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**Feb 7, 1994**

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

**LABORATORY TEST PROCEDURE**

**FOR**

**FMVSS 210**

**Seat Belt Assembly Anchorages**



**SAFETY ASSURANCE**  
**Office of Vehicle Safety Compliance**  
**Room 6115, NSA-30**  
**400 Seventh Street, SW**  
**Washington, DC 20590**

# OVSC LABORATORY TEST PROCEDURE NO. 210

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## 1. PURPOSE AND APPLICATION

The Office of Vehicle Safety Compliance (OVSC) provides contracted laboratories with Laboratory Test Procedures (TPs) which serve as guidelines for obtaining compliance test data. The data are used to determine if a specific vehicle or item of motor vehicle equipment meets the minimum performance requirements of the subject Federal Motor Vehicle Safety Standard (FMVSS). The purpose of the OVSC Laboratory Test Procedures is to present a uniform testing and data recording format, and provide suggestions for the use of specific equipment and procedures. Any contractor interpreting any part of an OVSC Laboratory Test Procedure to be in conflict with a Federal Motor Vehicle Safety Standard or observing any deficiencies in a Laboratory Test Procedure is required to advise the Contracting Officer's Technical Representative (COTR) and resolve the discrepancy prior to the start of compliance testing.

Contractors are required to submit a detailed test procedure to the COTR before initiating the compliance test program. The procedure must include a step-by-step description of the methodology to be used.

The OVSC Laboratory Test Procedures 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.

### **NOTE:**

The OVSC Laboratory Test Procedures, prepared for use by independent laboratories under contract to conduct compliance tests for the OVSC, are not intended to limit the requirements of the applicable FMVSS(s). In some cases, the OVSC Laboratory Test Procedures do not include all of the various FMVSS minimum performance requirements. Sometimes, recognizing applicable test tolerances, the Test Procedures specify test conditions, which are less severe than the minimum requirements of the standards themselves. Therefore, compliance of a vehicle or item of motor vehicle equipment is not necessarily guaranteed if the manufacturer limits certification tests to those described in the OVSC Laboratory Test Procedures.

## 2. GENERAL REQUIREMENTS

FMVSS 210 establishes requirements for seat belt assembly anchorages to insure their proper location for effective occupant restraint and to reduce the likelihood of their failure. The standard applies to passenger cars, multipurpose passenger vehicles (MPVs), trucks and buses.

Seat belt anchorages for a Type 2 seat belt assembly (combination lap and shoulder belts) shall be installed for each forward-facing outboard designated seating position (DSP) in passenger cars and for each DSP for which a Type 2 seat belt assembly is required by FMVSS 208 in vehicles other than passenger cars.

Seat belt anchorages for a Type 1 (lap belt) or a Type 2 seat belt assembly shall be installed for each DSP, except a passenger seat in a bus.

Each vehicle that is equipped with an automatic restraint at the front right outboard DSP that cannot be used for securing a child restraint system or cannot be adjusted by the vehicle owner to secure a child restraint system solely through the use of attachment hardware installed as an item of original equipment by the vehicle manufacturer shall have, at the manufacturer's option, either anchorages for a Type 1 or lap belt assembly at that position or a Type 1 or Type 2 seat belt assembly at that position.

Except for side-facing seats, the anchorage, attachment hardware, and attachment bolts for a Type 1 seat belt assembly or the pelvic portion of a Type 2 seat belt assembly, if voluntarily installed, or the pelvic portion of a Type 2 seat belt assembly or automatic seat belt assembly, if equipped with a detachable upper torso belt, shall withstand a 5,000 pound force. The anchorage, attachment hardware, and attachment bolts for a Type 2 or automatic seat belt assembly, installed to comply with FMVSS 208, shall withstand 3,000-pound forces. The attachment hardware of a seat belt assembly subjected to S5.1 or FMVSS 208 other than due to FMVSS 208, S4.1.2.1(c)(2) does not have to meet these requirements. Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for the specified time. Designated seating positions (DSPs) common to the same occupant seat and that face in the same direction or for laterally adjacent seating positions not common to the same occupant seat that face in the same direction, if the vertical centerline of the bolt hole for at least one of those DSPs is within 12 inches of the vertical centerline of assemblies attached to those anchorages of another DSP shall be tested by simultaneously loading the seat belt.

### 3. SECURITY

The contractor shall provide appropriate security measures to protect the OVSC test vehicles 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. Any security problems, which arise, shall be reported by telephone to the Industrial Property Manager (IPM), Office of Contracts and Procurement, within two working days after the incident. A letter containing specific details of the security problem will be sent to the IPM (with copy to the COTR) 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 COTR, unless specifically authorized by the COTR or the COTR's Branch Chief or Division Chief.

**NO INDIVIDUALS, OTHER THAN CONTRACTOR PERSONNEL DIRECTLY INVOLVED IN THE COMPLIANCE TESTING PROGRAM, SHALL BE ALLOWED TO WITNESS ANY VEHICLE COMPLIANCE TEST UNLESS SPECIFICALLY AUTHORIZED BY THE COTR.**

### 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 vehicle test schedule to the COTR prior to conducting the first compliance test. Tests shall be completed as required in the contract. Scheduling shall be adjusted to permit vehicles to be tested to other FMVSSs as may be required by the OVSC. All compliance testing shall be coordinated with the COTR in order to allow monitoring by the COTR or other OVSC personnel.

### 6. TEST DATA DISPOSITION

The contractor shall make all preliminary compliance test data available to OVSC within four hours after the test, if requested. Final test data, including digital printouts and computer generated plots (if applicable), shall be furnished to the COTR within 5 working days. Additionally, the contractor shall analyze the preliminary test results as directed by the COTR.

All backup data sheets, strip charts, recordings, plots, technician's notes etc., shall be either sent to the COTR or destroyed at the conclusion of each delivery order, purchase order, etc. Calibration information shall not be destroyed.

## 7. GOVERNMENT FURNISHED PROPERTY (GFP)

### ACCEPTANCE OF VEHICLE

The Contractor has the responsibility of accepting the test vehicle from either a new car dealer or a vehicle transporter. In both instances, the contractor acts in the OVSC's behalf when signing an acceptance of the test vehicle. If the vehicle is delivered by a dealer, the engineer must check to verify the following:

- A. All options listed on the "window sticker" are present on the test vehicle.
- B. Tires and wheel rims are new and the same as listed.
- C. There are no dents or other interior or exterior flaws.
- D. The vehicle has been properly prepared and is in running condition.
- E. The glove box contains an owner's manual, warranty document, consumer information, and extra set of keys.
- F. Proper fuel filler cap is supplied on the test vehicle.

If the test vehicle is delivered by a government-contracted transporter, the contractor's test engineer shall check for damage, which may have occurred during transit.

A "Report Of Vehicle Condition At The Completion Of Testing" form (shown on the next page) will be supplied to the contractor by the COTR when the test vehicle is transferred from the new car dealer or between test contracts. The upper half of the form describes the vehicle in detail, and the lower half provides space for a detailed description of the posttest condition. This form must be returned to the COTR with the copies of the Final Test Report or the reports will NOT be accepted.

### NOTIFICATION OF COTR

The COTR must be notified within 24 hours after a test vehicle has been delivered.

**REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING**

CONTRACT NO.: DTNH22-\_\_\_\_\_ DATE: \_\_\_\_\_

FROM: \_\_\_\_\_

TO: \_\_\_\_\_

The following vehicle has been subjected to compliance testing for FMVSS No. \_\_\_\_\_

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

MODEL YEAR/MAKE/MODEL/BODY STYLE: \_\_\_\_\_

NHTSA NO.: \_\_\_\_\_ BODY COLOR: \_\_\_\_\_ VIN: \_\_\_\_\_

ODOMETER READINGS: ARRIVAL - \_\_\_\_\_ miles DATE - \_\_\_\_\_

COMPLETION - \_\_\_\_\_ miles DATE - \_\_\_\_\_

PURCHASE PRICE: \$ \_\_\_\_\_ DEALER'S NAME: \_\_\_\_\_

ENGINE DATA: \_\_\_\_\_ Cylinders \_\_\_\_\_ Liters \_\_\_\_\_ Cubic Inches

TRANSMISSION DATA: \_\_\_\_\_ Automatic \_\_\_\_\_ Manual \_\_\_\_\_ No. of Speeds

FINAL DRIVE DATA: \_\_\_\_\_ Rear Drive \_\_\_\_\_ Front Drive \_\_\_\_\_ 4 Wheel Drive

TIRE DATA: Size - \_\_\_\_\_ Mfr. - \_\_\_\_\_

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

<input type="checkbox"/>	Air Conditioning	<input type="checkbox"/>	Traction Control	<input type="checkbox"/>	Clock
<input type="checkbox"/>	Tinted Glass	<input type="checkbox"/>	All Wheel Drive	<input type="checkbox"/>	Roof Rack
<input type="checkbox"/>	Power Steering	<input type="checkbox"/>	Speed Control	<input type="checkbox"/>	Console
<input type="checkbox"/>	Power Windows	<input type="checkbox"/>	Rear Window Defroster	<input type="checkbox"/>	Driver Air Bag
<input type="checkbox"/>	Power Door Locks	<input type="checkbox"/>	Sun Roof or T-Top	<input type="checkbox"/>	Passenger Air Bag
<input type="checkbox"/>	Power Seat(s)	<input type="checkbox"/>	Tachometer	<input type="checkbox"/>	Front Disc Brakes
<input type="checkbox"/>	Power Brakes	<input type="checkbox"/>	Tilt Steering Wheel	<input type="checkbox"/>	Rear Disc Brakes
<input type="checkbox"/>	Antilock Brake System	<input type="checkbox"/>	AM/FM/Cassette Radio	<input type="checkbox"/>	Other-

**LIST OTHER PERTINENT OPTIONAL EQUIPMENT ON NEXT PAGE (REMARKS SECTION)**

**REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING....Continued**

REMARKS:

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Equipment that is no longer on the test vehicle as noted on previous page:

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Explanation for equipment removal:

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Test Vehicle Condition:

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RECORDED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_



## 8. CALIBRATION OF TEST INSTRUMENTS

Before the contractor initiates the safety compliance test program, a test instrumentation calibration system shall be implemented and maintained in accordance with established calibration practices. Guidelines for setting up and maintaining such calibration systems are described in MIL-C-45662A, "Calibration System Requirements". The calibration system shall be set up and maintained as follows:

- A. Standards for calibrating the measuring and test equipment will 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 TO EXCEED SIX (6) MONTHS! Records, showing the calibration trace ability 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 will be labeled with the following information:
  - (1) Date of calibration
  - (2) Date of next scheduled calibration
  - (3) Name of company performing calibration service (if different than contractor)
  - (4) Name and employer 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 — see next page
  - (3) Accuracy — see next page
  - (4) Calibration interval
  - (5) Type of standard used to calibrate the equipment (calibration trace ability of the standard must be evident)

## 8. CALIBRATION OF TEST INSTRUMENTS....Continued

## TEST EQUIPMENT ACCURACY

EQUIPMENT	RANGE	ACCURACY
Hydraulic Rams (5 Reqd)	0-120% of Specified Load	N/A
Load Cells (5 Reqd)	0-120% of Readout Capability	$\pm 0.5\%$
Strip Chart Recorder	Readout Capability of 3% of Maximum Load	$\pm 1.0\%$
Hydraulic Pump	Approx. 3.8 gpm	N/A
DC Power Supply	Adequate for Load Cells Used	Line Reg. of 0.05% (105 to 125 v) Load Reg. of 0.05% (0 to Full) Ripple: 5 mv P/P Stability: 0.1%
Digital Voltmeter or Equivalent Used to Monitor Load Cell Outputs	4 Digit Readout	$\pm 0.1\%$
Signal Conditioning and Calibration Units	Adequate for Load Cells Used	$\pm 0.5\%$
H-Point Machine	N/A	N/A
Steel Scale	36" Minimum	$\pm 0.1"$

## 8. CALIBRATION OF TEST INSTRUMENTS....Continued

- E. Records of calibration for all test instrumentation 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 requested by the COTR. The calibration system shall need the acceptance of the COTR before the test program commences.
- F. Test equipment will receive a calibration check immediately prior to and after the test. This check will be recorded by the test technician(s) and included in the final report.

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

## 9. PHOTOGRAPHIC DOCUMENTATION

Photographs, if required, shall be glossy black and white, 8-1/2 x 11 inches, and properly focused for clear images. A tag, label or placard identifying the test vehicle model, NHTSA number and date or item of equipment part number and date shall appear in each photograph and must be legible. Each photograph shall be labeled as to the subject matter.

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

- A. 3/4 frontal right side view
- B. 3/4 rearward left side view
- C. Test vehicle's certification label
- D. Test vehicle's tire information placard or label
- E. 3/4 frontal left side view of test vehicle with test apparatus in place
- F. 3/4 frontal right side view of test vehicle with test apparatus in place
- G. Vehicle tie down at each tie down location
- H. Pretest full front and side views of each seat belt system installed in the vehicle
- I. Pretest equipment set up at each designated seating position
- J. Post test condition of each seat belt assembly anchorage
- K. Load system control and data recording device in test position
- L. Loading device with load cell and body block in test position  
NOTE: Not necessary if covered by other photographs
- M. Pretest condition of each seat belt anchorage
- N. Post test condition of each seat belt anchorage
- O. Any condition, which requires special detail

**10. DEFINITIONS**

**ATTACHMENT HARDWARE**

Any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.

**CURB WEIGHT**

Weight of the vehicle as delivered with full capacity of vehicle fluids.

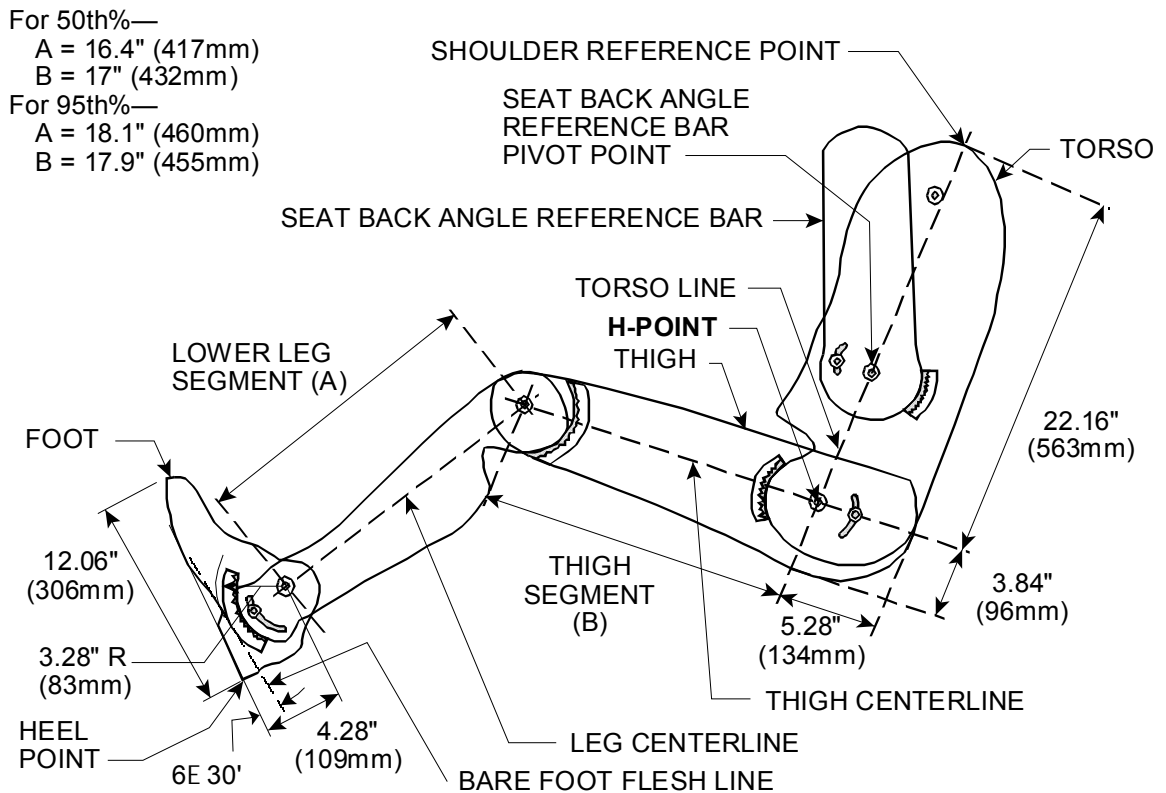
**DESIGNATED SEATING POSITION (DSP)**

Any plan view location capable of accommodating a person at least as large as a 5th percentile adult female, if the overall seat configuration and design and vehicle design is such that the position is likely to be used as a seating position while the vehicle is in motion, except for auxiliary seating accommodations such as temporary or folding jump seats. The number of DSP's in a vehicle is printed on the tire placard as required by FMVSS 110.

**H-POINT**

Mechanically hinged hip point of a manikin, which simulates the actual pivot center of the human torso and thigh, described in SAE J826.

**H-POINT TEMPLATE**



## 10. DEFINITIONS....Continued

### SEAT BELT ASSEMBLY

Any strap, webbing or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.

### SEAT BELT ASSEMBLY ANCHORAGE

Any component, other than the webbing or straps involved in transferring seat belt assembly loads to the vehicle structure, including, but not limited to, the attachment hardware, seat frames, seat pedestals, and the vehicle structure itself.

### SEATING REFERENCE POINT (SRP)

Manufacturer's Design Reference Point which —

- A. Establishes the rearmost normal design driving or riding position of each DSP in a vehicle
- B. Has coordinates established relative to the designed vehicle structure
- C. Simulates the position of the center pivot of the human torso and thigh
- D. Is the reference point employed to position the two-dimensional templates described in SAE Recommended Practice J826, Manikins for use In Defining Vehicle Seating Accommodation.

### SHOULDER REFERENCE POINT (SHRP)

A point 22.16" above the H-Point along the torso centerline of the two-dimensional drafting template described in SAE J383 — IT DOES NOT DESCRIBE A SHOULDER JOINT

### TORSO LINE

Line connecting the H-Point and the SHRP as defined in SAE Recommended Practice J383, Motor Vehicle Seat Belt Anchorage.

### TYPE 1 SEAT BELT ASSEMBLY

Lap belt assembly for occupants pelvic or lower body restraint.

### TYPE 2 SEAT BELT ASSEMBLY

A combination of pelvic (lap belt) and upper torso (shoulder belt) restraints.

## 11. PRETEST REQUIREMENTS

Prior to conducting any compliance tests, contractors are required to submit a detailed in-house compliance test procedure to the COTR, which includes:

- A. A step-by-step description of the methodology to be used. The in-house test procedure will be written in a check-off sheet format and will describe each significant task the test technician must perform to accomplish the testing. The check-off list test procedure is intended to provide the test technician with a foolproof cookbook plan to conduct the test and produce the necessary data. The test procedure shall be of sufficient detail to guarantee successful testing.
- B. A written quality control (QC) procedure which shall include calibrations, the data review process, report review, and the people assigned to perform QC on each task.
- C. A complete listing of test equipment, which shall include instrument accuracy and calibration, dates.
- D. Detailed check-off lists to be used during the test and during data review.

There shall be no contradiction between the OVSC Laboratory Test Procedure and the contractor's in-house test procedure. The procedures shall cover all aspects of testing from vehicle receipt to submission of the Final Report. Written approval must be obtained from the COTR before initiating the compliance test program so that all parties are in agreement. A compliance test is not to be conducted unless all of the various test conditions specified in the applicable OVSC Laboratory Test Procedure have been met. Failure of a contractor to obtain the required test data and to maintain acceptable limits on test parameters in the manner outlined in the applicable OVSC Laboratory Test Procedure shall require a retest at the expense of the contractor. The retest costs will include the cost of the replacement vehicle and the service costs for conducting the retest.

### RECEIVING INSPECTION OF TEST VEHICLES

- A. A clean and secure test vehicle storage area shall be maintained by the contractor. The test vehicle shall be protected from theft of equipment.
- B. Upon receipt of the test vehicle, it shall be identified by the contractor with a NHTSA number previously furnished by the COTR.
- C. The test vehicle's seats and restraint systems shall be subjected to a visual inspection to ascertain that the seat belt assembly anchorage systems are complete and the seats and seat belt assemblies are functional. Any damage that could influence the test results shall be recorded on the Vehicle Condition sheet, and any unusual condition shall be reported to the COTR before initiation of testing. The COTR must approve the testing of any unusual test specimen.

## 11. PRETEST REQUIREMENTS....Continued

- D. The operation of all adjustable seating systems will be checked to ascertain that the systems operate correctly. The results of this inspection shall be recorded on the Receiving-Inspection sheet.

## 12. COMPLIANCE TEST EXECUTION

### GENERAL STATEMENT OF S210 REQUIREMENTS

FMVSS 210 establishes requirements for Seat Belt Assembly Anchorages. Those requirements are detailed in Title 49 Code of Federal Regulations Part 571.210.

S210 TEST EQUIPMENT DESCRIPTION — The test laboratory is responsible for supplying all of the following equipment.

- A. A test loading, monitoring, and control system which shall consist of a maximum of 7 load cells, with 1 load cell mounted on each body block and where applicable one on each seat (where the seat belt assembly is attached to the seat) measuring the force applied. Force control shall be derived from a closed loop programmable force generator and shall be capable of simultaneously supplying loads to a maximum of 5 separate body blocks and two seats at a constant rate. In addition, if any seat belts or cables (used in lieu of seat belts) fail during the test, the effect on the loading of the remaining anchorages shall not cause those anchorages to exceed the load time, load rate or force requirements of the standard, as the test is completed for those anchorages that did not fail.

Recorded data shall include preload, loading, and unloading of the anchorages at the end of the holding period. The measured force at each body block shall be applied and controlled at a rate less than the maximum rate specified (50,000 pounds per second for Type 1 and 30,000 pounds per second for Type 2) in FMVSS 210. If all loading devices are not connected to the same load source, the application rate difference shall not exceed five percent. The maximum force, maintained for the time interval specified, shall be within -10, -50 pounds of the standard's specified maximum value. The loading apparatus shall be mounted so that it is sturdy enough to adequately withstand the loads applied and so that it will load the anchorages at the required angles.

**IT IS IMPORTANT TO NOTE THAT A MAXIMUM OF 7 SEPARATE LOADING DEVICES CAN BE REQUIRED DEPENDENT UPON THE TEST VEHICLE ANCHORAGE CONFIGURATION AND A PLOT OF LOAD VERSUS TIME MUST BE GENERATED DURING THE TEST OR FROM REAL TIME CONTINUOUS MEASUREMENTS RECORDED AND STORED DURING THE TEST.**

- B. Three (3) Type A lap belt blocks (or 2 Type A lap belt blocks and 1 Type B lap belt block) and 2 shoulder belt blocks shown in Figures 1, 2 and 3.
- C. Appropriate angle, length, width, height, etc. measuring devices.



12. COMPLIANCE TEST EXECUTION...Continued

- D. Restraining device or fixture to completely tie-down and immobilize the S210 test vehicle when applying the required anchorage loads.
- E. System to raise and hold the test vehicle at least 1" above the floor level.

**NOTE:** LAP BELT BODY BLOCK WILL BE COVERED BY 1" MEDIUM DENSITY CANVAS COVERED FOAM RUBBER WHERE LAP BELT CONTACTS BODY BLOCK.

**TYPE A LAP BELT BODY BLOCK**

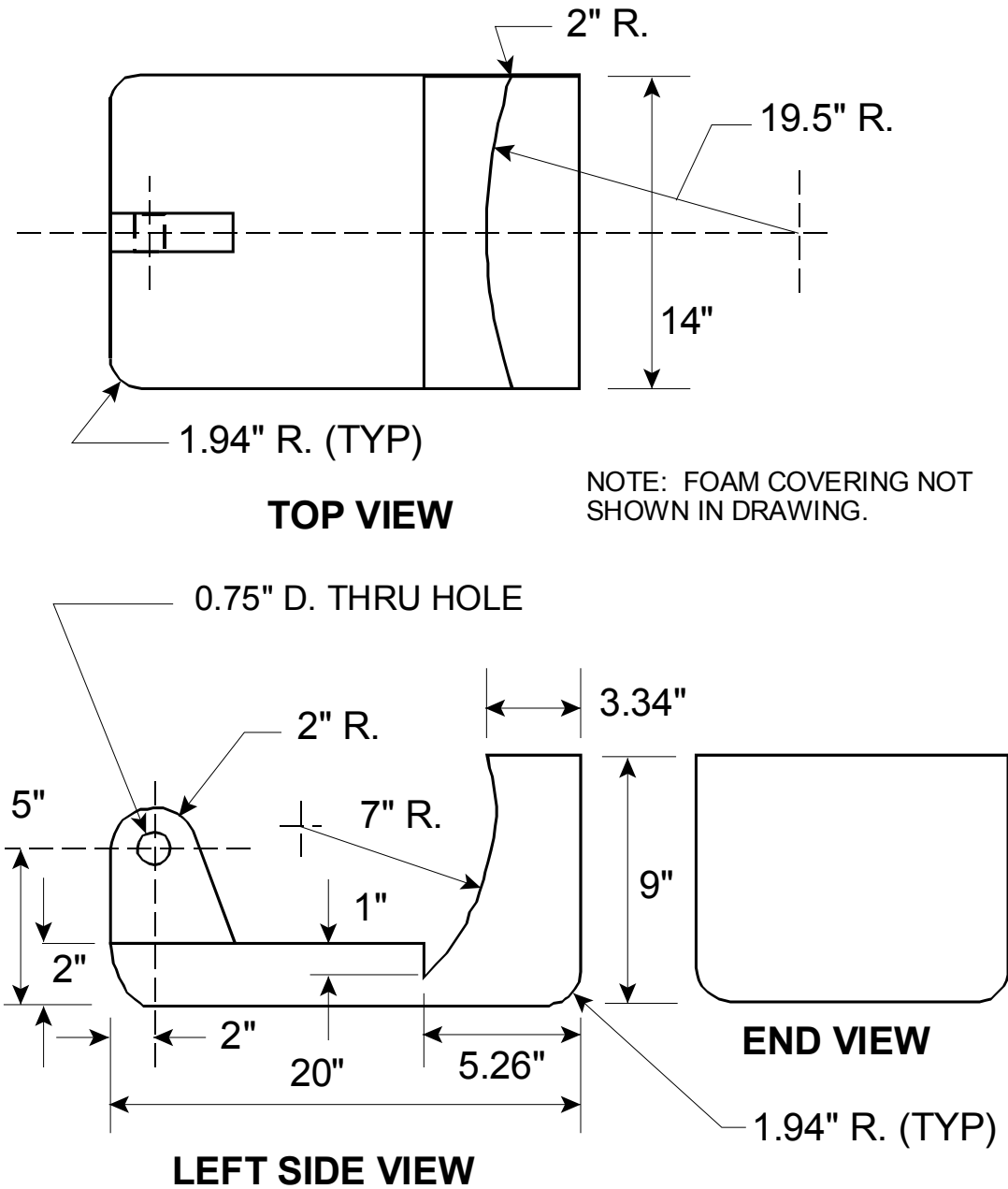


FIGURE 1

12. COMPLIANCE TEST EXECUTION....Continued

**NOTE:** At the manufacturer's option, the Type B pelvic body block may be substituted for the Type A pelvic body block to apply the specified force to the center set(s) of anchorages for any group of 3 or more sets of anchorages that are simultaneously loaded.

**TYPE B LAP BELT BODY BLOCK**

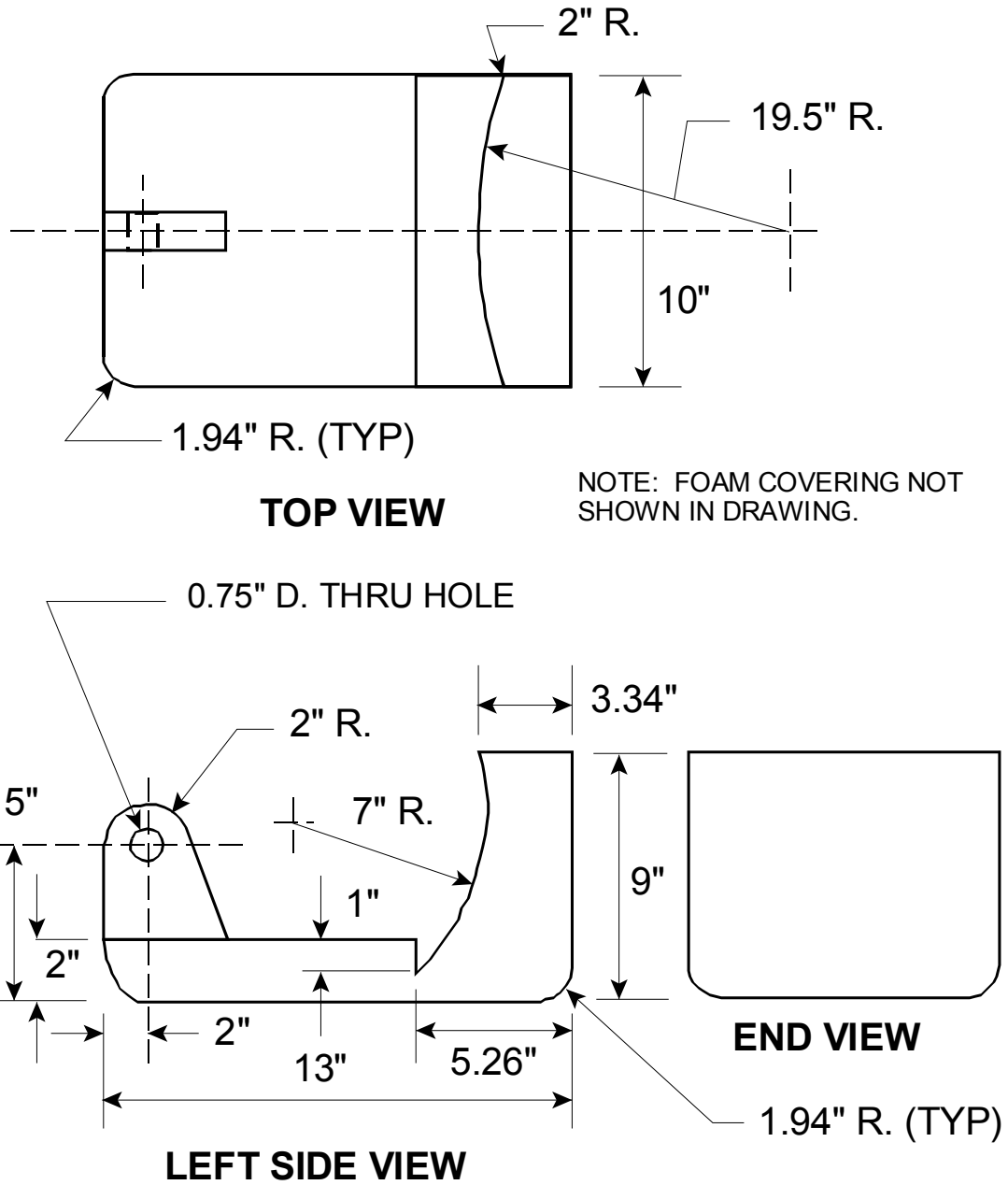


FIGURE 2

## 12. COMPLIANCE TEST EXECUTION....Continued

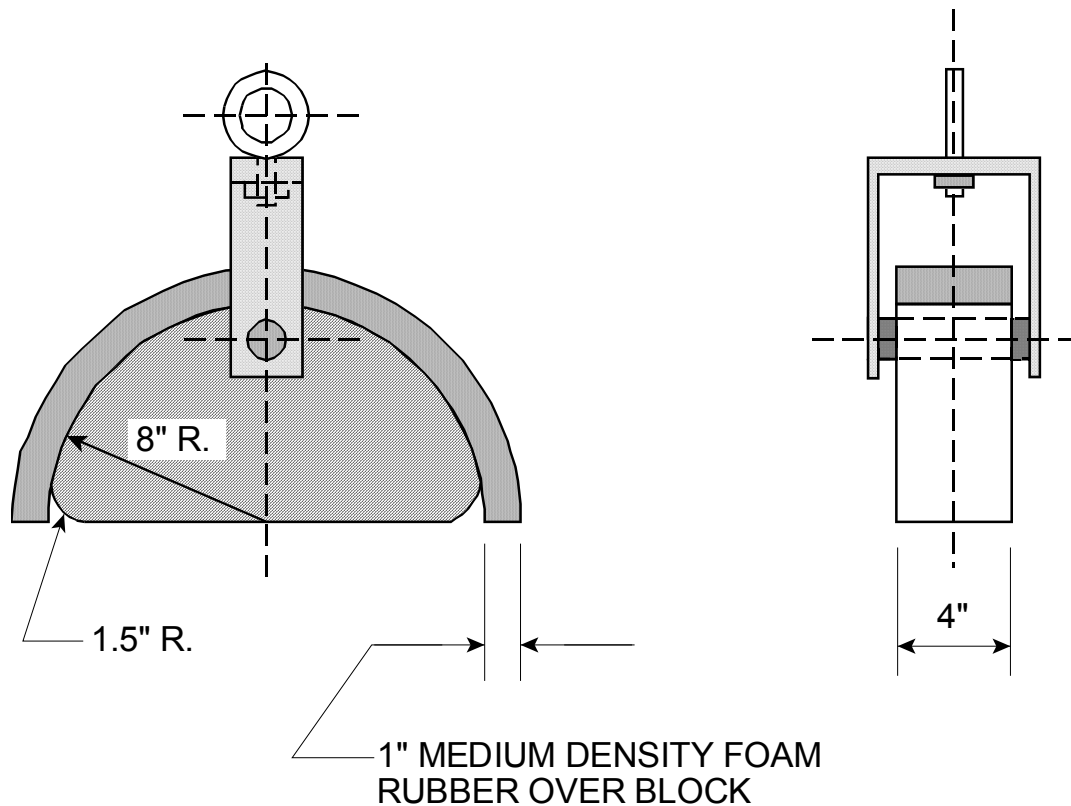
**SHOULDER BELT BODY BLOCK**

FIGURE 3

- F. A SAE two-dimensional manikin or equivalent device to determine the shoulder belt reference point — SHRP (see SAE J826).
- G. A camera to provide pertinent still photographs, which as a minimum, should include the photographs listed in this procedure.

**SEQUENCE FOR SEAT BELT ASSEMBLY ANCHORAGE TESTS**

The test vehicles shall be subjected to the tests in the order shown below:

- A. Dimensional measurements
- B. Static load testing of seat belt assembly anchorages

NOTE: All seat belt anchorages will be tested starting at the front of the vehicle and progressing to the rear of the vehicle.

## 12. COMPLIANCE TEST EXECUTION....Continued

### DIMENSIONAL MEASUREMENTS

The number of Designated Seating Positions (DSPs) specified on the test vehicle's tire information label or placard shall be recorded on Data Sheet 1, and the number of seat belt systems in the vehicle compared with this figure (DSPs stipulated for the maximum loading capacity). The type of seat belt system installed at each DSP shall also be recorded on Data Sheet 1; there should be a Type 2 seat belt anchorage system installed for each forward facing outboard DSP and Type 1 anchorages installed for center DSPs.

Measurements shall be made of the lateral spacing of the anchorages for individual seat belt assemblies and recorded on Data Sheet 2. The anchorages for an individual seat belt assembly must be at least 6.5" apart.

Next, the angle from the SRP to the belt attachment hardware shall be measured using the sketch shown in Figure 4 as a guide for the inboard and outboard anchorages at each DSP. Seat back angle and SRP data for each test vehicle will be obtained by the COTR from each manufacturer. Record the information on data Sheet 3.

For each outboard DSP, the shoulder belt anchorages should be located with respect to the shoulder reference point. With the front seat(s) placed in the full rearward and downward position and the seat back(s) in the most upright position the angle from the horizontal of a line projected from the SHRP to the shoulder belt anchorages shall be measured and recorded on Data Sheet 3.

For the lap portion of each seat belt assembly, visually inspect the belt to determine if the belt remains on the pelvis of a 5th percentile female dummy and a 95th percentile male dummy when the seat is adjusted to its rearward and forward most positions. Note the results on Data Sheet 3.

### STATIC LOAD TESTING OF SEAT BELT ASSEMBLY ANCHORAGES

#### A. Preparation of Test Vehicle

- (1) MODIFICATIONS MADE TO THE VEHICLE IN ORDER TO PERFORM THE TEST SHALL BE KEPT TO A MINIMUM. The test laboratory shall notify and obtain approval from the COTR for any required structural cutting or structural removal required on test vehicles prior to the conduct of such actions by the test laboratory.
- (2) If it appears that the seat belt buckle or webbing may incur loading that may cause it to fail, replace the seat belt webbing and or buckles in the area of the body blocks with wire rope.
  - (A) Position the seat as required by the standard



## 12. COMPLIANCE TEST EXECUTION....Continued

- (B) Position the seat belts around the body blocks
  - (C) Mark the seat belts at the length necessary to position the body blocks
  - (D) Replace the safety belt webbing in the areas that will come into contact with the body block. Remove the buckles that will incur side loading from the body blocks. Retain all hardware, which attaches the safety belt webbing to the anchorages. Attach wire rope securely to the remaining webbing and buckle hardware. The COTR will make the final decision on what will be removed and replaced with wire rope.
- (3) Raise the test vehicle until all 4 wheels are approximately 1" off the test surface and at its curb weight attitude. Secure the test vehicle to prevent lateral and longitudinal movement during belt anchorage load application. Test vehicles must not be restrained by the front or rear bumper systems. Position the test vehicle so that load application angles will be correct (See item A.(5)).
  - (4) Move the front seat(s) to their rearmost position.
  - (5) Attach the load cells to the body block load application cables, and connect the load application device to the load cells. The load application devices shall be positioned such that the angle of pull is  $10^{\circ} \pm 4^{\circ}$  above the horizontal. The plane of load application in the plan view shall be adjusted parallel to the test vehicle centerline,  $\pm 3^{\circ}$ .
  - (6) Perform pretest calibration checks on instrumentation prior to testing, and document for inclusion in the final report. Provide tolerance range indicators on the tracings, chart, or data paper, and provide tolerance range indicators on instruments so that if the test is video taped it shall be apparent that the test was conducted within the test procedure requirements. Identify each recording with date, time, vehicle, test technicians, NHTSA number, chart speed, if applicable, FMVSS number, X and Y axes names, units of measure and instrument settings. Record the serial numbers of equipment used for each specific load application location.

### B. Test Performance

- (1) The torso portion of each seat belt assembly and the pelvic portion of a type two seat belt assembly shall be loaded to 3,000 pounds. The pelvic portion of type one seat belt assemblies shall be loaded to 5,000 pounds. The load tolerance for each shall be -10 to -50 pounds. For rearward facing seats that do not have common

## 12. COMPLIANCE TEST EXECUTION....Continued

anchorages with forward facing seats, the loads will be applied in the rearward direction. For the case where the anchorages are common the COTR will decide which direction the anchorages shall be loaded. All seats on the transverse plane will be loaded simultaneous (i.e., a seat with three DSP's shall have **all three belt systems loaded simultaneously**). The test results shall be recorded on Data Sheet 4.

- (2) Seat Belt Assemblies That Attach to the Seats — Simultaneously apply the appropriate load from item B.(1) plus the seat load required by paragraph 4.2(a) or (b) of FMVSS 207 (See OVSC TP-207)
- (3) All seats shall have the seat belt assembly anchorages load tested. Remove the front seat(s), if necessary to allow access to the rear seat area. Apply loads to the rear seat belt anchorages in the manner of the front belt load applications with the same load tolerance. If there are more than two rows of seats, each row shall be tested in turn by going from the front of the vehicle to the back.
- (4) In a case where there are adjustable seat belt shoulder anchorage points, use the center position for the compliance test. If there is no center position, the COTR will make the final decision as to which position will be tested.
- (5) For each belt load application, all forces shall be adjusted to 10% of target load. While at this load level, photographs and measurements of the load application angles shall be taken. The load application angles shall be recorded on Data Sheet 5. The load shall then be increased to 100% of the target load. After holding the load for a minimum of 10 seconds (load application time from 10% of load can not exceed 30 seconds), the test loads shall be released, anchorages inspected, and all post test photographs taken.
- (6) Descriptions of test vehicle damage resulting from the anchorage loadings shall be recorded on the "Report of Vehicle Condition at the Completion of Testing" form and included in the final report. Permanent deformation, including rupture or breakage, of any anchorage or surrounding area may not constitute a failure. Any anomalies shall be reported immediately to the COTR prior to the next step in testing the vehicle.
- (7) If the seat belt webbing at a particular DSP breaks during the test, the anchorage test for that DSP is terminated at that point and so noted on the data sheet. This would also apply to failed webbing hardware such as buckles and latch plates. Testing of unbroken belts at the other DSPs shall continue to completion.

## 12. COMPLIANCE TEST EXECUTION....Continued

- (8) If the seat belt webbing breaks or a loading cylinder runs out of stroke, the contractor will reload these anchorages and continue to test after completing the anchorage test on the unbroken belts and anchorages.

## 13. POST TEST REQUIREMENTS

Contractor shall re-verify all instrumentation and check data sheets.

## 14. REPORTS

### 14.1. Monthly Status Reports

The contractor shall submit a monthly Test Status Report and a Vehicle or Equipment Status Report to the COTR. The Vehicle or Equipment Status Report shall be submitted until all vehicles or items of equipment are disposed of. See Figures 12 and 13 for samples of the required Monthly Status Reports.

### 14.2. Apparent Test Failure

Any indication of a test failure shall be communicated by telephone to the COTR within 24 hours with written notification mailed within 48 hours (Saturday and Sunday hours excluded). A Notice of Test Failure (see Figure 14) with a copy of the particular compliance test data sheet(s) and preliminary data plot(s) shall be included.

In the event of a test failure, a posttest calibration check of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration shall be at the COTR's discretion and shall be performed without additional costs to the OVSC.

### 14.3. Final Test Reports

#### 14.3.1 Copies

In the case of a test failure, **seven** copies of the Final Test Report shall be submitted to the COTR for acceptance within three weeks of test completion. The Final Test Report format to be used by all contractors can be found in this section.

Where there has been no indication of a test failure, **three** copies of each Final Test Report shall be submitted to the COTR for acceptance within three weeks of test completion. Payment of contractor's invoices for completed compliance tests may be withheld until Final Test Report acceptance by the COTR. Contractors are requested to NOT submit invoices before the COTR is provided with copies of the Final Test Report.

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



## 14. REPORTS....Continued

Contractors are required to PROOF READ all Final Test Reports before submittal to the COTR. 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.

### 14.3.2 Requirements

The Final Test Report, associated documentation (including photographs) is relied upon as the chronicle of the compliance test. The Final Test Report will be released to the public domain after review and acceptance by the COTR. For these reasons, each final report must be a complete document capable of standing by itself and containing all data sheets.

The contractor should use detailed descriptions of all compliance test events. Any events that are not directly associated with the standard 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.

### 14.3.3 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:

Final Report Number such as 210-ABC-9X-001, where —

210 is the FMVSS tested  
 ABC are the initials for the laboratory  
 9X is the Fiscal Year of the test program  
 001 is the Group Number (001 for the 1st test, 002 for the 2nd test, etc.)

Final Report Title And Subtitle such as

SAFETY COMPLIANCE TESTING FOR FMVSS 210  
 Seat Belt Assembly Anchorages  
 \* \* \* \* \*

Name of Vehicle Manufacturer  
 Model Year, Make/Model, Body Style  
 NHTSA Number Test Vehicle

Contractor's Name and Address such as

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

**14. REPORTS....Continued**

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

Date of Final Report Completion such as "March 15, 199X"

The words "FINAL REPORT"

The sponsoring agency's name and address as follows —

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Safety Assurance  
Office of Vehicle Safety Compliance  
400 Seventh Street, SW  
Room 6115 (NSA-30)  
Washington, DC 20590

**14. REPORTS....Continued**

**B. FIRST PAGE AFTER FRONT COVER**

A disclaimer statement and an acceptance signature block for the COTR 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: \_\_\_\_\_

Approval Date: \_\_\_\_\_

**FINAL REPORT ACCEPTANCE BY OVSC:**

Accepted By: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

**14. 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**

210-ABC-9X-001

**Block 2 — GOVERNMENT ACCESSION NUMBER**

Leave blank

**Block 3 — RECIPIENT'S CATALOG NUMBER**

Leave blank

**Block 4 — TITLE AND SUBTITLE**

Final Report of FMVSS 210 Compliance Testing of 199X Ace Super 2-door Coupe, NHTSA No. CX0401

**Block 5 — REPORT DATE**

March 15, 199X

**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-XXX-001

**Block 9 — PERFORMING ORGANIZATION NAME AND ADDRESS**

ABC Laboratories  
405 Main Street  
Detroit, MI 48070

**14. REPORTS....Continued****Block 10 — WORK UNIT NUMBER**

Leave blank

**Block 11 — CONTRACT OR GRANT NUMBER**

DTNH22-9X-D-12345

**Block 12 — SPONSORING AGENCY NAME AND ADDRESS**

US Department of Transportation  
National Highway Traffic Safety Administration  
Safety Assurance  
Office of Vehicle Safety Compliance (NSA-30)  
400 Seventh Street, SW, Room 6115  
Washington, DC 20590

**Block 13 — TYPE OF REPORT AND PERIOD COVERED**

Final Test Report  
Feb. 15 to Mar. 15, 199X

**Block 14 — SPONSORING AGENCY CODE**

NEF-30

**Block 15 — SUPPLEMENTARY NOTES**

Leave blank

**Block 16 — ABSTRACT**

Compliance tests were conducted on the subject 199X Ace Super 2-door coupe in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-210-0X for the determination of FMVSS 210 compliance. Test failures 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 COTR.

**14. REPORTS....Continued****Block 17 — KEY WORDS**

Compliance Testing  
Safety Engineering  
FMVSS 210

**Block 18 — DISTRIBUTION STATEMENT**

Copies of this report are available from —

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**Block 19 — SECURITY CLASSIFICATION OF REPORT**

Unclassified

**Block 20 — SECURITY CLASSIFICATION OF PAGE**

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**Block 21 — NUMBER OF PAGES**

Add appropriate number

**Block 22 — PRICE**

Leave blank

## 14. REPORTS....Continued

### 14.3.4 Table of Contents

Final test report Table of Contents shall include the following:

Section 1 -- Purpose of Compliance Test

Section 2 -- Compliance Test Data Summary

Section 3 -- Compliance Test Data

Section 4 -- Noncompliance Data (if applicable)

Section 5 -- Photographs