TP-537-02
July 24, 2023

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LABORATORY TEST PROCEDURE

FOR

49 CFR Part 537, AUTOMOTIVE FUEL ECONOMY ATTRIBUTE MEASUREMENTS

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PREFACE

In the effort to substantially improve Corporate Average Fuel Economy (CAFE) standards, the National Highway Traffic Safety Administration (NHTSA) published final rules. Beginning in MY 2011, all PC and LT compliance categories (fleets) use a formula for calculating a manufacturer's CAFE standard in miles per gallon based on the vehicle attributes of all models within the manufacturer's fleets (i.e., domestic and import PCs and LTs). The attribute used in deriving standards is known as the "footprint" and applies to each vehicle model type. Footprint is defined as the product of the vehicle measurements for wheelbase and average track width.

In accordance with 49 CFR Part 537, manufacturers are required to provide CAFE information to NHTSA including attribute measurements (front, rear and average track width; wheelbase; and footprint measurements). NHTSA expects manufacturers of PCs and LTs to report accurate information for its vehicles. As explained above, each fleet's CAFE standard is calculated from the attribute values. OVSC's expectation is that the reported attribute measurements will be less than or equal to the measured values. If NHTSA determines that the reported values for vehicles are inaccurate, particularly those resulting in a higher footprint area, an enforcement action may be commenced.

REVISION CONTROL LOG
FOR OVSC LABORATORY
TEST PROCEDURES

TP-537
Automotive Fuel Economy Reports

TEST PROCEDURE		49 CFR Part 537		DESCRIPTION
REV. No.	DATE	AMENDMENT	EFFECTIVE DATE	
00	Preliminary 05/02/2008	71FR17566 4/6/06 Final Rule 71FR19449 4/14/06 Final Rule 73FR24352 5/02/08 NPRM	8/4/2006	Final rule (71FR17566) establishes Footprint definition for *Average Fuel Economy Standards for Light Trucks* Final rule (71FR19449) corrects revised Footprint definition. NPRM (73FR24352) proposes to use this test procedure to validate the wheelbase, track width, and footprint data provided by manufacturers in their pre-model year reports. The NPRM also stated that NHTSA seeks comments on the appropriateness of the test procedure.
01	3/30/2009	74FR14196 3/30/09 Final Rule	5/29/2009	Final rule (74FR14196) requires the attribute of "footprint" to be used for determining fuel economy standards for passenger cars and light trucks beginning in MY 2011.
02	06/29/2016	75FR25324 5/7/2010 Final Rule 77FR62624 10/15/2012 Final Rule	7/6/2010 12/14/2012	Joint final rule with EPA (75FR25324) using footprint-based standards for CAFE and greenhouse gases (GHG). Joint final rule with EPA (77FR62624) using footprint-based standards for CAFE and GHG. Adds new flexibilities for large pickup trucks, off-cycle credits and alternative fueled vehicles as well as revises the base tire definition.
	06/2/2022	87FR25710	12/31/2022	Technical revisions to laboratory test procedure. Updated photographic views required while conducting the tests. Clarifying edits based on internal feedback and indicant tests. Added revisions for securing the TEDTs. Reformatted multiple areas. Several changes to attribute information resulting from adopting a standardized reporting template in the June 2022 final rule.

1. PURPOSE AND APPLICATION

This document is provided by the National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) for the purpose of presenting procedures for uniform testing and providing suggestions for the use of specific equipment for contracted testing laboratories. It contains requirements based on the test procedures specified in the Federal Motor Vehicle Safety Standard(s) (FMVSS) and any applicable safety Regulations. The OVSC test procedures include requirements that are general in scope to provide flexibility for contracted laboratories to perform compliance testing and are not intended to limit or restrain a contractor from developing or utilizing any testing techniques or equipment which will assist in procuring the required compliance test data. These test procedures do not constitute an endorsement or recommendation for use of any particular product or testing method.

Prior to conducting compliance testing, contracted laboratories are required to submit a detailed test procedure to the Contracting Officer's Representative (COR) to demonstrate concurrence with the OVSC laboratory test procedure and the applicable FMVSS. If any contractor views any part of an OVSC laboratory test procedure to be in conflict with a FMVSS or observes deficiencies in a laboratory test procedure, the contractor is required to advise the COR and resolve the discrepancy prior to the start of compliance testing or as soon as practicable. The contractor's test procedure must include a step-by-step description of the methodology and detailed check-off sheets. Detailed check-off sheets shall also be provided for the testing instrumentation including a complete listing of the test equipment with make and model numbers. The list of test equipment shall include instrument accuracy and calibration dates. All equipment shall be calibrated in accordance with the manufacturer's instructions. There shall be no contradictions between the laboratory test procedure and the contractor's in-house test procedure. Written approval of in-house test procedures shall be obtained from the COR before initiating the compliance test program.

NOTE: The OVSC Laboratory Test Procedures, prepared for the limited purpose of use by independent laboratories under contract to conduct compliance tests for the OVSC, are not rules, regulations or NHTSA interpretations regarding the meaning of a FMVSS. **The OVSC Laboratory Test Procedures do not carry the force or effect of the law nor are they intended to bind the public in any way, except that they may be binding on a government contractor consistent with the terms of their contract.** The laboratory test procedures are not intended to limit the requirements of the applicable FMVSS(s). In some cases, the OVSC laboratory test procedures do not include all the various FMVSS minimum performance requirements. Recognizing applicable test tolerances, the laboratory test procedures may specify test conditions that are less severe than the minimum requirements of the FMVSS or regulation. In addition, the laboratory test procedures may specify test conditions that are less severe than the minimum requirements of the standard. The laboratory test procedures may be modified by the OVSC at any time without notice, and the COR may direct or authorize contractors to deviate from these procedures, as long as the tests are performed in a manner consistent with the standard itself and within the scope of the contract. Laboratory test procedures may not be relied upon to create any right or benefit in any person. Therefore, compliance of a vehicle or item of motor vehicle equipment is not necessarily guaranteed if the manufacturer limits its certification tests to those described in the OVSC laboratory test procedures.

2. GENERAL REQUIREMENTS

Regulation Part 537 (49 CFR Part 537) specifies requirements for automobile manufacturers to submit reports to NHTSA regarding their efforts to improve automotive fuel economy. In § 537.7, each vehicle manufacturer is required to submit each year a pre-model and a mid-model year report. The required contents and deadlines of the reports as defined in Part 537 are as follows:

Report Type	General Content of Reports	Submission Date
Pre-model year (PMY) and mid-model year (MMY) reports	For each model year passenger car and light truck, include information on the projected average fuel economy, model type, configuration fuel economy and technical information as specified in the NHTSA Credit Template fillable form (Office of Management Budget (OMB) Control No. 2127–0019, NHTSA Form 1475).	Pre-model year report: Month of December of the previous model year (e.g. the pre-model year report for the 2009 model year must be submitted during December 2008). Mid-model year report: Month of July of the current model year[1]
Supplementary reports.	For each manufacturer whose mid-model year report omits any of the information in NHTSA Form 1475.	Not more than 45 days after the date on which the manufacturer determined, or could have determined with reasonable diligence, that the report was required.

The reports are used by NHTSA in evaluating a manufacturer's plans for complying with average fuel economy standards. § 537.7(b)(3) requires the PMY report to include in part the projected CAFE mpg for each manufacturer's PCs and LTs based upon the projected sales figures. The PMY also includes the fleet standards derived from each unique model type and footprint combination of the manufacturer's automobiles (includes PC and LT). In calculating the fleet standard, manufacturers report the following information which was modified beginning model year 2013 and standardized in the CAFE Projections Reporting Template (OMB Control No. 2127–0019, NHTSA Form 1474) for the 2023 compliance model year: base tire; front axle, rear axle, and average track widths; wheelbase; footprint area and, optionally, the target standard for each model type and footprint entry.

This test procedure specifies the procedure used for measuring a vehicle's physical track width and wheelbase dimensions and calculating its associated footprint. The footprint data determined by this test procedure will be used to validate the footprint data provided by manufacturers in their PMY, MMY and Supplementary reports and then ultimately coordinated with EPA to be included in manufacturers final verified reports.

1 In the case of a mid-model year report, current model year means the model year during which that report is required by § 537.5(b) to be submitted.

2. GENERAL REQUIREMENTS…. Continued

METRIC SYSTEM OF MEASUREMENT

Section 5164 of the Omnibus Trade and Competitiveness Act (Pub. L. 100-418) establishes that the metric system of measurement is the preferred system of weights and measures for trade and commerce in the United States. Executive order 12770 directs Federal agencies to comply with the Act by converting regulatory standards to the metric system after September 30, 1992. In a final rule published on March 15, 1990 (60 FR 13639), NHTSA completed the first phase of metrication, converting English measurements in several regulatory standards to the metric system. Since then, metrication has been applied to other regulatory standards (63 FR 28912).

Accordingly, the OVSC laboratory test procedures include revisions to comply with governmental directives in using the metric system. Regulatory standards converted to metric units are required to use metric measurements in the test procedures, whereas standards using English units are allowed to use English measurements or to use English measurements in combination with metric equivalents in parentheses. For any testing equipment that is not available for direct measurement in metric units, the test laboratory shall calculate the exact metric equivalent by means of a conversion factor carried out to at least five significant digits before rounding consistent with the specified metric requirement.

All final compliance test reports are required to include metric measurements for standards using metrication. However, Part 537 specifies requirements in inches and square feet, so the values must be converted accordingly.

NOTE: The methodology for rounding measurement in the test reports shall be made in accordance with ASTM E29-06b, "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications."

3. SECURITY

The contractor shall provide appropriate security measures to protect the OVSC test vehicles and Government Furnished Property (GFP) from unauthorized personnel during the entire compliance testing program. The contractor is financially responsible for any acts of theft and/or vandalism which occur during the storage of test vehicles and GFP. Any security problems which arise shall be reported by telephone to the Industrial Property Manager (IPM), Office of Acquisition Management, within two working days after the incident. A letter containing specific details of the security problem shall be sent to the IPM (with copy to the COR) within 48 hours.

The contractor shall protect and segregate the data that evolves from compliance testing before and after each vehicle test. No information concerning the vehicle safety compliance testing program shall be released to anyone except the COR, unless specifically authorized by the COR or the COR's Division Chief.

NOTE: No individuals, other than contractor personnel directly involved in the compliance testing program or OVSC personnel, shall be allowed to witness any vehicle or equipment item compliance test unless specifically authorized by the COR.

4. GOOD HOUSEKEEPING

Contractors shall maintain the entire vehicle compliance testing area, test fixtures and instrumentation in a neat, clean and painted condition with test instruments arranged in an orderly manner consistent with good test laboratory housekeeping practices.

5. TEST SCHEDULING AND MONITORING

The contractor shall submit a test schedule to the COR prior to conducting the first compliance test. Tests shall be completed at intervals as required in the contract. If not specified, the first test shall be conducted within 6 weeks after receiving the first delivered unit. Subsequent tests shall be completed in no longer than 1-week intervals unless otherwise specified by the COR.

Scheduling of tests shall be adjusted to permit vehicles (or equipment, whichever applies) to be tested to other FMVSSs as may be required by the OVSC. All compliance testing shall be coordinated with the COR in order to allow monitoring by the COR and/or other OVSC personnel if desired. The contractor shall submit a monthly test status report and a vehicle status report (if applicable) to the COR. The vehicle status report shall be submitted until all vehicles are disposed of. The status report forms are provided in the forms section.

6. TEST DATA DISPOSITION

The contractor shall make all preliminary compliance test data available to the COR on location within thirty minutes after completing all testing. Final test data, including digital printouts and computer-generated plots (if applicable), shall be available to the COR in accordance with the contract schedule or if not specified within two working days. Additionally, the contractor shall analyze the preliminary test results as directed by the COR.

All backup data sheets, strip charts, recordings, plots, technicians' notes, etc., shall be either sent to the COR or destroyed at the conclusion of each delivery order, purchase order, etc.
The contractor shall protect and segregate the data that evolves from compliance testing before and after each test.

TEST DATA LOSS

A. INVALID TEST DESCRIPTION

An invalid compliance test is one, which does not conform precisely to all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test.

B. INVALID TEST NOTIFICATION

The contractor shall notify NHTSA of any test not meeting all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test, by telephone, within 24 hours of the test and send written notice to the COR within 48 hours of the test completion.

6. TEST DATA DISPOSITION…. Continued

C. RETEST NOTIFICATION

The Contracting Officer of NHTSA is the only NHTSA official authorized to notify the contractor that a retest is required. The retest shall be completed within 2 weeks after receipt of notification by the Contracting Officer that a retest is required.

D. WAIVER OF RETEST

NHTSA, in its sole discretion, reserves the right to waive the retest requirement. This provision shall not constitute a basis for dispute over NHTSA's waiving or not waiving any requirement.

E. TEST VEHICLE

NHTSA shall furnish only one vehicle for each test ordered. The Contractor shall furnish the test vehicle required for the retest. The retest vehicle shall be equipped as the original vehicle. The original vehicle used in the invalid test shall remain the property of NHTSA, and the retest vehicle shall remain the property of the Contractor. The Contractor shall retain the retest vehicle for a period not exceeding 180 days if it fails the test. If the retest vehicle passes the test, the Contractor may dispose of it upon notification from the COR that the test report has been accepted.

F. TEST REPORT

No test report is required for any test that is determined to be invalid unless NHTSA specifically decides, in writing, to require the Contractor to submit such report. The test data from the invalid test must be safeguarded until the data from the retest has been accepted by the COR. The report and other required deliverables for the retest vehicle are required to be submitted to the COR within 3 weeks after completion of the retest. The electronic data and draft final test report shall be submitted within 14 days of the final test. The final test report and dummy calibration report shall be submitted within 7 days after receiving comments from the COR.

G. DEFAULT

The Contractor is subject to the default and subsequent re-procurement costs for non-delivery of valid or conforming test (pursuant to the “Termination for Default” clause in the contract).

H. NHTSA'S RIGHTS

None of the requirements herein stated shall diminish or modify the rights of NHTSA to determine that any test submitted by the Contractor does not conform precisely to all requirements/specifications of the OVSC Laboratory Test Procedure and Statement of Work applicable to the test.

7. GOVERNMENT FURNISHED PROPERTY (GFP)

GFP consists of test vehicles and testing equipment. The GFP is authorized by contractual agreement. The contractor is responsible for the following.

A. ACCEPTANCE OF TEST VEHICLES

The contractor has the responsibility of accepting each GFP test vehicle whether delivered by a new vehicle dealership or another vehicle transporter. In both instances, the Contractor acts on behalf of the OVSC when signing an acceptance of the GFP test vehicle delivery order. When a GFP vehicle is delivered, the contractor must verify:

1) All options listed on the "window sticker" are present on the test vehicle.
2) Tires and wheel rims are new and the same as listed.
3) There are no dents or other interior or exterior flaws in the vehicle body.
4) The vehicle has been properly prepared and is in running condition.
5) The glove box contains an owner's manual, warranty document, consumer information, and extra set of keys.
6) Proper fuel filler cap is supplied on the test vehicle (if equipped).
7) Spare tire, jack, lug wrench and tool kit (if applicable) are located in the vehicle cargo area.
8) The VIN (vehicle identification number) on the vehicle condition report matches the VIN on the vehicle.
9) The vehicle is equipped as specified by the COR.

A Vehicle Condition form will be supplied to the Contractor by the COR when the test vehicle is transferred from a new vehicle dealership or between test contracts. The upper half of the form is used to describe the vehicle as initially accepted. The lower half of the Vehicle Condition form provides space for a detailed description of the post-test condition. The contractor must complete a Vehicle Condition form for each vehicle and deliver it to the COR with the Final Test Report or the report will NOT be accepted for payment.

If the test vehicle is delivered by a government contracted transporter, the contractor should check for damage which may have occurred during transit. GFP vehicle(s) shall not be driven by the contractor on public roadways unless authorized by the COR.

B. TESTING EQUIPMENT

Test equipment may be furnished to the contracted laboratory by the OVSC. Otherwise, the contracted laboratory will be responsible for obtaining the test equipment required to execute this test.

C. NOTIFICATION OF COR

The COR must be notified within 24 hours after a vehicle (and/or equipment) has been delivered. In addition, if any discrepancy or damage is found at the time of delivery, a copy of the Vehicle Condition form shall be sent to the COR immediately.

8. CALIBRATION OF TEST INSTRUMENTS

Before the Contractor initiates the vehicle safety compliance test program, a test instrumentation calibration system must be implemented and maintained in accordance with established calibration practices. The calibration system shall include the following as a minimum:

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

B. 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 12 months for instruments and 12 months for the calibration standards except for static types of measuring devices such as rulers, weights, etc., which shall be calibrated at periodic intervals not to exceed two years. Records, showing the calibration traceability to the National Institute of Standards and Technology (NIST), shall be maintained for all measuring and test equipment.

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

   1) Date of calibration
   2) Date of next scheduled calibration
   3) Name of the technician who calibrated the equipment

D. A written calibration procedure shall be provided by the Contractor, which includes as a minimum the following information for all measurement and test equipment:

   1) Type of equipment, manufacturer, model number, etc.
   2) Measurement range
   3) Accuracy
   4) Calibration interval
   5) Type of standard used to calibrate the equipment (calibration traceability of the standard must be evident)
   6) The actual procedures and forms used to perform the calibrations.

E. Records of calibration for all test instrumentation shall be kept by the Contractor in a manner that assures the maintenance of established calibration schedules.

F. All such records shall be readily available for inspection when requested by the COR. The calibration system shall need the acceptance of the COR before vehicle safety compliance testing commences.

G. Test equipment shall receive a system functional check out using a known test input immediately before and after the test. This check shall be recorded by the test technician(s) and submitted with the final report.

H. The Contractor may be directed by NHTSA to evaluate its data acquisition system.

8. CALIBRATION OF TEST INSTRUMENTS…. Continued

Further guidance is provided in the International Standard ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and American National Standard ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment General Requirements."

NOTE: In the event of a failure to meet the standard's minimum performance requirements additional calibration checks of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration will be at the COR's discretion and shall be performed without additional cost.

9. SUGGESTED TEST EQUIPMENT

A. Steel tape measure 7,620 mm (300 inches) with 1 mm graduated increments, i.e., Tajima Tool Corp standard/metric shock resistant tape measure, Model No. G-25/7.5MBW, or equivalent

B. Four straight aluminum edge rulers, 3,658 mm x 51 mm (144 inches x 2 inches), with 1 mm and 1/10-inch graduated increments, i.e., Fairgate, Model No. FAI-20-144me, or equivalent. (Shorter Rulers 200cm x 3.81cm may be substituted, i.e. Fairgate, Model No. FAI-20-320 or equivalent, however these may not fit all vehicles)

C. Digital inclinometer with range of 0 - 360°, a resolution of 0.1°, and an accuracy of $\pm$ 0.2°, i.e., Digital Protractor Angle Finder, Model Pro 360, or equivalent

D. Straight edge 1,194 mm (47 inches) in length (i.e. MD Building Tools, SMARTTOOL (M-D part number 92296), or equivalent

E. Portable tire pressure gauge with bleeder valve and an operating pressure of 0-700 kPa (0-100 psi), accuracy of + 0.5% of applied pressure, and graduated increments of 1 kPa (0.1 psi), i.e., Intercomp Digital Tire Pressure Gauge, Model Digital Air, or equivalent

F. Portable rechargeable air compressor

G. Four ruler clamp holder – black ruler holder clamps, fits 1.5" to 2" rulers, i.e., Starrett Model No. 86403250, or equivalent

H. Eight bungee cords – Two sizes, Four 24" and Four 36". (all sizes +/- 2")

I. 406 mm x 610 mm (16" x 24") right angle ruler, (i.e., Johnson Aluminum Rafter Square, Model No. CS5), or equivalent

J. Painter's tape / chalk (optional)

K. Tent cards – Three tent cards labeled on opposing sides (LF/LR, RF/RR, Test 1 / Test 2)

9. SUGGESTED TEST EQUIPMENT…. Continued

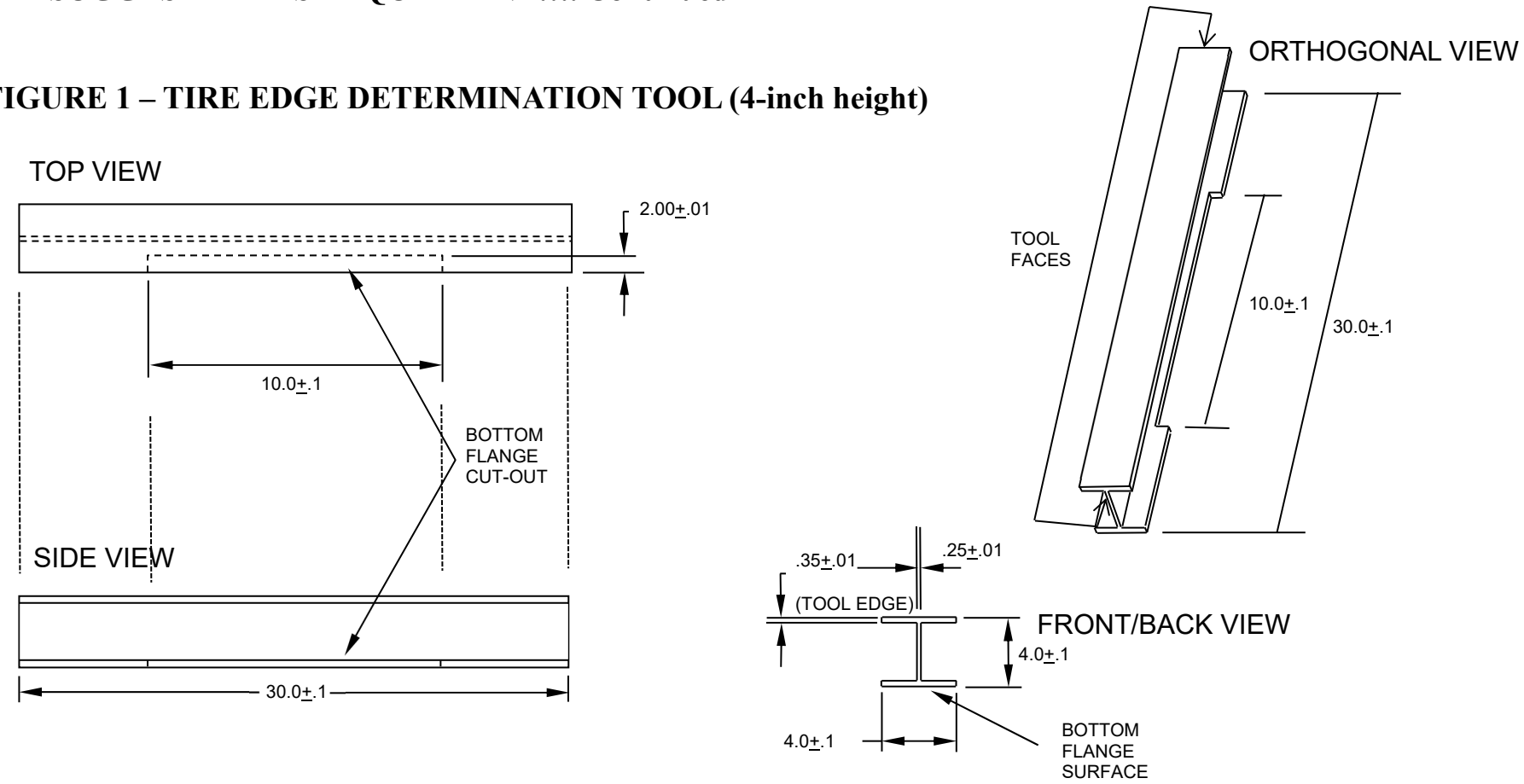
L. Spacer blocks - Three sizes (3”, 4”, 8” heights); eight for each size

M. Sets of Tire Edge Determination Tools (TEDTs) - Three sizes (3”, 4”, 8” heights); each set includes four for each size.

A set of TEDTs consist of four I-beams identical in design and fabricated to the dimensions shown in Figure 1. Additional sets of four I-beams are also available and fabricated to dimensions in figures 2 and 3 to accommodate vehicles of varying ground clearances. See figures 1, 2, and 3 in this section and section 13.5.A for more detail.

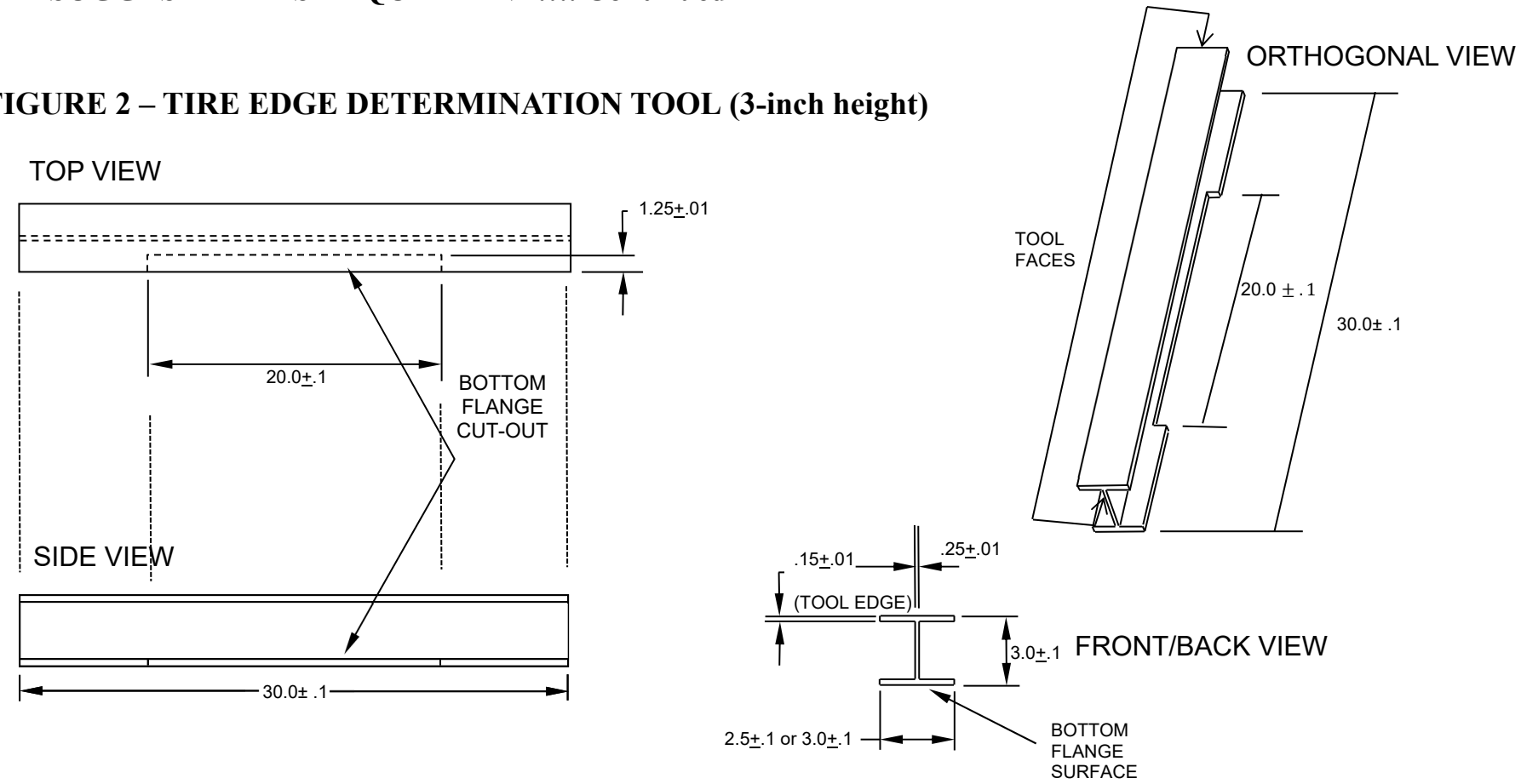
9. SUGGESTED TEST EQUIPMENT…. Continued

FIGURE 1 – TIRE EDGE DETERMINATION TOOL (4-inch height)



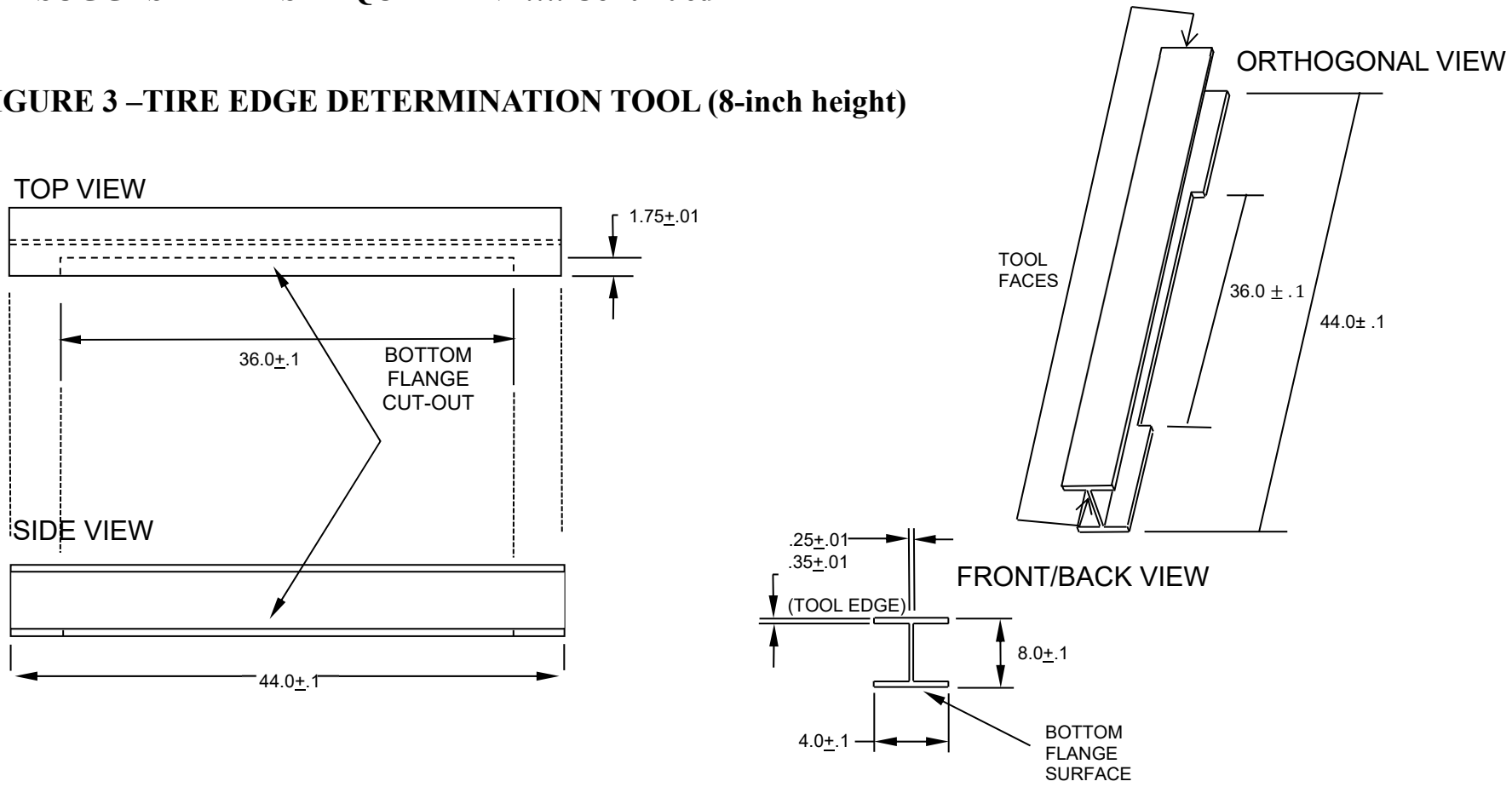
9. SUGGESTED TEST EQUIPMENT…. Continued

FIGURE 2 – TIRE EDGE DETERMINATION TOOL (3-inch height)



9. SUGGESTED TEST EQUIPMENT…. Continued

FIGURE 3 –TIRE EDGE DETERMINATION TOOL (8-inch height)



10. PHOTOGRAPHIC DOCUMENTATION

DIGITAL PHOTOGRAPHS

The contractor shall take digital photographs of the test procedure execution. Photographs shall be taken in color and contain clear images. A vehicle Model Year and Carline Name, NHTSA number, and photograph description with Test Procedure name shall appear in each photograph and must be legible. Utilizing the tent cards identify the test number and location of the tire to be tested on the vehicle. Each photograph shall be labeled as to the subject matter. The required resolution for digital photographs is a minimum of 1,600 x 1,200 pixels. Digital photographs are required to be created in color and in a JPG format. Glare from any illuminated or reflective surface should be minimized while taking photographs.

The test reports should include enough photographs to describe the testing in detail and should be organized in a logical succession of consecutive pictures. The digital photographs should be included in the test report in a logical order detailing the testing. Any non-conformance must be photographed at various angles to assure complete coverage. Upon request, the photographs should be sent to the COR on a CD or DVD and saved in a "read only" format to ensure that the digital photographs are the exact pictures taken during testing and have not been altered from the original condition.

PHOTOGRAPHIC VIEWS

As a minimum, the following test photographs shall be included in each vehicle final test report, submitted by the contractor:

A. Left Side of Vehicle Three-Quarter View
B. Vehicle Certification Label
C. Vehicle Placard
D. Vehicle Monroney Label
E. Tire Showing Manufacturer
F. Tire Showing Model
G. Tire Showing Size, Load, & Speed Index
H. Front Bumper Surface Measurement
I. Rear Bumper Surface Measurement
J. Left Sill Surface Measurement
K. Right Sill Surface Measurement
L. Tire Edge Determination Tools Positioned when Measuring Right Front Track Width
M. Front Right Tire Front Measurement
N. Front Right Tire Rear Measurement
O. Tire Edge Determination Tools Positioned when Measuring Left Front Track Width
P. Front Left Tire Front Measurement
Q. Front Left Tire Rear Measurement
R. Tire Edge Determination Tools Positioned when Measuring Right Rear Track Width
S. Rear Right Tire Front Measurement
T. Rear Right Tire Rear Measurement
U. Tire Edge Determination Tools Positioned when Measuring Left Rear Track Width
V. Rear Left Tire Front Measurement
W. Rear Left Tire Rear Measurement
X. Measuring Vehicle Left Side Wheelbase Inside Edge to Inside Edge
Y. Measuring Vehicle Left Side Wheelbase Outside Edge to Outside Edge
Z. Measuring Vehicle Right Side Wheelbase Inside Edge to Inside Edge
AA. Measuring Vehicle Right Side Wheelbase Outside Edge to Outside Edge

11. DEFINITIONS

BASE TIRE(s)[2]
Base tire (for passenger automobiles, light trucks, and medium duty passenger vehicles) means the tire size specified as standard equipment by the manufacturer on each unique combination of a vehicle's footprint and model type. Standard equipment is defined in 40 CFR 86.1803.

BASIC ENGINE[3]
Basic engine means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (e.g., type of fuel injection), catalyst usage, and other engine and emission control system characteristics specified by the Administrator. For electric vehicles, basic engine means a unique combination of manufacturer and electric traction motor, motor controller, battery configuration, electrical charging system, energy storage device, and other components as specified by the (EPA) Administrator.

CAMBER ANGLE
Camber angle is the angular displacement made between the vertical axis of the wheel and the vertical axis of the vehicle when viewed from the front or rear. If the top of the wheel is farther out than the bottom (that is, away from the axle), it is called positive camber; if the bottom of the wheel is farther out than the top, it is called negative camber (see Figure 4).

CAR LINE[4]
Car line means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats, or windows, except for station wagons or light-duty trucks. Station wagons and light-duty trucks are considered to be different car lines than passenger cars.

FOOTPRINT[5]
Footprint is the product of average track width (rounded to the nearest tenth of an inch) and wheelbase (measured in inches and rounded to the nearest tenth of an inch), divided by 144 and then rounded to the nearest tenth of a square foot.

GROSS VEHICLE WEIGHT RATING (GVWR)[6]
GVWR means the value specified by the manufacturer as the maximum design loaded weight of a single vehicle, consistent with good engineering judgment.

MODEL TYPE[7]
Model type means a unique combination of car line, basic engine, and transmission class.

MODEL YEAR[8]
Model Year means the manufacturer's annual production period (as determined by the (EPA) Administrator) which includes January 1 of such calendar year. If a manufacturer has no annual

2 See 49 CFR 523.2 Definitions
3 See 40 CFR. §600.002 Definitions
4 See 40 CFR. §600.002 Definitions
5 See 40 CFR §86.1803-01 Definitions
6 See 40 CFR §86.1803-01 Definitions
7 See 40 CFR. §600.002 Definitions
8 See 40 CFR. §600.002 Definitions

11. DEFINITIONS…. Continued

production period, the term "model year" means the calendar year.

STANDARD EQUIPMENT[9]
Standard equipment means those features or equipment which are marketed on a vehicle over which the purchaser can exercise no choice.

TOE ANGLE
The toe angle is the symmetric angle that each wheel makes with the longitudinal axis of the vehicle, as a function of static geometry, and kinematic and compliant effects. This can be contrasted with steer, which is the antisymmetric angle, i.e. both wheels point to the left or right, in parallel (roughly). Negative toe, or **toe out**, is the front of the wheel pointing away from the centerline of the vehicle. Positive toe, or **toe in**, is the front of the wheel pointing towards the centerline of the vehicle (see Figure 5).

TRACK WIDTH[10]
Track Width is the lateral distance between the centerlines of the base tires at ground, including the camber angle (see Figure 4).

NOTE: The track width is the distance between the intersection of the wheel lateral and longitudinal centerlines when a toe angle is present (the center of the wheel contact patch on the ground when considering the camber angle).

TRANSMISSION CLASS[11]
Transmission class means a group of transmissions having the following common features: Basic transmission type (e.g., automatic, manual, automated manual, semi-automatic, or continuously variable); number of forward gears used in fuel economy testing (e.g., manual four-speed, three-speed automatic, two-speed semi-automatic); drive system (e.g., front wheel drive, rear wheel drive; four wheel drive), type of overdrive, if applicable (e.g., final gear ratio less than 1.00, separate overdrive unit); torque converter type, if applicable (e.g., non-lockup, lockup, variable ratio); and other transmission characteristics that may be determined to be significant by the (EPA) Administrator.

UNLOADED VEHICLE WEIGHT (UVW)[12]
Unloaded vehicle weight is the weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants or accessories that are ordinarily removed from the vehicle when they are not in use.

WHEELBASE[13]
Wheelbase is the longitudinal distance between front and rear wheel centerlines (see Figure 6).

NOTE: Measured from the vertical centerlines of the wheels parallel to the ground.

9 See 40 CFR §86.1803-01 Definitions
10 See 40 CFR §86.1803-01 Definitions
11 See 40 CFR. §600.002 Definitions
12 See 49 CFR. §571.3 Definitions
13 See 40 CFR §86.1803-01 Definitions

11. DEFINITIONS…. Continued

VEHICLE CONFIGURATION[14]
Vehicle configuration means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio within a base level.

VEHICLE PLACARD AND OPTIONAL TIRE INFLATION PRESSURE LABEL
The sources of cold tire inflation pressure recommended by the vehicle manufacturer and provided in the location and format per Federal Motor Vehicle Safety Standard (FMVSS) No. 110.

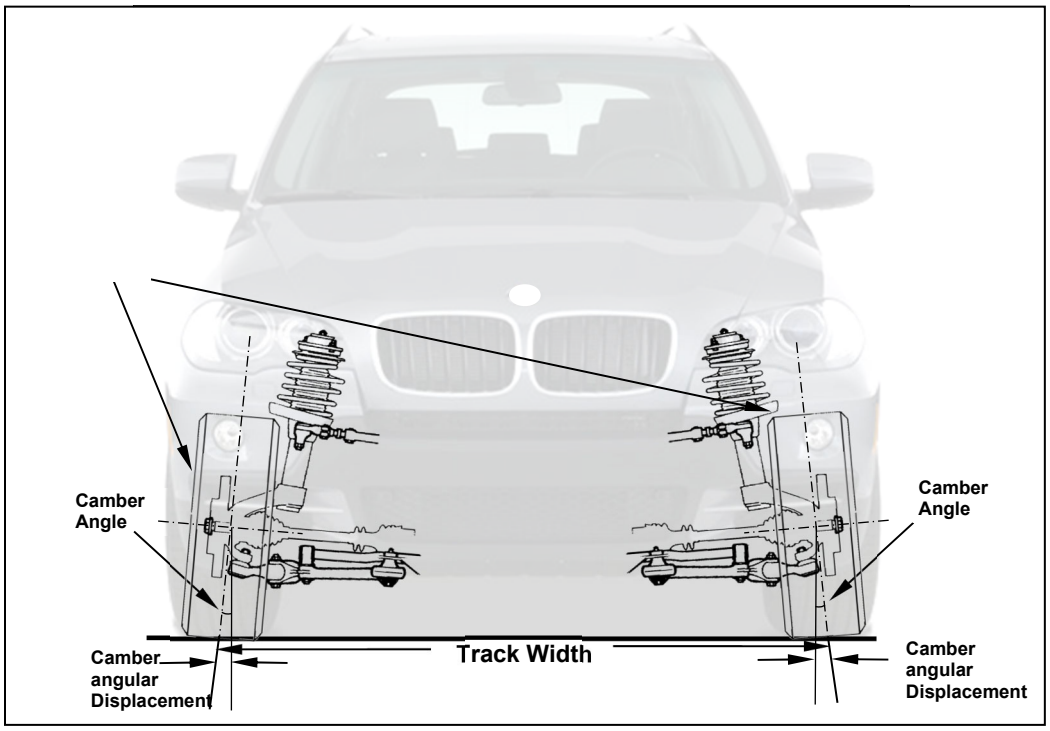


FIGURE 4 – TRACK WIDTH AND CAMBER ANGLE

14 See 40 CFR. §600.002 Definitions

11. DEFINITIONS…. Continued

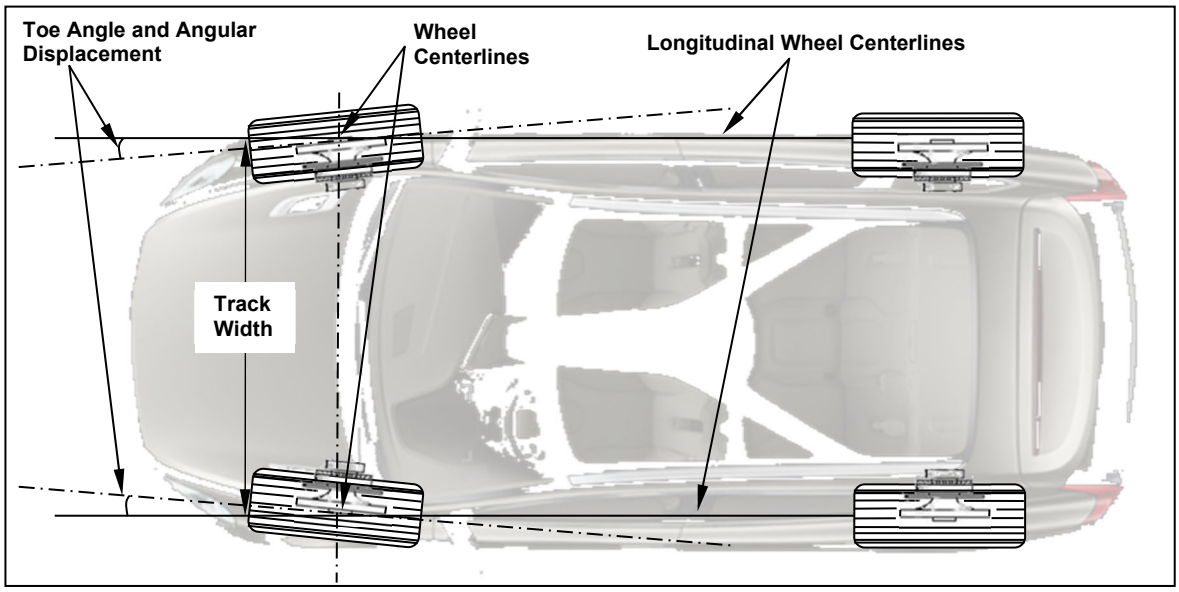


FIGURE 5 – TRACK WIDTH AND TOE ANGLE

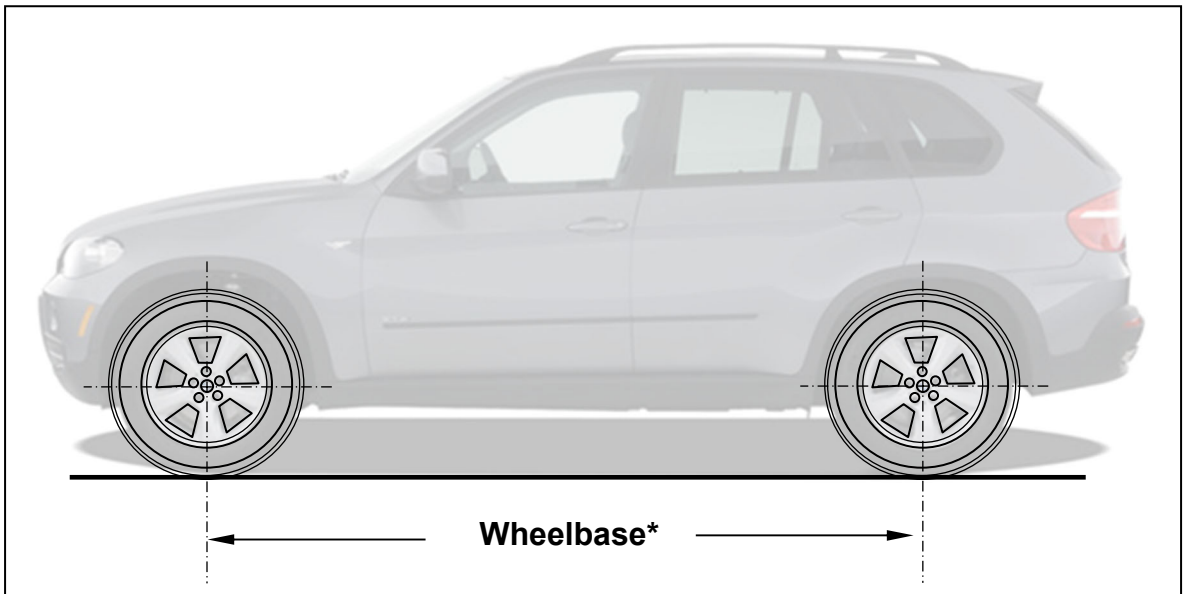


FIGURE 6 – WHEELBASE

12. TEST VEHICLE IDENTIFICATION AND INSPECTION

12.1 CALCULATION and ROUNDING

A. All rounding done during the calculation of results must be done according to ASTM E29-93a as indicated in 40CFR Part 91.509.

B. Outline of ASTM Rounding
   a. If the first discarded digit is less than 5, the last digit retained is not changed.
   b. If the first discarded digit is greater than 5 or is a 5 followed by at least one digit greater than 0, increase the last retained digit by one unit.
   c. If the first discarded digit is exactly 5, not followed by anything greater than 0, the last digit should be rounded up if it is an odd number and unchanged if it is an even number.

12.2 PROGRAM TOLERANCES

The allowable program tolerances for vehicle measurements vs the manufacturer reported information in the PMY Report are as follows:

Front Track Width	within +/- 0.30 in
Rear Track Width	within +/- 0.30 in
Average Track Width	within +/- 0.30 in
Wheelbase	within +/- 0.20 in
Vehicle Footprint	within +/- 0.20 ft^2

12.3 TEST LABORATORY IN-HOUSE PROCEDURE

A. Verify COR approval of contractor's detailed in-house test procedure.
B. Review all test preparation, regulation definitions and specifications, and test instrumentation requirements relating to this compliance test. Personnel supervising and/or performing the compliance test program shall be thoroughly familiar with the requirements, test conditions, and equipment for the test to be conducted.
C. Contracted laboratories must submit to the COR a list of the NHTSA procured test vehicles received. For each test vehicle note the make, model, engine, transmission, installed tire size(s), and tire model/manufacturer information.

12.4 RECORDING MANUFACTURER AND VEHICLE INFORMATION

A. Record data from the PMY report onto Data Sheet 1 - TEST VEHICLE MANUFACTURER'S REPORTED INFORMATON.
B. Verify and record the following information and that the information recorded matches test vehicle information:

12. TEST VEHICLE IDENTIFICATION AND INSPECTION…. Continued

i. Verify that model year, make, model, body type, engine type / displacement, transmission type (manual/automatic, CVT, number of speeds, etc.), drive system (FWD/RWD/AWD), tire branding, and sizes on vehicle all match the information recorded from the Pre-Model Year report.
ii. Verify that the vehicle mileage is less than 300 miles.
iii. Ensure vehicles do not have optional or adjustable suspension packaging.
iv. If the conditions in this section are not met, contact the COR.

13. TEST EXECUTION

13.1 TEST PREPARATION

A. Inspect test vehicle for possible test obstructions such as hubcaps, running boards, mud flaps, etc. Request removal if possible.
B. Make sure that the vehicle is at UVW and check that vehicle tire air pressure conforms with the manufacturer recommendation on the Tire Information Label, adjusting to conform if necessary.
C. Locate and inspect test location. Location shall be clean, uniform (no dips, cracks, etc.), free of equipment obstruction, large enough for testing, and having a consistent and level grade.

13.2 TEST VEHICLE POSITIONING

Follow the steps below for vehicle positioning to perform the testing:

Position test vehicle within test area, pulling vehicle forward one car length, holding position for approximately five seconds, then reversing into the testing area ensuring that the steer wheels are pointed straight forward by adjusting the steering wheel, so the vehicle's front tires are pointed in the forward direction parallel to the longitudinal centerline of the vehicle. When exiting the vehicle, ensure that steering direction is not altered by the operator contacting the wheel. If moving the vehicle for testing purposes is not viable, cycle the vehicles' suspension by "bouncing" the vehicle several times and allowing the vehicle to settle. Notate if this alternative procedure is used in the "notes" section of the data sheet.

B. Secure test vehicle (for automatic transmission place the transmission in "Park" and set the parking brake. For manual transmission, place the transmission in first gear and setting the parking brake).
C. Allow vehicle suspension to rest for five minutes to allow for it to settle

13.3 SURFACE MEASUREMENTS

Surface measurements should be taken as follows:

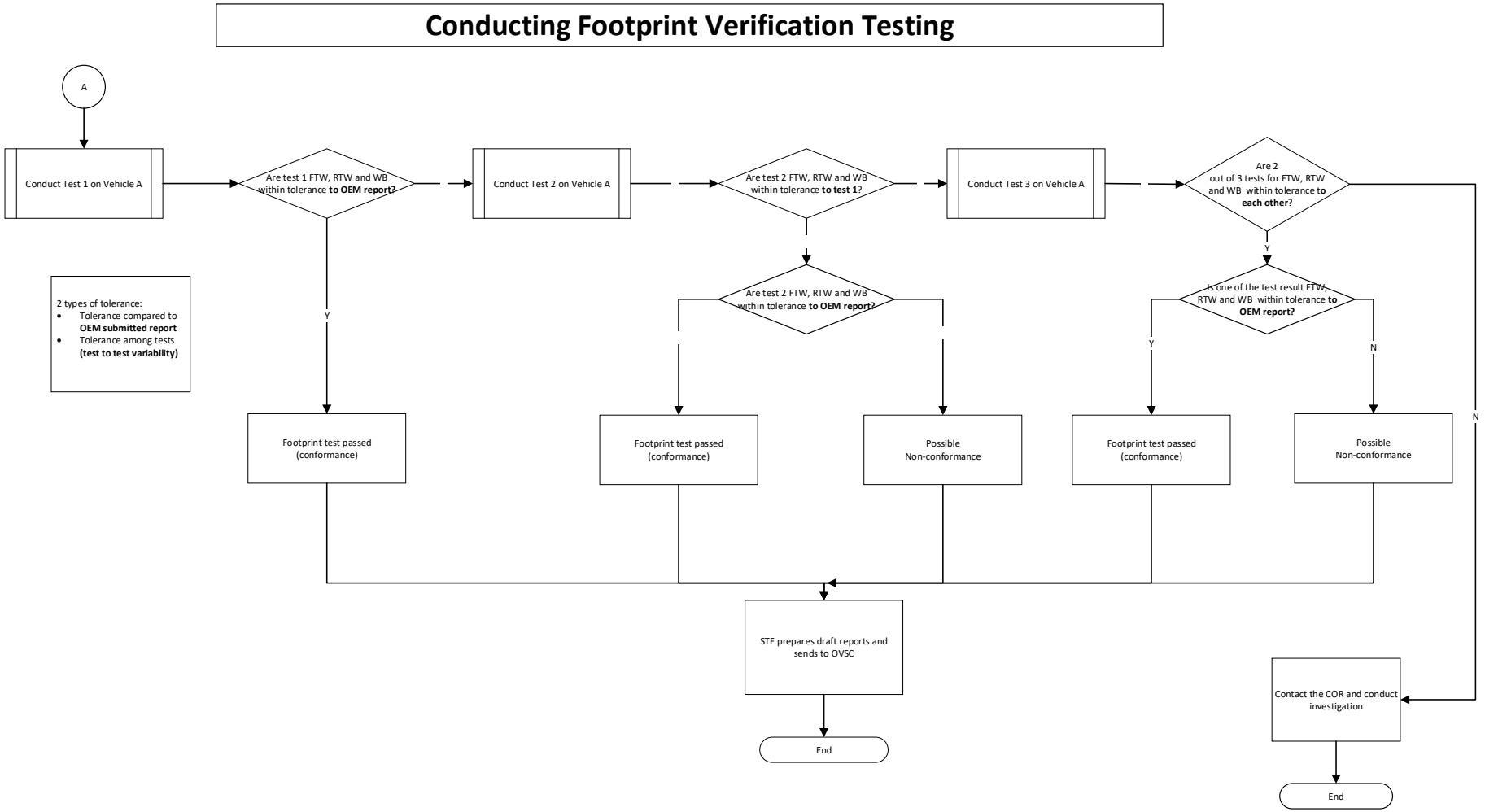
13. TEST EXECUTION…. Continued

A. Measure test surface attitudes, the measurements should be carried out utilizing the digital inclinometer placed on top of the 46-inch-long straight edge. The straight edge is utilized in order to ensure that the measurement is indicative of the inclination over a wider area so as to disallow localized defects from skewing the measurements.
B. Measure under the center of the front bumper, left sill, rear bumper, and right sill of the vehicle.
C. Record the measurements onto data sheet 2.
D. All measurements must be less than 2 degrees, otherwise a new test location must be found.
E. Using chalk or painters' tape, mark the vehicle testing surface to repeat vehicle position for subsequent tests.

13.4 TESTING FLOWCHART

A. In order to assure validity of the data, test results obtained are cross-compared with the data provided by the manufacturer in Form - 537. The process takes place in the series of steps explained below:
   a. Conduct Test 1 on the Vehicle.
   b. If the values obtained in Test 1 for Front Track Width, Rear Track Width, and Wheelbase are within the tolerance limit defined by NHTSA then the footprint test is in conformance. STF (San Angelo Test Facility) prepares the draft report and sends to OVSC for review. If the test is non-conforming, then follow Step c through Step d.
   c. Conduct Test 2 on the Vehicle.
   d. Compare Test 1 and Test 2 Values and check if the values obtained in Test 2 are within tolerance to Test 1. Check if Test 2 results are within the tolerance limit to the manufacturer's submitted data. If the test is in conformance, then STF prepares the draft report and sends to OVSC for review. If the test is non-conforming, then follow Step e through Step f.
   e. Conduct Test 3 on the Vehicle.
   f. Compare Test 1, Test 2 and Test 3 results and check if the values obtained in at least two out of three tests performed are within tolerance to each other. Check if the results of any one of the three tests conducted are within the tolerance limit to manufacturer's submitted data.
   g. If Step f results are conforming, then STF prepares the draft report and sends to OVSC for review.
   h. If the Step f results are non-conforming, then STF contacts the COR and then OVSC conducts the investigation.
B. Conduct test, in accordance with Sections 13.5 – 13.6.
C. The results of this test will be compared with the report submitted by the manufacturer utilizing the program tolerances outlined in Section 12.2. If the vehicle is found to be within tolerances, testing will be concluded.
D. In the event of test results falling outside of the program tolerances, sections 13.5-13.6 will be repeated with separate results recorded as test 2 on the same data sheet.

13. TEST EXECUTION…. Continued



13. TEST EXECUTION…. Continued

13.5 TRACK WIDTH MEASUREMENTS (DATA SHEET 3 – TEST RESULTS)

A. Place (4) 4-inch TEDTs on the floor on the left side of each tire with the lower flange cut-out facing towards the tires. Slide each TEDT against the tire sidewall so that two points on the upper flange make contact with the tire (see Figure 6). Affix appropriately sized elastic cords (i.e., bungee cords) to the TEDTS and around the opposite side of the wheel to ensure that the TEDT is securely held against the wheel/tire. Each TEDT has a cut-out along the bottom flange to prevent contact between the lower flange and the tire. The TEDT must make flush contact against the side of each tire at two points with the upper flange to ensure that the TEDT is able to define a longitudinal line on the inside or outside lower sidewall of the tire above the test floor oriented parallel to the longitudinal centerline of the tire. If the tire bulge, or any part of the vehicle, interferes with the upper flange, use a suitable supplied alternative TEDT size to eliminate interference.

   NOTE: The 4-inch TEDT is normally used when the tire bulge fits within the web of the I-beam. If this is not the case, contact the COR to determine the appropriate TEDT height for testing. When positioning the TEDTs, ensure the devices are in contact with the tire sidewalls or wheel rims in such a way that raised lettering or other asymmetric features of the tire or wheel do not influence alignment of the beams with the wheel plane. If necessary, the test vehicle should be repositioned following the procedure specified in 13.1B to eliminate any such interference. The bungee cords are used to ensure the TEDTs remain in steady contact with the tire sidewalls. Ensure the tension on each side of the bungee cords is equalized.

B. Adjust the end stop on the aluminum straight edges to a position (250-300mm, such that the straight edge contacts the full width of the tread surface) as appropriate, recording the setting in the "offset" field on the data sheet. Position the aluminum straight edges in contact with the forward most and rearmost points of the tire along the transverse vertical plane in order to measure the distance between the edge of each TEDT in contact with the tire to the nearest 1 mm. (see figures 6 - 8) supporting the center of the aluminum straight edge with the spacer blocks to prevent sagging.
C. Support each aluminum straight edge with the appropriate size blocks at two locations.
D. Record the measurements on the data sheet 3.
E. Repeat steps A & B with the TEDTs on the right side of the front wheels, recording the information on data sheet 3. (see figure 9)

   Calculate the front and rear axle track widths separately and record the values. The axle track widths are the average of the four measurements from the left and right sides of the tires as measured from the front and rear of each tire. The track width measurement uses the average of multiple independent measurements in order to eliminate errors associated with camber, toe and other steer angles.

   The calculated track width should be rounded to two decimal places (see example below). Record the calculated value in the data sheets in mm and in inches rounded (see 12.2) to two decimal places.

For example for any given 4 measurements:

(1662 (mm) + 1661 (mm) + 1663 (mm) + 1661 (mm)) ÷ 4 = 1661.75 (mm) = 65.42 (in)

13. TEST EXECUTION…. Continued

G. Calculate the vehicle track width by converting the average of the front and rear track widths in mm from steps D and E to inches rounded (see 12.2) to the nearest tenth of an inch (see example below). Record the calculated value.

For example for any given front and rear track width measurements:

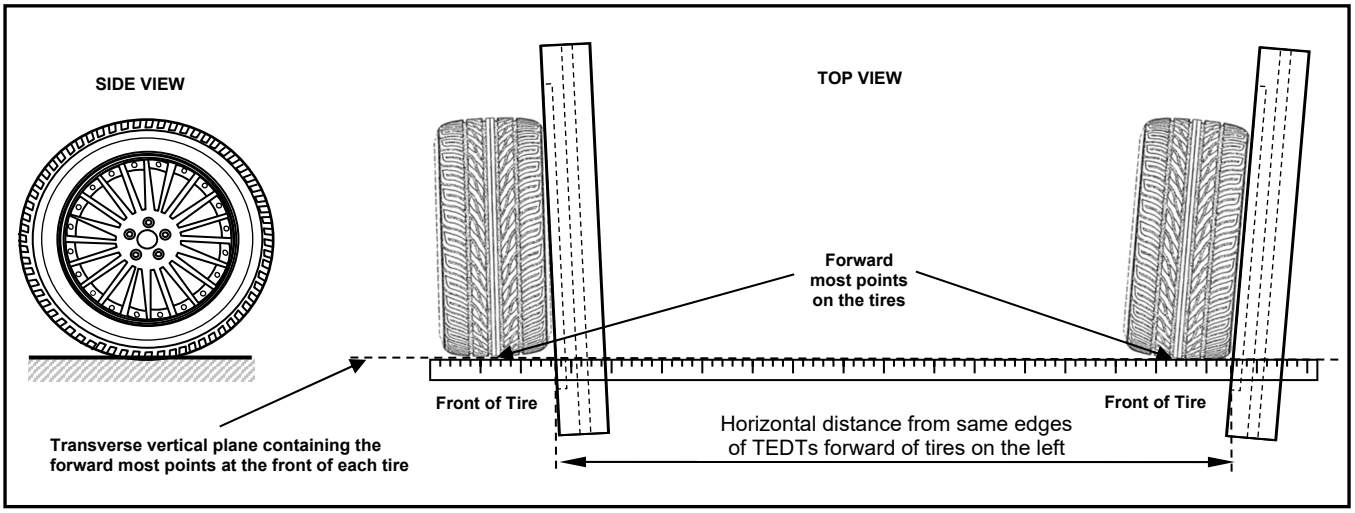


FIGURE 8 – TOP VIEW OF TREAD EDGE DETERMINATION TOOLS (TEDTS) MEASURED FROM THE FRONT LEFT OF TIRES

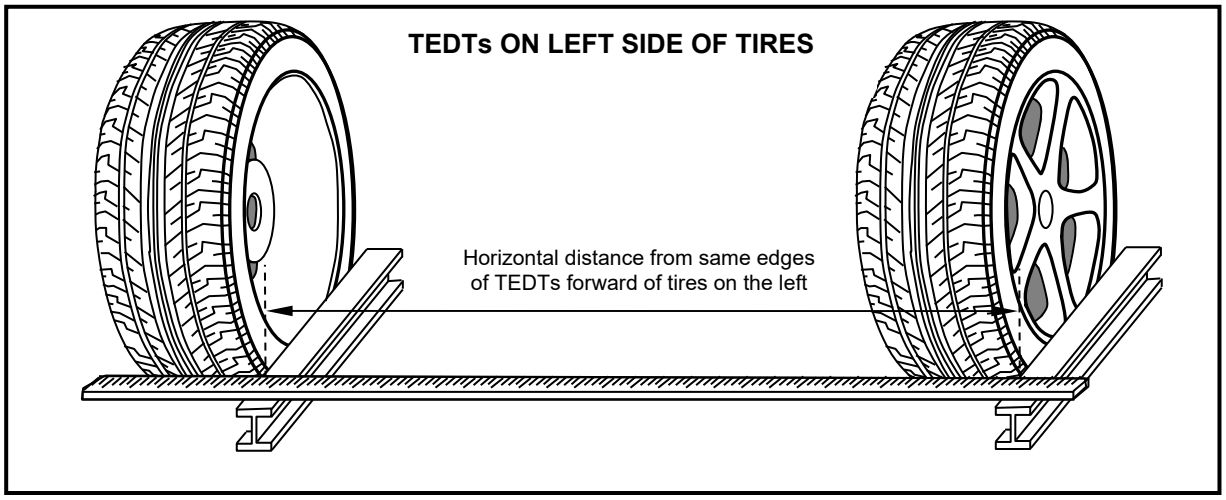


FIGURE 9 – ORTHOGONAL VIEW OF TREAD EDGE DETERMINATION TOOLS (TEDTS) MEASURED FROM THE FRONT LEFT OF TIRES

13. TEST EXECUTION…. Continued

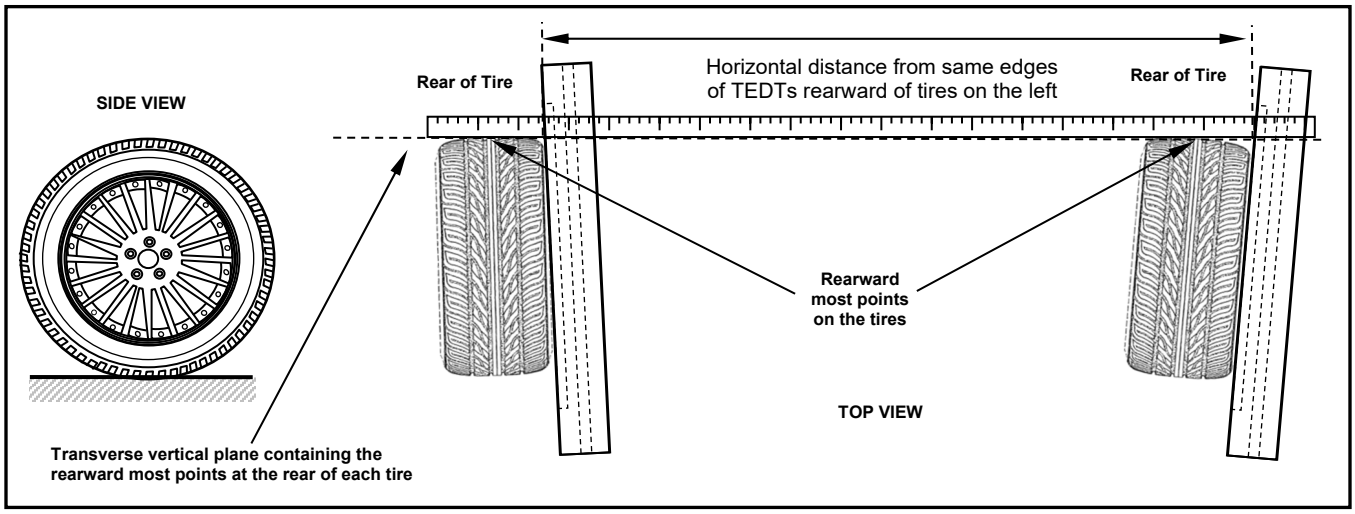


FIGURE 10 – TOP VIEW OF TREAD EDGE DETERMINATION TOOLS (TEDTS) MEASURED FROM THE FRONT LEFT OF TIRES

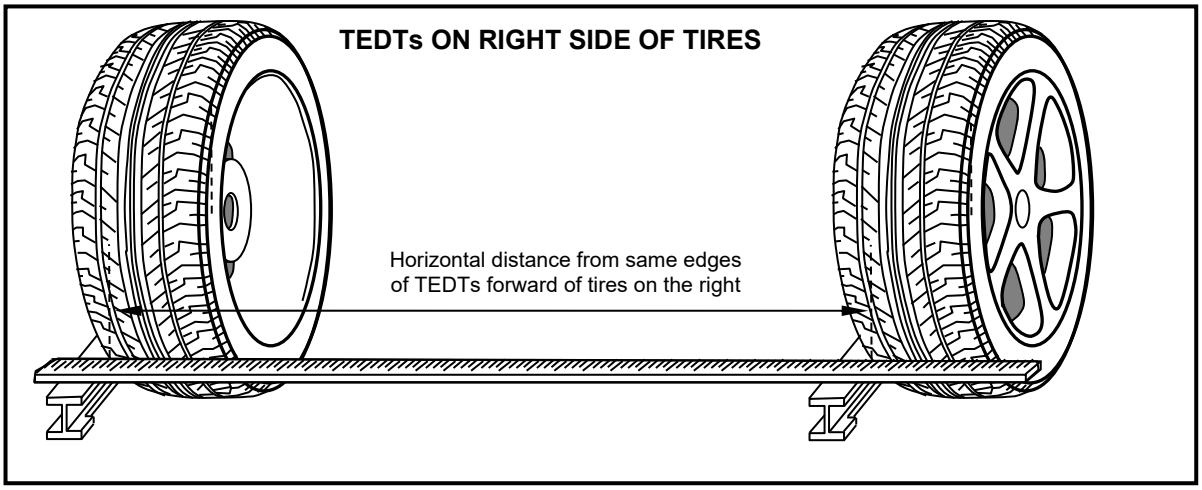


FIGURE 11 – TREAD EDGE DETERMINATION TOOLS (TEDTS) MEASURED FROM THE RIGHT OF TIRES

13. TEST EXECUTION…. Continued

13.5.1 Vehicles with Identical Front and Rear Wheel Size

A. Using the tape measure on the left side of the vehicle, measure the horizontal distance, parallel to the ground, from the forward most edge of the front wheel rim to the rearward most edge of the rear wheel rim. The measurement should be made to the nearest 1 mm. Record the distance (see Figure 10).
B. Using the tape measure on the left side of the vehicle, measure the horizontal distance, parallel to the ground, between the rearward most edge of the front wheel rim to the forward most edge of the rear wheel rim. The measurement should be made to the nearest 1 mm (see Figure8). Record the distance.

NOTE: Take photographs showing the wheelbase measurements and equipment positioning.

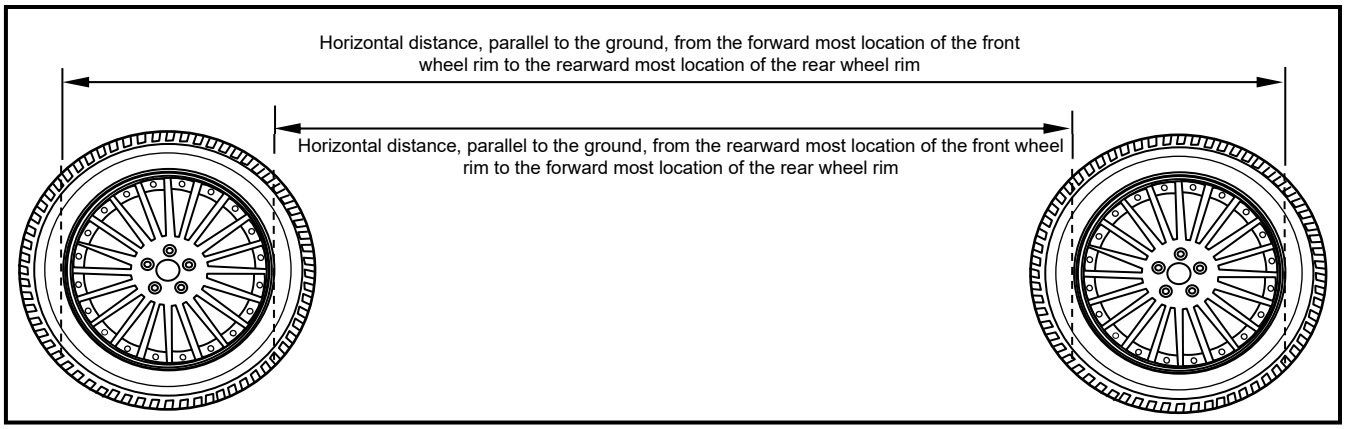


FIGURE 12 – WHEELBASE MEASUREMENTS

C. Calculate the left side wheelbase by averaging the measured distances in steps B and C. The calculated wheelbase should be rounded to two decimal places. Record the calculated value onto the data sheet in mm.
D. Repeat steps B through D for the right side of the vehicle. Record the two measured distances.
E. Calculate the vehicle wheelbase by converting the average of the left and right-side wheelbases in mm from steps D and E to inches rounded (see 12.2) to the nearest tenth of an inch. Record the calculated value.

13.5.2 Vehicles with Different Front and Rear Wheel Sizes

A. Using the right-angle rule, position the rule to the forward most edge of the vehicle rim on the front tire and rearward most edge of the rear tire.
B. Using the tape measure, measure the horizontal distance, parallel to the ground, between the right-angle rules at the forward most location of the front wheel rim to the vertical line at the rearward most location of the rear wheel rim. The measurement should be made to the nearest 1 mm. Record the distance.
C. Using the tape measure, measure the horizontal distance, parallel to the ground, between the rearward most location of the front wheel rim to the forward most location of the rear wheel rim. The measurement should be made to the nearest 1 mm. Record the distance.

13. TEST EXECUTION…. Continued

D. Repeat the procedure for the opposing side.

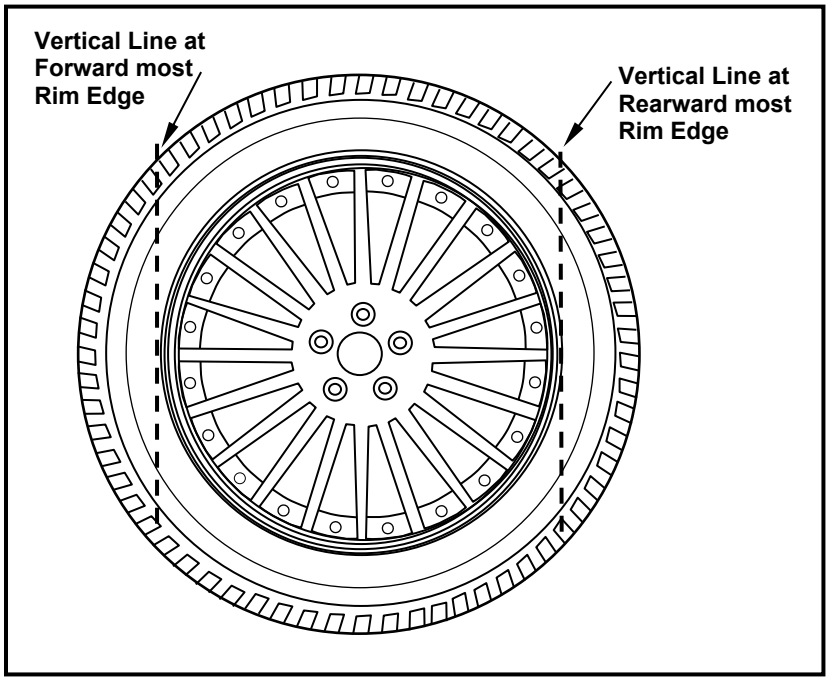


FIGURE 13 – FORWARD AND REARWARD MOST RIM EDGES

E. Calculate the left side wheelbase by averaging the measured distances in steps C and D. The measurement should be rounded (see 12.2) to two decimal places. Wheelbase is calculated using two vertical lines at the edges of the rims in order to account for differences in the vertical height of the wheel centers and differences in wheel diameter sizes for vehicles equipped with different tire sizes on each axle. Record the calculated value.

F. Repeat steps C through E for the right side of the vehicle. Calculate the vehicle wheelbase by averaging of the left and right-side wheelbases from steps E and F. Vehicle wheelbase in mm should be rounded to two decimal places and then converted to inches and rounded (see 12.2) to the nearest tenth of an inch (one decimal place). Record the calculated value.

13.6 Vehicle Footprint

A. Calculate vehicle footprint to the nearest tenth of a square foot. The footprint is the product of track width (measured in inches and rounded to the nearest tenth) times wheelbase (measured in inches and rounded to the nearest tenth) divided by 144 and then rounded (see 12.2) to the nearest tenth of a square foot.

B. Record the calculated value.

14. POST TEST REQUIREMENTS

A. Verify all data sheets have been completed and all photographs taken.

B. Complete the Vehicle Condition Report form including a word description of the vehicle's post-test condition.

15. REPORTS

15.1. MONTHLY STATUS REPORTS

The contractor shall submit a monthly Test Status Report and a Vehicle Status Report to the COR. The Vehicle Status report shall be submitted until all vehicles are disposed of. Samples of the required reports are found in the report forms section.

15.2. APPARENT NON-CONFORMANCE

Any indication of an apparent discrepancy or non-conformance shall be communicated by telephone to the COR within 24 hours with written notification mailed within 48 hours (Saturdays and Sundays excluded). A Notice of Non-conformance (see report forms section) with a copy of the particular test data sheet(s) and the preliminary data shall be included.

15.3 FINAL TEST REPORTS

15.3.1 COPIES

In the case of an apparent discrepancy or non-conformance, two paper copies and electronic copies in both Word and PDF formats of the Final Test Report shall be submitted to the COR for acceptance within three weeks of test completion. The Final Test Report format to be used by all contractors can be found in the "Report Section".

Where there has been no indication of an apparent non-conformance, one paper copy and electronic copies in both Word and PDF formats of each Final Test Report shall be submitted to the COR for acceptance within three weeks of test completion. No payment of contractor's invoices for conducting compliance tests will be made prior to the Final Test Report acceptance by the COR. Contractors are requested to NOT submit invoices before the COR is provided with copies of the Final Test Report.

Contractors are required to submit the first Final Test Report in draft form within one week after the compliance test is conducted. The contractor and the COR will then be able to discuss the details of both test conduct and report content early in the compliance test program.

Contractors are required to PROOFREAD all Final Test Reports before submittal to the COR. The OVSC will not act as a report quality control office
for contractors. Reports containing a significant number of errors will be returned to the contractor for correction, and a "hold" will be placed on invoice payment for the particular test.

15. REPORTS…. Continued

15.3.2 REQUIREMENTS

The Final Test Report and associated documentation (including photographs) are relied upon as the chronicle of the test verification. The Final Test Report will be released to the public domain after review and acceptance by the COR. For these reasons, each final report must be a complete document capable of standing by itself. The contractor should use DETAILED descriptions of all test validation events. Any events that are not directly associated with the regulation but are of technical interest should also be included. The contractor should include as much DETAIL as possible in the report. Instructions for the preparation of the first three pages of the final test report are provided for standardization.

15.3.3 FIRST THREE PAGES

A. FRONT COVER

A heavy paperback cover (or transparency) shall be provided for the protection of the final report. The information required on the cover is as follows:

(1) Report Number such as 537-ABC-XX-001, where –

537	is the Regulation tested
ABC	are the initials for the laboratory
XX	is the Fiscal Year of the test program
001	is the Group Number (001 for the 1st test, 002 for the 2nd test, etc.)

(2) Final Report Title and Subtitle such as

CONFORMANCE TESTING FOR 49 CFR 537
Automotive Fuel Economy Reports
* * * * * * * * * * * * * * * *
ABC Motor Company
20XX Saferider 4-door sedan
NHTSA No. CX0401

(3) Contractor's Name and Address such as

TESTING LABORATORIES, INC.
4335 West Dearborn Street
Detroit, Michigan 48090-1234

NOTE: DOT SYMBOL WILL BE PLACED BETWEEN ITEMS (3) AND (4)

(4) Date of Final Report completion

(5) The words "FINAL REPORT"

(6) The sponsoring agency's name and address as follows

U. S. Department of Transportation
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
Mail Code: NVS-220
1200 New Jersey Ave., SE
Washington, DC 20590

15. REPORTS…. Continued

B. FIRST PAGE AFTER FRONT COVER

When a contract test laboratory is reporting, a disclaimer statement and an acceptance signature block for the COR shall be provided as follows:

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: _____

Approved By: _____

Accepted By: _____

Acceptance Date: _____

15. REPORTS…. Continued

C. SECOND PAGE AFTER FRONT COVER

A completed Technical Report Documentation Page (Form DOT F1700.7) shall be completed for those items that are applicable with the other spaces left blank. Sample data for the applicable block numbers of the title page follows.

Block 1 — REPORT NUMBER

537-ABC-XX-001

Block 2 — GOVERNMENT ACCESSION NUMBER

Leave blank

Block 3 — RECIPIENT'S CATALOG NUMBER

Leave blank

Block 4 — TITLE AND SUBTITLE

Final Report of 49 CFR Part 537 Conformance Validation of 200X Saferider 4-door sedan, NHTSA No. CX0401

Block 5 — REPORT DATE

Month Day, 20XX

Block 6 — PERFORMING ORGANIZATION CODE

ABC

Block 7 — AUTHOR(S)

John Smith, Project Manager
Bill Doe, Project Engineer

Block 8 — PERFORMING ORGANIZATION REPORT NUMBER

ABC-DOT-20-XXX-001

15. REPORTS....Continued

Block 9 — PERFORMING ORGANIZATION NAME AND ADDRESS

ABC Laboratories
405 Main Street
Detroit, MI 48070-1234

Block 10 — WORK UNIT NUMBER

Leave blank

Block 11 — CONTRACT OR GRANT NUMBER

DTNH22-XX-D-12345

Block 12 — SPONSORING AGENCY NAME AND ADDRESS

United States Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Compliance
Mail Code: NVS-220
1200 New Jersey Avenue, SE
Washington, DC 20590

Block 13 — TYPE OF REPORT AND PERIOD COVERED

Final Test Report
Month Day to Month Day, 20XX

Block 14 — SPONSORING AGENCY CODE

NEF-200

Block 15 — SUPPLEMENTARY NOTES

Leave blank

15. REPORTS....Continued

Block 16 — ABSTRACT

Conformance validations were conducted on the subject 200X Saferider 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-537-0X to verify the vehicle's footprint data versus the manufacturer's data in its report submitted pursuant to 49 CFR 537 Automotive Fuel Economy Reports. The test non-conformances identified were as follows:

None

NOTE: Above wording must be shown with appropriate changes made for a particular compliance test. Any questions should be resolved with the COR.

Block 17 — KEY WORDS

Conformance Validation
Safety Engineering
49 CFR Part 537

Block 18 — DISTRIBUTION STATEMENT

Copies of this report are available from the following:

National Highway Traffic Safety Administration
Technical Information Services Division, NPO-411
1200 New Jersey Avenue, SE (ROOM E12-100)
Washington, DC 20590

e-mail: tis@nhtsa.dot.gov
FAX: 202-493-2833

Block 19 — SECURITY CLASSIFICATION OF REPORT

Unclassified

Block 20 — SECURITY CLASSIFICATION OF PAGE

Unclassified

Block 21 — NUMBER OF PAGES
Add appropriate number

15. REPORTS....Continued

Block 22 — PRICE

Leave blank

15.3.4 TABLE OF CONTENTS

Final test report Table of Contents shall include the following:

Section 1 — Purpose of Conformance Validation

Section 2 — Test Procedure and Discussion of Results

Section 3 — Test Data

Section 4 — Test Equipment List and Calibration Information

Section 5 — Photographs

Section 6 — Other Documentation

Section 7 — Notice of Test Non-conformance (if applicable)

15. REPORTS....Continued

Sample Report Layout

<table>
<tr><td>1. Report No.
537-ABC-XX-001</td><td>2. Government Accession No.
(Leave Blank)</td><td>3. Recipient's Catalog No.
(Leave Blank)</td></tr>
<tr><td colspan="2">4. Title and Subtitle

Final Report of 49 CFR Part 537 Conformance Validation of 20XX Saferider 4-door sedan, NHTSA No. CX0401</td><td>5. Report Date
Month Day, 20XX
6. Performing Organization Code STF</td></tr>
<tr><td colspan="2">7. Author(s)

John Smith, Project Manager
Bill Doe, Project Engineer</td><td>8. Performing Organization Report Number

ABC-DOT-20-XXX-001</td></tr>
<tr><td colspan="2">9. Performing Organization Name and Address

ABC Laboratories
405 Main Street
Detroit, MI 48070-1234</td><td>10. Work Unit No. (TRAIS)
(Leave Blank)
11. Contract or Grant No.

DTNH22-XX-D-12345</td></tr>
<tr><td colspan="2">12. Sponsoring Agency Name and Address

United States Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Compliance,
Mail Code: NEF-200
1200 New Jersey Avenue, SE
Washington, DC 20590</td><td>13. Type of Report and Period Covered

Final Test Report
Month Day to Month Day, 20XX
14. Sponsoring Agency Code

NEF-200</td></tr>
<tr><td colspan="3">15. Supplementary Notes
(Leave Blank)</td></tr>
<tr><td colspan="3">16. Abstract
Conformance validations were conducted on the subject 200X Saferider 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP- 537 -0X to verify the vehicle's footprint data versus the manufacturer's data in its report submitted pursuant to 49 CFR 537 Automotive Fuel Economy Reports. The test non-conformances identified were as follows: NONE.

NOTE: Above wording must be shown with appropriate changes made for a particular compliance test. Any questions should be resolved with the COR.</td></tr>
<tr><td colspan="2">17. Key Words

Conformance Validation
Safety Engineering
49 CFR Part 537</td><td>18. Distribution Statement

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1200 New Jersey Avenue, S.E.
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UNCLASSIFIED</td></tr>
</table>

16. TEST DATA

49 CFR 537 – TEST DATA SUMMARY

TEST DATE: **Month Day, 20XX** LAB: _____

MY/MAKE/MODEL

VEHICLE NHTSA NUMBER: _____ : _____

DATASHEET – 1 of 4 Test Vehicle Manufacturer's Reported Testing Setup Information

Field Data			
MY			
Make			
Model			
Body Type			
VIN			
Stock No.			
Engine Type/Displacement			
Transmission Class			
Drive System			
		Front and Rear Axles	
Tire Manufacturer/Model			
Tire Size			
Mileage			
Fuel			
Adjusted Tire Pressure to conform (Y/N)			
Monroney Label		Front Axle	Rear Axle
Tire Size			
Manufacturer Certification Label		Front Axle	Rear Axle
Tire Size			
GAWR (kg) *(Converted from lbs.)			
GVWR (kg) *(Converted from lbs.)			
Tire Placard	Total	Front	Rear
Seat Capacity			
Tire Size			
Required Tire Pressure (kPa)			
Vehicle Capacity Weight (kg)			
Dealer Information			
Dealer Name			
Address			

16. TEST DATA…. Continued

49 CFR 537 – TEST DATA SUMMARY

TEST DATE: **Month Day, 20XX** LAB: _____

VEHICLE NHTSA NUMBER: _____ **MY/MAKE/MODEL:** _____

DATASHEET – 2 of 4 Test Data

Track Width				
Ruler Offset (mm) 250	**Test 1**	**Test 2**	**Test 3**
Front Left Tire Front Measure (mm)			
Front Left Tire Rear Measure (mm)			
Front Right Tire Front Measure (mm)			
Front Right Tire Rear Measure (mm)			
Front Measurement Average (mm) (Ruler Offset Removed)			
Calculated Front Axle Track Width (in)			
Rear Left Tire Front Measure (mm)			
Rear Left Tire Rear Measure (mm)			
Rear Right Tire Front Measure (mm)			
Rear Right Tire Rear Measure (mm)			
Front Measurement Average (mm) (Ruler Offset Removed)			
Calculated Rear Axle Track Width (in)			
Average Front/Rear Axle Track Width (in)			

Wheelbase	**Test 1**	**Test 2**	**Test 3**
Left Side OUT-OUT (mm)			
Left Side IN-IN (mm)			
Calculated Left Side Wheelbase (in)			
Right Side OUT-OUT (mm)			
Right Side IN-IN (mm)			
Calculated Right Side Wheelbase (in)			
Average Left/Right Wheelbase (in)			

Footprint	**Test 1**	**Test 2**	**Test 3**
Calculated Footprint (sq. ft.)			

16. TEST DATA…. Continued

49 CFR 537 – TEST DATA SUMMARY

TEST DATE: **Month Day, 20XX** LAB: _____

VEHICLE NHTSA NUMBER: _____ **MY/MAKE/MODEL:** _____

DATASHEET – 3 of 4 Manufacturer's Setup Information (per Part 537) and Surface Measurements

Surface Measurement (less than 2 degrees)			
Front Bumper		Rear Bumper	
Left Sill		Right Sill	

Manufacturer's Setup Information (per Part 537)	**Front & Rear Axles**
Base Tire Size	
Front Track Width (in)	
Rear Track Width (in)	
Average Track Width (in)	
Wheelbase (in)	
Footprint (sq. ft.)	
Same configuration as test vehicle	

16. TEST DATA…. Continued

49 CFR 537– TEST DATA SUMMARY

TEST DATE: _____ LAB: _____

VEHICLE NHTSA NUMBER: _____ **MY/MAKE/MODEL :** _____

DATASHEET – 4 of 4 Manufacturer's Reported Information and Test Results

Comparison Chart (Test Values ± 0.15)	**Y/N**
Does test 1 indicate conformance?	
If No:	
Are tests 1 & 2 comparable?	
Are tests 2 & 3 comparable?	
Are tests 1 & 3 comparable?	
Are test(s) in tolerance with the manufacturer's reported information?	

	Test 1	**Test 2**	**Test 3**
Front Track Width (in)			
Rear Track Width (in)			
Average Track Width (in)			
Wheelbase (in)			
Footprint (sq. ft.)			

Tolerances[1]
Front Track Width + 0.3 in
Rear Track Width + 0.3 in
Average Track Width + 0.3 in
Wheelbase + 0.2 in
Footprint + 0.2 sq. ft.
The tolerances include the manufacturer's design and manufacturing tolerances. If the manufacturer has not provided tolerances, OVSC may assign default values based upon the result of measured vehicles.

Test Conductor: _____ Date: _____

Approval: _____

To be compliant with the CAFE Program, all manufacturer-submitted footprint dimensions must be less than or equal to the OVSC-measured test value. If a manufacturer's reported information value is larger than the corresponding test value, the difference between the two must be less than or equal to the associated program tolerance. If not, the test may represent a non-conformance.

16. TEST DATA…. Continued

SECTION 4

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

EQUIPMENT	DESCRIPTION	MODEL/SERIAL NO	CAL. DATE	NEXT CAL. DATE
AIR PRESSURE GAUGE				
RULERS				
TREAD EDGE DETERMINATION TOOLS (TEDTS)				
RULER				
LEVEL				
TAPE				

17. FORMS

LABORATORY NOTICE OF TEST NON-COMFORMANCE TO OVSC

FMVSS or REGULATION NO.: _____ TEST DATE:_____

LABORATORY:_____

CONTRACT NO.: _____ DELV. ORDER NO.:_____

LABORATORY PROJECT ENGINEER'S NAME:_____

TEST SPECIMEN DESCRIPTION:_____

VEHICLE NHTSA NO.: _____ VIN:_____

MFR:_____

NON-CONFORMANCE DESCRIPTION: _____

_____

_____

_____

FMVSS or REGULATION REQUIREMENT, PARAGRAPH S _____:

_____

_____

_____

NOTIFICATION TO NHTSA (COR): _____

DATE: _____ BY: _____

REMARKS:

17. FORMS....Continued

MONTHLY TEST STATUS REPORT
49 CFR Part 537
DATE OF REPORT:

NO.	VEHICLE NHTSA NO., MAKE & MODEL	COMPLIANCE TEST DATE	PASS/ FAIL	DATE REPORT SUBMITTED	DATE INVOICE SUBMITTED	INVOICE PAYMENT DATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

17. FORMS....Continued

MONTHLY VEHICLE STATUS REPORT
49 CFR Part 537
DATE OF REPORT:

NO.	VEHICLE NHTSA NO., MAKE & MODEL	DATE OF DELIVERY	ODOMETER READING	TEST COMPLETE DATE	VEHICLE SHIPMENT DATE	ODOMETER READING
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						