TP-119-04

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

# LABORATORY PROCEDURES FOR TIRE TESTING AND DATA REPORTING

## FMVSS 119

## NEW PNEUMATIC TIRES FOR VEHICLES OTHER THAN PASSENGER CARS

## ENFORCEMENT

## OFFICE OF VEHICLE SAFETY COMPLIANCE WASHINGTON, D.C.

TP-119-04 ISSUED MAY 1988

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# SECTION 1
# INTRODUCTION

## *1.1 RESPONSIBILITIES FOR PROGRAM ADMINISTRATION AND PROCUREMENT*

The Department of Transportation (DOT), National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) is responsible for administering the tire testing program. The procurement of test items is a responsibility of the NHTSA Office of Contracts and Procurement. No information concerning the standards enforcement testing program will be transmitted to anyone except the NHTSA Contract Technical Manager (CTM) unless specifically authorized by the NHTSA CTM or his supervisor. No individuals, other than contractor personnel directly involved in the test program, shall be allowed to witness any tire test unless specifically authorized by the NHTSA CTM or his supervisor.

## *1.2 PURPOSE AND SCOPE*

This manual describes the standard laboratory tire test and reporting procedure for independent testing laboratories in conformance with the Federal Motor Vehicle Safety Standard (FMVSS) 119, effective 1 March 1975. As amendments become effective , this procedure will be modified accordingly. Instructions for test preparation, test performance, recording tire data, and reporting test results are presented in detail, in this manual.

This manual is organized as follows:

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The procedure is in no way to conflict with the requirements set forth in FMVSS 119 or any amendments thereto. Any contractor interpreting any part of this

procedure to be in conflict with FMVSS 119 or noting any deficiency in it is required to advise the NHTSA CTM for a resolution or the discrepancy prior to testing.

**NOTE**

The testing laboratory is responsible for testing tires to all applicable requirements of this standard. The laboratory is responsible for verifying accuracy of computer data sheets supplied prior to the initiation of testing.

## *1.3 DEFINITIONS OF TERMS*

Definitions for all technical terms and specific words and phrases is found in the Glossary of Terms in Appendix A at the end of this manual. Should any questions arise concerning the meaning of certain terms, refer to this Glossary.

## *1.4 TIRE TEST PROGRAM AUTOMATIC DATA PROCESSING SYSTEM*

The Tire Compliance Program will use automated data processing techniques. This system is designed to more accurately and quickly qualify test results in conformance with FMVSS 119, establish a common language for all program participants, minimize invalid tests, eliminate redundancy of effort, and provide NHTSA Office of Vehicle Safety Compliance (OVSC) with timely test results and laboratory status information.

To this end, the Tire Test Reporting System has been developed for installation on Personal Computers (PCs) in the laboratories, and at the OVSC Contract Computer Center (OVSC-CC) which is responsible for validating tire test results, reporting these results to OVSC, and maintenance of the TTR System.

# SECTION 2
# LABORATORY LOG-IN PROCEDURES

## 2.1 GENERAL

Test samples (Tires) are provided to the testing laboratories by the Government. The laboratories acknowledge receipt of these tires via a TWX mailed to the Office of Vehicle Safety Compliance (OVSC). The incoming TWX is used to generate the Tire Compliance Test Report (TTR) Forms. These forms, with test performance requirements filled in, are used by the laboratories. The laboratories install the Tire Test Reporting (TTR) System software on Personal Computers (PCs) and transmit data to OVSC via diskette.

This section of the manual presents the detailed procedures for tire identification, marking, handling, and storage, and then concludes with an explanation of laboratory log-in, and TTR generation.

## 2.2 TIRE IDENTIFICATION

The test tires, as received, are to be marked and individually identified with a test number which will remain with the tire and be correlated with the laboratory, fiscal year of the program, and the type of test. During check-in, each tire shall be marked with its assigned test number, by use of a paint stick or equivalent marking material. The test laboratory is responsible for initiating and completing two (2) reports:

(1) Laboratory Tire Log-in Report Form

(2) Laboratory Tire Compliance Test Reports

a. In the case of a complete STD 119 test, this will include Category A, B, C or any combination of these categories and Summary Pages.

b. In the case of a special test, this will include category A, B, or C and the Summary.

## 2.3 PRELIMINARY INSPECTION AND TIRE STORAGE

The laboratory shall visually examine the tire's tread, sidewalls, and beads for any apparent damage prior to their final acceptance. The tires shall be entered into a perpetual inventory such that accurate reporting can be made to the Office of Vehicle Safety Compliance over any designated period.

All specimens awaiting testing shall be stored in a clean, secure area protected from direct sunlight, grease, oil, solvents, and any other substance that would contaminate the tire and thus adversely influence the results of the test program. The NHTSA Contractor shall provide appropriate security measures to protect the NHTSA test tires from contact with unauthorized personnel during the entire test program, as well as measures which protect and segregate the data that evolve from testing each tire.

## 2.4 INSTRUCTION FOR PREPARATION OF TIRE LOG-IN REPORT

The Tire Log-in Report will be sent via mail to the automatic processing agency within five (5) days of receipt of test tires, and the basic data will also be maintained at the test laboratory for five (5) years from the date of the test. The Laboratory shall enter data on the system and create a final Log-in report on a computer diskette. A copy of both the Log-in form and the diskette shall be sent to the OVSC within the five day time period. The Log-in report will be sent to OVSC. Each purchase order test tire shipment is recorded as a separate transmission, and grouped into a Matrix Tire Line (MTL). A MTL may have up to thirty test numbers, including the A, B, or C suffix. Complete tire identification data, including all test numbers contained therein, are entered for each MTL on the Log-in form (Figure 2-1). New tires without the DOT certification symbol will not be recorded on this form. The laboratory will request disposition instructions of these tires from the CTM. After Log-in, all reference to a test tire is by test number, including the Suffix A, B, or C, for the test category.

The Log-in form is designed for ease of interpretation and uniform recording. To eliminate potential erroneous interpretation of data, simple alphanumeric codes are used to identify the tire manufacturer, brand, name, material and construction.

These codes are entered on the form, by the TTR System. (see Section 6 for instructions on the use of the TTR System, and Appendices B and C for codes).

The Log-in form is roughly divided into three sections:

- The tire general identification fields, which includes the MTL number, tire manufacturer, brand, and name;
- The test number, date code section; and
- The tire parameters section, which includes details about tire construction, materials, size, inflation and loading, and so forth.

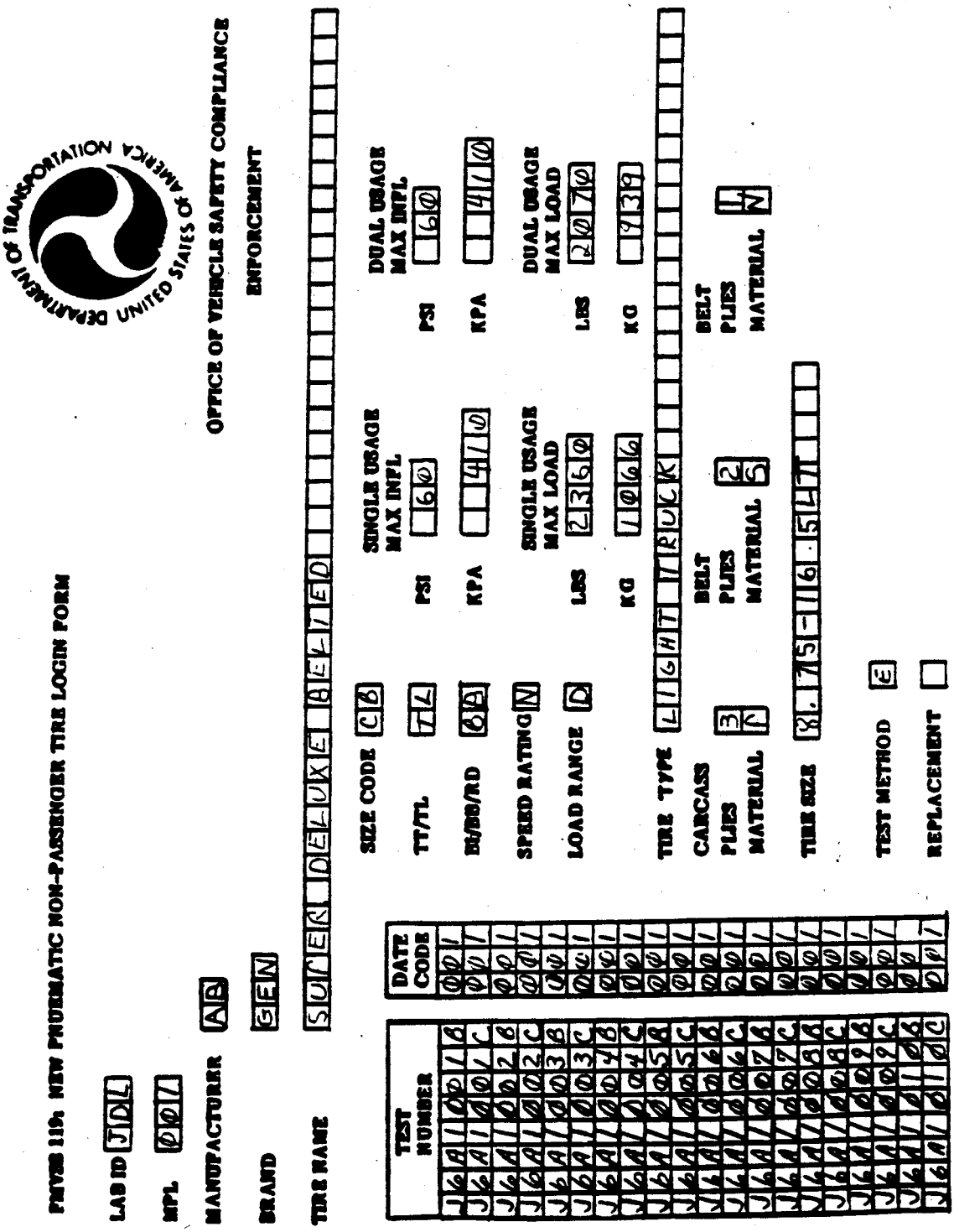



Figure 2-1 FMVSS 119 Tire Test Log-in Form

**NOTE**

When the data below are entered using the Tire Test Reporting System, the data parameters are identical, but the order for entry is different. See Section 6 for details.

Instructions for each of these sections follows:

## Tire General Identification Fields

- Enter the appropriate Lab ID. Current valid codes are:

  SSS = Smithers Scientific Services
  STL = Standards Testing Laboratories
  DTB = Dayton T. Brown, Inc.

- Enter the MTL number, right justified. Example:

  001 = Matrix Tire Line 1.

- Enter the two letter manufacturer's code. All valid codes are listed in Appendix B of this manual. The code is extracted from the first two letters of the tire's serial number. If this code does not appear in the table in Appendix B, OVSC shall be informed prior to sending the Log-in.

- Enter the three letter brandname code. All valid brandname codes are listed in Appendix C of this manual. If the brandname does not appear in Appendix C, OVSC shall be informed prior to sending the Log-in.

- Enter the Tire name as it is printed on the tire, including spaces, up to 41 characters. In the unlikely event that the tire name exceeds 41 characters, truncate the tire name, and inform OVSC.

## Test Number and Date Code

- Enter the Test number, including the A, B, or C suffix, in the Test Number Field. The test number consists of eight characters.

- The first is a code letter identifying the test laboratory,

- The second is the last number of the fiscal year (6 for 1986, 7 for 1987, etc.),

- The third digit is a letter identifying the type of test as Standard FMVSS-119. The letter "A" is used for Standard Matrix Tests, "B" is for Retest of matrix failures, and "F" for Consumer Complaint Responsive testing.

- The next four digits are assigned serially from a block of numbers provided each laboratory by the OVSC. These numbers account by individual tire, for all tires received by the laboratory and further identify the laboratory by the unique number series assigned to each laboratory. The last character is a letter identifying the test as a Category A, B, or C. The following is a sample test number:

  J6A4001A Test Category
  Block Serial Number (see above paragraph)
  Test Type (see above paragraph)
  Fiscal Year (FY86)
  Laboratory Identification (John Doe Labs, Inc.)

- Enter the date code in the appropriate field. The date code is extracted from the last three characters of the ID number. (See Figure 4-1 for instructions for determination of the Tire ID number.)

**Tire Parameters**

- Enter the two character size code in the size code field, if known.

- In the TT/TL field, enter TT if the tire is tube-type, and TL if it is tubeless type.

B - Bias - street
I - " deep tread
E - belted bias - street
S - " " - deep tread

- Enter B or I if the tire is of non-belted Bias construction, enter E or S if the tire is of Belted Bias construction, enter R or A if it is of Radial construction.

A - Radial tire, deep tread
R - " street

- Enter the speed restriction, if any, in the appropriate field. If there is none, enter, leave the field blank.

- Enter the Tire Load Range letter. Valid characters are: A, B, C, D, E, F, G, H, J, L, and N.

- Enter the Single Usage Maximum Inflation Pressure in pounds per square inch (psi) and, if known, kilopascals (kpa).

- Enter the Single Usage Maximum Load in pounds (lbs) and, if known, kilograms (kg).

- Enter the Dual Usage Maximum Inflation Pressure in pounds per square inch, (psi) and if known, in kilopascals (kpa).

- Enter the Dual Usage Maximum Load in Pounds (lbs) and, if known, in Kilograms (kg).

- Enter the Tire Type Code. Valid Codes are:

  K = Light Truck
  C = Motorcycle
  T = Others

- Enter the Carcass and Belt plies as follows:

Carcass plies are defined as those plies that extend from bead to bead. Belt plies are defined as those plies that extend circumferentially around the tire, below the tread, but above the Carcass Plies. Enter under Carcass plies the number of plies that extend from bead to bead. Enter the one letter material code from Table 2-1 for the Carcass Plies

- Two fields are provided for belt plies for often tires will have more than one type of material used for the belts. If only one type of material is used for the belts, fill in only one of these two sets. If more than one type of material is used, in the first Plies field, enter only the number of plies composed of that material. In the second belt Plies field, enter only the number of plies composed of the second material. In the respective material fields, enter the one letter code from table 2-1

**VALID MATERIAL CODES**

| | |
|---|---|
| A | ARAMID |
| D | DUPONT-1 |
| F | FIBERGLASS |
| N | NYLON |
| P | POLYESTER |
| R | RAYON |
| S | STEEL |

Table 2-1

- Enter the Tire Size exactly as it appears. In case there are two sizes given, only one size will be used on the log-in. Record the larger tire size designation only. When size is given in both inches and metric, report metric.

- Enter the Test Method: E for English, and M for Metric.

- Enter R if the test(s) are replacements. Otherwise, leave blank.

## *2.5 TIRE TEST REPORT (TTR) FORM*

The FMVSS-119 Tire Test Report Form provides a recording of test results for each tire tested and a summation of results for the entire sample. This form is generated by OVSC or by the laboratory using the TTR System.

FMVSS-119 specifies test requirements and the number of test samples per test. Accordingly, the Tire Test Report consists of individual forms for reporting results of the entire test sample, and recording labeling test results. Tire Report forms are identified as follows:

- FMVSS-119 Summary and Labeling Test
- FMVSS-119 Category A Test (Strength only)
- FMVSS-119 Category B Test (Endurance)
- FMVSS-119 Category C Test (High Speed)

The blank Tire Test Report Forms can be generated by the laboratory immediately. To assure report identification uniformity, and to minimize the possibility of human error in completing certain data on the report forms, requirements are filled in on the blank report forms automatically by the computer. The preprinted performance requirements are determined by the data on the Log-in and pertain to a specific tire for a specific test category. These requirements are extracted from FMVSS-119 and/or applicable references. All other test items constitute laboratory test results and for A, B, and C tests, as appropriate, are entered on the forms as test phases are completed. The Summary section of the Labeling test and Summary Report is completed by extracting appropriate data from the completed Category A, B, and C forms and completed Labeling Test section.

The screens of the Tire Test Reporting System replicate the TTR forms, including the preprinted performance requirements. If the automated system does not produce these requirements, either the log-in data was entered incorrectly, or some of the

data, such as Tire Size, is not present in the TTR System's reference tables. In the latter event, consult OVSC, and obtain the missing requirement data so that the test is run correctly.

The following data elements represent the preprinted requirements in accordance with the applicable test category.

- FMVSS-119 Category A Test

  Identification Data (from Log-in)

  Testing Laboratory
  Test Number
  All data pertaining to Tire Identification

  Tire Strength Test

  Recommended Test Rim Size
  Tire Pressure
  Plunger Diameter
  Minimum, Static Breaking Energy
  Temperature

- FMVSS-119 Category B Test

  Identification Data

  Testing Laboratory
  Test Number
  All Data Pertaining to Tire Identification

  Tire Endurance Test

  Temperature
  Recommended Test Rim Size
  Tire Pressure
  Test Cycle Duration Times (hours)
  Test Wheel Speed (MPH)
  Required Load, Lbs. (for each Cycle)

- FMVSS-119 Category C Test

  Identification Data

  Testing Laboratory
  Test Number
  All Data pertaining to Tire Identification

High Speed Performance Test

Temperature
Recommended Test Rim Size
Tire Pressure
Required Load, Lbs.
Speed in MPH.

| | |
|---|---|
| Break-in Period | 50 MPH |
| 1st Cycle | 75 MPH |
| 2nd Cycle | 80 MPH |
| 3rd Cycle | 85 MPH |

Sample Test Report Forms are shown in Figures 2-2, 2-3, and 2-4. Each test category is filled in as the various operations are completed by the responsible laboratory specialist. Likewise, the appropriate screens of the TTR System should be entered (See Section 6). After conclusion of Tests A, B, and C (all of which must be completed within five working days of each other), the Summary Sections of both the form and the screens are completed and authenticated. The entire report, including completed forms A, B, and C, is mailed to OVSC-CC, (or the export function of the TTR System can be used) and the diskette is mailed to OVSC-CC within five working days of the completion of the last tire test (within ten days of test initiation for tire A, B, or C).

TEST LAB: JOHN DOE LABS, INC. FMVSS 119 TIRE TEST REPORT - SUMMARY, LABELING TEST TEST NO.: 7881001

TIRE IDENTIFICATION: MANUFACTURER: GENERAL TIRE NAME: SUPER DELUXE BELTED DS NUMBER:

BRAND NAME: GENERAL TIRE TYPE: B TIRE SIZE: 8.75-16.5LT LOAD RANGE: D SPEED RATING: H VEH NUMBER: 001

MATERIAL: CARC-(3)PLYEST BELT-(2)STEEL BELT-(1)NYLON SPEED RESTRICTION: NA

CONSTRUCTION: TUBELESS/BELTED BIAS TEST MEASUREMENT: ENGLISH

SIN. MAXIMUM INFLATION PRESSURE: 080 PSI / 00410 KPA DUAL MAXIMUM INFLATION PRESSURE: 060 PSI / 00410 KPA

SIN. MAXIMUM LOAD RATING: 2350 LBS / 1066 KG DUAL MAXIMUM LOAD RATING: 2070 LBS / 0939 KG

| TEST CATEGORY A, B, C | TIRES | TEST RESULTS (P/F) | REMARKS: |
|---|---|---|---|
| LABELING | A,B,C | ___/___/___ | _____ |
| STRENGTH | A | _____ | _____ |
| ENDURANCE | B | _____ | _____ |
| HIGH SPEED | C | _____ | _____ |

| LABELING REQUIREMENTS | TIRE A | TIRE B | TIRE C |
|---|---|---|---|
| BRAND NAME | _____ | _____ | _____ |
| SIZE DESIGNATION | _____ | _____ | _____ |
| SIN. MAX. INFL. PRESS.(PSI) | _____ | _____ | _____ |
| DUAL MAX. INFL. PRESS.(PSI) | _____ | _____ | _____ |
| SIN. MAX. LOAD RATING(LBS) | _____ | _____ | _____ |
| DUAL MAX. LOAD RATING(LBS) | _____ | _____ | _____ |
| | PLY MAT | PLY MAT | PLY MAT |
| CARCASS MATERIAL | ___/___ | ___/___ | ___/___ |
| BELT MATERIAL | ___/___ | ___/___ | ___/___ |
| BELT MATERIAL | ___/___ | ___/___ | ___/___ |
| TUBELESS/TUBE | _____ | _____ | _____ |
| CONSTRUCTION | _____ | _____ | _____ |
| ID. NO. | _____ | _____ | _____ |
| CONFIRMATION SYMBOL (Y/N) | _____ | _____ | _____ |
| TREAD WEAR INDICATOR (Y/N) | _____ | _____ | _____ |

TESTED TO OVSC TEST PROCEDURE REVISED: ___/___/___

LABORATORY APPROVAL: _____
SIGNATURE AND TITLE

___/___/___
DATE

NHTSA ACCEPTANCE: _____
SIGNATURE

___/___/___
DATE

R-RAYON N-NYLON P-POLYESTER S-STEEL F-FIBERGLASS G-HYBRN
A-ARAMID D-DUPONT/DPI TT-TUBE TYPE TL-TUBELESS BB-BELTED BIAS
RD-RADIAL BI-BIAS PLY

Figure 2-2 - Summary and Labeling Test Report Form

TEST LAB: JOHN DOE LABS, INC. FMVSS 119 CATEGORY B TEST - TIRE TEST REPORT TIRE NO. J6A10018

TIRE IDENTIFICATION: MANUFACTURER: GENERAL MAN.CODE: AB BRAND: GENERAL ID NO: AB001

TIRE TYPE: R TIRE SIZE: 8.75-16.5LT LOAD RANGE: D SPEED RATING: H SPEED RESTRICTION: NA

MATERIAL: CARC-(3)PLYEST BELT-(2)STEEL BELT-(1)NYLON CONSTRUCTION: TUBELESS/BELTED BIAS

SIN. MAXIMUM INFLATION PRESSURE: 060 PSI / 00410 KPA DUAL MAXIMUM INFLATION PRESSURE: 060 PSI / 00410 KPA

SIN. MAXIMUM LOAD RATING: 2350 LBS / 1066 KG DUAL MAXIMUM LOAD RATING: 2070 LBS / 0939 KG

TIRE ENDURANCE TEST: PRE TEST DEFECTS NOTED: (Y/N) ___ RIM CONDITION SATISFACTORY: (Y/N) ___

TEST RIM WIDTH: 6.75 RIM WIDTH USED: _____ RIM NO.: _____ SPECIFIED INFL. PRESSURE: 060 PSI

3 HRS. CONDITIONING: START: DATE: __/__/__ TIME: _____ PSI: _____ TEMP.: _____

(95+0-10 DEG. F.) END: DATE: __/__/__ TIME: _____ PSI: _____ TEMP.: _____ COND.3 HRS.(Y/N): ___

INFL. PRESS ADJUSTED FROM _____ PSI TO _____ PSI WHEEL POSITION: ___ MACHINE NO. ___ MACHINE TYPE: AIR

START DATE __/__/__ END DATE __/__/__

| | 7 HOURS | | 16 HOURS | | 24 HOURS | | REMARKS: _____ |
|---|---|---|---|---|---|---|---|
| TIME START/END | ____ | ____ | ____ | ____ | ____ | ____ | _____ |
| REQUIRED LOAD, LBS. | 01762 | | 02279 | | 02679 | | _____ |
| TEST LOAD, LBS. | ____ | | ____ | | ____ | | _____ |
| TEST SPEED(250 RPM) | ____ | | ____ | | ____ | | _____ |
| TEST AREA TEMPERATURE | | | | | | | _____ |
| START/END | ____ | ____ | ____ | ____ | ____ | ____ | _____ |
| PSI END OF PERIOD | ____ | | ____ | | ____ | | _____ |
| TEST RESULTS: PASSED/FAILED | | | | | | | _____ |

TEST PERFORMED BY: _____ DATE: __/__/__ LABORATORY APPROVAL: _____ DATE: __/__/__
SIGNATURE , TITLE

Figure 2-3 - Category B Test Report Form

TEST LAB: JOHN DOE LABS, INC. FMVSS 119 CATEGORY C TEST - TIRE TEST REPORT TIRE NO. J6A1001C

TIRE IDENTIFICATION: MANUFACTURER: GENERAL MAN.CODE: AB BRAND: GENERAL ID NO: AB001

TIRE TYPE: K TIRE SIZE: 8.75-16.5LT LOAD RANGE: D SPEED RATING: M SPEED RESTRICTION: NA

MATERIAL: CARC-(3)PLYEST BELT-(2)STEEL BELT-(1)NYLON CONSTRUCTION: TUBELESS/BELTED BIAS

SIN. MAXIMUM INFLATION PRESSURE: 060 PSI / 00410 KPA DUAL MAXIMUM INFLATION PRESSURE: 060 PSI / 00410 KPA

SIN. MAXIMUM LOAD RATING: 2350 LBS / 1066 KG DUAL MAXIMUM LOAD RATING: 2070 LBS / 0939 KG

HIGH SPEED PERFORMANCE TEST: PRE TEST DEFECTS NOTED: (Y/N) ___ RIM CONDITION SATISFACTORY: (Y/N) ___

TEST RIM WIDTH: 6.75 RIM WIDTH USED: _____ RIM NO.: _____ SPECIFIED INFL. PRESSURE: 060 PSI

3 HRS. CONDITIONING: START: DATE: __/__/__ TIME: _____ PSI: _____ TEMP.: _____

(95+0-10 DEG. F) END: DATE: __/__/__ TIME: _____ PSI: _____ TEMP.: _____ COND.3 HRS.(Y/N): ___

INFL. PRESS ADJUSTED FROM _____ PSI TO _____PSI WHEEL POSITION: ___MACHINE NO.: ___ MACHINE TYPE: AIR

START DATE __/__/__ END DATE __/__/__

| | BREAK-IN PERIOD | COOLING PERIOD | HIGH SPEED PERIOD | | |
|---|---|---|---|---|---|
| | 250 RPM | 0 RPM | 1ST CYCLE:375 RPM | 2ND CYCLE:400 RPM | 3RD CYCLE:425 RPM |
| TIME START/END | ___/___ | ___/___ | ___/___ | ___/___ | ___/___ |
| REQUIRED LOAD, LBS. | 02068 | | 02068 | 02068 | 02068 |
| TEST LOAD, LBS. | ___ | | ___ | ___ | ___ |
| TEST SPEED RPM | ___ | ___ | ___ | ___ | ___ |
| TEST AREA TEMPERATURE | | | | | |
| START/END | ___/___ | ___/___ | ___/___ | ___/___ | ___/___ |
| PSI END OF PERIOD | ___ | ___ | ___ | ___ | ___ |

TIRE TEMP END OF COOLING PERIOD: ___ ___ ___

TEST RESULTS: PASSED/FAILED

REMARKS: _____ ____

TEST PERFORMED BY: _____ DATE: __/__/__ LABORATORY APPROVAL: _____ DATE: __/__/__
SIGNATURE , TITLE

Figure 2-4 - Category C Test Report Form

# SECTION 3
# GENERAL LABORATORY PROCEDURES

## 3.0 GENERAL

This section presents general laboratory procedures that are either contractually required prior to commencement of testing or general procedures to be followed in addition to actual test procedures.

## 3.1 CALIBRATION OF MEASUREMENT AND TEST EQUIPMENT

Before starting the test program the contractor shall implement and maintain a measurement and test equipment calibration system in accordance with established calibration practices. Guidelines for setting up and maintaining such systems are described in MIL-C-45662A, "Calibration System Requirements".

**NOTE**

In the event of an indicated failure to meet the performance requirements of the standard being tested, a post-test calibration check of some critically sensitive test equipment and instrumentation may be required for the verification of accuracy. The necessity for the calibration will be at the CTM's discretion and will be performed without additional costs.

In the event of a catastrophic failure (tire explosion) the entire test fixture will be recalibrated.

The calibration system shall be set up and maintained as follows:

1. Standards for calibrating the measuring and test equipment shall be stored and used under appropriate environmental conditions to assure their accuracy and stability.

2. All measuring instruments and standards shall be calibrated by the contractor, or a commercial facility, against a higher order standard at periodic intervals not exceeding 6 months and at any time the equipment or measuring devices are disturbed or suspect for any reason. Records, showing the calibration traceability to the National Bureau of Standards, shall be maintained for all measuring and test equipment.

3. All measuring equipment, test equipment and measuring standards shall be labeled with the following information:

   a. Date of calibration.

b. Date of next scheduled calibration.

c. Name of the person who calibrated the equipment.

4. A written updated calibration procedure shall be provided by the contractor annually to the OVSC, which includes as a minimum the following information for all measuring and test equipment used to record all test parameters - required.to be automatically and continuously recorded (including time):

   a. Type of equipment, manufacturer, model number, etc.

   b. Measurement range.

   c. Accuracy.

   d. Calibration interval.

   e. Type of standard used to calibrate the equipment.

   (Calibration traceability of the standard must be evident.)

5. Records of calibrations for all measuring and test equipment shall be kept by the contractor in a manner which assures the maintenance of established calibration schedules. All such records shall be readily available for inspection when authorized by the NHTSA Contract Technical Manager. The calibration system will need the acceptance of the NHTSA Contract Technical Manager before testing commences.

6. As a minimum the measurement and test equipment calibration system will encompass:

   a. Equipment and devices to measure and/or record all test parameters required by this Laboratory Procedures manual.

   b. Alignment of the test tire axle with the road wheel axle in both loaded and unloaded condition. For loaded condition, loads used should be as follows:

      2500 lbs. Light Truck

      8000 lbs. Heavy Truck

      300 lbs. Motorcycle

   Maximum allowable misalignment is ten (10) minutes of arc for camber and toe-in.

   c. The roughness and runout of the test wheel. A test wheel shall not be used when surface roughness exceeds .000125 inch or runout exceeds .010 inch Total Indicated Runout (TIR).

## 3.2 LABORATORY OPERATING TEST PROCEDURE APPROVAL

Prior to starting the test program, the contractor shall provide a written current operating test procedure which includes a step-by-step description of the test methodology used in the program and annually thereafter. Where appropriate, the test procedure will include items such as checkoff lists and individual worksheets for each testing phase. The operating test procedure will need the acceptance of the NHTSA Contract Technical Manager before testing commences and should incorporate as a minimum the following items:

1. Tire Identification and Marking. (Refer to paragraph 2.2 for discussion).

2. Test Tire Handling and Storage. (Refer to paragraph 2.3 for discussion).

3. Test Rims. Tires tested in accordance with the requirements of FMVSS-119 must be tested on a rim designated as a test rim (alternate rim widths are not acceptable without authorization from the (CTM) in the Tire and Rim Association Year Book, the Tire and Rim Association Supplementary Service Data Book, the Tire and Wheel Engineering Data Book of the Society of Motor Manufacturers and Traders Limited (SMMT),the Japan Automobile Tire Manufacturers Association, the Japanese Industrial Standards (JIS-D4202), the European Tyre and Rim Technical Organization practices (E.T.R.T.O.), or Deutsche Industrie Norm (DIN) 7817. A laboratory must obtain written approval from OVSC to use other than specified rims. Prior to initial usage, the conformance dimensions of each test rim will be verified by physical and appropriate measurement. Physical Test rim measurements shall include the use of calibrated dial gauge indicators ball gauge, mandrel, diameter, contour gauges and TRA sliding type gauge or equivalent. Test Rim measurements shall include those for lateral and radial runout. The rim is to be measured at the bead seat area as defined by the Tire and Rim Association Year Book. Maximum allowable runout being: .030" for radial and .040" for lateral. Each test rim shall be remeasured immediately after a tire failure on that rim. If no failures occur remeasure each rim at least every 25th mounting. A log of these measurements shall be maintained and made available to the laboratory monitor.

   If at any time a rim dimension falls outside its dimensional tolerances, that rim shall not be used for testing in this program. The test rims used are to be identified numerically and assigned specifically to a tire so that it can be established that the tire was tested on a specific rim. The test report form will indicate the rim used and the before and after test rim visual inspection results. This visual inspection will include at least a check for obvious deformation of pilot hole, bolt holes, rim contours, cracks, etc.

4. Test Logs. A log of the progress of each test shall be entered routinely during the test on a form suited to the individual test laboratory. This log format will be approved by the Contract Technical Manager for maximum attainable standardization of all testing laboratories. This log will be retained by the laboratory and made available upon request by the Office of

Vehicle Safety Compliance to support test report data. In the event of a failure of a test tire the initial report of Test Tire Failure (Section 5.0) will be followed.

**NOTE**

In the event of an indicated failure of a tire to meet the standard's performance requirements, a formal post-test recalibration check of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. In any event, the contractor is responsible for confirming that all equipment and instruments are in good working order prior to the next test. The necessity for each formal recalibration check, which must be traceable to the National Bureau of Standards, will be at the CTM's discretion. A routine post-test or daily calibration check, normally performed as part of the contractor's operating test procedure, where instruments are compared to physical parameters (e.g., ice bath for thermocouples) or by shunt calibrations (e.g., load cells), is not considered a formal recalibration check.

# SECTION 4
# TEST PROCEDURES

## 4.1 INTRODUCTION

This procedure serves as an operating supplement for testing to the Federal Motor Vehicle Safety Standard 119. Parameters are herein described for the following categories:

| Test Requirements | Sample A | Sample B | Sample C |
|---|---|---|---|
| (1) Tire Marking | X | X | X |
| (2) Tread Wear Indicators | X | X | X |
| (3) Tire Strength | X | | |
| (4) Tire Endurance | | X | |
| (5) Tire High Speed (Load Ranges ABCD Only) | | | X |

## 4.2 RECEIVING TEST SAMPLES

Each test tire will be received in such a manner as to avoid cuts, scuffs, tears, or any other deleterious condition that may affect the test validity. The receiving laboratory shall also audit the shipping documents to verify their correctness. Should any inconsistencies be noted, the CTM shall be contacted for disposition. Should improper shipping occur during non-working hours, then the laboratory shall accept the specimens and mark the document in such a manner that a claim can be made should the CTM deem it necessary.

**NOTE**

The NHTSA Contractor shall provide appropriate security measures to protect the NHTSA test tires from unauthorized personnel during the entire test program, as well as to protect and segregate the data that evolve from testing each tire.

## 4.3 GOOD HOUSEKEEPING

NHTSA Contractors will maintain the entire tire test area, test fixtures, and instrumentation in a neat, clean, and painted condition with test instruments set in an orderly manner consistent with good test laboratory housekeeping practices.

## 4.4 TEST INTERDEPENDENCE

The testing of each tire as a test sample will proceed independently. The results of one tire will not effect the completion of the remaining tires in that sample or the completion of the tire line unless otherwise instructed by the CTM.

## 4.5 TEST RIMS (MODEL RIMS)

FMVSS-119 utilizes and defines the concept of a "model rim." All physical dimensions of the "model rim" shall conform with published dimensions of a standard production rim commercially available. Tires tested in accordance with FMVSS-119 must be mounted on a rim with any configuration as shown appropriate for that tire size and designation in an associative table found in publications referenced in the standard, or alternatively in a publication issued by the tire manufacturer and distributed to dealers and to the public on request. In case of conflict, the latter type of publication would prevail over an associative table. Applicable publications are: The Tire and Rim Association, the European Tyre and Rim Technical Organization, Japanese Industrial Standards, Deutsche Industrie Norm, the Society of Motor Manufacturers and Traders, Ltd., British Standards Institution, and Scandinavian Tire and Rim Organization. Test conformance of each test rim will be verified by physical measurements and visual inspection. The physical measurements taken shall include diameter, width, radial runout and lateral runout.

Diameter and width measurements shall be made in accordance with procedures defined in the current TRA Year Book. The diameter will be verified using a mandrel calibrated disk tape or equivalent. The width shall be verified using a TRA Sliding Gage or equivalent. Tolerances as to diameter or width are as published in the current TRA Year Book for the particular rim involved. Lateral and radial runouts are to be measured in the bead seat areas. Rims with only one fixed flange will be measured on that side for lateral runout, disregarding the removable flange. These areas are defined in the current TRA Year Book. Tolerances on lateral and radial runout are as shown in Table 4-1. Prior to making measurements, the wheel shall be

Table 4-1

**Lateral and Radial Runout Tolerances**

(All measurements in inches)

| LATERAL | | RADIAL | |
|---|---|---|---|
| Width | Runout | Diameter | Runout |
| Up to 8 | 0.040 | Up to 15 | 0.030 |
| 8.1 to 10 | 0.050 | 15.1 to 17.5 | 0.035 |
| 10.1 to 12 | 0.060 | 17.6 to 20.0 | 0.040 |
| 12.1 to 14 | 0.070 | 20.1 to 22.5 | 0.045 |
| 14.1 to 16 | 0.080 | 22.6 and up | 0.050 |
| 16.1 and up | 0.090 | | |

visually examined for paint runs or any other abnormalities that would cause errors in any reading. All abnormalities shall be removed by light filing, sanding, or by the use of steel wool.

The measurements shall be recorded and perpetual records shall be kept and made available to the CTM. The frequency of wheel measurements shall be initial measurement, measurement immediately following tire failure on that rim, and measurement at least every 25th mounting.

The model rims are to be identified by a laboratory assigned serial number which is compatible with the recording requirements as established by these procedures. The serially numbered rims are to be assigned specifically to each tire so that it can be documented that the tire was tested on a specific rim. Prior to mounting of the test tire on the test rim the wheel shall be visually checked for obvious deformation of the pilot hole, bolt holes, contours, safety locks, cracks, etc.

## *4.6 COMPLETION OF SUMMARY SECTION OF TEST REPORT FORM - SUMMARY, LABELING TEST*

After the laboratory technicians have completed the labeling requirements section of the Labeling Test Requirements and Summary Report Form (Figure 2-2) and completed Category A, B, and C tests, the laboratory official responsible to the Office of Vehicle Safety Compliance for the test program completes the Summary section of the Summary, Labeling Test Report Form. This official will verify the tire identification data against the Labeling

Requirements (lower area) in the appropriate spaces on the Summary page (upper area). Then the labeling test data is reviewed on the Labeling Requirements and Summary Report Form, Strength Test Results on the Category A test form, Endurance Test results on the Category B test form, and High Speed Test results on the Category C test form. Then, the official will be responsible for completing data entry on the corresponding screen entries of the TTR System. Completion of both the forms and data entry should be accomplished so that there is duplication of test records.

The following lists the categories which must be addressed and describes the information that is required to complete the form and data entry:

**TIRE IDENTIFICATION**

Manufacturer - List the name of the manufacturer converted from ID Number only

Brand - Brand name molded into/ onto the tire, converted to the three character code.

Name - Tire name (name assigned by the original tire manufacturer) molded into/onto the tire

Size - Tire size molded into/onto the tire

Tire Type - Enter:

K for Light Truck

C for Motorcycle

T for Others

Speed Restriction - Enter one character code or leave blank if non-applicable

Carcass Plies/ Material - Enter the number of carcass plies, and the material code from Table 2-1

Belt-1 Plies/ Material - Enter the number of plies in the first set of belts, and the material code from Table 2-1

Belt-2 Plies/Material - Enter the number of plies in any additional belts and the material code from Table 2-1

Load Range - Enter one of the following characters - A, B, C, D, E, F, G, H, J, L, N.

Construction - Enter:

B or I for Bias (no belts)

E or S for Belted Bias

R or A for Radial construction.

Max. Infl. Press. - Enter the Maximum permissible inflation pressure molded into/onto the tire for both Single, and if applicable, Dual usage.

Maximum Load Rating - Enter the Maximum Load Rating molded into/onto the tire for both Single, and when applicable, Dual Usage.

After evaluating the test results, enter PAS for passed, or FAL for failure, as appropriate, in spaces provided adjacent to each test category, or test item in the Summary section of the Labeling Requirements and Summary Report Form, and the corresponding Screen entry field. In case of a failed tire, a brief description of the nature of the failure will be given in the "Remarks" section. Other remarks may be entered at the discretion of the laboratory official.

**NOTE**

A LABELING OMISSION OR ERROR CONSTITUTES A FAILURE.

Within five (5) days after test completion, the laboratory official who completed the Summary section of the report will sign the report, indicate the date of procedure followed for this test , enter his official title, date it and mail the completed original report to the OVSC-CC, or export the tire data, and send the computer diskette to OVSC-CC.

## LABELING REQUIREMENT

The Labeling Compliance Test consists of visually inspecting each sidewall of each tire of a test group (A, B, or C) and recording the information from the tire's sidewall into the Labeling Requirement Section of the labeling Test and Summary Form. For tires tested to FMVSS-119 each tire shall be labeled with each of the following identifications permanently molded into of onto the tire on each sidewall except as otherwise specified.

Brand Name - Not a 119 requirement, but will be recorded under Labeling Requirements (one side)

Size Designation - When dual size record both (both sides)

Maximum Inflation Pressure - Single/Dual (both sides)

Maximum Load Rating - Single/Dual (both sides)

NOTE

THE MAXIMUM LOAD RATING AND INFLATION PRESSURE OF THE TIRE MUST BE SHOWN AS FOLLOWS:

Tires rated for Single and Dual Load

Maximum Load Single_____lbs. at_____PSI Cold

Maximum Load Dual_____lbs. at_____PSI Cold

Tires Rated Only for Single Load

Maximum Load_____lbs. at_____PSI Cold

Cord Material - Carcass/Belt:(both sides)

Plies - Actual (carcass and belt)(both sides)

Tubeless, Tube Type - (both sides)

Regroovable - (both sides)

Radial:(both sides)

I.D.No. - (one side)

Confirmation Symbol - (One side)

Maximum Speed MPH - if speed restricted (both sides)

Tire Load Range - (both sides)

Tread Wear Indicator - 6 positions for all tires except motorcycle tires and tires with 12-inch rim diameter or less which shall have at least 3 tread wear indicators.

## 4.7 COMPLETION OF LABELING SECTION OF TTR

The entries on the labeling section of the TTR (Figure 2-2) and in the corresponding sections of the Labeling data entry screen shall be as follows:

Brand name - Enter the three character code from Appendix C that corresponds to the name that appears on the sidewall. If the name is not found in the table, or no name is given, enter three asterisks.

Size Designation - Enter the size (do no omit dashes or decimals - e.g. 10.00 - 20)

Maximum Inflation Pressure - Enter psi (record both single/dual if dual designated)

Maximum Load Rating - Enter load in pounds (record dual/single if dual designated)

Carcass Plies/Material - Enter the number of plies and the material from table 2-1

Belt-1 plies/material - enter the number of plies and the material from table 2-1

Tubeless/ Tube Type - Enter TL or TT as appropriate

ID Number -See figure 4-1 to determine the complete ID number. Enter the first two characters, which identify the Manufacturer, and the last three characters, which are the date code.

Confirmation Symbol - If DOT is molded on tire casing, enter "Y", if not, enter "N".

Maximum Speed M.P.H. - Enter speed restriction on tire if shown, or leave blank if non-applicable.

Tire Load Range - Enter letter designating the tire load range.

Tread Wear Indicator - Enter "Y" for yes and "N" for no.

**NOTE**

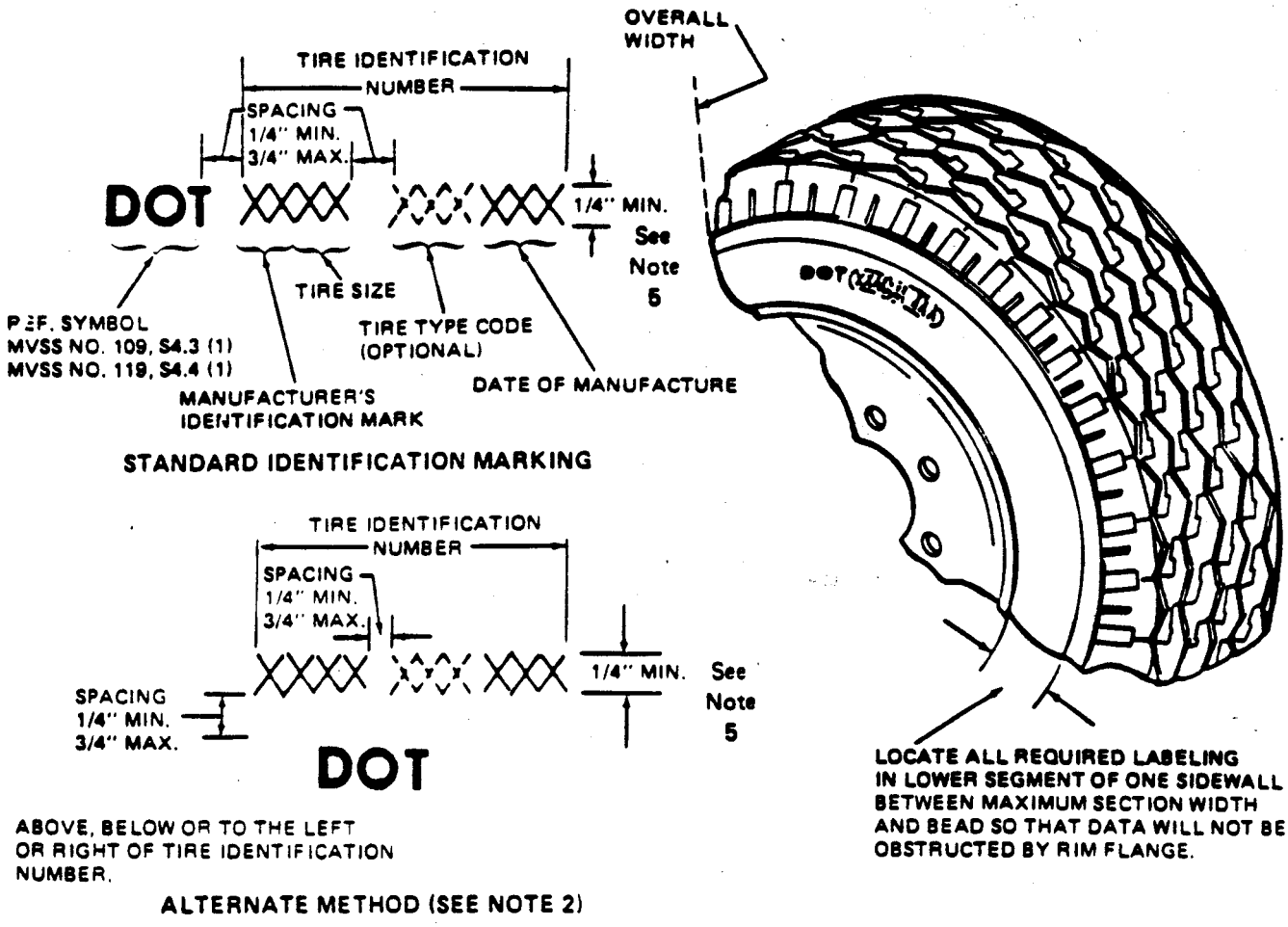
In case of a labeling failure, for items required on both sides of sidewall enter S (serial side) or O (opposite side) besides items of information appearing only on one sidewall. In the TTR System, enter this information in the remarks section, abbreviated as necessary. Beside each item is a #1 or #2, showing if item is required on one (1) or both (2) sides.

Tested to OVSC Procedure Dated - 1/15/78

Lab approval - signature and title of laboratory official responsible to OVSC for tests. In the TTR System, this information must be entered ONLY by that official.

Date - date of laboratory approval, entered by above official.

The tire shall be marked on each sidewall, between the maximum section width (exclusive of sidewall decoration or curb ribs) and the bead information, in letters and numbers not less than 0.078 inches high, as specified above. The markings shall be raised above or sunk below the tire surface not less than 0.015 inches (0.010 for motorcycle tires), except that the tire I.D. numbers will not be less that 0.020 inches and not more than 0.040 inches; for recreational, boat, motorcycle, baggage, and special trailer tires, the markings may appear on the entire sidewall and need appear only on one sidewall.




NOTES:

1. Tire identification number shall be in Futura Bold, Modified condensed or Gothic characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See note 4)

2. Groups of symbol in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.

3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.

4. Other print types will be permitted if approved by the Administration.

5. 5/32" lettering for tires of less than 6.00 inch cross section width as well as those less than 13" bead diameter may be used.

Figure 4-1 Identification Numbers for New Tires.

## *4.8 COMPLETION OF CATEGORY A, SECTION OF TTR*

The entries on the page of the TTR titled "Category A Test" shall be as follows:

**TIRE STRENGTH TEST:**

Pretest Defects Noted - - After visual inspection, enter Y (Yes) or N (No). If yes, clear with laboratory monitor or CTM before testing and inform us of that approval in the remarks section

Rim Condition Satisfactory - After Visual Inspection - Enter "Y" (Yes) of "N" (No)

Rim Size Used - Enter size of rim used

Rim No. - Enter laboratory assigned rim identification number

Twenty four hour conditioning - Enter:

Start - Date, Time, PSI, Temperature (degrees F.)

End - Date, Time, PSI, Temperature (degrees F.)

Inflation Pressure - Enter adjusted from (PSI) and to (PSI)

Plunger Diameter Used - Enter plunger Diameter used (using a whole number and fractions with lowest denominator - no decimals - e.g. 1-1/4 instead of 1-2/8 or 1.25)

Force, Penetration Energy - Entries of minimum of 5 positions or maximum of 9 positions, depending on test results. Force is limited to 5 digits (no decimals). Penetration is limited to 5 characters, 2 before the decimal and 2 mandatory after the decimal - e.g. --.--. Energy is limited to 5 digits (no decimals)

Actual average - Record actual average of last 5 test position results - number must be rounded to nearest whole number (limit of 5 digits)

Passed/Failed - Circle one

Performed by - Initials of technician making the test

Date - Date of test completion. Entry by technician

Laboratory Approval - Signature and title of laboratory official responsible to OVSC for tests

Date - Date of test completion. Entry by technician

NHTSA Approval - Signature of OVSC official accepting report

Date - Date of report acceptance by OVSC, entered by above official

Remarks - Enter any pertinent test info here, e.g. if plunger hits rim or penetrates tire

## *4.9 COMPLETION OF CATEGORY B, SECTION OF TTR*

The entries on the page of the TTR titled "Category B test" shall be as follows:

### TIRE ENDURANCE TEST

Pre-test defects noted - Enter "Y" for Yes or "N" for No. If Yes, clear with CTM before testing and note that approval in remarks section

Rim Condition Satisfactory - Enter "Y" for Yes and "N" for No

Rim Size Used - Enter size of rim used, including all punctuation.

Rim No - Enter Laboratory Assigned Serial Number

3 Hrs. Conditioning - Start: Enter Date,Time, PSI,Temperature (°F.)

End: Enter Date, Time, PSI, Temperature (°F)

Total Hours: Enter Total Conditioning Time

Inflation Pressure Adjusted - Enter from (PSI) to (PSI)

Wheel Position - Enter number of position

Machine Number and Type - Enter number and type of machine used in test

Date/Time Start/End (Test) - Enter appropriate date and times

*Tare Load, lbs. - Entries for 7, 16, 24 hour tests

*Load Arm Ratio - Entries for 7, 16, 24 hour tests

*Dead Weight, lbs. - Entries for 7, 16, 24 hour tests

*Dead weight Load,Lbs./PSIG - entries for 7, 16, 24 hour tests

Total Load, Lbs. - Entries for 7,16,24 hour tests

Test Speed (200 MPH) - Entries for 7,16,24 hour tests

Test area Temperature (start/end) - Entries for 7,16,24 hour tests (°F)

PSI End of Period - Entries 7, 16, 24 hour tests

*These entries are not made for hydraulically or pneumatically equipped machines.

Test Performed By - Technician performing test enter initials

Date - Date of Test Completion - Entered by Technician

Test Results - Circle either Passed of Failed, as appropriate

Laboratory Approval - Signature and Title of laboratory official responsible to OVSC for test

Date - Date entered by laboratory approving official

NHTSA Approval - Signature of OVSC official accepting Report

Date - Date of Report Acceptance by OVSC Entered by accepting official

Remarks - Enter remarks pertinent to test procedures or results

## *4.10 COMPLETION OF CATEGORY C, SECTION OF TTR*

The entries on the page of the TTR titled "Category C Test" shall be as follows:

**HIGH SPEED PERFORMANCE TEST:**

Pre-test Defects Noted - Enter "Y" for Yes or "N" for No. If yes, clear with CTM and inform us of the approval in the remarks section

Rim Condition Satisfactory - Enter "Y" for Yes or "N" for No

Rim Size Used - Enter size of rim used

Rim No. - Enter Laboratory assigned Serial Number

3 hrs. Conditioning - Start: Enter Date, Time, PSI, Temperature (°F)

End: Enter Date, Time, PSI, Temperature (°F)

Total: Enter Total Conditioning Time

Inflation Pressure Adjusted - Enter from (PSI) to (PSI)

Machine Number and Type - Enter number and type of machine used in test

Date/Time Start/End - Enter date and time as appropriate

*Tire Load Lbs. - Enter for each period and HS cycle

*Load Arm Ratio - Enter for each period and cycle

*These entries are not made for hydraulically or pneumatically equipped machines.

*Dead Weight, Lbs. - Enter for each period and cycle

*Dead Weight Load - Enter for each period and cycle

Total Load, Lbs. - Enter for each period and cycle

Test Speed (MPH) - Enter for each period and cycle

Test Area Temp Start/End - Enter Start and End of each period and cycle (°F)

PSI End of Period - Enter for each period and cycle

Tire Temp - End of Cooling Period Temperature (°F)

Remarks - enter clarifying and explanatory remarks pertinent to test

Test Results - Circle "Passed" or "Failed" as appropriate

Test Performed By - Initials of technician performing test

Date - Date test completed. Entered by technician

Laboratory Approval - Signature and title of laboratory official responsible to OVSC for tests

Date - Date of test results approval. Entered by above official

NHTSA Acceptance - Signature of OVSC official accepting report

Date - Date of OVSC receipt of report. Entered by above official

## *4.11 TREAD WEAR INDICATORS*

In accordance with FMVSS-119, the tire shall have at least six (6) tread wear indicators per groove spaced approximately equally around the circumference of the tire. Tires with 12-inch or smaller rim diameter and motorcycle tires shall have at least three such treadwear indicators. The indicators shall be designed to enable the person inspecting the tire to determine visually whether the tire has worn to the indicator. In the case of any tire except a motorcycle tire, the indicator shall be raised 1/16 of an inch from the bottom of the groove, and in the case of a motorcycle 1/32 of a inch from the bottom of the groove.

The indicators shall as a minimum, show tread wear:

a. at points on the tread not more than one-fourth of the tread width for the edge of the tread; and

b. at points not farther from the tread centerline than the shortest distance of a tread groove from the centerline. For the purpose of this requirement, "tread groove" means any tread opening or space between raised elements of the tread, regardless of direction or configuration.

The laboratory shall use the marking TWIM with an arrow drawn to the treadwear indicator to indicate where the measurement is to be taken. Measure the indicator by using a depth gauge and moving the same in a lateral direction along the groove. The difference between the two dimensions shall not be less than the specified requirements, +1/64" -0". Enter the word "No" if the tire does not have a treadwear indicator or does not meet the required measurement and add a comment to that effect in the remarks section of the Summary Page.

## *4.12 TIRE PRE-TEST INSPECTION (SAMPLES A, B, AND C)*

Prior to mounting the tires for any test phase, the laboratory shall conduct a detailed pre-test inspection. Special surveillance is required in looking for bead scuffs, radial or lateral mold flow cracks, splice breaks, wire breaks, cavities in bead covering, over-flow of rubber into mold vents which could prevent proper tire seating on the test rim. A visual inspection should also be made of the tire's sidewalls, treads, and innerliner for repair work or any abnormalities. All tire defects noted shall be brought to the attention of the CTM and recorded in the remarks section of the Test Report Form. Tires with defects can only be tests when the laboratory receives approval by the CTM. This approval shall also be noted in the "remarks" section.

## *4.13 TIRE MOUNTING - SAMPLES A,B,C*

The test tire shall be mounted on a serially numbered model rim. The rim shall be visually inspected for any apparent characteristics which may effect the test validity. This includes cracks or deformations of the bolt hole, hub, and flange. Those rims which may be in question are not to be saved for FMVSS-119 testing. The wheel must be free from any foreign substance, rust, oxidized rubber, or adhesives.

The tire shall be mounted so that the tire's serial number is to the inside of the rim. When mounting large truck tires on rims, mount tire with I.D. number toward the non-

removable flange. Mount the tire in such a manner that the beads do not bind against the rim ledge and bend improperly on the rim flange. Make certain that the valve core is inserted into the valve stem prior to inflation. Do not allow the air pressure the exceed the manufacturer's prescribed maximum inflation pressure. A thin solution of Bead Lubricant shall be applied to each bead to aid in the proper positioning and seating of the beads. If the beads have not seated by the time the pressure has reached maximum inflation, deflate the assembly, reposition the tire and reinflate. It should be noted that special safety precautions are necessary when working with snap or lock type rings. The pressure gauges shall be accurate within +/- 1 psi at the prescribed inflation pressure. After tire mounting, the information shall be recorded on the applicable test report form.

## *4.14 TIRE STRENGTH TEST*

**Preparation of the Tire.** The tire shall be examined as described under Pre-Test Inspection (4.12) on the specified test rim. The mounting methods are the same as those set forth in the Tire Mounting Procedure (4.13). Tube Type Tires shall be assembled using the tube size and type recommended by the manufacturer. Each test shall require a new tube and flap. Discrepancies shall be reported to the CTM and recorded under remarks and applicable sections of the standard report from.

The test tire is to be mounted on a test rim and inflated to the specified pressure +2 PSI -0 PSI corresponding to the maximum load or maximum dual load where there is both a single and dual load marked on the tire. The tire-rim assembly shall be conditioned for 3 hours minimum at an ambient temperature of 70°C (+0-15°). At the end of the conditioning period the pressure shall be checked and recorded on the test report form. If the loss of pressure exceeds 5 PSI, determine the cause. If loss is due to other than tire defects, correct if possible. If a remounting is necessary, recycle the tire through the conditioning phase and record the data on the standard report format. The tire's inflation pressure shall be adjusted to the test specified inflation and recorded prior to commencing the test. If a tire will not hold air via showing leakage around beads (except for bubbles emitting from the manufacturer "vent holes"), the CTM must be informed before continuing the test. The tire-rim assembly shall then be mounted on the plunger test fixture and testing, at the same temperature as specified above for conditioning of tire, started within 30 minutes after pressure adjustment.

The tire shall be marked at equally spaced points. Three points (approximately 120° intervals) will be marked for tires of 12 inch rim diameter or less and 5 points

(approximately 70° intervals) for all others. One penetration point shall be aligned with and running through the tire's serial number and extending to the opposite serial shoulder. The plunger applications shall be made at these circumferential locations as near as possible to the tire's centerline in the center of the closest tread. Care must be taken that the tire is free of dirt, chalk, or moisture at the point of contact with the plunger. The plunger must be free of rubber residue from previous application or any other foreign matter.

## *4.15 TEST PROCEDURE*

Force a cylindrical plunger with a hemispherical end and a surface finish of, at least, RMS64 and of the diameter specified in table 4-2 for the tire, perpendicularly into a raised element as near as possible to the centerline of the tread, at a rate of 2 inches per minute +/-3%, at each of the five points marked (see paragraph 4.14).

Table 4-2. Strength Test Plunger Diameter

| Tire Type | Plunger Dia. (Inches) |
|---|---|
| Light Truck | 3/4 |
| Motorcycle | 5/16 |
| Tires for 12 inch or smaller rims, except motorcycles | 3/4 |
| Tires other than the above types: | |
| Tubeless: | |
| 17.5 inch or smaller rims | 3/4 |
| Larger than 17.5 inch rims | |
| load ranges F or less | 1-1/4 |
| load ranges over F | 1-1/2 |
| Tube Type | |
| load ranges F or less | 1-1/4 |
| load ranges over F | 1-1/2 |

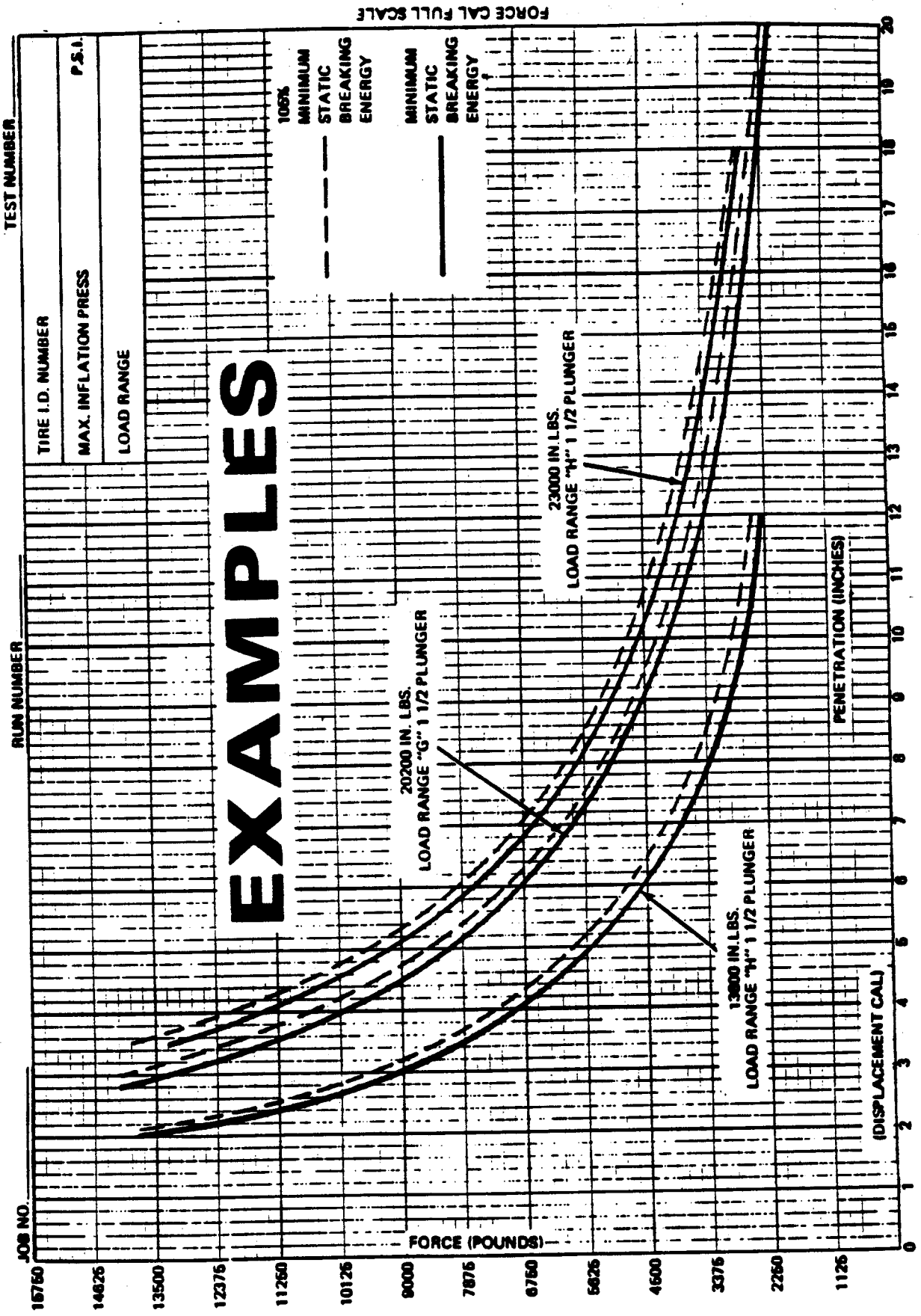



Figure 4-2 - Typical Tread Penetration Plunger Energy for Load Range G and H Tires (Example Only)

For the first four applications, the energy applied by the plunger to the tire should be equal to or greater than 105% of the minimum static breaking energy requirement (refer to figure 4-2) as specified in table 4-3. If the tire does not break on the first four applications, then at the fifth and final application energy should be applied beyond the limits, until the tire breaks or the plunger touches the rim. If the tire fails in any of the positions before reaching 105% of the minimum static breaking energy requirement (see table 4-3), note in the remarks section of the report. Note also whether the failure was that the plunger penetrated the tire of bottomed out on the rim. If during the first four applications, the tire breaks below the minimum static breaking energy requirement, all subsequent applications on this tire will be carried to ultimate static breaking energy.

**NOTE**

For tires of 12 inch rim diameter or less there is only 3 applications as noted in paragraph 4.14.

The force in pounds, penetration in inches and energy in inch pounds for each load approved shall be recorded in the appropriate space provided on the test report form. If the tire fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached and use these values in the formula indicated below:

$$W = \frac{F\,P}{2}$$

*where:*

*W = Breaking energy*

*F = Force in pounds*

*P = Penetration in inches*

The force application shall be carried to the appropriate energy levels within the tolerance as in table 4-4. The average breaking energy is determined by computing the average of the plunger values and rounding off to the nearest inch-pound; applicable to the standard round-off rule ASA Z 25.1. The performing technician shall indicate the test results by submitting a filled in graph form as shown in figure 4-2 which shows the desired values as filled-in by the technician and the actual values as recorded by the plotter. If the tire should fail, notify

the Laboratory Monitor or the CTM within 24 hours. The technician shall enter the date of the test performed and his initials on the tire test report form.

## *4.16 ENDURANCE TEST*

**Preparation.** The tire shall be examined as described under the Tire Pre-Test Inspection (4.12) on the specified test rim. the mounting methods are the same as those set forth in the tire mounting procedure (4.13). Tube Type Tires shall be assembled using the tube size and tube type recommended by the manufacturer. Each test shall require a new tube and new flap. Discrepancies shall be reported to the Laboratory Monitor or CTM and reported under remarks and applicable sections of the standard report form.

Besides the standard report format, each testing laboratory is to maintain a Progress Log. The log format will be agreed upon by the CTM for maximum standardization of all test laboratories. The Progress Log is intended only for the Dynamic Test Specimens. This log will supplement and summarize all automatically recorded data. The format must contain tire identification information, test station information, times and all other information which is necessary for the individual laboratory to properly coordinate all testing activities. The logs must be kept available for OVSC personnel.

**Test Procedure - Endurance Test.** The test assembly shall be conditioned at 95°F(+0° -10°) for a minimum of three (3) hours prior to dynamic loading. At the end of conditioning the PSI shall be verified and adjusted to the specific test inflation pressure. Record the beginning PSI, ending PSI and the adjusted PSI from and to. If the loss of pressure exceeds 5 PSI, determine the cause and if the loss is due to other than tire defects, correct, if possible. If a remounting is necessary, recycle the tire through the conditioning phase, and record the data on the standard report format. If tire will not hold air because of leakage, CTM shall be notified before continuing test.

Press the tire against the 67.23 inch diameter roadwheel within 1/2 hour following conditioning. The roadwheel must be at least as wide as the full loaded tread width of the tire being tested. Record the test start up time, machine and station number, and machine loading method.

The laboratory must continuously record the following parameters by automatically recording and signal conditioning systems within the prescribed operating tolerances:

| | | |
|---|---|---|
| A | Test speed in MPH | +0 to -10 of required speed (refer to table 4-7) |
| B | Tire Ambient Temperature | 95°F (+0° -10°) |
| C | Tire Inflation Pressure in PSI | +2 to -0 PSI |
| D | Elapsed Running Time in hrs. and Minutes (see tables 4-6 and 4-7) | |
| | 4hr. +0 min., -2 min. | 7hr. +0 min., -3 min. |
| | 6hr. +0 min., -3 min. | 16 hr. +0 min., - 7 min. |
| | | 24 hr. +0 min., - 10 min. |
| E | Tire Load in Pounds (see tables 4-5, 4-6, and 4-7) | |

The test machines shall be equipped with automatic retraction devices to prohibit failed tires from continuing to run. Tires which have run flat due to switch malfunction, or unmanned surveillance cannot be considered failures since it is possible that the cause of the defect cannot be determined.

In an instance of automatic retraction, the tire need not be examined until the conclusion of the remainder of the testing on the machine scheduled run. If the analysis of the tire shows any visual evidence of tread, sidewall, ply, cord, inner liner or

**Table 4-3.**

**Minimum Static Breaking Energy (Inch-pounds)**

| Plunger Diameter | 5/16 Inch | 3/4 Inch | | 1-1/4 Inch | | 1-1/2 Inch | |
|---|---|---|---|---|---|---|---|
| Tire type | Motorcycle | 12-in or smaller rim | All other | Tubetype | Tubeless | Tubetype | Tubeless |
| Load Range | | | | | | | |
| A | 150 | 600 | 2000 | - | - | - | - |
| B | 300 | 1200 | 2600 | - | - | - | - |
| C | 400 | 1800 | 3200 | 6800 | 5100 | - | - |
| D | - | 2400 | 4550 | 7900 | 6500 | - | - |
| E | - | 3000 | 5100 | 12500 | 8600 | - | - |
| F | - | 3600 | 5700 | 15800 | 12500 | - | - |
| G | - | - | 6300 | - | - | 20200 | 15000 |
| H | - | - | 6800 | - | - | 23000 | 18500 |
| J | - | - | - | - | - | 25000 | 19500 |
| L | - | - | - | - | - | 27000 | - |
| M | - | - | - | - | - | 28500 | - |
| N | - | - | - | - | - | 30000 | - |

For rayon cord tires, applicable energy values are 60 percent of those in table.

**Table 4-4.**

**Energy Levels for Force Application Test**

| Load Range | Load Range Accuracy | Deflection Range | Accuracy |
|---|---|---|---|
| 0 - 3000 lbs | 0 to -50 lbs. | 0 to 8 inches | 0 to -1/8 inches |
| 3001 - 6000 lbs | 0 to -100 lbs. | 8.1 - 16 inches | 0 to -1/4 inches |
| 6001 - 9000 lbs | 0 to -150 lbs. | 16.1 - 24 inches | 0 to -3/8 inches |

bead separation, chunking, broken cords, cracking, or open splices, then the tire shall be classified as a failed tire. If the tire does not show any of the above mentioned conditions, the test for this tire shall be aborted. In any case, the tire shall not be re-run on the test wheel to amplify the suspected defect.

The load step changes shall be accomplished without interruption of speed or adjustment of inflation pressure. The first five minutes of the second and third cycles, during which the load is being increased is to be counted as part of that cycle. Test speed (MPH) for each cycle is the value specified in table 4-6 and 4-7. If an interruption is necessary for any reason, approval of the deviation shall be obtained from the Laboratory Monitor or the CTM.

**Ambient Tire Test Temperature.** The ambient tire test temperature shall be maintained at 95°F (+0° to - 10°) and shall be monitored by a thermocouple or sensor capable of sensing the temperature within +/- 1°F. The ambient tire test temperature is to be measured by the sensor located 12" +/- 3" for tires up to 36" O.D. and 18" +/-3" for tires over 36" O.D. from the edge of the rim flange at any point in the circumference on either side of the tire. The sensor shall be located in such a way as to prevent influence by walls, ceilings, floors, room ventilators, or air intakes or outlets.

Due to the vast difference in heat generation characteristics that will be encountered when testing tires under this standard, special care must be taken to insure an envelope temperature within the limits prescribed by the standard. If external means of heating or cooling of the tire are employed, they must be of such a nature as to give an even dispersion over both sides of the tire and must be restricted to a velocity lower than the tire velocity. The temperature shall be recorded on the test report at the start of each load step mode cycle (i.e. Cycle I,II, and III).

**Test Completion.** At completion of the test, all tires requiring snap or lock rings will be allowed to cool for a minimum of 1 hour before a technician is allowed to dismount and inspect. Likewise, should a tire be terminated during any mode for any reason, the laboratory shall wait a minimum of 1 hour prior to inspection. The tire shall be deflated prior to removing from the machine. After 1 hour, the technician shall dismount the assembly and inspect both the tire and rim. The tire shall be considered passed provided there is no sign of partial or complete separation of any portion or component of the tire from any other portion or component. except for the exposure of chafer fabric and surface cracking that does not expose ply cord or belt cord. However, no crack in a tread groove shall, in any case, exceed 3/16 of an inch in length.

**Table 4-5.**

**Load Operating Tolerances**

| Test Load (Pounds) | Tolerance (Pounds) |
|---|---|
| Up to 2.500 | +0, -40 |
| 2501 - 5000 | +0, -50 |
| 5001 - 7500 | +0, -75 |
| 7501 - 10,000 | +0, -100 |
| 10,001 and up | +0, -200 |

**Table 4-6.**
**Endurance Test Schedule**

| Description | Load Range | Test wheel speed (mph) | Test Load: Percent of maximum load rating | | | Total test revolutions (thousands) |
|---|---|---|---|---|---|---|
| | | | I 7 hrs | II 16 hrs. | III 24 hrs. | |
| Speed restricted service | | | | | | |
| 55 m.p.h | All | 25 | 66 | 84 | 101 | 352.5 |
| 50 m.p.h. | C, D | 30 | 75 | 97 | 114 | 423.0 |
| | E, F, G, H, J, L | 20 | 66 | 84 | 101 | 282.0 |
| 35 M.P.H | All | 13 | 66 | 84 | 101 | 282.0 |
| All Others | A, B, C, D, | 50 | 75 | 97 | 114 | 705.0 |
| | E | 40 | 70 | 88 | 106 | 564.0 |
| | F | 40 | 66 | 84 | 101 | 564.0 |
| | G | 35 | 66 | 84 | 101 | 493.5 |
| | H, J, L, N | 30 | 66 | 84 | 101 | 423.0 |

**Table 4-7.**
**Endurance Schedule**
**Motorcycle Tires and Non-speed restricted tires of 14.5 Nominal Rim diameter or less)**

| Description | Load range | Test wheel speed (mph) | Test Load: percent of maximum load rating | | | Total Test revolutions (thousands) |
|---|---|---|---|---|---|---|
| | | | I 4 hrs. | II 6 hrs. | III 24 hrs. | |
| Motorcycle | All | 50 | 100 | 108 | 117 | 510.0 |
| All Others | A, B, C, D | 50 | 75 | 97 | 114 | 510.0 |

The tire pressure at the end of the test shall not be less that the initial inflation pressure. Use single load (PSI) value when the tire is marked with both single and dual maximum load. Any unusual conditions or defects shall be marked on the tire and recorded on the test report form. If a defect is noted in the tire, a failed tire report shall be completed and the CTM notified within the first working day after the failure. A defective rim resulting in a tire failure shall be the basis for voiding the test and complete rerun with a new tire must be made.

The Contracting Officer upon receipt of an engineering report on the failed rim, shall decide whether the retest shall be paid for by DOT or the testing laboratory. The cognizant laboratory official responsible for the test program shall affix his signature, title, and date in spaces provided on all report forms. By doing so he acknowledges that the test information has been checked and verified with the documented recordings, and that all accumulated data have been entered on the test report and reconciled with the test requirements.

## 4.17 HIGH SPEED TEST

**Preparation.** The tire shall be examined as described under Pre-test Inspection (4.12) on the specified test rim. The mounting methods are the same as those set forth in the Tire Mounting Procedure (4.13). Tube Type Tires shall be assembled using the tube size and type recommended by the manufacturer. Each test shall require a new tube and flap. Discrepancies shall be reported to the CTM and recorded under remarks and applicable sections of the standard report form.

Besides the standard report format, each testing laboratory is to have a Progress Log. The log format will be agreed upon by the Office of Vehicle Safety Compliance for a maximum attainable standardization of all testing laboratories. This log will supplement and summarize all automatically recorded data. The format must contain tire identification information, test station identification, times, and all other information which is necessary for the individual laboratory to properly coordinate all testing activities. The logs must be available for OVSC personnel. The Progress Log is intended for only the Dynamic Test specimens.

**Test Procedures.** The test assembly shall be conditioned at 95°F (+0, -10°) for a minimum of three (3) hours prior to dynamic loading. At the end of the conditioning phase, the PSI shall be verified and adjusted to the specified test inflation pressure. Record the beginning PSI, the ending PSI, and the adjusted PSI, from and to. If the loss of pressure exceeds 5 PSI, determine the cause, and if loss is due to other than tire defects, correct if possible. Should this

occur, a note that the tire was checked and found to be ok shall be put in the remarks section of the test report. If a remounting is necessary, recycle the tire through the conditioning phase, and record that data on the standard report format. If tire will not hold air because of leakage, CTM shall be contacted before continuing test. Press the tire against the 67.23 inch diameter roadwheel within 1/2 hour following the end of conditioning. The roadwheel must be at least as wide as the full loaded width of the tire being tested. Record the test start up time, machine and station number, and machine loading method.

The laboratory must continuously record the following parameters by automatically recording and signal conditioning systems within prescribed operating tolerances.

| | | | |
|---|---|---|---|
| A | Tire Speed in MPH | +0 to -10 of required speed | |
| B | Ambient Tire Temperature in °F | 95°F (+0-10°F) | |
| C | Tire Inflation Pressure in PSI | +2 to -0 PSI | |
| D | Elapsed Running Time in hrs. and minutes (cycles) | | |
| | | 2 hrs. (break-in) | +3 to -0 min. |
| | | 2 hrs. (cooling) | +30 to -0 min. |
| | | 30 min. | +0 to -2 min. |
| E | Tire Load in Pounds (see tables 4-5, 4-6, and 4-7) | | |

The test machines will be equipped with automatic retraction devices to prohibit failed tires from continuing to run. Tires which have been run flat due to retract switch malfunction or unmanned surveillance cannot be considered failures since it is possible that the cause of the defect cannot be determined.

In any instance of automatic retraction, the tire need not be examined until the conclusion of the remainder of the testing on the machine scheduled run. If the analysis of the tire shows any visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices, then the tire shall be classified as a failed tire. If the tire does not show any of the above mentioned conditions, the test for this tire shall be aborted. In any case, the tire shall not be rerun on the testwheel to amplify the suspected defect.

**Test Duration (High Speed).** The same parameters shall be monitored as under the Endurance test. The following conditions are applicable to High Speed. Apply the load of 88% of the maximum load rating for single tire use and rotate the 67.23" wheel at 50 MPH for 2 hours break-in. Remove the tire from the roadwheel and allow the tire to cool in a static unloaded position. The tire shall be allowed to cool for a minimum of 2 hours and a maximum of 2-1/2 hours. If the tire has not cooled to 95°F (+0 -10°F) at the end of 2 1/2 hours, continue the cooling until it does. When more than one tire is run, the shoulder temperature of the hottest tire will govern the end of the cooling cycle. The tire's temperature shall be determined by a probe type pyrometer being inserted 3/8 inch deep in the center of the first rib nearest the shoulder.

The probe penetration shall be made in an area to avoid any sipe. An arrow shall be drawn on the tire's sidewall pointing to the point of penetration with the letter PP. The 95°F(+0 -10°F) will be verified by three readings taken at three equally located positions around the circumference.

All parameters shall be automatically recorded during the cool down. Should the recorded PSI be less than the specified starting pressure, adjust to the re-required PSI. If the PSI is greater than the starting pressure, do not adjust. At the end of the cooldown, reapply and load against the standard roadwheel. Without interruption or readjustment of inflated pressure, rotate the test wheel at 75 MPH for 30 minutes, then at 80 MPH for 30 minutes, and then at 85 MPH for 30 minutes.

**Ambient Tire Test Temperature.** The ambient tire test temperature shall be maintained at 95°F (+0 -10°F.) and shall be monitored by a thermocouple or sensor capable of sensing the temperature within +/-1°F. The ambient tire test temperature is to be measured by the sensor located 12" +/-3" for tires up to 36" O.D. and 18" +/-3" for tires over 36" O.D. from the edge of the rim flange at any point in the circumference on either side of the tire. The sensor shall be located in such a way as to prevent influence by walls, ceilings, floors, room ventilators, or air intakes or outlets. Due to the vast difference in heat generation characteristics that will be encountered when testing under this standard, special care must be taken to insure an envelope temperature within the limits prescribed by the standard. If external means of heating or cooling the tire are employed, they must be of such a nature as to give an even dispersion over both sides of the tire and must be restricted to a velocity lower than the tire velocity. The temperature shall be recorded on the test report at the start and finish of each load step mode cycle (i.e., Cycle I, II, and III).

**Test Completion.** At completion of the test, all tires requiring split rims will be allowed to cool for a minimum of 1 hour before a technician is allowed to dismount and inspect. Likewise, should a tire be terminated during any mode for any reason, the laboratory shall wait a minimum of 1 hour prior to inspection. The tire shall be deflated prior to removing from the machine.

After 1 hour, the technician shall dismount the assembly and inspect both the tire and the rim. The tire shall be considered passed provided there is no sign of partial or complete separation of any portion or component of the tire from any other portion or component, except for the exposure of chafer fabric and surface cracking that does not expose ply cord or belt cord. However, no crack in a tread shall, in any case, exceed 3/16 of an inch.

The tire pressure at the end of the test shall not be less than the initial pressure. Use single maximum load value when the tire is marked with both single and dual maximum load. Any unusual conditions or defects shall be marked on the tire and recorded on the test report form. If a defect is noted in the tire, a failed tire report shall be completed and the CTM notified within the first working day after failure. A defective rim resulting in a tire failure shall be the basis for voiding the test and a complete rerun with a new tire must be made. The Contracting Officer, upon receipt of an engineering report on the failed rim shall decide whether the retest shall be paid for by DOT or the testing laboratory.

The cognizant laboratory official responsible for the test program shall affix his signature, title, and date in the spaces provided on all report forms, or shall enter his name, and title into the appropriate fields on the TTR System, prior to the execution of an export. By doing so he acknowledges that the test information has been checked and verified with the documented recordings, and that all accumulated data have been entered on the test report and reconciled with the test requirements.

# SECTION 5
# REPORT PROCEDURES

## *5.1 FAILED TIRE PROCEDURES*

In the event of the failure of any tire, the Office of Vehicle Safety Compliance shall be notified immediately by telephone and provide the information outlined on the Office of Vehicle Safety Compliance Initial Report of Tire Test Failure for FMVSS-119 (see figure 5-1). Should a failure occur during OVSC non-working hours, notification will be made during the following working day. Labeling failures shall be reported after all other tests are completed and the final report is assembled. A failed tire or suspect tire shall not be disposed of until directed by the CTM.

## *5.2 TEST REPORT SUBMISSION*

Upon completion of all test categories, the test data shall be used to assemble a complete test report. Scheduling should be in a coordinated manner to complete a test set( A, B, or C) in six working days, and report submitted to the validating agency within ten working days from test start-up date. If the test report includes a tire which has failed either strength, Endurance, of High Speed, 5 copies of the continuous recordings shall be mailed directly to the OVSC on the same date as the test report is mailed to the validating agency. The original data shall remain at the testing laboratory. The original copy of the test report shall be submitted to the validating agency for validation by the computer and acceptance of the failed tire test report.

## *5.3 PASSED TIRE PROCEDURE*

Passed tire reports will not require submission of recorded data, but such data will be maintained at the laboratory at least until the original test report is returned indicating validation and acceptance of the test report. Computer rejected test reports will be returned to the Office of Vehicle Safety Compliance, CTM or Laboratory Monitor by the validating agency for resolution with copies of the rejection notice. After acceptance of the test reports by the CTM or the Laboratory Monitor, the laboratory shall be responsible for cutting the sidewall in such a manner as to make the tire unserviceable and irrepairable. The laboratory shall not dispose of the test tire without authorization of the CTM or Laboratory Monitor. The laboratory shall ensure that none of these tires, prior to testing or the test reports, become available to unauthorized individuals. Should

there be any conflict in the interpretation of the test procedures prescribed herein, they must be brought to the attention of the CTM prior to conducting the test for discussion and resolution.

## *5.4 TEST DATA ENTRY PROCEDURES*

The laboratory shall use data entry on the Tire Test Reporting System, which shall be installed on Personal Computers at the laboratory, to report test data. These data shall be sent on computer diskettes to OVSC-CC, which shall validate the data. In the event of errors, the data entry shall be resolved by the validating agency after consulting with the laboratory by telephone. OVSC-CC shall produce printed, validated reports for OVSC's approval. These validated, approved tests shall become the public records of the tests. Instructions are contained in Section 6 of this manual.

**OFFICE OF VEHICLE SAFETY COMPLIANCE**

**INITIAL REPORT OF TIRE TEST FAILURE**

**FMVSS-119**

CIR No. _____ FY _____ Program P.C. No. _____

Matrix Tire Line No. _____ Test No. _____

Date of Report _____ Test Date _____ Laboratory _____

MFR _____ Brand _____

Tire Line _____ DOT Number _____

Tire I.D. No. _____ Size: _____ Type: TL_____ TT _____

Ply Rating _____ Sidewall: BW _____ WW _____ Construction _____

Cord Material: Casing _____ Belt _____ Actual Plies: SW _____ T _____

Max. Infl. Press. _____ Max. Load Rating _____ Test Rim: Size _____ No. _____

Test Phases: Labeling _____ Strength _____ Thread Wear Indicator _____
Endurance _____ Physical Dimensions _____ High Speed _____
Bead Unseat _____ Other _____

Failure Ratio: Lab No. 1. _____ 2. _____ 3. _____ Total _____

Time to Failure: _____

Description of Failure: _____

_____

_____

_____

Received From _____ Received By _____

**MANUFACTURER NOTIFICATION RECORD**

Individual Notified: _____ Telephone No. _____

Date Contracted: _____ Time _____ Called By _____

OVSC Action Required: _____

_____

Figure 5-1 - OVSC Initial Report of Tire Test Failure

# SECTION 6
# TIRE TEST REPORTING SYSTEM

## *6.0 INTRODUCTION*

In this section, the use of the Tire Test Reporting (TTR) system is described. The system uses IBM-PC-XT personal computers or compatible equipment to:

- Provide the testing laboratories with a simple means of transmitting data to OVSC;
- Provide OVSC with a method of monitoring test results;
- Provide test result reports that may be made public.

Currently, the labs are using the automated reporting system, it is discussed below:

- Automated Reporting by Laboratories:

  The lab will install the TTR system on Personal Computers at the laboratory. The log-ins will be reported to OVSC, using the TTR system. The log-in information is written to a computer diskette, which is mailed to OVSC.

  The test results will be entered at the lab using the TTR system. Test parameters are generated by the TTR system, based on the log-in data entered. Test results are also written to a computer diskette, which are validated by the lab to ensure that all the test results which have been collected fall within certain OVSC guidelines. Any data entry or test procedure errors are resolved and a final report is completed. This completed Tire Test Report is forwarded to OVSC for signature, and the report is made public. The original copy of the report is photocopied for public file. Backup copies of the data files used by the TTR system, will serve as the permanent records of test results.

## *6.1 INITIAL REPORT OF TEST TIRE FAILURE*

In the event of a failure of any tire, the OVSC shall be notified immediately by telephone and provided the information outlined in Figure 5-1. If the failure occurs during OVSC non-working hours, notification will be during the following day. Labeling failures shall be reported after machine tests are completed and the final report is assembled. A failed or suspect tire shall be shipped by the laboratory to the NHTSA warehouse as soon as the OVSC laboratory monitor is notified. Unless

instructed otherwise, the tire will be sent by prepaid freight to OVSC who will reimburse the Lab for the shipping cost.Automatically recorded charts and test logs will be required by OVSC; upon OVSC notification of tire failure ask for specific instructions as to what documentation should be provided.

Passed tire reports will not require submission of automatically recorded charts, but such data will be maintained at the laboratory at least until the original test report is returned indicating validation and acceptance of the test report. Passed tire disposal will be in accordance with contractual provisions.

## *6.2 TIRE TEST REPORTING PROCEDURES*

The laboratory specialist will enter test data from the test logs to the TTR System as each of the various test operations is completed. Corrections can be made simply by modifying the data entry. All test operations must be completed within five working days of each other, and when all test are completed, the Summary screen of the TTR System is to be entered and authenticated. The entire test is then to be exported onto a computer (floppy) diskette which is to be mailed to the OVSC within five working days of test completion.

## *6.3 WEEKLY TEST PROGRAM STATUS REPORT*

Each testing laboratory shall, on the first working day of each week while testing is in progress, contact its respective monitor via telephone to provide current program testing status. This is to include test components available, test started and tests completed.

## *6.4 SECTION CONTENTS*

The rest of this section will provide a step-by-step guide to the on-line procedures to be used with the TTR system, and includes the following sections:

6.4.1 Hardware/Software Requirements

6.4.2 General Information: Use of Personal Computers For The TTR System

- 6.4.2.1 Directories
- 6.4.2.2 Files
- 6.4.2.3 Printing and Displaying Files

## *6.4.1 HARDWARE/SOFTWARE REQUIREMENTS*

The system is designed for implementation on the IBM PC-XT (or compatible) with a minimum of 256 K of memory, a 10 megabyte (or greater) hard disk drive, one or more floppy disk drive(s),and IBM DOS version 2.00 or higher (or MS-DOS). The installation of a printer is optional, but highly desirable.

If your system does not have DOS installed, you will be unable to execute many of the functions described, including the print and backup functions. If your system is not IBM compatible, you will not be able to use this system.

## *6.4.2 GENERAL INFORMATION ABOUT THE USE OF PERSONAL COMPUTERS FOR THE TTR SYSTEM*

This section contains basic general information needed to used the TTR System. For additional information about DOS, or specific capabilities of your hardware, see your DOS and hardware manuals.

Throughout these instructions, boldface type indicates prompts which appear on the screen, and italics indicate entries to made by the user. There will be **generic** references, including:

- *filename* which is the file name, which can be a maximum of eight characters,
- *.ext*, the file name extension, separated from the filename by a period, which can be a maximum of three characters.
- *Directoryname* which can be a maximum of eight characters, and is usually prefaced with a backslash (\).

There are other limitations on file and directory names; see your DOS manual.

**NOTE:**

**It is imperative that all instructions given in this manual concerning DOS be followed exactly. Before pressing the ENTER key to carry out a command, check to be sure that the entry you have made correctly matches that given in this manual. When using items that are referenced <u>generically</u> (such as *filename.ext*, etc.) , be sure that the correct <u>specific</u> item is entered. Failure to make entries correctly could result in loss of data.**

**NOTE:**

**If you are using MS-DOS or other non-IBM DOS System, the specific DOS commands may be different than those used in this manual.**

*6.4.2.1 DISK DRIVES AND DIRECTORIES*

Your PC will have at least two disk drives: One Hard Disk drive, which is addressed in all commands as the **C:** drive; and at least one floppy diskette drive, which is addressed in all commands as the **A:** drive. If there are two floppy diskette drives, the second one will be addressed as the **B:** drive. To make organization of the drives easier, they are divided into sections, called *directories*. There is a central directory, called the *root directory*. All other directories are considered to be *subdirectories* of the root.

The installation instructions in Section 6.4.3 result in the TTR system being installed in a directory named USERS at the root directory level. A subdirectory, DOT, is established during installation under the USERS directory. Therefore, the path from the root directory to the TTR system is \USERS\DOT.

When any command is issued, or any executable program is entered on the PC, the PC will look only in the directory currently in use (the *current directory*)

unless a different path has been established in the AUTOEXEC.BAT file, or by a subsequent manual action, indicating that directories other than the current directory should be searched to find the program.

To determine the current directory, type:

C>*cd*

The system will respond with the name of the disk drive, followed by a colon and the name of the directory. For example,

C:\

indicates that the system is reading from drive C ( the hard disk) and is in directory '\', the symbol for the root directory. The *prompt* command (see your DOS manual) can be used to change the DOS prompt so that it will display the current directory, date and time, etc., with every response. You may find this useful.

To change the current directory to another directory, type:

C>*cd\directoryname*

The TTR system will look for command (*.com*), executable (*.exe*), and batch (*.bat*) files both in the current directory (which will be \USERS\DOT) and the root directory. On some PCs, the DOS command files have been established in the root directory. On some PCs, the DOS commands have been established in a separate subdirectory, usually called \DOS. If you find you cannot execute a DOS command, such as PRINT, try this:

C>*cd\dos*

then attempt your DOS command. Alternatively, try:

C>*path=\;\dos;\users\dot;*

This will tell the system to look in the root, \DOS, and the \USERS\DOT directories for the command you wish to use. If it cannot find the command, you will get an error message:

**Bad command or filename**

If none of the above methods work, see the detailed instructions in your DOS manual for directory and file access.

*6.4.2.2 FILES*

Files are those units in which data are contained. They reside within directories of the disk drives, and unless they reside within the current directory, they must be addressed with respect to their location. For example, a file on the a: drive must be addressed: a:filename.ext A file in a directory on the C: drive called "mydir" must be addressed: c:\mydir\filename.ext

You can check on the status of files by use of the DIR command. You can list all the files in a given directory, or just those with certain names:

| | |
|---|---|
| C>*dir* | all the files in the current directory. |
| C>*dir *.idx* | all those files with .idx filename extension |
| C>*dir sl** | all those files beginning with sl |
| C>*dir/w* | specifies a wide display. Instead of the directory being displayed in one column, it will be displayed in several columns across the screen. This is useful if the entire directory will not fit on one screen at a time. File sizes and dates, however, will not be displayed. |
| C>*dir/p* | Columnar listing of the directory, with a pause when the screen is full. Press any key to get the next screen of the directory. |
| C>*dir a:* | Directory of files on the floppy disk.(or a: drive.) (Note: if your PC has two diskette drives: one will be the a: drive, the other will be the b: drive) |

### *6.4.2.3 PRINTING AND DISPLAYING FILES*

All printing specified in this manual is designed to use the DOS *Print* command, which will print the entire contents of the file specified in the print command statement. See your DOS manual for printer communication modes, and specifications.

Usually, all printing is directed to the parallel printer port, (LPT1) for transmission to a parallel printer. If yours is a serial printer, the LPT1 will have to be rerouted to COM1 or COM2, and appropriate communications specifications made. See your DOS manual's description of the MODE and PRINT commands, and the communication specifications of your printer type, to modify your PC's printer interface.

All printing should be done on 9 1/2 x 11 perforated paper, in 16.5 character per inch pitch. Be sure to align the paper at the top of the page before printing.

The general print command is:

C>*print filename.ext* or C>*print a:filename.ext*

If you wish to stop printing, enter:

C>*print/t*

Files can also be displayed directly on the screen. Use the TYPE command:

C>*type filename.ext* or C>*type a:filename.ext*

The data in the file will be displayed rapidly down the screen. If a slower rate is desired, enter:

C>*type filename.ext/more*

This will display the data one screen at a time. The screen will not be wide enough to display more than 80 characters of data, making it difficult to read. Therefore, this command is generally only useful when looking for something specific in a file.

### *6.4.2.4 DEFINED KEYS*

To make data entry easier while using the TTR system, the use of certain keys has been predefined. Please note that these keys are not active or have different functions while in DOS, and these predefined uses only apply to the TTR System.

| KEY | DESCRIPTION |
|---|---|
| ESC | This key will allow you to exit from a data entry screen to the main menu. If you are on the menu, it will exit to DOS. |
| TAB | This is the key on the left of the keyboard with two arrows, pointing left and right. It will move the cursor forward from field to field while you are on a data entry screen. Rapid movement can be caused by holding it down. |
| BACKTAB | This is the TAB key (above) struck simultaneously with the shift key (an arrow pointing upward). It will move the cursor backwards from field to field. Rapid movement can be caused by holding the tab and shift keys down. |
| RETURN | This key, sometimes marked ENTER, is used for data entry. It will also "activate" a record that has already been entered. |
| F1 | This key will display a HELP message, which displays the functions of defined keys. HELP will not always be available, depending upon where you are in the TTR System. |
| F2 | No function |
| F3 | This key will move you forward to the next data entry screen. |
| F4 | This key will move the cursor forward one field, like the TAB key. |
| F5 | No function |
| F6 | This key will clear all data from a screen. |

| | |
|---|---|
| F7 | No function |
| F8 | No function |
| F9 | No function |
| F10 | No function |
| Shift and F1 | This key combination will print the screen on the line printer. **NOTE:** The printer **MUST** be on, or system behavior will be unpredictable. |
| Shift and F3 | This key combination will move you backward to the prior screen. |
| Shift and F4 | This key combination will move you backward field to field. |
| Shift and F9 | This key combination will end action on a screen without saving any changes. The cursor will be returned to the record identification field. |
| Shift and F10 | This key combination will, on the LOG-IN screens, delete a record IF that record has not been made final. In the test data screens, it has the same function as Shift and F9. |

All other shift and function keys combinations, the CTRL key, and its combinations are not active.

### *6.4.2.5 BACKING UP YOUR WORK*

It is a good operating practice to periodically backup your work on floppy disks, in case the hard drive is damaged, or if the data files are inadvertently deleted or damaged. This backup copy is kept on floppy disks. If you backup an entire 10 megabyte hard disk drive, and if all its storage capacity is used, twenty-five diskettes will be required. You will probably need fewer than this, depending on how much storage is in use. To compute the number that will be required, enter:

C>*chkdsk*

This will tell you how much storage is in use. Look for the figure listing storage in **USER FILES**, divide this figure by 362,496, and round up to the nearest whole number. The result will be the number of diskettes needed. For all backups, start with diskettes with NO data files on them, or use the set of diskettes from the previous backup. If there are any files on the diskettes, they will be erased during the backup process. (The system will produce a warning for this)

If you just want to backup the USER DOT files, enter:

C>*backup c:\users\dot*.* a:*

You will need between four and ten diskettes for a complete backup of the USER DOT directory. Should you want to backup the entire hard disk drive, enter:

C>*backup c:*.* a:/s*

You will be prompted to insert new diskettes as they are needed. Be sure to label and number these diskettes, and reserve them for no other purpose. Use the same set of diskettes for each backup. Store the diskettes in a secure area.

To restore files that have be damaged or deleted, or to transfer the system to another PC, insert the first backup diskette, and enter:

C>*restore a:\users\dot*.* c:*

You will prompted to enter new diskettes as they are needed. Always insert the diskettes in the same order as they were used during the backup. Do not write-protect the backup diskettes. For additional details, see your DOS manual.

*6.4.2.6 ARCHIVING DATA*

The data you enter on the system are contained in four data files called

**LOG109.IDX** (Log-in data of FMVSS 109 Testing)

**LOG119.IDX** (Log-in data of FMVSS 119 Testing)

**SL109.IDX** (Test data for FMVSS 109)

**SL119.IDX** (Test data for FMVSS 119)

At the end of a Fiscal Year program, it is no longer necessary to retain old tire data on the PC, but this data must be kept at the laboratories a minimum of five years.

**NOTE**

**It is imperative that the instructions given in this section be followed exactly. Before striking the ENTER key, check to be sure that the entry you have made correctly matches that given in this manual. When generic references (such as *filename.ext*, etc.) are used, be sure that the correct specific item is used. Failure to make entries correctly could result in loss of data.**

In the following set of instructions, the files are renamed, and copied to floppy disks. Then, if desired, they may be removed from the hard drive, if storage space is needed. It may be it more convenient to leave the renamed files on the hard disk.

a) To rename the files, enter:

C>*ren log109.idx log109.0fy* ("*.0fy*" is the fiscal year the program, such as .086)

C>*ren log119.idx log119.0fy*

C>*ren sl109.idx sl109.0fy*

C>*ren sl119.idx sl119.0fy*

b) To copy the files, enter:

C>*backup c:\users\dot\log1?9.0fy a:* (the ? character will backup both log files)

C>*backup c:\users\dot\sl109.0fy a:*

C>*backup c:\users\dot\sl119.0fy a:*

One diskette is required for the two log data files, and at least one diskette is required for each of the test data files. If more are needed, you will be so prompted. Use only diskettes with no other data on them. Do not use the same diskette for any two

steps. Label and store the diskettes safely. If desired, see your DOS manual on how to write protect the files (see the ATTRIB command).

c) Removal of files from the hard disk is not absolutely necessary. The renamed files cannot be read by the TTR system, and new files will be created for new data entry. However, removal will free up hard disk space for your use. To remove files, enter:

C>*del log109.0fy*

C>*del log119.0fy*

C>*del sl109.0fy*

C>*del sl119.0fy*

d) If it is ever necessary to look at these data, first RENAME the current files into something other than the filenames you used for the archive, then copy the archived files back into the system, then rename them .idx. This is accomplished by:

C>*ren filename.idx filename.old* (*filename* will be either log109, log119, sl109, or sl119.)

Insert the archived floppy into drive a:, and enter:

C>*restore a:\users\dot\filename.0fy c:* (same filenames as above)

and then

C>*ren filename.0fy filename.idx* (same filenames as above)

When you are through looking at this data, if you have not changed it, merely delete it, as you already have it on floppy disk, or rename it, and rename the current file .idx:

C>*del filename.idx* or C>*ren filename.idx filename.0fy*

C>*ren filename.old filename.idx*

If you have made changes you wish to keep, be sure that you do not delete, but rename it and back it up on to the floppy. You may or may not want to use the floppies that served as the source for this backup.

### *6.4.3 INITIAL INSTALLATION AND UPDATING OF THE TTR SYSTEM*

#### *6.4.3.1 INITIAL INSTALLATION OF THE TTR SYSTEM*

a) The system comes on three floppy disks. From the DOS prompt, C> , enter:

**C>**

This will change the current directory to the "root" directory.

If the prompt looks like this: A> enter:

**A>*C:***

This will change the default drive to the Hard Disk Drive, (the "C" drive). Now enter the C>cd\ (Change Directory) command above.

b) Insert the first diskette, labeled disk #1, and enter:

**C>*a:install***

The floppy drive will begin operation, and you will be prompted to insert the first diskette. Since you have already done so, strike return, and the process will continue. A number of commands will be executed, which will copy the contents of the diskette to the hard disk drive.

c) You will be prompted to remove the first diskette, and to insert the second, Strike return after you have done so and when ready and the process will continue.

d) You will be prompted again to remove the second diskette and to insert the third. Strike return and the process will continue. When the DOS prompt returns to the screen, the system will be ready to use.

e) Turn to Section 6.4 to start the system.

#### *6.4.3.2 UPDATING THE SYSTEM*

Periodically, the system may be updated by OVSC-CC. You will receive the update diskette(s) in the mail, when they become necessary. To install the updates, unless otherwise instructed, enter at the DOS prompt:

**C>*cd\users\dot***

Insert the update diskette into drive A: (the floppy drive), and enter:

C>*copy a:*.*/b/v*

The update will be complete after this is repeated for all the diskettes sent to you.

*6.4.4 USING THE TTR SYSTEM*

*6.4.4.1 STARTING THE SYSTEM*

The instructions for beginning to use the TTR System are the same for each time it is used. It is assumed that the TTR System has been installed as described in Section 6.3.

| STEP | DESCRIPTION |
|---|---|
| 1 | Be sure the PC is turned on, and if not, then be sure the floppy drive is empty, and turn on the computer. Wait for the start up routines to complete, which should end with the DOS prompt. |
| 2 | It is best to start either from the "root" directory, or the \users\dot directory. Enter:<br><br>C>*cd* |
| 3 | Enter:<br><br>C>*user dot*<br><br>This will change you to the \users\dot directory and start the TTR System. The Tire Test Menu will now appear. (See figure 6-1) |
| 4 | Enter the desired option, 1 through 21, or 99 to return to DOS, and strike return. See the specific instructions in Sections 6.4.4.3 - 6.4.4.13 for the Functions you wish to perform. |

General Information which pertains to TTR screens

There are three basic field areas on the data entry screens (options 1, 2, 4, 6, 11, 12, 14, 16): The record identification fields, the record existence flag (non-accessible), and the data entry fields. Some of the fields are numeric only, and you will hear a tone if you attempt to enter alpha data in these fields. Both fields of the record identification are mandatory (both MTL and Test number). You cannot enter a screen without them.

The record existence flag indicates whether a record is NEW or EXISTS. The only existing records that can be deleted are non-final LOG-INs.

The Tire Test data entry option (option 14) has multiple screens. The user may enter the type of screen to move backwards and forwards between screens. For example, the user may enter **SUMMARY** in the CMD field to display the summary data screen. The record identifier in use will be kept and you move ahead. The <RETURN> key will save data that is entered for a particular screen.

For your convenience, data entered into a previous record will be kept on the screen if a new or previously unedited record is called. If the record is identical with that just entered, tab to the first field, and strike return and all the data will be captured. If there are changes, just tab to the relevant field(s) and make those changes.

When you are through entering data for a particular screen or set of screens, strike return to return the cursor to the record identifier, which will ensure capture of the current record, and you will be returned to the particular suboption menu. If you are through using the system, strike either ESC or 99 <CR>, and you will be returned to DOS. Return to DOS before turning off the PC.

*6.4.4.2 MENU*

The menu is shown in Figure 6.1.

DEPARTMENT OF TRANSPORTATION
TIRE TEST SYSTEM MENU

| Option | Description |
|---|---|
| 1 | Login 109 TWX Update |
| 2 | Login 109 TWX Report |
| 3 | Blank 109 TTR Form Generation |
| 4 | 109 TTR Data Entry Program |
| 5 | Generate a Completed 109 TTR |
| 6 | Validate a Completed 109 TTR |
| 11 | Login 119 TWX Update |
| 12 | Login 119 TWX Report |
| 13 | Blank 119 TTR Form Generation |
| 14 | 119 TTR Data Entry Program |
| 15 | Generate a Completed 119 TTR |
| 16 | Validate a Compelted 119 TTR |
| 20 | Prepare 109 Export Diskette |
| 21 | Prepare 119 Export Diskette |

Enter Selected Option or 99 to Exit <CR> [ ]

The Tire Test System Menu
Exhibit 6-1

NOTE: OPTION 21, PREPARE 119 EXPORT DISKETTE IS INACTIVE AT THIS TIME.

*6.4.4.3 CREATING A TWX LOG-IN 119*

| STEP | DESCRIPTION |
|---|---|
| 1 | From the tire test system menu (hereafter referred to as the main menu), select option 11 to begin the LOG-IN 119 program. The Login 119 menu shown in Figure 6-2 will appear on the screen.<br>NOTE: OPTION 4 OF THE LOGIN 119 MENU, "DELETE 119 TWX", IS INACTIVE AT THIS TIME. |
| 2 | Select option 1, CREATE 119 TWX from the Login 119 menu, and the Login 119 Data Entry screen will be displayed as shown in Figure 6-3. The cursor will be positioned at the MTL NUMBER field. Enter the MTL number and strike the return key. |
| 3 | Enter the test number, which will have a format such as B5A1001:<br><br>The first letter identifies the laboratory:<br>B=Standards Testing Labs;<br>D=Dayton T. Brown, Inc.:<br>M=Smithers Scientific Services.<br>The second character is the last number of the Fiscal year of the Tire Test program. (i.e.: 1985 program = 5)<br>The third character, A, indicates that this is the FMVSS 119 scheduled compliance testing program. Other codes for this field are B=retest, and F=responsive test. The last four characters are the sequential test number assigned by DOT. |
| 4 | Tab to the next field which is the TEST TYPE. Enter the appropriate code assigned by DOT:<br>A=dimensions and bead unseating, |

See page 2-4

DEPARTMENT OF TRANSPORTATION
LOGIN 119 MENU

| Option | Description |
|---|---|
| 1 | CREATE 119 TWX |
| 2 | MODIFY 119 TWX |
| 3 | DISPLAY 119 TWX |
| 4 | DELETE 119 TWX |
| 91 | RETURN to Previous menu |
| 99 | EXIT to DOS |

Enter Selected Option or 99 to Exit <CR> [ ]

Login 119 TWX Menu
Exhibit 6-2

MTL NO [ ] TEST NO [ ] LAB ID ( ) CMD [ ]

| | | | |
|---|---|---|---|
| DATE CODE | [ ] | MANUFACTURER | [ ] |
| BRAND NAME | [ ] | | |
| TIRE NAME | [ ] | | |
| TT/TL | [ ] | | |
| BIAS/BELT/RAD | [ ] | | |
| SPEED RATING | [ ] | LOAD RANGE | [ ] |
| TIRE TYPE | [ ] | | |
| SIN. INFL. PSI | [ ] | KPA | [ ] |
| DUAL INFL.KPA | [ ] | KPA | [ ] |
| SIN.LOAD LBS | [ ] | KG | [ ] |
| DUAL LOAD KG | [ ] | KG | [ ] |
| CARCASS MATERIAL | [ ] | | |
| BELT-1 MATERIAL | [ ] | | |
| BELT-2 MATERIAL | [ ] | | |
| TIRE SIZE | [ ] | | |
| SPEED RESTRICTION | [ ] | | |
| CONF. SYMBOL | [ ] | | |
| TREAD WEAR IND | [ ] | | |
| REPLACEMENT | [ ] | | |

A & R = Radial B & S = Belted Bias B & I = Bias

Add Date ( / / ) Update ( / / )

Login Data Entry Screen
Exhibit 6-3

B=endurance test,

C=high speed test.

5 The next field, which is not directly accessible, is the LAB ID field. This is the three letter abbreviation for the Lab:

STL=Standards Testing Labs;

DTB=Dayton T. Brown;

SSS=Smithers Scientific Services.

6 The first field is the date code field. The rest of the fields are self explanatory.

**NOTE:**

a. Fields containing leading zeros are numeric only. Attempting to enter alpha characters will result in a tone, and the cursor will not move until a numeric is entered.

b. All Alpha characters should be in all upper case. Use the CAPS LOCK key to switch from lower to upper case.

c. Enter the two character code for the manufacturer as obtained from the ID number of the tire and as shown in Appendix B.

d. Enter the three character code for the brand name from Appendix C.. If there is no brand name or it is not known, enter three asterisks: ***

e. Enter the tire name as it appears on the tire.

f. Enter the Size code, if known.

g. Enter the appropriate abbreviation:

T = Tube Type

L = Tubeless

h. Enter the appropriate abbreviation:

B or I = bias tire,

E or S = belted bias tire,

A or R = radial tire

i. Enter the Tire Type:

K = Light Truck

C = Motorcycle

T = Others

j. Enter the Speed Rating. If there is none, leave blank.

k. Enter the Load range: either A,B,C,D,E,F,G,H,J,L,N.

l. Enter the Single and Dual usage Maximum Inflation Pressure and Maximum Load.

m. CARCASS MATERIAL refers to the bead to bead plies, their number and material. A tire, for example, with 2 nylon plies, bead to bead, would be abbreviated 2N. The following material types are valid:

R = Rayon
P = Polyester
F = Fiberglass
A = Aramid
N = Nylon
S = Steel
G = Nygen
D = Dupont/DPI

m. BELT-1 MATERIAL and BELT-2 MATERIAL refers to the belt plies around the tread. This is NOT the number of plies through the tread, but just the belt plies.

Plain Bias Tire = blank
Belted Tire = same format as Carcass field,
Radial Tire = same format as Carcass field.

The BELT-2 field should only be filled if there is more than one type of material used in the belts. For example, a tire with 2 bead to bead plies of polyester, 2 belts of steel, and one of nylon would have the following configuration:
CARCASS MATERIAL [2P] BELT-1 MATERIAL [2S]
BELT-2 MATERIAL [1N]

n. Enter the Tire Size, including all punctuation.

o. If the test is a Replacement, enter R in the replacement field.

p. Strike return to capture the record. Enter EX and press the return key at the CMD field and the Login 119 menu will reappear.

q. Records for which a final report has been made cannot be accessed and changed.

119 TIRE TEST LOGIN REPORT

Enter MTL Number [ ]
Enter Lab ID [ ]
Draft or Final (D/F) [ ]

Login Report Creation Screen
Exhibit 6-4

### *6.4.4.4 CREATING A DRAFT LOG-IN 119 REPORT*

| STEP | DESCRIPTION |
|---|---|
| 1 | Choose option 12 from the main menu to create a draft report. The screen shown in figure 6-4 will appear. |
| 2 | Insert a diskette in Drive A: and strike return. |
| 3 | The cursor will be positioned at the MTL field. Enter the correct number and press the return key. |
| 4 | The cursor will be positioned at the REPORT OPTION field. Enter *D* for draft report or *F* for final report. DO NOT ENTER F IN THIS FIELD UNLESS YOU ARE POSITIVE YOU WANT A FINAL REPORT AND NOT A DRAFT REPORT. Always make a draft report and check it very carefully before making a final report. |
| 5 | The program will give a count of the number of records read, processed, and written during the program. When it is complete, the program will pause, and you have the option of recording these counts. Strike return when ready to continue. |
| 6 | You will be returned to the main menu. If you wish to check the entry on the MTL processed, enter 99 and return, or ESC to exit to DOS. |
| 7 | You can either PRINT the file, or display it on the screen by entering TYPE. To print, exit to DOS and enter:<br><br>C>*print a:dft119.nnn*<br><br>where *nnn* is the MTL number with leading zeros. If the MTL is 1, for example, nnn will be 001. Printing for this file can be done either at 12 or 16.5 characters per inch. To display the file on the screen, enter:<br>C>*Type a:dft119.nnn*<br>or<br>C>*Type a:dft119.nnn/more* (displays one screen at a time.) |
| 8 | Carefully check the printed or typed draft log-in. Be sure that you have the correct number and type of tests in |

each MTL, and that all tire specifications are correct. **THIS WILL BE YOUR LAST CHANCE TO MAKE CORRECTIONS.**

9 If any corrections are necessary, modify the log-in and create another draft report before continuing.

### *6.4.4.5 MODIFYING A TWX LOG-IN 119*

| STEP | DESCRIPTION |
|---|---|
| 1 | From the main menu, enter 11, as in the creation mode. The Login 119 menu shown in figure 6-2 will appear. Enter the MTL number and the TEST NO, and TEST TYPE as before. You should get an indication that the RECORD EXISTS, with the cursor at the DATE CODE field. If you get TEST IS NEW, then the record was either previously deleted, or was never entered. Check that your record identification is correct. If you get an indication that a FINAL REPORT has been created, and the cursor returns to the MTL NO. field, then you will not be able to modify that record. |
| 2 | Enter the field name in the CMD field to move the cursor to whatever field(s) need to be modified, and simply type over the previous data. Strike return when you are through. If you wish to enter data into that record again, use the up and/or down cursor arrow keys to move through the record identification fields, without changing them. Strike return when finished. |
| 3 | To return to the Login 119 menu, type EX and press the return key at the CMD field. |
| 4 | If you have inadvertently created a final report of an MTL and it has incorrect data, there is a way to remove that data, BUT it will ELIMINATE ALL of your data entry. Exit to DOS, and enter:<br>C>*del log119.idx*<br>and<br>C>*del sl119.idx* |

All data entry made on the 119 program will be deleted. Use this ONLY if you have inadvertently made final reports with incorrect data.

### *6.4.4.6 DISPLAYING A TWX LOG-IN 119*

| STEP | DESCRIPTION |
|---|---|
| 1 | From the main menu, select option 11. When the Login 119 menu appears, select option 3, "Display 119 TWX." The screen shown in Figure 6-3 will appear. Enter the MTL, TEST NO, and TEST TYPE as before. You should get an indication that the RECORD EXISTS, in which case the data will appear on the screen **FOR DISPLAY PURPOSES ONLY - YOU CANNOT EDIT DATA USING THIS OPTION.** If you get TEST IS NEW, then the record was either deleted previously, or was never entered. |
| 2 | When you have finished viewing the data, type EX and press the return key at the CMD field to return to the Login 119 menu. |

### *6.4.4.7 CREATING A FINAL LOG-IN 119 REPORT*

| STEP | DESCRIPTION |
|---|---|
| 1 | Be sure that you have created a draft version of the MTL after each modification of data in that MTL before creating a final report, and that it has been checked very carefully for errors. AFTER A FINAL REPORT IS CREATED, THERE IS NO WAY TO MODIFY THE DATA EXCEPT TO DELETE IT AND START AGAIN. |
| 2 | Select option 12 from the main menu. The screen shown in figure 6-4 will appear. |
| 3 | Insert a diskette in drive A:, and strike return. |
| 4 | Enter the MTL desired, and press the tab key. Enter F only if you are sure you have completed step 1 above. After making sure of your selection, press TAB. Notice the record counts: |

- Records read will reflect the total number of records in the log-in file.
- Records processed should be the same as the number of different test numbers and types in the MTL, i.e., and MTL with 5 test numbers, each with B and C tests assigned, will have 10 records processed.
- Records written will be the records processed plus 7 (headers on the output file).

5 Strike return to exit to the menu, and enter 99 to exit to DOS. To print the final log-in report, enter:

C>*print a:log119.nnn*

where nnn is the MTL number. If you have entered different log-ins on the same diskette,and you need to view those which are on the diskette, enter:

C>*dir a:/p*

It is suggested that you keep all log-ins, both draft and final, for one fiscal year on one diskette; this will save diskettes. The log-in files are short enough that all log-ins for one year could be kept on one diskette. Do not use the same diskette for two years in a row, since overwrites will take place. If you wish to delete the draft versions, enter:

C>*del a:dft119.nnn* , where *nnn* indicates the number of the draft version to be deleted; or to **delete all** the drafts:

C>*del a:dft119.**

### *6.4.4.8 GENERATING THE BLANK 119 TTRS*

| STEP | DESCRIPTION |
|---|---|
| 1 | To generate a blank form, a final report of the MTL must have been made. See Section 6.4.4.7 |
| 2 | You will need a diskette with at least 120 kbytes of free space. Exit to DOS, insert the diskette in Drive A:, and enter: C>*Dir A:* |

DEPARTMENT OF TRANSPORTATION
BLANK FORM 119/COMPLETE TTR GENERATOR

Put a floppy in drive A: hit a key when ready

MTL-NUMBER [ ]
LAB ID: ( )
NUMBER OF RECORD(S) READ: (000000)

Blank TTR Generation Screen
Exhibit 6-5

If the diskette has less than 120 kbytes of free space, either delete undesired files from the diskette, or use a diskette with more free space. It is suggested that a diskette be designated just for the purpose of generating blank forms.

3 Enter C>*user\dot* to return to the main menu, and select option 13. The screen in Figure 6-5 will appear. Insert the selected diskette into drive A: if you have not already done so.

4 Enter the MTL number, and press the Tab key. The record counters will start as the blank form is written on the diskette. When the process is complete, the menu will return.

5 Leave the diskette in Drive A:. Enter 99 to exit to DOS. Check that your printer is on, and that the Characters per inch is set to 16.5. Enter:

C>*print a:~~Blank~~BLK.nnn*

where *nnn* is the MTL number.

6 When you are through printing all the copies of the blank forms you need, you should delete the file from the diskette. It requires a great deal of diskette space, and the file is not useful for anything other than printing. Enter:

C>*del a:~~blank~~BLK.nnn*

If blank forms for a particular MTL are required again, steps 2 through 5 can be repeated.

### *6.4.4.9 ENTERING TIRE TEST RESULTS*

| STEP | DIRECTIONS |
|---|---|
| 1 | To enter tire test results, a final log-in report must have been generated for the MTL. If this has not been done, see section 6.4.4.7 |
| 2 | There will be no need to have a diskette in drive A: during this process. From the main menu, enter option 14. The Completed 119 TTR menu shown in |

DEPARTMENT OF TRANSPORTATION
COMPLETED 119 TTR MENU

| Option | Description |
|---|---|
| 1 | MODIFY Completed 119 TTR |
| 2 | DISPLAY Completed 119 TTR |
| 3 | DELETE Completed 119 TTR |
| 91 | RETURN to Previous Menu |
| 99 | EXIT TO DOS |

Enter Selected Option or 99 to Exit <CR> [ ]

Completed 119 TTR Menu
Exhibit 6-6

Figure 6-6 will appear. Select option 1 "Modify Completed 119 TTR."

3 The Summary screen (figure 6-7) will appear. There are four screens for this program: Summary Screen, Labeling Test Results Screen, and a screen for each of the B and C Test Results . To move forward or backward through the screens, type the name of the screen in the CMD field and press the return key. "Summary" will display the Summary screen. "Label" will display the Label Results screen, "BE" will display the B Test Results screen, and "CS" will display the C Test Results screen. These screens are shown in Figures 6-7 through 6-10.

4 Start data entry by entering the record identifiers MTL NO and TEST NO. You will get an indication on each screen if a record exists, or if it is invalid. An invalid record means that it did not have a final log-in report.

After you tab into the record, entry may begin. If you have been entering data, and have not left this program, previous data entry will be left on the screen if the record has not been entered before. This will make much of the data entry considerably easier and faster. Tab through those fields where the data are the same. End data entry on a screen from any field by striking return. You can always return to a record by beginning this step again.

5 On the summary screen, the cursor will be placed at the label result fields. (You cannot access the fields above this). Enter P for Passed,or F for Failed. If for that particular test number there is no "A", no "B", or no "C" test, leave the relevant label result field blank by tabbing through it.

6 Enter any remarks. As with all "remarks" fields, if there are no remarks enter NONE.

7 Enter the Test Results: PAS for Passed, and FAL for failed, and remarks for each. If there is no "A", no "B",

MTL NO [ ] TEST NO [ ] LAB ID ( ) CMD [ ]

BRAND NAME ( )
TIRE NAME ( )
TIRE SIZE ( )
SPEED RATING ( ) LOAD RANGE ( ) SPEED
RESTRICT ( )
CARCASS MATERIAL ( ) BELT-1 MATERIAL ( ) BELT-2 MATERIAL ( )
TT/TL ( ) BIAS/BELT/RADIAL ( )
SIN. INFL. PSI ( ) KPA ( )
DUAL INFL. PSI ( ) KPA ( )
SIN. LOAD LBS ( ) KG ( )
DUAL LOAD LBS ( ) KG ( )
LABEL RESULTS A [ ] B [ ] C [ ]
REMARKS 1 [ ]
TEST RESULTS AS [ ] 2 [ ]
B [ ] 3 [ ]
C [ ] 4 [ ]
LAB APPROVAL [ ] DATE [ ]
DOT ACCEPTANCE [ ] DATE [ ]

Add Date (03/02/88) Update (03/02/88)

Summary Data Entry Screen
Exhibit 6-7

MTL NO [001] TEST NO [D1S0001] LAB ID (CRC) CMD [ ]

| | (A) | | (B) | | (C) | |
|---|---|---|---|---|---|---|
| BRAND | ( ) | | (TEST ) | | (TEST ) | |
| SIZE | ( ) | | (P205/70*15 ) | | ( P205/70*15) | |
| INFL PSI | S( ) | D( ) | S(032) | D( ) | S(032) | D( ) |
| LOAD LBS | S( ) | D( ) | S(3200) | D( ) | S(3200) | D( ) |
| CARCASS | ( ) | | (2N) | | (2N) | |
| BELT-1 | ( ) | | (2S) | | (2S) | |
| BELT-2 | ( ) | | ( ) | | ( ) | |
| TT/TL | ( ) | | (L) | | (L) | |
| CONSTRUCTION | ( ) | | (A) | | (A) | |
| SERIAL NO | ( ) | | (DOT-AA-001 ) | | (DOT-AA-011 ) | |
| CONF SYM (Y/N) | ( ) | | (Y) | | (Y) | |
| TREADWEAR (Y/N) | ( ) | | (Y) | | (Y) | |

Add Date (03/02/88) Update (03/02/88)

Labeling Test Data Entry Screen
Exhibit 6-8

```
MTL NO [001]          TEST NO [D4S0001]          LAB ID (CRC)          CMD [          ]
-------------------------------------------------------------------------------
PRE-TEST DEF                [N]          RIM COND      [Y]
RIM SIZE REC.               (                )ACT. SIZE      [4.5J ]
RIM NUMBER                  [123 ]       SPEC INFL     [024]
COND START  DATE  [01-02-88]   TIME  [1200]   PRESS  [024]   TEMP  [090]
COND END    DATE  [01-03-88]   TIME  [1300]   PRESS  [026]   TEMP  [091]
COND 3 HRS  (Y/N)  [Y] INFL ADJ FROM [024]   TO   [024]
WHEEL POSITION   [A ] MACH NO   [1]          MACH TYPE [H ]
START DATE      [01-02-88]
TEST TIMES  4S  [0800] E [1200] 6S [0800] E [1400] 24S [0800] E [0800]
END DATE        [01-03-88]
REQ. LOAD    7 [2720]       16 [2880]                    24 [3200]
TEST LOAD    7 [2700]       16 [2880]                    24 [3200]
RECOM. SPEED   [ ]
ACTUAL SPEED  7 [49]        16 [49]                      24 [49]
TEST AREA TEMP  7S [078] E [078]  16S [078] E [078]  24S [078] E [078]
END INFL     7 [24]         16 [26]                      24 [26]
PERF BY     INIT [MCM]     DATE [01-03-88]
LAB APP     INIT [XXX]     DATE [01-04-88]
TEST RESULTS  (P/F) [P]
REMARKS                    1 [TEST                      ]
                           2 [TEST                      ]
```

B Test Data Entry Screen
Exhibit 6-9

```
MTL NO [001]          TEST NO [D4S0001]          LAB ID (CRC)        CMD [          ]
-------------------------------------------------------------------------------
PRE-TEST DEF.    [y]          RIM COND        [n]          RECOM RIM SIZE (  )
ACT RIM SIZE  [123 ]          RIM NUMBER [123 ]            SPEC INFL  [030 ]
COND START  DATE         [01-01-88]  TIME [1100]          PRESS [026]  TEMP [  ]
COND END  DATE           [    ]  TIME [  ]                PRESS [  ] TEMP [  ]
COND 3 HRS (Y/N)         [ ] INFL ADJ FROM [  ]           TO [  ]
WHEEL POSITION [ ] MACH NO   [ ]                          MACH TYPE [ ]
START DATE [     ]
TEST TIMES 50 S  [    ]  E  [    ]  0 S   [    ]  E  [    ]  75 S     [    ]  E  [ ]
           80 S  [    ]  E  [    ]  85 S  [    ]  E  [    ]
END DATE         [          ]
REQ. LOAD   250  [    ]                  375  [    ]  400  [    ]  425  [    ]
TEST LOAD   250  [    ]                  375  [    ]  400  [    ]  425  [    ]
SPEED       250  [    ]  0  [    ]  375  [    ]  400       [    ]  425  [    ]
TST TEMP 250 S   [    ]  E  [    ]  0 S   [    ]  E  [    ]  375 S    [    ]  E  [ ]
         400 S   [    ]  E  [    ]  425 S [    ]
END INFL    250  [    ]  0  [    ]  375  [    ]  400       [    ]  425  [    ]
TIRE TEMP POS 1  [    ]          POS 2  [    ]          POS 3  [    ]
PERF BY   INIT   [    ]       DATE  [         ]
LAB APP   INIT   [    ]       DATE  [         ]  TEST RESULT [         ]
REMARKS          [                                              ]
                 [                                              ]
```

C Test Data entry Screen
Exhibit 6-10

or no "C" test, tab through the result field, and leave the remarks blank for the absent test type.

8 Enter the full Name and Title of the Laboratory official who approved the test, with the date of approval. All dates have the format MM/DD/YY. Tab through the partitions of the date fields.

9 Leave the DOT ACCEPTANCE field and date blank. This is for the use of the validating contractor use .

10 At the present time, the export option is invalid. It will be added at a later date.

11 Strike return, type "Label" and press the return key to move to the Labeling screen. (Figure 6-8)

12 The record identifier from the last screen will be kept, and if this is the record desired, tab through it. If not, enter the record desired.

13 There are three columns of data entry. Enter data only into the columns relating to the existing test types. Leave the columns relating to absent test type(s) blank by tabbing through them. Note: zeros in numeric-only fields are equivalent to blanks and must remain in the fields. The cursor will move to the first BRAND field. Enter the three letter brand code from APPENDIX B.

14 The rest of the fields are self-explanatory, but note the following rules:

a. Enter the three character brand name code from Appendix B.

b. Enter the tire size with all punctuation.

c. Enter the single and dual(if applicable) usage parameters for maximum inflation pressure and maximum load.

d. Carcass means the coded number and material of plies that exist bead to bead. A tire with two nylon plies bead to bead would be coded 2N See section 3.2 for a complete list of materials.

e. Belt-1 and Belt-2 means the number of belt plies. This does NOT mean the number of plies through the tread. The Belt-2 field will only be filled in if more than one type

of belt material is used. These two fields will be blank for a plain bias tire. For a Belted Bias or Radial tire for example, with 2 Nylon plies bead to bead, 2 steel belt plies, and 1 polyester ply , the carcass, belt-1, and belt-2 plies would be coded as, respectively: 2N, 2S, and 1P.

f. T = Tube Type
L = Tubeless

g. Construction codes:
B or I = Bias
E or S = Belted Bias
A or D = Radial

h. The Serial number should only include the two letter Manufacturer code from Appendix B, and the date code, combined. For example, a tire with General Tire as the manufacturer and a date code of 233, would be coded: AB233 (see figure 4-1)

i. Verify the existence of the Confirmation symbol and treadwear indicator with a Yes or a No (Y/N).

15 When you are finished, press return, and the record will be saved with the displayed data. If you do not wish to save the present display in favor of previous data entry, do not press return, but rather Shift and F9.

16 Type "BE" and press the return key at the CMD field to display the B Test Results screen (Figure 6-9).

17 Use the cursor arrow keys to move through the record identifiers, or enter the desired identifier to enter or edit data for this screen. Previous data entry will be left on the screen if you have not left the program. Some data are placed on this screen as products of the log-in program: the recommended rim size, specified inflation, and the required loads. If any of these are blank, it is because the tire size you are using was not on the most recently updated table. Inform OVSC-CC by telephone, and continue data entry, as this will not be affected. Be sure that the correct values were used during testing.

18 Most of the fields are self-explanatory, but note the following explanations:

a. PRE-TEST DEF means Pre-Test Defects. If there are none, answer N.

RIM COND means Rim Condition Satisfactory? If so, answer Y, otherwise, use a different Rim, or answer N.

If the answers are Y and N, respectively, for these two fields, explain in the Remarks section.

b. ACT means Actual Rim Size. Enter only the width portion, i.e., a rim of 14x2.15 should be coded 2.15

c. All dates are mm/dd/yy, and times should be local time on a 24 hour basis. If the time overlaps during a change to or from daylight savings time, enter times based on the beginning of test time, with no time change reflected. Make a note of this in the remarks section.

d. Temperatures are to be in Degrees Fahrenheit.

Speeds are to be in revolutions per minute.

Pressure is to be in Pounds per Square Inch. For details on test operation, see the Laboratory Procedures (Chapter 4).

e. PERF BY will be the initials of those persons who conducted the test.

LAB APP will be the initials of the Laboratory official who approved the test.

TEST RESULTS [P/F] should reflect either a PASSED or a FAILED test.

Remarks are free-form entry.

19 When you are through entering data on this screen, press return. If you do not wish to save data entry, do not press return, but type "CS" and press the return key at the CMD field to move to the C Test Results screen, which is shown in figure 6-10.

20 The C test screen has the same data entry procedure as the B test. When you are through, press return. Type "Summary" and press the return key at the CMD field to return to the Summary screen. You can now repeat the

| | |
|---|---|
| | procedure for the next test. Be sure that you change the MTL number and/or the Test number before entering data for the next test. |
| 21 | Type EX and press the return key at the CMD field to return to the Completed 119 TTR menu. |

### *6.4.4.10 MODIFYING 119 TEST DATA*

| STEP | DESCRIPTION |
|---|---|
| 1 | Test data can be modified any time before an export takes place. If a second export is necessary, the test data can still be modified, but the EXPORT [Y/N] flag will have to be changed to Y to assure an export of that test. Select option 14 from the main menu, and the Completed 119 TTR menu will appear. Select option 1 "Modify Completed 119 TTR", to modify the test data. |
| 2 | The cursor will be placed at the MTL number field of the Summary screen. Enter the MTL Number and the Test number. Previous data entry for this test will appear, and the cursor will be placed at the labeling test result field for the A test. Use the cursor arrow keys to move to the field(s) desired to be changed, and when finished, press return. If you do not want to save your changes in favor of previous data entry, do not press return. |
| 3 | Type the screen name and press return at the CMD field to move around between the screens as outlined in section 6.4.4.9, "Entering Tire Test Results." Use the cursor arrow keys to move through the record identification fields, or change them appropriately, and then tab to the fields to be changed. When through, press return. |
| 4 | Type EX and press the return key at the CMD field to return to the Completed 119 TTR menu. |

### *6.4.4.11 GENERATING COMPLETE 119 TTR FORMS*

| STEP | DESCRIPTION |
|---|---|
| 1 | Generating completed TTR forms will provide an easy way of checking your data entry. These completed forms are essentially the same as the blank forms created in Section 2, but they have the various fields filled in. These forms are not intended to be delivered or shipped, and do not constitute validated TTRs.. Select option 15 from the main menu to generate these forms. |
| 2 | Insert a diskette in drive A:. This diskette will need at least 120 Kbytes of free space. You may wish to designate a diskette just for generating completed forms. Press return. |
| 3 | The cursor will be placed at the MTL number field. Enter the Number desired and press the return key. |
| 4 | When the process is complete, the menu will reappear. Leave the Diskette in drive A:, and enter 99 to exit to DOS. |
| 5 | Check that your printer is on, and that it is set to 16.5 characters per inch pitch. Enter:<br>C>*print a:com09.nnn*<br>where *nnn* is the MTL number. When printing is complete, you should delete the completed form from the diskette. Enter:<br>**C>***del a:com09.nnn* |
| 6 | This process can be repeated as many times as desired. |

### *6.4.4.12 VALIDATE 119 TTR*

The validate 119 TTR option is selected by entering **16** from the main menu (see Figure 6-1). The user will be prompted to enter an MTL number of the tire test to be validated. Once a valid MTL number is entered, the system will run through the Summary and Label information. The system will then prompt the user to insert a floppy in Drive A, and once the floppy is inserted, will generate a report file to the floppy called **VAL19.XXX**, where **XXX** is the requested MTL number. In addition, the system will indicate incorrect test data for the user by displaying error messages.

*6.4.4.13 EXPORT 119 TEST DATA*

NOTE: AT THIS TIME, THE EXPORT OPTION IS NOT OPERABLE. IT WILL BE ADDED AT A LATER DATE.

## ATTACHMENT 1
## LOGIN DATA ENTRY COMMANDS

These commands are entered in the CMD field of the Login Data Entry Screen (see Exhibit 6-3) to move the cursor to the data field having the same name as the command. Therefore, the commands are self explanatory. The only fields that may be entered are those with brackets following them.

DATE CODE
MANUFACTURER
BRAND NAME
TIRE NAME
TT/TL
BIAS/BELT/RAD
SPEED RATING
LOAD RANGE
TIRE TYPE
SIN PRESS PSI
SIN PRESS KPA
DUAL PRESS PSI
DUAL PRESS KPA
SIN LOAD LBS
SIN LOAD KG
CARCASS MATERIA
BELT
TIRE SIZE
SPEED RESTRICTI
CONFIRM SYM
TREADWEAR IND
REPLACEMENT

## ATTACHMENT 2
## DRIVER COMMANDS

These commands may be entered at the CMD field of any screen that is displayed. A summary of the commands follows:

| COMMAND | DESCRIPTION |
|---|---|
| EX<br><br>EXI<br>EXT<br>E | Redisplays the menu used to call up the document. |
| HELP<br><br>HEL<br>HE<br>H | Displays help information and list of valid commands. |
| SUMMARY SCREEN<br><br>SUMMARY<br>SUMMAR<br>SUMMA<br>SUMM<br>SUM<br>S S<br>SS | Displays the Summary Data Entry Screen (see Exhibit 6-7). |
| LABEL SCREEN<br><br>LABEL<br>S L<br>SL | Displays the Labeling Test Data Entry Screen (see Exhibit 6-8). |
| AS TEST SCREEN<br><br>AS TEST<br>AS<br>ASTS | Displays the A Test Data Entry Screen. This screen is not being used at this time. |
| BE TEST SCREEN<br><br>BE TEST<br>BE<br>BETS | Displays the B Test Data Entry Screen (see Exhibit 6-9). |

## ATTACHMENT 2
## DRIVER COMMANDS
## (CONTINUED)

| COMMAND | DESCRIPTION |
|---|---|
| CS TEST SCREEN | Displays the C Test Data Entry Screen (see Exhibit 6-10). |
| CS TEST<br>CS<br>CSTS | |
| MTL | Moves the cursor to the MTL field at the top of the screen. |
| NEXT MTL<br>NM | |
| TEST NUMBER | Moves the cursor to the Test No. field at the top of the screen. |
| TEST NUMBE<br>TEST NUMB<br>TEST NUM<br>TEST NU<br>TEST N<br>TES N<br>TE N<br>T N<br>TN | |

## ATTACHMENT 3
## SUMMARY COMMANDS

These commands are entered in the CMD field of the Summary Data Entry Screen (see Exhibit 6-7) to move the cursor to the data field having the same name as the command. Therefore, the commands are self explanatory. The only fields that maybe entered are those with brackets following them.

LABEL RESULT A

LABEL RESULT B

LABEL RESULT C

TEST RESULT AS

TEST RESULT B

TEST RESULT C

REMARKS

LAB APPROVAL

LAB DATE

DOT ACCEPT

DOT DATE

NOTE: For the **REMARKS** command, the user is required to enter a particular line number along with the command. For example, **REMARKS-1** will move the cursor to the first **REMARKS** line; **REMARKS-2** will move the cursor to the second **REMARKS** line, and so on.

If a number is not entered with **REMARKS**, the following message will be displayed:

Missing Page/Line Number: try again or enter **HELP.**

## ATTACHMENT 4
## BE COMMANDS

These commands are entered in the CMD field of the B Test Date Entry Screen (see Exhibit 6-9) to move the cursor to the date field having the same name as the command. Therefore, the commands are self explanatory. The only fields that may be entered are those with brackets following them.

PRE TEST DEF

RIM CONDITION

ACTUAL RIM SIZE

RIM NUMBER

COND START DATE

COND START TIME

COND START PRES

COND START TEMP

COND END DATE

COND END TIME

COND END PRESS

COND END TEMP

COND 3 HOURS

INFL ADJ FROM

INFL ADJ TO

WHEEL POSITION

MACHINE NUMBER

MACHINE TYPE

**ATTACHMENT 4**
**BE COMMANDS**
**(CONTINUED)**

TEST START DATE

TEST TIME 4S

TEST TIME 4E

TEST TIME 6S

TEST TIME 6E

TEST TIME 24S

TEST TIME 24E

TEST END DATE

TEST LOAD 7

TEST LOAD 16

TEST LOAD 24

ACT SPEED 7

ACT SPEED 16

ACT SPEED 24

AREA TEMP 7S

AREA TEMP 4E

AREA TEMP 16S

AREA TEMP 16E

AREA TEMP 24S

AREA TEMP 24E

## ATTACHMENT 4
## BE COMMANDS
## (CONTINUED)

END INFL 7

END INFL 16

END INFL 24

PERFORM BY INIT

PERFORM BY DATE

LAB APPROVAL

LAB APPR DATE

TEST RESULTS

REMARKS

NOTE: For the **REMARKS** command, the user is required to enter a particular line number along with the command. For example, **REMARKS-1**, **REMARKS-2**, will move the cursor to the first and second **REMARKS** lines respectively.

If a number is not entered with **REMARKS**, the following message will be displayed:

Missing Page/Line Number: try again or enter **HELP.**

## ATTACHMENT 5
## CS COMMANDS

These commands are enterd in the CMD field of the C Test Data Entry Screen (see Exhibit 6-10) to move the cursor to the data field having the same name as the command. Therefore, the commands are self explanatory. The only fields that may be entered are those with brackets following them.

PRE TEST DEF

RIM CONDITION

ACTUAL RIM SIZE

RIM NUMBER

COND START DATE

COND START TIME

COND START PRES

COND START TEMP

COND END DATE

COND END TIME

COND END PRESS

COND END TEMP

COND 3 HOURS

INFL ADJ FROM

INFL ADJ TO

WHEEL POSITION

MACHINE NUMBER

MACHINE TYPE

TEST START DATE

## ATTACHMENT 5
## CS COMMANDS
## (CONTINUED)

TEST TIME 50S

TEST TIME 50E

TEST TIME 0S

TEST TIME 0E

TEST TIME 75S

TEST TIME 75E

TEST TIME 80S

TEST TIME 80E

TEST TIME 85S

TEST TIME 85E

TEST END DATE

TEST LOAD 250

TEST LOAD 375

TEST LOAD 400

TEST LOAD 425

ACT SPEED 250

ACT SPEED 0

ACT SPEED 375

## ATTACHMENT 5
## CS COMMANDS
## (CONTINUED)

ACT SPEED 400

ACT SPEED 425

AREA TEMP 250S

AREA TEMP 250E

AREA TEMP 0S

AREA TEMP 0E

AREA TEMP 375S

AREA TEMP 375E

AREA TEMP 400S

AREA TEMP 400E

AREA TEMP 425S

AREA TEMP 425E

END INFL 250

END INFL 0

END INFL 375

END INFL 400

END INFL 425

TIRE TEST POS 1

TIRE TEST POS 2

TIRE TEST POS 3

PERFORM BY INIT

PERFORM BY DATE

LAB APPROVAL

## ATTACHMENT 5
## CS COMMANDS
## (CONTINUED)

LAB APPR DATE

TEST RESULTS

REMARKS

NOTE: For the **REMARKS** command, the user is required to enter a particular line number along with the command. For example, **REMARKS-1**, **REMARKS-2**, will move the cursor to the first and second **REMARKS** lines respectively.

If a number is not entered with **REMARKS**, the following message will be displayed:

Missing Page/Line Number: try again or enter **HELP.**

# APPENDIX A

# GLOSSARY OF TERMS

## GLOSSARY OF TERMS

| | |
|---|---|
| **Accepted Report** | A tire test report, validated by the Tire Test Data Management System that has been certified as meeting NHTSA acceptance criteria and which is signed by the CTM or his representative. |
| **Alpha Character** | A single alphabetical character from A thru Z. |
| **Byte** | The amount of data necessary to define one character of information. Often used with metric-type prefixes, i.e., Kilobyte (Kb) (1000 bytes), Megabyte (Mb) (1 million bytes). |
| **Certified Report** | A computer validated test report, stamped and signed by the cognizant validating official. |
| **Contract Technical Manager (CTM)** | The designated OVSC Official who is responsible for assuring laboratory compliance with contractual obligations. |
| **Disk Drive** | A device installed in a PC for the reading and writing of data onto a floppy diskette. |
| **DOS** | Disk Operating System. The computer language that controls the operation of a PC. |
| **Fields** | Any group of letters and numbers that have significance or meaning. |
| **Floppy Diskette** | A 5-inch, 360 kilobyte (kb) magnetic medium diskette used for the storage and transmittal of data. |
| **Group** | Sets of eight characters and/or numbers separated by periods in the Log-in TWX. A group may consist of a field, several fields or part of a field. |
| **Hard Disk** | A magnetic drum installed inside a PC used for the storage of data, usually with a capacity of 10, 20, or 30 megabytes. |

| | |
|---|---|
| **Log-in** | Teletype (TWX) or mailed message from a testing laboratory to the computer center containing the characteristics and identification information of tires received by the testing laboratory for test purposes. |
| **NHTSA/OVSC** | National Highway Traffic Safety Administration/ Office of Vehicle Safety Compliance. |
| **Off line** | In reference to teletype operation: used for typing locally. No transmission takes place. Perforated tape can be fed back through machine and printed out to check for errors without transmitting the message. In reference to printers used with PCs: The printer interface with the PC has been interrupted, usually so that a change in printer configuration can take place. |
| **Paper Tape** | Teletype (TWX) message tape. |
| **Personal Computer** | An IBM-compatible desktop computer, with a hard disk, floppy diskette drives, central processing unit, keyboard, display screen, and optionally a printer, that is to be used, with OVSC-CC provided software, to operate the Tire Test Reporting System. |
| **PC** | Acronym for Personal Computer. |
| **Ply** | A layer of rubber coated parallel cords. |
| **Responsive Test** | A special test initiated by a complaint, failed standard test or at the discretion of the OVSC. |
| **Test Specimen** | A tire provided by OVSC for the purpose of compliance testing. |
| **Tire Test Reporting System** | A system written for use on IBM Compatible PCs, that is to be used for the entry, storage, transmittal, and validation of tire testing results |

| | |
|---|---|
| **TTR** | Tire Test Report. It can be produced by the Tire Test Reporting System in three forms: Blank, based on the Log-in with test requirements preprinted; Complete with test results printed as well; and Validated produced by OVSC-CC after test data has been computer checked for compliance with testing requirements. |
| **TWX** | Teletype Exchange Service (TWX) using teletypewriters equipped for automatic tape transmission. All 100 speed teletypewriters have four row electric keyboards similar to electric office teletypewriters. The equipment operates on the American Standard Code for Information Exchange (ASCII). This enables interconnection with other business machines and computers either directly or by a tape relay. |

# APPENDIX B

## NEW TIRE MANUFACTURER'S CODE LIST

(as of January, 1987)

| CODE | MANUFACTURER |
|---|---|
| AB | GENERAL |
| AC | GENERAL |
| AD | GENERAL |
| AE | GENERAL |
| AF | GENERAL |
| AH | GENERAL |
| AJ | UNIROYAL |
| AK | UNIROYAL |
| AL | UNIROYAL |
| AM | UNIROYAL |
| AN | UNIROYAL |
| AP | UNIROYAL |
| AS | STOMIL |
| AT | AVON |
| AU | UNIROYAL |
| AV | SEIBERLING |
| AW | SAMSON |
| AX | PHOENIX |
| AY | PHOENIX |
| A1 | MICHELIN |
| A2 | LEE |
| A3 | GENERAL |
| A4 | HUNG-A |
| A5 | ZAKLADY |
| A6 | APOLLO TYRES |
| A7 | BRIDGESTONE |
| A8 | BRIDGESTONE |
| A9 | GENERAL |
| BA | B.F.GOODRICH |
| BB | B.F.GOODRICH |
| BC | B.F.GOODRICH |
| BD | B.F.GOODRICH |
| BE | B.F.GOODRICH |
| BF | B.F.GOODRICH |
| BH | B.F.GOODRICH |
| BJ | B.F.GOODRICH |
| BK | B.F.GOODRICH |
| BL | B.F.GOODRICH |
| BM | B.F.GOODRICH |
| BN | B.F.GOODRICH |
| BP | B.F.GOODRICH |
| BT | SEMPERIT |
| BU | SEMPERIT |
| BV | INQUE RUBBER CO. |
| BW | GATES |
| BX | GATES |
| BY | GATES |
| B1 | MICHELIN |
| B2 | DUNLOP |
| B3 | MICHELIN |
| B4 | TAURUS |
| B5 | ZAKLADY |
| B6 | MICHELIN |
| B7 | MICHELIN |

| CODE | MANUFACTURER | CODE | MANUFACTURER |
|---|---|---|---|
| B8 | MICHELIN | C7 | IRONSIDES |
| B9 | BRIDGESTONE | C8 | BRIDGESTONE |
| CA | MOHAWK | DA | DUNLOP |
| CB | MOHAWK | DB | DUNLOP |
| CC | MOHAWK | DC | DUNLOP |
| CD | ALLIANCE | DD | DUNLOP |
| CE | ARMSTRONG | DE | DUNLOP |
| CF | ARMSTRONG | DF | DUNLOP |
| CH | ARMSTRONG | DH | DUNLOP |
| CJ | INQUE RUBBER CO. | DJ | DUNLOP |
| CK | ARMSTRONG | DK | DUNLOP |
| CL | CONTINENTAL | DL | DUNLOP |
| CM | CONTINENTAL | DM | DUNLOP |
| CN | CONTINENTAL | DN | DUNLOP |
| CP | CONTINENTAL | DP | DUNLOP |
| CT | CONTINENTAL | DT | DUNLOP |
| CU | CONTINENTAL | DU | DUNLOP |
| CV | ARMSTRONG | DV | VREDESTEIN |
| CW | TOYO | DW | VREDESTEIN |
| CX | TOYO | DX | VREDESTEIN |
| CY | MCCREARY | DY | DENMAN |
| C1 | MICHELIN | D1 | VIKING ASKIM |
| C2 | KELLYSPRINGFIELD | D2 | DAYTON |
| C3 | MCCREARY | D3 | UNITED |
| C4 | ARMSTRONG | D4 | DUNLOP |
| C5 | ZAKLADY | D5 | DUNLOP |
| C6 | MITAS | D6 | BOROVO |

| CODE | MANUFACTURER |
|---|---|
| D7 | DUNLOP |
| D8 | DUNLOP |
| D9 | UNITED |
| EA | METZLER |
| EB | METZLER |
| EC | METZLER |
| ED | OKAMOTO |
| EE | NITTO |
| EF | HUNG AH |
| EH | BRIDGESTONE |
| EJ | BRIDGESTONE |
| EK | BRIDGESTONE |
| EL | BRIDGESTONE |
| EM | BRIDGESTONE |
| EN | BRIDGESTONE |
| EP | BRIDGESTONE |
| ET | SUMITOMO |
| EU | SUMITOMO |
| EV | KLEBER-COLOMBES |
| EW | KLEBER-COLOMBES |
| EX | KLEBER-COLOMBES |
| EY | KLEBER-COLOMBES |
| E1 | CHUNG HSING |
| E2 | FIRESTONE |
| E3 | SEIBERLING |
| E4 | FIRESTONE |
| E5 | FIRESTONE |

| CODE | MANUFACTURER |
|---|---|
| E6 | FIRESTONE |
| E7 | FIRESTONE |
| E8 | FIRESTONE |
| E9 | FIRESTONE |
| FA | YOKOHAMA |
| FB | YOKOHAMA |
| FC | YOKOHAMA |
| FD | YOKOHAMA |
| FE | YOKOHAMA |
| FF | MICHELIN |
| FH | MICHELIN |
| FJ | MICHELIN |
| FK | MICHELIN |
| FL | MICHELIN |
| FM | MICHELIN |
| FN | MICHELIN |
| FP | MICHELIN |
| FR | MICHELIN |
| FR | MICHELIN |
| FT | MICHELIN |
| FU | MICHELIN |
| FV | MICHELIN |
| FW | MICHELIN |
| FX | MICHELIN |
| FY | MICHELIN |
| F1 | MICHELIN |
| F2 | FIRESTONE |

| CODE | MANUFACTURER | CODE | MANUFACTURER |
|---|---|---|---|
| F3 | MICHELIN | H3 | SAVA |
| F4 | CNB | H4 | BRIDGESTONE |
| F5 | FATE | H5 | HUTCHINSON |
| F6 | FIRESTONE | H6 | SHIN HUNG |
| F7 | FIRESTONE | H7 | LI HSIN |
| F8 | VIKRANT | H8 | FIRESTONE |
| HA | MICHELIN | JA | LEE |
| HB | MICHELIN | JB | LEE |
| HC | MICHELIN | JC | LEE |
| HD | MICHELIN | JD | LEE |
| HE | MICHELIN | JE | LEE |
| HF | MICHELIN | JF | LEE |
| HH | MICHELIN | JH | LEE |
| HJ | MICHELIN | JJ | LEE |
| HK | MICHELIN | JK | LEE |
| HL | MICHELIN | JL | LEE |
| HM | MICHELIN | JM | LEE |
| HN | MICHELIN | JN | LEE |
| HP | MICHELIN | JP | LEE |
| HT | CEAT | JT | LEE |
| HU | CEAT | JU | LEE |
| HV | CEAT | JV | LEE |
| HW | RUDY RIJEN | JW | LEE |
| HX | DAYTON | JX | LEE |
| HY | DAYTON | JY | LEE |
| H1 | MICHELIN | J1 | PHILLIPS |
| H2 | SAM YANG | J2 | BRIDGESTONE |

| CODE | MANUFACTURER |
|---|---|
| J3 | GUMARNE 1 MAJA |
| J4 | RUBENA |
| J5 | LEE |
| J6 | JAROSLAVL |
| J7 | R.& J.MFG.CORP. |
| J8 | DA CHUNG HUA |
| KA | LEE |
| KB | LEE |
| KC | LEE |
| KD | LEE |
| KE | LEE |
| KF | LEE |
| KH | LEE |
| KJ | LEE |
| KK | LEE |
| KL | LEE |
| KM | LEE |
| KN | LEE |
| KP | LEE |
| KT | LEE |
| KU | LEE |
| KV | LEE |
| KW | LEE |
| KX | LEE |
| KY | LEE |
| K1 | PHILLIPS |
| K2 | LEE |

| CODE | MANUFACTURER |
|---|---|
| K3 | KENDA |
| K4 | UNIROYAL |
| K5 | REIFENKOMBINAT |
| K6 | LEE |
| K7 | LEE |
| K8 | KELLYSPRINGFIELD |
| LA | LEE |
| LB | LEE |
| LC | LEE |
| LD | LEE |
| LE | LEE |
| LF | LEE |
| LH | UNIROYAL |
| LJ | UNIROYAL |
| LK | UNIROYAL |
| LL | UNIROYAL |
| LM | UNIROYAL |
| LN | UNIROYAL |
| LP | UNIROYAL |
| LT | UNIROYAL |
| LU | UNIROYAL |
| LV | MANSFIELD-DENMAN |
| LW | TRELLEBORG |
| LX | MITSUBOSHI |
| LY | MITSUBOSHI |
| L1 | GOODYEAR |
| L2 | WUON POONG |

| CODE | MANUFACTURER |
|---|---|
| L3 | TONG SHIN |
| L4 | INTREPRINDEREA |
| L5 | LASSA |
| L6 | MODI RUBBER |
| L7 | INTREPRINDEREA |
| L8 | DUNLOP |
| MA | GOODYEAR |
| MB | GOODYEAR |
| MC | GOODYEAR |
| MD | GOODYEAR |
| ME | GOODYEAR |
| MF | GOODYEAR |
| MH | GOODYEAR |
| MJ | GOODYEAR |
| MK | GOODYEAR |
| ML | GOODYEAR |
| MM | GOODYEAR |
| MN | GOODYEAR |
| MP | GOODYEAR |
| MT | GOODYEAR |
| MU | GOODYEAR |
| MV | GOODYEAR |
| MW | GOODYEAR |
| MX | GOODYEAR |
| MY | GOODYEAR |
| M1 | GOODYEAR |
| M2 | GOODYEAR |

| CODE | MANUFACTURER |
|---|---|
| M3 | MICHELIN |
| M4 | GOODYEAR |
| M5 | MICHELIN |
| M6 | GOODYEAR |
| M7 | GOODYEAR |
| NA | GOODYEAR |
| NB | GOODYEAR |
| NC | GOODYEAR |
| ND | GOODYEAR |
| NE | GOODYEAR |
| NF | GOODYEAR |
| NH | GOODYEAR |
| NJ | GOODYEAR |
| NK | GOODYEAR |
| NL | GOODYEAR |
| NM | GOODYEAR |
| NN | GOODYEAR |
| NP | GOODYEAR |
| NT | GOODYEAR |
| NU | GOODYEAR |
| NV | GOODYEAR |
| NW | GOODYEAR |
| NX | GOODYEAR |
| NY | GOODYEAR |
| N1 | MALOJA |
| N2 | HURTUBISE |
| N3 | NITTO |

| CODE | MANUFACTURER | CODE | MANUFACTURER |
|---|---|---|---|
| N4 | INTREPRINDEREA | P4 | KELLYSPRINGFIELD |
| N5 | PNEUMANT | P5 | GENERAL |
| N6 | PNEUMANT | P6 | KELLYSPRINGFIELD |
| N7 | INTREPRINDEREA | P7 | KELLYSPRINGFIELD |
| N8 | LEE | P8 | NO.2 RUBB.PLANT |
| PA | GOODYEAR | TA | KELLYSPRINGFIELD |
| PB | GOODYEAR | TB | KELLYSPRINGFIELD |
| PC | GOODYEAR | TC | KELLYSPRINGFIELD |
| PD | GOODYEAR | TD | KELLYSPRINGFIELD |
| PE | SEIBERLING | TE | KELLYSPRINGFIELD |
| PF | GOODYEAR | TF | KELLYSPRINGFIELD |
| PH | KELLYSPRINGFIELD | TH | KELLYSPRINGFIELD |
| PJ | KELLYSPRINGFIELD | TJ | KELLYSPRINGFIELD |
| PK | KELLYSPRINGFIELD | TK | KELLYSPRINGFIELD |
| PL | KELLYSPRINGFIELD | TL | KELLYSPRINGFIELD |
| PM | KELLYSPRINGFIELD | TM | KELLYSPRINGFIELD |
| PN | KELLYSPRINGFIELD | TN | KELLYSPRINGFIELD |
| PP | KELLYSPRINGFIELD | TP | KELLYSPRINGFIELD |
| PT | KELLYSPRINGFIELD | TT | KELLYSPRINGFIELD |
| PU | KELLYSPRINGFIELD | TU | KELLYSPRINGFIELD |
| PV | KELLYSPRINGFIELD | TV | KELLYSPRINGFIELD |
| PW | KELLYSPRINGFIELD | TW | KELLYSPRINGFIELD |
| PX | KELLYSPRINGFIELD | TX | KELLYSPRINGFIELD |
| PY | KELLYSPRINGFIELD | TY | KELLYSPRINGFIELD |
| P1 | GISLAVED | T1 | HANKOOK |
| P2 | KELLYSPRINGFIELD | T2 | UNIROYAL |
| P3 | SKEPPLANDA | T3 | ZAKLADY |

| CODE | MANUFACTURER | CODE | MANUFACTURER |
|---|---|---|---|
| T4 | CARIDENG | U4 | GEO.BYERS SONS |
| T5 | TIGAR-PIROT | U5 | FARBENFABRIKEN |
| T6 | HULERA | U6 | PNEUMANT |
| T7 | HANKOOK | U7 | PNEUMANT |
| T8 | GOODYEAR | U8 | NANKANG |
| UA | KELLYSPRINGFIELD | VA | FIRESTONE |
| UB | KELLYSPRINGFIELD | VB | FIRESTONE |
| UC | KELLYSPRINGFIELD | VC | FIRESTONE |
| UD | KELLYSPRINGFIELD | VD | FIRESTONE |
| UE | KELLYSPRINGFIELD | VE | FIRESTONE |
| UF | KELLYSPRINGFIELD | VF | FIRESTONE |
| UH | KELLYSPRINGFIELD | VH | FIRESTONE |
| UJ | KELLYSPRINGFIELD | VJ | FIRESTONE |
| UK | KELLYSPRINGFIELD | VK | FIRESTONE |
| UL | KELLYSPRINGFIELD | VL | FIRESTONE |
| UM | KELLYSPRINGFIELD | VM | FIRESTONE |
| UN | KELLYSPRINGFIELD | VN | FIRESTONE |
| UP | COOPER | VP | FIRESTONE |
| UT | COOPER | VT | FIRESTONE |
| UU | CARLISLE | VU | UNIVERSAL |
| UV | KZOWA | VV | FIRESTONE |
| UW | OKADA | VW | OHTSU |
| UX | TAY FENG | VX | FIRESTONE |
| UY | CHENG SHIN | VY | FIRESTONE |
| U1 | LIEN SHIN | V1 | LIVINGSTONS TIRE |
| U2 | SUMITOMO | V2 | VSESOJUZNOE |
| U3 | MILOJE | V3 | TA HSIN |

| CODE | MANUFACTURER |
|---|---|
| V4 | OHTSU |
| V5 | FIRESTONE |
| V6 | FIRESTONE |
| V7 | VSESOJUZNOE |
| V8 | BORAS |
| WA | FIRESTONE |
| WB | FIRESTONE |
| WC | FIRESTONE |
| WD | FIRESTONE |
| WE | NANKANG |
| WF | FIRESTONE |
| WH | FIRESTONE |
| WK | PENNSYLVANIA |
| WL | MANSFIELD |
| WM | OLYMPIC |
| WN | OLYMPIC |
| WP | SCHENUIT |
| WT | MADRAS |
| WU | CEAT |
| WV | GENERAL |
| WW | EUZKADI |
| WX | EUZKADI |
| WY | EUZKADI |
| W1 | FIRESTONE |
| W2 | FIRESTONE |
| W3 | VREDESTEIN |
| W4 | OLYMPIC |
| W5 | FIRESTONE |
| W6 | FIRESTONE |
| W7 | FIRESTONE |
| W8 | FIRESTONE |
| W9 | FIRESTONE |
| XA | PIRELLI |
| XB | PIRELLI |
| XC | PIRELLI |
| XD | PIRELLI |
| XE | PIRELLI |
| XF | PIRELLI |
| XH | PIRELLI |
| XJ | PIRELLI |
| XK | PIRELLI |
| XL | PIRELLI |
| XM | PIRELLI |
| XN | PIRELLI |
| XP | PIRELLI |
| XT | VEITH-PIRELLI |
| XU | SAM YANG |
| XV | DAYTON |
| XW | DAYTON |
| XX | BANDAG |
| XY | DAYTON |
| X0 | VSESOJUZNOE |
| X1 | TONG SHIN |
| X2 | HWA FONG |

| CODE | MANUFACTURER |
|---|---|
| X3 | VSESOJUZNOE |
| X4 | PARS TYRE |
| X5 | J.K.INDUSTRIES |
| X6 | VSESOJUZNOE |
| X7 | VSESOJUZNOE |
| X8 | VSESOJUZNOE |
| X9 | VSESOJUZNOE |
| YA | DAYTON |
| YB | DAYTON |
| YC | DAYTON |
| YD | DAYTON |
| YE | DAYTON |
| YF | DAYTON |
| YH | DAYTON |
| YJ | DAYTON |
| YK | DAYTON |
| YL | OY NOKIA |
| YM | SEIBERLING |
| YN | SEIBERLING |
| YP | SEIBERLING |
| YT | SEIBERLING |
| YU | SEIBERLING |
| YV | SEIBERLING |
| YW | SEIBERLING |
| YX | SEIBERLING |
| YY | SEIBERLING |
| Y1 | GOODYEAR |
| Y2 | DAYTON |
| Y3 | SEIBERLING |
| Y4 | DAYTON |
| Y5 | TSETAI |
| Y6 | DUNLOP |
| Y7 | BRIDGESTONE |
| ... | |

# APPENDIX C

## BRAND NAME CODE LIST

(As of January, 1987)

| CODE | BRANDNAME |
|---|---|
| *** | NO BRAND |
| ACM | ACME |
| ACO | AMOCO |
| ADM | ADMIRAL |
| AGL | ARGYLE |
| AGW | AGWAY |
| AHN | AUTOBAHN |
| AJX | AJAX |
| ALA | ALL AMERICAN |
| ALC | ALCARD |
| ALN | ARLANS |
| ALS | ALLSTATE |
| ALT | ALLIANCE |
| AMC | ALL MAC |
| ARA | AURORA |
| ARM | ARMSTRONG |
| ARY | ALRAY |
| AST | ASTROSTAR |
| ATB | AUTO CLUB |
| ATL | ATLAS |
| AUR | AUBURN |
| AUT | AUTOFLITE |
| AVA | AVALON |
| AVN | AVON |
| AVT | AVANTI |
| AWD | AWARD |
| BAR | BARCLAY |

| CODE | BRANDNAME |
|---|---|
| BDG | BRIDGESTONE |
| BFG | B.F.GOODRICH |
| BIG | BIG "O" |
| BLD | BOLIDE |
| BLP | BILLUPS |
| BOB | BOBBY UNSER |
| BON | BONDED |
| BOR | BOROVO |
| BRM | BARUM |
| BRA | BRADLEY |
| BSW | BRUNSWICK |
| BTM | BILT-MOR |
| BUC | BUCCANEER |
| BAR | BARCLAY |
| CAR | CARLISLE |
| CAV | CAVALIER |
| CBB | CARIBBEAN |
| CBI | CBI |
| CDE | CONCORDE |
| CDV | CORDOVAN |
| CEN | COEN |
| CGR | COUGAR |
| CLB | CLUB |
| CLC | CLASSIC |
| CLN | COLONIAL |
| CNG | CARNEGIE |
| CNL | CORNELL |

| CODE | BRANDNAME |
|---|---|
| COL | COLUMBUS |
| CON | CONTINENTAL |
| COP | CO-OP |
| CPR | COOPER |
| CRD | CORDUROY |
| CRN | CARLETON |
| CRT | CREST |
| CRV | CARAVELLE |
| CSA | CEAT |
| CSN | CHENG SHIN |
| CTC | COAST-TO-COAST |
| CTL | CENTENNIAL |
| DCP | DICK CEPEK |
| DEN | DEAN |
| DGL | DOUGLAS |
| DHL | DUNHILL |
| DIA | DIAMOND |
| DLA | DELTA |
| DMK | DURAMARK |
| DNB | DANUBIANA |
| DNM | DENMAN |
| DOR | DORAL |
| DRE | DREXEL |
| DTN | DAYTON |
| DUN | DUNLOP |
| DUR | DURALON |
| DVS | DAVIS |

| CODE | BRANDNAME |
|---|---|
| ECO | EMPCO |
| ECL | EL CLASSICO |
| ELC | ELECTRA |
| ELD | ELDORADO |
| ELI | ELIMINATOR |
| EMP | EMPIRE |
| ENG | ENGLEBERT |
| EUR | EUROCCO |
| EVT | EVEREST |
| EXN | EXXON |
| ESC | ESCORT |
| ESP | ESPRIT |
| FAI | FAIRMONT |
| FAL | FALCON |
| FDA | FULDA |
| FEM | FED-MART |
| FHF | FRUEHAUF |
| FIR | FIRESTONE |
| FLS | FALLS |
| FLY | FLYING A |
| FMA | FORMULA 1 |
| FML | FORMULA |
| FOM | FOREMOST |
| FSK | FISK |
| FWD | FLEETWOOD |
| GAT | GATOR |
| GDR | GOODRICH |

| CODE | BRANDNAME |
|---|---|
| GDY | GOODYEAR |
| GEN | GENERAL |
| GET | GETTY |
| GIB | GIBSON |
| GIS | GISLAVED |
| GLF | GULF |
| GNT | GIANT |
| GOB | GLOBAL |
| GRD | GUARDIAN |
| GRM | GRANTMASTER |
| GRT | GRANT |
| GTS | GATES |
| GTT | GILLETTE |
| HAN | HANKOOK |
| HAR | HARVARD |
| HCL | HERCULES |
| HIL | HILLCREST |
| HMK | HALLMARK |
| HNG | HUNG-A |
| HOD | HOOD |
| HOL | HOLIDAY |
| IMK | INTERMARK |
| IMP | IMPERIAL |
| INL | INLAND |
| INT | INTERSTATE |
| IRC | INQUE RUBBER CO. |
| IRN | IRONSIDES |

| CODE | BRANDNAME |
|---|---|
| IRO | IRONSIDES |
| IRI | I.R.I. |
| JAV | JAVELIN |
| JCP | JC PENNEY |
| JET | JETZON |
| JTW | JTW |
| KBR | KLEBER |
| KEL | KELLYSPRINGFIELD |
| KMT | K-MART |
| LAN | LANCER |
| LAR | LARAMIE |
| LAV | LARAVELLE |
| LEE | LEE |
| LEH | LEHAVRE |
| LMG | LAHER MUSTANG |
| LMK | LUMARK |
| LMN | LEMANS |
| LST | LESTER |
| LXN | LEXINGTON |
| MAD | MADRAS |
| MAN | MANSFIELD |
| MBR | MOBILINER |
| MCC | MCCREARY |
| MCL | MCCLAREN |
| MCO | MONACO |
| MED | MEDALLION |
| MEL | MELBOURNE |

| CODE | BRANDNAME |
|---|---|
| MIC | MICHELIN |
| MIN | MICHELIN NIGRA |
| MIT | MITCHELL |
| MLL | MILLER |
| MOB | MOBIL |
| MOH | MOHAWK |
| MON | MONARCH |
| MRS | MORRIS |
| MTN | MARTIN |
| MTR | METRO |
| MTS | MICKEY THOMPSON |
| MTW | MOTORWAY |
| MTZ | METZLER |
| MUM | MULTI-MILE |
| MUS | MUSTANG |
| MGW | MONTGOMERY WARD |
| NAN | NANKANG |
| NAP | NAPA |
| NAT | NATIONAL |
| NIT | NITTO |
| NOR | NORTHSTATE |
| NVA | NOVA |
| NWD | NATION-WIDE |
| OBN | ORBAN |
| OHT | OHTSU |
| OKT | O.K. TIRES |
| OXF | OXFORD |

| CODE | BRANDNAME |
|---|---|
| PAN | PANTHER |
| PAR | PHARIS |
| PEL | PEERLESS |
| PEN | PENNSYLVANIA |
| PER | PERFORMANCE |
| PIL | PHILLIPS |
| PMT | PNEUMANT |
| PNX | PHOENIX |
| PNY | PENNEYS FOREMOST |
| POR | PORTAGE |
| POS | POS-A-TRACTION |
| PRL | PIRELLI |
| PRM | PRIMERO |
| PRN | PRINCETON |
| PTC | PRO-TRAC |
| PUR | PURE OIL |
| PWL | PROWLER |
| PRK | PARKWAY |
| PRO | PRO-PAR |
| RAM | RAM |
| RAN | RANGER |
| RCM | RACEMASTER |
| RDK | ROAD KING |
| REG | REGAL XL |
| REM | REMINGTON |
| REP | REPUBLIC |
| REV | REVERE |

| CODE | BRANDNAME |
|---|---|
| REY | REYNOLDS |
| RGL | REGUL |
| RIK | RIKEN |
| RIV | RIVERSIDE |
| RLX | ROLEX |
| RSP | ROAD SPEED |
| RWD | ROGER WARD |
| SAF | SAFEMARK |
| SAR | SARATOGA |
| SAT | SATURN |
| SAX | SAXON |
| SBL | SEIBERLING |
| SBR | SABRA |
| SCH | SCHENUIT |
| SEC | SECURITY |
| SEM | SEMPERIT |
| SHL | SHELL |
| SLR | SOLAR |
| SMS | SAMSON |
| SMT | SUMMIT |
| SMY | SAM YANG |
| SNG | STINGRAY |
| SON | SONIC |
| SPN | SPARTAN |
| SPR | SUPERIOR |
| SPS | SUPER S |
| SPT | SUPER TEST |

| CODE | BRANDNAME |
|---|---|
| SRA | SIERRA |
| SRS | SEARS |
| STA | STAR |
| STC | SUPER TRACTION |
| STF | STARFIRE |
| STL | STERLING |
| STN | STRATTON |
| STO | STOMIL |
| STP | STRIPPER |
| STR | STRATOFLIGHT |
| STX | STAHLFLEX |
| SUM | SUMITOMO |
| SVA | SAVA |
| SVM | SAVOY MASTER |
| SVR | SOVEREIGN |
| SVY | SAVOY |
| SWL | SWALLOW |
| TAY | TAYFENG |
| TCO | TRANSCO |
| TEL | TELSTAR |
| TIG | TIGAR |
| TIS | TRI-STATE |
| TKW | TRUK-WAY |
| TOY | TOYO |
| TRE | TRELLEBORG |
| TRI | TRISUN |
| TRM | TRIUMPH |

| CODE | BRANDNAME |
|---|---|
| TRP | TRIPPER |
| TRS | TAURUS |
| TRY | TREASURY |
| TSN | TONG SHIN |
| TVL | TRAVELER |
| TYO | TYRINO |
| TEC | TECHNA |
| UCO | UNICO |
| UNE | UNIROYAL/EUROPE |
| UNI | UNIROYAL |
| T | UNITED |
| U. V | UNIVERSAL |
| UON | UNION 76 |
| VAL | VALIANT |
| VAN | VAN NESS |
| VCO | VICO |
| VDB | VANDERBILT |
| VEE | VELOCE |
| VEI | VEITH |
| VGD | VANGUARD |
| VIC | VICTORIAN |
| VIK | VIKING |
| VIS | VISTA |
| VLT | VELTRO |
| VOG | VOGUE |
| VRD | VREDESTEIN |
| VTA | VETTA |

| CODE | BRANDNAME |
|---|---|
| WCK | WARWICK |
| WDS | WINDSOR |
| WLF | WOLFSBURG |
| WNS | WINSTON |
| WNT | WINTERMASTER |
| WRD | WARD |
| WRR | WARRIOR |
| WSA | WESTERN AUTO |
| WTE | WHITE |
| WUN | WUON POONG |
| XPR | X PRES |
| YKS | YKS |
| YOK | YOKOHAMA |
| YRK | YORK |
| ZEN | ZENITH |