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Vehicle Handling Study: Interim Report

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16. Abstract

Ninety-nine single-vehicle and 41 two-vehicle accidents occurring in part of Oakland County and Washtenaw County, Michigan from September 1, 1976 to March 31, 1976 were investigated. Data relevant to determination of the potential role of vehicle handling in accident causation, particularly tire data, were collected, together with injury-causation information on 180 vehicles.

Tire pressure data were also obtained from Michigan State Police checklane inspections in the summer of 1975 on randomly selected vehicles. The checklane and accident-population tire pressures were compared and additional comparisons were made between accident-population subsets on carcass-type and tread-depth data.

The data reveal generally poor tire maintenance practices in both populations, but there is no evidence to implicate poorly maintained tires as causative factors in accident occurrence. This conclusion is highly tentative because there are too few vehicles in the accident population and because vehicle-handling accidents are not well defined and accurately classified. Larger sample sizes, more definitive control-group data, and development of techniques for classifying vehicle-handling accidents are recommended.

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The data collection forms and procedures of the ongoing collision investigation programs in Oakland and Washtenaw Counties were modified on September 1, 1975, to include elements relevant to determining the potential role of vehicle handling in causing accidents. Emphasis was placed on the collection of data pertaining to tires because of their clear and leading role in influencing handling characteristics. Data on 180 of the 181 vehicles involved in 99 single-vehicle and 41 two-vehicle accidents--in which all involved vehicles were towed from the scene--were collected and built into digital files.

Tire pressure data were also obtained from the Michigan State Police checklane inspections operated in the summer of 1975. Vehicles were selected randomly, and thus the data obtained are representative of a control population drawn from an exposed, at-risk population.

The analytical approach consisted of comparing the checklane tire pressure data with similar data from the accident population and with the following subsets of the accident population: single-vehicle accidents; two-vehicle, intersection-type accidents; and two-vehicle, nonintersection-type accidents. Additional data about the carcass type and about tire tread depth were available for the accident population, and further comparisons were made on these variables for the accident subsets.

Conclusions

Several conclusions emerge strongly from the study to date. Large tire pressure deviations from those recommended by the manufacturer exist for both the control and accident populations. The two populations differ from each other on the tire pressure variable, but the differences almost certainly occur because of differences in the temperatures at which the tires in the two populations were measured. The data do not indicate that significantly larger pressure deviations exist in the accident population.

Various comparisons between the accident subsets show that vehicles with mixes of generic carcass types are not overrepresented in any particular subset of the accident data. Similar comparisons with the tread depth variable also fail to demonstrate that vehicles having bald tires are overrepresented in any of the accident subsets.

Together these specific conclusions lead to the general conclusion that there is no evidence in the present data set to identify poor tires--improperly inflated, improperly matched, or with insufficient tread--as causative factors in accident occurrence, with degraded vehicle-handling performance as the intervening agent. This conclusion must be tempered by two observations. There are only 180 vehicles in the digital file on which the analysis was performed, and this is too few to engender confidence that the results will not change with larger samples. Also highly significant is the fact that we are as yet unable to partition the accident data into sharply delineated subsets, one of which clearly contains accidents and vehicles in which vehicle handling is involved. It is possible that the phenomenon is real but that we have failed to identify it because of insufficiently sharp comparisons with an insufficiently large data base.

Recommendations

The accident data base should be expanded to include several hundred cases, with case-selection criteria and sampling procedures remaining generally as currently defined. Vehicle-handling accidents should be defined and concurrence obtained on the definition by government, industry, and private and university research organizations. Data collection should be expanded to include those pre-crash data elements about the driver, vehicle, and environment that are needed to determine whether an accident involves vehicle-handling characteristics. Dynamic modeling approaches should be undertaken both for their inherent worth in furthering the understanding of the role that vehicle handling may have in accident causation, and to identify present weaknesses in the data elements or data collection procedures. Resources should be made available so that adequate samples of the exposed, at-risk population of vehicles in use can be obtained with data elements of comparable detail and quality to those in the accident sample.

1. INTRODUCTION

The general topic of vehicle handling and its relationship to safety has been of interest to the automotive industry for many years (1). The federal government's interest in this topic is, of course, more recent and is exemplified by NHTSA's Advanced Notices of Proposed Rulemaking on Automatic Braking Systems (2); Rollover Resistance (3); and Directional Control (4). The safety agency also supported research related to vehicle handling and accident avoidance capability as part of its Experimental Safety Vehicle program (5).

Despite these interests in vehicle handling and safety, the literature does not report any accident investigation programs focussed specifically on this topic. Thus far the role of handling characteristics in accidents has been analyzed using existing data bases. The NHTSA-supported study by Dunlap et al. (6) is an effort on the government's part to establish a sound technical approach to the topic. This report contains a review of some of the pertinent literature on this subject.

The Motor Vehicle Manufacturers Association, because of the dearth of prior research using accident investigations directed specifically to vehicle-handling issues, requested that HSRI undertake work on this topic as part of the ongoing Oakland and Washtenaw Counties collision investigation programs. Accordingly, the data collection forms and procedures in the two counties were modified in the fall of 1975 to include, along with data pertinent to injury causation, data elements designed to assess the potential role of vehicle handling in the occurrence of accidents.

The purposes of this report are to identify the data elements that have been collected, to provide descriptive statistics about the currently computerized accident population in terms of these data elements, and to indicate some of the more important modifications in the data collection process which we are recommending for future field investigations. In addition, comparisons between accident-population tire pressures and those of an exposed, at-risk population are included. The scope of the analytical work is necessarily limited at this time because of the inadequate sample size to date and because of certain methodological issues to be discussed subsequently.

2. METHODOLOGICAL CONSIDERATIONS

The term "vehicle handling" does not have a precise, generally understood, and accepted meaning among all parties employing the term. Industry generally applies the term to the directional control and stability properties of the driver/vehicle combination, but rigorous definitions such as those pertaining to vehicle dynamics terminology (7) are missing. Braking characteristics are not generally included among vehicle-handling properties except possibly for the influence they may exert on the vehicle behavior during combined braking-turning maneuvers.

The government, on the other hand, apparently has used a broader meaning of the term than has industry, although no formal definitions have yet appeared. Its usage of the term in the proposed rules cited earlier suggests, however, that "vehicle handling" encompasses a wide range of vehicle behaviors and design characteristics related to pre-crash safety. All steering, braking, and other design characteristics of the vehicle related to controlling the path or the speed of the vehicle during the pre-crash phase of the accident sequence would likely be included under the term.

It is not surprising, then, that there is no generally accepted definition of a "vehicle-handling accident." Further, an initial review of the literature does not record any attempts in this direction with the exception of the work by Dunlap et. al. (6) cited earlier. As noted subsequently, this lack of understanding and agreement as to what a vehicle-handling accident is--or isn't--influenced the approach that was undertaken to the investigation of these kinds of accidents.

More important is the fact that there can be little progress in determining the scope of the "vehicle-handling problem"--or even determination that there exists such a thing--unless there is general agreement about the meaning of a vehicle-handling accident. Resolution of the definitional issue also has implications for the formulation and administration of appropriate countermeasure programs.

This definitional problem is not addressed in this report. This is partly because the work to date has not required the adoption of a formal definition of a vehicle-handling accident, and partly because our own thinking on the subject is still in the formative stage. Nonetheless, this issue will have to be faced sooner or later, and all parties with an interest in braking, steering, maneuvering, and road-holding capabilities of vehicles relative to accident causation or prevention should seek a common understanding of a vehicle-handling accident.

2.1 Modeling Approach to Investigating Vehicle-Handling Accidents

One approach to conducting a field investigation of vehicle-handling accidents would be to define a vehicle-handling accident, develop criteria for identifying the subset of vehicle-handling accidents among all accidents occurring, screen the population of all accidents for those meeting the criteria, and then investigate only the appropriate accidents. Analysis would proceed by attempting to explain the observed accident experience in terms of a model relating vehicle dynamics, roadway design parameters, and the attempted or required maneuvers pertinent to the particular accident geometrics.

This is an appealing approach, and it is probably the kind of investigation that the safety community should strive for in the future, particularly if standards or design changes are contemplated. It places a heavy burden, however, on an *a priori* knowledge of exactly what accidents are to be investigated. The problem of not having an accepted definition of a vehicle-handling accident has been discussed and applies here.

Several practical issues are of concern as well. If such a modeling approach is to be executed successfully, then collection of the complete set of data believed to be relevant to the problem is implied for each accident investigated. Extensive driver and environmental data would presumably be required,as well as data elements related to the vehicle dynamics. Clearly the collection of such a data set is a time-consuming and costly operation.

Screening of all accidents to select those identified as vehicle-handling accidents may not be straightforward, either. Ordinarily it is desirable, for purposes of operating efficiency, to perform any selection procedures on the basis of data and information on the police accident report prior to undertaking any investigation activities. In the case of vehicle-handling accidents, the required selection variables do not appear on the accident report, unless one employs a relatively coarse criterion, such as "all single-vehicle accidents."

One final point is appropriate with respect to the above approach. If an *a priori* selection procedure is employed and only vehicle-handling accidents are investigated, then it becomes much more difficult, if not altogether impossible, to estimate the total number of vehicle-handling accidents in some larger population. Whether this is important or not depends on the particular interests of the persons posing the research questions.

A result is, however, that use of such an approach would preclude the formulation of estimates about the proportion or number of vehicle-handling accidents on a nationwide basis. These sorts of numbers are invariably needed for cost effectiveness studies.

2.2 Representative Sample Approach

Another approach to investigating vehicle-handling properties as related to accident occurrence is the following. A target population of accidents of interest is first specified, and the data to be collected for the population in question--including, of course, the data elements pertinent to vehicle-handling questions--are defined. In principle, the accident investigation process can then be undertaken on all accidents within the population of interest. As a practical matter, however, the number of such accidents is usually so large as to preclude investigation of all of them, so an appropriate sample is drawn. Various sampling techniques are available, but the general objective of each of them is to be able to estimate, with acceptable accuracy and precision, the characteristics of the target population with respect to the variables of interest. A representative sample of known characteristics is required.

Having selected the cases for investigation in the above manner, two avenues for subsequent analysis of the data are available. They are not mutually exclusive, of course, and both techniques can be followed. First, a dynamic modeling approach, such as suggested earlier, can be followed for all of the accidents in the sample or for some particular subset of interest. For example, it might be postulated that single-vehicle accidents in which rollover occurred involved vehicle-handling characteristics to at least some degree, and an investigator might wish to focus on this class of accidents.

A second analytical approach is available if data on a representative sample of accidents have been obtained. A representative sample of the exposed, at-risk population is also selected, and data elements comparable to those for the accident sample are collected for the at-risk sample. The analysis consists of identifying those data elements in the accident population that are over-represented with respect to their proportion in the control population. The presumption is that, barring interactive effects with other variables, the over-represented variables identify factors that contribute causally to accidents.

This use of a representative sample together with a control group, followed thus far in the study and planned for the future, has two particularly attractive features in terms of the present collision investigation programs. It enables a complex problem of the kind under consideration to be attacked in pieces of manageable size and scope with limited resources. Thus it is possible to gain considerable insight into the role that one component may have in accident causation without attempting to gather a complete set of data elements believed to be relevant to the subject and attempting concurrently to understand their relationship to each other and to the overall problem.

A second advantage is that very different research interests can be served within the same collision investigation program. In particular an interest in injury causation and injury patterns continues, and the representative sample approach lends itself to these interests as well. The selection criteria adopted for the study--accidents in which all involved vehicles were towed from the scene because of damage--are not necessarily independent (in a statistical sense) of either vehicle-handling considerations or injury patterns, but they define a class of accidents of general interest to the traffic safety community. Research findings about a sample drawn from the defined population are therefore of more general interest and utility than would be findings obtained from a sample containing unknown biases.

3.0 DATA SET

The methodological considerations discussed in the preceding section gave rise to a well defined set of data collection procedures and data elements. These are reviewed in the present section, and the accident population resulting from application of these procedures is compared to that obtained in the predecessor "Restraint System Effectiveness Study" in terms of general accident configuration.

3.1 Data Collection Procedures

The data collection procedures employed in the present study follow closely those employed in earlier studies in Oakland and Washtenaw Counties. Police agencies in the six participating Oakland County jurisdictions (Pontiac, Royal Oak, Southfield, and Troy and Bloomfield and Waterford Townships) and all of those operating in Washtenaw County routinely investigate traffic accidents and compile the results on the standard State of Michigan police report (UD-10). Either police personnel or HSRI accident investigators subsequently screen these police reports for accident cases meeting the current case-selection criteria and sampling procedures.

At the beginning of the current project, on September 1, 1975, the case-selection criteria called for the investigation of all accidents involving one or two vehicles in which all vehicles were towed from the scene because of damage and which met the model year criteria. Passenger cars and light trucks (those with four wheels) were required to be among the 1972-1976 model years, whereas "heavy" trucks (those with more than four wheels) and buses could be up to ten model years old.

The projected case load expected to be realized from these criteria was larger than could be handled by the field investigation staff. Therefore simple random sampling was employed, with the sampling fraction initially set at 0.2 in both counties. Specific accidents were selected for field investigation if, for single-vehicle accidents, the sum of the last two digits of the license plate ended in a four or a nine; for two-vehicle accidents, the sum of the last digit of the license plate of each involved vehicle must have ended in a four or nine for the accident to have been selected.

These procedures were followed through March, 1976. It was noted, however, that fewer passenger cars than anticipated were being investigated in Oakland County and fewer trucks and buses than desired were being investigated in both counties. Accordingly, the sampling fraction was increased from 0.2 to 0.3 in Oakland County for passenger cars and from 0.2 to 1.0 in both counties for "heavy" trucks and buses; the effective date of the changes was April 1, 1976. The revised sampling fractions resulted in more desirable case loads.

Following application of the case-selection criteria and the sampling procedure,* HSRI field investigators examine the involved vehicles and the accident scene and also interview the drivers. Injury data are obtained by procedures employed in earlier programs and

*Occasionally a few accident reports are not available for screening purposes until several days after the accident. Cases are not investigated if the accident report is received more than five days following the accident.

described by Scott (8). The data elements given in the next section were recorded on appropriate forms, and the forms were returned to the central HSRI office for editing and keypunching of those data elements to be entered into a digital computer file.

3.2 Data Elements

The data elements collected by the field investigators for each vehicle meeting the case-selection and sampling procedures are shown fully in Appendix 1 (Annotated Collision Performance and Injury Report, Revision 3, Edition 1/76, VH/IC Study, 4/76). It will be recalled that two diverse research interests are being served by the collision investigation programs--the continuing interests in determining the cause of injuries, given that a crash has occurred, and the new interest in determining whether vehicle-handling characteristics contributed to occurrence of the collision. The data elements now being collected clearly reflect both of these interests.

The data elements to be collected that are pertinent to injury causation were determined wholly by MVMA through its subcommittee and staff structure. It was recognized by MVMA that the time and effort devoted to collection of injury-causation data elements would have to be scaled down to accomodate the new data elements pertinent to vehicle handling. Therefore the CPIR form was re-examined with this in mind, and the data elements judged worthy of inclusion are shown in the Appendix.

A somewhat similar procedure was followed in determining which vehicle-handling data elements to include. However, there existed no established data collection form to serve as a point of departure, so MVMA staff and subcommittee members prepared the initial list of desired data elements. These were subsequently reviewed and modified somewhat by members of HSRI's Systems Analysis Division in order to match data collection practices in the field, and new data elements have been added occasionally as their need has become clear.

The data collection form demonstrates a major emphasis on the collection of tire data. This practice was adopted for both theoretical and practical reasons. From the first perspective, it is known (9) that the equation for the characteristic speed of a typical understeer vehicle includes several terms involving tires--cornering stiffness, aligning torque, camber stiffness, and deflection steer coefficients. It is further known that carcass type, tire pressure, tread depth, and the like exert a strong influence on these parameters. These considerations were coupled with the fact that in-use tires are known to have serious departures from OE conditions (10). Together they led to the reasoning that, if vehicle-handling properties are involved in accident causation, then tires that are inappropriately used or maintained would be easily identified in the accident population.

Examination of the current data collection form will show that there is not a great deal of emphasis on determining the roadway and scene factors that may be related to vehicle-handling accidents. From the outset extensive data collection on these factors was omitted, not because they were considered unimportant, but because of the increased workload that would be required. Further, it was recognized that collection of the scene data in a form that would be appropriate for subsequent coding into digital files would entail considerable development work.

Much of the required developmental work has been completed so that a more detailed examination of accidents on a case-by-case basis may be undertaken. The additional precrash data elements which we believe should be obtained about the roadway, the general environment, and driver control actions have been specified in preliminary form. Work is currently focussed on attempting to define and record the situations in which maneuvering was called for in the precrash phase to avoid the crash which in fact resulted, and to try to assess whether the system breakdown involved the driver, the vehicle, the environment, or some combination of the three in a manner that could properly be identified as a vehicle-handling accident.

This developmental work is now taking place in field investigations on a trial basis of limited scope. When a full package of materials and procedures has been assembled they will be submitted to the sponsor for review and approval with the expectation that they will be considered for inclusion in the data collection activities.

3.3 Comparison of Accident Samples

The sample frame for this project is all reported accidents of one or two vehicles which necessitate the towing of all vehicles because of damage they sustained.* This population clearly differs from the population of all reported accidents, even from the population of all towaway crashes (i.e., those requiring the towing of at least one vehicle). Data were collected in the same geographic areas from March, 1974 to August, 1975 for an evaluation of restraint systems (11,12). These earlier data provided an unbiased sample of late-model passenger cars involved in towaway accidents.

*The sampling frame is further limited to accidents in Washtenaw County and the six project communities of Oakland County, and excludes accidents involving motorcycles or vehicles with more than four wheels.

A comparison of the types of collisions in which the vehicles were involved is shown in Table 1. The vehicle-handling study includes both vehicles in two-vehicle accidents, but only if both vehicles were towed for damage. This is considerably more restrictive than requiring that the case vehicle must be towed, and not necessarily the other vehicle. Therefore, the vehicle-handling study includes a smaller proportion of vehicles which were in multi-vehicle collisions--45 percent compared to 80 percent for the restraint study. Correspondingly, proportionately more of the vehicles in the vehicle-handling study are in single-vehicle crashes.

The differences are even greater when the two data sets are compared on the basis of accidents rather than vehicles. Since only a small portion of the vehicles in the restraint study are multiple cases, i.e., two or more vehicles of an accident included as case vehicles, the distribution of vehicles shown in Table 1 for the restraint study is nearly the same as the distribution of accidents by type. On the other hand, the number of two-vehicle accidents in the vehicle-handling study is one-half the number of vehicles involved in two-vehicle crashes. Thus 71 percent of the accidents sampled in the present study are single-vehicle crashes, compared to about 20 percent in the restraint study. This is an overrepresentation of 3.6.

There are also substantial differences in collision type among the vehicles in multi-vehicle collisions. Many vehicles struck in the rear in rear-end collisions are not towed, so this group is low in the present study. Vehicles in head-on collisions are more likely to be included in the present study.

The overrepresentation of head-on and single-vehicle collisions might lead one to conjecture that the present

Table 1

COMPARISON OF TYPES OF COLLISIONS IN VEHICLE-HANDLING STUDY AND RESTRAINT STUDY

Data weighted on inverse of sampling fraction.

Collision Type	Distribution in Percent of Vehicles			
	Vehicle-Handling Study		Restraint Study	
Single Vehicle	55		19.7	
Multi Vehicle	45		80.3	
Head-On		27.2		11.4
Rearend		9.9		27.1
Sideswipe		2.5		4.1
Intersection		58.0		56.6
Other		2.5		0.8
TOTAL	100.0	100.1	100.0	100.0

study would include a greater incidence of more severe injury. The distributions of the overall AIS of outboard-front-seat occupants are given in Table 2 for both the vehicle-handling and restraint study data sets. There are fewer uninjured people in the present study, and 9.1 percent received injuries of AIS ≥ 2 compared with only 7.6 percent in the restraint study. However, this increase is not statistically significant because of the relatively small number of occupants currently in the vehicle-handling file. The lack of any occupants with an AIS of 4 or greater is not surprising, for the same reason. If the proportion in the vehicle-handling population were actually the same as in the restraint study (0.72), the probability of observing none in a sample of 232 would be 0.19. Thus, while there are some indications that injury is more severe in the population currently sampled, the differences are not yet statistically significant.

Table 2

COMPARISON OF INJURY SEVERITY
OF OUTBOARD-FRONT-SEAT OCCUPANTS
(weighted on inverse of sampling fraction)

Overall AIS	Distribution in Percent: Vehicle-Handling Study	Distribution in Percent: Restraint Study
0	34.9	44.3
1	56.0	48.2
2	6.5	4.7
3	2.6	2.1
4	0	0.19
5	0	0.12
6	0	0.22
7	0	0.12
8	0	0.0
9	0	0.02
10	0	0.05
2-10	9.1	7.6
3-10	2.6	2.8
N	232	4153

4.0 PRELIMINARY RESULTS

This section presents preliminary results from the 180 cases now in the digital file. The results are restricted to data elements (variables) that have been collected for the vehicle-handling study, and concentrates on those relating to tires.

A number of variables related to handling have been collected on both the vehicle and wheels as well as the tires. Univariate percentages of a number of these variables are presented for descriptive purposes. The distributions indicate that abnormal conditions on components other than tires are too infrequent to allow analysis with the quantity of data currently available.

The inferential analyses are restricted to tires for reasons stated earlier. The tire characteristics examined are (1) inflation pressure, (2) mixes of generic carcass types, and (3) remaining tread depth. The basic analysis technique used is to compare the distribution of these characteristics in the accident population and a control population, and between subsets of the accident population. The purpose of both types of comparisons is to measure overrepresentation (or underrepresentation) of tire misuse as an accident factor. Both methods compare an accident population with an "at-risk" group. The first uses a control group external to the accident population. The second uses the technique of "induced exposure" in the absence of an external measure of exposure.

Since May, 1975, HSRI has participated in an evaluation of the Michigan checklane vehicle inspection program. During the summer of 1975, tire pressures were measured on a random sample of all vehicles stopped at State Police random checklane sites in Monroe and Jackson Counties (13). This provides a measure of the non-accident involved population at risk. Unfortunately, the only tire parameter measured in the program was inflation pressure. Thus, while pressures in the accident population can be compared with those in the exposed checklane population, overrepresentation of generic mix and tread depth can only be investigated by induced exposure.

Ideally, the method of induced exposure is to identify a set of cases in a target population, such as vehicle-handling cases, and an "innocent" set of victims who can provide an unbiased representation of the exposed, at-risk population. Since we are not yet prepared to define and identify vehicle-handling cases on a case-by-case basis, we have selected a set of accident-involved vehicles (a subset of all vehicles involved) that might contain a higher than average proportion of handling cases.

It has been suggested (and seems plausible) that single-vehicle accidents might contain a substantial proportion of vehicle-handling cases. On the basis of this a priori assumption, single-vehicle cases have been selected for comparison with the non-single vehicle cases.

Single-vehicle and non-intersection-type involvements are also compared with intersection-type involvements. These comparisons are included under the unproven assumption that this last group may contain few vehicle-handling cases, and thus sharpen the contrasts.

Measurement of overrepresentation by comparing two populations is a common and appropriate analytical technique. There are cautions that should be observed in its use, however. Determination of real differences between the populations--rather than observed differences resulting from chance--is based on methods of statistical inference. If statistical significance is achieved, two questions must be addressed. One is whether the differences, even if real, are operationally significant, i.e., are important or relevant. The second is whether there is truly a deterministic relationship--a causal effect--as opposed to correlation with an unidentified causal factor.

4.1 Univariate Distributions of Selected Variables

The distributions of the principal variables--other than inflation pressures and tread depth measurements--which have been added to the field data collection specifically for the vehicle-handling study are given in Table 3. The total number of cases in each tabulation is 180. Thus entries of 0.6 and 1.1 percent represent one and two cases, respectively.

Most of the variables show little variation, with 85 percent or more of the cases with a common response, and very few cases with other responses. The few exceptions are not surprising. For example, about 16 percent of the front wheels were damaged--nearly all as a result of the accident--but a much smaller proportion for the rear wheels. A substantial incidence of snow tires on rear wheels was encountered because the data collection period included the winter months. Capping was detected on only eight tires, two on each position. Pressure loss prior to impact--which could have contributed to the crash--was encountered on only one vehicle. No modifications of the suspension systems

Table 3

DISTRIBUTIONS OF SELECTED VARIABLES
IN PERCENT OF CASES

I - Variables on Tires and Wheels

Variable:	LF	RF	LR	RR
	Tire Position			
Wheel O.E.?				
(1) Yes	98.9	98.3	97.8	96.7
(2) No	0.6	0.6	1.1	1.1
(9) Unknown	0.6	1.1	1.1	1.2
Wheel Damaged?				
(1) Yes	18.3	14.4	7.2	3.9
(2) No	81.1	85.0	92.2	94.0
(9) Unknown	0.6	0.6	0.6	1.7
Tire Tread Type				
(1) Regular	97.8	96.7	77.2	77.2
(2) Non-studded snow	2.2	2.8	21.7	21.1
(9) Unknown	0.0	0.6	1.1	1.7
Tire Intended Use				
(1) Passenger Car	93.9	92.2	93.3	92.8
(2) Light Truck	5.6	6.1	5.6	5.6
(9) Unknown	0.6	1.7	1.1	1.7
Tire Load Range				
(2) B	87.2	86.1	85.6	83.9
(3) C	4.4	4.4	3.9	3.9
(4) D	1.7	2.2	2.2	2.2
(5) E	1.7	1.1	1.1	1.1
(9) Unknown	5.0	6.1	7.2	8.9
Tire Retread?				
(1) Yes	0.6	0.6	0.6	0.6
(2) No	97.2	96.1	96.7	95.6
(9) Unknown	2.2	3.3	2.8	3.9
Tire Tube?				
(1) Yes	1.7	1.7	2.2	2.2
(2) No	95.0	94.4	93.9	93.3
(9) Unknown	3.3	3.9	3.9	4.4

Table 3 continued

	LF	RF	LR	RR
Tire Carcass Type				
(1) Bias Ply	19.4	20.6	20.0	18.9
(2) Belted-Bias Ply	32.8	31.1	31.7	31.1
(3) Radial Ply	47.2	46.7	47.2	46.7
(9) Unknown	0.6	1.7	1.1	3.3
Cupping?				
(1) Yes	1.1	1.1	1.1	1.1
(2) No	94.4	93.3	94.4	94.4
(9) Unknown	4.4	5.6	4.4	4.4
Pressure Loss Suspected				
(1) None	77.8	76.1	89.4	91.7
(2) Pre-Crash	0.6	0.0	0.6	0.0
(3) At Crash	18.3	22.8	6.1	6.1
(4) Post-Crash	0.6	0.0	0.0	0.0
(8) Loss, Unknown Time	2.8	0.6	3.3	1.1
(9) Unknown if Loss	0.0	0.6	0.6	1.1
Tire Damaged:				
(1) Yes	6.7	6.1	3.9	1.1
(2) No	90.6	89.4	95.0	95.6
(9) Unknown	2.8	4.4	1.1	3.3
Damage Contributory to Accident				
(1) Yes	0.6	0.0	0.0	0.0
(2) No	7.2	8.3	3.3	1.1
(3) Not Applicable, No Damage	90.0	89.4	95.0	95.6
(9) Unknown	2.2	2.2	1.7	3.3

Table 3 continued

II - Vehicle Variables

Steering Wheel Original Equipment?	
(1) Original Equipment	97.8%
(2) Non-original Equipment	1.1
(9) Unknown	1.1
Glazing Obstructions?	
(1) Glazing Obstructions	1.7
(2) No Glazing Obstructions	84.4
(9) Unknown	13.9
Suspension Alterations?	
(1) Suspension Alterations	0.0
(2) No Suspension Alterations	97.2
(9) Unknown	2.8
Fuel Level	
(1) Full	12.2
(2) 3/4	22.8
(3) 1/2	24.4
(4) 1/4	20.6
(5) Empty	0.6
(9) Unknown	19.4
Air Conditioning?	
(1) Air Conditioning	49.4
(2) No Air Conditioning	44.4
(9) Unknown	6.1
Cargo?	
(1) Cargo	13.3
(2) No Cargo	73.9
(9) Unknown	12.8

were observed, and only two cases of replacement of the original steering wheel with non-OEM.

4.2 Tire Inflation Pressures

4.2.1 Tire Pressure--Accident Versus Checklane. Table 4 presents the comparison of the inflation pressures from the accident population with those of the checklane control population. The number of cases (tires), the mean pressures, and the standard deviation of measured pressures are given for each population and each wheel location. The significance level for the difference in the means is given in the right column, and is based on the F statistic.

The means of the checklane sample are all higher than those of the accident sample by about 3 psi. These differences are almost surely the result of the conditions under which the pressures were measured, namely hot versus cold.

The cold ambient versus equilibrium hot pressures can easily vary by 5 psi (10). Tests conducted by the Traffic Institute of Northwestern University indicate that the exponential pressure drop as a stationary tire cools has a time constant of about 10-15 minutes. The pressure rise while traveling at 60 mph is more rapid, and the total pressure increase (to the equilibrium hot condition) does not vary appreciably with the initial pressure (14).

The pressures in accident data are cold pressures measured hours after the accident. Pressures obtained in the checklane program were measured within five minutes after the vehicles were stopped, and before any appreciable cooling could have occurred. Since the cars stopped in the checklane probably had been traveling at speeds less than 60 mph, the mean pressure increase could be expected to be less than 5 psi. The observed differences between the control and accident populations probably result from a comparison of hot and cold measurements, and not from a difference in the cold pressures of the two populations.

Comparisons of several other variables, such as the difference between actual and recommended pressures, have been made. They are also subject to the same systematic bias and show similar results.

Pressure differentials between tires on one car will not be measurably effected by differences in the hot/cold measurements. Such differentials can materially effect the directional response of vehicles (15). For these reasons two derived variables were created for both populations which remove the effects of temperature.

The first variable, maximum front-to-rear pressure difference, gives the maximum pressure difference between either of the front two tires and either of the rear two tires. Vehicles with missing data, or zero pressure (primarily in the accident population and due to crash damage) on any one tire were excluded. The second variable derived is the maximum side-to-side pressure difference, representing the maximum pressure difference between either of the two right side tires and either of the two left side tires. Again, vehicles having missing data were excluded. Table 5 shows the results of comparing the accident and control populations on the two variables previously described. Front-to-rear and side-to-side differences are not significantly different between the two populations. It should be noted that for both variables the accident population has a higher mean difference than does the control population.

Table 4

TIRE PRESSURE MEANS FOR ACCIDENT AND CONTROL POPULATIONS

		Accident			Control		Sig
Tire	N	Mean	S.D.	N	Mean	S.D.	
LF	127	24.9	5.8	2680	28.4	5.5	0.0000
RF	123	25.6	5.7	2669	28.1	5.5	0.0000
LR	147	25.0	7.6	2677	27.9	5.8	0.0000
RR	145	24.9	6.6	2675	27.8	5.9	0.0000

Table 5

COMPARISON OF THE ACCIDENT AND CONTROL POPULATIONS ON FRONT-TO-REAR AND SIDE-TO-SIDE TIRE PRESSURE IMBALANCES

		Accident			Control		
	N	Mean	S.D.	N	Mean	S.D.	Sig
Maximum Front-to-Rear Difference	91	5.4	5.25	1179	4.6	4.68	0.09
Maximum Side-to-Side Difference	91	5.4	5.38	1179	4.5	4.64	0.10

4.2.2 Accident Population Subsets. Tables 6 and 7 present results of comparing subsets of the accident population. Table 6 compares the difference between the actual tire pressure and the manufacturer's recommended pressure (at maximum loading) for each tire position. It can be seen that none of the accident subsets compared is statistically different, and that the mean values of each subset are quite similar. These findings could be due to statistical factors, such as small cell sizes within the table. They might also arise because no differences in fact exist between vehicle-handling and non-vehicle-handling accidents on these variables, or because the accident subsets are poor surrogates for vehicle-handling accidents.

Comparing these same collision configurations on the maximum front-to-rear and side-to-side pressure differences, Table 7, we find that only the comparison between two-vehicle intersection and non-intersection accidents yields statistical significance. The non-intersection type accidents (head-on, rearend, and sideswipe accident configurations) have the highest mean tire pressure imbalance of all the accident subsets, both front-to-rear and side-to-side. Even though statistically significant, the number of cases (20) for this group is very small. The only inference warranted at this time is that further comparisons of these groups should await the availability of more data.

4.2.3 Accident Subsets Versus Control Population. The accident subsets compared in the previous section were also compared individually with the State Police checklane population. Table 8 shows the statistical significance of the subsets versus checklane comparisons

Table 6

ACTUAL TIRE PRESSURE MINUS MANUFACTURER'S RECOMMENDED TIRE PRESSURE (AT MAXIMUM LOADING) FOR ACCIDENT POPULATION SUBSETS

		Subset			Subset			Subset			Subset		
Tire		Sing*	Multi*	Sig.	Sing*	Int*	Sig.	Sing*	Nonint*	Sig.	Int*	Nonint*	Sig.
LF	N	34	30	.79	34	17	.43	34	13	.64	17	13	.17
	Mean	-.35	-.80		-.35	-2.00		-.35	.77		-2.00	.77	
	SD	7.75	5.48		7.75	4.76		7.75	6.13		4.76	6.13	
RF	N	36	34	.91	36	20	.96	36	14	.75	20	14	.77
	Mean	-.14	0.59		-.14	-.25		-.14	.50		-.25	.50	
	SD	7.12	7.21		7.12	9.18		7.12	2.93		9.18	2.93	
LR	N	40	33	.78	40	19	.73	40	14	.36	19	14	.27
	Mean	-2.68	-3.18		-2.68	-1.95		-2.68	-4.86		-1.95	-4.86	
	SD	7.61	7.43		7.61	6.88		7.61	8.06		6.88	8.06	
RR	N	38	33	.52	38	19	.81	38	14	.15	19	14	.17
	Mean	-1.68	-2.67		-1.68	-1.26		-1.68	-4.57		-1.26	-4.57	
	SD	6.09	6.84		6.09	6.54		6.09	7.01		6.54	7.01	

*Sing = single-vehicle accident; Multi = multiple (2) vehicle; Int = intersection type T or L; Nonint = non-intersection, i.e., head-on, sideswipe, rearend, etc.

Table 7

COMPARISON OF ACCIDENT SUBSETS ON SIDE-TO-SIDE AND FRONT-TO-REAR TIRE PRESSURE IMBLANCES

	Subset			Subset			Subset			Subset		
	Sing*	Multi*	Sig.	Sing*	Int*	Sig.	Sing*	Nonint*	Sig.	Int*	Nonint*	Sig.
Maximum Front-to-Rear Difference												
N	38	53	.60	38	33	.19	38	20	.47	33	20	.04
Mean	5.76	5.17		5.76	4.12		5.76	6.90		4.12	6.90	
S.D.	5.82	4.85		5.82	4.41		5.82	5.14		4.41	5.14	
Maximum Side-to Side Difference												
N	38	53	.46	38	33	.13	38	20	.56	33	20	.03
Mean	5.89	5.04		5.89	3.94		5.89	6.85		3.94	6.85	
S.D.	6.17	4.77		6.17	4.15		6.17	5.25		4.15	5.25	

*Sing = single-vehicle accident; Multi = multiple (2) vehicle; Int = intersection type T or L; Nonint = non-intersection, i.e., head-on, sideswipe, rearend, etc.

Table 8

COMPARISON OF ACCIDENT SUBSETS WITH THE CONTROL POPULATION (MODEL YEARS 1972-1975) ON MAXIMUM FRONT-TO-REAR AND SIDE-TO-SIDE TIRE PRESSURE IMBALANCES

		Subset			Subset			Subset			Subset		
Variable		Sing	Check	Sig.	Inters	Check	Sig.	Nonint	Check	Sig.	Multi	Check	Sig.
Maximum Front-to-Rear Difference	N	38	1179	.12	33	1179	.60	20	1179	.03	53	1179	.35
	Mean	5.76	4.55		4.12	4.55		6.96	4.55		5.17	4.55	
	S.D.	5.82	4.68		4.41	4.68		5.14	4.68		4.85	4.68	
Maximum Side-to-Side Difference	N	38	1179	.08	33	1179	.46	20	1179	.03	53	1179	.45
	Mean	5.89	4.55		3.94	4.55		6.85	4.55		5.04	4.55	
	S.D.	6.17	4.64		4.15	4.64		5.25	4.64		4.77	4.64	

for the two derived variables previously described. Single-vehicle accidents were marginally different from the control group on the side-to-side comparison, but not on the front-to-rear comparison. Non-intersection, two-vehicle accident involved vehicles were significantly different from the control group for both side-to-side and front-to-rear comparisons. Again the significance is based on very small sample sizes and bears further investigation.

4.3 Mixing of Generic Carcass Types

Mixes of generic carcass types exist on only 20 of the 180 vehicles. This number is too small for meaningful analysis. Chi-square contingency table comparisons of vehicles having mixed tires with those not having mixed tires, by collision type and road surface condition, are not significant at the 0.1 level. Even 2x2 tables for single-vehicle versus multi-vehicle, and for dry versus all other conditions, are not significant.

Because the number of cases is small, a summary of each is given in Table 9. Only two of the cases involved mixing radial-ply tires with non-radials. Six of the vehicles had bias-ply tires on the front and belted-bias tires on the rear. Another six had the reverse: belted-bias on the front and bias on the rear. The other six cases include various mixes of bias and belted-bias tires.

4.4 Tread Depth

Data are collected on the depth of each groove of each tire. One measurement is made in each groove at a point that is not over a treadwear indicator. Of the 180 cases now in the computer file, one tire has nine grooves. The others have from two to eight grooves. The data presented here are based on 700 tires with non-missing data on tread depth and with two to eight grooves.

Table 9

SUMMARY LIST OF CASES WITH
MIX OF GENERIC CARCASS TYPES

Case Number	Vehicle	Collision	Left Front*		Right Front*		Left Rear*		Right Rear*	
HS-2003-1	72 Maverick	Rollover	B	18	B	0	BB	0	BB	18
HS-2028-1	72 Chevrolet Pickup	Fixed Object-Rollover	B	35	B	33	BB	25	BB	16
HS-2034-1	74 Mustang	Fixed Object	B	20	B	20	BB	19	B	17
HS-2044-1	72 Maverick	Fixed Object	B	27	B	27	BB	25	BB	25
HS-2066-1	72 Maverick	Fixed Object	BB	10	BB	23	B	23	BB	21
HS-2067-1	73 GMC Pickup	Fixed Object	B	24	B	0	BB	37	BB	41
HS-2068-1	72 Cutlass	Intersection-T	BB	16	BB	23	B	23	B	25
HS-2069-2	72 Gremlin	Intersection-T	BB	15	BB	26	B	30	B	25
HS-2080-1	74 Colt Wagon	Fixed Object-Rollover	BB	19	BB	0	B	21	B	0
HS-2081-1	72 Cadillac	Head-On	BB	25	BB	22	B	23	B	21
HS-2087-1	72 Ranchero	Head-On	B	22	B	23	BB	15	BB	28
HS-2090-1	72 Vega Wagon	Head-On	BB	26	BB	24	B	18	B	16
HS-2093-1	72 Cutlass	Fixed Object	BB	28	BB	28	B	28	B	28
HS-2098-1	72 Galaxie	Fixed Object	B	22	B	21	BB	21	BB	20
HS-2102-1	73 El Camino	Intersection-T	BB	29	B	29	BB	29	BB	28
HS-2114-1	72 Pinto	Rollover	B	23	BB	24	B	27	BB	27
OK-2415-1	74 Chevrolet Van	Rollover	BB	0	BB	28	R	26	BB	33
OK-2424-1	74 Continental	Fixed Object	R	0	BB	0	R	M.D.	R	0
OK-2485-1	72 Catalina	Intersection-T	BB	16	B	21	B	14	BB	14
OK-2538-1	73 Fury	Intersection-T	BB	28	B	28	B	26	B	26

*The letter indicates the generic carcass type, the number gives the cold inflation pressure after the accident. B=Bias ply, BB=Belted Bias ply, R=Radial ply

The tread depth examined here is the mean depth of each tire. All grooves--from two to eight--are used in calculating the mean. The distribution of the mean tread depth for each of the four tire positions is given in Table 10. Since the data set includes a number of light truck tires, the means exceed the value that would be expected on new passenger cars in a number of cases. The mode for both front tires is 9/32 in., and 11/32 in. for rear tires. Both are close to the depth of new tires (11/32-13/32).

The last column of Table 10 gives the distribution of the minimum mean tread depth on the car, i.e., the minimum of all four tires.

The number of tires with a mean tread depth of 2/32 in. or less is given at the bottom of the table. Of the 700 tires in the table, 32 (4.6 percent) have a mean depth of 2/32 in. or less. The minimum mean on the car was 2/32 in. or less on 21 (11.9 percent) of the cars.

The minimum mean tread depths for the cars have been compared for subsets of the accident sample, and tests of significance have been computed.* The comparison of vehicles in single-vehicle crashes with those in multi-vehicle crashes is not significant ($p = 0.98$). Although the results are not statistically significant, the single-vehicle cases had less tread than the other group in both comparisons.

*The RIDITS technique of Flora was used for the tests (16). This technique was used because it is a distribution-free method of determining if the numbers (scores) of one population are greater than those of a second population. The significance levels given by Flora's technique are the same as those obtained by the Mann-Whitney (U) test, although U is not obtained explicitly by Flora.

Table 10

DISTRIBUTION OF MEAN TREAD DEPTH

Depth in 32's	Left Front N	Left Front %	Right Front N	Right Front %	Left Rear N	Left Rear %	Right Rear N	Right Rear %	Minimum Mean on Car N	Minimum Mean on Car %
0	0	0	3	1.7	1	0.6	1	0.6	4	2.3
1	2	1.1	2	1.1	3	1.7	3	1.7	8	4.5
2	3	1.7	6	3.4	5	2.9	3	1.7	9	5.1
3	10	5.7	8	4.6	7	4.0	4	2.3	15	8.5
4	13	7.4	6	3.4	7	4.0	6	3.4	12	6.8
5	11	6.3	12	6.9	9	5.1	9	5.2	16	9.0
6	15	8.5	11	6.3	13	7.4	15	8.6	18	10.2
7	21	11.9	20	11.4	14	8.0	19	10.9	21	11.9
8	20	11.4	15	8.6	22	12.6	21	12.1	16	9.0
9	25	14.2	30	17.1	25	14.3	20	11.5	21	11.9
10	18	10.2	22	12.6	15	8.6	17	9.8	8	4.5
11	16	9.1	20	11.4	28	16.0	27	15.5	20	11.3
12	12	6.8	10	5.7	9	5.1	11	6.3	4	2.3
13	7	4.0	5	2.9	7	4.0	9	5.2	3	1.7
14	1	0.6	3	1.7	3	1.7	2	1.1	0	0
15	0	0	0	0	3	1.7	3	1.7	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	2	1.1	1	0.6	0	0
18	0	0	0	0	0	0	1	0.6	0	0
19	1	0.6	0	0	0	0	0	0	1	0.6
20	0	0	2	1.1	1	0.6	0	0	1	0.6
21	1	0.6	0	0	1	0.6	2	1.1	0	0
Total	176	100.0	175	100.0	175	100.0	174	100.0	177	100.0
Less than 3/32	5	2.8	11	6.3	9	5.1	7	4.0	21	11.9

Similarly, the comparison of tread depth of vehicles involved on dry pavement with those on other surface conditions is not significant ($p = 0.21$). This is true even when the other conditions are wet, i.e., dry versus wet ($p = 0.10$).

The tests listed above were computed using the first 15 levels of Table 10 and a sixteenth level obtained by grouping cases with depths of 15/32 - 21/32 in. The lack of significance in the wet-dry comparison could be a result of using a large number of levels, especially if differences in wet-versus-dry performance occur only at the lower tread depths. Consequently a 2x2 contingency table test was conducted comparing the number of cars with a minimum tread of 2/32 in. or less with the number with tread of over 2/32 in. The result is not significant, with a maximum-likelihood χ^2 probability of 0.29.

A method of deriving a simple characterization of the tread wear pattern from tread depth measurements that is meaningful to vehicle handling has not yet been developed. A simple measure of the pattern is the range of tread depths on each tire, i.e,, the maximum minus minimum groove depth. The distributions of the range for front and rear tires are shown in Table 11 for descriptive rather than inferential purposes. The differences in these two distributions are not significant.* The range for front tires was 2/32 in. or less on 71.5 percent of the tires, and on 69.1 percent of the rear tires. The difference in these proportions is not statistically significant.

*The RIDIT technique of Flora gives a significance level of 0.57.

Table 11

TREAD DEPTH RANGE ON EACH TIRE
(Maximum - Minimum Groove Depth)

Range in 32's	Front Tires N	Front Tires %	Rear Tires N	Rear Tires %
0	71	20.2	96	27.5
1	97	27.6	79	22.6
2	83	23.6	66	18.9
3	47	13.3	45	12.9
4	26	7.4	23	6.6
5	10	2.8	17	4.9
6	10	2.8	7	2.0
7	5	1.4	9	2.6
8	0	0.0	4	1.1
9	1	0.3	2	0.6
10	1	0.3	0	0.0
11	0	0.0	1	0.3
Total	351		349	
$\leq$ 2/32	251	71.5	241	69.1

(a) The differences between front and rear, using Flora's RIDITS and 12 levels, is not significant (p = 0.57), although the front tires have greater ranges.
(b) The 2x2 chi-square for $\leq$ 2/32's is 0.5, d.f. = 1 or not significant.

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APPENDIX

ANNOTATED

COLLISION PERFORMANCE and INJURY REPORT

REVISION 3

EDITION 1/76

VH/IC STUDY

4/76

GM
PG2070

Form 2/76

2/1

HIGHWAY SAFETY RESEARCH INSTITUTE
THE UNIVERSITY OF MICHIGAN

Card 5 0 (10)

VEHICLE HANDLING AND INJURY CAUSATION STUDY

*

TEAM ____________

INVESTIGATOR __ __ (12)

CASE NO. __ __-__ __ __ __ __ __-__ (2) (9)

INVESTIGATION DATE __ __/__ __/__ __ (14)
mo day yr

OTHER VEHICLE CASE NO. __ __-__ __ __ __ __ __-__ (20) (27)

*

REPORTING POLICE DEPT. __ (28)

POLICE REPORT NO. __ __ __ __ __ (29)

DATE OF ACCIDENT __ __/__ __/__ __ (34)
mo day yr

TIME OF ACCIDENT __ __ __ __ (40)
24 hour clock

*

CASE VEHICLE ACTUALLY TOWED? (44)

( )1 YES ⟶ to: ____________
( )2 NO reason: ____________

OTHER VEHICLE ACTUALLY TOWED? (45)

( )1 YES ⟶ to: ____________
( )2 NO reason: ____________
( )3 NO OTHER VEHICLE

*
*

INVESTIGATION TERMINATED

I. Investigation Complete: (46)

a( )1 Data Complete
b( )2 Data Incomplete

II. Investigation Incomplete:

c( )3 No Data--case could not be investigated.
reason: ____________

d Case Did Not Meet Criteria.
Reason:
( )4 Not towed from scene
( )5 Not towed for damage
( )6 License plate no. incorrect
( )8 Other: ____________

*

SAMPLE RULE/PERIOD (47)
( ) 1 ( ) 3
( ) 2 ( ) 4

VEHICLE INSPECTED (48)
( )1 YES
( )2 NO

TOTAL CASE SLIDES __ __ (49)

KP DATE 51-56 57-58=0

LEFT-FRONT WHEEL AND TIRE

WHEEL

WHEEL

INSPECTED 12 (1) Yes (2) No, why ________ (9) Unk

ORIGINAL EQUIPMENT 13 (1) Yes (2) No, describe ________ (9) Unk

DAMAGED 14 (2) No (1) Yes, describe ________ (9) Unk

TIRE

IDENTIFICATION

POSITION 15 (1) This Position (9) Unknown Position

INSPECTED 16 (1) Yes (2) No, why ________ (9) Unk

TREAD TYPE ___ 17

(1) Regular (3) Studded Snow (5) Reg/Chains (8) Other

(2) N/S Snow (4) Snow/Chains (6) Slick (9) Unknown

INTENDED USE ___ 18

(1) Pass. Car (3) Off Road (8) Other

(2) Light Truck (4) Trailer (9) Unknown

SIZE: 19 __ __ __ __ __ __ __ __ __ __ 28

BRAND ________ 29 __ __ __

MODEL ________ 32 __ __ __

DOT CODE* 35 __ __ __ __ __ __ __ __ __ __ __ __ 46

LOAD RANGE* __ 47 MAXIMUM LOAD* 48 __ __ __ __ MAXIMUM PSI* 52 __ __

RETREAD 54 (2) No (1) Yes (9) Unk TUBE 55 (2) No (1) Yes (9) Unk

CONSTRUCTION

CARCASS TYPE 56 (1) Bias (2) Belted-Bias (3) Radial (8) Other (9) Unk

NO. TREAD PLIES* __ 57

BELT MATERIAL __ 58 __ 59 0 60

NO. SIDEWALL PLIES* __ 61

UNKNOWN = 9

SIDEWALL MATERIAL __ 62

(0) None (2) Rayon (4) Polyester (8) Other

(1) Nylon (3) Fiberglass (5) Steel (9) Unk

Dup 1-9 Card 5 2 (10)

CONDITION

OUTER GROOVE

TREAD DEPTH* NO. GROOVES* 12 __ __

14 __ __ : __ __ : __ __ : __ __ : __ __ : __ __ : __ __ : __ __ : __ __ : __ __ 33

UNKNOWN = 9's

CUPPING 34 (2) No (1) Yes (9) Unk

PRESSURE LOSS SUSPECTED 35

(1) None (2) Pre-crash (3) Crash

(4) Post-crash (8) Unknown time

PSI* 36 __ __

NUMBER OF SLIDES* __ 38

DAMAGED 39 (2) No (1) Yes, describe ________ (9) Unk

DAMAGE CONTRIBUTORY TO ACCIDENT 40 ( )3 Not Damaged ( )2 No ( )1 Yes (9) Unk

* UNKNOWN = 9's

Dup 1-9 Card 5 3

2/76

RIGHT-FRONT WHEEL AND TIRE

WHEEL

WHEEL

INSPECTED 12 (1) Yes (2) No, why ________________ (9) Unk

ORIGINAL EQUIPMENT 13 (1) Yes (2) No, describe ________________ (9) Unk

DAMAGED 14 (2) No (1) Yes, describe ________________ (9) Unk

TIRE

IDENTIFICATION

POSITION 15 (1) This Position (9) Unknown Position

INSPECTED 16 (1) Yes (2) No, why ________________ (9) Unk

TREAD TYPE ___ 17

(1) Regular (3) Studded Snow (5) Reg/Chains (8) Other

(2) N/S Snow (4) Snow/Chains (6) Slick (9) Unknown

INTENDED USE ___ 18

(1) Pass. Car (3) Off Road (8) Other

(2) Light Truck (4) Trailer (9) Unknown

SIZE: ___ 19 ___ ___ ___ ___ ___ ___ ___ ___ ___ 28

BRAND ________________ ___ 29 ___ ___

MODEL ________________ ___ 32 ___ ___

DOT CODE* ___ 35 ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ 46

LOAD RANGE* ___ 47 MAXIMUM LOAD* ___ 48 ___ ___ ___ MAXIMUM PSI* ___ 52 ___

RETREAD 54 (2) No (1) Yes (9) Unk TUBE 53 (2) No (1) Yes (9) Unk

CONSTRUCTION

CARCASS TYPE 56 (1) Bias (2) Belted-Bias (3) Radial (8) Other (9) Unk

NO. TREAD PLIES* ___ 57 BELT MATERIAL ___ 58 ___ 59 0 60

NO. SIDEWALL PLIES* ___ 61 SIDEWALL MATERIAL ___ 62

UNKNOWN = 9

(0) None (2) Rayon (4) Polyester (8) Other

(1) Nylon (3) Fiberglass (5) Steel (9) Unk

Dup 1-9 Card 5 4

CONDITION

OUTER GROOVE TREAD DEPTH* NO. GROOVES* ___ 13 ___

___ 14 ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ : ___ ___ 33

UNKNOWN = 9's

CUPPING 34 (2) No (1) Yes (9) Unk

PRESSURE LOSS SUSPECTED 35

PSI* ___ 36 ___

(1) None (2) Pre-crash (3) Crash

NUMBER OF SLIDES* ___ 38

(4) Post-crash (8) Unknown time

DAMAGED 39 (2) No (1) Yes, describe ________________ (9) Unk

DAMAGE CONTRIBUTORY TO ACCIDENT 40 (3) Not Damaged (2) No (1) Yes (9) Unk

* UNKNOWN = 9's

Dup 1-9 Card 5 5

LEFT-REAR WHEEL AND TIRE

WHEEL

WHEEL

INSPECTED 12 (1) Yes (2) No, why ________ (9)Unk

ORIGINAL EQUIPMENT 13 (1) Yes (2) No, describe ________ (9)Unk

DAMAGED 14 (2) No (1) Yes, describe ________ (9)Unk

TIRE

IDENTIFICATION

POSITION 15 (1) This Position (9) Unknown Position

INSPECTED 16 (1) Yes (2) No, why ________ (9)Unk

TREAD TYPE ___ (17)

(1) Regular (3) Studded Snow (5) Reg/Chains (8) Other
(2) N/S Snow (4) Snow/Chains (6) Slick (9) Unknown

INTENDED USE ___ (18)

(1) Pass. Car (3) Off Road (8) Other
(2) Light Truck (4) Trailer (9) Unknown

SIZE: __ __ __ __ __ __ __ __ __ __ (19–28)

BRAND ________ __ __ __ (29)

MODEL ________ __ __ __ (32)

DOT CODE* __ __ __ __ __ __ __ __ __ __ __ __ (35–46)

LOAD RANGE* __ (47) MAXIMUM LOAD* __ __ __ __ (48) MAXIMUM PSI* __ __ (52)

RETREAD 54 (2) No (1) Yes (9) Unk TUBE 55 (2) No (1) Yes (9) Unk

CONSTRUCTION

CARCASS TYPE 56 (1) Bias (2) Belted-Bias (3) Radial (8) Other (9) Unk

NO. TREAD PLIES* __ (57) BELT MATERIAL __ (58) __ (59) 0 (60)

NO. SIDEWALL PLIES* __ (61) SIDEWALL MATERIAL __ (62)

UNKNOWN = 9

(0) None (2) Rayon (4) Polyester (8) Other
(1) Nylon (3) Fiberglass (5) Steel (9) Unk

Dup 1-9 Card 5 6

CONDITION

OUTER GROOVE TREAD DEPTH* NO. GROOVES* __ __ (73)

__ __: __ __: __ __: __ __: __ __: __ __: __ __: __ __: __ __: __ __ (14–33)

UNKNOWN = 9's

CUPPING 34 (2) No (1) Yes (9) Unk

PRESSURE LOSS SUSPECTED 35

(1) None (2) Pre-crash (3) Crash
(4) Post-crash (8) Unknown time

PSI* __ __ (36)

NUMBER OF SLIDES* __ (38)

DAMAGED 39 (2) No (1) Yes, describe ________ (9)Unk

DAMAGE CONTRIBUTORY TO ACCIDENT 40 ( )3 Not Damaged ( )2 No ( )1 Yes (9)Unk

* UNKNOWN = 9's

Dup 1-9 Card 5 7

RIGHT-REAR WHEEL AND TIRE

WHEEL

WHEEL

INSPECTED 12 (1) Yes (2) No,why ______ (9)Unk

ORIGINAL EQUIPMENT 13 (1) Yes (2) No, describe ______ (9)Unk

DAMAGED 14 (2) No (1) Yes, describe ______ (9)Unk

TIRE

IDENTIFICATION

POSITION 15 (1) This Position (9) Unknown Position

INSPECTED 16 (1) Yes (2) No,why ______ (9)Unk

TREAD TYPE ___ 17

(1) Regular (3) Studded Snow (5) Reg/Chains (8) Other
(2) M/S Snow (4) Snow/Chains (6) Slick (9) Unknown

INTENDED USE ___ 18

(1) Pass. Car (3) Off Road (8) Other
(2) Light Truck (4) Trailer (9) Unknown

SIZE: 19 ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ 28

BRAND ______ 29 ___ ___ ___

MODEL ______ 32 ___ ___ ___

DOT CODE* 35 ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ 46

LOAD RANGE* ___ 47 MAXIMUM LOAD* 48 ___ ___ ___ ___ MAXIMUM PSI* 52 ___ ___

RETREAD 54 (2) No (1) Yes (9) Unk TUBE 55 (2) No (1) Yes (9) Unk

CONSTRUCTION

CARCASS TYPE 56 (1) Bias (2) Belted-Bias (3) Radial (8) Other (9) Unk

NO. TREAD PLIES* ___ 57 BELT MATERIAL ___ 58 ___ 59 . 0 60

NO. SIDEWALL PLIES* ___ 61 SIDEWALL MATERIAL ___ 62

UNKNOWN = 9

(0) None (2) Rayon (4) Polyester (8) Other
(1) Nylon (3) Fiberglass (5) Steel (9) Unk

Dup 1-9 Card 5 8

CONDITION

OUTER GROOVE TREAD DEPTH* NO. GROOVES* ___ 13 ___

14 ___ ___: ___ ___: ___ ___: ___ ___: ___ ___: ___ ___: ___ ___: ___ ___: ___ ___: ___ ___ 33

UNKNOWN = 9's

CUPPING 34 (2) No (1) Yes (9) Unk

PRESSURE LOSS SUSPECTED 35

(1) None (2) Pre-crash (3) Crash
(4) Post-crash (8) Unknown time

PSI* 36 ___ ___

NUMBER OF SLIDES* ___ 38

DAMAGED 39 (2) No (1) Yes,describe ______ (9)Unk

DAMAGE CONTRIBUTORY TO ACCIDENT 40 (3) Not Damaged (2) No (1) Yes (9)Unk

* UNKNOWN = 9's

ACCIDENT SCHEMATIC

CASE VEHICLE (A): ______________________ OTHER VEHICLE (B): ______________________

ACCIDENT DESCRIPTION: ____

____

____

____

NORTH

2/76

SUPPLEMENTARY DATA--VEHICLE

STEERING WHEEL
12
( ) 1 Original Equipment
( ) 9 Unknown
( ) 2 Non-O.E., describe____
____

AIR CONDITIONING EQUIPPED
16
( ) 1 Yes
( ) 2 No
( ) 9 Unknown

GLAZING OBSTRUCTIONS
13
( ) 2 None
( ) 9 Unknown
( ) 1 Yes, type and location ___
____

CARGO
17
( ) 2 None
( ) 9 Unknown
( ) 1 Yes, describe location and estimate weight
____
____
____
____
____
____

SUSPENSION MODIFICATIONS
14
( ) 2 None
( ) 9 Unknown
( ) 1 Yes, describe__________
____

FUEL LEVEL
15
( ) 1 Full ( ) 2 3/4 ( ) 3 1/2
( ) 4 1/4 ( ) 5 Empty ( ) 9 Unk

PLACARD INFORMATION

Vehicle Capacity Weight (Maximum Load)

___ ___ ___ ___ LBS.
18 21

Vehicle Average, Minimum, or Light Load

___ ___ ___ ___ LBS.
26 29

Manufacturer's Recommended Tire Pressure at Capacity Weight (Maximum Load)

FRONT ___ ___ PSI
22

REAR ___ ___ PSI
24

Manufacturer's Recommended Tire Pressure at Average or Minimum Load

FRONT ___ ___ PSI
30

REAR ___ ___ PSI
32

RIGHT-FRONT SEATING SYSTEM

DAMAGE TO ADJUSTERS (0,1,2,3)	___ 34
TYPE OF DAMAGE (2) None (4) Chucking (5) Deformed and Released (6) Separated (8) Swivel Damage (0) Unknown	___ 35
LOCATION OF SEPARATION (3) Not Applicable (4) At Floor (5) At Adjuster (6) At Seat (0) Unknown	___ 36
HEAD RESTRAINTS (Right Front) Equipped (1,2,0) Removed Prior to Collision (1,2,3,0) Retained During Collision (1,2,3,0) Damaged (1,2,3,0) Occupant Contact (1,2,3,0)	___ 37 ___ 38 ___ 39 ___ 40 ___ 41
HEAD RESTRAINT ADJUSTMENT AT TIME OF COLLISION (3) Not Applicable, None (4) UP From Seat Top (5) Down on Seat Top (6) Integral (0) Unknown	___ 42
WAS THIS SEATING POSITION OCCUPIED? (1,2,0)	___ 43

CASE VEHICLE MALFUNCTION

(0) Unknown
(1) Malfunction definite
(2) No Malfunction
(4) Malfunction probable
(5) Malfunction possible
(6) Driver claimed malfunction- No investigation

	Code
(01) Brake System	___ 44
(02) Exhaust System	___
(03) Steering System	___
(04) Suspension System	___
(05) Tires	___
(06) Electrical System	___
(07) Throttle System	___
(08) Driver Controls	___
(09) Power Train	___
(10) Fuel System	___
(11) Visibility Items	___
(12) Other:___________	___
(13) Applicable, but Unknown	___

Primary Item Noted Above (01 to 13) from above (00) None (99) Unknown	___ 57 ___ 58
HAD ROUTINE MAINTENANCE BEEN PERFORMED (0,1,2)	___ 59

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. __ __ (12 13) / DAY __ __ (14 15) / YR. __ __ (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

	PUNCH CODE	CARD COL.
LOCATION STATE: (FIPS Code)	__ __	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   POSSIBLE MECHANICAL MALFUNCTION

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 (1) YES, TYPE UNKNOWN OR OTHER (2) NO (3) POTHOLE, BUCKLING, ROAD DISREPAIR (4) RAISED OR SUNKEN SEWER (5) RAISED OR SUNKEN RR GRADE CROSSING (6) DROP FROM ROAD TO SHOULDER (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	0	40
WAS COMMENT ABOUT MECHANICAL MALFUNCTION MADE BY ANY PERSON(s)? (1) YES (2) NO (0) UNKNOWN	0	41

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

______

POSSIBLE MECHANICAL MALFUNCTION   ENVIRONMENTAL CONDITIONS

POSSIBLE MECHANICAL MALFUNCTION

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

INVESTIGATOR:

DATE OF INVESTIGATION:

DATE OF REPORT:

GENERAL INFORMATION

COLLISION CONFIGURATION (of case vehicle)	PUNCH CODE	CARD COL.
VEHICLE TO OBJECT (1,2,0)*	—	42
ROLLOVER (1,2,0)* (90^{o} 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 CONFIGURATION (1,2,0)* (5) Non-Collision only (6) Vehicle-part to Vehicle (7) Vehicle to O.V. Trailer (8) Self-induced (9) Veh to Object to Veh	—	48
VEHICLES INVOLVED TOTAL NUMBER (INCLUDING CASE VEHICLE) In Accident (0) Unknown	—	49

OBJECTS CONTACTED

Enter Only Damage- or Injury-Producing Objects in Order of Contact

(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)
(17) Train
(18) Pedalcycle (bicycle+)
(19) Building
(20) Light/Pickup Truck, Small Van, Carryall
(22) Tractor without trailer
(23) Van delivery (walk-in/step van)
(24) Straight truck, motor home
(25) Tractor-trailer combination
(26) Multi-purpose vehicle (jeep)
(28) Bus
(29) Trailer
(40) Object disengaging from other vehicle
(50) Hydrants, short posts, stumps
(51) Mailbox (rural), small posts/trees
(52) Pier, Pillar (e.g., bridge support)
(53) Retaining wall, abutment, Hiway fixtures
(54) Impact attenuator
(55) Breakaway Fixtures
(99) Other

PUNCH CODE	CARD COL.
— —	50-51
— —	52-53
— —	54-55
— —	56-57

CASE VEHICLE DRIVER'S ABILITY TO DRIVE IMPAIRED BY	PUNCH CODE	CARD COL.
(CHOOSE NO MORE THAN TWO) (00) UNKNOWN (02) NONE (03) DRINKING INVOLVED (Broad) (04) Drunk By Local Legal Standards (BAC given) (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.	0	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: ____	0	63
(Accident Point of View) TYPE OF LOSS		
PERSONAL INJURY (1,2,0)*	0	64
PROPERTY DAMAGE (1,2,0)*	0	65

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

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

COLLISION SKETCH

DESCRIBE COLLISION EVENTS ______________________________

INFORMATION SOURCES: ______________________________

REPORTED BY: ______________________________
(Attach Police Report)

COMMENTS (Include 3rd vehicle speed estimate) ______________________________

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.

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 2 (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)

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

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

BODY STYLE	PUNCH CODE	CARD COL.
(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 (inc. pickups+carryalls) (9) Other (e.g. bus, jeep, train) (0) Unknown	__	41
NUMBER OF CYLINDERS OR ROTORS (Enter "0" if Unknown)	__	42
HIGH PERFORMANCE/AIR BAG EQUIPPED (0) No A/B: Unk if High Perf. (1) No A/B: High Performance (2) No A/B; Not High Perf. Air Bag Equipped (any engine) and: (4) Any Deployments (5) No Deployments (6) Deployment Unknown (9) Both High Performance and A/B Equipped Unknown	__	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

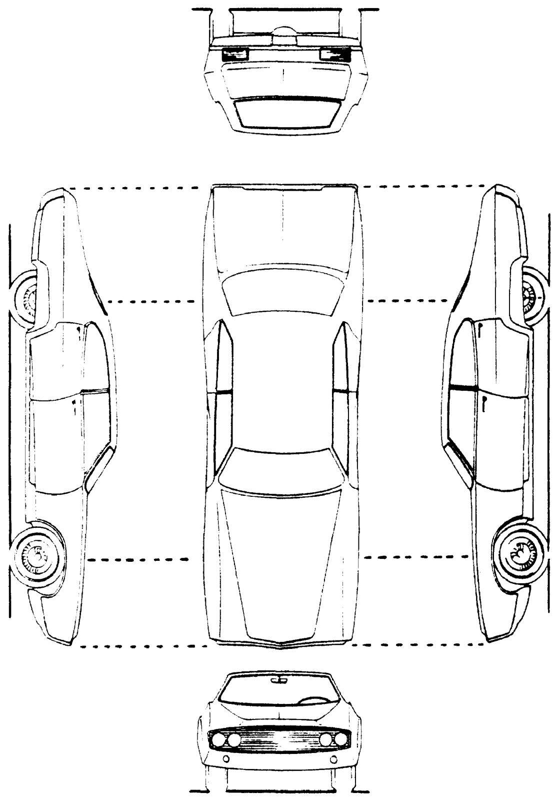
*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO

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

OTHER VEHICLE

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 (inc. pickups+carryalls) (9) Other (e.g. bus, jeep, train) (0) Unknown	___	41
BODY STRUCTURE (1) Body and Frame (2) Unitized (3) Integral-Stub Frame (4) Body and Platform-Frame (e.g., VW bug) (9) Other: ____________ (0) Unknown	___	42
NUMBER OF CYLINDERS OR ROTORS (Enter "0" if Unknown)	___	43
HIGH PERFORMANCE/AIR BAG EQUIPPED (0) No A/B; Unk if High Perf. (1) No A/B; High Performance (2) No A/B; Not High Perf. Air Bag Equipped (any engine) and: (4) Any Deployments (5) No Deployments (6) Deployment Unknown (9) Both High Performance and A/B Equipped Unknown	___	44
NUMBER OF OCCUPANTS (Enter 99 if unknown)	__ __	45-46

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

	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~~	0	53

CASE VEHICLE REPAIR OR REPLACEMENT COST $ __ __ __ __ (54 55 56 57)
Unknown (9999)

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 03

EXTERIOR DAMAGE

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

SHEET METAL DAMAGE (Direct)

	PUNCH CODE	CARD COL.
FRONT (1,2,0)*	0	12
REAR (1,2,0)*	0	13
LEFT SIDE (1,2,0)*	0	14
RIGHT SIDE (1,2,0)*	0	15
ROOF (1,2,0)*	0	16
OTHER (1,2,0)*: ______	0	17

REMARKS: ______

SHEET METAL CRUSH (Direct)

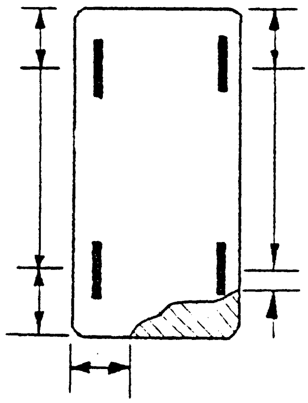
INSERT MAXIMUM CRUSH DIMENSION TO THE NEAREST INCH. DIMENSIONS MUST AGREE WITH DIAGRAMS ON FACING PAGE. (INSERT "99", IF UNKNOWN INSERT "98", IF 98 INCHES OR OVER)

	PUNCH CODE	CARD COL.
FRONT (INCHES)	__ __	18-19
REAR	__ __	20-21
LEFT SIDE	__ __	22-23
RIGHT SIDE	__ __	24-25
ROOF	__ __	26-27
OTHER:	__ __	28-29

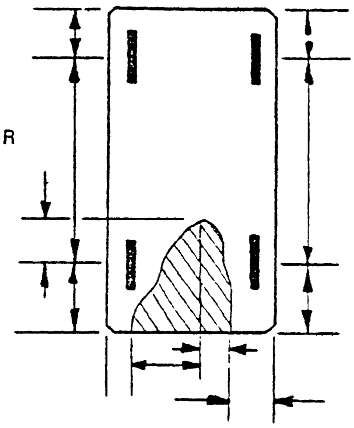
*WHERE (1,2,0) IS INDICATED, USE 1 FOR YES
2 FOR NO
0 FOR UNKNOWN

EXAMPLES.

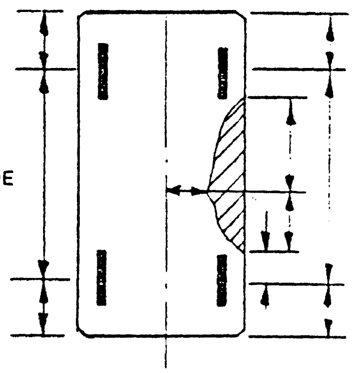
FRONT OR REAR



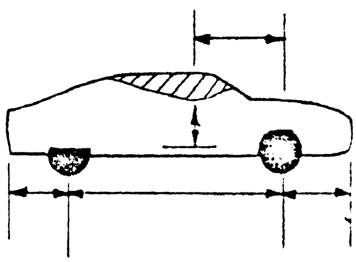
FRONT OR REAR



SIDE



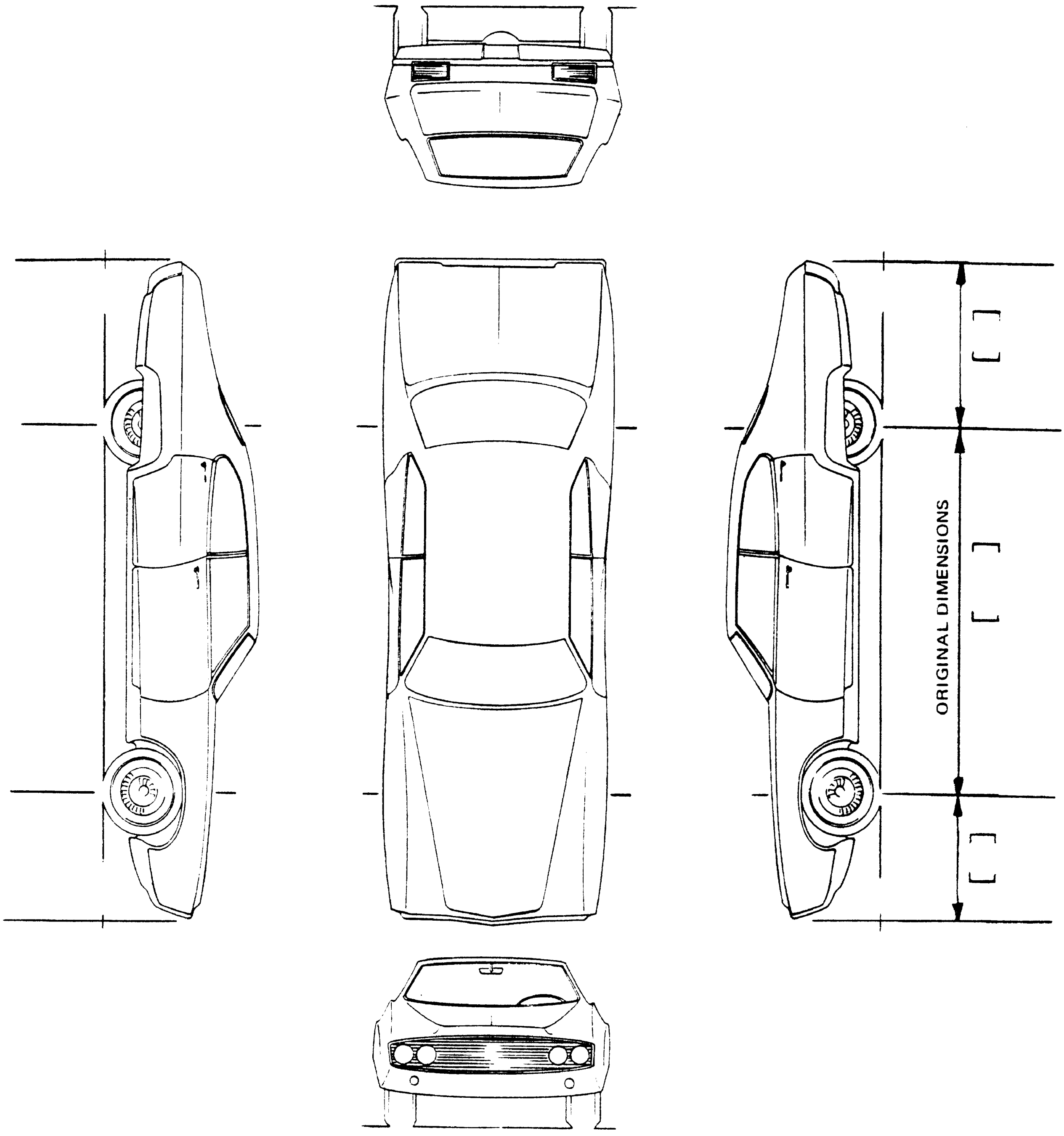
ROOF
(REFERENCE TO TOP OF DOOR SILL OR WINDOW SILL)



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.



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 (9) OTHER: ________ (0) UNKNOWN	FRONT	___	33
	REAR	___	34
TREAD WEAR			
(4) LIGHT (5) MEDIUM (6) HEAVY (7) BALD (8) LEFT AND RIGHT SIDES DIFFERENT (9) OTHER: ________ (0) UNKNOWN	FRONT	___	35
	REAR	___	36
PROFILE			
(4) REGULAR 80,78 (5) WIDE OVAL 70,60,50 (6) LEFT AND RIGHT SIDES DIFFERENT (7) OTHER: ________ (0) UNKNOWN	FRONT	___	37
	REAR	___	38
CARCASS TYPE			
(4) BIAS PLY (5) BELTED-BIAS PLY (6) RADIAL PLY (7) LEFT AND RIGHT SIDES DIFFERENT (8) OTHER: ________ (0) UNKNOWN	FRONT	___	39
	REAR	___	40

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

TIRES (CONT'D.)

		SIZE	MANUFACTURER	MODEL	CODE	LOAD RANGE
FRONT	LEFT	___	___	___	___	___
	RIGHT	___	___	___	___	___
REAR	LEFT	___	___	___	___	___
	RIGHT	___	___	___	___	___

FRONT EXTERIOR

HOOD PERFORMANCE
(FRONT OF VEHICLE)

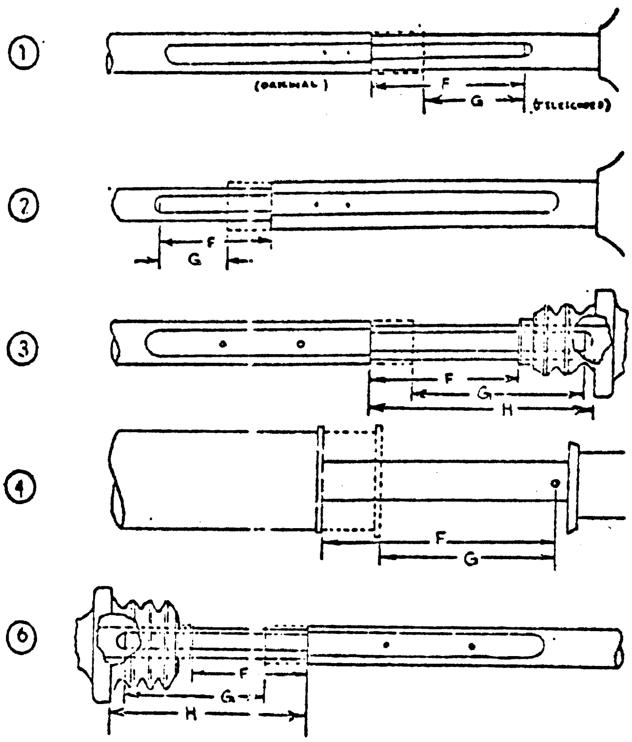
	PUNCH CODE	CARD COL.
HOOD LATCH(ES)		
RELEASED (1,2,3,0)*	___	41
DAMAGED (1,2,3,0)*	___	42
JAMMED (1,2,3,0)*	___	43
HOOD HINGES		
LEFT — DAMAGED (1,2,3,0)	___	44
LEFT — SEPARATED (1,2,3,4,5,0)**	___	45
RIGHT — DAMAGED (1,2,3,0)	___	46
RIGHT — SEPARATED (1,2,3,4,5,0)**	___	47
HOOD REMAINED ON VEHICLE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

STEEERING COLUMN FLEXIBLE COUPLING

	PUNCH CODE	CARD COL.
EQUIPPED (2) No; Yes: (1) Type Unknown, (6) Rag, (7) Pot, (8) Universal, (9) Other; (0) Unknown	___	54
SEPARATED (1,2,3,4,5,0)**	___	55
OTHER DAMAGE (1,2,3,0)*	___	56
DESCRIBE: ______________________		

ENGINE COMPARTMENT TELESCOPING UNIT

(SEE DRAWING ON PAGE 18 FOR LOCATION)



FRONT OF VEHICLES

LOWER TELESCOPING SHAFT

TYPE OF UNIT	PUNCH
(5) None Installed (1-6) See Sketch Above (8) Double U-Joint or Flexible Cable Joint (9) Others ________ (0) Unknown	___ 57
ORIGINAL LENGTH, (F) ________ TELESCOPED LENGTH, (G) ________ DIFFERENCE (F-G) ________ (tolerance ± 0.6 in.) (777) Device Extended (888) Not Equipped, (999) Unknown (998) Compressed, Unknown Amount	__ __ . __ 58 59 60
	END OF CARD 04

HOOD

*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

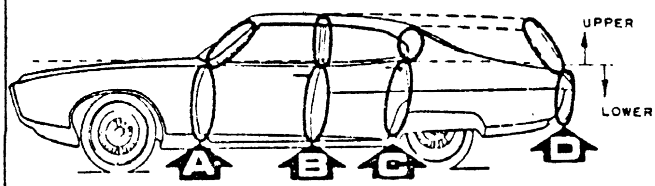
FIRE

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

	PUNCH CODE	CARD COL.
FIRE (Accident Viewpoint) (1) Fire - 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. Code remainder of column		0	15
A-PILLAR			
UPPER	DAMAGED (1,2,0)*	0	16
	SEPARATED (1,2,3,4,5,0)**	0	17
LOWER	DAMAGED (1,2,0)*	0	18
	SEPARATED (1,2,3,4,5,0)**	0	19
B-PILLAR (Also Rear Pillar on Pick-Up Truck, Corvette, Camaro, Firebird)			
UPPER	DAMAGED (1,2,3,0)*	0	20
	SEPARATED (1,2,3,4,5,0)**	0	21
LOWER	DAMAGED (1,2,0)*	0	22
	SEPARATED (1,2,3,4,5,0)**	0	23
C-PILLAR			
UPPER	DAMAGED (1,2,3,0)*	0	24
	SEPARATED (1,2,3,4,5,0)**	0	25
LOWER	DAMAGED (1,2,3,0)*	0	26
	SEPARATED (1,2,3,4,5,0)**	0	27
D-PILLAR (Station Wagon & Limousine)			
UPPER	DAMAGED (1,2,3,0)*	0	28
	SEPARATED (1,2,3,4,5,0)**	0	29
LOWER	DAMAGED (1,2,3,0)*	0	30
	SEPARATED (1,2,3,4,5,0)**	0	31

LEFT ROOF SIDE RAIL	PUNCH CODE	CARD COL.
DAMAGED (1,2,3,0)*	___	32
BUCKLED (1,2,3,0)*	___	33

*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

LEFT EXTERIOR

SIDE STRUCTURE – LEFT SIDE	PUNCH CODE	CARD COL.
LEFT BODY MOUNT SEPARATION (1,2,3,0)* (3 — 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. Code remainder of 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)* i.e., Is Side Boundary Broken. Not restricted to vehicles with reinforced side structure.	___	44
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

	PUNCH CODE	CARD COL.
FUEL TANK AND LINES		
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)* (if 1 → location of leaks)	___	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 hitch (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 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

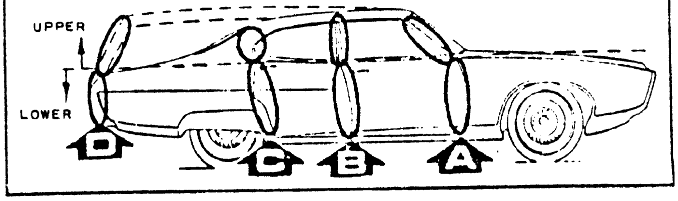
REAR EXTERIOR

	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)

	PUNCH CODE	CARD COL.
TRUNK LID PERFORMANCE (REAR OF VEHICLE)		
LATCHES		
RELEASED (1,2,3,0)*	0	12
DAMAGED (1,2,3,0)*	0	13
LATCH OR LID JAMMED (1,2,3,0)*	0	14
HINGES		
LEFT — DAMAGED (1,2,3,0)*	0	15
LEFT — SEPARATED (1,2,3,4,5,0)**	0	16
RIGHT — DAMAGED (1,2,3,0)*	0	17
RIGHT — SEPARATED (1,2,3,4,5,0)**	0	18
TRUNK or PARTITIONED LUGGAGE AREA		
DAMAGED (1,2,3,0)	___	19
SPARE TIRE SEPARATION (1,2,3,4,0) (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	0	22

RIGHT PILLARS



*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

RIGHT EXTERIOR

RIGHT PILLARS			PUNCH CODE	CARD COL.
If right pillars were not damaged or separated or right roof side rail was not damaged or buckled, place a "1" in code column. Code remainder of column			0	23
A-PILLARS				
	UPPER	DAMAGED (1,2,0)*	0	24
		SEPARATED (1,2,3,4,5,0)**	0	25
	LOWER	DAMAGED (1,2,0)*	0	26
		SEPARATED (1,2,3,4,5,0)**	0	27
B-PILLAR (ALSO REAR PILLAR ON PICK-UP TRUCK, CORVETTE, CAMARO, FIREBIRD)				
	UPPER	DAMAGED (1,2,3,0)*	0	28
		SEPARATED (1,2,3,4,5,0)**	0	29
	LOWER	DAMAGED (1,2,0)*	0	30
		SEPARATED (1,2,3,4,5,0)**	0	31
C-PILLAR				
	UPPER	DAMAGED (1,2,3,0)*	0	32
		SEPARATED (1,2,3,4,5,0)**	0	33
	LOWER	DAMAGED (1,2,3,0)*	0	34
		SEPARATED (1,2,3,4,5,0)**	0	35
D-PILLAR (STATION WAGON & LIMOUSINE)				
	UPPER	DAMAGED (1,2,3,0)*	0	36
		SEPARATED (1,2,3,4,5,0)**	0	37
	LOWER	DAMAGED (1,2,3.0)*	0	38
		SEPARATED (1,2,3,4,5,0)**	0	39
RIGHT ROOF SIDE RAIL				
	DAMAGED (1,2,3,0)*		___	40
	BUCKLED (1,2,3,0)*		___	41
WINDSHIELD HEADER				
	DAMAGED OR BUCKLED (1,2,0)*		___	42

SIDE STRUCTURE – RIGHT SIDE			PUNCH CODE	CARD COL.
RIGHT BODY MOUNT SEPARATION (1,2,3,0)* (3 — 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. Code remainder of column			___	44
DOOR LATCHES				
	RIGHT FRONT	DAMAGED (1,2,3,0)*	___	45
		RELEASED (1,2,3,0)*	___	46
	RIGHT REAR	DAMAGED (1,2,3,0)*	___	47
		RELEASED (1,2,3,0)*	___	48
DOOR HINGES				
	RIGHT FRONT	DAMAGED (1,2,3,0)*	___	49
		SEPARATED (1,2,3,4,5,0)**	___	50
	RIGHT REAR (Hinge or track)	DAMAGED (1,2,3,0)*	___	51
		SEPARATED (1,2,3,4,5,0)**	___	52
CONTINUITY OF SIDE STRUCTURE MAINTAINED (1,2,3,0)* i.e., Is Side Boundary Broken. Not restricted to vehicles with reinforced side structure.			___	53
DOORS OPENED DURING COLLISION				
	RIGHT	FRONT (1,2,0)*	___	54
		REAR (1,2,3,0)*	___	55
DOORS JAMMED CLOSED				
	RIGHT	FRONT (1,2,0)*	___	56
		REAR (1,2,3,0)*	___	57

RIGHT SIDE STRUCTURE

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

STEERING WHEEL

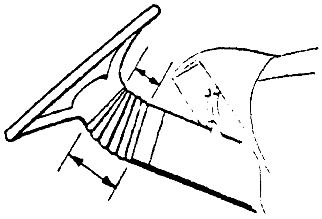
STEERING WHEEL	PUNCH CODE	CARD COL.
~~TYPE~~ ~~GM only, others and unknown use (99).~~	9 9	58-59
NOTES ON NON-ORIGINAL EQUIPMENT STEERING WHEEL: ______ ______ ______		
STEERING WHEEL RIM		
DAMAGE (2) NONE (4) SLIGHTLY DEFORMED (5) SEVERELY BENT (6) BROKEN (0) UNKNOWN	___	60
OCCUPANT CONTACT (1,2,3,0)	___	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 (1,2,3,0)	___	64
~~HORN RING, HORN BUTTON(S), OR SPOKE SHROUD~~ OR DRIVER AIR BAG COVER DAMAGED (1,2,0)*	0	65
~~OCCUPANT CONTACT (1,2,3,0)~~	0	66

STEERING WHEEL ENERGY ABSORBING DEVICE	PUNCH CODE	CARD COL.
(SEE DRAWING ON PAGE 18 FOR LOCATION) 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

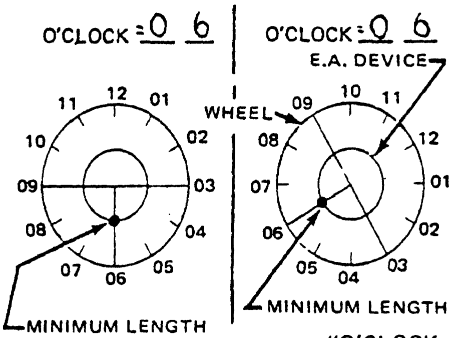


MAX. = ______in.; MIN. = ______ in.

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= ___ ___ (68, 69)

(ENTER 00 IF UNKNOWN)

ENERGY ABSORBING DEVICE COMPRESSION

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

8's for Not Equipped

ORIGINAL LENGTH (H) ______ IN.

DAMAGED MAX. LENGTH (X) ______ IN.

DIFFERENCE (H-X) ______ IN. — ___ ___.___ (70, 71, 72)

ORIGINAL LENGTH (H) ______ IN.

DAMAGED MIN. LENGTH (Y) ______ IN.

DIFFERENCE (H-Y) ______ IN. — ___ ___.___ (73, 74, 75)

DEVICE EXTENDED
(4) X GREATER THAN H
(5) X AND Y GREATER THAN H
(6) NEITHER
(0) UNKNOWN
(8) NOT APPLICABLE
______ 76

*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

END OF CARD 06

STEERING WHEEL AND COLUMN

DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD 0 (10) 7 (11)

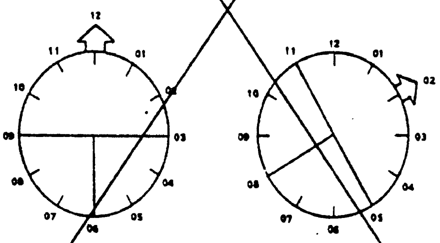
STEERING WHEEL POSITION AT TIME OF COLLISION

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 = 0 0 — 12-13

Steering Wheel Pad or Air Bag

S.W. Pad Equipped (1,2,0)*

Steering Wheel Air Bag:
(4) Deployment
(5) Equipped-No Deployment
(6) Deployment Unknown
(9) Both Pad and Air Bag Unknown
— ____ 14

S.W. Pad Deformed or Contact to Driver Air Bag(1,2,3,0)* — ____ 15

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.

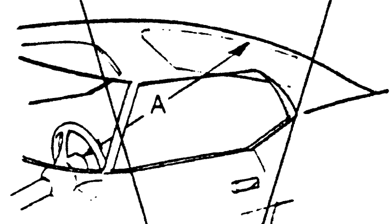
EQUIPPED (1,2,0)* — ____ 20

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| ________ — 9 (22) 9 (23) . 9 (24)

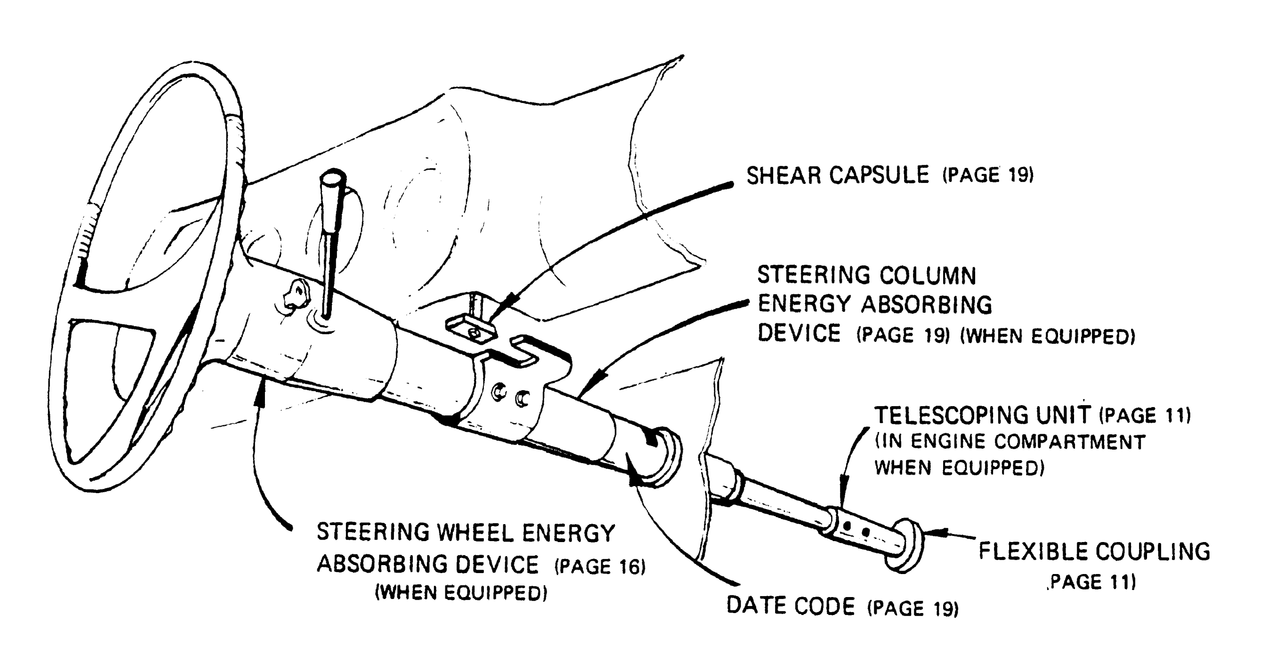
tolerance ± 1.0

DIRECTION OF MOVEMENT
(4) FORWARD (A GREATER THAN B)
(5) REARWARD (A LESS THAN B)
(6) NEITHER
(0) UNKNOWN
— 0 (25)

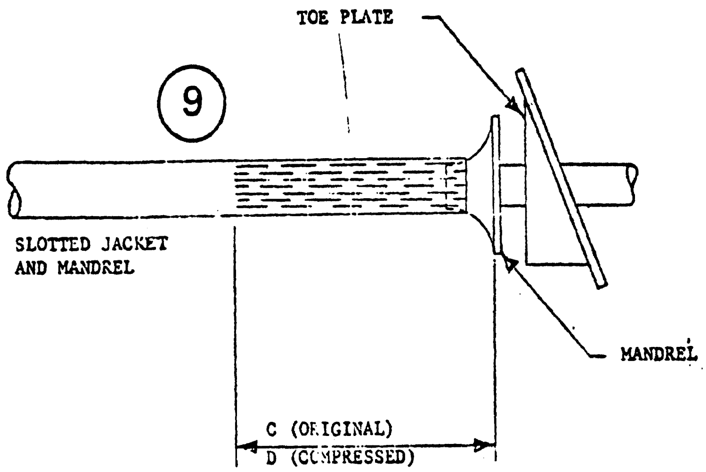
*WHERE (1,2,0) OR (1,2,3,0) ARE INDICATED, USE 1 FOR YES, 2 FOR NO, 3 FOR NOT APPLICABLE, 0 FOR UNKNOWN

STEERING WHEEL AND COLUMN

STEERING COLUMN (CONT'D.)

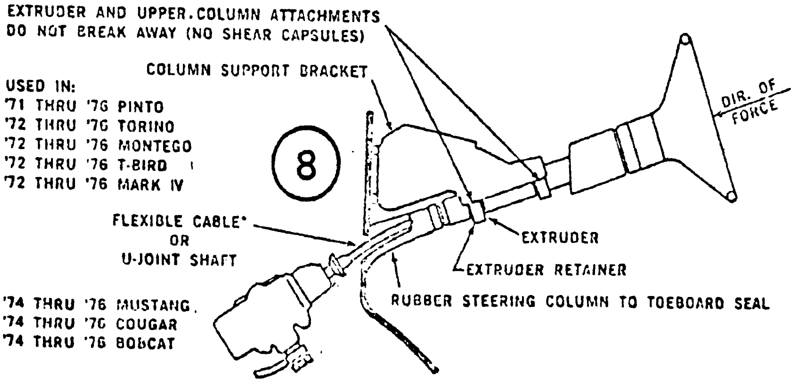


1974 CHRYSLER CORPORATION ENERGY ABSORBING STEERING COLUMN



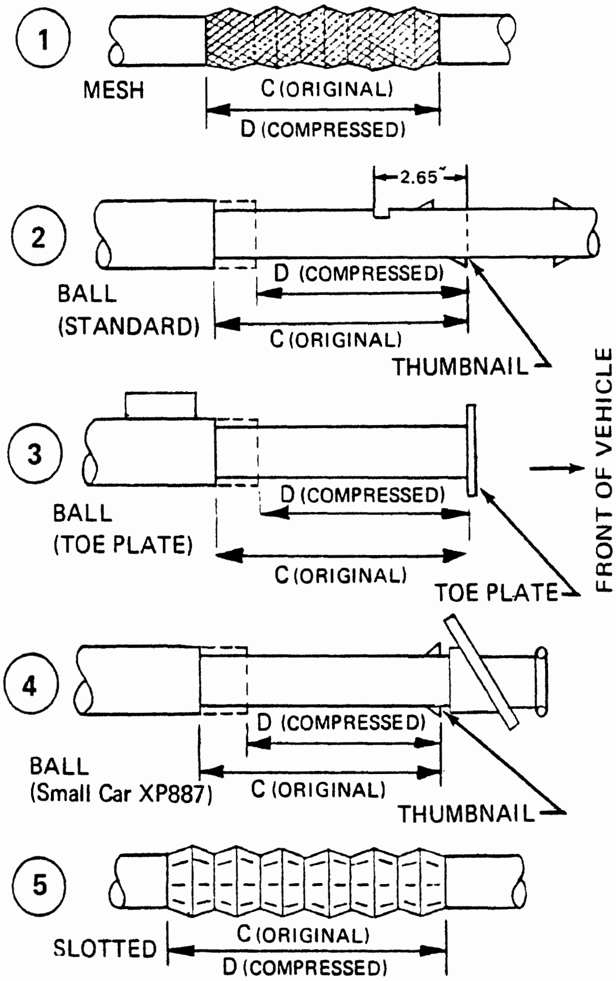
FORD ENERGY ABSORBING "MINI" COLUMN

(1971-76 PINTO; 1972-76 TORINO, MONTEGO, T-BIRD, MARK IV) AND 1975-76 BOBCAT; 1974-76 MUSTANG & COUGAR, AND 1975-76 GRANADA & MONARCH



STEERING COLUMN (CONT'D.)

STEERING COLUMN ENERGY ABSORBING DEVICE SEE ALSO: page 18



STEERING COLUMN ENERGY ABSORBING DEVICE

TYPE OF DEVICE

(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

PUNCH: ___ 26

(SEE DRAWING ON PAGE 18 FOR LOCATION)

ORIGINAL LENGTH, (C) ________

COMPRESSED LENGTH, (D) ________

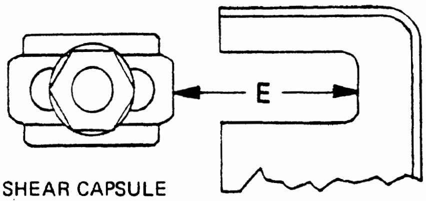
COMPRESSION, (C-D) ________

(777) Device Extended
(888) Not Equipped, (999) Unknown
(998) Compressed, Unknown Amount

___ ___.___
27 28 29

SHEAR CAPSULE SEPARATION

(SEE DRAWING ON PAGE 18 FOR LOCATION)



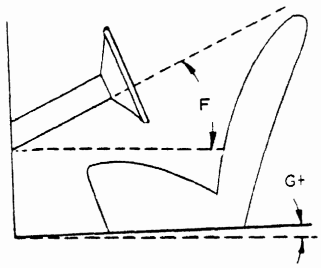
NOTE: WHEN CAPSULES HAVE SEPARATED IT MAY BE NECESSARY TO LIFT COLUMN ASSEMBLY INTO POSITION AGAINST INSTRUMENT PANEL BEFORE MEASURING.

SHEAR CAPSULE SEPARATION (E)

(888) Not Equipped, (999) Unknown
(998) Separated, Unknown Amount

PUNCH: ___ ___.___
30 31 32

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

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 DIMENSION (J)______

DAMAGED VEHICLE DIMENSION (H)______

COLUMN ROTATION (H-J)______

(ENTER 99 IF UNKNOWN) tolerance ± 1°
98 Rotated - Unknown amount

PUNCH: Either + or -
___ ___
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~~	Y Y	46-47

WINDSHIELD MARK

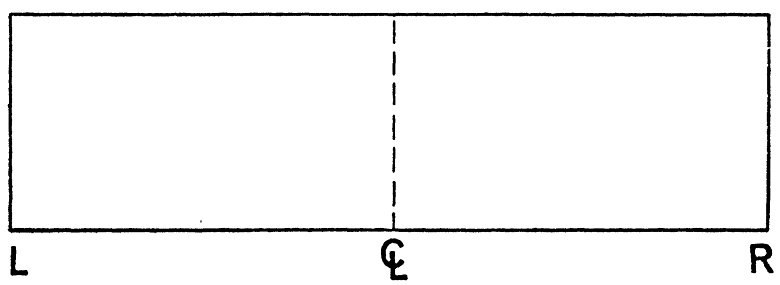
DRAW GLASS MANUFACTURER'S WINDSHIELD MARK WHICH IS LOCATED ALONG THE BOTTOM OF THE WINDSHIELD AT CENTER OR AT ONE CORNER.

EXAMPLE OF TYPICAL MARK:

SAFETY L O F PLATE
ASI GA
LAMINATED
M3

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.



KEYPUNCH:
Col. 48-75=0
End of Card 07
Dup. 1-9 0/10 8/11
Col. 12-34=0

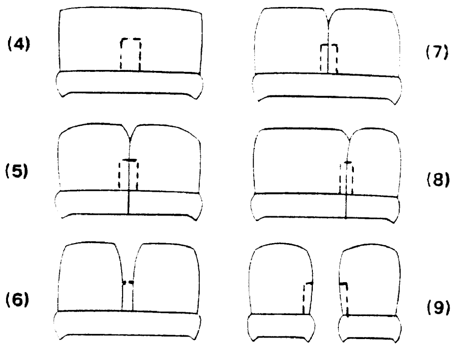
*WHERE (1,2,3,0) IS INDICATED, USE 1 FOR YES, 2 FOR NO, 3 FOR NOT APPLICABLE, 0 FOR UNKNOWN

PASSENGER COMPARTMENT (CONT'D.)

SEATS

TYPE OF FRONT SEAT

PUNCH CODE | CARD COL.



(0) UNKNOWN
3) Drivers Seat Only — 35

FOLDING BACKS (1,2,0)* — 36

DELUXE ACCESSORIES
(1) Deluxe Accessories
(2) None
(4) Reclining Seatbacks
(0) Unknown — 37

TYPE OF SEAT ADJUSTERS

Driver's Side

(4) MANUAL
(5) POWER
(6) RIGID
(7) OTHER: ____________
(0) UNKNOWN — 38

TYPE OF SEAT ADJUSTMENT

Driver's Side

(3) NONE (NOT APPLICABLE)
(4) 2-WAY
(5) 4-WAY
(6) 6-WAY
(7) OTHER: ____________
(0) UNKNOWN — 39
(8) Swivel Seats

DAMAGE TO ADJUSTERS (1,2,0)*

Include Rigid — 40

TYPE OF DAMAGE TO ADJUSTERS

(CHOOSE TWO: rank in order of severity)

(2) None
(4) Chucking (some free play)
(5) Deformed (e.g. Released or Jammed) — 41
(6) Separated
(0) Unknown — 42
(8) Swivel Damaged

LOCATION OF SEPARATION

(3) NOT APPLICABLE
(4) AT FLOOR
(5) AT ADJUSTER
(6) AT SEAT
(0) UNKNOWN — 43

POSITION OF SEAT PRIOR TO CRASH

PUNCH CODE | CARD COL.

DRIVER S SEAT

(4) FORWARD
(5) MIDDLE
(6) REARWARD
(0) UNKNOWN — 44

RIGHT FRONT PASSENGER'S SEAT

(code the same if bench seat)

(3) NOT APPLICABLE (No Seat)
(4) FORWARD
(5) MIDDLE
(6) REARWARD
(0) UNKNOWN — 45

DAMAGE TO FRONT SEAT

BACKREST DAMAGE (1,2,0)* — 46

CUSHION DAMAGE (1,2,0)* — 47

CONTACTED BY REAR OCCUPANT (1,2,3,0)* — 48
(3 = If no rear occupant)

SEAT CENTER ARMRESTS (FRONT)

EQUIPPED (1,2,0)* — 49

DAMAGED (1,2,3,0)* — 50

HEAD RESTRAINTS (FRONT)

Driver's Side

EQUIPPED (1,2,0)* — 51

REMOVED PRIOR TO COLLISION (1,2,3,0)* — 52
(3 = Integral)

RETAINED DURING COLLISION (,1,2,3,0)* — 53

DAMAGED (1,2,3,0)* — 54

OCCUPANT CONTACT (1,2,3,0)* — 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 — 56

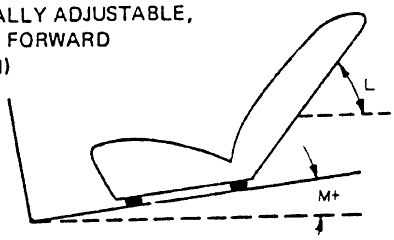
SEATS

SEATS (CONT'D)

	PUNCH CODE	CARD COL.
FRONT SEAT BACK LOCKS		
LEFT or center — EQUIPPED (1,2,3,0)*	___	57
LEFT or center — 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

	PUNCH CODE	CARD COL.
(2) NO SEAT (4) NON-FOLDING (5) FOLDING (0) UNKNOWN	___	65

END OF CARD 08

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

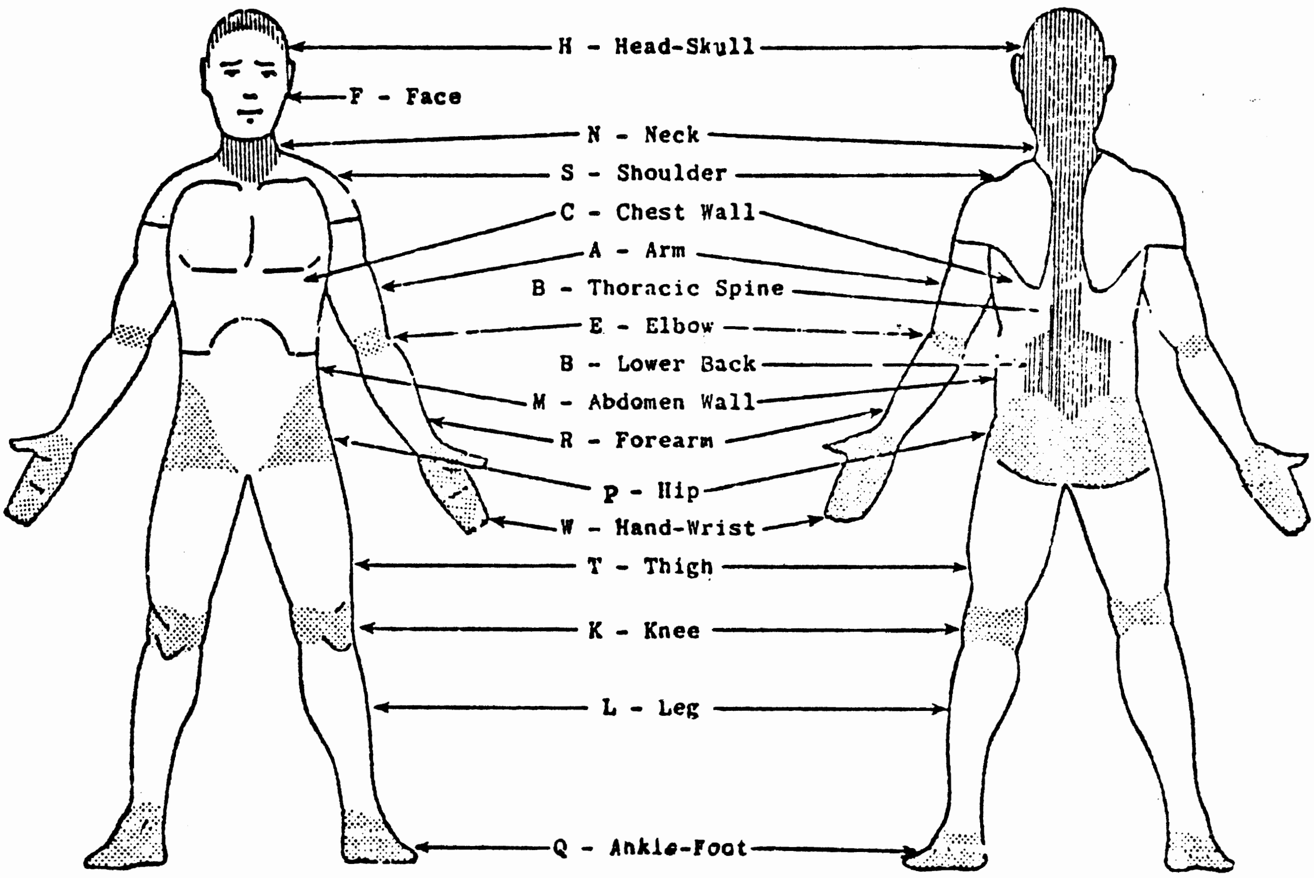
DAMAGE TO REAR SEAT	PUNCH CODE	CARD COL.
BACKREST DAMAGED OR LOOSENED (1,2,3,0)*	___	12
CUSHION DAMAGED OR LOOSENED (1,2,3,0)*	___	13
SEAT CENTER ARMRESTS (REAR)		
EQUIPPED (1,2,3,0)*	___	14
DAMAGED (1,2,3,0)*	___	15
REAR SEAT BACK LOCKS		
LEFT OR CENTER — EQUIPPED (1,2,3,0)*	___	16
LEFT OR CENTER — 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)*~~	0	23
~~OCCUPANT CONTACT (1,2,3,0)*~~	0	24
~~BACKLIGHT HEADER~~		
~~DAMAGED (1,2,3,0)*~~ convertible	0	25
~~OCCUPANT CONTACT (1,2,3,0)*~~	0	26
WINDOWS CLOSED AT TIME OF COLLISION (3=no window)		
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

KEYPUNCH: Col. 34-59=0 End of Card 09
Dup 1-9 1 (10) 0 (11) 12-41=0 End of Card 10

*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

Case No. __-______-_

Occupant Position ______________



OCCUPANT INFORMATION

OCCUPANT

	PUNCH CODE	CARD COL.
DUPLICATE COLUMNS 1-9 FROM PRECEDING CARD	/ /	10 11
OCCUPANT NUMBER	__ __	12-13
SEAT LOCATION (3) EXTERNAL TO PASS. COMP. (e.g., bed of pickup) (4) FRONT (5) REAR (6) THIRD (7) OTHER: ____________ (0) UNKNOWN	___	
POSITION ON SEAT (3) EXTERNAL TO PASS. COMP. (4) LEFT (5) LEFT CENTER (6) CENTER (7) RIGHT CENTER (8) RIGHT (9) ALL (Lying on seat) (0) UNKNOWN	___	
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 OR OTHER OBJECT (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 (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 CORRECTLY (1,2,3,0)*	___	29
LOCKING RETRACTOR (1,2,3,0)*	___	30
UPPER TORSO RESTRAINT Upper Torso Belt and/or Air Bag Equipped (1) No A/B & Upper Belt Equipped (2) No A/B & Upper Belt Not Equipped (0) No A/B & Upper Belt Unk if Equipped (4) A/B Equipped & Upper Belt Equipped (5) A/B Equipped & Upper Belt Not Equipped (6) A/B Equipped & Upper Belt Unk if Equipped (9) Both A/B & Upper Belt Unk if Equipped	___	31
Upper Torso Belt and/or Air Bag Used (1) No Deployment or No Bag; Upper Belt Worn (2) No Deployment or No Bag; Upper Belt Not Worn (3) No Deployment or No Bag; No Upper Belt (0) No Deployment or No Bag; Unknown if Worn (4) Deployment; Upper Belt Worn (5) Deployment; Upper Belt Not Worn (6) Deployment; No Upper Belt (7) Deployment; Upper Belt Unknown if Worn (9) Both Upper Torso Worn or Air Bag Deployed Unknown	___	32
WORN CORRECTLY (1,2,3,0)*	___	33
INERTIA REEL (1,2,3,0)*	___	34
LAP AND/OR UPPER TORSO RESTRAINT USAGE CODE	__ __	35-36
TYPE OF UPPER TORSO PESTRAINT USED (3) No Torso Restraint Used (4) 3-point (5) 4-point (6) Other (e.g. VW passive restraint system) (7) Air Bag Deployed & No Belts Used (8) Air Bag Deployed & Any Belts Used (9) Air Bag Deployed & Unknown Belt Use (0) Unknown	___	37
CHILD RESTRAINT SYSTEM: NOTE MAKE AND MODEL NUMBER ____________ ____________		
CHILD RESTRAINT CODE (99 none)	__ __	38-39
	___	40
	___	41

*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

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 OR FROM EXTERNAL AREA (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 (USE 1976 AIS) (00) NONE (01) MINOR (02) NON-DANGEROUS, MODERATE (03) NON-DANGEROUS, SEVERE (04) DANGEROUS, SERIOUS (05) DANGEROUS, CRITICAL (06) MAXIMUM, UNTREATABLE (98) INJURY UNKNOWN (99) INJURED, SEVERITY UNKNOWN	___ ___	45-46
	END OF CARD	

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

Dup 1-9 Card 8 0 (10) Dup 12-13	0 (14)
POSTURE (10) Sitting on Seat (11) Sitting on Seat in Abnormal Position (e.g., Feet on Dash, Sideways, Etc.) (12) Sitting on Console (20) On Lap or in Arms (30) Standing on Seat (40) Standing on Floor (47) Standing - External to Passenger Compartment (50) In Bassinet (60) In Child Seat (65) In Child Harness (70) Lying on Seat (80) Lying or Sitting on Passenger Floor (83) Lying or Sitting on Other Object in Passenger Compartment (85) On Station Wagon Cargo Floor or Fold Seat Back (87) Lying or Sitting - External to Passenger Compartment (98) Other: ________ (00) Unknown	___ ___ (16) 9 (17)
Occupant Alcohol Involvement/Test (0) Unknown (999).................. NO TEST (1) Alcohol Not Suspected (000)........... (2) Alcohol Indicated & No Test Requested (999). (3) Test Requested & Refused (999)............. (4) Reason Unknown & Alcohol Indicated (999)... (5) Charged DWI, Booked Drunk (999)............... (6) Fled Scene (999).......... BAC TESTED (8) Results Not Given (999)... (9) Results Reported (____)...	___ (18)
Occupant Blood Alcohol Level (MG%) (000) Had Not Been Drinking or Negative Test BAC=.000 ... ____ Record Actual BAC (MG%).... (999) Tested but results Unknown or No Results.....	. ___ ___ ___ (19 20 21)
Occupant Alcohol Test (2) None YES: (1) Type Unknown (4) Urine (5) Spinal (6) Breath (7) Blood (8) Other: ________ (9) Several of Above (0) Unknown	___ (22)

k

SEAT BELT BUZZER/INTERLOCK EQUIPPED

23

(0) Unknown if Equipped
(1) Equipped, Type Unknown
(2) Not Equipped
(4) Non-Cycled Buzzer
(5) Ignition Interlock
(6) 4-second buzzer (post-interlock)
(9) Other: ____________

SEAT BELT BUZZER OPERATIONAL

24

(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, Hooked To Upper Belt, etc.)
(7) Temporarily Fixing (Sitting on Belt, Holding onto Belt, Hook on Floor, etc.)
(8) Letting it Buzz
(9) Other: (Defective)
____

IGNITION INTERLOCK OPERATIONAL

(1,2,3,0) 25

PASSIVE RESTRAINT SYSTEM EQUIPPED

(2) No

YES: 26

(1) Type Unknown
(4) Air Bag
(5) Knee and Torso Restraint (e.g., VW)
(9) Other: ____________
(0) Unknown

PASSIVE RESTRAINT SYSTEM ACTIVATED

27

(3) Not Applicable, None
(2) No
(1) Yes
(0) Unknown

INVESTIGATOR'S JUDGEMENT OF RESTRAINT SYSTEM EFFECTIVENESS

29

(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 Severity
(6) Increased Severity
(7) Would Have Increased Severity if Worn
(8) More Restraints Would Have Reduced Severity

TREATMENT/MORTALITY

30 __

(00) None
(01) First Aid At Scene
(02) Treated at Hospital/Clinic but not Admitted
(03) Hospitalized (observation less than 24 hours)
(04) Hospitalized over 24 Hours or Significant Treatment
(05) Fatal--Dead at Scene
(06) Fatal--DOA
(07) Fatal--Dead within 24 Hours
(08) Fatal--Dead 24 hrs to 1 yr
(09) Fatal--Period Unknown
(99) Unknown

EMS CONTRIBUTORY TO SEVERITY

Due to delays and/or insufficient treatment on-scene or in transport? 32

(2) No
(1) Yes
(0) Unknown
(4) Exemplary Service

AUTOPSY PERFORMED

(3) Not Applicable/ Non-fatal 33
(1) Yes
(2) No
(0) Unknown

OVERALL POLICE INJURY SEVERITY (KABC)

(0) 0,O No Injury

(1) C Possible Injury

(2) B Non-incapacitating Injury ____ 34

(3) A Incapacitating Injury

(4) K Fatal

(9) Unknown

(5) Reported as Injured (severity not reported)

RESTRAINT SYSTEM CONDITION

Belts Operable (0,1,2,3)	Lap ____ 35	Shoulder ____ 36
Belts or Fittings Damaged (0,1,2,3)	Lap ____ 37	Shoulder ____ 38
Belts or Fittings Damaged by Occupant Loading (0,1,2,3)	Lap ____ 39	Shoulder ____ 40

RESTRAINT USAGE

SOURCE OF INFORMATION:

Vehicle (0,1,2,3) ____ 41

Injury Data (0,1,2,3) ____ 42

Occupant (0,1,2,3) ____ 43

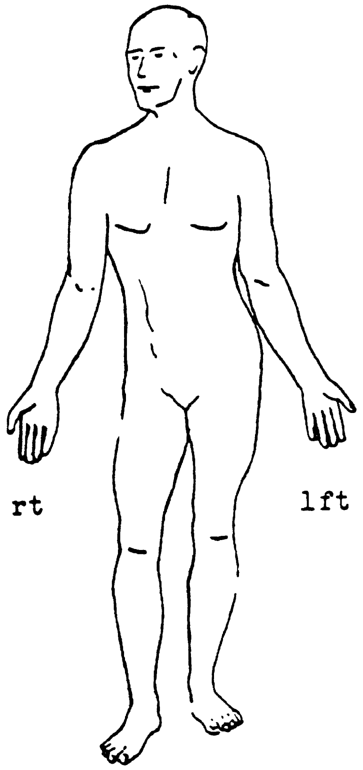
Other: ____ (0,1,2,3) ____ 44

Restraint Usage Conclusion Lap ____ ____ 45 Shoulder ____ ____ 48

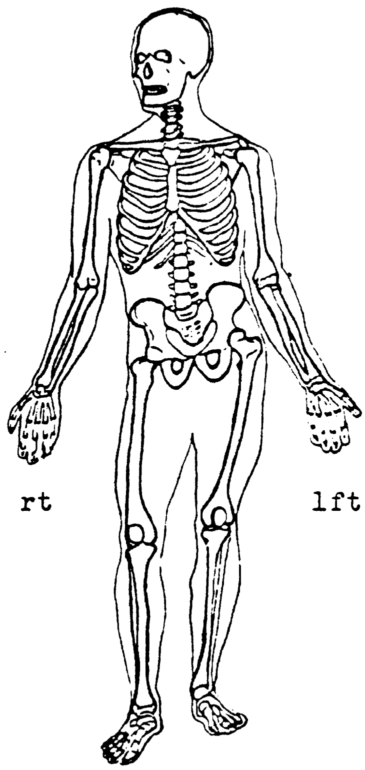
Yes		No
+3	Definite	-3
+2	Probable	-2
+1	Possible	-1
00	Unknown	00
99	Not Applicable	99

INDICATE LOCATION OF INJURIES, INCLUDING MAJOR BRUISES

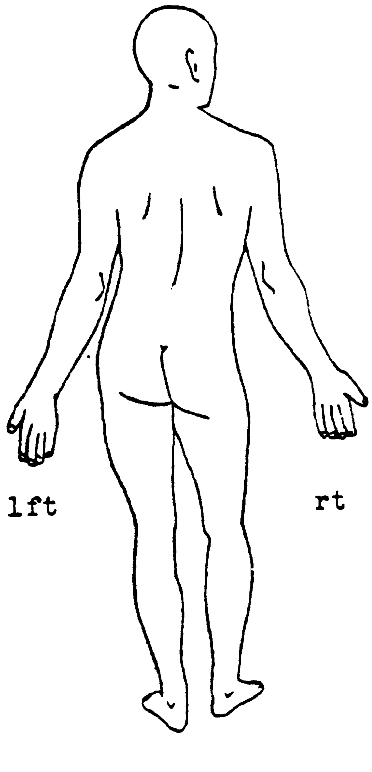
( ) NO INJURIES
( ) INJURED

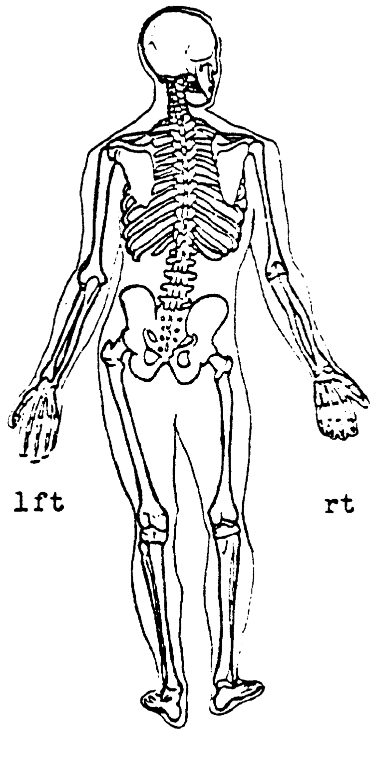


SOFT TISSUE INJURIES



SKELETAL INJURIES





X Rays: ______________________________

Other Tests: ______________________________

INJURY INFORMATION

2/76

BEST SOURCE OF INJURY INFORMATION

49

( ) 1 Hospital/Doctor
( ) 2 Personal interview with occupant
( ) 3 Personal interview with other occupant
( ) 4 Other: ____________________________

*
*
*

END CARD 80

OCCUPANT INJURY CLASSIFICATION

Place contacts in order of probability (horizontally). Start with most probable in col. 14-15.

	CARD NUMBER	OCCUPANT NO.	FOUR AREA(S) OF POSSIBLE CONTACT			
1–6	10–11	12–13	14–15	16–17	18–19	20–21
DUPLICATE FROM PRECEDING CARD	81					
	82					
	83					
	84					
	85					
	86					
	87					
	88					
	89					
	90					
	91					
	92					
	93					
	94					
	95					

CARD NUMBER	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
10–11	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
81															
82															
83															
84															
85															
86															
87															
88															
89															
90															
91															
92															
93															
94															
95															

NOTE areas of occupant contact.

____

____

____

____

RESTRAINT DEVICE & USAGE

DEVICE STATUS

AT TIME OF COLLISION	SOURCE USED	LAP BELT		SHOULDER BELT		OTHER DEVICE ①		CHILD SEAT	
EQUIPPED for this POSITION		11 1( ) Y 2( ) N 9( ) U	Original Equipment 12 1( ) Y 2( ) N 9( ) U	13 1( ) Y 2( ) N 9( ) U	Original Equipment 14 1( ) Y 2( ) N 9( ) U	15 1( ) Y 2( ) N 9( ) U	Original Equipment 16 1( ) Y 2( ) N 9( ) U	17 1( ) Y 2( ) N 9( ) U	Mfg: ______ Model: ______
BELTS OPERABLE		18 1( ) Y 2( ) N 9( ) U	Malfunction 19 1( ) ② Defeat 2( ) ③	20 1( ) Y 2( ) N 9( ) U	Malfunction 21 1( ) ② Defeat 2( ) ③	22 1( ) Y 2( ) N 9( ) U	Malfunction 23 1( ) ② Defeat 2( ) ③	24 1( ) Y 2( ) N 9( ) U	Malfunction 25 1( ) ② Defeat 2( ) ③
INTERLOCK BUZZER FUNCTIONAL		26 1( ) Y 2( ) N 9( ) U	Malfunction 27 1( ) ② Defeat 2( ) ③	28 1( ) Y 2( ) N 9( ) U	Malfunction 29 1( ) ② Defeat 2( ) ③	30 1( ) Y 2( ) N 9( ) U If ACRS --④	Malfunction 31 1( ) ② Defeat 2( ) ③		

DEVICE USAGE

		Response	Judgement	Response	Judgement	Resp	ACRS Deploy	Judge	Response	Judgement
VEHICLE	11 (1)Y (2)N (7)UA		12,13		14,15		16 1( ) Y 2( ) N 9( ) U	17,18		19,20
INJURY DATA	21 (1)Y (2)N (7)UA		22,23		24,25		26 1( ) Y 2( ) N 9( ) U	27,28		29,30
INTERVIEW OCCUPANT	31 (1)Y (2)N (7)UA	32 1( ) Y 2( ) N 6( ) NR	33,34	35 1( ) Y 2( ) N 6( ) NR	36,37	38 1( ) Y 2( ) N 6( ) NR	39 1( ) Y 2( ) N 9( ) U	40,41	42 1( ) Y 2( ) N 6( ) NR	43,44
INTERVIEW: ______	45 (1)Y (2)N (7)UA	46 1( ) Y 2( ) N 6( ) NR	47,48	49 1( ) Y 2( ) N 6( ) NR	50,51	52 1( ) Y 2( ) N 6( ) NR	53 1( ) Y 2( ) N 9( ) U	54,55	56 1( ) Y 2( ) N 6( ) NR	57,58
INTERVIEW: ______	59 (1)Y (2)N (7)UA	60 1( ) Y 2( ) N 6( ) NR	61,62	63 1( ) Y 2( ) N 6( ) NR	64,65	66 1( ) Y 2( ) N 6( ) NR	67 1( ) Y 2( ) N 9( ) U	68,69		
CONCLUSION			70,71		72,73		74 1( ) Y 2( ) N 9( ) U	75,76		77,78

YES		NO
+3	DEFINITE	-3
+2	PROBABLE	-2
+1	POSSIBLE	-1

00 UNKNOWN
99 NOT APPLICABLE

Y = YES
N = NO
U = UNKNOWN
NR = NO RESPONSE
UA = UNAVAILABLE

Response = Literal response of interviewee.
Judgement = Interviewer's best judgement of and confidence in interviewees response to question of restraint usage.

① Specify & describe device: ______________________________

Describe irrespective of source. Source of Information

② Malfunction: ______________________________

③ Defeat: ______________________________

④ Summarize status of ACRS: ______________________________