

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

**PROCEDURES
FOR
TIRE TREADWEAR TESTING**

**CONSUMER INFORMATION REGULATIONS
PART 575.104**

UNIFORM TIRE QUALITY GRADING

ENFORCEMENT

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

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS	iii
SECTION I INTRODUCTION	
1-1. Responsibilities for Program Administration and Procurement	1-1
1-3. Purpose and Scope	1-1
1-7. Definitions of Terms	1-1
1-9. Tire Test Program Automatic Data Processing System	1-1
SECTION II GENERAL PROCEDURES	
2-1. General	2-1
2-3. Calibration of Measurement and Test Equipment	2-1
2-5. Operating Test Procedure	2-2
2-7. Good Housekeeping	2-2
2-9. Test Security	2-2
2-11. Test Forms	2-2
2-13. Test Program Overview	2-2
SECTION III TIRE PREPARATION	
3-1. General	3-1
3-3. Tire Receipt and Handling	3-1
3-6. Tire Identification and Marking	3-1
3-11. Tire Pre-Test Inspection	3-2
3-13. Test Rims	3-2
3-18. Tire Mounting	3-3
SECTION IV VEHICLE PREPARATION	
4-1. General	4-1
4-3. Test Vehicle Identification	4-1
4-5. Vehicle Preventive Maintenance Schedule	4-1
4-7. Safety Equipment	4-1
4-9. Vehicle Test Weight	4-1
4-12. Vehicle Wheel Alignment	4-2
4-15. Time, Speed and Mileage Measurement	4-2
SECTION V TESTING PROCEDURES	
5-1. General	5-1
5-3. Test Convoy	5-1
5-7. Vehicle Repairs	5-1
5-9. Vehicle Storage	5-1
5-11. Treadwear Course Description	5-1
5-15. Driving Instructions	5-6
5-17. Tire Break-In	5-7
5-21. Tread Depth Measurement	5-7
5-34. Test Series	5-8
5-39. Test Data	5-9
5-42. Abnormal Conditions	5-9
5-44. Time, Speed and Mileage Analysis	5-9
5-46. Tire Disposition	5-9

TABLE OF CONTENTS (cont)

SECTION VI REPORT PROCEDURES

6-1. General 6-1
6-3. Receipt of Forms..... 6-1
6-6. Disposition of Forms..... 6-1
6-8. Additional Data and Forms..... 6-1
6-10. Treadwear Test Package Procedures 6-1
6-11. Completing the UTQG Treadwear Summary Sheet..... 6-1
6-15. Completing the UTQG Treadwear Daily Run Sheet 6-1
6-18. Completing the UTQG Tire Measurement Form..... 6-7

APPENDIX A A-1

GLOSSARY OF TERMS G-1

LIST OF ILLUSTRATIONS

Figure	Page
1 Treadwear Test Procedure Flow	iv
2 Tire Marking.	3-2
3 Key Points Along Treadwear Test Course	5-2
4 San Angelo, Texas Vicinity	5-3
5 UTQG Treadwear Test Course (Sheet 1 of 2)	5-4
6 UTQG Treadwear Test Course (Sheet 2 of 2)	5-5
7 The “Forward X” Rotation Plan.	5-7
8 UTQG Test Assignment Form	6-2
9 UTQG Treadwear Summary Sheet	6-3
10 UTQG Treadwear Daily Run Sheet.	6-4
11 UTQG Treadwear Measurement Form	6-5

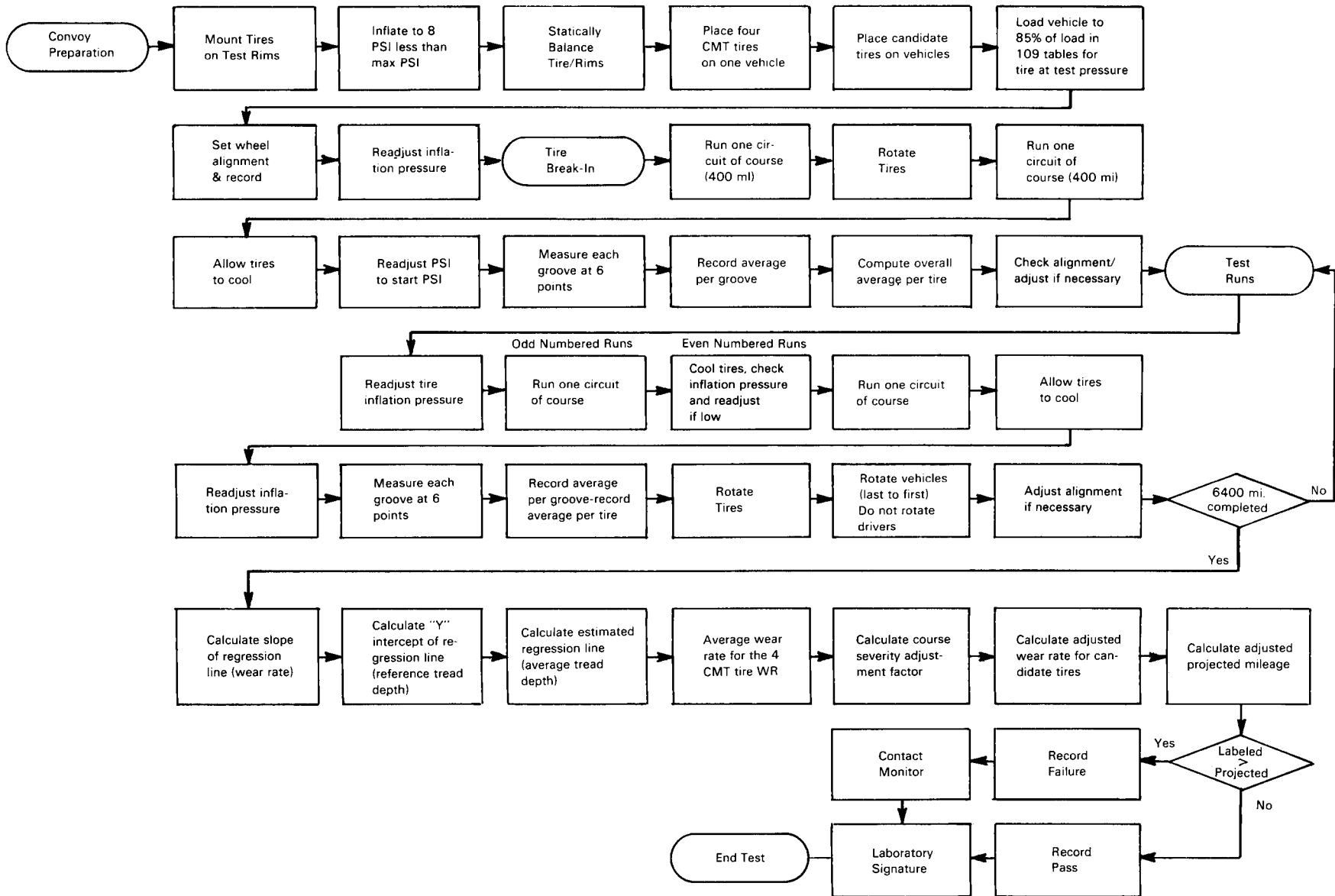


Figure 1. Treadwear Test Procedure Flow.

SECTION I. INTRODUCTION

1-1. RESPONSIBILITIES FOR PROGRAM ADMINISTRATION AND PROCUREMENT

1-2. The Department of Transportation (DOT) National Highway Traffic Safety Administration (NHTSA), Enforcement, Office of Vehicle Safety Compliance (OVSC) is responsible for administering the tire testing program. The procurement of test items is a NHTSA Office of Contracts and Procurement responsibility. 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 superiors. 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 superiors.

1-3. PURPOSE AND SCOPE

1-4. This manual describes the standardized tire test and reporting procedure for independent testing organizations in conformance with Part 575.104 Consumer Information Regulations-Uniform Tire Quality Grading-Treadwear Testing, effective April 1, 1979 for Bias Ply Tires, October 1, 1979 for Bias Belted Tires and April 1, 1980 for Radial Tires. 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.

1-5. The procedure is not intended to conflict with the requirements set forth in the Uniform Tire Quality Grading Regulation (UTQG) or any amendments thereto. Any contractor interpreting any part of this procedure to be in conflict with UTQG or noting any deficiency in it is required to advise the NHTSA CTM for a resolution of the discrepancy prior to testing.

NOTE

The testing organization is responsible for testing tires to all applicable requirements of this regulation and procedure.
The testing organization is responsible for verifying accuracy of all data sheets.

1-6. The UTQG Test Facility in San Angelo, Texas has been established by the DOT, NHTSA as the test facility for UTQG treadwear and traction testing. The test facility is centered around the Goodfellow Air Force Base and the Treadwear Course utilizes the public roadways in the vicinity of San Angelo, Texas for the established 400 mile test course. The UTQG Test Facility is operated by the Vehicle Research and Test Center (VRTC) of Research and Development (R&D), NHTSA. The UTQG Test Facility Chief has overall responsibility for all operations of the Test Facility.

1-7. DEFINITIONS OF TERMS

1-8. Definitions for all specific technical words and phrases will be found in the Glossary of Terms at the end of this manual. Should any questions arise as to the interpretation of these definitions, contact the CTM.

1-9. TIRE TEST PROGRAM AUTOMATIC DATA PROCESSING SYSTEM

1-10. The tire compliance test program will use automated data processing techniques. The system is designed to more accurately qualify test results in conformance with UTQG, establish a common language for all program participants, minimize invalid tests, eliminate redundancy of effort, and provide the NHTSA Office of Vehicle Safety Compliance (OVSC) with timely test results and laboratory status information.

SECTION II. GENERAL PROCEDURES

2-1. GENERAL

2-2. 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 specific test procedures.

2-3. CALIBRATION OF MEASUREMENT AND TEST EQUIPMENT

2-4. 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."

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. 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 person who calibrated the equipment.
4. A written calibration procedure shall be provided by the contractor which includes, as a minimum, the following information for all measuring and test equipment:
 - 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.

TP-UTQG-W-01

6. As a minimum, the measurement and test equipment calibration system will encompass:
 - a. Vehicle speed measuring device.
 - b. Vehicle distance measuring device.
 - c. Vehicle weighing device(s).
 - d. Vehicle front end alignment equipment.
 - e. Tire pressure gage.
 - f. Digital probe treadwear measurement device (to be calibrated by the UTQG Test Facility).
 - g. Mechanical dial gage (backup use only).
 - h. Tire rim measurement equipment.

2-5. OPERATING TEST PROCEDURE

2-6. Before starting the test program, the contractor shall provide a written operating test procedure which includes a step-by-step description of the test methodology used in the program. Where appropriate, the test procedure will include such items as check-off lists and individual worksheets for each testing phase. The operating test procedure must be approved by the NHTSA CTM before testing commences.

2-7. GOOD HOUSEKEEPING

2-8. NHTSA Contractors will maintain the test vehicles, test fixtures, and instrumentation in a neat and clean condition with test instruments set up in an orderly manner consistent with good test laboratory housekeeping practices.

2-9. TEST SECURITY

2-10. All test specimens shall be protected from 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 to protect and segregate the data that evolve from testing each tire.

2-11. TEST FORMS

2-12. All report items and test results are entered in black ink, or indelible pen on the forms by the testing organization. A sample set of UTQG Treadwear Test forms appears in Figures 8, 9, 10 and 11.

2-13. TEST PROGRAM OVERVIEW

2-14. The NHTSA test contractor will receive Course Monitoring Tires (CMT's) and candidate tires (test tires) from from the UTQG Test Facility in San Angelo, Texas. The tires will then be labeled, inspected, mounted onto rims, balanced and then placed onto the test vehicle. The test vehicle will be ballasted to achieve the required loading of the tires. The vehicles will be driven over the established 400 mile course utilizing the prescribed driving techniques for a total of 7,200 miles.

After each 800 miles, the tire pressure and tire depth will be measured, the tire position will be rotated, and the vehicle's front end alignment will be adjusted where required. At the completion of the test the wear rates of each tire will be calculated. The candidate tire wear rate will be adjusted to compensate for changes in course severity utilizing the data from the course monitoring tires. Based on the adjusted wear rate the tire is graded, and the resultant grade is compared with the published grade of the tire manufacturer, to determine the accuracy of the UTQG treadwear grade.

SECTION III. TIRE PREPARATION

3-1. GENERAL

3-2. In addition to the candidate tires, course monitoring tires of the three basic construction types will be received. This section presents procedures for tire receipt, handling, storage, identification, marking and mounting.

3-3. TIRE RECEIPT AND HANDLING

3-4. Inventory and log-in procedures as detailed in the UTQG Data Management System will be accomplished by the Test Facility personnel prior to release of the tires to the test contractor.

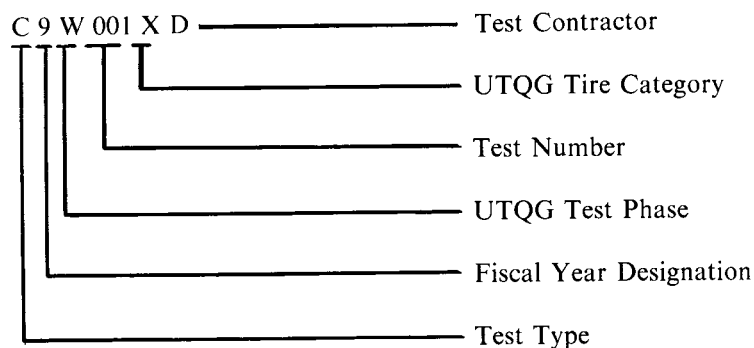
3-5. The candidate tires and the course monitoring tires will be disbursed from NHTSA to the contracted testing organization by the UTQG Treadwear Manager (TWM). The TWM will inspect the tires to ascertain that they are acceptable for use when received. The testing organization will insure that the tires are handled with care to avoid cuts, tears, or any condition that may adversely affect test validity.

3-6. TIRE IDENTIFICATION AND MARKING

3-7. The tires will have been marked with the fiscal year and an inventory number when they arrive from NHTSA storage. This number will be supplemented with the code "B" - Bias, "B/B" - Belted-Bias or "R" - Radial corresponding to that tire's construction.

3-8. A test number shall be written onto the outboard sidewall of the tire by the contractor utilizing tire paint or tire paint stick and kept legible at all times.

3-9. The test number shall consist of eight characters. The first is a code letter identifying the test type (C = compliance test, B = breakin, R = retest, S = special test, M = monitoring, E = responsive). The second is the last number of the fiscal year (9 = 1979). The third digit is a letter identifying the UTQG test phase (W = treadwear). The next three digits are assigned serially from a block of numbers provided each contractor by the NHTSA, OVSC. These numbers account by individual tire, for all tires received by the contractor and further identify the contractor by the different number series assigned to each contractor. The next character represents the UTQG tire category (C = CMT, X = Candidate, S = Special). The last character is a code letter identifying the test contractor. See Figure 2 for the tire marking requirements.



NOTE

Each group of four tires will carry the same test number. The four tires will be individualized with a letter A, B, C, or D.

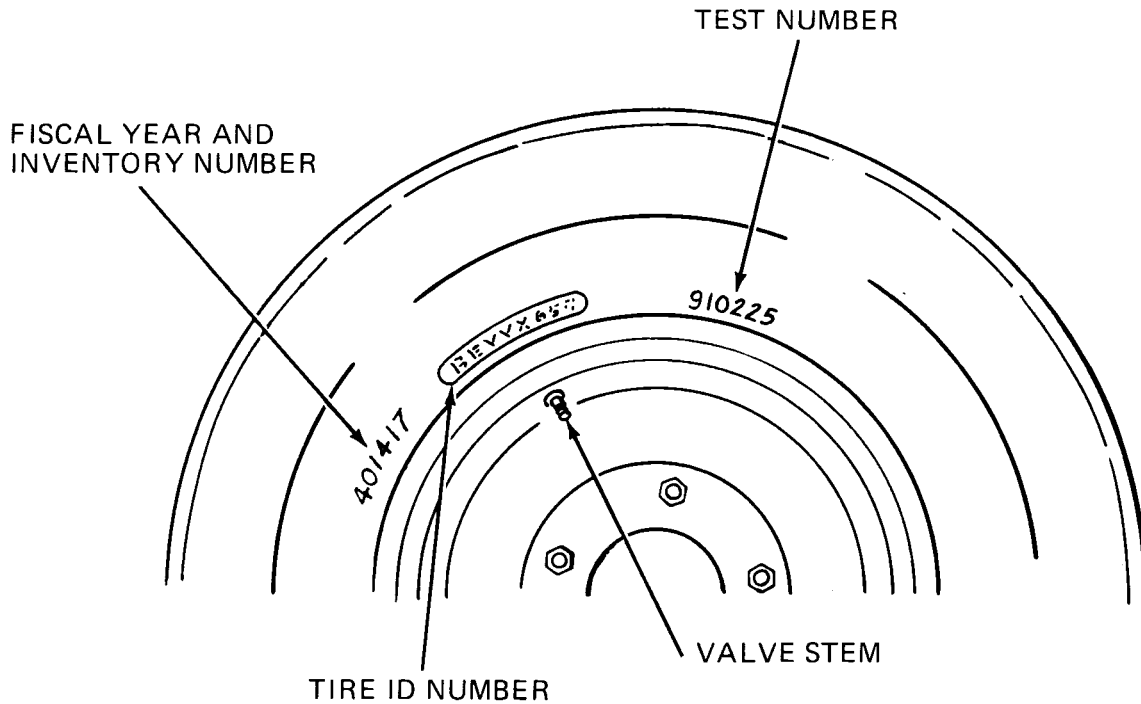


Figure 2. Tire Marking.

3-10. In addition to the test number, the test car number, and tire position shall be indicated on the tire utilizing white chalk.

3-11. TIRE PRE-TEST INSPECTION

3-12. Prior to mounting the tires the contractor shall conduct a detailed pre-test inspection. Special attention 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 tested when the contractor receives approval by the CTM.

3-13. TEST RIMS

3-14. All physical dimensions of the test rim shall conform with published dimensions of a standard production rim commercially available. Tires tested in accordance with UTQG 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. 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 measurement and visual inspection. The physical measurements taken shall include diameter and width.

3-15. 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. The test rim should have a width within $+0.50$ ₋₀ inch of the width listed. Prior to making measurements, the wheel shall be 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.

3-16. The measurements shall be recorded and perpetual records shall be kept and made available to the CTM.

3-17. The test rims are to be identified by a contractor 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 a 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.

3-18. TIRE MOUNTING

3-19. The test tire shall be mounted on a serially numbered test 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 UTQG testing. The wheel must be free from any foreign substance, rust, oxidized rubber, or adhesives.

3-20. The tire shall be mounted so that all tire markings are to the outside of the rim and so that the tire identification number is located above the valve stem as shown in figure 2. Mount the tire in such a manner that the beads do not bind against the rim ledge and bend improperly on the rim flange. Do not allow the air pressure to 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. The pressure gauges shall be accurate within ± 1 PSI at the prescribed inflation pressure.

3-21. Any tread face irregularities such as mold vent extrusions, shifted shell protrusions, flashing, etc. shall be removed by light buffing to the top of the tire tread rows.



Extreme care should be taken to avoid indenting or burning tread surface during the light buffing operation. If any damage to the tread surface occurs, the tire must be discarded and a replacement tire tested.

3-22. The tires shall be inflated to 8 PSI less than their maximum permissible inflation pressure. The tire/wheel assemblies shall then be dynamically balanced. A record of weights used and their location relative to the I.D. number on each test tire shall be kept.

3-23. The tires will be mounted onto the vehicle in the positions as indicated on form UTO-21. See Figure 8.

SECTION IV. VEHICLE PREPARATION

4-1. GENERAL

4-2. Vehicles for treadwear testing will be supplied by the testing organization. The vehicles shall be identical as to engine, transmission, drive ratio and suspension. The vehicles must specify the tire size to be tested as standard equipment or approved alternate for that vehicle.

NOTE

Air shocks and auxiliary fuel tanks are prohibited.

4-3. TEST VEHICLE IDENTIFICATION

4-4. All test vehicles shall be marked (at least 3" high) "TEST VEHICLE" on both doors along with the name of the testing organization. A test vehicle identification number (at least 3" high) will be assigned by the TWM for the purpose of data reporting. This number shall be placed in both the upper right-hand corner of the windshield and the rear window.

4-5. VEHICLE PREVENTIVE MAINTENANCE SCHEDULE

4-6. The testing organization shall establish a preventive maintenance schedule to maximize vehicle/convoy reliability. The contractor shall present his maintenance schedule to the TWM before the start of each test.

4-7. SAFETY EQUIPMENT

4-8. Each test vehicle shall comply with all applicable Federal Motor Vehicle Safety Standards. All standard safety equipment shall be kept operational at all times. Additional safety equipment shall include flares, fire extinguishers and first aid kits.

4-9. VEHICLE TEST WEIGHT

4-10. With the tires inflated to 8 psi less than their maximum permissible inflation pressure, the vehicle weight shall be adjusted so that the load on each tire is 85 percent of the load which is specified in Appendix A of Federal Motor Vehicle Safety Standard 109 for that pressure.

NOTE

Vehicle weight tolerances for candidate tire vehicles: +0, -2% of specified load. Vehicle weight tolerance for CMT vehicles: +2, -0% of specified load.

4-11. The vehicle weighing procedure shall be conducted with 150 pounds of ballast in the driver's position, (100 lbs in the driver's seat and 50 lbs on the floor) and the fuel tank 1/2 full (-0% +5%). Utilization of the vehicle's fuel gage to determine the 1/2 tank condition is not acceptable. The 1/2 tank condition must be evaluated utilizing exact measurement techniques. The vehicle shall not be altered or modified to meet load requirements except by adding weight.

CAUTION

Due to the large amount of hysteresis inherent in a vehicle, and a vehicle weighing system, it is extremely important that the contractor establish a precise weighing procedure that will guarantee that the results will be repeatable.

4-12. VEHICLE WHEEL ALIGNMENT

4-13. After the tires have been mounted and inflated to the prescribed pressure with the vehicle ballasted with the test load, the front end alignment shall be checked and adjusted if found to fall outside of the manufacturer's specifications.

4-14. The alignment procedure will be mandatory initially, after tire break-in and at midpoint of treadwear testing. It shall also be conducted if any situation develops during testing which could possibly change the original wheel alignment.

4-15. TIME, SPEED AND MILEAGE MEASUREMENT

4-16. The test vehicles shall be equipped to accurately measure and automatically record driving time and speed data. Automatic recording shall be accomplished by the use of a tachograph or similar device. The automatic recording device shall be calibrated by a method having an accuracy of $\pm 1\%$.

4-17. The speedometer and odometer on each test vehicle shall be checked prior to commencement of each 6400 mile test segment to verify that they are registering accurate speed and distance data.

SECTION V. TESTING PROCEDURES

5-1. GENERAL

5-2. This section describes the test course, the required driving procedures, the tread depth measurement procedures, and all other procedures which are required for the successful completion of a UTQG treadwear test.

5-3. TEST CONVOY

5-4. A test convoy shall consist of a maximum of four, rear wheel drive passenger vehicles.

5-5. One vehicle of the convoy shall be equipped with four course monitoring tires, of the same construction type (bias, bias belted, radial) as the candidate tires. The remaining vehicles will be equipped with the candidate tires. The tires of each vehicle must be identical with respect to manufacturer, brand, tire line and size.

5-6. Each convoy shall be equipped with a CB radio on the first and fourth vehicles.

5-7. VEHICLE REPAIRS

5-8. In an effort to maintain continuity of the test program, each convoy shall be equipped to make minor on course repairs where necessary (i.e. fan belts, hoses). If additional parts or assistance is required, arrangements should be made to have a repair service conduct the maintenance on course. In the event that the malfunction requires the vehicle to be removed from the test course, the test tires shall be removed and installed on a qualified replacement vehicle and the test continued. If a test tire fails on course, it shall be replaced with a dead spare of identical type. The test will continue utilizing only the remaining three tires for data collection.

5-9. VEHICLE STORAGE

5-10. During any non-working hours for any test the tires and vehicle shall be stored within the area supplied each test organization at the Goodfellow Air Force Base.

5-11. TREADWEAR COURSE DESCRIPTION

5-12. The 400-mile course is shown in Figures 4, 5 and 6. Key points along the route are identified by number on Figure 3.

The course consists of three loops as follows:

1. **Southern Loop**

The southern loop begins at the Convoy Gate and Paint Rock Rd. (FM388) at the northwest corner of Goodfellow AFB (1). Drive east via FM388 to junction with Loop Road 306 (2). Turn right onto Loop Road 306 and proceed south and west to junction with US277 (3). Turn left onto US277 and proceed south through Eldorado and Sonora (4), continuing on US277 to junction with FM189 (5). Turn right onto FM189 and proceed to junction with Texas 163 (6). Turn left onto Texas 163, proceed south to Camp Hudson Historical Marker (7) and U-turn in highway. Reverse route to junction of Loop Road 306 and FM388 (2). Food and gasoline can be obtained at Cristoval, Eldorado and Sonora. Gasoline can be obtained in Juno.

TP-UTQG-W-01

		<u>Mileages</u>	<u>Remarks</u>
<u>Southern Loop</u>			
1.	Convoy Gate & FM388	0	
2.	FM388 & Loop 306	3	STOP/Calibrated Mile
3.	Loop 306 & US277	10	
4.	Sonora	72	Food & Fuel
5.	US277 & FM189	88	
6.	FM189 & Texas 163	124	
7.	Historical Marker (Camp Hudson)	143	U-Turn
4.	Sonora	214	Food & Fuel
3.	Loop 306 & US277	276	
2.	FM388 & Loop 306	283	
<u>Eastern Loop</u>			
13.	FM388 & FM2334	290	STOP
14.	FM2334 & FM765	292	STOP
15.	FM2334 & US87	295	STOP/U-Turn/Food
14.	FM2334 & FM765	298	STOP
13.	FM2334 & FM388	300	STOP
1.	FM388 & Loop 306	307	
<u>Northwestern Loop</u>			
8.	US277 & FM2105	313	
12.	FM2105 & US87	320	
11.	US87 & FM2034	338	Food & Fuel
10.	FM2034 & Texas 208	362	
9.	Texas 208 & FM2105	387	
8.	FM2105 & US277	391	YIELD
2.	Loop 306 & FM388	397	
1.	Convoy Gate & FM388	399	

Figure 3. Key Points Along Treadwear Test Course.

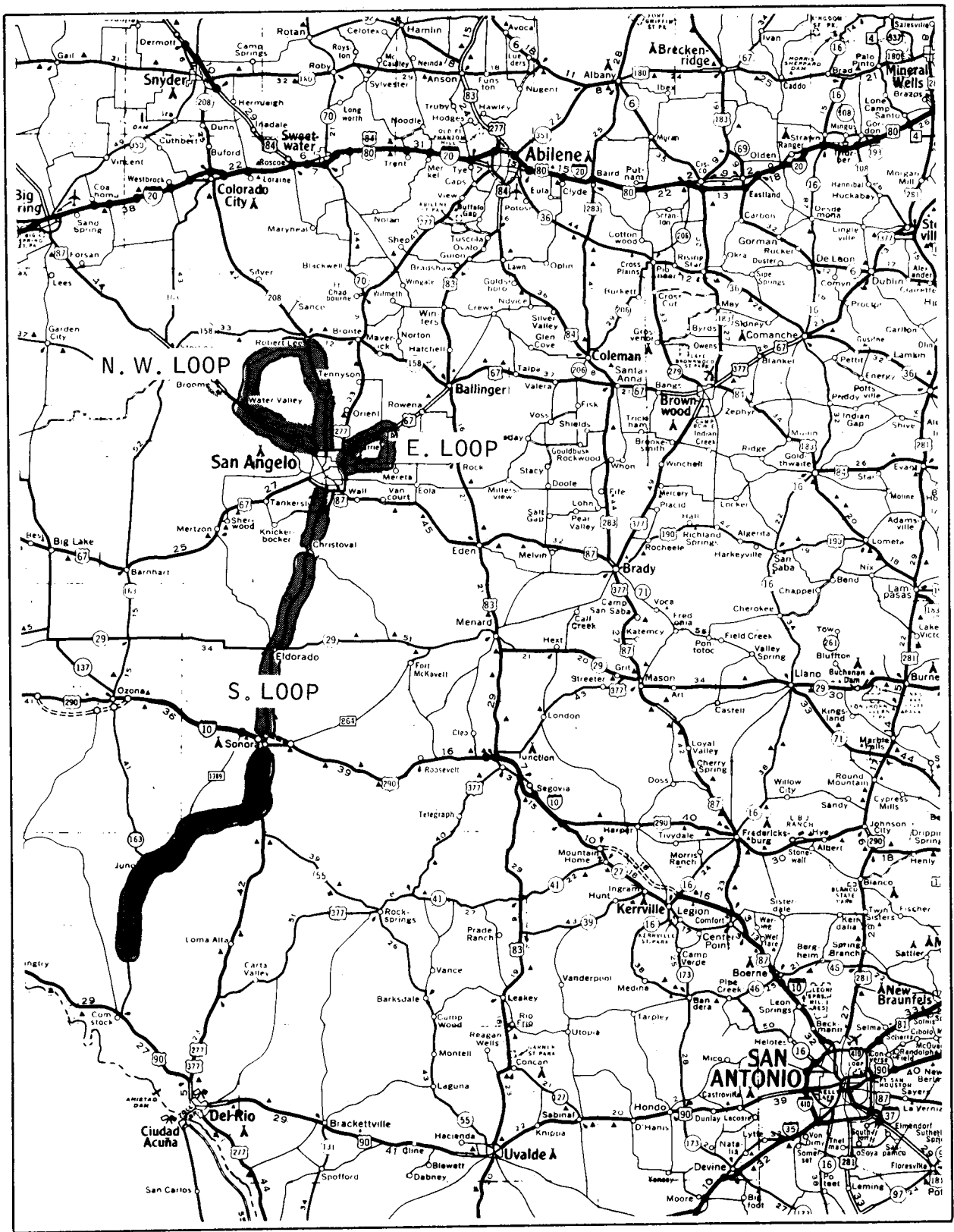


Figure 4. San Angelo, Texas Vicinity.

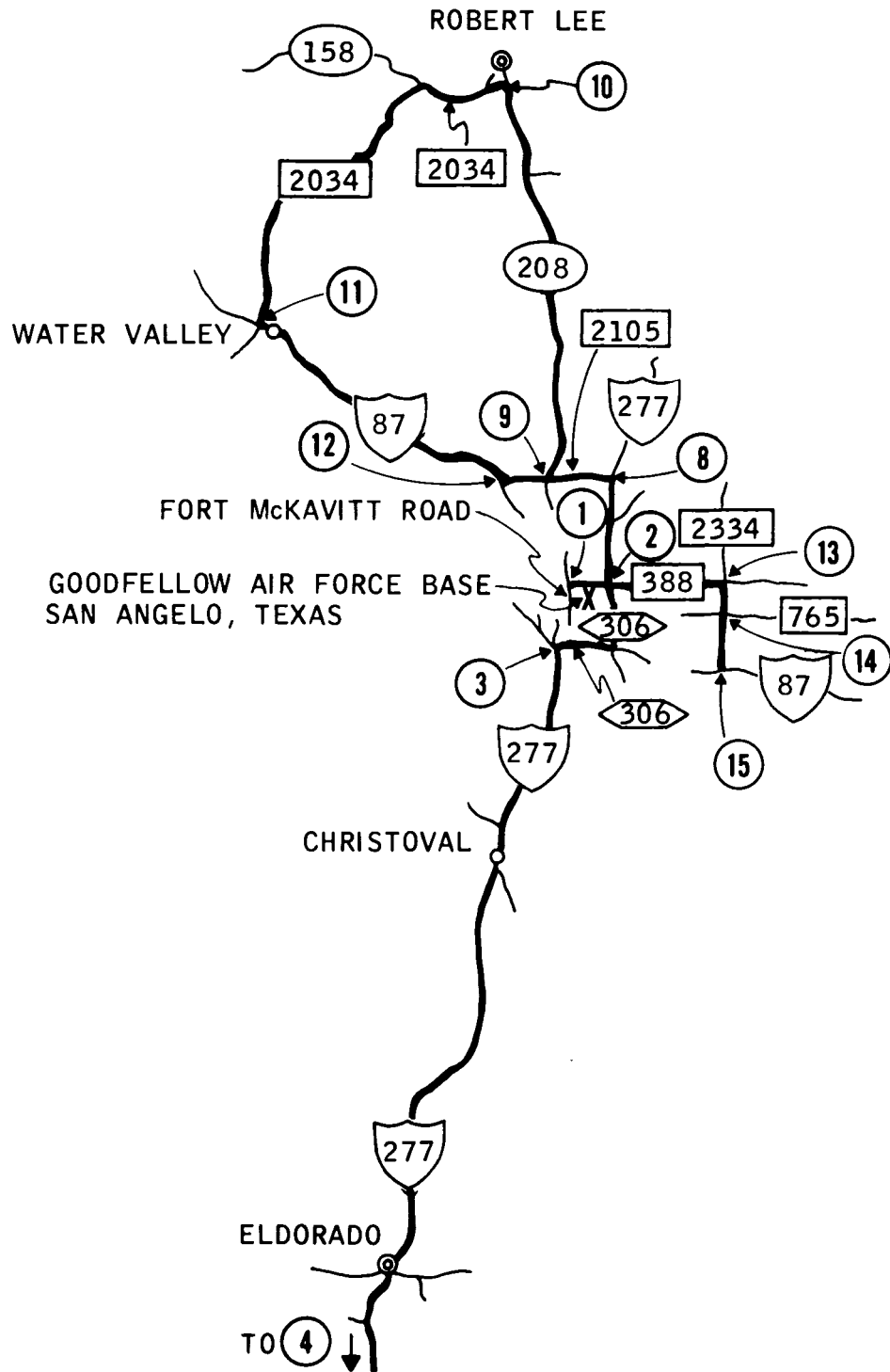


Figure 5. UTQG Treadwear Test Course (Sheet 1 of 2).

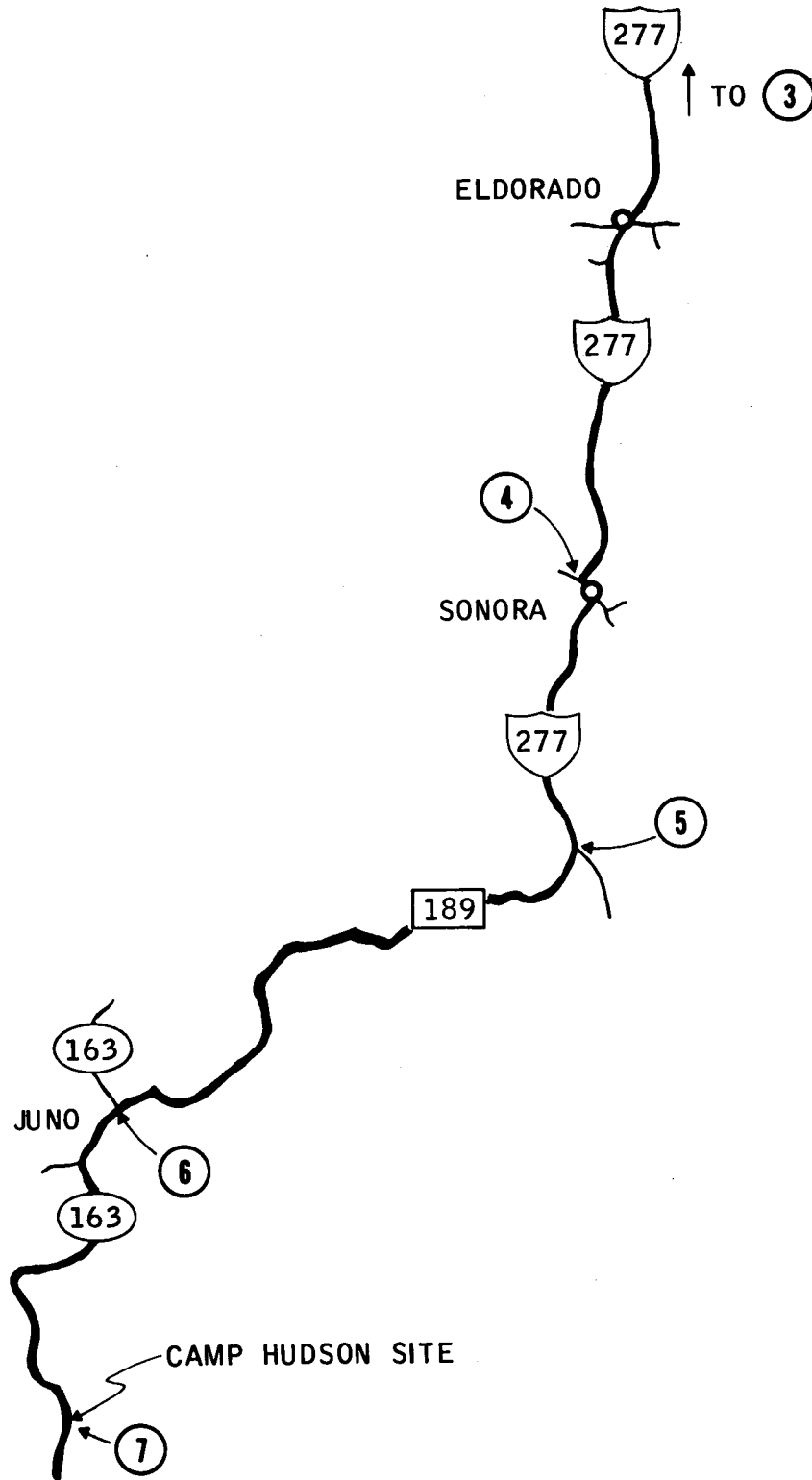


Figure 6. UTQG Treadwear Test Course (Sheet 2 of 2).

TP-UTQG-W-01

2. Eastern Loop

The eastern loop begins at the junction of Loop Road 306 and FM388 (2) make right turn onto FM388 and proceed east to junction with FM2334 (13). Turn right onto FM2334 and proceed south across FM765 (14) to junction of FM2334 and US87 (15). Food and gasoline are available at this point. Make the U-turn and return to junction of FM388 and Loop Road 306 (2) by the same route.

3. Northwestern Loop

The northwestern loop begins at the junction of Loop Road 306 and FM388 (2). Proceed north on Loop Road 306, onto US277, to junction with with FM2105 (8). Turn left onto FM2105 and proceed west to junction with US87 (12). Turn right onto US87 and proceed northwest to junction with FM2034 near the town of Water Valley (11). Turn right onto FM2034 and proceed to junction with Texas 208 (10). Turn right onto Texas 208 and proceed south to junction with FM2105 (9). Turn left onto FM2105 and proceed east to junction with US277 (8). Turn right onto US277 and proceed south to junction with FM388 and Loop 306 (2). Return to start point at Convoy Gate at Paint Rock Road (1). There is food and gasoline at FM2105 and US87 (12); along US87; along FM2034 between (10) and (11).

5-13. The TWM shall provide the testing contractor with instructions as to the sequence in which the above three loops will be driven.

5-14. The treadwear testing will always be centered around the Goodfellow Air Force Base. Each circuit of the 400 mile course will originate and terminate at the base. The tire rotation and tread measurement procedures will be conducted within the area designated for each testing organization.

5-15. DRIVING INSTRUCTIONS

5-16. The drivers shall strictly adhere to the following procedures:

1. Vehicle Speed

The speed to be maintained throughout the course shall be the posted speed limit unless unsafe conditions arise. Under such circumstances, the speed should be reduced to a maximum safe operating speed.

2. Braking Procedures at STOP Signs

There are a number of intersections at which stops are required. At each of these intersections a series of signs are placed in a fixed order as follows:

SIGN LEGEND

Highway Intersection 1000 (or 2000) feet

STOP AHEAD

Junction XXX

Direction Sign (Mereta ———>)

STOP or YIELD

PROCEDURE

- a. Approach each intersection at the posted speed limit.
- b. When abreast of the STOP AHEAD sign, apply the brakes so that the vehicle decelerates smoothly to 20 mph when abreast of the direction sign and make a complete stop at the STOP sign.

3. Vehicle Separation

During the entire test, no convoy vehicle, other than the lead car, shall be out of sight of the preceding vehicle. If, due to a dire situation, the test convoy must be broken, the lead driver shall be notified of the situation.

4. Passing Procedure

When approaching a slow moving vehicle, the convoy lead driver should attempt to safely pass the vehicle and then wait for the remainder of the convoy to pass the vehicle. Once all the convoy cars have passed the slow moving vehicle, the lead driver may accelerate to the posted speed limit.

5-17. TIRE BREAK IN

5-18. The convoy will be driven over one circuit of the 400 mile treadwear course. At the completion of the first circuit the tires will be rotated utilizing the "Forward X" rotation plan. See figure below.

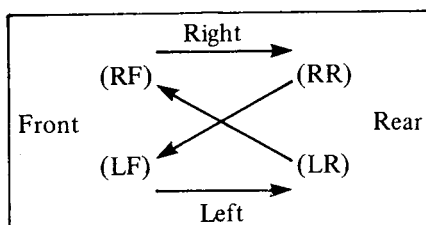


Figure 7. The "Forward X" Rotation Plan.

The new vehicle tire position shall then be re-marked onto the sidewall of the tire.

5-19. After the tires have been rotated, the convoy will be driven over the course for 1 additional circuit (for a total of 800 break-in miles.)

5-20. At the completion of the tire break-in, the tires will immediately be removed from the vehicle and prepared for the initial tread depth measurement.

5-21. TREAD DEPTH MEASUREMENT

5-22. The tires will be allowed to cool until the initial inflation pressure is reached or 2 hours, whichever occurs first.

5-23. Clean the tires to remove accumulated road dirt, stones or anything that may impair the accuracy of the tread depth measurement. Washing is permissible if necessary.

5-24. Utilizing tire paint or tire paint stick the tire shall be marked radially at six (6) equally spaced locations. The marks shall originate at the shoulder, continue across the tread to the opposite shoulder. The marks shall be located so that the treadwear indicators are avoided. The six locations will be utilized for the tread depth measurement of each tread groove. The first of the six locations shall be in the vicinity of the tire identification number. Note that the shoulder grooves which are not provided with treadwear indicators are not utilized for tread depth measurement.

5-25. Check tire pressure and adjust to specified test pressure if necessary.

TP-UTQG-W-01

5-26. The tires will be brought to the UTQG tread depth measurement stand located at Goodfellow Air Force Base, where the remaining tread depth will be measured by the testing organization utilizing the hand held digital probe tread depth gage supplied by the Test Facility. The depth gage will digitally indicate the remaining tread depth and simultaneously input the information into the UTQG computer.

5-27. The tread depth gage shall be checked utilizing a calibrated gage block prior to each use.

5-28. Place the tire onto the measurement stand with the tire identification number facing the operator. Measurements will be taken at the six marked locations in each successive tread groove (starting with the groove nearest the operator). The measurements will be taken in a clockwise direction (rotate the tire counterclockwise).

5-29. The depth gage will indicate a 3 digit number representing the remaining tread depth in thousandths of an inch. Each of these measurements will be logged in onto the tire measurement form. See figure 11.

5-30. The tire section width, outside diameter, tread profile and Shore Hardness will be measured and logged onto the tire measurement form once after the break-in phase. Any additional measurements of these parameters will be conducted at the discretion of the CTM.

5-31. The new vehicle tire position shall then be re-marked onto the sidewall of the tire.

5-32. Each tire will be replaced onto the vehicle that it was originally on, except the tire vehicle position will be rotated utilizing the "Forward X" rotation plan.

5-33. The vehicle's front end alignment shall be checked and readjusted if necessary. Note: If it is necessary to remove the vehicle from the base to conduct the alignment checks, the vehicle must be moved utilizing "dead spares."

5-34. TEST SERIES

5-35. Upon completion of the 800 mile tire break-in and the post break-in procedures, the remaining 6400 miles of the treadwear test will follow, in 800 mile increments.

5-36. At the completion of each 800 mile series all of the tread depth measurement procedures will be repeated as follows:

1. Tire Removal (Ref 5-20).
2. Tire Cleaning (Ref 5-23).
3. Tire Pressure Check (Ref 5-22).
4. Tire Measurement (Ref 5-26 thru 5-30).
5. Tire Marking (Ref 5-31).
6. Tire Rotation (Ref 5-32).
7. Vehicle Front End Alignment As Specified (Ref 5-33).

5-37. Prior to starting the second thru the eighth test runs, the convoy order will be changed by placing the last vehicle in the lead position and shifting each other vehicle back by one position. While the vehicle convoy order will be shifting throughout the test, the vehicle driver order shall remain the same.

5-38. The contractor must exercise care during dismounting to avoid damage to the test tires.

5-39. TEST DATA

5-40. In addition to the UTQG test forms the test contractor is responsible for maintaining additional logs and data sheets which will be required to support the test data.

5-41. As a minimum the following information and records shall be maintained for each test convoy.

1. Vehicle Maintenance Records (repairs, alignment).
2. Vehicle Weights and Ballasting.
3. Vehicle Calibration Information (speed and distance).
4. Convoy Slowup and Delay Logs.
5. Weather and Driving Conditions including the number of "wet" miles driven.

5-42. ABNORMAL CONDITIONS

5-43. Abnormal conditions encountered while driving the test course such as tire replacement, mechanical malfunctions and accidents shall be reported on a case-by-case basis to the TWM.

5-44. TIME, SPEED AND MILEAGE ANALYSIS

5-45. The senior testing contractor representative shall review all automatically recorded time and speed data to insure that the course has been driven properly. The representative shall also verify the correct accumulation of mileage, per test vehicle. Any deviations noted shall be brought to the attention of the TWM.

5-46. TIRE DISPOSITION

5-47. Upon completion of each test, the contractor representative will return the tested tires to the TWM.

SECTION VI. REPORT PROCEDURES

6-1. GENERAL

6-2. This section relates to the Treadwear Test Forms, function of the forms and the supportive data required to be submitted by the contractor to corroborate entries on the test forms.

6-3. RECEIPT OF FORMS

6-4. Upon receipt of each tire set (4 tires) from the UTQG test facility, the testing organization will receive a 56 page treadwear test package. It is the test contractor's responsibility to complete the forms neatly and accurately.

6-5. The treadwear data package will consist of one UTQG Test Assignment Form (UTQG 21), one UTQG Treadwear Summary Sheet (Form UT031), eighteen UTQG Treadwear Daily Run Sheets (Form UT032) and thirty six UTQG Treadwear Measurement Forms (Form UT033). See figures 8, 9, 10 and 11.

6-6. DISPOSITION OF FORMS

6-7. Upon completion of all forms for a test series, they will be returned to the UTQG TWM.

6-8. ADDITIONAL DATA AND FORMS

6-9. It is the test organization's responsibility to supply as much additional data and information as required to back up and substantiate the test data for the treadwear test package sheets.

6-10. TREADWEAR TEST PACKAGE PROCEDURES

6-11. COMPLETING THE UTQG TREADWEAR SUMMARY SHEET

6-12. The contractor will complete the UTQG Treadwear Summary Sheet. Prior to mounting the test tire onto the rim, the test organization technician shall compare the information on the summary sheet with the information actually on the tire. If the information agrees, the technician will then sign the sheet, enter the Julian date and his identification code. (See Figure 9).

6-13. If a discrepancy of information is noted, the TWM shall resolve the problem.

6-14. Upon completion of the tire inspection the treadwear summary sheet will be returned to the TWM.

6-15. COMPLETING THE UTQG TREADWEAR DAILY RUN SHEET

6-16. Sufficient daily run sheets will be supplied to the test organization for the complete treadwear test.

6-17. Daily run sheet, information (see Figure 10).

1. **Test Number.:** Tire Test Number
2. **Run Number:** Sequence Number (one run - 800 miles).
3. **Circuit Number:** 01 or 02 (01 equals first 400 miles of the run. 02 equals second 400 miles of the run).
4. **Circuit Date:** Julian date circuit was started.
5. **Test Load:** Enter tires specific load.

U.T.Q.G. TREADWEAR SUMMARY SHEET

TEST START DATE: _ _ _ _ _
TEST END DATE: _ _ _ _ _

TEST NUMBER: _ _ _ _ _

TESTING ORG. _ _ _

SPEC. INVENTORY TIRE I.D. NO.
I.D. NO.

MANUFACTURER: -----

BRAND: -----

TIRE LINE NAME: -----

TIRE SIZE: _ _ _ _ _

CONSTRUCTION: _ , _ , _ -

MAX PSI: _ _

MAX LOAD: _ _ _ _

LOAD RANGE: _

CORD MATERIAL: CAR. _ _
BLT. _ _

NO. OF PILES: SW. _ _
TREAD _ _

NO. OF BELTS: _ _

NO. OF MEASR. GROOVES: _ _

RECOMMENDED RIM SIZE: _ _ _ _ _

ALTERNATE RIM SIZES: _ _ _ _ _ , _ _ _ _ _ , _ _ _ _ _

TREADWEAR GRADE: _ _ _

SIGNATURE: _____ UTQG REP. SIGNATURE: _____

CODE: _ _ _ DATE: _ _ _ _ _ CODE: _ _ _ DATE: _ _ _ _ _

TESTING ORGANIZATION REP SIGNATURE: _____

CODE: _ _ _ DATE: _ _ _ _ _

UT031

VERSION 4

Figure 9. UTQG Treadwear Summary Sheet.

U.T.Q.G. TREADWEAR DAILY RUN SHEET

TEST NO.: _ _ _ _

RUN NO.: _ _ _ _

CIRCUIT NO.: _ _ _ _

CIRCUIT DATE: _ _ _ _

TEST LOAD: _ _ _ _

TEST PSI: _ _ _ _

TEST VEHICLE I.D.: _ _ _ _

POSITION IN CONVOY: _ _ _ _

TEST ORG.: _ _ _ _

DRIVER I.D.: _ _ _ _

TIRE POS.	INV.NO.	ACTUAL LOAD	- -START PSI-	- - MID PSI	END PSI
			MEASURED	ADJ. TO	
1	_ _ _ _	_ _ _ _	_ _	_ _	_ _
2	_ _ _ _	_ _ _ _	_ _	_ _	_ _
3	_ _ _ _	_ _ _ _	_ _	_ _	_ _
4	_ _ _ _	_ _ _ _	_ _	_ _	_ _

MILEAGE END: _ _ _ _

TIME END: _ _ _

MILEAGE START: _ _ _ _

TIME START: _ _ _

TOTAL TIME: _ _ _

TOTAL MILES: _ _ _ _

WET MILES: _ _ _

TIRE FAILURE CODE: _ _ _

TIRE FAILURE CODE: _ _ _ _

INVENTORY NO.: _ _ _ _

INVENTORY NO.: _ _ _ _

MILEAGE AT FAILURE: _ _ _ _

MILEAGE AT FAILURE _ _ _ _

MECHANICAL FAILURE CODE: _ _ _

MECHANICAL FAILURE CODE: _ _ _

MILEAGE AT FAILURE: _ _ _ _

MILEAGE AT FAILURE: _ _ _ _

WHEEL ALIGNMENT: MILEAGE: _ _ _ _

DATE: _ _ _ _

SIGNATURE: _____

REMARKS: _____

SIGNATURE: _____

DATE: _ _ _ _

Figure 10. UTQG Treadwear Daily Run Sheet.

U.T.Q.G. TREADWEAR MEASUREMENT FORM

TEST NUMBER_ _ _ _ _ START DATE_ _ _ _ _ TIME_ _ _ _ _
 INV. NUMBER_ _ _ _ _ END DATE_ _ _ _ _ TIME_ _ _ _ _
 WHL. POS. OFF_ _ MEASURING ORG._ _ _ _ _
 CUMM. MILES_ _ _ _ _ MEASURER_ _ _ _ _
 TEST MILES_ _ _ _ _ RECORDER_ _ _ _ _
 THREAD PROFILE GA._ _ _ PSI START_ _ _ ADJ. TO_ _ _
 OUTSIDE DIAMETER_ _ _ DEPTH GA. ID_ _ _ ZERO (Y - N)_ _ _
 SECTION WIDTH_ _ _ SHORE GA. ID_ _ _
 RUN_PHASE_SERIES_ _ _ SHORE HARDNESS_ _ _

GROOVE POSITION

GROOVE NUMBER	1	2	3	4	5	6	AVG.
1	---	---	---	---	---	---	---.---
2	---	---	---	---	---	---	---.---
3	---	---	---	---	---	---	---.---
4	---	---	---	---	---	---	---.---
5	---	---	---	---	---	---	---.---
6	---	---	---	---	---	---	---.---
7	---	---	---	---	---	---	---.---
8	---	---	---	---	---	---	---.---
9	---	---	---	---	---	---	---.---
10	---	---	---	---	---	---	---.---
11	---	---	---	---	---	---	---.---
12	---	---	---	---	---	---	---.---

WEAR IRREGULARITIES

SIGNATURE _____
 UT033

PREVIOUS O/A_ _ _ . _

NEW O/A_ _ _ . _

LOSS CYCLE_ _ _ . _

CODE_ _ _ _

DATE_ _ _ _ _

VERSION 3

Figure 11. UTQG Treadwear Measurement Form.

TP-UTQG-W-01

6. **Test psi:** Enter test tires psi.
7. **Test Vehicle I.D.:** Enter identification number of vehicle.
8. **Position in Convoy:** Enter numbered position (1, 2, 3, 4).
9. **Test Organization:** Enter Testing Company initials or UTQG assigned numeric code if issued.
10. **Driver I.D.:** Enter driver's name, initials or UTQG assigned numeric code if issued.
11. **Tire Position:** PREPRINTED 1 2 3 4.
12. **Inventory Number:** Enter test tires' inventory numbers in the specific tire position order (1 2 3 4) they are to run in.
13. **Actual Load:** Enter weights of this particular vehicle's 1 (LF), 2 (RF), 3 (LR), 4 (RR) positions.
14. **Tire Pressure (Cold):** Enter start, start adjusted to, middle of and end of circuit psi gaged.
15. **Time End:** Enter local 24 hour time for the circuit.
16. **Time Start:** Enter local 24 hour time at start of circuit.
17. **Total Time:** Deduct time start from time end and enter total hours and minutes consumed.
18. **Mileage End:** Enter Test Vehicle mileage for the circuit.
19. **Mileage Start:** Enter Test Vehicle mileage at start of circuit.
20. **Total Mileage:** Deduct mileage start from mileage end and enter completed circuit mileage.
21. **Wet Miles:** Enter wet miles test tires received in this circuit.
22. **Tire Failure Code:** See UTQG Tire Failure Code Listing (Appendix A) Manager.
23. **Inventory Number:** Inventory number of failed tire.
24. **Mileage at Failure:** Enter vehicle's mileage at time of failure.
25. **Mechanical Failure Code:** See UTQG Vehicle Failure Code Listing (Appendix A).
26. **Mileage at Failure:** Enter vehicle's mileage at time of mechanical failure.
27. **Wheel Alignment:**
Mileage: Enter cumulative mileage on test tires when vehicle aligned.
Date: Enter Julian date vehicle aligned.
28. **Signature:** Enter Test Organization's Supervisor's signature if an entry is made for tire failure, mechanical failure and wheel alignment lines of this form.
29. **Remarks:** Enter remarks pertinent to the test circuit such as,
 - a. Tire replacement numbers in case of tire failure and wheel position.

- b. Mechanical problems and which test convoy vehicle.
 - c. Any other significant incident.
30. **Signature:** Vehicle driver's signature.
31. **Date:** Julian date of circuit's completion.

6-18. COMPLETING THE UTQG TIRE MEASUREMENT FORM

6-19. Sufficient measurement forms will be supplied to the test organization for the complete treadwear test.

6-20. Treadwear measurement form, information (see Figure 10).

1. **Test Number:** Tire Test Number.
2. **Inventory Number:** Enter tire inventory number of tire being measured.
3. **Wheel Position Off:** Enter wheel position number 1 2 3 4 that test tire just completed 800 mile testing on.
4. **Cumulative Miles:** Enter cumulative (break-in and test miles) this specific tire has completed.
5. **Tread Profile Gage:** Enter the value of the profile template that fits the tread profile. Nominally 1200 equals 12" radius of curvature, 1225 equals 12 1/4" radius and etc. in 1/4" increments.
6. **Outside Diameter:** Enter outside diameter in hundredths of an inch increments of the test tire.
7. **Section Width:** Enter section width in hundredths of an inch increments of the test tire.
8. **Run:** Enter run sequence number (one run equals 800 miles).
Series: Enter tire's series (one series equals 6400 miles).
9. **Start Date:** Enter Julian date the tire started its 800 mile run.
10. **Start Time:** Enter local 24 hour time the tire started its 800 mile run.
11. **End Date:** Enter Julian date the tire completed its 800 mile run.
12. **End Time:** Enter local 24 hour time the tire completed its 800 mile run.
13. **Measuring Organization:** Enter measuring organization's assigned I.D.
14. **Measurer:** Enter measurer's name initials or assigned numeric UTQG code.
15. **Recorder:** Enter recorder's name initials or assigned numeric UTQG code.
16. **PSI Start:** Enter psi of tire prior to measuring.
17. **Adj. To:** Enter psi tire adjusted to at time measurements were started.
18. **Depth Gage I.D.:** Enter measuring organization numeric identifier or assigned alpha-numeric UTQG code, if issued.

TP-UTQG-W-01

19. **Zero (Y-N):** Enter Y for yes or N for no if measuring depth gage being used was calibrated before the depths recorded on this form are entered.
20. **Shore Hardness:** Enter average of three readings around tires circumference (example sheet shows 60 reading, (read 55, 60, 65 - avg. is 60)) and the time in seconds after starting reading the average value was read (example shows 5 (5th second)). Example reading shows 605.
21. **Groove Number & Groove Position:** Enter measured groove depths taken at the six premarked groove measuring points around the tire. Enter average of these 6 values in AVG. column to the four significant figures. Tire grooves can be measured only in a circumferential manner. No lateral, tread face measuring allowed. Tire groove 1 is the 1st groove of the tire on the air valve side of the rim which must face measurer when measuring.
22. **Previous O/A (Overall Average):** Enter value (mils) previous measuring sheets 800 miles earlier.
23. **New O/A (Overall Average):** Enter value (mils) for this measuring sheet's 800 mile loss.
24. **Loss Cycle:** Enter difference of new O/A from previous O/A here.
25. **Wear Irregularities:** 3 lines - enter as follows:
Line 1 = Wet Miles.
Line 2 = UTQG TWM Input Only.
Line 3 = UTQG TWM Input Only.
26. **Signature:** Signature of contractor's supervisor certifying that the data, calibration, test number, inventory number, etc., entered on this measurement form are true and correct as shown.
27. **Code:** Enter name initials or assigned UTQG alpha or numeric code is issued for Signature Contractor's Supervisor.
28. Enter Julian date of certification contractor's supervisors sign off.

APPENDIX A. TIRE CHARACTERISTIC CODES**Tread**

street	S
CMT	C

Construction

tube type	T
tubeless	L
bias	B
belted-bias	E
radial	R

Appearance

blackwall	B
other	O

(other: whitewall, white raised letters, red stripe, etc.)

Cord Materials

nylon	N
rayon	R
polyester	P
fiberglass	F
steel	S
nygen	G
aramid	A
*fortiflex	A
*DP01	A

*Additional product names for Aramid

VEHICLE AND TIRE POSITION CODES

Vehicle Positions		Tire Positions	
lead position	1	left front	1
2nd position	2	right front	2
3rd position	3	left rear	3
4th position	4	right rear	4
		spare	5

TIRE FAILURE CODES

- 01A Labeling
- 01B Tread Separation
- 01C Bead Separation
- 01D Linear Separation
- 01E Chipping or Chunking
- 01F Splice Separation
- 01G Flat Spot
- 01H Mold fold - row edges, sometimes strip off
- 01J Flash - mold misalignment
- 01N Splice opening
- 01P Groove cracking = Externally produced (by small stone in groove which induces a small cut which propagates. Not product defect.)
- 01R = Internally produced. (Due to shallow rubber underbase at groove bottom, compounding of rubber, extreme carcass growth. Usually grows in length and depth).
- = Always 6-B in a product defect. Tire fails test. Can be isolated to a single tire but usually all specimens do it.
- 01S Porosity = Rubber compound aerated due to bag pressure loss during curing. Fast wearing tire. Single Product defect.
- 01T = Bent or damaged beads. = Tire will not inflate or hold air.
- 01U = Workmanship = irregularities that occur in tire production line whereby tire gets damaged.

EXTERNAL, ENVIRONMENTAL TIRE FAILURE CODES

02A	Run FLAT
02B	Puncture
02C	Valve Problems
02D	Cuts Produced by Foreign Object
02E	Patch Lockup
02F	Accident
02G	Other

VEHICLE SYSTEMS FAILURE CODES

Steering Assembly	62A
Suspension	62B
Brakes	62C
Emergency Brakes	62D
Engine	62E
Fuel, Carburation, Exhaust	62F
Power Train	62G
Electrical System	62H
Lighting and Communication System	62J
Visual System	62K
Heat, Defroster, Air Conditioner	62L
Vehicle Instrumentation	62M
Structure	62N
Electronic System	62P
Rim	62R
Speedometer or Tachograph	62S

TEST EQUIPMENT CODES

Shore Hardness Durometer ID

1. Durometer Serial No. 55070-A
2. Durometer Serial No. 43930-A

Surface Thermometer

1. Wahl Infrared Thermometer Serial No. 1588A

Depth Gauges

- H1 Federal Tread Depth Gauge
- D1 Digital Tread Depth Gauge No. 1
- D2 Digital Tread Depth Gauge No. 2
- D3 Digital Tread Depth Gauge No. 3
- D4 Digital Tread Depth Gauge No. 4
- D5 Digital Tread Depth Gauge No. 5

TEST ORGANIZATION CODES

- A. If a testing organization is a tire manufacturer, use his brand or manufacturer code.
- A ARA Automotive Research Associates
 - P APG Automotive Providing Grounds
 - C CTI Compliance Testing Inc.
 - K KJL K.J. Law (PATTCO)
 - N NAT Nevada Automotive Test Center
 - M SMI Smithers Scientific Services
 - S SRI Southwest Research Inc.
 - E STX South Texas Testing
 - T TTI Transportation Testing Inc. of Texas
 - R TRC Transportation Research Center of Ohio

GLOSSARY OF TERMS

Base Wear Rate	A rate of wear provided by NHTSA for a specific Course Monitoring Tire. Used in calculating the Course Severity Adjustment Factor.
Bead	That part of the tire made of steel wires, wrapped or reinforced by ply cords, that is shaped to fit the rim.
Belted-Bias	A type of pneumatic tire which features a bias tire construction reinforced with textile ply (belt) at an angle less than the carcass angle, located between the carcass and the tread.
Bias Tire	A type of pneumatic tire construction which features the ply cords that extend to the beads laid at alternate angles, substantially less than 90°, to the centerline of the tread.
Brand, Tire	The identifying name assigned by the seller of the tire.
Break-In	The running of a tire <i>prior to test</i> for 800 miles. A stated load/inflation/rotation procedure on a stipulated route to remove any production finishes or excess protrusions and to stretch and stabilize the carcass.
Candidate	A tire to be tested in a convoy with CMT's to determine the projected mileage and thus a value for stating the relative treadwear grade for the tire.
Carcass	The tire structure, except tread and sidewall rubber.
Circuit	The complete 400-mile course consisting of all three loops.
CMT	(Course Monitoring Tire)-Any one of three construction types (radial, belted bias, or bias) used to evaluate environmental variations in the treadwear course and to thus determine the course severity adjustment factor.
Construction	The reference to the body structure of the tire; the type designator of the tires tested—R-radial; BB-belted bias; B-bias.
Contract Technical Manager (CTM)	The designated OVSC Official who is responsible for assuring contractor compliance with contractual obligations.
Convoy	Consists of no more than 4 vehicles operating in a group at least one of which is equipped with a set of course monitoring tires.
Convoy Order	The order from the first to last vehicle in line during a run. The convoy order changes for each run as the <i>last</i> vehicle moves to the <i>lead</i> and the remainder of the cars shift back one position.
DOT	Department of Transportation.
FMVSS	Federal Motor Vehicle Safety Standard.
GFE	Government Furnished Equipment.

TP-UTQG-W-01

Loop	Any one of the three segments of the 400-mile treadwear course starting and ending in the vicinity of Goodfellow Air Force Base at San Angelo, Texas. The loops are identified as Southern, Eastern and Northwestern.
NHTSA/OVSC	National Highway Traffic Safety Administration/Office of Vehicle Safety Compliance.
OVSC CC	Office of Vehicle Safety Compliance Computer Center.
Production Lot	An undesignated number of tires, all made of the same supply of raw materials with the same specification, in the same production facility, as nearly as possible during the same time (i.e., sequentially without interruption).
Projected Mileage	The calculated number of miles a tire will run to the point of being worn out (to the treadwear indicators).
Radial Tire	A type of pneumatic tire in which the ply cords extend to the beads and are aligned substantially 90° to the centerline of the tread.
Remaining Tread Depth	(Average Tread Depth)—The thickness of the tread rubber, on the average, from the tread surface to the base of the grooves, determined by averaging all the groove depths.
Rim	A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.
Rotation Plan	The rotation order between wheels and vehicles can vary; in this program, the Forward X plan or pattern was used. See Forward X.
Rotation, Vehicle	The changing of vehicle positions within the convoy—see Position, Vehicle.
Rotation, Wheel	The changing of wheel positions on the vehicle—see Position, Wheel.
Run	Consists of two 400-mile circuits or 800 miles of break-in or treadwear testing. Eight runs constitute a test series.
Sidewall	That portion of a tire between the tread and the bead.
Test-(Also Test Series)	Consists of one vehicle operating for eight runs of 800 miles for a total of 6400 miles. Does not include the break-in run or previously accumulated mileage.
Test, First Series Also Single Series	Same as Test (Test Series) except the tire set has accumulated no mileage, other than break-in, prior to the test start; the first series test, as all other complete test series, must then consist of 8 runs.
Test Course	The 400-mile roadway specified for use during this program; made up of the Southern, Eastern, and Northwestern loops.
Test Facility	The UTQG Test Facility at Goodfellow AFB, San Angelo, Texas, operated by the VRTC, R&D, NHTSA.
Test Number	An eight character number which denotes a particular test, performed by one vehicle with its accompanying set of 4 tires, either course monitoring or candidate.
Test Period	The calendar time period during which a test is conducted.