

**15. DATA SHEETS**

**DATA SHEET 1**

**SEAT BELT ASSEMBLY ANCHORAGE INSTALLATION TYPES**

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_ ; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_ ; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

Number of DSPs in Test Vehicle As Stated On Tire Label using Figures For Maximum Vehicle Loading

Front Seat = \_\_\_\_\_

Rear Seat = \_\_\_\_\_

Third Seat = \_\_\_\_\_

**TOTAL =** \_\_\_\_\_

SEAT	SEATING POSITION	SEAT FACING	REQUIRED ANCHORAGE	OBSERVED ANCHORAGE
FRONT	Outboard-Left	Forward	Type 2	
	Center	Forward	Type 1	
	Outboard-Right	Forward	Type 2	
REAR	Outboard-Left	Forward	Type 2*	
	Center	Forward	Type 1	
	Outboard-Right	Forward	Type 2*	
THIRD	Outboard-Left	Rearward	Type 1	
	Center	Rearward	Type 1	
	Outboard-Right	Rearward	Type 1	
SIDE FACING	Left	Side	Type 1	
	Right	Side	Type 1	

\* SEE NEXT PAGE

**15. DATA SHEETS....Continued**

- \* It may be necessary to cut the test vehicle's headlining material or cut/remove trim panels in order to verify the existence of shoulder belt anchorage provisions. Care should be taken to cause no more damage than necessary.

For vehicles without manufacturer installed rear outboard Type 2 seat belts, does the owner's manual have a diagram of the location of the shoulder belt anchorages?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No

If yes, attach a copy of the diagram.

REMARKS:

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

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

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

**15. DATA SHEETS....Continued**

**DATA SHEET 2**

**LATERAL SPACING OF SEAT BELT ASSEMBLY ANCHORAGES**

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

SEAT	ANCHORAGE LOCATION	MEASURED SPACING
FRONT	Left Outer - Left Inner	
	Center Left - Center Right	
	Right Inner - Right Outer	
REAR	Left Outer - Left Inner	
	Center Left - Center Right	
	Right Inner - Right Outer	
THIRD	Left Outer - Left Inner	
	Left Inner - Right Inner	
	Right Inner - Right Outer	
SIDE FACING		

NOTE: The spacing for an individual seat belt assembly anchorage shall be at least 6.5" apart as measured between the vertical centerlines of the boltholes.

REMARKS:

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

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

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

**15. DATA SHEETS....Continued**

**DATA SHEET 3**

**SEAT BELT ANGLES**

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

LAP BELT ANCHORAGES:

SEAT	SEATING POSITION	SPECIFIED ANGLE RANGE ABOVE HORIZONTAL	MEASURED ANGLE		DOES BELT SECURELY FIT ON PELVIS?
			I/B	O/B	
FRONT	Left	30 to 75 degrees			
	Center	30 to 75 degrees			
	Right	30 to 75 degrees			
REAR	Left	30 to 75 degrees			
	Center	30 to 75 degrees			
	Right	30 to 75 degrees			
THIRD	Left	30 to 75 degrees			
	Center	30 to 75 degrees			
	Right	30 to 75 degrees			
SIDE FACING	Left Side	30 to 75 degrees			
	Right Side	30 to 75 degrees			

REMARKS:

**15. DATA SHEETS....Continued**

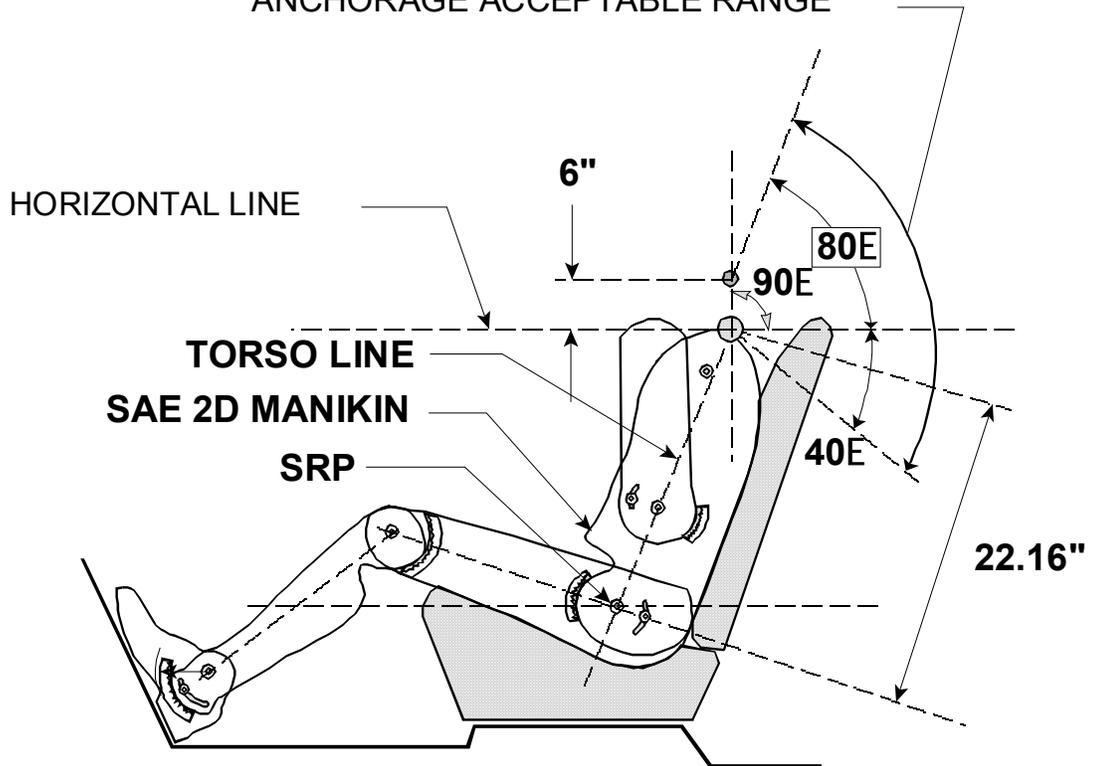
**SHOULDER BELT ANCHORAGES:**

SEAT	SEATING POSITION	SPECIFIED ANGLE RANGE ABOVE OR BELOW HORIZONTAL	MEASURED ANGLE
FRONT	Left	0 - 80 degrees above	
		0 - 40 degrees below	
	Right	0 - 80 degrees above	
		0 - 40 degrees below	
REAR	Left	0 - 80 degrees above	
		0 - 40 degrees below	
	Right	0 - 80 degrees above	
		0 - 40 degrees below	

REMARKS:

**SHOULDER BELTS**

**ANCHORAGE ACCEPTABLE RANGE**



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

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

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

15. DATA SHEETS...Continued

**DATA SHEET 4**

**LAP AND SHOULDER BELT ASSEMBLY ANCHORAGE LOADINGS**

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_ ; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_ ; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

SEAT	BELT ASSEMBLY TESTED	MAXIMUM LOAD REQUIREMENT	APPLIED LOAD
FRONT	Left Lap	5,000 lbs, -10, -50	
	Left Shoulder	3,000 lbs, -10, -50	
	Right Lap	5,000 lbs, -10, -50	
	Right Shoulder	3,000 lbs, -10, -50	
	Center Lap	5,000 lbs, -10, -50	
REAR	Left Lap	5,000 lbs, -10, -50	
	Left Shoulder	3,000 lbs, -10, -50	
	Right Lap	5,000 lbs, -10, -50	
	Right Shoulder	3,000 lbs, -10, -50	
	Center Lap	5,000 lbs, -10, -50	
THIRD	Left Lap	5,000 lbs, -10, -50	
	Left Shoulder	3,000 lbs, -10, -50	
	Right Lap	5,000 lbs, -10, -50	
	Right Shoulder	3,000 lbs, -10, -50	
	Center Lap	5,000 lbs, -10, -50	

REMARKS:

15. DATA SHEETS....Continued

DATA SHEET 5

SEAT BELT ASSEMBLY LOAD ANGLE MEASUREMENT

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

TYPE	ANGLE MEASURED	ANGLE REFERENCE	ANGLE AT 10% LOAD (degrees)						
			LEFT DSP		CNTR DSP		RIGHT DSP		
			FRT	RR	FRT	RR	FRT	RR	
LAP BELT	Load Application Angle (degrees)	From Side View Horizontal 10 ± 4							
		From Plan View Vehicle Centerline 0 ± 3							
SHOULDER BELT	Load Application Angle (degrees)	From Side View Horizontal 10 ± 4							
		From Plan View Vehicle Centerline 0 ± 3							

REMARKS:

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

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

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

## 15. DATA SHEETS....Continued

## DATA SHEET 6

## TEST VEHICLE RECEIVING-INSPECTION

VEH. MOD YR/MAKE/MODEL/BODY: \_\_\_\_\_

VEH. NHTSA NO.: \_\_\_\_\_; VIN: \_\_\_\_\_

VEH. BUILD DATE: \_\_\_\_\_; TEST DATE: \_\_\_\_\_

TEST LABORATORY: \_\_\_\_\_

OBSERVERS: \_\_\_\_\_

1. First compliance test by laboratory for this vehicle is S210 test.

 Yes  No (Go to item 2) 1.1 Label test vehicle with NHTSA Number 1.2 Verify all options on the "window sticker" are present on the vehicle 1.3 Verify tires and wheel rims are new and the same as listed 1.4 Verify there are no dents or other interior or exterior flaws 1.5 Verify the glove box contains an owner's manual, warranty document, consumer information, and extra keys 1.6 Verify the vehicle is equipped with the proper fuel filler cap 1.7 If the vehicle has been delivered from the dealer, verify the vehicle has been properly prepared and is in running condition

2. Verify seat adjusters are working

 Yes  No

3. Verify there is a seat belt at each seating position

 Yes  No

4. Without disturbing the integrity of each seat belt and anchorage, verify that each seat belt is attached to the anchorage. For seat belts that are attached to the seat, also verify the seats are attached to the seat anchors and the seat anchors are attached to the vehicle.

 Yes  No

**15. DATA SHEETS...Continued**

5. REMARKS: (Explain any problems here)

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

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

16. FORMS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NO.: 210 TEST DATE: \_\_\_\_\_

LABORATORY: \_\_\_\_\_

CONTRACT NO.: DTNH22-\_\_\_\_\_; DELV. ORDER NO.: \_\_\_\_\_

LABORATORY PROJECT ENGINEER'S NAME: \_\_\_\_\_

TEST VEHICLE MAKE/MODEL/BODY STYLE: \_\_\_\_\_

\_\_\_\_\_

VEHICLE NHTSA NO.: \_\_\_\_\_; VIN: \_\_\_\_\_

VEHICLE MODEL YEAR: \_\_\_\_\_; BUILD DATE: \_\_\_\_\_

TEST FAILURE DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

S210 REQUIREMENT, PARAGRAPH \_\_\_\_ : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NOTIFICATION TO NHTSA (COTR) : \_\_\_\_\_

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

REMARKS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. FORMS....Continued

**MONTHLY TEST STATUS REPORT**

**FMVSS 210**

**DATE OF REPORT: \_\_\_\_\_**

No.	VEHICLE NHTSA No., MAKE & MODEL	COMPLIANCE TEST DATE	PASS/ FAIL	DATE REPORT SUBMITTED	DATE INVOICE SUBMITTED	INVOICE PAYMENT DATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

16. REPORT FORMS....Continued

**MONTHLY VEHICLE STATUS REPORT**

**FMVSS 210**

**DATE OF REPORT: \_\_\_\_\_**

No.	VEHICLE NHTSA No., MAKE & MODEL	DATE OF DELIVERY	TEST COMPLETE DATE	VEHICLE SHIPMENT DATE	CONDITION OF VEHICLE
1					
2					
3					
4					
5					
6					
7					
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9					
10					
11					
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13					
14					
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20					

## APPENDIX A

### MOTOR VEHICLE SAFETY STANDARD NO. 210 Seat Belt Assembly Anchorages — Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (Docket No. 2-14; Notice No. 4)

#### S1. PURPOSE AND SCOPE

This standard establishes requirements for seat belt assembly anchorages to insure their proper location for effective occupant restraint and to reduce the likelihood of their failure.

#### S2. APPLICATION

This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

#### S3. DEFINITION

Seat belt anchorage means any component, other than the webbing or straps, involved in transferring seat belt loads to the vehicle structure, including, but not limited to, the attachment hardware, seat frames, seat pedestals, the vehicle structure itself, and any part of the vehicle whose failure causes separation of the belt from the vehicle structure.

#### S4. REQUIREMENTS

##### S4.1 Type

- S4.1.1 Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each forward-facing outboard designated seating position in passenger cars, other than convertibles, and for each designated seating position for which a Type 2 seat belt assembly is required by Standard No. 208 (49 CFR 571.208) in vehicles other than passenger cars. Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each rear forward facing outboard-designated seating position in convertible passenger cars manufactured on or after September 1, 1991.
- S4.1.2 Seat belt anchorages for a Type 1 or a Type 2 seat belt assembly shall be installed for each designated seating position, except a passenger seat in a bus or a designated seating position for which seat belt anchorages for a Type 2 seat belt assembly are required by S4.1.1.
- S4.1.3 (a) Notwithstanding the requirement of S4.1.1, each vehicle manufactured on or after September 1, 1987, that is equipped with an automatic restraint at the front right outboard-designated seating

## APPENDIX A...Continued

position, which automatic restraint cannot be used for securing a child restraint system solely through the use of attachment hardware installed as an item of original equipment by the vehicle manufacturer shall have, at the manufacturer's option, either anchorages for a Type 1 seat belt assembly installed at that position or a Type 1 or Type 2 seat belt assembly installed at the position. If a manufacturer elects to install anchorages for a Type 1 seat belt assembly to comply with this requirement, those anchorages shall consist of, at a minimum, holes threaded to accept bolts complying with S4.1(f) of Standard No. 209 (49 CFR 571.209).

- (b) The requirement in S4.1.1 and S4.1.2 of this standard that seat belt anchorages for a Type 1 or a Type 2 seat belt assembly shall be installed for certain designated seating positions does not apply to any such seating positions that are equipped with a seat belt assembly that meets the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR 571.208).

### S4.2 Strength

- S4.2.1 Except as provided in S4.2.5, and except for side-facing seats, the anchorages, attachment hardware, and attachment bolts for any of the following seat belt assemblies shall withstand a 5,000-pound force when tested in accordance with S5.1 of this standard
  - (a) Type 1 seat belt assembly;
  - (b) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is voluntarily installed at a seating position; and
  - (c) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is equipped with a detachable upper torso belt.
- S4.2.2 Except as provided in S4.2.5, the anchorages, attachment hardware, and attachment bolts for all Type 2 and automatic seat belt assemblies that are installed to comply with Standard No. 208 (49 CFR 571.208) shall withstand 3,000 pound forces when tested in accordance with S5.2.
- S4.2.3 Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for the specified time.
- S4.2.4 Anchorages, attachment hardware, and attachment bolts shall be tested by simultaneously loading them in accordance with the applicable procedures set forth in S5 of this standard if the anchorages are either

**APPENDIX A...Continued**

- (a) For designated seating positions that are common to the same occupant seat and that face in the same direction; or
- (b) For laterally adjacent designated seating positions that are not common to the same occupant seat, but that face in the same direction, if the vertical centerline of the bolt hole for at least one of the anchorages for one of those designated seating positions is within 12 inches of the vertical centerline of the bolt hole for an anchorage for one of the adjacent seating positions.

S4.2.5 The attachment hardware of a seat belt assembly, which is subject to the requirements of S5.1 of Standard No. 208 (49 CFR 571.208) by virtue of any provision of Standard No. 208 (49 CFR 571.208) by virtue of any provision of Standard No. 208 other than S4.1.2.1(c)(2) of that standard, does not have to meet the requirements of S4.2.1 and S4.2.2 of this standard.

### S4.3 Location

As used in this section, "forward" means in the direction in which the seat faces, and other directional references are to be interpreted accordingly. Anchorages for seat belt assemblies that meet the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR Part 571.208) are exempt from the location requirements of this section.

S4.3.1 Seat belt anchorages for Type 1 seat belt assemblies and the pelvic portion of Type 2 seat belt assemblies.

- S4.3.1.1 In an installation in which the seat belt does not bear upon the seat frame —
- (a) If the seat is a nonadjustable seat, then a line from the seating reference point to the nearest contact point of the belt with the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.
  - (b) If the seat is an adjustable seat, then a line from a point 2.50 inches forward of and 0.375 inch above the seating reference point to the nearest contact point of the belt with the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

S4.3.1.2 In an installation in which the belt bears upon the seat frame, the seat belt anchorage, if not on the seat structure, shall be aft of the rearmost belt contact point on the seat frame with the seat in the rearmost position. The line from the seating reference point to the nearest belt contact point on the seat frame, with the seat positioned at the seating reference point, shall extend forward from that contact point at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

**APPENDIX A....Continued**

- S4.3.1.3 In an installation in which the seat belt attaches to the seat structure, the line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the seat structure shall extend forward from that contact point at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.
- S4.3.1.4 Anchorages for an individual seat belt assembly shall be located at least 6.50 inches apart laterally, measured between the vertical centerline of the bolt holes [or, for designs using another means of attachment to the vehicle structure, between the centroid of such means. (57 F.R. 32902 July 24, 1992. Effective: September 1, 1993.)
- S4.3.1.5 Notwithstanding the provisions of S4.3.1.1 through S4.3.1.4, the lap belt angle for seats behind the front row of seats shall be between 20 degrees and 75 degrees for vehicles manufactured between September 1, 1992 and September 1, 1993.
- S4.3.2 Seat belt anchorages for the upper torso portion of Type 2 seat belt assemblies. Adjust the seat to its full rearward and downward position and adjust the seat back to its most upright position. With the seat and seat back so positioned, as specified by subsection (a) or (b) of this section, the upper end of the upper torso restraint shall be located within the acceptable range shown in Figure 1, with reference to a two-dimensional drafting template described in SAE Recommended Practice J826 (May 1987). The template's "H" point shall be at the design "H" point of the seat for its full rearward and full downward position, as defined in SAE Recommended Practice J1100 (June 1984), and the template's torso line shall be at the same angle from the vertical as the seat back.
- (a) For fixed anchorages, compliance with this section shall be determined at the vertical centerline of the boltholes or, for designs using another means of attachment to the vehicle structure, at the centroid of such means.
  - (b) For adjustable anchorages, compliance with this section shall be determined at the midpoint of the range of all adjustment positions. (57 F.R. 32902 July 24, 1992. Effective: September 1, 1993.)

**S5. TEST PROCEDURES**

Each vehicle shall meet the requirements of S4.2 of this standard when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range.

## APPENDIX A...Continued

For the testing specified in these procedures, the anchorage shall be connected to material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position. The geometry of the attachment duplicates the geometry, at the initiation of the test, of the attachment of the originally installed seat belt assembly.

### LOCATION OF ANCHORAGE FOR UPPER TORSO RESTRAINT

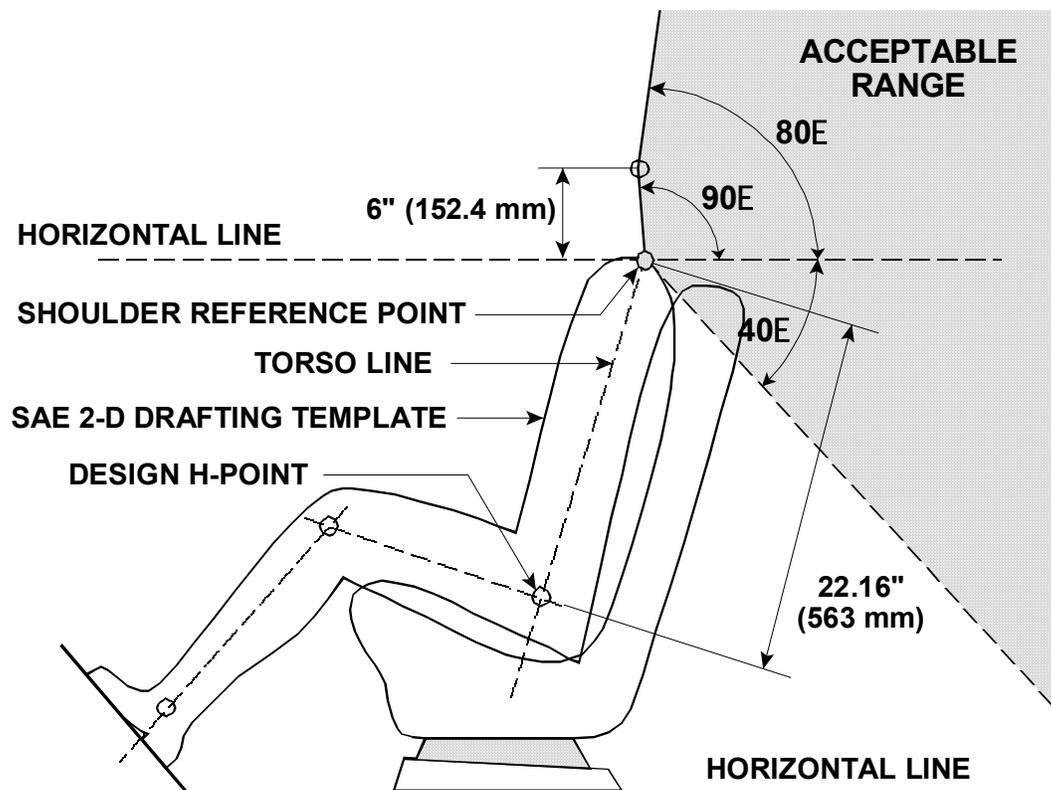


FIGURE 1

#### S5.1 Seats with Type 1 or Type 2 Seat Belt Anchorages

With the seat in its rearmost position, apply a force of 5,000 pounds in the direction in which the seat faces to a pelvic body block as described in Figure 2A, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the force at the onset rate of not more than 50,000 pounds per second. Attain the 5,000-pound force in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

**APPENDIX A...Continued**

**S5.2 Seats with Type 2 Seat Belt Anchorages**

With the seat in its rearmost position, apply forces of 3,000 pounds in the direction in which the seat faces simultaneously to a pelvic body block, as

**BODY BLOCK FOR LAP BELT ANCHORAGE**

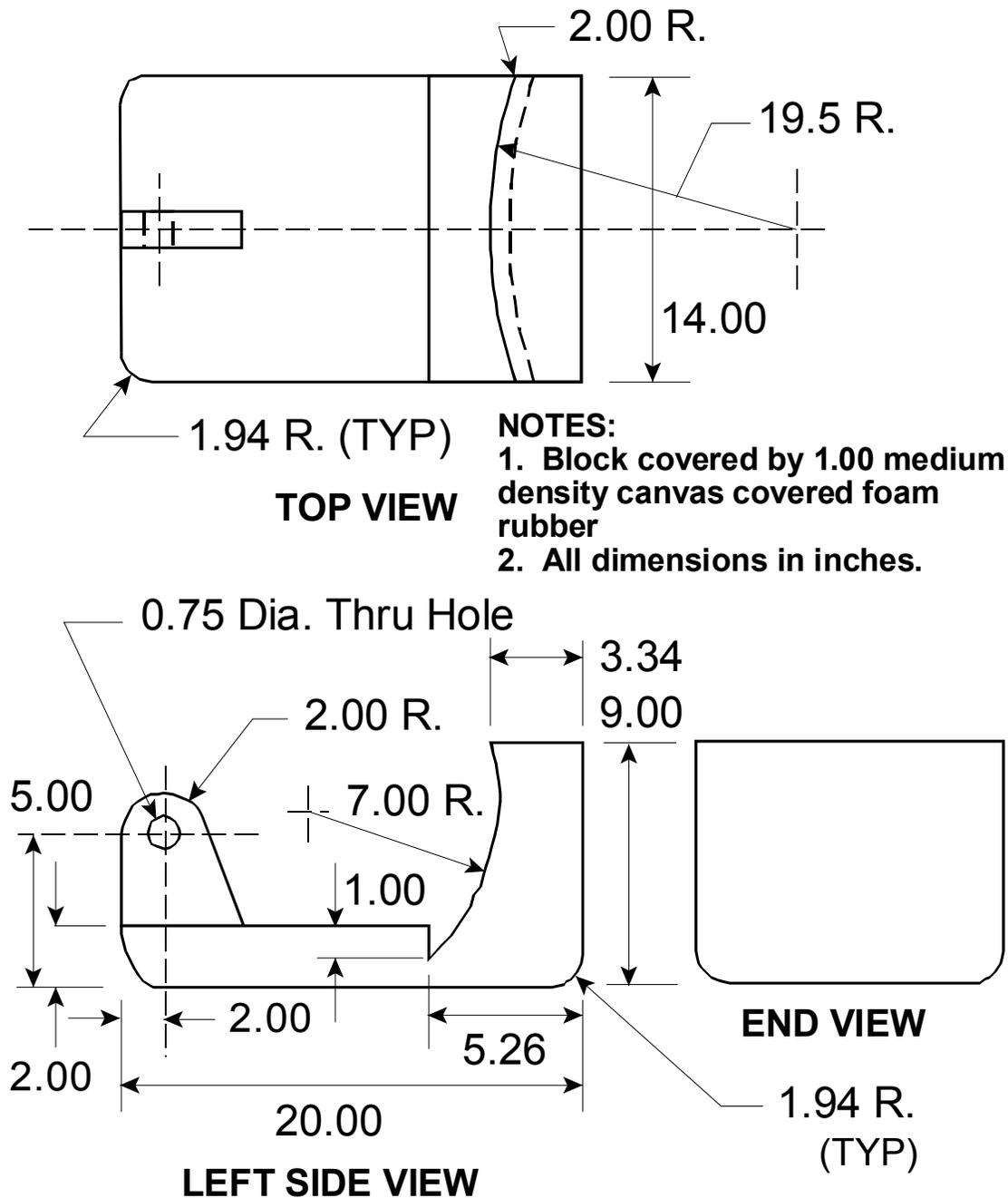


FIGURE 2A

## OPTIONAL BODY BLOCK FOR CENTER SEATING POSITIONS

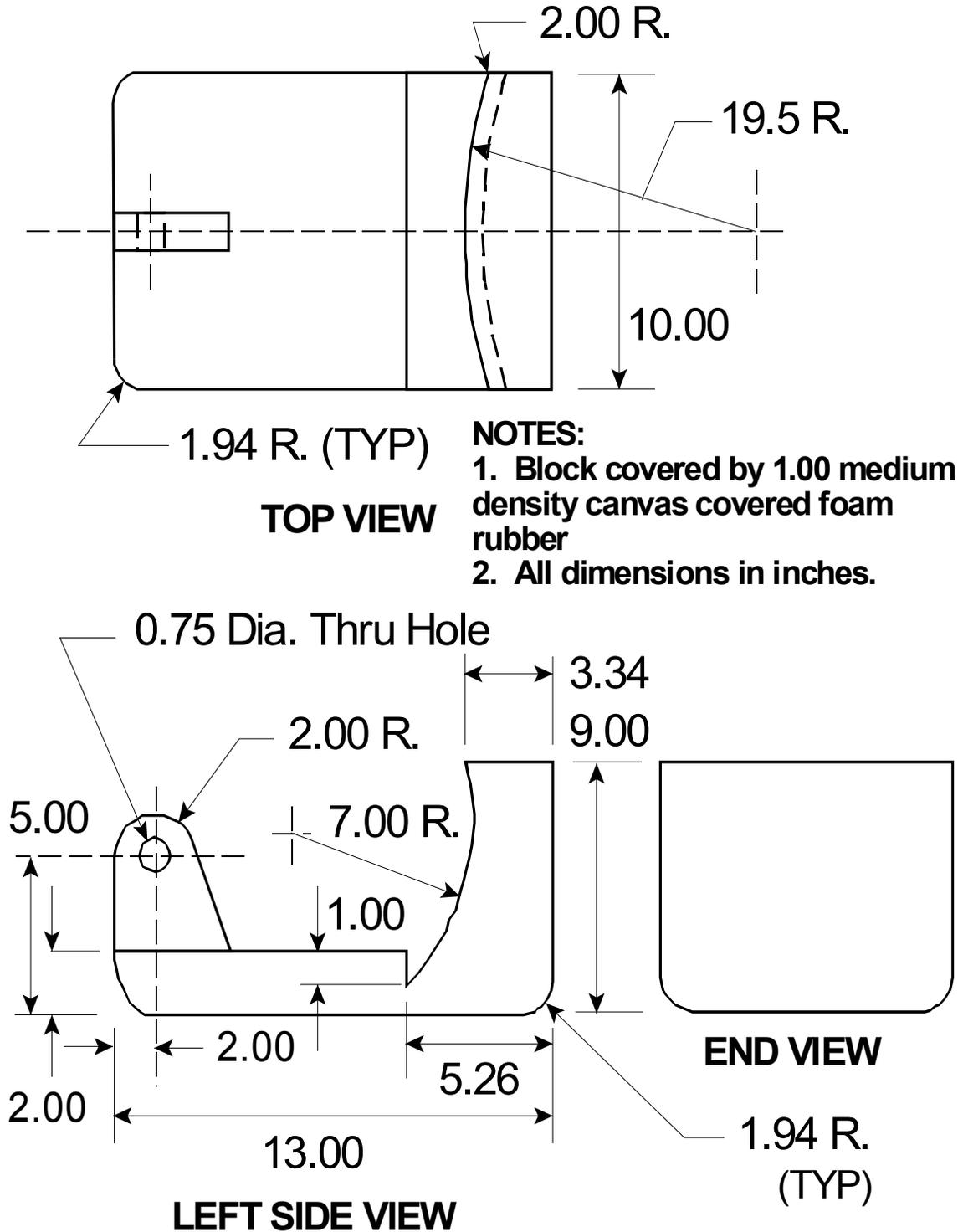


FIGURE 2B

## APPENDIX A....Continued

described in Figures 2A, and an upper torso body block, as described in Figure 3, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000-pound forces in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

### S6. OWNER'S MANUAL INFORMATION

The owner's manual in each vehicle with GVWR of 10,000 pounds or less, manufactured after September 1, 1987, shall include —

- (a) A section explaining that all child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. The section shall also explain that children could be endangered in a crash if their child restraints are not properly secured in the vehicle.
- (b) In a vehicle with rear designated seating positions, a statement alerting vehicle owners that, according to accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
- (c) In each passenger car, a diagram or diagrams showing the location of the shoulder belt anchorages required by this standard for the rear outboard designated seating positions, if shoulder belts are not installed as items of original equipment by the vehicle manufacturer at those positions.

### S7. INSTALLATION INSTRUCTIONS

The owner's manual in each vehicle manufactured on or after September 1, 1987, with an automatic restraint at the front right outboard designated seating position that cannot be used to secure a child restraint system when the automatic restraint is adjusted to meet the performance requirements of S5.1 of Standard No. 208 shall have —

- (a) A statement that the automatic restraint at the front right outboard designated seating position cannot be used to secure a child restraint and as appropriate, one of the following three statements —
  - (1) A statement that the automatic restraint at the front right outboard

**APPENDIX A....Continued**

designated seating position can be adjusted to secure a child restraint system using attachment hardware installed as original equipment by the vehicle manufacturer;

- (2) A statement that anchorages for installation of a lap belt to secure a child restraint system have been provided at the front right outboard designated seating position; or
  - (3) A statement that a lap or manual lap or lap/shoulder belt has been installed by the vehicle manufacturer at the front right outboard designated seating position to secure a child restraint.
- (b) In each vehicle in which a lap or lap/shoulder belt is not installed at the front right outboard designated seating position as an item of original equipment, but the automatic restraint at that position can be adjusted by the vehicle owner to secure a child restraint system using an item or items of original equipment installed in the vehicle by the vehicle manufacturer, the owner's manual shall also have
- (1) A diagram or diagrams showing the location of the attachment hardware provided by the vehicle manufacturer.
  - (2) A step-by-step procedure with a diagram or diagrams showing how to modify the automatic restraint system to secure a child restraint system. The instructions shall explain the proper routing of the attachment hardware.
- (c) In each vehicle in which the automatic restraint at the front right outboard designated seating position cannot be modified to secure a child restraint system using attachment hardware installed as an original equipment by the vehicle manufacturer and a manual lap or lap/shoulder belt is not installed as an item of original equipment by the vehicle manufacturer, the owner's manual shall also have —
- (1) A diagram or diagrams showing the locations of the lap belt anchorages for the front right outboard designated seating position.
  - (2) A step-by-step procedure and a diagram or diagrams for installing the proper lap belt anchorage hardware and a Type 1 lap belt at the front right outboard designated seating position. The instructions shall explain the proper routing of the seat belt assembly and the seat belt attachment of the assembly to the lap belt anchorages. H

**APPENDIX B**  
**MOTOR VEHICLE SEAT BELT ANCHORAGES — DESIGN RECOMMENDATIONS**  
**SAE J383 APR86**  
**SAE Recommended Practice**

**1. SCOPE**

This SAE Recommended Practice specifies design recommendations for location of seat belt assembly anchorages. It applies to seat belt anchorages attached to vehicle structure or installed to seat assemblies in the vehicle (this SAE Recommended Practice supersedes the Design Section of SAE J787b). Test Procedures and Performance Requirements are specified in SAE J384, Motor Vehicle Seat Belt Anchorages — Test Procedure, and SAE J385, Motor Vehicle Seat Belt Anchorages — Performance Requirements, respectively.

**2. DEFINITIONS**

**2.1 ANCHORAGE**

The final point of attachment for transferring seat belt assembly loads to the vehicle structure.

**2.2 SEATING REFERENCE POINT (SRP)**

The Design H-Point with the seat in the rearmost, lowest normal design position. (The "Design H-Point" has coordinates relative to the design vehicle structure. It is located at the H-Point of the two-dimensional drafting template placed in any designated seating position (DSP).)

**2.3 SHOULDER REFERENCE POINT (SRP)**

A point 22.16 inches (563 mm) above the "H" Point along the torso centerline of the two-dimensional drafting template described in SAE J826. This dimension added to the dimension of 3.84 inches (97.5 mm) from the "H" Point to the buttocks flesh line and an angular relationship of 90 degrees between the torso and thigh segment of the two-dimensional drafting template has been indicated to represent 99 percent of the male driver population.

**2.4 ATTACHMENT HARDWARE**

Any or all hardware designed for securing a seat belt assembly to the anchorage(s) in a motor vehicle.

**2.5 SEAT BELT ASSEMBLY**

Any strap, webbing, or similar device designed to secure a person in a motor vehicle with the intention of minimizing the risk of bodily harm in an accident,

## **APPENDIX B...Continued**

including all buckles, adjusting mechanism, fasteners, and related hardware. This SAE Recommended Practice covers anchorages for the following types of assemblies:

Type 1 — Pelvic restrain belt (lap belt).

Type 2 — Combination of pelvic (lap) and upper torso (shoulder) restraints belts.

Type 2a — Upper torso (shoulder) restraint for use only in conjunction with a pelvic restraint (lap) belt as a Type 2 seat belt assembly.

### **2.6 BELT CONTACT POINT**

The point where the seat belt webbing's longitudinal centerline would make contact with the load bearing member of the seat structure, body structure, retractor hardware (or webbing wound on the spool of a retractor), or attachment hardware such as a swivel plate which may be bolted to the seat belt anchorage. The components on which belt contact point is located must be capable of sustaining a load that might be imposed by the webbing of a seat belt assembly.

### **2.7 BELT ANGLE REFERENCE POINT**

The point 2.50 inches (63.5 mm) forward of and 0.375 inches (9.5 mm) above the seating reference point (SRP).

## **3. GENERAL**

### **3.1 INSTALLATION AND REPLACEMENT**

Anchorage shall permit seat belt assemblies to be readily installed or replaced, and shall comply with the strength requirements of SAE J385.

### **3.2 COMMON ANCHORAGE(S)**

A common anchorage point may be used for more than one belt end, provided it meets the pertinent requirements of paragraph 4.4 and SAE J385. The location of the lower anchorage(s) of the upper torso restraint may be common with the pelvic restraint anchorage(s).

## **4. LOCATION OF PELVIC RESTRAINT ANCHORAGES**

### **4.1 PELVIC RESTRAINT ANGLE GUIDELINES**

Many factors affect the preferred more vertical pelvic restraint belt angle, which is

## APPENDIX B...Continued

basically intended to prevent the lap belt from sliding over the iliac crest during the forward and downward movement of the restrained individual.

Ideally, component tests, sled tests or vehicle crash tests should be run, utilizing a test device containing a humanlike ilium with appropriate "soft tissue" damping in relation to the spine and femur along with humanlike abdominal contents, to determine the preferred pelvic restraint belt angle which is influenced by any or all of the following factors:

- (a) Seat cushion compression and/or seat deflection
- (b) Seat cushion angle and seat back angle
- (c) Proximity of "hard" vehicle structures in front of the restrained occupant
- (d) Initial length and elongation characteristics of belt webbing
- (e) Type of restraint system
- (f) Presence or absence of upper torso restraint belt
- (g) Placement of upper torso restraint anchorage
- (h) Stiffness of components or structures on which are found the belt contact points

In the absence of component tests, sled tests or vehicle crash tests, a more vertical pelvic restraint belt angle is preferred and should be selected within the range of 20 to 75 degrees from the horizontal.

### 4.2 ANCHORAGES ON VEHICLE STRUCTURE FOR PELVIC RESTRAINT BELTS

#### 4.2.1 MOVABLE SEATS

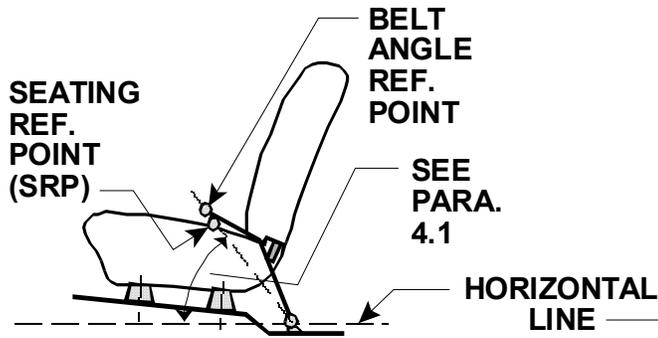
The location of anchorages for occupants of seats, which are adjustable or movable in the fore and aft direction and in which the belt passes outside of the seat or through, the seat cushions shall be as follows:

A line from the belt contact point to the belt angle reference point 2.50 inches (63.5 mm) forward of and 0.375 inches (9.5 mm) above the seating reference point (SRP) will form an angle as determined from the guidelines in paragraph 4.1 and as shown in Figure 1.

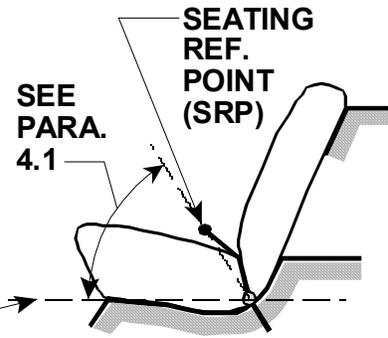
#### 4.2.2 FIXED SEATS

The location of anchorages for occupants of fixed seats in which the belt passes outside the seat or through the seat springs shall be as follows:

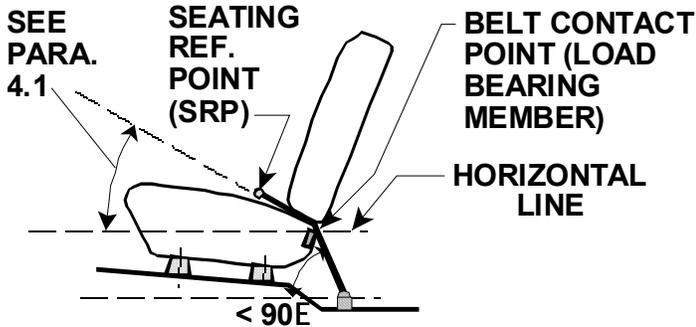
A line from the belt contact point to the seating reference point (SRP) will form an angle as determined from the guidelines in paragraph 4.1 and as shown in Figure 2.



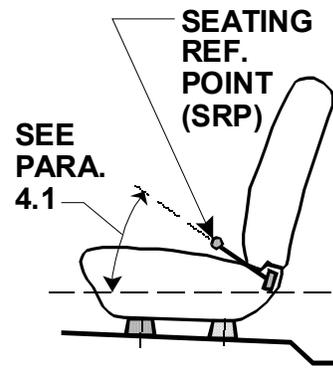
**FIG. 1 - BELT OUTSIDE SEAT OR THROUGH SEAT SPRINGS SEAT CROSS BAR**



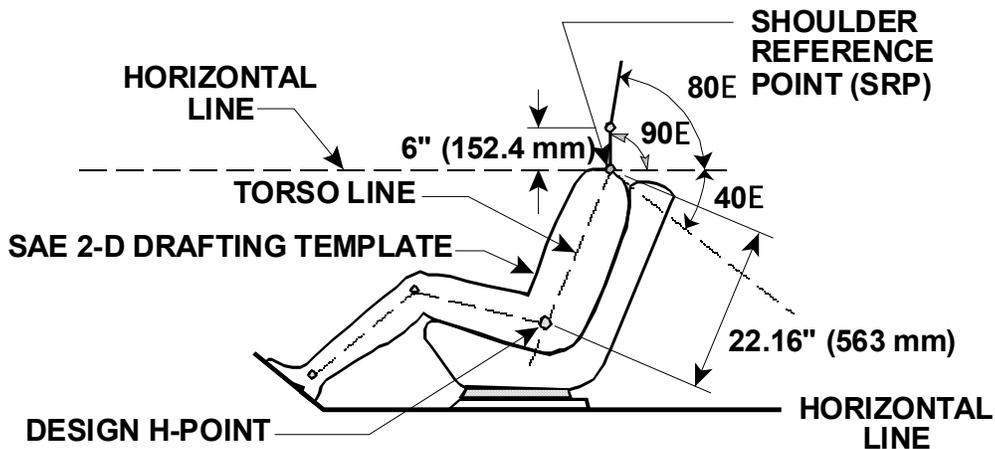
**FIG. 2 - REAR SEAT BELT INSTALLATION**



**FIG. 3 - BELT OVER SEAT CROSS BAR**



**FIG. 4 - BELT ATTACHED TO SEAT FRAME**



**FIG. 5 - UPPER TORSO RESTRAINT**

## **APPENDIX B...Continued**

### **4.2.3 SEAT BELT ROUTING TO ANCHORAGE**

In the side view where a direct belt routing is interrupted by intervening load bearing member (refer to Belt Contact Point definition in paragraph 2.6) the anchorage shall not be located forward of the rearmost point at which the webbing passes over that intervening member. Movable seats should be measured in the rearmost normal position. See Figure 3.

### **4.3 ANCHORAGES ON SEAT STRUCTURE FOR PELVIC RESTRAINT BELTS**

The location of anchorages for occupants of seats in which the belts are anchored to seat structure shall be as follows:

A line from the belt contact point to the seating reference point (SRP) will form an angle as determined from the guidelines in paragraph 4.1 and as shown in Figure 4.

### **4.4 LATERAL LOCATION FOR ALL PELVIC RESTRAINT BELTS**

Anchorage for any individual pelvic restraint belt assembly shall be located at least 6.5 inches (165.1 mm) apart and preferably shall be placed equidistant from the longitudinal centerline of the designated seating position (DSP) unless intervening load bearing members provide the spacing desired.

## **5. LOCATION OF UPPER TORSO RESTRAINT ANCHORAGES**

### **5.1 SIDE VIEW LOCATION**

With the seat in its full rearward and downward position and the seatback in its most upright design position, the upper anchorage(s) shall be longitudinally in line with, or rearward of, a line extending 6 inches (152.4 mm) vertically above the shoulder reference point (SRP) and then extending rearward at an angle of 80 degrees above the horizontal (see Figure 5). If there is a downward angle of the belt, passing from the shoulder reference point (SRP) to an anchorage or over suitable structure to an anchorage, this anchorage shall be (on or) above a line extending rearward and 40 degrees below the horizontal.

### **5.2 FRONT VIEW LOCATION**

The upper torso restraint anchorage shall be positioned to minimize contact of the seat belt assembly with the neck and avoid it sliding off the shoulder of the occupant in a reasonably erect position.

**APPENDIX B....Continued****6. CORROSION PROTECTION**

Design consideration shall be given to providing protection from corrosion for the seat belt anchorage(s) and the adjacent body structure. Special consideration shall be given to that portion or portions of the structure, which must sustain the anchorage test loads. The degree or type of protection required will be determined by the location of the anchorage(s) in the vehicle structure, the amount of exposure to corrosive elements, the configuration of the structure (if configuration may tend to induce corrosion). and the thickness of the supportive structure.