Chapter One

FUSELAGE CONSTRUCTION

PARTS & MATERIALS CALL OUT

DWG. REF. NO.	DESCRIPTION	QUANTITY BD-5A	QUANTITY BD-5B	MATERIAL IDENTIFICATION NO.	MATERIAL DESCRIPTION
FU1	BULKHEAD	1		MBD5FU1	.025 2024T42
FU3	DOOR,L.H.	1		MBD5FU95	.025 2024T42
FU4	DOOR, R.H.	1		MBD5FU96	.025 2024T42
FU6	BULKHEAD	1		MBD5FU6	.025 2024T42
FU7	HAT SECTION	1		BD-0006	.025 2024T3
FU8	REINFORCEMENT PLATE	2		BD-5-0028	.032 2024T3
FU9	STOP BLOCK	1		BD-5-M-0075	.750 X .625 2024T3 BAR
FU10	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU11	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU12	TEE SPLICE	1		BD–0008	.078 X 1.00 X 1.50 2024T EXT'S.
FU13	BELLY DOUBLER	1		BD-5-M-0030	.063 2024T3
FU14	BULKHEAD	1		BD-5-M-0027	.025 2024T3
FU17	LONGERON,W.L. 23.50	1		MBD5FU17	.025 2024T42
FU18	LONGERON,W.L.23.50	1		MBD5FU18	.025 2024T42
FU21	ANGLE,L.H.	1		MBD5FU21	.025 2024T42
FU22	ANGLE,R.H.	1		MBD5FU22	.025 2024T42
FU23	LONGERON,W.L. 41.50	1		MBD5FU23	.025 2024T42
FU24	LONGERON,W.L. 41.50	1		MBD5FU24	.025 2024T42
FU25	CLIP,L.H.	1		BD-0003	.032 X 2.00 X 2.00 2024T3 ANGLE
FU26	CLIP,R.H.	1		BD-0003	.032 X 2.00 X 2.00 2024T3 ANGLE
FU27	DOUBLER,INSIDE	1		BD-5-M-0027	.025 2024T3
FU28	DOUBLER,INSIDE	1		BD-5-M-0027	.025 2024T3
FU29	DOUBLER,OUTSIDE	1		MBD5FU29	.090 2024T3
FU30	DOUBLER,OUTSIDE	1		MBD5FU30	.090 2024T3
FU31	ANGLE,L.H.	1		BD-0013	.063 x 1.00 x 1.00 2024T3 ANGLE
FU32	ANGLE,R.H.	1		BD-0013	.063 x 1.00 x 1.00 2024T3 ANGLE
FU33	ANGLE,L.H.	1		BD-0007	.125 X 1.50 X 2.00 2024T3 ANGLE
FU34	ANGLE,R.H.	1		BD-0007	.125 X 1.50 X 2.00 2024T3 ANGLE
FU35	TUBE	1		BD-5-M-0031	.38 O.D. X .058 WALL 2024T3 TUBING
FU36	ANGLE CLIP	3		BD-5-M-0028	.032 2024T3
FU37	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU38	BULKHEAD	1		BD-5-M-0027	.025 2024T3
FU39	SKIN, AFT, UPPER	1		MBD5FU39	.025 2024T3
FU40	SKIN,AFT,UPPER	1		MBD5FU40	.025 2024T3
FU41	SKIN,AFT,LOWER	1		MBD5FU41	.020 2024T3
FU42	SKIN,AFT,LOWER	1		MBD5FU42	.020 2024T3
FU43	SPLICE STRIP,L.H.	1		BD-5-M-0028	.032 2024T3
FU44	SPLICE STRIP,R.H.	1		BD-5-M-0028	.032 2024T3
FU45	ANGLE	1		BD-0002	.032 X 1.00 X 1.00 2024T3 ANGLE
FU46	SHIM	2		BD-5-M-0030	.063 2024T3
FU47	SHIM	2		BD-5-M-0025	.016 2024T3
FU48	GUSSET	2		BD-5-M-0027	.025 2024T3
FU49	ANGLE CLIP, L.H.	1		BD-0002	.032 X 1.00 X 1.00 2024T3 ANGLE
FU50	ANGLE CLIP,R.H.	1		BD-0002	.032 X 1.00 X 1.00 2024T3 ANGLE
FU51	DOOR FRAME,FWD.	1		MBD5FU51	.025 2024T3
FU52	DOOR FRAME,FWD.	1		MBD5FU52	.025 2024T3
FU53	DOOR FRAME,AFT	1		MBD5FU53	.025 2024T3
FU54	DOOR FRAME,AFT	1		MBD5FU54	.025 2024T3
FU55	DOUBLER	2		BD-5-M-0030	.063 2024T3
FU56	BULKHEAD	1		BD-5-M-0025	.016 2024T3
FU57	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU58	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU59	SPLICE STRIP	1		BD-5-M-0028	.032 2024T3
FU60	BULKHEAD	1		BD-5-M-0026	.020 2024T3
FU61	BULKHEAD	1		BD-5-M-0025	.016 2024T3
FU62	BULKHEAD	1		BD-5-M-0025	.016 2024T3
FU63	BULKHEAD	1		BD-5-M-0025	.016 2024T3
FU64	BULKHEAD	1		BD-5-M-0025	.016 2024T3
FU65	DOUBLER	2		BD-5-M-0028	.032 2024T3
FU66	BULKHEAD	1		MBD5FU66	.032 6061T6
FU67	FORE SKIN,L.H.	1		MBD5FU67	.032 2024T42
FU68	FORE SKIN, R.H.	1		MBD5FU68	.032 2024T42
FU69	LONGERON,L.H.	1		MBD5FU69	.032 2024T42
FU70	LONGERON,R.H.	1		MBD5FU70	.032 2024T42
FU72	SPLICE STRIP	1		MBD5FU72	.032 2024T42
FU73	SKIN,NOSE CAP, L.H.	1		MBD5FU73	.032 2024T42
FU74	SKIN,NOSE CAP,R.H.	1		MBD5FU74	.032 2024T42
FU95	SKIN,MID,L.H.	1		MBD5FU95	.025 2024T42
FU96	SKIN,MID,R.H.	1		MBD5FU96	.025 2024T42
FU97	SKIN,MID,L.H.	1		MBD5FU97	.025 2024T42
FU98	SKIN,MID,R.H.	1		MBD5FU98	.025 2024T42

FUSELAGE

THE DRAWING ON THE FACING PAGE ILLUSTRATES LOCATION AND IDENTIFICATION OF PARTS IN CONSTRUCTION OF THE BD-5 FUSELAGE. THE DRAWING ON THE PAGE FOLLOWING ILLUSTRATES LOCATION OF PARTICULAR CONSTRUCTION DETAILS OF THE FUSELAGE ASSEMBLY.

Before Beginning Construction, Note The Following:

1 The center portion of the fuselage should be assembled first.

2 Pay particular attention to where flush rivets and dome head rivets are used.

3 Pay particular attention to **Water Line** references on the detail drawings. These help to accurately locate the respective parts.

4 Do not finally rivet one side of the aft section of the fuselage. (One side is left open for later installation of the drive system).

5 Should a discrepancy in overall size between two preformed fuselage skins occur, always trim the larger part to match the smaller part in size.

6 When cutting aluminum, make sure all sharp edges are removed and cleaned of all burrs and roughness.

7 When drilling holes, make sure all burrs and roughness are removed from the edges of the holes before dimpling, bolting or riveting in place.

Beginning Construction

SPECIAL NOTE:
BONDING SEALANT SHOULD BE APPLIED TO ALL PARTS IMMEDIATELY PRIOR TO FINAL ASSEMBLY AND RIVETING.

1. Trim off all "tabs" from fuselage skins, making sure that all edges are trimmed straight and all roughness is removed.

   Note: The "tabs" should be trimmed even with the existing straight edges of each skin. Lay a straight edge to align with the edges of a section and mark across the tabs.

2. After trimming, clean and deburr all roughness from the edges of the sections.

3. Lay out Water Line 25.00 on both FU1 and FU6 using dimensions shown in Detail A.

4. Trial-fit sections FU97 and FU98 on formed bulkheads FU1 and FU6. Note that there is a "joggle" in the side edges of both FU1 and FU6 bulkheads – side skins FU97 and FU98 have corresponding "joggles". These will help in alignment of the skins with the bulkheads. (Detail A)

   Note: Joggles are not designed to be tight. Clearance was allowed so that the skin can be shifted slightly during the fitting process.

5. Insure distance from bottom centerline of bulkheads to top edges of both FU97 and FU98 are identical each side of bulkhead and that the top edges are on W.L. 25.00 at both ends.

6. Cut FU13 strap from .063" 2024-T3 aluminum (Detail B) and mark a centerline along its whole length.

7. Place FU13 along bottom edge of FU98 and clamp in place. Mark hole centers as shown in Detail B and pilot drill (No.39 or 40 drill) both parts.

   Note: FU13 ends at forward side of bulkhead FU14 location (STA.91.15)

8. Cleco FU13 and FU98 together.

9. Locate FU97 on FU13 and mark hole centers and drill as directed in Detail D.

10. Cleco FU97 to FU13.

11. Fabricate one FU27 and one FU28 doubler from .025" 2024-T3 aluminum (Detail G).

12. Locate FU97/FU98 assembly on FU1 and FU6 bulkheads with FU27 and FU28 doublers between skin and FU1 bulkhead. Mark rivet hole centers as instructed in Detail E. Pilot drill (No.39 or 40 drill) and cleco assembly in place.

    Note: It will be more convenient to leave the area covered by FU29 (FU30) blank at this time and drill later when FU29 (FU30) is being fitted. (See Detail E)

13. Make parts FU31 and FU32 from BD-0013 material. (Detail G)

14. Make FU11 and FU59 from .032" 2024-T3 aluminum.

    Note: FU11 and FU59 – no template drawings are provided for these parts as they are simple straps. They are 1.44" wide and run from a position .6" forward of bulkhead FU14, rearward along the bottom centerline to short of the aft end of fuselage sections FU41 and FU42. Further note that FU11 and FU59 joins at bulkhead FU6. (Detail V)

15. Make FU12 from BD-0008 extrusion. Trim the upstanding leg on forward and aft ends as shown in Detail D. The internal radius on the forward cut should be .12" minimum.

    Note: The horizontal part of the "T" extends further forward than the upstanding leg.

16. Remove FU13 from parts FU97 and FU98 and position FU12 on FU13. Clamp FU12 and FU13 firmly together and drill holes (No.39 or 40 drill), as shown in Detail D.

17. Cleco FU12 and FU13 together and position FU31 and FU32. Bolt FU31 and FU32 to FU12 and clamp these two parts to FU13, inserting shims FU46 and FU47 first. Drill as shown in Detail D (using existing holes in FU13 as a guide).

18. Assemble FU12/FU13/FU31 and FU32 at bottom centerline of FU97 and FU98 and cleco in place.

19. Angles FU17 and FU18 can now be cut to length from MBD5FU17 and MBD5FU18. These angles form part of the inside framework of the engine compartment doors.

20. FU17 runs from .80" behind skin trim of FU97 (.05"behind bulkhead FU1) to .60" past the aft edge (trim line) of FU97. See Details E .

    Note: FU17 is installed so that 1.50" is below the top edge of FU97. This leaves .75" above the top edge of FU97. (The same applies to FU18 – See Detail H and respectively).

21. See Detail H also for rivet spacing detail and general angle location. Cleco angles FU17 and FU18 in place as they are drilled.

22. Drill OUT all rivet holes to full size. Disassemble all parts. Make sure all holes and edges are smooth and free of burrs. Seal and rivet FU11, FU12, FU13, FU17, FU18, FU31, FU32, FU46, FU47, FU97 and FU98 parts to each other and to FU1 and FU6.

23. Next, position FU95 and FU96 on bulkheads FU1 and FU6. Set these top fuselage sections flush with FU97 and FU98 and insure accurate alignment on bulkheads FU1 and FU6.

24. Trim to fit, if necessary, along the top centerline.

25. Remove FU96 (right side) and clamp FU95 firmly in place on the two main bulkheads and drill at one inch intervals as depicted in Details I , N , T and U and cleco FU95 in place.

26. Fabricate FU10 from .032" 2024-T3 aluminum. Drill to fit FU95 skin.

    Note: Splicing strap FU10 should be located at the top centerline of FU95 as shown in Main Plans Drawings. See also Detail J, which shows forward end of FU10 ending .10" behind the canopy arm channel. Do not drill last two aft holes in the splicing strap at this time (where it laps under FU6 bulkhead flange), as this is done when FU39 and FU40 are installed.

27. With FU95 held in position with clecos, parts FU23, FU51, and FU53 (FU24,FU52 and FU54 right side) should be trimmed out from the preformed material furnished. See Detail H for dimensions and location of these parts.

    Note: Install FU23 before FU51 and FU53.

28. Detail L shows that FU23 ends .80" aft to skin trim line (.05" short of FU1 bulkhead). FU23 goes on top of FU48 doubler.

29. Detail I shows that FU23 extends aft .60" past the joint between FU95 and FU41.

30. Refer to Detail H for exact position of FU51 and FU53 in relation to FU17 and FU23.

31. Detail K shows specific rivet layout on parts FU17 and FU21. – See Detail H for dimensions.

32. When installing FU23, remember that doubler plate FU48 will be installed at the forward end of FU95 (Detail N) and located between FU95 and FU23. Particularly note that FU51 goes over FU23 at this position.

33. After FU23, FU51 and FU53 have been positioned on side skins FU95 and FU97 using clecos, complete installation of the opposite equivalent parts on the right side skins FU96 and FU98. Next mark and cut out top center of FU95/FU96 as shown in Detail J for installation of FU7 hat section.

    Note: A part of the forward top end of side skins FU95 and FU96 has to be cut out at the centerline, .30" wide by 16.08" long in order to provide a channel opening of .60" wide when FU95 and FU96 are together.

34. Make FU7 hat section from BD-0006 material.

35. Make FU10 splice strip from .032" 2024-T3 aluminum.

36. Fabricate three FU36 brackets from .032" 2024-T3 aluminum. (Detail J)

37. Fabricate FU8 (two parts) from .032" 2024-T3 aluminum, and FU9 from .750" X .625" 2024-T3 aluminum bar material. (Detail J)

38. Cut opening in FU1 for forward end of FU7.

39. Clamp FU7 in place on skins and mark rivet hole centers and drill holes with No.39 drill.

40. Remove FU7 and install FU8 and FU9 in FU7 hat section, as shown in Detail J.

41. Dimple, finish drill and deburr all holes in fuselage skins FU7 and FU10.

    Note: Remember to drill (No.12) the .250" pivot pin hole through both FU7 and FU8 at this time. Note particularly that it must be located and drilled at 90 degrees to the centerline and on a W.L. The hole should be drilled through both FU7 and FU8 simultaneously.

42. Reposition FU7 assembly in the fuselage and cleco in place.

43. Position two FU36 brackets at the front sides of FU7, mark hole centers and drill and cleco in place onto FU1 bulkhead. Check position and alignment (Details J and M).

44. Do not apply bonding sealant to the sides of the FU36 brackets at this time. (Detail M)

45. Position FU36 bracket below FU7 inside fuselage and drill and cleco in place.

46. Finally install splicing strap FU10, first dimpling, finish drilling and deburring holes in both fuselage skins and strap. Leave out four aft rivets which will later go through FU6 bulkhead. Do not rivet FU36 clips to FU1.

47. Finally install FU7 hat section assembly, first dimpling, drilling and deburring all rivet holes. Leave out two forward rivets which will later go through FU1.

    Note: FU10 and FU7 do not have to be final riveted at this time. but it will save clecos to do so. Otherwise the riveting may be done later when the skins are being riveted to the bulkheads.

48. Reinstall FU95/FU96 skin assembly with clecos on FU1 and FU6.

    Note: ALL engine compartment frame angles must be in place when this is done.

CUTTING OUT ENGINE COMPARTMENT DOORS

49. At this time, mark engine compartment door outline on the outside of FU95 – See Detail H for dimensions.

    Note: The best method for cutting out the doors is to continuously scribe along the door outline until the metal is almost completely cut through. Then "break" the door free and file and sand all edges smooth. The best way to scribe around the radii at the top corners of the door is to use a metal washer as a template. Do not scribe into the backup structure or into the skin beyond the opening. Thin strips of metal may be inserted between the door frame angles and the skin, if desired, to prevent scribe marks on the understructure.

50. Remove all angles from around engine compartment door opening and deburr and sand smooth the door opening in the skin. Save the skin cut outs as they will be used to make FU3 and FU4 doors.

51. Cut out FU4 engine compartment door from the right side of the fuselage. Repeat procedures in paragraphs 49 and 50.

52. Dimple and deburr all rivet holes in FU95 and FU96 skins and bulkheads FU1 and FU6.

53. Dimple and deburr all rivet holes in all engine compartment door frame angles.

54. Finally install FU23, FU24, FU51, FU52, FU53 and FU54 angles around engine compartment door openings, and FU95/FU96 skin assembly to FU1, FU6, FU23 and FU24 using flush rivets.

    Note: Do not rivet extreme fore and aft ends of FU17/FU18 and FU23/FU24 at this time. See Details I and N.

55. Install one FU36 clip to the aft side of FU1, sealing and riveting it to both FU1 and FU7. Install two FU36 clips on the forward side of FU1. Seal and rivet these clips to FU1 but seal them only to FU7. Rivets at this location will interfere with the canopy pivot arm when it is installed later.

56. Sand or file edges of FU3 and FU4 doors smooth.

57. Place FU3 door in opening in FU95. Tape in place, if necessary.

58. Lay out holes for door fastening screws and nutplates. (Detail H)

59. Pilot drill (No.39, No.40 or No.30 depending on cleco size) all holes through FU3 door skin and frame FU23, FU51 and FU53. Install clecos as you drill out the holes.

60. Remove clecos and door. Lay door aside.

61. Drill out the nut plate center holes in the door frame angles with a No.19 drill.

62. Position nutplates on the outside of the fuselage assembly by inserting a short 10-32 round head screw through the sheet metal into the nutplate.

    Note: Pay particular attention to positions of nutplates.

63. With nutplates properly positioned, drill through the nutplate mounting holes with a No.40 drill.

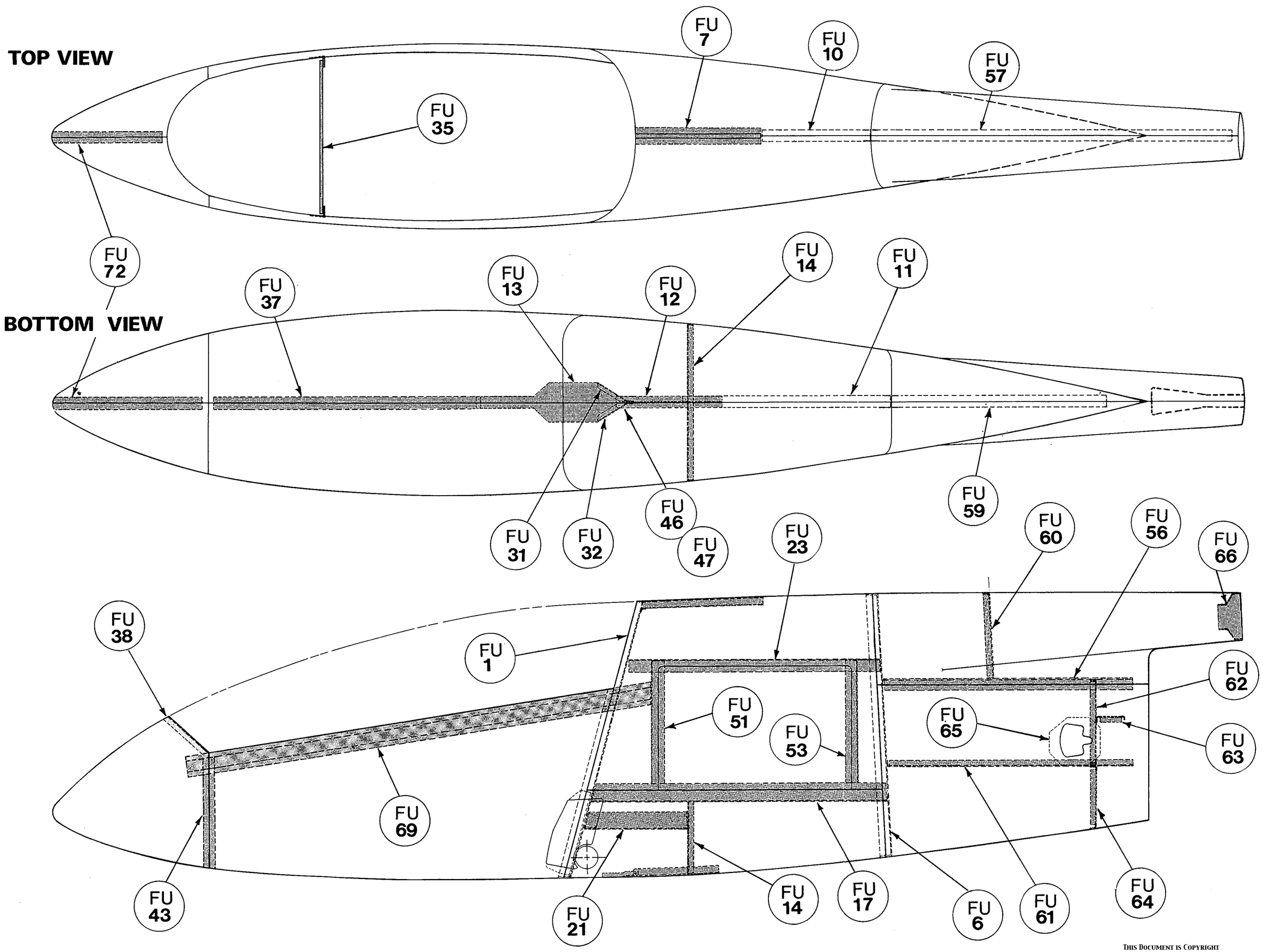
64. Dimple the nutplate rivet holes with a 100° dimple die (or a rivet head).

65. Either dimple the screw holes with a 100° dimple die or drill the holes out to 5/16" diameter to allow clearance for the dimples on the door.

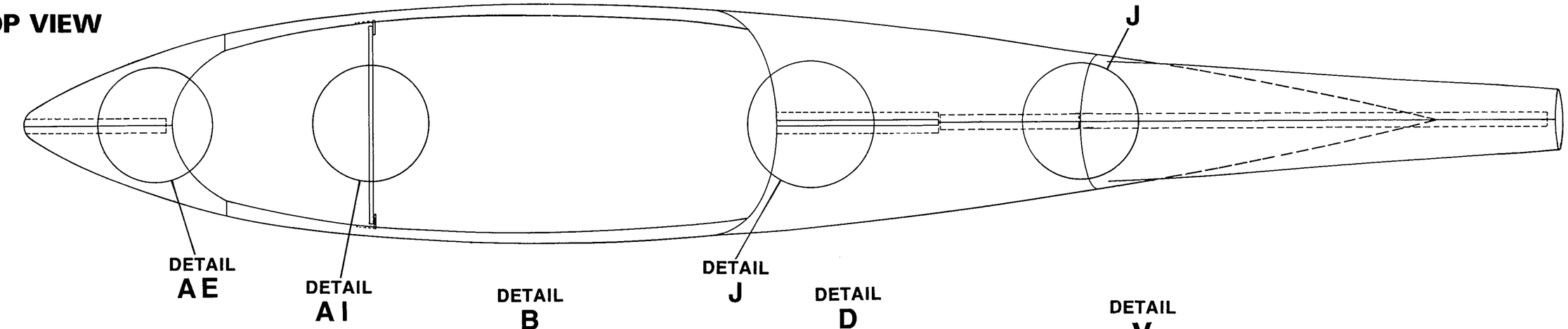
(continued on page 1-4)

TOP VIEW

BOTTOM VIEW



TOP VIEW



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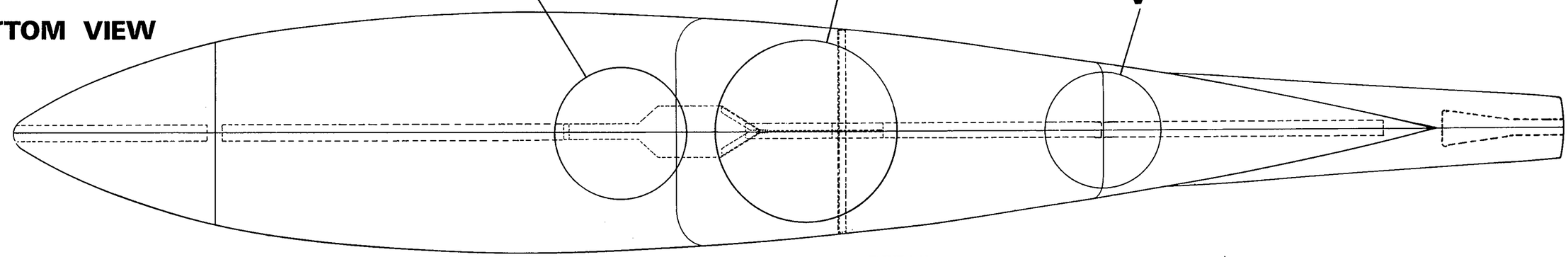
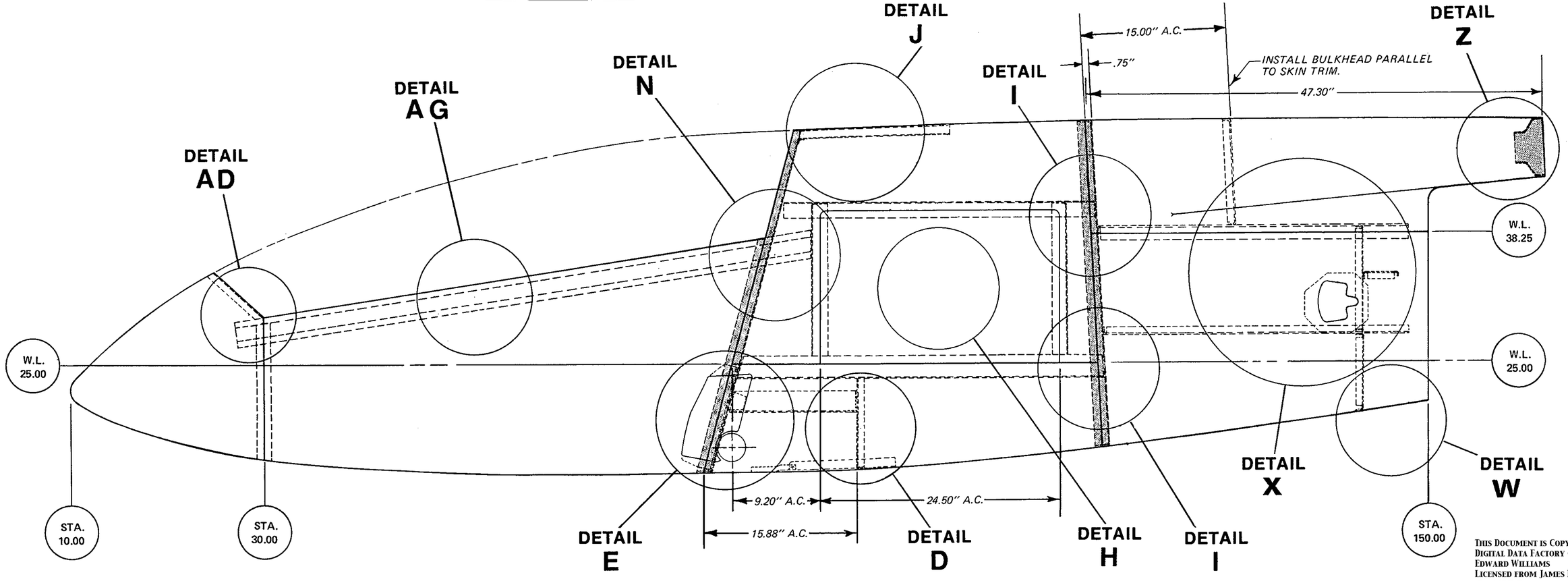




66. Clean and deburr all holes. Install nutplates with CCR264SS-3-1 rivets.

67. Dimple the screw holes in **FU3** door with a 100° dimple die using a pilot diameter to match the pilot holes used (or redrill the holes). Drill to finished size (No.19) if necessary and deburr.

68. Fit **FU4** door on right hand side using the procedure described in paragraphs **56** through **66.**

69. Fabricate **FU14** from .025" 2024-T3 aluminum . **(Detail C)**

70. After fabrication, trial-fit **FU14** in position 15.88" to the rear of the forward trim lines of **FU97** and **FU98.** (See Main Plans Drawings – Page 1²

    Note: This measurement is taken along the contour of the fuselage skins – NOT in a direct horizontal plane from the point mentioned. (See Introductory Section, Page VI)

71. Drill and install **FU14,** using clecos (hole spacing 1.00" apart – **Detail D).**

72. Make **FU21** and **FU22** from MBD5FU21 and MBD5FU22 angle material, cutting these to length on assembly. Refer to **Details D** and **E** for location and trim details. Note particularly the details of the integral tab on the aft end of the angles. Be sure the parts fit properly between **FU1** and **FU14.**

    Note: FU21 is located 5.00"A.C. below the top edge (trimline) of FU97. See Detail E.

73. Mark hole centers along inside of **FU21** and **FU22** angles, spacing holes as called out in **Detail E.** (See also **Detail K** for relationship of **FU21** to **FU17).**

    Note: Drill the No.19 holes in the forward end of the angles only to pilot hole size at this time.

74. Trial-fit **FU21,** then hold in place while drilling holes through it and **FU14.** Cleco in place on **FU14.**

75. Drill holes through length of **FU21** and **FU97** and cleco in place.

76. Repeat procedure for **FU22.** See **Detail K** for rivet hole pattern on **FU21** (same for **FU22).**

77. Dimple holes, deburr and make final installation of **FU21** and **FU22.** Use clecos in the forward holes to hold parts in contact while sealant sets up.

CONSTRUCTION OF THE FUSELAGE AFT SECTION

Note: Before beginning actual assembly of fuselage skins FU39, FU40, FU41 and FU42, all internal bulkheads and doublers should be fabricated. In respect of parts FU56 and FU61, it will be noticed that the template drawings have had to be printed in two parts, each part on a separate page. Fabrication of the parts themselves is, of course, each in one piece.

78. Make template and fabricate **FU56** from .016" 2024-T3 aluminum. **(Detail O)**

79. Make template and fabricate **FU61** from .016" 2024-T3 aluminum. **(Detail P)**

80. Make templates and fabricate parts **FU62, FU63,** and **FU64** from .016" 2024-T3 aluminum. **(Detail Q)**

81. Make templates and fabricate parts **FU58** and **FU65** from .032" 2024-T3 aluminum **(Detail R).** Mark hole centers.

82. Make template and fabricate **FU60** from .020" 2024-T3 aluminum **(Detail S)**

83. Trial-fit **FU41** and **FU42** to bulkhead **FU6.** Check for good alignment all around, with first alignment being made with the side skins already installed on **FU6** (i.e. **FU95, FU96, FU97** and **FU98).**

84. First install **FU41** in place on bulkhead **FU6,** mark hole centers 1.00" apart – except at the positions where **FU17** and **FU23** join **FU6 (Details T and U).** Drill No.39 all holes.

85. Note that in **Detail V** the aft end of **FU11** splicing strap (shown ending on top of the **FU6** bulkhead flange) is finally drilled when **FU41** is in place (two holes).

86. Dimple **FU6, FU11** and **FU41** and cleco parts together.

87. Drill (Drill No.39) all holes through **FU41** and **FU6** bulkhead.

88. Cut from .032" 2024-T3 aluminum **FU59** splicing strap. No template is provided for this strap as it is a simple strip of aluminum, 1.44" wide and running from **FU6** rearwards to within 2.5" of the extreme aft end of fuselage skins **FU41** and **FU42. (Detail W)**

89. Note that **FU59** is tapered slightly at its aft end to fit inside skin contour. It must also be hand formed in a slight "Vee" to fit inside the skins.

90. Draw a centerline down complete length of **FU59** and position strap on **FU41.** Clamp in place. Mark hole centers (1.00" spacing) along its entire length, then drill holes through both **FU59** and **FU41** with No.39 drill.

91. Cleco **FU59** to **FU41.**

92. Position **FU64** inside **FU41** at 7.10"A.C. from extreme trailing edge of **FU41.** Clamp in place, mark hole centers and drill No.39 holes at 1.00" intervals **(Details W** and **X).**

93. Next, mark hole centers along outside of **FU41** for installation of **FU61.**

    Note: Hole centers for this part are 1.5" apart, with the exception of the area where FU65 is installed (See Detail X).

94. Holes can be drilled in **FU41. DO NOT** drill holes at this time in the area where **FU65** is to be installed.

95. Reposition **FU61** inside **FU41** and, using the holes drilled in **FU41** skin as a guide, drill **FU61.**

96. Cleco **FU61** to **FU41.**

97. Drill holes through **FU61** and **FU6** bulkhead 1.5" apart. **(Detail T)**

    Note: Holes in FU61 and the top flange of FU64 can be drilled and FU61 fastened to FU64 with clecos. Hole centers will be the same as those in the bottom flange of FU62 as shown in Detail X.

98. Position **FU62** on **FU61** and, removing clecos holding **FU61** to **FU64,** mark hole positions in bottom flange of **FU62** with a felt-tip marker.

99. Remove **FU62** and drill holes with No.29 drill. **(Detail X)**

    Note: It is important to insure that both FU64 and FU62 are accurately located inside FU41 (Detail X). It is especially important to insure that FU62 is located the same distance forward of the trailing edge on BOTH sides as this determines whether the horizontal stabilizer pivot will be straight across the fuselage.

100. Mark hole centers on **FU41** skin for riveting **FU62** and, with **FU62** clamped firmly in place, drill both **FU41** and **FU62** at the same time.

     Note: Do not drill holes as indicated in Detail X.

101. Remove necessary clecos so that **FU65** can be installed.

102. Position **FU65** between **FU41** skin and bulkheads **FU61, FU62** and **FU64.**

     Note: The cut out shown in FU65 for installation of the horizontal stabilizer is the nominal size required. Variations in individual airplanes may require slight trimming during the stabilizer rigging process.

103. With **FU65** held firmly in position, the top hole through **FU64** and **FU41,** the fifth hole along **FU61** forward of **FU64,** and the first hole along **FU61** rearward of **FU64** can be used as guides to drill holes at these positions in **FU65. (Detail X)**

104. Cleco **FU65** in place.

105. From inside **FU41,** mark remaining hole centers on **FU65** and drill No.39 holes as shown in **Detail X.**

106. Finish cleco **FU65** in place.

107. Position **FU63** bulkhead on **FU62** and **FU41.** Mark hole centers in **FU62** and **FU41** and drill No.39 holes. **(Detail X)**

108. Position **FU56** along the top of **FU41** as shown in **Detail X.**

109. Mark hole centers as shown and drill No.39 holes 1.00" apart. **(Detail X)**

110. See **Detail X** for hole spacing and position on top flange of **FU62** on **FU56.**

111. After all bulkheads have been drilled and fastened in place with clecos, use **FU65** as a template and draw cut-out outline on inside of **FU41.**

112. Remove all bulkheads and **FU41** from **FU6** and cut out hole for horizontal stabilizer installation. **(Detail X)**

113. Dimple all holes in parts where flush rivets are to be used, drill out all holes for 1/8" rivets to No.29 and reassemble all bulkheads in **FU41** and attach to **FU6** using No.30 (1/8") clecos.

114. Assemble **FU42** in position, mark all holes centers following procedure as with **FU41.** Drill this part and dimple and deburr all holes.

115. Cleco **FU42** in place and double check general alignment and good fit.

116. Position **FU60** on **FU56.** Mark hole centers in bottom flange of **FU60** and drill both **FU60** and **FU56** simultaneously (No.39 drill). Cleco **FU60** to **FU56. (Detail Y)**

     Note: FU60 is installed parallel to the forward trim line of skin FU41 (FU42) and 15.00" from it. (See Detail Y)

117. Shape **FU58** to fit contour of **FU39/FU40** skins. **(Detail Z)**

118. Position **FU39** in place. Mark hole centers around trim lines and drill holes. **Details X** and **Y)**

119. Position **FU57** splicing strap along inside top of **FU39.** Mark hole centers and drill holes. Cleco in place on **FU39.**

120. Position **FU66** in **FU39. See special note in Detail Z.**

121. Position **FU40** in place, mark hole centers for parts **FU60, FU57** and **FU58** and drill holes.

122. Remove all parts, dimple, finish drill and deburr holes.

     SPECIAL NOTE: Final assembly of one side only of the aft end of the fuselage should be carried out at this time. That is, final riveting of FU40 and FU42 only can be completed (and the inside bulkheads where they attach to these skins at this time. The complete left side of the aft end of the fuselage should be left open for installation of drive system and control system.

CONSTRUCTION OF THE FORWARD FUSELAGE SECTION

123. Position side skins **FU67** and **FU68** on bulkhead **FU1,** insuring good centerline alignment. (See Main Plans Drawing – Page 1²) Drill No.39 holes through skins and **FU1** bulkhead **(Detail E).** Cleco skins to bulkhead.

     Note: Leave out the holes which will be under FU29 and FU30 doublers.

124. Make **FU37** splicing strip from .032" 2024-T3 aluminum and mark hole centers as called out in Detail AA.

     Note: See Detail AA for splicing strap FU37 installation. With holes in FU13 already drilled, use these as a guide to drill FU67 and FU68 skins along bottom centerline. FU37 should be cut to end at the trim line of FU67 and FU68 with FU73/FU74.

125. Drill (No.39) **FU37** and side skins **FU67** and **FU68** and cleco splicing strip in place.

126. Assemble nose cone by joining **FU73** and **FU74** with **FU72** splicing strip (which, in this case, is a preformed part from .032" 2024-T3 aluminum – Bede Aircraft Part No.BD5FU72). **(Detail AE)**

127. Make two parts **FU43** and **FU44** from .032" 2024-T3 aluminum. **(Detail AB)**

128. Make template and fabricate **FU38** from .025" 2024-T3 aluminum. **(Detail AC)**

     Note: A Form Block will have to be made in order to form FU38. Form the complete bulkhead with no cutout in the web at this stage.

129. Cut **FU45** from BD-0002 material.

130. Position nose cone assembly **(FU73/FU74)** against **FU67** and **FU68** and locate side straps **FU43** and **FU44.** Clamp these parts together and mark hole centers. **(Detail AN and AE).**

131. Remove nose cone and finish drill, countersink and deburr all holes.

132. Reassemble the nose cone on **FU67/FU68** side skin.

133. Position **FU45** behind **FU38 (Detail AF)** and mark hole centers and drill No.29 holes as indicated.

134. Cleco **FU45** to **FU38** to stiffen the bulkhead while it is being fitted.

135. Mark hole centers for installation of **FU38** and drill holes. **(Details AD and AE).**

136. Remove **FU38** and finish drill, countersink and deburr all holes in this bulkhead and **FU73/FU74.**

137. Remove **FU45** angle from **FU38.**

138. Next, cut out center of **FU38** as shown in **Detail AF** and deburr edges.

139. Position **FU45** behind **FU38** and rivet in place with dome head rivets.

140. Relocate **FU38** inside fuselage nose cone and cleco in place.

141. **FU72, FU73, FU74** and **FU38** can now be finally riveted together using flush rivets.

142. Cleco completed nose cone assembly in place on **FU67** and **FU68** with **FU43** and **FU44** side strips in position.

143. Final rivet nose cone assembly to **FU67** and **FU68** using **FU43** and **FU44** splice strips.

     Note: Install only those rivets below the level of FU69 and FU70.

144 Make two **FU55** parts from .063" 2024-T3 aluminum. **(Detail AB)**

145. Cut out **FU1** on both sides to allow **FU69** and **FU70** to be inserted. **(Detail N)**

146. Make **FU69** and **FU70** from MBD5FU69 and MBD5FU70. Trim upper and lower flanges to width. **(See Detail AD)**

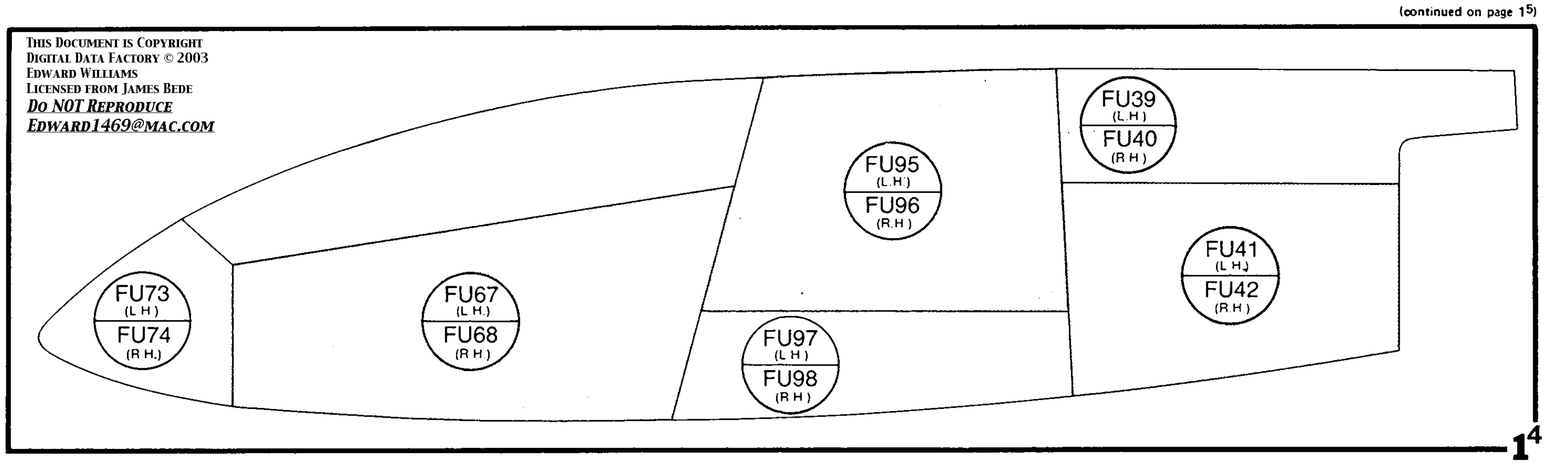
     Note: Upper flange is .60" wide and lower flange is .50" wide.

147. Trial fit **FU69/FU70** before cutting to final length.

     Note: The hat section should overlap the nose skin by 3.00" at the top flange and extend back to FU51 (FU53) at the aft end. This part will appear to shorten as the fuselage skin is spread in a following step so do not over trim at this time.

148. Trim the aft ends of **FU69** and **FU70** to the proper angle to be parallel to **FU51** and **FU52.**

(continued on page 1⁵)



149. Clamp **FU69** and **FU70** flush with the upper edge of **FU67** and **FU68** skins. **Details N and AD.** The aft ends should be within .05" of the flange on **FU51/FU52.**

150. Drill the four holes in each hat section that will pick up rivets in **FU1** bulkhead and the skins. Install clecos.

Note: Do not drill any other holes in the longerons at this time.

151. Measure 15.12" from the forward trim lines of **FU67/FU68** aft along the contour at the top edge of the skins. **Detail AI.** Make a mark on each skin at this point.

152. Insert a temporary spreader (wood strip or other suitable material) to spread the fuselage, longerons and all. After spreading, the fuselage skins should be 20.18" apart (outside to outside) at the points where the marks were made.

Note: This operation will cause the longerons to slip with relation to the skin. Ease up pressure on any clamps to let this take place. No slippage should take place where the clecos are in the aft end.

153. With the fuselage spread to the proper width, transfer the marks on the skin (per paragraph 151) onto the hat sections. This establishes a locating reference for installation of **FU33** and **FU34** angles

154. From this point on, the **FU69** and **FU70** longerons can be fitted and drilled in using the wooden spacer to maintain fuselage contour or the fuselage size can be held by installing **FU33/FU34** angles and **FU35** tube. The assembly sequence is written assuming the second method.

155. Fabricate **FU33/FU34** brackets from BD-0007 angle material as shown in **Detail AH.** Drill two No.19 holes as indicated. Pilot drill the rivet holes to No.39

156. Make one **FU35** part from .375"O.D. aluminum tubing to the dimensions given in **Detail AH,** and drill the two inner holes full size (No.19 drill) as shown. Drill the outside two holes undersize (No.39 or No.40).

157. Using the reference lines marked in paragraph 153, **(See also Detail AI)** locate **FU33** and **FU34.**

Note: The upper corner of FU33/FU34 should be located on the reference line, but not parallel with it. The aft face of the angle should be approximately vertical when the airplane is in flight attitude.

158. Drill No.29 through the existing holes in **FU33/FU34** into the longerons. Cleco **FU33/FU34** in place.

159. Install **FU35** in place and install 8-32 screws in the full size holes.

160. Drill No.39 through the pilot holes in **FU35** into **FU33/FU34.** After the alignment is checked, drill these holes out with a No.19 drill.

161. Remove **FU33, FU34** and **FU35.** Deburr all holes.

162. Finish rivet **FU33** and **FU34** to **FU69** and **FU70** with dome head rivets.

163. Install **FU35** with two screws, washers and nuts. **Detail AI**

164. Make two **FU55** parts from .063" 2024-T3 aluminum. **(Detail AB)**

165. Clamp **FU55** straps along tops of **FU69** and **FU70,** as shown in **Section View B - B** of **Detail AD.** Double check alignment of **FU69/FU70** with top edge of skins. **(Details N and AD)**

Note: FU69/FU70 should still be attached with clecos where it crosses FU1 bulkhead.

166. Mark hole centers on outside of fuselage skins and drill holes as indicated.

SPECIAL NOTE: Carefully study special drawing in Detail AG, as well as Details N and AD, before drilling holes. Pay particular attention to double countersink of specific holes for installation of double-flush rivets. Also note No.29 holes for later installation of windshield.

167. Cleco canopy hat sections in place during the drilling process.

168. It will be advantageous to start drilling holes at bulkhead **FU1** and work forward on the longerons. Drill a few holes on one side of the fuselage and then drill some on the opposite side. In other words do not drill all the holes on any one side at one time. Keep enough clecos in the holes to prevent slippage.

169. Make two **FU48** gussets from .025" 2024-T3 aluminum. **(Detail G)**

170. Insert one **FU48** on each side of the fuselage between the longerons and skin.

Note: FU48 also slips between FU23 (FU24) and the skin and between FU1 bulkhead and the skin. (Detail N)

171. Drill No.39 all rivet holes necessary to install **FU48** (both sides).

172. Remove **FU48, FU69, FU70** and **FU55.**

173. Finish drill, countersink and deburr holes for those rivets which will install in .032" skin **(FU67** and **FU68).** Dimple, finish drill and deburr holes for those rivets which will install in .025" skin **(FU95** and **FU96).**

Note: Both the skin and under structure must be dimpled.

174. Trim forward end of **FU69/FU70** if necessary.

175. Countersink all rivet holes in **FU67,FU68, FU73, FU74** and **FU55.**

Note: Pay particular attention to the different size and angle of countersink for the Avex 1/8" rivets and the MS 3/32" rivets.

176. Make final installation of **FU48** including the rivets which also go through **FU69/FU70.**

Note: Make sure to get sealant under the flange of FU23/FU24 and to get complete coverage on the skin contact side of FU48.

177. Make final installation of **FU69** and **FU70.** Use the same technique of working from aft to forward and alternating rivets on each side that was described for the drilling process.

Note: Be sure to install the rivets previously left out of the top end of FU43/FU44.

178. Trim **FU29** and **FU30** doublers along the scribe line furnished on the preformed blank.

179. File a bevel along the top edge. This bevel should start .25" from the top of the part and taper down to a material thickness of .020" - .040" at the edge.

180. Make one each of **FU25** and **FU26** from VS-0003 angle material.

181. Locate hole centers for both the rivets and screws on **FU29. (Detail E)**

182. Fit **FU29** in proper position on side of fuselage and drill No.29 holes at all hole locations. Cleco in place.

183. Fit **FU25** in place. Drill to match **FU29** four places. Drill No.29 four places into **FU1** bulkhead.

184. Drill out all rivet holes in **FU29** to No.29 drill size and all screw holes to No.19 size. Remove the No.40 clecos and replace with No.30 (in the rivet holes) as holes are drilled out.

185. Remove **FU25** and **FU29.**

186. Countersink all screws holes in **FU29** 100° X .323" diameter. Countersink all rivet holes 120° X .205" diameter.

Note: The bottom eight(8) rivets through FU27 doubler may be either flush or dome head.

187. Deburr all holes in skins, bulkhead, doublers and clip.

188. Make final installation of **FU25** and **FU29.**

189. Repeat installation procedure for **FU26** and **FU30.**

190. Make **FU49/FU50** from BD-0002 material (note that these parts are opposites). **(Detail AH)**

191. Fit **FU49** in place and drill No.29 through **FU49, FU69** and **FU1** on hole centers as shown on **Detail N.**

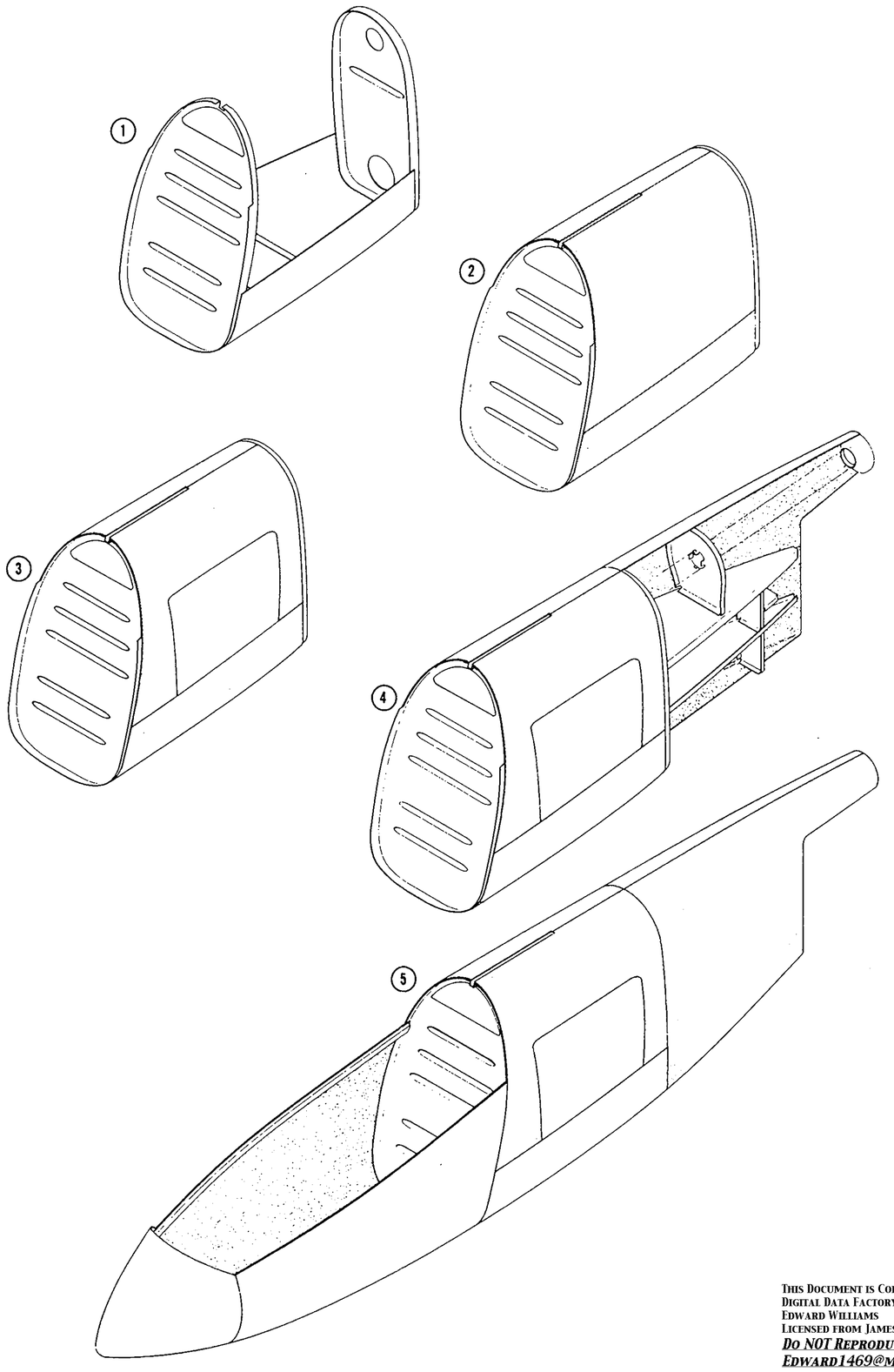
192. Deburr holes, clean out chips and final rivet **FU49** in place with dome head rivets.

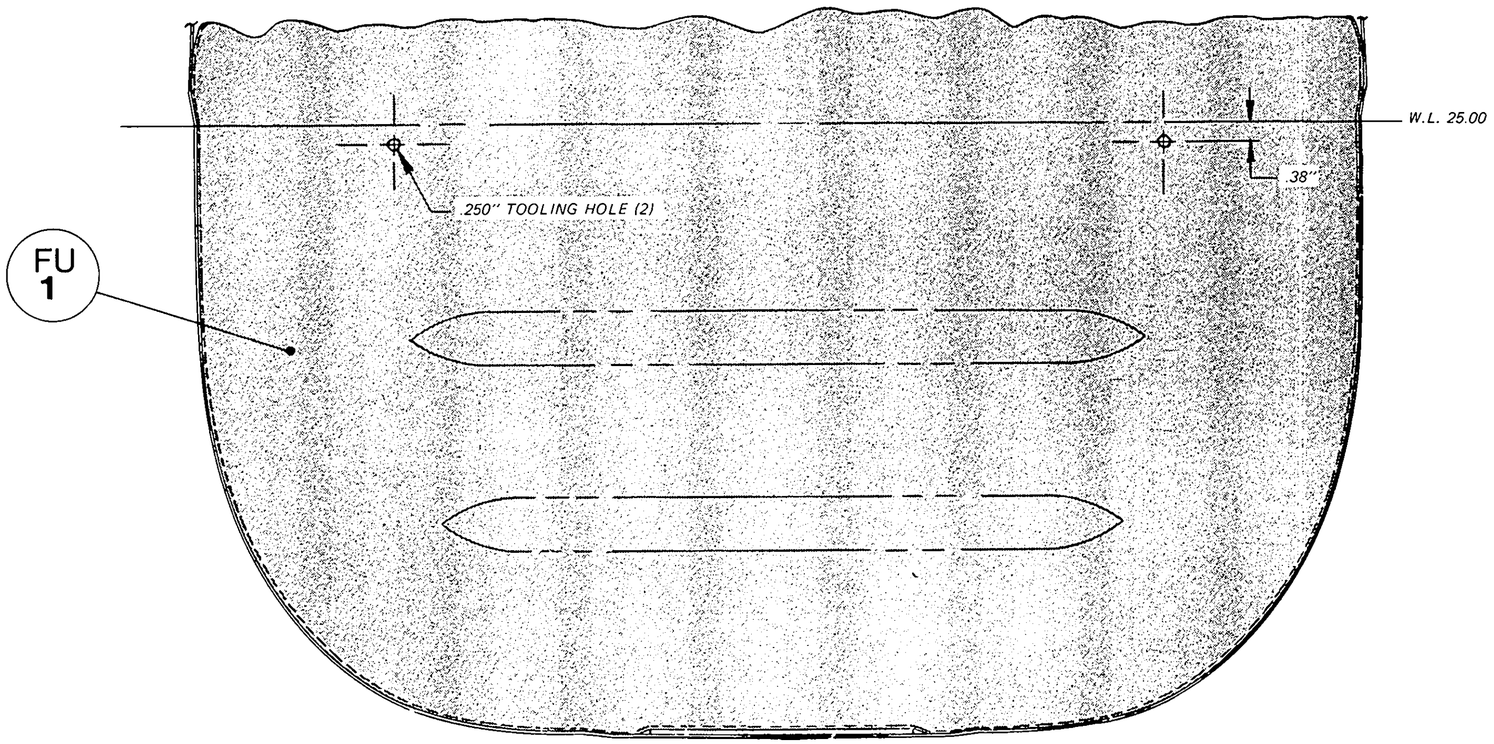
193. Install **FU50** opposite to **FU49.**

FURTHER WORK ON THE FUSELAGE IS COVERED IN THE CHAPTERS ON "LANDING GEAR","CONTROL SYSTEM" AND "COCKPIT & CANOPY".

FUSELAGE
CONSTRUCTION SEQUENCE

HERE IS THE SUGGESTED SEQUENCE OF CONSTRUCTION FOR THE FUSELAGE, AS COVERED BY THE WRITTEN INSTRUCTIONS IN THIS CHAPTER





DETAIL A

1. Lay out **Water Line 25.00** on both **FU1** and **FU6**, using dimensions shown.

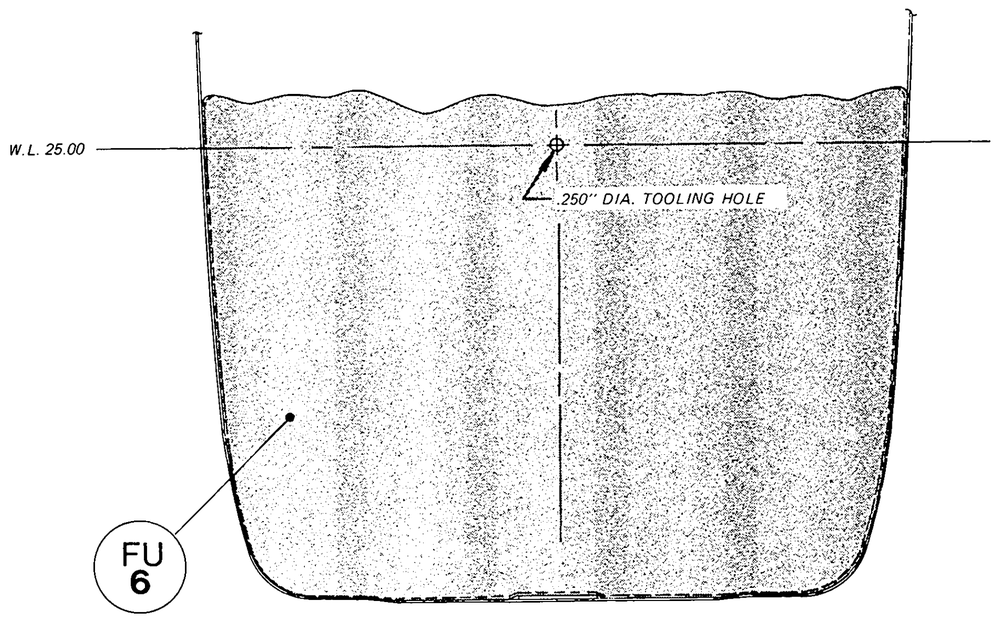
2. Notice the "joggle" in the side edges of **FU1**. There is also a slight joggle in the sides of **FU6**, although this is difficult to reproduce in the scaled down drawing on the left.

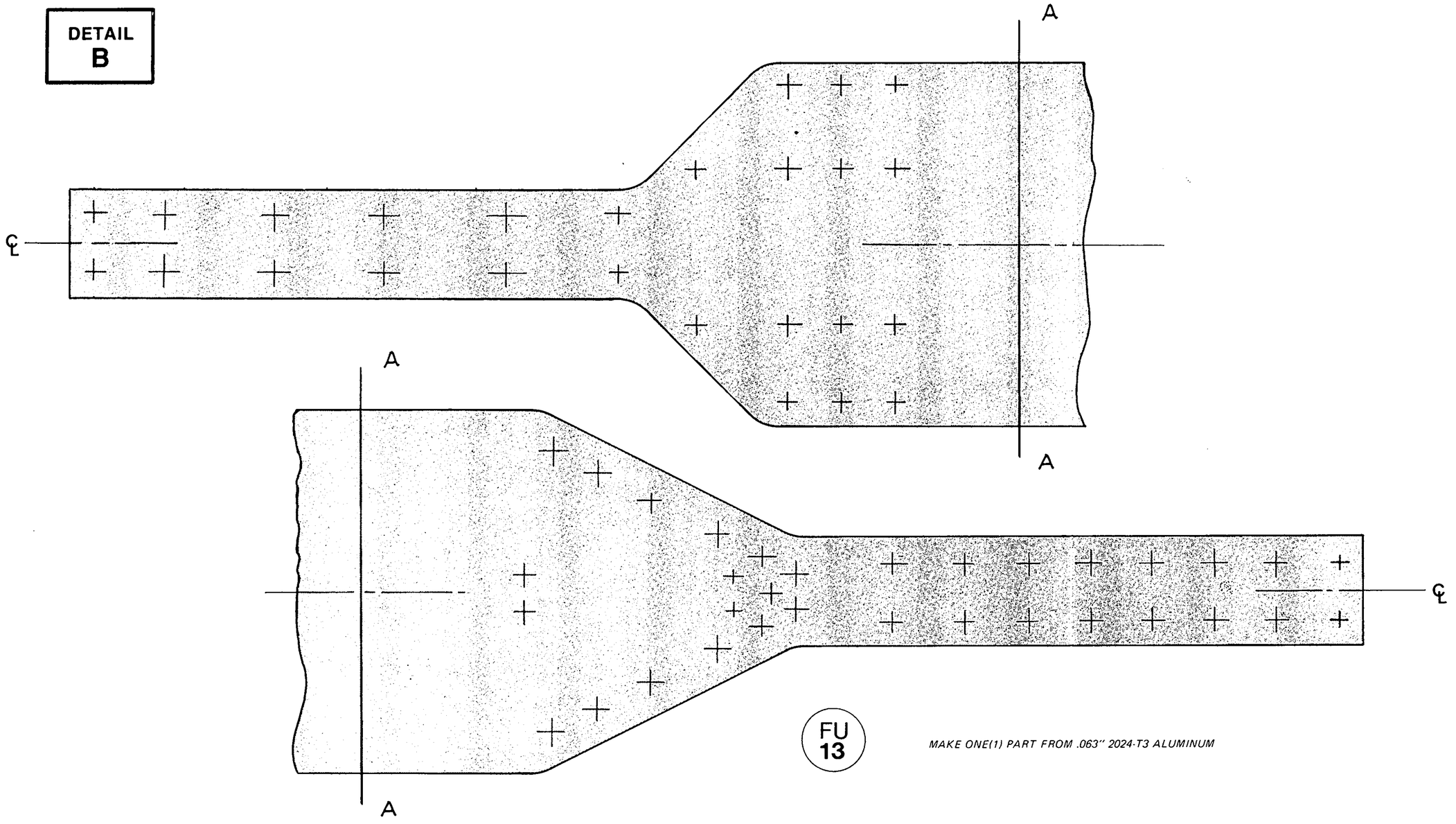
3. These joggles are not tight, and clearance is allowed so that the skin can be shifted slightly during installation.

4. Make certain that the distance from the bottom centerline of the bulkheads to the top edges of both **FU97** and **FU98** are identical each side of the bulkhead, and that the top edges are on **W.L. 25.00** at both ends.

5. It would also be a good idea to mark the vertical centerline on each bulkhead before installation of side skins. This will also help in accurate alignment of the side skins.

6. Note that cut outs have to be made in the sides of **FU1** to allow **FU69** and **FU70** to be installed (see general instructions, para. 145 and **Detail N**).





MAKE ONE(1) PART FROM .063" 2024-T3 ALUMINUM

1. After making a template and cutting **FU13** from .063" sheet aluminum, mark the centerline along its whole length.

2. Mark hole centers as shown.

3. Position **FU13** along the bottom edge of **FU98** and clamp in place. Drill as directed in paragraph 7 of general instructions.

4. Cleco **FU13** to **FU98.**

5. Particularly note that **FU13** ends at the forward side of **FU14** bulkhead **(Station 91.15).** Refer to **Detail D** for further clarification of this.

6. Install **FU97** and drill and cleco to **FU13.**

7. See paragraphs 11 thru 18 in the general instructions for further installation clarification involving **FU13.**

DETAIL C

FU 14

A

A

B

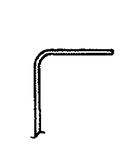
B

IML - BEND FLANGE DOWN 90° X .12"B.R.

3/16" DIA. TOOLING HOLE

IML - BEND FLANGE UP 90° X .12"B.R.

IML - BEND FLANGE UP 90° X .12" B.R.



Section A-A

Section B-B

MAKE ONE(1) PART FROM .025" 2024-T3 ALUMINUM

FU 32

5.25"

6.05"

STA. 91.15

4.00"

1604-0412 FLUSH RIVET

DRILL NO.12 HOLE
AN3-3A BOLT
AN960-10L WASHER
MS20365-1032 NUT

JOGGLE UP .078" X .250"

CUTOUT IN FU14 TO
CLEAR T-SECTION

B.L. 0.00

SKIN

FU 13

FU 11

FU 11

FU 46

MAKE TWO(2) 3.40" X .625" SHIMS FROM
.063" 2024-T3 ALUMINUM (ONE EACH SIDE)

FU 47

MAKE TWO(2) 3.40" X .625" SHIMS FROM
.016" 2024-T3 ALUMINUM (ONE EACH SIDE)

FU 31

FU 17

FU 14

1604-0412 FLUSH RIVET
SPACING 1.00" MAXIMUM

FU 21

FU 17

SKIN

DRILL NO.29 HOLE
1601-0410 DOME RIVET

FU 14

A

A

FU 21

DETAIL D

FU 12

SKIN

FU 31

FU 13

FU 11

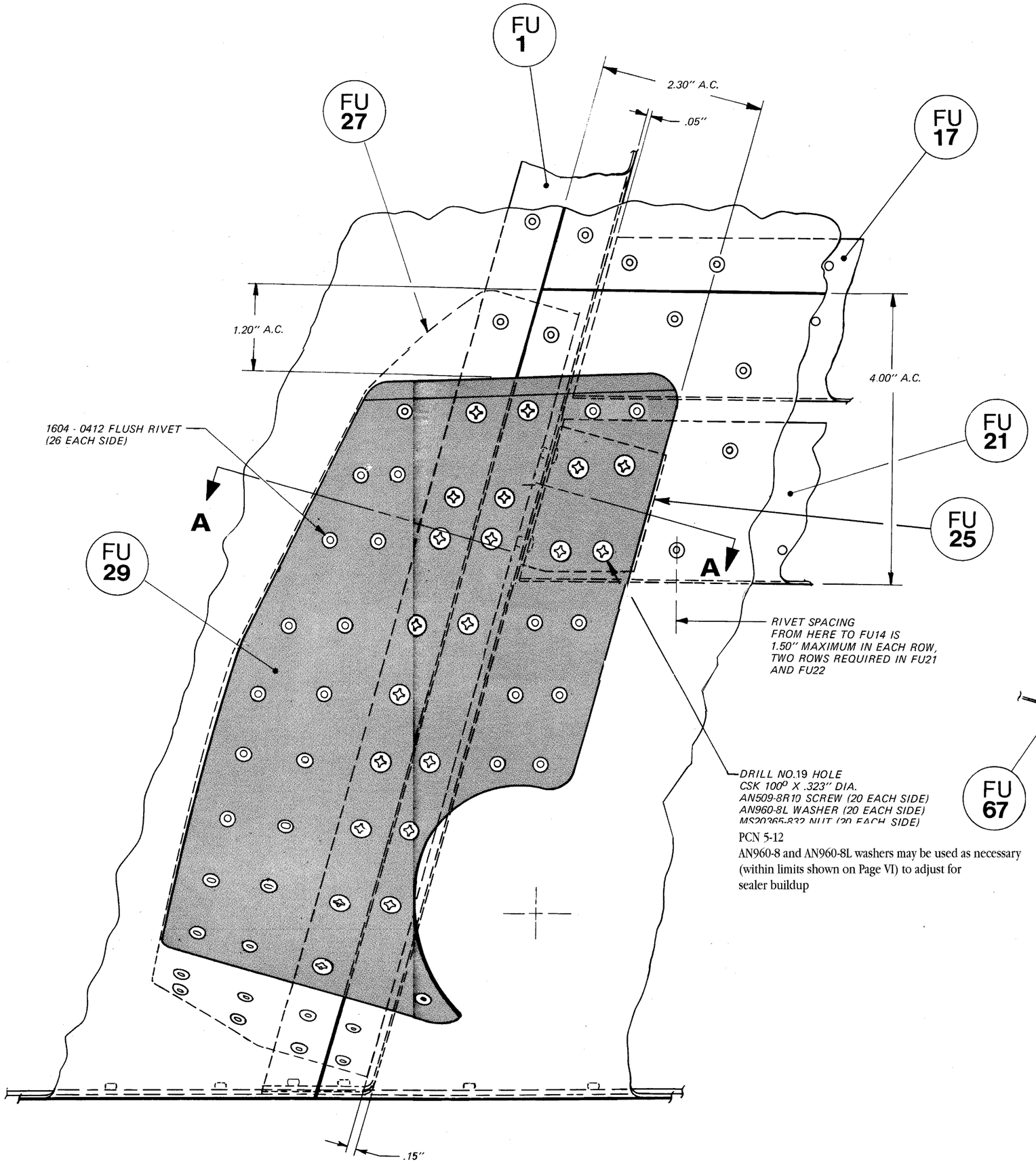
FU 21

FU 97

.12" B.R.

FU 14

Section A-A



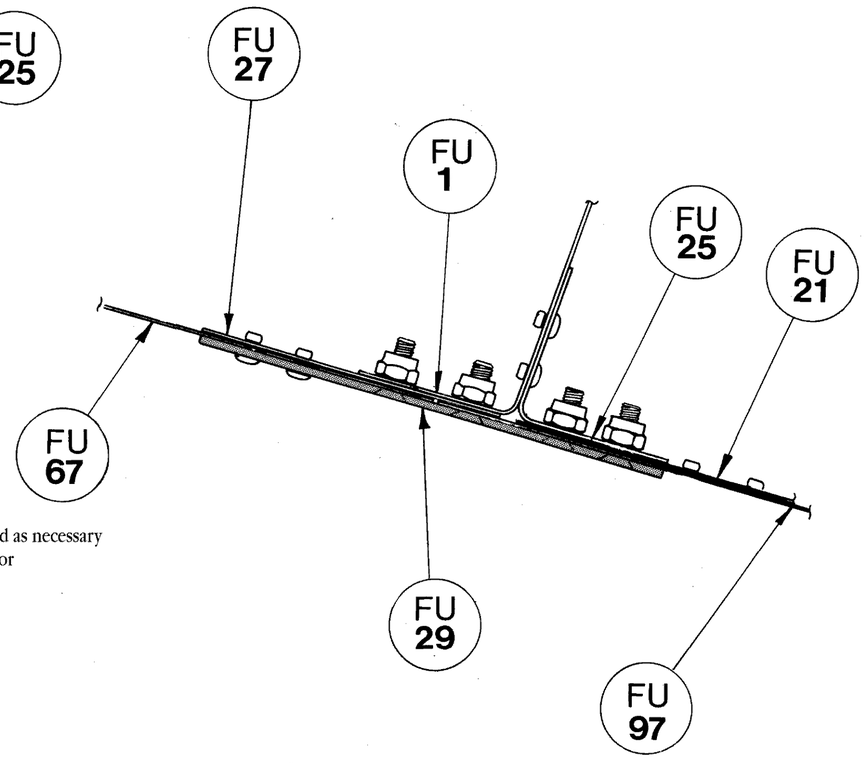
PCN 5-12

AN960-8 and AN960-8L washers may be used as necessary (within limits shown on Page VI) to adjust for sealer buildup

DETAIL E

DETAIL E IS CONTINUED ON PAGE 1[11]

1. This Detail can be used as a reference for installation of several parts.
2. Note the location of **FU 21** at *4.00" A.C.* below the top edge (trimline) of **FU 97**.
3. Detail also shows forward trim of **FU 17** (.05" short of **FU 1** bulkhead).
4. The holes in the forward end of angle **FU 21** should be drilled to No. 19 size only (pilot hole size) until all holes have been drilled along its length and in **FU 14 (Detail D)**and the angle finally installed using bonding sealant and rivets. (see general instructions – paras. **72** thru **77**, page 1[4]).
5. **FU 29** (and **FU 30**) is supplied as a preformed blank and has to be trimmed to the scribed lines on the blank.

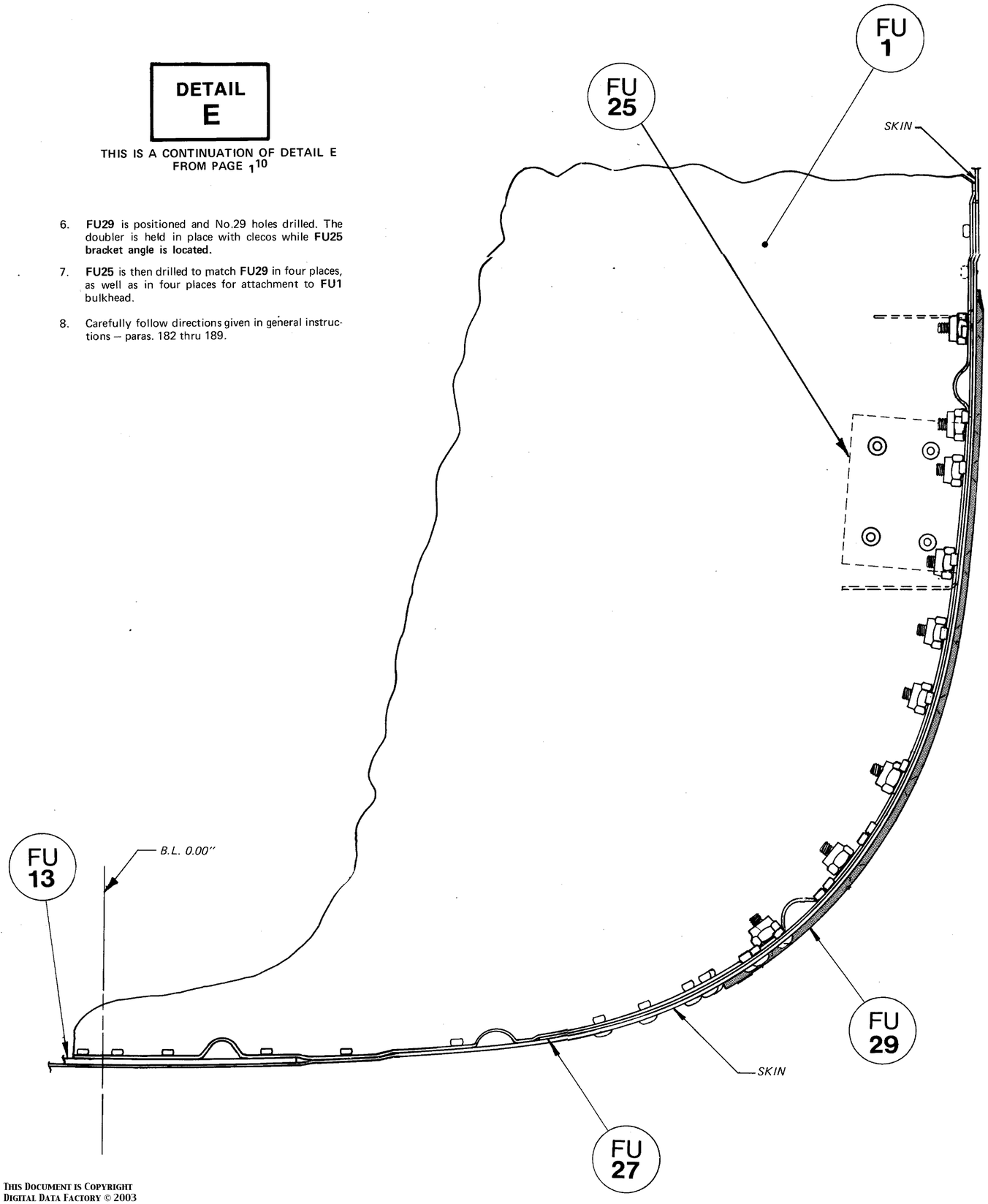


Section A-A

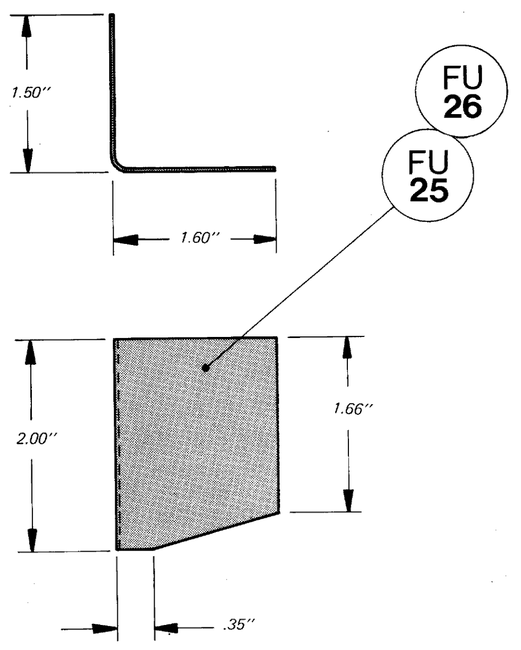
DETAIL E

THIS IS A CONTINUATION OF DETAIL E FROM PAGE 1[10]

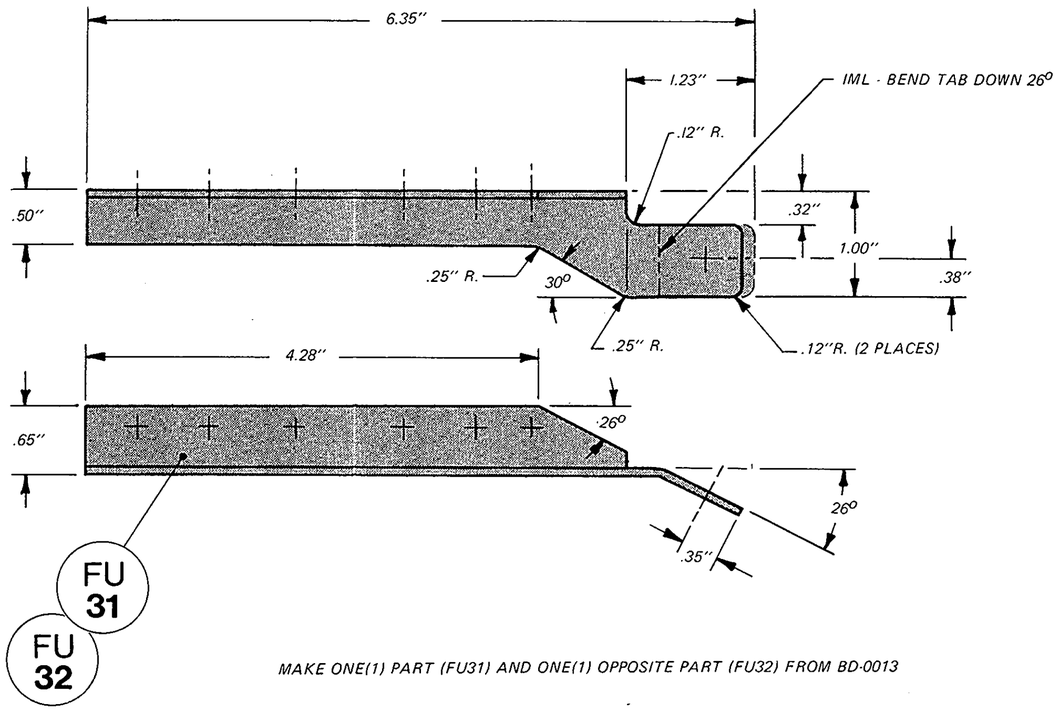
6. **FU29** is positioned and No.29 holes drilled. The doubler is held in place with clecos while **FU25 bracket angle is located.**
7. **FU25** is then drilled to match **FU29** in four places, as well as in four places for attachment to **FU1** bulkhead.
8. Carefully follow directions given in general instructions – paras. 182 thru 189.



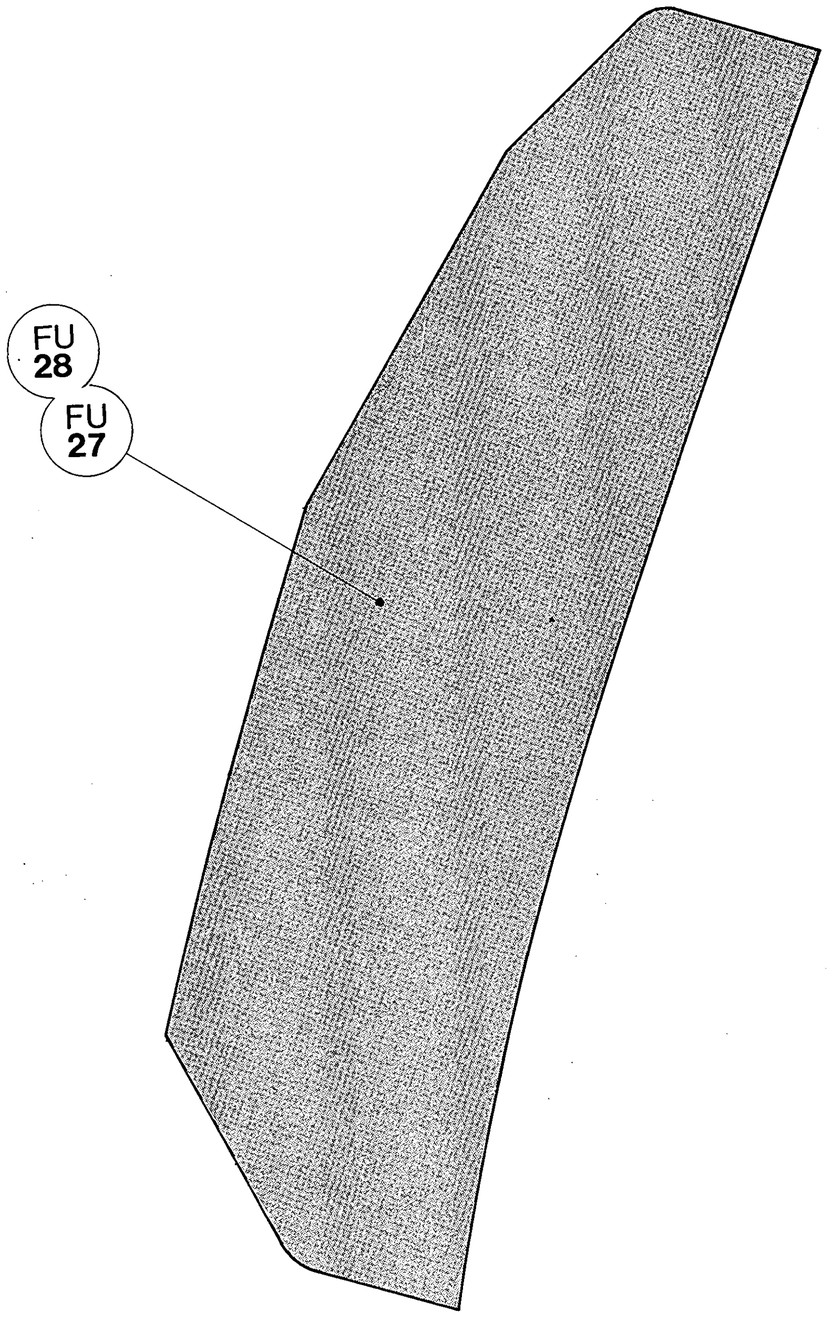
DETAIL F



MAKE ONE(1) PART (FU25) AND ONE (1) OPPOSITE PART (FU26) FROM BD-0003.

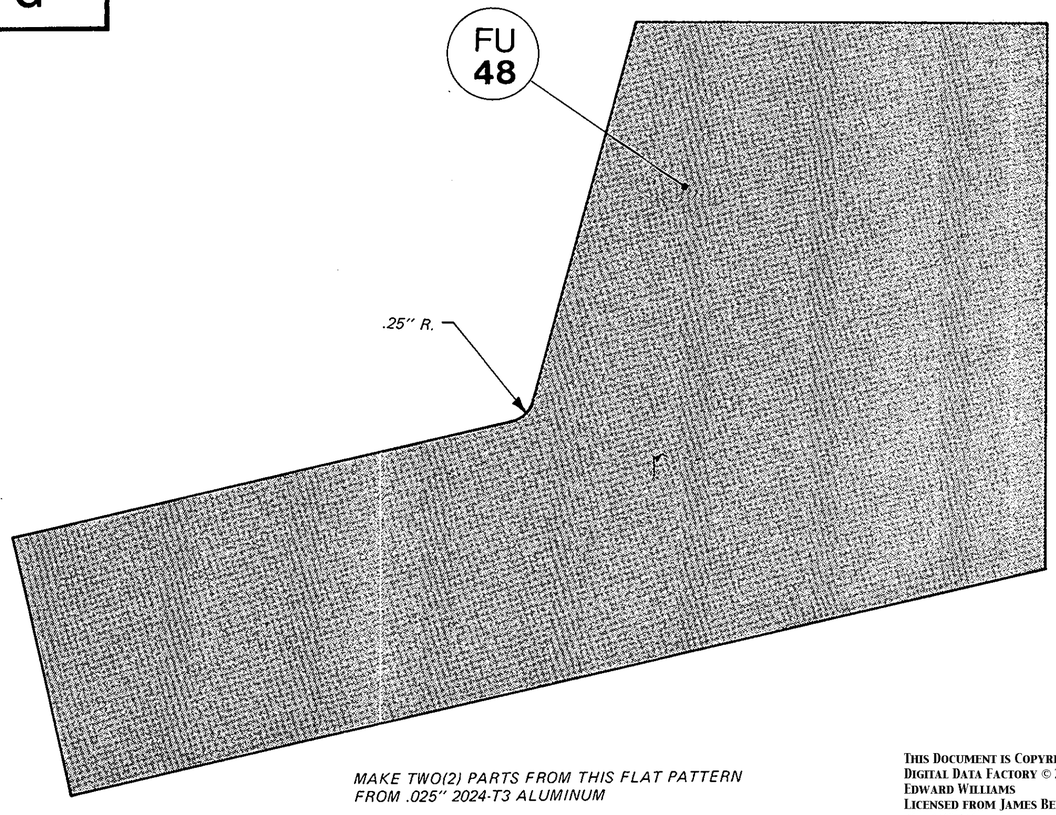


MAKE ONE(1) PART (FU31) AND ONE(1) OPPOSITE PART (FU32) FROM BD-0013



MAKE TWO(2) PARTS FROM .025″ 2024-T3 ALUMINUM

DETAIL G



MAKE TWO(2) PARTS FROM THIS FLAT PATTERN
FROM .025″ 2024-T3 ALUMINUM

DETAIL H

NO. 19 DRILL
DIMPLE DOOR SKIN 100° X .323" DIA.
AN509-8R5 SCREW (30)

.75"

.75"

CUT ALONG THIS OUTLINE
FOR ACCESS DOOR OPENING

FU 95

FU 23

FU 23

FU 53

15.80" A.C.

A

A

APPROX. 2.00"
NUTPLATE
SPACING AND
RIVET SPACING
1.00" MAX.

FU 51

NO.19 DRILL (30 PLACES)
NAS1024N08K NUTPLATES (30)
NO.40 DRILL (60 PLACES)
DIMPLE 100° X .185" DIA.
CCR264SS-3-2 RIVET (60)

AFTER RIVET HOLES ARE DRILLED
(PRIOR TO INSTALLATION OF
NUTPLATES) DRILL OUT SCREW
HOLES WITH 5/16" DRILL TO
PROVIDE ROOM FOR DIMPLE IN
ACCESS DOOR.
OPTIONAL TO DIMPLE FRAME
100° X .323" DIA.

FU 17

.16" (TYPICAL)

1604-0412 FLUSH RIVET

FU 97

FU 17

24.50" A.C.

9.20" A.C. TO INTERSECTION OF W.L.25.00"
AND FU95 AND FU67 SKIN SPLICE

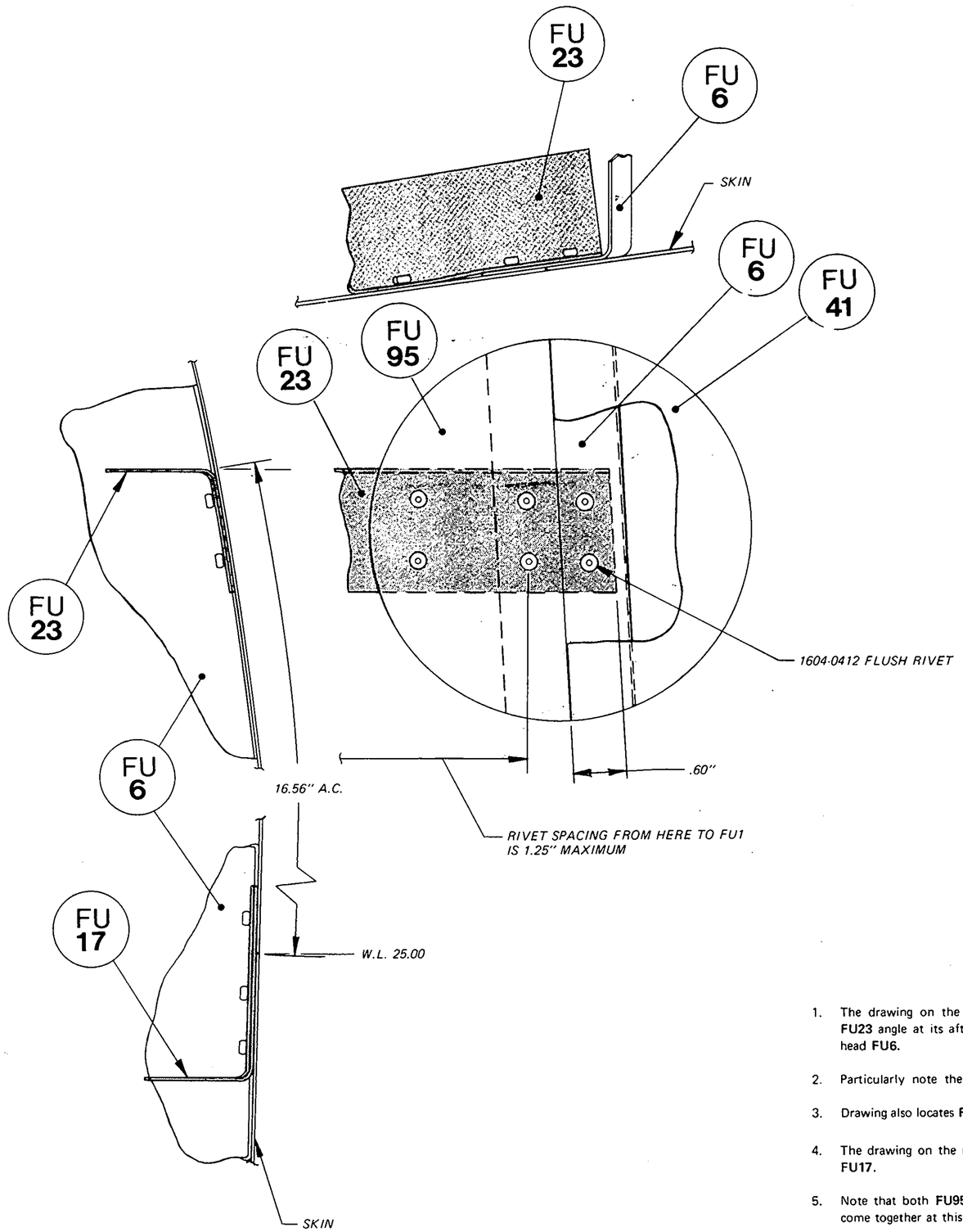
NUTPLATE SPACING 3.00" MAXIMUM
RIVET SPACING 1.00" MAXIMUM
IN STAGGERED ROW

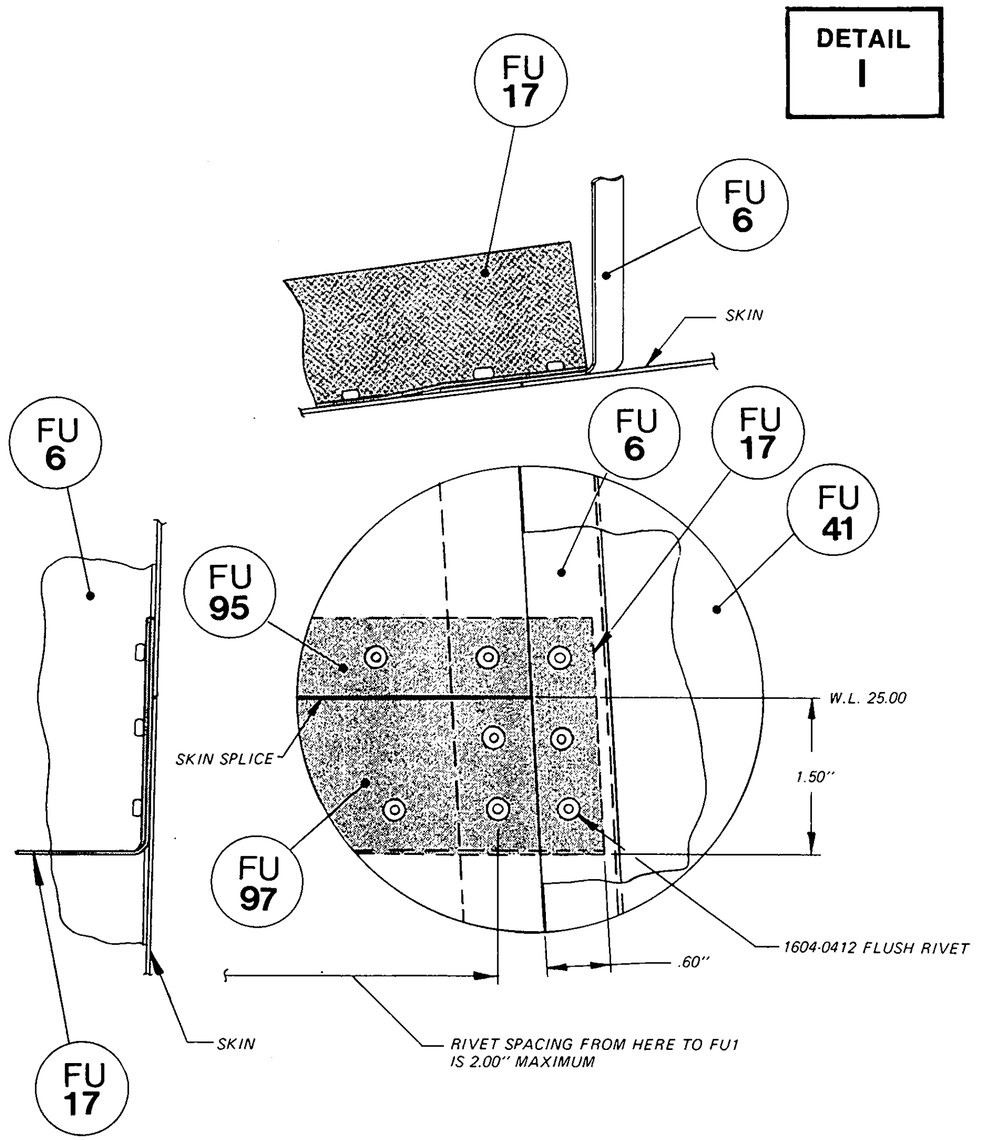
FU 51

ACCESS DOOR PANEL

.00" - .06" GAP

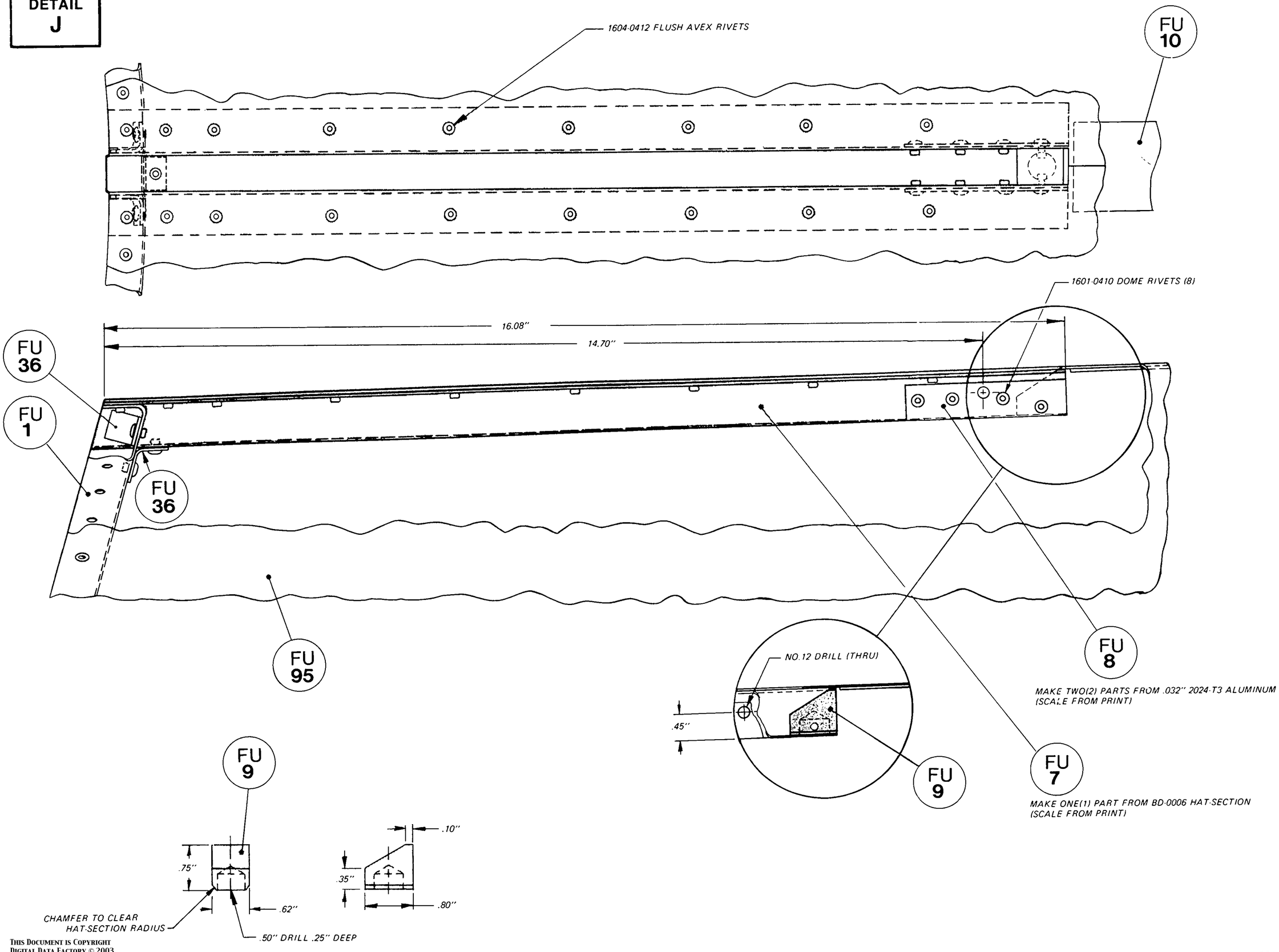
FU 95



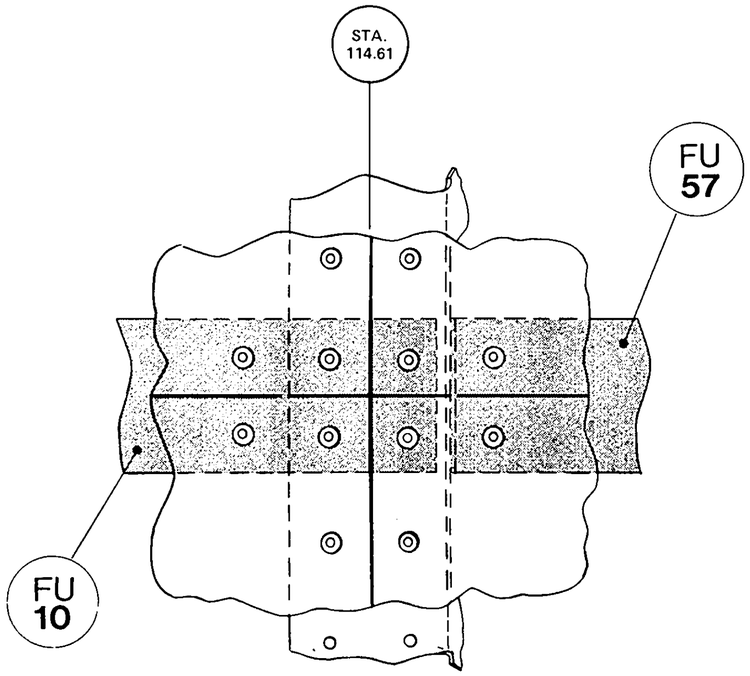


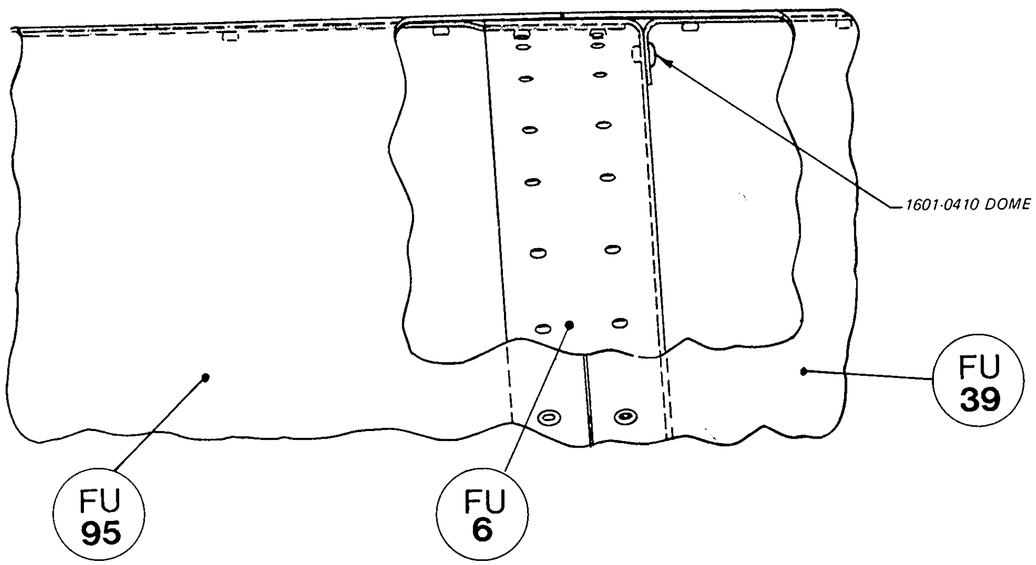
1. The drawing on the left illustrates the location of **FU23** angle at its aft end, where it joins main bulkhead **FU6.**
2. Particularly note the rivet spacing at this location.
3. Drawing also locates **FU23** in relation to **FU17.**
4. The drawing on the right illustrates the location of **FU17.**
5. Note that both **FU95** and **FU97** fuselage side skins come together at this point.
6. Particularly note the rivet spacing at this location.
7. Refer also to **Details E, H, I, T** and **N.**
8. See paragraphs 19 thru 32 in the general instructions for further installation clarification involving **FU17** and **FU23.**

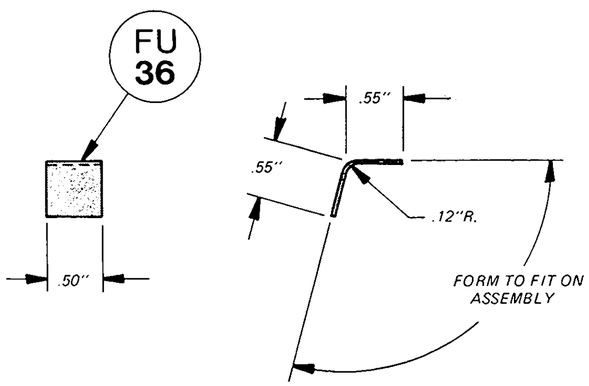
DETAIL J



DETAIL J CONTINUED ON PAGE 1[16]







MAKE THREE(3) PARTS FROM .032" 2024-T3 ALUMINUM

DETAIL J

DETAIL J CONTINUED
FROM PAGE 1[15]

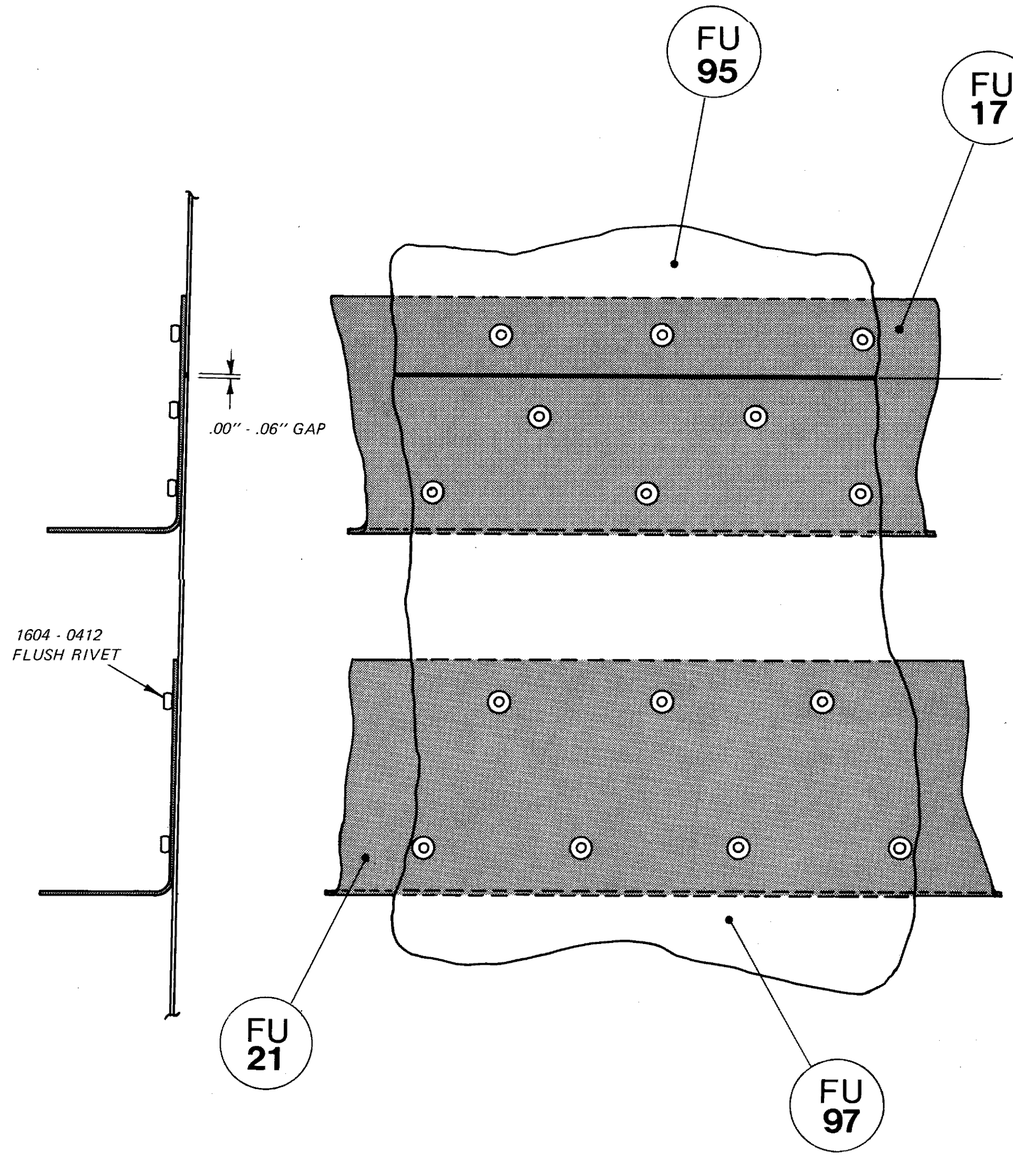
1. This Detail is in two parts, with the drawings on this page being an extension of the drawings on page 1[15].
2. Page 1[15] primarily illustrates the installation of **FU7** hat section and its accompanying mounting brackets. Also notice, however, that the forward location of **FU10** splicing strap is shown.
3. **FU7** hat section installation (front view) is also shown in **Detail M.**
4. Dimensions for fabrication of **FU36** brackets are also given in **Detail M.**
5. The drawing on page 1[16] illustrates the aft location of **FU10** splicing strap, and forward location of **FU57** splicing strap.
6. Note that the forward end of **FU57** is bent down and attached to **FU6** bulkhead with two (2) dome rivets.
7. See paragraphs 33 thru 48 and paragraph 55 in the general instructions for further clarification involving the parts shown in **Detail J.**

DETAIL K

1. This Detail illustrates the relationship of **FU17** to **FU21** angles and should be studied together with the Main Plans Drawings on pages 1^2 **and** 1^3, as well as **Details D** and **E.**

2. This Detail also illustrates rivet pattern for both angles.

3. See paragraphs 19 thru 22 and paragraphs 72 thru 77 in the general instructions for further clarification of both fabrication and installation of parts **FU17** and **FU21.**



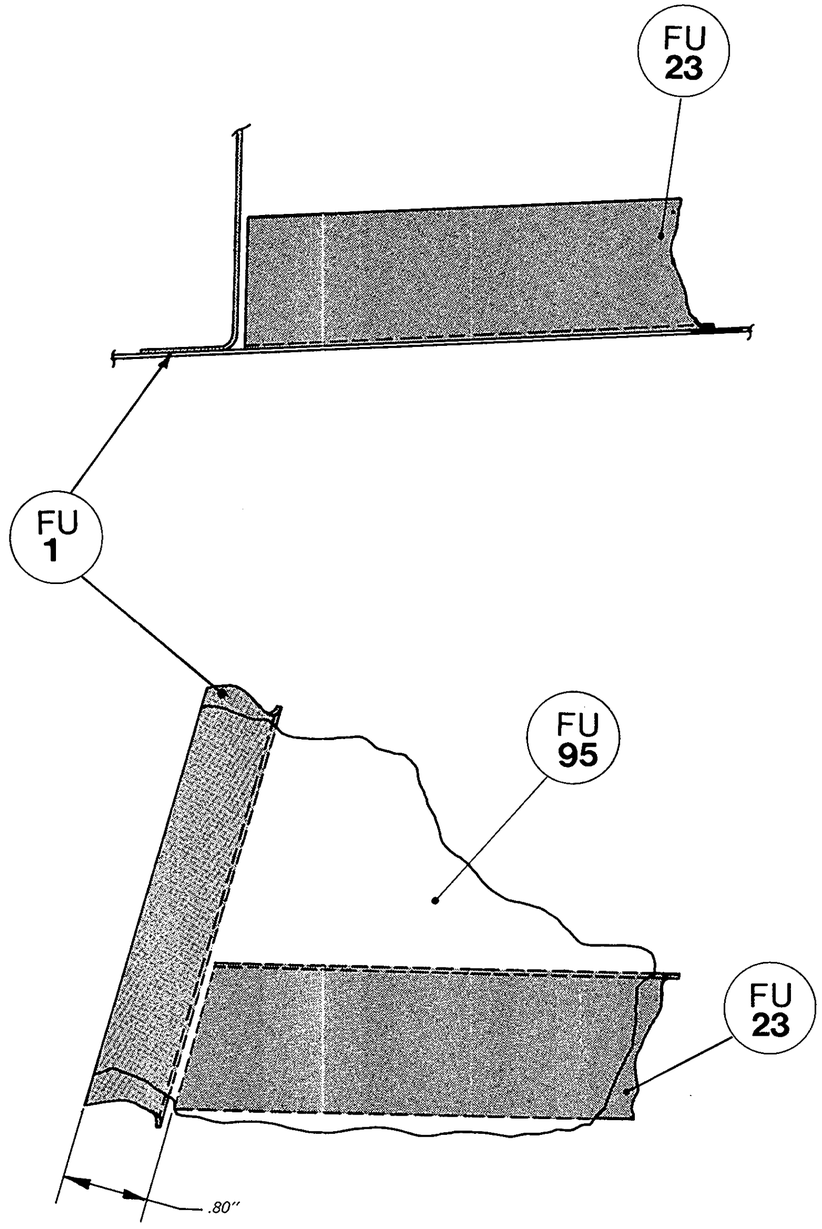
DETAIL L

1. This illustration is provided merely to clarify the forward location of **FU23** angle.

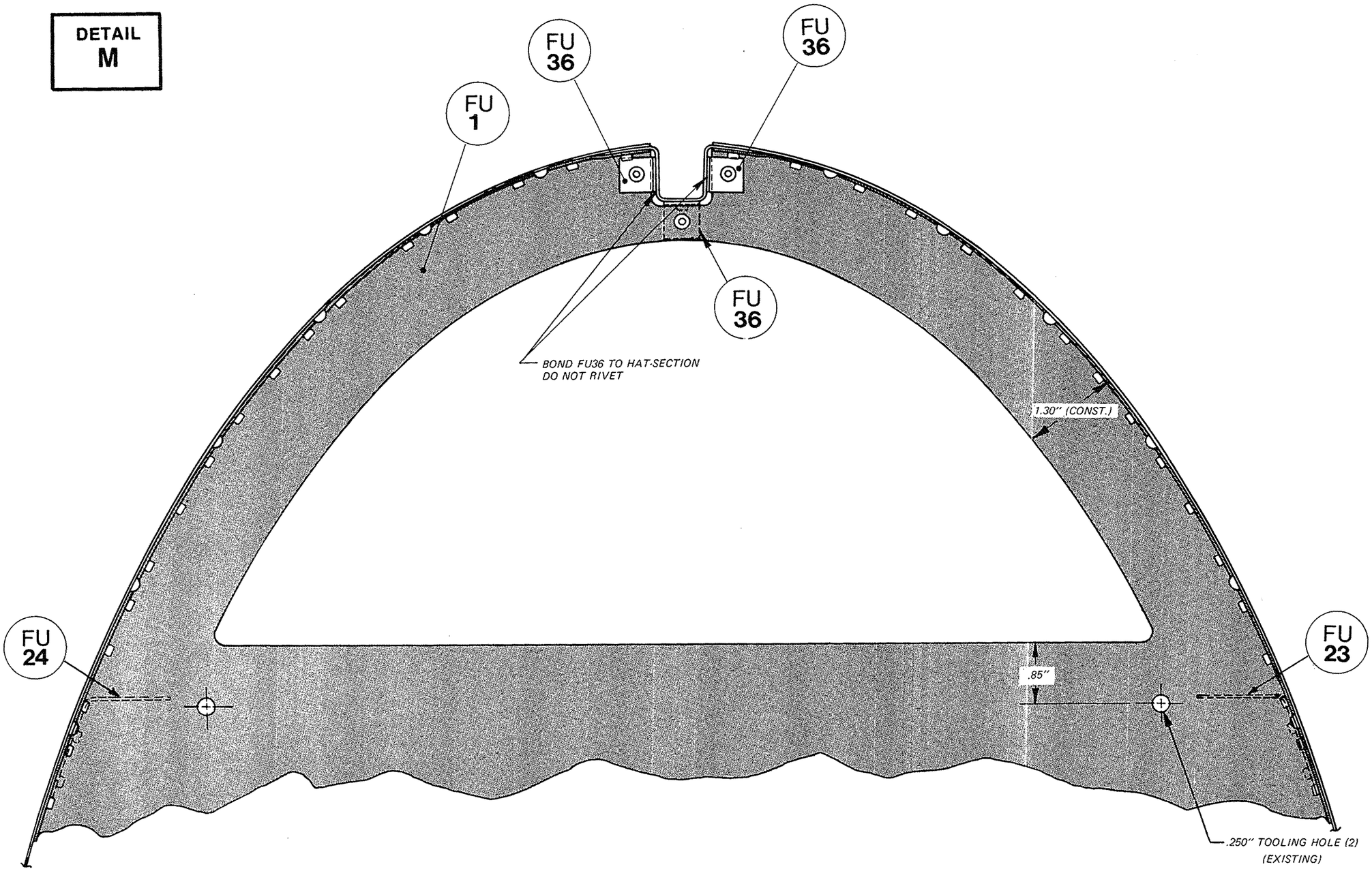
2. Note that **FU23** ends .80" behind the forward edge of **FU1** bulkhead.

3. This Detail should be studied in conjunction with **Detail N.**

4. **FU48** doubler and rivet spacing are not shown in this Detail.



DETAIL M



1. This illustrates the cut out to be made in **FU1** bulkhead, as well as the front view of **FU7** hat section installation.

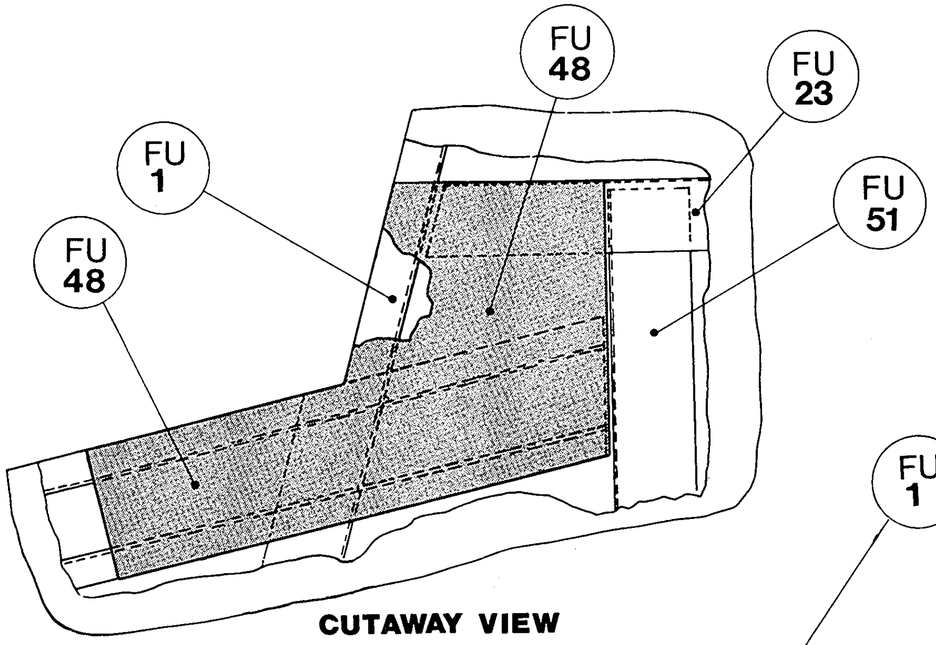
2. Note position of **FU36** brackets. Read in conjunction with **Detail J.**

3. Particularly note that the two **FU36** brackets at the sides of **FU7** hat section are bonded to **FU7,** but riveted to **FU1** bulkhead.

4. Note location of **FU23** and **FU24** angles. Read in conjunction with **Details N** and **H.**

5. See paragraphs 36, 38, 43 thru 47, and 55 in the general instructions for further installation clarification involving parts **FU7** and **FU36.**

Special Note: FU48 doublers are not shown in this Detail. Refer to Detail N for this clarification.

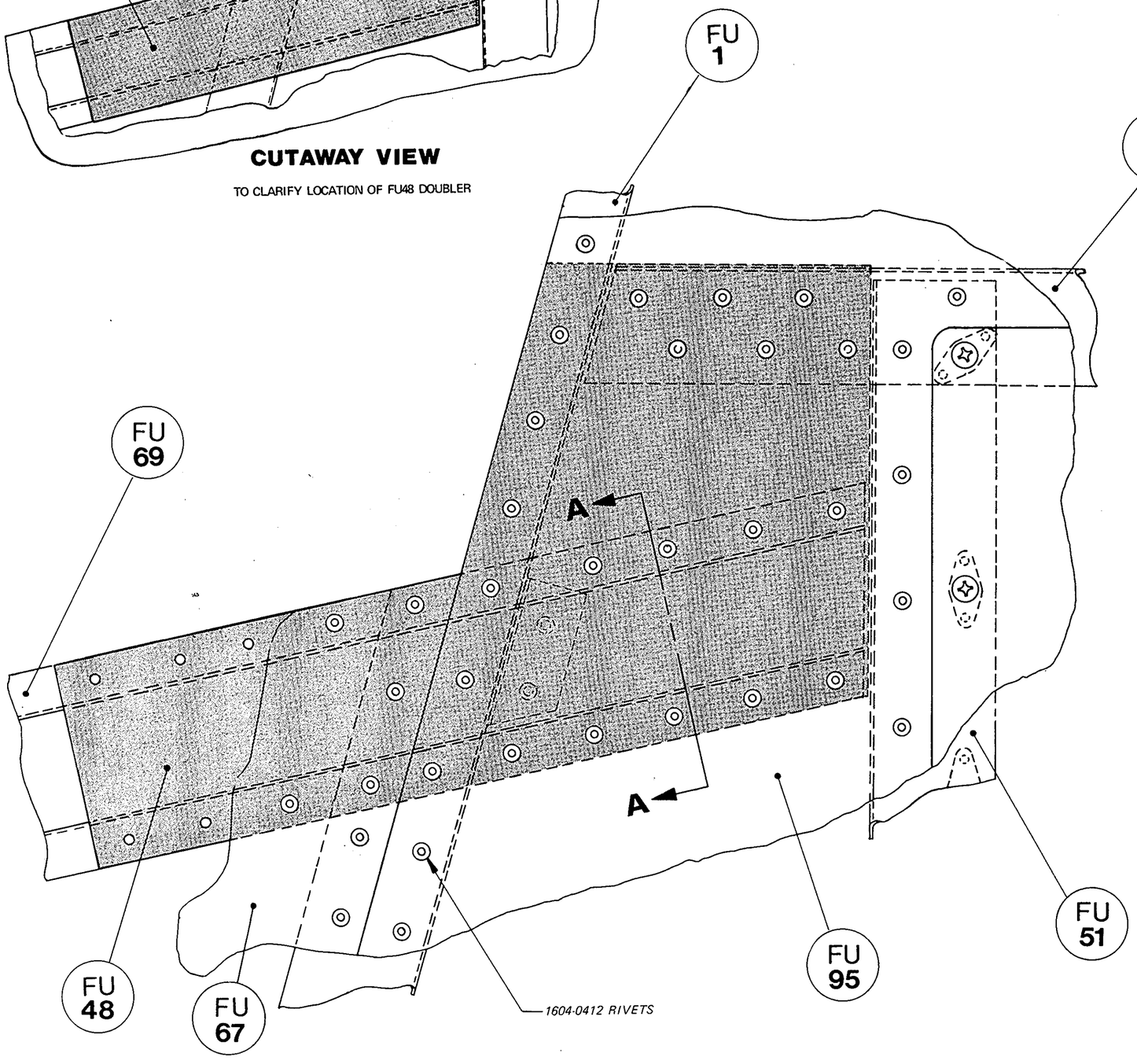


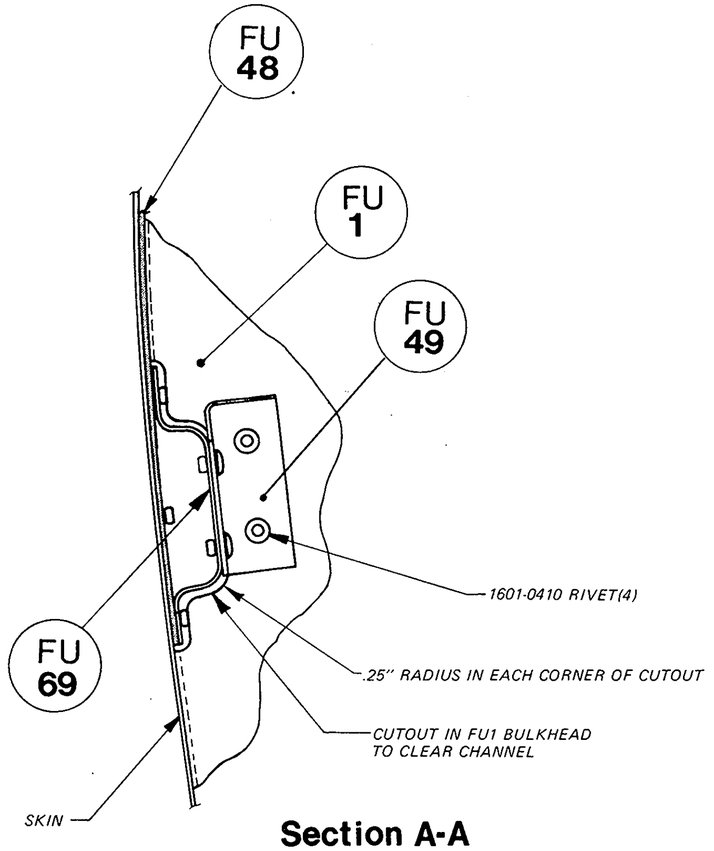
CUTAWAY VIEW

TO CLARIFY LOCATION OF FU48 DOUBLER

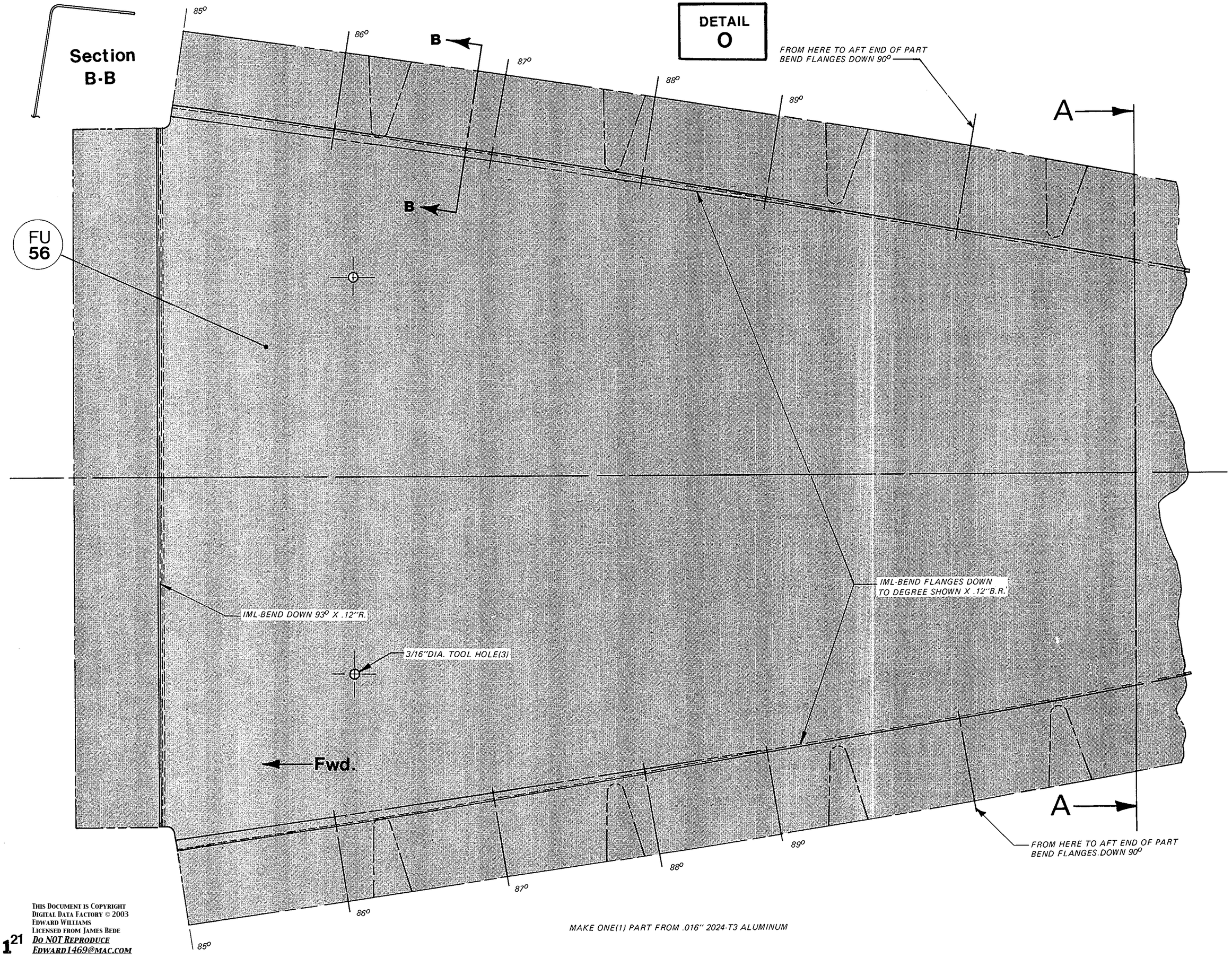
DETAIL N

1. This illustrates installation of **FU48** doubler where side skins **FU67** and **FU95** join at **FU1** bulkhead.
2. Note that **FU48,** as detailed in the special cutaway view at the far left, is located between **FU69** channel and **FU67** skin and between **FU23** angle and **FU95** skin.
3. Also notice that **FU23** angle is between **FU51** angle and **FU95** skin, yet **FU23** "jogs" over slightly to locate on top of **FU48** doubler.
4. **FU49/FU50** brackets are made from dimensions given in **Detail A-H,** and drilled upon installation as shown here.
5. See paragraphs 169 thru 172, 176, 190 thru 193 in the general instructions for further clarification involving **FU48** doubler and **FU49/FU50** brackets.



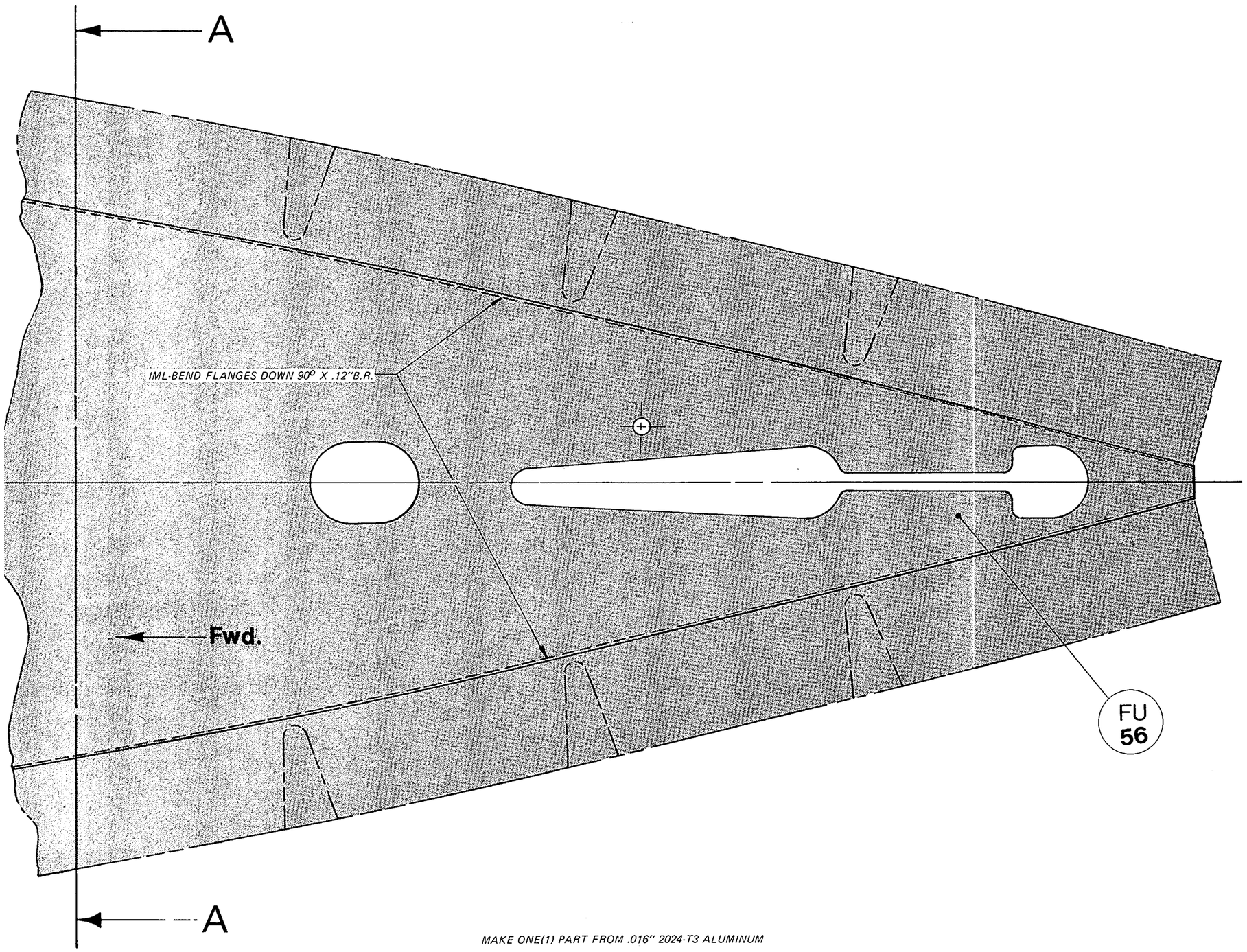


Section A-A



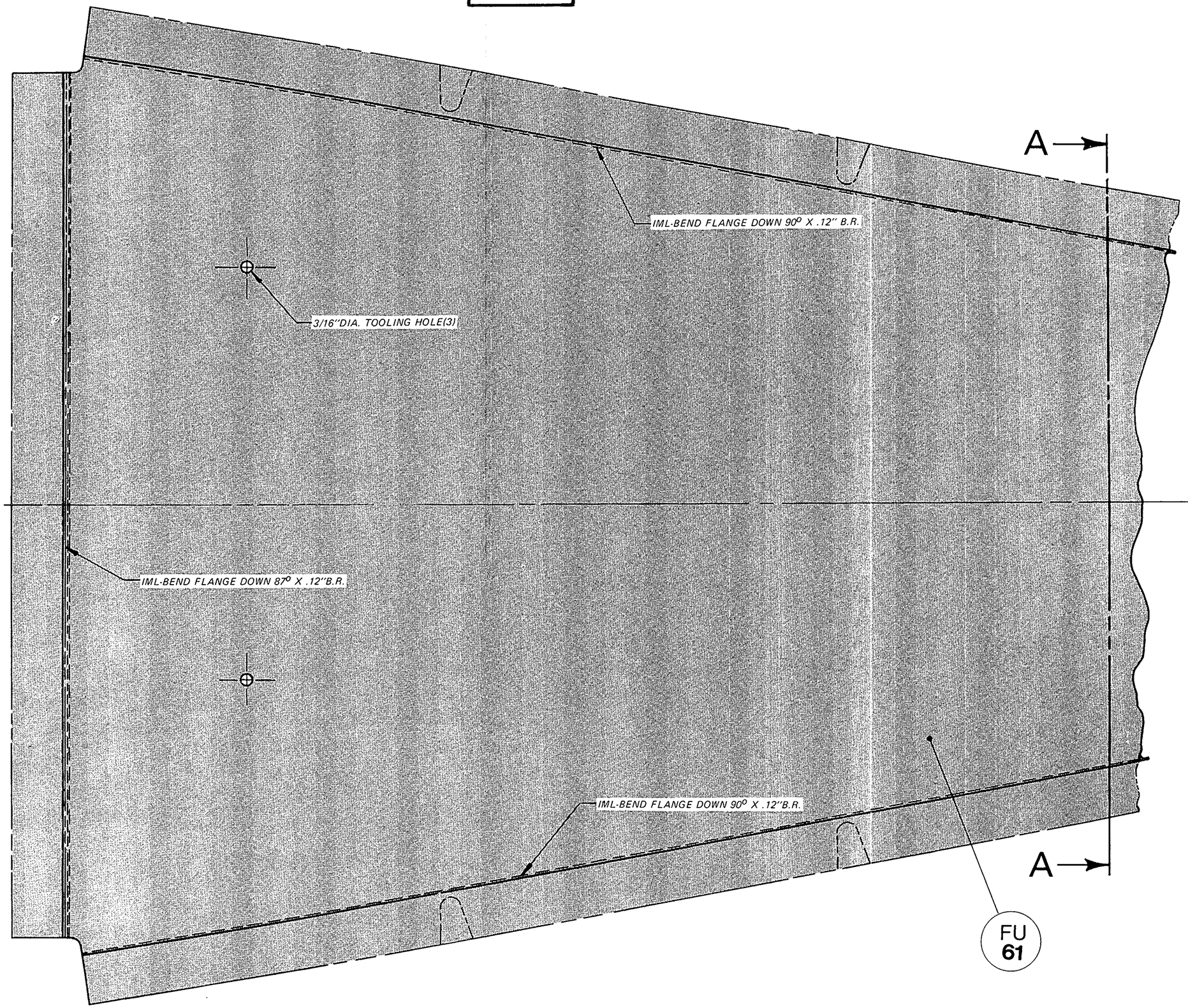
MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM

DETAIL
O



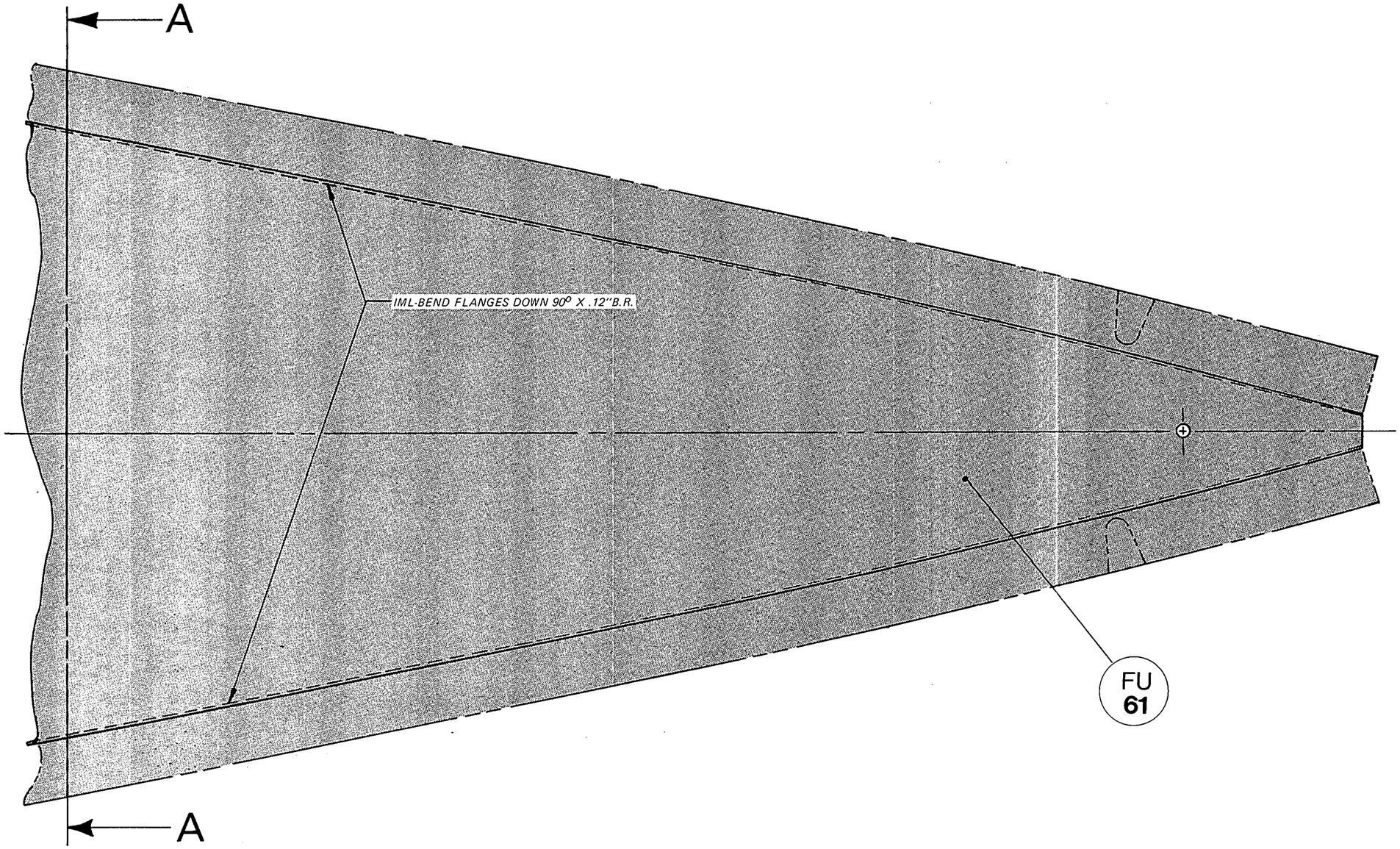
MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM

DETAIL
P

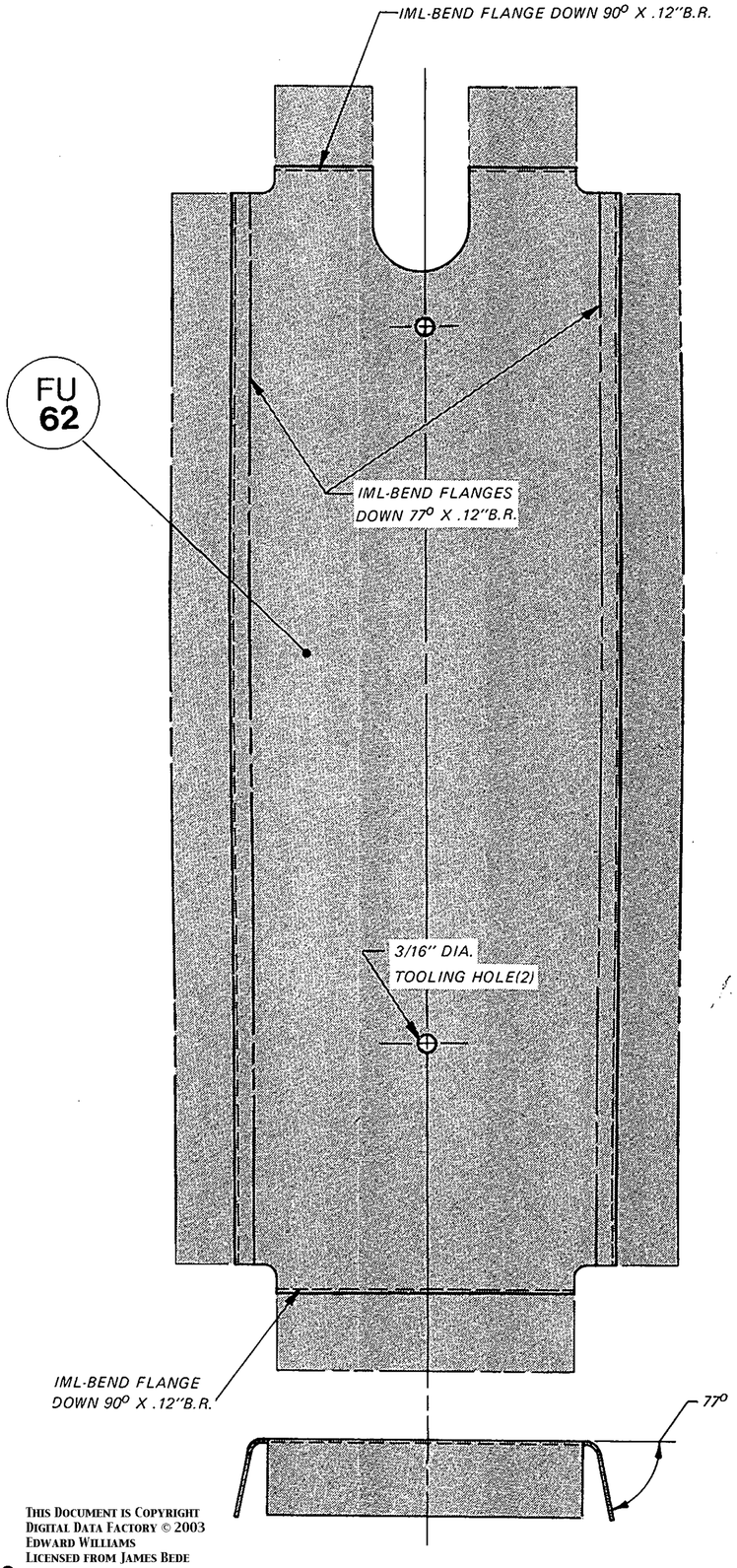


MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM

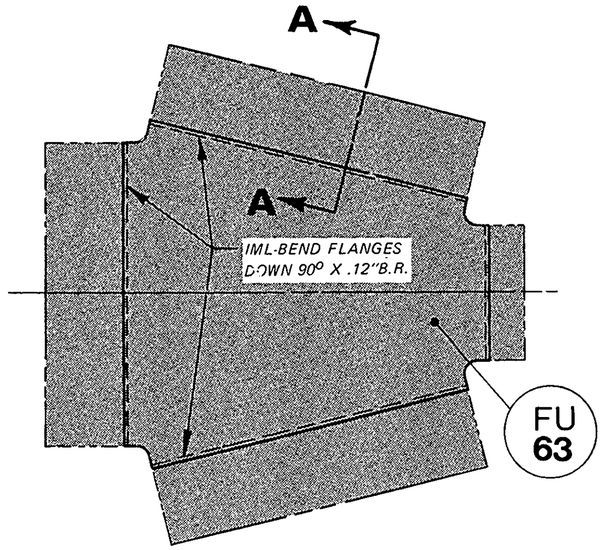
DETAIL P



MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM



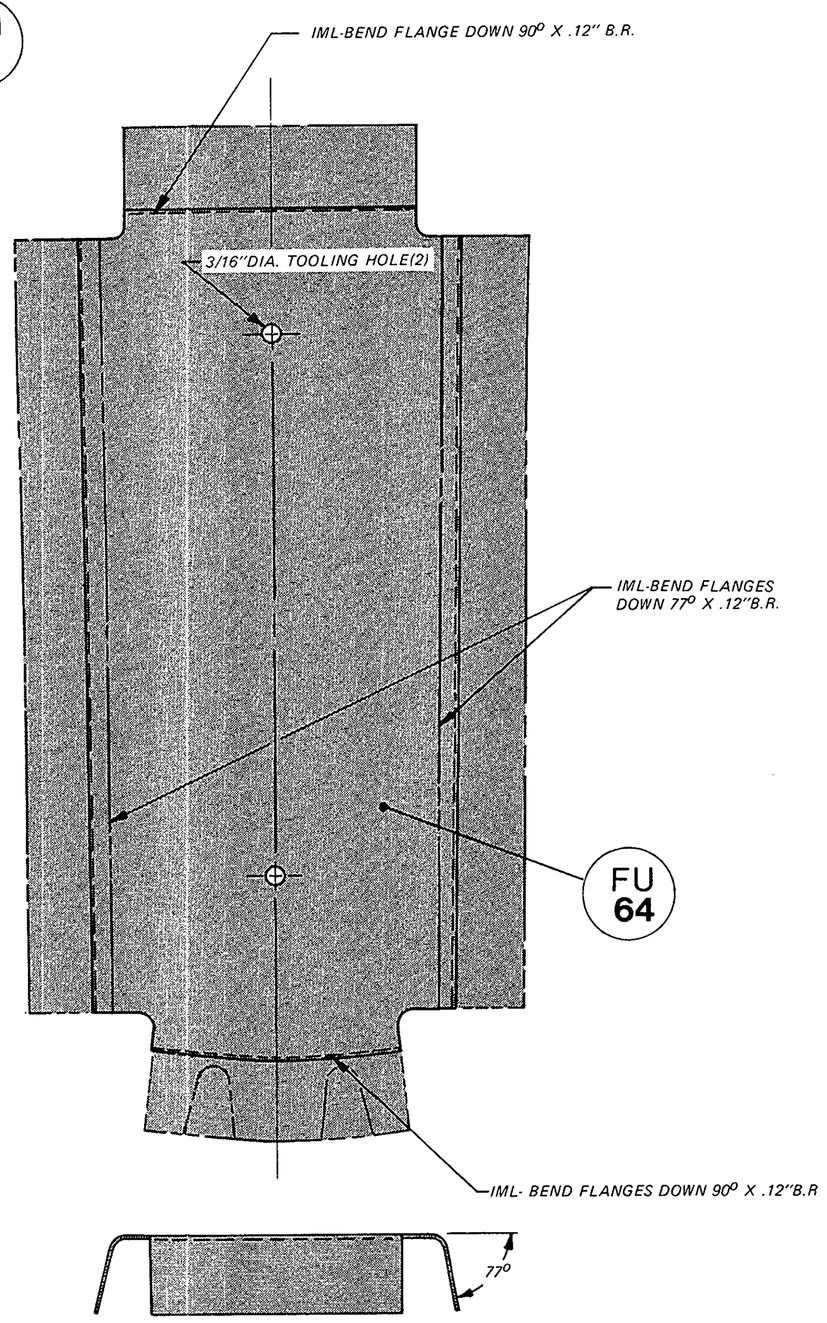
MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM



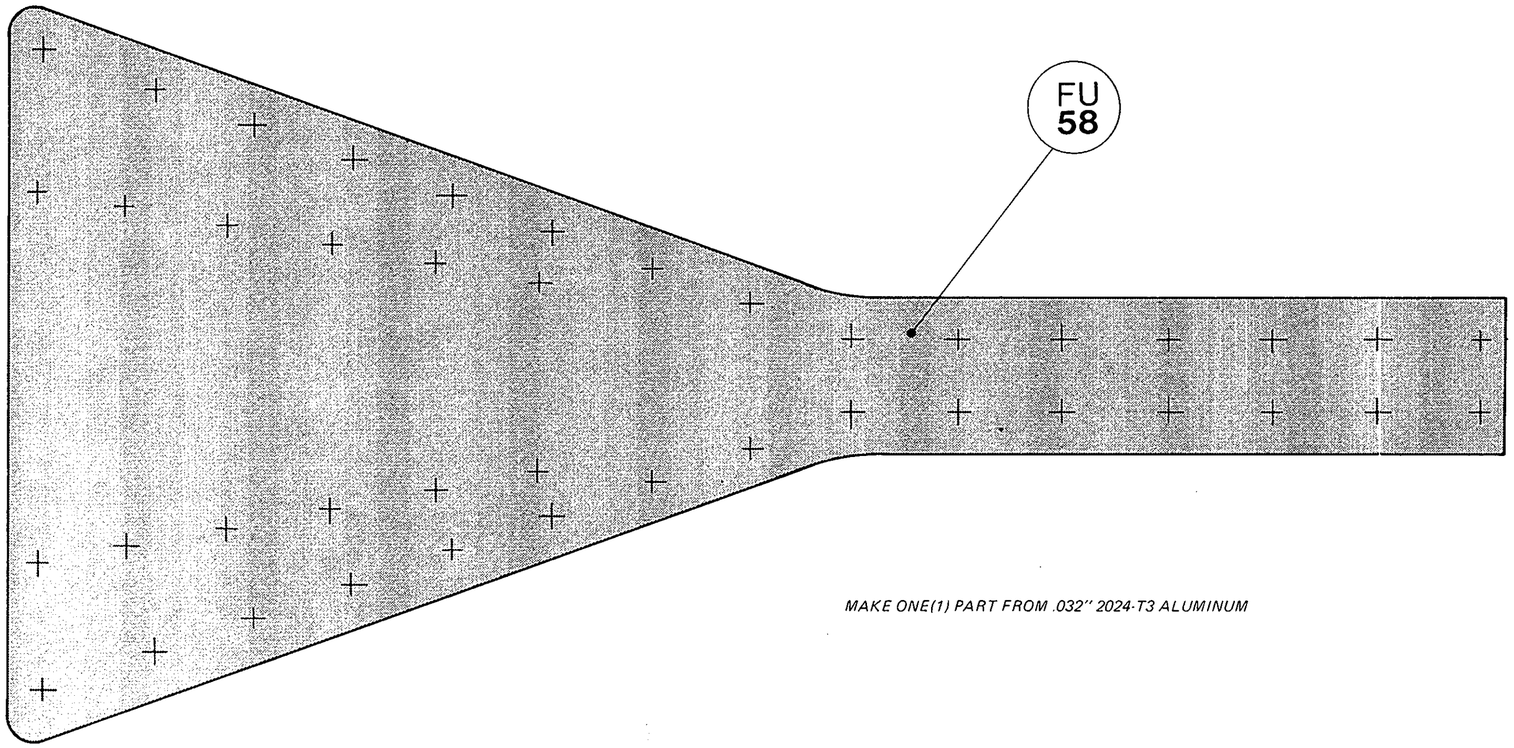
MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM

Section A-A

DETAIL Q

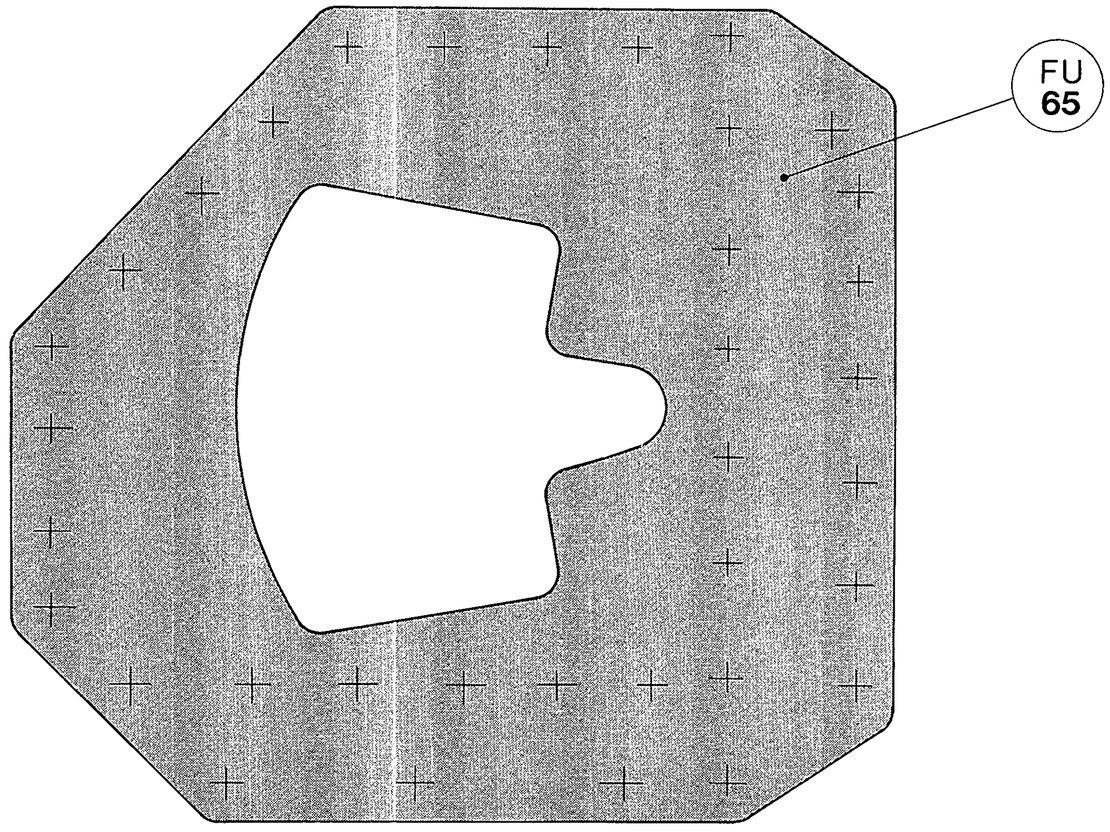


MAKE ONE(1) PART FROM .016" 2024-T3 ALUMINUM



DETAIL
R

MAKE ONE(1) PART FROM .032" 2024-T3 ALUMINUM



MAKE TWO(2) PARTS FROM .032" 2024-T3 ALUMINUM

1. After cutting out **FU58** it should be shaped to fit the contour of **FU39/FU40** skins, as shown in **Detail Z.**

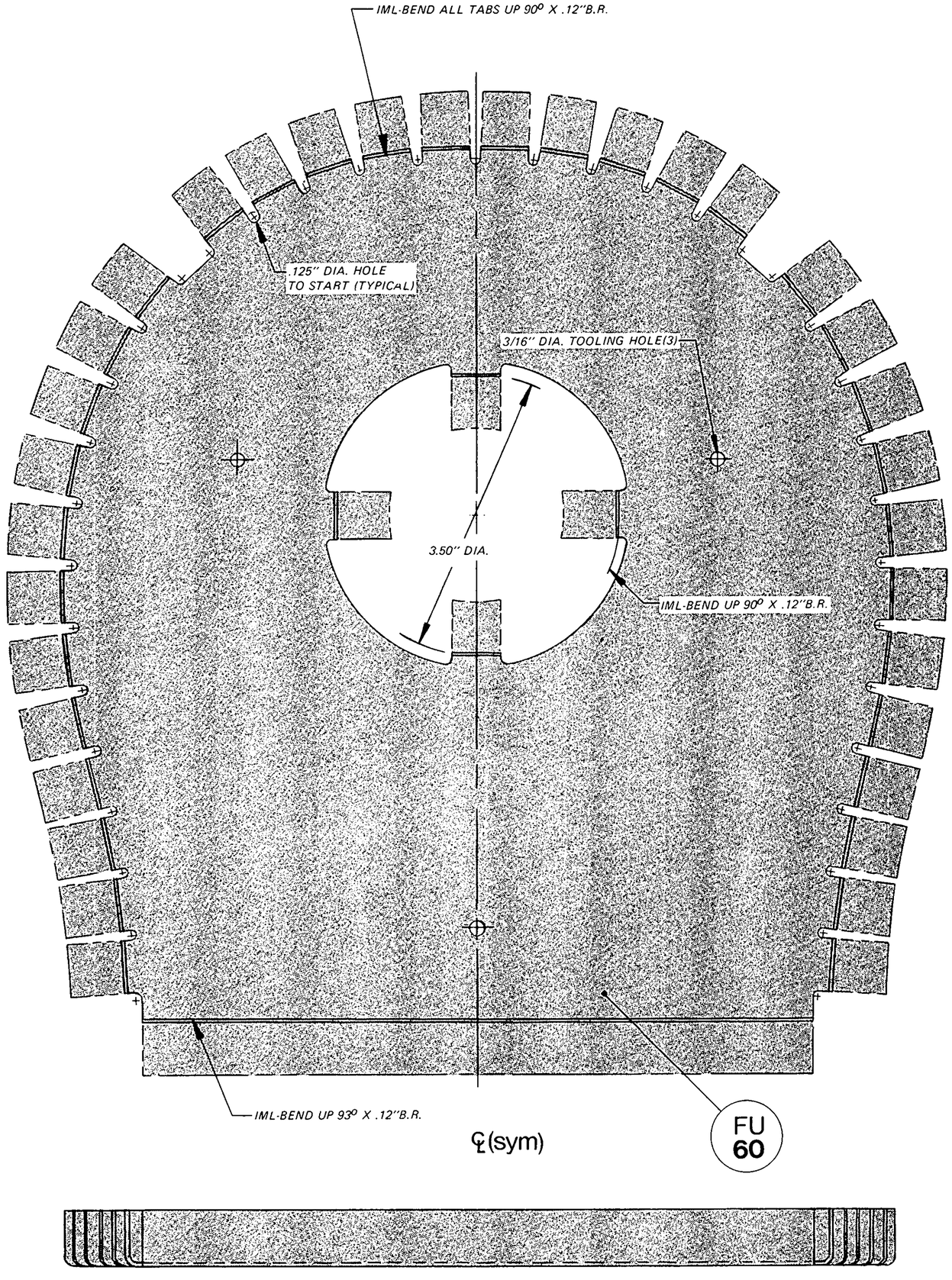
2. Read SPECIAL NOTE following paragraph 122 in the general instructions regarding final riveting of the aft section fuselage skins.

3. When cutting out two **FU65** parts, the center of these plates can be marked and cut out. However, pay particular attention to the Note following paragraph 102 in the general instructions.

4. See paragraphs 101 thru 106 and paragraphs 111 and 112 in the general instructions for further clarification.

5. Refer also to **Detail X.**

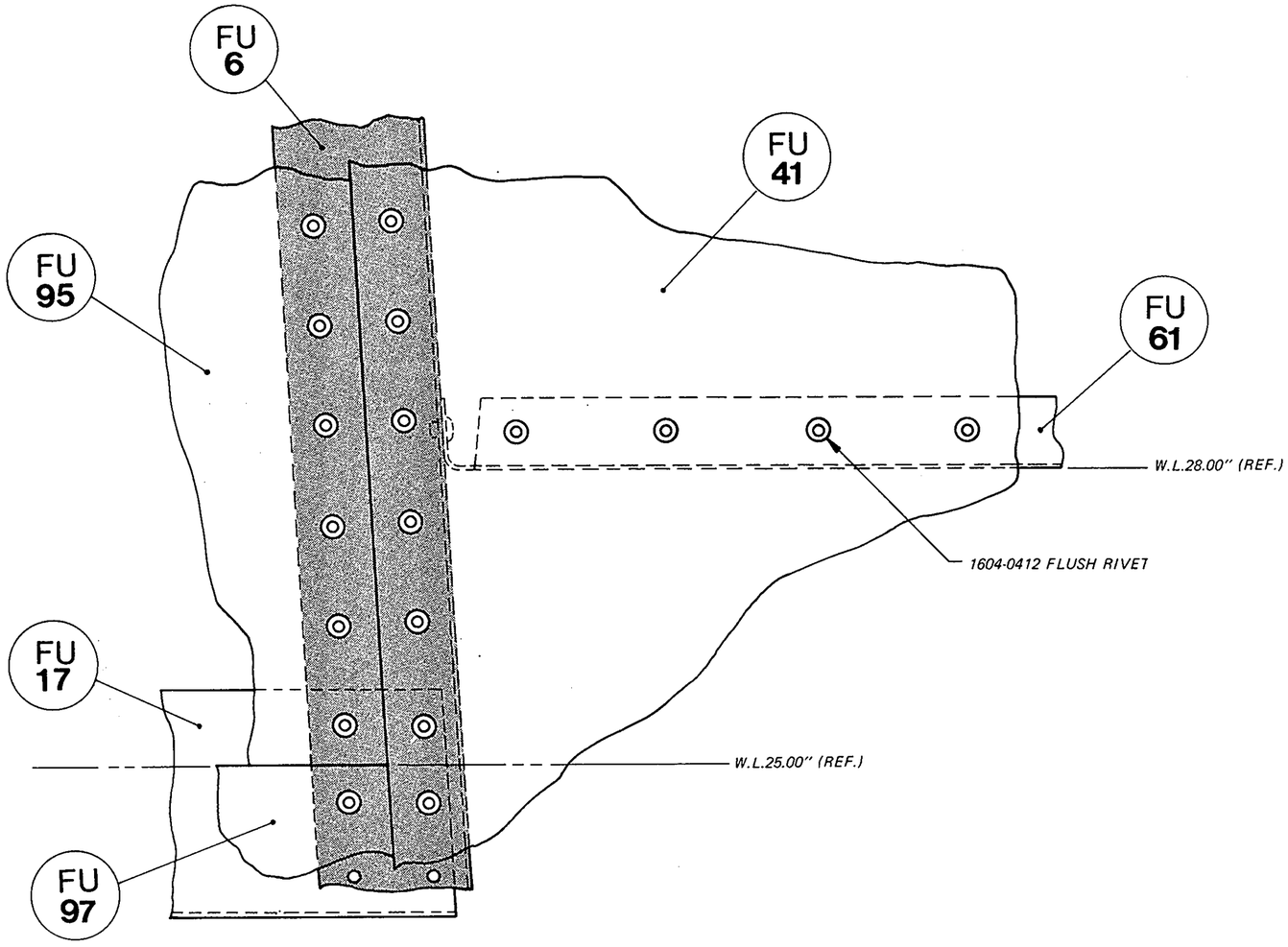
DETAIL S

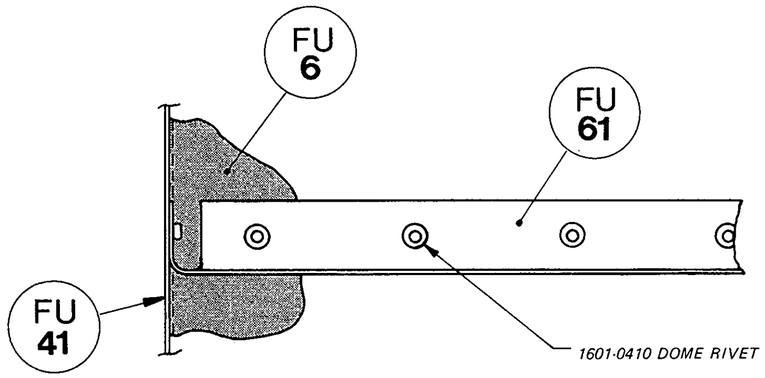


NOTE: 1. TOOLING HOLES MAY BE ANY DESIRED DIAMETER (UP TO 3/16") AS NECESSARY TO ACCOMODATE TOOLING PINS BEING USED.

MAKE ONE(1) PART FROM .020" 2024-T3 ALUMINUM

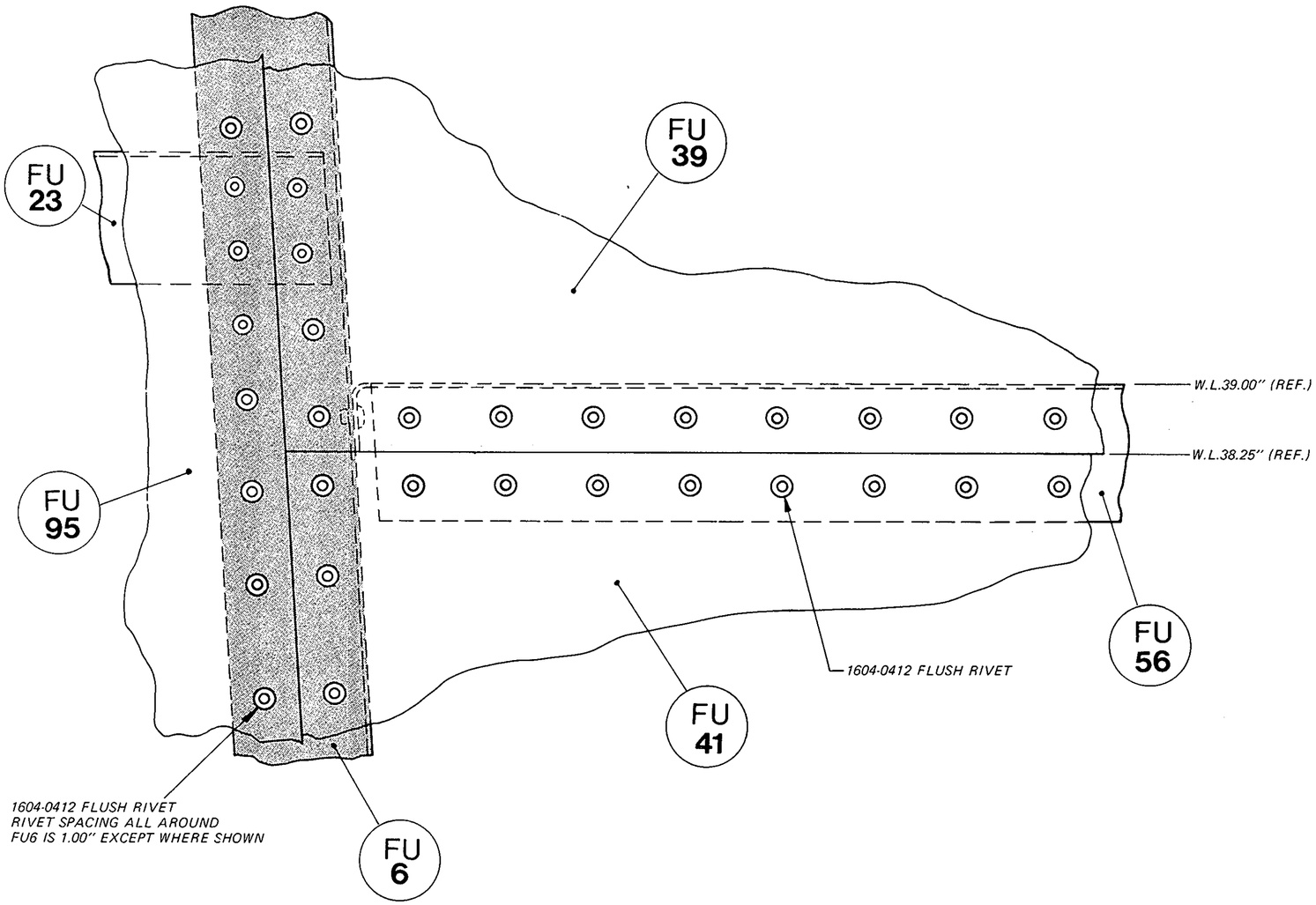
DETAIL T

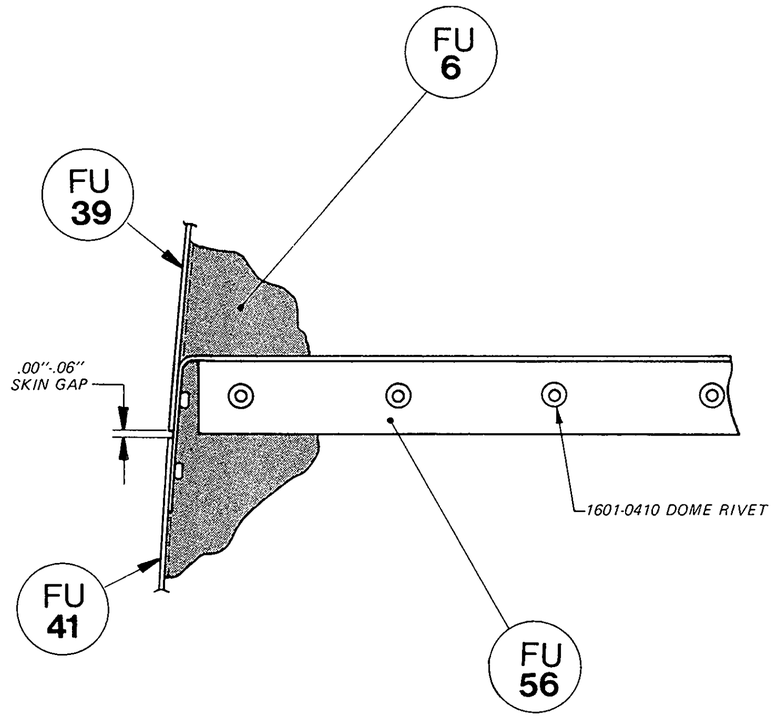




1. **FU61** is installed on **W.L. 28.00"** as shown above.
2. This Detail also illustrates location of aft end of **FU17** where it attaches to **FU6** bulkhead.
3. Study this Detail drawing together with **Details U, X and Y.**
4. Template drawing for fabrication of **FU61** is shown in **Detail P.**
5. Paragraphs 79 thru 122 in the general instructions give construction sequence for the aft section of the fuselage and further clarifies installation of **FU61.**

DETAIL U





1. **FU56** is installed on **W.L. 39.00"** as shown above

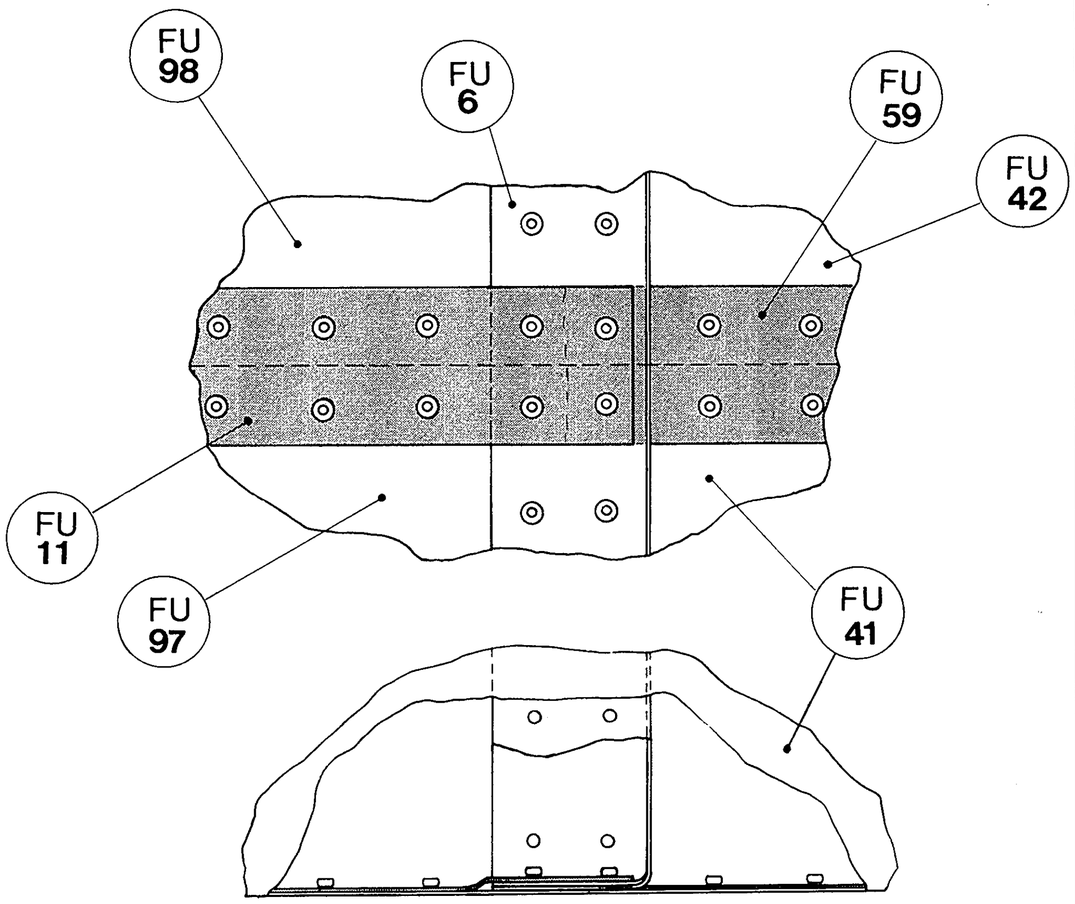
2. Also note **W.L. 38.25"** reference on which fuselage skins **FU39** and **FU41** meet.

3. This Detail also illustrates location of the aft end of **FU23** where it attaches to **FU6** bulkhead.

4. Study this Detail drawing together with **Details T, X** and **Y.**

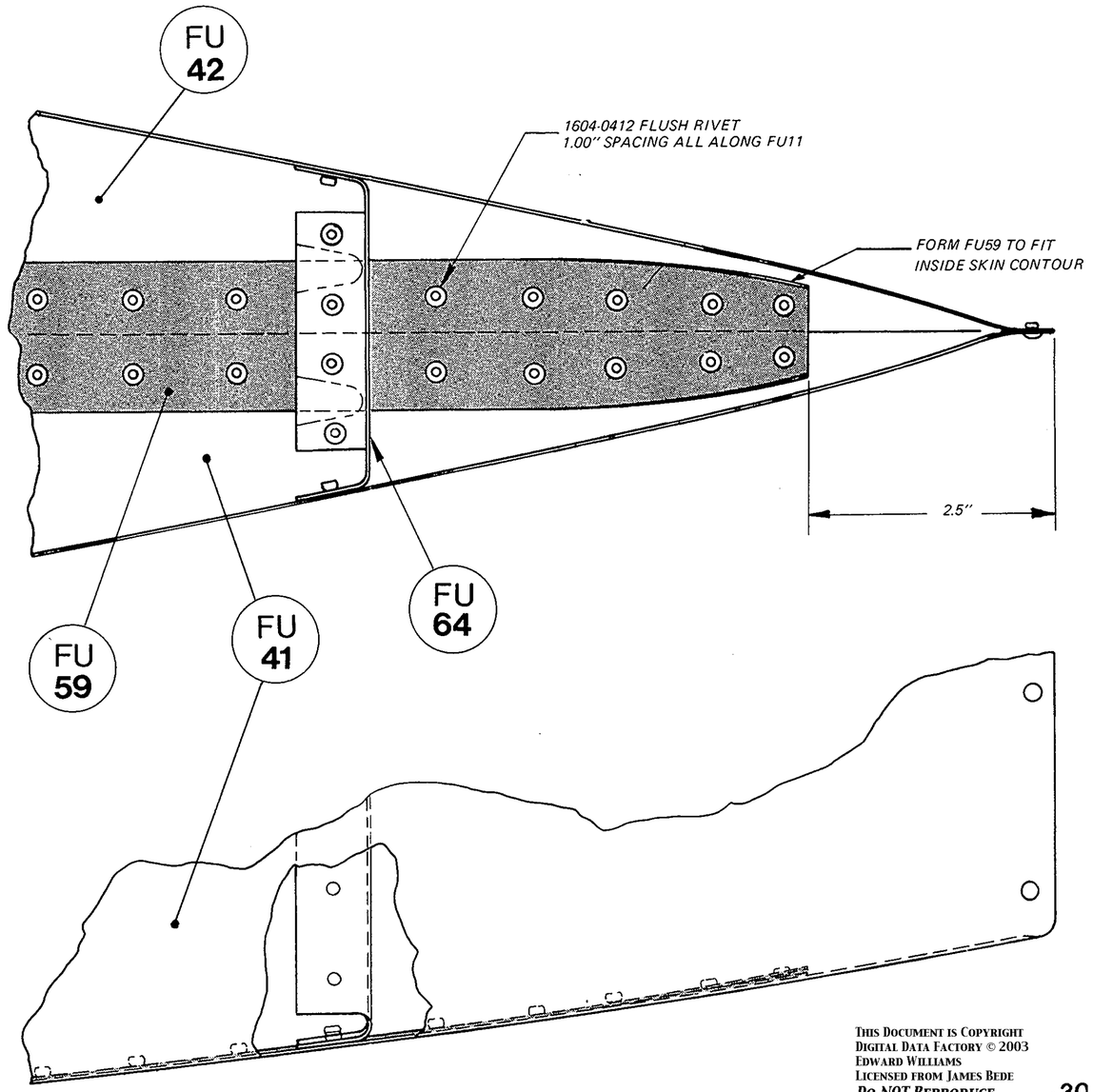
5. Template drawing for fabrication of **FU56** is shown in **Detail O.**

6. Paragraphs 79 thru 122 in the general instructions give construction sequence for the aft section of the fuselage and further clarifies installation of part **FU56.**



DETAIL V

DETAIL W



DETAIL X

FU 39

FU 56

FU 62

FU 63

FU 65

FU 61

FU 64

FU 41

RIVET SPACING FROM HERE TO FU6 IS 1.00" IN EACH ROW
TWO ROWS REQUIRED IN FU56

NO.30 DRILL
MS20470AD3-2 RIVET

DRILL NO.29 HOLE
1601-0410 DOME RIVET

1604 - 0412 FLUSH RIVET

.75"

W.L.38.25 (SKIN TRIM LINE)

A

A

RIVET SPACING FROM HERE
TO FU61 IS 1.00" MAXIMUM

4.25"

HORIZONTAL STABILIZER PIVOT BRACKET
INSTALL DURING CONTROL SYSTEM INSTALLATION

CUTOUT FOR HORIZONTAL
STABILIZER PIVOT ASSEMBLY

B

1604-0412 FLUSH RIVET

7.25"

10.25"

B

DO NOT DRILL OR RIVET THESE SIX(6) HOLES/SIDE UNTIL
CONTROL SYSTEM INSTALLATION

SECTION VIEWS OF
DETAIL X
ARE SHOWN ON
PAGE 132

1604 - 0412 FLUSH RIVET

D

D

C

C

1604-0412 FLUSH RIVET

RIVET SPACING ALL ALONG TRAILING EDGE IS 2.00" MAXIMUM
EXCEPT FOR 6.00" GAP ABOVE THIS RIVET TO ALLOW FOR
FUTURE INSTALLATION OF TRIM TAB.

RIVET SPACING ALL ALONG FU64
IS 1.00" MAXIMUM

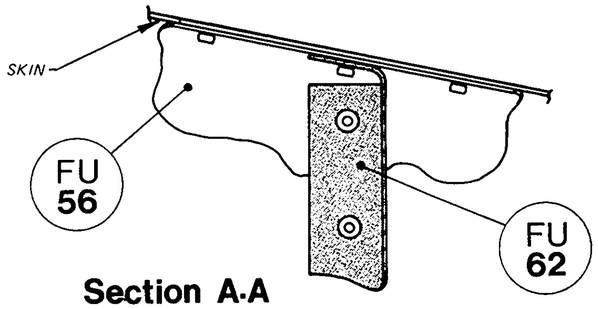
1.40"A.C.

7.10"A.C.

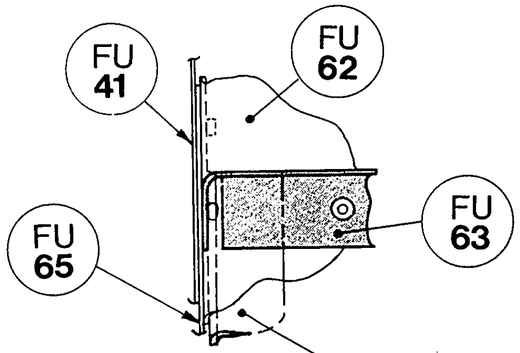
8.50"A.C.

RIVET SPACING FROM HERE TO FU6 IS
1.50" MAXIMUM (EXCEPT AS SHOWN)

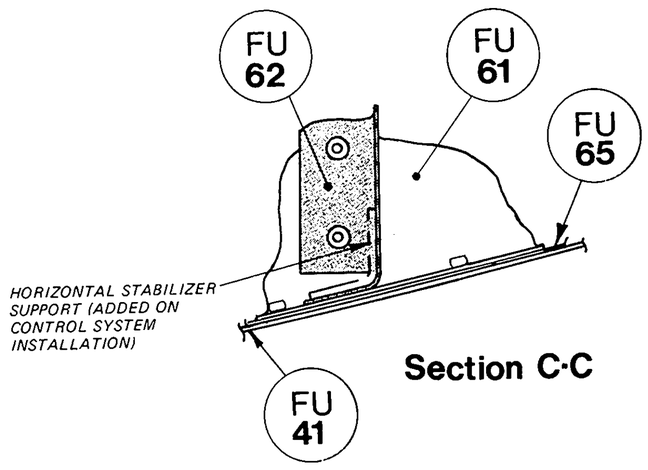
DETAIL Y



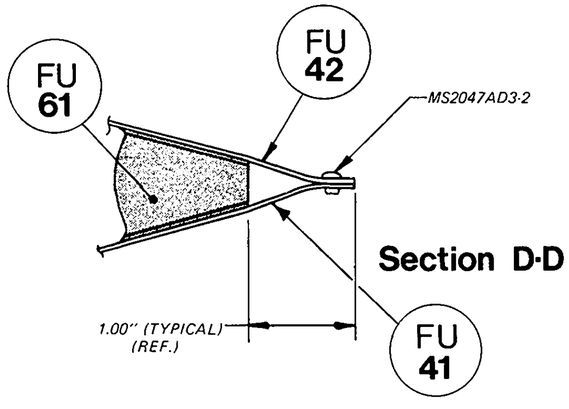
Section A-A



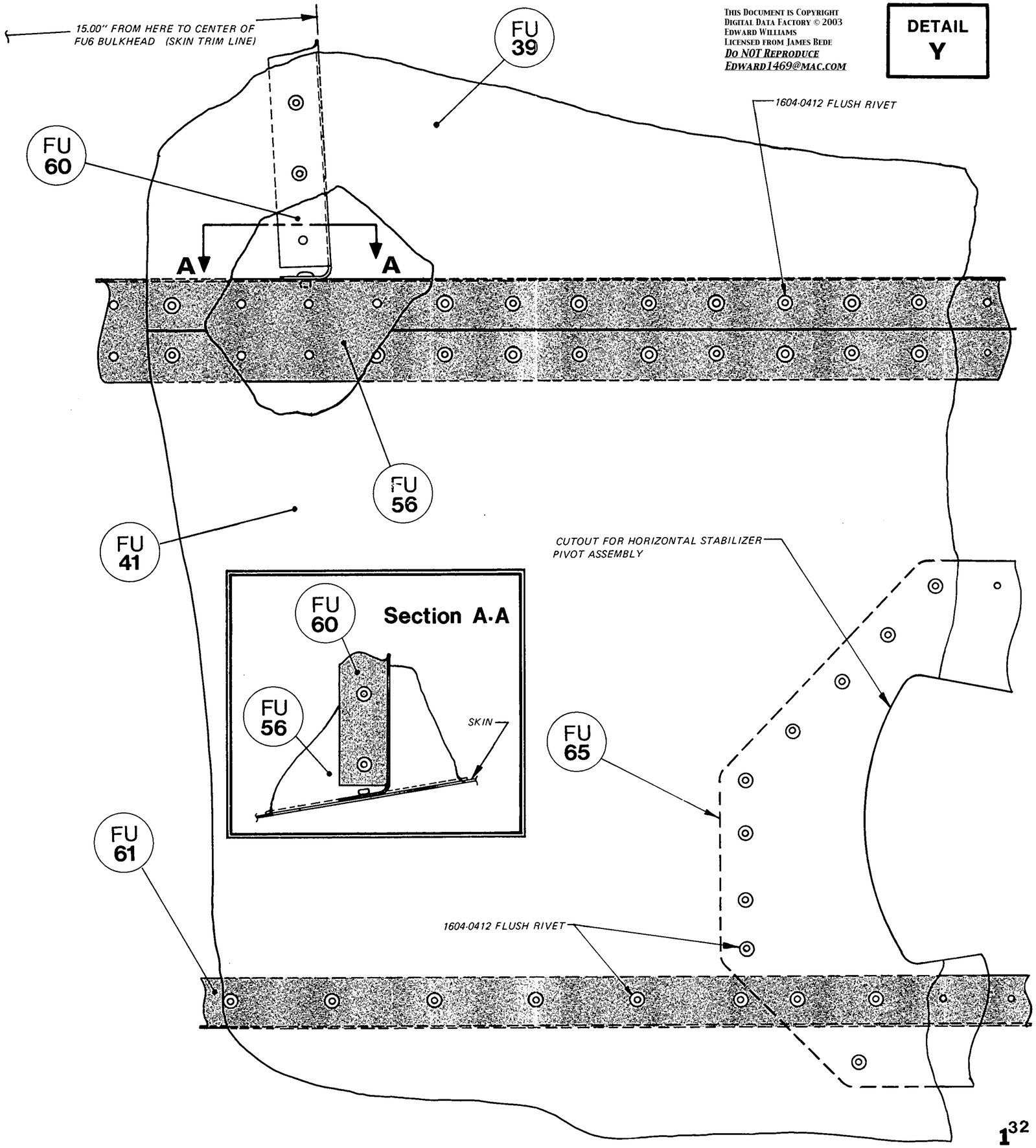
Section B-B



Section C-C



Section D-D



DETAIL Z

DETAIL Z CONTINUED ON PAGE 134

1. This Detail is in two parts, with the drawing on this page being continued on page 134, opposite.

2. Splicing strap **FU57** location at the top aft end of the fuselage is shown, and should be studied together with **Detail J** and Main Plans Drawing on page 12.

3. Template drawing for **FU60** bulkhead is shown in **Detail S.**

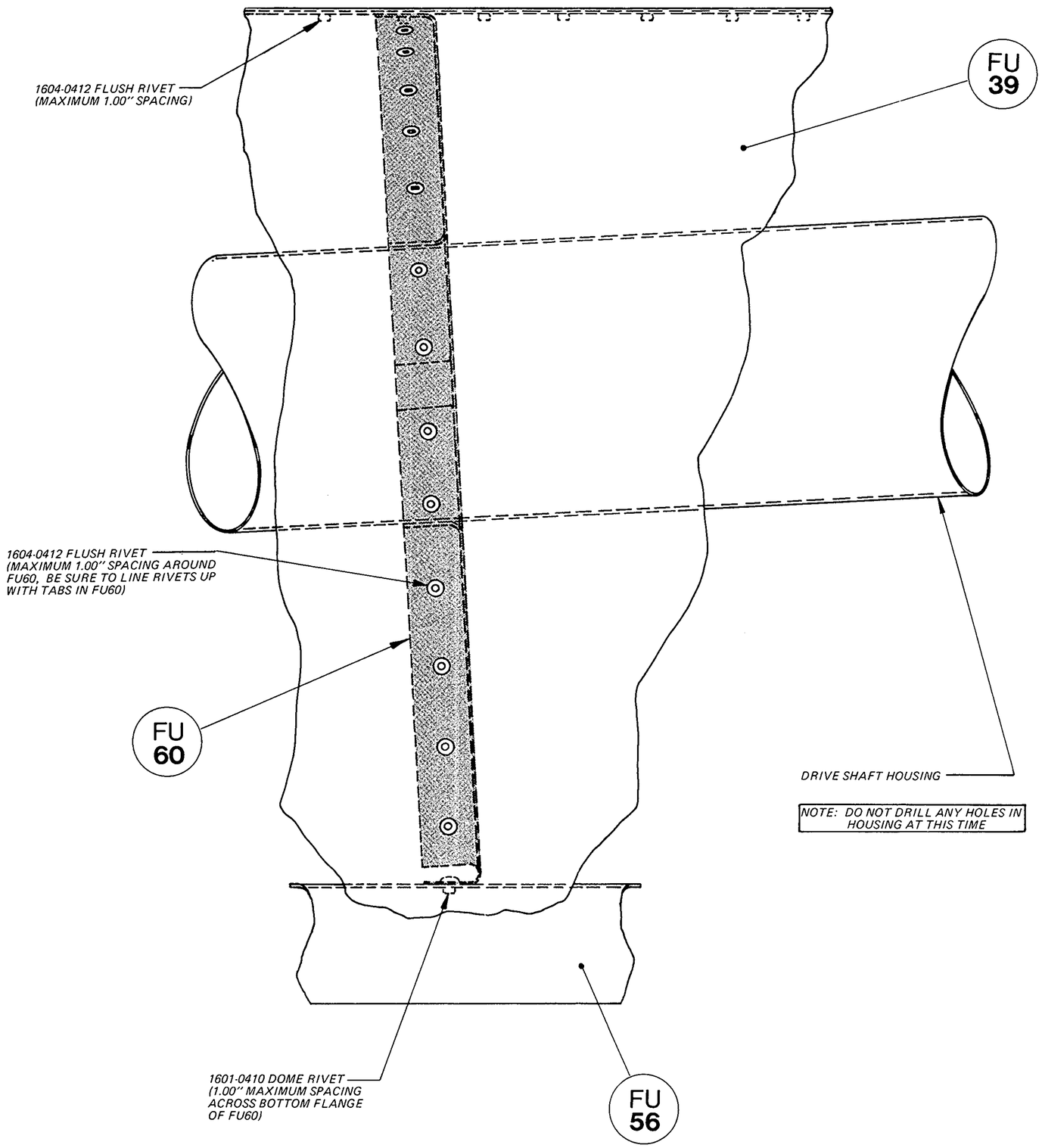
4. Template drawing for splicing strap **FU58** is shown in **Detail R.**

5. Part **FU66** is supplied preformed by Bede Aircraft. During initial stage of construction of the fuselage this part is **not** finally riveted in place. It is temporarily installed to accurately align fuselage skins **FU39** and **FU40,** and is clamped in place during installation of **FU60** bulkhead. Final installation of **FU66** is covered in Chapter 10 – "Engine and Drive System".

6. Refer to **Detail Y – Section View A-A** – for clarification of **FU60** installation on **FU56.**

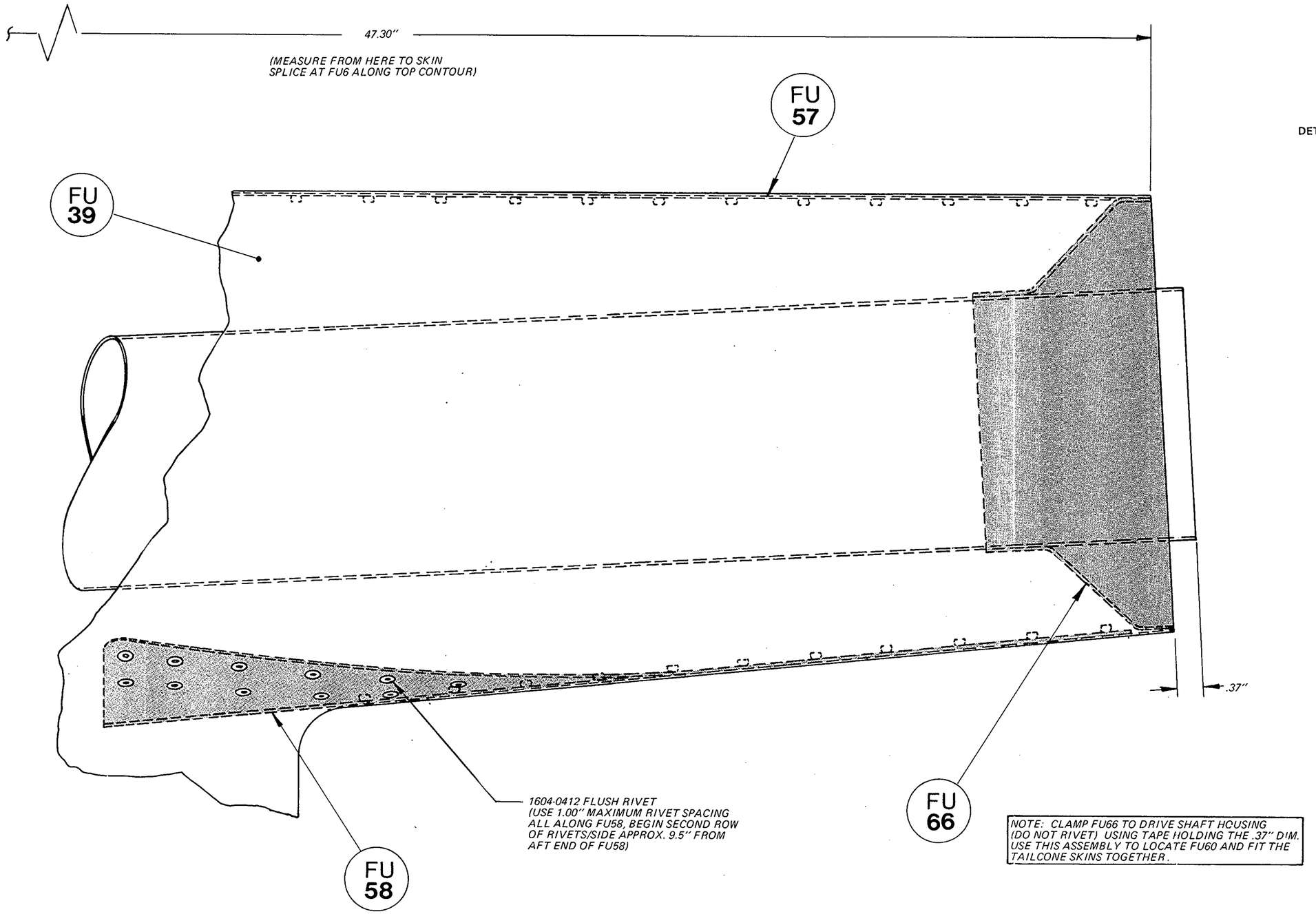
7. Drive shaft housing installation is covered in Chapter 10.

8. See paragraphs 81, 82 and 108, and paragraphs 116 thru 122 in the general instructions for further clarification involving the parts shown in this Detail.



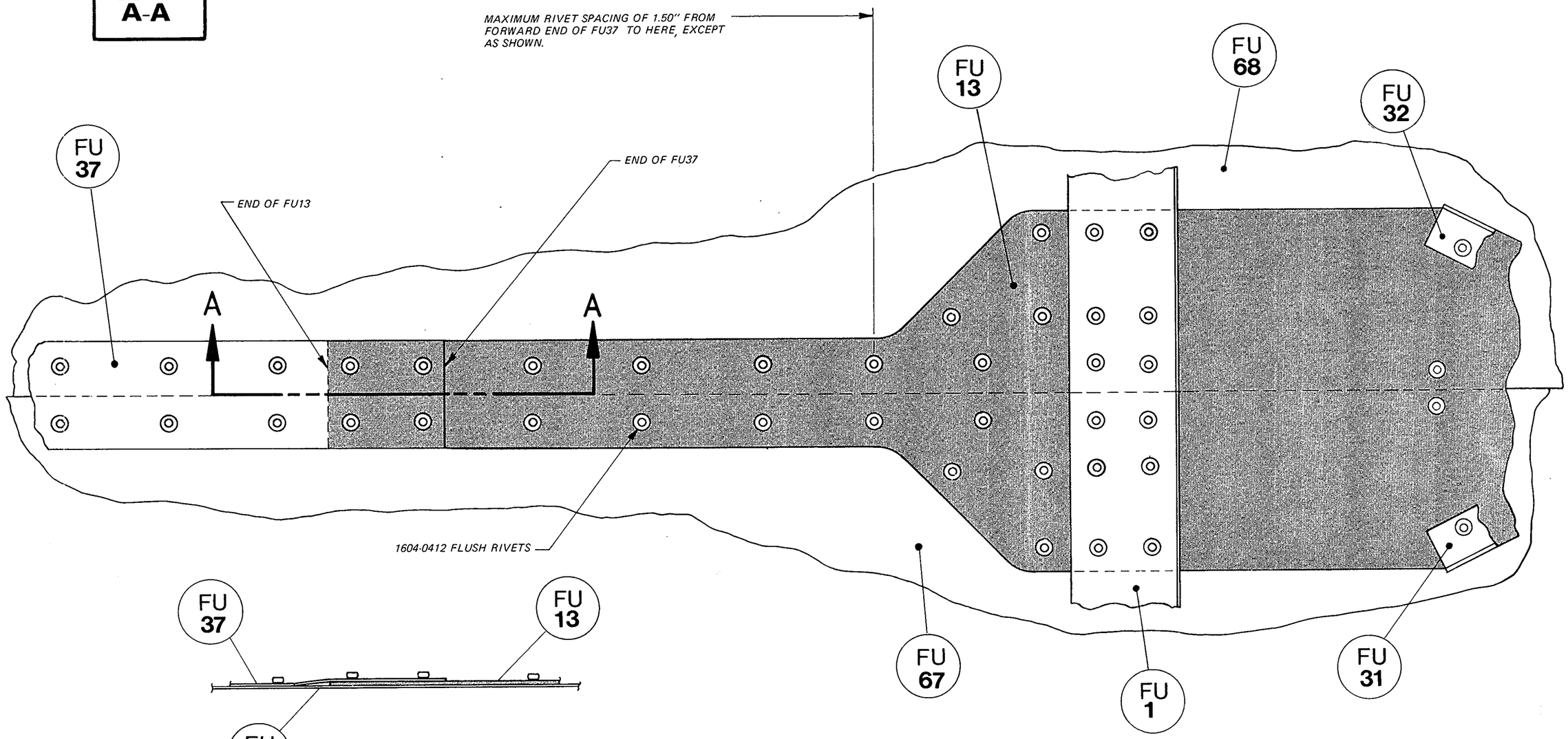
DETAIL Z

DETAIL Z CONTINUED FROM PAGE 133



NOTE: CLAMP FU66 TO DRIVE SHAFT HOUSING (DO NOT RIVET) USING TAPE HOLDING THE .37" DIM. USE THIS ASSEMBLY TO LOCATE FU60 AND FIT THE TAILCONE SKINS TOGETHER.

DETAIL A-A



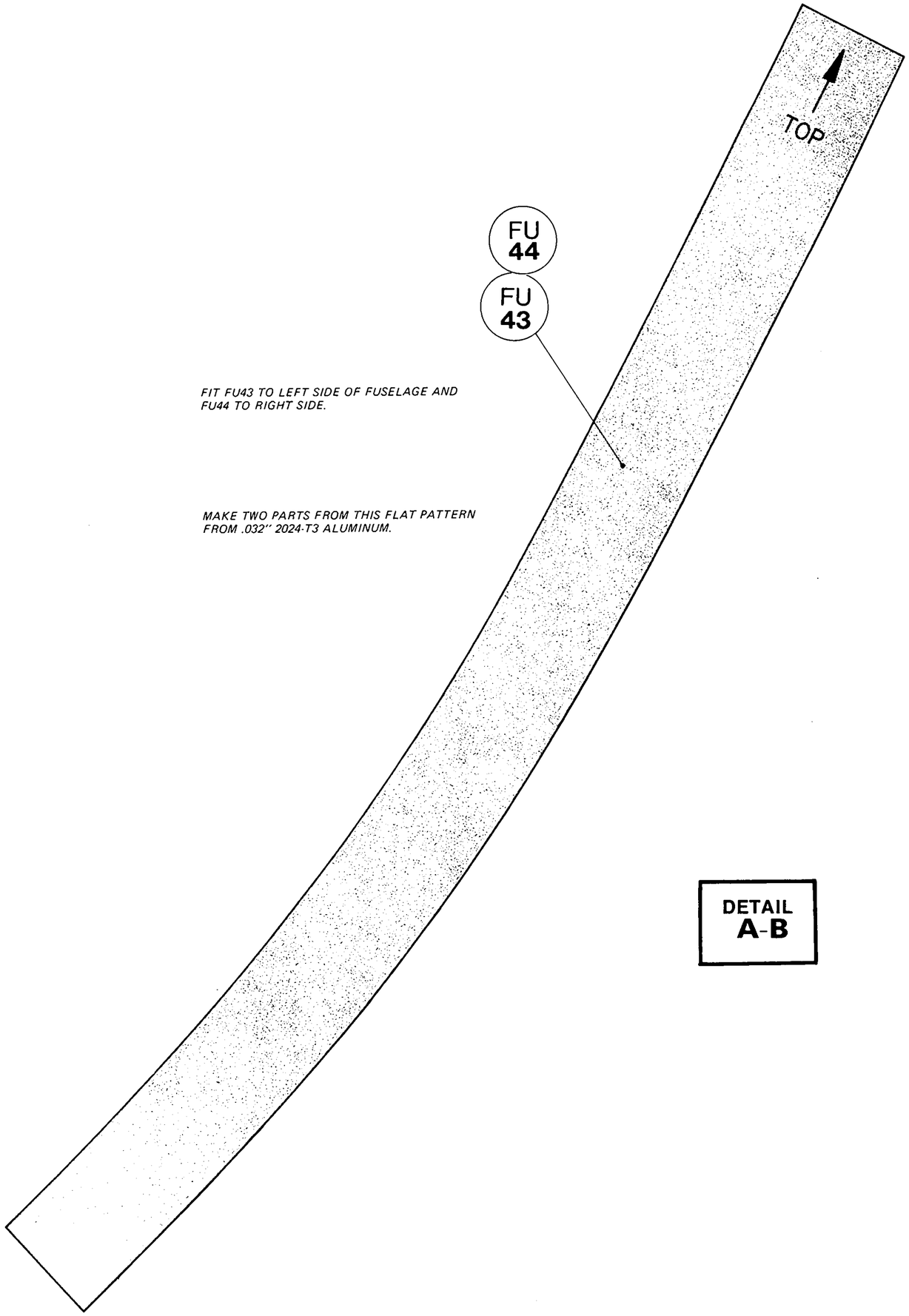
1. This Detail illustrates installation of **FU13**, forward of **FU1** bulkhead.

2. Study this Detail in conjunction with **Detail B** and **Detail D.**

3. Particularly note **Section View** A-A, which clearly illustrates how splicing strap **FU37** joins **FU13.**

4. See Main Plans Drawing on page 1^2 (Bottom View), which illustrates forward termination of splicing strap **FU37.**

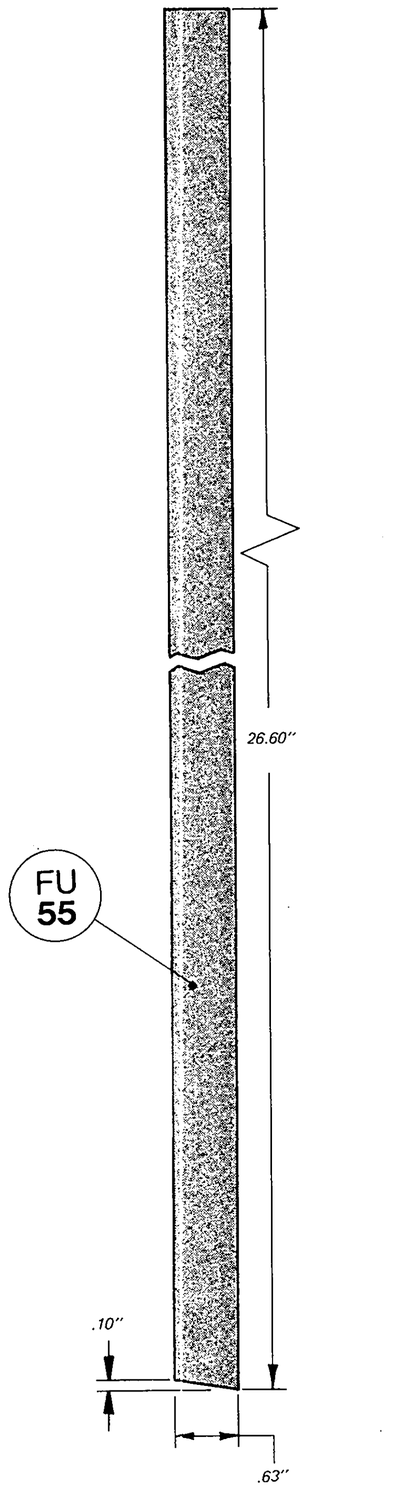
5. Paragraphs 6 thru 18, and paragraphs 124 and 125 in the general instructions further clarify installation of the parts shown in this Detail.



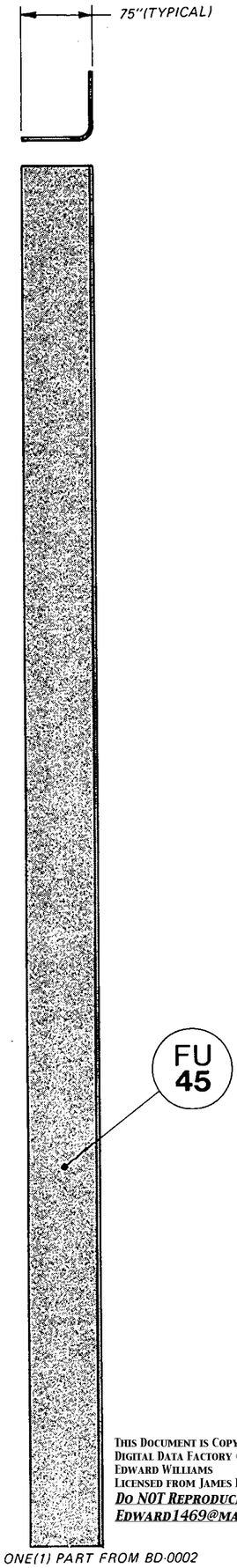
FIT FU43 TO LEFT SIDE OF FUSELAGE AND FU44 TO RIGHT SIDE.

MAKE TWO PARTS FROM THIS FLAT PATTERN FROM .032" 2024-T3 ALUMINUM.

DETAIL A-B

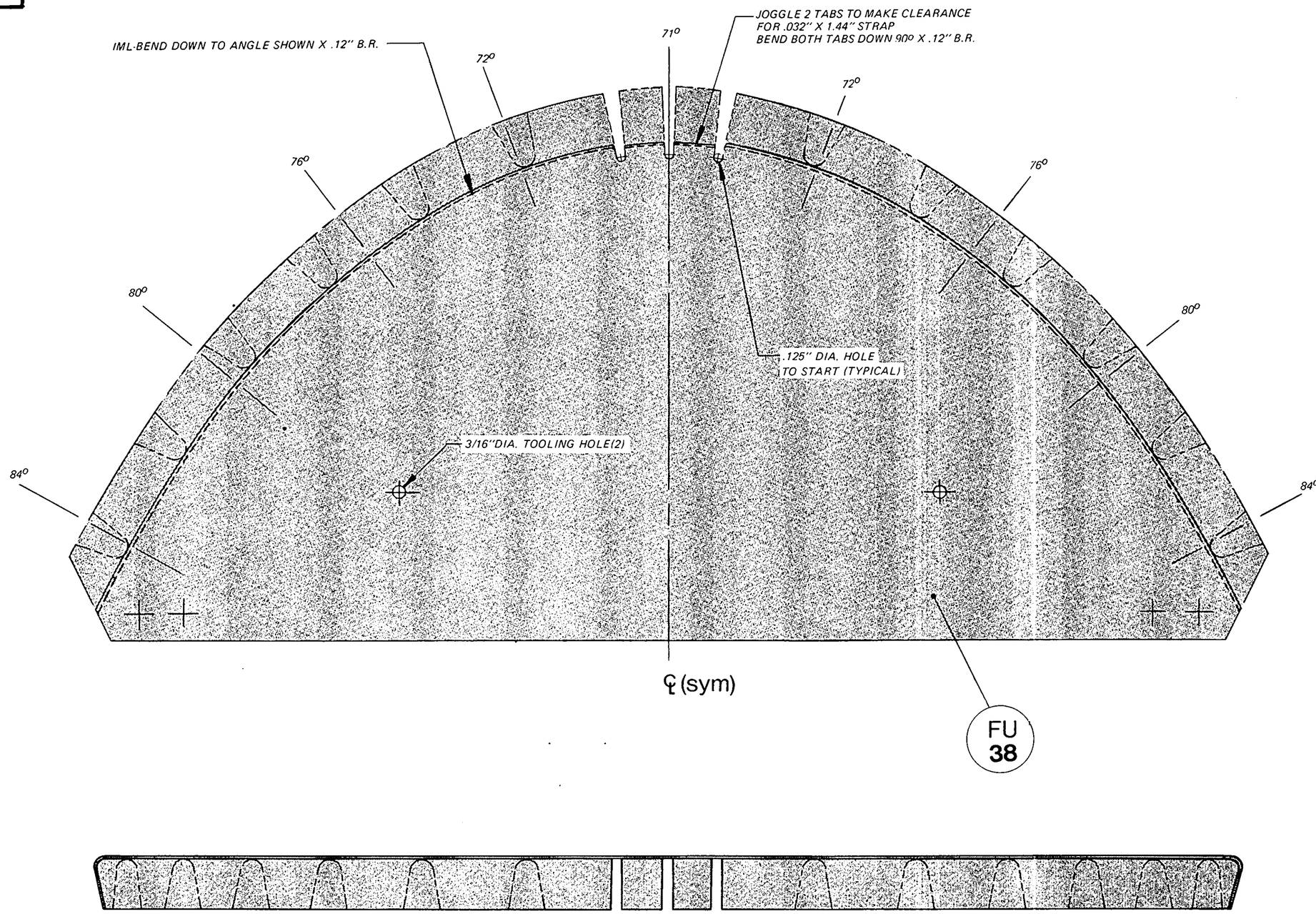


MAKE TWO(2) PARTS FROM .063" 2024-T3 ALUMINUM



MAKE ONE(1) PART FROM BD-0002

DETAIL A-C



MAKE ONE(1) PART FROM .025" 2024-T3 ALUMINUM

DETAIL A-D

1604-0412 FLUSH RIVE I
RIVET SPACING ALL ALONG FU38 IS 1.50" MAXIMUM

.75"

FU 38

FU 45

FORWARD END OF FU55 DOUBLER

DRILL NO.40
CSK BOTH SIDES 100° X .185"DIA.
MS20426AD3-4 RIVET
(DOUBLE FLUSH)

PILOT HOLES FOR CANOPY
INSTALLATION SCREWS
SEE DETAIL A-G

FU 55

FU 69

FU 73

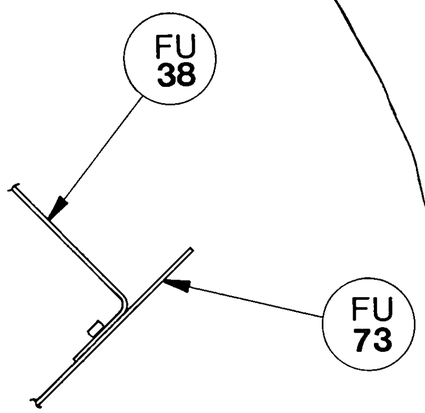
FU 67

1604-0412 FLUSH RIVET
RIVET SPACING ALL ALONG
FU69 IS 1.00" MAXIMUM

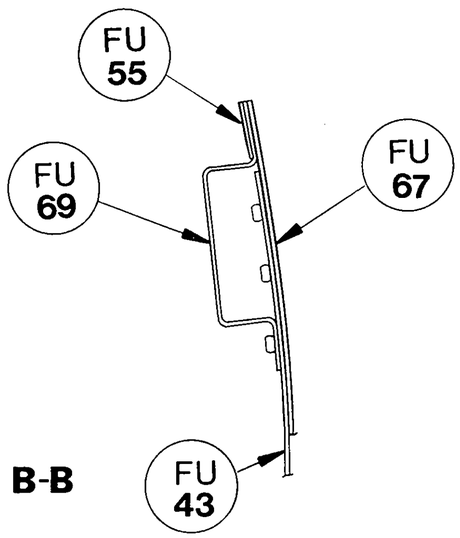
1604-0412 FLUSH RIVET
RIVET SPACING ALL ALONG FU43 IS 1.00" MAXIMUM

FU 43

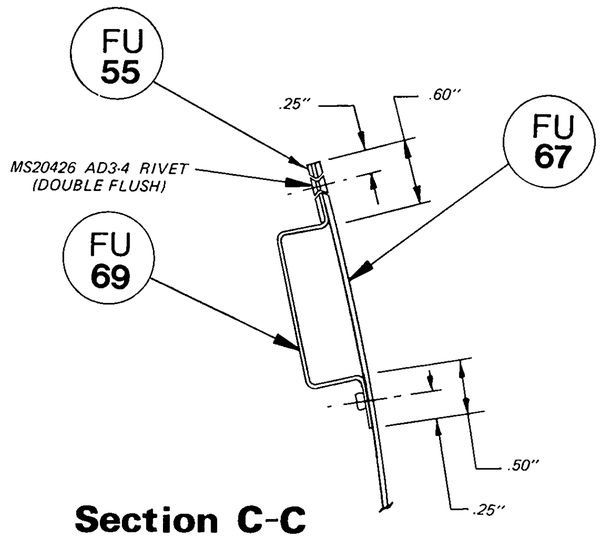
Section A-A



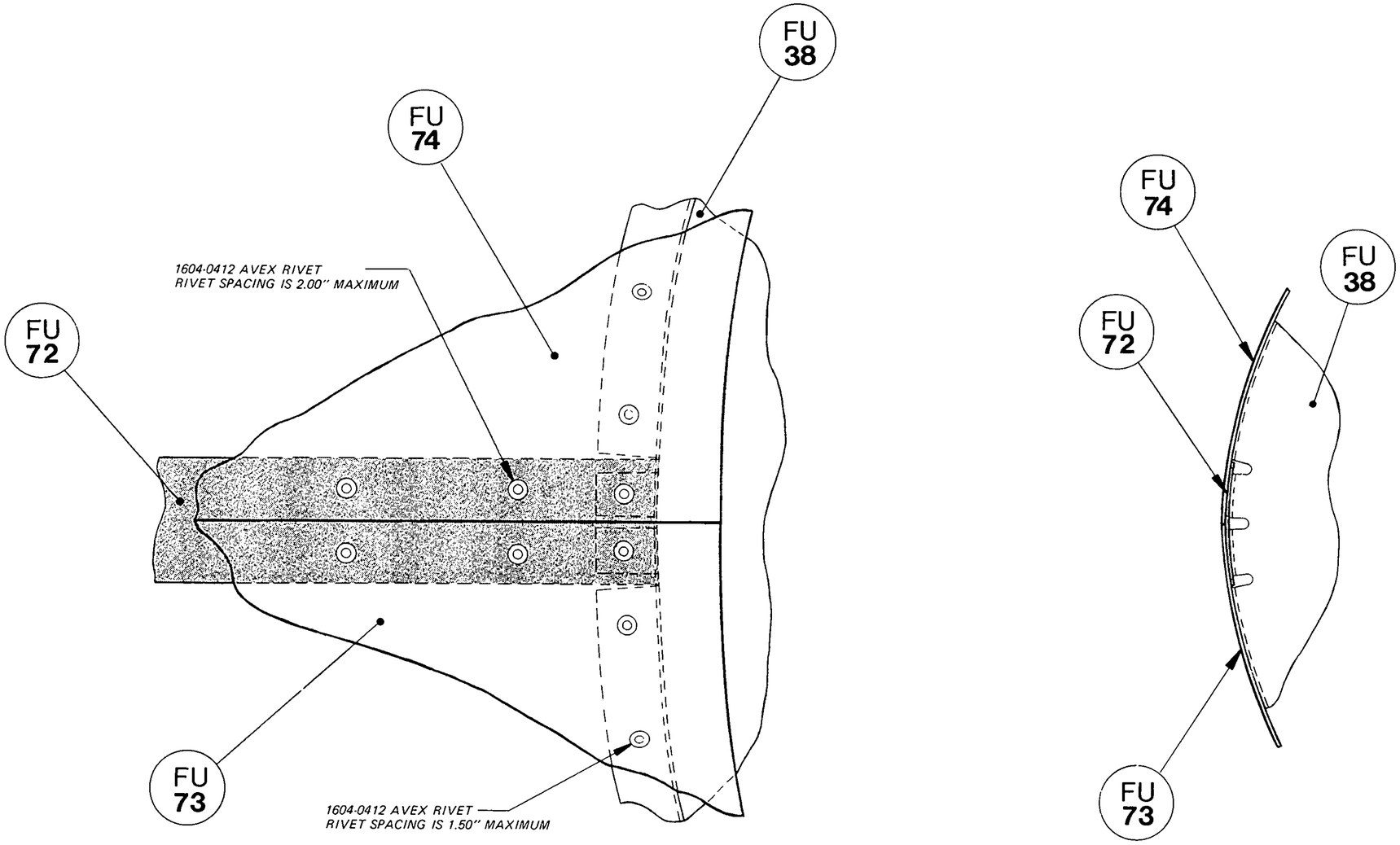
Section B-B



Section C-C



DETAIL A-E

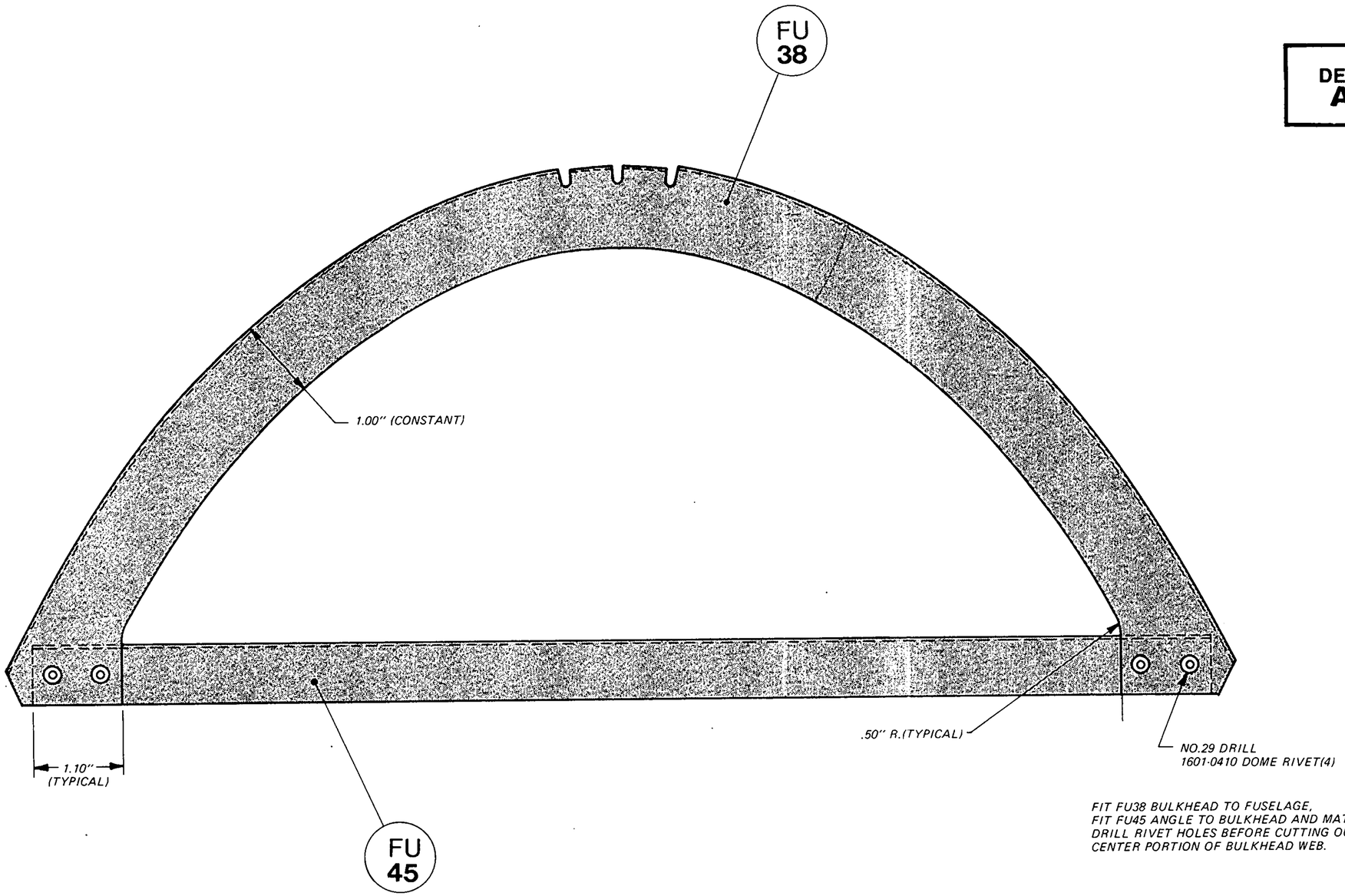


1. This Detail should be referred to for installation of both **FU72** nose cone strap and **FU38** bulkhead.

2. Notice rivet spacing in both these parts.

3. See **Details A-F** and Main Plans Drawing (page 1[2]) for further reference.

4. See paragraph 126, and paragraphs 130 thru 142 in the general instructions, as well as **Detail A-D**, for further clarification involving installation of the parts shown in this Detail.

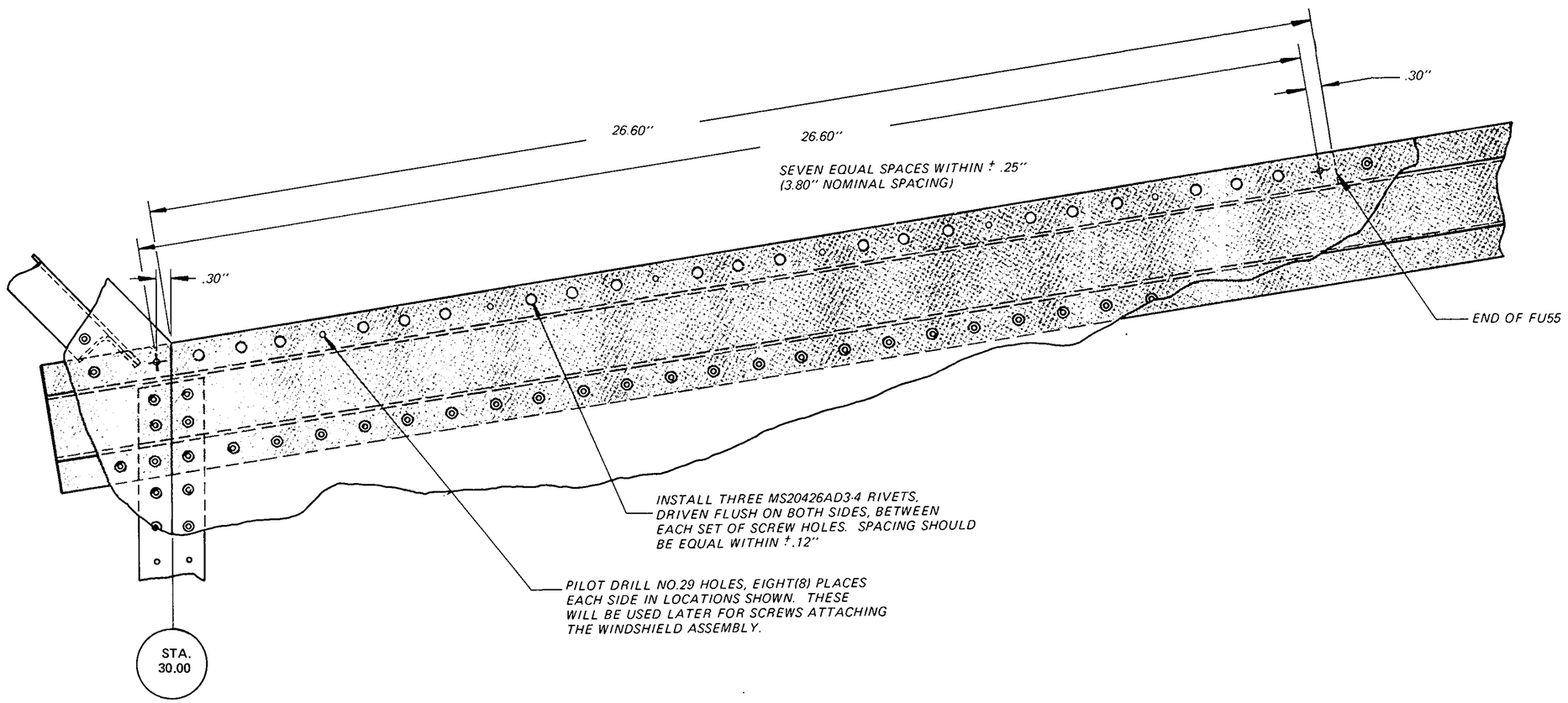


DETAIL A-F

FIT FU38 BULKHEAD TO FUSELAGE, FIT FU45 ANGLE TO BULKHEAD AND MATCH DRILL RIVET HOLES BEFORE CUTTING OUT CENTER PORTION OF BULKHEAD WEB.

1. Make **FU38** from .025" sheet aluminum, using the template drawing in **Detail A-C.**
2. Fit **FU38** bulkhead to the fuselage as shown in **Details A-D** and **A-E.**
3. Make **FU45** to template drawing in **Detail A-B.**
4. Drill rivet holes through **FU38** and nose skins **FU73/ FU74** and cleco in place.
5. With **FU38** bulkhead held in place, fit **FU45** angle to **FU38** and match drill the rivet holes as shown.
6. Remove **FU38** and **FU45** and cut out center of **FU38** as illustrated above.
7. Refer to paragraphs 128 thru 141 in the general instructions for further clarification.

DETAIL A-G



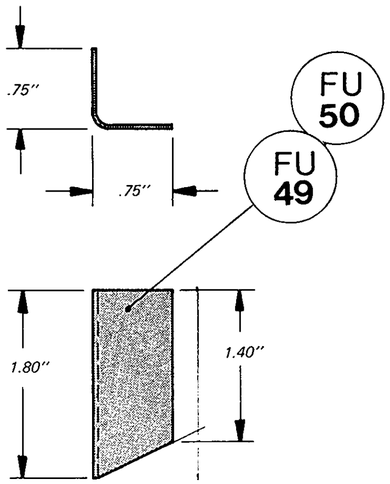
1. This Detail is drawn 1/2-size scale.

2. It should be studied together with **Detail A-D** and **Detail N**, as well as the Main Plans Drawings on pages 12 and 13.

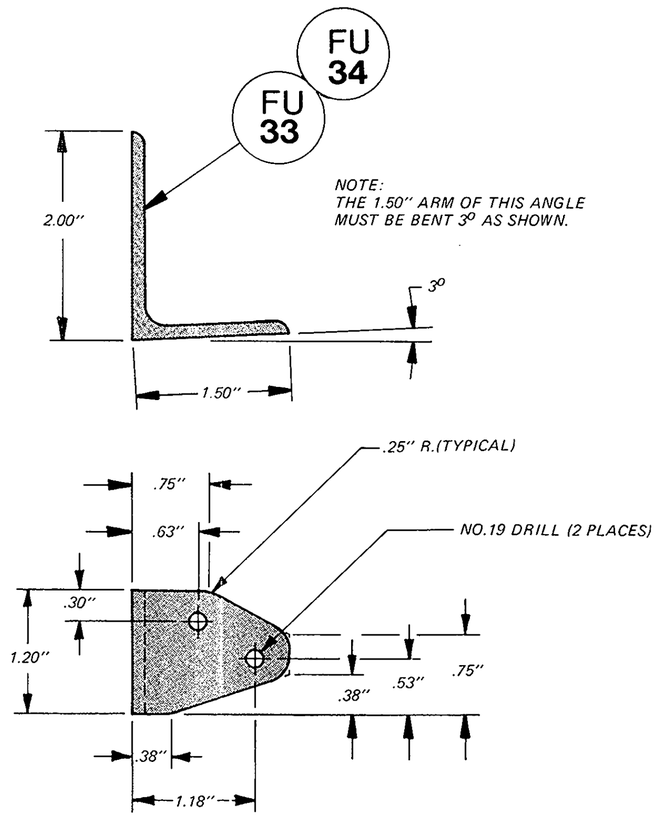
3. Take particular notice of the hole drilling instructions given.

4. Also refer to **Detail A-I** for location and installation of cross brace **FU35.**

5. See paragraphs 123 thru 177 in the general instructions for further clarification of installation of the different parts in this section of the fuselage.

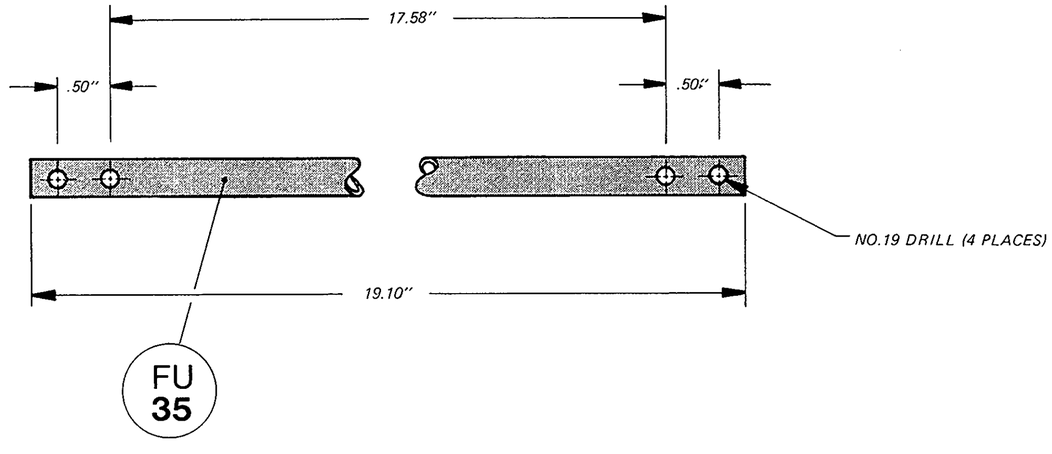


MAKE ONE(1) PART (FU49) AND
ONE OPPOSITE PART (FU50)
FROM BD-0002



MAKE ONE(1) PART (FU33) AND
ONE(1) OPPOSITE PART (FU34) FROM
BD-0007 .125" X 1.50" X2.00" ANGLE.

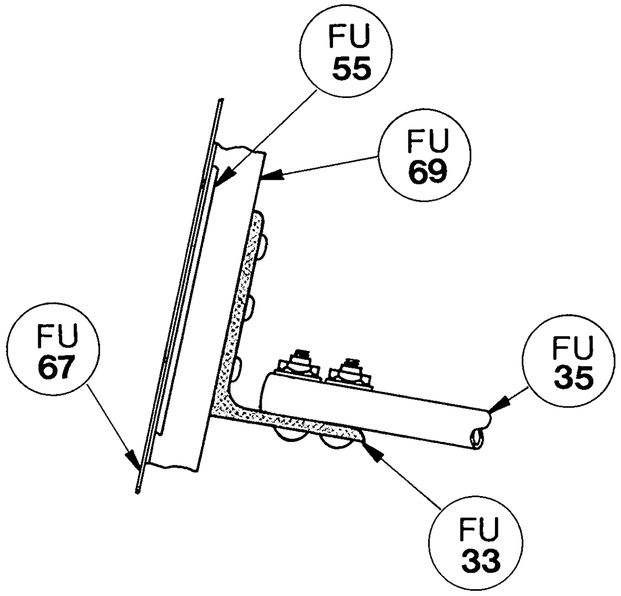
DETAIL A-H

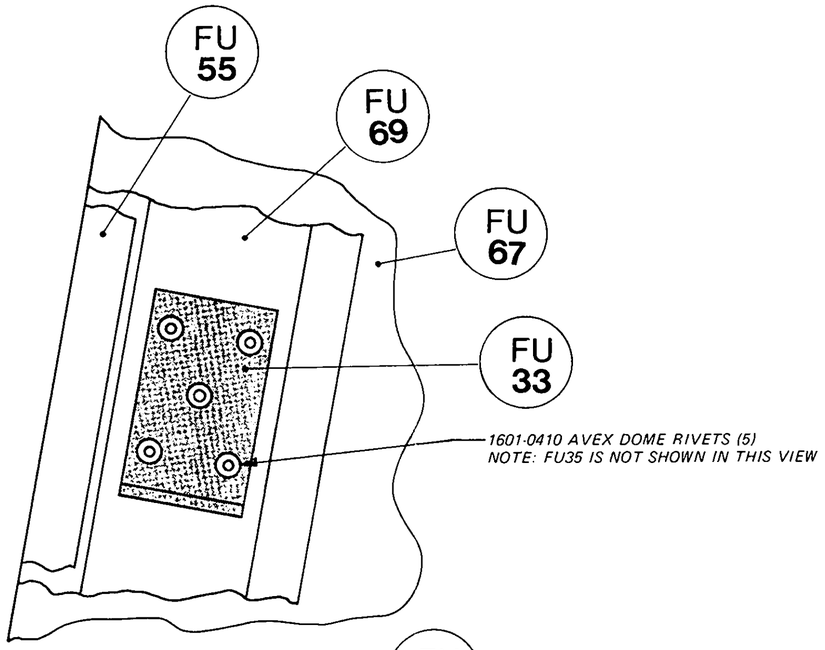


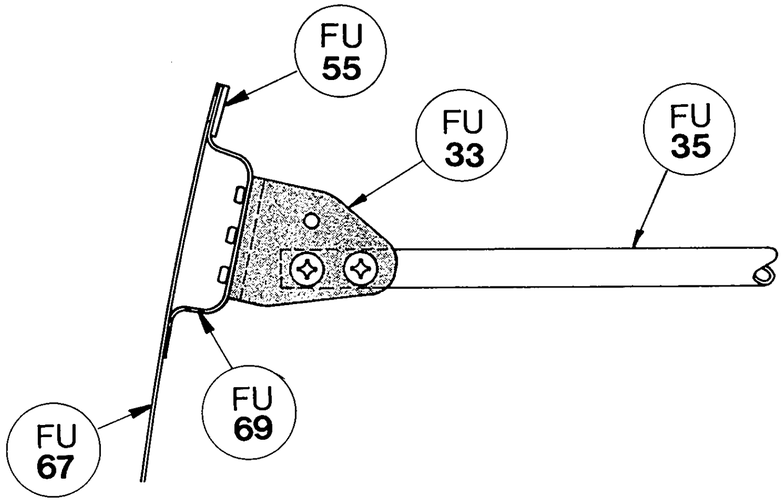
MAKE ONE(1) PART FROM .375" O.D. X .058" WALL 2024-T3 ALUMINUM TUBING

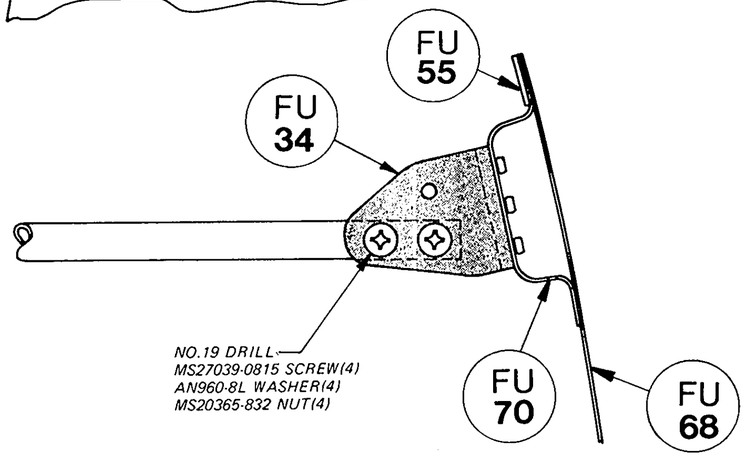
NOTE:
1. SEE DETAIL A-I ON THE NEXT PAGE FOR INSTALLATION DRAWINGS OF PARTS FU33/ FU34 AND FU35.
2. SEE DETAIL N FOR INSTALLATION DRAWINGS OF PARTS FU49/FU50.

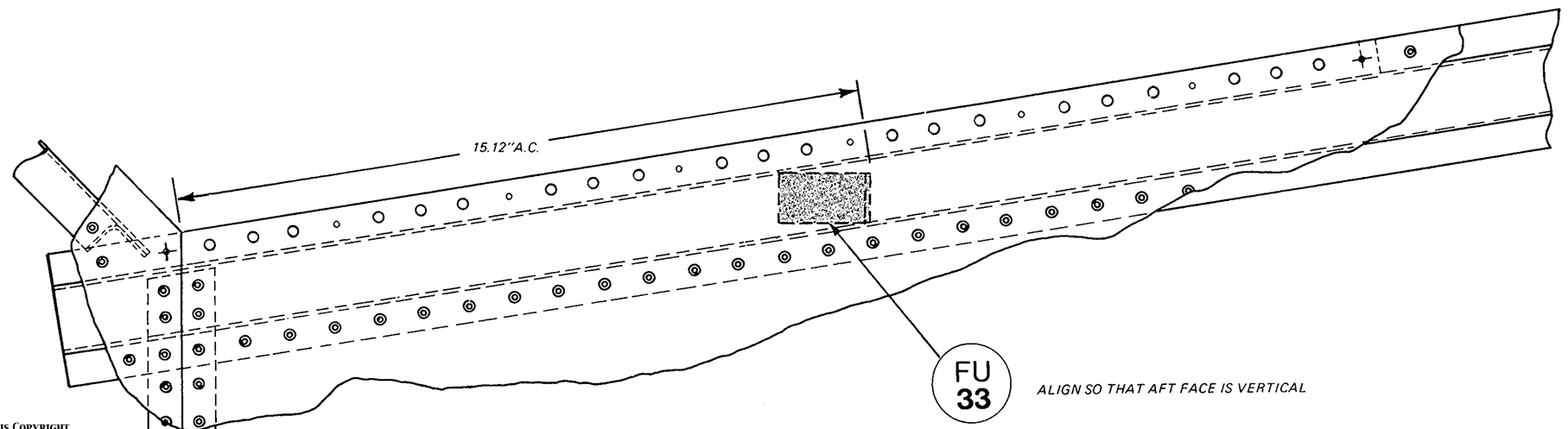
DETAIL AI











PARTS & MATERIALS CALL OUT

DWG. REF. NO.	DESCRIPTION	QUANTITY	MATERIAL IDENTIFICATION NO.	MATERIAL DESCRIPTION
FU 71	SHIM	2	BD-5-M-0101	.032" 2024-T3
FU 77	BULKHEAD	1	BD-5-M-0027	.025" 2024-T3
FU 78	ANGLE TOP	1	BD-5-M-0101	.032" 2024-T3
FU 79	FRONT PLATE	1	BD-5-M-0101	.032" 2024-T3
FU 80	TOP PLATE	1	BD-5-M-0101	.032" 2024-T3
FU 81	WHEELCOVER	1	BD-5-M-0025	.016" 2024-T3
FU 82	FLOORBOARD BRACE	1	BD-5-M-0101	.032" 2024-T3
FU 83	FLOOR SUPPORT BULKHEAD	1		.032" 2024-T3
FU 84	SIDE PANNEL	2	BD-5-M-0025	.016" 2024-T3
FU 85	SIDE PANNEL	2	BD-5-M-0101	.032" 2024-T3
FU 86	SIDE PANNEL	2	BD-5-M-0101	.032" 2024-T3
FU 87	DOUBLER L.H.	1	BD-5-M-0101	.032" 2024-T3
FU 88	DOUBLER R.H.	1	BD-5-M-0101	.032" 2024-T3
FU 89	CHANNEL PULLEY BRACE	1	BD-0069	.063" 2024-T3
FU 91	SHIM L.H. PULLEY BRACKET	1	BD-5-M-0101	.032" 2024-T3
FU 100	SPACER, LOWER PULLEY	1	BD-5-M-0123	.25" O.D. X .028" WALL 2024-T3 ALUMINUM TUBING
FU 102	ANGLE R.H. FWD.	1	BD-0002	.032" X 1.00" X 1.00" 2024-T3 ANGLE
FU 103	ANGLE TOP L.H.	1	BD-5-M-0101	.032" 2024-T3
FU 104	ANGLE TOP R.H.	1	BD-5-M-0101	.032" 2024-T3
FU 105	ANGLE BOTTOM L.H.	1	BD-5-M-0101	.032" 2024-T3
FU106	ANGLE BOTTOM R.H.	1	BD-5-M-0101	.032" 2024-T3
FU 107	ANGLE L.H.	1	BD-0002	.032" X 1.00" X 1.00" ANGLE
FU 108	ANGLE R.H.	1	BD-0002	.032" X 1.00" X 1.00" 2024-T3 ANGLE
FU 109	ANGLE L.H.	1	BD-5-M-0027	.025" 2024-T3
FU 110	ANGLE R.H.	1	BD-5-M-0027	.025" 2024-T3
FU 111	HAT SECTION L.H.	1	BD-0004	.032" HAT SECTION 2024-T3
FU 112	HAT SECTION R.H.	1	BD-0004	.032" HAT SECTION 2024-T3
FU 113	ANGLE L.H.	1	BD-5-M-0101	.032" 2024-T3
FU 114	ANGLE R.H.	1	BD-5-M-0101	.032" 2024-T3
FU 115	ANGLE L.H.	1	BD-5-M-0027	.025" 2024-T3
FU 116	ANGLE R.H.	1	BD-5-M-0027	.025" 2024-T3
FU 117	ANGLE TOP L.H.	1	BD-0002	.032" X 1.00" X 1.00" 2024-T3 ANGLE
FU 118	ANGLE TOP R H.	1	BD-0002	.032" X 1.00" X 1.00" 2024-T3 ANGLE
FU 119	HAT SECTION L.H.	1	BD-0004	.032" HAT SECTION 2024-T3
FU 120	HAT SECTION R.H.	1	BD-0004	.032" HAT SECTION 2024-T3
FU 121	PULLEY BRACKET L.H.	2	BD-5-M-0088	.040" 2024-T3
FU 123	STIFFNER L.H.	1	BD-5-M-0101	.032" 2024-T3
FU 124	STIFFNER R.H.	1	BD-5-M-0101	.032" 2024-T3
FU 125	FLOOR SUPPORT L.H.	1	BD-5-M-0027	.025" 2024-T3
FU 126	FLOOR SUPPORT R.H.	1	BD-5-M-0027	.025" 2024-T3
FU 127	BULKHEAD L.H.	1	BD-5-M-0027	.025" 2024-T3
FU 128	BULKHEAD R.H.	1	BD-5-M-0027	.025" 2024-T3
FU 129	SPACER	1	BD-5-M-0123	.250" O.D. X .028" WALL 2024-T3 ALUMINUM TUBING
FU 130	SPACER	1	BD-5-M-0123	.250" O.D. X .028" WALL 2024-T3 ALUMINUM TUBING
FU 131	PULLEY BRACKET L.H.	1	BD-5-M-0101	.032" 2024-T3
FU 132	PULLEY BRACKET R.H.	1	BD-5-M-0101	.032" 2024-T3

NOSE GEAR BOX CONSTRUCTION

Before Beginning Construction, Note The Following:

1 A jig has been designed to insure torsional regidity of the nosegear box during final construction. This will prevent any twist and insures that the strut travel is not off center.

2 Pay particular attention where flush rivets and dome rivets are used and their direction.

3 Prior to final assembly, remove all sharp edges and deburr all holes.

4 Thoroughly read and familiarize yourself with the prints before construction.

5 All critical dimensions are noted on drawing. Other dimensions can be taken from full scale drawings.

6 When drilling holes, hold the drill as close to 90° to the material as possible.

7 Before permenantly installing nosegear box into aircraft, the type of pitot static system must be determined and installed.

8 It is assumed that the builder is experienced enough at this point of construction to know that when locating parts, that he periodically installs clecos to hold the parts in their proper location after opening holes.

Beginning Construction

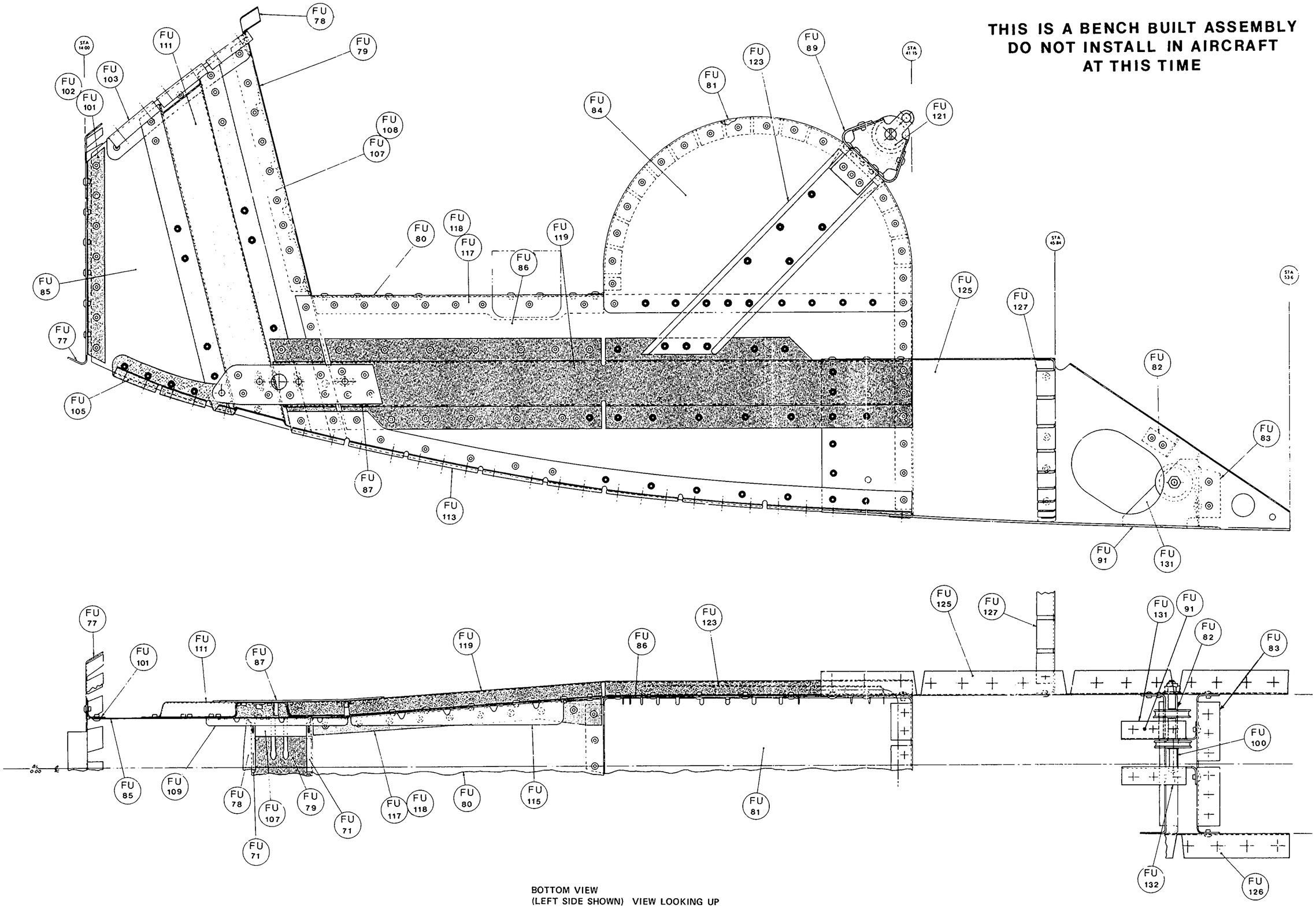
1. Cut out all flat petterns, **Detail A-J, Page 1[48]**, through **Detail A-R, Page 1[54]** and identify with flet tip pen using drawing reference numbers. All parts may be formed at this time with the exceptions of **FU86's** and **FU119** and **120.** No bending should be done with these four parts at this time. Also, the large hole in **FU77** should not be cut out at this time, a 1/4" hole should be drilled in the center of this hole location.
2. Cut angles **FU101, 102, 107, 108** and **118** from BD-0002 material, **Detail A-S, Page 1[55].** Note shape of **FU117** and **118** angles **(Detail A-U, Page 1[57] and Detail A-S, Page 1[55]) FU107 - 108 (Detail A-S, Page 1[55] and Detail A-X, Section A-A, Page 1[59]).**
3. Make full size drawing of left hand **FU85** showing reference line and bearing block location, **Page 1[60], Detail A-Y.** Glue this drawing to the left hand **FU85** and tape or clamp both **FU85's** together so that all edges are flush and both parts are exactly the same size and shape (this may require some filing).
4. With **FU85's** still taped together, lay them on a flat work surface with the left hand side up. Tape **FU86's** together with all edges flush and position them on top of **FU85's** using reference line on **FU85.** The reference line on **FU85** is to be lined up with the top edge of **FU86** along its entire length **(Detail A-S, Page 1[55]).**
5. Counting from top edge of **FU86's,** locate the drill with No.40 drill rivet holes 1, 2, and 4 through **FU86's and FU85's.(Note that rivet hole No.4 is hidden below FU119, Detail A-S).**
6. Lay out and drill the eight No.40 holes through one of the **LG69** bearing blocks using the dimensions scaled from **Detail A-Y, Page 1[60].** IDENTIFY THIS R/H.
7. Clamp both **LG69** bearing blocks together with the flat portion back to back. Using the bearing block that has already been drilled as a drill guide, drill the eight No.40 holes through the other **LG69** bearing block (it is best to install a snug fitting 3/4"O.D. tube through the upper and lower bushings of both bearing blocks to insure perfect alignment).
8. Lay the **right hand** bearing block on top of the **left hand FU85** and locate it by matching it to the drawing that is glued to the **FU85.** (The three bushing holes in **LG69** must match drawing).
9. Using the eight No.40 holes in the right hand bearing block, drill through both **FU85's** using the bearing block as a drill guide.
10. Tape both **FU84's** together and lay on flat working surface with left side up.
11. Locate and drill **FU123** on **FU84's** as in **Detail A-S** (No.40 drill). **Note: Omit the three rivet holes that are covered by FU89 at this time.** Also locate rivet holes on **FU84** that attach **FU81** and open with No.40 drill. (Do not open holes in **FU81** at this time).
12. Locate and drill **FU84's** onto **FU86's** using No.40 drill as in **Detail A-S.**
13. Remove the **FU123** and place it back to bakc with the **FU124** and using the **FU123** as a drill guide, drill all 40 holes through **FU124.**
14. With both **FU85's** taped together and both **FU86's** taped together and clecoed to the **FU85's** (left hand side up, right hand side flat on working surface) locate and drill through angles and both **FU85's** or **FU86's** with No.40 drill the following parts in this order: **FU101, FU103, FU111, FU105 and FU113.** These angles are then to be placed back to back with the corresponding right hand parts and used as a drill guide to drill out the right hand parts.
15. Locate and drill with No.40 drill the **FU108** and **FU118** angles on **FU85's** and **FU86's.**

    Note: Although these two angles are right hand parts, it is necessary to lay them on the left hand side of the FU85's and 86's for drilling. They are then placed back to back with the FU107 and 117 angles and used as drill guides.
16. Position **FU125** on the **FU86's** and locate and drill with a No.40 drill the four rivet holes common to the **FU86's** only. **Do not** drill those rivet holes that are covered by **FU119** and **FU113.** The **FU125** can then be placed back to back with the **126** and used as a drill guide to drill the **126.**
17. Lay out all holes to be drilled in **FU79** and drill with No.40 drill, reference **Detail A-X.** It should be understood that the holes should be drilled in the **FU79** only at this time.
18. Lay out and drill with No.40 drill all rivet holes common to **FU117** and **118** and **FU80.** These holes are to be drilled in **FU80** only, at this time. **Do not** drill **FU117** and **118. (Detail A-U, Page 1[57].**
19. Remove all clecos and tape and separate all parts. Deburr all holes and edges of parts.
20. Cleco **FU111** to left hand **FU85** and **FU112** to right hand **FU85.** Using **FU85's** as a drill guide, drill the eight No.40 holes common to the **LG69** bearing block through **FU111** and **FU112,** (Be sure to cleco **FU111** and **FU112** to outside of **FU85's).**

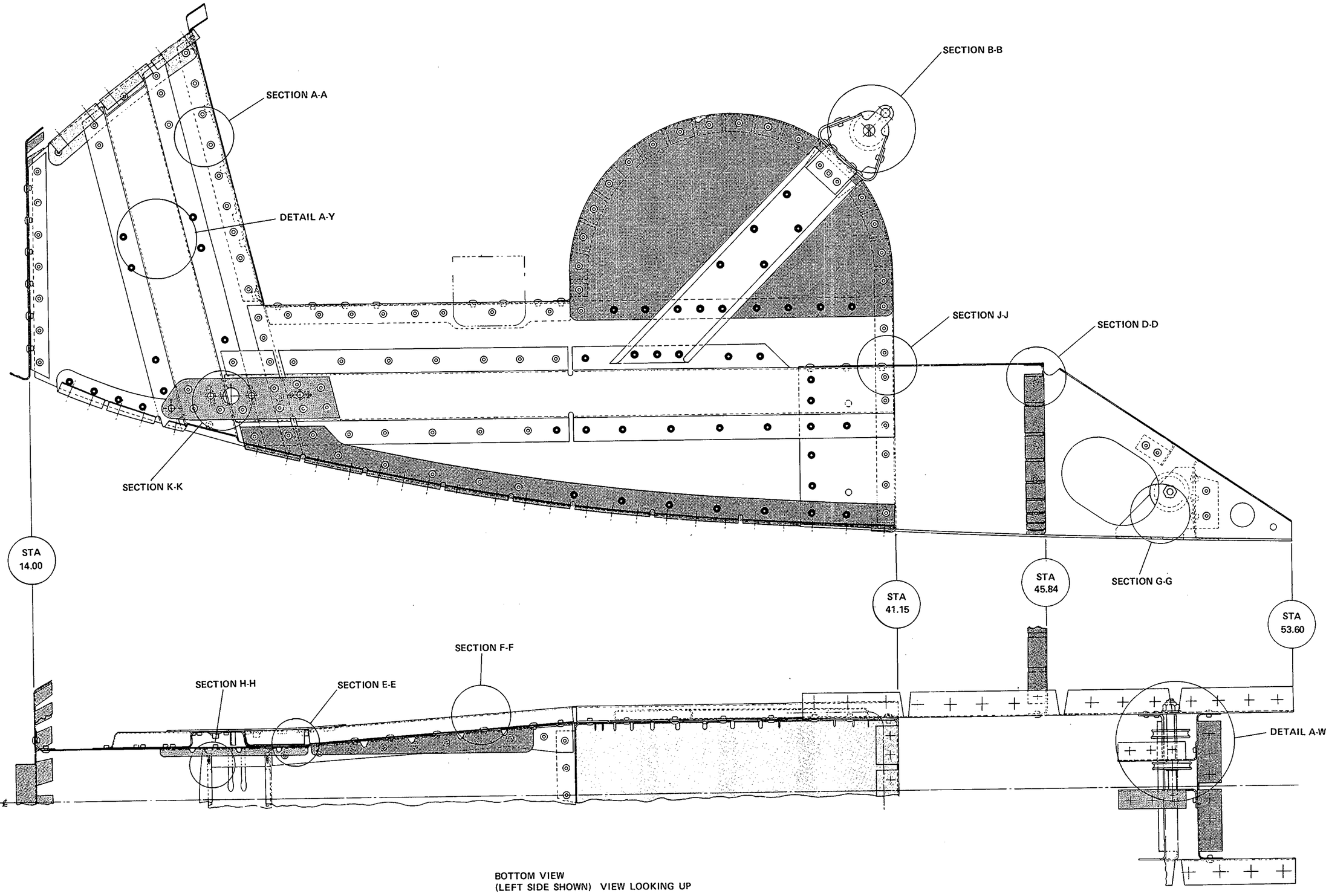
THE FOLLOWING INSTRUCTIONS ARE FOR LOADING THE NOSEGEAR BOX ONTO THE JIG FIXTURE.

21. Install bearing block jig between bearing blocks as shown on jig drawings with 3/4"O.D. tubes through bushings. Apply a small amount of contact cement between the bearing blocks and the jig and clamp together until the cement dries.
22. Cleco bearing blocks in place between left hand and right hand **FU85's** making sure to place the right hand block on the right hand side and the tops of the blocks toward the top of the **FU85's.** It is also necessary to install the **FU111** and **FU112** on the **FU85's** at this time.
23. Install the **FU85** assembly on the wheelwell jig. The forward edge of the **FU85's** must be located exactly flush with the forward edge of endplate **A** and positioned so that the reference line in the **FU85's** matches the reference line on the endplate. Check to make sure that the reference line on the aft side of the **FU85's** is flush with the top edge of the"T" section of the jig.
24. With the **FU85** assembly held firmly in place, drill through the top and bottom No.40 holes at the forward end of each **FU85.** These holes should go into the endplate **A** approximately 1/4" - 1/2".
25. Remove **FU85's** from jig and enlarge these top and bottom holes in the **FU85's** to a No.30. Reinstall the **FU85's** on jig using four small No.5 wood screws through the forward top and bottom holes on each side of the **FU85** assembly (before tightening screws, recheck alignment of reference line forward and aft).
26. Loacte the exact center line of **FU80**(B.L.O.OO). Drill two No.40 holes on center line 1" aft and 1" forward from ends of part. Place **FU80** in jig so that it rests on top of the "T".
27. Cleco **FU107** and **108** angles in place onto **FU85's, Detail A-X, Section H-H, Page 1[59].**
28. Move **FU80** aft until flange contacts **FU107** and **108** angles, **Detail A-S, Page 1[55].** Carefully locate the two No.40 holes in **FU80** over the center line of the "T" section and drill through these holes approximately 1/4" - 1/2" into the jig. Raise aft end of **FU80** and open the two No.40 holes in **FU80** to a No.30.
29. Install **FU80** on jig with two No.5 wood screws.
30. Make the proper bends in both **FU86's** as shown in **Detail A-L, Page 1[50]** (this detail shows the bends for **FU119** and **120,** however, the same measurements apply to the **FU86's**). Note that the **right hand** side is to be bent in the opposite direction of the **left hand** side.
31. Cleco **FU117** and **118** angles to **FU86's.**
32. Cleco **FU86's to FU85's.** Locate and drill **FU117** and **118** angles onto **FU80** using **FU80** as a drill guide. Make sure that the **FU86's** are flush with the **FU80** along its entire length.
33. Drill a No.40 hole 1" below the top edge of the **FU86's** making sure that it hits the center line of endplate **B.** It is important that the top edge of the **FU86** is aligned with the reference line and the top of the"T". Drill a similar hole approximately 1 1/2" up from the bottom edge of the **FU86's,** making sure that it also hits the center line of endplate **B.** Enlarge these No.40 holes to a No.30 and fasten the **FU86's** to endplate **B** with two No.5 wood screws each.
34. Cleco **FU84's** to **FU86's** and drill a No.40 hole through each **FU84** near the top center line of endplate **B** and attach to jig with a No.5 wood screw.
35. Cleco **FU125** and **126** onto **FU86's.**
36. Locate **FU119** and **120** and drill with a No.40 drill all rivet holes through **FU85's** and **FU86's,** using **FU119** and **120** as a drill guide, also drill all the holes that go through **FU111** and **112, FU125** and **126.** Note that the top edge of **FU119** and **120** is parallel with the reference lire (top of **FU80**). It is necessary at this time to make the bends in **FU119** and **120** as shown on **Page 1[50], Detail A-L.**
37. Reinstall **FU113** and **114** and drill holes common to **FU119** and **120, FU125** and **126.**
38. Reinstall **FU105** and **106** an drill holes common to **FU111** and **112.**
39. Cleco **FU123** and **124** to **FU84's** and drill with No.40 drill all holes common to **FU84's, FU119** and **120. (Do not** drill the holes covered by **FU89).**
40. Locate and install **FU81.** Locate forward tab onto **FU80** first, then drill No.40 holes into tabs of **FU81** starting forward and work around **FU84's** to the rear.
41. Locate **FU89** and **FU121** onto **FU81** and **FU123** and **124, (Detail A-S and A-X).** Drill to No.40.
42. Locate **FU87** and **FU88** onto **FU119, 120, 111, 112** hat sections and drill to No.40. (Mark nutplate locations in hat sections and drill with No.12 drill. These nutplates must be installed before final assembly of the gearbox. **(Deatil A-U, Section K-K).**
43. Locate and drill **FU115, 116, 109** and **110, Detail A-T, Section K-K and Detail A-U.** these parts use holes common to **FU105, 106 and FU114 and 113.**
44. Locate **FU79** onto angles **FU107** and **108.** Drill holes per **Detail A-X, Section A-A.** (The **FU71** shims should be located on **FU79** with contact cement before **FU79** is drilled into place).
45. Locate **FU78** and drill to No.40, **Detail A-X, Page 1[59].**
46. Position **FU77** on **FU101, 102** angles (vertically by **Detail A-S** and laterally by **Detail A-U).** Locate rivet holes and open with No.40 drill. **(Note: Do not pro-seal FU77 onto angles until nosegear box is located to fuselage).**
47. All darkened rivets on **FU111, 112, 105** and **106** are dimpled and heads are on the inside of nosegear box. Mark these with felt tip pen. **Do not** open to No.30 at this time.
48. Open all rivet holes to No.29. (Except flush rivet holes).
49. Note direction of dome rivets in **FU84's** and **FU86's** and mark with felt tip pen.
50. Disassemble nosegear box and deburr rivet holes and edtes. Dimple designated riveted holes. **(Note: Direction of rivets and then open with No.29 drill).**
51. At this time, open 3/4" hole in **FU85's** and **FU111, 112 (Detail A-Y, Page 1[60]). Note: This is not a close tolerance hole.**
52. Install nutplates on **FU107, 108, FU78** and **FU80. (Detail A-X, Section A-A)** and nutplates on hat sections **FU111, 112, 119** and **120 (Detail A-T, Section K-K).**
53. Locate onto **FU125, 126 (Detail A-S** and **A-W)** the following parts: **FU82, 83, 127, 128, 131** and **132.** Open rivet holes with No.40 drill, recheck measurements and open holes with No.29 drill. Locate **FU91** shim with contact cement to the bottom of **FU131.** Disassemble and deburr.
54. Prepare all surfaces to be sealed and seal when reassembling onto jig. **FU103** and **104** and **FU111** and **112** should be sealed and riveted to **FU85** at this time. Reassemble nosegear box onto jig by using the previous instructions (21 through 47). **Do not** seal these angles onto nesegear box at this time, **FU101, 102, 109, 110, 113, 114, 115** and **116.** Cleco these angles onto nosegear box only. These should be sealed after locating nosegear box in aircraft.
55. Install clecos or screws in any interferring rivet holes in Plate B of jig. Rivets should be installed after removal of jig. Leave jig installed until you have nosegear box located in aircraft. **Note: Pitot Static System must be installed before nosegear box is permanently installed in aircraft.**
56. Upper and lower pulley assemblies may be installed after nosegear box is assembled.

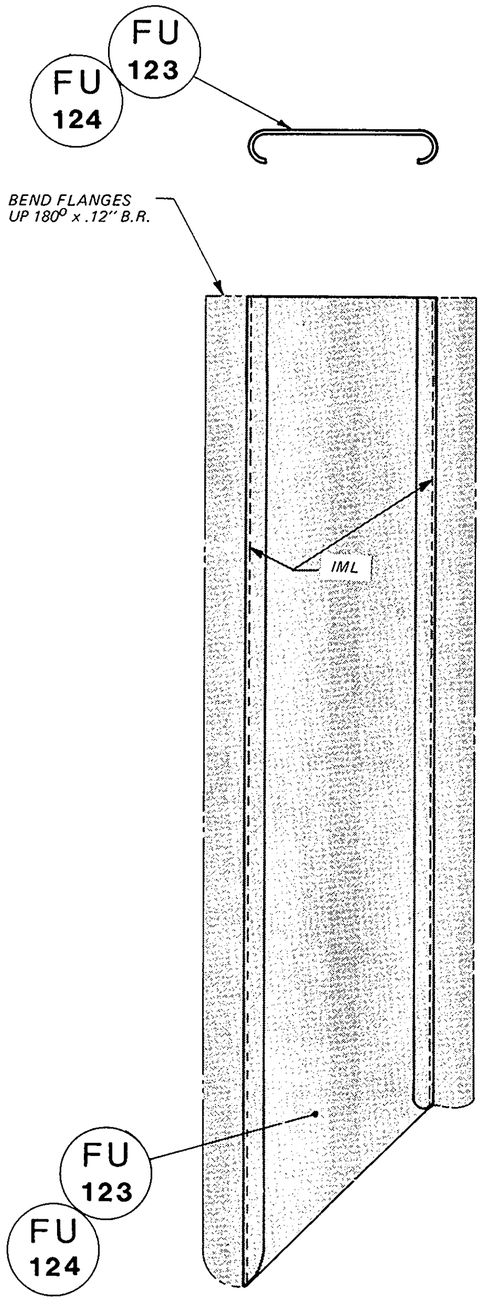
THIS IS A BENCH BUILT ASSEMBLY
DO NOT INSTALL IN AIRCRAFT
AT THIS TIME



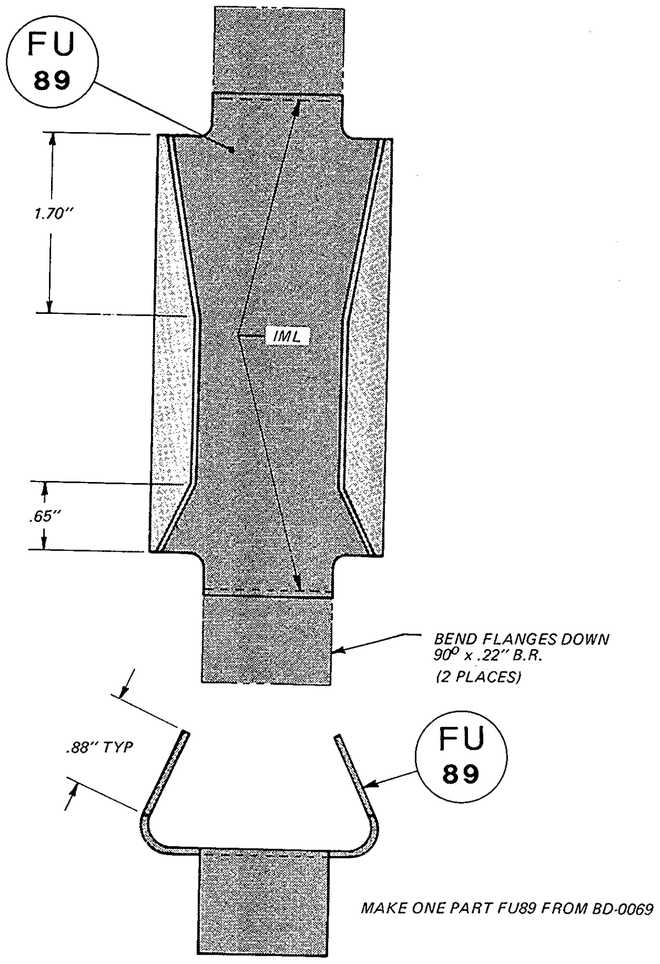
BOTTOM VIEW
(LEFT SIDE SHOWN) VIEW LOOKING UP



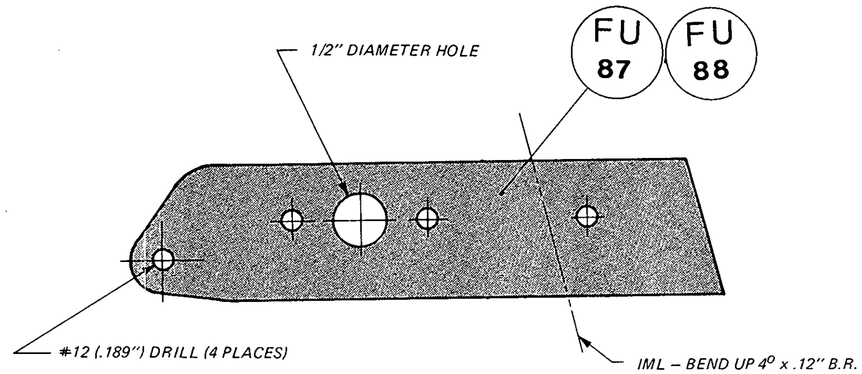
BOTTOM VIEW
(LEFT SIDE SHOWN) VIEW LOOKING UP



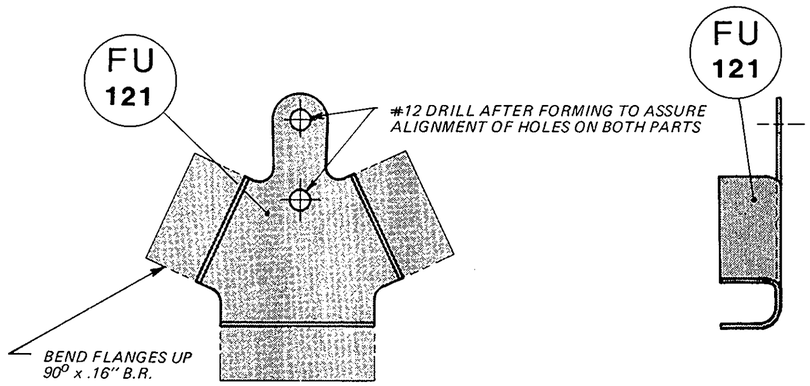
MAKE ONE PART FU123 AND ONE OPPOSITE PART FU124 FROM .032" 2024-T3



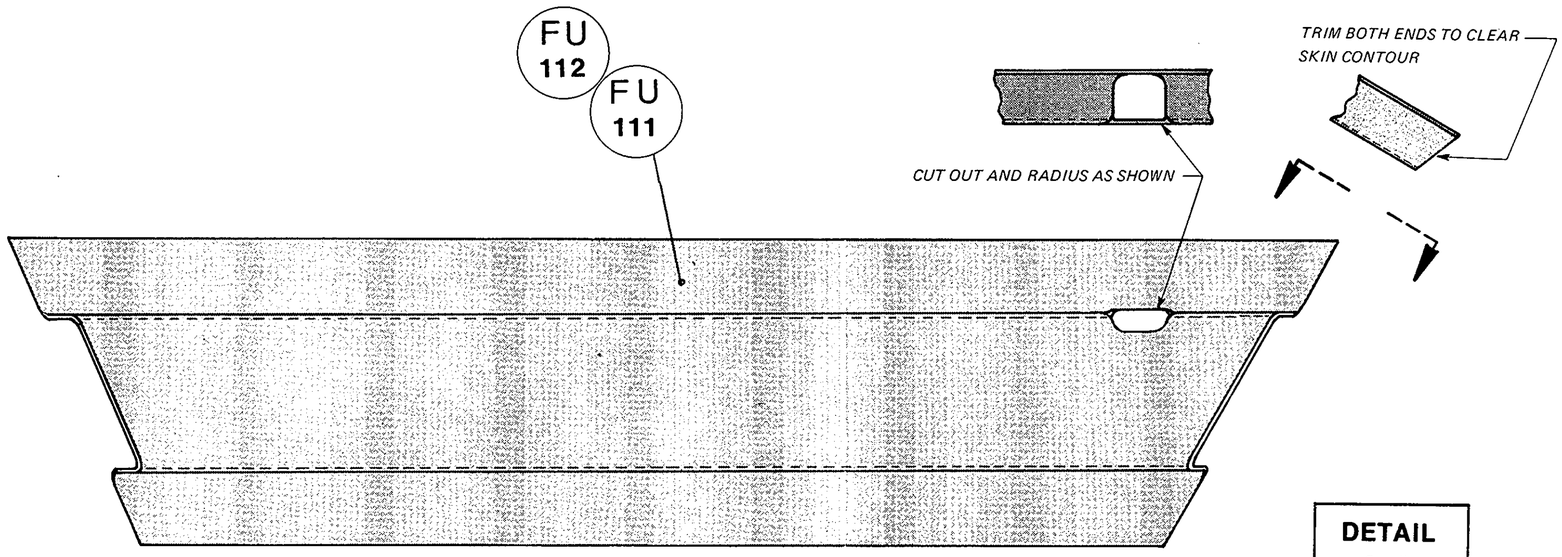
MAKE ONE PART FU89 FROM BD-0069



MAKE ONE PART FU87 AND ONE OPPOSITE PART FU88 FROM .032" 2024-T3

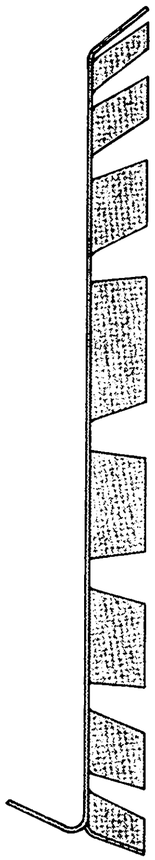


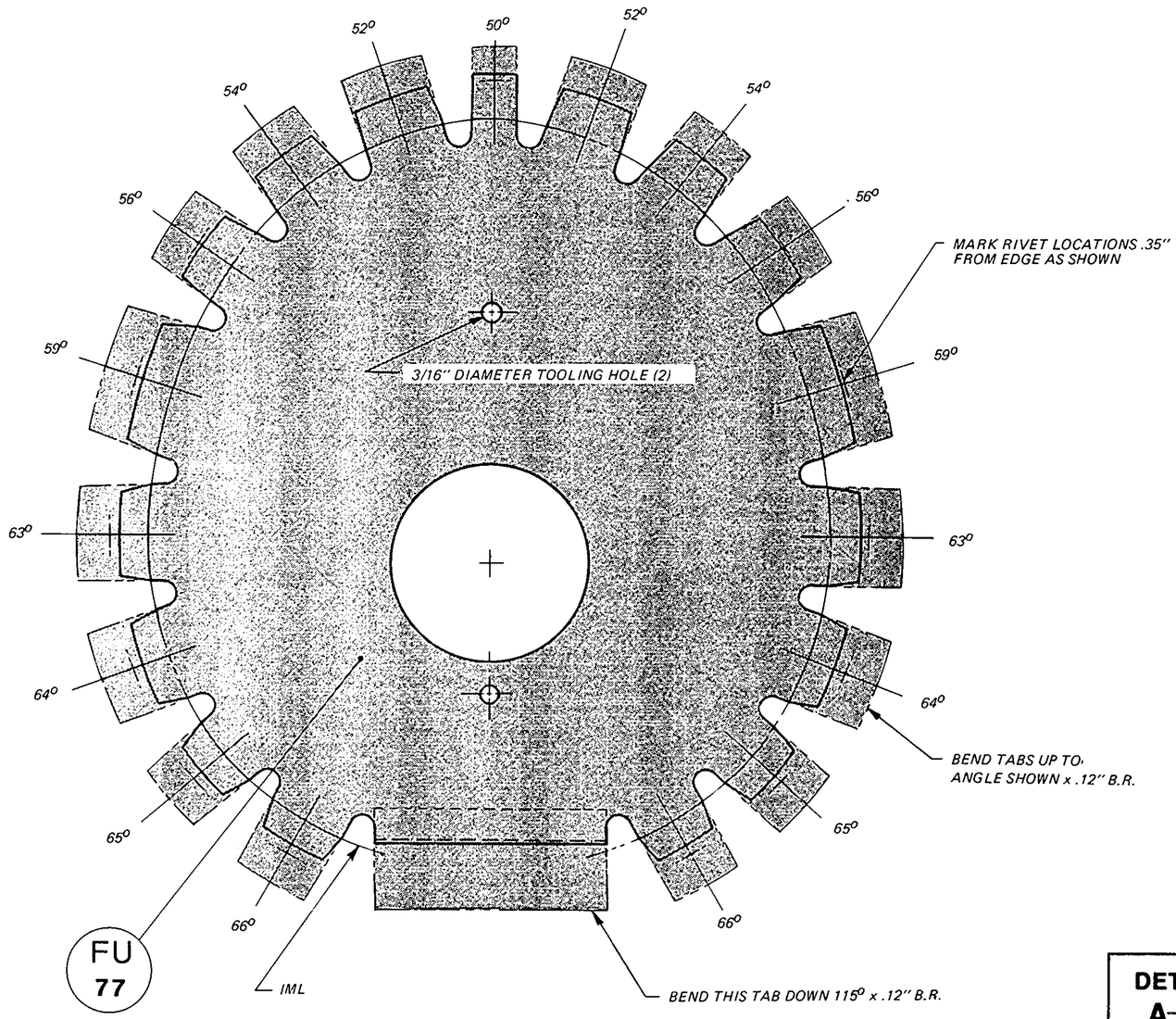
MAKE TWO PARTS FU121 FROM .040 2024-T3



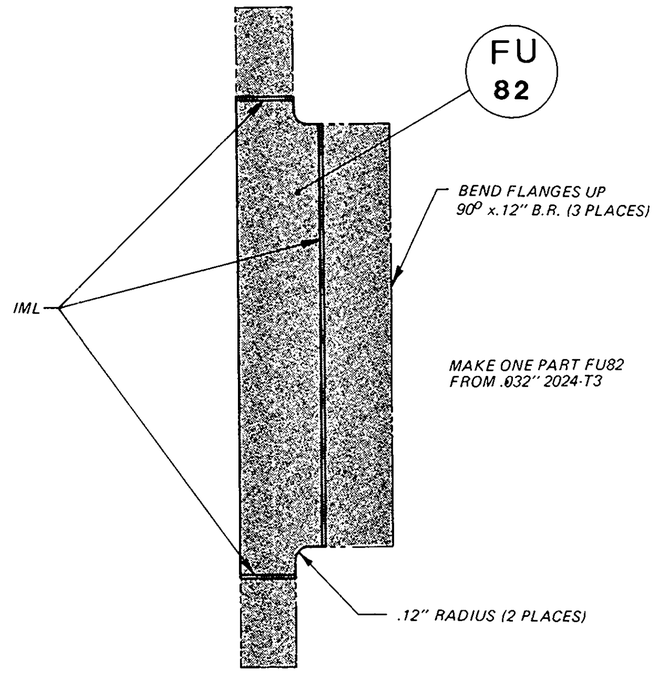
MAKE ONE PART FU111 AND ONE OPPOSITE PART 112 FROM BD-0004

DETAIL A-J

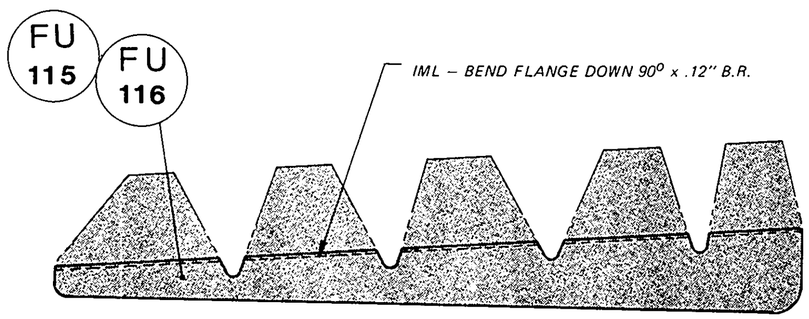




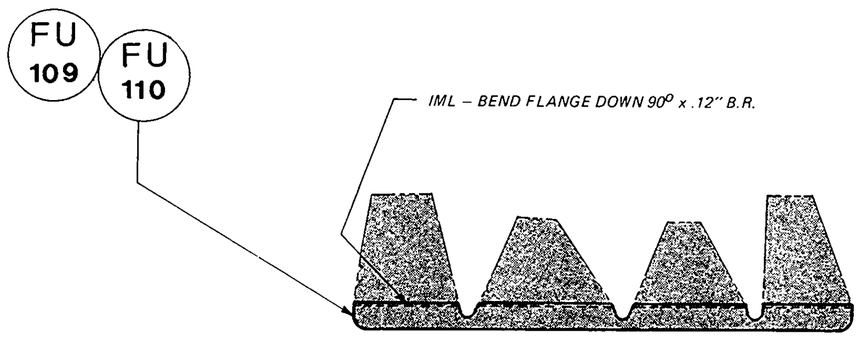
MAKE ONE PART FROM .025" 2024-T3



DETAIL A-K



MAKE ONE PART FU115 AND ONE OPPOSITE PART FU116 FROM .025" 2024-T3



MAKE ONE PART FU109 AND ONE OPPOSITE PART FU110 FROM .025" 2024-T3

FU 132

FU 131

#12 DRILL AFTER FORMING TO ASSURE ALIGNMENT OF HOLES

IML

BEND FLANGES UP 90^{O} x .12" B.R. (2 PLACES)

2^{O}

IML

MAKE ONE PART FU131 AND ONE OPPOSITE PART FU132 FROM .032" 2024-T3

21.25"

10.15"

IML – BEND UP 4^{O}

C C

B B

IML BEND DOWN 4^{O}

MAKE ONE PART FU119 AND ONE OPPOSITE PART FU120 FROM BD-0004.

FU 119

FU 120

DETAIL A-L

Section B-B

FILE TO BEND LINE

BEND FLAT AND ROUND OFF OUTSIDE EDGE TO REMOVE SHARP CORNER.

.44"

BEND LINE

Section C-C

DETAIL A-M

MAKE ONE PART FU125 AND ONE OPPOSITE PART FU126 FROM .025" 2024-T3

IML– BEND FLANGE UP 90^{O} x .12" B.R.

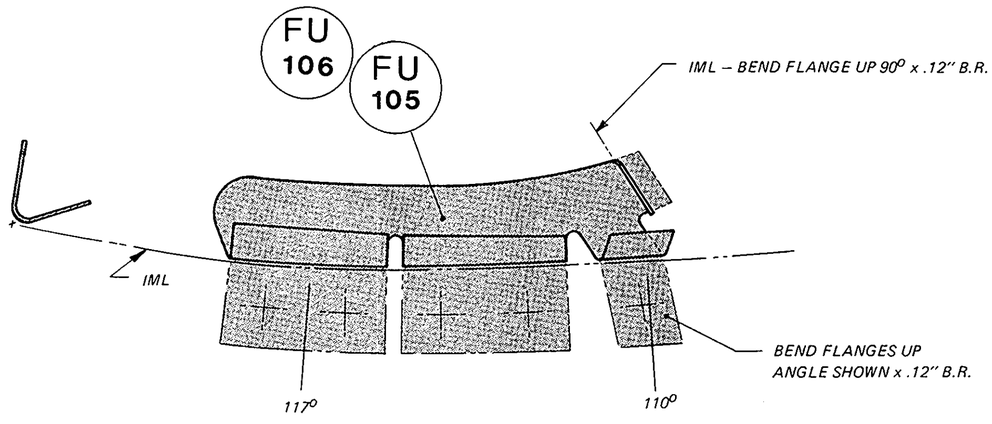
IML – BEND FLANGE UP 90^{O} x .12" B.R.

FU 126

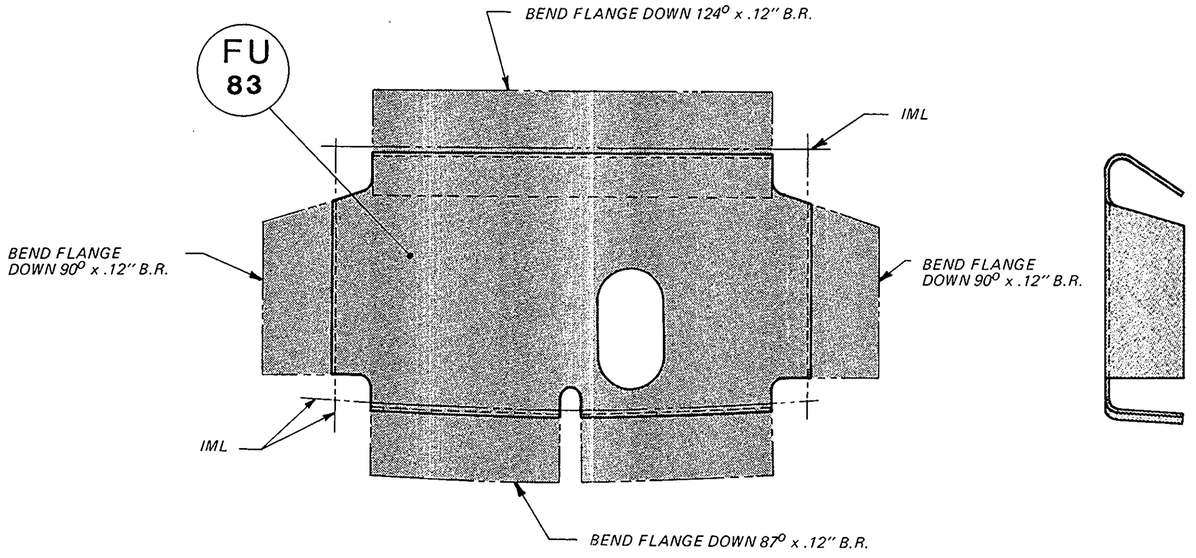
FU 125

3/16" DIAMETER TOOLING HOLE (3 PLACES)

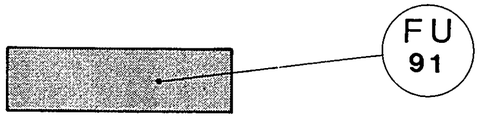
IML – BEND FLANGE UP 95^{O} x .12" B.R.



MAKE ONE PART FU105 AND ONE OPPOSITE
PART FU106 FROM .032" 2024-T3

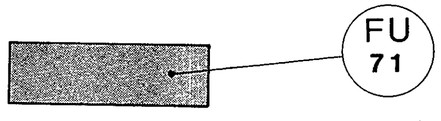


MAKE ONE PART FROM .032" 2024-T3

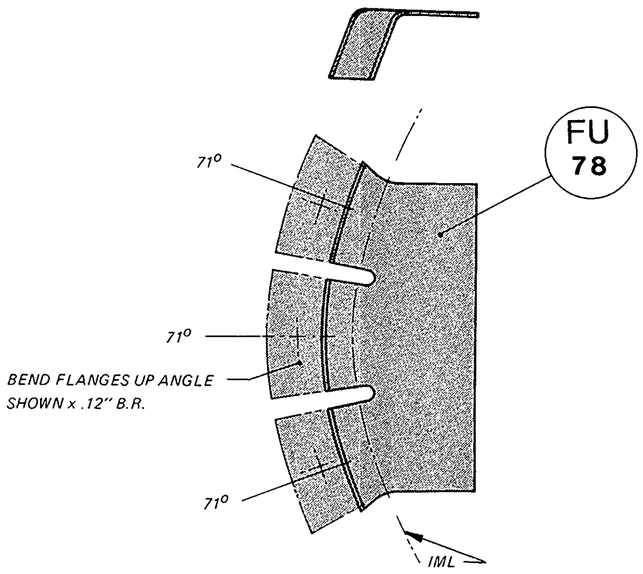


MAKE ONE PART FROM .032" 2024-T3

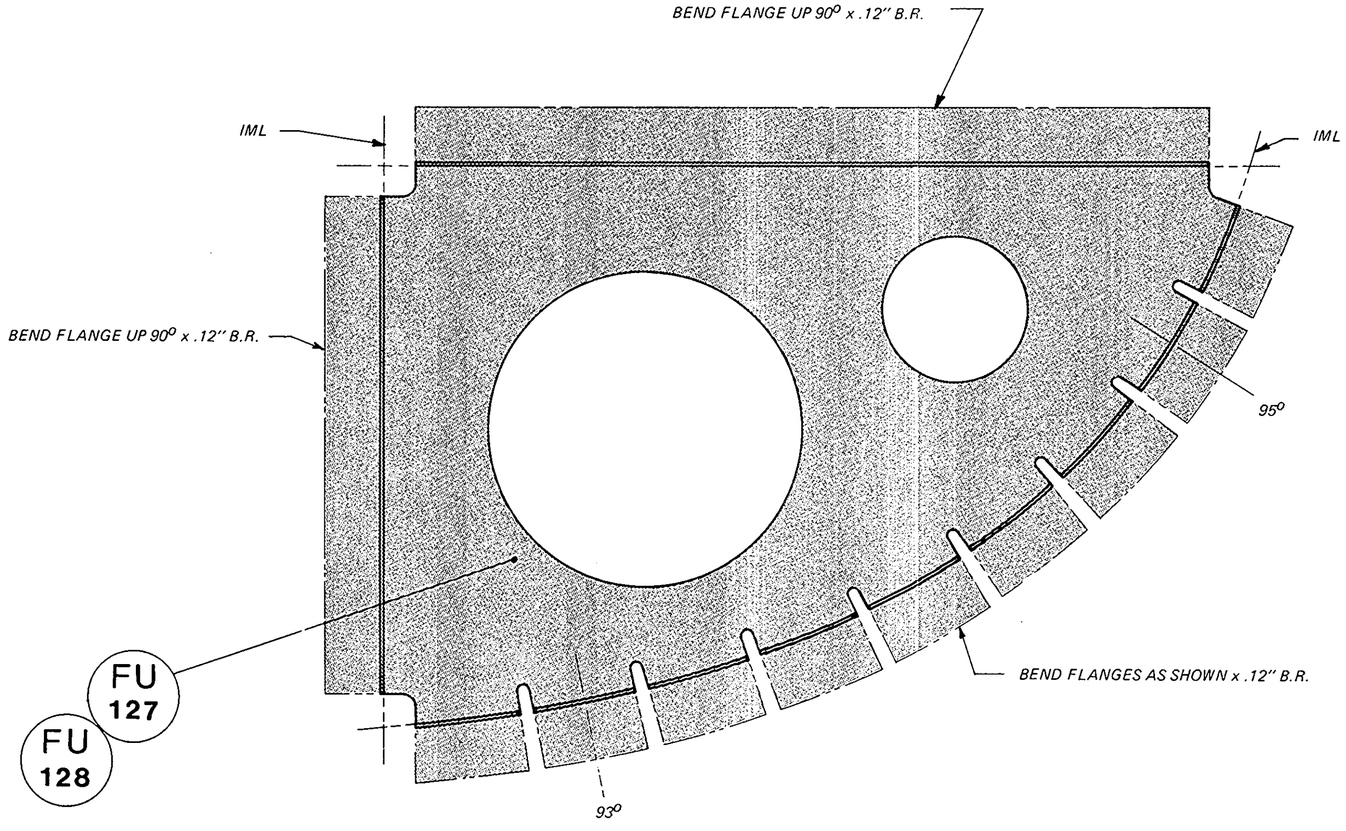
DETAIL A-N



MAKE TWO PARTS FROM .032" 2024-T3

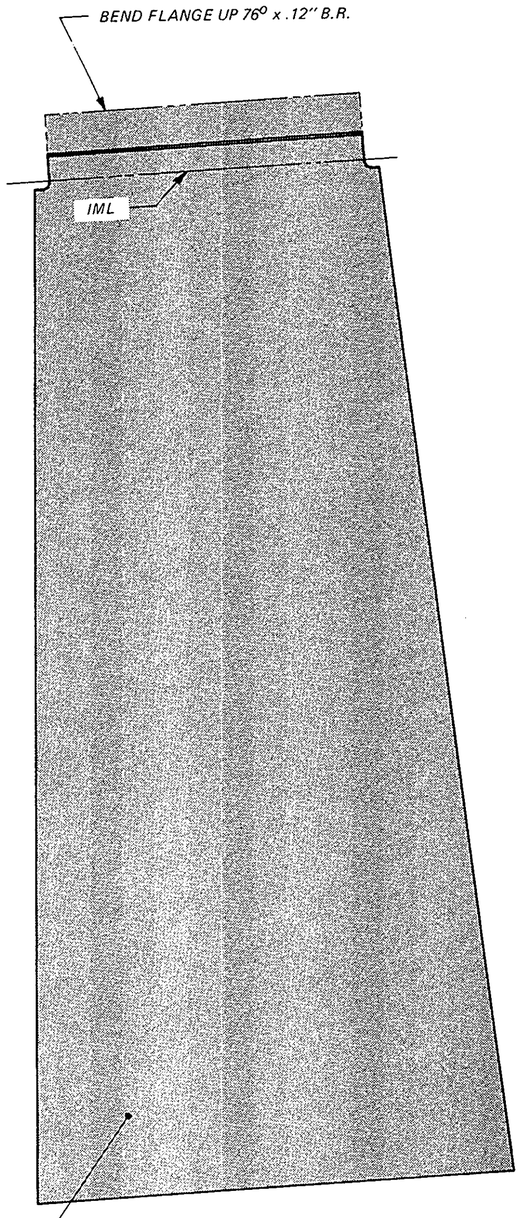


MAKE ONE PART FROM .032" 2024-T3



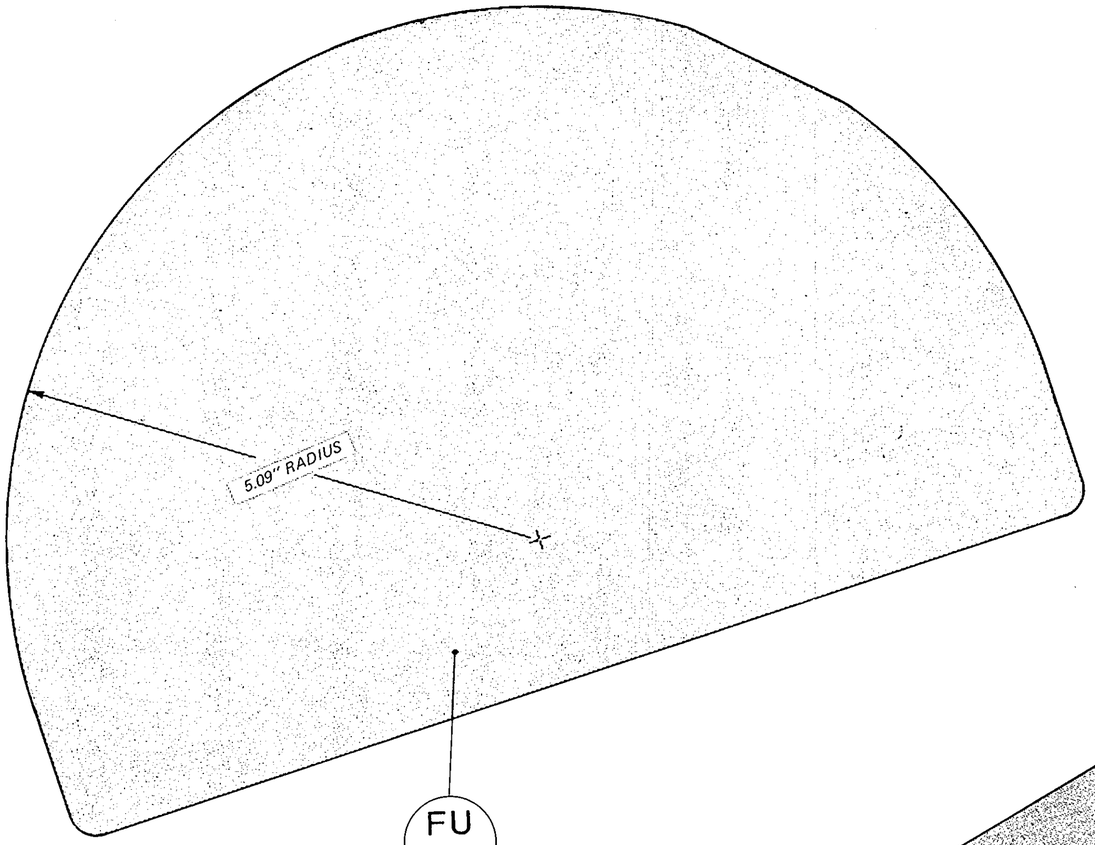
MAKE ONE PART FU127 AND ONE OPPOSITE
PART FU128 FROM .025" 2024-T3

DETAIL A-O



FU 80

MAKE ONE PART FU80 FROM .032" 2024-T3



FU 84

MAKE TWO PARTS FU84 FROM .016" 2024-T3

FU 113

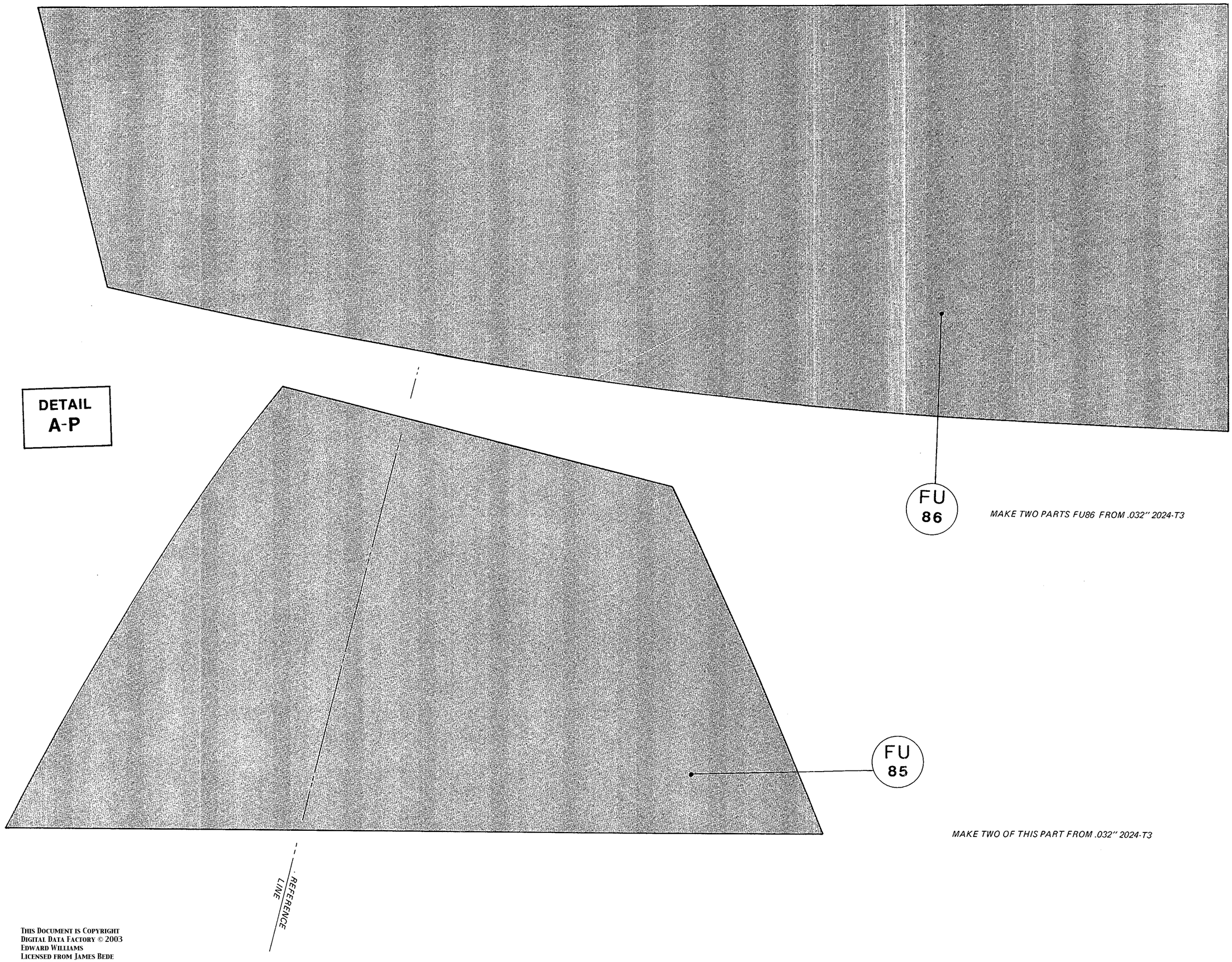
FU 114

MAKE ONE PART FU113 AND ONE OPPOSITE PART FU114 FROM .032" 2024-T3

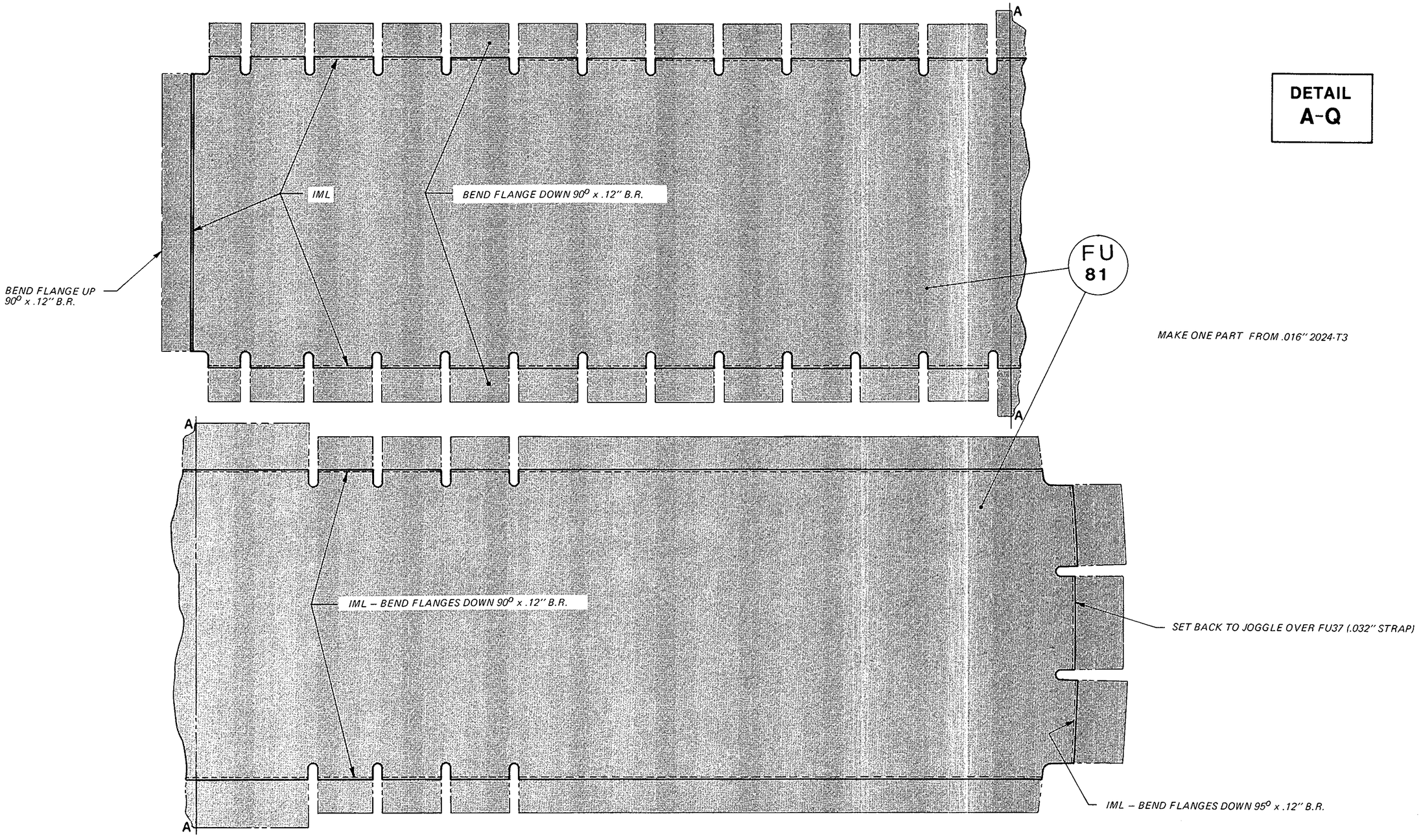
FU 103

FU 104

MAKE ONE PART FU103 AND ONE OPPOSITE PART FU104 FROM .032" 2024-T3

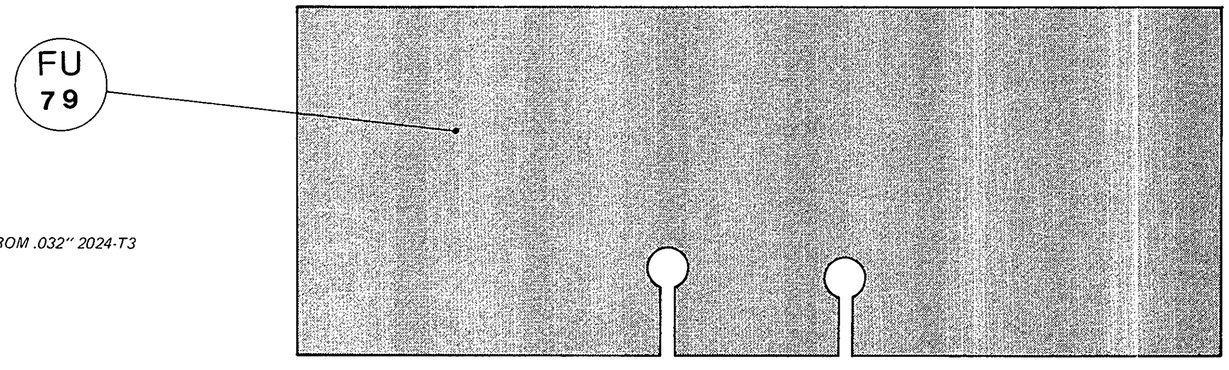


DETAIL A-Q

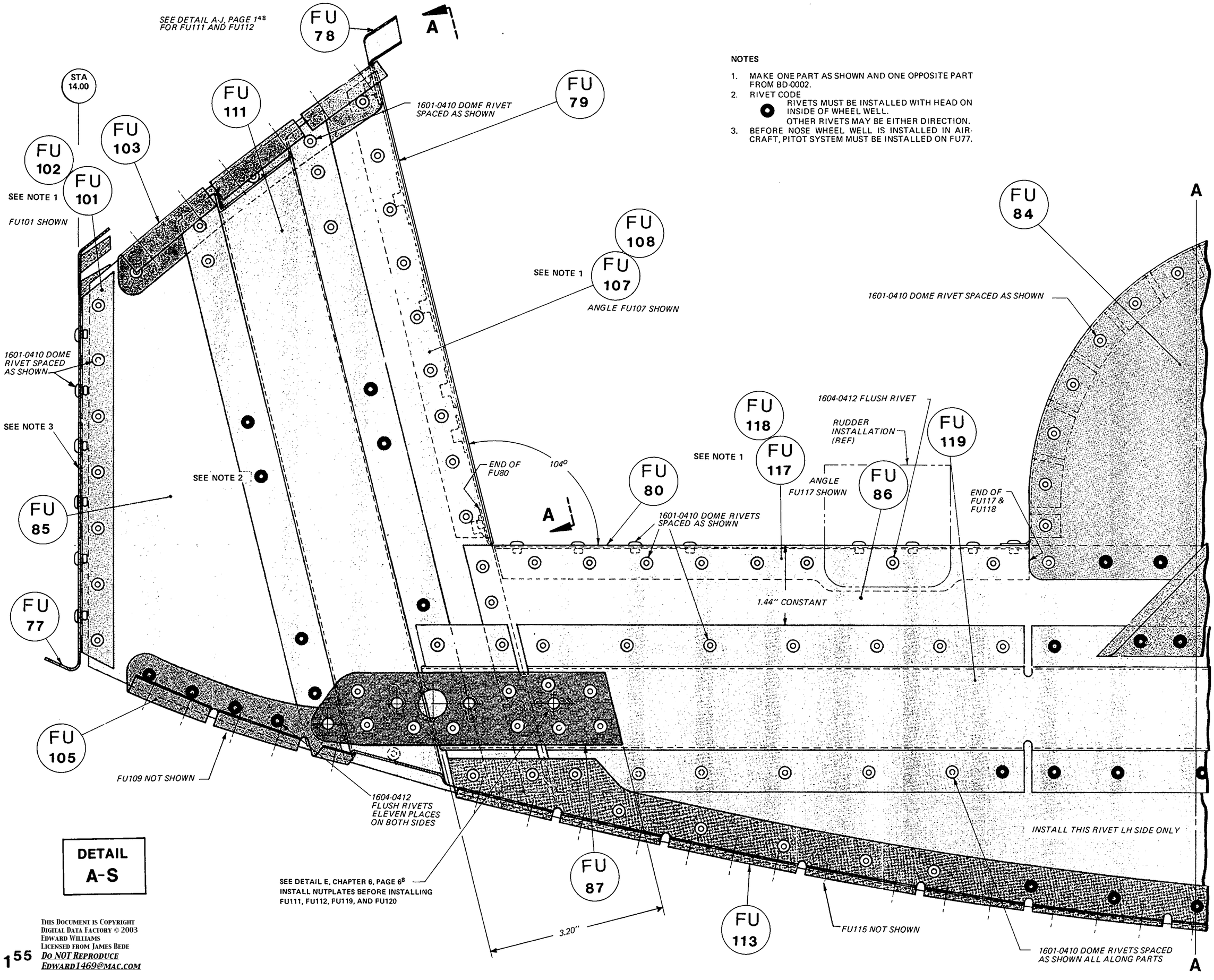


MAKE ONE PART FROM .016" 2024-T3

DETAIL A-R



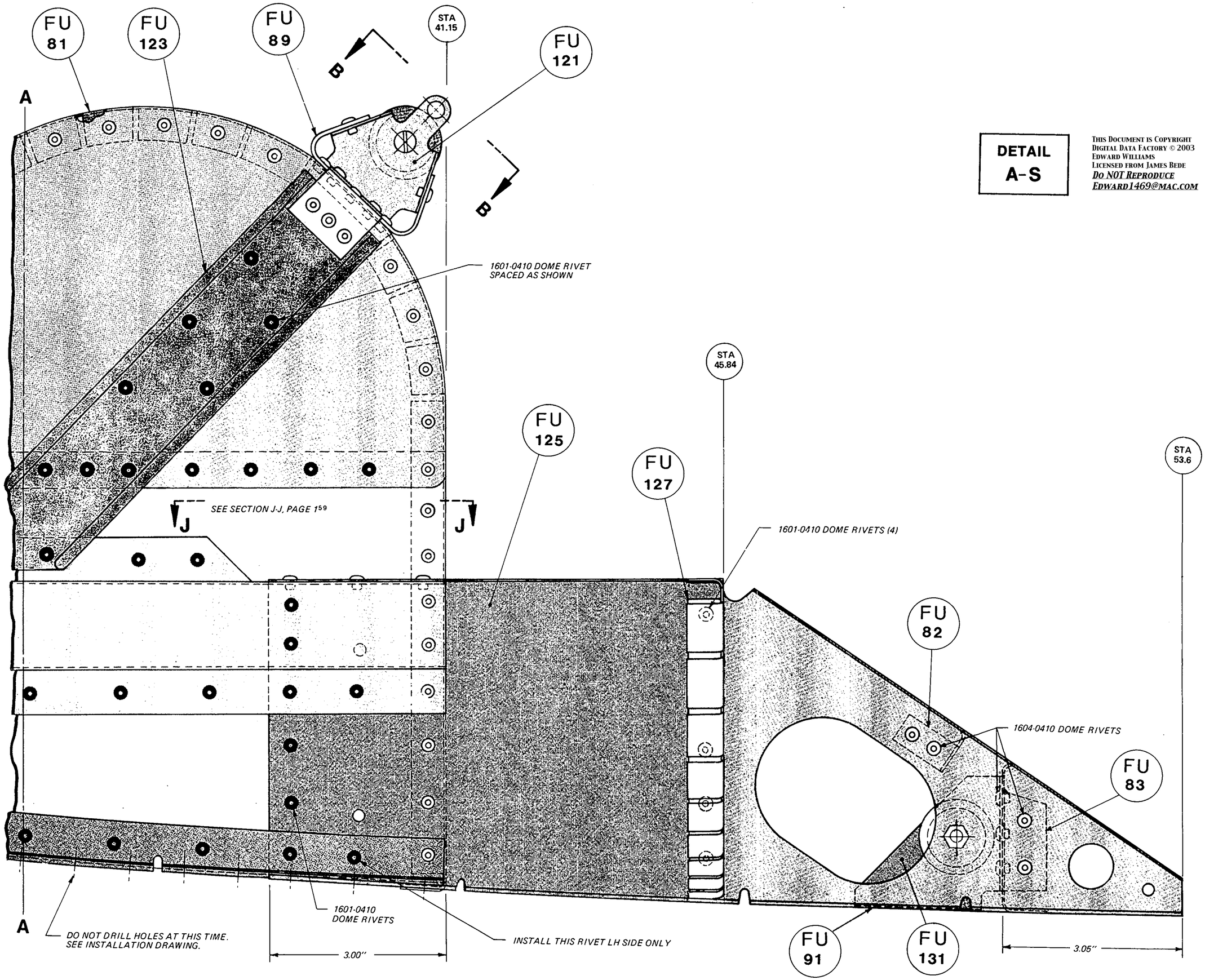
MAKE ONE PART FROM .032" 2024-T3



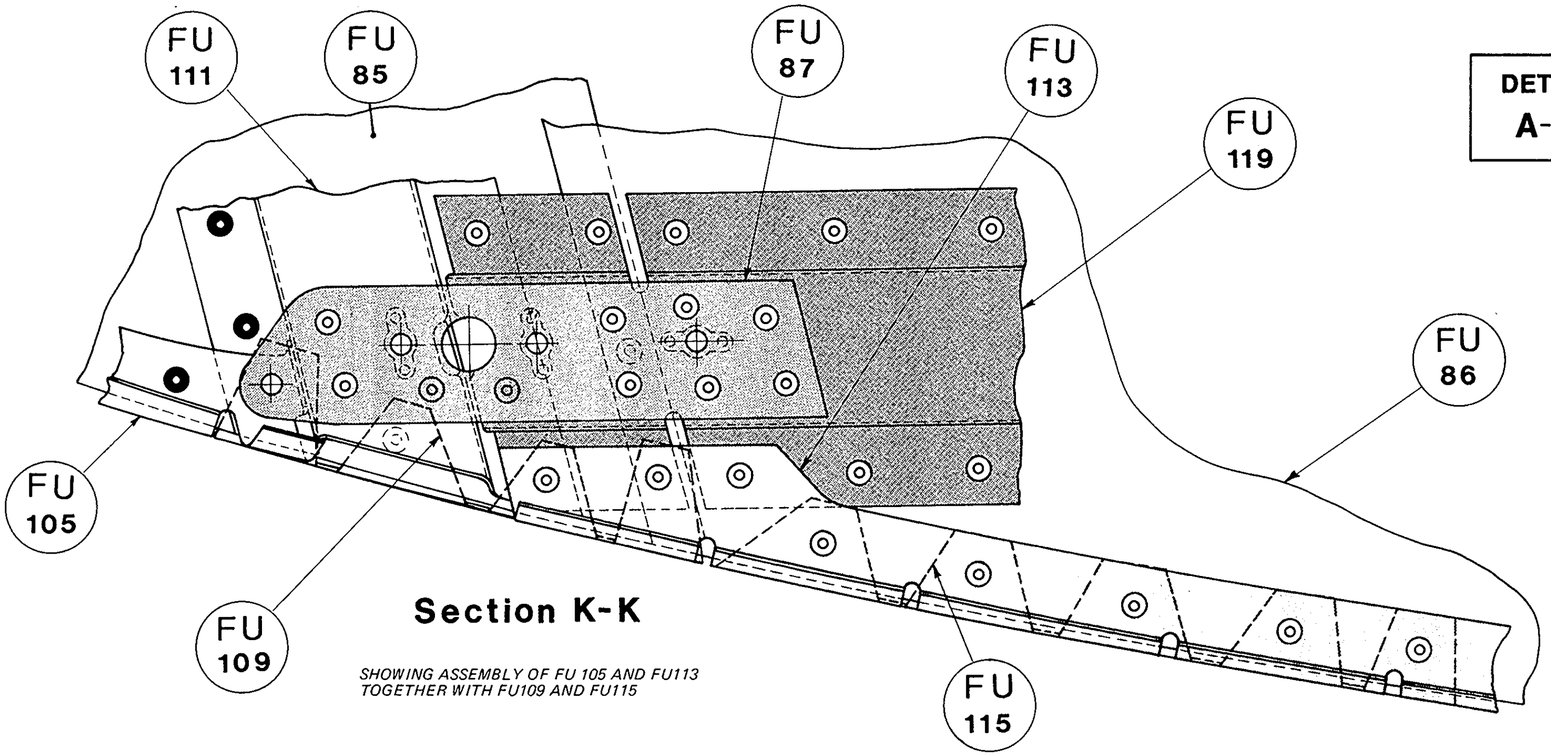
NOTES

1. MAKE ONE PART AS SHOWN AND ONE OPPOSITE PART FROM BD-0002.
2. RIVET CODE
   - ● RIVETS MUST BE INSTALLED WITH HEAD ON INSIDE OF WHEEL WELL.
   - OTHER RIVETS MAY BE EITHER DIRECTION.
3. BEFORE NOSE WHEEL WELL IS INSTALLED IN AIRCRAFT, PITOT SYSTEM MUST BE INSTALLED ON FU77.

DETAIL A-S



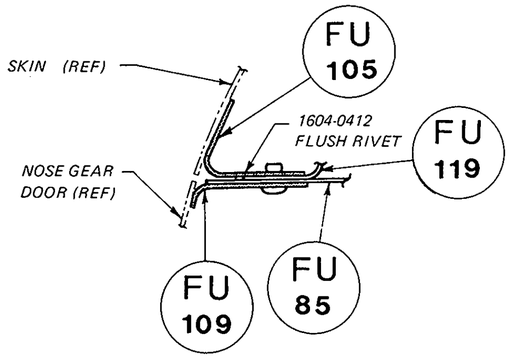
DETAIL A-S



Section K-K

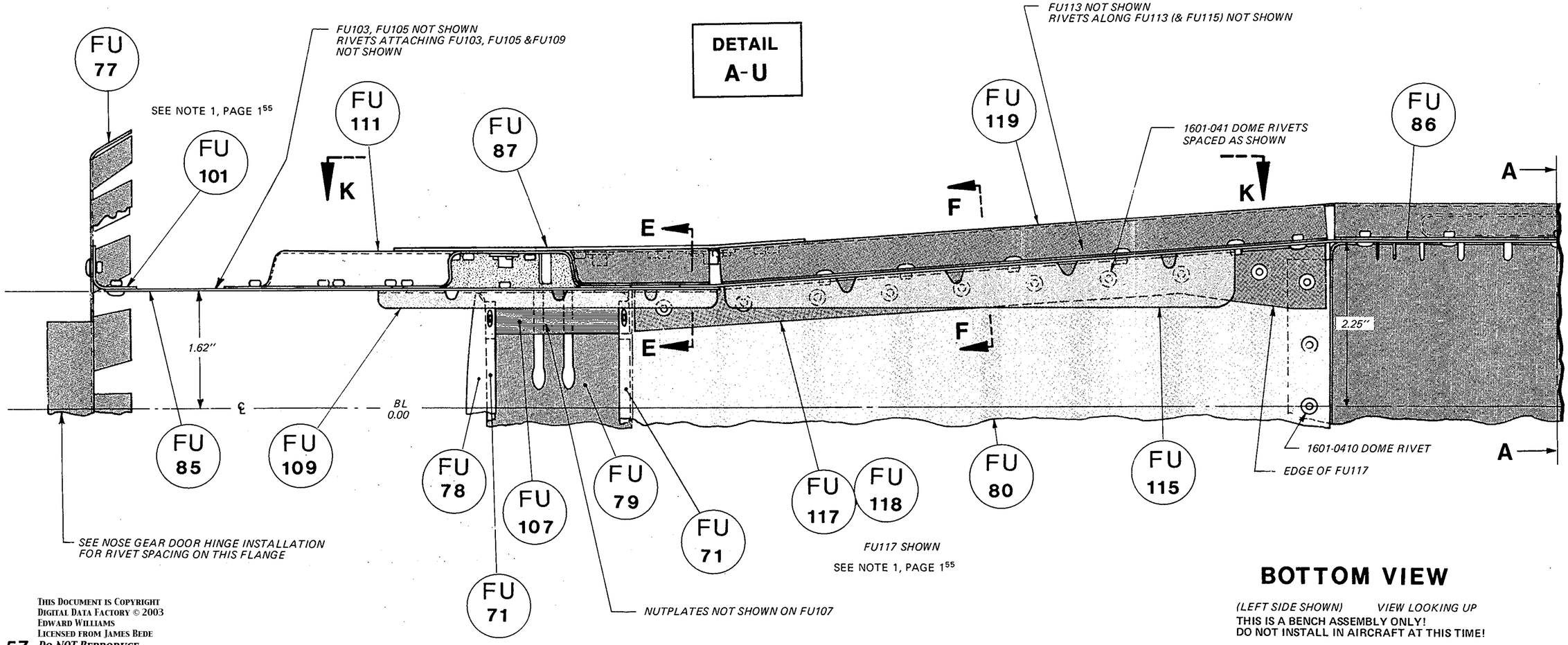
SHOWING ASSEMBLY OF FU 105 AND FU113 TOGETHER WITH FU109 AND FU115

DETAIL A-T



Section E-E

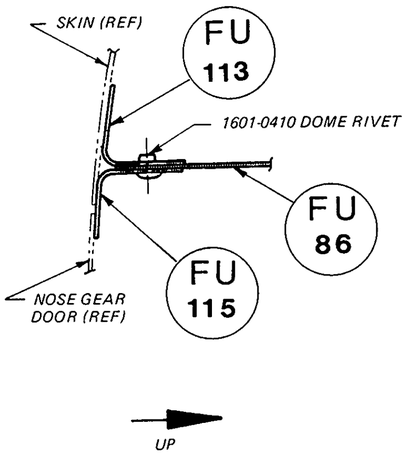
DETAIL A-U



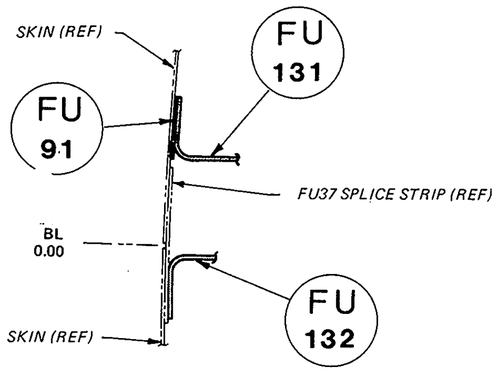
BOTTOM VIEW

(LEFT SIDE SHOWN) *VIEW LOOKING UP*

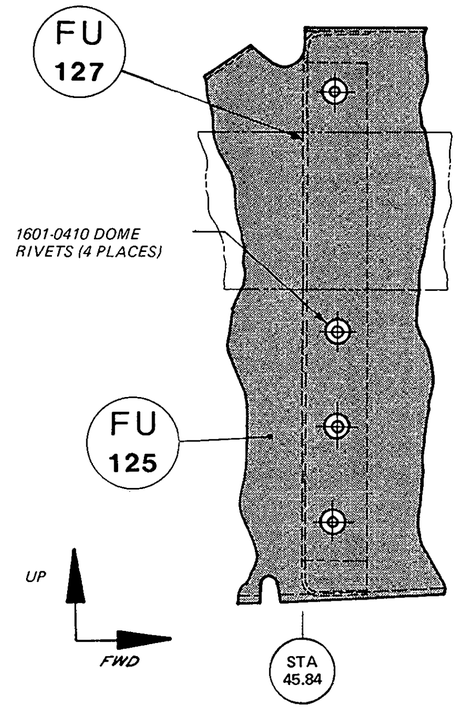
THIS IS A BENCH ASSEMBLY ONLY!
DO NOT INSTALL IN AIRCRAFT AT THIS TIME!



Section F-F



Section G-G

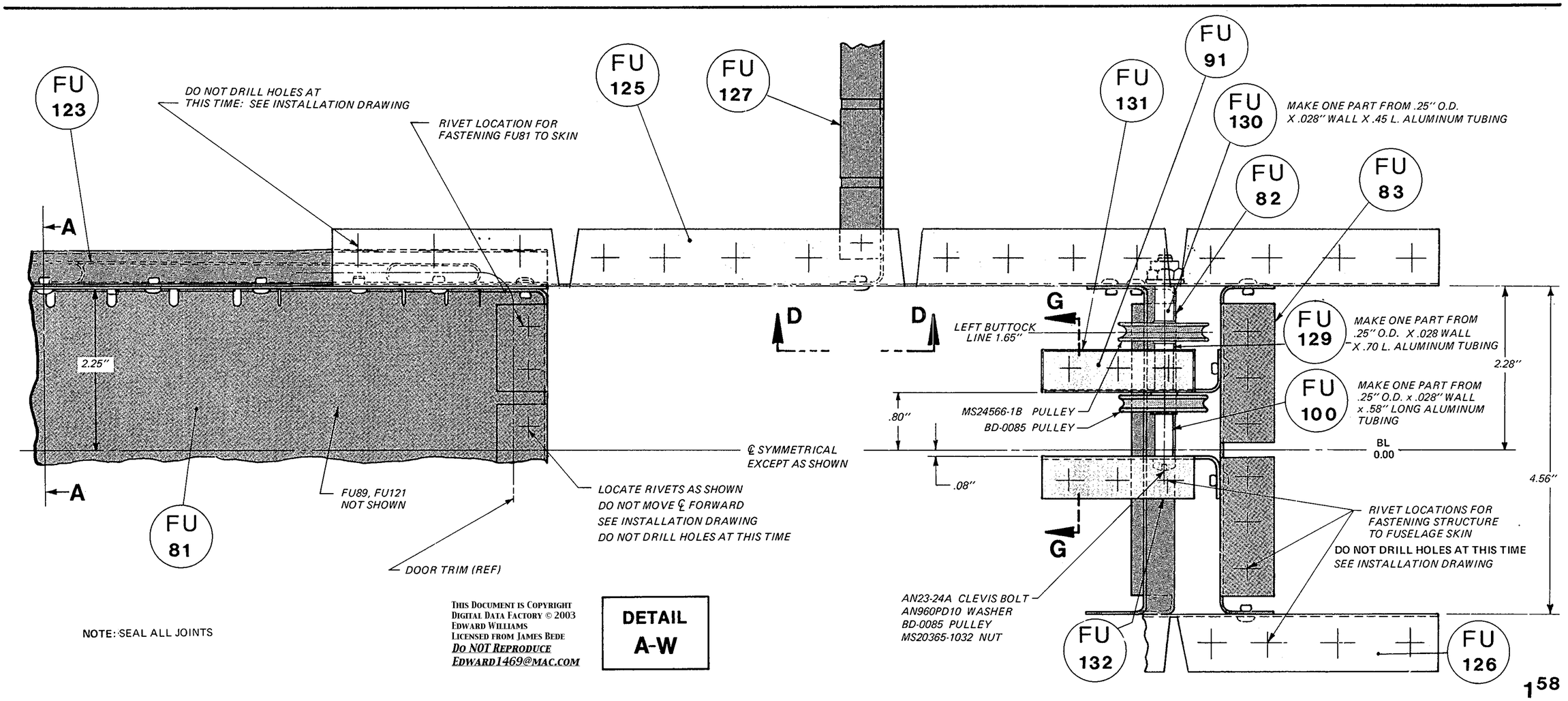


LOOKING OUTBOARD
LEFT SIDE VIEW

Section D-D

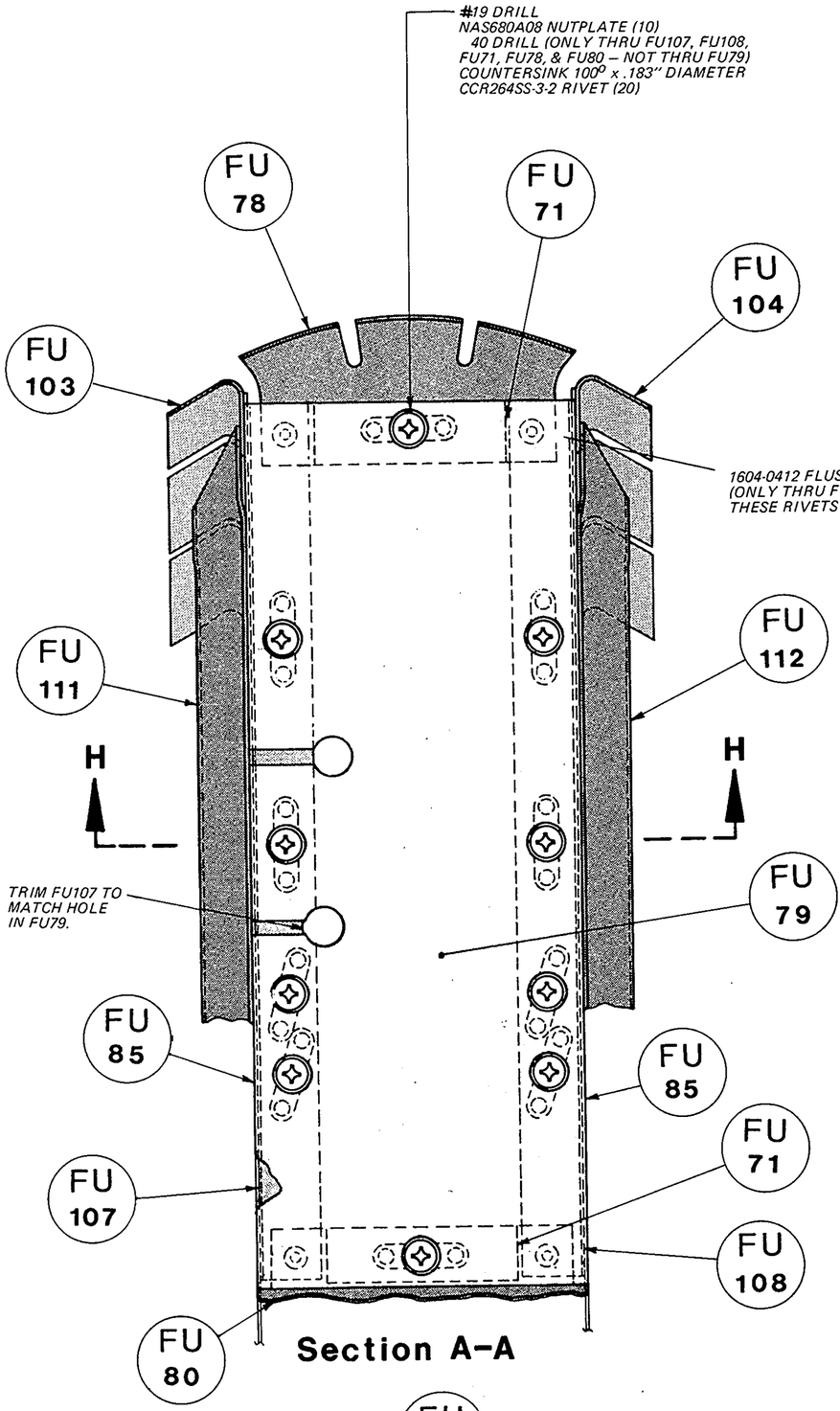
VIEW ROTATED 180°

DETAIL A-V

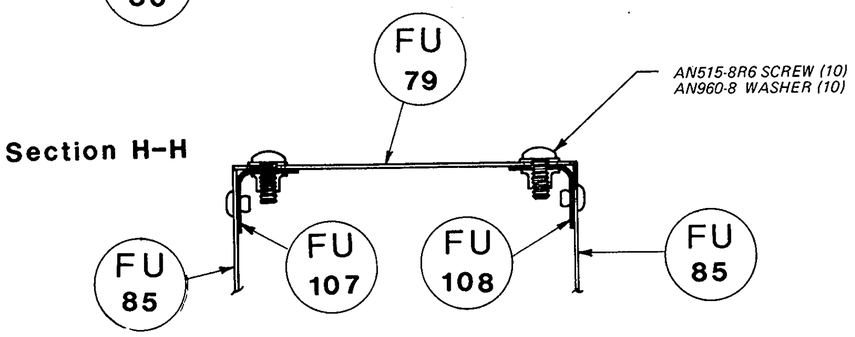


NOTE: SEAL ALL JOINTS

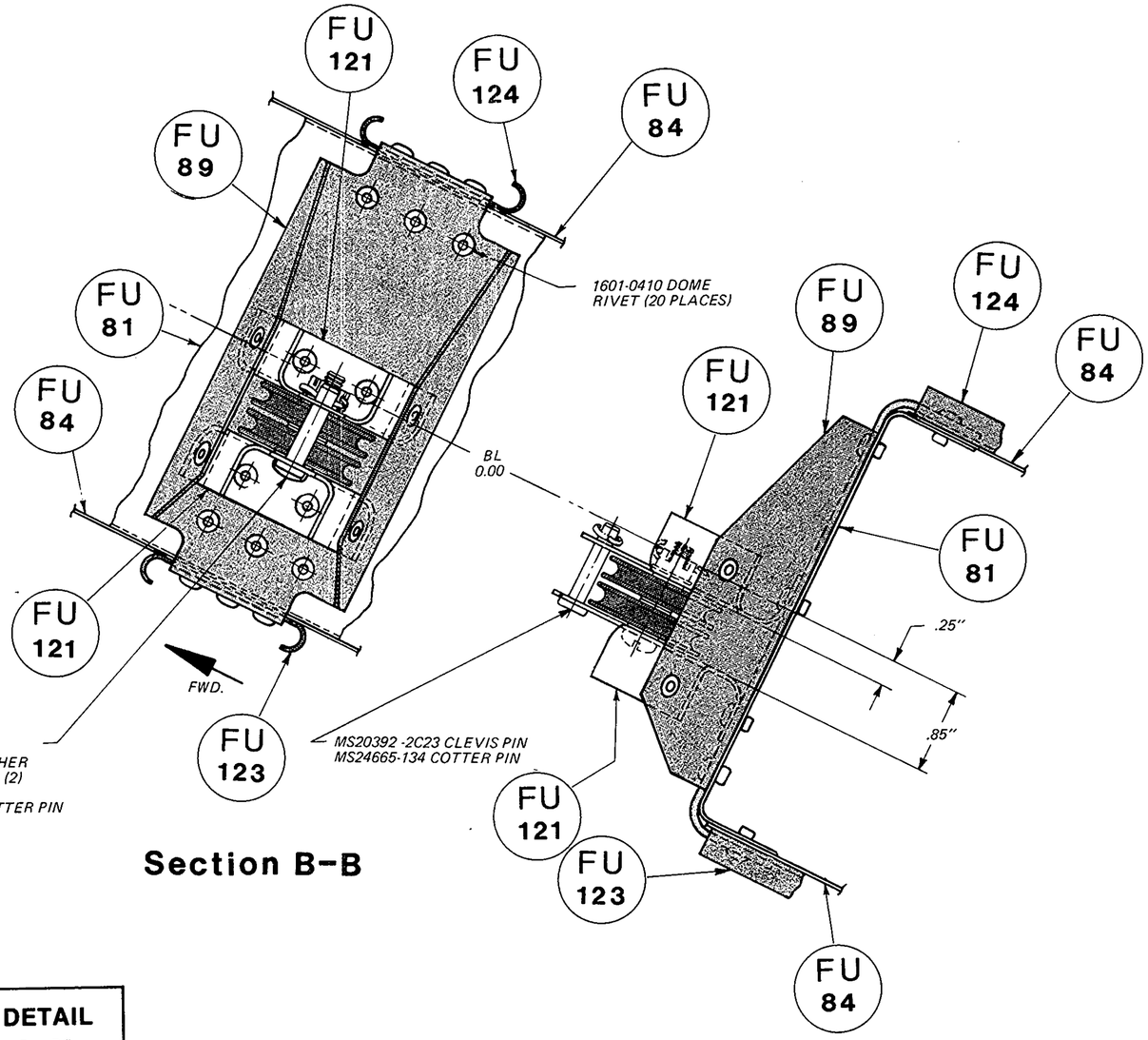
DETAIL A-W



Section A-A

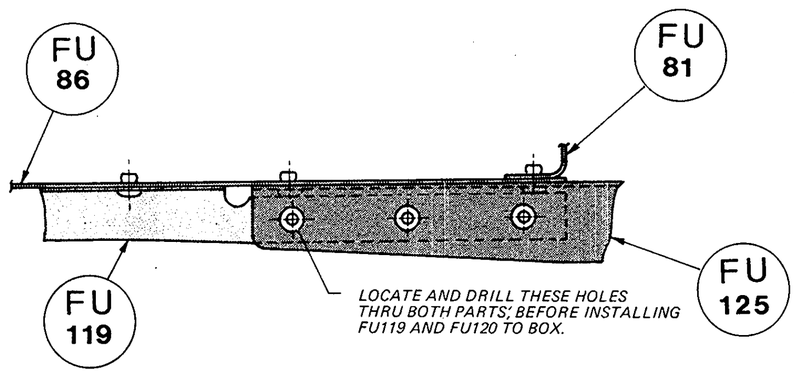


Section H-H

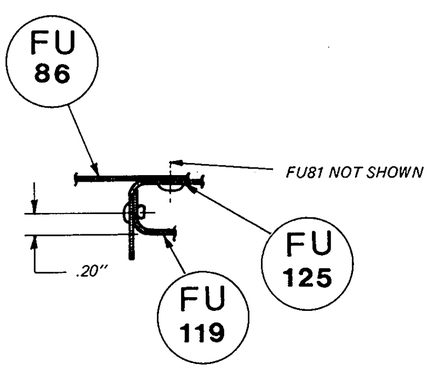


Section B-B

DETAIL A-X

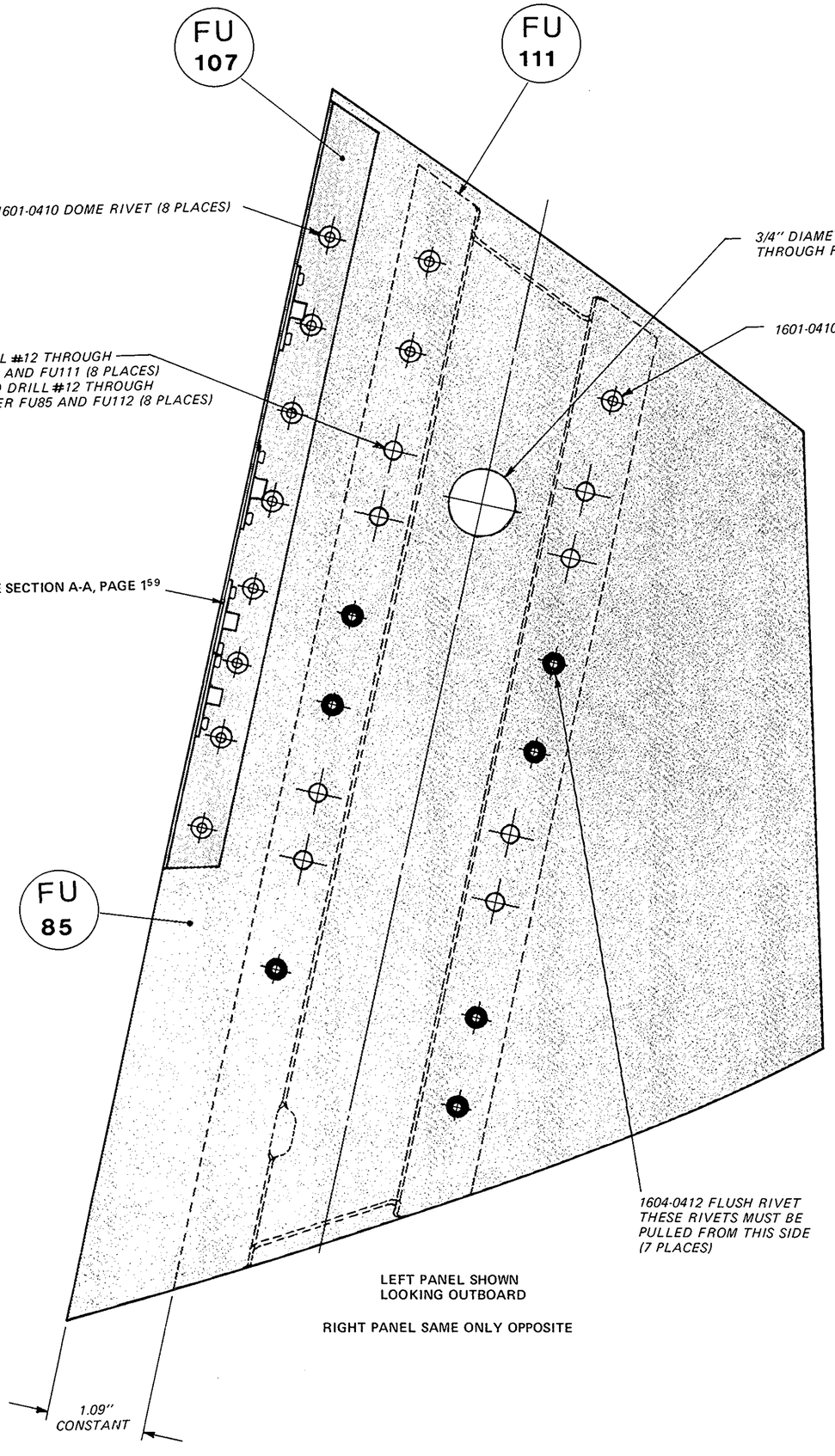


Section J-J



SEE PAGE 1[56]

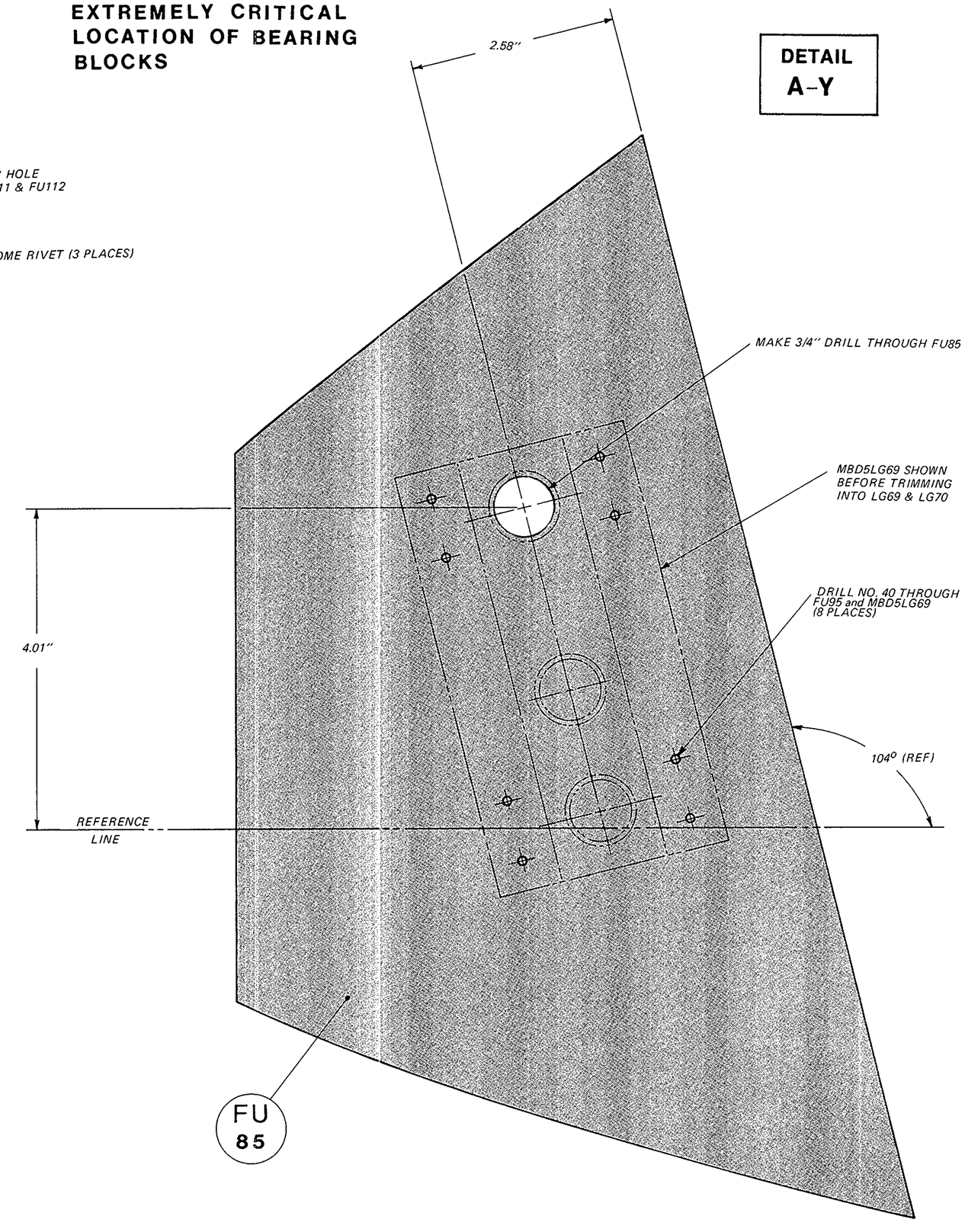
EXTREMELY CRITICAL LOCATION OF BEARING BLOCKS



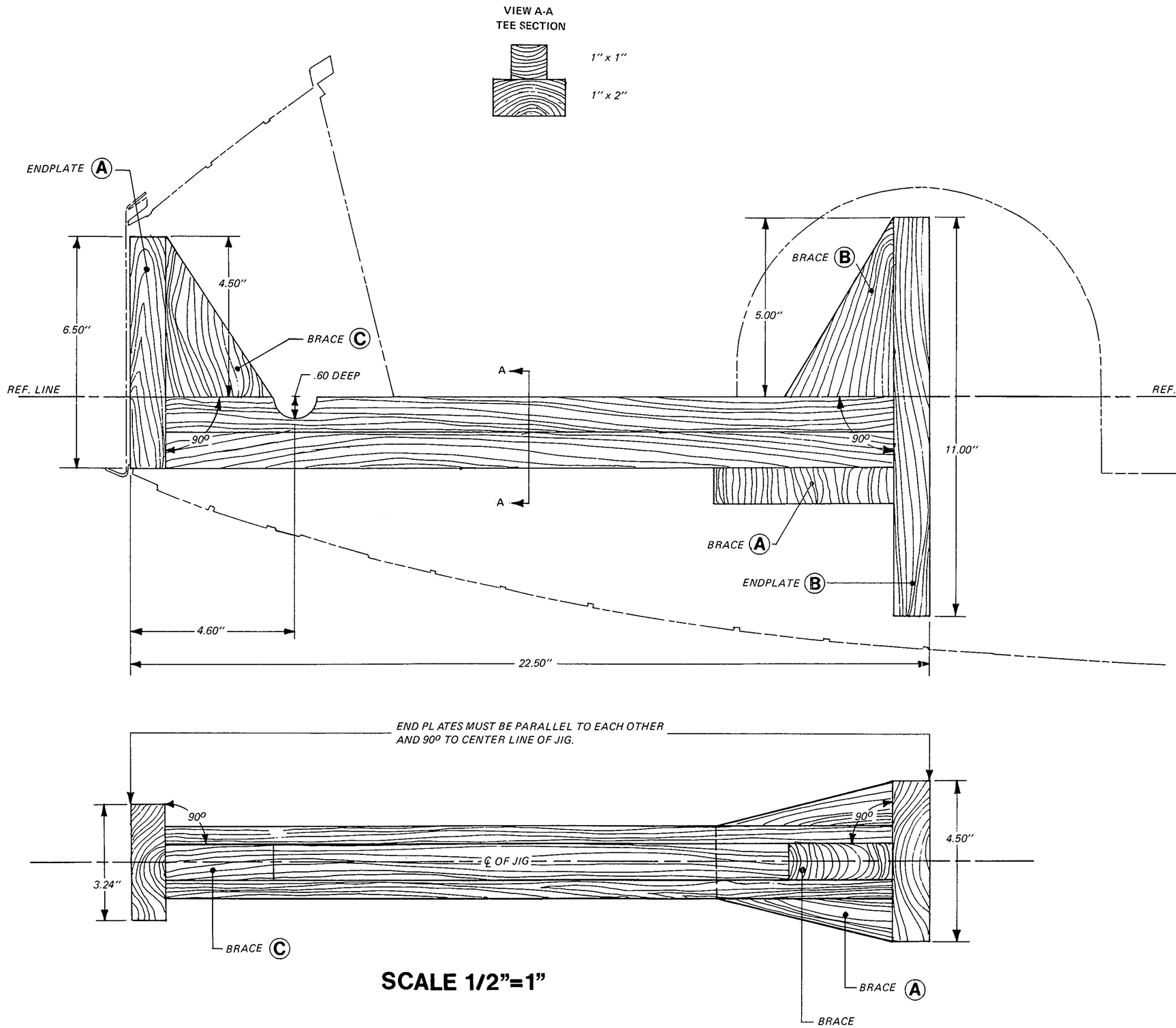
LEFT PANEL SHOWN
LOOKING OUTBOARD

RIGHT PANEL SAME ONLY OPPOSITE

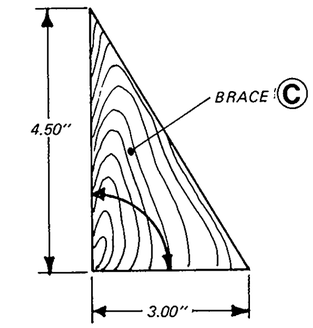
DETAIL A-Y

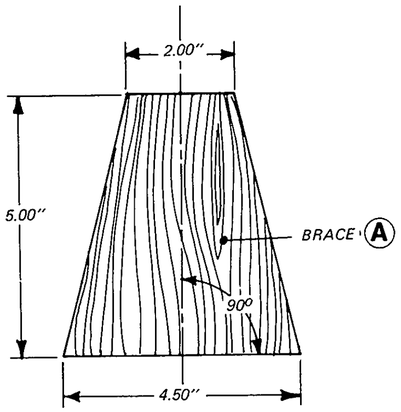


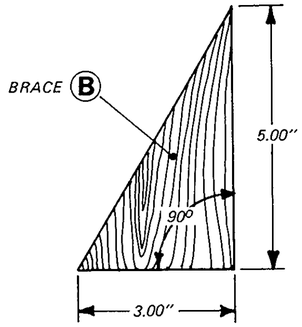
NOSEGEAR BOX JIG

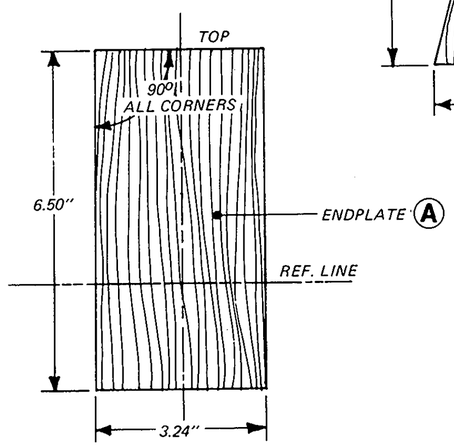


SCALE 1/2"=1"

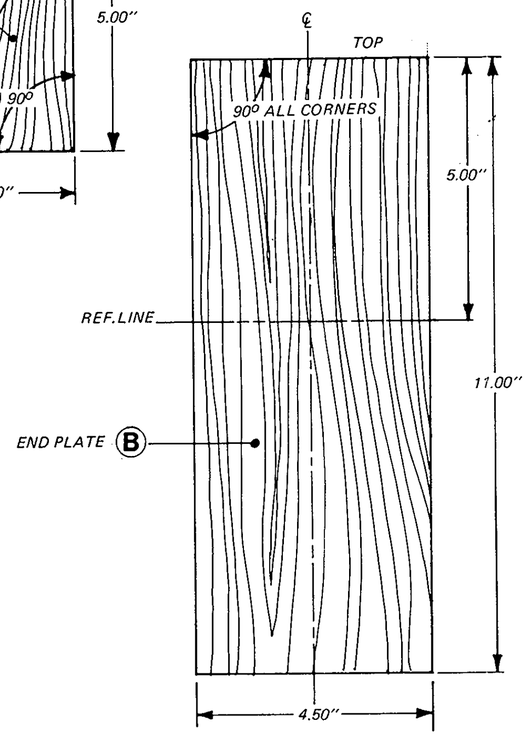








SCALE 1/2"=1"

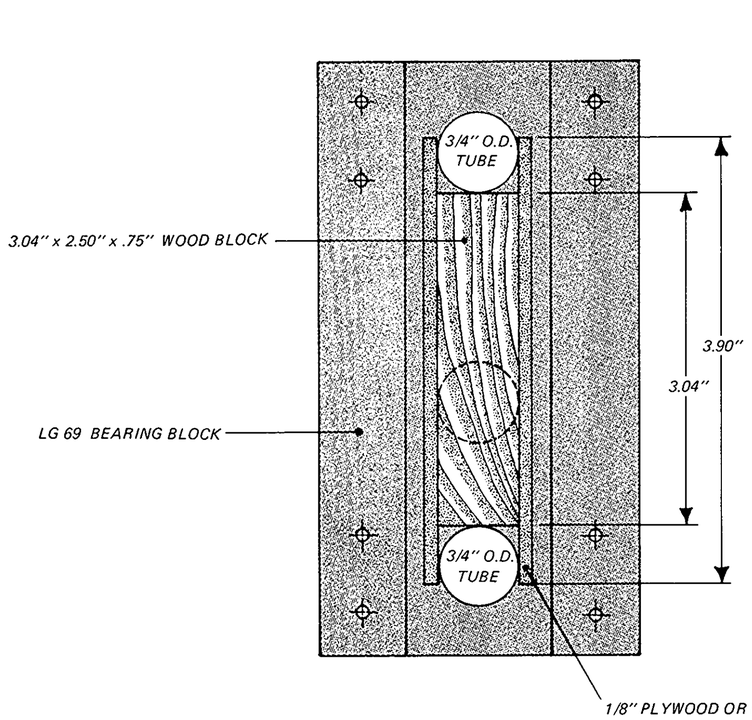


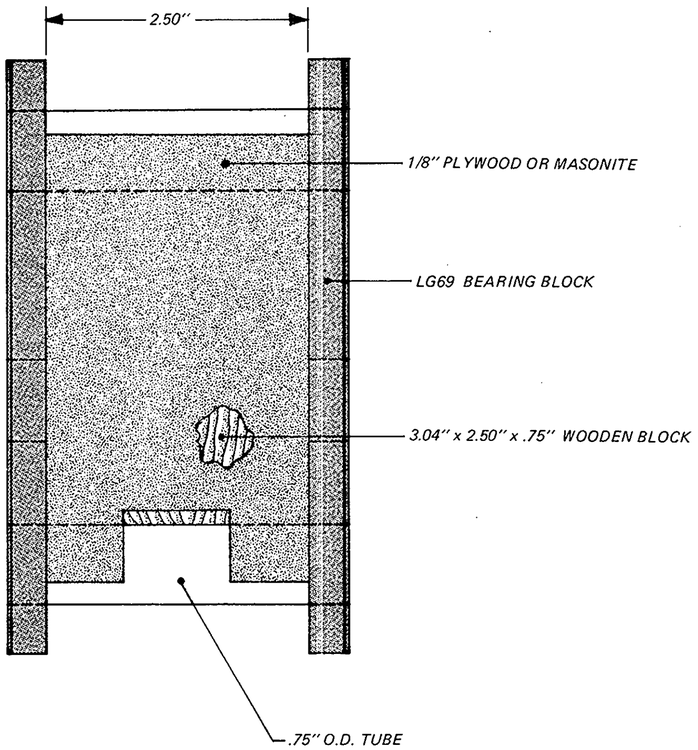
JIG CONSTRUCTION

1. CUT OUT ALL PARTS FROM GOOD QUALITY WOOD WITH NO WARP OR TWIST.
2. MARK REFERANCE LINES ON END PLATES (A) AND (B) AS SHOWN ON ALL SIDES.
3. LOCATE BRACE (B) AND (C) ON ENDPLATES MAKING SURE THEY ARE CENTERED ON CENTERLINE AND THE BOTTOM EDGE IS EVEN WITH AND PARALLEL TO THE REFERANCE LINE. FASTEN IN PLACE WITH SCREWS OR NAILS AND WHITE GLUE.
4. MAKE "TEE" SECTION FROM 1" x 1" AND 1" x 2" WOOD. CENTER 1" x 1" ON CENTER LINE OF 1" x 2" AND GLUE AND ALIGN TEE SECTION WITH CENTER LINE OF END PLATES AND BRACES THEN GLUE AND FASTEN IN PLACE.

   ALIGN TEE SECTION WITH CENTER LINE OF END PLATES AND BRACES THEN GLUE AND FASTEN IN PLACE.
6. ALIGN BRACE (A) WITH CENTER LINES OF TEE SECTION AND ENDPLATE AND GLUE AND FASTEN IN PLACE.
7. IT IS IMPORTANT THAT ALL 90° MEASUREMENTS ARE ACCURATE.

BEARING BLOCK SPACER





INSTALLATION OF THE PITOT STATIC SYSTEM

NOTE: Care must be taken when installing the tubes into the pitot and static blocks as not to plug them with sealant.

STATIC SYSTEM

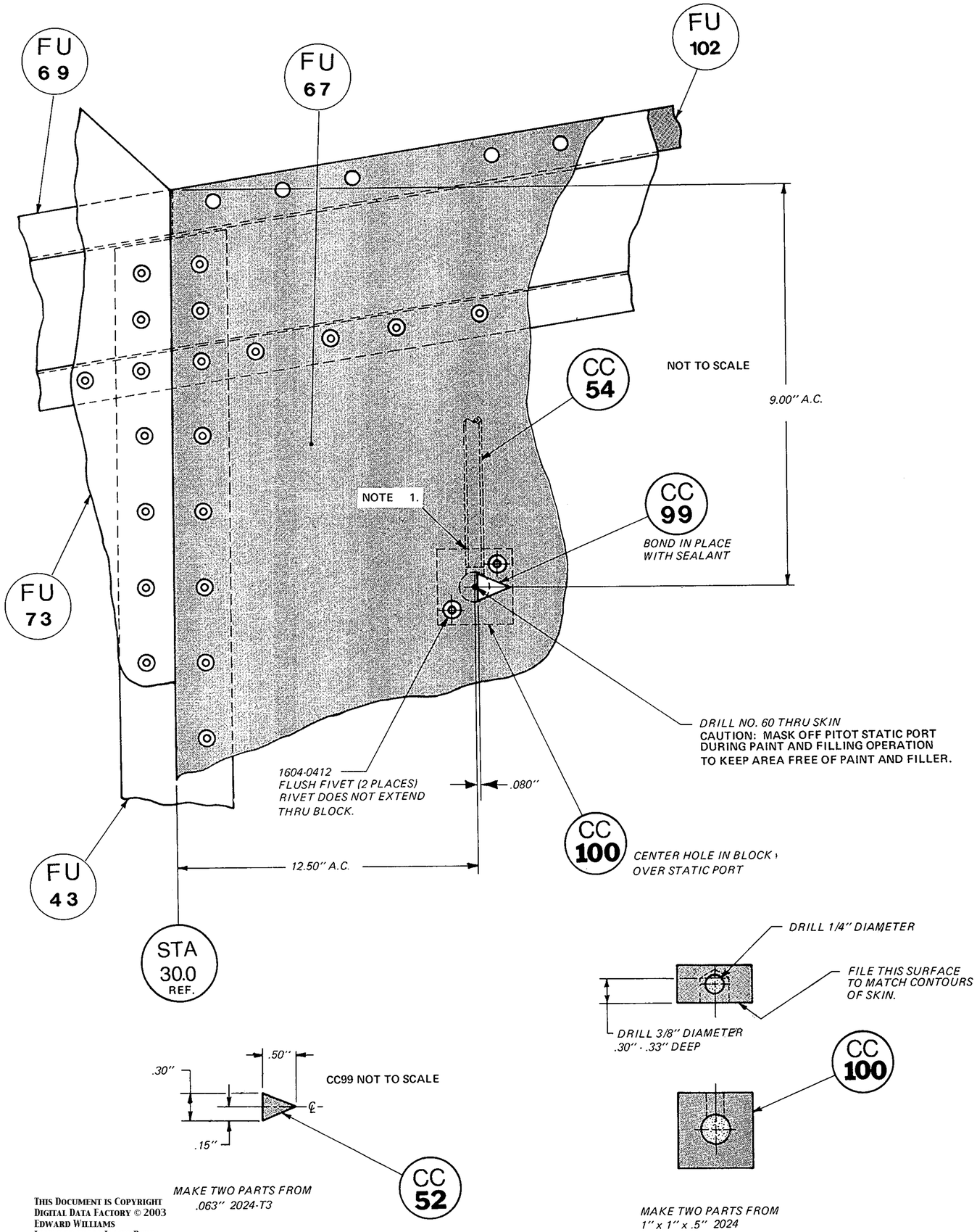
1. Cut out a 2" hole in FU77 (page 1[65], view AA).
2. Fabricate CC56 pitot block and the two CC100 static blocks and the two CC99 static triangles. Cut to length CC57 pitot tube and the pitot and static plastic tubes to length.
3. Drill the 3/8" diameter hole and the ¼" hole in CC100 (Note the depth of the 3/8" hole). Also open the two rivet holes with a # 40 drill.
4. Locate the static port using a square lined up with the center of the skin splice at station 30.00 and 9.00" from the intersection of the skins and canopy. Extend the horizontal center line approximately ¾" aft of the 12.50"dimension, repeat for oppisite side. Mark the 12.50" dimension and the 9.00" dimension intersect and using a No. 60 drill, open the static port holes in FU 67 and FU 68.
5. Position the CC100 static block as shown making sure the ¼" hole is on the top side, and using the # 40 holes in the CC100 as a drill guide, open the rivet holes in FU67 & 68 &CC100 with a # 30 drill. Dimple the holes in FU67 & 68 and countersink the # 30 holes in CC100.
6. The surface of CC100 with a 3/8" hole must be filled to fit the contour of the fuselage.
7. Pro-seal and rivet into place the CC100's, making sure the ¼" hole is in the up position on both sides.
8. Pro-seal the two CC99's in position (page 1[64]). make sure there is no pro-seal in the static port or along the front edge of the CC99 triangles.
9. Install the two CC101 static line tubes into the CC100 static blocks and pro-seal into place. Caution must be taken not to get any pro-seal in the static blocks or the tubes.
10. The opposite ends of the CC101 tubes slide into the two tee-fittings (BD-0093) and the CC60 tube connects these two tee's together.
11. Install the tube fittings (BD-0092) in back of the altimeter and airspeed indicator.
12. Slide the tubes CC102 over tube fittings and tee-fittings. Be sure to connect the fitting marked for the static line on the back of the airspeed indicator.
13. Cut out the CC59 pitot plate and locate the two ¼" holes (Note depth of holes). Position CC56 pitot block on the exact center of CC59. Open the rivet holes with a No. 30 drill, deburr, pro-seal and rivet these two together.
14. Drill the ¼" hole in the extreme nose of the aircraft.
15. The end of CC57 tube that is inserted into the CC56 pitot block must be cut at a 45° angle. After deburring this, apply pro-seal on the end of CC57 and install into the CC56 pitot block as shown. Make sure the tapered side of CC57 pitot tube is facing up.
16. Using a square, make sure the CC57 pitot tube is perpendicular to CC59 pitot plate.
17. Cleco into place the FU77 bulkhead into the fuselage.
18. Insert the pitot tube plate assembly into the aircraft through the 2" hole in the FU77 bulkhead until the CC59 pitot plate rests against the bulkhead. There should be a center line on FU77 and on the CC59 plate for alignment.
19. Position this assembly with the hole in the CC56 pitot block in the up position and the extension of the CC57 pitot tube that is out of the nose is in the center sideways and between level with the water lines and 2° nose down. A carpenter's level is adequate for this procedure. With the pitot tube in this position, drill out the four holes in CC59 pitot plate to a # 12 (drill through a CC59 pitot plate and FU77 bulkhead).
20. Remove pitot tube plate assembly and the FU77 bulkhead and install the nutplates in the FU77 bulkhead.
21. Drill a 7/16" hole in FU77 at location shown (view AA) and install grommet.
22. Drill a 5/16" hole through the side of the hat section FU111 as shown on page 1[65] and install the snap bushings.
23. Rivet the FU77 bulkhead to nosegear box.
24. Install the CC58 tubing through the snap bushings, grommet and pro-seal into the CC56 pitot block. Tubing may be bent by applying a very small amount of heat. NOTE: Between the grommet and the snap bushing, the tubing should be kept as close as possible to the wheelwell to make sure the over center spring arm of LG91 does not hit it when cycling the gear. Exercise care as to not collapse the walls of the tubing when bending.
25. Install wheelwell by clecoing into place and insert the CC57 assembly to the hole in the nose. Install the bolts in the CC59 pitot plate.
26. Recheck the position of pitot tube out of the nose (see step 8).
27. Route the opposite end of the tubing CC58 high in the fuselage and connect to the tube fitting in the airspeed indicator labeled "pitot".

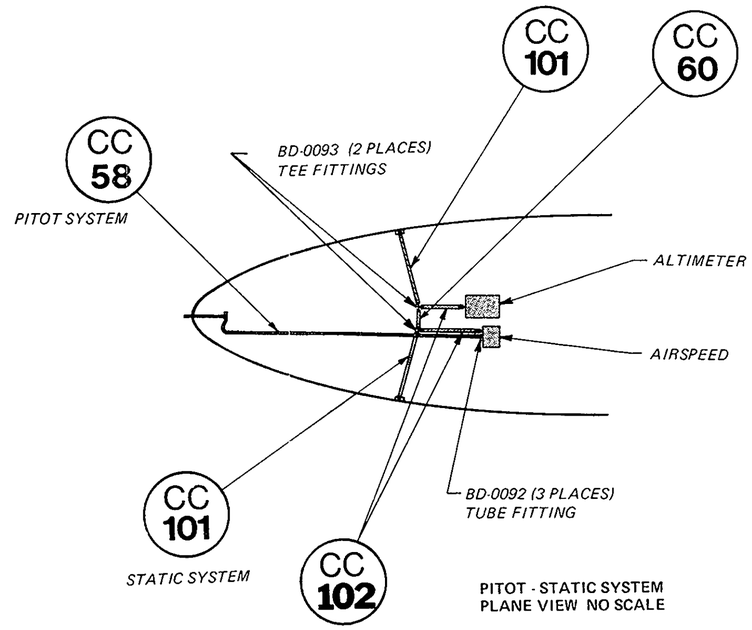
INSPECTION HOLE FAB. & INSTL.

1. Make a template 6" I.D. dia. from .025" material for the insp. holes in FU39 and FU40.
2. Position the template per print on FU39 and FU40 then carefully scribe out the hole. The piece cut out of FU39 and FU40 will be the insp. hole cover. Cut out the lower insp. hole in bottom of fuselage.
3. Fabricate the two doublers per print and a insp. hole cover for the bottom insp. hole.
4. Locate and open the .75" holes in FU39 and FU40.
5. Lay out the rivet hole patterns on the fuselage skin for the doublers and open the holes with a # 40 # 40 drill.
6. Position the doublers and using the # 40 holes as a drill guide open the holes in the doublers.
7. Lay out the screw hole location on the insp. hole covers and open holes with a # 40 drill.
8. Position insp. hole cover on doubler and using the # 40 holes as a drill guide in the cover, open the holes with a # 40 drill in the doublers.
9. Deburr and dimple all holes in doubler and covers, install nutplates on soublers, pro-seal and permanently install doublers.
10. Cut out the 6" dia. hole per print in FU61.

PARTS & MATERIALS CALL OUT

PART NO.	DESCRIPTION	QTY.	MATERIAL IDENT. NO.	MATERIAL
CC-56	Pitot Block	1	BD-5-M-0130	½"X1"X1" Alum.
CC-57	Pitot Tube	1	BD-5-M-0123	.25" O.D.X.028" Wall 2024-T3 Tubing
CC-58	Pitot Line	1	BD-5-M-0131	¼" Plastic Tubing
CC-59	Pitot Plate	1	BD-5-M-0027	.025" 2024-T3
CC-60	Static Line	1	BD-5-M-0131	¼" O.D. Plastic Tubing
CC-99	Static Triangle	2	BD-5-M-0030	.063" 2024-T3
CC-100	Static Block	2	BD-5-M-0130	½"X1"X1" Alum.
CC-101	Static Line	2	BD-5-M-0131	¼" O.D. Plastic Tubing
CC-102	Static Line	2	BD-5-M-0131	¼" O.D. Plastic Tubing

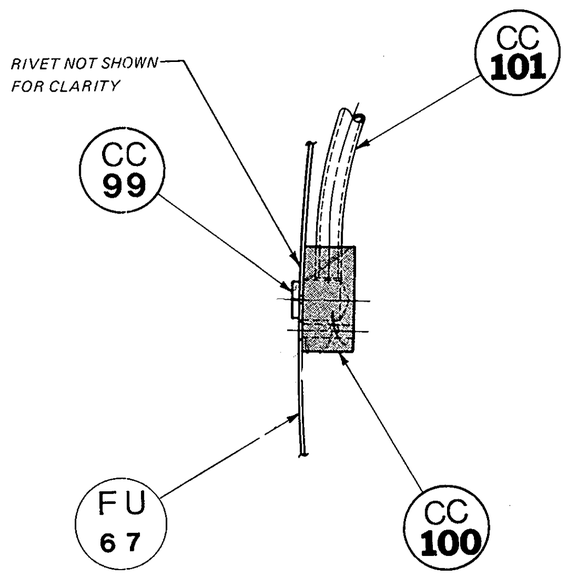


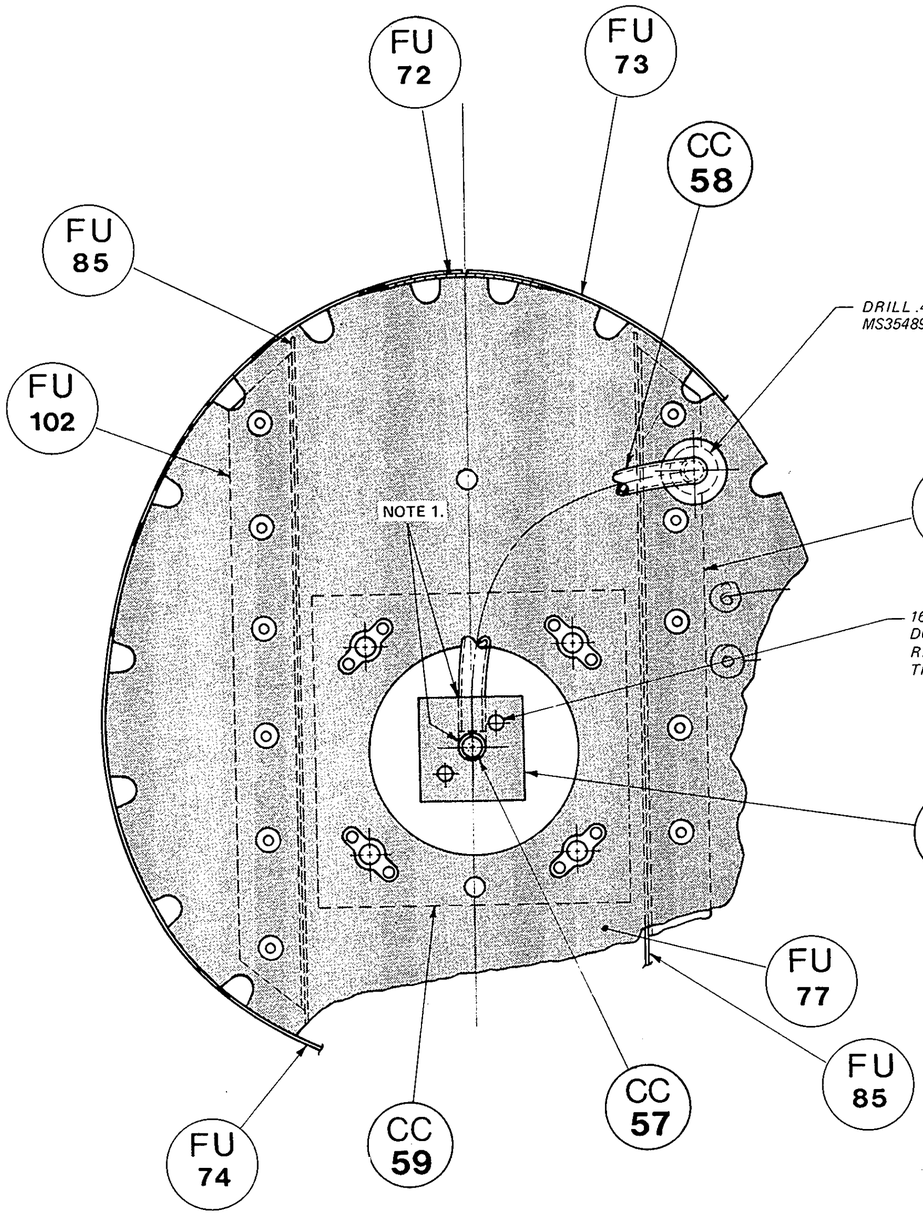


PITOT - STATIC SYSTEM
PLANE VIEW NO SCALE

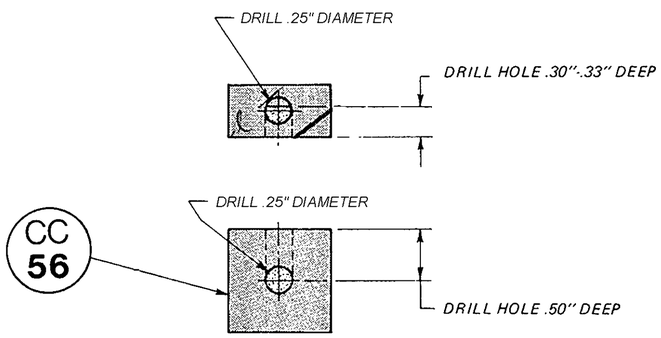
PART NO.	PLASTIC TUBING LENGTHS	QT.
CC101	16"	2
CC102	7"	2
CC58	42"	1
CC60	3"	1

NOTE 1. INSTALL TUBING IN BLOCKS WITH SEALANT TO ENSURE NO LEAKAGE.

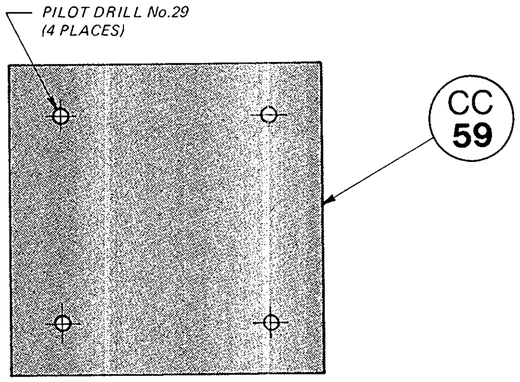




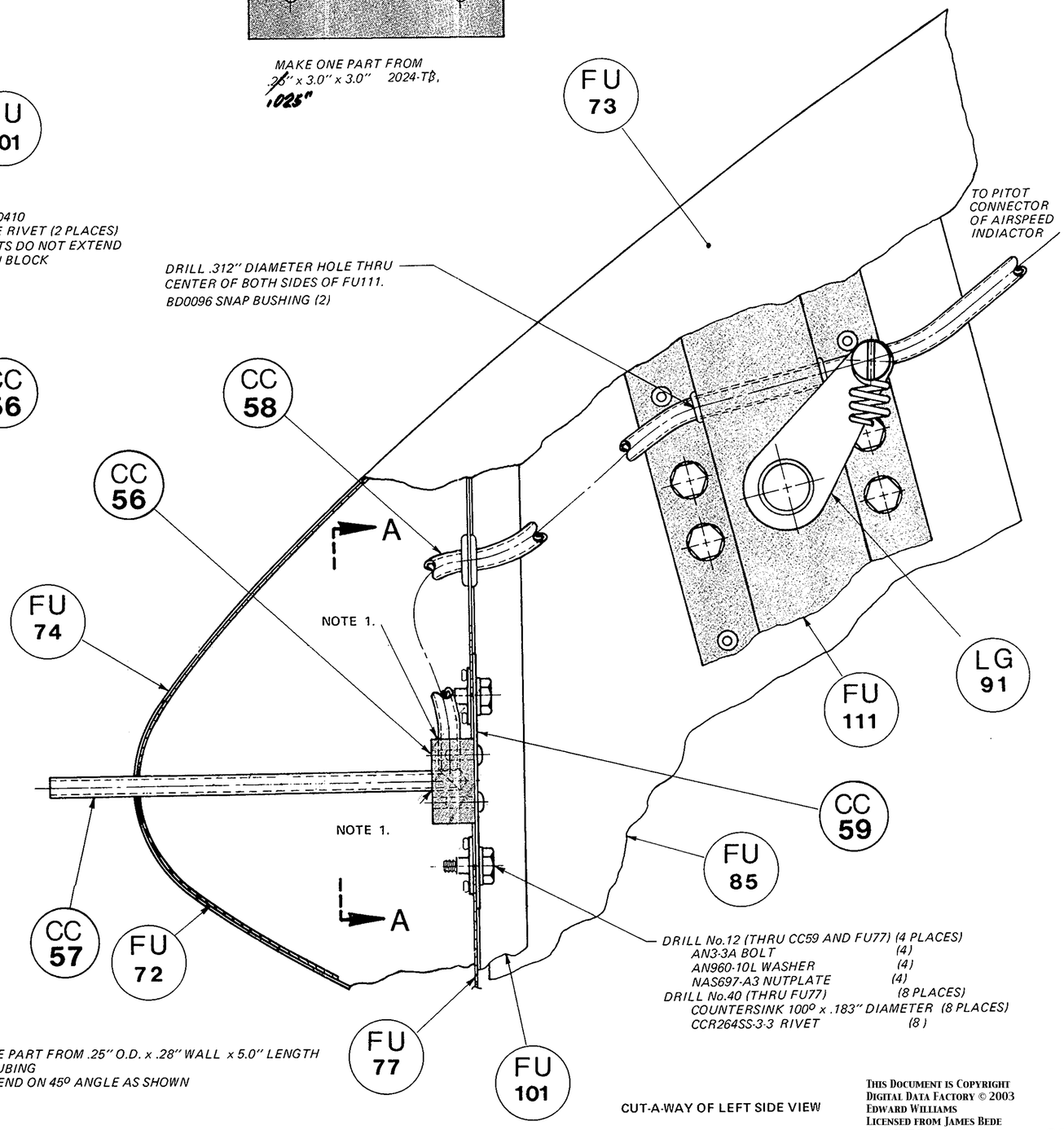
VIEW A-A



MAKE ONE PART FROM 1" x 1" x .5" 2024



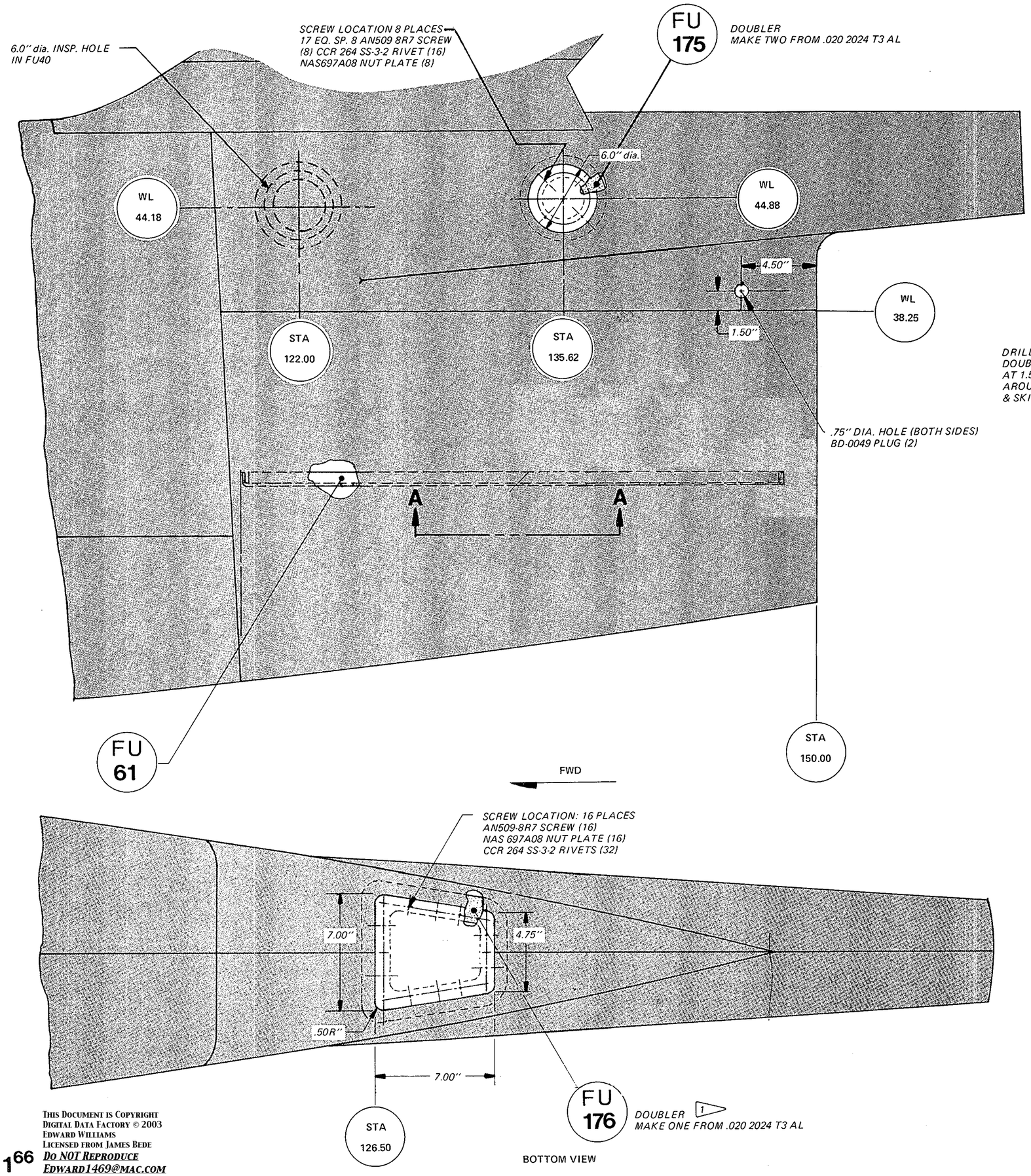
MAKE ONE PART FROM
.25" x 3.0" x 3.0" 2024-T3,
1025"



MAKE ONE PART FROM .25" O.D. x .28" WALL x 5.0" LENGTH
2024-T3 TUBING
CUT ONE END ON 45° ANGLE AS SHOWN

DRILL No.12 (THRU CC59 AND FU77) (4 PLACES)
AN3-3A BOLT (4)
AN960-10L WASHER (4)
NAS697-A3 NUTPLATE (4)
DRILL No.40 (THRU FU77) (8 PLACES)
COUNTERSINK 100° x .183" DIAMETER (8 PLACES)
CCR264SS-3-3 RIVET (8)

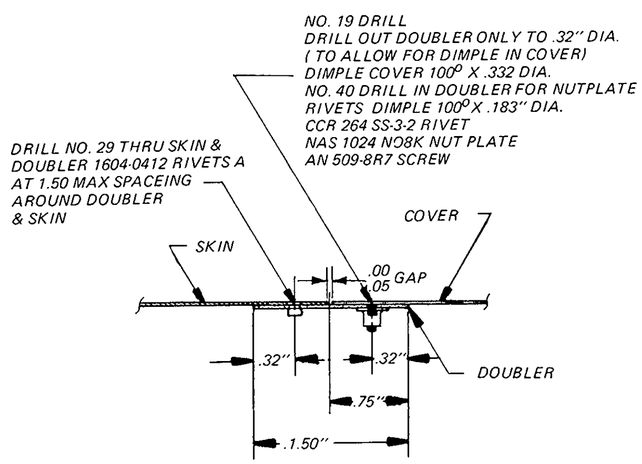
CUT-A-WAY OF LEFT SIDE VIEW



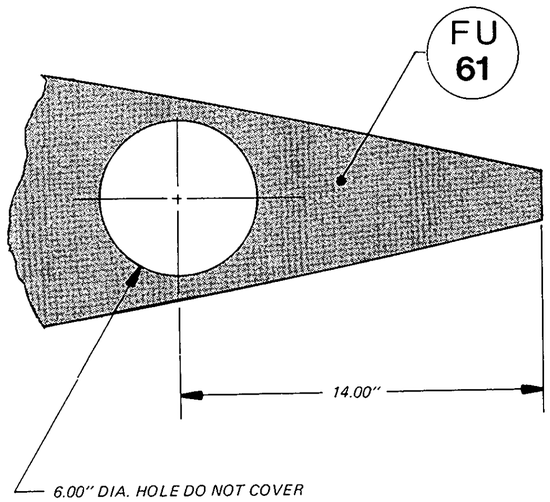
NOTES:

1. DOUBLER MAY CONSIST OF MORE THAN ONE PIECE IF DISIRED.

2. MAKE CUTOUTS PER FUSELAGE INSTRUCTIONS PAGE 11 INSTRUCTION 49.

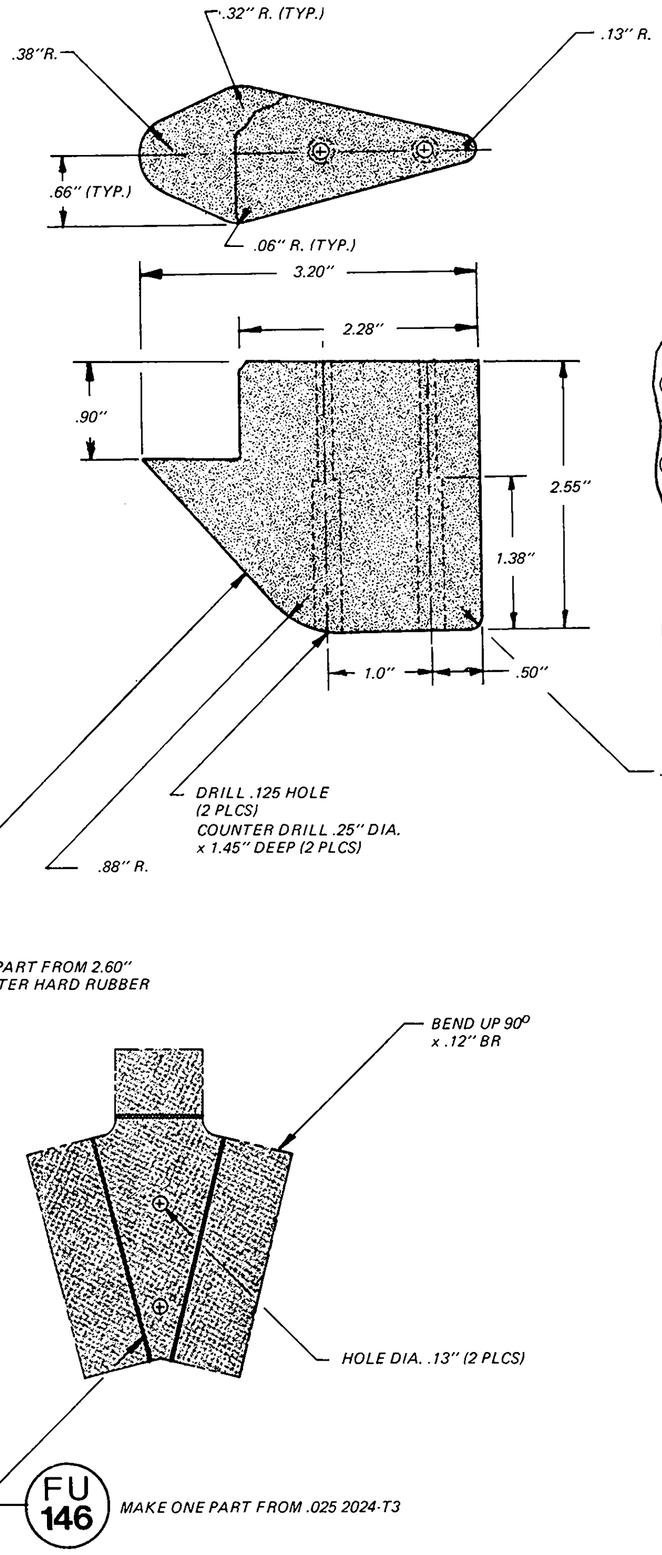


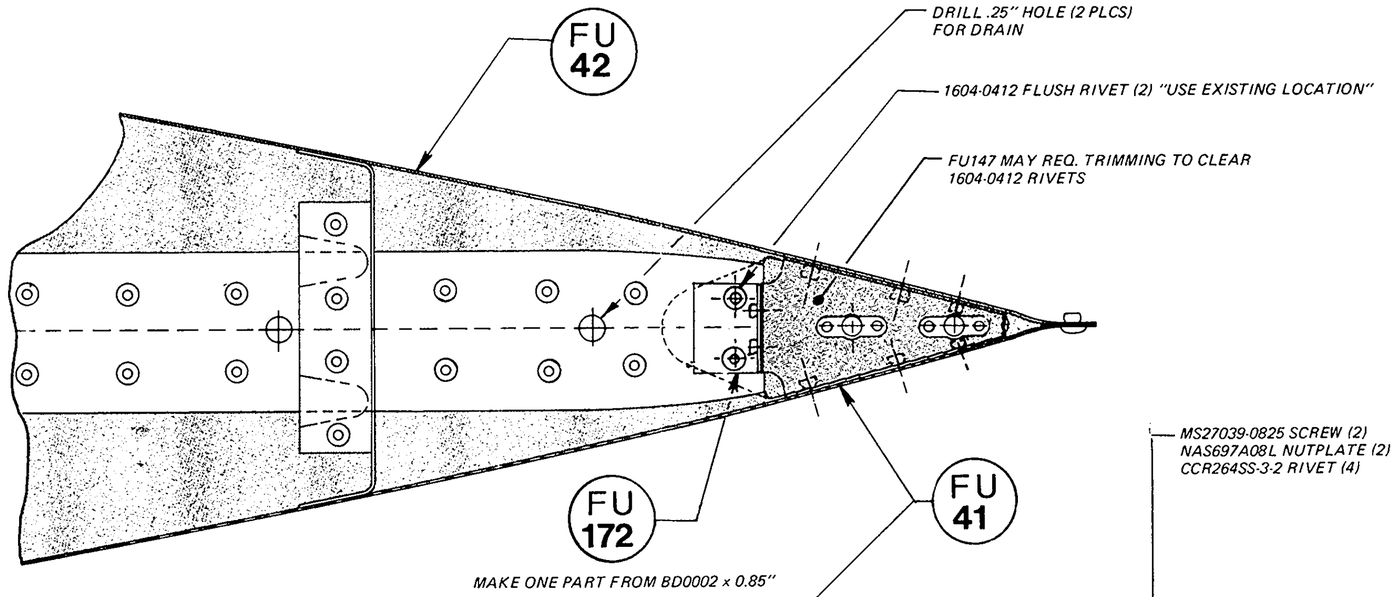
TYPICAL CROSS SECTION THRU BOUBLER
SEE PANEL LOCATION FOR SCREW SPACEING



VIEW A-A

Tail-Skid Installation





TAIL SKID ASSY.

WING ROOT FILLET

Beginning Construction

1 Cut and bend tabs on FU137 rib as noted.

2 Install left hand wing on aircraft temporarily.

3 Slide FU93 fillet over wing, locate and tape to fuselage.

4 Hold light under fillet and scribe line on fillet allowing .03" to .06" between end of fillet and wing skin.

5 Remove and trim FU93 fillet.

6 Remove wing and locate FU137 rib inside FU93 fillet. NOTE: Prior to installation of FU137 Rib, set square on FU99 center section and verify web of FU137 to be perpendicular to FU99 center section.

7 Install FU137 rib.

8 Fabricate FU143 Bulkhead.

9 Locate and install FU143 bulkhead inside FU93 fillet.

10 Temporarily reinstall L/H wing.

11 Verify proper location of FU93 fillet and with fillet held firmly in place, scribe fuselage fillet trim line as noted per print.

12 Remove wing and trim FU93 fillet. NOTE: If FU29 doubler interferes with FU93 fillet flange, lightly sand upper edge of FU29 doubler to eliminate interference.

13 Reinstall fillet and wing. Drill fillet attach holes from center of FU93 fillet, drilling progressively outward while holding fillet in place.

14 Trim preliminary main gear door cutout as indicated in drawings.

15 Fabricate and install FU139 filler.

16 Fabricate FU36 doubler and FU141 rib.

17 Locate and drill the two 3/4" dia. holes in FU136 fillet.

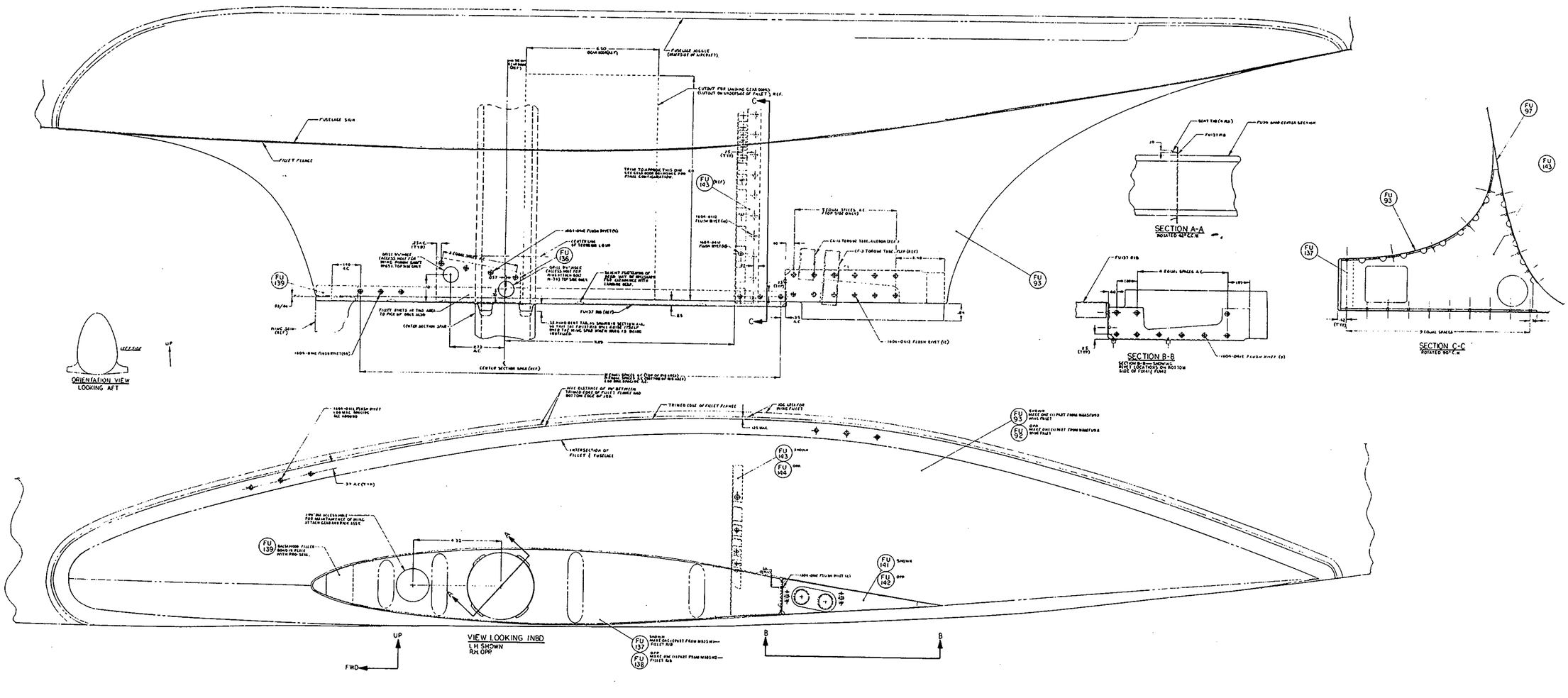
18 Install FU136 and FU141 as noted.

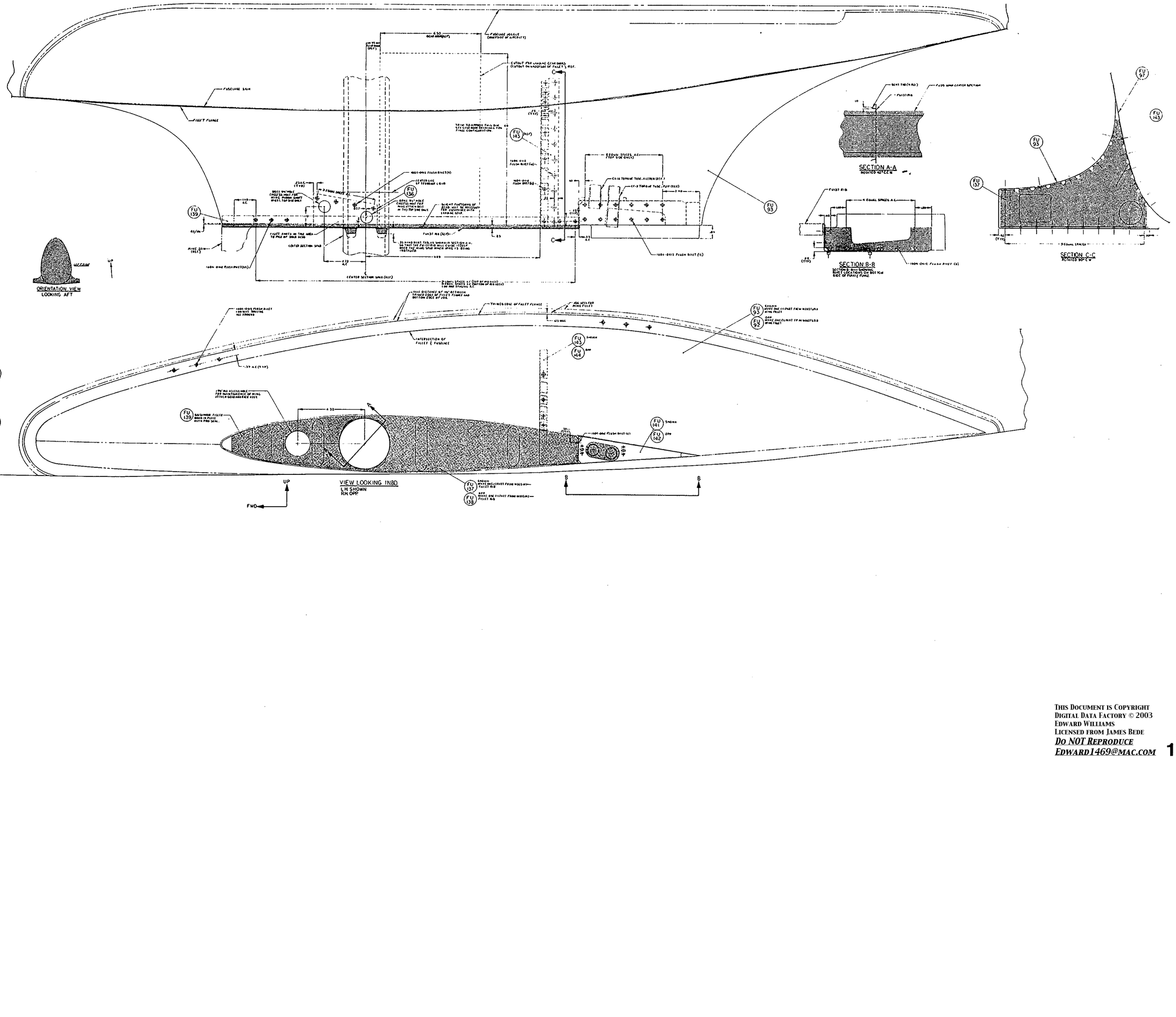
19 Repeat steps 1 through 18 for R/H fillet installation.

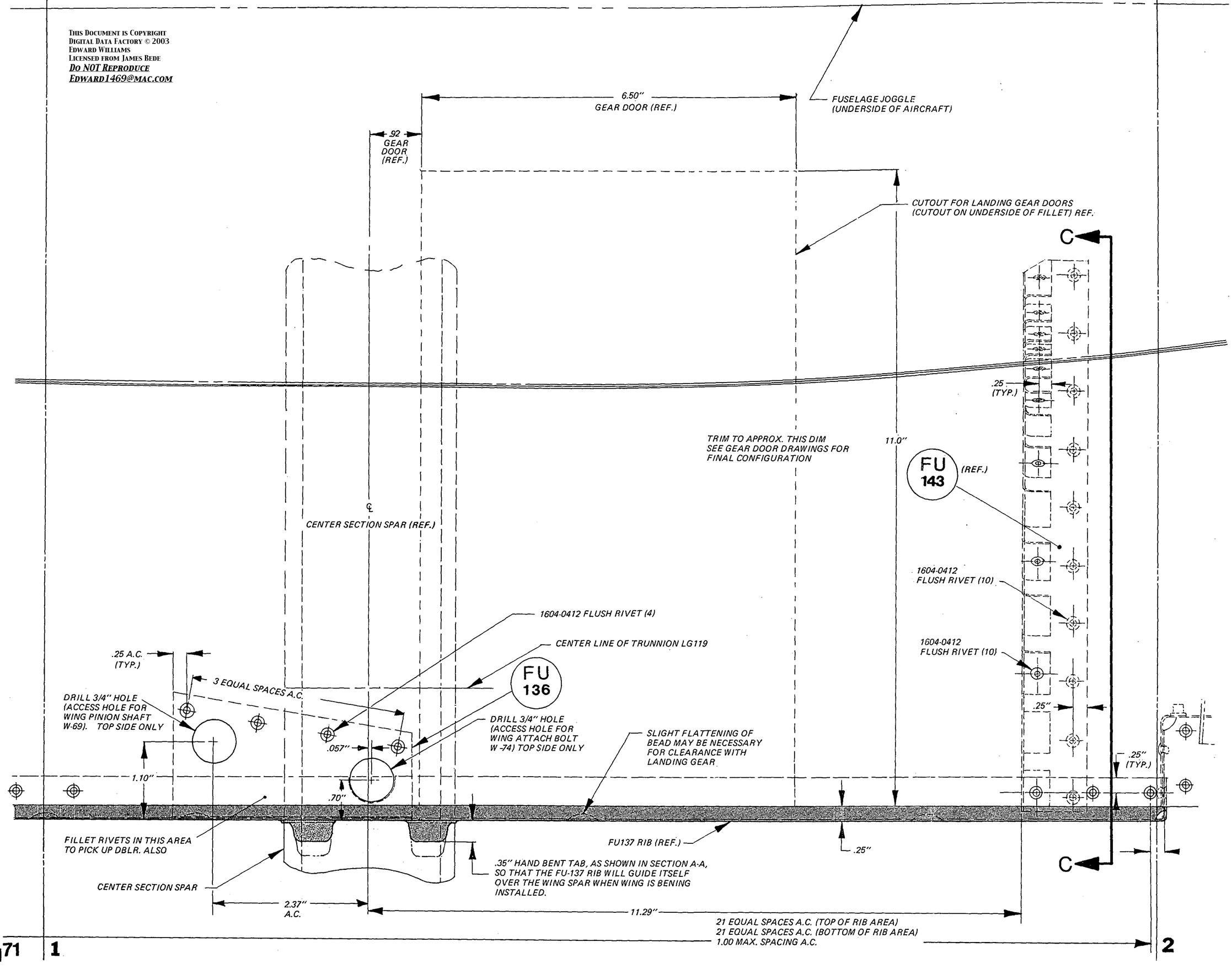
NOTE: Prior to final installation of fillet, control system, seat belt structure, wing rack, brakes lines and landing gear must be installed.

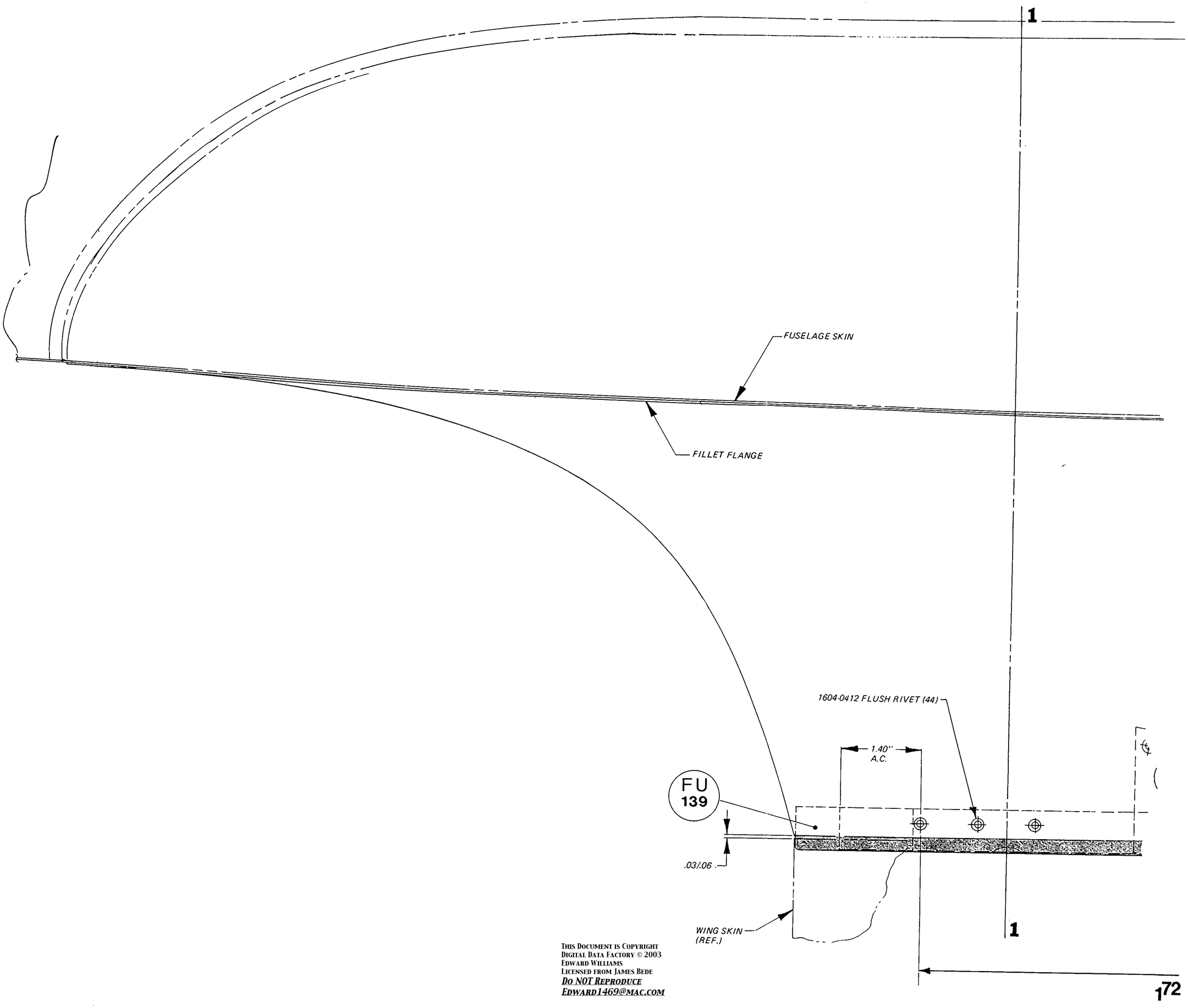
PARTS & MATERIALS CALL OUT

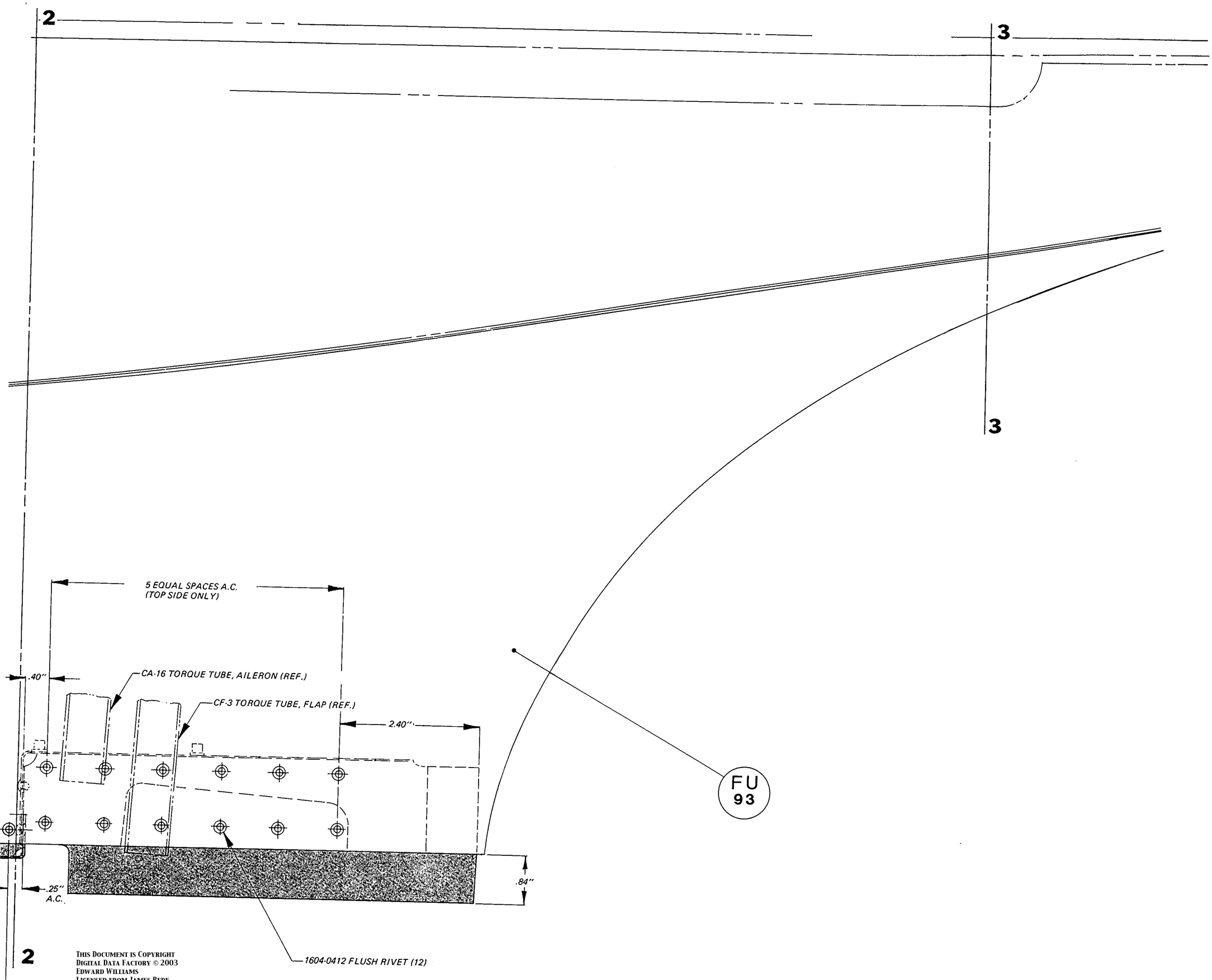
DRAWING REF. NO.	DESCRIPTION	QUANTITY	MATERIAL IDENTIFICATION NO.	MATERIAL DESCRIPTION
FU39	Filler Block	2		2" X 2" X .75" balsa wood
FU36	Stop plate	2		.020 2024-T3 Al.
FU93	Wing fillet	1	MBD5FU93	
FU92	Wing Fillet	1	MBD5FU92	
LG97	Plate	2		.020 2024-T3 Al.
LG99	Angle	1		.020 2024-T3 Al.
LG100	Angle	1		.020 2024-T3 Al.
LG101	Angle	1		.020 2024-T3 Al.
LG102	Angle	1		.020 2024-T3 Al.
LG103	Angle	2		.020 2024-T3 Al.
LG188	Brace	2		.250 X .028 wall 2024-T3 tube
FU137	Rib	1	MBD5W1	
FU138	Rib	1	MBD5W2	
FU141	Rib	1		.032 2024-T3 Al.
FU142	Rib	1		.032 2024-T3 Al.
FU143	Bulkhead	1		.025 2024-T3 Al.
FU144	Bulkhead	1		.025 2024-T3 Al.
LG173	Shim	2		.020 2024-T3 Al.
LG174	Shim	2		.032 2024-T3 Al.
LG175	Shim	2		.032 2024-T3 Al.
LG176	Shim	2		.032 2024-T3 Al.
LG202	Shim	2		.032 2024-T3 Al.

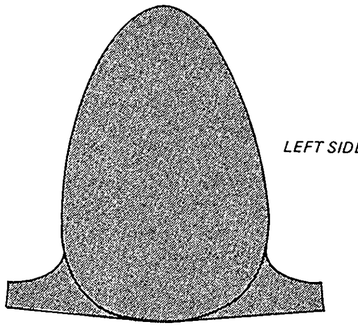












LEFT SIDE

ORIENTATION VIEW LOOKING AFT

UP

1604-0412 FLUSH RIVET
1.50 MAX. SPACING
ALL AROUND

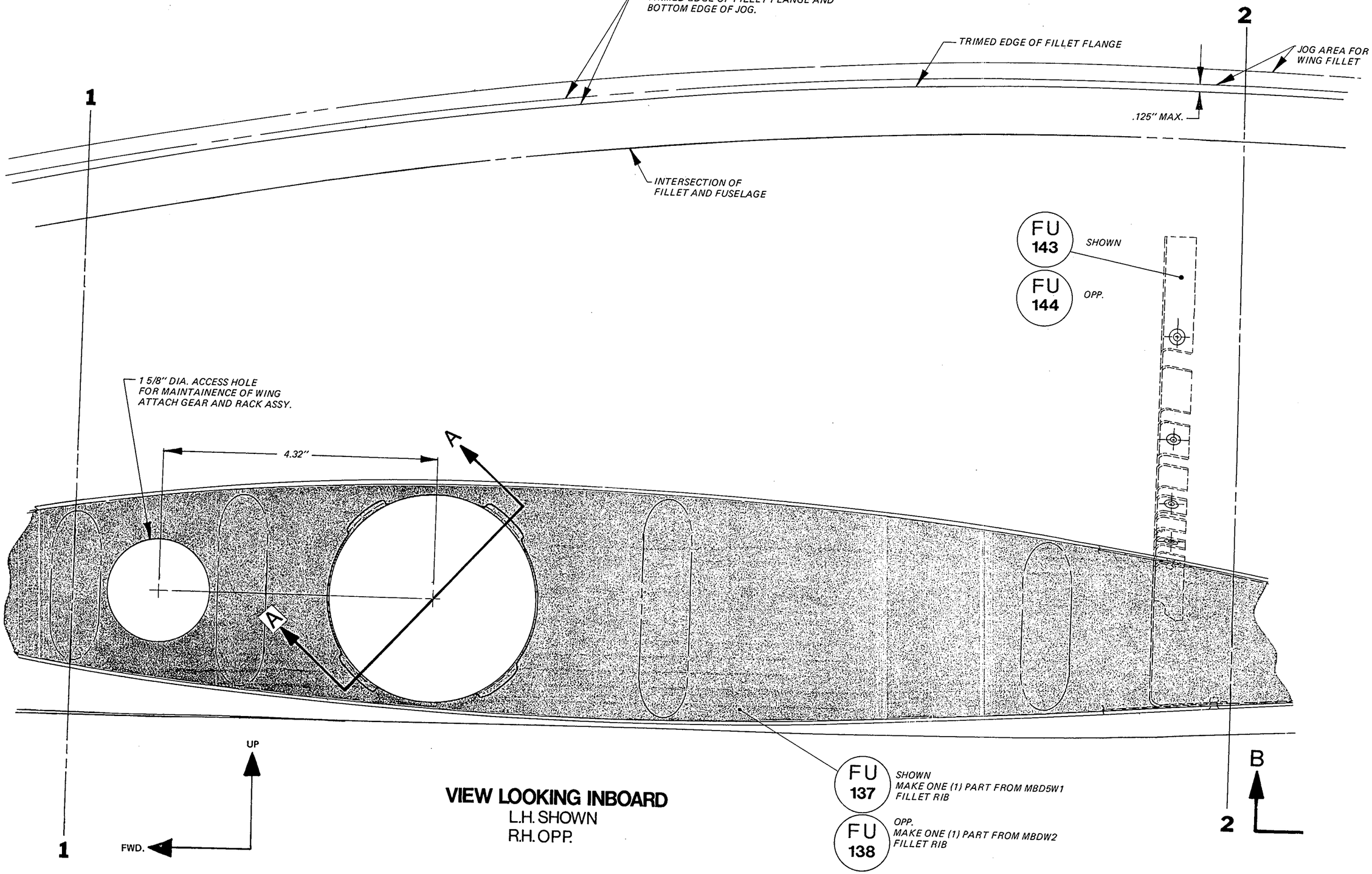
.37" A.C. (TYP.)

1

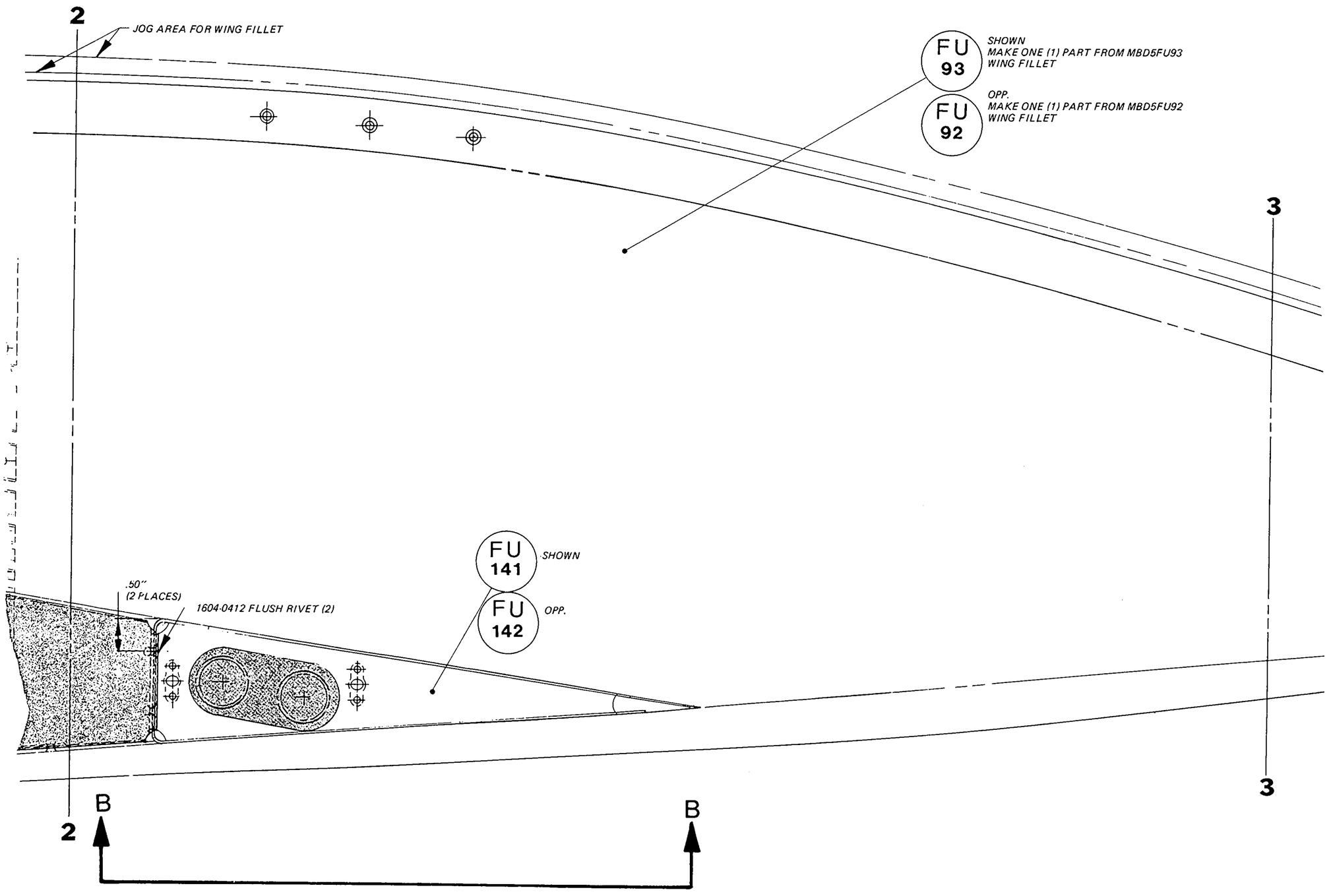
FU
139

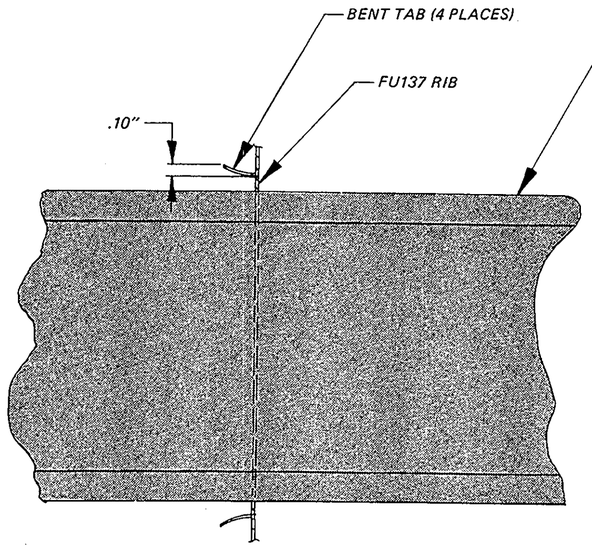
BALSAWOOD FILLER
BOND IN PLACE
WITH PRO-SEAL.

1



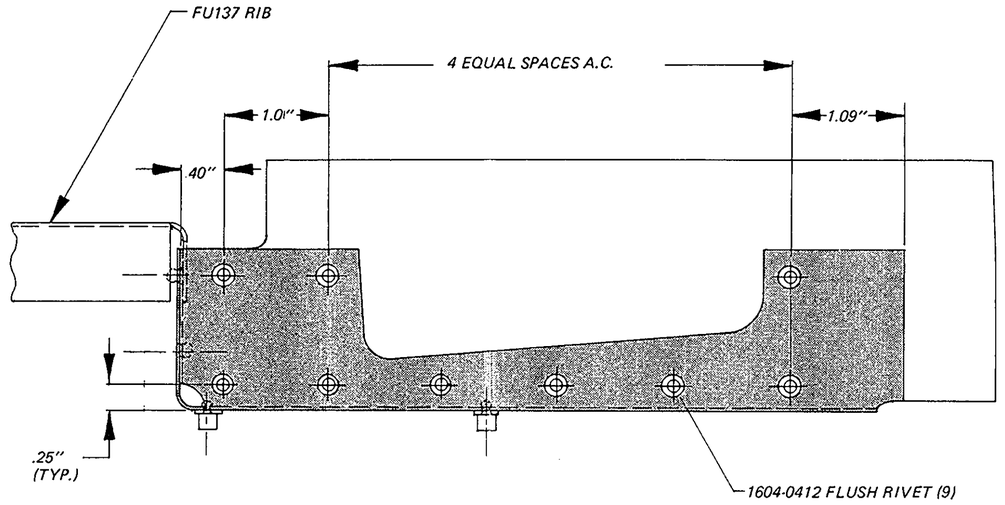
VIEW LOOKING INBOARD
L.H. SHOWN
R.H. OPP.



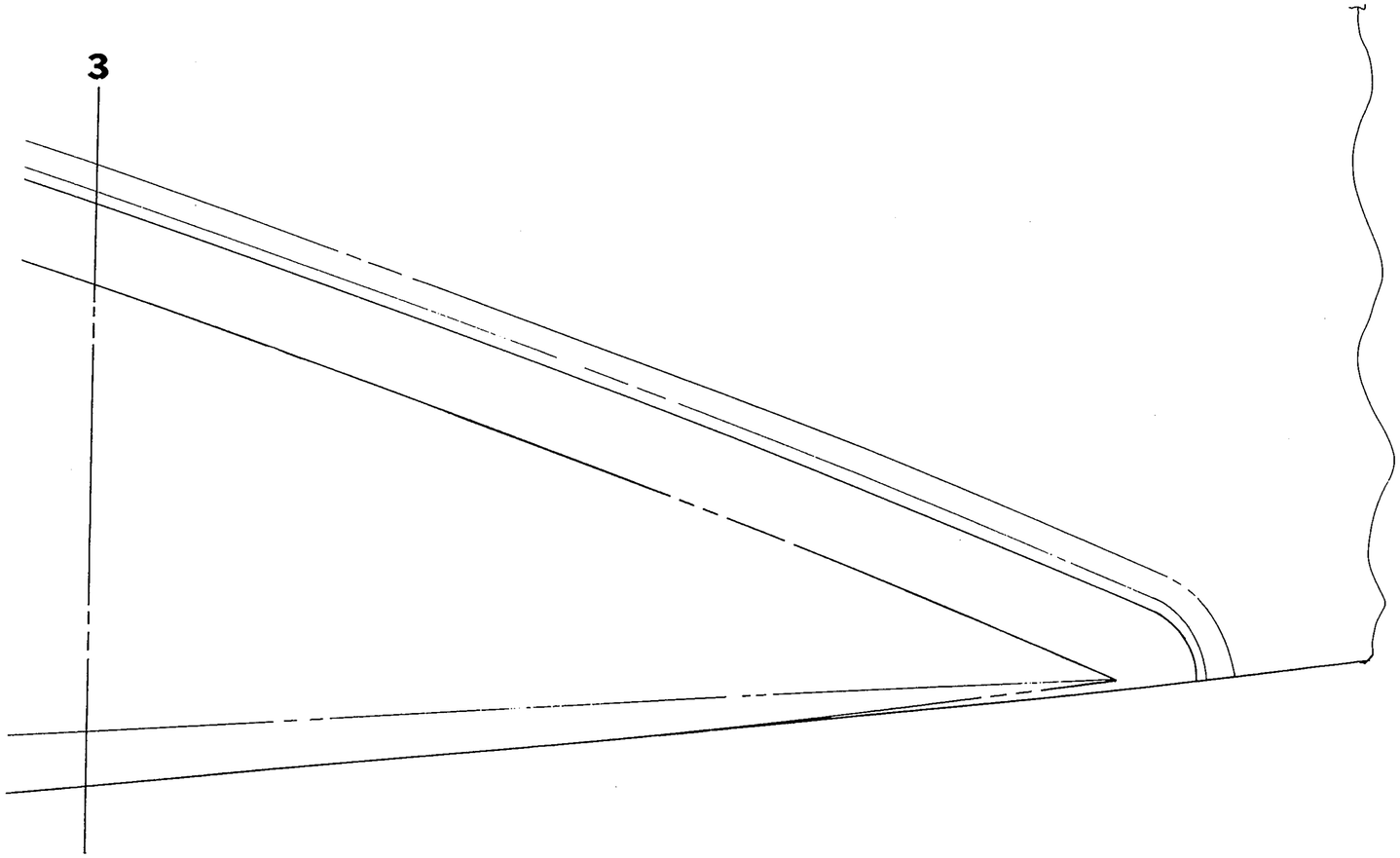


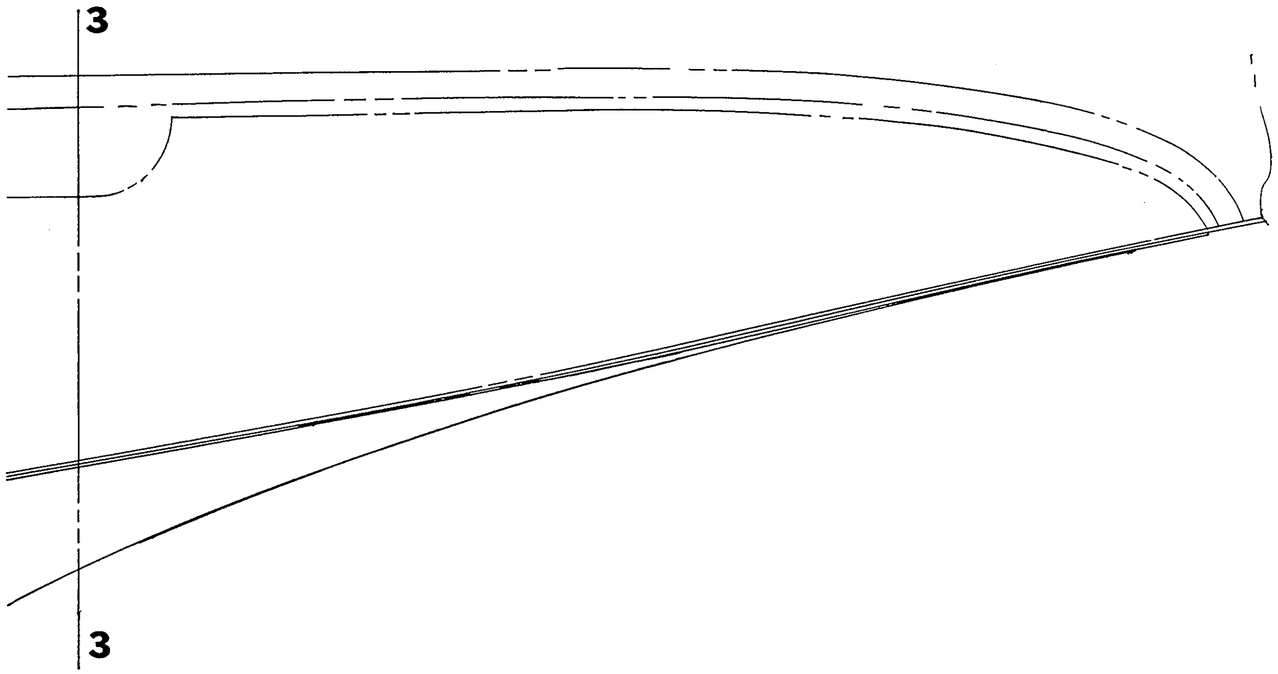
SECTION A-A

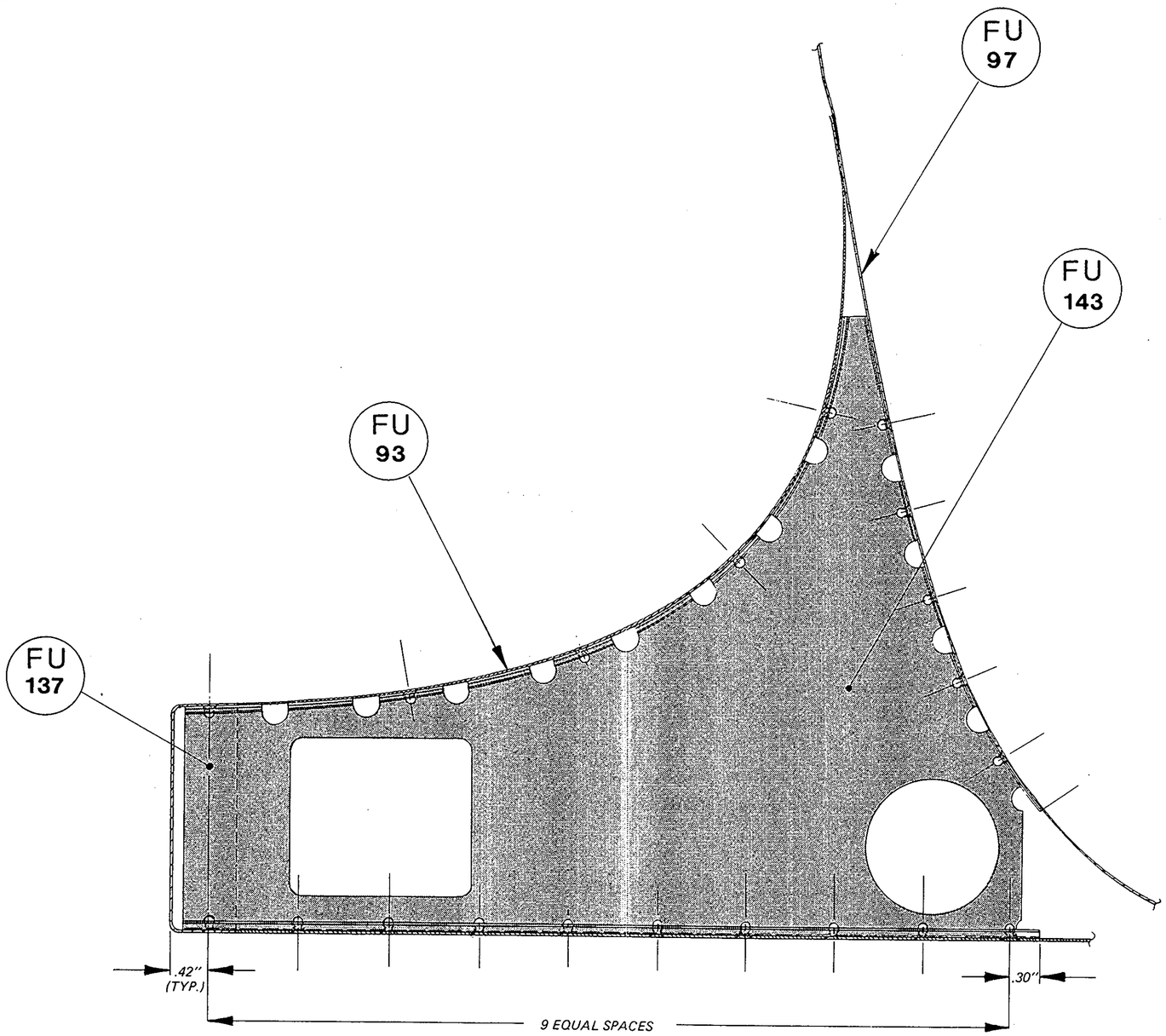
ROTATED 42° COUNTER CLOCK WISE



SECTION B-B SHOWING
RIVET LOCATIONS ON BOTTOM
SIDE OF FU141 AND FU142

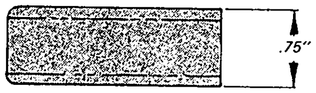


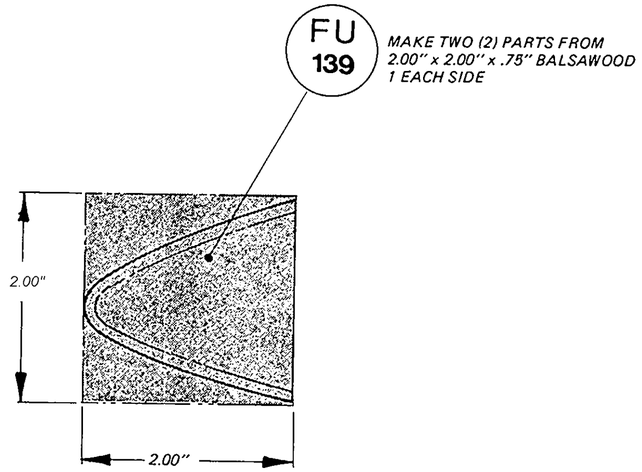


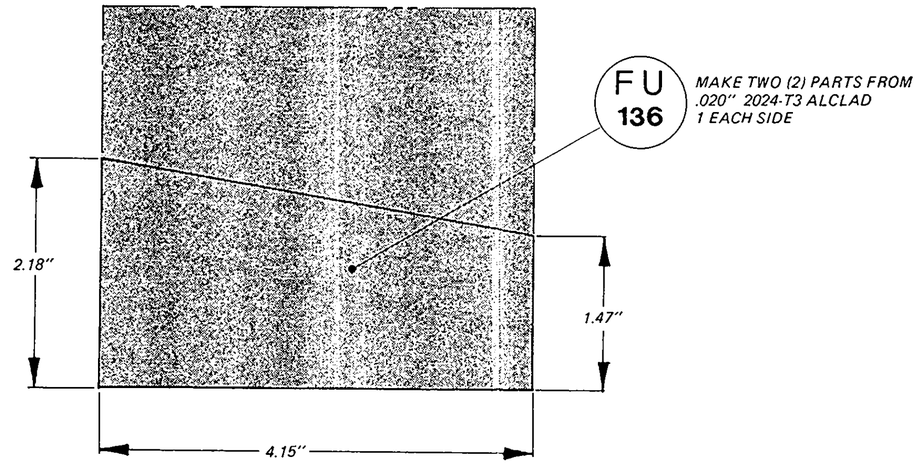


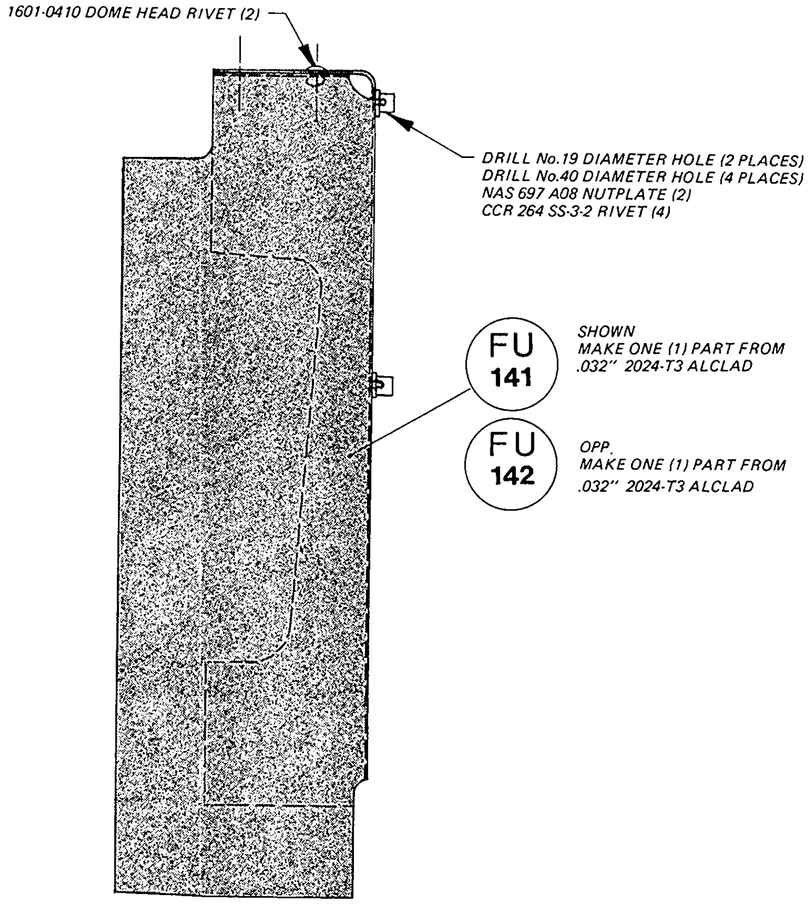
SECTION C-C

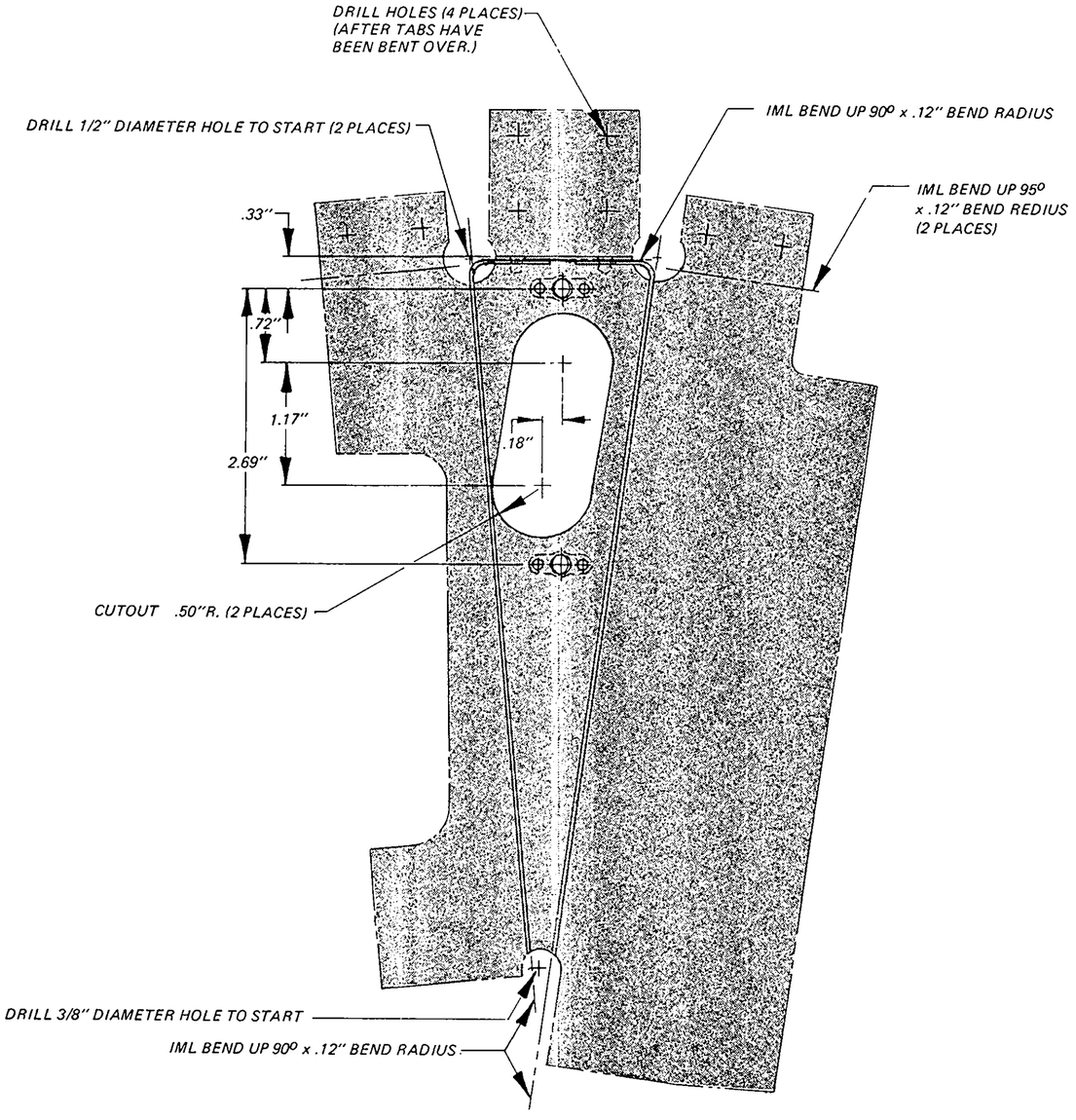
ROTATED 90° C.W.

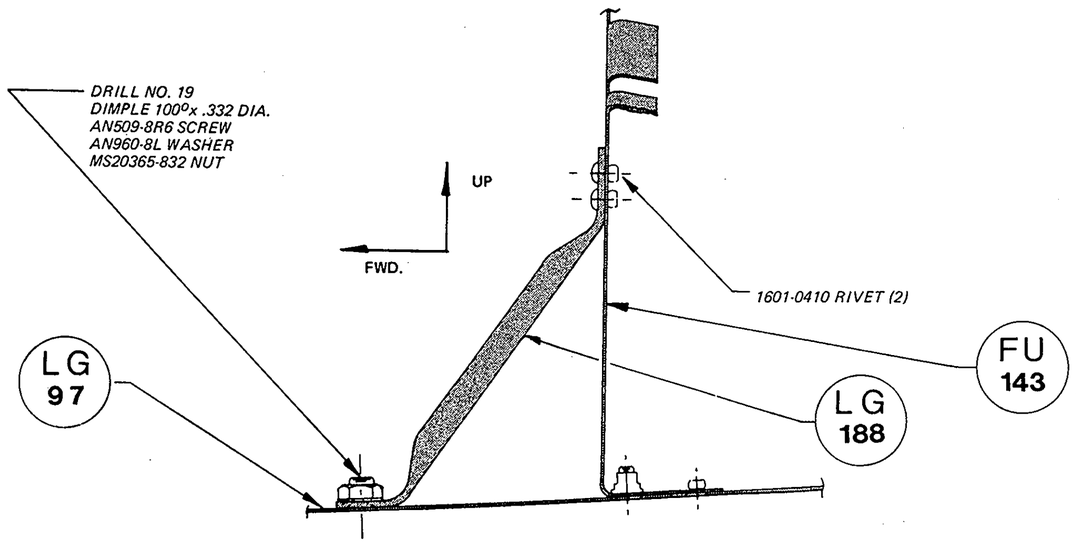












VIEW A-A

ROTATED 90°