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U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LABORATORY TEST PROCEDURE

FOR

FMVSS 202aD

Head Restraints – Dynamic Testing

ENFORCEMENT
Office of Vehicle Safety Compliance
Mail Code: NVS-220
1200 New Jersey Ave. SE
Washington, DC 20590

REVISION CONTROL LOG
FOR OVSC LABORATORY
TEST PROCEDURES

Head Restraints

TEST PROCEDURE		FMVSS 202aD		DESCRIPTION
REV. No.	DATE	AMENDMENT	EFFECTIVE DATE	
00	1/04/11	Final Rule	07/03/2007	Original release signed by O.D.
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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 Technical Representative (COTR) 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 COTR 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 the in-house test procedures shall be obtained from the COTR 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 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 of the various FMVSS minimum performance requirements. 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 COTR 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

FMVSS 202a, Head Restraints, specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear end and other collisions. The standard applies to each front and rear outboard Designated Seating Position (DSP) with a head restraint, and allows head restraints to be tested either dynamically or statically. Exceptions are made for school buses; refer to the Code of Federal Regulations for the specific exceptions. This test procedure covers the dynamic requirements. The test requirement is that the head restraint must restrict head-to-torso rotation to a maximum of 12 degrees and head injury criteria to a maximum HIC_{15} value of 500.

The dynamic option relieves most of the static dimensional requirements in the standard, except that the head restraints must still meet the width requirement in S4.2.2. Section S4.2.2 states:

When measured in accordance with S5.2.2 of this section, 65 $\pm$ 3 mm below the top of the head restraint, the lateral width of a head restraint must be not less than 170 mm, except the lateral width of the head restraint for front outboard designated seating positions in a vehicle with a front center designated seating position, must be not less than 254 mm.

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.

All final compliance test reports are required to include metric measurements for standards using metrication.

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 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 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 or test dummy calibration unless specifically authorized by the COTR.

4. GOOD HOUSEKEEPING

Contractors shall maintain the entire vehicle compliance testing area, 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 COTR 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 that 1 week intervals unless otherwise specified by the COTR.

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 COTR in order to allow monitoring by the COTR 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 COTR. 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 COTR on location within 30 minutes after the test. Final test data, including digital printouts and computer generated plots, shall be available to the COTR 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 COTR.

All backup data sheets, strip charts, recordings, plots, technicians' notes, etc., shall be either sent to the COTR 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.

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 COTR within 48 hours or the test completion.

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 the 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 COTR 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 COTR. The report and other required deliverables for the retest vehicle are required to be submitted to the COTR within 3 weeks after completion of the retest.

G. DEFAULT

The Contractor is subject to the default and subsequent re-procurement costs for non-delivery of valid or conforming tests (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 consist of test vehicles and test 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.

7. Spare tire, jack, lug wrench and tool kit (if applicable) is 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 COTR.

A Vehicle Condition form will be supplied to the Contractor by the COTR 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 COTR 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 COTR.

B. NOTIFICATION OF COTR

The COTR must be notified within 24 hours after a vehicle (and/or equipment item) 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 COTR immediately.

C. TEST DUMMIES

50^{th} Percentile male Hybrid III test dummies specified in 49 CFR Part 572, Subpart E, will be furnished to the contract laboratory by the OVSC.

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 exceeding12 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.

Accelerometers shall be calibrated every twelve months or after a test failure or after any indication from calibration checks that there may be a problem with the accelerometer whichever occurs sooner.

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 COTR. The calibration system shall need the acceptance of the COTR 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. Anthropomorphic test devices shall be calibrated before and the calibration checked after each crash and low risk deployment test. The calibrations and calibration check shall be submitted with the final report.

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

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 COTR's discretion and shall be performed without additional cost.

9. DEFINITIONS

9.1 BACKSET (571.202a.S3)

The minimum horizontal distance between the rear of a representation of the head of a seated 50th percentile male occupant and the head restraint, as measured by the head restraint measurement device.

9.2 DESIGNATED SEATING POSITION (DSP)(571.3)

Designated seating position means a seat location that has a seating surface width, as described in §571.10(c) of this part, of at least 330 mm (13 inches). The number of designated seating positions at a seat location is determined according to the procedure set forth in § 571.10(b) of this part. However, for trucks and multipurpose passenger vehicles with a gross vehicle weight rating greater than 10,000 lbs, police vehicles as defined in S7 of FMVSS No. 208, firefighting vehicles, ambulances, and motor homes, a seating location that is labeled in accordance with S4.4 of FMVSS No. 207 will not be considered a designated seating position. For the sole purpose of determining the classification of any vehicle sold or introduced into interstate commerce for purposes that include carrying students to and from school or related events, any location in such a vehicle intended for securement of an occupied wheelchair during vehicle operation is regarded as four designated seating positions.

9.3 HEAD RESTRAINT (571.202a.S3)

A device that limits rearward angular displacement of a seated occupant's head relative to the occupant’s torso.

9.4 HEAD RESTRAINT MEASUREMENT DEVICE (HRMD) (571.202a.S3)

Means the Society of Automotive Engineers (SAE) (July 1995) J826 three-dimensional manikin with a head form attached, representing the head position of a seated 50th percentile male, with sliding scale at the back of the head for the purpose of measuring backset. The head form is designed by and available from the ICBC, 151 West Esplanade, North Vancouver, BC V7M 3H9, Canada (*www.icbc.com*).

9.5 HEIGHT (571.202a.S3)

When used in reference to a head restraint, the distance from the H-point to a point measured parallel to the torso reference line defined by the three dimensional SAE J826 (July 1995) manikin, to a plane normal to the torso reference line.

9.6 H-POINT (571.3)

Means the pivot center of the torso and thigh on the three-dimensional device used in defining and measuring vehicle seating accommodation, as defined in Society of Automotive Engineers (SAE) Recommended Practice J1100, revised February 2001"Motor Vehicle Dimensions" (incorporated by reference, see § 571.5).

9.7 INTENDED FOR OCCUPANT USE (571.202a.S3)
When used in reference to the adjustment of a seat, positions other than that intended solely for the purpose of allowing ease of ingress and egress of occupants and access to cargo storage areas of a vehicle.

9.8 REAR HEAD RESTRAINT (571.202a.S3)
A rear seat back or any independently adjustable seat component attached to or adjacent to a seat back that has a height equal to or greater than 700 mm in any position of adjustment.

Procedure for determining presence of head restraints in rear outboard seats. Measure the height of the top of a rear seat back or the top of any independently adjustable seat component attached to or adjacent to the rear seat back in its highest position of adjustment using the scale incorporated into the SAE J826 (July 1995) manikin or an equivalent scale, which is positioned laterally within 15 mm of the centerline of the rear seat back or any independently adjustable seat component attached to or adjacent to the rear seat back.

9.9 REAR OUTBOARD DESIGNATED SEATING POSITION (571.202a.S3)
Any outboard designated seating position located rearward of the front designated seating position.

9.10 TOP OF THE HEAD RESTRAINT (571.202a.S3)
The point on the head restraint with the greatest height.

10. TEST EQUIPMENT & FACILITY REQUIREMENTS

DIMENSIONAL MEASUREMENT TOOLS

A. Three-dimensional H-point manikin, SAE J826, July 1995.

B. 25 mm ± 0.25 mm diameter sphere

C. Steel Tape

D. Carpenter’s Square

E. Calipers with accuracy of ± 0.75 mm and sufficient range for measuring the width of the head restraint.

VEHICLE PREPARATION BUILDING

The Contractor shall have a temperature controlled building large enough to house and prepare the test vehicle for sled testing, and allow for government, vehicle manufacturer, and laboratory personnel to move around the test vehicle. The building climate control must be capable of maintaining the ambient air temperature between 20.5°C and 22.2°C.

SLED SYSTEM

The sled system shall be capable of sustaining the crash pulse indicated in Figure 1 and Table 1 for any test vehicle weighing up to 2563 Kg.

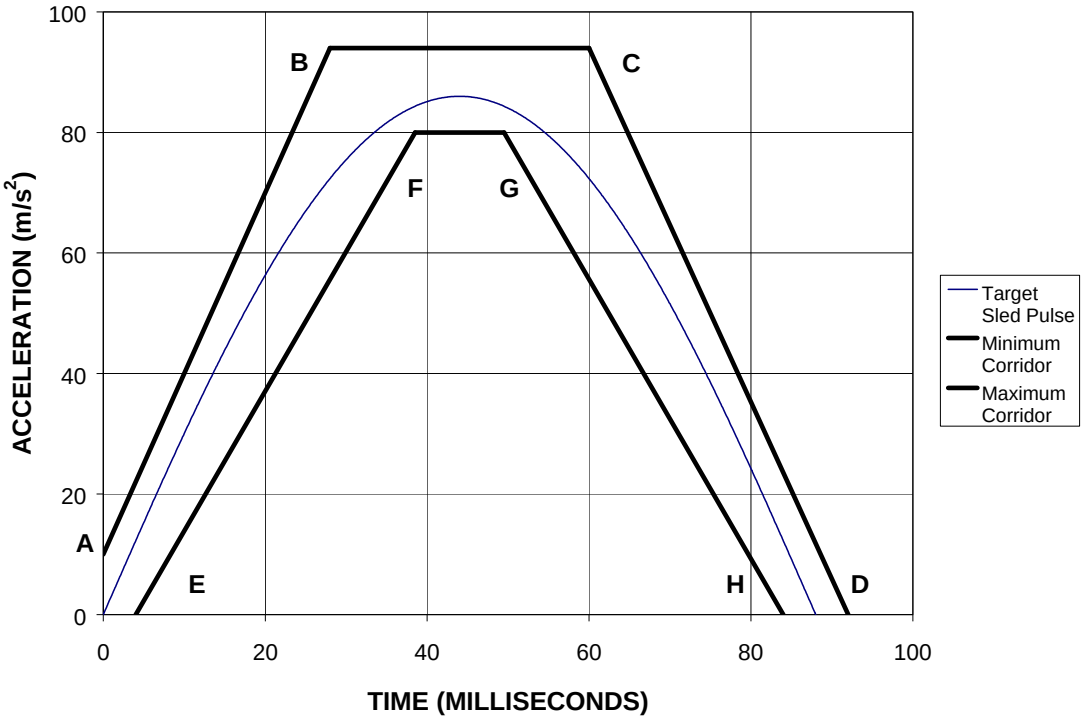


Figure 1

Table 1 – Sled pulse corridor reference point locations.

Reference Point	Time (ms)	Acceleration (m/s^2)
A	0	10
B	28	94
C	60	94
D	92	0
E	4	0
F	38.5	80
G	49.5	80
H	84	0

TEST DATA ACQUISITION AND REDUCTION

A precision time system compatible with the test equipment shall be used to provide a time reference for all recorded data (see Figure 2). A system that identifies the precise instant of sled test actuation will be incorporated with the time reference signal. Data shall be collected for at least 300 ms after time zero, pre-filtered (Class 1000) and digitized at a minimum rate of 10,000 samples per second.

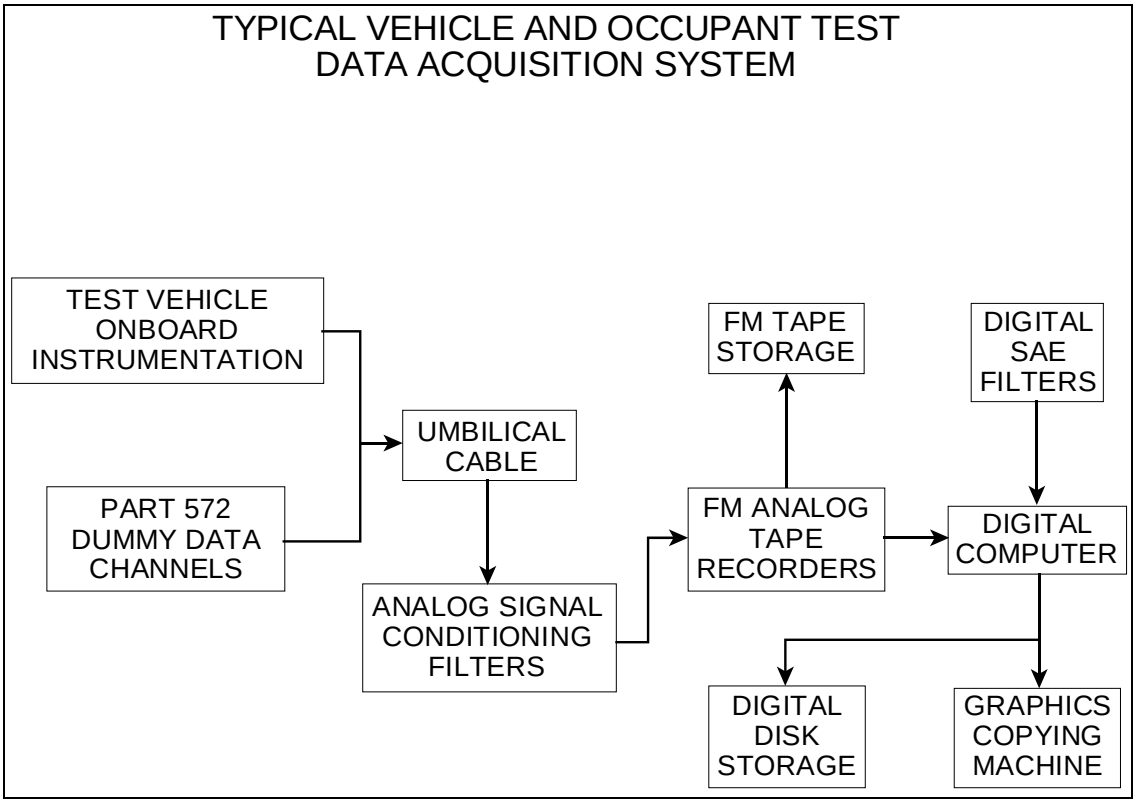


Figure 2

DUMMY INSTRUMENTATION

The Contractor shall:

A. Provide and install the instrumentation in Table 2 below in the GFP dummies. The instrumentation shall meet the specifications and be in the locations as required by the drawing packages referenced in Title 49, Code of Federal Regulations Part 572. The Contractor may propose to the COTR/Standard's Engineer a different sensor to measure the head to torso acceleration; however, a different sensor shall not be used unless approved by the COTR/Standard's Engineer.

TABLE 2

Dummy	Head	Chest
50th male 49 CFR part 572 Subpart E	3 uniaxial accelerometers DTS-ARS (Model ARS-1500) Triax Package with DTS mounting block (Figure 3) Or 1 Denton ATD Rate Gyro, Model IES 3103 (Figure 4)	3 uniaxial accelerometers DTS-ARS (Model ARS-1500)Triax Package with DTS mounting block (Figure 3) Or 1 Denton ATD Rate Gyro, Model IES 3103 (Figure 4)

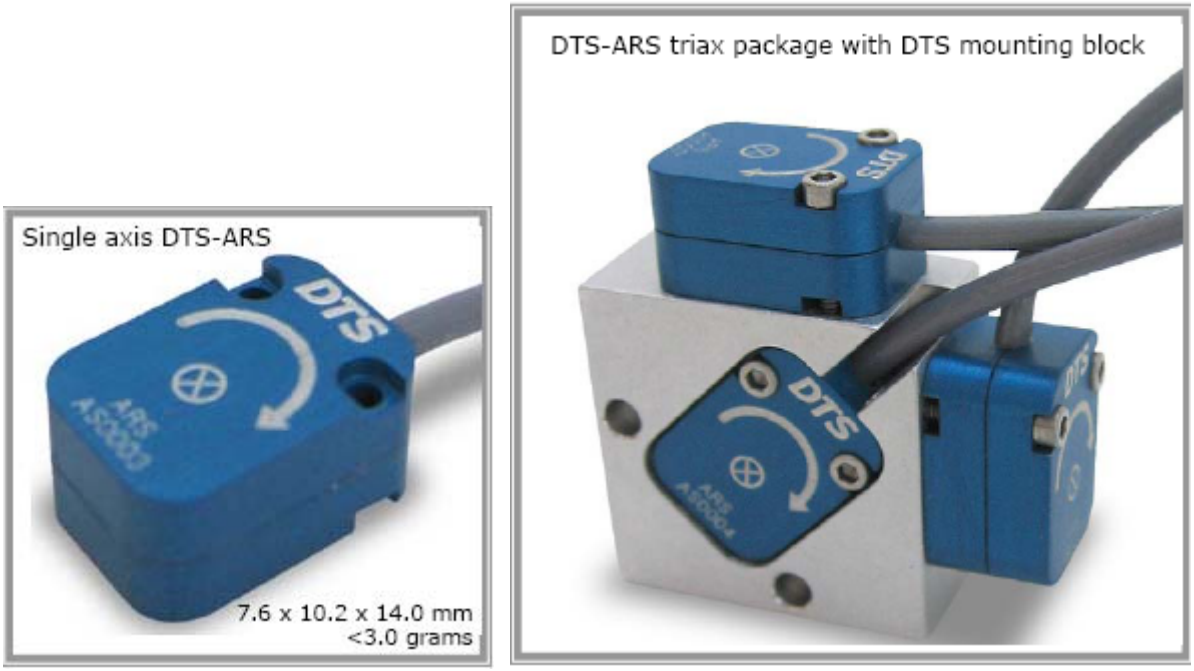


Figure 3 – DTS Sensor and Triax Package with DTS Mounting Block

Figure 4 – Denton ATD Rate Gyro, Model IES 3103

Note: Sensors for Chest Deflection, Femur, and Nij are not required for this compliance test.

B. Install temperature sensors to measure and ensure stabilized temperature of the dummy. (See section 12,2)

C. Install three uniaxial accelerometers in the center of gravity in the dummy head to measure HIC.

OTHER INSTRUMENTATION

The Contractor shall, for all crash tests, provide and install two x-direction accelerometers, one on the sled, and one on the vehicle frame/body. Mount the sled accelerometer on a rigid portion of the sled. Mount the vehicle accelerometer on the sill in line with the mid track position of the front row seats. In addition, remove all sprung

masses (e.g. rear axle, suspension, engine, transmission, exhaust, etc). The sled accelerometer used to determine when the sled acceleration reaches 0.5g shall be filtered at channel class 60.

11. PHOTOGRAPHIC DOCUMENTATION

Digital Photographs

The contractor shall take digital photographs of the test execution procedures. Photographs shall be taken in color and contain clear images. A tag, label or placard identifying the test item, NHTSA number (if applicable) and date shall appear in each photograph and must be legible. 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 or light from any illuminated or reflective surface shall be minimized while taking photographs.

The test reports shall include enough photographs to describe the testing in detail and shall be organized in a logical succession of consecutive pictures. The digital photographs shall be included in the test report as 203 mm x 254 mm or 215.9 mm x 279 mm (8 x 10 or 8½ x 11 inch) pictures (or for equipment testing -- 125 mm x 175 mm (5 x 7 inch) pictures). All photographs are required to be included in the test report in the event of a test failure. Any failure must be photographed at various angles to assure complete coverage. Upon request, the photographs shall be sent to the COTR 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 view of vehicle

B. Right side view of vehicle

C. 3/4 frontal view from left side of vehicle

D. 3/4 rear view from right side of vehicle

E. Vehicle's certification label

F. Vehicle's tire information label

G. 3/4 frontal view of each head restraint system

E. J826 manikin positioned, as required by the standard, in each DSP

F. Measurement of head restraint width

G. Removal of front head restraint with a tool (if applicable)

H. Reinstallation of the front head restraint (if applicable)

I. Action necessary for rear head restraint adjustment (if applicable)

J. Action necessary for rear head restraint removal (if applicable)

K. Reinstallation of the rear head restraint (if applicable)

L. For head restraints with a manual non-use position: (if applicable)

   a. Side view of head restraint in a position of occupant use showing the reference line and the initial inclination of the line

   b. Side view of head restraint in a non-use position showing the reference line and the inclination of the line

M. For head restraints with an automatic non-use position: (if applicable)

   a. Side view of head restraint in a non-use position

   b. Side view of head restraint in a position of occupant use with the 5th percentile female Hybrid III Subpart O dummy positioned in the seat

HIGH-SPEED DIGITAL VIDEO CAMERAS

Each sled test shall be documented in color using High-speed digital video cameras that operate at 1000 frames per second. The high-speed video shall include at least 500 ms from time zero.

The minimum resolution for these cameras shall be 1536 CMOS sensors per every two rows of pixels, with 80% of the horizontal distance of the two rows covered by effective light sensors. There shall be a minimum of 1024 rows of sensors. Some camera views may not need to meet these specifications. Cameras that do not meet these specifications may be used if approved by the COTR.

When using high speed film, a timing mark must be registered on the film edge a minimum of every 10 milliseconds (ms) and a time zero (0.5g on the sled) impact mark must be registered on the film to permit dummy kinematics analysis on a film analyzer. The Contractor shall report all camera locations along with camera speeds and lens focal lengths on the appropriate final report data sheets. Camera locations will be referenced to the front of the sled, sled centerline, and the top surface of the sled with the X, Y, and Z coordinates of the film surface recorded for each camera.

Glare or lights showing on any glass area must be minimized so that views of the dummies during the test are visible for film analysis.

VEHICLE AND DUMMY PHOTOGRAPHIC COVERAGE

The real-time camera (24 fps) shall be used to document the pretest and post test condition of the test vehicle and the test dummies' pretest and post test positions (including marks showing the fore and aft seat position and head restraint position) and placement of the lap and shoulder belts on these dummies. Real-time camera is not required during the actual sled test. The camera configuration shall be modified from that shown in Figure 5 if testing a rear head restraint (e.g. remove front seats and reposition cameras 1 – 4 to record dummies in rear seat positions).

CAMERAS REQUIRED – See Figure 5

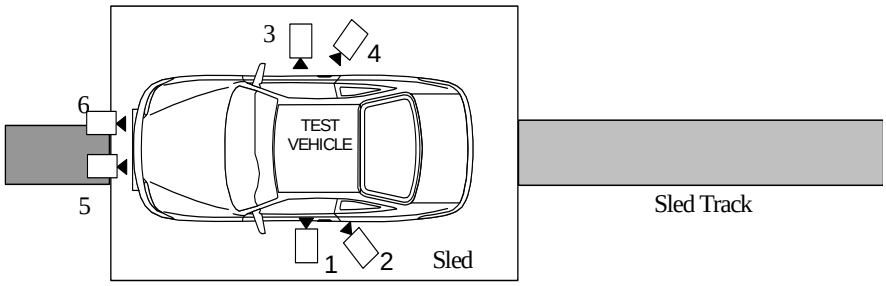


Figure 5

CAMERA 1 High-speed left side view camera positioned adjacent to the vehicle's left front door to document the driver dummy's movement during the test. The centerline of the camera shall be perpendicular to the longitudinal centerline of the vehicle. It shall be attached to the sled or sled interface frame.

CAMERA 2 High-speed left side view camera positioned to view over the driver's left shoulder during the test. It shall focus on the head, neck and torso region. It shall be attached to the sled interface frame. At the COTR's option the camera shall be positioned adjacent to the vehicle's A-post to document the driver dummy's head movement in relation to the head restraint.

CAMERA 3 High-speed right side view camera positioned adjacent to the vehicle's right front door to document the passenger dummy's movement during the test. The centerline of the camera shall be perpendicular to the longitudinal centerline of the vehicle. It shall be attached to the sled or sled interface frame.

CAMERA 4 High-speed right side view camera positioned to view over the passenger's right shoulder during the test. It shall focus on the head, neck and torso region. It shall be attached to the sled interface frame. At the COTR's option the camera shall be positioned adjacent to the vehicle's A-post to document the passenger dummy's head movement in relation to the head restraint.

CAMERA 5 High-speed front view camera, mounted on the sled or sled interface frame, to document the movement of the driver dummy during the test.

CAMERA 6 High-speed front view camera, mounted on the sled or sled interface frame, to document the movement of the passenger dummy during the test.

IMPACT EVENT MARKER

Strobe lights or taped photoflash bulbs (cloth tape on bulb exterior to form small slit for light passage) will be placed in the field-of-view of all cameras to mark the beginning (time zero) of the sled test. Light from the time zero detectors SHOULD NOT COVER MORE THAN 3 FRAMES OF HIGH-SPEED FILM. Suggested locations for impact detectors or "time zero" markers are as follows:

A. Vehicle's roof panel along longitudinal centerline above windshield header

B. Top surface of vehicle's instrument panel along longitudinal centerline

INFORMATIONAL PLACARDS

Vehicle identification placards shall be positioned so that at least 1 placard will be visible in the field-of-view for each of the cameras. The following information will be shown:

A. Vehicle's NHTSA Number

B. “FMVSS 202a Dynamic Test”

C. Date of test

D. Name of contract laboratory

E. Vehicle year, make and model

SLED VIDEO TITLE AND ENDING

The video shall include the following title frames:

A. "The following FMVSS 202a Dynamic test was conducted under contract with the National Highway Traffic Safety Administration by [***name and location of test laboratory***]"

B. “FMVSS 202a Dynamic Test”

TEST VEHICLE MODEL YEAR, MAKE AND MODEL

NHTSA No. CXXXXX

DATE OF TEST

CONTRACT NO.: DTNH22-XX-X-XXXXX

C. The ending frame shall state "THE END"

12. PRETEST REQUIREMENTS

RECEIVING-INSPECTION OF TEST VEHICLE
Complete the "Vehicle Condition" form supplied by the COTR.

Upon receipt of the test vehicle, it shall be identified with a visible sign or placard showing the following information:

A. Vehicle Make/Model

B. Vehicle Identification Number (VIN)

C. Vehicle NHTSA number (provided by COTR)

D. Compliance Test for Head Restraints (S202a).

Before taking each required test photo, place the sign or placard noted above in the field of view. The sign size and location should not obstruct the test detail being highlighted in the photograph.

The head restraint system, seat, all associated components and trim shall be inspected for function and damage. Record the results of this examination on the appropriate data sheet. If structural damage or other defects are noted that could influence the test results obtain approval from the COTR before initiating the test program.

12.1 DETAILED TEST AND QUALITY CONTROL PROCEDURES REQUIRED

Prior to conducting any compliance test, contractors shall*:*

A. Verify COTR approval of Contractor’s in-house test procedure,
B. Verify the training of technicians for performance of this test,
C. Verify the calibration status of test equipment,
D. Review applicable revision of FMVSS 202a,
E. Review vehicle Owner’s Manual (or equipment mfg. instructions),
F. Set cold tire pressures according to the vehicle manufacturer’s recommendations, and
G. Submit a detailed in-house compliance test procedure to the COTR that includes:

a. A step-by-step description of the methodology to be used.
b. A written Quality Control (QC) Procedure that shall include calibrations, the data review process, report review, and the people assigned to perform on each task.
c. A complete listing of test equipment that shall include instrument accuracy and calibration dates.

d. Detailed check-off lists to be used during the test and during the data review. These lists shall include all test procedure requirements and FMVSS requirements pertaining to the safety standard for which testing is being performed. Each separate check-off sheet shall identify the lab, test date, vehicle and test technicians. These check sheets shall be used to document that all requirements and procedures have been complied with. These sheets shall be submitted with the test report.

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 test report. Written approval of the procedures shall be obtained from the COTR before initiating the compliance test program. After testing commences, written approval shall also be obtained from the COTR prior to any changes in the procedures.

H. The sign convention shall be as shown in Figure 6 below.

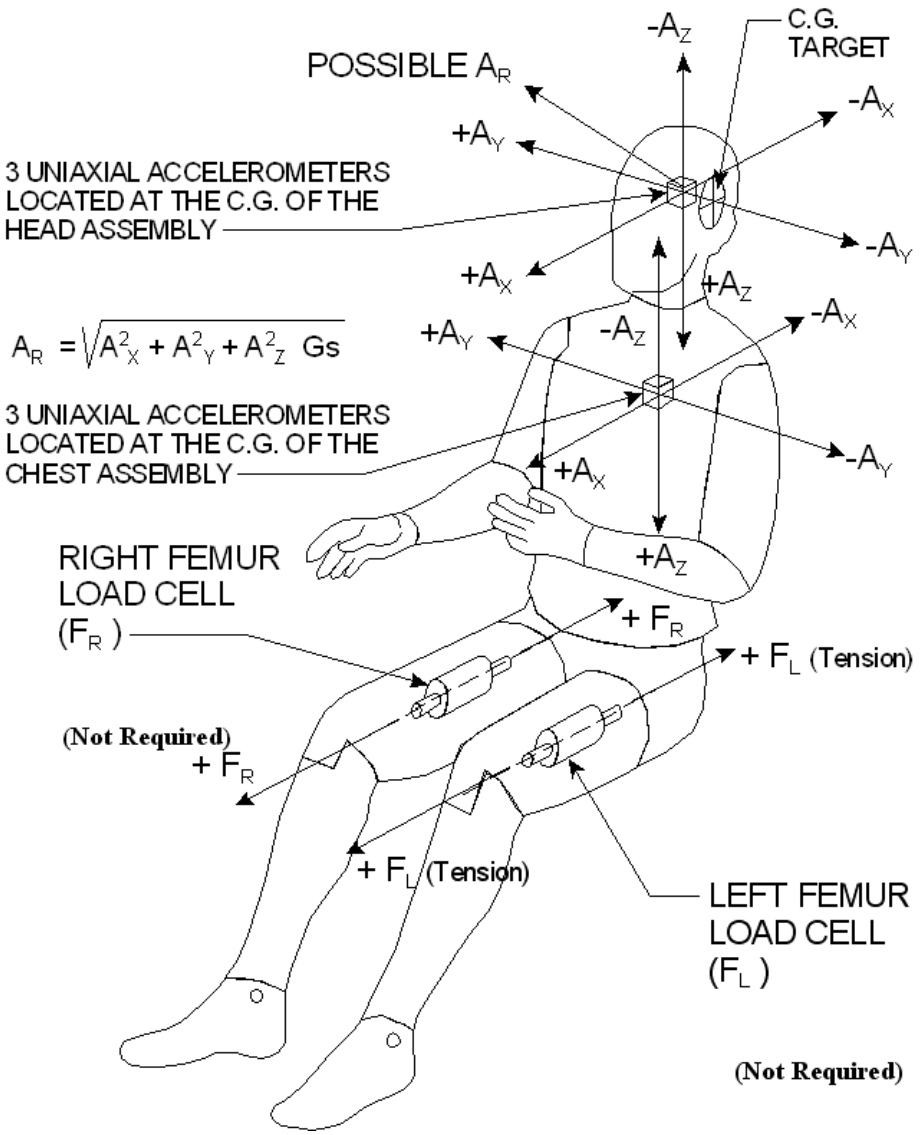


Figure 6 – Sign conventions for dummies. Part 572 Subpart E Test Dummies

12.2 TEST TEMPERATURE CONDITIONS

Prior to conducting any measurements or dynamic tests, the test vehicle must be soaked in an ambient air environment in the temperature range of 19°C to 26°C for a minimum of 4 hours.

The Contractor must verify that the dummy temperature for the sled test is in the specified temperature range (20.5^{o}C to 22.2^{o}C) by either of the following two methods. The temperature sensors for both methods shall be accurate to ±0.25^{o}C.

A. The dummy must be soaked in an ambient air environment in the specified range as shown above for 16 hours prior to the test and any time after that until just before the movement of the sled. The ambient air temperature must be monitored and continuously recorded within 36 inches of the dummies. If at any time the ambient air temperature is not in the specified range, as shown above, the dummy part temperature measurement of Method B must be used prior to the impact test to verify a stabilized dummy temperature.

B. The dummy must be soaked in an ambient air environment in the specified range (20.5^{o}C to 22.2^{o}C) for 16 hours prior to the test. The ambient temperature must be monitored and continuously recorded until just before impact. The temperature of the following dummy parts must be monitored and continuously recorded at least 30 minutes prior to the impact test.

   (1) The outside surface temperature of the forehead. (remove this sensor immediately prior to the test)
   (2) The surface temperature of the spine box. (this is in the internal portion of the dummy)
   (3) The outside surface temperature of the neck. (remove this sensor immediately prior to the test)
   (4) The outside surface temperature of one knee. (remove this sensor immediately prior to the test)

The chalk coating may be put on the face and knee around the sensor. The sensors shall be taped into place on the outer surfaces of the dummy and secured to the spine box for the internal sensor.

When the temperature of these four components has reached the applicable temperature range as listed above, and has remained in that range for 30 continuous minutes, the impact test may be performed.

It is not the intent of Method B to have the dummy outside the ambient air temperature range that corresponds to the specified dummy temperature range listed above. However, the purpose is to confirm that the dummy is still at the proper stabilized temperature even if there are short fluctuations of ambient air temperature outside the range specified for the dummy temperature. Therefore, if there is an ambient air temperature excursion outside the specified dummy temperature range, the Contractor must work quickly to bring the ambient air temperature back into that range.

The Contractor shall mark the ambient air temperature recording with the date, time and technician name at the beginning of the 16 hour soak and when the sled begins to move. The dummy part temperature recordings shall also be marked at the beginning and end with the date, time, and technician's name. Any excursions from the specified temperature must be noted on the recording along with the reason for the excursion. Temperature recordings shall be supplied to the COTR with final test reports.

The COTR may require that positioning of the dummies for sled tests be performed in the presence of the NHTSA and vehicle manufacturer's representatives. The manufacturer's representatives will also be afforded the opportunity to take measurements of the dummies' positions after the dummy positioning procedures are complete and before the Contractor records dummy measurements.

The dummies used in the sled test shall be alternated in the driver's and passenger's seat. For example, if three dummies are prepared for each test, the driver dummy from the previous test will become the spare, the passenger dummy from the previous test will be the driver, and the spare from the previous test will be the passenger.

12.3 ELECTROMAGNETIC INTERFERENCE AND STATIC CHARGE CONTROL

The laboratory shall take all necessary precautions to avoid electromagnetic and/or static charge interference with the test data. These precautions should include:

A. Grounding the head, thorax, and both femurs of the anthropomorphic test devices. This is accomplished by connecting the four components to a single wire that then exits the dummy and is attached to a grounding block on the vehicle. The grounding block is then connected to earth ground. The actual wire size and connections will depend on the system the laboratory uses, and are therefore left to their discretion.

B. Using static electricity elimination spray on the dummies and the interior of the vehicle.

12.4 USE CHECK SHEET IN APPENDIX A TO PREPARE THE TEST VEHICLE

13. COMPLIANCE TEST EXECUTION

A. Conduct the width measurement test per the most current 202 Static Test Procedure. (S 4.2.2)
B. Conduct the folding or retracting rear head restraint test per the most current 202 Static Test Procedure. (S 4.4)
C. Refer to the most current 202 Static Test Procedure for testing the requirements for the owner’s manual and removability requirements. (S4.5)
D. Determine the seat back angle (S5.5.3.4):

    1. Seat the SAE J826 three-dimensional manikin (Figure 7) using the “SAE J826 three-dimensional manikin positioning procedure” (See Appendix B).

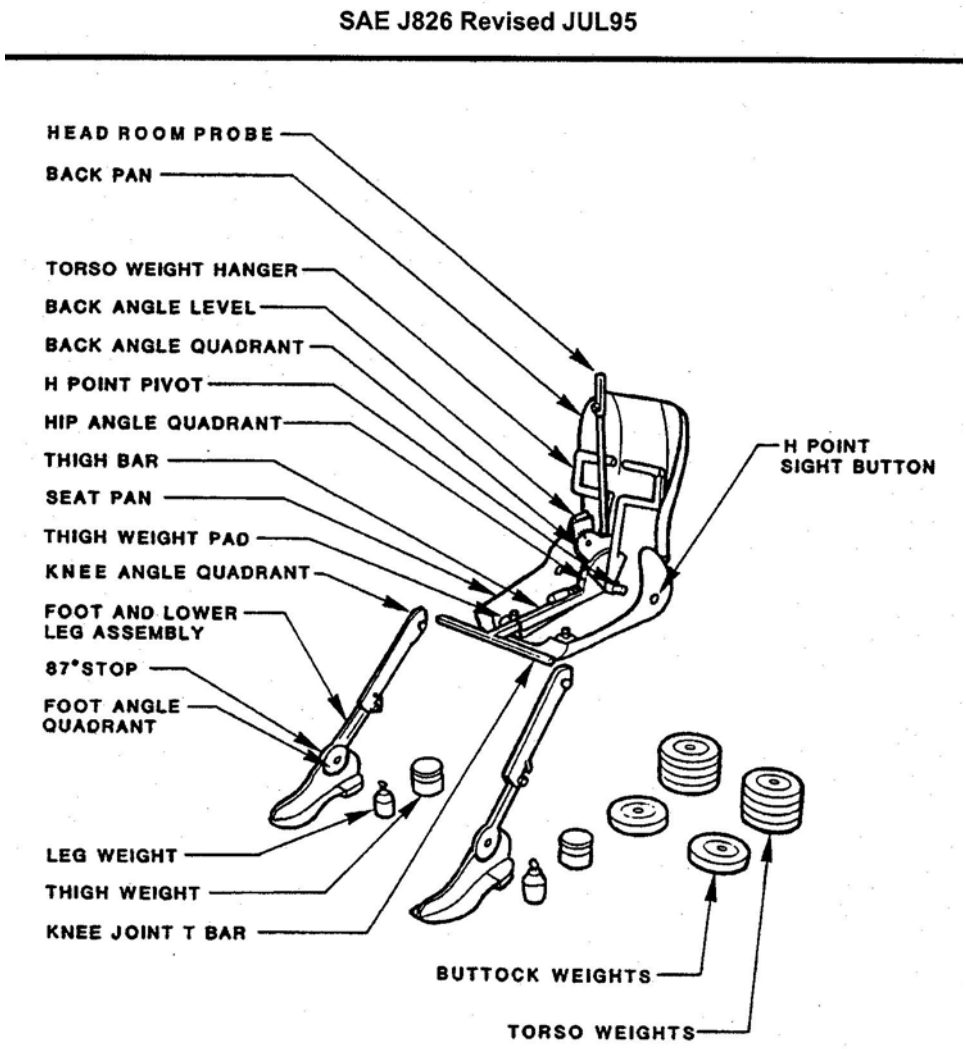


Figure 7 – SAE J826 three-dimensional manikin

2. The COTR will provide the manufacturer's H-point location. Compare the measured H-point to the manufacturer provided data. If the vertical dimension of the H-point deviates from the manufacturer data by more than 10 mm, contact the COTR.
3. Measure the seat back angle using the back angle quadrant incorporated into the manikin.
4. Adjust the seat as necessary to achieve the inclination position closest to 25° from vertical seat back angle. If there is more than one inclination position closest to 25°, set the seatback inclination reward of 25°.
5. Remove SAE J826 three-dimensional manikin from the seat completely. Repeat Steps 1 thru 4. If seat adjustment is required, remove manikin and repeat Steps 1 thru 4 again.

IMPORTANT: This process is iterative, due to the manikin settling in the cushion and movement during any seat adjustment. Only proceed to the next step if, when seating the manikin, no seat adjustment is required.

6. Record the H-point and seat back angle on Data Sheet.

E. Use Check Sheet in Appendix C to seat an instrumented dummy for each forward-facing outboard dynamically certified seating position. (S 5.3.4, 5.3.5)
F. Set the sled gun pressures and volumes such that the vehicle will meet the acceleration corridor in Figure 1. (S 5.3.8)

The target acceleration with time expressed in milliseconds is:

$a = 86 Sin \frac{(\prod t)}{88} \frac{m}{s^2}$, for $V = 17.3 \pm 0.6 \frac{km}{h}$.

The time zero for the test is defined by the point when the sled acceleration achieves 2.5 m/s^2 (0.25 G's).

G. Subject the loaded test vehicle to the sled pulse. (S 5.3.8)
H. Measure head and torso rotation and head accelerations. (S 5.3.9)
I. Calculate maximum head to torso rotation and HIC values. (S 5.3.10)

$$HIC = \left[\frac{1}{(t_2 - t_1)} \int_{t_1}^{t_2} a_r \, dt \right]^{2.5} (t_2 - t_1) \qquad \text{for} \quad HIC_{15} \ (t_2\text{-}t_1) \leq 15 \text{ ms}$$

14. POST TEST REQUIREMENTS

A. Verify all instrumentation, data sheets and photographs are complete.

B. Copy applicable pages of the vehicle Owner's Manual for attachment to the final test report

C. Place all original records in a secure and organized file awaiting test data disposition.

D. Immediately following the sled test, perform a post impact null reference and shunt calibration check. The pretest adjustment and posttest check will be recorded and the data submitted with the report.

E. Calculate the angular displacement from the output of instrumentation placed in the torso and head of the test dummy and an algorithm capable of determining the relative angular displacement to within one degree and conforming to the requirements of a 600 Hz channel class, as specified in SAE Recommended Practice J211/1, (rev. Mar 95). No data generated after 200 ms from the beginning of the forward acceleration are used in determining angular displacement of the head with respect to the torso.

The Contractor must meet all the requirements in the NHTSA Test Reference Guides which are available from the NHTSA website:

http://www.nhtsa.gov/DOT/NHTSA/NRD/Articles/Databases%20and%20Software/Software%20Applications/NHTSA%20Test%20Reference%20Guides/Version%205/Volume%20III%20-%20Component%20-%20Version%205%20_Revision_.pdf

The data is placed onto permanent storage media after the application of appropriate calibration scale factors.

As the data is recalled for integration or plotting, the appropriate phase-less digital filter, such as the Butterworth four-pole phase-less digital filter is applied. These filters are in accordance with SAE Recommended Practice J211/1 MAR95, "Instrumentation for Impact Tests."

Table 4 – Filtering Requirements From SAE J211/1 Mar95

	Filter Class	Cut-off Frequency
Head acceleration	1000	1650
Chest acceleration	180	300
Vehicle acceleration	60	100
Velocity	180	300
Displacement	180	300

Before plotting, the Contractor's program manager or engineer shall determine the "time zero", which is verified with the trigger signal. When a velocity or displacement trace is to be plotted, integration for the appropriate acceleration signal is performed digitally.

Algorithms that are used to calculate the HIC, 3 millisecond clips of a waveform, and to digitally filter the Class 1000 data collected from the tests, are on the NHTSA web site (www.nhtsa.dot.gov).

Any questions pertaining to the algorithms should be directed to the following organization:

National Highway Traffic Safety Administration
Office of Crashworthiness Research
Safety Systems Engineering and Analysis Division
1200 New Jersey Ave, SE
Mail Code: NVS-321
Washington, DC 20590
Telephone No.: 202-366-4850

15. REPORTS

15.1. MONTHLY STATUS REPORTS

The contractor shall submit a monthly Test Status Report and a Vehicle Status Report to the COTR. 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 NONCOMPLIANCE

Any indication of a test failure shall be communicated by telephone to the COTR within 24 hours with written notification mailed within 48 hours (Saturdays and Sundays excluded). A Notice of Test Failure (see report forms section) 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 post test 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.

15.3 FINAL TEST REPORTS

15.3.1 COPIES

In the case of an apparent test failure, one electronic copy in MS Word format 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 the "Report Section".

Where there has been no indication of an apparent noncompliance, two electronic copies (each on a separate compact disc) in both Word and PDF formats of each Final Test Report shall be submitted to the COTR 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 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 one week 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.

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.

15.3.2 REQUIREMENTS

The Final Test Report and associated documentation (including photographs) are 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. 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.

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) Final Report Number such as XXX-ABC-XX-001, where –

126 is the FMVSS tested
ABC are the initials for the laboratory
XX is the last two numbers of 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

SAFETY COMPLIANCE TESTING FOR FMVSS 202aD
Head Restraints
* * * * * * * * * * * * * * * *
ABC Motor Company
20XX Saferider 4-door sedan
NHTSA No. CX0401

(3) Contractor's Name and Address such as

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

NOTE: DOT SYMBOL SHALL 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, W43-481
1200 New Jersey Avenue, SE
Washington, DC 20590

B. FIRST PAGE AFTER FRONT COVER

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

This publication is distributed by the National Highway Traffic Safety Administration in the interest of information exchange. 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.

Prepared By: _____

Approved By: _____*

Approval Date: _____*

FINAL REPORT ACCEPTANCE BY OVSC:*

Accepted By: _____

Acceptance Date: _____

* These lines not required when OVSC staff writes the Test Report

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

XXX-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 FMVSS XXX Compliance Testing of 20XX 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-XXX-00

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

NVS-220

Block 15 — SUPPLEMENTARY NOTES

Leave blank

Block 16 — ABSTRACT

Compliance tests 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-XXX-0X for the determination of FMVSS XXX 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.

Block 17 — KEY WORDS

Compliance Testing
Safety Engineering
FMVSS XXX

Block 18 — DISTRIBUTION STATEMENT

Copies of this report are available from —

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

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 Compliance Test

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 Failure (if applicable)

16. FORMS

MONTHLY STATUS REPORT
FMVSS 202a
DATE OF REPORT_____

Test Program:_____ Contract Number:_____ Fiscal Year:_____
Laboratory: _____

Report Date:_____

NHTSA No.	Date Of Delivery	Initial Odometer Reading	Test Date	Pass Or Fail	Date of Final Report	Vehicle Condition Report Date	Invoice No.	Invoice Date	Final Odom. Reading	Date Veh. Is Disposed

LABORATORY NOTICE OF APPARENT TEST FAILURE TO OVSC

FMVSS NO. 202aD TEST DATE: _____

LABORATORY: _____

CONTRACT NO.: _____ DELIV. ORDER NO.: _____

LABORATORY PROJECT ENGINEER'S NAME: _____

TEST SPECIMEN DESCRIPTION: _____

_____

VEHICLE NHTSA NO.: _____ VIN: _____

MFR: _____

APPARENT TEST FAILURE DESCRIPTION: _____
_____
_____
_____
_____

FMVSS REQUIREMENT, PARAGRAPH S___ :
_____
_____
_____
_____

NOTIFICATION TO NHTSA (COTR): _____

DATE: _____ BY: _____

REMARKS:
_____
_____
_____

17. DATA SHEETS

DATA SHEET 1
SUMMARY OF RESULTS

NHTSA No. _____ Test Date: _____
Laboratory: _____ Test Technician(s): _____
Observers:_____

TEST VEHICLE INFORMATION:
Year/Make/Model/BodyStyle: _____
VIN:_____ BUILD DATE: _____

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS:

B. DYNAMIC RESULTS

Head to Torso Rotation (12° limit) (S 4.3.6.9)	**PASS**	**FAIL**
Driver	____	____
Passenger's	____	____
HIC_{15} (500 maximum)	**PASS**	**FAIL**
Driver's	____	____
Passenger	____	____

C. DIMENSIONAL REQUIREMENTS (S 4.3.2)	**PASS**	**FAIL**	**N/A**
Driver (254 mm min if 3 DSP in row or 170 mm if 2 DSP in row)	____	____	___
Passenger (170 mm min) (254 mm min if 3 DSP in row or 170 mm if 2 DSP in row)	____	____	___
Rear Designated Seating Positions (170 mm min)			

2nd row				
	Left outboard	____	____	____
	Right ouboard	____	____	____
3rd row				
	Left outboard	____	____	____
	Right ouboard	____	____	____

D.	**NON-USE POSITION (S 4.4)**	**PASS**	**FAIL**	**N/A**
	Rear Designated Seating Positions			
	Left Seat	____	____	____
	Right Seat	____	____	____
E.	**REMOVABILITY (S 4.5)**	**PASS**	**FAIL**	**N/A**
	Driver	____	____	____
	Passenger	____	____	____
	Rear Designated Seating Positions			
	Left Seat	____	____	____
	Right Seat	____	____	____
F.	**OWNER'S MANUAL (S 4.6)**	**PASS**	**FAIL**	
	Information in owner's manual is in compliance	____	____	

Technician Signature _____ Date _____

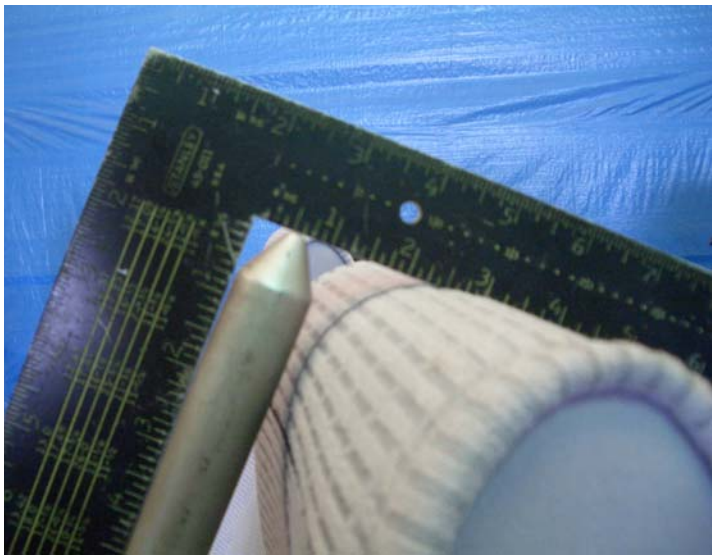
DATA SHEET 2
DIMENSIONAL REQUIREMENTS FOR FIXED HEAD RESTRAINTS

NHTSA No. _____ Test Date: _____
Laboratory: _____ Test Technician(s): _____
Observers:_____

Seat Location:_____

Width Measurements (S 4.2.2)

Seat the J826 manikin per Section 13.D of this procedure and extend the head room probe to the top of the head restraint using a carpenter's square to align the top of the probe with the top of the head restraint (top of head restraint is 90 degrees with the top of the probe – see photo).



Measure the distance, H, between the H-point and top of probe. Without moving the carpenter's square, mark a point on the head restraint, 65 mm from the top of the extension, draw a line through the point along the width of the head restraint to each end. On each the side of the head restraint, draw a line parallel to the perpendicular edge of the carpenter's square.

___Measured Height of Head Restraint (H)
___ Mark Hw Height 65 mm below top of Head Restraint by drawing a line on both sides of the head restraint along the carpenter's square perpendicular to the probe.

Width is measured 65 mm below the measured Height, H along the drawn line on each side of the head restraint

Height, Hw (= H – 65):

Width, W (mm):_____PASS _____FAIL_____

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position, the front outboard head restraints must be greater than or equal to 254 mm.

Technician Signature Date

DATA SHEET 3
OWNER'S MANUAL

NHTSA No. _____ Test Date: _____
Laboratory: _____ Test Technician(s): _____
Observers: _____

Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury. (S 4.7.1)

PASS _____ **FAIL** _____

Description of the head restraint system and identification of which seats are equipped. (S 4.7.2.a)

PASS _____ **FAIL** _____

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment. (S 4.7.2.b)

PASS _____ **FAIL** _____ **N/A** _____

Warn that all head restraints must be reinstalled properly to protect occupants. (S 4.7.2.c)

PASS _____ **FAIL** _____

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative the head. The description must include the following: (S 4.7.2.d)

1) a presentation and explanation of the main components of the vehicle's head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant's head position, including information regarding the proper positioning of the center of gravity of an occupant's head in relation to the head restraint.

PASS _____ **FAIL** _____

_____ _____
Technician Signature Date

DATA SHEET 4
REMOVABILITY

NHTSA No. _____ Test Date: _____
Laboratory: _____ Test Technician(s): _____
Observers:_____

Are the head restraints removable? (S 4.5) **YES** _____ **NO**_____

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint?

YES (PASS)_____ **NO (FAIL)**_____

Description of action(s) for head restraint adjustment:

_____
_____
_____

Description of distinct action for removal:

_____
_____
_____

Attach a copy of the relevant pages from the owner's manual describing the actions necessary for head restraint removal.

REMARKS:

_____
_____
_____
_____

_____ _____
Technician Signature Date

DATA SHEET No. 5

VEHICLE DATA

NHTSA No. _____ Test Date: _____ Side Tested: _____

Laboratory: _____ Test Technician(s): _____

TEST VEHICLE INFORMATION:
Year/Make/Model/Bodystyle: _____VIN: _____
Manufactured By: _____Date of Manufacture: _____
GVWR: _____ kg; GAWR FRONT: _____ kg GAWR REAR: _____kg

VEHICLE CAPACITY DATA:
Type of Front Seats: Bench-_____; Bucket-_____; Split Bench-_____
Number of Occupants: Front-_____; Rear-_____; TOTAL-_____
Vehicle Capacity Weight (VCW) = _____ kg No. of Occupants x 68 kg. = _____ kg

Rated Cargo/Luggage Weight (RCLW) =_____ kg (Difference)

UNLOADED VEHICLE WEIGHT:

Right Front =	_____ kg	Right Rear =	_____ kg
Left Front =	_____ kg	Left Rear =	_____ kg
Total Front =	_____ kg	Total Rear =	_____ kg
% Total Weight =	_____ %	% Total Weight =	_____ %

Total Delivered Weight = _____ kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:
Target Test Weight = Total Delivered Weight + Rated Cargo/Luggage Wt. + 2 * (50^{th} Percentile Adult Male)
Target Test Weight = _____ kg + _____ kg + 2 * (68 kg) = _____ kg

WEIGHT OF TEST VEHICLE

Right Front =	_____ kg	Right Rear =	_____ kg
Left Front =	_____ kg	Left Rear =	_____ kg
Total Front =	_____ kg	Total Rear =	_____ kg
% Total Weight =_____ %		% Total Weight =_____ %	

TOTAL TEST WEIGHT = _____ kg.

TEST VEHICLE ATTITUDE:

Angle Type	Measured at	UVW	FULLY LOADED	ON SLED
Pitch	Right Door Sill			
	Left Door Sill			
Roll	Front Bumper			
	Rear Bumper			

LOCATION OF ACCELEROMETERS: _____

REMARKS:

_____

_____

_____ _____
Technician Signature Date

18. TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

ITEM	MFR	MODEL	S/N	CALIB. PERIOD	DATE OF LAST CALIB.	ACCURACY

REMARKS:

_____ _____

I certify that I have read and performed each instruction. Date

APPENDIX A
CHECK SHEET FOR VEHICLE PREPARATION

___1. After the test vehicle is received, add fluids to capacity and inflate tires to the manufacturer's specifications (tire placard).
___2. Locate the vehicle on a flat, horizontal surface.
___3. Weigh the vehicle to determine the "Unloaded Vehicle Weight" (UVW). Record in Data Sheet No. 5.
___4. Exercise the suspension, pushing up and down on all four corners of the vehicle at least 5 times in an interval not to exceed 40 seconds.
___5. Determine the "as delivered" vehicle attitude by measuring the angles relative to a horizontal plane, from front-to-rear (pitch) and from left-to-right (roll).
    ___5.1. Measure the pitch angle along a fixed reference on the driver's and front passenger's door sill using a digital inclinometer. Mark where the angle is taken on the door sill. Record measurement on Data Sheet No. 5.
    ___5.2. Measure the roll angle by taking the vertical distance between the flat horizontal surface and bottom (lowest point) of the driver and passenger side sills at points adjacent to the front outboard seats. Mark where each measurement is taken, and record measurement on Data Sheet No. 5.
___6. Load the vehicle to its unloaded vehicle weight (UVW) plus its rated cargo and luggage capacity weight (RCLW) in the luggage area, plus two 50th-percentile adult male test dummies located at the front outboard designated seating positions. (571.208.S8.1.1(a)). Obtain the vehicle capacity weight (VCW) and the designated seating capacity (DSC) from the tire information placard. (Check the number of restraints provided in the vehicle against the DSC. Inform the COTR immediately if they do not match.) Use this information to determine the RCLW as follows: RCLW = VCW - (68 Kg x DSC)
___7. Determine the "fully loaded" vehicle attitude by measuring the angles relative to a horizontal plane, from front-to-rear (pitch) and from left-to-right (roll).
    ___7.1. Measure the pitch angle along a fixed reference on the driver's and front passenger's door sill using a digital inclinometer. Record measurement on Data Sheet No. 5.
    ___7.2. Measure the roll angle by taking the vertical distance between the flat horizontal surface and bottom (lowest point) of the driver and passenger side sills at points adjacent to the front outboard seats. Record measurement on Data Sheet No. 5.
___8. Drain the fuel system and operate the engine until the fuel system is dry. Drain all other fluids from the test vehicle.
___9. Disconnect the air bags without cutting the wires.
___10. Remove following items from the vehicle:
    ___10.1. Wheels
    ___10.2. Remove all sprung masses (e.g. rear axle, suspension, engine, transmission, exhaust, etc). If the vehicle has a frame, rigidly attach the body to the frame.
___11. Mount the vehicle on the sled:
    ___11.1. Rigidly attach the vehicle to the sled interface frame or sled so that movement between the base of the vehicle and the test platform is prevented. (In other words, the acceleration pulse of the vehicle body is within the corridors of the sled pulse.) Mount the vehicle as low as possible on the sled in order to keep the center of gravity as low as possible.

___11.2. If the vehicle is not attached directly to the sled, rigidly attach the vehicle/interface frame unit to the sled.

___12. Verify that the pitch attitude is between the “Unloaded Vehicle Weight (UVW)” and the “fully loaded” condition, and the roll attitude is within 1 inch of either the UVW or the “fully loaded” measurements taken before. Record measurements on Data Sheet No. 5.

___13. Record the location of the vehicle and sled accelerometers in Data Sheet No. 5.

___14. Install onboard instrumentation, and perform a null reference and a shunt calibration adjustment to set all data devices including FM magnetic tape recorders. Assure that the instrumentation and wires will not affect the motion of the dummies during the impact event.

___15. Movable vehicle windows and vents are placed in the fully open position.

___16. Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

___17. Doors are fully closed and latched but not locked. The hood, hood latches, and any other hood retention components are fully engaged.

___18. Remove the battery if vehicle electrical functions are no longer needed. (Make sure the battery is not needed during the test to keep the seat position or for other test related functions.)

_____ _____

I certify that I have read and performed each instruction. Date

APPENDIX B

CHECK SHEET FOR SEATING J826 MANIKIN

NHTSA No. _____ Test Date: _____ SeatTested: _____

Laboratory: _____ Test Technician(s): _____

Position the three dimensional manikin specified in Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995, "Devices for Use in Defining and Measuring Vehicle Seating Accommodation," (incorporated by reference, see paragraph S3.2), in accordance to the seating procedure specified in that document, with leg length specified in S10.4.2.1 of 571.208.

___1. Before any seat adjustment, place a 910 mm^2 piece of muslin cotton cloth over the seat area. (The muslin cloth shall be comparable to 48 threads/in^2 and density of 2.85 lb/yd.) Tuck the muslin cloth in a sufficient amount to prevent hammocking of the material.
___2. Install the lower leg, and foot segments.
___3. Place the seat and back assembly of the H-Point machine at the centerline of the seat.
___4. Set the length of the lower leg segment at 414 mm and the length of the thigh bar at 401 mm.
___5. Leg and foot placement
- ___5.1. Driver Designated Seating Position.
  - ___5.1.1. If the H-Point machine is equipped with a foot angle pin, insert it so that the foot angle is never less than 87 degrees.
  - ___5.1.2. Place the right foot on the undepressed accelerator pedal with the sole of the foot on the pedal and the heel as far forward as allowable. Do not place the heel on the toe board.
  - ___5.1.3. Adjust the left leg to be the same distance from H-point machine centerline as the right leg.
  - ___5.1.4. Level the T-bar. Place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
    - ___Foot on toe board
    - ___Foot on floor pan
- ___5.2. Passenger Designated Seating Position (identify seating position on top right in "seat tested").
  - ___5.2.1. If the H-Point machine is equipped with a foot angle pin, insert it so that the foot angle is never less than 87 degrees.
  - ___5.2.2. Space the lower legs 269 mm apart, equally spaced about the centerline of the H-point machine – see Figure B1.

Figure B1

___5.2.3. Level the T-bar. Place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.
___Foot on toe board
___Foot on floor pan

___6. Apply the lower leg weights.
___7. Apply the thigh weights.
___8. Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.
___9. Repositioning the back pan
___9.1. Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.
__The seat pan does not slide rearward. Go to 9.2
___9.2. Slide the H-point machine rearward by a horizontal rearward load applied at the T-bar until the seat pan contacts the seat back.
___10. Apply a 10 kg load TWICE at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.
___11. Carefully return the back pan to the seat back.
___12. Install the right and left buttock weights.
___13. Install the eight torso weights alternating the installation between right and left – see Figure B2.

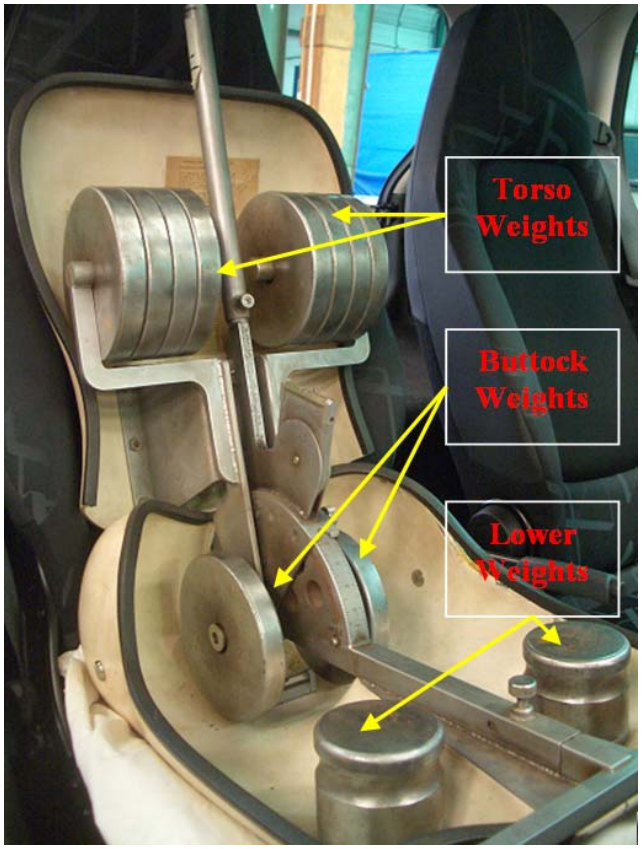


Figure B2

___14. Tilt the back pan forward until the stop is contacted.

___15. Rock the H-point from side to side over a 10 degree arc (5 degrees to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.

___16. Without applying a forward or lateral load, lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

___17. Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor, toe board, or undepressed accelerator pedal.

___18. Without applying a forward or lateral load, lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.

___19. Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.

___20. Is the seat pan level?
__Yes. Go to 22
__No. Go to 21

___21. Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.

___22. Holding the T-bar to prevent the H-point machine seat pan from sliding forward on the seat cushion, return the seatback pan to the seatback.

___23. Holding the T-bar to prevent the H-point machine seat pan from sliding forward on the seat cushion, apply sufficient rearward force perpendicular to the back angle bar just above the torso weights to increase the hip angle 3 degrees or a maximum of 66 N (15 lb). Minimize the exterior downward or side forces applied to the H-point machine. Release the force.

Repeat this step until the hip angle readout is identical – see Figure B3.

Figure B3

Complete as many force applications as necessary and record the results in the following table:

Force Application	Hip Angle
1	
2	
3	
4	
5	

___24. Is the H-point machine level?
__Yes
__No, re-level. Go back to item 15 and repeat using a new data sheet.

APPENDIX C
CHECK SHEET FOR DUMMY POSITIONING
FOR DRIVER TEST DUMMY CONFORMING TO SUBPART E OF PART 572

NHTSA No. _____ Test Date: _____

Laboratory: _____ Test Technician(s): _____

___1. Position the seat's adjustable lumbar supports to its most posterior nominal design position. If the seat cushion adjusts independently of the seat back, position the seat cushion such that the highest H-point position is achieved with respect to the seat back, as measured by SAE J826 (July 1995) manikin, with leg length specified in S10.4.2.1 of 571.208. If the specified position of the H-point can be achieved with a range of seat cushion inclination angles, adjust the seat inclination such that the most forward part of the seat cushion is at its lowest position with respect to the most rearward part. With the head restraint fully retracted, measure the distance from the h-point to the top of the head restraint. All tests specified are conducted with the ambient temperature between 18 degrees C and 28 degrees C. (S 5)
___N/A – No lumbar adjustment
___Distance between H-point and top of fully retracted head restraint.
___Seat cushion angle
___N/A – Seat cushion not adjustable
___Temperature (degrees C)

Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full forward position, and mark a part of the seat and another mark on the vehicle sill adjacent to the seat mark.
___Mark the seat the sill at full forward
Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full rearward position, and mark on the vehicle sill adjacent to the seat mark.
___Mark the sill at full forward
Measure the distance between the full forward mark and the full rearward mark on the sill and mark a point that this midway (mid-track) between the two positions. Adjust the seat on the seat track, using only the controls that move the seat to align with the mid track mark.
___Seat aligned in mid-track position

___2. At each out-board designated seating position; if the seat back is adjustable, it is set using the J826 manikin at an initial inclination position closest to 25 degrees from the vertical, set the seat back inclination to the position closest to and rearward of 25 degrees. Using any control that primarily moves the entire seat vertically; place the seat in the lowest position. Using any control that primarily moves the entire seat in the fore and aft directions, place the seat midway between the forwardmost and rearmost position. If an adjustment position does not exist midway between the fowardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used. (S 5.3.4)
___Seat back angle of next position more up-right
___Seat back angle of seating position of next position more reclined
___Seat back angle of seating position used

___3. Is the seat a bucket seat?
___Yes, go to 4 and skip 5
___No, go to 5 and skip 4

___4. Bucket seats:
Locate and **mark** the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion. (208 S10.4.1.2 and 208 S16.3.1.10)

___5. Bench seats:
Locate and **mark** the longitudinal line on the seat cushion that marks the intersection of the vertical longitudinal plane through the centerline of the steering wheel and the seat cushion upper surface. (208 S10.4.1.1)

___6. If the head restraint is adjustable, adjust the top of the head restraint to a position midway between the lowest position of adjustment and the highest position of adjustment. If an adjustment position midway between the lowest and highest position does not exist, adjust the head restraint to a position below and nearest to the midway between the lowest position of adjustment and the highest position of adjustment by measuring the height of head restraint at full extension and head restraint height at lowest position and calculating the mean to determine the mid position height. (S 5.3.4)
___ Height with head restraint fully extended
___ Height with head restraint set a lowest position
___Calculated position at midway = (fully extended height + lowest position)/2
___Measured midway height used
___ N/A – No head restraint adjustment

___7. If the backset is adjustable, set the head restraint to the largest backset setting
___N/A – No head restraint adjustment

___8. If an adjustable seat belt D-ring anchorage exists, place it in the adjustment position closest to the mid-position. If an adjustment position does not exist midway between the highest and lowest position, the closest adjustment position above the midpoint is used. (S 5.3.5)
___N/A – No adjustable upper seat belt anchorage
Tested anchorage position_____

___9. Place adjustable pedals in the full forward position. (208 S 10.6.1.1)
___N/A – the pedals are not adjustable.

___10. Is the steering wheel adjustable up and down and/or in and out?
___Yes – go to 11
___No – go to 14

___11. Find and **mark** each up and down position. Label three of the positions with the following: H for highest, M for mid-position (if there is no mid-position, label the next lowest adjustment position), and L for lowest.
___N/A – steering wheel is not adjustable up and down

___12. Find and **mark** each in and out position. Label three of the positions with the following: F for foremost, M for mid-position (if there is no mid-position, label the next rearmost adjustment position), and R for rearmost.
___N/A – steering wheel is not adjustable in and out.

___13. Set the steering wheel hub at the geometric center of the full range of driving positions including any telescoping positions. (208 S 8.14)

___14. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 10 or 11 and the upper torso rests against the seat back. (208 S10.4.1.1 & S10.4.1.2)

___15. Rest the thighs on the seat cushion. (208 S10.5)

___16. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point. (208 S10.4.2.1)

___17. Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (208 S10.4.2.1 and 208 S10.4.2.2)
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20^o to 25^o)

___18. Is the head level within $\pm$ 0.5^o? (208 S10.1)
___Yes, go to 19
___No, go to 18.1

___18.1. Adjust the position of the H-point. (208 S10.1)

___18.2. Is the head level within $\pm$ 0.5^o? (208 S10.1)
___Yes, record the following, then go to 19.
___No, go to 18.3
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20^o to 25^o) (208 S10.4.2.2)

___18.3. Adjust the pelvic angle. (208 S10.1)

___18.4. Is the head level within $\pm$ 0.5^o? (208 S10.1)
___Yes, record the following, then go to 19.
___No, go to 18.5
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
____vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20^o to 25^o) (208 S10.4.2.2)

___18.5. Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted “0” setting until the head is level within $\pm$ 0.5^o. (208 S10.1) Record the following, then go to 19
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20^o to 25^o) (208 S10.4.2.2)

___19. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
___measured distance (10.6 inches) (208 S10.5)

___20. Can the right foot be placed on the accelerator?

___20.1. ___Yes, go to 21.1 and skip 21.2 and 21.3___No, go to 21.2

___20.2. To the extent practicable keep the right thigh and the leg in a vertical plane (208 S10.5) while resting the foot on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. (208 S10.6.1.1)

___20.3. Initially set the foot perpendicular to the leg and then place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. (208 S10.6.1.1)

___20.4. Move the adjustable pedal to its most rearward position or until the right foot is flat on the pedal, whichever occurs first. (208 S10.6.1.1)
___N/A – the accelerator pedal is not adjustable

___21. Does the vehicle have a foot rest?
___Yes, go to 22.1
___No, go to 22.2

___21.1. With the left thigh and leg in a vertical plane, place the left foot on the foot rest with the heel resting on the floor pan. (208 S10.6.1.2) Is the left foot elevated above the right foot?
___Yes, go to 23 and position the foot off the foot rest
___No, go to 20

___21.2. Check the ONLY one of the following that applies
___The left foot reaches the toeboard without adjusting the foot or leg. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (208 S10.5) and place the foot on the toeboard, skip 19.3 (208 S10.6.1.2)
___The left foot reaches the toeboard but contacts the brake or clutch pedal and must be rotated to avoid pedal contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (208 S10.5) and place the foot on the toeboard. The foot was rotated about the leg to avoid pedal contact, skip 19.3 (208 S10.6.1.2)
___The left foot reaches the toeboard but contacts the brake or clutch pedal and the foot and leg must be rotated to avoid pedal contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (208 S10.5) and place the foot on the toeboard. The foot was rotated about the leg and the leg was rotated outboard about the hip the minimum distance necessary to avoid pedal contact, skip 19.3 (208 S10.6.1.2)
___N/A – the foot does not reach the toeboard, go to 22.3

___21.3. Check the ONLY one of the following that applies
___The left foot did not contact the brake or clutch pedal. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (208 S10.5). Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan. (208 S10.6.1.2)
___The left foot did contact the brake or clutch pedal and the foot was rotated to avoid contact. To the extent practicable keep the left thigh and the leg in a vertical longitudinal plane (208 S10.5). Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan and rotate the foot the minimum amount to avoid pedal contact. (208 S10.6.1.2)
___The left foot did contact the brake or clutch pedal and the foot was rotated about the leg and the leg was rotated outboard about the hip the minimum distance necessary to avoid pedal contact. Set the foot perpendicular to the leg and place it as far forward as possible with the heel resting on the floor pan and rotate the foot about the leg and the thigh and leg outboard about the hip the minimum distance necessary to avoid pedal contact. (208 S10.6.1.2)

___22. Place the right upper arm adjacent to the torso with the centerline as close to a vertical plane as possible. (208 S10.2.1)

___23. Seat Belt.

___23.1. Fasten the seat belt around the dummy.

___23.2. Prior to placing the Type 2 seat belt around the test dummy, fully extend the webbing from the seat belt retractor(s) and release it three times to remove slack. (S5.3.5)

___24. Place the left upper arm adjacent to the torso with the centerline as close to a vertical plane as possible. (208 S10.2.1)
___25. Place the right hand with the palm in contact with the steering wheel at the rim's horizontal centerline and with the thumb over the steering wheel. (208 S10.3.1)
___26. Place the left hand with the palm in contact with the steering wheel at the rim's horizontal centerline and with the thumb over the steering wheel. (208 S10.3.1)
___27. Tape the thumb of each hand to the steering wheel by using masking tape with a width of 0.25 inch. The length of the tape shall only be enough to go around the thumb and steering wheel one time.

_____ _____
I certify that I have read and performed each instruction. Date

DUMMY POSITIONING PROCEDURES FOR FRONT PASSENGER TEST DUMMY CONFORMING TO SUBPART E OF PART 572

NHTSA No. _____ Test Date: _____

Laboratory: _____ Test Technician(s): _____

___1. Position the seat's adjustable lumbar supports to its most posterior nominal design position. If the seat cushion adjusts independently of the seat back, position the seat cushion such that the highest H-point position is achieved with respect to the seat back, as measured by SAE J826 (July 1995) manikin, with leg length specified in S10.4.2.1 of 571.208. If the specified position of the H-point can be achieved with a range of seat cushion inclination angles, adjust the seat inclination such that the most forward part of the seat cushion is at its lowest position with respect to the most rearward part. With the head restraint fully retracted, measure the distance from the h-point to the top of the head restraint. All tests specified are conducted with the ambient temperature between 18 degrees C and 28 degrees C. (S 5)
___N/A – No lumbar adjustment
___ Distance between H-point and top of fully retracted head restraint.
___Seat cushion angle
___N/A – Seat cushion not adjustable
___Temperature (degrees C)

Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full forward position, and mark a part of the seat and another mark on the vehicle sill adjacent to the seat mark.
___Mark the seat the sill at full forward
Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full rearward position, and mark on the vehicle sill adjacent to the seat mark.
___Mark the sill at full forward
Measure the distance between the full forward mark and the full rearward mark on the sill and mark a point that this midway (mid-track) between the two positions. Adjust the seat on the seat track, using only the controls that move the seat to align with the mid track mark.
___Seat aligned in mid-track position

___2. At each out-board designated seating position, if the seat back is adjustable, it is set at the an initial inclination position closest to 25 degrees from the vertical, set the seat back inclination to the position closest to and rearward of 25 degrees. Using any control that primarily moves the entire seat vertically, place the seat in the lowest position. Using any control that primarily moves the entire seat in the fore and aft directions, place the seat midway between the forwardmost and rearmost position. If adjustment position does not exist midway between the fowardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used. Adjust the seat cushion and seat back as required by S5 and S5.1 of the standard. (S5.3.4)

___3. Is the seat a bucket seat?
___Yes, go to 4 and skip 5
___No, go to 5 and skip 4

___4. Bucket seats:
Locate and **mark** for future reference the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion. (208 S10.4.1.2 and 208 S16.3.1.10)

___5. Bench seats:
Locate and **mark** for future reference the longitudinal centerline of the passenger seat cushion. The longitudinal centerline is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel. (208 S10.4.1.1)
Record the distance from the longitudinal centerline of the vehicle to the longitudinal centerline of the seat cushion. _____

___6. If the head restraint is adjustable, adjust the top of the head restraint to a position midway between the lowest position of adjustment and the highest position of adjustment. If an adjustment position midway between the lowest and highest position does not exist, adjust the head restraint to a position below and nearest to the midway between the lowest position of adjustment and the highest position of adjustment by measuring the height of head restraint at full extension and head restraint height at lowest position and calculating the mean to determine the mid position height. (S 5.3.4)
____ Height with head restraint fully extended
____ Height with head restraint set a lowest position
____ Calculated position at midway = (fully extended height + lowest position)/2
____ Measured midway height used
____ N/A – No head restraint adjustment

___7. If the backset is adjustable, set the head restraint to the largest backset setting
__N/A – No head restraint adjustment

___8. If an adjustable seat belt D-ring anchorage exists, place it in the adjustment position closest to the mid-position. If an adjustment position does not exist midway between the highest and lowest position, the closest adjustment position above the midpoint is used.
__N/A – No adjustable upper seat belt anchorage
Tested anchorage position _____

___9. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 11 or 12 and the upper torso rests against the seat back. (208 S10.4.1.1 & 208 S10.4.1.2)

___10. Rest the thighs on the seat cushion. (208 S10.5)

___11. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (208 S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (208 S10.4.2.1 and 208 S10.4.2.2)
____horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
____vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
____pelvic angle (20^o to 25^o)

___12. Is the head level within $\pm$ 0.5^o? (208 S10.1)
___Yes, go to 12
___No, go to 11.1
___12.1.1. Adjust the position of the H-point. (208 S10.1 and 208 S10.4.2.1)

___12.2. Is the head level within ± 0.5°? (208 S10.1)
___Yes, record the following, then go to 12.
___No, go to 11.3
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)
___12.3. Adjust the pelvic angle. (208 S10.1)
___12.4. Is the head level within ± 0.5°? (208 S10.1)
___Yes, record the following, then go to 12.
___No, go to 11.5
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)
___12.5. Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted "0" setting until the head is level within ± 0.5°. (S10.1). Record the following, then go to 12
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)

___13. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
___ measured distance (10.6 inches) (208 S10.5)

___14. Check the only one of the following that applies:
___To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, place the feet on the toeboard (on the floor for rear seat dummies) with the heels resting on the floor pan as close as possible to the intersection of the floor pan and toeboard.
___The feet cannot be placed flat on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heels resting on the floor pan.
___The vehicle has a wheelhouse projection. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heels resting on the floor pan. Do not set the feet on the wheelhouse projection.
___The vehicle has a wheelhouse projection and the feet cannot be placed on the toeboard. To the extent practicable keep the left thigh and leg in a vertical plane and the right thigh and leg in a vertical plane, set the feet perpendicular to the legs and place them as far forward as possible with the heel resting on the floor pan. Do not set the feet on the wheelhouse projection.

___15. Place the left upper arm in contact with the seat back and side of the torso. (208 S10.2.2)

___16. Seat Belt:
___16.1. Fasten the seat belt around the dummy.

___16.2. Prior to placing the Type 2 seat belt around the test dummy, fully extend the webbing from the seat belt retractor(s) and release it three times to remove slack. (S5.3.5)

___17. Place the left hand palm in contact with the outside of the left thigh and the little finger in contact with the seat cushion. (208 S10.3.2)

___18. Place the right hand palm in contact with the outside of the right thigh and the little finger in contact with the seat cushion. (208 S10.3.2)

_____ _____

I certify that I have read and performed each instruction. Date

DUMMY POSITIONING PROCEDURES FOR REAR TEST DUMMY CONFORMING TO SUBPART E OF PART 572

NHTSA No. _____ Test Date: _____

Laboratory: _____ Test Technician(s): _____

___1. Position the seat's adjustable lumbar supports to its most posterior nominal design position. If the seat cushion adjusts independently of the seat back, position the seat cushion such that the highest H-point position is achieved with respect to the seat back, as measured by SAE J826 (July 1995) manikin, with leg length specified in S10.4.2.1 of 571.208. If the specified position of the H-point can be achieved with a range of seat cushion inclination angles, adjust the seat inclination such that the most forward part of the seat cushion is at its lowest position with respect to the most rearward part. With the head restraint fully retracted, measure the distance from the h-point to the top of the head restraint. All tests specified are conducted with the ambient temperature between 18 degrees C and 28 degrees C. (S 5)
___N/A – No lumbar adjustment
___Distance between H-point and top of fully retracted head restraint.
___Seat cushion angle
___N/A – Seat cushion not adjustable
___Temperature (degrees C)

Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full forward position, and mark a part of the seat and another mark on the vehicle sill adjacent to the seat mark. If seat is not adjustable, go to 3.
___Mark the seat the sill at full forward
Adjust the seat on the seat track, using only the controls that move the seat primarily in the forward aft direction to the full rearward position, and mark on the vehicle sill adjacent to the seat mark.
___Mark the sill at full forward
Measure the distance between the full forward mark and the full rearward mark on the sill and mark a point that this midway (mid-track) between the two positions. Adjust the seat on the seat track, using only the controls that move the seat to align with the mid track mark.
___Seat aligned in mid-track position

___2. At each out-board designated seating position; if the seat back is adjustable, it is set using the J826 manikin at an initial inclination position closest to 25 degrees from the vertical, set the seat back inclination to the position closest to and rearward of 25 degrees. Using any control that primarily moves the entire seat vertically; place the seat in the lowest position. Using any control that primarily moves the entire seat in the fore and aft directions, place the seat midway between the forwardmost and rearmost position. If an adjustment position does not exist midway between the fowardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used. (S 5.3.4)
___Seat back angle of next position more up-right
___Seat back angle of seating position of next position more reclined
___Seat back angle of seating position used

___3. Is the seat a bucket seat?
___Yes, go to 4 and skip 5
___No, go to 5 and skip 4

___4. Bucket seats:
Locate and **mark** for future reference the longitudinal centerline of the seat cushion. The intersection of the vertical longitudinal plane that passes through the SgRP and the seat cushion upper surface determines the longitudinal centerline of a bucket seat cushion. (208 S10.4.1.2 and 208 S16.3.1.10)

___5. Bench seats:
Locate and **mark** for future reference the longitudinal centerline of the passenger seat cushion. The longitudinal centerline is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel. (208 S10.4.1.1)
Record the distance from the longitudinal centerline of the vehicle to the longitudinal centerline of the seat cushion. _____

___6. If the head restraint is adjustable, adjust the top of the head restraint to a position midway between the lowest position of adjustment and the highest position of adjustment. If an adjustment position midway between the lowest and highest position does not exist, adjust the head restraint to a position below and nearest to the midway between the lowest position of adjustment and the highest position of adjustment by measuring the height of head restraint at full extension and head restraint height at lowest position and calculating the mean to determine the mid position height. (S 5.3.4)
___ Height with head restraint fully extended
___ Height with head restraint set a lowest position
___Calculated position at midway = (fully extended height + lowest position)/2
___Measured midway height used
___ N/A – No head restraint adjustment

___12. If the backset is adjustable, set the head restraint to the largest backset setting
___N/A – No head restraint adjustment.

___13. If an adjustable seat belt D-ring anchorage exists, place it in the adjustment position closest to the mid-position. If an adjustment position does not exist midway between the highest and lowest position, the closest adjustment position above the midpoint is used.
___N/A – No adjustable upper seat belt anchorage
Tested anchorage position _____

___14. Place the dummy in the seat such that the midsagittal plane is coincident with the longitudinal seat cushion markings as determined in item 11 or 12 and the upper torso rests against the seat back. (208 S10.4.1.1 & 208 S10.4.1.2)

___15. Rest the thighs on the seat cushion. (208 S10.5)

___16. Position the H-point of the dummy within 0.5 inch of the vertical dimension and 0.5 inch of the horizontal dimension of a point 0.25 inch below the H-point determined by using the equipment and procedures specified in SAE J826 (APR 1980). (208 S10.4.2.1) Then measure the pelvic angle with respect to the horizontal using the pelvic angle gage. Adjust the dummy position until these three measurements are within the specifications. (208 S10.4.2.1 and 208 S10.4.2.2)
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20^o to 25^o)

___17. Is the head level within $\pm$ 0.5^o? (208 S10.1)
___Yes, go to 12
___No, go to 11.1
___17.1. Adjust the position of the H-point. (208 S10.1 and 208 S10.4.2.1)

___17.2. Is the head level within ± 0.5°? (208 S10.1)
___Yes, record the following, then go to 12.
___No, go to 11.3
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)

___17.3. Adjust the pelvic angle. (208 S10.1)

___17.4. Is the head level within ± 0.5°? (208 S10.1)
___Yes, record the following, then go to 12.
___No, go to 11.5
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)

___17.5. Adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted "0" setting until the head is level within ± 0.5°. (S10.1). Record the following, then go to 12
___horizontal inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___vertical inches from the point 0.25 below the determined H-point (0.5 inch max.) (208 S10.4.2.1)
___pelvic angle (20° to 25°) (208 S10.4.2.2)

___18. Set the distance between the outboard knee clevis flange surfaces at 10.6 inches.
___ measured distance (10.6 inches) (208 S10.5)

___19. Place the left upper arm in contact with the seat back and side of the torso. (208 S10.2.2)

___20. Seat Belt:
___20.1. Fasten the seat belt around the dummy.
___20.2. Prior to placing the Type 2 seat belt around the test dummy, fully extend the webbing from the seat belt retractor(s) and release it three times to remove slack. (S5.3.5)

___21. Place the left hand palm in contact with the outside of the left thigh and the little finger in contact with the seat cushion. (208 S10.3.2)

___22. Place the right hand palm in contact with the outside of the right thigh and the little finger in contact with the seat cushion. (208 S10.3.2)

_____ _____
I certify that I have read and performed each instruction. Date