01	
USC 27	2	OTHER CAR	TYPE L	10-LBEW-2	03	
USC 28	1	OTHER CAR	REAR END	06-BDEW-2	01	
USC 28	2	OTHER CAR	REAR END	06-BDEW-2	01	
USC 29	1	OTHER CAR	REAR END	12-FREW-1	01	

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
USC 29	2	OTHER CAR	REAR END	06-BDEW-2	01	
USC 31	0	OTHER	VEH-OBJ	12-FZEW-2	03	
USC 72 32	1	OTHER CAR	TYPE L	12-FYEW-1	01	
USC 72 32	2	OTHER CAR	TYPE L	10-LBMW-1	02	
USC 33	1	OTHER CAR	HEAD-ON	12-FDEW-1	01	
USC 33	2	OTHER CAR	HEAD-ON	02-FZEW-2	02	
USC 34	0	FENCE	VEH-OBJ	12-FDEW-2	01	
USC 35	0	GUARDRAIL	VEH-OBJ	01-FRES-1	01	
USC 72 36	1	OTHER CAR	TYPE L	02-RFEW-2	02	
USC 72 36	2	OTHER CAR	TYPE L	09-LBEW-2	02	
USC 72 38	0	MOTORCYCLE	HEAD-ON	01-FCEN-1	01	
USC 39	0	POLE,TREE	VEH-OBJ	12-FREE-1	01	
USC 40	0	GUARDRAIL	SIDE-SIDE	12-FDEW-2	01	
USC 73 4	0	OTHER CAR	HEAD-ON	11-FREW-1	01	
USC 73 5	0	OTHER CAR	SIDE-SIDE	11-FYEW-2	01	
USC 73 20	1	OTHER CAR	TYPE L	01-FYEW-2	01	
USC 73 20	2	OTHER CAR	TYPE L	10-LZMW-2	02	
SRI 2 001	0	POLE,TREE	VEH-OBJ	12-FLEN-2	04	
SRI 2 002	1	OTHER CAR	REAR END	12-FDEW-1	00	
SRI 2 002	2	OTHER CAR	REAR END	06-BDEW-1	02	
SRI2 006	1	OTHER CAR	TYPE T	11-FLEW-1	01	
SRI2 006	2	OTHER CAR	TYPE T	04-RPAW-2	01	
SRI 2 007 1	1	MOTORCYCLE	TYPE T	00-LPMW-2	00	
SRI 2 007 2	2	MOTORCYCLE	TYPE T	02-FREE-2	01	
SRI-0006	0	OTHER CAR	REAR END	12-FCMW-1	00	HS 800 870
SRI-0007	0	OTHER CAR	REAR END	01-RFMS-2	00	HS 800 855
SRI-0009	0	POLE,TREE	VEH-OBJ	11-FREW-2	02	HS 800 853
SRI-0012	0	EMBANKMENT	VEH-OBJ	11-UYEW-4	00	HS 190 730
SRI-0020	0	POLE,TREE	VEH-OBJ	12-FREN-3	01	HS 800 157
SRI-0061	1	OTHER CAR	REAR END	12-FCMW-1	00	HS 800 452
SRI-0061	2	OTHER CAR	REAR END	06-BCMW-1	99	HS 800 452
SU 002	0	PEDESTRIAN	VEH-OBJ	12-FCMN-1	00	HS 800 893
SU 003	0	MOTORCYCLE	HEAD-ON	02-FDMW-2	00	HS 800 894
SU 005	1	GUARDRAIL	HEAD-ON	12-FYEW-6	03	
SU 005	2	OTHER CAR	HEAD-ON	11-FYEW-6	00	
SU 008	0	MOTORCYCLE	HEAD-ON	11-FZEW-1	00	
SU 010	1	OTHER CAR	HEAD-ON	01-FZEW-4	02	HS 800 927
SU 010	2	OTHER CAR	SIDE-SIDE	11-LDES-2	00	HS 800 927
SU 010	3	OTHER CAR	HEAD-ON	11-FDEW-4	01	HS 800 927
SU 010	4	OTHER CAR	HEAD-ON	11-FLEW-2	01	HS 800 927
SU 011	1	OTHER CAR	TYPE T	01-RYEW-3	01	HS 800 897
SU 011	2	OTHER CAR	TYPE T	11-FREE-2	01	HS 800 897
SU 012	1	OTHER CAR	HEAD-ON	12-FLEW-5	01	
SU 012	2	OTHER CAR	HEAD-ON	12-FLEE-3	01	
SU 013	0	GUARDRAIL	VEH-OBJ	01-FYEW-3	06	HS 800 898
SU 014	0	OTHER	VEH-OBJ	12-FCEW-2	02	
SU 015	0	FENCE	VEH-OBJ	12-FCEN-8	07	HS 800 900
SU 021	1	OTHER CAR	HEAD-ON	01-FZEW-4	01	HS 800 951
SU 021	2	OTHER CAR	HEAD-ON	12-FDEW-4	04	HS 800 951
SU 022	1	OTHER CAR	REAR END	12-FZEW-3	01	
SU 022	2	OTHER CAR	REAR END	06-BYEW-6	00	
SU 023	0	PEDESTRIAN	VEH-OBJ	12-FZEW-1	00	HS 800 901
SU 029	0	TRACT-TRAIL	SIDE-SIDE	10-LYAW-3	07	HS 800 955
SU 030	0	OTHER	VEH-OBJ	00-TPGO-1	02	HS 800 902
SU 031	0	ST TRUCK	REAR END	12-FLAW-7	00	HS 800 700
SU 032	0	FENCE	VEH-OBJ	12-FLEW-6	05	HS 800 903

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
SU 034	1	OTHER CAR	SIDE-SIDE	11-FLEE-2	01	HS 600 849
SU 034	2	OTHER CAR	SIDE-SIDE	12-LYAS-3	02	HS 600 849
SU 035	1	ST TRUCK	REAR END	07-BDAW-9	05	HS 600 904
SU 035	2	OTHER CAR	REAR END	06-BDEW-1	00	HS 600 904
SU 037	1	OTHER CAR	REAR END	12-FDEW-2	01	HS 600 954
SU 037	2	OTHER CAR	REAR END	07-BDAW-5	01	HS 600 954
SU 038	0	OTHER	TYPE L	00-TDAA-6	09	
SU 039	0	LIGHT TRUCK	SIDE-SIDE	01-FLEN-3	00	
SU 040	0	ST TRUCK	REAR END	01-FREE-2	01	HS 600 953
SU 041	1	OTHER CAR	REAR END	12-FZEW-2	01	
SU 041	2	OTHER CAR	REAR END	07-BDAW-7	09	
SU 042	1	OTHER CAR	TYPE L	01-FDEW-1	00	
SU 042	2	OTHER CAR	TYPE L	10-LYHW-3	01	
SWRI-6901	0	POLE,TREE	VEH-OBJ	12-FRMN-3	01	HS 600 020
SWRI-6903	1	OTHER CAR	TYPE L	12-FDEW-3	01	HS 600 032
SWRI-6903	2	OTHER CAR	TYPE L	10-LDEW-3	03	HS 600 032
SWRI-6904	0	POLE,TREE	VEH-OBJ	11-FLMN-1	06	HS 600 033
SWRI-6905	1	OTHER CAR	SIDE-SIDE	08-LZES-3	01	HS 600 103
SWRI-6905	2	OTHER CAR	SIDE-SIDE	02-RYES-4	03	HS 600 103
SWRI-6906	0	POLE,TREE	VEH-OBJ	12-FLMN-2	06	HS 600 036
SWRI-6908	1	OTHER CAR	TYPE L	12-FDEW-3	00	HS 600 104
SWRI-6908	2	OTHER CAR	TYPE L	00-TPGO-6	04	HS 600 104
SWRI-6911	0	PIER,PILLAR	VEH-OBJ	09-LPAW-6	08	HS 600 024
SWRI-6912	1	LIGHT TRUCK	HEAD-ON	12-FDEW-3	00	HS 600 105
SWRI-6912	2	OTHER CAR	HEAD-ON	12-FDEW-5	04	HS 600 105
SWRI-6913	0	GUARDRAIL	VEH-OBJ	00-TDHO-6	03	HS 600 023
SWRI 6914	1	OTHER CAR	TYPE T	10-LYEW-4	08	HS 600 106
SWAI 6914	2	OTHER CAR	TYPE T	01-FDEW-2	00	HS 600 106
SWRI-6917	1	OTHER CAR	SIDE-SIDE	03-RPAS-3	01	HS 600 247
SWRI-6917	2	OTHER CAR	SIDE-SIDE	02-RBMS-1	00	HS 600 247
SWRI-7003	1	OTHER CAR	REAR END	12-FRMW-3	00	HS 600 109
SWRI-7003	2	OTHER CAR	REAR END	06-BLMW-3	03	HS 600 109
SWRI-7004	1	OTHER CAR	TYPE L	12-FZMW-2	01	HS 600 152
SWRI-7004	2	OTHER CAR	TYPE L	09-LBMW-2	00	HS 600 152
SWRI-7005	1	OTHER CAR	HEAD-ON	11-FYEW-4	03	HS 600 110
SWRI-7005	2	OTHER CAR	HEAD-ON	11-FYEW-6	04	HS 600 110
SWRI-7006	0	SIGN	VEH-OBJ	01-FREN-3	02	HS 600 111
SWRI-7007	0	GROUND	VEH-OBJ	00-XDAO-3	01	HS 600 153
SWRI-7008	1	OTHER CAR	HEAD-ON	12-RFEE-3	00	HS 600 112
SWRI-7008	2	OTHER CAR	HEAD-ON	12-RFEE-3	00	HS 600 112
SWRI-7009	1	OTHER CAR	REAR END	12-FZMW-1	01	HS 600 113
SWRI-7009	2	OTHER CAR	REAR END	06-BYEW-2	01	HS 600 113
SWRI-7011	0	POLE,TREE	VEH-OBJ	12-FCMN-3	02	HS 600 154
SWRI-7012	0	GROUND	VEH-OBJ	00-XDAO-3	03	HS 600 248
SWRI-7013	0	GUARDRAIL	VEH-OBJ	00-TDAO-3	01	HS 600 249
SWRI-7014	0	SIGN	VEH-OBJ	01-RFEW-3	02	HS 600 155
SWRI-7017	0	GUARDRAIL	VEH-OBJ	00-XDAO-4	01	HS 600 156
SWRI-7018	1	EMBANKMENT	TYPE L	09-LFEW-2	02	HS 600 250
SWRI-7018	2	OTHER CAR	TYPE L	03-FZEW-3	02	HS 600 250
SWRI-7019	1	OTHER CAR	TYPE L	11-FZMW-2	00	HS 600 251
SWRI-7019	2	OTHER CAR	TYPE L	03-RZMW-3	01	HS 600 251
SWRI-7020	1	GUARDRAIL	HEAD-ON	11-FYEW-5	99	HS 600 252
SWRI-7020	2	LIGHT TRUCK	HEAD-ON	11-FYEW-5	02	HS 600 252
SWRI-7021	1	OTHER CAR	SIDE-SIDE	11-FLEE-2	00	HS 600 253
SWRI-7021	2	OTHER CAR	SIDE-SIDE	11-LZES-3	01	HS 600 253
SWRI-7022	1	OTHER CAR	TYPE L	12-FZEW-5	01	HS 600 254

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SWRI-7022	2	OTHER CAR	TYPE L	10-LFEW-3	02	HS 800 254
SWRI-7023	0	OTHER CAR	SIDE-SIDE	02-RBMS-2	00	HS 800 453
SWRI-7024	1	OTHER CAR	TYPE L	12-FDMW-1	01	HS 800 345
SWRI-7024	2	OTHER CAR	TYPE L	03-RPMW-3	00	HS 800 345
SWRI-7025	0	PIER,PILLAR	VEH-OBJ	12-FCEW-5	06	HS 800 454
SWRI-7026	0	GROUND	VEH-OBJ	00-TQ00-4	00	HS 800 455
SWRI-7027	0	TRACT-TRAIL	REAR END	07-BZEW-3	02	HS 800 456
SWRI-7030	0	MOTORCYCLE	TYPE L	09-LFMN-2	00	HS 800 458
SWRI-7032	1	OTHER CAR	REAR END	12-FDMW-1	00	HS 800 459
SWRI-7032	2	OTHER CAR	REAR END	06-BDEW-2	00	HS 800 459
SWRI-7037	1	OTHER CAR	TYPE L	12-FZMW-3	01	HS 800 460
SWRI-7037	2	OTHER CAR	TYPE L	03-RBMW-2	01	HS 800 460
SWRI-7037	3	OTHER CAR	SIDE-SIDE	11-LFMW-1	00	HS 800 460
SWRI-7043	0	GUARDRAIL	VEH-OBJ	10-LPAW-3	01	HS 800 461
SWRI 7126	1	OTHER CAR	HEAD-ON	12-FZEW-2	01	HS 800 756
SWRI 7126	2	OTHER CAR	HEAD-ON	12-FZEW-3	01	HS 800 756
SWRI 7132	1	OTHER CAR	TYPE L	01-FDEW-2	01	HS 800 758
SWRI 7132	2	OTHER CAR	TYPE L	10-LFEW-2	00	HS 800 758
SWRI 7134	1	OTHER CAR	TYPE L	10-LFMW-2	00	HS 800 760
SWRI 7134	2	OTHER CAR	TYPE L	01-FZEW-2	01	HS 800 760
SWRI 7136	1	OTHER CAR	REAR END	11-FDEW-3	01	HS 800 761
SWRI 7136	2	OTHER CAR	REAR END	05-BDEW-4	02	HS 800 761
SWRI 7138	1	OTHER CAR	TYPE L	01-FDEW-2	02	HS 800 762
SWRI 7138	2	OTHER CAR	TYPE L	10-LYEW-4	01	HS 800 762
SWRI 7143	1	OTHER CAR	HEAD-ON	11-FZEW-2	02	
SWRI 7143	2	OTHER CAR	HEAD-ON	01-FREW-3	01	
SWRI 7144	1	OTHER CAR	HEAD-ON	12-FZEW-2	02	HS 800 767
SWRI 7144	2	OTHER CAR	HEAD-ON	12-FZEW-1	01	HS 800 767
SWRI 7145	0	SIGN	VEH-OBJ	00-TPHO-2	02	HS 800 768
SWRI 7146	1	OTHER CAR	TYPE T	11-FDMW-1	01	HS 800 769
SWRI 7146	2	OTHER CAR	TYPE T	02-RZEW-3	01	HS 800 769
SWRI 7147	1	OTHER CAR	TYPE T	11-FDEW-3	04	HS 800 770
SWRI 7147	2	OTHER CAR	TYPE T	02-RYAW-4	09	HS 800 770
SWRI 7148	1	OTHER CAR	TYPE T	01-FDEW-2	01	HS 800 771
SWRI 7148	2	OTHER CAR	TYPE T	10-LPEW-2	01	HS 800 771
SWRI 7149	0	GROUND	VEH-OBJ	00-XDAO-2	01	HS 800 780
SWRI 7150	1	OTHER CAR	TYPE L	12-FDEW-2	02	HS 800 735
SWRI 7150	2	OTHER CAR	TYPE L	03-RFEW-3	01	HS 800 735
SWRI 7151	1	OTHER CAR	REAR END	12-FLEW-1	02	
SWRI 7151	2	OTHER CAR	REAR END	06-BZAW-7	02	
SWRI 7152	0	ST TRUCK	HEAD-ON	12-FYEW-2	04	
SWRI 7153	1	OTHER CAR	TYPE L	12-FREN-3	01	HS 800 736
SWRI 7153	2	OTHER CAR	TYPE L	10-LFEW-4	01	HS 800 736
SWRI 7154	1	OTHER CAR	HEAD-ON	12-FLEE-5	04	HS 800 737
SWRI 7154	2	OTHER CAR	HEAD-ON	12-FLEE-4	02	HS 800 737
SWRI 7155	1	OTHER CAR	REAR END	12-FZEW-3	02	HS 800 738
SWRI 7155	2	OTHER CAR	REAR END	06-BDEW-5	06	HS 800 738
SWRI 7156	0	ST TRUCK	TYPE T	11-FDMA-3	01	HS 800 739
SWRI 7157	0	POLE,TREE	VEH-OBJ	11-LYAS-2	02	HS 800 788
SWRI 7158	0	ST TRUCK	HEAD-ON	11-FYEW-3	09	
SWRI 7159	1	OTHER CAR	TYPE L	11-FLEE-3	03	HS 800 742
SWRI 7159	2	OTHER CAR	TYPE L	08-RYAW-3	01	HS 800 742
SWRI 7160	0	OTHER CAR	HEAD-ON	12-FDEW-2	01	HS 800 743
SWRI 7161	1	OTHER CAR	TYPE T	01-FDEW-2	01	HS 800 744
SWRI 7161	2	OTHER CAR	TYPE T	08-LPEW-3	02	HS 800 744
SWRI 7162	1	OTHER CAR	REAR END	09-LBMW-3	01	HS 800 799

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SWRI 7162	2	OTHER CAR	REAR END	06-BDMW-1	01	HS 600 799
SWRI 7162	3	OTHER CAR	REAR END	11-FYEW-3	01	HS 600 799
SWRI 7163	0	POLE,TREE	VEH-OBJ	12-FCEN-2	01	HS 600 745
SWRI 7164	1	OTHER CAR	TYPE L	11-FZEW-2	01	HS 600 746
SWRI 7164	2	OTHER CAR	TYPE L	02-RZMW-3	01	HS 600 746
SWRI 7165	0	POLE,TREE	VEH-OBJ	00-TDGO-4	02	HS 600 706
SWRI 7166	1	OTHER CAR	HEAD-ON	12-FDEW-4	06	HS 600 707
SWRI 7166	2	OTHER CAR	HEAD-ON	12-FDEW-2	02	HS 600 707
SWRI 7167	1	OTHER CAR	TYPE L	01-FZEW-3	02	HS 600 747
SWRI 7167	2	OTHER CAR	TYPE L	10-LFEW-3	01	HS 600 747
SWRI 7168	1	LIGHT TRUCK	TYPE T	12-FDEW-3	03	HS 600 800
SWRI 7168	2	OTHER CAR	TYPE T	02-RDEW-3	03	HS 600 800
SWRI 7169	0	BRIDGE RAIL	VEH-OBJ	01-FYEW-3	02	HS 600 708
SWRI 7170	1	TRACT-TRAIL	HEAD-ON	01-FZHA-7	01	HS 600 971
SWRI 7171	1	OTHER CAR	HEAD-ON	12-FDEW-2	02	HS 600 709
SWRI 7171	2	OTHER CAR	HEAD-ON	12-FDEW-3	01	HS 600 709
SWRI 7173	0	TRAIN,BUS	TYPE T	09-LPAW-5	03	HS 600 710
SWRI 7174	0		SIDE-SIDE	02-FDES-3	09	HS 600 711
SWRI 7175	0	ST TRUCK	TYPE L	08-LBAE-2	01	HS 600 712
SWRI 7176	1	OTHER CAR	TYPE L	11-FLMW-2	02	HS 600 713
SWRI 7176	2	OTHER CAR	TYPE L	04-RFEW-2	01	HS 600 713
SWRI 7177	1	OTHER CAR	REAR END	12-FLEW-3	01	
SWRI 7177	2	LIGHT TRUCK	REAR END	06-BREW-3	02	
SWRI 7178	1	OTHER CAR	TYPE L	11-FYEW-2	02	HS 600 714
SWRI 7178	2	OTHER CAR	TYPE L	02-RFEW-2	02	HS 600 714
SWRI 7179	1	ST TRUCK	SIDE-SIDE	11-LDES-2	01	HS 600 802
SWRI 7179	2	ST TRUCK	SIDE-SIDE	06-LZAS-2	01	HS 600 802
SWRI 7180	0	POLE,TREE	VEH-OBJ	12-FCEN-2	03	
SWRI 7181	1	OTHER CAR	HEAD-ON	11-FDEW-4	03	HS 600 803
SWRI 7181	2	OTHER CAR	HEAD-ON	11-FYEW-3	03	HS 600 803
SWRI 7182	1	OTHER CAR	HEAD-ON	12-FDEW-2	03	
SWRI 7182	2	LIGHT TRUCK	HEAD-ON	11-FDEW-3	03	
SWRI 7183	1	OTHER CAR	TYPE L	02-FDEW-2	03	HS 600 715
SWRI 7183	2	LIGHT TRUCK	TYPE L	10-LDAW-4	07	HS 600 715
SWRI 7184	1	OTHER CAR	REAR END	04-RBEW-3	01	HS 600 804
SWRI 7184	2	OTHER CAR	REAR END	01-FZEW-2	01	HS 600 804
SWRI 7186	0	DITCH	VEH-OBJ	00-LDHO-2	01	HS 600 717
SWRI 7187	0	GROUND	VEH-OBJ	00-TYHO-2	01	HS 600 805
SWRI 7188	1	OTHER CAR	TYPE T	11-FZEW-2	00	HS 600 718
SWRI 7188	2	OTHER CAR	TYPE T	02-RZAW-3	01	HS 600 718
SWRI 7189	1	OTHER CAR	TYPE T	01-FZEW-4	01	HS 600 806
SWRI 7189	2	OTHER CAR	TYPE T	02-RZEW-3	01	HS 600 806
SWRI 7190	1	OTHER CAR	TYPE L	10-LFEW-3	04	
SWRI 7190	2	OTHER CAR	TYPE L	02-RFEW-2	03	
SWRI 7191	1	OTHER CAR	SIDE-SIDE	11-FYES-3	03	HS 600 719
SWRI 7191	2	OTHER CAR	SIDE-SIDE	10-LDAW-6	02	HS 600 719
SWRI 7192	0	TRACT-TRAIL	TYPE T	11-FDGA-9	00	HS 600 807
SWRI 7193	1	OTHER CAR	TYPE T	11-FDEW-2	01	
SWRI 7193	2	OTHER CAR	TYPE T	02-RPEW-2	00	
SWRI 7201	1	OTHER CAR	TYPE T	02-RFEE-2	00	
SWRI 7201	2	OTHER CAR	TYPE T	11-LDAS-3	04	
SWRI 7202	0	TRACT-TRAIL	SIDE-SIDE	11-LDHS-3	01	
SWRI 7203	1	OTHER CAR	TYPE L	12-FCEN-2	01	
SWRI 7203	2	OTHER CAR	TYPE L	10-LYEW-2	01	
SWRI 7205	1	OTHER CAR	TYPE L	11-FYEW-1	02	
SWRI 7205	2	OTHER CAR	TYPE L	02-RFEW-2	02	

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SWRI 7206	1	OTHER CAR	TYPE T	11-FDEW-6	02	
SWRI 7206	2	VAN	TYPE T	02-RPAW-3	05	
SWRI 7207	1	BRIDGE RAIL	SIDE-SIDE	01-FZEW-3	01	HS 600 945
SWRI 7207	2	OTHER CAR	SIDE-SIDE	10-LPMS-2	01	HS 600 945
SWRI 7208	1	LIGHT TRUCK	REAR END	01-FREE-5	01	HS 600 946
SWRI 7208	2	OTHER CAR	REAR END	00-TDHO-3	04	HS 600 946
SWRI 7209	0	OTHER	VEH-OBJ	01-FREE-2	01	
SWRI 7210	1	OTHER CAR	TYPE T	10-LZMW-2	01	HS 600 916
SWRI 7210	2	OTHER CAR	TYPE T	02-RYEW-4	02	HS 600 916
SWRI 7211	0	FENCE	VEH-OBJ	10-LPEE-3	01	HS 600 947
SWRI 7212	0	POLE,TREE	VEH-OBJ	00-LPAN-3	02	
SWR7213 1	1	OTHER CAR	TYPE T	12-FDEW-3	05	
SWR7213 2	2	OTHER CAR	TYPE T	02-RDAW-6	03	
SWRI 7214	0	SMALL POST	VEH-OBJ	11-FCEN-2	03	HS 601 006
SWR72151	1	OTHER CAR	TYPE T	11-FDEW-3	01	
SWR72152	2	OTHER CAR	TYPE T	02-RZEW-3	03	
SWRI 7217	1	OTHER CAR	HEAD-ON	02-FDEW-3	01	
SWRI 7217	2	LIGHT TRUCK	HEAD-ON	10-FLEE-9	02	
SWR 7219	0	OTHER	VEH-OBJ	12-FZEW-2	01	
SWRI 7220	1	OTHER CAR	REAR END	01-FREE-6	01	
	2	OTHER CAR	REAR END	05-BLEE-4	00	
SWR72221	1	OTHER CAR	TYPE T	11-FDEW-1	01	
SWR72222	2	OTHER CAR	TYPE T	02-RYAW-6	02	
SWRI 7223	0	SIGN	VEH-OBJ	10-LYAN-4	03	
SWR72241	1	OTHER CAR	TYPE L	02-FREE-3	02	
SWR72241	2	OTHER CAR	TYPE L	10-LFEW-3	04	
SWRI 7227	1	OTHER CAR	REAR END	12-FYEW-1	01	
SWRI 7227	2	OTHER CAR	REAR END	01-FYEW-3	03	
SWRI 7227	3	OTHER CAR	HEAD-ON	11-FLEE-4	01	
SWRI 7231	1	FENCE	VEH-OBJ	00-TPGO-3	01	
SWRI 7232	1	OTHER CAR	HEAD-ON	01-FZEW-1	02	
SWRI 7232	2	OTHER CAR	HEAD-ON	11-FLEE-2	02	
SWRI 7233	1	OTHER CAR	TYPE L	12-FYEW-2	02	
SWRI 7233	2	OTHER CAR	TYPE L	02-RFEW-3	02	
SWRI 7242	0	BRIDGE RAIL	VEH-OBJ	01-FYEW-3	02	
UC 852D	0	TRAIN,BUS	TYPE L	03-RPMW-3	05	HS 600 000
UC 927D	0	MOTORCYCLE	HEAD-ON	12-FYEN-3	01	HS 600 328
UC 945D	1	OTHER CAR	HEAD-ON	12-FDEW-3	02	HS 600 114
UC 945D	2	OTHER CAR	HEAD-ON	12-FDEW-4	02	HS 600 114
UC 973D	1	OTHER CAR	HEAD-ON	12-FLMW-5	06	HS 600 347
UC 973D	2	OTHER CAR	REAR END	12-FLEW-3	01	HS 600 347
UC 973D	3	OTHER CAR	TYPE L	12-FYMW-2	01	HS 600 347
UC 1000D	0	POLE,TREE	VEH-OBJ	11-FCEN-3	02	HS 600 160
UC 1003D	1	OTHER CAR	TYPE L	12-FDEW-3	06	HS 600 050
UC 1003D	2	OTHER CAR	TYPE L	03-RZAW-4	09	HS 600 050
UC 1010D	0	MOTORCYCLE	TYPE L	02-RFEN-2	01	HS 600 329
UC 1014D	0	GUARDRAIL	VEH-OBJ	10-LYEW-5	01	HS 600 257
UC 1023D	0	GUARDRAIL	VEH-OBJ	10-LPAW-5	00	HS 600 072
UC 1055D	0	POLE,TREE	VEH-OBJ	12-FZEW-2	02	HS 600 115
UC 1067D	0	EMBANKMENT	VEH-OBJ	11-FZEW-5	03	HS 600 350
UC 1073D	0	GUARDRAIL	VEH-OBJ	02-RZAW-4	07	HS 600 351
UC 1075D	1	OTHER CAR	TYPE L	01-FLEE-2	05	HS 600 101
UC 1075D	2	OTHER CAR	TYPE L	10-LYHS-3	07	HS 600 161
UC 1090D	0	POLE,TREE	VEH-OBJ	12-FYEN-2	05	HS 600 041
UC 1107D	0	GUARDRAIL	VEH-OBJ	00-TZGO-5	06	HS 600 250
UC 1120D	0	OTHER	VEH-OBJ	02-RPAN-4	09	HS 600 116

TEAM CASE NUMBER	VEH NO.	FIRST OBJECT CONTACTED	CONFIG-URATION	PRIMARY CDC/VDI	VEH AIS	DOT-HS REPORT NO.
UC 1143D	0	FENCE	VEH-OBJ	01-FLEW-3	06	HS 600 042
UC 1146D	0	FENCE	VEH-OBJ	12-FYEN-2	07	
UC 1161D	0	POLE,TREE	VEH-OBJ	12-FCEN-4	03	HS 600 259
UC 1164D	1	OTHER CAR	HEAD-ON	12-FLEW-2	02	HS 600 260
UC 1164D	2	OTHER CAR	HEAD-ON	12-FYAW-7	06	HS 600 260
UC 1172D	1	OTHER CAR	TYPE L	02-RYEW-4	09	HS 600 162
UC 1172D	2	OTHER CAR	TYPE L	12-FDEW-3	05	HS 600 162
UC 1176D	0	OTHER CAR	SIDE-SIDE	00-TDGO-2	06	HS 600 354
UC 1177D	0	POLE,TREE	VEH-OBJ	02-TYGO-6	05	
UC 1181D	0	VAN	TYPE L	01-LFAE-6	06	HS 600 261
UC 1182D	0	OTHER CAR	TYPE L	11-FLEW-2	04	HS 600 045
UC 1183D	1	OTHER CAR	TYPE L	10-LYAW-4	08	HS 600 043
UC 1183D	2	OTHER CAR	TYPE L	11-FYEW-2	01	HS 600 063
UC 1188D	0	OTHER	VEH-OBJ	11-UYLW-3	06	HS 600 117
UC 1190D	0	FENCE	VEH-OBJ	12-FDEW-3	02	HS 600 355
UC 1204D	0	FENCE	VEH-OBJ	00-TDGO-4	02	HS 600 356
UC 1212D	0	NO OBJECT	VEH-OBJ	99-0000-0	09	HS 600 163
UC 1224D	0		HEAD-ON	11-FYMW-3	08	HS 600 357
UC 1227D	0	GUARDRAIL	VEH-OBJ	00-XDAO-2	02	HS 600 262
UC 1240D	0	POLE,TREE	VEH-OBJ	12-FCEN-3	08	HS 600 361
UC 1245D	1	OTHER CAR	TYPE L	03-RZAW-4	09	HS 600 362
UC 1245D	2	OTHER CAR	TYPE L	12-FDEW-2	02	HS 600 362
UC 1261D	1	FENCE	HEAD-ON	01-FCEW-3	05	HS 600 363
UC 1261D	2	OTHER CAR	HEAD-ON	11-FLEW-5	08	HS 600 363
UC 1263D	1	OTHER CAR	REAR END	01-FREW-2	01	HS 600 364
UC 1263D	2	OTHER CAR	REAR END	05-BYEW-5	00	HS 600 364
UC 1264D	1	OTHER CAR	TYPE L	00-BDEO-3	02	HS 600 330
UC 1264D	2	OTHER CAR	TYPE L	00-TYHO-4	00	HS 600 330
UC 1265D	1	OTHER CAR	REAR END	11-FZEW-4	03	HS 600 263
UC 1265D	2	OTHER CAR	REAR END	05-BYEW-3	01	HS 600 263
UC 1266D	0	FENCE	VEH-OBJ	01-URLN-3	03	HS 600 264
UC 1267D	1	OTHER CAR	SIDE-SIDE	11-FYEW-2	00	HS 600 365
UC 1267D	2	OTHER CAR	SIDE-SIDE	11-LYMS-3	03	HS 600 365
UC 127D	0	GROUND	VEH-OBJ	00-XDAO-7	06	HS 600 366
UC 1278D	0	FENCE	VEH-OBJ	11-FLEN-2	00	HS 600 368
UC 1289D	0	NO OBJECT	VEH-OBJ	99-0000-0	00	HS 600 164
UC 1292D	0	POLE,TREE	VEH-OBJ	00-TDAO-4	02	HS 600 370
UC 1294D	0	EMBANKMENT	VEH-OBJ	00-XDAO-9	06	HS 600 371
UC 1301D	0	OTHER	VEH-OBJ	04-TZAO-3	01	HS 600 265
UC 1302D	0	SIGN	VEH-OBJ	12-FREN-4	01	HS 600 266
UC 1303D	0	POLE,TREE	VEH-OBJ	00-LPAN-4	00	HS 600 372
UC 1305D	1	OTHER CAR	TYPE L	12-FDEW-3	03	HS 600 373
UC 1305D	2	OTHER CAR	TYPE L	03-RZMW-3	00	HS 600 373
UC 1307D	1	OTHER CAR	TYPE L	11-FZEW-2	01	HS 600 267
UC 1307D	2	OTHER CAR	TYPE L	01-RFEW-2	01	HS 600 267
UC 1316D	0	POLE,TREE	VEH-OBJ	12-FCEN-3	02	HS 600 374
UC 1318D	0	SIGN	VEH-OBJ	12-FCEN-3	01	HS 600 268
UC 1322D	0		TYPE L	01-FREW-3	03	HS 600 376
TU5A0270	0	ST TRUCK	OTHER	00-TYHW-6	01	HS 600 462
TU1201670	0	BRIDGE RAIL	VEH-OBJ	01-FREW-3	01	HS 600 159
TU1302870	1	VAN	TYPE L	10-LYAW-4	08	HS 600 256
TU1302870	2	OTHER CAR	TYPE L	11-FYMW-2	01	HS 600 256
TU1402770	0	TRACT-TRAIL	TYPE L	03-RYMW-2	01	HS 600 383
TU18D2770	0	GUARDRAIL	VEH-OBJ	00-TDHO-5	06	HS 600 324
TU19E1170	0	OTHER CAR	TYPE L	11-FYEW-2	08	HS 600 325
TU20E2170	0	TRACT-TRAIL	REAR END	12-FDHA-4	03	HS 600 326

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TU24F0170	1	OTHER CAR	TYPE L	11-FDEW-3	02	HS 600 463
TU 24F0170	2	OTHER CAR	TYPE L	02-RYEW-4	01	HS 600 463
TU 25F2165	0	POLE,TREE	VEH-OBJ	12-FLMN-3	01	HS 600 327
TU 26F1470	0	OTHER	VEH-OBJ	12-FDLW-1	01	HS 600 346
TU29G0470	0	GROUND	VEH-OBJ	09-XDAO-1	05	HS 600 464
TU 42I1670	1	OTHER CAR	TYPE T	02-RYAW-3	06	
TU 42I1670	2	OTHER CAR	TYPE T	01-FDEW-4	01	
TU 71 4	1	OTHER CAR	TYPE L	01-FZEW-5	01	HS 600 958
TU 71 4	2	OTHER CAR	TYPE L	10-LFMW-2	01	HS 600 958
TU 71 5	1	OTHER CAR	TYPE L	01-FREE-2	01	HS 600 940
TU 71 5	2	OTHER CAR	TYPE L	10-LFEE-2	01	HS 600 940
TU 71 8	0	VAN	TYPE T	01-FREW-1	01	
TU 71 09	1	OTHER CAR	TYPE L	11-LFMW-1	01	
TU 71 09	2	OTHER CAR	TYPE L	04-RFEW-3	00	
TU 71 11	1	OTHER CAR	TYPE L	01-RFME-2	01	
TU 71 11	2	OTHER CAR	TYPE L	11-FLMW-1	01	
TU 71 12	1	OTHER CAR	TYPE T	11-FDEW-2	01	
TU 71 12	2	OTHER CAR	TYPE T	03-RPEW-2	01	
TU 71 13	0	TRACT-TRAIL	SIDE-SIDE	08-LFMW-3	01	
TU 71 15	1	OTHER CAR	REAR END	12-FDEW-2	01	
TU 71 15	2	OTHER CAR	REAR END	00-BDEW-5	01	
TU 71 16	1	OTHER CAR	TYPE L	01-FDEW-1	98	HS 600 976
TU 71 16	2	OTHER CAR	TYPE L	10-LYMW-2	01	HS 600 976
TU 71 17	1	OTHER CAR	HEAD-ON	12-FLMW-2	01	
TU 71 17	2	OTHER CAR	HEAD-ON	12-FLMW-2	01	
TU 71 20	1	OTHER CAR	TYPE L	02-FREW-2	01	
TU 71 20	2	OTHER CAR	TYPE L	08-LYEW-2	99	
TU 71 21	0	SIGN	VEH-OBJ	00-TZHW-5	02	HS 601 010
TU 71 23	0	POLE,TREE	VEH-OBJ	02-RPAN-8	07	
TU 71 24	0		TYPE L	10-LYAW-4	04	
TU 71 25	1	OTHER CAR	REAR END	12-FYEW-4	01	HS 601 012
TU 71 25	2	OTHER CAR	REAR END	06-BZEW-6	01	HS 601 012
TU 71 26	0	TRACT-TRAIL	REAR END	11-FDHA-8	00	
TU 71 28	1	OTHER CAR	TYPE L	11-FLEW-3	02	
TU 71 28	2	OTHER CAR	TYPE L	02-RFEW-3	06	
TU 71 28	3	OTHER CAR	TYPE L	10-LPEW-3	02	
TU 71 31	0	OTHER	VEH-OBJ	00-BDAO-2	06	
TU 49A0571	1	OTHER CAR	TYPE L	11-FYEW-2	99	
TU 49A0571	2	OTHER CAR	TYPE L	02-RFEE-5	01	
321 KY 01	1	OTHER CAR	TYPE T	11-FDEW-1	02	
321 KY 01	2	OTHER CAR	TYPE T	02-RPEW-2	01	
321 KY 01	3	OTHER CAR	TYPE T	11-FZEW-1	00	
321 KY 04	0	POLE,TREE	VEH-OBJ	12-FCEN-3	01	
UOK 72 1	1	OTHER CAR	TYPE T	02-RYEW-2	01	
UOK 72 1	2	OTHER CAR	TYPE T	12-FDEW-2	01	
UOK 72 2	1	OTHER CAR	TYPE L	11-FYMW-1	00	
UOK 72 2	2	OTHER CAR	TYPE L	02-RFMW-1	00	
UTAH 001-69	0	GUARDRAIL	VEH-OBJ	12-FZEW-3	06	HS 600 811
UTAH 002-69	0	POLE,TREE	VEH-OBJ	10-LPAN-6	06	HS 600 822
UTAH 003-69	0	GROUND	VEH-OBJ	00-XDAO-4	06	HS 600 834
UTAH 004-69	1	OTHER CAR	TYPE L	11-LYEW-3	02	HS 600 831
UTAH 004-69	2	OTHER CAR	TYPE L	01-FCMW-2	00	HS 600 831
UTAH 005-69	0	GROUND	VEH-OBJ	00-XDAO-4	05	HS 600 848
UTAH 006-69	0	BRIDGE RAIL	VEH-OBJ	12-FRAW-9	07	HS 600 165
UTAH 007-69	0	BRIDGE RAIL	VEH-OBJ	12-FRAN-7	07	HS 600 118
UTAH 008-69	0	GUARDRAIL	VEH-OBJ	10-LZEW-3	02	HS 600 269

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UTAH 009-69	1	OTHER CAR	TYPE L	01-RZAW-9	01	HS 600 119
UTAH 009-69	2	OTHER CAR	TYPE L	01-FZEW-3	01	HS 600 119
UTAH 010-70	1	OTHER CAR	TYPE L	01-FZEW-3	00	HS 600 331
UTAH 010-70	2	OTHER CAR	TYPE L	09-LFEW-3	01	HS 600 331
UTAH 011 70	1	OTHER CAR	TYPE L	10-LREW-2	00	HS 600 465
UTAH 011 70	2	OTHER CAR	TYPE L	01-FYEW-3	03	HS 600 465
UTAH 012-70	0	OTHER CAR	SIDE-SIDE	00-XDAD-4	06	HS 600 466
UTAH 013-70	0	GUARDRAIL	VEH-OBJ	10-LFEN-2	02	HS 600 467
UTAH 034-70	0	OTHER CAR	REAR END	00-TPGO-5	06	

APPENDIX F

DOT-HS REPORT NUMBER CROSS INDEX

This cross index contains one entry for each MDAI team accident report number with a recorded DOT-HS report number.

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HS 600 004    OSU 4
HS 600 005    GIT 49
HS 600 006    MI=697001
HS 600 007    GIT 56
HS 600 008    RTI 5
HS 600 009    GIT 47
HS 600 010    RTI 7
HS 600 011    UTAH 001=69
HS 600 013    RTI 6
HS 600 014    GIT 48
HS 600 015    RTI 2
HS 600 016    RTI 4
HS 600 017    GIT 46
HS 600 018    GIT 53
HS 600 019    GIT 55
HS 600 020    SWRI=6901
HS 600 021    GIT 51
HS 600 022    UTAH 002=69
HS 600 023    SwRI=6913
HS 600 024    SWRI=6911
HS 600 025    OSU 8
HS 600 026    OSU 7
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HS 600 030    GIT 61
HS 600 031    UTAH 004=69
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HS 600 036    SWRI=6906
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HS 600 055    SRI=0007
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HS 600 061    GIT 52
HS 600 062    GIT 50
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HS 600 066    MCR693
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HS 600 070    SRI=0006
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HS 600 154 SWRI-7011
HS 600 155 SWRI-7014
HS 600 156 SWRI-7017
HS 600 157 SRI-0028
HS 600 159 TU12B1670
HS 600 160 UC 1000D
HS 600 161 UC 1075D
HS 600 162 UC 1172D
HS 600 163 UC 1212D
HS 600 164 UC 1289D
HS 600 165 UTAH 006-69
HS 600 167 CAL-70-25B
HS 600 168 CAL-70-27B
HS 600 169 CAL-70-28B
HS 600 172 CAL-70-31B
HS 600 173 CAL-70-32B
HS 600 175 CAL-70-34B
HS 600 176 CAL-70-35B
HS 600 177 CAL-70-36B
HS 600 178 CAL-70-37B
HS 600 180 CAL-70-39B
HS 600 181 CAL-70-40B
HS 600 182 CAL-70-41B
HS 600 184 CAL-70-43B
HS 600 187 CAL-70-46B
HS 600 188 CAL-70-47B
HS 600 189 CAL-70-50B
HS 600 192 GIT 68

HS 600 823 MIAMI72 201
HS 600 825 MIAMI72 207
HS 600 826 MIAMI72 209
HS 600 827 MIAMI72 220
HS 600 829 UNM 67
HS 600 830 UNM 72
HS 600 831 UNM 74
HS 600 835 UNM 81
HS 600 849 SU 034
HS 600 866 CAL 71 11B
HS 600 870 CAL 71 38B
HS 600 872 CAL 71 40B
HS 600 877 MMF 71 22
HS 600 880 UNM 63
HS 600 881 UNM 64
HS 600 884 RAI 112
HS 600 885 RAI 117
HS 600 886 RAI 131
HS 600 893 SU 002
HS 600 894 SU 003
HS 600 897 SU 011
HS 600 898 SU 013
HS 600 900 SU 015
HS 600 901 SU 023
HS 600 902 SU 030
HS 600 903 SU 032
HS 600 904 SU 035
HS 600 913 CAL 71 56B
HS 600 914 UNM 79
HS 600 915 UNM 80
HS 600 916 SWRI 7210
HS 600 920 USC 21
HS 600 921 USC 22
HS 600 927 SU 010
HS 600 934 MMF 71 9
HS 600 940 TU 71 5
HS 600 943 USC 19
HS 600 945 SWRI 7207
HS 600 946 SWRI 7208
HS 600 947 SWRI 7211
HS 600 951 SU 021
HS 600 953 SU 040
HS 600 954 SU 037
HS 600 955 SU 025
HS 600 958 TU 71 4
HS 600 961 USC 20
HS 600 962 USC 18
HS 600 971 SWRI 7170
HS 600 976 TU 71 16
HS 600 985 CAL 70 111B
HS 600 986 CAL 71 25B
HS 600 987 CAL 71 48B
HS 601 001 RTI 48
HS 601 002 RTI 095 49
HS 601 003 RAI 127
HS 601 006 SWRI 7214
HS 601 010 TU 71 21
HS 601 012 TU 71 25
HS 601 024 CAL 71 10B
HS 601 025 CAL 71 7B
HS 601 026 CAL 71 51B
HS 601 059 AA 148
HS 601 060 AA 145
HS 601 061 AA 144
HS 601 064 AA 150
HS 601 069 AA 134
HS 601 074 AA 125
HS 601 075 AA 115
HS 601 077 MIAMI72 208
HS 601 080 GIT 260 110
HS 601 082 GIT 260 107
HS 601 083 GIT 260 106

APPENDIX G
ACCIDENT DATA FILES

The following is the December 1973 list of accident files available to NHTSA via the time-shared keyword data access system (ADAAS) as part of the MDAI Report Automation and Utilization contract.

HIGHWAY SAFETY RESEARCH INSTITUTE
LIST OF CURRENT FILES
November 30, 1973

FILE NAME	FILE TYPE	SPAD ACCESS	DATA BASE KEYWORD	NUMBER OF CASES	NUMBER OF VARIABLES
Bureau Motor Carrier Safety					
1966 (1/2 Year)	A	No	BMCS-66	24,405	42
1967	A	No	BMCS-67	42,604	42
1968	A	No	BMCS-68	46,320	42
1969	A	No	BMCS-69	50,609	42
1966-1969	A	No	BMCS	163,938	42
CPIR Revision 2					
Vehicle	V	Yes	CPIR2VEH	716	320
Occupant	O	Yes	CPIR2OCC	1,162	507
CPIR Revision 3					
Vehicle	V	Yes	CPIR3VEH	4,201	576
Occupant	C	Yes	CPIR3OCC	6,885	636
Injury	I	Yes	CPIR3INJ	23,048	647
Veh. Cond. & Maint. Report	V	No	VCMR	401	298
Dade Co., Florida					
1969 (1/2 Year)	A	Yes	DADE-69	31,056	83
1970	A	Yes	DADE-70	61,767	83
1971	A	Yes	DADE-71	64,046	84
1972	A	Yes	DADE-72	64,190	84
Denver Co., Colorado					
1969	A	Yes	DENV-69	25,581	234
1970	A	Yes	DENV-70	29,432	217
1971	A	Yes	DENV-71	29,585	217
1972	A	Yes	DENV-72	33,166	217
Indiana Turnpike	A	No	INDTNPK	5,744	145
King Co., Washington					
1969 (Seattle Metro Area)	A	Yes	KING-69	28,572	194
1970	A	Yes	KING-70	35,181	236
1971	A	Yes	KING-71	34,720	236
1972	A	Yes	KING-72	35,355	235
Michigan Fatal					
Accident					
1964	A	No	MF64ACC	1,808	24
1965	A	No	MF65ACC	1,823	24
1966	A	No	MF66ACC	1,940	24
1967	A	No	MF67ACC	1,754	24
1968	A	No	MF68ACC	1,987	24
1969	A	No	MF69ACC	2,154	24
1970	A	No	MF70ACC	1,863	24
1964-1970	A	No	MFACC1	13,329	24
1971	A	No	MF71ACC	1,889	46
1972	A	No	MF72ACC	1,997	46
Vehicle					
1964	V	No	MF64VEH	2,715	43
1965	V	No	MF65VEH	2,749	43

FILE NAME	FILE TYPE	SPAD ACCESS	DATA BASE KEYWORD	NUMBER OF CASES	NUMBER OF VARIABLES
Michigan Fatal					
Vehicle					
1966	V	No	MF66VEH	2,946	43
1967	V	No	MF67VEH	2,606	43
1968	V	No	MF68VEH	3,057	43
1969	V	No	MF69VEH	3,265	43
1970	V	No	MF70VEH	2,815	43
1964-1970	V	No	MFVEH1	20,153	43
1971	V	No	MF71VEH	3,287	120
1972	V	No	MF72VEH	3,453	121
Mini-Car	O	No	MINICAR	372	118
New York Level I					
1970	A	Yes	CAL1-70	39,992	159
New York Level II					
Accident					
1970(1/4)-1971	A	Yes	NY71ACC	9,081	32
1972	A	Yes	NY72ACC	8,048	32
1973 (1/2 Year)	A	Yes	NY73ACC	3,654	32
Vehicle					
1970(1/4)-1971	V	Yes	NY71VEH	17,533	66
1972	V	Yes	NY72VEH	15,695	66
1973 (1/2 Year)	V	Yes	NY73VEH	7,012	66
Occupant					
1970(1/4)-1971	O	Yes	NY71OCC	24,914	81
1972	O	Yes	NY72OCC	21,817	81
1973 (1/2 Year)	O	Yes	NY73OCC	9,377	81
Oakland Co., Michigan					
1968	A	Yes	OAK-68	25,387	120
1969	A	Yes	OAK-69	29,265	213
1970	A	Yes	OAK-70	29,650	190
1971	A	Yes	OAK-71	29,362	233
1972	A	Yes	OAK-72	34,262	189
Ohio Turnpike					
Accident	A	No	OTNPKACC	6,189	87
Vehicle	V	No	OTNPKVEH	8,663	49
Pennslyvania Turnpike	A	No	PENNTNPK	11,492	124
Truck, Bus, Motorcycle, and Pedestrian	V	No	TBMP	212	62
Texas					
Bexar County					
1969 Accident	A	Yes	BEX69ACC	26,673	56
1969 Vehicle	V	Yes	BEX69VEH	45,859	139
1970 Accident	A	Yes	BEX70ACC	27,458	56
1970 Vehicle	V	Yes	BEX70VEH	47,284	139
1971 Accident	A	Yes	BEX71ACC	27,254	56
1971 Vehicle	V	Yes	BEX71VEH	48,359	179
1972 Accident	A	Yes	BEX72ACC	32,329	56
1972 Vehicle	V	Yes	BEX72VEH	57,532	179

FILE NAME	FILE TYPE	SPAD ACCESS	DATA BASE KEYWORD	NUMBER OF CASES	NUMBER OF VARIABLES
Texas					
5% State Sample					
1969 Accident	A	No	TXS69ACC	18,837	56
1969 Vehicle	V	No	TXS69VEH	32,224	139
1970 Accident	A	No	TXS70ACC	19,392	56
1970 Vehicle	V	No	TXS70VEH	33,204	139
1971 Accident	A	No	TXS71ACC	19,088	56
1971 Vehicle	V	No	TXS71VEH	33,140	179
1972 Accident	A	No	TXS72ACC	21,000	56
1972 Vehicle	V	No	TXS72VEH	36,505	179
Fatal					
1969 Accident	A	No	TXF69ACC	2,913	56
1969 Vehicle	V	No	TXF69VEH	4,257	139
1970 Accident	A	No	TXF70ACC	2,965	56
1970 Vehicle	V	No	TXF70VEH	4,280	139
1971 Accident	A	No	TXF71ACC	2,993	56
1971 Vehicle	V	No	TXF71VEH	4,896	179
1972 Accident	A	No	TXF72ACC	3,099	56
1972 Vehicle	V	No	TXF72VEH	5,133	179
Truck					
1969 Accident	A	No	TXT69ACC	11,590	56
1969 Vehicle	V	No	TXT69VEH	20,641	139
1970 Accident	A	No	TXT70ACC	10,680	56
1970 Vehicle	V	No	TXT70VEH	19,088	139
1971 Accident	A	No	TXT71ACC	8,172	56
1971 Vehicle	V	No	TXT71VEH	14,467	179
1972 Accident	A	No	TXT72ACC	10,835	56
1972 Vehicle	V	No	TXT72VEH	19,530	179
Washtenaw Co., Michigan					
1969 - 1973 (1/2 Year)	A	Yes	WASH	34,985	185
1973 (1/2 Year)	A	No	WASH-73	4,408	185
Washtenaw Driver Record	D	Yes	WASHDRIV	17,989	48

Legend of File Types

- A Accident
- V Vehicle
- C Occupant
- I Injury
- D Driver Registration
- R Vehicle Registration