

ENGINEERING CHANGE PROPOSAL

Revision K
Hybrid III 5th Percentile Female Test Dummy
Part 572, Subpart O

Changes to:
Parts List
Engineering Drawing Package
Procedure for the Assembly, Disassembly, and Inspection (PADI)
Subpart O Regulatory Text

National Highway Traffic Safety Administration

November 2019

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OVERVIEW OF REVISION K

This document identifies revisions to the parts list, engineering drawing package, and procedures for the assembly, disassembly, and inspection (PADI) referenced by 49 CFR § 572 Subpart O, Hybrid III Fifth Percentile Adult Female Crash Test Dummy (HIII-5F), Alpha Version (2002) incorporated by reference in § 572.131. Three separate revisions are described:

I. Spine box revision. The revision to the spine box consists of the specification of new bolts to fasten the box to the lumbar. The new bolts eliminate a source of signal noise caused by the old fasteners, which could become loose and rattle within the spine box.

II. Jacket revision. This revision implements a new design of the zippered jacket covering the dummy's rib cage. The foam-filled vinyl jacket has an outer contour that mimics a female human's chest, including breasts. New drawings and specifications assure uniformity in the production of new jackets.

III. Revisions to the regulatory text. No changes to the Subpart O regulatory text are needed to incorporate the spine box and jacket revisions. However, minor changes to the regulatory text have been implemented to improve the overall clarity of Subpart O. These are essentially "housekeeping" changes. They do not affect the performance requirements of the dummy.

The changes associated with each revision are described herein.

HIII-5F Specifications

The HIII-5F is specified in 49 CFR Part 572 Subpart O. This publication contains regulatory text describing the qualification procedures and requirements for the dummy. Subpart O also incorporates several other documents by reference. Those documents describe the physical make-up of the dummy, and include a parts list, a set of engineering drawings, and a document entitled, "Procedures for Assembly, Disassembly, and Inspection" (PADI). The current revisions of these references reside in docket folder NHTSA-2000-6940 found on www.regulations.gov.

The full document titles and document numbers are:

- Parts List, Part 572 Subpart O Hybrid III Fifth Percentile Small Adult Female Crash Test Dummy, June 2002, NHTSA-2000-6940, document no. 0015. The current revision level is Revision J.
- Procedures for Assembly, Disassembly, and Inspection (PADI) of the Hybrid III 5th Percentile Adult Female Crash Test Dummy (HIII-5F), Alpha Version, June 2002, NHTSA-2000-6940, document no. 0014.
- Drawings, Part 572 Subpart O Hybrid III Fifth Percentile Small Adult Female Crash Test Dummy, Revision J, June 2002, NHTSA-2000-6940, document nos. 0016 and 0017.

I. SPINE BOX REVISION

I.1. Changes to the Engineering Drawing Package and Parts List.

a. New drawings added.

The following engineering part and assembly drawings describe new parts associated with the revised spine box. These are entirely new drawings, not revisions to existing drawings, and do not appear in the current set of Subpart O drawings. They will be added to the drawing package.

880105-1045, Rev C, Hybrid III 5th Female Thoracic Spine Upgrade, Sheets 1-3.

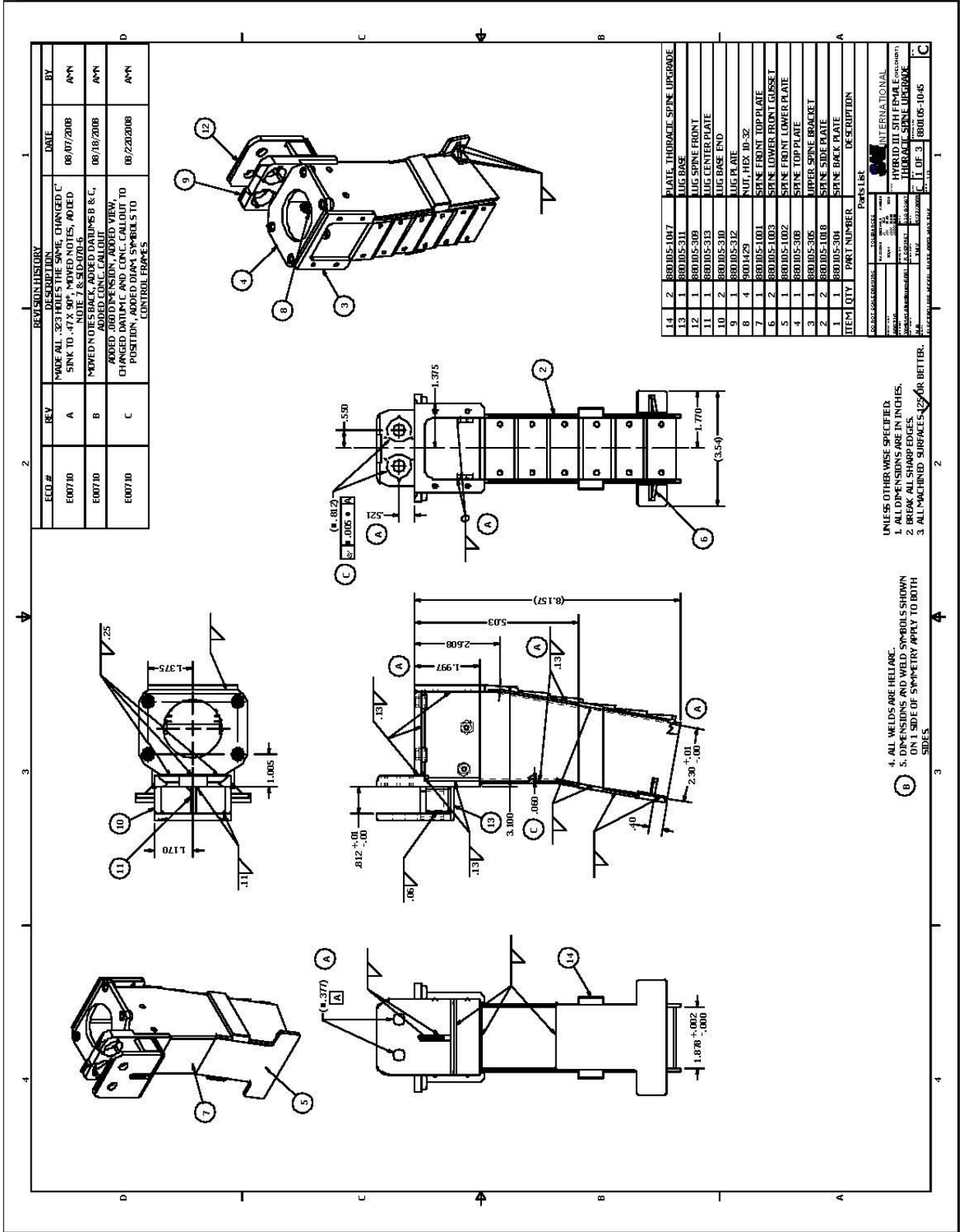
880105-1047, HIII-5F Plate, Thoracic Spine Upgrade

SID-070-6, Rev B, DOT-SID, Modified 5/16-18x5/8" SHCS

The first drawing (three sheets) is an assembly drawing of the revised spine box (880105-1045). Item 14 on Sheet 1 calls out a new plate (880105-1047) with countersunk holes. Item 5 on Sheet 3 calls out a longer bolt (5/8" vs 1/2") that extends through the new plate and threads into the existing adapter assembly (880105-1085), sometimes referred to as the spine tower. All three drawings are derived from the reprints of SAE J2915 (Aug 2011) shown on pages 3-7.

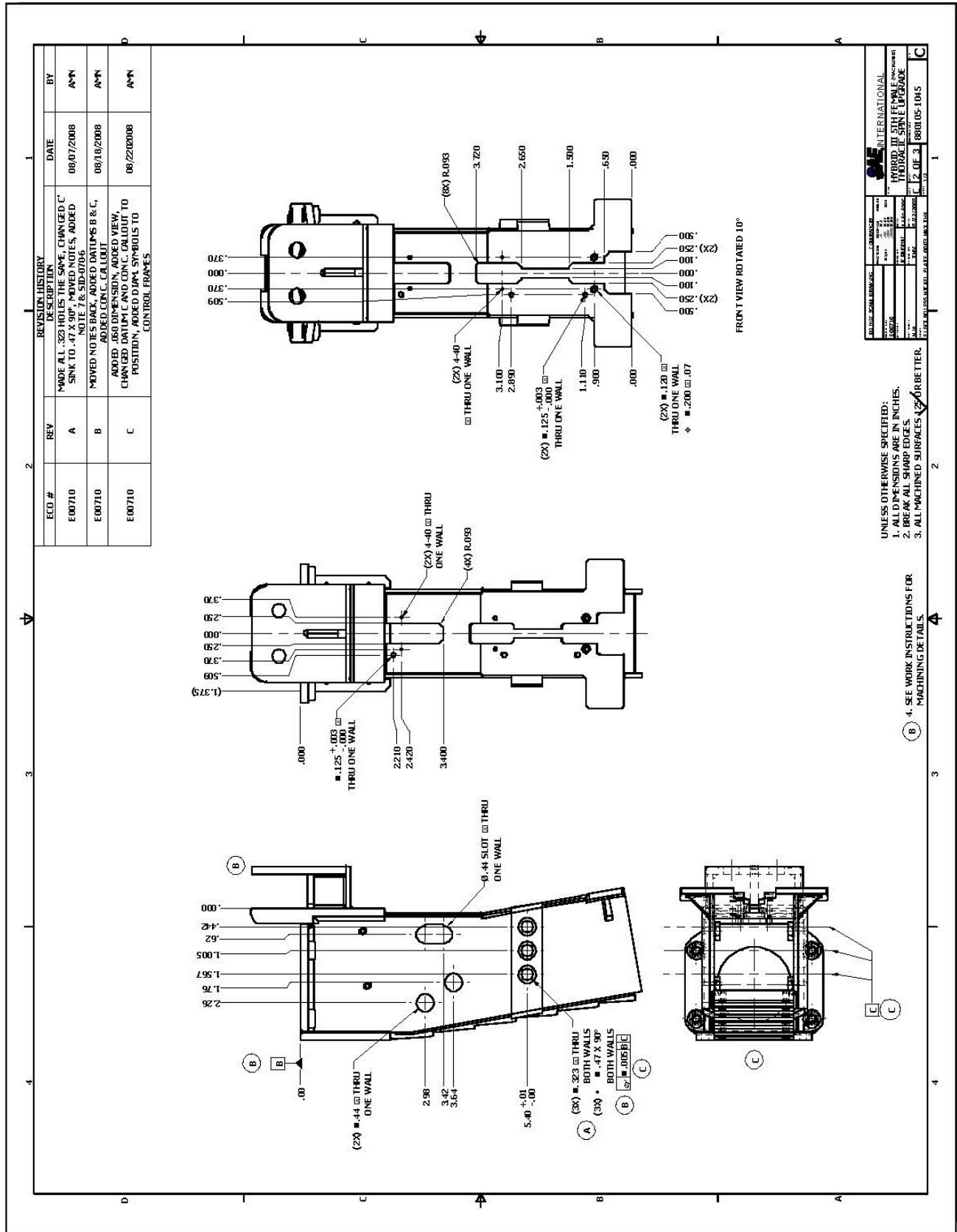
The 5/16-inch bolt is also used on the lumbar spine of the Subpart F Side Impact Dummy. It is modified from a standard socket head bolt by machining a 45-degree taper on the head. In the Subpart F engineering drawings, it is called out within a parts list of several modified socket head bolts. Herein, a separate engineering drawing of the modified bolt is included for added clarity.

NEW DRAWING



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NEW DRAWING



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NEW DRAWING

ECO #	REV	REVISION HISTORY	DATE	BY
E00710	A	MADE ALL 3/27 HOLES THE SAME, CHANGED 'C' SINK TO .474 HOLES, ADDED DIMS TO .474 HOLES, ADDED DIMS TO .474 HOLES, ADDED DIMS TO .474 HOLES	08/07/2008	AMN
E00710	B	MOVED NOTES BACK, ADDED DATUMS B & C, ADDED CONC. CALLOUT	08/18/2008	AMN
E00710	C	ADDED .060 DIMENSION, ADDED VIEW, CHANGED DATUM C, AND CONC. CALLOUT TO POSITION, ADDED DIMM SYMBOLS TO CONTROL FRAMES	08/22/2008	AMN

LOCATE STOP FLUSH WITH METAL EDGES. SEE NOTES 4 AND 5 BEFORE GLUING.

FLUSH TYP.

SEAT FLUSH WITH THIS EDGE AND CENTERED ON PART WITH BEVEL OF STOP FACING AS SHOWN. SEE NOTES 4 AND 5 BEFORE GLUING.

(2X) .13 SEE NOTE 4

PRESS IN FLUSH WITH SURFACE WITH SURFACE SEE NOTE 4

TORQUE SCREWS TO 28 Nm (250 LBF-IN)

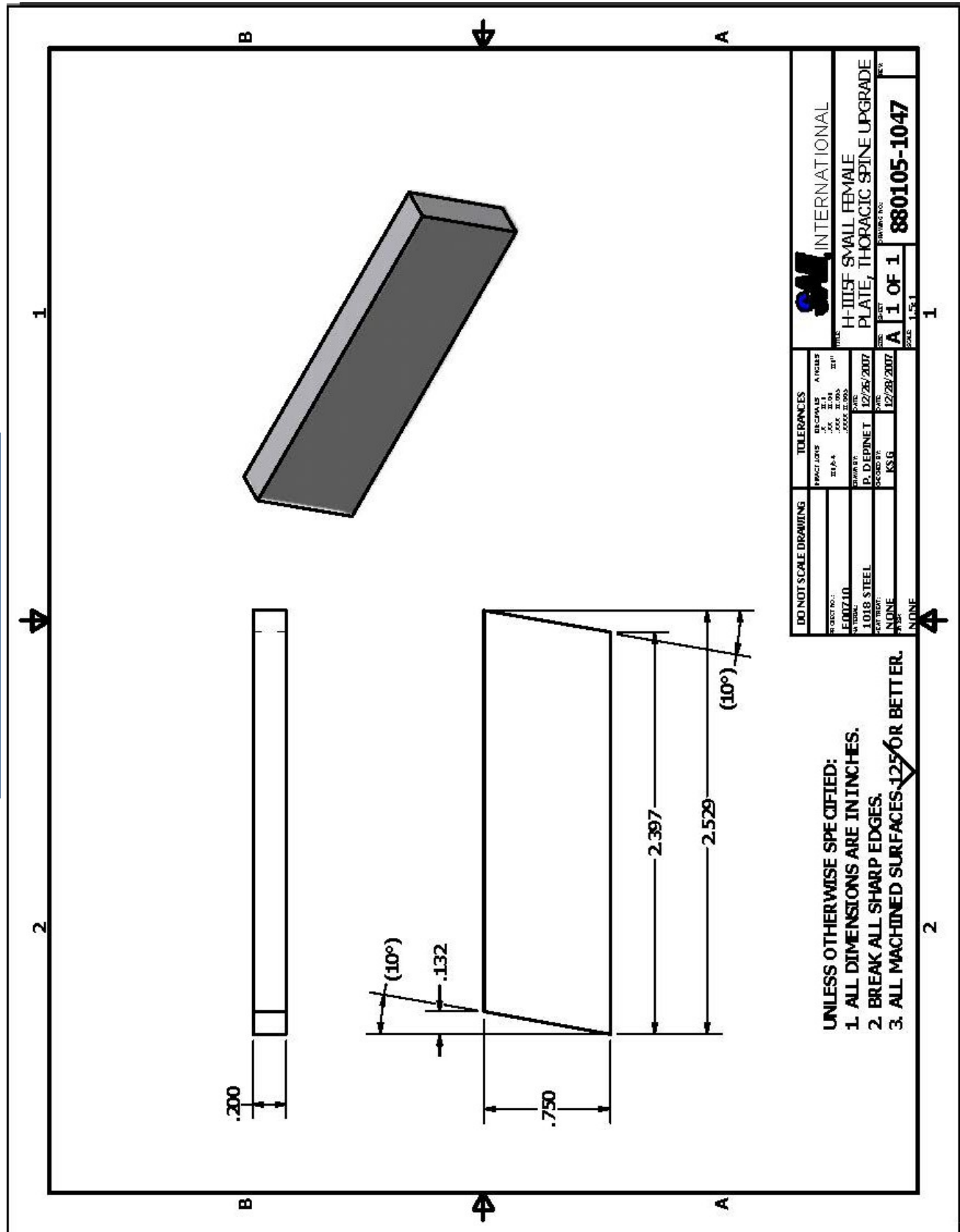
ITEM	QTY	PART NUMBER	DESCRIPTION
5	6	SID-070-6	SCREW, SHCS, S16-18 X .58" MODIFIED
4	6	8000046	FIN DOBEL 1.8 X 3/8
3	1	8001423	FIN DOBEL 1.8 X 1/4
2	1	880105-1090	FRONT SPINE URETHANE SHEET
1	4	78051-3	STOP, STERNUM

UNLESS OTHERWISE SPECIFIED:

- ALL DIMENSIONS ARE IN INCHES.
- BREAK ALL SHARP EDGES.
- ALL MACHINED SURFACES OR BETTER.
- LOCITITE 411 ADHESIVE.

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NEW DRAWING

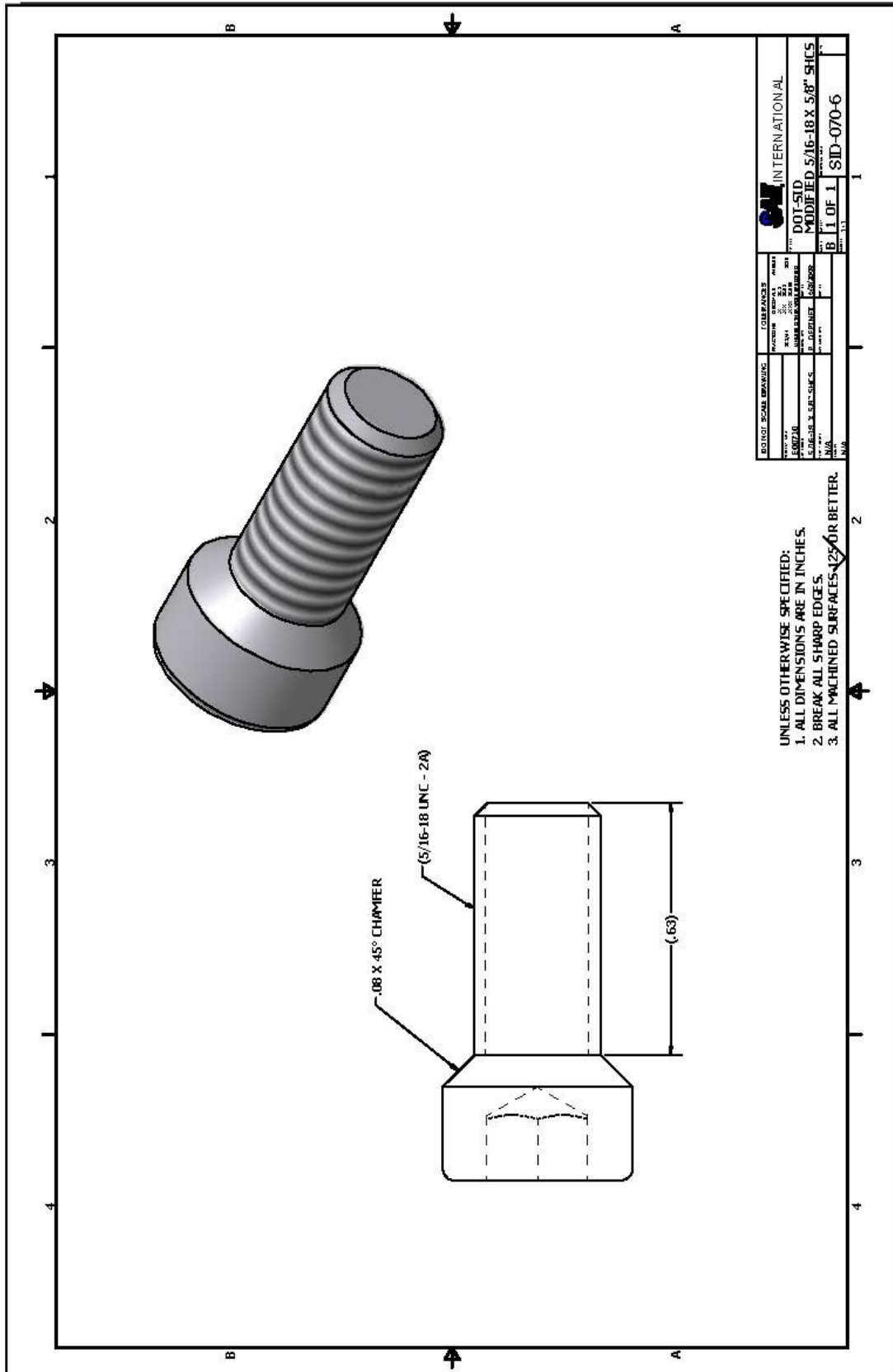


DO NOT SCALE DRAWING		TOLERANCES		SAE INTERNATIONAL	
FRAC. UNITS	DECIMALS	ANGLES	FRAC. UNITS	DECIMALS	ANGLES
1/16"	.001"	1/16°	1/16"	.001"	1/16°
1/32"	.0005"	1/32°	1/32"	.0005"	1/32°
1/64"	.00025"	1/64°	1/64"	.00025"	1/64°
1/128"	.000125"	1/128°	1/128"	.000125"	1/128°
DESIGNER: EDZJLO		DATE: 12/28/2007		PART NO: H-III5F SMALL FEMALE	
DRAWN BY: P. DEPINNET		DATE: 12/28/2007		PLATE, THORACIC SPINE UPGRADE	
CHECKED BY: NONE		DATE: 12/28/2007		DRAWING NO: 880105-1047	
MATERIAL: 1018 STEEL		SCALE: 1:1		SHEET: A	
FINISH: NONE		TOTAL SHEETS: 1		OF 1	

- UNLESS OTHERWISE SPECIFIED:
1. ALL DIMENSIONS ARE IN INCHES.
 2. BREAK ALL SHARP EDGES.
 3. ALL MACHINED SURFACES 12.5 OR BETTER.

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NEW DRAWING



SAE INTERNATIONAL	
DOT-SID MODIFIED 5/16-18 X 5/8" SHCS	
B 1 OF 1 SID-070-6	
EDITION	DATE
1.0	11/11
2.0	11/11
3.0	11/11
4.0	11/11
5.0	11/11
6.0	11/11
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94.0	11/11
95.0	11/11
96.0	11/11
97.0	11/11
98.0	11/11
99.0	11/11
100.0	11/11

- UNLESS OTHERWISE SPECIFIED:
1. ALL DIMENSIONS ARE IN INCHES.
 2. BREAK ALL SHARP EDGES.
 3. ALL MACHINED SURFACES $425 \mu\text{R}$ OR BETTER.

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b. Drawings revised.

The following drawings, contained within the current set of Subpart O drawings, include call-outs for parts used on the old spine box. The call-outs are changed to reflect new part numbers used on the revised spine box.

880105-300, Rev. J, Upper Torso Assembly.

Item 2, Thoracic Spine

Was: part no. 880105-1000

Now: part no. 880105-1045

Item 29, Screw, 5/16-18 SHCS

Was: part no. 9000489, SHCS, 5/16-18 x 1/2L

Now: part no. SID-070-6, Modified SHCS, 5/16-18 x 5/8L

The revision level for this drawing is updated to Rev. K.

SA572-S28, Rev. A, Thoracic Spine Load Cell.

Call-out for bolts in center of drawing.

Was: (6) 5/16-18 x 1/2 UNC

Now: (6) 5/16-18 x 5/8 Modified (Part No. SID-070-6)

The revision level for this drawing is updated to Rev. B.

REVISED DRAWING

REVISION RECORD	
ITEM NO.	DATE
A	6/6/02
REVISIONS: REVISED TOLERANCE FORMAT, CHANGED SINGLE DECIMAL PLACE TOLERANCE FROM ±0.1/2.54 TO ±0.1/2.5, AND ADDED MATERIAL NOTE, CHANGED OUTPUT A' CAPACITY FROM 1 mV/V MIN. TO 0.75 mV/V MIN., ADDED LENGTH TO WEIGHT INCLUDES NOTE.	

(6) 5/16-18 x 5/8 Modified (Part No. SID-070-6)

PART #880105-329
 CHEST/ACCELEROMETER MOUNTING BRACKET
 CABLE (2)
 THORACIC SPINE LOAD CELL REPLACES PART # 880105-328 LOAD CELL SIMULATOR
 1.125/28.6 NEUTRAL AXIS
 BOX T. LOAD CELL TO LUMBAR SPINE WITH (4) 5/16-18 x 1/2 UNC SOCKET HEAD CAP SCREWS TORQUE TO 750 LB-IN
 FULL LOAD CELL TO THORACIC SPINE WITH (4) 5/16-18 x 1/2 UNC SOCKET HEAD CAP SCREWS TORQUE TO 250 LB-IN

RELEASED

JUN. 10, 2002

NHTSA

UNITS ARE in/mm	TOLERANCES ARE: *	DECIMALS	ANGLES	WITHOUT SEE NOTES / A	SCALE NONE / A
		.XX	.001/7.5	NONE	NONE
		.XXX	+ 0.5	APPROX.	NONE
		.XXX	.0005/127	DATE	DATE
		* unless otherwise noted		DRAWN	DATE
				H. RITZ	A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION THORACIC SPINE LOAD CELL HYBRID III - 5th FEMALE DRAWING NUMBER: SA572-S28 SIZE: A REV: A	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION THORACIC SPINE LOAD CELL HYBRID III - 5th FEMALE DRAWING NUMBER: SA572-S28 SIZE: A REV: A
---	---

CAPACITY: 3000 lbs./1113.73 kg, 3000 lbs./1113.73 kg, 4000 lbs./1482.97 kg, 5000 lbs./1866.21 kg, 5000 lbs./1866.21 kg.

NONLINEARITY: <1% OF FULL SCALE
 CROSSLINEARITY: <5% OF FULL SCALE
 OUTPUT AT CAPACITY: 0.75 mV/V MIN.

WEIGHT: 1.50 lb./0.68 kg MAX.
 LENGTH INCLUDES APPROXIMATELY 8" OF CABLE LENGTH (EACH CABLE).
 SIGNAL OUTPUT MUST BE COMPATIBLE WITH AND RECORDED IN A DATA CHANNEL AS DEFINED BY SAE J211
 FREE AIR RESONANT FREQUENCY: MONKEY'S 5000 Hz MIN.

OPERATING TEMPERATURE: 0° TO 200° F
 THERMAL SENSITIVITY: (60° TO 80° F) 5% OF RADING / °

MATERIAL: THE LOAD BEARING STRUCTURE OF THE LOAD CELL, INCLUDING PROVISIONS FOR THE LOAD CELL MOUNTING, ARE OF METAL OR METAL ALLOYS. NON-LOAD BEARING PARTS OF THE LOAD CELL, INTERNALLY AND/OR EXTERNALLY, INCLUDING WIRING AND THEIR ATTACHMENTS, MAY BE MADE OF ANY MATERIAL PROVIDED THEY DO NOT INTERFERE WITH THE PERFORMANCE OF THE LOAD CELL OR THE TRANSMISSION OF THE LOAD CELL SIGNALS.

c. Drawing removed.

The following drawing is contained within the current set of Subpart O drawings. This drawing is the assembly drawing of the old spine box. It will be removed from the revised drawing package.

880105-1000, Rev E, Sheets 1-3, Thoracic spine box.

In the new spine box, 880105-1000 is replaced by 880105-1045.

DRAWING REMOVED

REVISIONS

REV	DATE	DESCRIPTION
1	8/19/93	ISSUE
2	8/19/93	ADD LUGS TO LOWER FRONT
3	8/19/93	ADD LUGS TO LOWER FRONT
4	11/14/97	ADD LOWER FRONT AND SPINE FRONT TOP PLATE
5	11/14/97	ADD SPINE, LOWER FRONT GUSSET
6	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)
7	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)
8	12-7-99	ADD (OPTIONAL) TO NOTE 4E

RELEASED
JAN 31 2000
NHTSA

RELEASE 12/21/99

DESCRIPTION

ITEM NO.	DESCRIPTION	QTY	UNIT
1	FRONT LOWER FRONT GUSSET	1	PC
2	FRONT LOWER FRONT GUSSET	1	PC
3	FRONT LOWER FRONT GUSSET	1	PC
4	FRONT LOWER FRONT GUSSET	1	PC
5	FRONT LOWER FRONT GUSSET	1	PC
6	FRONT LOWER FRONT GUSSET	1	PC
7	FRONT LOWER FRONT GUSSET	1	PC
8	FRONT LOWER FRONT GUSSET	1	PC
9	FRONT LOWER FRONT GUSSET	1	PC
10	FRONT LOWER FRONT GUSSET	1	PC
11	FRONT LOWER FRONT GUSSET	1	PC
12	FRONT LOWER FRONT GUSSET	1	PC
13	FRONT LOWER FRONT GUSSET	1	PC
14	FRONT LOWER FRONT GUSSET	1	PC
15	FRONT LOWER FRONT GUSSET	1	PC

REV	DATE	DESCRIPTION	BY
1	8/19/93	ISSUE	JM
2	8/19/93	ADD LUGS TO LOWER FRONT	JM
3	8/19/93	ADD LUGS TO LOWER FRONT	JM
4	11/14/97	ADD LOWER FRONT AND SPINE FRONT TOP PLATE	JM
5	11/14/97	ADD SPINE, LOWER FRONT GUSSET	JM
6	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)	JM
7	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)	JM
8	12-7-99	ADD (OPTIONAL) TO NOTE 4E	JM

APPROVALS

DESIGNED BY	DATE	APPROVED BY	DATE
J.M.	8/19/93	J.M.	8/19/93
J.M.	8/19/93	J.M.	8/19/93
J.M.	11/14/97	J.M.	11/14/97
J.M.	11/14/97	J.M.	11/14/97
J.M.	4/10/98	J.M.	4/10/98
J.M.	4/10/98	J.M.	4/10/98
J.M.	12-7-99	J.M.	12-7-99

REVISIONS

REV	DATE	DESCRIPTION	BY
1	8/19/93	ISSUE	JM
2	8/19/93	ADD LUGS TO LOWER FRONT	JM
3	8/19/93	ADD LUGS TO LOWER FRONT	JM
4	11/14/97	ADD LOWER FRONT AND SPINE FRONT TOP PLATE	JM
5	11/14/97	ADD SPINE, LOWER FRONT GUSSET	JM
6	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)	JM
7	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)	JM
8	12-7-99	ADD (OPTIONAL) TO NOTE 4E	JM

NOTES

- REMOVE ALL BURS AND SHARP EDGES
- STAMP OR ETCH PART NUMBER AND REVISION (OPTIONAL)
- WELD ALL COMPONENT PARTS PER DRAWING
- USE BEVEL SURFACE FOR SUBSEQUENT MACHINING
- WHEN WELD ITEM 1, 2, AND 4, MAKE SURE TO LEAVE ENOUGH SPACE FOR WELDING ITEM 15 (4 NOTES).
- INCHES SURFACE 125/ MAX.

APPLICATION

REV	DATE	DESCRIPTION
1	8/19/93	ISSUE
2	8/19/93	ADD LUGS TO LOWER FRONT
3	8/19/93	ADD LUGS TO LOWER FRONT
4	11/14/97	ADD LOWER FRONT AND SPINE FRONT TOP PLATE
5	11/14/97	ADD SPINE, LOWER FRONT GUSSET
6	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)
7	4/10/98	ADD .315 DIA Ø 328 (SHIT 2 OF 3)
8	12-7-99	ADD (OPTIONAL) TO NOTE 4E

THORACIC SPINE BOX

880105-1000

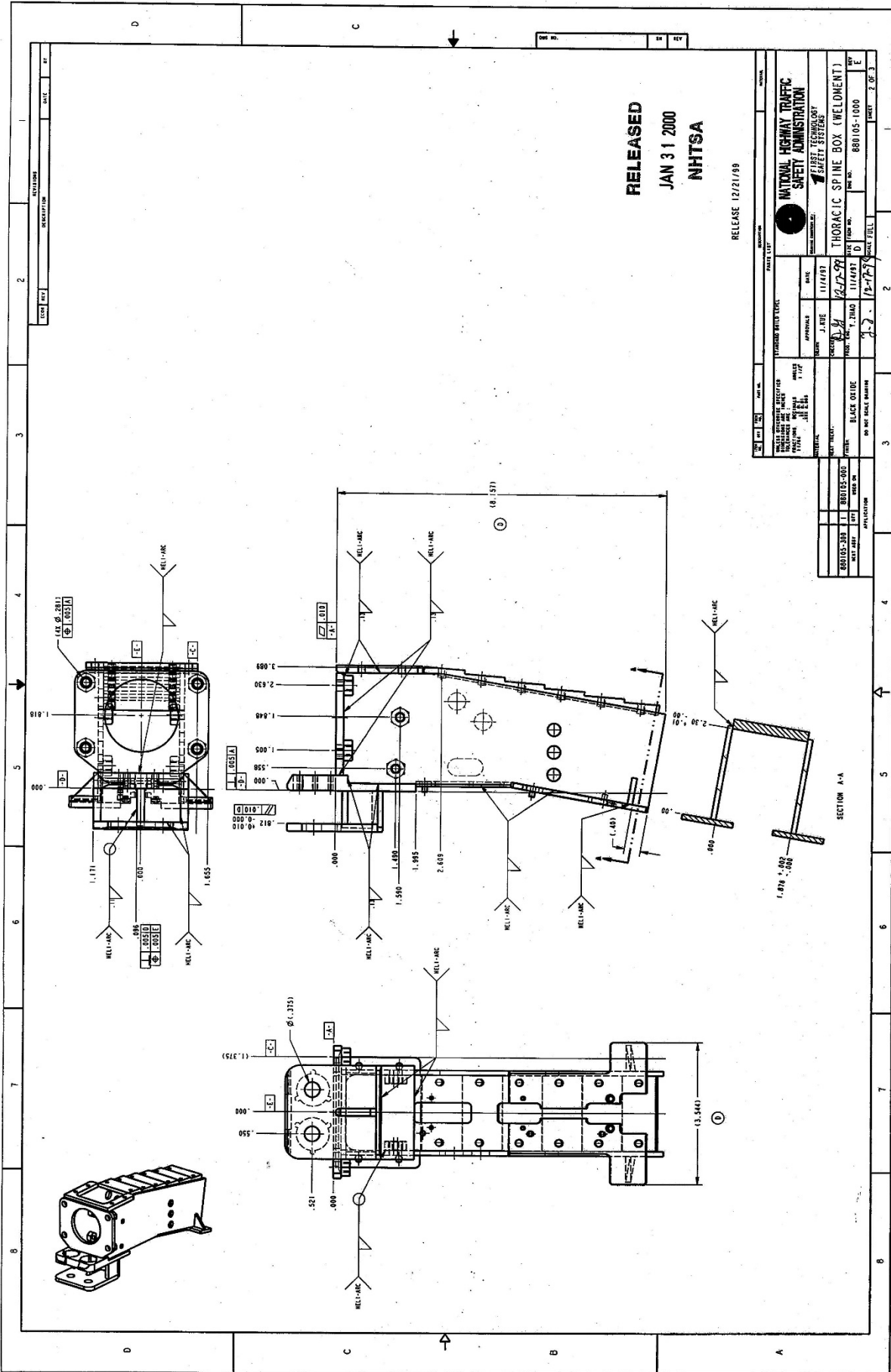
12-7-99

12-7-99

880105-1000

12-7-99

DRAWING REMOVED



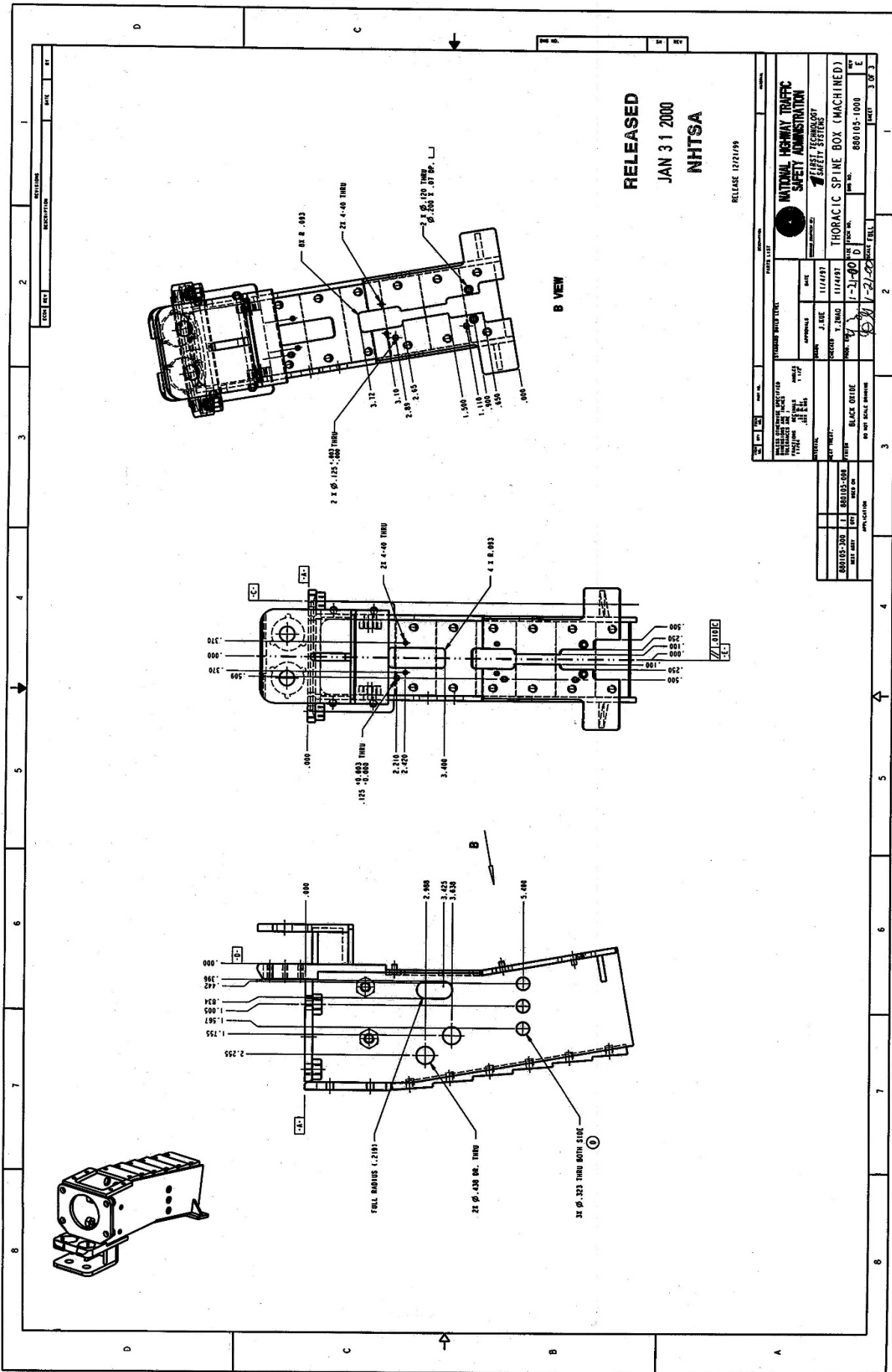
RELEASED
JAN 31 2000
NHTSA

RELEASE 12/21/99

DATE LIT		DATE		REV	
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11/14/99		11/14/99		2	
12/21/99		12/21/99		3	
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12/21/99		12/21/99		67	
12/21/99		12/21/99		68	
12/21/99		12/21/99		69	
12/21/99		12/21/99		70	
12/21/99		12/21/99		71	
12/21/99		12/21/99		72	
12/21/99		12/21/99		73	
12/21/99		12/21/99		74	
12/21/99		12/21/99		75	
12/21/99		12/21/99		76	
12/21/99		12/21/99		77	
12/21/99		12/21/99		78	
12/21/99		12/21/99		79	
12/21/99		12/21/99		80	
12/21/99		12/21/99		81	
12/21/99		12/21/99		82	
12/21/99		12/21/99		83	
12/21/99		12/21/99		84	
12/21/99		12/21/99		85	
12/21/99		12/21/99		86	
12/21/99		12/21/99		87	
12/21/99		12/21/99		88	
12/21/99		12/21/99		89	
12/21/99		12/21/99		90	
12/21/99		12/21/99		91	
12/21/99		12/21/99		92	
12/21/99		12/21/99		93	
12/21/99		12/21/99		94	
12/21/99		12/21/99		95	
12/21/99		12/21/99		96	
12/21/99		12/21/99		97	
12/21/99		12/21/99		98	
12/21/99		12/21/99		99	
12/21/99		12/21/99		100	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
THORACIC SPINE BOX (WELDMENT)
880105-300
880105-1000
880105-200
880105-300
880105-400
880105-500
880105-600
880105-700
880105-800
880105-900
880105-1000

DRAWING REMOVED



RELEASED
 JAN 31 2000
 NHTSA

RELEASE 12/21/99

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION SAFETY SYSTEMS	
PART NO. 880105-1000 REV. 1000	DATE 11/14/97
DRAWN BY J. B. BROWN CHECKED BY T. BROWN DESIGNED BY J. B. BROWN APPR. BY J. B. BROWN	TITLE THORACIC SPINE BOX (MACHINED) PART NO. 880105-1000 REV. 1000
MATERIAL BLACK OXIDE FINISH	QUANTITY 1 UNIT EACH
SCALE AS SHOWN	SHEET 3 OF 3

I.2. Changes to the PADI.

Revision to thorax part number reference table, page 21. The table entry is changed to reflect the new part number for the revised spine box as follows:

	<u>Description</u>	<u>Part Number</u>	<u>Figure Number</u>	<u>Item Number</u>
Was:	Spine Weldment	880105-1000	25	2
Now:	Spine Box	880105-1045	25	2

II. JACKET REVISION.

II.1. Changes to the Engineering Drawing Package and Parts List

a. New drawings added.

The following engineering part and assembly drawings describe new parts associated with the revised new jacket. These are entirely new drawings, not revisions to existing drawings, and do not appear in the current set of Subpart O drawings. They will be added to the drawing package.

880105-355-H, Rev B, Chest Flesh Assembly, Sheet 1

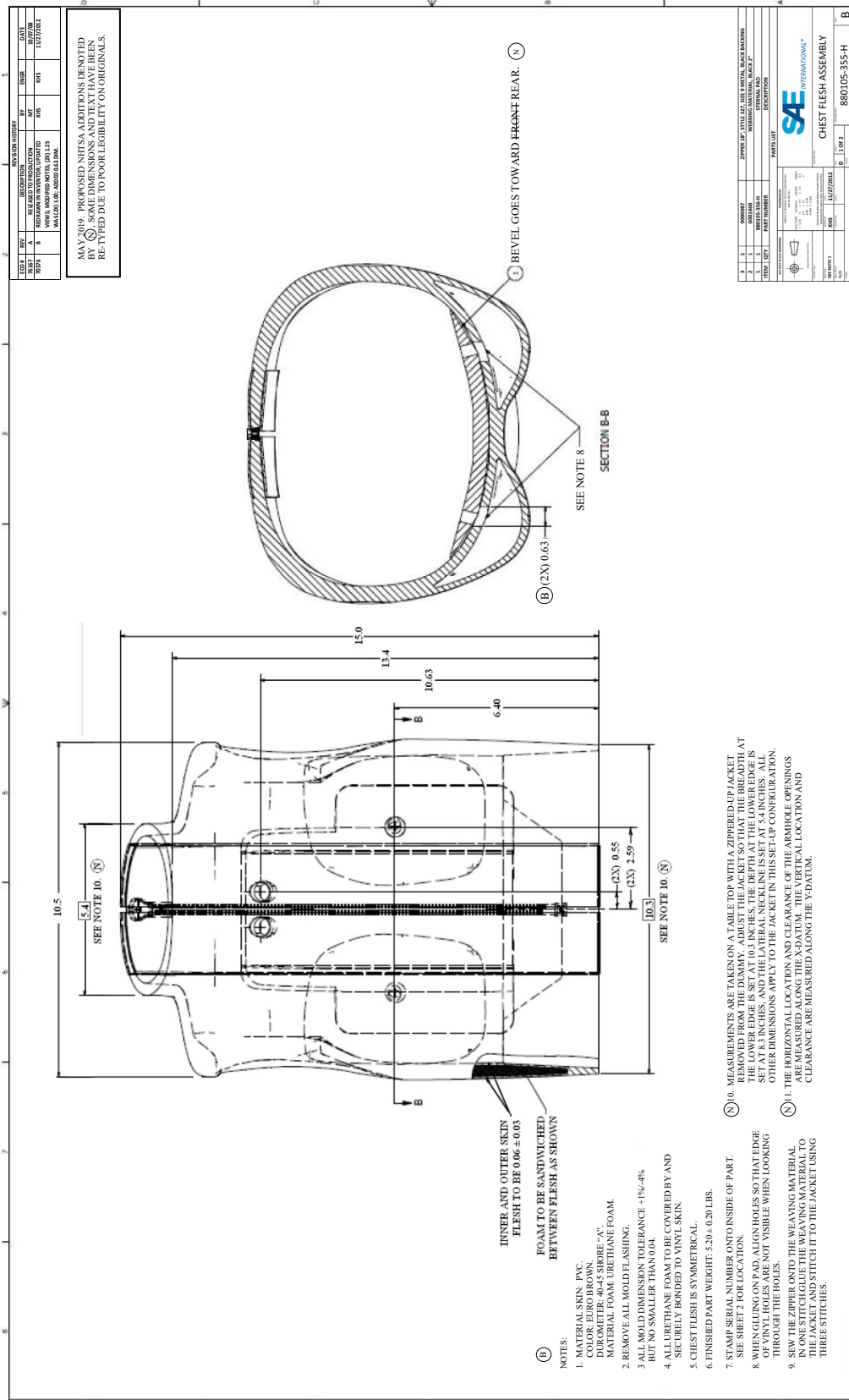
880105-355-H, Rev B, Chest Flesh Assembly, Sheet 2

880105-356-H, Rev C, Sternum Pad

The Chest Flesh Assembly (880105-355-H, Sheets 1 and 2) and the Sternum Pad (880105-356-H) will be derived from the reprints of drawings contained within SAE J2921 (Jan 2013) shown in the next three pages.

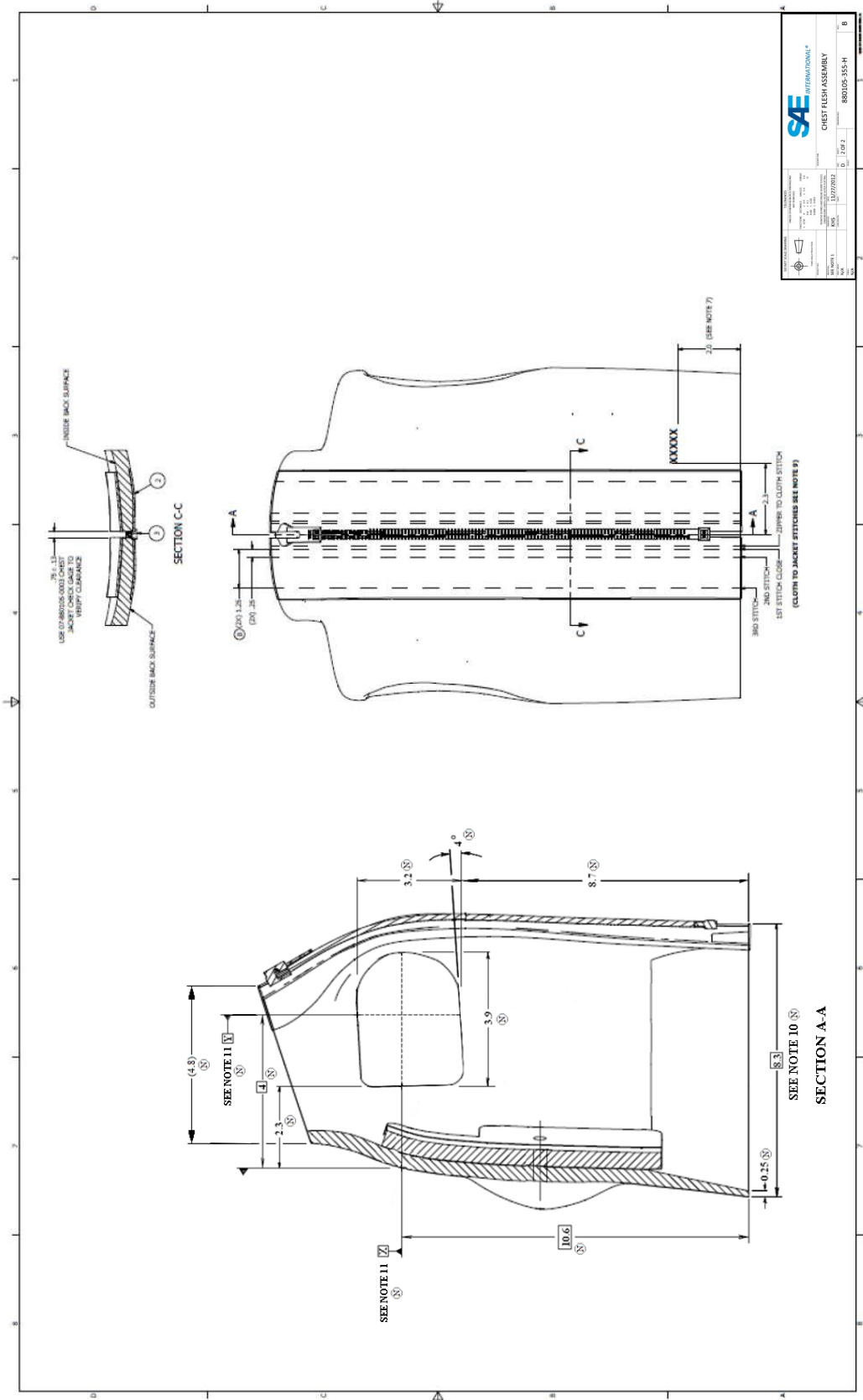
For the Chest Flesh Assembly, NHTSA has added a note on set-up dimensions and tolerances to Sheet 1. A presumed error on the sternal pad orientation has been corrected on Sheet 1. On Sheet 2, NHTSA has added dimensions for the arm holes and the taper near the lower edge to more fully specify the jacket. All additions are annotated on the drawings using the symbol \textcircled{N} indicating that they have been added by NHTSA.

NEW DRAWING



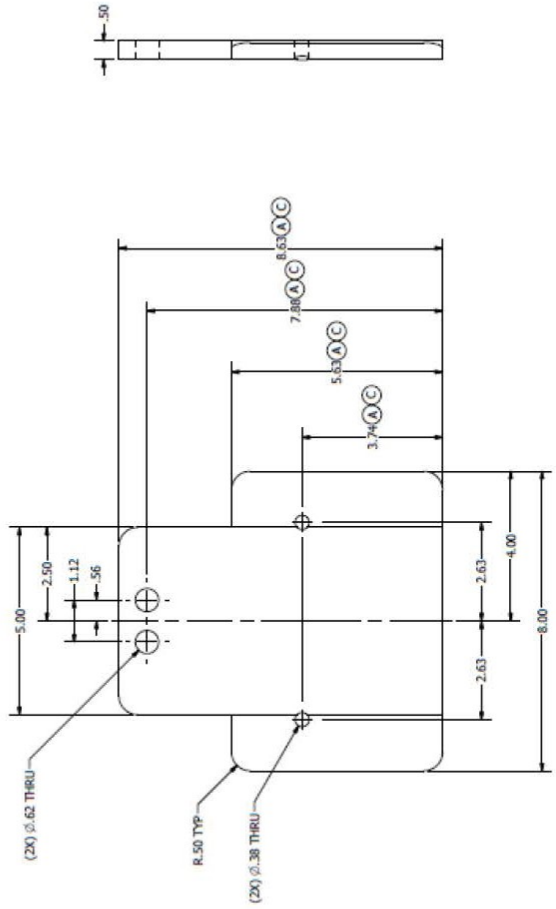
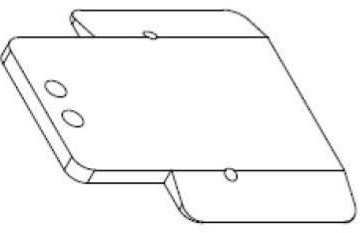
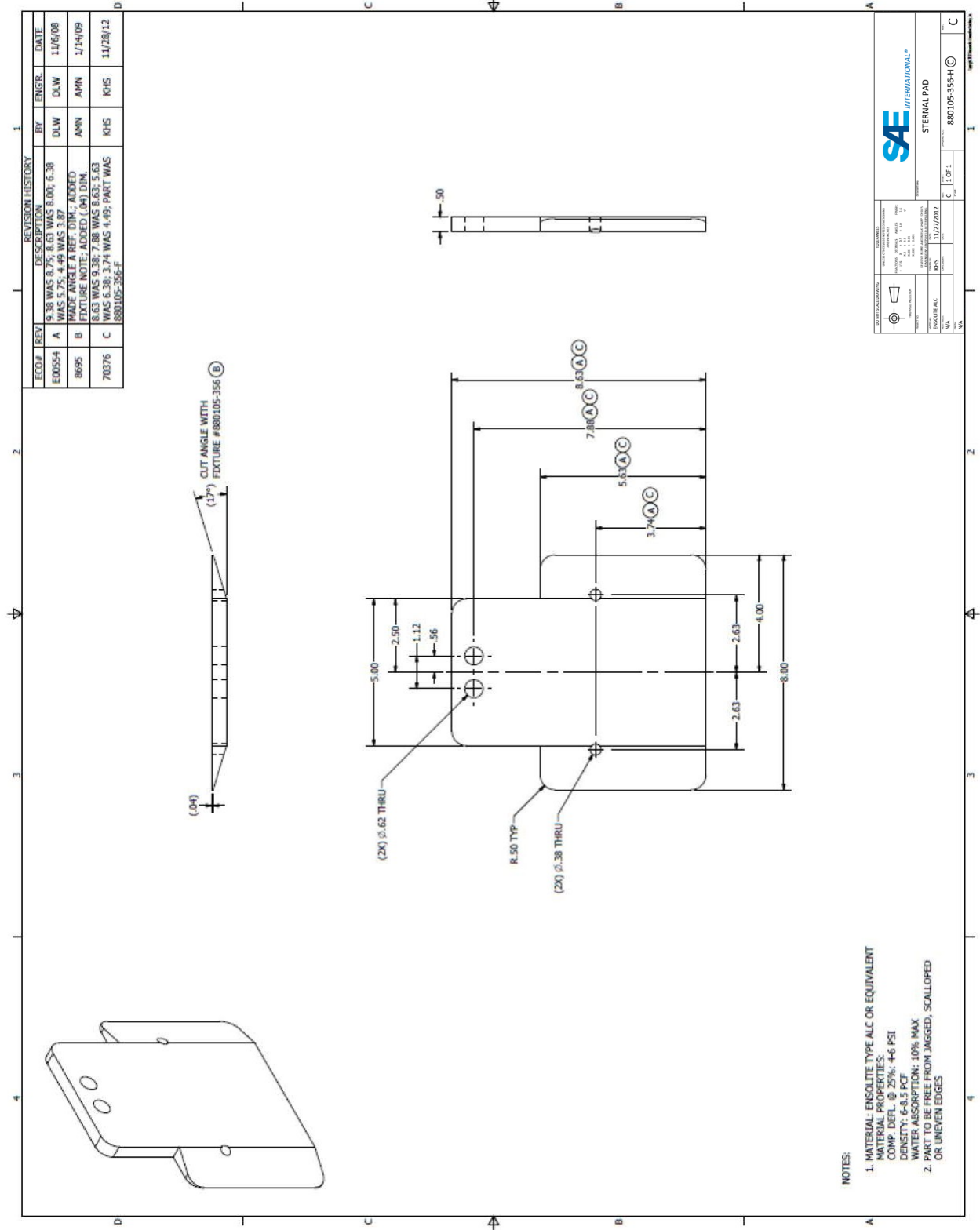
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NEW DRAWING



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NEW DRAWING



- NOTES:
- MATERIAL: ENSOLITE TYPE ALC OR EQUIVALENT
 MATERIAL PROPERTIES:
 COMP. DEF. @ 25%: -4± FSI
 DENSITY: 6-8.5 PCF
 WATER ABSORPTION: 10% MAX
 PART TO BE FREE FROM JAGGED, SCALLOPED OR UNEVEN EDGES

SAE
INTERNATIONAL*

STERNA PAD

880105-356-F © C

Reprinted with permission from SAE J2921, Copyright © 2013, SAE International. SAE has authorized the public use and reproduction of this drawing.

b. Drawings revised.

The following drawings, contained within the current set of Subpart O drawings, are revised.

880105-300, Upper Torso Assembly, Rev J.**880105-000, Complete assembly, 5th female, Rev. J, Sheet 5.**

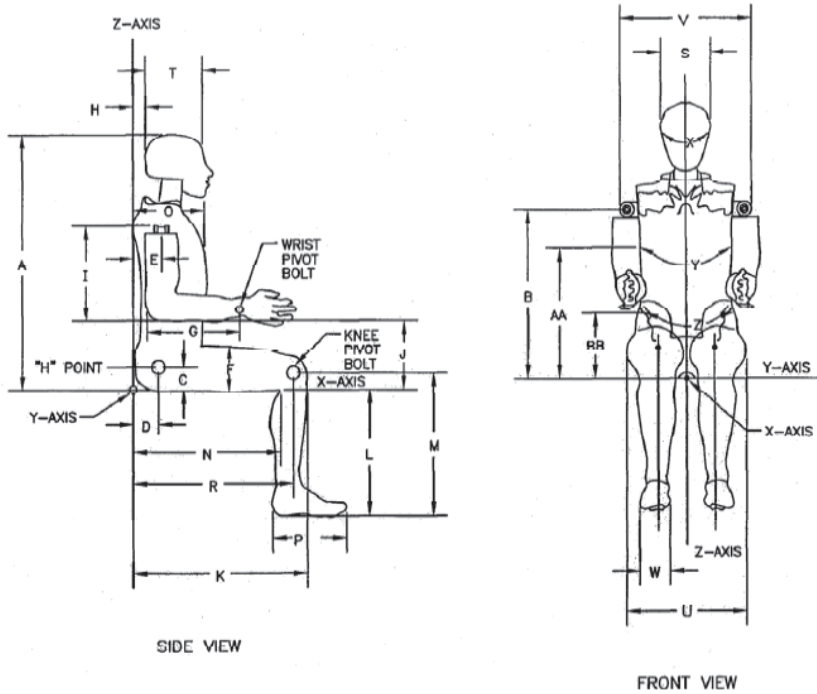
In 880105-300, Upper Torso Assembly, Item 13 is now 880105-355-H, which refers to the new jacket drawing (it was 880105-355-E, which is the old jacket drawing). The revision level for this drawing is updated to Rev. K.

In 880105-000, Complete assembly, 5th female, Sheet 5 is revised to add jacket dimensions at various cross sections. (This revision is not contained in SAE J2921.) The added dimensions are needed to more fully specify the outer shape of the jacket. The specifications for chest circumference, currently denoted as Y and AA in the table on Sheet 5, are replaced by new section dimensions. Additionally, the locations of the anterior-most points on the jacket (on the right and left breasts) and the anterior-most point on the bottom edge of the jacket are specified.

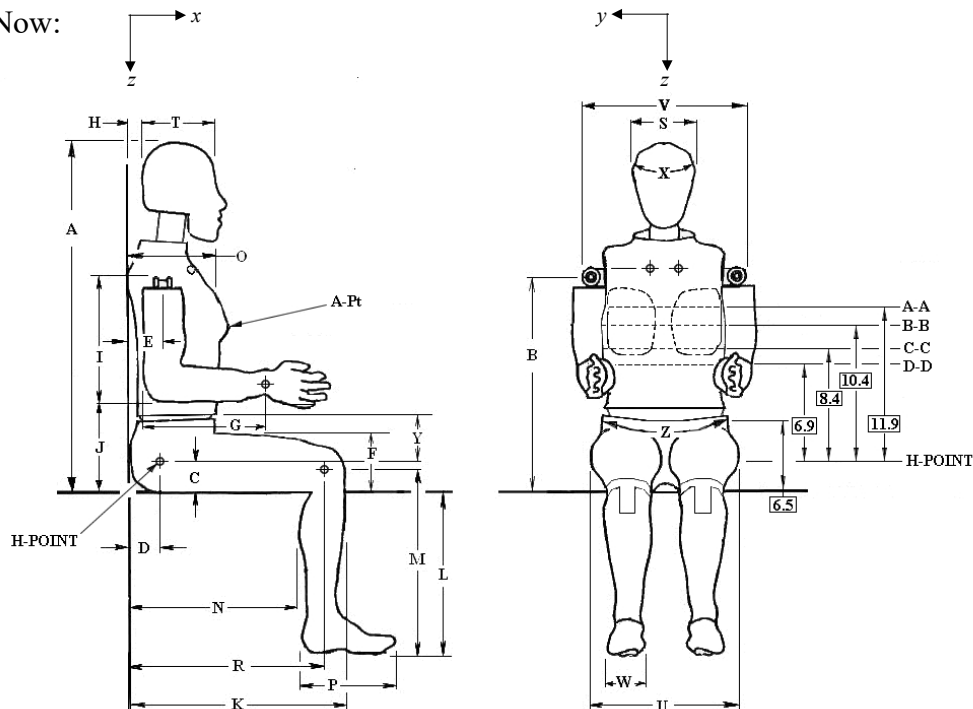
The revision level for this drawing (all sheets) is updated to Rev. K. The revision consists of four basic changes shown below.

Change 1. Replace the reference figure of the sitting dummy (side and front views) with a revised figure that shows the new section levels and the new anterior-most points. Dimensions for chest circumference are now shown in new section level figures (see Change 2). Locations for section levels and waist circumference are basic dimensions (no tolerances). Section levels are located with respect to the average H-point as defined in new Note 2 (See Change 4).

Was:



Now:



Change 1, continued. Figure letter references are changed as follows:

Dimension Y

Was: Chest circumference

Now: Location of anterior-most point on lower edge of jacket on the dummy midline defined by Note 3 (see Change 4).

Dimension AA

Was: Location of chest circumference measurement

Now: Omitted. Chest circumference specified in new cross-sectional figures (see Change 2).

Dimension BB

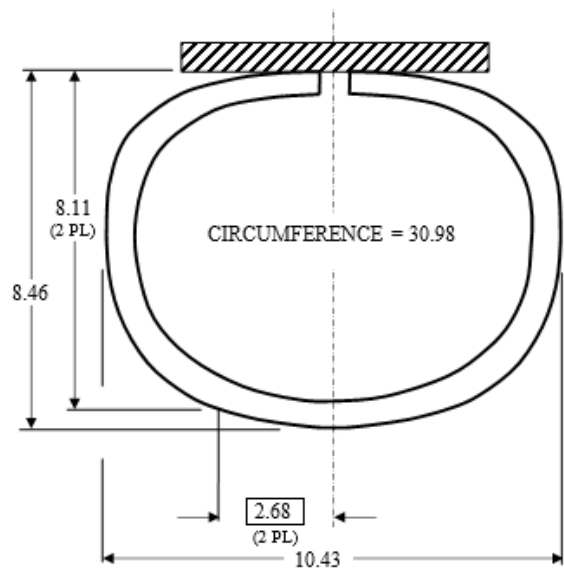
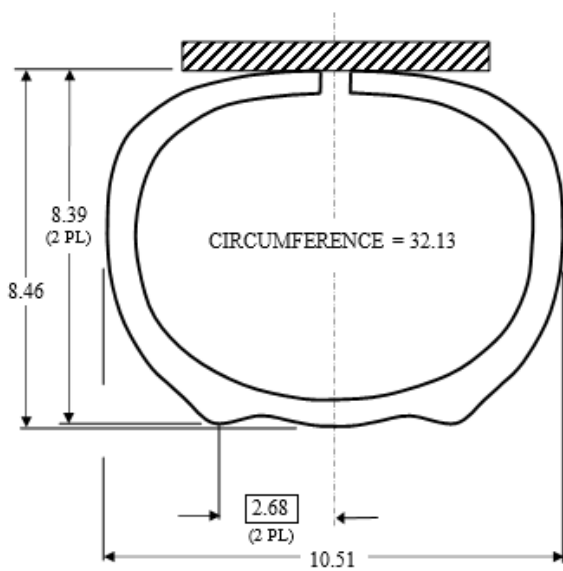
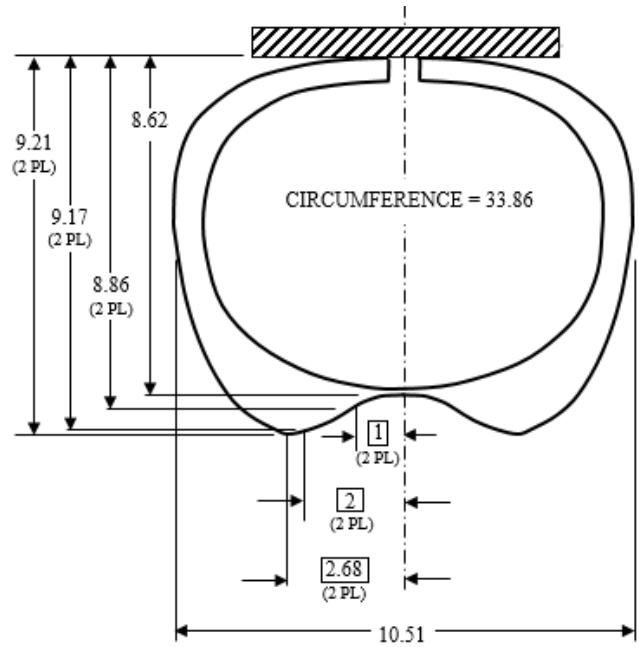
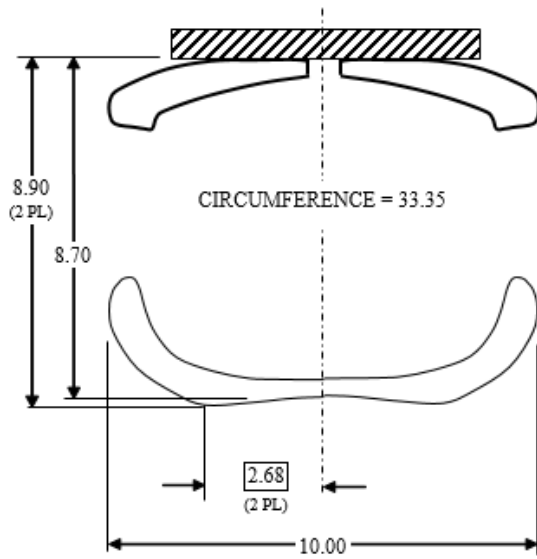
Was: Location for waist circumference

Now: Omitted. Basic dimension of 6.5 is now shown on the figure in place of BB.

Point A-Pt (right and left)

New dimensions. Locations now specified for anterior-most points on the jacket breast, right and left (see new Note 6 shown in Change 4).

Change 2. Add a new set of figures showing the cross-sectional dimensions of Sections A-A, B-B, C-C, and D-D. For all sections, the reference for the left/right offset dimensions is the midline of the dummy defined in accordance with new Note 3 (see Change 4).



Nominal Section Dimensions of Jacket (inches)

Change 3. Replace the last four rows in the “External Dimensions” table with three new rows as follows:

Was:

EXTERNAL DIMENSIONS			
SYM.	DESCRIPTION	SPEC INCHES	TOLERANCE INCHES +/-
Y	Chest Circumference With Jacket	34.10	0.60
Z	Waist Circumference	30.50	0.60
AA	Reference Location for Chest Circumference	13.6	0.50
BB	Reference Location for Waist Circumference	6.50	0.20

Now:

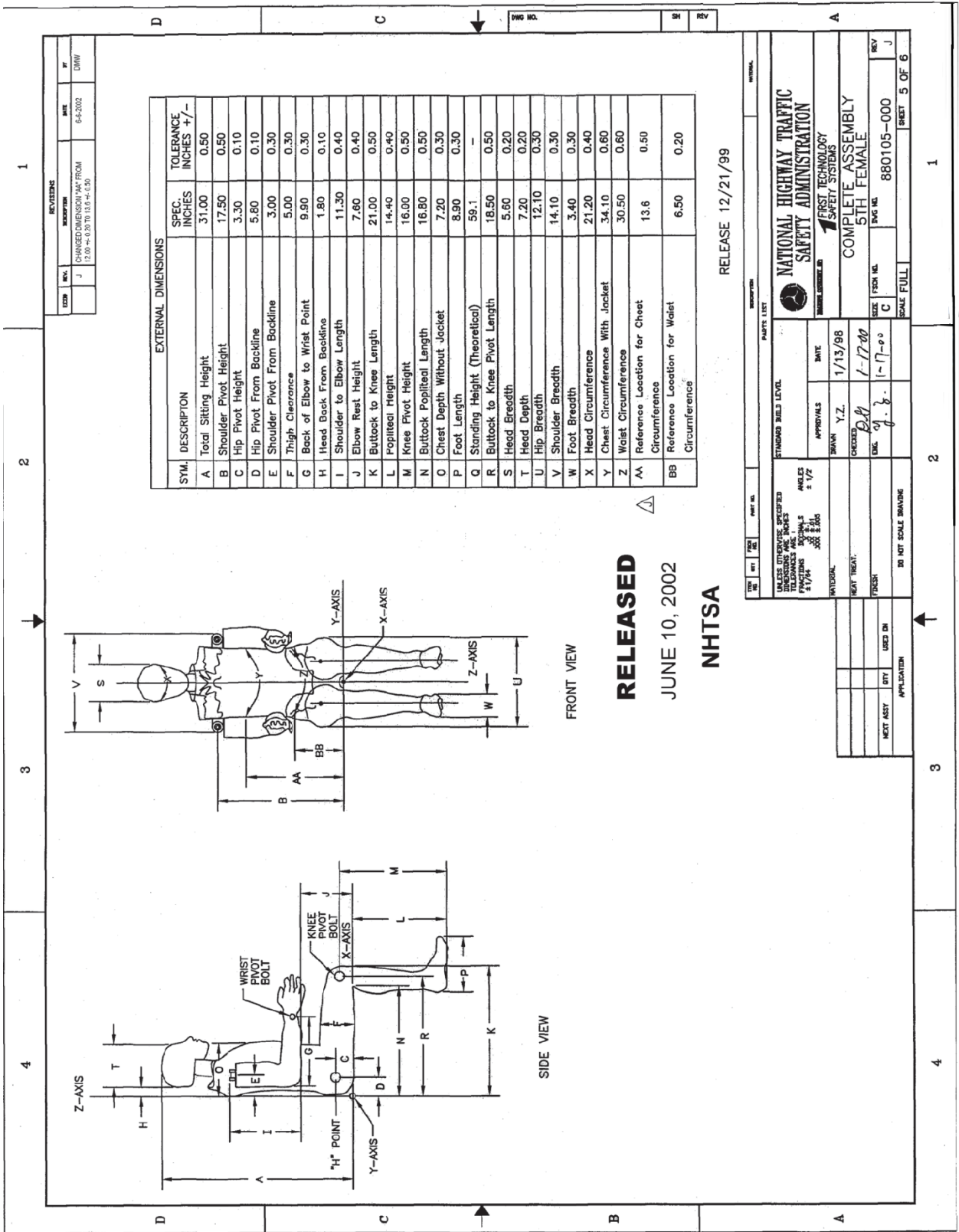
EXTERNAL DIMENSIONS			
SYM.	DESCRIPTION	SPEC INCHES	TOLERANCE INCHES +/-
Y	Height of lower edge of jacket at anterior-most point on dummy midline	4.33	0.30
Z	Waist Circumference	30.5	0.6
A-Pt	(x,y,z) coordinates of anterior-most point on breast, right and left	(9.21, +/-2.68, 10.43)	See note 6

Change 4. Notes shall be added to Sheet 5 to explain how to record the measurements.

Notes:

1. The dummy shall be assembled and positioned by following the step-by-step instructions provided in the Procedures for Assembly, Disassembly, and Inspection (PADI), External Dimensions.
2. Locations for Point Y and Sections AA, BB, CC, and DD are basic dimensions referenced from the average H-point, defined as the midpoint of a line connecting the actual right and left H-points of the seated dummy.
3. The midline of the dummy is coincident with the vertical plane passing through the anterior-most point of the lowest intervertebral disc of the molded neck. Cross-sectional offsets are basic dimensions referenced with respect to the dummy midline.
4. Circumference measurements shall be taken with a string or flexible scale that will span any gaps along the surface contour of the jacket.
5. The tolerance on section dimensions for depth, breadth, and circumference is +/- 0.30 inches unless stated otherwise.
6. The anterior-most points (A-Pt right and left) shall be within 0.40 inches from the point defined by: (x) 9.21 inches (234 mm) from the backplate; (y) 2.68 inches (68 mm) right/left from the dummy midline; (z) 10.43 inches (265 mm) from the average H-point.

ORIGINAL UNREVISED DRAWING



SYM.	DESCRIPTION	SPEC. INCHES	TOLERANCE INCHES +/-
A	Total Sling Height	31.00	0.50
B	Shoulder Pivot Height	17.50	0.50
C	Hip Pivot Height	3.30	0.10
D	Hip Pivot From Backline	5.80	0.10
E	Shoulder Pivot From Backline	3.00	0.30
F	Thigh Clearance	5.00	0.30
G	Back of Elbow to Wrist Point	9.90	0.30
H	Head Back From Backline	1.80	0.10
I	Shoulder to Elbow Length	11.30	0.40
J	Elbow Rest Height	7.60	0.40
K	Buttock to Knee Length	21.00	0.50
L	Popliteal Height	14.40	0.40
M	Knee Pivot Height	16.00	0.50
N	Buttock Popliteal Length	16.80	0.50
O	Chest Depth Without Jacket	7.20	0.30
P	Foot Length	8.90	0.30
Q	Standing Height (Theoretical)	59.1	-
R	Buttock to Knee Pivot Length	18.50	0.50
S	Head Breadth	5.60	0.20
T	Head Depth	7.20	0.20
U	Hip Breadth	12.10	0.30
V	Shoulder Breadth	14.10	0.30
W	Foot Breadth	3.40	0.30
X	Head Circumference	21.20	0.40
Y	Chest Circumference With Jacket	34.10	0.60
Z	Waist Circumference	30.50	0.60
AA	Reference Location for Chest Circumference	13.6	0.50
BB	Reference Location for Waist Circumference	6.50	0.20

FRONT VIEW

SIDE VIEW

RELEASED
JUNE 10, 2002
NHTSA

RELEASE 12/21/99

DATE	BY	DESCRIPTION
6-4-2002	DMW	CHANGED DIMENSION "AA" FROM 12.00 TO 13.6 (11.13.94-C35)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± 1/16 DECIMALS ± 0.015		STANDARD BUILD LEVEL	
NATIONAL		APPROVALS	DATE
NEXT ASSEMBLY		DESIGNED BY	1-17-00
CITY		CHECKED BY	1-17-00
STATE		ENG. BY	1-17-00
APPLICATION		SCALE	FULL
DO NOT SCALE DRAWING		SIZE	C
NEXT ASSEMBLY		REV. NO.	J
CITY		SCALE	5 OF 6
STATE		REV. NO.	J
APPLICATION		SCALE	5 OF 6

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
FIRST TECHNOLOGY SAFETY SYSTEMS
COMPLETE ASSEMBLY 5TH FEMALE
880105-000

REV	BY	DATE	DESCRIPTION

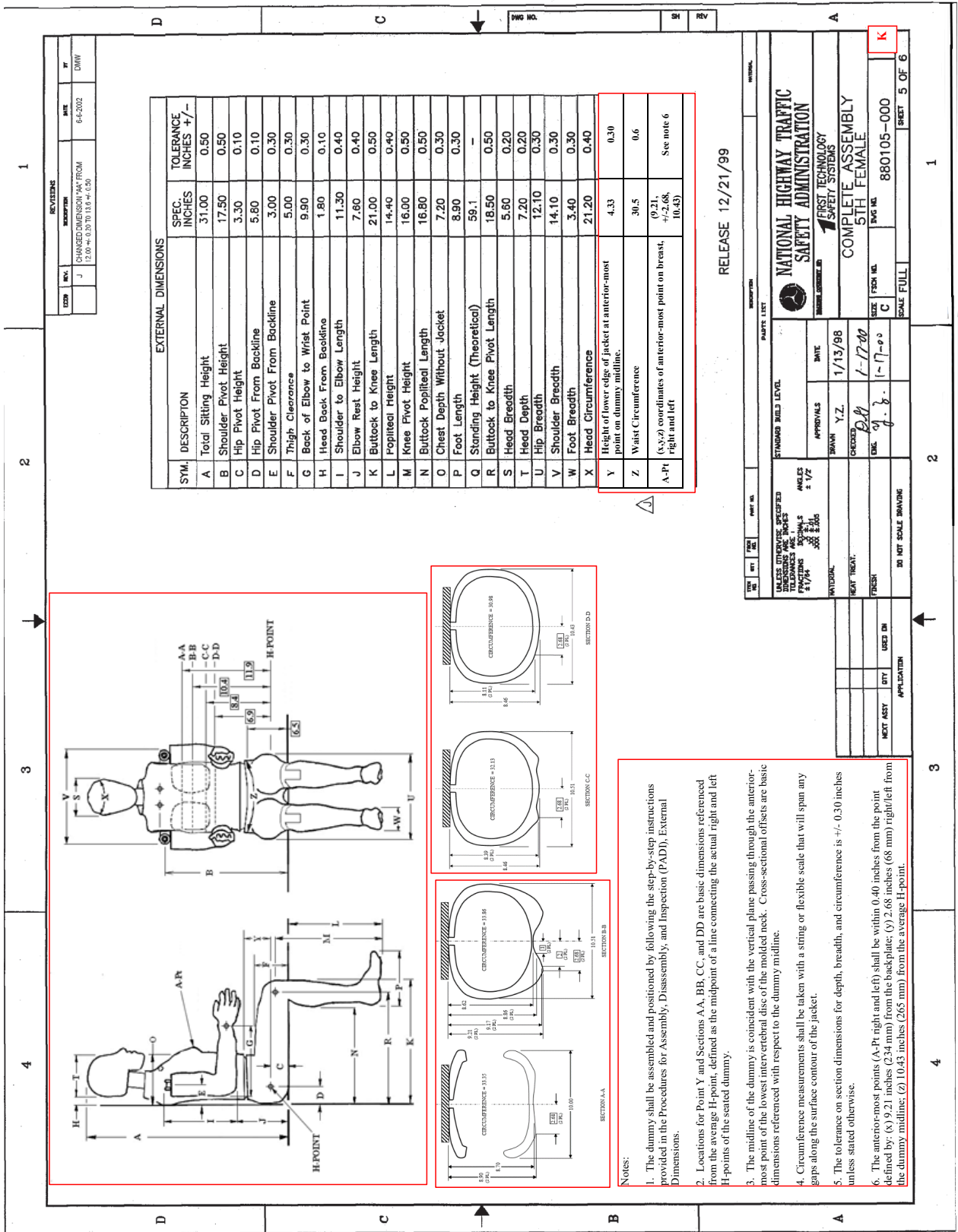
REV	BY	DATE	DESCRIPTION

REV	BY	DATE	DESCRIPTION

REV	BY	DATE	DESCRIPTION

REV	BY	DATE	DESCRIPTION

REVISED DRAWING

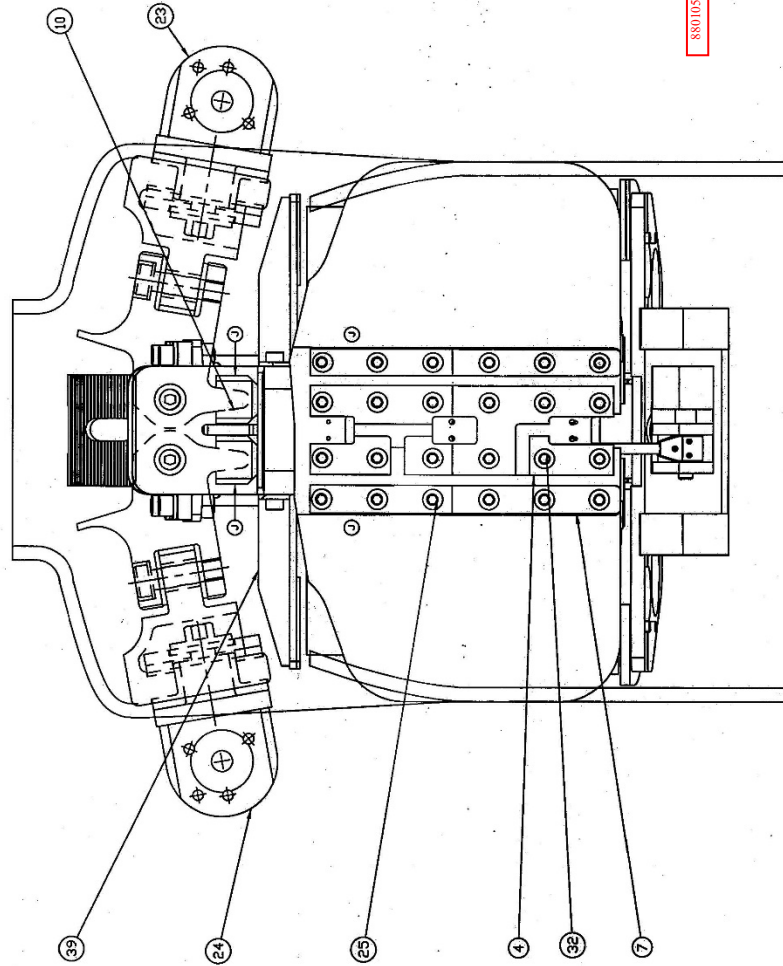


RELEASE 12/21/99

<p>NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION</p>		<p>COMPLETE ASSEMBLY 5TH FEMALE</p>	
<p>STANDARD BUILD LEVEL</p>	<p>DATE 1/13/98</p>	<p>SIZE FISH ML C</p>	<p>880105-000</p>
<p>APPROVALS</p>	<p>DESIGNED BY J.B.</p>	<p>DATE 1-17-00</p>	<p>SCALE FULL</p>
<p>DO NOT SCALE DRAWING</p>	<p>APPLICATION</p>	<p>REV. 5 OF 6</p>	<p>SHEET 5 OF 6</p>

- Notes:
- The dummy shall be assembled and positioned by following the step-by-step instructions provided in the Procedures for Assembly, Disassembly, and Inspection (PAD), External Dimensions.
 - Locations for Point Y and Sections A.A, B.B, C.C, and D.D are basic dimensions referenced from the average H-point, defined as the midpoint of a line connecting the actual right and left H-points of the seated dummy.
 - The midline of the dummy is coincident with the vertical plane passing through the anterior-most point of the lowest intervertebral disc of the molded neck. Cross-sectional offsets are basic dimensions referenced with respect to the dummy midline.
 - Circumference measurements shall be taken with a string or flexible scale that will span any gaps along the surface contour of the jacket.
 - The tolerance on section dimensions for depth, breadth, and circumference is +/- 0.30 inches unless stated otherwise.
 - The anterior-most points (A, Pt right and left) shall be within 0.40 inches from the point defined by: (X) 5.21 inches (2.34 mm) from the backplate; (Y) 2.68 inches (68 mm) right/left from the dummy midline; (Z) 10.43 inches (265 mm) from the average H-point.

REVISED DRAWING



RELEASE 12/21/99

REV	NO	DESCRIPTION	DATE	BY
1009	7	8800454 WAS 8800147 (1/4-20 X 5/8) SCS	3/24/94	JK
1141	B	REVISED 8800138-364	3/24/94	JK
	C	ADD RIB UPPER AND LOWER STOPS. MODIFY STERNUM SLIDER AND SPINE FOR MOUNTING 6 ACCELEROMETER MODIFY THE TRANSDUCER ARM SHAPE	7/17/97	VZ
5658D		CHANGE STERNUM STOP LOCATION, MODIFY SPINE BNS, TRANSDUCER ARM, STERNUM SLIDER	11/2/97	VZ
5671	E	ADD ITEM 45	11/26/97	VZ
5705	F	ADD NOTE 1	12/9/97	VZ
5776	G	ADD X AND Z AXIS, CG LOCATION, AND NOTE #6	5/9/98	JK
5841	H	MODIFY TITLE OF ITEM 32, 34 AND 41	6/18/99	VZ
5845	I	8800553 WAS 8800444	9-15-99	JK
5853	J	ADD DR NOTES	12-15-99	JK

REV	NO	DESCRIPTION	DATE	BY
481	1	880051000 FRONT SPINE URETHANE SHEET		
441	1	WASHER-CLAMPING (REF)		
441	1	SCREW, SHCS 3/8-16 X 1 (REF)		
441	1	UPPER NECK BRACKET (REF)		
441	1	ACCELEROMETER MOUNT SPINE, BOTTOM		
441	1	UPPER RIB STOP ASSEMBLY, RIGHT		
441	1	SCREW, FMS 1/2-28 X 1/2		
441	1	SCREW, SHCS 4-40 X 1/4		
441	1	SCREW, SHCS 1/2-28 X 1/2		
441	1	LOWER RIB STOP, LEFT		
441	1	ACCELEROMETER MOUNT SPINE, TOP		
441	1	SCREW, SHCS 1/2-28 X 3/8		
441	1	UPPER RIB STOP ASSEMBLY, LEFT		
441	1	SCREW, SHCS 5/16-18 X 1/2		
441	1	SCREW, SHCS 1/4-20 X 3/4		
441	1	WASHER, 201 ID X .500 OD X .060		
441	1	SCREW, SHCS 3/8 X 1.00		
441	1	SCREW, SHCS 1/2-28 X 1.00		
441	1	SCREW, SHCS 1/2-28 X 1.00		
441	1	SHOULDER ASSEMBLY, RIGHT		
441	1	STRIP, STERNUM		
441	1	ADAPTER ASSEMBLY		
441	1	RIB NL 6 ASSEMBLY		
441	1	RIB NL 5 ASSEMBLY		
441	1	RIB NL 4 ASSEMBLY		
441	1	RIB NL 3 ASSEMBLY		
441	1	RIB NL 2 ASSEMBLY		
441	1	RIB NL 1 ASSEMBLY		
441	1	WASHER, STERNUM		
441	1	CHEST FLESH		
441	1	CHEST REFLECTION TRANSDUCER ASSEMBLY		
441	1	CLAVICLE LINK WASHER		
441	1	CLAVICLE LINK WASHER		
441	1	NUT		
441	1	RIB ASSEMBLY		
441	1	STIFFENER STRIP (BEHIND RIBS)		
441	1	STERNUM NUT PLATE		
441	1	STERNUM SLIDER		
441	1	TRICOR SPINE MOUNTMENT		
441	1	LOWER NECK BRACKET		

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REV	NO	DESCRIPTION	DATE	BY
880051000	1	880051000	12/21/99	VZ
880051000	1	880051000	12/21/99	VZ

NOTES:
1. BEND ITEM 22 AND ITEM 45 TO THE FRONT OF THE SPINE BOX AS SHOWN ON SHEET 2 OF 2
2. X AND Z DIMENSION ON SHEET 2 SHOW THE C. G. LOCATION.

UPPER TORSO ASSEMBLY
8800105-300
REV 1 OF 2

c. Drawings removed.

These drawings are contained within the current set of Subpart O drawings that describe parts associated with the old jacket. They will be removed from the revised drawing package.

880105-355-E, Rev D, Chest Flesh Assembly, Sheets 1 and 2

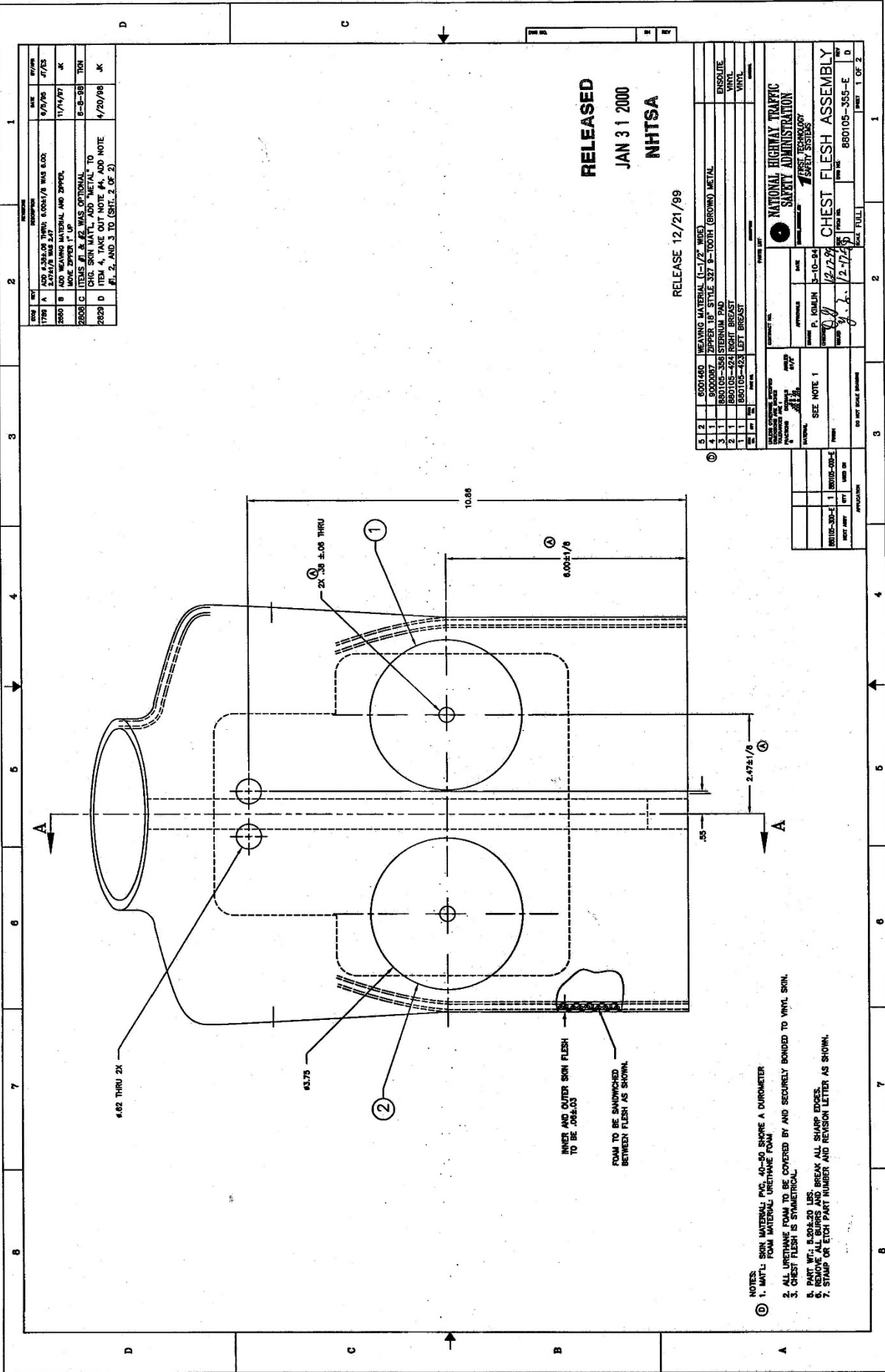
880105-356, Sternum Pad

880105-423, Breast mold, left.

880105-424, Breast mold, right

The first two drawings (880105-355-E and -356) refer to the old versions of the jacket and sternal pad. They will be removed. The last two drawings (880105-423 and -424) only serve to call out mold pattern numbers for the original breasts. There are no actual drawings of parts. These drawings are no longer applicable and are not needed. They will also be removed.

DRAWING REMOVED



REV	DATE	DESCRIPTION	BY	CHK
1728	8/7/93	ADD 4.82±.02 THRU 6.00±1/8 WAS R/O.D.		
2040	11/14/97	ADD 4.82±.02 THRU 6.00±1/8 WAS R/O.D. AND 2040. MOVE DIMENSION 1" UP.		
2008	8-5-98	CHG. SKIN MAT'L. ADD "METAL" TO ITEM 4. TAKE OUT NOTE #4. ADD NOTE #1, 2, AND 3 TO (SHT. 2 OF 2)		
2029	4/20/98			

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REV	DATE	DESCRIPTION	BY	CHK
3		6001460 METAL SKIN MATERIAL (1.17 OF WIRE)		
2		6001460 PAPER, 1/4" STYLE 327 P-TIGHT (BROWN) METAL		
1		880105-326 STERNUM PAD		
2		880105-424 RIGHT BREAST		
1		880105-423 LEFT BREAST		

APPROVALS:
 P. KOHLIN 5-10-94
 12/28
 2-17-95

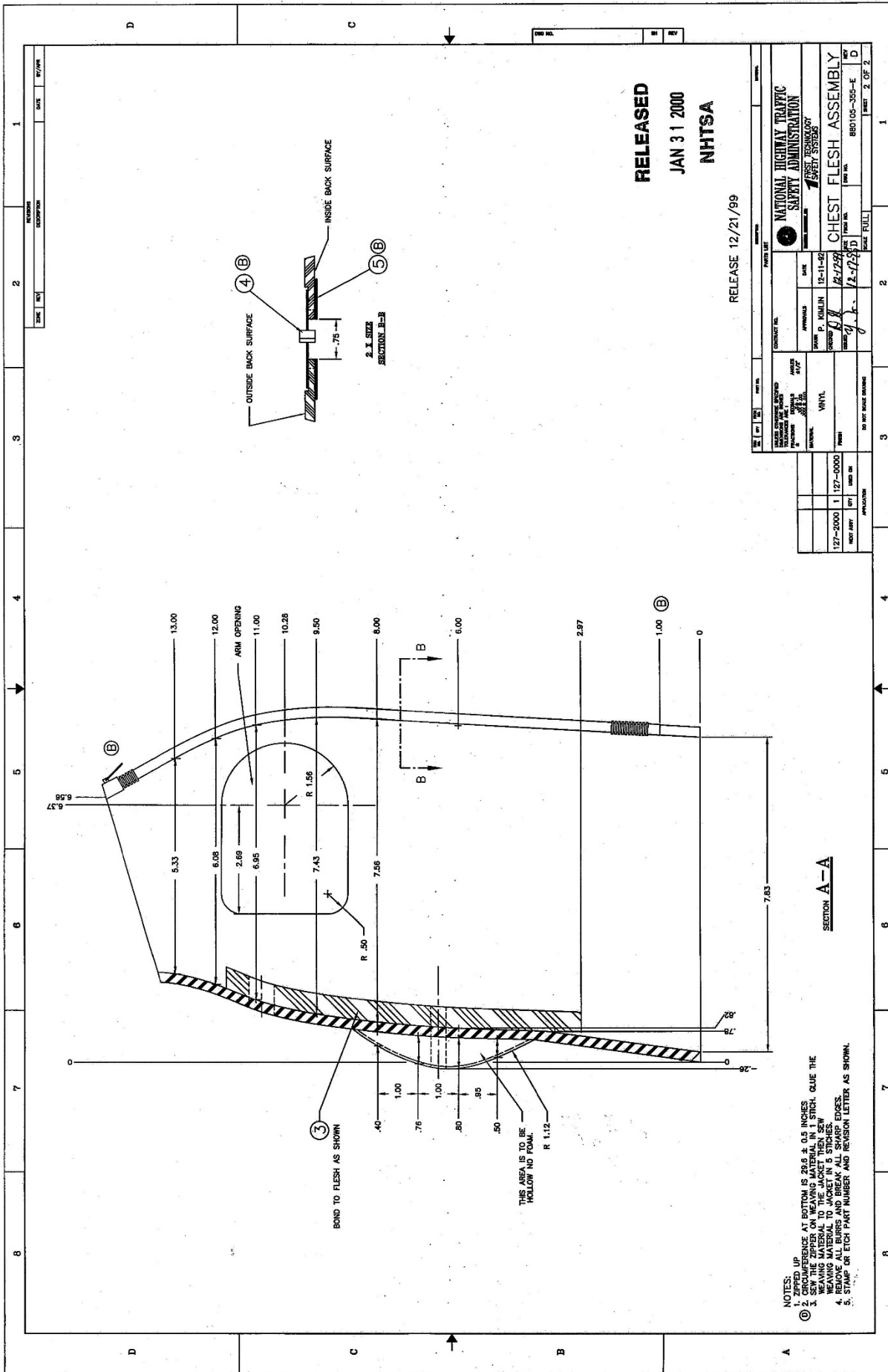
DATE: 12/28/94
 TIME: 2:17:45
 DRAWN BY: P. KOHLIN
 CHECKED BY: J. J. J. J.

880105-355-E
 880105-355-E

1 OF 2

- NOTES:
1. MET'L SKIN MATERIAL P/N: 40-250 SHAVE A DURIOMETER FOAM INTERIOR URETHANE FOAM
 2. ALL URETHANE FOAM TO BE COVERED BY AND SECURELY BONDED TO VINYL SKIN.
 3. CHEST FLESH IS SYMMETRICAL.
 4. PART W/T: 8.20±.20 LBS.
 5. BREAK ALL SHARP EDGES.
 6. STAMP ON EACH PART NUMBER AND REVISION LETTER AS SHOWN.

DRAWING REMOVED



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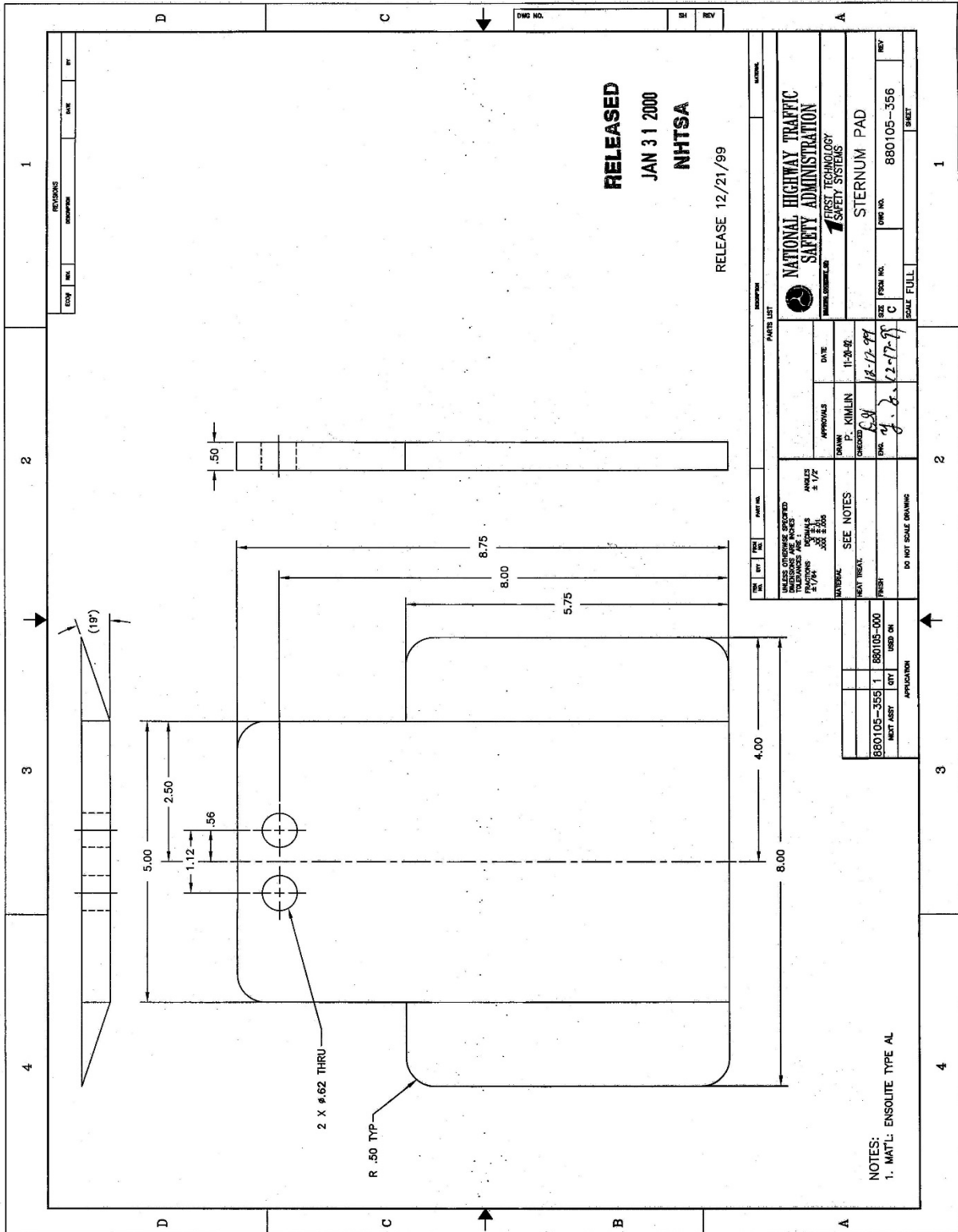
RELEASE 12/21/99

PROJECT NO.		DATE	
CONTRACT NO.		DATE	
DESIGNED BY		DATE	
CHECKED BY		DATE	
DRAWN BY		DATE	
MATERIAL		SCALE	
PART NO.		SHEET	
REV.		OF	
APPROVAL		BY	
DATE		BY	
PROJECT TITLE		SHEET	
127-2000 1 127-0000		2 OF 2	
NEXT REV.		BY	
REV. NO.		DATE	
REV. BY		DATE	
REV. DESCRIPTION		DATE	

- NOTES:
1. ZIPPED UP
 2. CIRCUMFERENCE AT BOTTOM IS 28.6 ± 0.5 INCHES
 3. SEW THE MATERIAL ON THE INSIDE OF THE JACKET THEN SEW WEAVING MATERIAL TO JACKET IN 5 STITCHES.
 4. REMOVE ALL BURS AND BREAK ALL SHARP EDGES.
 5. STITCH OR EACH PART NUMBER AND REVISION LETTER AS SHOWN.

SECTION A-A

DRAWING REMOVED



RELEASED
JAN 31 2000
NHTSA
 RELEASE 12/21/99

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
FIRST TECHNOLOGY SAFETY SYSTEMS	
STERNUM PAD	
FORM NO.	DWG NO.
SIZE C	880105-356
SCALE FULL	SHEET

DATE	11-28-99
APPROVALS	P. KIMLIN
DESIGNED	J. J. [Signature]
DATE	12-17-99
APPROVALS	J. J. [Signature]

ITEM	QTY	UNIT	APPLIC.	APPLIC.
880105-355	1		1	880105-000
NEXT ASSEMBLY USED ON				

NOTES:
 1. MAT'L: ENSOLITE TYPE AL


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES ± 1/32 ± 1/64 ± 1/8 ± .005	
ANGLES ± 1/2°	
TOLERANCES ARE ± 1/32 ± 1/64 ± 1/8 ± .005	
SEE NOTES	
NEXT TREAT: FRESH	
DO NOT SCALE DRAWING	

DRAWING REMOVED

REVISIONS		DATE	BY
ECOR	REV.		

- NOTES:
1. USE MOLD 880105-423
 2. MAT'L: PVC

RELEASED
JAN 31 2000
NHTSA
 RELEASE 12/21/99

ITEM NO.	QTY	FSCM NO.	PART NO.	DESCRIPTION
PARTS LIST				
		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION DRAWING COURTESY OF:  FIRST TECHNOLOGY SAFETY SYSTEMS		
		LEFT BREAST		
		SIZE	FSCM NO.	DWG NO.
		B		880105-423
		SCALE		
		SHEET		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DIMENSIONS IN PARENTHESES ARE DECIMALS FRACTIONS ARE IN 1/16" ANGLES ARE IN 1/2" SEE NOTE 2 FOR FINISHES .XXX, .005				
STANDARD BUILD LEVEL				
		APPROVALS	DATE	
		DRN Y. Z.	5/6/98	
		CHECKED <i>DA</i>	12-17-99	
		PROD. ENG. <i>g.z.</i>	12-17-99	
MATERIAL SEE NOTE 2				
HEAT TREAT.				
FINISH				
DO NOT SCALE DRAWING				
880105-355-E 1		880105-000		
NEXT ASST	QTY	USED ON	APPLICATION	

DRAWING REMOVED

REV. NO.		REV.	DATE	BY

RELEASED
JAN 31 2000
NHTSA

RELEASE 12/21/99

NOTES:
 1. USE MOLD 880105-424
 2. MAT'L: PVC

ITEM NO.	QTY	FSCM NO.	PART NO.	DESCRIPTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMALS ARE TO THE TENTH FRACTIONS ARE TO THE SIXTEENTH TOLERANCES ARE: ±.0125 ±.0150 ±.0200	STANDARD BUILD LEVEL APPROVALS Y. Z. DATE DRAWN 5/6/98 CHECKED <i>QW</i> 12-17-99 PROD. ENG. <i>y.a.</i> 12-17-99	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION FIRST TECHNOLOGY SAFETY SYSTEMS RIGHT BREAST SCALE SHEET
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MATERIAL SEE NOTE 2 MEAT TREAT. FINISH	DO NOT SCALE DRAWING
--	----------------------

880105-355-E-1 NEXT ASST	880105-000 USED ON
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II.2. Changes to the PADI.

External Dimensions, page 82. The revision to this section of the PADI consists of five basic changes described below.

Change 1. Add the following text to the beginning of this section.

Exterior dimensions of the assembled dummy are also specified on Drawing No. 880105-000, Complete Assembly, 5th Female, Sheet 5 of 6 to assure that individual parts are manufactured within their respective tolerances.

Since any given dummy is frequently disassembled, the PADI includes a check on the exterior dimensions to assure that all assemblies and fitted parts (such as the chest jacket) are properly installed on the reassembled dummy. For the jacket, only the mid-level circumference needs to be checked to assure a proper fit. The additional sectional jacket dimensions appearing on Sheet 5 do not need to be checked during reassembly.

Change 2. Revise the instructions as follows:

Was:

7. ...A strap or bungee cord may be placed around the forehead of the dummy to stabilize the head in this position.

...

12. Record the dimensions listed in Table 4, except for dimension Y and Z (reference Fig. 107).

13. Install the abdominal insert and chest jacket. Reposition the dummy on the test fixture. The head need not be level as previously specified.

14. Mark the locations and record the dimensions Y, Z, AA, and BB as specified in Table 4 and Fig. 107.

Now:

7. ...A strap or bungee cord may be placed around the head of the dummy to stabilize the head in this position.

...

12. Record the exterior dimensions except for the jacket and waist.

13. Install the abdominal insert and chest jacket. Reposition the dummy on the test fixture by following steps 6-8 above.

14. Record the exterior dimensions of the jacket and waist.

Change 3. Revise Table 4. Hybrid III Small Adult Female External Dimensions, as follows:

a. New title: Table 4. Hybrid III Small Adult Female External Dimensions (reference Fig. 107).

b. Revise the last four rows as follows:

Was:

Dim.	Description	English (in)		Metric (mm)	
		Spec.	Tolerance +/-	Spec.	Tolerance +/-
Y	Chest Circumference with Jacket	34.10	0.60	866.1	15.2
Z	Waist Circumference	30.50	0.60	774.7	15.2
AA	Reference Location for dim. "Y"	13.6	0.50	345.4	12.7
BB	Reference Location for dim. "Z"	6.50	0.20	165.1	5.1

Now:

Dim.	Description	English (in)		Metric (mm)	
		Spec.	Tolerance +/-	Spec.	Tolerance +/-
Y	Jacket Circumference	33.9	0.2	860	5
Z	Waist Circumference	30.5	0.6	775	15

Change 4. Revise Table 5. External Dimension Details, as follows:

a. New title: Table 5. External Dimension Details (reference Fig. 107)

b. Revise the last four rows as follows:

Was:

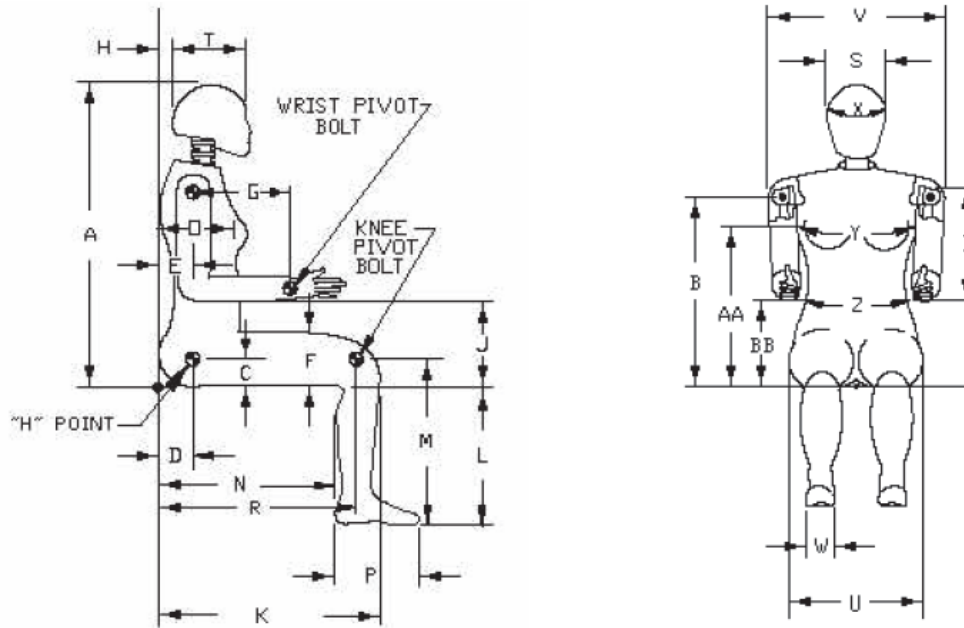
Dim.	Description	Details
Y	Chest Circumference with Jacket	measured 304.8 +/- 5.1 mm (12 +/- 0.2 in) above seat surface
Z	Waist Circumference	measured 165.1 +/- 5.1 mm (6.5 +/- 0.2 in) above seat surface
AA	Reference Location for dim. "Y"	REFERENCE
BB	Reference Location for dim. "Z"	REFERENCE

Now:

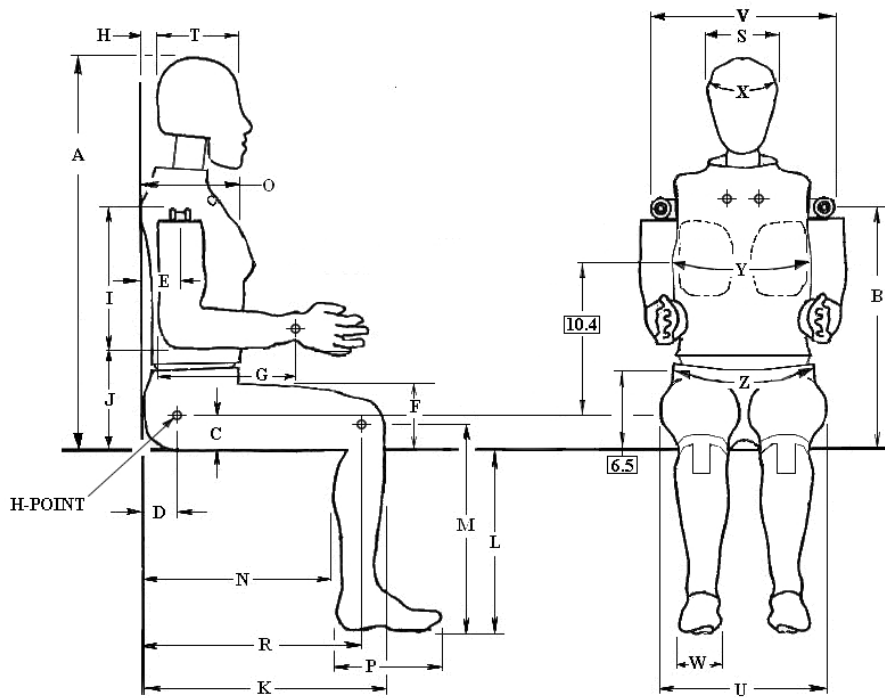
Dim.	Description	Details
Y	Jacket Circumference	measured 265 mm (10.4 in) above average H-point
Z	Waist Circumference	measured 165 mm (6.5 in) above seat surface

Change 5. Revise Figure 107 as follows (note the locations for waist and chest circumference measurements are now basic dimensions shown on the new figure and no longer have separate entries in Tables 4 and 5):

Was:



Now:



III. REVISIONS TO THE REGULATORY TEXT

No changes to the Subpart O regulatory text are needed to incorporate the changes to the spine box and jacket. However, the regulatory text has been revised to incorporate several “housekeeping” changes. They are described as follows:

1. The title of Subpart O adds the word “adult” between “5th percentile” and “female” for clarity.
2. The words “Alpha Version” are removed from the title of Subpart O. During adoption of some of the subparts of Part 572 NHTSA had decided that referring to the alpha, beta, etc., “versions” of the test dummies would better distinguish a current version of an ATD from a previous version. The agency later decided this naming convention was not helpful and has not followed it.
3. References to SAE J211 parts 1 and 2 and to SAE J1733 now refer to the most up-to-date versions of the standards. SAE J211 is revised with improved diagrams for defining the dummy coordinate system, and corrections to minor mistakes in print. New information and recommendations for data system grounding, sensor cable shielding, and minimizing the effects of transducer resonance are included. Clarifications on data processing are also included. J1733 is revised with improved diagrams for defining the dummy coordinate system (for the HIII-5F, the system itself is unchanged).

The word-by-word revisions to the regulatory text are published in the Federal Register issue in which the NPRM is described.
