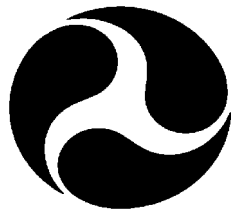




Data Reference Guide
Version 4
Volume III: Component Tests

April 1997



U.S. Department of Transportation

<http://www-nrd.nhtsa.dot.gov/nrd10/software>

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PREFACE

This guide documents the format of magnetic media (3.5 inch high density diskettes) to be submitted to the National Highway Traffic Safety Administration (NHTSA) for component tests. This guide is designated Volume III. NHTSA Data Reference Guide (Component). Three other volumes exist; they correspond to the other NHTSA databases: I. NHTSA Data Reference Guide (Vehicle), II. NHTSA Data Reference Guide (Biomechanics), and IV. NHTSA Data Reference Guide (Signal Waveform Generator).

While the four databases are similar, they differ significantly as well. Your data submission will be returned as unacceptable if you submit data in the wrong format for a particular data base.

The first step in creating a data submission is to determine which volume of the guide (vehicle crash tests, biomechanics tests, component tests, or signal waveform generator tests) to use. The surest method of determining which volume is appropriate for your use is to check with the Contracting Officer's Technical Representative (COTR) who should be able to identify the appropriate data base format. The following guidelines will help to explain the differences between the four data bases.

Information in the vehicle data base relates to the performance and response of vehicles and other structures in impacts.

The biomechanics data base contains information used (1) to evaluate human impact response, (2) to evaluate prototype dummy designs, or (3) to evaluate standard dummy designs in new impact environments.

A component test identifies a specific vehicle component and/or dummy part and summarizes test conditions. Component tests are conducted on various internal or external components of automobiles to provide force deflection or time series data for use in computer simulation models available to NHTSA.

Information in the signal waveform generator data base relates to the evaluation of data acquisition systems at sites performing vehicle crash and biomechanics tests.

A biomechanics test always has exactly one occupant; a vehicle test may have zero occupants or many occupants but normally utilizes dummy occupants.

Raw data is required unless submission of filtered data is authorized by the Contracting Officer's Technical Representative (COTR).

Several examples may help to illustrate where certain types of tests fit into the data bases:

- ▶ Tests done as part of the new car assessment program are always vehicle tests.
- ▶ Pendulum tests to cadavers are always biomechanics tests.
- ▶ Lateral vehicle-to-vehicle impacts are vehicle tests.
- ▶ Sled tests with new dummy designs are biomechanics tests.
- ▶ Calibration tests are component tests.
- ▶ Tests featuring a car body on a sled designed to evaluate occupant response are biomechanics tests.
- ▶ Tests using dummy components are always component tests.
- ▶ Tests (either static or dynamic) measuring deformation impact of a particular interior or exterior component of an automobile by dummy or dummy part are component tests.
- ▶ Tests evaluating data acquisition systems are signal waveform generator tests.
- ▶ Tests to record a standard waveform using new car assessment conditioning amplifiers are signal waveform generator tests.

Always check with the COTR in determining which format to use. In all cases where the COTR's advice is contrary to this guide, check with Barbara Hennessey at (202)366-4714.

When a diskette has been generated according to the appropriate guide, it should be sent via CERTIFIED MAIL to:

The COTR

-or-

Barbara Hennessey
NHTSA, NRD11, Room 6226
400 Seventh Street, S.W.
Washington, DC 20590

More than one submission may be mailed at one time. The following must be supplied for each mailing:

- ▶ A cover letter containing a description of each test on each diskette or series of diskettes. This description should contain the data base into which the test should be loaded, the contractor's test reference number, the date of the tests, the test vehicles, component part and the test configuration.
- ▶ A label on each diskette listing all tests, along with the contractor's test reference numbers.
- ▶ A sheet containing a dump of the specification data for each test.
- ▶ A copy of the plot of each channel of measurement data identifying the curve number and the location and axis of each instrument. These plots do not have to be report quality since they will only be used to verify the test data for each channel.

As soon as possible after each test, a copy of the final test report (if a report has been generated) should be sent to the above address. The COTR should be consulted if different arrangements for the test film and report are required, as would be the case for a test not conducted under DOT auspices.

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INTRODUCTION

BACKGROUND

In September of 1966, the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1381) was signed into law in the United States. The Act specifies that the Secretary of Transportation shall establish appropriate Federal Motor Vehicle Safety Standards that would lead to the reduction of the number of deaths and injuries resulting from motor vehicle accidents. In prescribing standards, the Secretary was to consider: (1) relevant motor vehicle safety data, (2) whether the proposed standard is reasonable, practical, and appropriate for the particular type of motor vehicle equipment for which it is prescribed, and (3) the extent to which such standards contribute to carrying out the purposes of the Act.

In order to meet the above requirements, the National Highway Traffic Safety Administration (NHTSA) has been mandated to develop safety standards. For each proposed regulation, an extensive research program is undertaken to ensure that the proposed standard satisfies the requirements of the Act. An analytical tool that has been utilized to support the research program is the NHTSA crash test data base. For each test conducted for the agency, a formatted magnetic data submission on diskette is generated. The diskette contains specifications about the test as well as the measurement data acquired from the test instrumentation. The specification data is loaded into a data base which has routine data base functions. Analysis techniques are developed for evaluation of the measurement data. This data base was initiated in 1978 and currently contains results from over 2,000 crash tests. An important attribute of this data base is that it provides a standardized format that allows for exchange of data among participating researchers.

This reference guide has been written for two reasons. The first is to document the requirements for the generation of a data diskette. The second is to encourage the adoption of this standardized format so that the exchange of data by the safety research community is readily accomplished and ultimately leads to new and better ways for reducing the fatalities and injuries in motor vehicle accidents.

ORGANIZATION

The guide is divided into two portions: the first consists of the definitions of the data gathered during tests (for use as a reference tool by new users), and the second consists of a series of appendices. In addition to definitions, the definition section includes, for each field, the number of allowable characters, the type of field (integer, text, coded text, and real), and the acceptable units for the entry.

Included in the pocket under the front cover of the guide is a diskette containing the PC-based data entry program, ENTREEW, which may be used to generate the data files described in this document.

The data to be collected during the testing are grouped into six general categories: general test information; vehicle information; barrier information; occupant information; restraint information; and instrumentation information. The organization of the first portion of the guide corresponds to this data grouping scheme, with each chapter comprising one category of data elements:

Chapter 1, **GENERAL TEST INFORMATION**, includes the definitions of data elements identifying the test (type, date, performing contractor) as well as some elements that identify test conditions (closing speed or impact angle).

Chapter 2, **VEHICLE INFORMATION**, if the test being conducted involves a specific vehicle, information about the vehicle (make, model, year) is recorded in this section. If the component(s) being tested are not vehicle components, this group may be omitted.

Chapter 3, **COMPONENT INFORMATION**, defines the component that is being tested, including its weight, any modifications, and, if the component is a dummy or dummy part, the type, size and manufacturer of the dummy.

Chapter 4, **TEST CONFIGURATION INFORMATION**, describes the specific test being performed. It includes information about the test device, the speed of both the test device and the component at initiation of the test, and the contact points between the test device and the component being tested.

Chapter 5, **INSTRUMENTATION INFORMATION**, describes the sensor used in each test by type of instrument, location on the component being tested, attachment points, and other information about how the sensor data is transmitted.

Four appendices appear at the end of this guide:

Appendix A, **MAGNETIC MEDIA FORMAT**, gives an explanation for formatting the data and provides a brief description of the data entry program, ENTREEW, which may be used to generate the required data files in either NHTSA's own binary format or in ASCII format.

Appendix B, **CODES**, is a listing of the valid codes for each field.

Appendix C, **FIELD FORMATS**, lists each field, in sequence, the data type, and the maximum field length (for ASCII format data).

Appendix D, **DATA COORDINATE SYSTEM**, explains the rules for determining sign conventions and lists pertinent SAE recommended practices, Instrumentation for Impact Test -- SAE J211/1 MAR95, and Collision Deformation Classification--SAE J224, which provide helpful information for the preparation of data submissions.

DATA REQUIREMENTS

Data is collected during testing for eventual transmission to diskette. The format is fixed, thus the data must be transcribed with precision so that it can be read by the processing software.

Users are encouraged to utilize the data entry program, ENTREEW, which formats the specification data files automatically and performs validity checks to avoid cross field compatibility and numeric range errors, omissions and miscodings.

ENTREEW output files may be written in one of two ways; either in a special binary format, which NHTSA's in-house processing software loads directly into the NHTSA data bases, or the files may be written in ASCII, for purposes of data exchange outside the agency.

(The format is described in detail in Appendix A: Magnetic Media Format.)

Updates to the ENTREEW program and to this guide may be downloaded from the Internet

<URL <http://www-nrd.nhtsa.dot.gov/nrd10/software>>

Optional Information Groups

The only optional information group for component tests is Group 2 (Vehicle), when the component being tested is not a part of a vehicle or in the case of dummy testing, when the dummy is not seated in a vehicle. All other information groups are required.

Empty Channels

Instrument channels having no data are not of interest. If channels are bad or empty, an indication of their status should be made in DASTAT (see Appendix B for the allowable codes for DASTAT). Further comments on the status of the data should be made in INSCOM (instrument commentary) -- a code of MN (meaningless) requires an explanation in INSCOM, for example.

CONVENTIONS FOR CODING

NOT APPLICABLE Code Option

Some of the coded fields include NOT APPLICABLE and OTHER codes as options. The NOT APPLICABLE code should be used only if the category is not relevant to the data being collected. For example, in the field OCCTYP (Occupant Type), the NOT APPLICABLE category will be used if the component undergoing the test is not a dummy or dummy component. NOT APPLICABLE numeric fields will be left blank. If the data file is written in ASCII rather than the NHTSA ENTREE binary format, empty fields are delimited by the pipe (|) character. For text fields, a left-justified NOT APPLICABLE will be entered.

OTHER Code Option

The code option, OTHER, should be used if the data element is applicable but none of the codes is appropriate. For CMPNT, for example, choosing the OTHER code would be appropriate if the component is not one of the dummy or vehicle parts listed in Appendix B, CODES, as a valid CMPNT code. Any time the option OTHER is chosen, a brief explanation must be included in the general comment field for that group.

EMPTY FIELDS

Some numeric and free text fields may be left blank if no data is available or the field is not applicable to the test.

Coded text fields may not be left blank, since there are codes which indicate when a field is either not applicable or no data is available.

MEASUREMENT UNITS

Use metric units only.

For a list of acceptable units and corresponding codes, see Table 1 - 1.

CERTIFICATION REQUIREMENTS

In order to raise and maintain the level of quality of data diskettes being submitted for inclusion in the NHTSA data bases and to insure more efficient processing, a certification process is being instituted effective with this new data format. Each contractor must complete this certification process before we will accept data in the new format. To complete the certification process, contractors will follow the steps listed below:

- ▶ Submit Data in Appropriate Format
Each contractor will submit data in the new format for certification approval. The diskette will be submitted in the Component Data Base format (or the format for which certification approval is desired). The test written to this diskette may be an old test, a new test submission, or a sample test if an old or new test is not available.

- ▶ Repeat Submissions Until Certification is Achieved
The diskette will be checked for compliance with the magnetic media processing guidelines. If the data submission is found to be acceptable, a certificate will be sent to the contractor denoting compliance with the current version of the NHTSA magnetic media format. If the data submission is not acceptable, the contractor may repeat the submission until an acceptable diskette is produced.

- ▶ Earn Certification for Each Format
A certificate will be required for each format: vehicle crash test, biomechanics test, component test, or signal waveform generation. A contractor submitting diskettes in more than one format will require a certificate for each. The certificate may be revoked whenever it is evident that a contractor is not maintaining the required level of quality in data submission.

- ▶ Do Not Submit Diskettes Without Being Certified
Only after a contractor has completed this certification process will data be accepted for inclusion in the OCR data bases.

- ▶ Submit Certificate with Future Bids
For Research and Development contracts, this certificate will be kept on file in the NHTSA Office of Contracts and Procurement and must be submitted as evidence of compliance when bidding for future contracts. If a proposal on a Research and Development-sponsored RFP is received from a bidder without a valid certificate, the proposal will be rejected as non-responsive to the solicitation. Each Research and Development RFP requiring the submission of data should contain a statement to this effect.

- ▶ Incur Costs for Unacceptable Data Submissions
For all NHTSA contracts, including Research and Development contracts, when a data submission is returned to the contractor as unacceptable because of errors, a resubmittal may be validated at a specified cost to the contractor per data resubmission. If required, payment to the Government for this shall be made by offset against the contractor's invoices. Each NHTSA contract which requires the submission of data diskettes will contain a clause to this effect.

RETURN POLICY

If a data diskette cannot be processed or has too many errors flagged by the loading and checkout programs, the submission will be returned to the contractor to be corrected and resubmitted. Two categories of errors lead to the return of a data submission.

Major Errors

The first category is major errors. If one major error occurs during the processing of a diskette, the submission will be returned. Examples of major errors are:

- ▶ Inability to read or load the diskette.

- ▶ Missing data without which the data submission cannot be processed, such as DELT, NFP, etc.

- ▶ Omitted data where data fields have been left out. Examples include leaving out an instrument channel, or data shifted as a result of a field delimiter being omitted.

- ▶ Split channels, which occur when one test is artificially split into two on the diskette with part of the measurement data filed under each.

- ▶ The rejection of one test on a diskette containing multiple tests.

Minor Errors

The second class of errors is minor errors. If ten or more minor errors occur on a diskette, it will be returned. Examples of minor errors are:

- ▶ Conversion errors in the measurement data whereby one of the values cannot be read.
- ▶ Incorrect codings, such as entering a nonvalid sensor attachment code in the SENATT field.
- ▶ Missing or incorrect information not critical to the processing of the tests such as pretest or post-test measurements.
- ▶ Anything else not listed here that is flagged by the loading or checkout programs.

A letter will accompany the data diskette being returned, detailing the errors noted. The contractor should correct the submission and return it within two weeks. If the delinquent submission has one bad test among multiple tests, the diskette that is resubmitted should be identical to the diskette that was originally submitted, except that the noted errors will have been corrected. No new tests may be added and none of the previously submitted tests should be omitted.

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1. GENERAL TEST INFORMATION

The data elements defined below comprise the first test group, General Test Information. Appendix B contains a list of valid codes.

TSTNO - TEST NUMBER

TSTNO is a preassigned code (0) which is utilized by the data processing software when loading ASCII format input files into the NHTSA Component database.

Coded text, fixed length, 1 character.

VERSION NUMBER

VERNO is the number of this version of the NHTSA Data Tape Reference Guide, which is a preassigned code (C4). This code should be chosen for all component tests.

TITLE - Contract or Study Title

TITLE is the title of the contract or study.

Free text, variable length, maximum 70 characters.

TSTOBJ - Test Objective

TSTOBJ is a description of the purpose of the test.

Free text, variable length, maximum 70 characters.

TSTDAT - Test Date (DD/MMM/YYYY)

TSTDAT is the date the test was performed.

Date text, fixed length, 11 characters.

TSTPRF - Test Performer

TSTPRF is the code for the name of the organization performing the test.

Coded text, fixed length, 3 characters.

CONNO - Contract Number

CONNO is the Department of Transportation contract number (generally assigned by the sponsoring organization).

Free text, variable length, 17 characters max.

TSTREF - Test Reference Number

TSTREF is an alphanumeric code number assigned to the test by the test performer.

Free text, variable length, maximum 10 characters.

TSTTYP - Test Type

TSTTYP indicates the type of test conducted, such as 216 for an FMVSS216 roof crush test.

Coded text, fixed length, 3 characters.

TEMP - Ambient Temperature (°C)

TEMP is the temperature at the test location at the time of the test.

Numeric field, integer.

TOTCRV - Total Number of Curves

TOTCRV is the total number of recorded instrument channels (curves) in the test.

Numeric field, integer.

TSTCOM - Test Commentary

TSTCOM is used to describe any extraneous information needed to define the test. This field should explain any OTHER or N/A codes listed in required fields.

Free text, variable length, maximum 70 characters.

Table 1-1. Table of Units

Measurement Quantity	Unit of Measure	Standard Metric Code*(MET)
Absolute Pressure	Kilopascals	KPA
Acceleration	G's	G'S
Angular Acceleration	Degrees/second**2	DP2
Angular Displacement	Degrees	DEG
Angular Velocity	Degrees/second	DPS
Curvature	Reciprocal millimeters	RMM
Displacement	Millimeters	MM
Force	Newtons	NWT
Gauge Pressure	Kilopascals	KPG
Impulse	Newton-seconds	NSC
Noise	Decibels	DEC
Strain	Micrometers/meter	MPM
Temperature	Degrees Celsius	CEN
Time	Seconds	SEC
Torque	Newton-meters	NWM
Velocity	Kilometers/hour	KPH
Voltage	Volts	VOL

* Codes used must be in uppercase.

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2. VEHICLE INFORMATION

The data elements defined below constitute the second test group, Vehicle Information. If the component(s) being tested is not a vehicle component this group may be omitted (Entree users). Appendix B contains a list of valid codes.

TSTNO - TEST NUMBER

TSTNO is a preassigned code (0) which is utilized by the data processing software when loading ASCII format input files into the NHTSA Component database.

Coded text, fixed length, 1 character.

VEHNO - Vehicle Number

VEHNO is the reference number for a particular vehicle. This number should always be 1 unless there are components from more than one vehicle involved in the test.

Numeric field, integer.

MAKE - Vehicle Make

MAKE is the manufacturer of the vehicle; for instance, 01 represents a Chevrolet.

Coded text, fixed length, 2 characters.

MODEL - Vehicle Model

MODEL is the model of the vehicle; 06 represents an Impala, for example.

Coded text, fixed length, 2 characters.

YEAR - Model Year

YEAR is the last two digits of the model year of the vehicle.

Numeric field, integer.

NHTSANO - NHTSA Number

NHTSANO is the six character code (2 alpha characters followed by 4 digits) used to track the test vehicle through purchase, testing and disposal. This designation is used only for vehicles tested under NHTSA contracts.

Coded text, fixed length. 6 characters.

BODY - Body Type

BODY is the body type of the vehicle. A four-door sedan would be coded as 4S.

Coded text, fixed length, 2 characters.

VIN - Vehicle Identification Number

VIN is the identification number of the vehicle that has been assigned by the manufacturer.

Free text, variable length, maximum 20 characters.

CRTEST - Crash Tested Indicator

CRTEST is a marker to indicate whether or not the vehicle has been previously crash tested.

Coded text, fixed length, 1 character.

VEHCOM - Vehicle Commentary

VEHCOM is used to describe any special features of the vehicle. The reason for coding any of the coded fields in this group OTHER or NOT APPLICABLE should be recorded in this field as well. If no comments are to be made, enter NO COMMENTS in this field.

Free text, variable length, maximum 70 characters.

3. COMPONENT INFORMATION

The data elements defined below comprise the third group, Component Information. The information in this group completely defines the single component that is being tested. Appendix B contains a list of valid codes.

TSTNO - TEST NUMBER

TSTNO is a preassigned code (0) which is utilized by the data processing software when loading ASCII format input files into the NHTSA Component database.

Coded text, fixed length, 1 character.

VEHNO - Vehicle Number

VEHNO is the reference number for a particular vehicle. This number should always be 1 unless there are components from more than one vehicle involved in the test. Code a zero (0) for non-vehicle components.

Numeric field, integer.

CMPNO - Component Number

CMPNO is the identifying number of the component being tested. The first such component shall be 1, the second 2, etc.

Numeric field, integer.

CMPNT - Component Tested

CMPNT is the specific component being tested.

Coded text, fixed length, 4 characters.

CMPTYP - Component Type

CMPTYP is the type of the component being tested.

Coded text, fixed length, 2 characters.

CMPWGT - Component Weight (kg)

CMPWGT is the weight of the component.

Numeric field, real.

MODIND - Component Modification Indicator

MODIND is a marker identifying whether or not the component has been previously modified.

Coded text, fixed length, 1 character.

MODDSC - Modification Description

MODDSC is a description of any modifications to the component. This field applies to any type of component.

Free text, variable length, maximum 70 characters.

OCCTYP - Occupant Type

OCCTYP is the type of dummy being tested.

Coded text, fixed length, 2 characters.

DUMSIZ - Dummy Size Percentile

DUMSIZ indicates the size of the dummy, measured either as a standard size percentile or by 'age' classification for child dummies.

Coded text, fixed length, 2 characters.

DUMMAN - Dummy Manufacturer

DUMMAN is the serial number as well as the manufacturer of the test dummy. The information should be entered as MFG: (manufacturer's name), S/N (dummy serial number). If the component tested was not a dummy part, leave this field blank.

Free text; variable length; maximum 70 characters.

CMPCOM - Component Commentary

CMPCOM is a descriptive field containing any extraneous information needed to define the component. This field should explain any OTHER or N/A codes listed in required fields.

Free text, variable length, maximum 70 characters.

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4. TEST CONFIGURATION INFORMATION

The data elements defined below comprise the fourth test group, Test Configuration Information. The information in this group completely describes the specific test being performed. Appendix B contains a list of valid codes.

TSTNO - TEST NUMBER

TSTNO is a preassigned code (0) which is utilized by the data processing software when loading ASCII format input files into the NHTSA Component database.

Coded text, fixed length, 1 character.

VEHNO - Vehicle Number

VEHNO is the reference number of the vehicle for the component that is being tested. Code a zero (0) for non-vehicle components.

Numeric field, integer.

CMPNO - Component Number

CMPNO is the reference number of the component being tested.

Numeric field, integer.

CNFNO - Configuration Number

CNFNO is the number identifying the specific test configuration for this component. The first such test configuration shall be 1, the second 2, etc.

Numeric field, integer.

TSTDEV - Test Device

TSTDEV is the test device, such as a linear impactor, static loading device, etc.

Coded text, fixed length, 3 characters.

DEVSPD - Test Device Speed (km/h)

DEVSPD is the speed of the test device at time zero.

Numeric field, real.

DEVCOM - Test Device Commentary

DEVCOM is a descriptive field for any extra information needed to define the test device. This field should explain any OTHER or NA codes listed in the TSTDEV field.

Free text, variable length, maximum 70 characters.

CONFIG - Test Configuration

CONFIG is the specific test configuration, e.g. abdominal compression (static, coded ABD) or guided headform dynamic impact (coded HDG for FMVSS 201 testing).

Coded text, fixed length, 3 characters.

CMPSPD - Component Speed (km/h)

The initial speed of the component at time zero.

Numeric field, real.

CNTANG - Contact Angle (degrees)

CNTANG is the angle of contact between the travel vector of the test device and the plane tangent to the component at the impact point. A perpendicular impact is defined as 0 degrees, which is also the reference line for the measurement. This field applies only to dynamic tests.

Numeric field, integer.

CNTLOC1 - Contact Location #1 (millimeters)

CNTLOC1 is the location on the component where contact occurred with the test device. It may also be the attachment location for the test device. CNTLOC1 is the vertical measurement taken from the top of the component to the test device contact point. If the component being tested is a vehicle roof pillar or a dummy component, such as an arm or leg, this measurement may be taken along the local axis of the component. Table 4-1 lists examples of contact measurements for various components. Figure 4-1 shows the contact codes for various points on the dashpanel.

Numeric field, integer.

CNTLOC2 - Contact Location #2 (millimeters)

CNTLOC2 is the location on the component where contact occurred with the test device. It may also be the attachment location for the test device. CNTLOC2 is the horizontal measurement taken from the left edge of the component being tested to the test device contact point. This field supplies additional location data when CNTLOC1 is not enough to uniquely define the contact point. Table 4-1 lists examples of contact measurements. Figure 4-1 shows the contact codes for various points on the dashpanel.

Numeric field, integer.

CNTCOM - Contact Commentary

CNTCOM is a descriptive field for any extra information needed to explain the contact. It may be used to describe a reference location for CNTLOC1 and CNTLOC2.

Free text, variable length, maximum 70 characters.

CFNCOM - Configuration Commentary

CFNCOM is a descriptive field for any extra information needed to define the test configuration. This field should explain any OTHER or N/A codes listed in the CONFIG field.

Free text, variable length, maximum 70 characters.

Component (CMPNT)	Component Plane or Axis*	Reference Point for Vertical Measurement (CNTLOC1 - mm)	Reference Point for Horizontal Measurement (CNTLOC2 - mm)
<i>Dash Panel</i> DP01 through DP09	Not applicable.	See Figure 4.1 Enter 0.0	See Figure 4.1 Enter 0.0
<i>Doors</i> DRLF DRLR DRRF DRRR DRSL DROT (rear door)	X-Z	Top of window frame or window downward to contact point.	Outside or rearmost edge of window frame, window or door, forward to contact point. Left edge of door, right to contact point
<i>Pillars</i> PLAL PLAR PLBL PLBR	Z	Top of pillar down longitudinal axis to contact point.	Not applicable.
HOOD	X-Y	Front edge of hood backward to contact point.	Left edge of hood, right to contact point.
<i>Seats</i> SEBK SECU	Y-Z X-Y	Top edge of seatback downward to contact point. Front edge of seat cushion backward to contact point.	Left edge of seatback, right to contact point. Left edge of seat cushion, right to contact point.
<i>Dummies</i> CHST FEMR TIBA	Y-Z Z	Top of chest or shoulder downward to contact point. Top of component down longitudinal axis.	Left side of chest, right to contact point. Not applicable.

Table 4.1 - CNTLOC1 and CNTLOC2 Reference Points.

* For structures such as the roof, doors and hood, the plane is approximately parallel to the surface of the component.

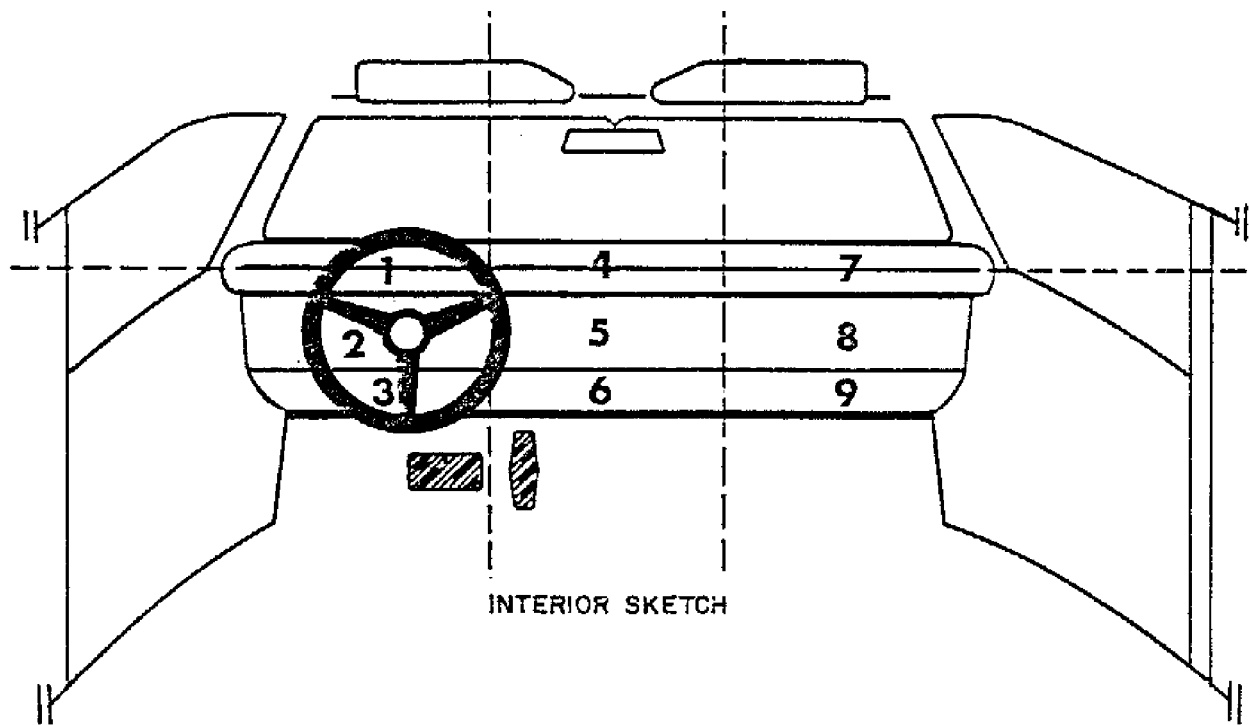


Figure 4-1: CNTLOC1 and CNTLOC2 Reference Points

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5. INSTRUMENT INFORMATION

The data elements defined below comprise the fifth test group, Instrumentation Information. Curve data should have a minimum of 20 milliseconds of pre time zero data for dynamic tests, and 1000 milliseconds for static tests. Curves should be truncated appropriately. The minimum sampling rate for dynamic tests is 10000 Hz. The sampling rate for static tests should fall between the minimum of 100 Hz and the maximum of 1000 Hz. Appendix B contains a list of valid codes.

TSTNO - TEST NUMBER

TSTNO is a preassigned code (0) which is utilized by the data processing software when loading ASCII format input files into the NHTSA Component database.

Coded text, fixed length, 1 character.

VEHNO - Vehicle Number

VEHNO is the reference number of the vehicle for the component that is being tested. Code zero (0) for non-vehicle components.

Numeric field, integer.

CMPNO - Component Number

The reference number of the component

Numeric field, integer.

CNFNO - Configuration Number

CNFNO is the number identifying the specific test configuration for this component. The first such test configuration shall be 1, the second 2, etc.

Numeric field, integer.

CURNO - Curve Number

CURNO is the sequential number (1,2,3 ...) assigned to a specific sensor and data curve.

Numeric field, integer.

SENTYP - Sensor Type

SENTYP indicates the type of sensor used for collecting the measurements at the time of the test, such as AC for accelerometer.

Coded text, fixed length, 2 characters.

SENATT - Sensor Attachment Location

SENATT is the actual physical attachment point of the sensor. The sensor may or may not be attached to the component being tested.

Coded text, fixed length, 4 characters.

AXIS - Sensor Axis of Sensitivity

AXIS is the axis direction for sensors measuring vector quantities. Specific component axes are local and may be different for every component. See the Appendix for an explanation of the coordinate systems. Any ambiguous reference for a coordinate system should be explained in the INSCOM field.

Coded text, fixed length, 2 characters.

UNITS - Data Units

UNITS indicates the units used to measure the signal of the sensor data. (Refer to Table 1-1 for the only acceptable units.)

Coded text, variable length, maximum 3 characters.

PREFIL - Prefilter Frequency (Hz)

PREFIL is the corner (or cutoff) frequency in Hz of a low-pass filter used for digitizing data. This frequency is defined as where filter gain equals 70 percent (-3dB).

Numeric field, integer.

INSMAN - Instrument Manufacturer

INSMAN describes the manufacturer of the instrument. The model and serial number should also be included. The format for this field should be: MFG: manufacturer name, S/N: serial number.

Free text, variable length, maximum 70 characters.

CALDAT - Calibration Date (DD/MMM/YR)

CALDAT is the most recent calibration date of the instrument (day/month/year, e.g. 12-Jan-95).

Date format, fixed length, 9 characters.

INSRAT - Instrument Rating

INSRAT represents the manufacturer's maximum rated value for the transducer. This value is in the units that the transducer will measure (g's for an accelerometer).

Numeric field, integer.

CHLMAX - Channel Maximum Rating (%)

CHLMAX represents the full-scale value of the data based upon the actual test setup, including signal conditioning, as a percentage of INSRAT. If the maximum signal that could be recorded was 100 g's (equal to INSRAT) and the peak value of the signal was 85 g's, then CHLMAX would be 85.

Numeric field, integer.

INIVEL - Initial Velocity (km/h)

The initial (time zero) velocity of the sensor along the axis of sensitivity. This field applies only to linear accelerometers.

Numeric field, real.

NFP - Number of First Point

NFP represents the index number of the first point in the data array (less than or equal to 0). NFP is always less than or equal to 0. The time zero point is assigned an index number of 0. There may never be more than 10,000 points before time zero.

Numeric field, integer.

NLP - Number of Last Point

NLP represents the index number of the last point in the data array. If 1,000 points were digitized, and NFP is equal to -100, then NLP is equal to 899. NLP can never be greater than 99,999.

Numeric field, integer.

DELTA - Time Step (microseconds)

DELTA is the time increment in microseconds between each data point. DELTA is assumed to be constant for all data points for a given sensor (uniform sampling frequency).

Numeric field, integer.

DASTAT - Data Status

DASTAT indicates the status of the data as it appears in the data submission. This field is used to indicate a signal which is invalid (code MN for meaningless), or which becomes questionable or invalid part of the way through a signal (code CF and explained in INSCOM). If a signal is computed, DASTAT is CM. An example of a computed signal would be the resultant acceleration from a triaxial accelerometer in a chest form.

Coded text, fixed length, 2 characters.

CHSTAT - Channel Status

CHSTAT indicates whether the data channel is primary or redundant. If, for example, any component is instrumented with a backup instrumentation, the primary channels would be coded P and redundant channels should be labeled R.

Coded text, fixed length, 1 character.

INSCOM - Instrument Commentary

INSCOM is any further commentary on the instrumentation data, including any unusual conditions affecting the data or a reference to a document that describes problems with a particular curve. The reasons for coding any of the coded fields in this group OTHER or NOT APPLICABLE should be recorded in this field as well. If no comments are to be made, enter NO COMMENTS.

Free text, variable length, maximum 70 characters.

APPENDIX A: MAGNETIC MEDIA FORMAT

Each data submission consists of two types of data: descriptive specification data defined in the previous sections of this Guide, and the measurement data digitized from the test instrumentation signal traces. Several disks may be required to record the specification and measurement files for a test submitted on diskette.

USING THE ENTREEW PROGRAM TO CREATE SPECIFICATION FILES

NHTSA has developed the data entry program, ENTREEW, in order to facilitate preparation of the specification data defined in the previous sections of this Guide. A diskette containing the ENTREEW program, Version 4.0, is included in the front of the Guide. Because ENTREEW contains built-in, on-line checkers for data validation, it is highly recommended that specification data be generated using the ENTREEW program.

Equipment Requirements for ENTREEW

ENTREEW is a Windows-based application which has the following minimum requirements:

- ▶ IBM PC or compatible with 80386 or better processor.
- ▶ 10 Megabytes of disk space.
- ▶ Microsoft Windows 3.1 or later.
- ▶ 8 Megabytes of memory.

ENTREEW should also run properly under Microsoft Windows 95, Windows NT 3.51 or Windows NT 4.0.

ENTREEW Conversion Utilities

The ENTREEW program output file is in NHTSA's own binary format (file extension .ENT). The included EWCONV utility supports the export of binary .ENT files to the ASCII .EV4 format .EV4 files, which is the accepted data format specified under SAE J211. EWCONV also supports the import of .EV4 ASCII data files into the binary .ENT format for editing using ENTREEW.

An optional utility, EWCV32, provides the ability to convert from the older Entree V3 ASCII format to the EV4 format as specified under SAE J211. This utility is not included with the ENTREEW distribution, but is available for download from the Internet at

<URL <http://www-nrd.nhtsa.dot.gov/nrd10/software/entreew>>

EWCV32 requires Microsoft Windows 95, or Microsoft Windows NT 4.0 for proper execution.

ENTREEW Specification File Format Options

ENTREEW output for a given test may be formatted one of two ways: as either a single file in NHTSA's own binary format (<filename>.ENT), or as an ASCII file (<filename>.EV4) for data exchange outside the agency. Data submitted for inclusion in the NHTSA Vehicle Database must be written in the binary format.

The data files should be written to 3.5 inch high density floppies.

ASCII FORMAT SPECIFICATION FILE

The ASCII file for a specific test consists of groups of records from each of the categories listed below:

Record Type	Group
TEST	1
VEHICLE	2
COMPONENT	3
CONFIGURATION	4
INSTRUMENTATION	5

For example, a vehicle test might consist of specification records for TEST, VEHICLE, COMPONENT, COFIGURATION, and INSTRUMENTATION. The EWCONV utility may be used to create the ASCII file automatically from an ENTREEW generated binary file.

Omitting Information Groups from the ASCII File

The only optional information group for component tests data submission is 2, Vehicle Information.

Record Layout for ASCII Specification File

Appendix C lists the fields and their positions in each of the specification data records. The first line of the ASCII (.EV4) specification file should be the string

“----- EV4 -----”

or

“-----”+space+ “EV4”+space+ “-----”

Each section within an EV4 file should begin with a “key” line indicating the type of records following the key. These keys have the form

“----- KEY -----”

or

“-----”+space+ “KEY”+space+ “-----”

where KEY is appropriate to a particular record type. (KEY equals TEST, VEHICLE, etc..)

Fields within a record are delimited by the pipe character (|), records are delimited by a line feed. Comment lines may also be included in the file. A comment line should start with the # (pound) sign and end with a line feed.

The ASCII specification file should terminate with the line

“----- END -----”

Fields for which no information is available should contain one blank character. In other words, an empty field begins after the pipe delimiter of the previous field, and consists of a single blank followed by another pipe delimiter. All text should be uppercase.

Table A-1 is an example of an ASCII specification file for a vehicle crash test.

LAYOUT FOR MEASUREMENT DATA ON DISK

Each subsequent file after the specification data files contains unfiltered, digitized data collected from the sensors used in the tests. The order of the measurement files corresponds to the order of the instrumentation records in the instrumentation group specification records. The measurement files are made up of ASCII records of 1 data point each, delimited by a line feed character (ASCII decimal 10, hexadecimal \x0a, octal \012). The point specification will allow for any floating point format, but the preferred format is the C format %12.5E. Thus, each record will be 12 characters long, e.g. +1.23400E-01. The maximum number of points for one channel is 110,000. There cannot be more than 10,000 data points prior to time zero, nor more than 99,999 after time zero.

The name of the ASCII measurement data files should be the same given to the specification file described above (ENTREEW binary file with extension .ENT or ASCII file with extension .EV4). The file extension should be the curve number of the curve contained in the file, and should correspond to the curve number in the instrumentation record in the instrumentation specification group. There should be no leading zeros in the file extensions.

If the specification file is named TSTABC.ENT (binary) or TSTABC.EV4 (ASCII), and there are 35 measurement (curve) files, the curve files should be named TSTABC.1 through TSTABC.35.

Right:	TSTABC.1	TSTABC.12	TSTABC.101
Wrong:	TSTABC.T0	TSTABC.012	TSTABCDAT

Table A-1. Sample ASCII Specification File

```
# This is a comment field for a sample ASCII format specification data file
---- EV4 ----
---- TEST ----
0|C4|COMPLIANCE TEST FOR FMVSS 216 ROOF CRUSH RESISTANCE|ROOF CRUSH TEST ON 1996
ACURA INTEGRA
|07/NOV/1996|TRC|DTNH22-95-D-1000|960001|216|VTB|CON|DRY|21|FMT|UMB|2|NO COMMENTS
---- VEHICLE ----
0|1|73|02|96|MT0707|4S|JH4UA264XTC002137|N|NO COMMENTS
---- COMPONENT ----
0|1|1|RRLF|VE| |N|NO MODIFICATIONS|NA|NA| |COMPONENT TESTED IS LEFT FRONT ROOF RAIL
---- CONFIGURATION ----
0|1|1|1|SLD|.009144|76 X 183 CM RIGID CRUSHING DEVICE|CRU|0.0| |0.0|0.0|ROOF/LOADING DEVICE
CONTACT AT LEFT FRONT CORNER|LONG AXIS 5 DGREES LAT AXIS 25 DEGREES|
---- INSTRUMENTATION ----
0|1|1|1|1|LC|01|TSTD|OT|NWT| | |22/OCT/1996|20000|0.0|0|340|50000|AM|P|STATIC LOAD ON ROOF
0|1|1|1|2|DS|01|ROFR|OT|MM| | |22/OCT/1996|500|56|0.0|0|340|50000|AM|P|MM ROOF DISPLACEMENT
---- END ----
```

APPENDIX B: CODES

CODES

All codes are categorized and alphabetized in a logical manner. Field names are left justified in bold print and underlined, code names are in capital letters indented to the right. Categories (and sub-categories) are in italicized print. When more detailed explanations are warranted, text is listed after the field name. Any use of the code “other” should be explained in an appropriate commentary field.

AXIS

Vehicle body axes are global and predefined. If local axes are used, it may be necessary to reference the coordinate system in a commentary field. The surface normal axis code (NR) should be used when the test is designed to impact, or make contact with, a perpendicular to a surface.

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
GLOBAL - fixed wrt vehicle geometry	XG	X AXIS
	YG	Y AXIS
	ZG	Z AXIS
LOCAL - local reference system	XL	X AXIS
	YL	Y AXIS
	ZL	Z AXIS
OTHER	NR	NORMAL (to a surface)
	RS	RESULTANT (computed)
	NA	NOT APPLICABLE
	OT	OTHER

BODY

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
CAR	2D	2 DOOR CAR
	4D	4 DOOR CAR
	3H	3 DOOR HATCHBACK
	5H	5 DOOR HATCHBACK
	SW	STATION WAGON
	CV	CONVERTABLE
TRUCK/VAN	PU	PICKUP
	MV	MINIVAN
	VN	VAN (other than MV)
	UV	SPORT/UTILITY VEHICLE
	TR	TRUCK (other)
OTHER	MH	MOTOR HOME
	BU	BUS
	NA	NOT APPLICABLE
	OT	OTHER

CHSTAT

<u>CODE</u>	<u>DESCRIPTION</u>
P	PRIMARY
R	REDUNDANT

CMPNT

These codes are grouped into two categories: *body part* and *vehicle part*. If the component type (CMPTYP) is an occupant, then the CMPNT field will denote a general body location, and the SENATT field will denote a more specific location. If the component type (CMPTYP) is a vehicle, then the CMPNT field will denote a specific location on the vehicle, and the SENATT field will denote a general location. Many categories contain their own “other” codes - these should be used in place of the general code OTHR when available (e.g. DROT for “other door”)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
BODY PART:		
Lower Body	ANKL	ANKLE
	FEMR	FEMUR
	FOOT	FOOT
	KNEE	KNEE
	PELV	PELVIS
	TIBA	TIBIA
Upper Body	ABDO	ABDOMEN
	CHST	CHEST
	FASC	FASCIA
	HEAD	HEAD
	NECK	NECK
	RIBS	RIB CAGE
	SHLD	SHOULDER
	SPNE	SPINE
	STRN	STERNUM
Other Body Parts	CRBV	CEREBOVASCULAR SYSTEM
	CRDV	CARDIOVASCULAR SYSTEM
	PULM	PULMONARY SYSTEM

CMPNT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
VEHICLE PART:		
Seat Belt Anchorages		
Lap Belt	ALLF	LEFT FRONT DSP
	ALLR	LEFT REAR
	ALCF	CENTER FRONT
	ALCR	CENTER REAR
	ALRF	RIGHT FRONT
	ALRR	RIGHT REAR
	ALL1	LEFT MID ROW 1
	ALC1	CENTER MID ROW 1
	ALR1	RIGHT MID ROW 1
	ALL2	LEFT MID ROW 2 - REARWARD OF MID ROW 1
	ALC2	CENTER MID ROW 2
	ALR2	RIGHT MID ROW 2
	A LOT	OTHER
Shoulder Belt		
	ASLF	LEFT FRONT DSP
	ASLR	LEFT REAR
	ASCF	CENTER FRONT
	ASCR	CENTER REAR
	ASRF	RIGHT FRONT
	ASRR	RIGHT REAR
	ASL1	LEFT MID ROW 1
	ASC1	CENTER MID ROW 1
	ASR1	RIGHT MID ROW 1
	ASL2	LEFT MID ROW 2 (REARWARD OF MID ROW 1)
	ASC2	CENTER MID ROW 2
	ASR2	RIGHT MID ROW 2
	ASOT	OTHER
Bumpers		
	BMPF	FRONT
	BMPR	REAR
Dash Panel		
	DP01	01 POSITION AS DEFINED IN DATA REF. GUIDE
	DP02	<i>see above</i>
	DP03	<i>see above</i>
	DP04	<i>see above</i>
	DP05	<i>see above</i>
	DP06	<i>see above</i>
	DP07	<i>see above</i>
	DP08	<i>see above</i>
	DP09	<i>see above</i>

CMPNT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
VEHICLE PART:		
Doors: door sill (side rail below door)	DSL F	LEFT FRONT
	DSL R	LEFT REAR
	DSR F	RIGHT FRONT
	DSR R	RIGHT REAR
	ENGN	ENGINE
Fenders	FNLF	LEFT FRONT
	FNLR	LEFT REAR
	FNRF	RIGHT FRONT
	FNRR	RIGHT REAR
Floorpan	FLLF	LEFT FRONT
	FLLR	LEFT REAR
	FLRF	RIGHT FRONT
	FLRR	RIGHT REAR
	FLOT	OTHER
Frame Rail	FRRF	FRONT
	FRRR	REAR
	FRSL	LEFT SIDE
	FRSR	RIGHT SIDE
	FROT	OTHER
	FWLL	FIREWALL
Headers (interior)	HDFR	FRONT
	HDLF	LEFT FRONT
	HDLR	LEFT REAR
	HDRF	RIGHT FRONT
	HDRR	RIGHT REAR
	HDRR	REAR
Head Rests	HRLF	LEFT FRONT
	HRLR	LEFT REAR
	HRRF	RIGHT FRONT
	HRRR	RIGHT REAR
	HRCR	CENTER REAR
	HRL1	LEFT MID ROW 1
	HRC1	CENTER MID ROW 1
	HRR1	RIGHT MID ROW 1
	HRL2	LEFT MID ROW 2 (REARWARD OF MID ROW 1)
	HRC2	CENTER MID ROW 2
	HR R2	RIGHT MID ROW 2
	HROT	OTHER
	HOOD	HOOD

CMPNT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
VEHICLE PART:		
Pillars	PLAL	A PILLAR LEFT
	PLAR	A PILLAR RIGHT
	PLBL	B PILLAR LEFT
	PLBR	B PILLAR RIGHT
	PL1L	MID ROW 1 LEFT
	PL1R	MID ROW 1 RIGHT
	PL2L	MID ROW 2 LEFT (REARWARD OF ROW 1)
	PL2R	MID ROW 2 RIGHT
	PLRL	REAR PILLAR LEFT (SAME AS C PILLAR IN A 4 DR CAR)
	PLRR	REAR PILLAR RIGHT
Rollbar	ROLL	ROLLBAR
	ROLB	ROLLBAR BRACE (LEFT OR RIGHT)
Roof	RFIN	INTERIOR
	RFEX	EXTERIOR
Roof Rail (exterior)	RRLF	LEFT FRONT
	RRLR	LEFT REAR
	RRRF	RIGHT FRONT
	RRRR	RIGHT REAR
Seats bucket (reclining)	SELF	LEFT FRONT
	SELR	LEFT REAR
	SECF	CENTER FRONT
	SECR	CENTER REAR
	SERF	RIGHT FRONT
	SERR	RIGHT REAR
	SEL1	LEFT MID ROW 1
	SEC1	CENTER MID ROW 1

CMPNT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>	
VEHICLE PART: Seats (continued)			
bucket (reclining)	SER1	RIGHT MID ROW 1	
	SEL2	LEFT MID ROW 2 (REARWARD OF MID ROW 1)	
	SEC2	CENTER MID ROW 2	
	SER2	RIGHT MID ROW 2 BENCH	
	SEBF	FRONT	
	SEBR	REAR	
	SEM1	MID ROW 1	
	SEM2	MID ROW 2 (REARWARD OF MID ROW 1)	
	SEOT	OTHER SEAT	
	SEBK	SEAT BACK (USE ONLY IF MORE APPROPRIATE THAN SE _{xx})	
	SECU	SEAT CUSHION (USE ONLY IF MORE APPROPRIATE THAN SE _{xx})	
	Seat Base Assemblies		
	bucket (individual)	SBLF	LEFT FRONT
		SBLR	LEFT REAR
SBCF		CENTER FRONT	
SBCR		CENTER REAR	
SBRF		RIGHT FRONT	
SBRR		RIGHT REAR	
SBL1		LEFT MID ROW 1	
SBC1		CENTER MID ROW 1	
SBR1		RIGHT MID ROW 1	
SBL2		LEFT MID ROW 2 (REARWARD OF MID ROW 1)	
SBC2		CENTER MID ROW 2	
SBR2	RIGHT MID ROW 2		

CMPNT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
Seat Base Assemblies (continued)		
bench	SBBF	FRONT
	SBBR	REAR
	SBM1	MID ROW 1
	SBM2	MID ROW 2 (REARWARD OF MID ROW 1)
	SBOT	OTHER SEAT BASE SEAT TRACK
	STLF	LEFT FRONT
	STLR	LEFT REAR
	STRF	RIGHT FRONT
	STRR	RIGHT REAR
	STOT	OTHER STEERING ASSEMBLY
	STCL	COLUMN
	SWHB	WHEEL/HUB
	SWRM	WHEEL RIM SUSPENSION
	SULF	LEFT FRONT
	SULR	LEFT REAR
	SURF	RIGHT FRONT
	SURR	RIGHT REAR TRUNK FLOOR
	TRFC	CENTER
	TRFL	LEFT
	TRFR	RIGHT WINDSHIELD
	WNDF	FRONT
	WNDR	REAR
	OTHR	OTHER

CMPTYP

<u>CODE</u>	<u>DESCRIPTION</u>
OC	OCCUPANT
VE	VEHICLE

CONFIG

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>	
STATIC TESTS	ABD	ABDOMINAL COMPRESSION	
	CGF	CG POSITION STATIC LOADING - FORWARD (FMVSS207)	
	CGR	CG POSITION STATIC LOADING - REARWARD (FMVSS207)	
	CLF	COMBINED STATIC LOADING OF FMVSS207 AND FMVSS210 - FORWARD	
	CLR	COMBINED STATIC LOADING OF FMVSS207 AND FMVSS210- REARWARD	
	CRU	STATIC CRUSH (FMVSS214, FMVSS216)	
	RML	REARWARD MOMENT STATIC LOADING (FMVSS207)	
	STC	GENERIC COMBINED STATIC LOADING (I.E. MULTIPLE SEAT BELT ANCHORAGES; MULTIPLE HEAD RESTRAINTS)	
	STL	GENERIC STATIC LOADING (FMVSS202, FMVSS210)	
	DYNAMIC TESTS	FLY	FREE FLYING (DROP TEST)
		HDF	FREE FLYING HEADFORM DYNAMIC IMPACT (FMVSS201)
HDG		GUIDED HEADFORM DYNAMIC IMPACT (FMVSS201)	
DYI		GENERIC DYNAMIC IMPACT	
SLB		SLED WITH VEHICLE BODY	
SLN		SLED WITHOUT VEHICLE BODY	
	OTH	OTHER	

CRTEST

<u>CODE</u>	<u>DESCRIPTION</u>
N	no
Y	yes
U	unknown

DASTAT

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
VALID DATA	AM	AS MEASURED
PROBLEM DATA	CF MN QD SF	CHANNEL FAILED MEANINGLESS QUESTIONABLE SYSTEM FAILURE
MANIPULATED DATA	CM SC NO	COMPUTED SCALED NO DATA

DUMSIZ

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
child	3C 6C	3 year old 6 year old
adult	05 50 95	5 percentile 50 percentile 95 percentile
other	NA OT	not applicable (occupant not a dummy) other

MAKE

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
73	ACURA	
11	AMERICAN	
12	AUDI	
53	BATTRONICS	
27	BMW	
04	BUICK	
10	CADILLAC	
68	CARPENTER	SCHOOLBUS
35	CHAMPION	
36	CHECKER	
01	CHEVROLET	
37	CHINOOK	
79	CHOO-CHOO	
21	CHRYSLER	
75	COLLINS	
29	COMUTA	
39	DAIHATSU	
38	DELOREAN	
07	DODGE	
70	EAGLE	
55	EEVC	
58	EVA	
19	FIAT	
02	FORD	
63	GEO	
40	GMC	
23	HONDA	
34	HYUNDAI	
41	IH	
72	INFINITI	
42	ISUZU	
44	JEEP	
54	JET	
77	KIA	
80	LAND ROVER	
22	LECTRA	
59	LECTRIC	
65	LEWIS	
64	LEXUS	
13	LINCOLN	
18	MAZDA	
28	MERCEDES	
09	MERCURY	
25	MG	
62	MINISUBISHI	
32	NHTSA	
15	NISSAN	

MAKE, (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
48	ODYSSEY	
06	OLDSMOBILE	
14	PEUGEOT	
05	PLYMOUTH	
03	PONTIAC	
81	RENAISSANCE	
17	RENAULT	
30	SAAB	
69	SATURN	
78	SEBRING	
76	SOLECTRIA	
26	SUBARU	
33	SUZUKI	
67	THOMAS	
74	TIARA	
16	TOYOTA	
31	TRIUMPH	
56	UM	
08	VOLKSWAGEN	
20	VOLVO	
71	WARD	
66	WAYNE	SCHOOLBUS
60	WINNEBAGO	
24	YUGO	
99	OTHER	

MODEL

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>ACURA</u> (make code 73)		
02	INTEGRA	
01	LEGEND	
04	TL	
03	VIGOR	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>AMERICAN</u> (make code 11)		
03	ALLIANCE	
06	AMX	
11	CONCORD	
01	GREMLIN	
02	HORNET	
09	MATADOR	
12	PACER	
14	SPIRIT	
99	OTHER	
 <u>AUDI</u> (make code 12)		
08	A4	
01	100	LS, GL
03	200	
05	4000	
04	5000	
06	80	
07	90	
02	FOX	
99	OTHER	
 <u>BATTRONICS</u> (make code 53)		
01	VAN	
99	OTHER	
 <u>BMW</u> (make code 27)		
08	2002	
05	3.0 SI	
09	318	
01	320 I	
10	325 I	
02	528 I	
06	530 I	
07	630 CSI	
03	633 CSI	
04	733 I	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>BUICK</u> (make code 04)		
06	CENTURY	
04	ELECTRA	225
09	ESTATE	
02	LE SABRE	
16	OPEL	STD, GT, KADETT, 1900, MANTA
07	PARK AVENUE	
17	REGAL	
05	RIVIERA	
08	ROADMASTER	
11	SKYHAWK	
01	SKYLARK	
03	SOMERSET	
99	OTHER	
<u>CADILLAC</u> (make code 10)		
05	BROUGHAM	
09	CIMARRON	
10	CONCOURSE	
08	DE VILLE	
04	ELDORADO	
03	FLEETWOOD	60, 75
02	SEVILLE	
99	OTHER	
<u>CARPENTER</u> (make code 68)		
02	CADET	
01	CONVENTIONAL	
99	OTHER	
<u>CHAMPION</u> (make code 35)		
01	MOTOR HOME	
99	OTHER	
<u>CHECKER</u> (make code 36)		
01	TAXICAB	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>CHEVROLET</u> (make code 01)		
01	ASTRO	
40	BEAUVILLE	
15	BELAIR	
17	BERETTA	
28	BLAZER MPV	C10, K5, K10, C20, K10
33	C10 PICKUP	
34	C1500 PICKUP	
25	C30 PICKUP	
08	CAMARO	
07	CAPRICE	
31	CAVALIER	
32	CELEBRITY	
02	CHEVELLE	
13	CHEVETTE	
38	CHEVY II	
23	CITATION	
16	CORSICA	
09	CORVETTE	
20	EL CAMINO	
19	FULL SIZE	
26	G10 VAN	
29	G30 VAN	
06	IMPALA	
35	K10 PICKUP	
36	K20 PICKUP	
30	LUMINA	
22	LUV PICKUP	
14	MALIBU	
03	MONTE CARLO	
21	MONZA	
10	NOVA	
37	PICKUP	
39	S10 BLAZER	
24	S10 PICKUP	
04	SPECTRUM	
27	SPORTVAN	C20, G15, G20, G25
05	SPRINT	
11	SUBURBAN	
41	TAHOE	
12	VEGA	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>CHINOOK</u> (make code 37)		
01	MOTOR HOME	
99	OTHER	
<u>CHOO-CHOO</u> (make code 79)		
01	CUSTOM	
99	OTHER	
<u>CHRYSLER</u> (make code 21)		
03	300	
13	CIRRUS	
12	CONCORDE	
10	CONQUEST	
07	CORDOBA	
09	FIFTH AVENUE	
06	IMPERIAL	
08	LE BARON	
01	NEWPORT CUSTOM	
04	NEW YORKER	
05	TOWN AND COUNTRY	
99	OTHER	
<u>COLLINS</u> (make code 75)		
01	SUPER BANTAM	
99	OTHER	
<u>COMUTA</u> (make code 29)		
01	CAR ELECTRIC	
99	OTHER	
<u>DAIHATSU</u> (make code 39)		
01	CHARADE	
99	OTHER	
<u>DELOREAN</u> (make code 38)		
01	COUPE	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>DODGE</u> (make code 07)		
29	400	
08	600	
19	ARIES	
14	ASPEN	
11	CARAVAN	
27	CELESTE	
05	CHALLENGER	
06	CHARGER	
07	COLT	
22	COLT PICKUP	D50
02	CORONET	
30	D150 PICKUP	
23	DAKOTA	
01	DART	
13	DAYTONA	
10	DIPLOMAT	
32	DYNASTY	
34	INTREPID	
12	LANCER	
15	MAGNUM	XE
16	MINIRAM VAN	
18	MIRADA	
04	MONACO	
24	024	
09	OMNI	DE TOMASO
31	PICKUP	
28	RAM50	
36	RAM 150	
37	RAM 250 VAN	
26	RAMCHARGER MPV	AD100, AW100
03	RAMPAGE	
33	RAM WAGON VAN	
21	SHADOW	
25	SPIRIT	
20	SPORTSMAN VAN	B100, B150, B200, B250, B300, B350
17	ST. REGIS	
35	STEALTH	
39	T300	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>EAGLE</u> (make code 70)		
04	MEDALLION	
01	MPV	
02	PREMIER	
03	SUMMIT	
05	TALON	
06	VISION	
99	OTHER	
<u>EEVC</u> (make code 55)		
01	DEFORMABLE IMPACTOR	
99	OTHER	
<u>EVA</u> (make code 58)		
02	EVCORT	
01	FAIRMONT	
99	OTHER	
<u>FIAT</u> (make code 19)		
03	124	
02	128	
10	131	
11	132	
09	BRAVA	
05	SPIDER	850, 2000
08	STRADA	
06	X19	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
FORD (make code 02)		
06	AEROSTAR	
43	ASPIRE	
21	BRONCO	
22	BRONCO II	
32	CLUBWAGON MPV	E100, E150
44	CONTOUR	
35	COURIER	
40	CROWN VICTORIA	
24	E100VAN	
25	E150VAN	
19	ELITE	
27	ESCORT	
33	EXP	
41	EXPLORER	
36	FI 50 PICKUP	
37	F250 PICKU P	
38	F350 PICKUP	
17	FAIRMONT	
11	FESTIVA	
14	FIESTA	
18	FULL SIZE	
31	GALAXIE	500
20	GRANADA	
34	LASER	
07	LTD II	
02	MAVERICK	
03	MERKUR	
05	MUSTANG II	
39	PICKUP	
13	PINTO	
12	PROBE	
15	RANCHERO	
10	RANGER	R100
08	TAURUS	
01	TEMPO	
09	THUNDERBIRD	
04	TORINO	
23	VAN	E250,E350,P500
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>GEO</u> (make code 63)		
01	METRO	
02	PRIZM	
03	STORM	
04	TRACKER	
99	OTHER	
<u>GMC</u> (make code 40)		
06	ASTRO TRUCK	
01	JIMMY MPV	C15, C25, K15, SUBURBAN
02	PICKUP	C15, C25, CABALLERO, K15, K25
07	S15 PICKUP	
04	SPORTVAN	G15, G25, G35
03	SPRINT MPV	
05	VANDURA	G1500, G2500
99	OTHER	
<u>HONDA</u> (make code 23)		
02	ACCORD	
01	CIVIC	CVCC
06	DELSOL	
07	ODYSSEY	
08	PASSPORT	
05	PRELUDE	
99	OTHER	
<u>HYUNDAI</u> (make code 34)		
06	ELANTRA	
03	EXCEL GLS	
01	PONY EXCEL	
05	SCOUPE	
04	SONATA	
02	STELLAR	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>IH</u> (make code 4 1)		
01	SCOUT MPV	
02	SS MPV	
03	TERRA MPV	
04	TRAVELER MPV	
99	OTHER	
<u>INFINITI</u> (make code 72)		
01	G20	
04	J30	
02	M30	
03	Q45	
99	OTHER	
<u>ISUZU</u> (make code 42)		
06	AMIGO	
01	I-MARK	
03	IMPULSE	
09	PICKUP	
02	PUP	
08	RODEO	
05	SPACECAB	LS
07	STYLUS	
04	TROO	PER II
99	OTHER	
<u>JEEP</u> (make code 44)		
01	CHEROKEE MPV	WAGONEER
02	CJ MPV	5, 7, 8
05	COMANCHE	
03	PICKUP	J10, J20
04	TOWNSIDE MPV	
06	VJ	
07	WRANGLER MPV	
99	OTHER	
<u>JET</u> (make code 54)		
02	COURIER	
03	ELECTRICA	MERCURY, ETC.
01	ELECTRICA 007	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>KIA</u> (make code 77)		
01	SETHIA	
99	OTHER	
<u>LAND ROVER</u> (make code 80)		
01	DISCOVERY	
99	OTHER	
<u>LECTRA</u> (make code 22)		
01	400	
02	CENTAURI	
99	OTHER	
<u>LECTRIC</u> (make code 59)		
01	LEOPARD	
99	OTHER	
<u>LEWIS</u> (make code 65)		
01	REDDIBUS	
99	OTHER	
<u>LEXUS</u> (make code 64)		
01	ES250	
02	ES300	
06	GS300	
05	LS400	
03	SC300	
04	SC400	
99	OTHER	
<u>LINCOLN</u> (make code 13)		
01	CONTINENTAL	FULL SIZE
02	MARK	H, W, V, VI
06	TOWN CAR	
05	VERSAILLES	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>MAZDA</u> (make code 18)		
02	323	
15	323-PROTEGE	
07	626	
01	808	
03	929	
14	B2000 PICKUP	
09	COSMO	
05	GLC	
08	MIATA	
17	MILLENNIA	
11	MIZER	
06	MPV	
16	MX3	
12	MX6	
13	PICKUP	
04	RX	2,3,4,5, 6,7
99	OTHER	
<u>MERCEDES</u> (make code 28)		
03	190	
14	230	
01	240	
06	280	CE, E, SE
02	300	CD, D, SD, TD
15	380	SL,SLC,SEL
09	450	SE, SEL, SL, SLC
12	6.9	
99	OTHER	
<u>MERCURY</u> (make code 09)		
04	BOBCAT	
13	CAPRI	
10	COMET	
07	COUGAR	XR7
16	LN7	
15	LYNX	
09	MARQUIS	FULL SIZE
12	MONARCH	
01	MONTEGO	
03	SABLE	
05	TOPAZ	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>MERCURY</u> (continued)		
02	TRACER	
08	ZEPHYR	
99	OTHER	
 <u>MG</u> (make code 25)		
03	MGB	GT
01	MIDGET	
99	OTHER	
 <u>MITSUBISHI</u> (make code 62)		
12	3000 GT	
03	CORDIA	
11	DIAMANTE	
10	ECLIPSE	
05	GALANT	
07	MIRAGE	
13	MIGHTY MAX	
02	MONTERO	
01	PICKUP	
08	PRECIS	
06	STARION	
04	TREDIA	
09	VAN	
99	OTHER	
 <u>NHTSA</u> (make code 32)		
02	CALSPAN RSV	
09	CONTOURED IMPACTOR	MOVING; NOTE IF NOT SAE STANDARD
01	DEFORMABLE IMPACTOR	MOVING
06	FLAT IMPACTOR	MOVING; - NOTE IF NOT SAE STANDARD
03	LOAD CELL IMPACTOR	MOVING
04	MINICARS RSV	
10	ROLLOVER CART	NOTE IF NOT SAE STANDARD
11	SLED	NON-BIOMECHANICS TEST
08	TRUCK SIMULATOR	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>NISSAN</u> (make code 15)		
18	1200	
13	200 SX	
06	2000	ROADSTER
08	210	B210, HLB
30	240	SX
10	260	Z
11	280	Z, ZX
03	300	ZX
15	310	
12	510	
07	610	
26	710	
16	810	
35	ALTIMA	
31	AXXESS	MODEL
24	F10	
28	KING CAB PICKUP	
25	MAXIMA	
37	NX	
34	PATHFINDER	
 <u>NISSAN</u> (make code 15)		
29	PICKUP	
01	PULSAR	
36	QUEST	
02	SENTRA	
07	STANZA	XE
17	VAN	
99	OTHER	
 <u>ODYSSEY</u> (make code 48)		
01	MOTOR HOME	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>OLDSMOBILE</u> (make code 06)		
03	98	
07	ACHIEVA	
01	CALAIS	
14	CUSTOM	
05	CUTLASS	
02	DELTA 88	
15	FIRENZA	
10	OMEGA	
06	ROYALE	
11	STARFIRE	
04	TORONADO	
99	OTHER	
<u>PEUGEOT</u> (make code 14)		
02	405	
01	504	TURBO
04	505	TURBO
03	604	
99	OTHER	
<u>PLYMOUTH</u> (make code 05)		
07	ACCLAIM	
19	ARROW PICKUP	
05	CARAVELLE	
17	CHAMP	
26	COLT	
02	COLT VISTA	
03	CONQUEST	
20	CRICKET	
21	FARGO PICKUP	150,250
12	FURY	GRAN FURY
16	HORIZON	
25	LASER	
18	RELIANT	
10	SAPPORO	
04	SCAMP	
06	SUNDANCE	
22	TC3	TURISMO
23	TRAILDUSTER MPV	P D150, PW150
01	VALIANT	
14	VOLARE	
24	VOYAGER VAN	B150, B250, B350, PB OR PH 150, 250, 350
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>PONTIAC</u> (make code 03)		
18	6000 LE	
04	BONNEVILLE	
02	CATALINA	
03	FIERO	
06	FIREBIRD	
13	FULL SIZE	
14	GRAND AM	
05	GRAND PRIX	
16	J2000	
12	LEMANS	
01	PARISIENNE	
08	PHOENIX	
07	SUNBIRD	
17	T1000	
19	TRANS SPORT	
11	VENTURA	
99	OTHER	
<u>RENAISSANCE</u> (make code 81)		
01	TROPICA	ELECTRIC CAR
99	OTHER	
<u>RENAULT</u> (make code 17)		
03	12	
04	15	
05	17	GORDINI
02	18	I
06	5	
09	ALLIANCE	
08	ENCORE	
07	FUEGO	
01	LECAR	
11	MEDALLION	
10	SPORTSWAGON	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>SAAB</u> (make code 30)		
02	900	
03	9000	
01	99	
99	OTHER	
<u>SATURN</u> (make code 69)		
01	SL2	
99	OTHER	
<u>SEBRING</u> (make 78)		
01	ZEV	ELECTRIC CAR (DODGE)
99	OTHER	
<u>SOLECTRIA</u> (make code 76)		
01	FORCE	
99	OTHER	
<u>SUBARU</u> (make code 26)		
07	BRAT MPV	
03	DL	
04	FE	
05	GF	
02	GL	
08	GLF	
13	IMPREZA	
10	JUSTY	
11	LEGACY	
12	LOYALE	
09	WAGON	
01	XT	
99	OTHER	
<u>SUZUKI</u> (make code 33)		
01	SAMURAI	
02	SIDEKICK	
03	SWIFT	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>THOMAS</u> (make code 67)		
01	CONVENTIONAL	
02	MIGHTY MITE	
99	OTHER	
<u>TIARA</u> (make code 74)		
01	STEALTH	
99	OTHER	
<u>TOYOTA</u> (make code 16)		
16	4X4	
13	4RUNNER	
19	AVALON	
03	CAMRY	
06	CELICA	
02	COROLLA	
04	CORONA	
08	CRESSIDA	
01	LAND CRUISER	
05	MARK II	
14	R2	
17	PASEO	
09	PICKUP	
15	PREVIA	
12	STARLET	
07	SUPRA	
18	T1002	
20	TACOMA	
10	TERCEL	
11	VAN	
99	OTHER	
<u>TRIUMPH</u> (make code 31)		
01	SPITFIRE	
02	TR7	
99	OTHER	
<u>UM</u> (make code 56)		
01	ELECTREK	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>VOLKSWAGEN</u> (make code 08)		
02	BEETLE	
20	CABRIOLET	
19	CARRADO	
04	DASHER	
21	EUROVAN	
03	FOX	
01	GOLF	
14	JETTA	
18	PASSAT	
16	PICKUP	
05	POLO	
17	QUANTUM	
09	RABBIT	
10	SCIROCCO	
08	THE THING	
15	VANAGON	BUS
99	OTHER	
<u>VOLVO</u> (make code 20)		
04	164	
06	240	
10	244	DL, 242
15	245	
07	260	
16	265	
17	740 GLE	
19	850	
18	940	
11	COUPE	
12	DL	
13	GLE	
14	GLT	
99	OTHER	
<u>WARD</u> (make code 71)		
01	VANDURA.	
99	OTHER	

MODEL (continued)

<u>CODE</u>	<u>DESCRIPTION</u>	<u>COMMENT</u>
<u>WAYNE</u> (make code 66)		
01	CONVENTIONAL	
02	FORWARD CONTROL	
99	OTHER	
<u>WINNEBAGO</u> (make code 60)		
01	TREKKER	
99	OTHER	
<u>YUGO</u> (make code 24)		
01	GV	
99	OTHER	
<u>OTHER</u> (make code 99)		
99	OTHER	

MODIND

<u>CODE</u>	<u>DESCRIPTION</u>
N	NO
Y	YES
U	UNKNOWN

OCCTYP

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
DUMMY		
all purpose	AO	APR omni-directional
	CH	child
	H3	Hybrid III
	P5	Part 572
	TR	TRRL
side impact	AS	APR side impact
	BS	BIOSID
	ES	EUROSID
	SD	HSRI side impact
other	HP	humanoid pedestrian
HUMAN		
	CD	cadaver
OTHER		
	NA	not applicable
	OT	other

SENATT

These codes are grouped into three categories: *body part*, *vehicle part*, and *test device*. SENATT codes for occupant components are specific, while SENATT codes for vehicle components are more general. The SENATT code should reflect the actual attachment location of the sensor, and not necessarily refer to the component being tested.

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
BODY PART:		
LOWER BODY:		
Ankle	ANKL	LEFT
	ANKR	RIGHT
Femur	FMRL	LEFT
	FMRR	RIGHT
Foot	FOTL	LEFT
	FOTR	RIGHT
Knee	KNEL	LEFT
	KNER	RIGHT
Pelvis	PVCN	CENTER
	PVHP	H POINT
	PVIL	ILIAC
	PVLL	- LEFT LOWER
	PVLM	- LEFT MIDDLE
	PVLU	- LEFT UPPER
	PVPS	PUBIC SYMPHYSIS
	PVRL	- RIGHT LOWER
	PVRM	- RIGHT MIDDLE
	PVRU	- RIGHT UPPER
Tibia	PVSA	SACRUM
	TIBL	TIBIA LEFT
	TIBR	TIBIA RIGHT

SENATT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
UPPER BODY:		
Abdomen	ABD1	ABDOMEN CONTACT SWITCH #1
	ABD2	- #2
	ABD3	- #3
	ABDO	ABDOMEN
	CHBD	CHEST BAND
	CHST	CHEST
Head	HD90	HEAD 9 ARRAY - CENTER
	HD9X	- X ARM
	HD9Y	- Y ARM
	HD9Z	- Z ARM
	HDCG	HEAD CG
Neck	NECK	NECK
	NEKL	- LOWER
	NEKU	- UPPER
Rib	RBLA	LOWER ABDOMEN
	RBLL	LEFT LOWER
	RBLM	LEFT MIDDLE
	RBLU	LEFT UPPER
	RBRL	RIGHT LOWER
	RBRM	RIGHT MIDDLE
	RBRU	RIGHT UPPER
	RBUA	UPPER ABDOMEN
	Shoulder	SHLL
SHLR		RIGHT
Sternum	SNML	LOWER
	SNMU	UPPER
Spine	SPNL	LOWER
	SPNM	MIDDLE
	SPNU	UPPER
OTHER BODY PART		
	CRBV	CEREBROVASCULAR SYSTEM
	CRDV	CARDIOCASCULUR SYSTEM
	PULM	PULMONARY SYSTEM

SENATT (continued)

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>	
VEHICLE PART	ABGM	AIR BAG MANIFOLD	
	ABTK	AIR BAG TRIP SWITCH - KNEE	
	ABTM	AIR BELT MANIFOLD	
Belts	LPBI	LAP BELT - INBOARD	
	LPBO	- OUTBOARD	
	SHBE	SHOULDER BELT - EXTENSION	
	SHBT	SHOULDER BELT	
	BMPP	BUMPER	
	DASH	DASHBOARD	
	DOOR	DOOR	
	DRSL	DOOR SILL	
	ENGN	ENGINE	
	FNDR	FENDER	
	FLOR	FLOORPAN	
	FRAM	FRAME RAIL	
	FWLL	FIREWALL	
	PLAP	A PILLAR	
	PLBP	B PILLAR	
	PLCP	C PILLAR	
	RAXL	REAR AXLE	
	REDK	REAR DECK	
	ROFR	ROOF RAIL	
	ROOF	ROOF	
	Seats	SEAT	SEAT
		SEBK	SEAT BACK
		SECU	SEAT CUSHION
SEBS		SEAT BASE	
SETR		SEAT TRACK	
STER		STEERING WHEEL/COLUMN	
SUSP		SUSPENSION	
TRFL		TRUNK FLOOR	
VECG		VEHICLE CG	
WDSH		WINDSHIELD	
TEST DEVICE		BODY	BODY BLOCK (BLAK TUFFY DEVICE)
		HDFR	RIGID HEADFORM
	HEMI	RIGID HEMISPHERE	
	IMCG	IMPACTOR CG	
	PEND	PENDULUM	
	POLE	POLE	
	SLED	SLED	
	TSTD	TEST DEVICE (GENERAL)	
	OTHR	OTHER SENATT	

SENTYP

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
ACCELERATION	AA	ANGULAR ACCELEROMETER
	AC	LINEAR ACCELEROMETER
DISPLACEMENT	AD	ANGULAR DISPLACEMENT TRANSDUCER
	DS	LINEAR DISPLACEMENT TRANSDUCER
	SG	STRAIN GAGE
FORCE BASED	LC	LOAD CELL
	PR	PRESSURE TRANSDUCER
VELOCITY	AV	ANGULAR VELOCITY TRANSDUCER
	VL	LINEAR VELOCITY TRANSDUCER
OTHER	CC	CHESTBAND CURVATURE GAGE
	ET	EVENT TIME INDICATOR
	TB	TIME BASED CHANNEL
	OT	OTHER

TSTDEV

<u>CODE</u>	<u>DESCRIPTION</u>
CAN	CANNON - FREE FLYING LAUNCHER (DYNAMIC)
LIN	LINEAR IMPACTOR (DYNAMIC)
PIV	PIVOTING IMPACTOR (DYNAMIC)
SLD	STATIC LOADING DEVICE (STATIC)
OTH	OTHER

TSTPRF

<u>CODE</u>	<u>DESCRIPTION</u>
BAT	BATTELLE
CAL	CALSPAN
CIR	CA INJURY RESEARCH ASSOC.
DYS	DYNAMIC SCIENCE
ENS	ENSCO
GMC	GENERAL MOTORS
GTL	GENERAL TEST LABS
HDL	HEIDELBERG
MCR	MCR TECHNOLOGY
MCW	MEDICAL COLLEGE OF WASHINGTON
MGA	MGA RESEARCH CORP.
MSE	MOBILITY SYSTEMS
NBL	NAVAL BIODYNAMICS LAB
NTC	NTS - CA
NTV	NTS - VA

TSTPRE (continued)

<u>CODE</u>	<u>DESCRIPTION</u>
ONS	ONSER
SWR	SWRI
TRC	TRC OF OH
TRI	U. OF MICH.
TSC	TRANSPORTATION SYSTEMS CENTER
TTI	TX TRANSPORTATION INST.
UVA	U. OF VIRGINIA
VRT	VRTC
VWG	VOLKSWAGON
WSU	WAYNE STATE U.
OTH	OTHER

TSTTYP

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
	BAS	BASELINE
	CLB	CALIBRATION
COMPLIANCE	201	FMVSS 201
	202	FMVSS 202
	203	FMVSS 203
	207	FMVSS 207
	210	FMVSS 210
	214	FMVSS 214
	216	FMVSS 216
	2CC	COMBINED FMVSS 207 & FMVSS 210
	COM	OTHER COMPLIANCE
	DEV	TEST PROCEDURE DEVELOPMENT
	OCC	OCCUPANT PERFORMANCE TEST
	RES	RESEARCH
	RWS	REAL WORLD SIMULATION
	OTH	OTHER

UNITS

The only acceptable measurement system is metric units.

<u>CATEGORY</u>	<u>CODE</u>	<u>DESCRIPTION</u>
ACCELERATION	DP2	DEGREE/SEC ² (ANGULAR)
	G'S	G'S (LINEAR)
DISPLACEMENT	DEG	DEGREES (ANGULAR)
	MM	MILLIMETERS (LINEAR)
	MPM	MICROMETERS/METER (STRAIN)
	PST	PERCENT STRAIN
FORCE BASED	KPA	KILOPASCALS - ABSOLUTE (PRESSURE)
	KPG	KILOPASCALS - GAGE (PRESSURE)
	NSC	NEWTON-SECONDS (IMPULSE)
	NWM	NEWTON-METERES (TORQUE)
	NWT	NEWTONS

VERNO

Coded text, fixed length, 2 characters.

APPENDIX C: FIELD FORMATS

1. TEST INFORMATION

FIELD NAME	DATA TYPE	MAXIMUM FIELD LENGTH/RANGE
TSTNO	predefined text=0	1 char
VERNO	predefined coded text=V4	2 char
TITLE	free text	70 char
TSTOBJ	free text	70 char
TSTDAT	date text (DD/MMM/YYYY)	11 char
TSTPRF	coded text	3 char
CONNO	free text	17 char
TSTREF	free text	10 char
TSTTYP	coded text	3 char
TEMP	integer	-99 to 99
TOTCRV	integer	1 to 200
TSTCOM	free text	70 char

2. VEHICLE INFORMATION

FIELD NAME	DATA TYPE	MAXIMUM FIELD LENGTH/RANGE
TSTNO	predefined text=0	1 char
VEHNO	integer	1 to 2
MAKE	coded text	4 char
MODEL	coded text	4 char
YEAR	integer	4 char
NHTSANO	free text	9 char
BODY	coded text	2 char
VIN	free text	20 char
CRTEST	coded text	1 char
VEHCOM	free text	70 char

3. COMPONENT INFORMATION

FIELD NAME	DATA TYPE	MAXIMUM FIELD LENGTH/RANGE
TSTNO	predefined text=0	1char
VEHNO	integer	1 to 2
CMPNO	integer	1 to 99
CMPNT	coded text	4 char
CMPTYP	coded text	2 char
CMPWGT	float	0 to 9999
MODIND	coded text	1 char
MODDSC	free text	70 char
OCCTYP	coded text	2 char
DUMSIZ	coded text	2 char
DUMMAN	free text	70 char
CMPCOM	free text	70 char

4. TEST CONFIGURATION INFORMATION

FIELD NAME	DATA TYPE	MAXIMUM FIELD LENGT/RANGE
TSTNO	predefined text=0	1 char
VEHNO	integer	1 to 2
CMPNO	integer	1 to 200
CNFNO	integer	1 to 999
TSTDEV	coded text	3 char
DEVSPD	float	.0001 to 99999
DEVCOM	free text	70 char
CONFIG	coded text	3 char
CMPSPD	float	.0001 to 99999
CNTANG	integer	0 to 359
CNTLOC1	integer	0 to 99999
CNTLOC2	integer	0 to 99999
CNTCOM	free text	70 char
CNFCOM	integer	0 to 9999

5. INSTRUMENTATION INFORMATION

FIELD NAME	DATA TYPE	MAXIMUM FIELD LENGTH/RANGE
TSTNO	predefined text=0	1 char
VEHNO	integer	1 to 2
CMPNO	integer	1 to 200
SENTYP	coded text	2 char
SENLOC	coded text	2 char
SENATT	coded text	4 char
AXIS	coded text	2 char
UNITS	coded text	3 char
PREFIL	integer	0 to 99999
INSMAN	free text	70 char
CALDAT	date text (DD/MMM/YYYY)	11 char
INSRAT	integer	-999999 to 999999
CHLMAX	integer	0 to 100
INIVEL	float	-200 to 200
NFP	integer	-10000 to 0
NLP	integer	-999999 to 99999
DELT	integer	0 to 999999
DASTAT	coded text	2 char
CHSTAT	coded text	1 char
INSCOM	free text	70 char

APPENDIX D: DATA COORDINATE SYSTEM

With the introduction of this version (V4) of the NHTSA data format, all submissions will conform to SAE J211/1 MAR95 Instrumentation for Impact Test. Please refer to SAE J211 for a complete description of the coordinate system and signal polarities for vehicle occupants.

USING THE COORDINATE SYSTEM CORRECTLY

The rules for determining the sign conventions described below will enable anyone involved in NHTSA-sponsored testing to determine the proper sign and coordinate axis for any measured quantity.

All coordinate systems are orthogonal, three-dimensional, and right handed. The global coordinate systems for the vehicle and the test occupants are shown in Figure D-1. The coordinate system for the nine accelerometer head array is shown in Figure D-2, along with the proper SENATT codes. Table D-1 lists the polarity of the sensor output from various dummy manipulations when using this coordinate system.

VEHICLE GLOBAL COORDINATE SYSTEM

- ▶ X is positive forward
- ▶ Y is positive right (toward the passenger side door)
- ▶ Z is positive down

OCCUPANT GLOBAL COORDINATE SYSTEM (all occupant types - OCCTYP)

- ▶ X is positive forward (posterior to anterior)
- ▶ Y is positive right
- ▶ Z is positive down

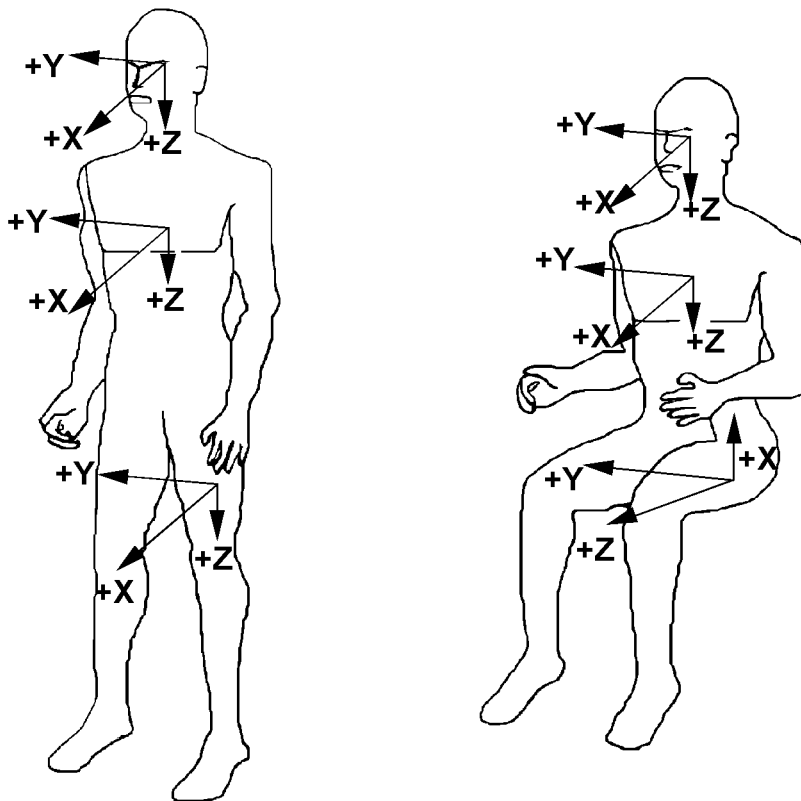
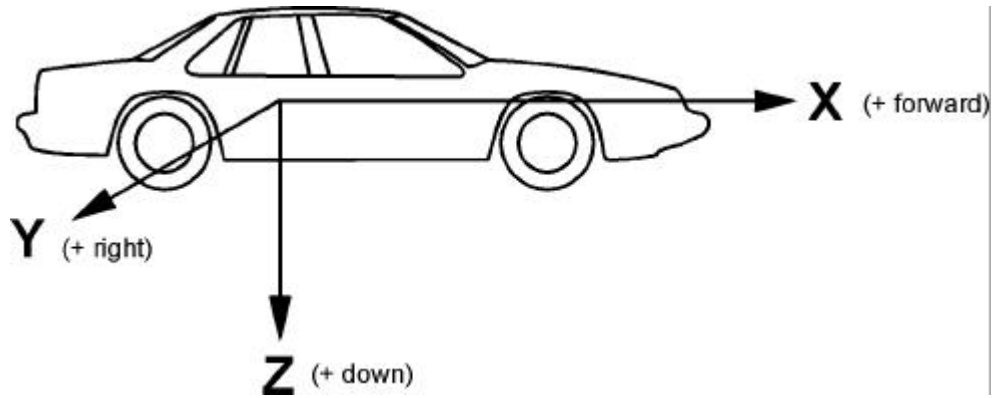


Figure D-1: Vehicle and Body-Based Coordinate Systems

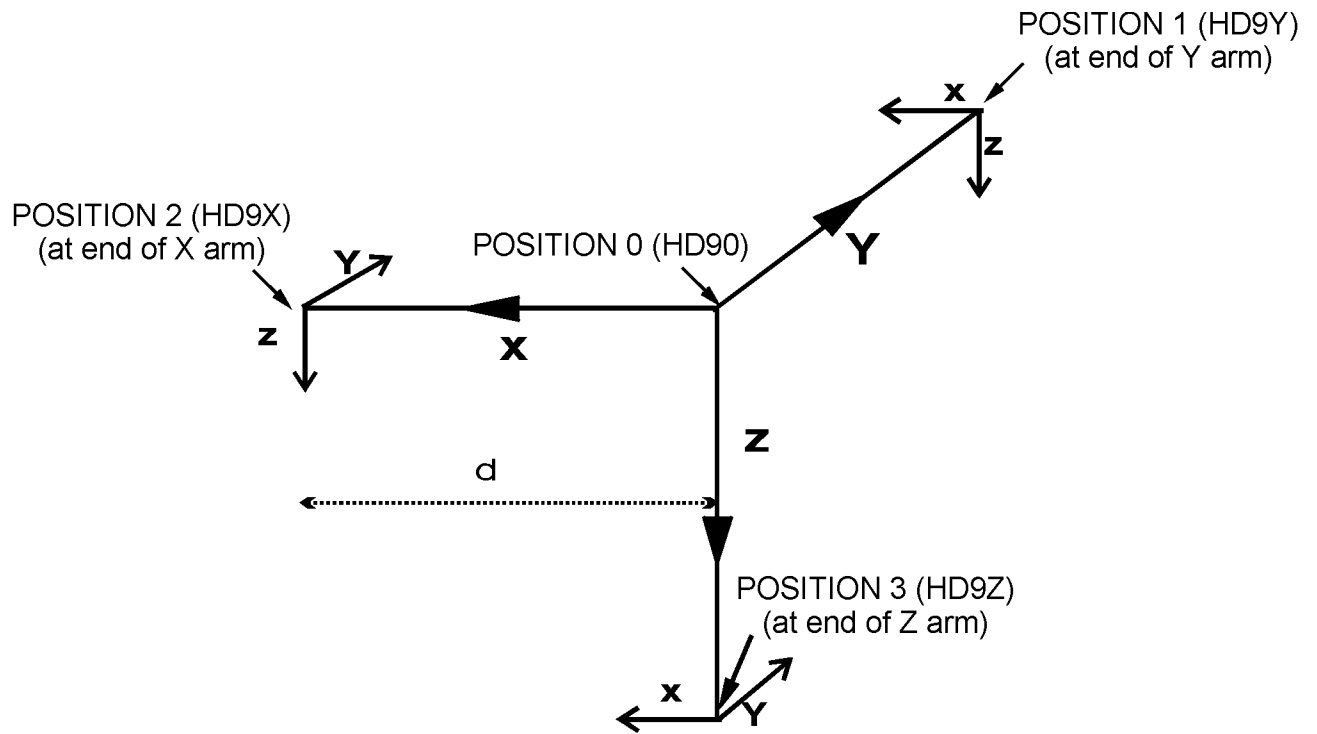


Figure D-2: Coordinate System for 9-Accelerometer Array

TABLE D.1

Dummy Manipulations for Checking Recorded Load Cell Polarity Relative to Sign Convention

Load Cell	Measure	Dummy Manipulations	Polarity
Upper and lower neck loads	Fx	Head rearward, chest forward	+
	Fy	Head leftward, chest rightward	+
	Fz	Head upward, chest downward	+
	Mx	Left ear toward left shoulder	+
	My	Chin toward sternum	+
	Mz	Chin toward left shoulder	+
Left shoulder loads (BIOSID)	Fx	Left shoulder forward, chest rearward	+
	Fy	Left shoulder rightward, chest leftward	+
	Fz	Left shoulder downward, chest upward	+
Right shoulder loads (BIOSID)	Fx	Right shoulder forward, chest rearward	+
	Fy	Right shoulder rightward, chest leftward	+
	Fz	Right shoulder downward, chest upward	+
Clavicle loads	Fx	Shoulder forward, chest rearward	+
	Fz	Shoulder downward, chest rearward	+
Upper and lower lumbar spine	Fx	Chest rearward, Pelvis forward	+
	Fy	Chest leftward, pelvis rightward	+
	Fz	Chest upward, pelvis downward	+
	Mx	Left shoulder toward left hip	+
	My	Sternum toward front of legs	+
	Mz	Right shoulder forward, left shoulder rearward	+
Sacrum load (BIOSID)	Fy	Left H-point pad leftward, chest rightward	+
Left iliac load (BIOSID)	Fy	Left iliac rightward, chest leftward	+

TABLE D.1 (continued)

Load Cell	Measure	Dummy Manipulations	Polarity
Right iliac load (BIOSID)	Fy	Right iliac rightward, chest leftward	+
Pubic load (side impact)	Fy	Right H-point pad leftward, left pad rightward	(-)
Crotch belt loads	Fx	Pubic rearward, pelvis forward	(-)
	Fz	Pubic upward, chest downward	(-)
Iliac lap belt loads	Fx	Upper iliac spine rearward, chest forward	(-)
	My	Upper iliac spine rearward, chest forward	+
Left side abdominal load (Eurosid-1)	Fy	Left side of abdomen rightward, chest leftward	+
Right side abdominal load (Eurosid-1)	Fy	Right side of abdomen leftward, chest rightward	(-)
Femur loads (dummy in seated position, femurs horizontal)	Fx	Knee upward, upper femur downward	+
	Fy	Knee rightward, upper femur leftward	+
	Fz	Knee forward, pelvis rearward	+
	Mx	Knee leftward, hold upper femur in place	+
	My	Knee upward, hold upper femur in place	+
Knee clevis	Mz	Tibia leftward, hold pelvis in place	+
		Tibia downward, femur upward	+
Upper tibia loads	Fz	Tibia downward, femur upward	+
	Mx	Ankle leftward, hold knee in place	+
	My	Ankle forward, bottom of knee clevis rearward	+
Lower tibia loads	Fx	Ankle forward, knee rearward	+
	Fy	Ankle rightward, knee leftward	+
	Mx	Ankle leftward, hold knee in place	+
	My	Ankle forward, bottom of knee clevis rearward	+

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