Section II

WING GROUP

2-1. WING GROUP.

2-2. The wing is of full cantilever, stressed skin construction with a delta configuration. This configuration has a 60-degree sweepback of the leading edge and a 5-degree sweep forward of the trailing edge, as shown on figure 2-1. Early F-106 airplanes (F-106A 56-453 thru 56-466 and F-106B 57-2507) have case XIV wings. Later F-106 airplanes have case XXIX wings. The wings are quite similar in construction, the basic difference being that the case XXIX has more camber. The right and left wing panels are attached to the fuselage by means of bolts through the forged fittings on the wing spars and fuselage frames. Drag angles are also used to attach the wing panels to the fuselage. These drag angles are riveted to the inboard edge of the wing and are attached to the outside surface of the fuselage by means of screws. Each wing panel consists of an interspar section with integral fuel tanks, a cambered leading edge, a cambered wing tip, a main landing gear and landing gear fairing, an elevon, outboard elevon actuator fairing, and provisions for the external mounting of droppable fuel tanks. Wing stations are shown on figure 2-2. The F-106A and F-106B airplanes incorporate nine integral fuel tanks. There are four fuel tanks in each wing, identified as No. 1, No. 2, No. 3 and "T" tanks. The F-106A center of gravity control transfer system consists of the "F" tank in the fuselage and the "T" (transfer) tank in the trailing edge structure of each wing. Refer to paragraph 2-4 for the location of the wing fuel tanks Nos. 1, 2 and 3, and the "T" (transfer) tank. See figure 4-1 for the location of the fuselage "F" tank.

2-3. DESCRIPTION OF WING COMPONENTS.

2-4. Interspar Structure.

2-5. The interspar structure is fabricated principally of 7075-T6 aluminum alloy. This structure consists basically of chordwise ribs and spanwise spars to which machined, stressed skin is riveted. The three main integral fuel tanks are contained in this interspar structure between the number 1 and number 6 spars and the wing closing rib; the "T" or transfer tank is located between the number 6 and number 7 spars. All fuel tanks within the interspar structure are designed with machined fuel-tight corner fittings. Small openings in the chordwise ribs permit an even distribution of fuel within each tank. Figure 2-3 illustrates the wing structure and Figure 2-4 shows the location of the fuel tanks.

2-6. Spars and Ribs.

2-7. The wing leading edge spar and the number 7 spar are of built-up construction. Number 2, 3, 4, 5, and 6 spars are constructed of machined forgings. The spanwise spars extend at an angle of 90 degrees from the centerline of the airplane and are interconnected by a series of closely spaced chordwise ribs. The main landing gear attaches to the trunnion mounts on the number 3 and 4 wing spars. See figure 5-4 for the location of the trunnion mounts on the wing spars. The built-up ribs consist of upper and lower extruded rails which are joined together with stiffener reinforced webs. The inboard bulkheads incorporate a series of heavy-gage press-formed brackets and clips to provide attachment for the wing plating and wing to fuselage drag angles.

2-8. Wing Plating.

2-9. The wing plating is made of highly stressed, heavy gage, bare aluminum alloy. Figures 2-5 and 2-6 show the wing plating and the alloy designation for each section of wing plating. Refer to paragraph 2-35 for information concerning repairs to the wing plating. The wing plating is installed with the machined surfaces inside the fuel tank area. Machining provides for the heaviest gages at the points of attachment to the ribs and spars, eliminating doublers and fillers. The requirements for maximum aerodynamic smoothness are partially achieved by machining the large wing skins on the inner surface so that internal ribs, doublers, and fillers are an integral part of the skin. This practice increases rigidity and reduces the tendency of skin buckling, with the attendant effects of disrupted airflow and vibration. The number of outside seams is also reduced, and the existing ones are filled with aerodynamic smoothing compound. Plating above the main landing gear area is of uniform thickness and is attached by means of standard flush-head fasteners. Access doors are located throughout the plating area of the lower wing surface to provide access to all internal areas. The access doors are machined to provide a flush installation and to preserve the aerodynamic characteristics of the wing surfaces.

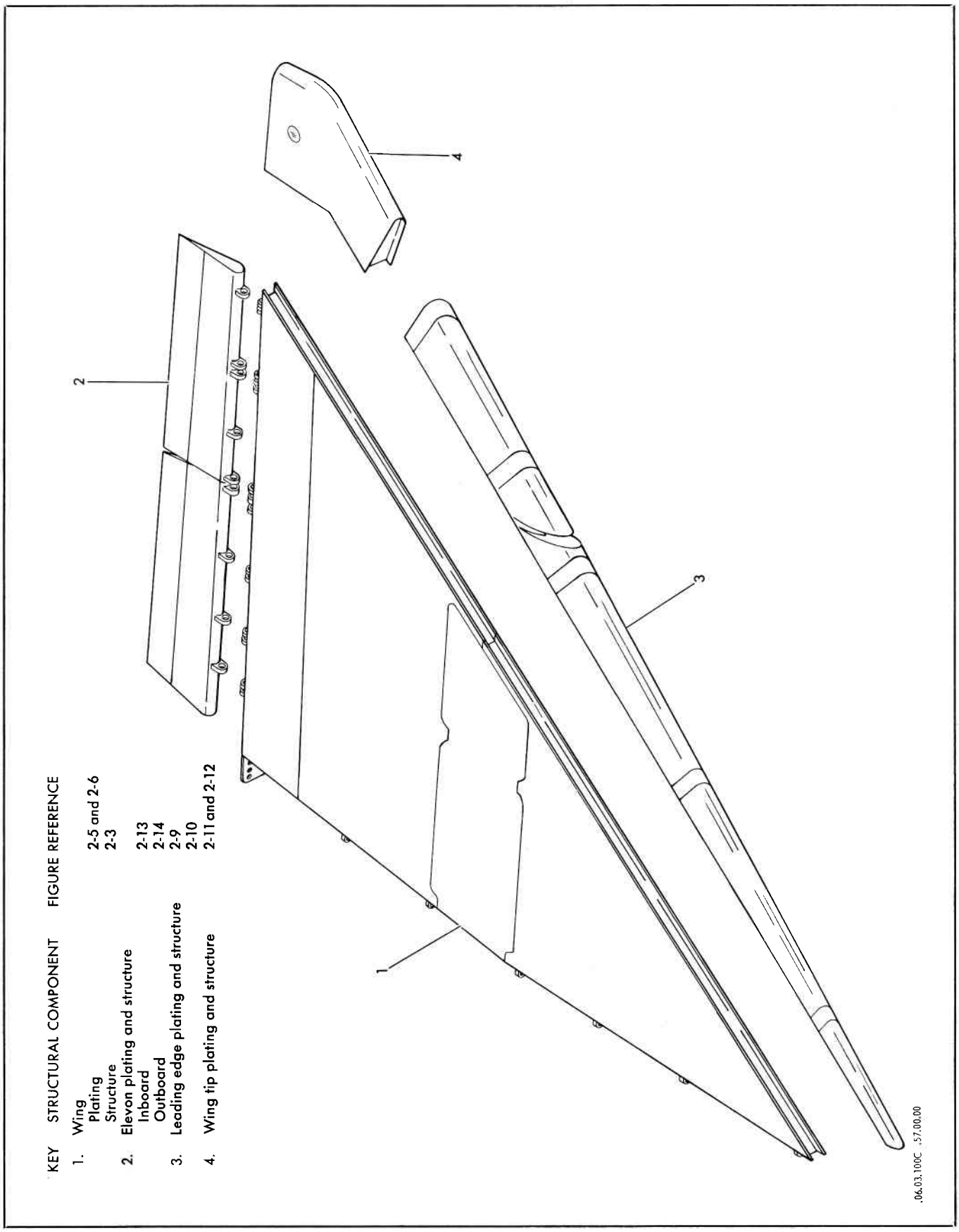


Figure 2-1. Wing Group Components and Index

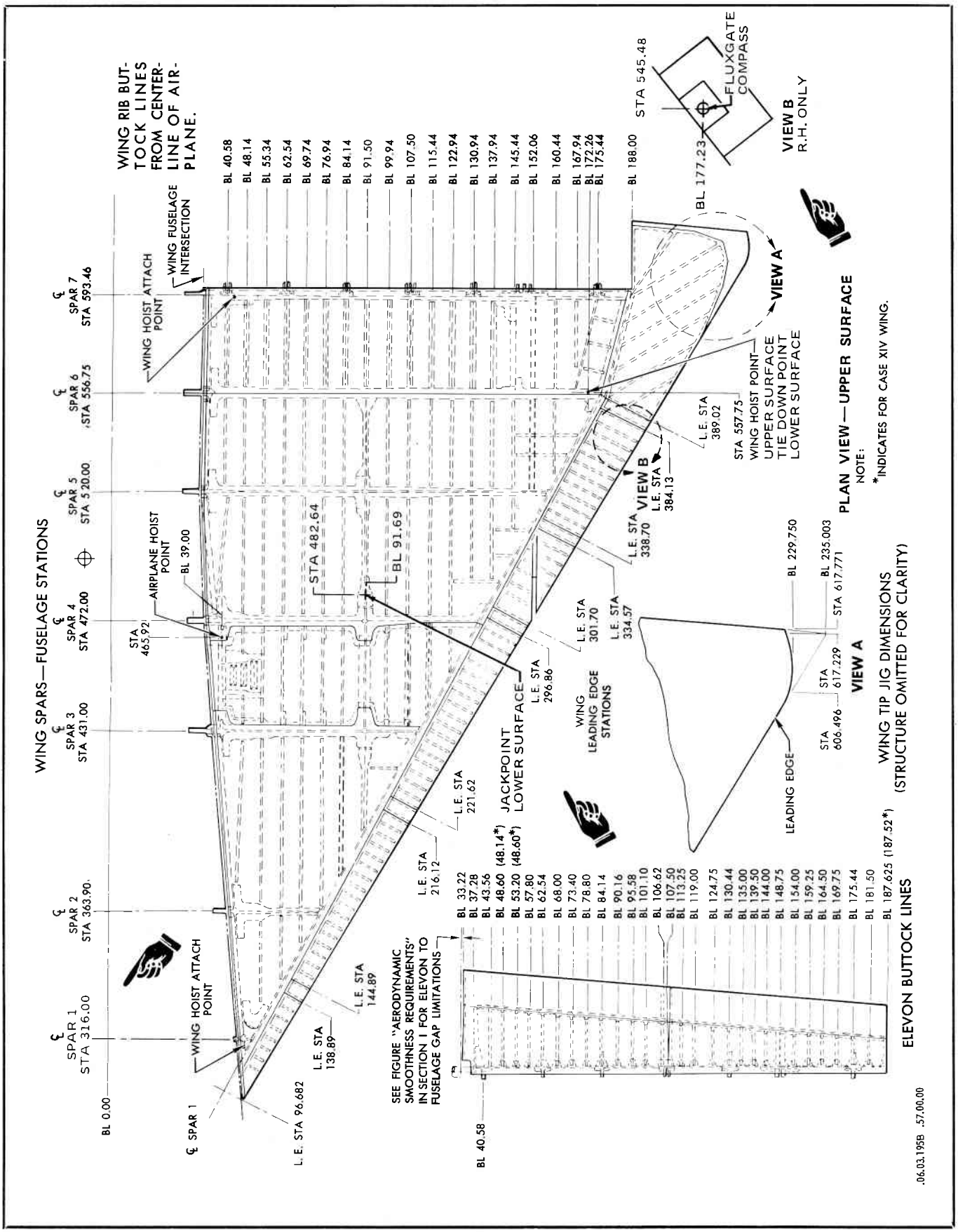


Figure 2-2. Wing Station Diagram

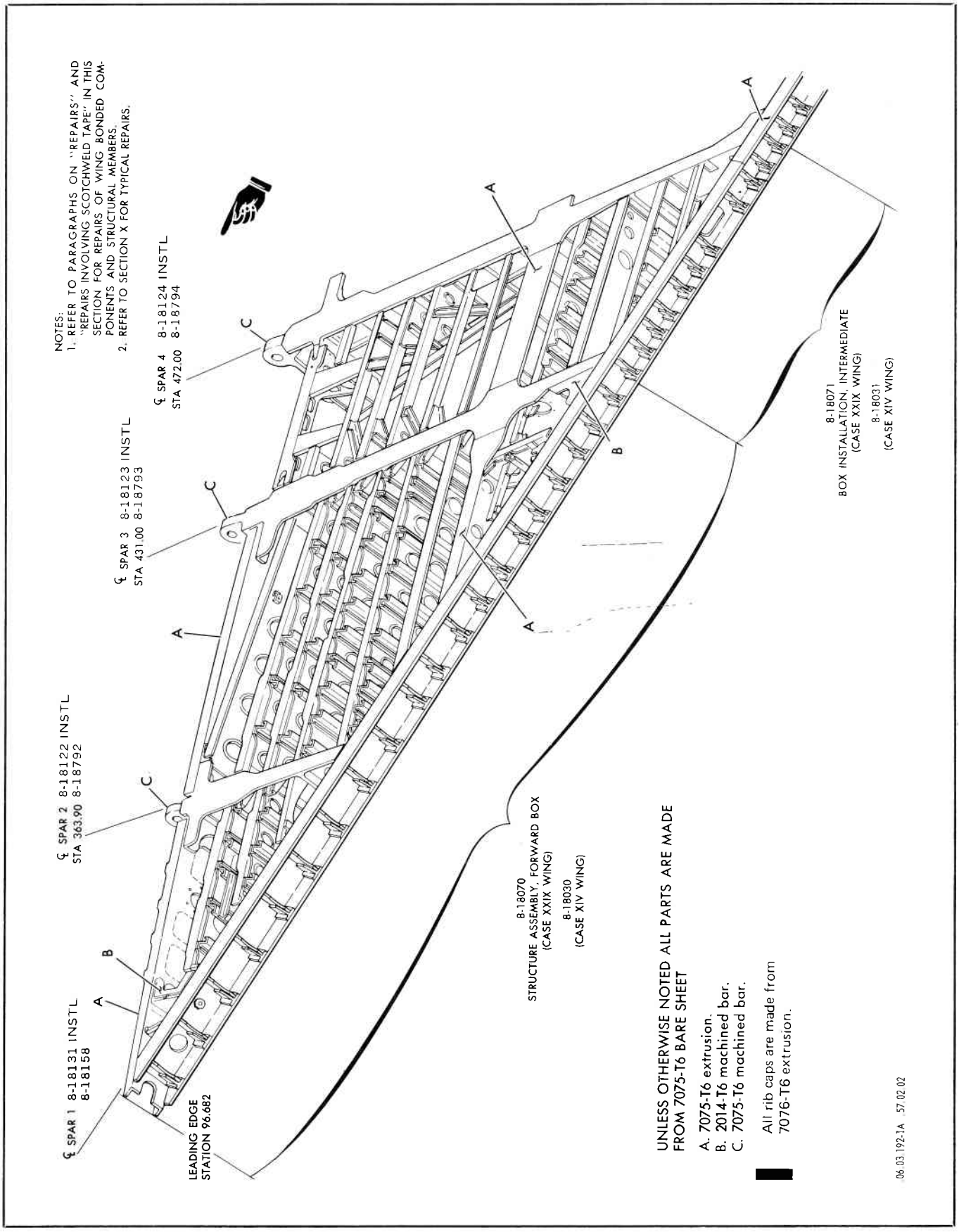


Figure 2-3. Wing Structure (Sheet 1 of 2)

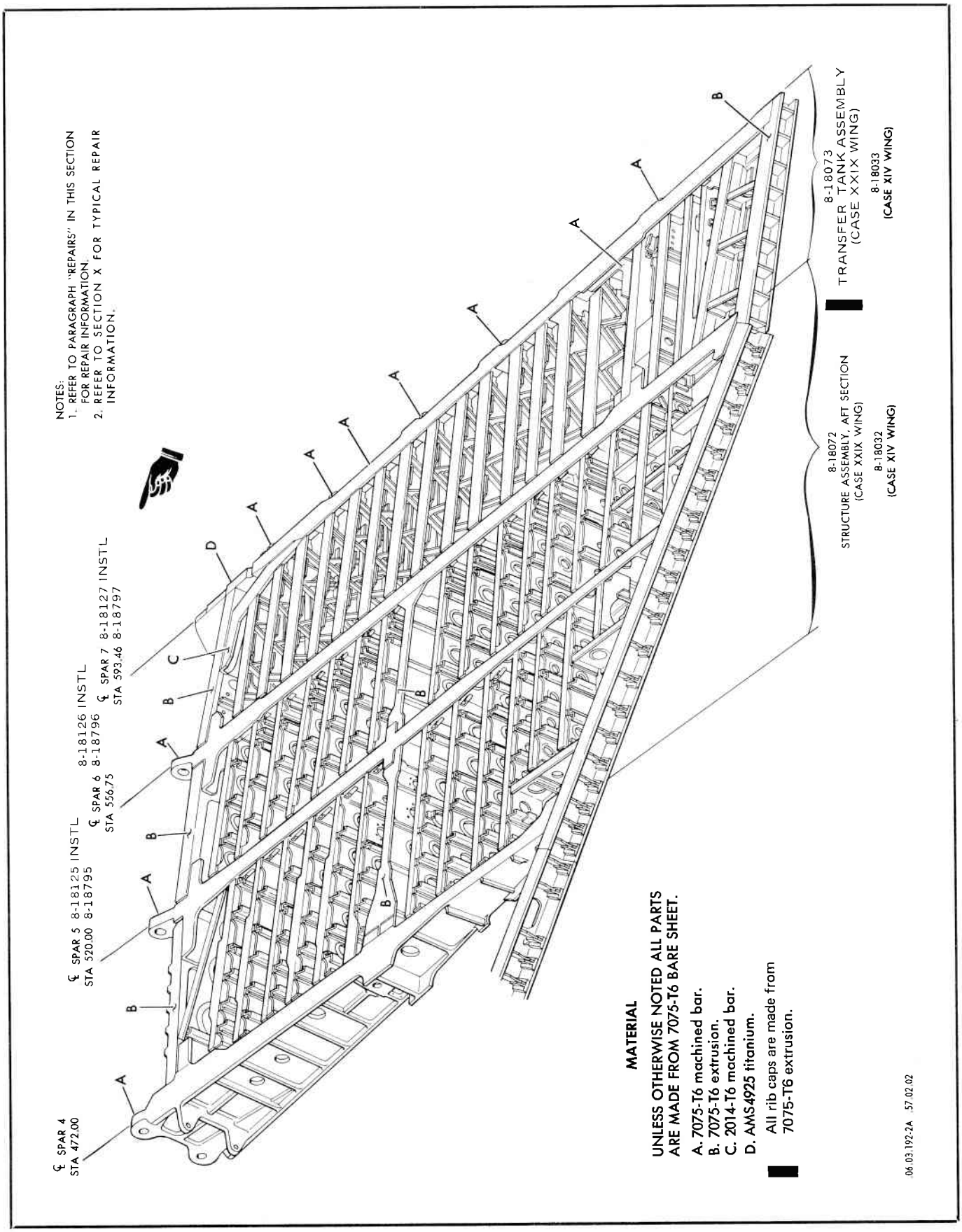
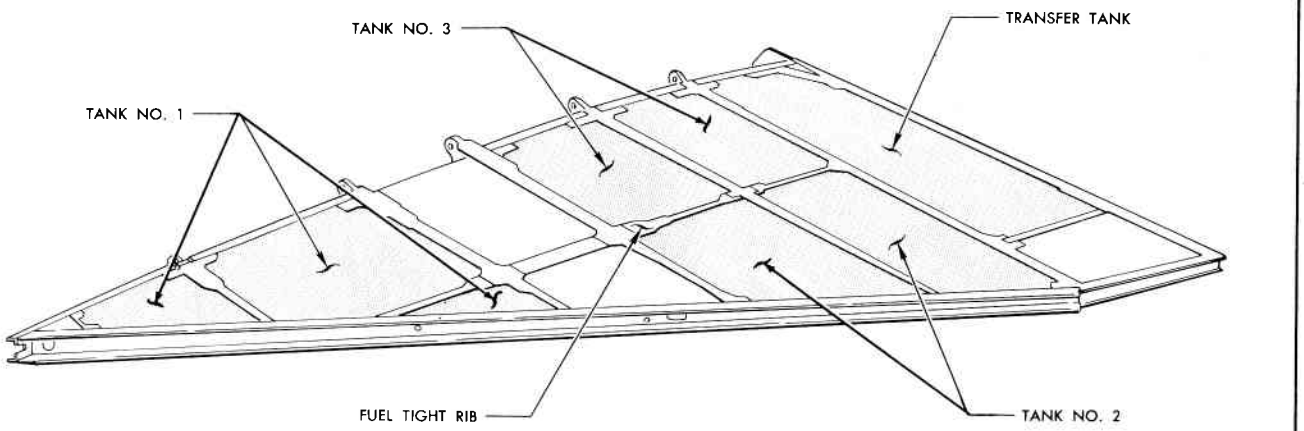


Figure 2-3. Wing Structure (Sheet 2 of 2)



NOTE:
FOR REPAIRS AND TESTS ON INTEGRAL FUEL TANKS, REFER TO PARAGRAPHS "PREPARATION FOR FUEL LEAK REPAIR," "REPAIRS," AND "FUEL TANK LEAK TEST," IN THIS SECTION.

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Figure 2-4. Wing Fuel Tank Area

2-10. Wing Attachment.

2-11. The wing is attached to the fuselage with bolts through the wing spars and spar fittings on the fuselage bulkheads, and by drag angles riveted to the inboard edge of the wing and attached to the outside surface of the fuselage with screws. No drilling or reaming is required for the installation of a new wing at the forged fitting attach points. Some match-drilling of screw holes in the drag angles is required. Otherwise the wing is completely interchangeable. Number 1 spar attaches to the fuselage with one bolt; numbers 2, 3, 4, 5, and 6 spars are connected to the fuselage with two bolts, and number 7 spar is attached to the fuselage with a web attachment requiring ten bolts. Detailed instructions giving torque values, type of fittings, special tools, and equipment required for the installation and removal of the wings are given on figure 2-7. Since original installation wing attachment fittings do not require bushings, wing attachment fittings that have become worn or damaged may require bushings to be within tolerances when a new wing is attached. See figure 2-8 for information on bushed fitting repairs.

2-12. Wing Leading Edge.

2-13. The wing leading edge sections are cambered to maintain the airfoil in a given contour specifically for the purpose of improving the aerodynamic characteristics of the wing. See figures 2-9 and 2-10 for details of the wing leading edge construction. The basic construction consists of medium-gage press-formed, aluminum alloy ribs, doublers, and fillers riveted to extruded angles in sections. A short section located between leading edge stations 301.70 and 338.70 provides additional ribs and angles for reinforcement of the leading edge slot. The leading edge slot controls outward air flow over the wing similar to a wing fence but with less drag. Leading edge sections are secured to the wing leading edge spar by means of screws through gang channel nuts. The gang channels are riveted to the inner flange of the wing leading edge spar. The leading edge does not provide for anti-icing.

2-14. Wing Tip.

2-15. The wing tip attached to the Case XIV wing consists basically of spanwise, press-formed channel spars and chordwise ribs as shown on figure 2-11. Two "tee" shaped rails are riveted together to form the main spar at the point of attachment to the wing trailing edge closing rib. Light-weight machined magnesium castings form the leading edge, corner, and trailing edge of the structure. The inner structural parts are riveted together

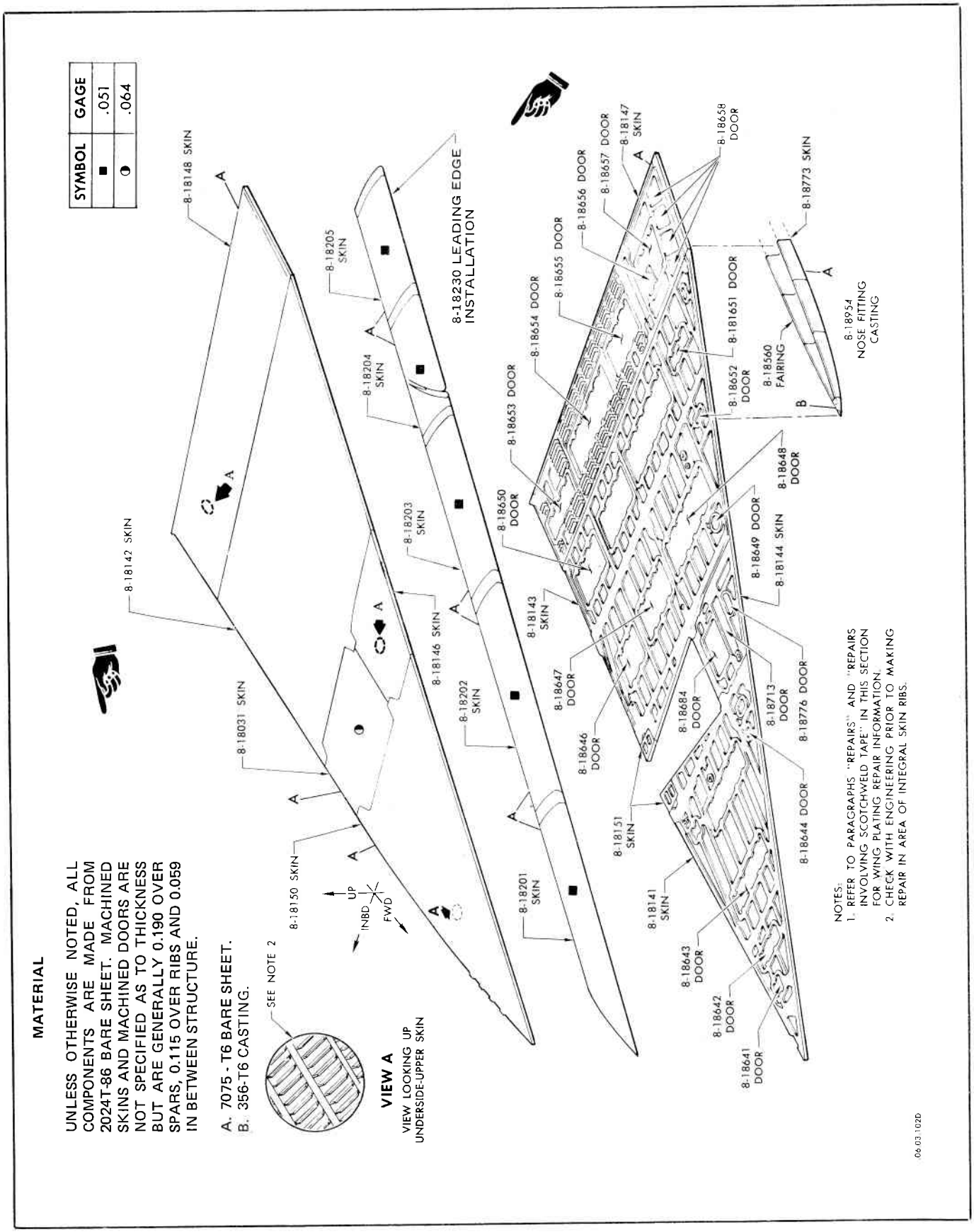


Figure 2-5. Case XIV Wing Plating Diagram
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

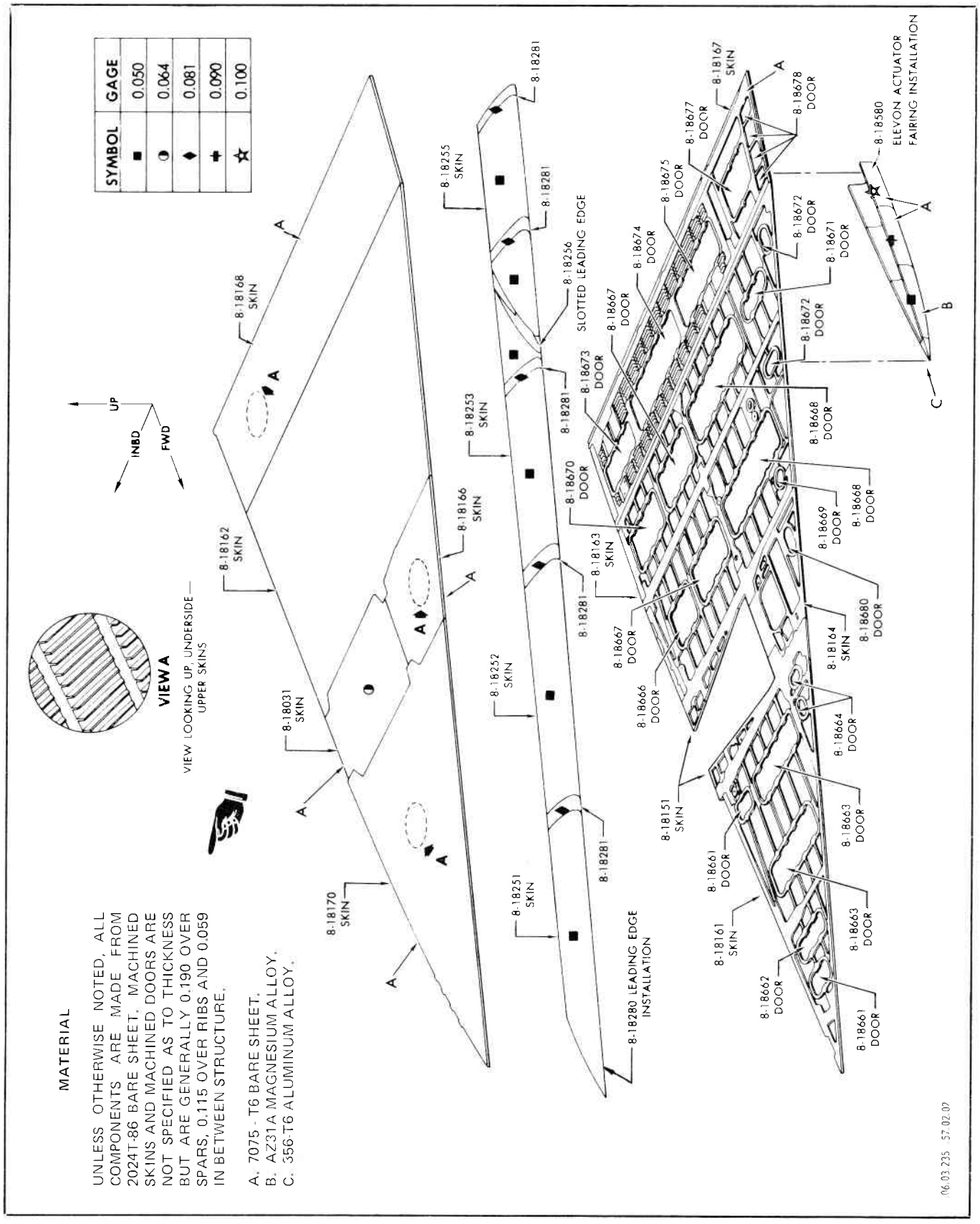
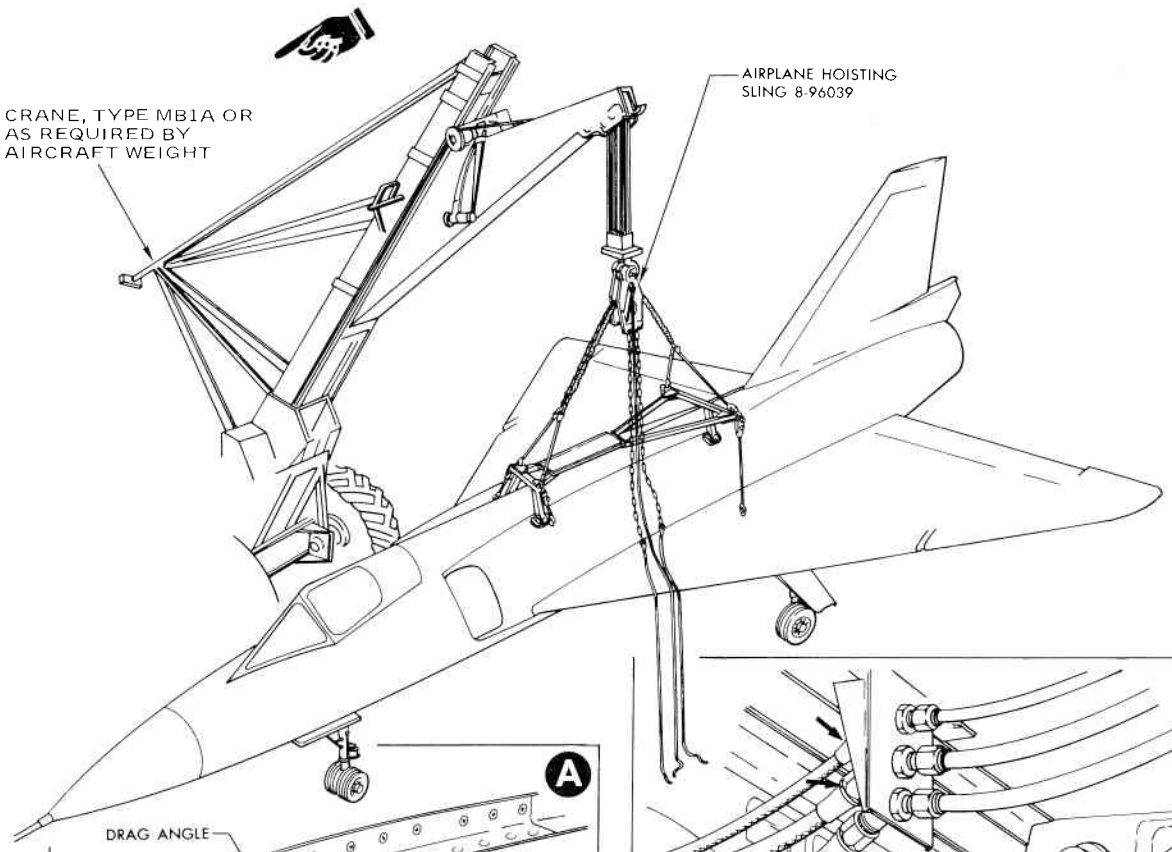
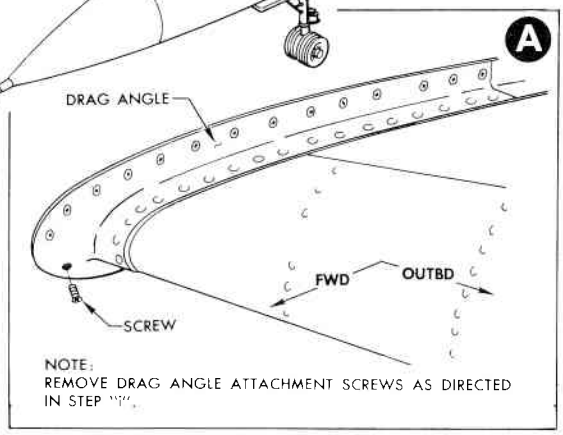
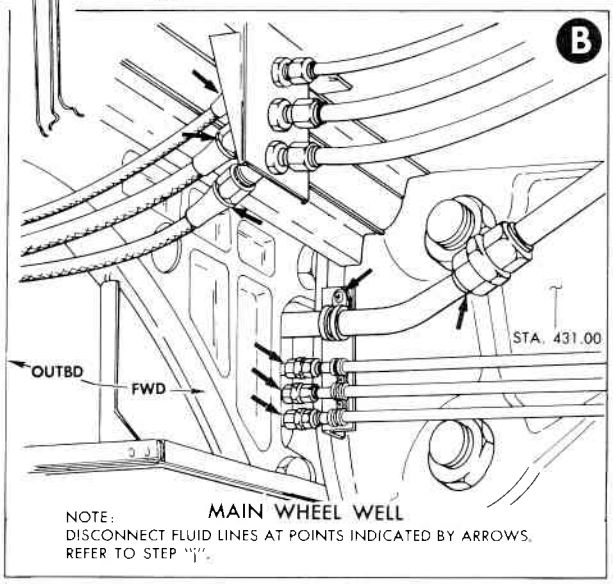
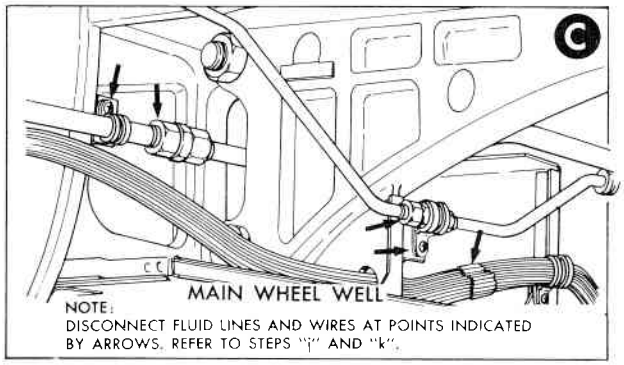


Figure 2-6. Case XXIX Wing Plating Diagram
Applicable to F-106A airplanes 57-230 and subsequent, and F-106B airplanes 57-2508 and subsequent





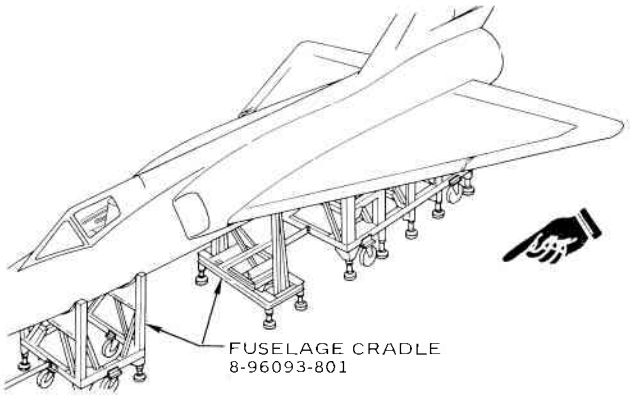


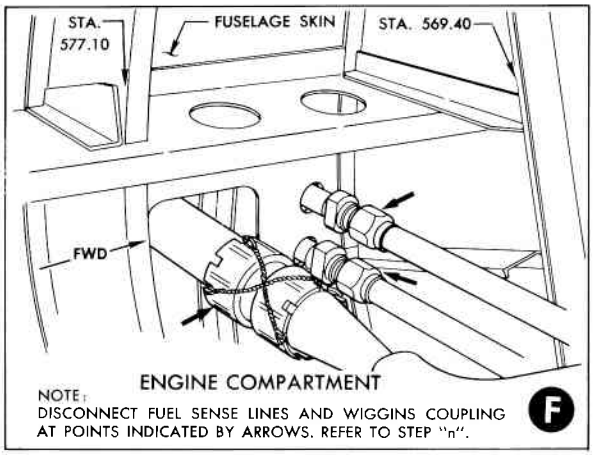


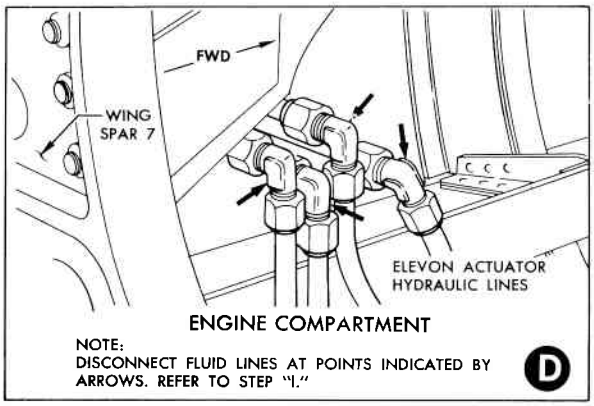
WING REMOVAL

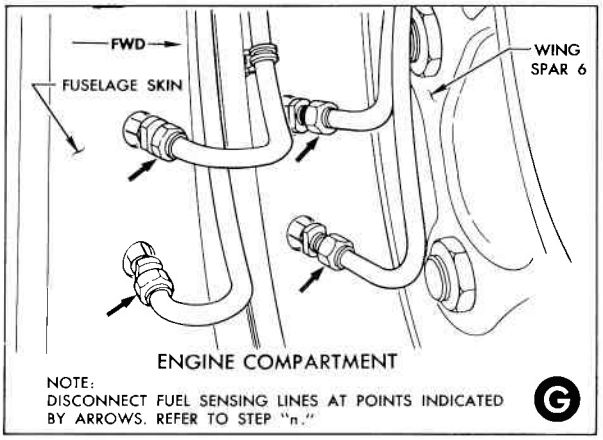
a. Defuel airplane and remove external fuel tanks if installed. Refer to T.O. 1F-106A-2-5-2-1 for procedure.
b. Jack airplane and remove tailcone and engine. Refer to T.O. 1F-106A-2-4-2-1 for procedure.
c. Remove electrical power from airplane. Remove battery as directed in T.O. 1F-106A-2-10-2-1.
d. Remove the fuselage main landing gear doors and fairings and the ram air turbine doors as directed in T.O. 1F-106A-2-8-2-1. Disconnect the missile bay door actuators as directed in T.O. 1F-106A-2-12-2-1 and allow doors to hang free.
e. Lower aircraft onto landing gear and remove jacks.
f. Attach airplane hoisting sling assembly, 8-96039 to airplane. Refer to illustration titled "Airplane Hoisting" in Section 1 for procedure. Hoist airplane off ground.
g. Retract nose landing gear, using the manual retraction procedure. Disconnect nose gear door actuator and close nose landing gear door manually. Refer to T.O. 1F-106A-2-8-2-1 for procedure.

Figure 2-7. Wing Replacement (Sheet 1 of 5)



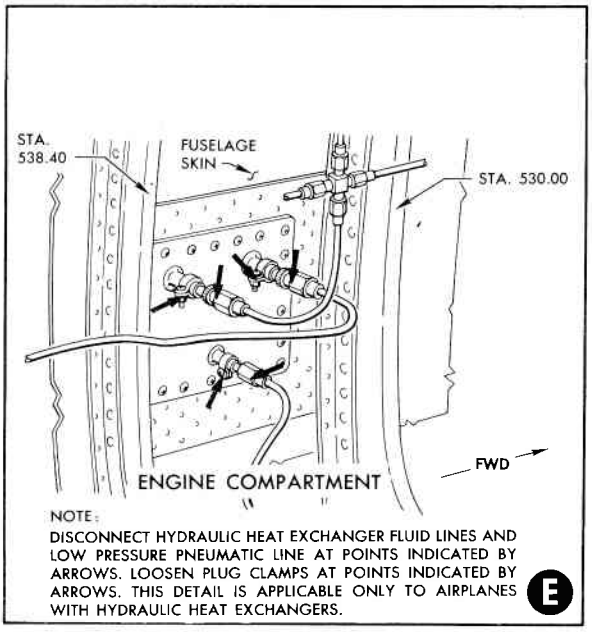






WING REMOVAL (Cont'd)

h. Position fuselage cradle 8-96093-801 and lower airplane onto cradle.



i. After removal of 8-96039 airplane hoisting sling assembly, remove drag angle-to-fuselage attachment screws as shown in Detail A.

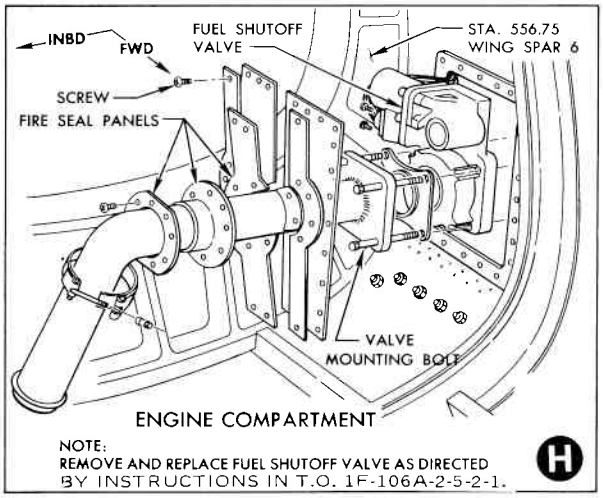


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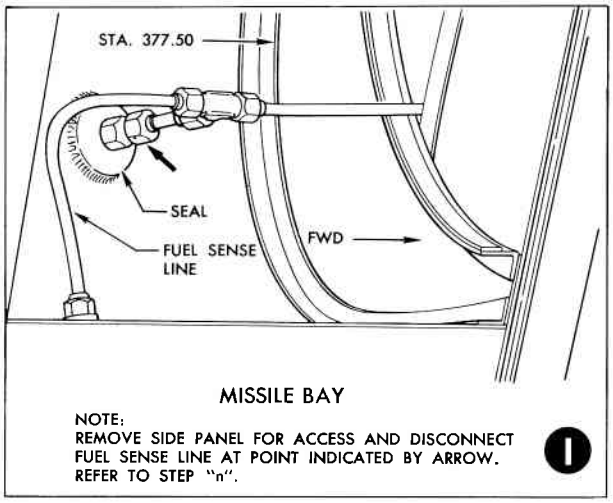
Figure 2-7. Wing Replacement (Sheet 2 of 5)



j. Remove elevon by procedure outlined in T.O. 1F-106A-2-7-2-1. Remove main landing gear from wing; refer to T.O. 1F-106A-2-8-2-1. Disconnect main landing gear hydraulic lines as shown in Detail B and C.

k. Disconnect all wing circuit electrical wires at permanent splices in harness located in main wheel well. Refer to T.O. 1F-106A-2-10-2-1 for wiring diagrams. Identify each wire to facilitate reinstallation. See Detail C.

l. Disconnect elevon actuator hydraulic lines as shown in Detail D.

m. Disconnect hydraulic heat exchanger lines and low pressure pneumatic line as shown in Detail E. This step applies only to airplanes with hydraulic heat exchangers in the wings.

n. Disconnect fuel lines as shown in Details F through K. Refer to T.O. 1F-106A-2-5-2-1 for detailed information.

o. Remove rivets as required (approximately 12 each) from AC exciter regulator and DC control support assembly, part No. 8-65078, located at approximately station 465.00 in right hand main wheel well.

p. Remove nuts from bolts in all wing-to-fuselage attach fittings as shown in Details L and M.

q. Place a suitable padded prop under opposite wing to maintain airplane balance when wing is removed.

r. Attach wing hoisting sling assembly, 8-96004 as shown below.

s. Support wing with hoist and remove bolts from all wing-to-fuselage attach fittings.

t. Pull wing outboard until all lines and fittings are free: remove wing.

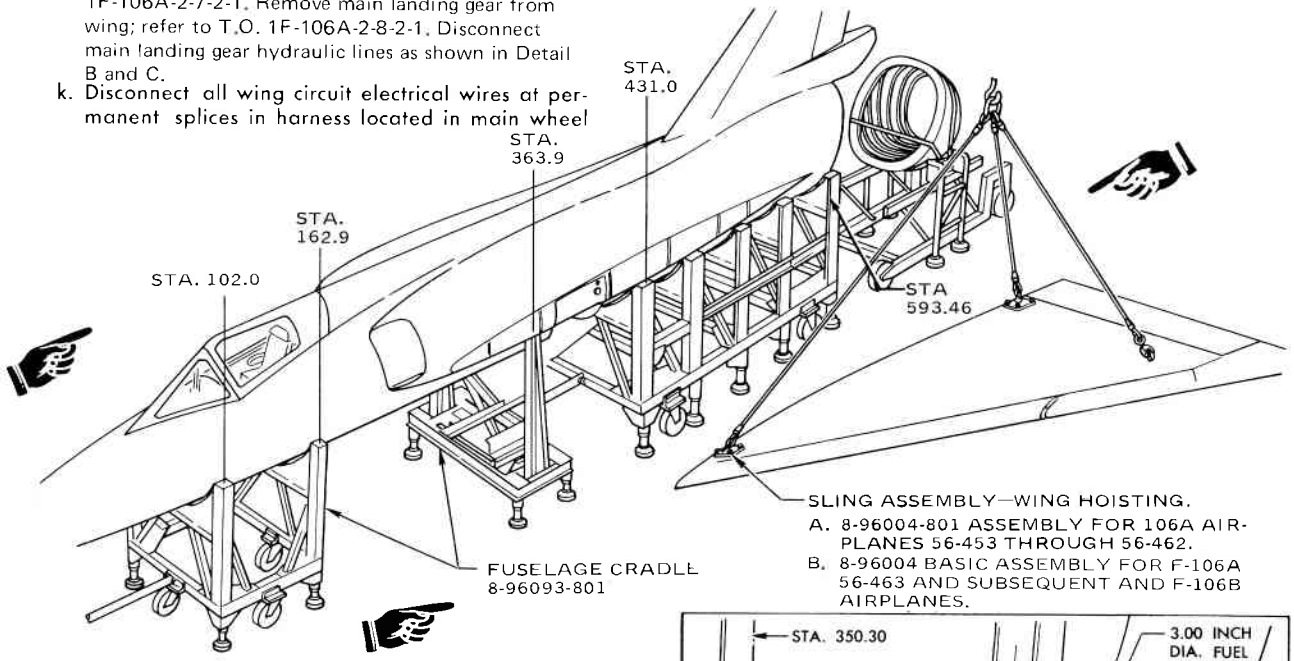
INSTALLATION:

To install wing, perform removal steps in reverse order and observe the following:

a. Prior to installing wing attach bolts, insert one aligning pin, 8-96096 in each wing attach fitting except at spar No. 7. Chill pins in refrigerator to ease installation.

b. Install and torque wing attach bolts according to the table on sheet 4.

c. When assembling Wiggins couplings, torque size -12D to 8-10 foot-pounds and size -16D to 10-13 foot-pounds.



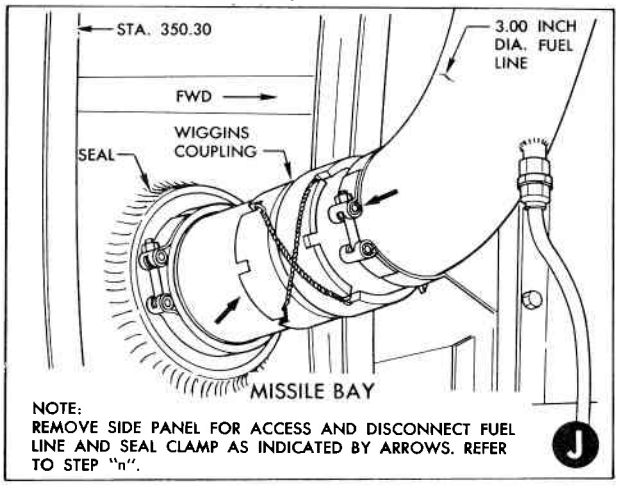


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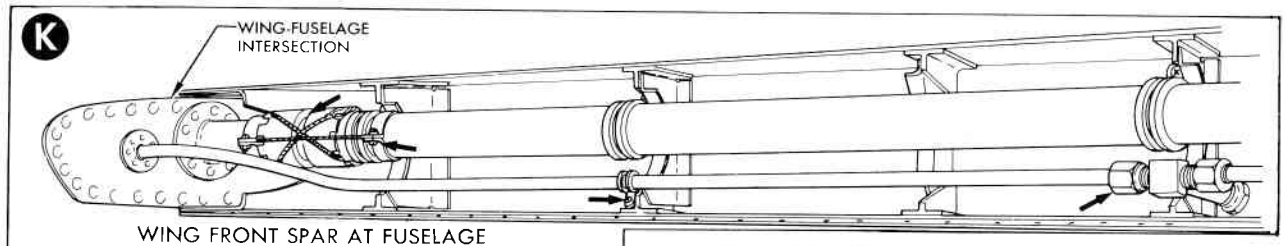
Figure 2-7. Wing Replacement (Sheet 3 of 5)

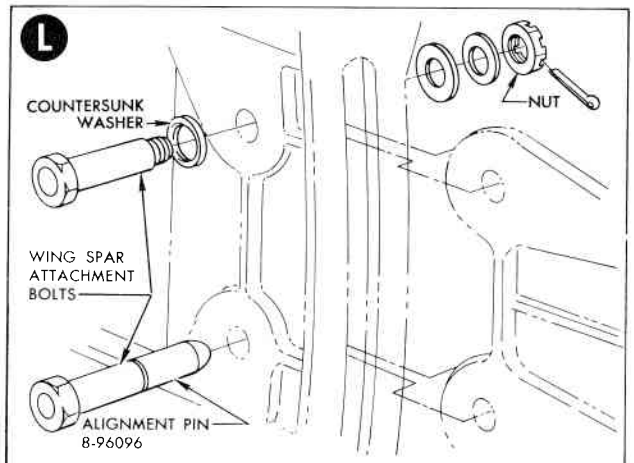


WING FRONT SPAR AT FUSELAGE

NOTE:
REMOVE INBOARD LEADING EDGE SECTION AND DISCONNECT FUEL VENT LINE WIGGINS COUPLING AND FUEL SENSE LINE AT POINTS INDICATED BY ARROWS. REFER TO STEP "n".

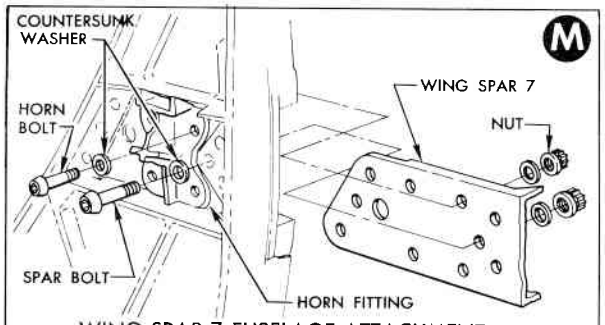
INSTALLATION (Cont'd)

d. After assembling operations are completed, bleed air from hydraulic system. Refer to T.O. 1F-106A-2-3-2-1 for procedure.
e. Perform elevon operation check. Refer to T.O. 1F-106A-2-7-2-1 for procedure.
f. Perform fuel system operation checks. Refer to T.O. 1F-106A-2-5-2-1 for procedures.
g. Perform landing gear operation check. Refer to T.O. 1F-106A-2-8-2-1 for procedure.
h. Check operation of wing tip and landing lights. Refer to T.O. 1F-106A-2-10-2-1.



WING SPAR-FUSELAGE ATTACHMENT

NOTE:
USE 3/8 INCH ALLEN WRENCH TO SCREW ALIGNMENT PINS ON ENDS OF WING BOLTS. TYPICAL FOR WING SPARS 2, 5 AND 6.



WING SPAR 7-FUSELAGE ATTACHMENT

NOTE:
TORQUE SIX SPAR BOLTS AND FOUR HORN BOLTS WITHIN LIMITS GIVEN IN TABLE BELOW.

SPAR NO.	BOLT DIRECTION	BOLT AND WASHER	NUT AND WASHER	TORQUE (INCH-POUNDS)
1	NUT AFT	(1)NAS464-8-22 (1)MS20002-C8	(1)AN320-8 (1)AN960-816	40 TO 80
2	NUTS AFT	(2)8-18941-15 (2)MS20002-C16	(2)AN320-14 (2)8-18930-11 (2)AN960-1416L	100 TO 200
3	NUTS FWD	(2)8-18941-13 (2)8-17975-7	(2)AN320-20 (2)8-17975-13 (2)AN960-2016L	100 TO 200
4	NUTS AFT (SEE NOTE 2)	(2)8-18941-11 (2)8-17975-7	(2)AN320-20 (2)8-17975-13 (2)AN960-2016L	100 TO 200
5	NUTS AFT	(2)8-18941-9 (2)MS20002-C20	(2)AN320-16 (2)8-18930-9 (2)AN960-1616L	100 TO 200
6	NUTS AFT	(2)8-18941-7 (2)8-18930-7	(2)AN320-20 (2)8-18930-13 (2)AN960-2016L	100 TO 200
7	NUTS AFT	(3)MS20012-18 (3)MS20012-22 (6)MS20002-C12	(6)42FW-1216 (6)MS20002-12	2300 TO 2500
7 (HORN FITTING)	NUTS AFT	(2)MS20010-28 (2)MS20010-30 (4)MS20002-C10	(4)42FW-1018 (4)MS20002-10	1100 TO 1300

NOTE:
1. PROCEDURE 42FW-1018 AND -1216 NUTS FROM STANDARD PRESSED STEEL COMPANY, JENKINTOWN, PA.
2. UPPER LEFT ATTACH BOLT IS INSTALLED WITH NUT FORWARD.

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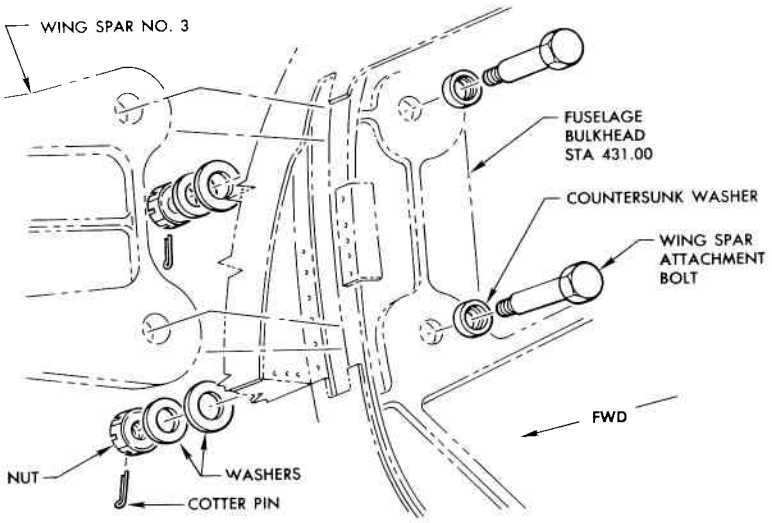
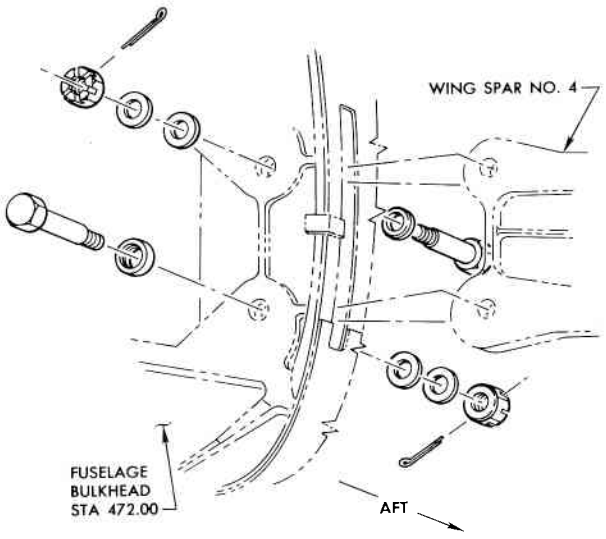
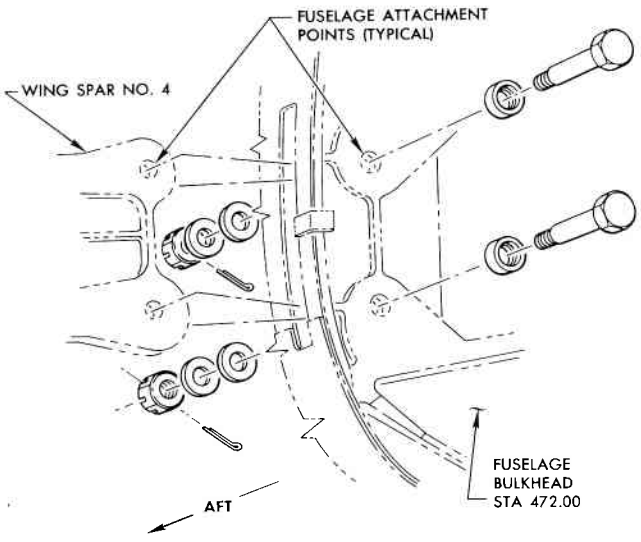
Figure 2-7. Wing Replacement (Sheet 4 of 5)



LEFT NO. 3 WING SPAR—FUSELAGE ATTACHMENT



LEFT NO. 4 WING SPAR—FUSELAGE ATTACHMENT



RIGHT NO. 4 WING SPAR—FUSELAGE ATTACHMENT

NOTE:
SEE SHEET 4 FOR WING ATTACHMENT HARDWARE PART NUMBERS.

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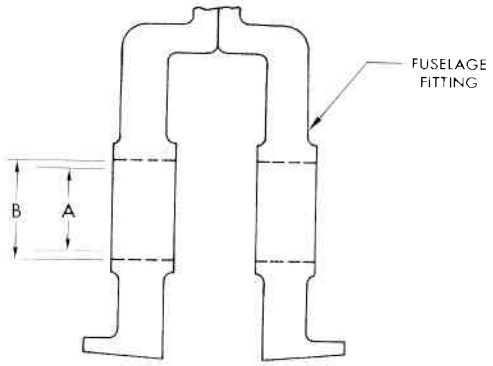
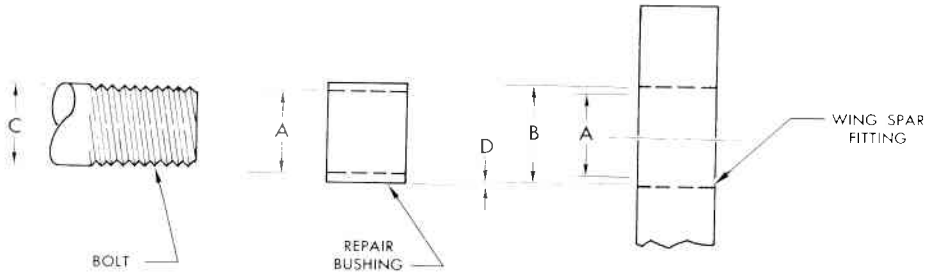
Figure 2-7. Wing Replacement (Sheet 5 of 5)

NOTES:
1. MAKE BUSHINGS FROM SAE4130 OR SAE8630 STEEL. HEAT TREAT TO 125,000 TO 150,000 PSI TENSILE STRENGTH PER SPECIFICATION MIL-H-6875.
2. CADMIUM PLATE ALL BUSHINGS SURFACES PER SPECIFICATION QQ-P-416. DIMENSIONS TO BE MET AFTER PLATING.
3. BUSHINGS SIDES TO BE PARALLEL AND CONCENTRIC WITHIN 0.003 INCH TOTAL INDICATOR READING.
4. BUSHINGS TO RECEIVE MAGNETIC INSPECTION PER SPECIFICATION MIL-I-6868.
5. MAINTAIN 0.06 INCH MINIMUM BUSHING WALL THICKNESS.





SPAR NUMBER	A		B		C	D
	ORIGINAL FITTING HOLE SIZE	MAXIMUM ALLOWABLE WEAR TOLERANCE	MAXIMUM ALLOWABLE HOLE OVERSIZE		BOLT DIAMETER	BUSHING CLEARANCE
1.	+0.0010 0.5000 −0.0005	+0.0040 0.5000 −0.0005	+0.0010 0.6250 −0.0005		+0.0000 0.4991 -0.0010	±0.0004
			WING	FUSELAGE		
2.	+0.0010 1.0000 −0.0005	+0.0040 1.0000 −0.0005	+0.0010 1.2500 −0.0005	+0.0010 1.1250 −0.0005	+0.0000 0.9990 -0.0020	±0.0005
3.	+0.0010 1.6250 −0.0005	+0.0040 1.6250 −0.0005	+0.0010 1.8750 −0.0005	+0.0010 1.7500 −0.0005	+0.0000 1.6240 -0.0020	±0.0005
4.	+0.0010 1.6250 −0.0005	+0.0040 1.6250 −0.0005	+0.0010 1.8750 −0.0005	+0.0010 1.7500 −0.0005	+0.0000 1.6240 -0.0020	±0.0005
5.	+0.0010 1.2500 −0.0005	+0.0040 1.2500 −0.0005	+0.0010 1.5000 −0.0005		+0.0000 1.2490 -0.0020	±0.0005
6.	+0.0010 1.6875 −0.0005	+0.0025 1.6875 −0.0005	+0.0010 1.9375 −0.0005		+0.0000 1.6865 -0.0020	±0.0005
7.	+0.0010 0.7500 −0.0005	+0.0025 0.7500 −0.0005	+0.0010 0.8750 −0.0005		+0.0000 0.7488 -0.0030	±0.0005
	+0.0010 0.6250 −0.0005	+0.0025 0.6250 −0.0005	+0.0010 0.7500 −0.0005		+0.0000 0.6240 -0.0030	±0.0005

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Figure 2-8. Wing Attachment — Bushed Fitting Repair

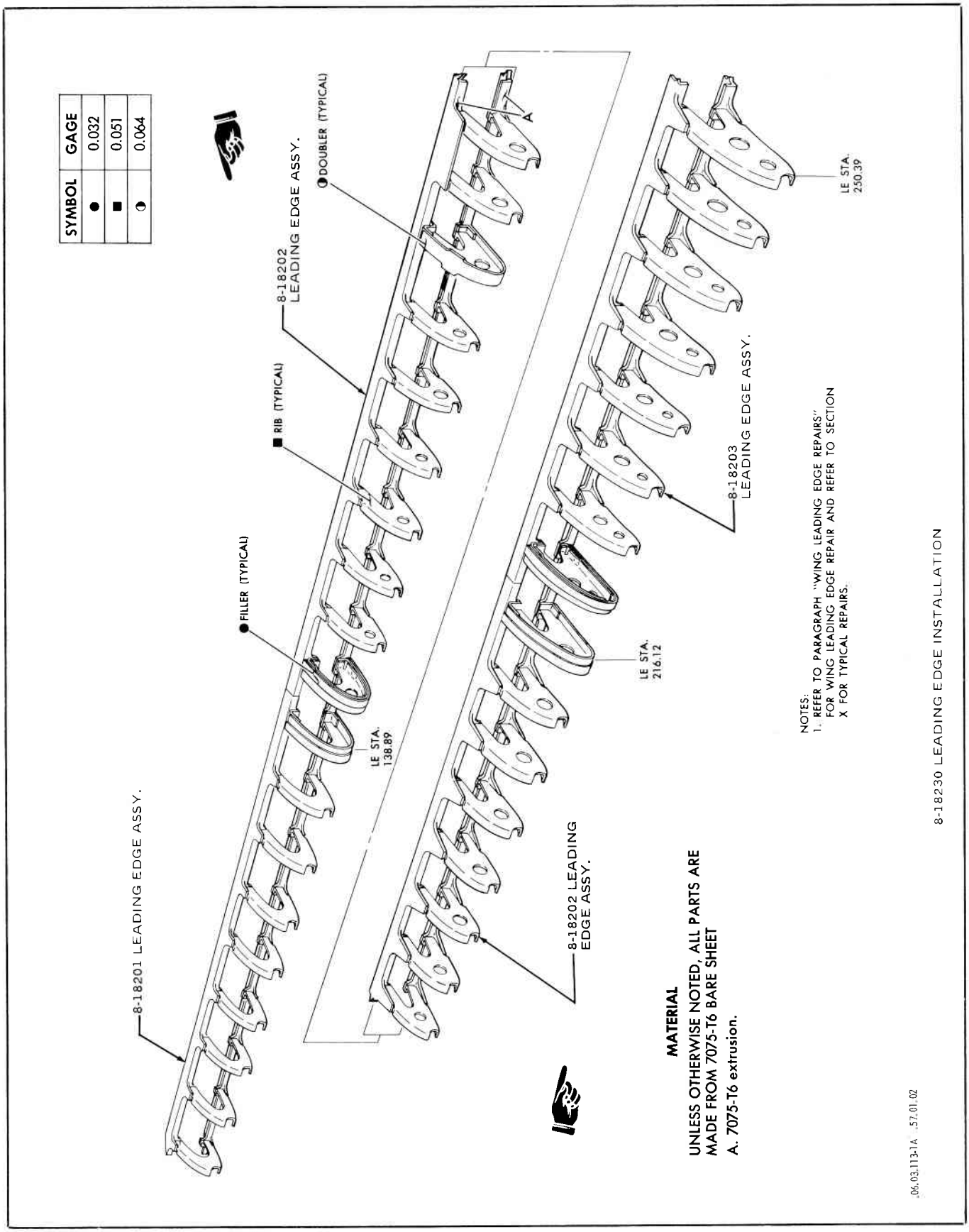


Figure 2-9. Case XIV Wing Leading Edge Structure (Sheet 1 of 2)
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

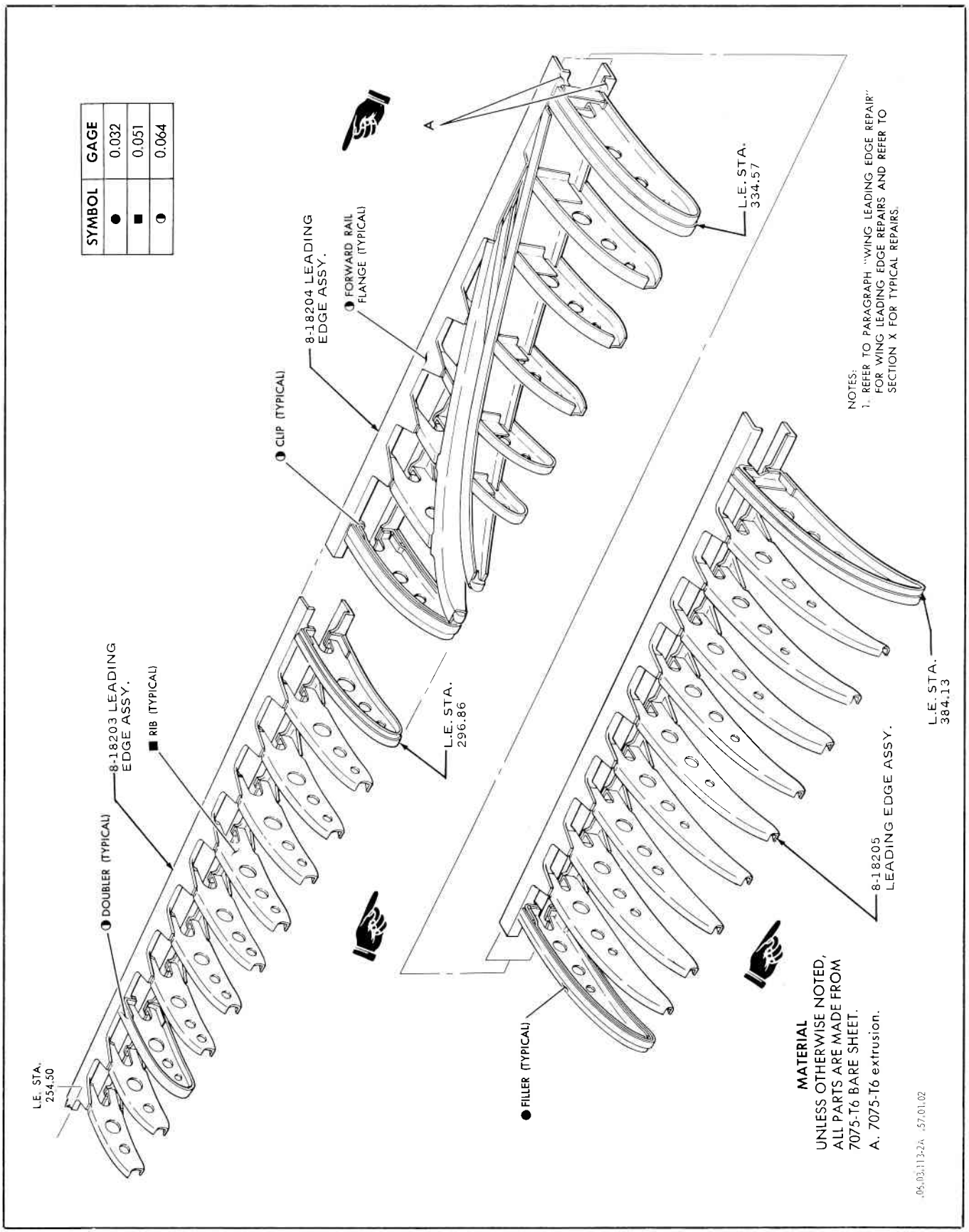


Figure 2-9. Case XIV Wing Leading Edge Structure (Sheet 2 of 2)
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

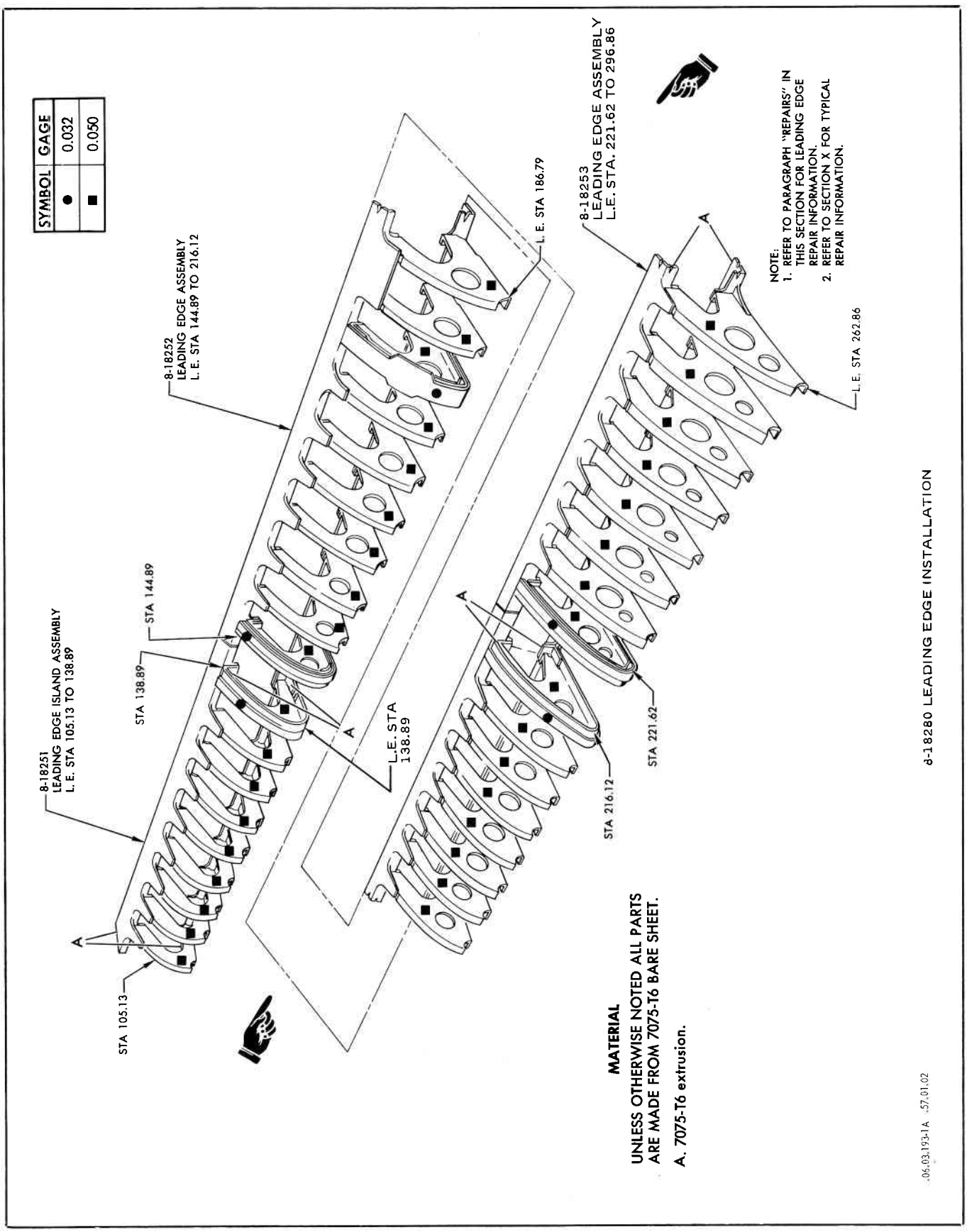


Figure 2-10. Case XXIX Wing Leading Edge Structure (Sheet 1 of 2)
Applicable to F-106A airplanes, 57-230 and subsequent, and F-106B airplanes 57-2508 and subsequent

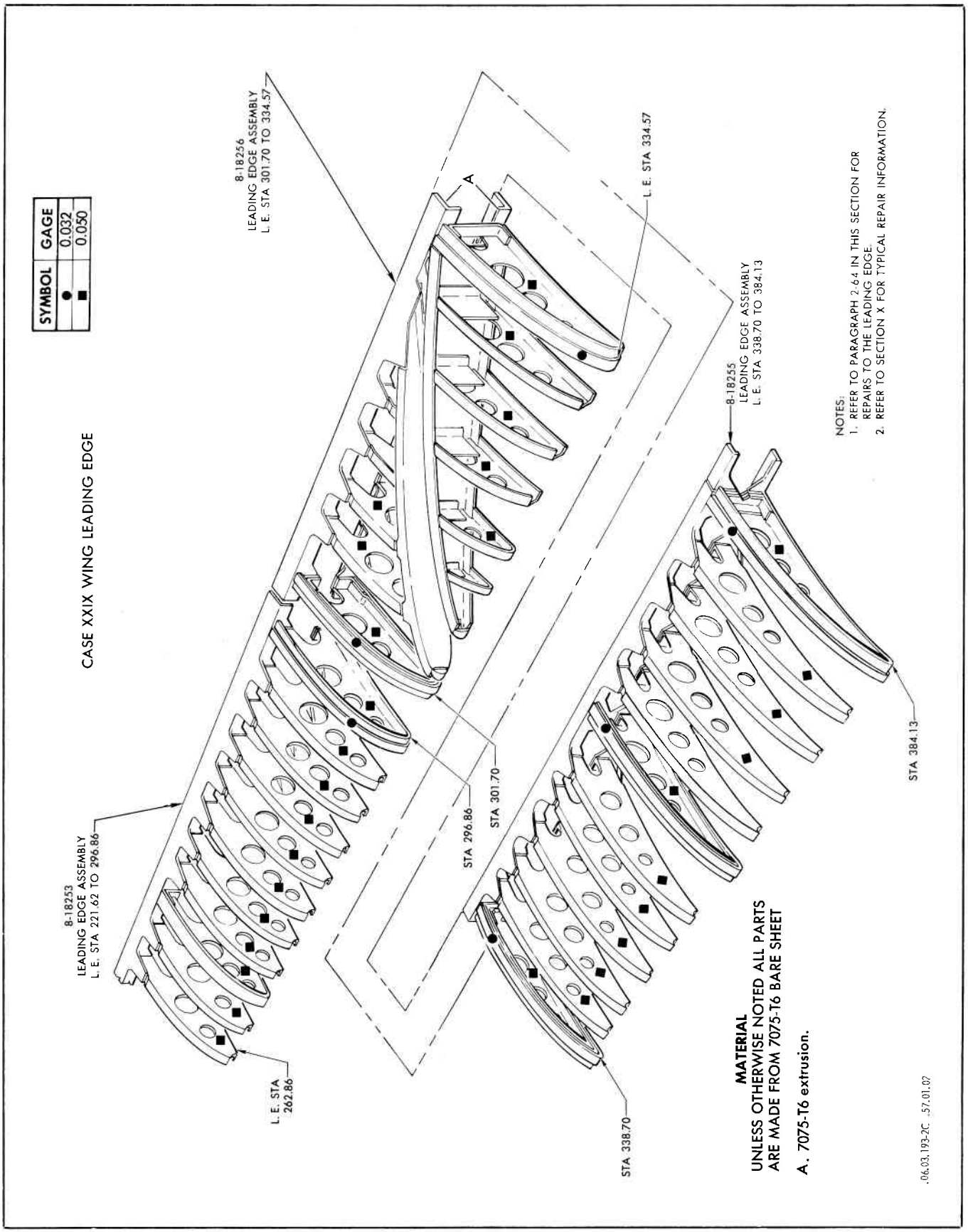


Figure 2-10. Case XXIX Wing Leading Edge Structure (Sheet 2 of 2)

Applicable to F-106A airplanes, 57-230 and subsequent, and F-106B airplanes 57-2508 and subsequent

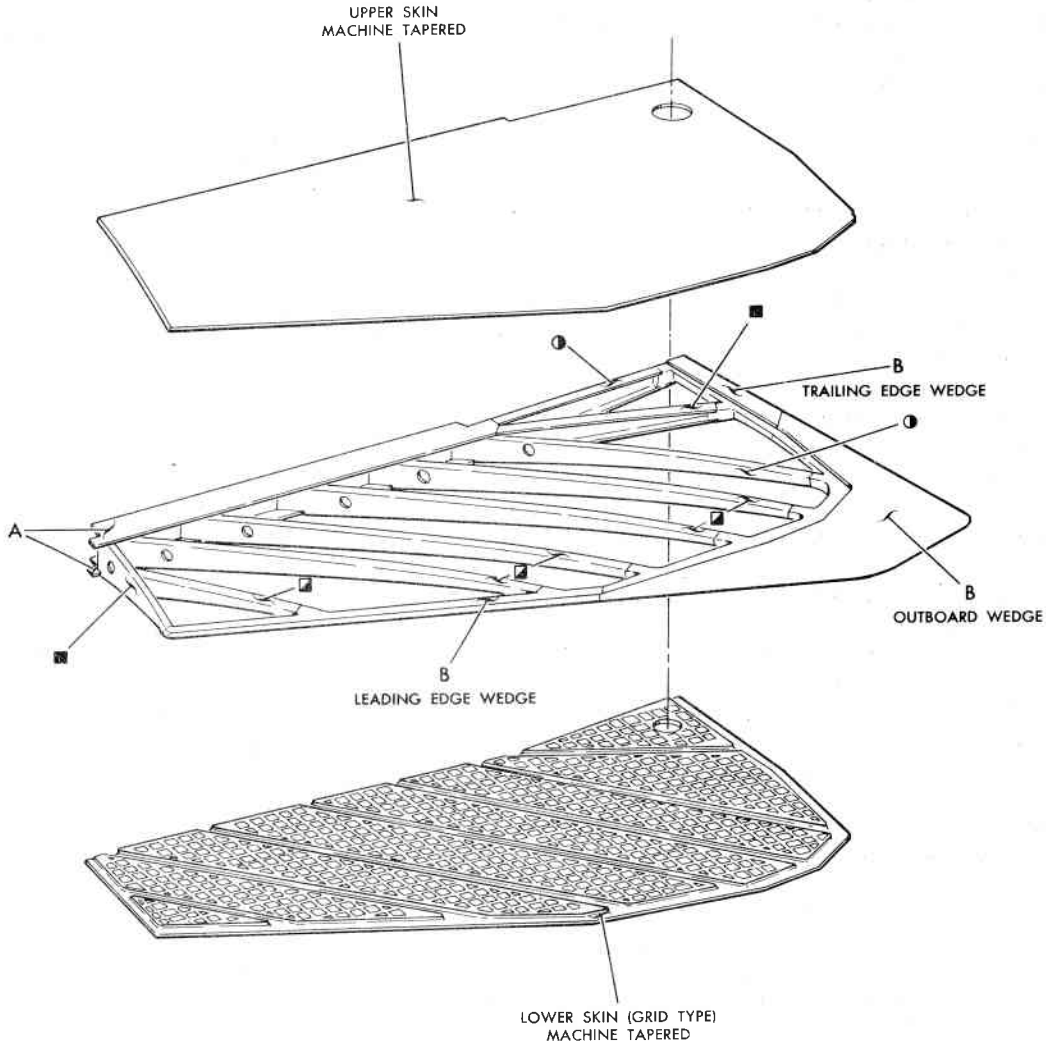
MATERIAL

UNLESS OTHERWISE NOTED ALL PARTS ARE MADE FROM 7075-T6 BARE SHEET.

A. 7075-T6 extrusion.

B. AZ91 magnesium alloy casting.

SYMBOL	GAGE
■	0.051
◑	0.064
◪	0.072



NOTE:
REFER TO PARAGRAPH "WING TIP REPAIR" FOR REPAIRS.

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Figure 2-11. Case XIV Wing Tip Structure and Plating
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

with clips. The structure is enveloped by chemically milled, grid type, 7075-T6 aluminum alloy plating. The wing tip assembly is attached by screws through nut plates attached to the inside flange of the wing rib wing tip support. This type of wing tip is used on *F-106A airplanes 56-453 through 56-466 and on F-106B airplane 57-2507.*

2-16. The wing tip attached to the Case XXIX wing, except for an increase in camber and minor structural differences, is similar to the wing tip used on the Case XIV wing. These wing tips are not interchangeable from one type of wing to the other. See figure 2-12 for an illustration of the Case XXIX wing tip. This wing tip is used on *F-106A airplanes 56-467, 57-229 and subsequent, and on F-106B airplanes 57-2508 and subsequent.*

2-17. Elevon.

2-17A. The elevon structure is divided into an inboard and an outboard section, as shown on figures 2-13 and 2-14. The primary structural portion of each section consists of an aluminum alloy torque box covered with machine tapered plating. Each section also incorporates a metal honeycomb trailing edge. The two elevon sections are attached to number 7 spar by means of forged aluminum hinge fittings. Each section attaches at four locations, although there are only seven hinge fittings. The middle hinge fitting is common to both sections. The elevon chordwise, press-formed ribs are reinforced by a heavy gage spar to provide added rigidity at points of attachment to the wing trailing edge spar assembly. The two sections are bolted together through a steel link between aluminum forged fittings riveted to the elevon ribs at elevon buttock line 107.50. The link permits a slight horizontal flexing to take place between the two sections back of the common hinge fitting. The gap between the two sections is filled by a teflon plastic chafing strip which provides aerodynamic smoothness not only in a nonflexed condition but also during flexing.

2-18. INSPECTION AND REPAIR OF SURFACES CONTAINING HONEYCOMB CORE.

a. Inspect, dehydration, repair, and seal surfaces containing honeycomb core, applicable to trailing edge wedge.

(1) X-ray elevon assembly in accordance with T.O. 1F-106A-36 to determine if moisture is present, core is damaged or corroded.

NOTE

Non-perforated cores do not require dehydration.

(2) If moisture is present, remove elevon from aircraft in accordance with T.O. 1F-106A-2-2-2-2 and T.O. 1F-106A-2-7-2-1.

(3) Utilizing a "Q" drill bit (0.3320 diameter) drill hole in the core assembly inboard end rib on the centerline of symmetry at least 3 inches aft of spar.

CAUTION

Use drill stop to assure that bit does not penetrate more than 1/8 inch into honeycomb core.

(4) Tap hole with 3/8–24 tap and install union fitting AN815-3 (FSN 4730-187-0483) in tapped hole using sealant MIL-S-8802 class B.

(5) Utilizing low temperature boil procedure, dehydrate assembly using set moisture removal FSN 4020-000062F Vacuum shall be between 10 PSIG to 12 PSIG to assure boiling of water at as low as 160°F and temperature shall not exceed 180°F. 4 to 8 hours may be required for dehydration of core assembly, dependent on the amount of water in the core.

NOTE

A vacuum chamber capable of safely maintaining 12.3 PSIG vacuum at 160° to 180°F with adequate safety provisions to assure preventing excess temperature or collapsing from excess vacuum may be used as a suitable substitute.

(6) Re-X-ray assembly to determine that all moisture has been removed.

(7) When all moisture has been removed from assembly or x-ray reveals no moisture present, repair any damage in accordance with applicable procedures outlined in this technical order.

(8) Test and seal all assemblies as follows:

(a) Connect air line to fitting (Part No. AN815-3)

(b) Pressureize assembly between 10 to 12 PSI with dry oil free air and submerge in water to locate leaks.

(c) Mark leaks with black grease pencil or suitable substitute.

(d) Seal all leaks with sealant MIL-S-8802 class B 1/2. Surfaces to be sealed shall be cleaned with a clean cloth and methylethyl-ketone prior to applying sealant.

NOTE

To assure that sealant penetrates into all openings, apply sealant while assembly is subjected to a slight vacuum (approximately 7 PSIG), after sealant has cured, recheck assembly (submerged) and repeat sealing process until all leaks are sealed.

(e) If leaks are indicated along the core assembly front spar, remove skin that is closed out with blind fasteners (upper or lower) and repeat steps (a) thru (d).

(9) Remove union fitting (Part No. AN815-3) and install plug, machine thread FSN 4730-529-4871 or suitable substitute with sealant MIL-S-8802 class B.

(10) Reinstall panel assembly skin if removed. using solid rivets except the last seven rivet on each rib and the double row on aft edge of skin which are blind fasteners. (Refer to drawings 8-13031 and 8-13062).

(11) Identify sealed assemblies by stenciling "SEALED" and date on inboard rib of elevon.

(12) Reinstall surfaces on aircraft in reverse order of removal.

2-18A. Removal and Installation of Elevon Trailing Edge Wedges.

a. Removal of elevon wedges:

(1) Remove skin closed out with blind fasteners from elevon assembly by drilling out all attaching rivets.

NOTE

Do not remove fairing from elevon trailing edge (wedge) unless a new trailing edge replacement is required.

(2) Drill out rivets (double row) attaching lower skin to trailing edge.

(3) Drill out rivets attaching actuator fairing to elevon skin.

(4) Remove chromate primer from ribs to facilitate locating all rivets heads.

(5) Remove rivets attaching trailing edge to elevon ribs.

(6) Remove inboard and outboard elevon trailing edges. If trailing edges do not slip out freely, inspect for additional rivets.

b. Test and seal all elevon trailing edge wedges in accordance with paragraph 2-18.

(1) Replace wedges in reverse order or removal.

(2) To identify sealed elevon assemblies, paint or stencil "SEALED" and the date on inboard rib of elevon assembly.

c. Install new trailing edges as follows:

(1) Place inboard and outboard trailing edges in position on elevon.

(2) Align the trailing edges.

(3) Flush trailing edge ends with the elevon ends.

(4) Maximum permissible gap between trailing edge and elevon upper and lower skins is 0.200 inch.

(5) Match inboard and outboard trailing edges.

(6) Match drill holes in lower skin through new trailing edges.

(7) Match drill holes in ribs through clips of new trailing edges.

(8) Replace trailing edge rivets in reverse order of removal, except use blind rivets, FA 200 in lieu of rivets removed along the aft surface of the trailing edge.

d. Reinstall surfaces on aircraft in reverse order of removal.

2-19. Elevon Fairing.

2-20. The elevon actuator wing fairing is composed of a forward and an aft section. The forward section is attached to the wing and the aft section is attached to the elevon. The forward section consists of an end assembly attached with screws to the wing structure, two adjacent extruded angles fitted with plate nuts attached to wing structure, ribs attached to wing structure, and three removable sections of skin which are attached to the con-

tour ribs and angles with screws. The aft section is composed of ribs and angles attached to elevon structure and covered by one piece of skin which is riveted to the angles and ribs.

2-21. External Fuel Tank.

2-22. The external fuel tank is a welded assembly equipped with lugs for attachment to a fixed pylon. The fixed pylon, with installed tank ejection rack, provided attachment for the pylon fairings. See figure 2-15A for the different types of material used in the external tank and pylon.

2-23. INDEXING.

2-24. Figure 2-1 indexes the various wing components by reference to figure number. Refer to applicable figure number for information concerning repairs to the wing components.

2-25. REPAIRS.

2-26. Repair information is given on figures 2-4 and 2-16 through 2-31. Most repairs to the wing structure which do not involve the Scotchweld tape or wing plating integral rib areas may be made in the conventional manner. All repairs in the fuel tank area will require sealing to provide fuel-tight seams. Figure 2-31 and paragraphs 2-35 through 2-50 describe the method for repairing wing plating areas which are bonded with Scotchweld tape. See figures 2-23, 10-1, 10-5, and 10-7 for repairs applicable to the components of the intermediate box area and outer trailing edge structure. To remove moisture from the honeycomb sections of the elevon, follow the moisture removal procedure given on figure 2-22. One-time flight or temporary repairs may be made in case of emergency, and are described on figure 2-29. Due to the restrictions which may be imposed on the strength factors of the components involved and the flight characteristics of the airplane, one-time flight or temporary repairs should not be employed except by prior structural engineering approval. Although the delta-form wing is much less critical aerodynamically than conventional types, maximum performance and range cannot be realized with outer surface discontinuities. The range of an airplane restricted to low speeds because of a considerable number of outside repairs could easily be reduced to less than half of the maximum obtainable under the most favorable conditions. Prescribed limits for negligible damage to the various components of the wing structure are shown in Table 2-I.

2-27. Negligible Damage Limits — Wing Group.

2-28. Negligible damage is damage allowed to remain "as is," after minor rework such as stop-drilling cracks and fairing nicks or scratches. Table 2-I indicates the maximum allowable classification of five types of negligible damage. The maximum allowable damage classification will be found to the right of the component name in the vertical column under the "Type of Damage" heading. After classification is determined, see figures 1-17 through 1-19 for the damage limits allowed for each class: I, II, or III. The limits given on figures 1-17 through 1-19 apply only for a damaged area after rework, as shown on figures 1-20 and 1-21. An aeronautical engineer must be consulted for damage exceeding the limits given on figures 1-17 through 1-19, and for damage to components not listed in this table.

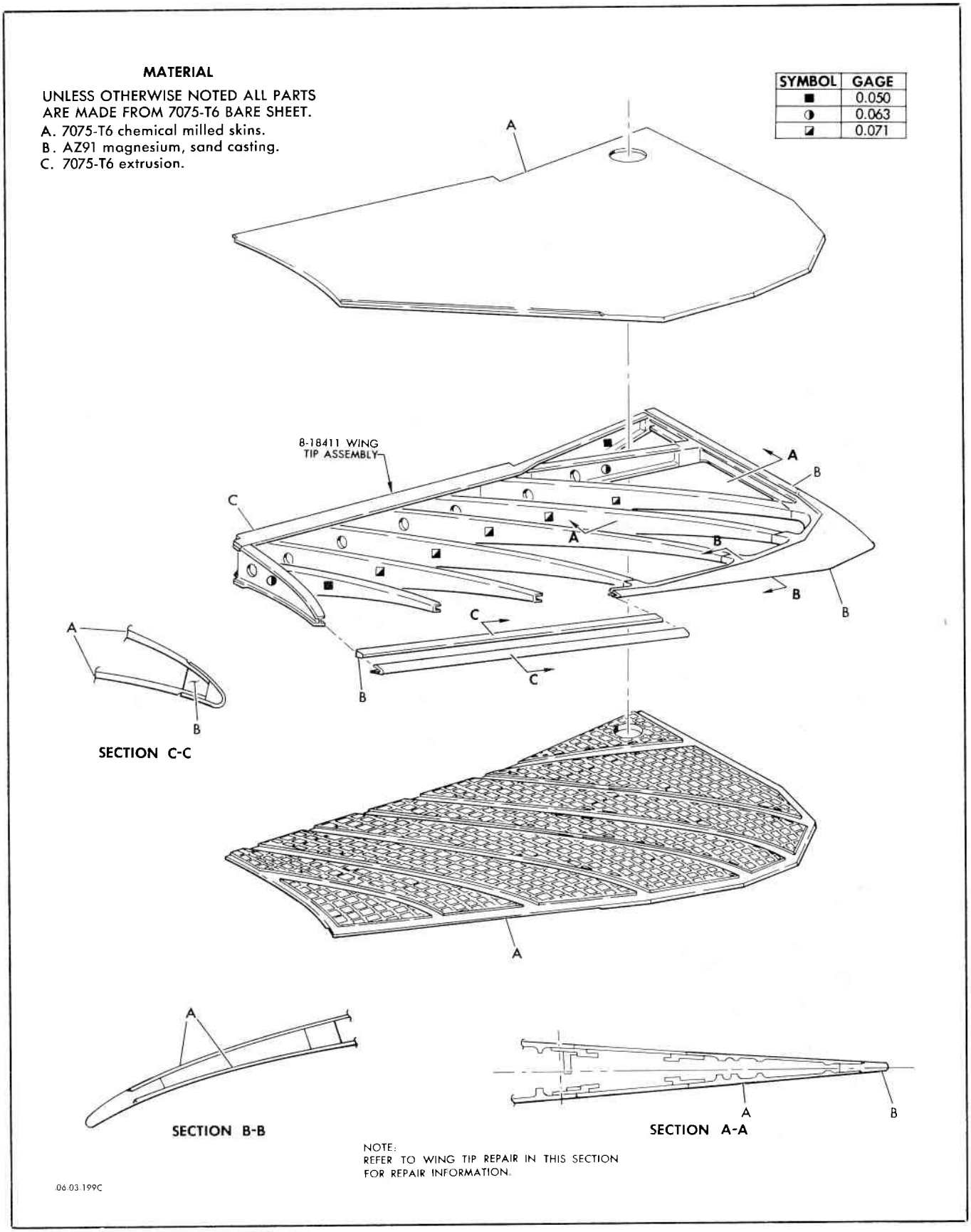
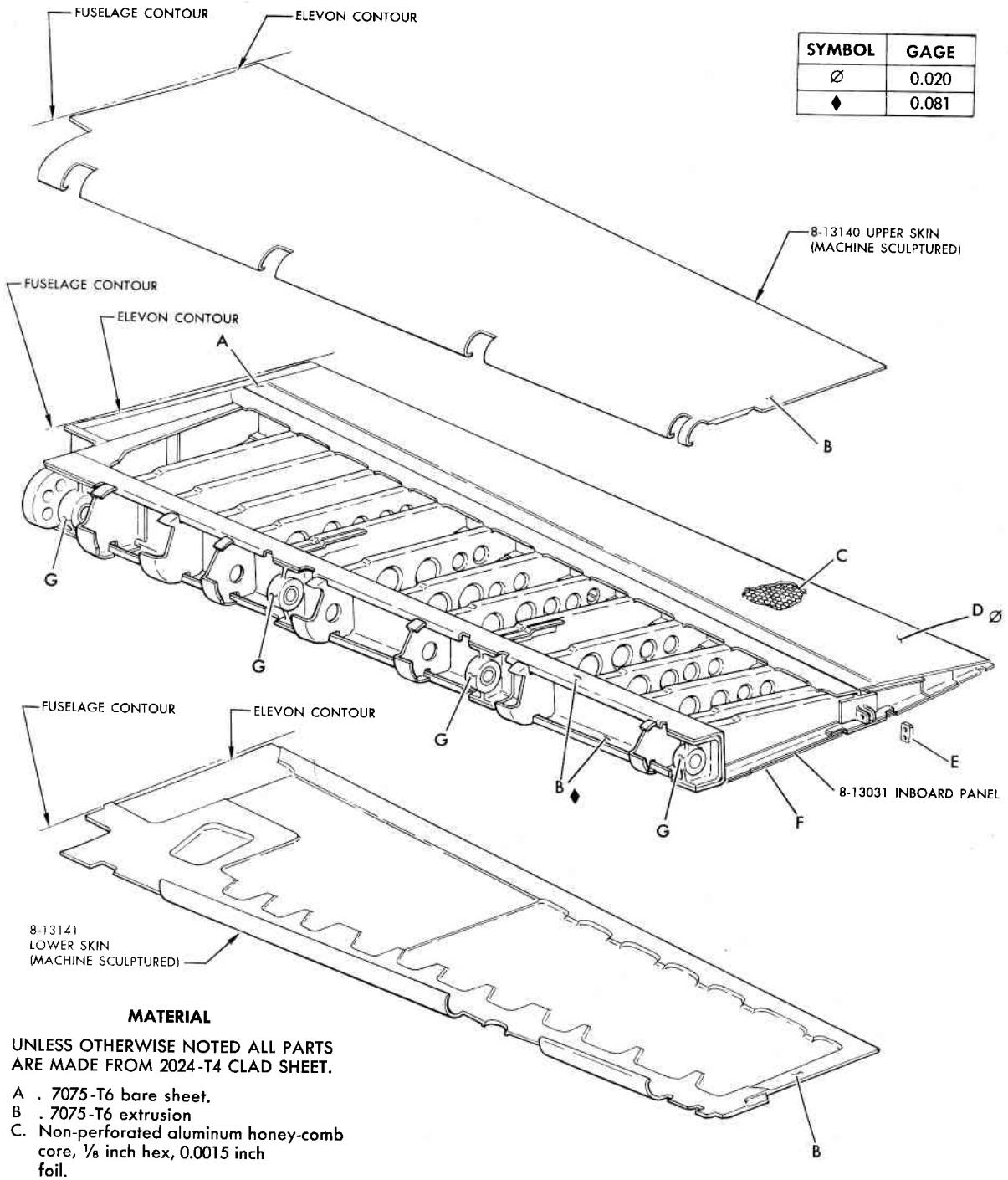


Figure 2-12. Case XXIX Wing Tip Structure and Plating

Applicable to F-106A airplanes 56-467, 57-229 and subsequent, and F-106B airplanes 57-2508 and subsequent



MATERIAL

UNLESS OTHERWISE NOTED ALL PARTS ARE MADE FROM 2024-T4 CLAD SHEET.

A . 7075-T6 bare sheet.
B . 7075-T6 extrusion
C. Non-perforated aluminum honey-comb core, 1/8 inch hex, 0.0015 inch foil.
D. 2024-T6 clad sheet.
E. SAE 4130 steel.
F. AMS3150 Teflon.
G. 7075-T6 machined forging.

NOTE:
REFER TO PARAGRAPH "ELEVON REPAIRS" IN THIS SECTION FOR REPAIR INFORMATION.

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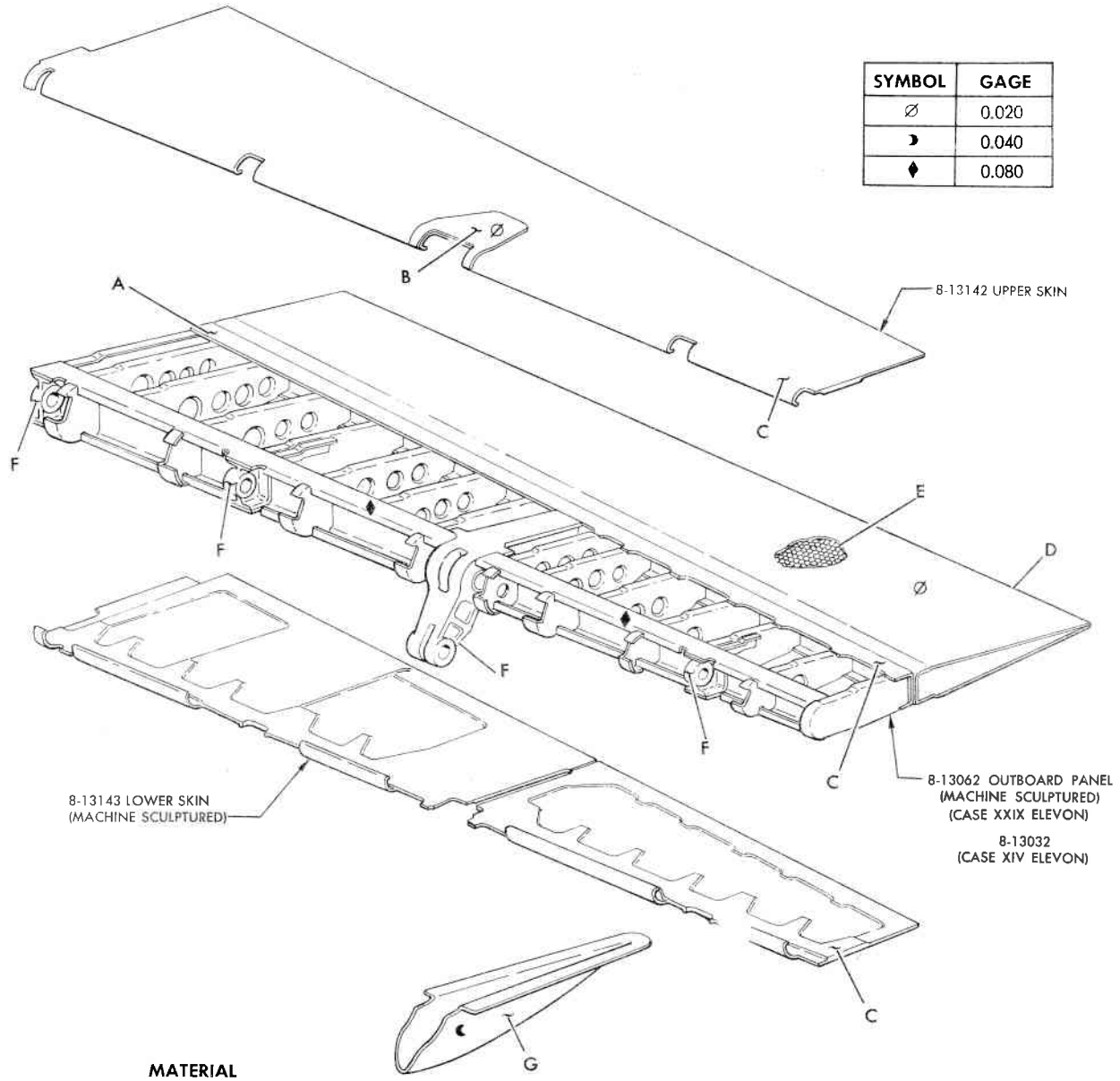
Figure 2-13. Elevon Structure and Plating — Inboard Panel



MATERIAL

UNLESS OTHERWISE NOTED ALL PARTS ARE MADE FROM 2024-T4 CLAD SHEET.

A. 7075-T6 bare sheet.
B. 302 corrosion resistant steel.
C. 2024-T6 clad sheet.
D. 7075-T6 bare sheet.
E. Non-perforated aluminum honey-comb core, 1/8 inch hex, 0.0015 inch foil.
F. 7075-T6 machined forging.
G. 7075-T6 clad sheet.

NOTE:
REFER TO PARAGRAPH "ELEVON REPAIRS" IN THIS SECTION FOR REPAIR INFORMATION.

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Figure 2-14. Elevon Structure and Plating — Outboard Panel

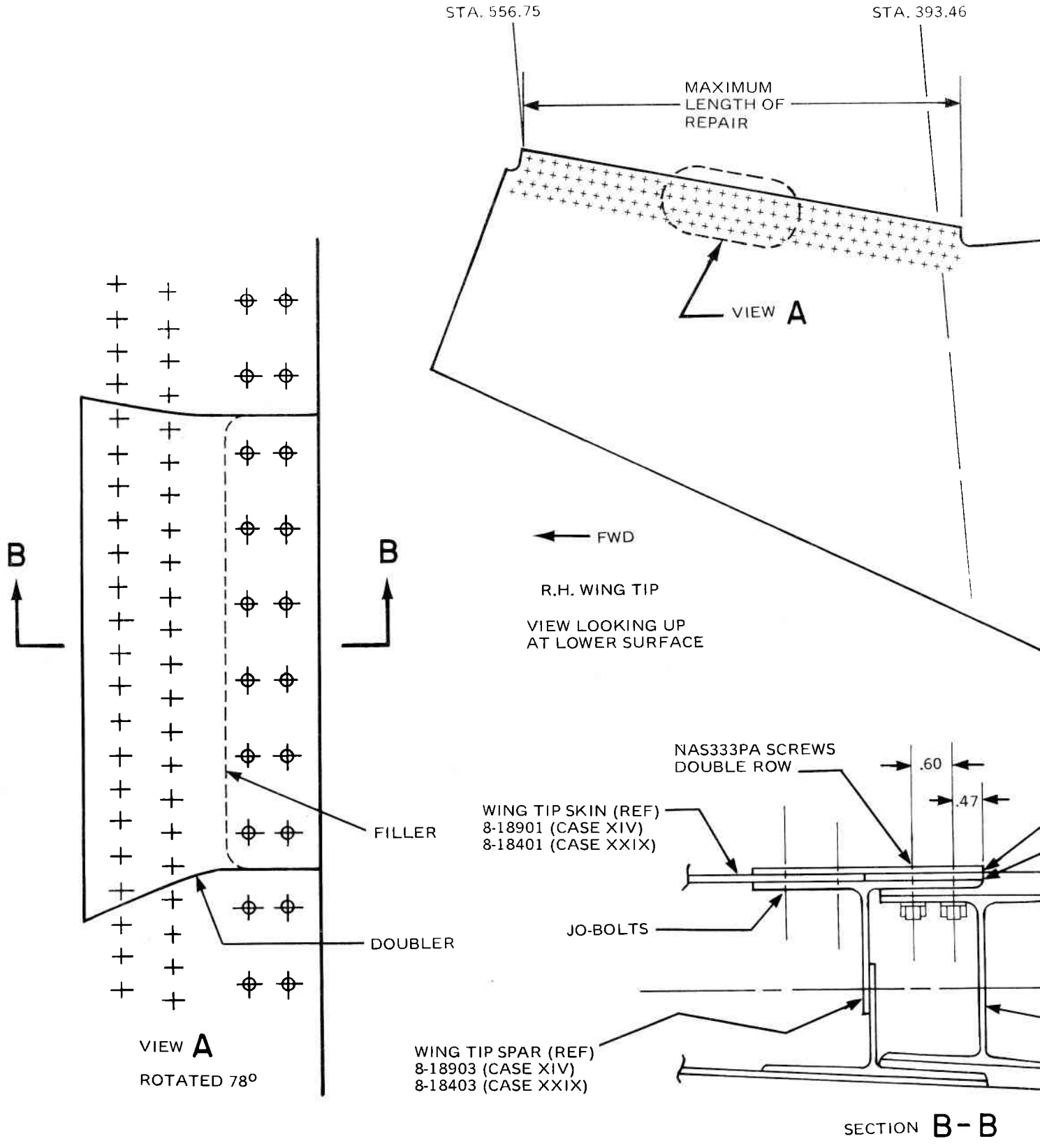
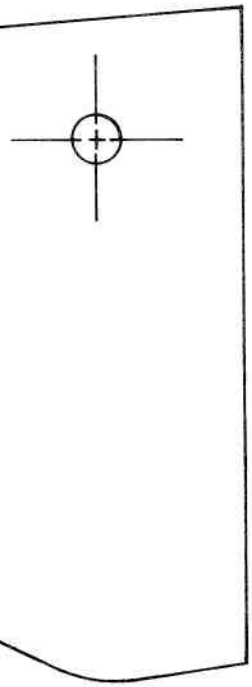
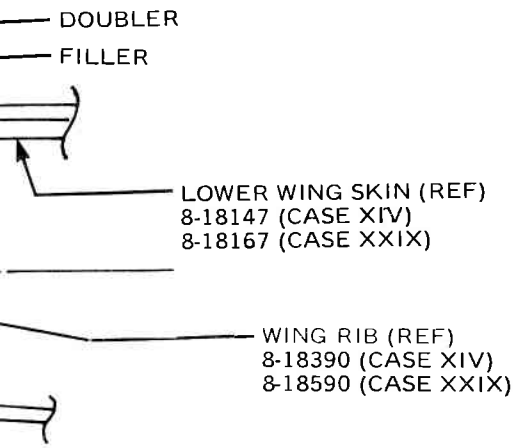
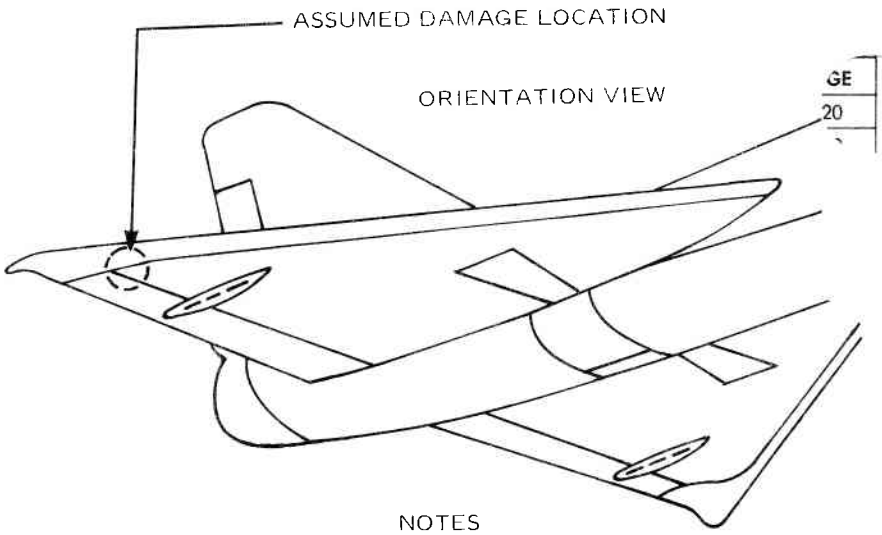


Figure 2-15. Wing Tip Repair







NOTES

A. THIS REPAIR IS A TEMPORARY REPAIR FOR TIPS HAVING ILLEGAL REPAIRS, CORROSION AND DEEP GRINDOUTS ON THE LOWER SKIN. REPAIRED TIPS WILL BE REPLACED AS SOON AS SPARE TIPS ARE AVAILABLE.

B. REMOVE THE FILLER STRAP, OR CUTOUT DAMAGED AREA SUPPORTED BY COUNTERSUNK SCREWS. RETAIN STRAP FOR TRANSFERING SCREW HOLES TO NEW FILLER STRAP AND DOUBLER.

C. FABRICATE DOUBLER FROM 7075 T6 BARE SHEET 0.080 THICK AND WIDE ENOUGH TO PICK UP FOUR ROWS OF FASTENERS. MAXIMUM LENGTH OF DOUBLER IS FULL LENGTH OF WING TIP.

D. FABRICATE NEW FILLER FROM 7075-T6 BARE SHEET SAME SIZE AS OLD FILLER OR CUT OUT.

E. INSTALL NEW FILLER AND DOUBLER AND DRILL HOLES TO MATCH EXISTING HOLES IN WING TIP. MACHINE COUNTERSINK HOLES IN DOUBLER ONLY.

F. FILL IN COUNTERSINKS IN SKIN USING THE COUNTERSUNK HEADS FROM REMOVED JO-BOLTS OR COUNTERSUNK RIVET HEADS. BOND TO COUNTERSINKS WITH ADHESIVE TO PREVENT SPINNING DURING DRILLING.

G. REFER TO T.O. 1F-106A-23 FOR FINISH REQUIREMENTS.

H. INSTALL DOUBLER AND FILLER USING MIL-S-81733 FAYING SURFACE SEALANT AND MILLABLE COUNTERSUNK JO-BOLTS.

I. FILLET ALL EDGES WITH MIL-S-38228 FAIRING COMPOUND AFTER WING TIP IS INSTALLED ON AIRCRAFT. SEE FIGURE 1-27.

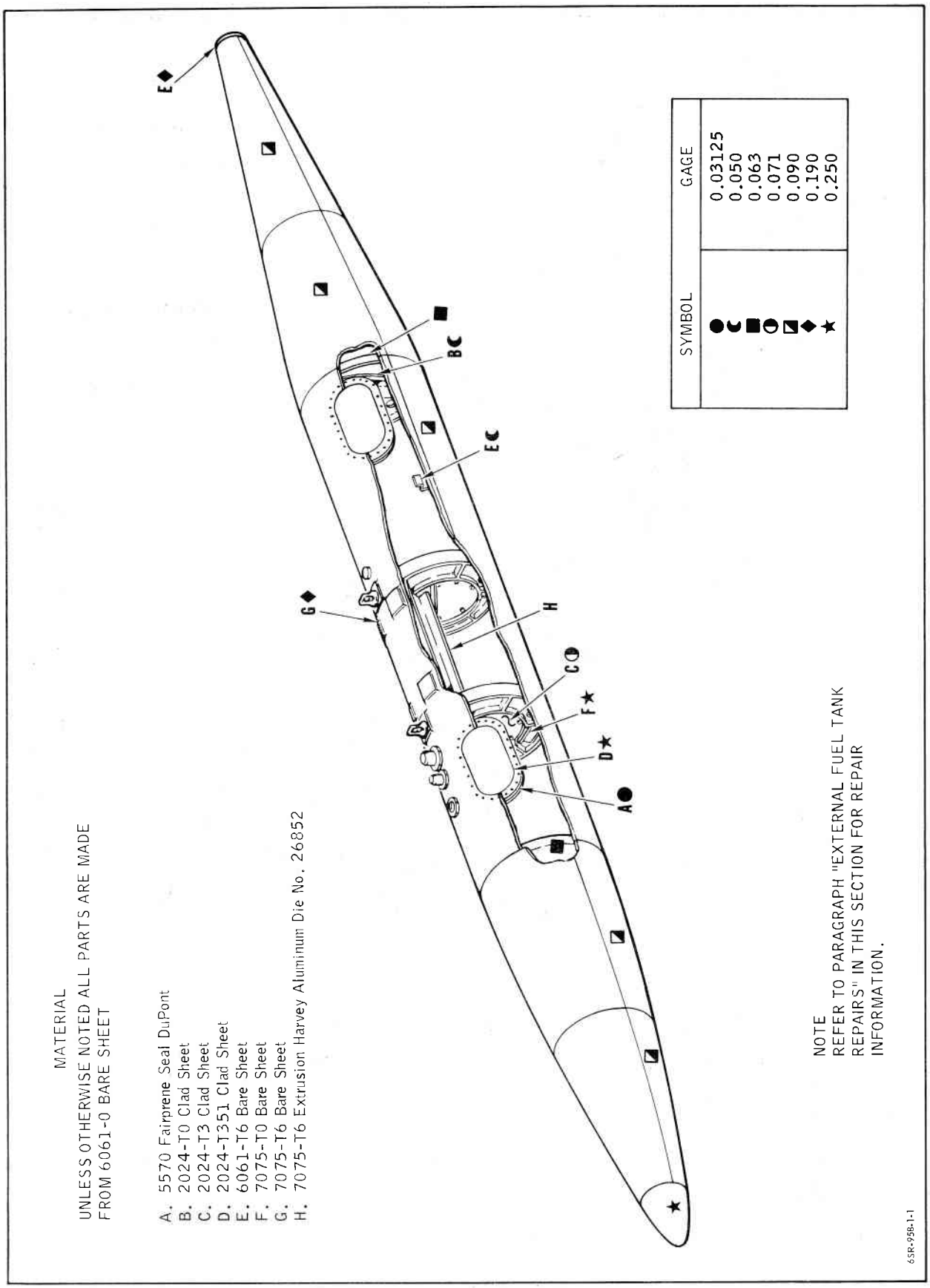


Figure 2-15A. External Fuel Tank and Pylon (Sheet 1 of 2)
Applicable after incorporation of TCTO 1F-106-958

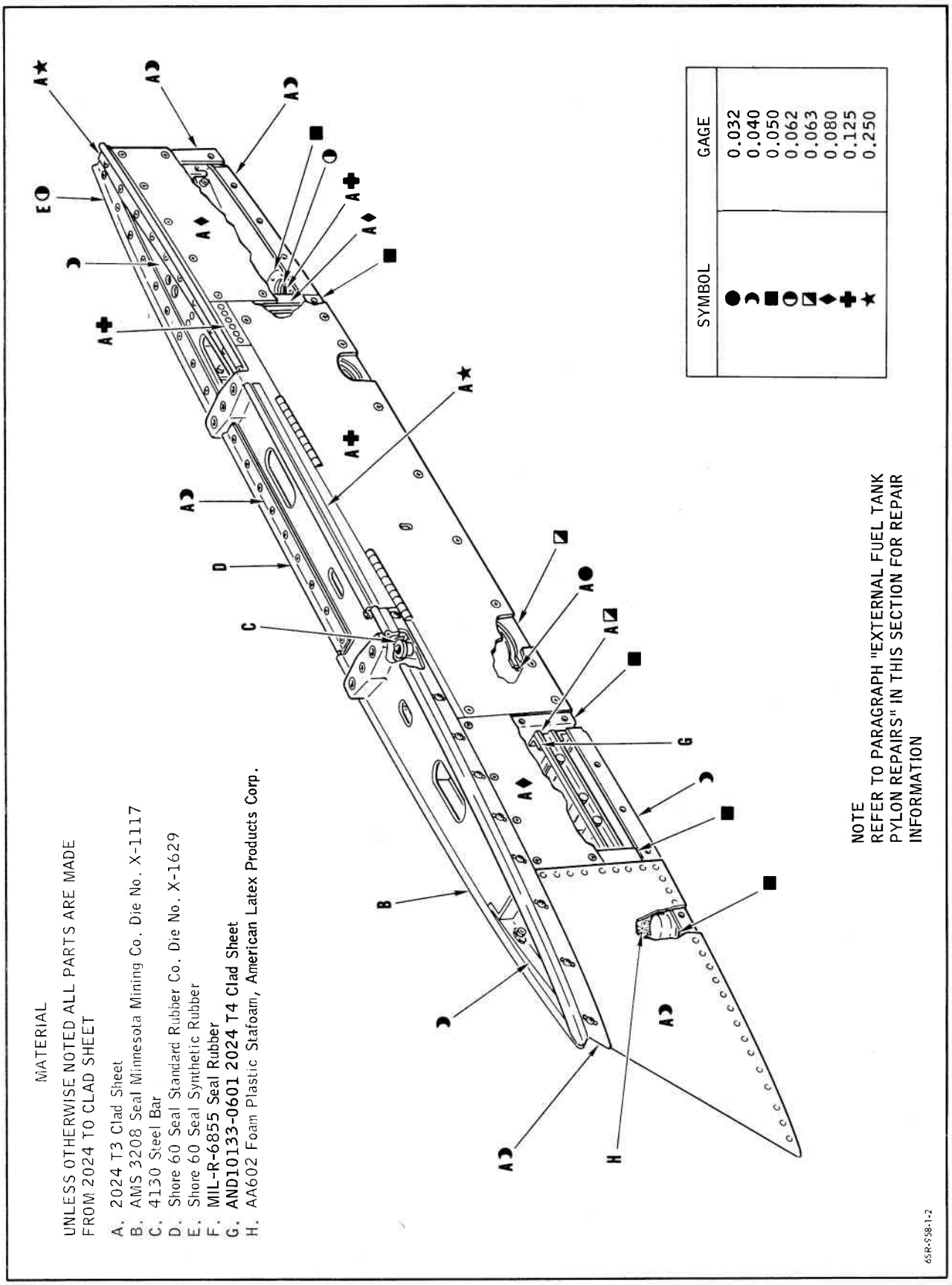
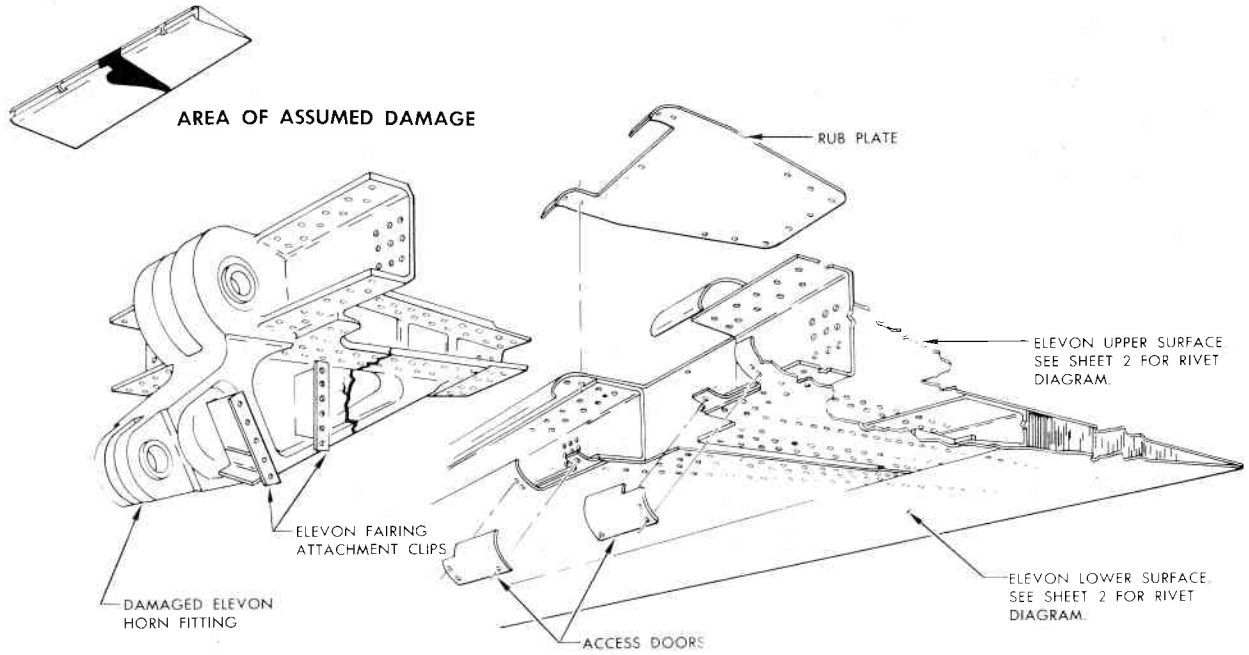


Figure 2-15A. External Fuel Tank and Pylon (Sheet 2 of 2)
Applicable after incorporation of TCTO 1F-106-958



REMOVAL OF DAMAGED HORN FITTING

a. Remove damaged elevon from wing in accordance with procedures outlined in T.O. 1F-106A-2-7-2-1.
b. Place damaged elevon on work stand or bench which has been suitably padded to protect elevon skins.
c. Remove all rivets connecting horn fitting to upper surface.
d. Remove all rivets connecting rub plate to upper surface. Remove rub plate and hold for reinstallation.
e. Remove access doors (2) from lower surface of elevon by extracting NAS333 PA4 screws (3 each door). Hold doors and screws for reinstallation.
f. Remove all rivets connecting elevon fairing to support angles on side of horn fittings.
g. Remove all rivets connecting elevon fairing to horn fitting and to lower surface. Remove elevon fairing and hold for reinstallation.
h. Remove enough rivets each side of elevon horn fitting from lower surface to allow insertion of a micarta wedge.
j. Insert micarta wedge between elevon lower surface plating and internal structure. Micarta wedge should be of sufficient thickness to hold elevon plating away from internal structure so that mechanic may work within the structure.
k. Remove two NAS464-4A-5 bolts and two AN365-428 nuts which connect horn fitting to support tee in elevon aft spar.
l. Remove micarta wedges and remove horn fitting.

INSERTION OF REPLACEMENT HORN FITTING

a. Locate and drill two (2), 0.2500 (−0.0000, +0.0020) inch diameter bolt holes in replacement horn fitting as shown in view A.
b. Insert replacement fitting in elevon.
c. Insert micarta wedges between lower surface elevon plating and internal structure.
d. Install two (2) NAS464-4A-5 bolts and two (2) AN365-428 nuts through support tee in elevon aft spar and through replacement horn fitting.
e. Locate replacement horn fitting buttock line wise by using inside micrometer. See figure 2-44 for horn fitting location and use of inside micrometer.
f. Remove micarta wedge and clamp replacement fitting in place.
g. Drill rivet holes in replacement horn fitting using holes in elevon plating as a guide.
h. Remove clamps and insert micarta wedge between lower surface elevon plating and internal structure. Remove two (2) NAS464-4A-5 bolts and two (2) AN365-428 nuts and remove replacement horn fitting.
i. Remove all burrs and chips from replacement horn fitting and elevon.

NOTE
REFER TO FINISH REQUIREMENTS IN SECTION I FOR MATERIAL FINISHES PRIOR TO FINAL INSTALLATION OF REPLACEMENT HORN FITTING.

j. Rivet elevon fairing support clips to horn fitting. (Refer to engineering blueprint No. 8-18560 for support clip location and method of attachment.)
k. Install replacement horn fitting. Reinstall two (2), NAS464-4A-5 bolts and two (2) AN365-428 nuts. (Install bolt head on outboard side).

NOTE
REFER TO SECTION I FOR STANDARD BOLT TORQUE VALUES.

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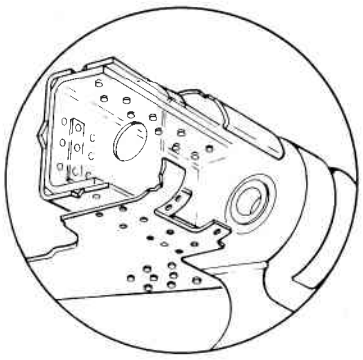
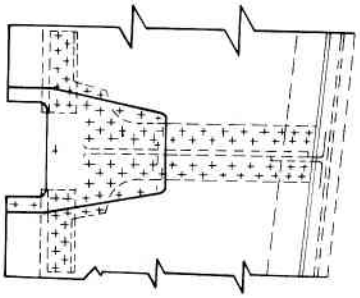
Figure 2-16. Replacement of Outboard Elevon Actuator Horn (Sheet 1 of 2)



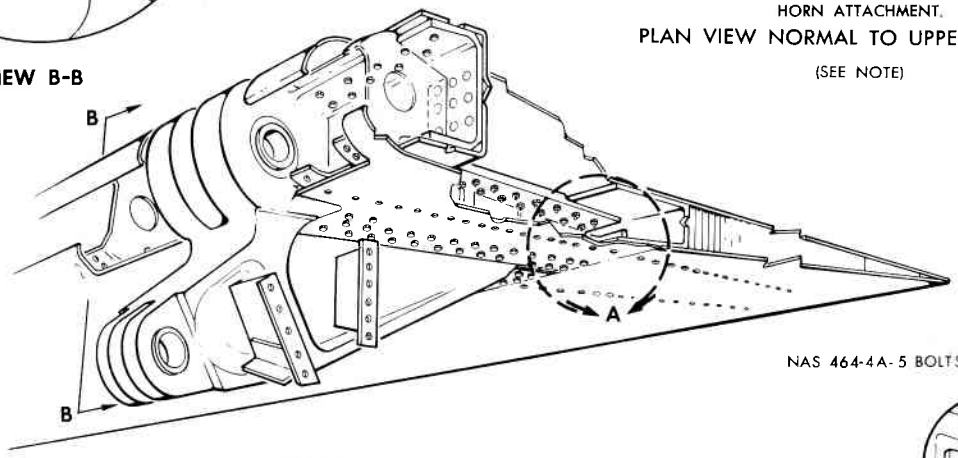
VIEW B-B

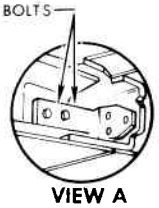


RIVET PATTERN FOR OUTBOARD ELEVON HORN ATTACHMENT.

PLAN VIEW NORMAL TO UPPER SURFACE

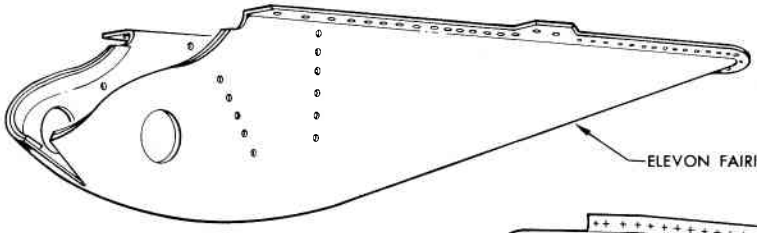
(SEE NOTE)

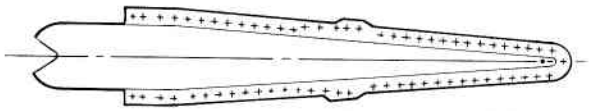




VIEW A

ROTATED TO SHOW BOLT ATTACHMENT





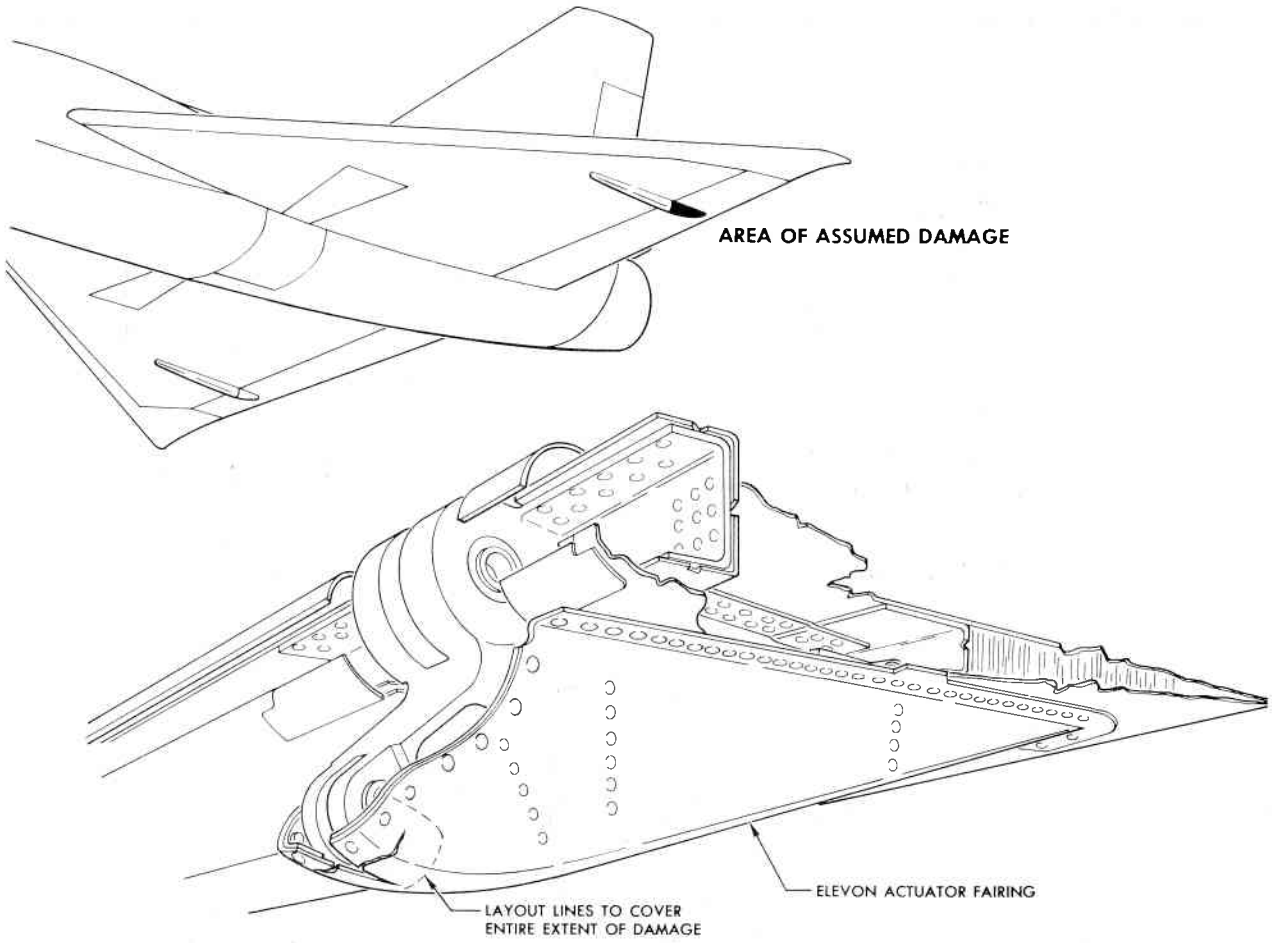
VIEW LOOKING DOWN AT THE ELEVON FAIRING

l. Remove micarta wedge; then align drilled holes in horn fitting with holes in elevon plating and clamp in place.
m. Spot rivet five (5) places in upper and lower surfaces to prevent horn fitting from slipping out of place during riveting process.
n. Remove clamps and finish riveting on upper and lower surface.
o. Reposition nut plate on upper surface and install rivets.
p. Reposition elevon fairing on lower surface and hold in place with Clecos.
q. Use existing holes in elevon fairing as a guide to drill holes in elevon fairing support clips.
r. Rivet elevon fairing to support angles on horn fitting.
s. Rivet elevon fairing to lower elevon surface.
t. Replace elevon nose doors with NAS333-PA4 screws.
u. Reinstall elevon to wing in accordance with procedures outlined in T.O. 1F-106A-2-7-2-1.

NOTE:
REFER TO ENGINEERING DRAWING NO. 8-13032 FOR LOCATION AND TYPE OF RIVETS USED IN THE ELEVON.

.06.03.190-2A .57.04.03

Figure 2-16. Replacement of Outboard Elevon Actuator Horn (Sheet 2 of 2)



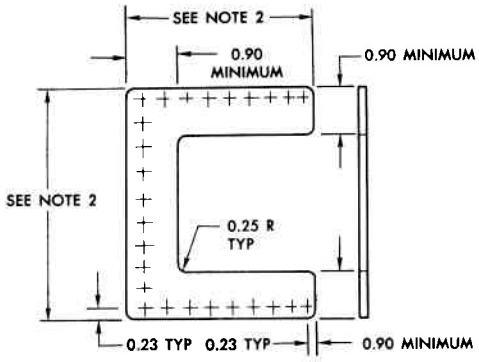
ENLARGED VIEW OF DAMAGE

REPAIR PROCEDURE

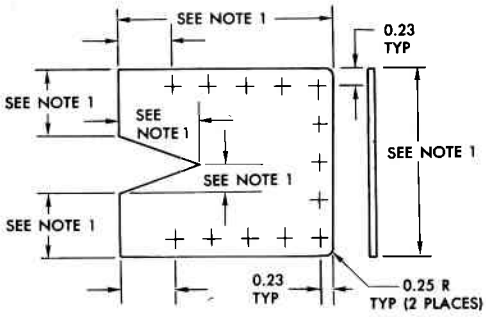
a. Move the elevon to extreme up position and place a padded support beneath the elevon.
b. Remove rivets attaching actuator fairing to elevon skin.
c. Remove rivets attaching actuator fairing to actuator clips.
d. Remove actuator fairing.
e. Remove all paint and primer from damaged area of actuator fairing. Use Methyl Ethyl Ketone, Specification TT-M-261, to remove paint and primer.
f. Perform Fluorescent penetrant inspection on damaged actuator fairing. Refer to Section I for Fluorescent penetrant materials and inspection procedures.
g. Cut out damaged portion of actuator fairing.
h. Fabricate a doubler from 0.050, 7075-T6 bare sheet to dimensions shown in Detail A.
i. Fabricate a flush skin patch from 0.040, 7075-T6 bare sheet to dimension shown in Detail B.
j. Treat repair parts and bare portion of actuator fairing with primer. See Primer and Paint Coating in Section I.
k. Predrill the doubler and flush skin patch as shown using a No. 30 (0.1285) drill.
l. Install the doubler as shown and hold in place with clamps.
m. Using the predrilled holes as a guide, drill holes through doubler and actuator fairing. Use a No. 30 (0.1285) drill.
n. Remove the doubler and remove all drill chips and burrs from doubler and actuator fairing.
o. Reinstall doubler and hold in place with clecos.
p. Ream holes in doubler and actuator fairing with a No. 20 (0.161) drill.
q. Heat dimple holes in actuator fairing and doubler for 5/32 countersunk rivets. Refer to Section I for flush rivet installation procedure.
r. Rivet doubler to actuator flaring with BB rivets. Refer to Table 1-XXIII for basic rivet code.
s. Install flush skin patch and hold in place with clamps.
t. Using predrilled holes in flush skin patch as a guide, drill holes through patch and repair doubler. Pick up holes from existing doubler. Use a No. 30 (0.1285) drill.

06.03.246-1B

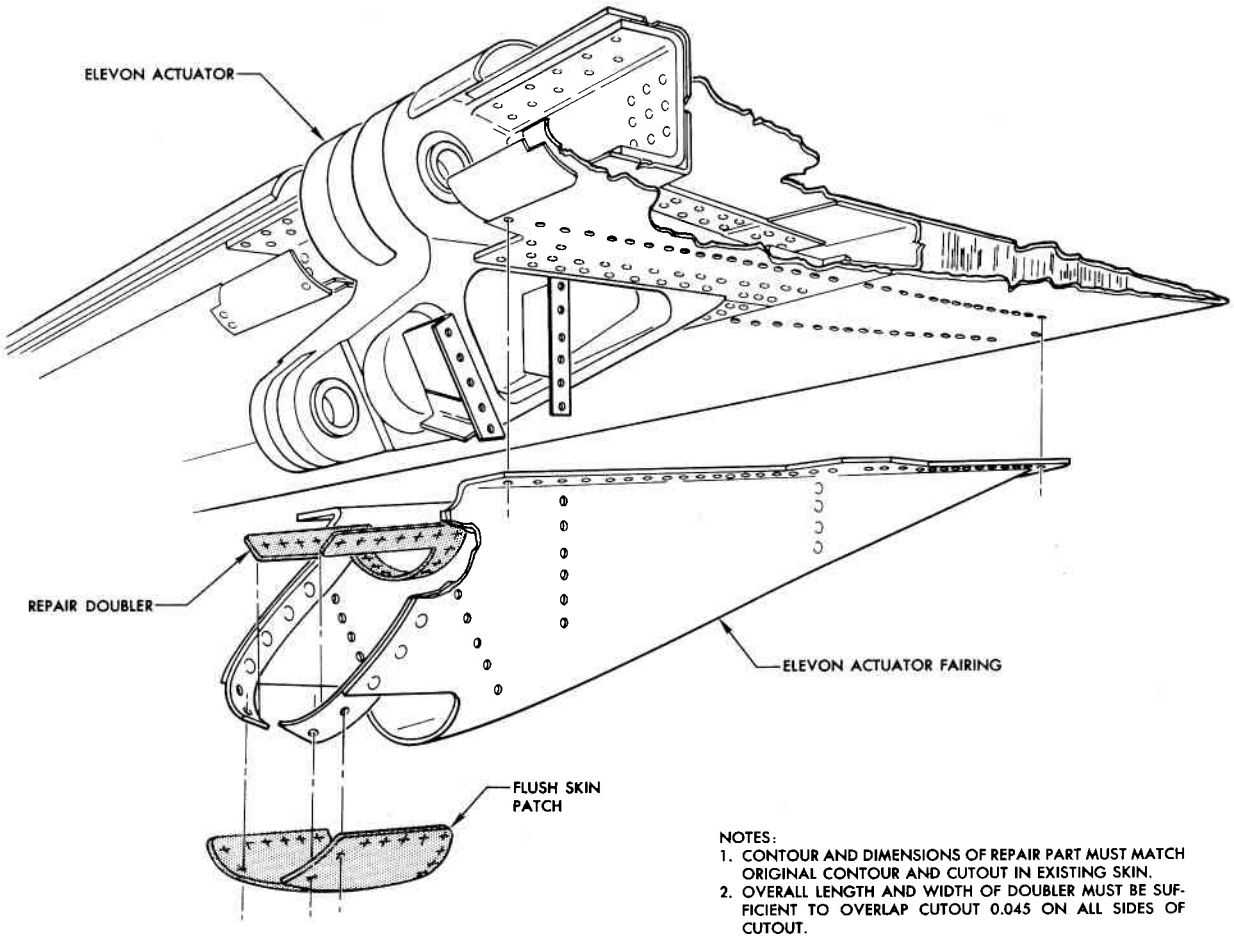
Figure 2-17. Elevon Actuator Aft Fairing Repair (Sheet 1 of 2)



DETAIL A
REPAIR DOUBLER



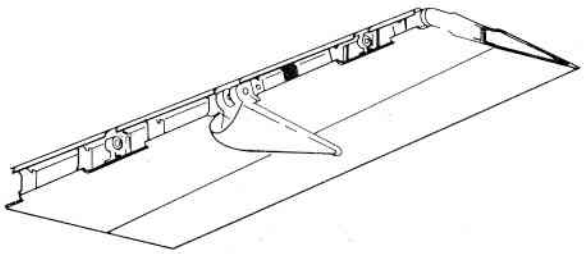
DETAIL B
FLUSH SKIN PATCH



NOTES:
1. CONTOUR AND DIMENSIONS OF REPAIR PART MUST MATCH ORIGINAL CONTOUR AND CUTOUT IN EXISTING SKIN.
2. OVERALL LENGTH AND WIDTH OF DOUBLER MUST BE SUFFICIENT TO OVERLAP CUTOUT 0.045 ON ALL SIDES OF CUTOUT.

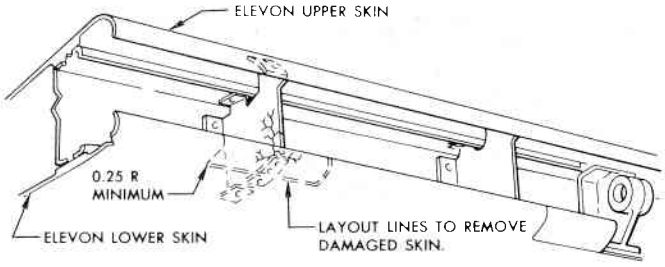
.06.03.246-2 .57.04.03

Figure 2-17. Elevon Actuator Aft Fairing Repair (Sheet 2 of 2)

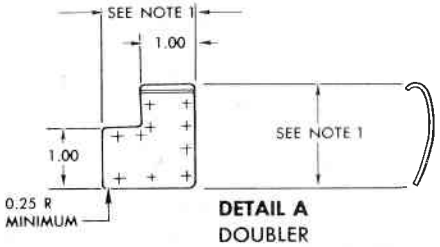


AREA OF ASSUMED DAMAGE

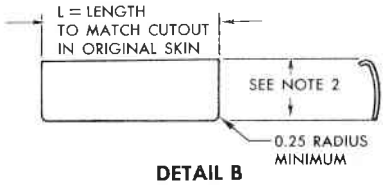
NOTES:
1. OVER-ALL DIMENSIONS OF DOUBLERS MUST BE DETERMINED BY A PHYSICAL MEASUREMENT.
2. DIMENSIONS OF FLUSH SKIN PATCH MUST MATCH CUTOUT IN EXISTING SKIN. REFER TO AERODYNAMIC SMOOTHNESS REQUIREMENTS IN SECTION I FOR ALLOWABLE GAP AND MISMATCH.
3. DIMENSIONS FOR NEW RIB MAY BE OBTAINED FROM DAMAGED RIB AND BY PHYSICAL MEASUREMENT OF AREA VACATED BY REMOVED DAMAGED RIB.



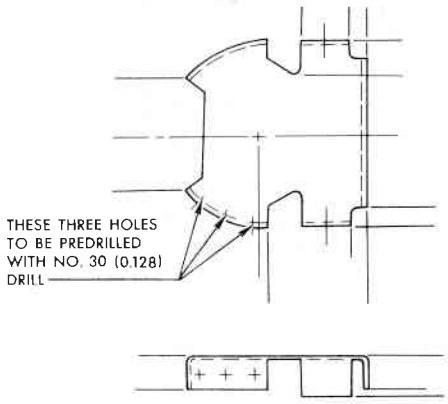
ENLARGED AREA OF ASSUMED DAMAGE



DETAIL A
DOUBLER
LEFT HAND SHOWN, RIGHT HAND OPPOSITE



DETAIL B
FLUSH SKIN PATCH



DETAIL C
RIB REPAIR
(SEE NOTE 3)

REPAIR PROCEDURE

a. Remove the elevon. Refer to T.O. 1F-106A-2-7-2-1 for elevon removal procedure.
b. Place the elevon on a suitably padded work bench or table.
c. Remove all paint and primer from damaged area of elevon. Use Methyl Ethyl Ketone, Specification TT-M-261, to remove paint and primer.
d. Perform a dye penetrant inspection to determine extent of damage. Refer to Section I for dye penetrant inspection procedures and materials.
e. Using a No. 20 (0.161) drill, remove rivets attaching damaged elevon nose rib to elevon upper and lower skins and elevon forward spar.

NOTE:
DOUBLERS AND FLUSH SKIN PATCH MUST BE HEAT TREATED TO -T6 CONDITION PER SPECIFICATION MIL-H-6088 AFTER FORMING.

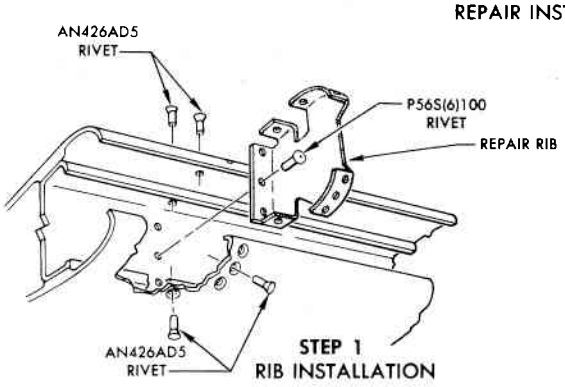
f. Remove damaged elevon nose rib.
g. Cut out damaged portion of elevon skin.
h. Fabricate doublers from 0.050, 7075-0 bare sheet as shown in detail A.
i. Fabricate a flush skin patch from 0.040, 7075-0 bare sheet as shown in detail B.
j. Fabricate a new rib from 0.040, 2024-T4 clad as shown in detail C.
k. Install the new rib and hold in place with clamps.
l. Using the existing holes in elevon skins and elevon spar as a guide, drill holes through flanges of new rib. Use a No. 20 (0.161) drill.

NOTE
USE LINE LAYOUT METHOD OF LOCATING BLIND HOLES AS SHOWN IN SECTION I TO PICK UP EXISTING HOLES FROM ELEVON SPAR.

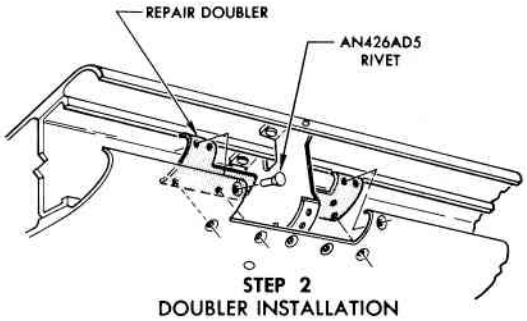
06.03.248-1B

Figure 2-18. Elevon Leading Edge Repair (Sheet 1 of 2)

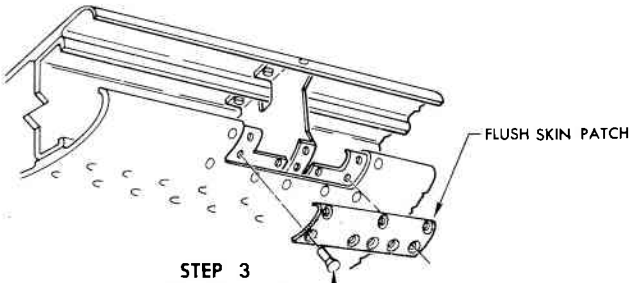
REPAIR INSTALLATION PROCEDURE



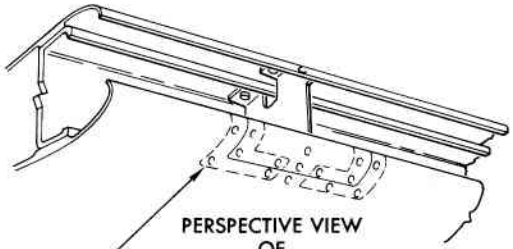
STEP 1
RIB INSTALLATION



STEP 2
DOUBLER INSTALLATION



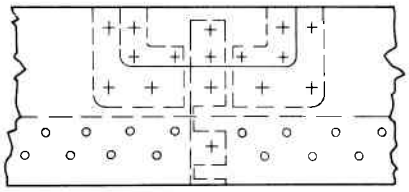
STEP 3
FLUSH SKN PATCH
INSTALLATION



PERSPECTIVE VIEW
OF
COMPETED REPAIR

FILL GAP WITH MIL-S-38228 AERODYNAMIC SMOOTHING COMPOUND

NOTE:
REFER TO TABLE 1-XXIII
FOR BASIC RIVET CODE.

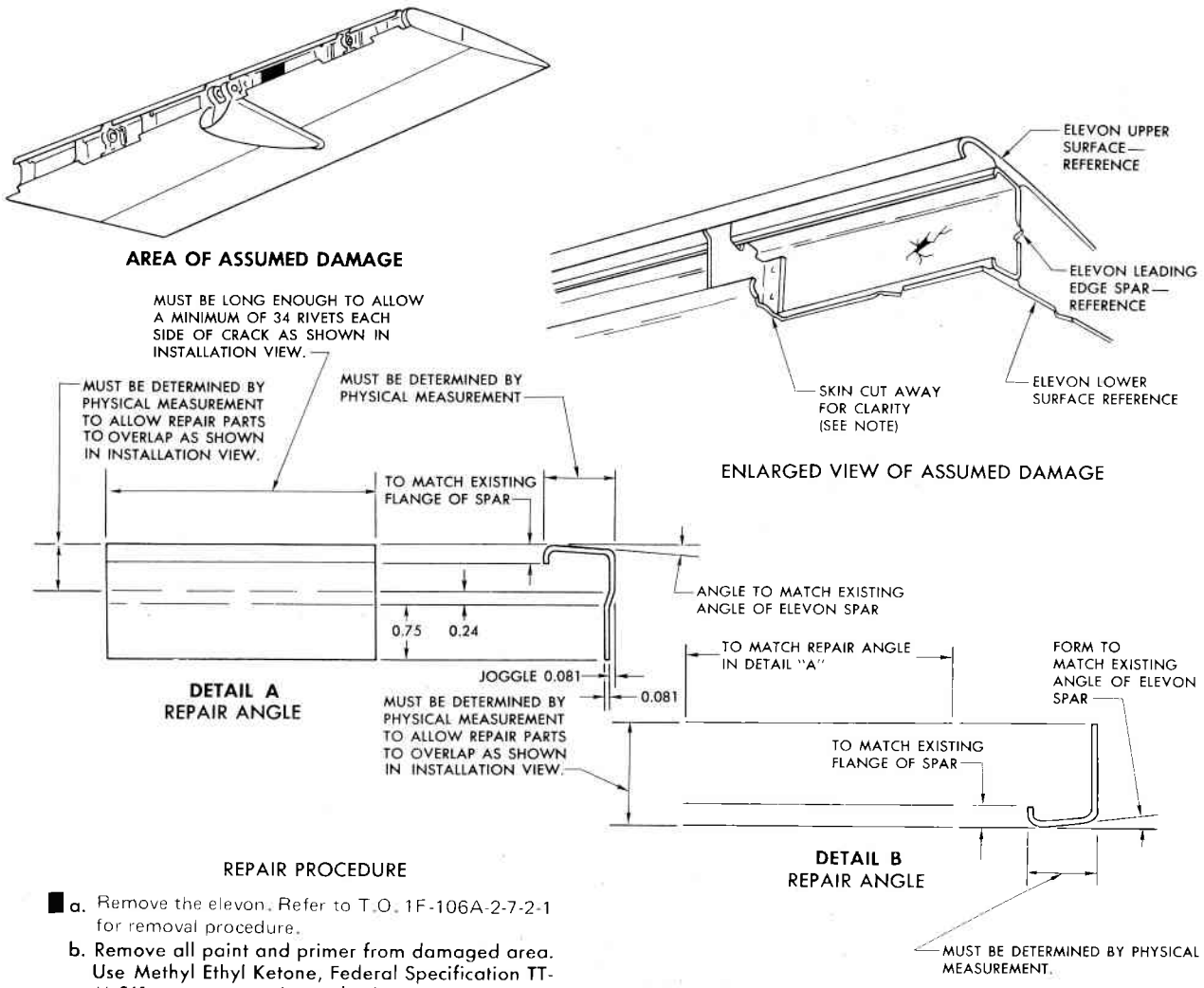


PLAN VIEW
ELEVON LOWER SURFACE
COMPLETED REPAIR

m. Ream holes in vertical flange of rib and elevon spar with a 3/16 (0.187) drill.
n. Remove rib from elevon and remove all burrs from rib and elevon.
o. Predrill holes in undrilled flanges of rib as shown. Use a No. 30 (0.128) drill.
p. Reinstall rib and rivet in place as shown.
q. Using No. 30 (0.128) drill, predrill holes in doublers as shown.
r. Install doublers and hold in place with clamps.
s. Using predrilled holes in doublers as a guide, drill holes through existing elevon skin. Use a No. 30 (0.128) drill.
t. Ream holes drilled in steps with a No. 20 (0.161) drill.
u. Remove doublers and remove all burrs from doublers and elevon.
v. Countersink 100 degrees all holes, in exterior surface, of elevon skin.
w. Reinstall doublers and rivet in place as shown.
x. Install flush skin patch and hold in place with clamps.
y. Using predrilled holes in doublers and rib as a guide, drill holes through flush skin patch. Use a No. 30 (0.128) drill.
z. Ream holes drilled in step x with a No. 20 (0.161) drill.
aa. Remove flush skin patch and remove all burrs from patch and elevon.
ab. Countersink 100 degrees all holes in exterior surface of flush skin patch. Reinstall flush skin patch and rivet in place as shown.
ac. Apply paint to elevon exterior surface in accordance with finish requirements contained in Section I.
■ ad. Reinstall elevon. Refer to T.O. 1F-106A-2-7-2-1 for elevon installation procedures.

06 03 248-2B

Figure 2-18. Elevon Leading Edge Repair (Sheet 2 of 2)



REPAIR PROCEDURE

■ a. Remove the elevon. Refer to T.O. 1F-106A-2-7-2-1 for removal procedure.

b. Remove all paint and primer from damaged area. Use Methyl Ethyl Ketone, Federal Specification TT-M-261, to remove paint and primer.

c. Perform a dye penetrant inspection to determine extent of damage. Refer to Section I for dye penetrant inspection procedures and materials.

NOTE

IF SPAR IS BENT AND CANNOT BE STRAIGHTENED IN PLACE OR IF A SECTION OF SPAR MUST BE CUT OUT TO REMOVE DAMAGE, REMOVE AND REPLACE THE ENTIRE SECTION OF ELEVON SPAR WHICH CONTAINS THE DAMAGE.

d. Fabricate repair angles as shown in Details A and B from 7178-0 bare sheet. Repair parts must be heat treated to -T6 condition after forming per Specification MIL-H-6088.

e. Apply one coat of wash primer to repair parts. Apply primer in accordance with Specification MIL-C-8514.

f. Apply one coat of zinc chromate primer to repair parts. Apply zinc chromate primer in accordance with Specification MIL-P-8585 or MIL-P-6808.

g. Install repair parts as shown and hold in place with clamps.

h. Using the existing holes in upper and lower surface of elevon as a guide, drill holes through the repair parts. Use a 3/16 (0.1875) drill.

i. Layout and drill holes through vertical flanges of repair parts and spar as indicated in repair installation view. Use a No. 30 (0.128) drill.

j. Ream holes drilled in step I with a 3/16 (0.1875) drill.

k. Remove repair parts and remove all burrs from repair parts and elevon.

l. Reinstall repair parts and hold in place with clecos.

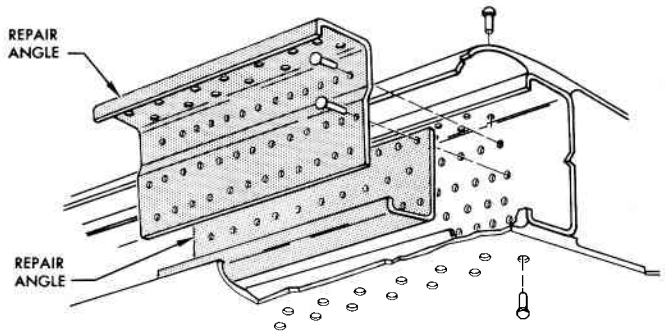
m. Rivet repair parts in place as indicated in installation view.

n. Refinish elevon exterior surface in accordance with finish requirements contained in Section I.

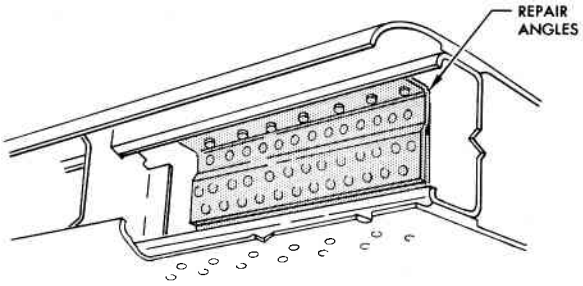
■ o. Reinstall elevon. Refer to T.O. 1F-106A-2-7-2-1 for elevon installation procedure.

06.03.249-1B

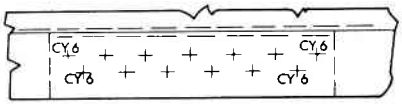
Figure 2-19. Elevon Forward Spar Repair (Sheet 1 of 2)



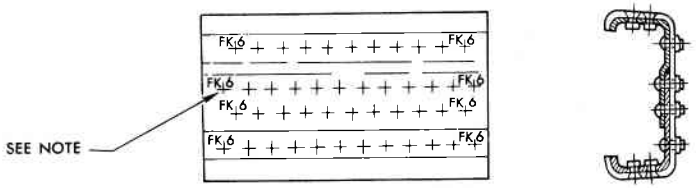
STEP 1
EXPLODED REPAIR



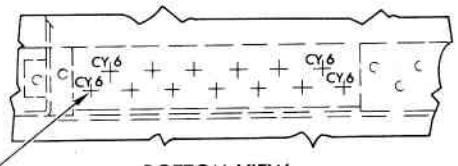
STEP 2
ASSEMBLED REPAIR



TOP VIEW COMPLETED REPAIR



FRONT VIEW COMPLETED REPAIR



BOTTOM VIEW COMPLETED REPAIR

NOTE:
REFER TO TABLE 1-XXIII FOR BASIC RIVET CODE.

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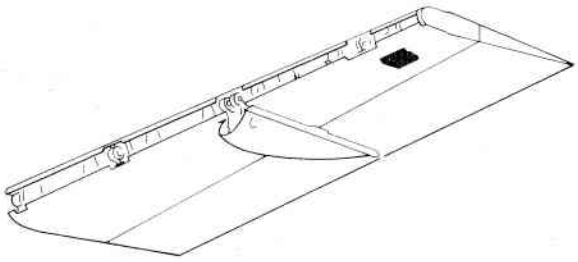
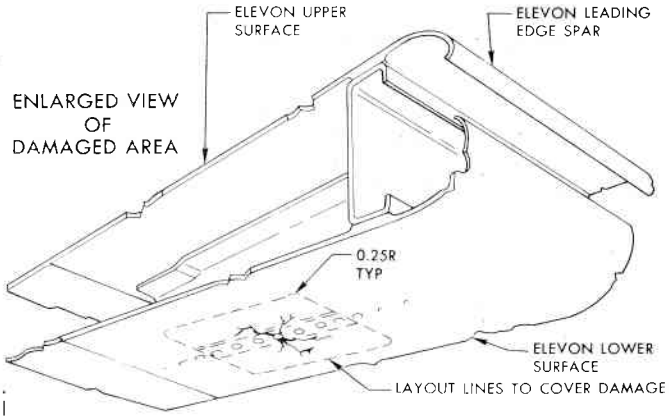
Figure 2-19. Elevon Forward Spar Repair (Sheet 2 of 2)



AREA OF ASSUMED DAMAGE



REPAIR PROCEDURE

a. Remove all paint and primer from the damaged area. Use a cloth dampened with Methyl Ethyl Ketone, Federal Specification TT-M-261, to remove paint and primer.

b. Perform a Fluorescent penetrant inspection to determine extent of skin damage. Refer to Section I for Fluorescent penetrant inspection procedures and materials.

c. Using a No. 30 (0.218) drill, remove the rivets attaching the skin to internal structure in damaged area.

d. Using a 0.375-inch diameter router bit, rout out the damaged skin to a regular shape.

NOTE

ROUT OUT DAMAGED SKIN EACH SIDE OF ELEVON RIB; PLACE A SPACER MADE FROM SOFT ALUMINUM SHEET BETWEEN SKIN AND RIB, THEN CONTINUE ROUTING TO REMOVE REMAINDER OF DAMAGED SKIN.

e. Visually inspect internal rib for damage.

NOTE

IF RIB HAS BEEN DAMAGED, CONTINUE WITH STEP "f." IF RIB HAS NOT BEEN DAMAGED, CONTINUE WITH STEP "u."

f. Remove primer from elevon rib. Use a cloth dampened with Methyl Ethyl Ketone, Federal Specification TT-M-216, to remove primer.

g. Perform a Fluorescent penetrant inspection to determine extent of damage. Refer to Section I for Fluorescent penetrant inspection procedures and materials.

h. Using metal cutting hand shears and hand files, cut out damaged section of rib to a regular shape.

i. Fabricate a filler angle and stiffener angle, as shown in Details B and C, from 7075-0 bare sheet. Rib repair parts must be heat treated to -T6 condition per Specification MIL-H-6088 after forming.

j. Predrill holes in rib filler and stiffener angles as shown. Use a No. 39 (0.099) drill.

k. Apply one coat of wash primer to rib repair parts per Specification MIL-C-8514.

l. Apply one coat of zinc chromate primer to rib repair parts per Specifications MIL-P-8585 or MIL-P-6808.

m. Install stiffener angle, as shown, and hold in place with clamps.

n. Using predrilled holes in stiffener angle as a guide, drill holes in elevon rib. Use a No. 39 (0.099) drill.

o. Using existing holes in elevon rib as a guide, drill holes through stiffener angle. Use a No. 30 (0.128) drill.

p. Install rib filler angle, as shown, and hold in place with clamps.

q. Using predrilled holes in filler angle as a guide, drill holes through stiffener angle. Use a No. 39 (0.099) drill.

r. Ream all No. 39 (0.099) holes with a No. 30 (0.218) drill.

NOTE

DUE TO RESTRICTED WORKING AREA, A RIGHT ANGLE DRILL MUST BE USED TO DRILL HOLES THROUGH VERTICAL FLANGES OF REPAIR PARTS AND ELEVON RIB.

s. Remove rib repair parts and remove all burrs from repair parts and from elevon.

t. Reinstall rib repair parts and rivet in place through vertical flanges only, with AN470AD-4 rivets.

NOTE

DUE TO RESTRICTED WORKING AREA, AN AIR OPERATED RIVET SQUEEZER MUST BE USED TO INSTALL RIVETS THROUGH VERTICAL FLANGES OF REPAIR PARTS AND ELEVON RIB.

u. Fabricate doublers and flush skin patch from 7075-T6 bare sheet as shown in Details A and D.

v. Predrill doublers and flush skin patch as shown. Use a No. 39 (0.099) drill.

w. Apply one coat of wash primer to doublers and flush skin patch per Specification MIL-C-8514.

x. Apply one coat of zinc chromate primer to doublers and flush skin patch per Specifications MIL-P-8585 or MIL-P-6808.

y. Install doublers and hold in place with clamps.

z. Using predrilled holes in doublers as a guide, drill holes through existing skin. Use a No. 39 (0.099) drill.

aa. Ream holes drilled in step "z" with a No. 30 (0.128) drill.

ab. Remove doublers and remove all burrs from doublers and elevon.

ac. Machine countersink 100 degrees all new holes in existing elevon skin.

ad. Reinstall doublers and rivet in place with AN426AD-4 rivets.

ae. Install flush skin patch.

af. Using predrilled holes in flush skin patch as a guide, drill holes through doublers. Use a No. 39 (0.099) drill.

ag. Using lines layout method of locating blind holes contained in Section I, pick up existing holes in elevon rib. Use a No. 39 (0.099) drill.

ah. Ream holes drilled in steps "af" and "ag" with a No. 30 (0.218) drill.

ai. Remove flush skin patch and remove all burrs from patch and from elevon.

aj. Machine countersink 100 degrees all holes in flush skin patch.

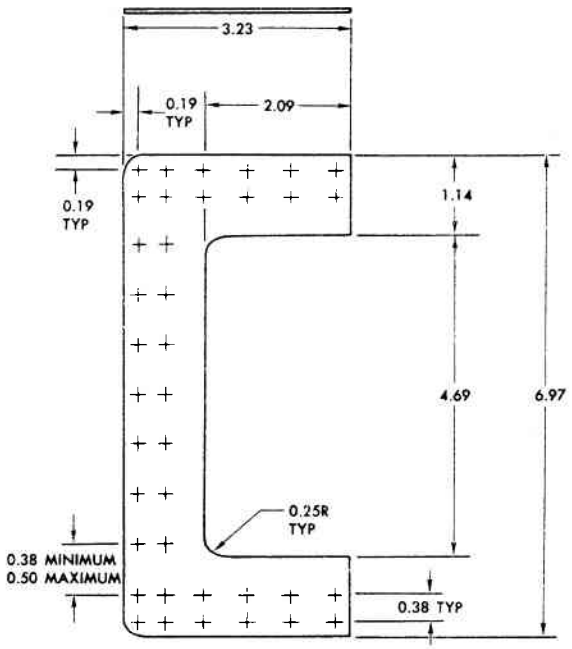
ak. Reinstall flush skin patch and rivet in place with 56S-100-4 Dupont blind explosive rivets.

al. Fill gaps between flush skin patch and existing elevon with MIL-S-38228 Aerodynamic Smoothing Compound.

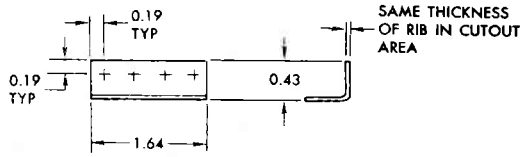
am. Refinish exterior surface of elevon skin in repair area according to applicable finish schedule contained in Section I.

06 03 250 18

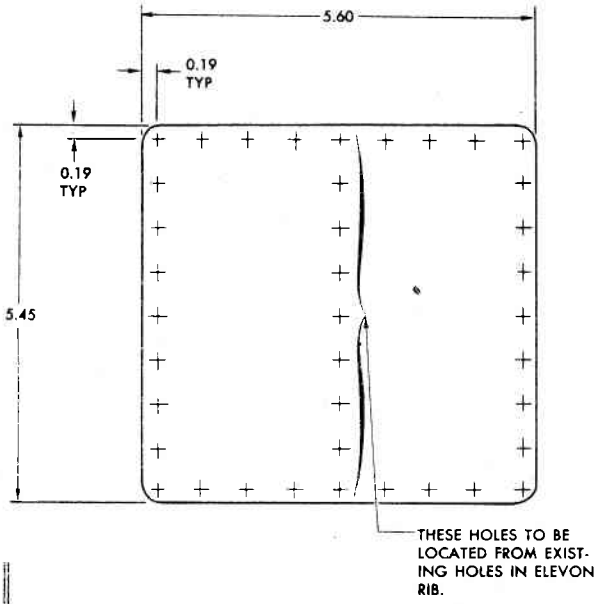
Figure 2-20. Elevon Skin Repair (Sheet 1 of 3)



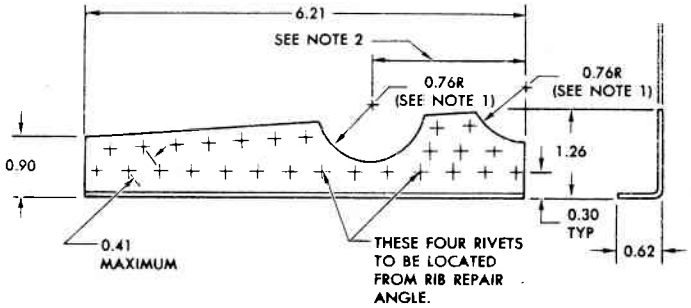
DETAIL A
DOUBLER
LEFT HAND SHOWN
RIGHT HAND OPPOSITE



DETAIL B
ELEVON RIB FILLER ANGLE



DETAIL D
FLUSH SKIN PATCH
THICKNESS OF PATCH MUST EQUAL THICKNESS OF SKIN BEING REPAIRED.



DETAIL C
ELEVON RIB STIFFENER ANGLE

NOTES:
1. CUTOUTS IN STIFFENER ANGLE ARE PROVIDED FOR CLEARANCE OF Q2001-100 HOLES IN ELEVON RIB.
2. DIMENSIONS BETWEEN CUTOUTS IN RIB STIFFENER ANGLE MUST BE DETERMINED BY A PHYSICAL MEASUREMENT.
3. ALL DIMENSIONS ARE MINIMUM. REFER TO REPAIR LIMITATIONS SHOWN IN THIS REPAIR FOR MAXIMUM ALLOWABLE DIMENSIONS.

REPAIR LIMITATIONS
1. Maximum size of skin cutout = 27.50 square inches.
2. Maximum length of coutout in rib = 5.00 inches.

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Figure 2-20. Elevon Skin Repair (Sheet 2 of 3)

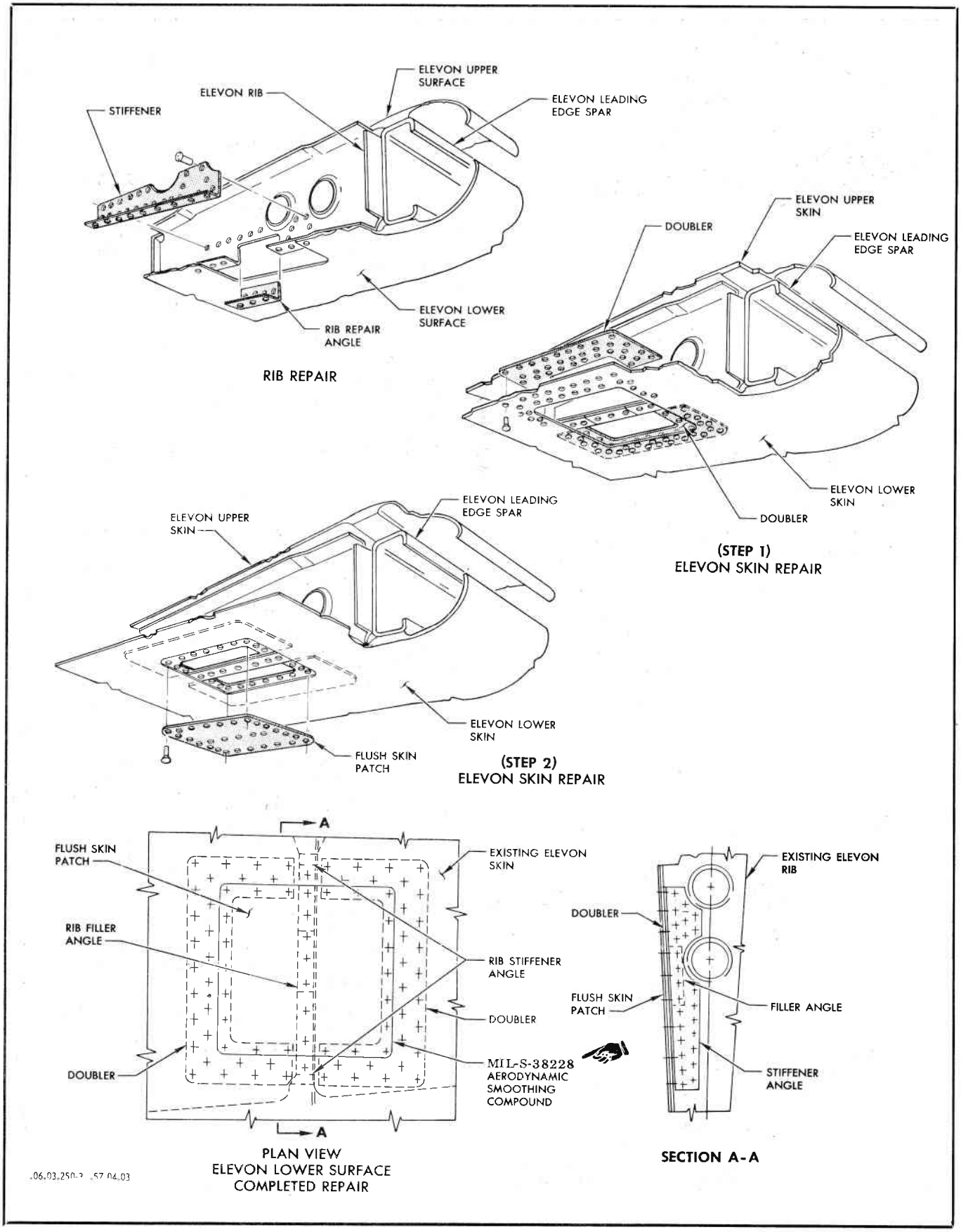
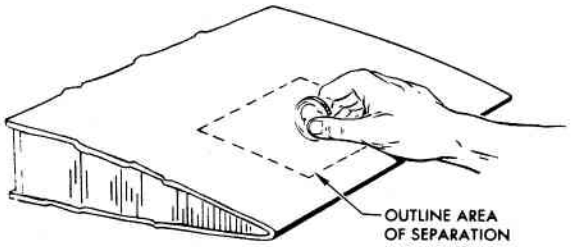
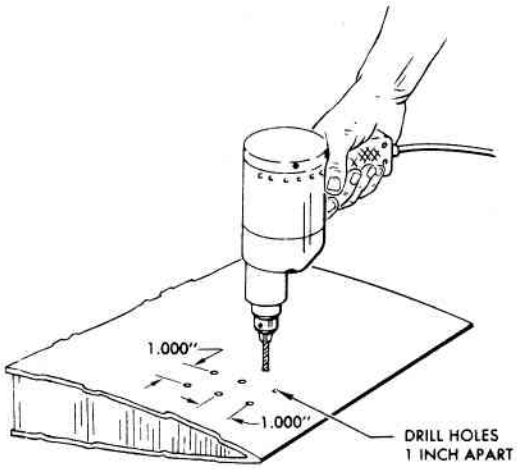


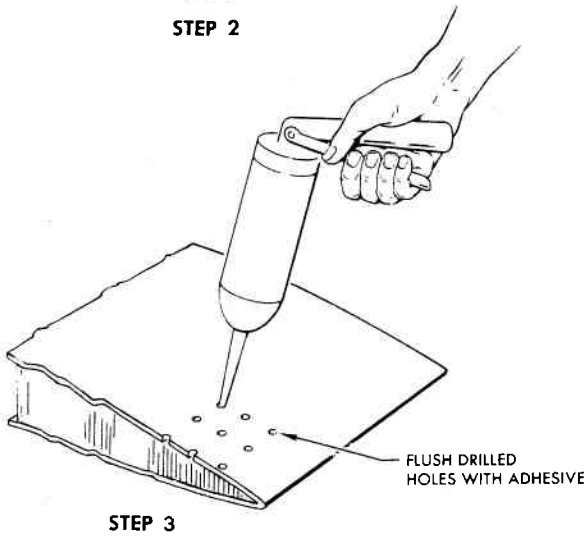
Figure 2-20. Elevon Skin Repair (Sheet 3 of 3)



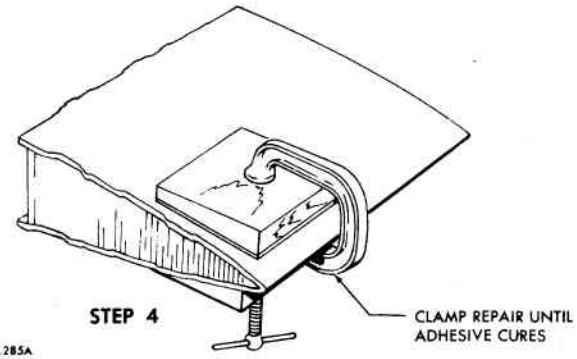
STEP 1



STEP 2

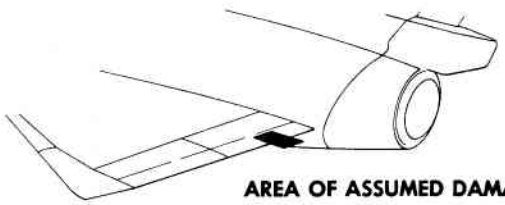


STEP 3



STEP 4

06.03.285A



AREA OF ASSUMED DAMAGE

REPAIR PROCEDURE

a. Determine exact area of separation by rapping the upper and lower surface of the elevon with a large coin. **(STEP 1)**

b. Repair limitations.

(1) Circular shape areas-4inch maximum diameter.

(2) All other shape areas-maximum area of 12 square inches with maximum dimension being no greater than 6 inches.

c. Outline area of separation with a pencil and measure area. If area of separation exceeds 12 square inches, refer to Section X for additional repairs. If area is less than 12 square inches, continue with the following repair procedure.

NOTE

REMOVE AND INVERT ELEVON IF SEPARATION IS ON LOWER SURFACE.

(1) Drill holes through skin in area where separation has occurred. Use a No. 40 (0.098") drill. Holes should be drilled one inch apart throughout area as shown in **STEP 2**.

CAUTION

DO NOT ALLOW DRILL TO PENETRATE MORE THAN 1/16 INCH THROUGH SKIN TO PREVENT DAMAGING HONEYCOMB SEGMENTS.

(2) Mix adhesive. Refer to Table II-VIII for mixing procedure. Use one of the following adhesives: Epon VIII, Epon 3119 or EC1469.

(3) Use a sealant gun with a small tip on a large hypodermic type needle and inject enough mixed adhesive to saturate separated area until all the drilled holes are flushed. **(STEP 3)**

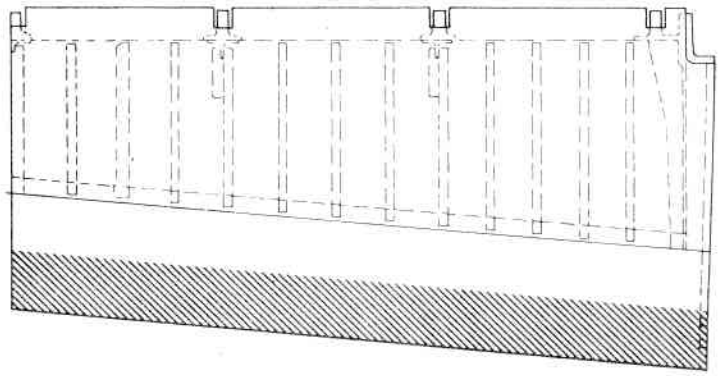
NOTE

IF AREA OF SEPARATION IS SMALL (2 SQUARE INCHES OR LESS) ADHESIVE MAY BE INJECTED FIRST WITH ONE NEEDLE FOLLOWED BY THE ACCELERATOR IN ANOTHER NEEDLE. THIS METHOD WILL ELIMINATE PRE-MIXING. HOWEVER, PROPER MIXTURE RATIOS BETWEEN ADHESIVE AND ACCELERATOR MUST BE OBSERVED. REPAIRS MADE BY THIS METHOD DO NOT REQUIRE CLAMPING.

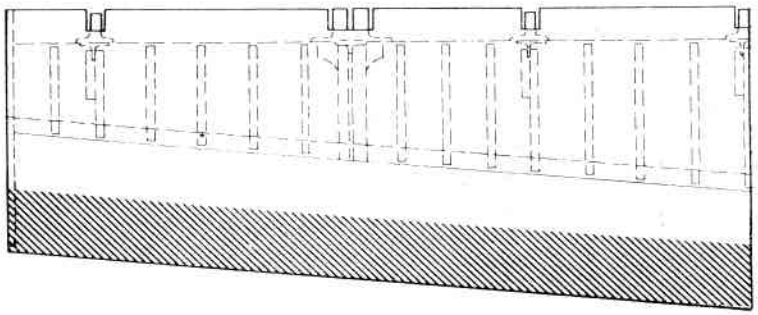
(4) Clamp a block over repair area and allow adhesive to cure for time recommended by the manufacturer. **(STEP 4)**

d. If area of separation exceeds limits specified in **step b**, refer to figure 2-22 for extended limits, and repair in accordance with figure 10-41.

Figure 2-21. Elevon Honeycomb Separation Repair



ELEVON–INBOARD



ELEVON–OUTBOARD

REPAIR LIMITATIONS

a. Elevon trailing edge repair, see Figure 10–41 or 10–42, is restricted to:
   (1) Shaded area shown.
   (2) Maximum spanwise length of repairs in a section are:
      (a) Single Repair – 20 per cent of the spanwise length of section.
      (b) Multiple Repairs – Total of 35 per cent of spanwise length of section.
   (3) Minimum distance between repair cutouts is 4 inches.

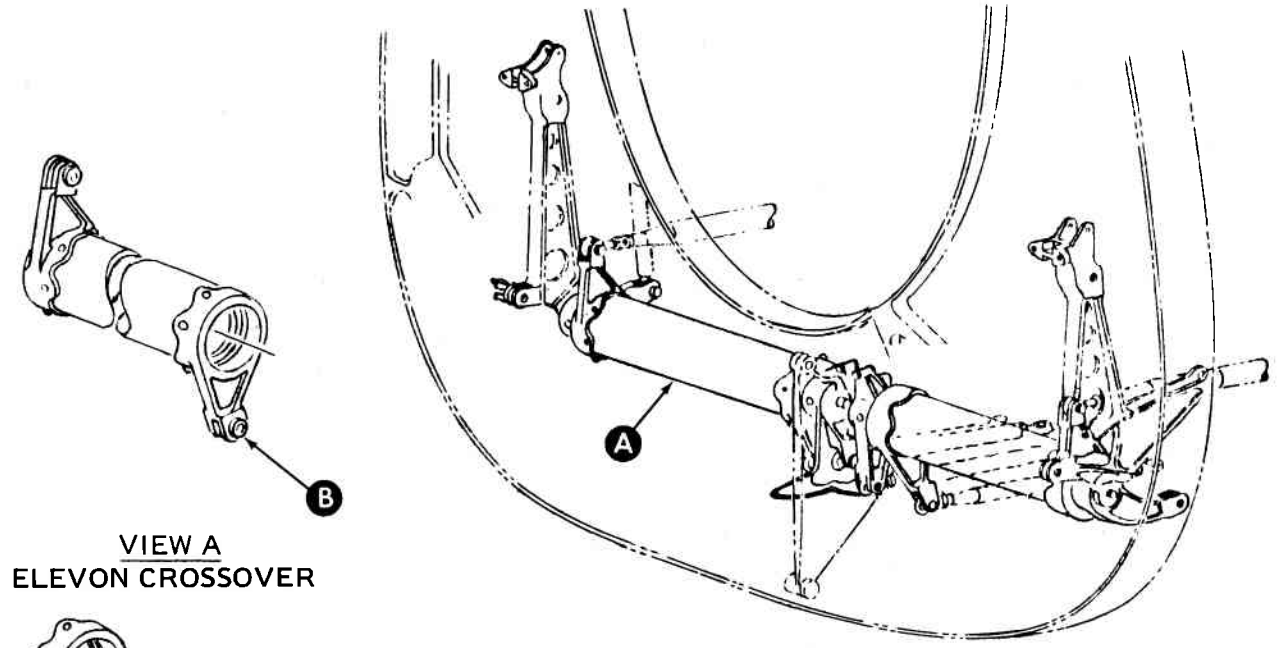
■ b. Use the typical repair shown in Figures 10–37 or 10–39 to repair damages in elevons having a minimum of 3 inches between cutout and trailing edge, and a diameter of 6 inches or less. Minimum distance between repair cutout is diameter of larger of the two adjacent repairs.

c. See Figure 2–21 for separation repair limits.

d. Mixing of Repairs:
   (1) Trailing edge repair, Figures 10–41 or 10–42, and plating repair, Figure 10–37, must not overlap.
   (2) Trailing edge repair, Figures 10–41 or 10–42, and plating repair, Figure 10–37, may overlap a separation repair, Figure 2–21.

e. Refer damages that exceed above limitations to an aeronautical structures engineer for disposition or replace components.

Figure 2-22. Elevon Honeycomb Repair–Moisture Removal Procedure

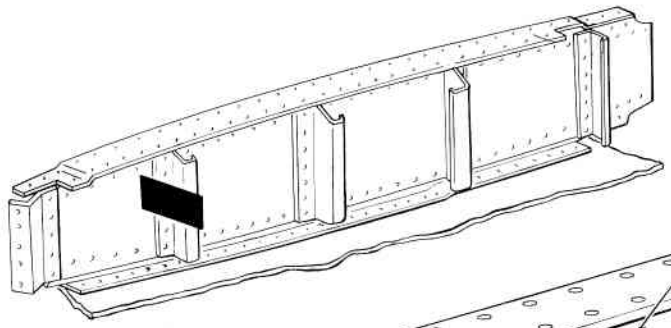


VIEW A
ELEVON CROSSOVER

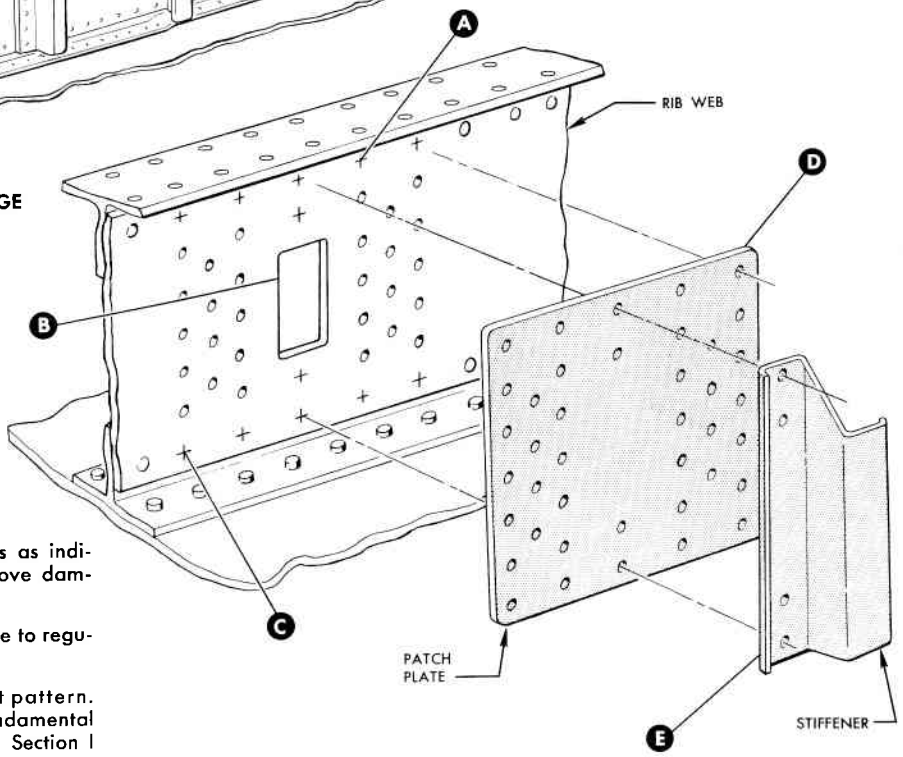
VIEW B

1. Repair of out-of-round holes for bushings as shown in View B above will be accomplished as follows:
   a. Line ream or line bore holes in end fitting only to a point that will eliminate out-of-round condition. Maximum diameter allowed after line reaming or boring is 0.415 inch.
   b. Manufacture repair bushings in accordance with NAS77-4-19 and NAS77-4-2D but increase the O.D. by 0.001 in. $^{+\ 0.0000\ \text{in.}}_{-\ 0.0005\ \text{in.}}$ larger than the diameter of the ream or bored hole.
   c. Freeze bushings in dry ice alcohol solution five minutes prior to installation.
2. The repair procedure applies to left and right hand cross over tube assemblies.

Figure 2-22A. Elevon Crossover Tube, Bushing Hole Repair



AREA OF ASSUMED DAMAGE



- **A** Remove attaching rivets as indicated by (+) and remove damaged rib stiffener.
- **B** Trim out area of damage to regular contour.
- **C** Layout and drill rivet pattern. Refer to paragraph Fundamental Principles of Repair in Section I for formula.
- **D** Use rivet pattern in web as guide to layout and fabricate patch plate. Use same type material, but next heavier gage.
- **E** Use new rib stiffener and pick up rivet pattern as shown.
- **F** Install patch plate and rib stiffener with AN470AD rivets.

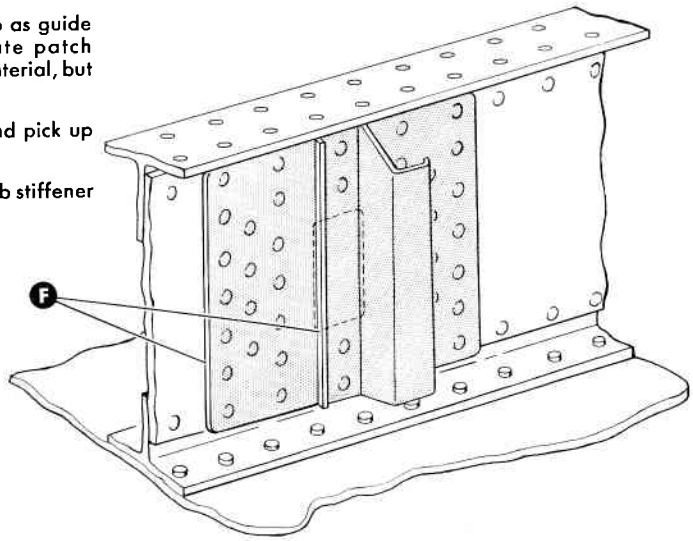


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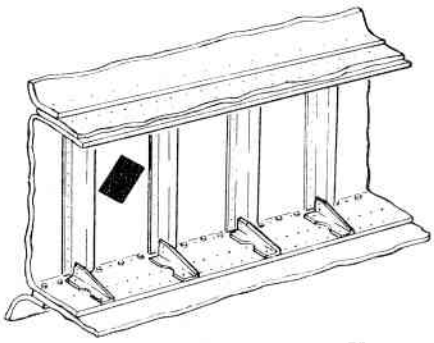
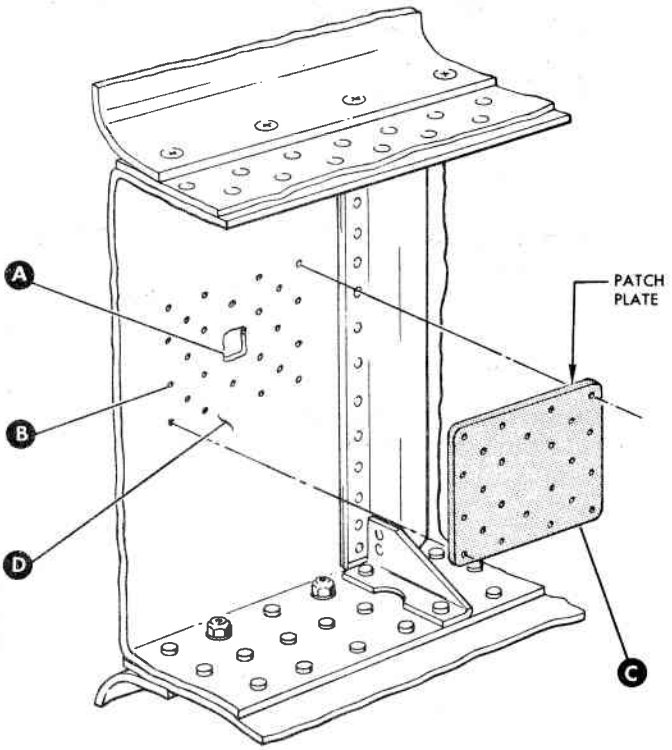
Figure 2-23. Wing Rib Repair — Intermediate Box Area



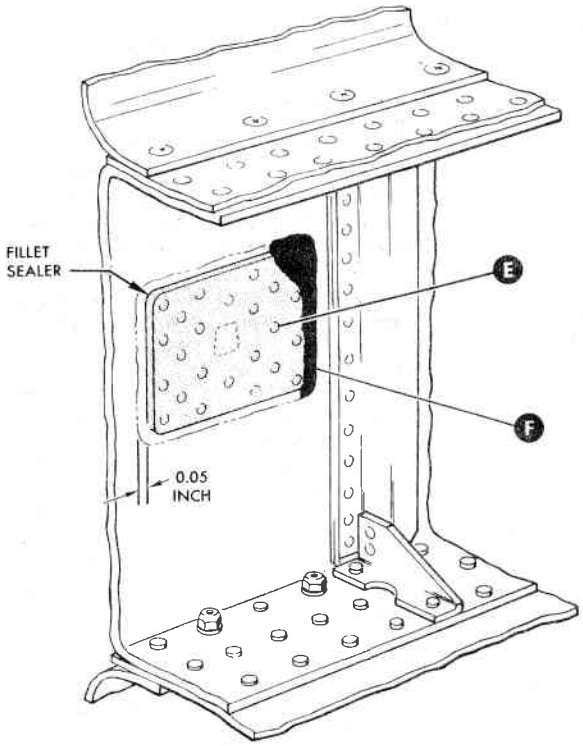
AREA OF ASSUMED DAMAGE



A Trim out area of damage to regular contour.

B Refer to paragraph "Fundamental Principles of Repair" in Section I for rivet pattern layout. Drill No. 11 (0.191) rivet holes as shown.

C Use rivet pattern in web as guide to layout and fabricate patch plate. Use same type material as web, but next heavier gage.



D Apply sealer, Military Specification MIL-S-8802 to faying surfaces of reinforcing plate, rib web member, and to shank of rivets on installation.

E Install patch plate with MS20470AD6 rivets.

F Apply 0.060 inch thick coating of fillet sealer, Military Specification MIL-S-8802 over entire repair. Allow sealer to dry until tack free.

CAUTION

DO NOT SUBSTITUTE SCREWS FOR SOLID RIVETS IN FUEL TIGHT REPAIRS.

NOTES:

1. REFER TO PARAGRAPHS TITLED "PREPARATION OF SURFACE SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" IN THIS SECTION FOR SEALANT.
2. PRESSURE TEST FUEL TANK IN ACCORDANCE WITH INSTRUCTIONS CONTAINED IN THIS SECTION AFTER COMPLETION OF REPAIR.

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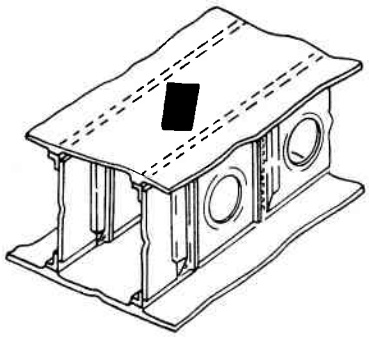
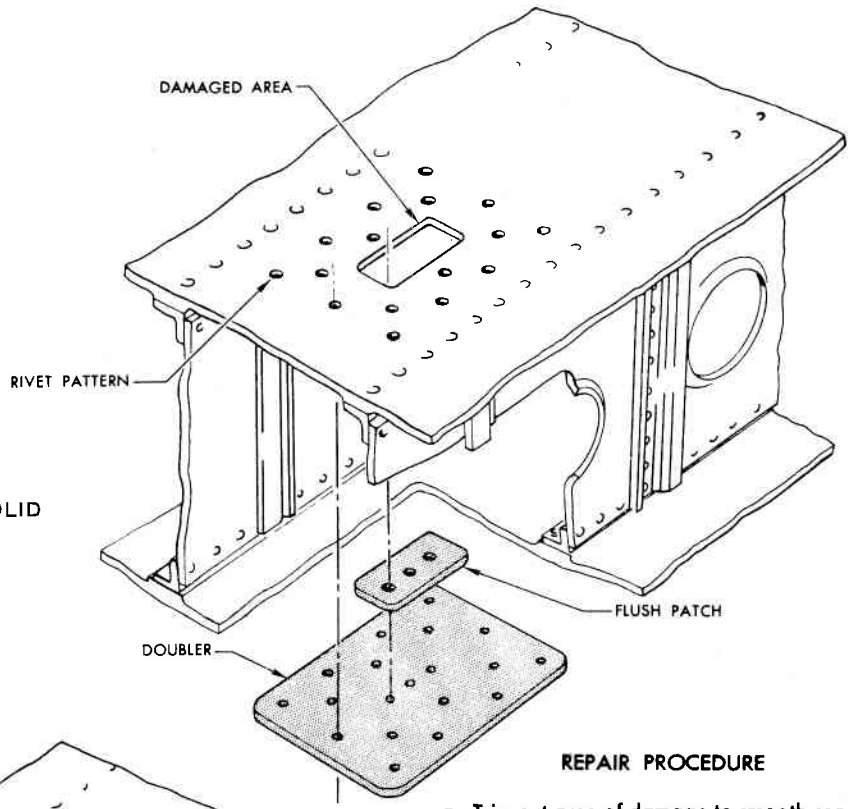
Figure 2–24. Wing Rib Repair–Fuel-Tight Area

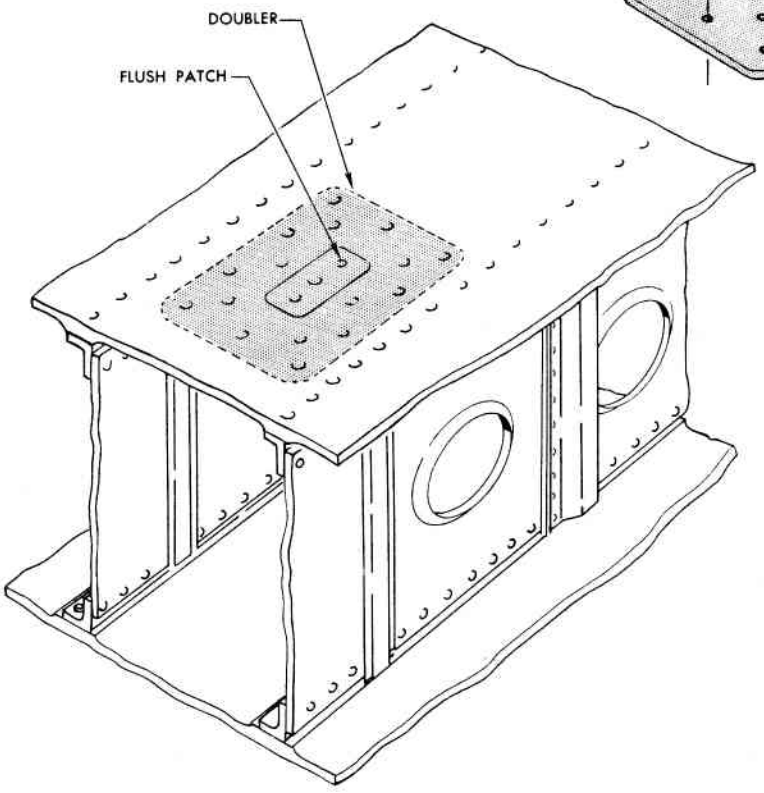


AREA OF ASSUMED DAMAGE
(PLATING THICKNESS UNIFORM AT DAMAGE)

CAUTION

DO NOT SUBSTITUTE SCREWS FOR SOLID RIVETS IN FUEL TIGHT REPAIRS.





REPAIR PROCEDURE

a. Trim out area of damage to smooth contour.
b. Layout and drill rivet pattern in plating. Refer to Section I for rivet pattern.
c. Use rivet pattern in plating as guide to layout, and fabricate doubler. Use same type material as original plating, but next heavier gage.
d. Fabricate flush patch and drill out rivet holes as shown. Use same type material and gage as original plating.
e. Apply sealer, Military Specification MIL-S-8802 on faying surfaces of patch plate, doubler and shank of rivets on installation.
f. Attach flush patch to doubler with MS20426AD4 rivets.
g. Install doubler with MS20426AD6 rivets.
h. Apply 0.060 inch thick coating of fillet sealer, Military Specification MIL-S-8802 over entire repair. Allow sealer to dry until tack free.

NOTES:
1. REFER TO PARAGRAPHS TITLED "PREPARATION OF SURFACE SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" IN THIS SECTION FOR SEALANT.
2. PRESSURE TEST FUEL TANK IN ACCORDANCE WITH INSTRUCTIONS CONTAINED IN THIS SECTION AFTER COMPLETION OF REPAIR.

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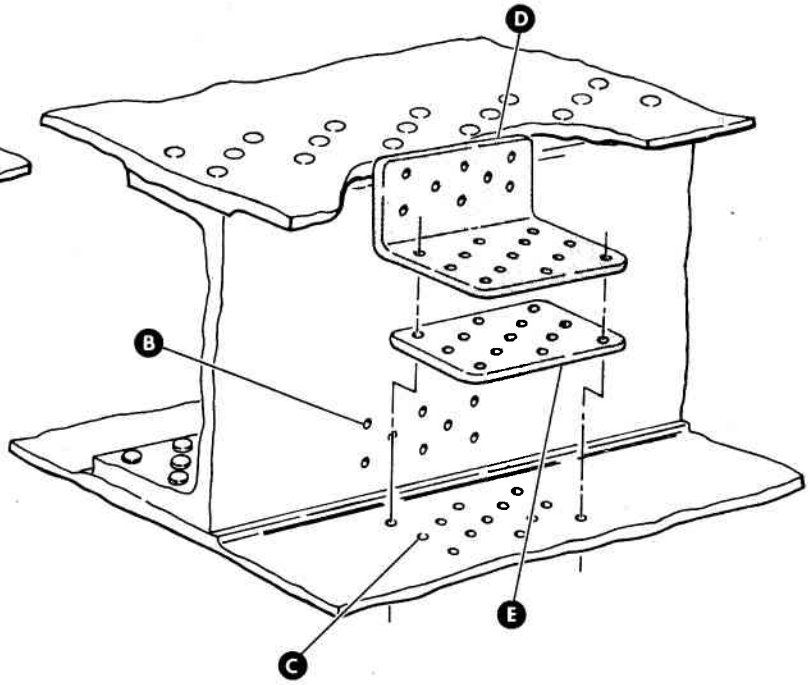
Figure 2–25. Wing Plating Repair–Fuel-Tight Area

All data on pages 2-41 thru 2-49 including figure 2-26 deleted.

AREA OF ASSUMED DAMAGE
(PLATING THICKNESS
UNIFORM AT DAMAGE)



A Tap out dent using a plastic hammer or rawhide mallet. Back opposite side of plating with heavy bucking bar covered with masking tape when tapping out dent.

B Layout and drill rivet pattern. Refer to paragraph "Fundamental Principles of Repair" in Section I.

C Layout and drill rivet pattern same as for hole repair. Countersink holes 100° on far side.

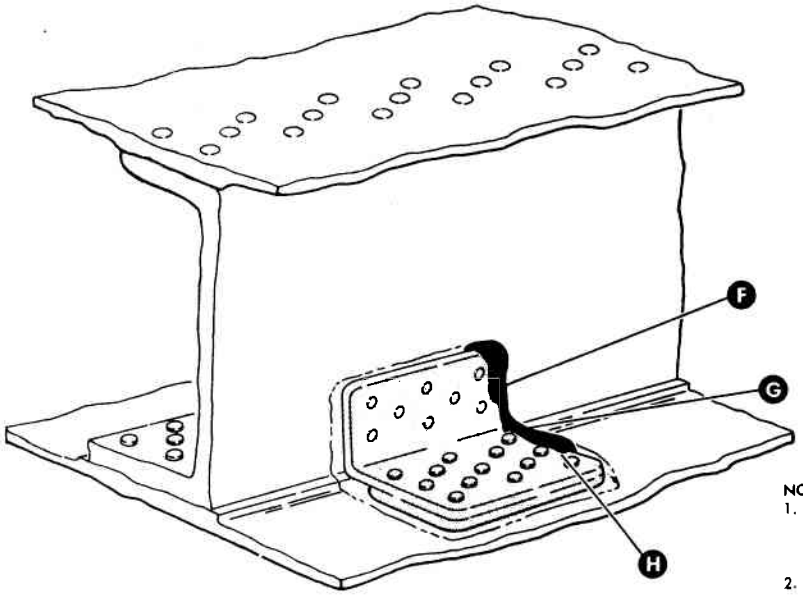
D Use rivet pattern as a guide and fabricate reinforcing angle of same type material as original plating, but next heavier gage.

E Use rivet pattern as a guide and fabricate filler plate of same type material as original plating. Use gage equal to depth of machined portion of plating.

F Apply sealer, Military Specification MIL-S-8802 to all faying surfaces and install filler plate and reinforcing angle. Use MS20470D rivets through reinforcing angle and channel and MS20426AD rivets through reinforcing angle, filler, and plating.

G Plug ends of voids created by assembly of repair with plugs made of 1100 aluminum.

H Apply 0.060 inch thick coating of fillet sealer, Military Specification MIL-S-8802 over entire repair. Allow sealer to dry until tack free.



CAUTION

DO NOT SUBSTITUTE SCREWS FOR SOLID RIVETS IN FUEL TIGHT REPAIRS.

NOTES:
1. REFER TO PARAGRAPHS TITLED, "PREPARATION OF SURFACES FOR SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" FOR CORRECT SEALANT APPLICATION AND PROCEDURE.
2. REFER TO PARAGRAPH TITLED "FUEL TANK LEAK TEST" FOR FUEL TANK PRESSURE TEST AFTER COMPLETION OF REPAIR.

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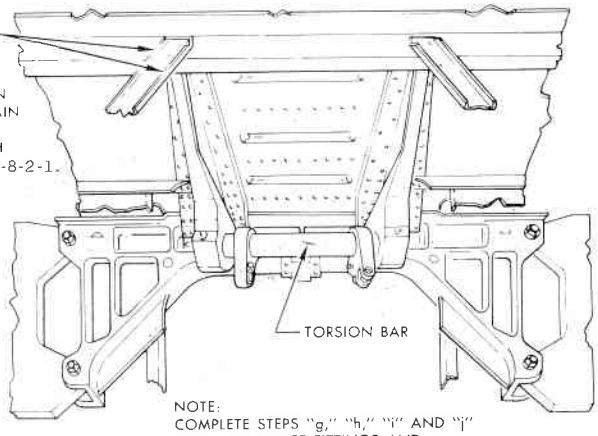
Figure 2–27. Wing Plating Dent Repair–Fuel-Tight Area

AREA OF ASSUMED DAMAGE



ASSEMBLY VIEW LOOKING UP AND INBOARD

a. Using a No. 13 (0.185) drill, remove existing lockbolts in angle and damaged side brace fitting.
b. Remove NAS464-8A10 bolts (2) from side brace fitting and bridge fitting.
c. Working from upper surface of the wing skin, remove MS20426-DD6 rivets (48). Remove side brace fitting.

CAUTION

CARE MUST BE TAKEN NOT TO DAMAGE ADJACENT STRUCTURE WHEN REMOVING SIDE BRACE FITTING.

d. Align side brace fitting replacement part in approximate position and drill No. 40 (0.098) pilot holes through flanges of side brace support. Locate holes from existing holes in angle, wing plating and bridge fitting.
e. Align side brace fitting in permanent position by using torsion bar as an aligning tool. (Torsion bar must turn freely for proper alignment). Clamp and cleco side brace fitting securely and drill 3/16-inch (0.187) holes (48) through flanges. Drill two, ½-inch (0.500) holes through inboard end of side brace fitting. Drill two No. 13 (0.185) holes through outboard end of side brace fitting.
f. Remove torsion bar and side brace fitting, then remove all drill chips and burrs from wing plating and side brace fitting. Holes in side brace fitting must be spotfaced on surface indicated by arrows. Refer to Section I for material finish requirements for repairs.
g. Reinstall and align side brace fitting as outlined in step "e."
h. Rivet side brace fitting to wing plating, using MS20426-DD6 rivets (48).
i. Secure side brace fitting to bridge fitting with two NAS464-8A10 bolts, two AN364-820 nuts and four AN960-816L washers.
j. Secure side brace fitting to angle with two Huck Lockbolts (5320-262-7672) and two collars (5320-489-4823).

NOTE

INSTALL HUCK LOCKBOLTS IN ACCORDANCE WITH INSTALLATION INSTRUCTIONS GIVEN IN SECTION I.

k. Reinstall main landing gear as outlined in T.O. 1F-106A-2-8-2-1.

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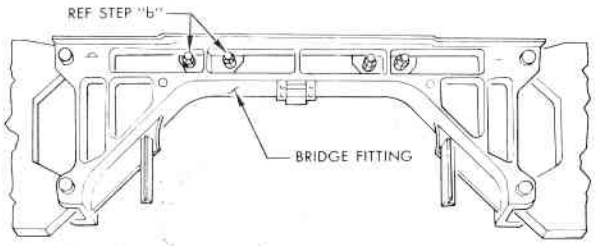
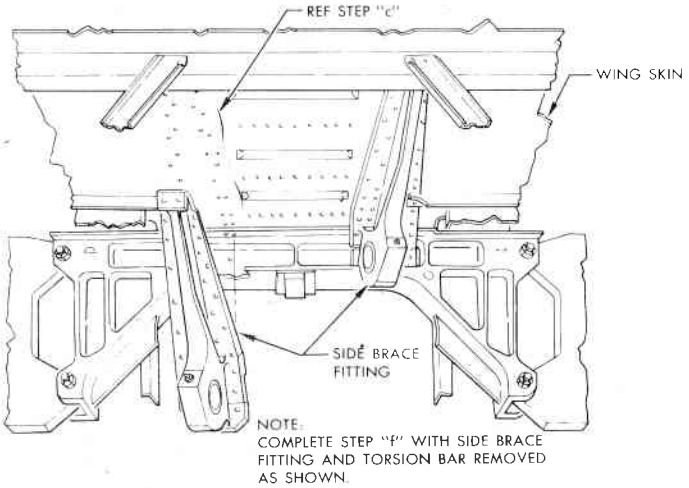
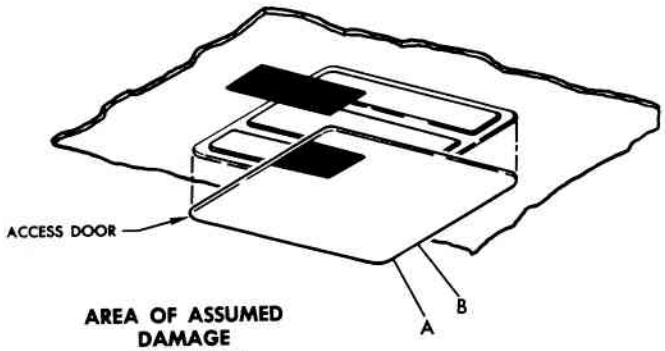


VIEW LOOKING OUTBOARD



EXPLODED VIEW LOOKING UP AND INBOARD WITH SIDE BRACE FITTING REMOVED

Figure 2-28. Replacement of Main Landing Gear Side Brace Fitting



AREA OF ASSUMED DAMAGE
(SEE NOTE)

A. Remove screws attaching damaged wing access door and remove door.

B. Hold access door, attaching screws and Fairprene seal for reinstallation. Place seal on clean, flat surface until reinstallation.

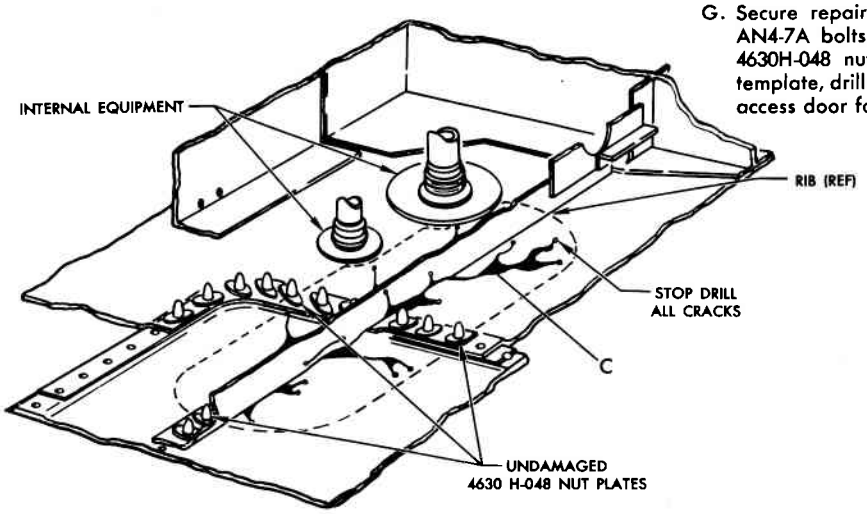
C. Bump out damaged area in wing skin and door to original contour as near as possible. Stop drill all cracks at end with ⅛ (0.125) drill.

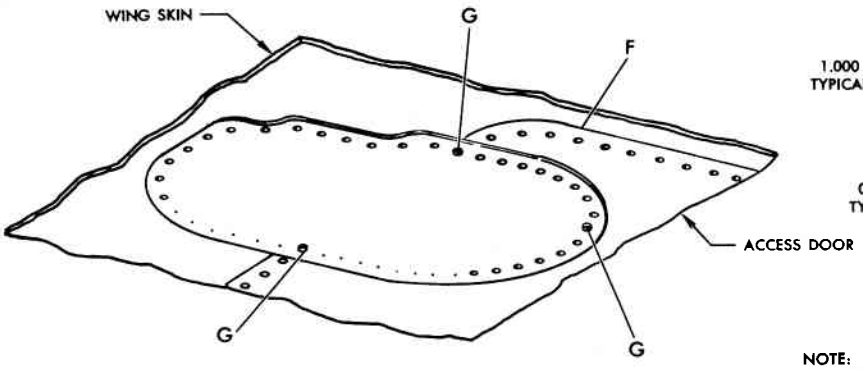
D. Fabricate repair plate from 0.125 gage 7075-T6 clad material. Dimension plate to exceed damaged area approximately 1.500 all around. Determine location of wing internal equipment adjacent to damaged area and contour repair plate accordingly. Edge distance of 1.500 may be reduced where necessary to alter contour to accept internal equipment.

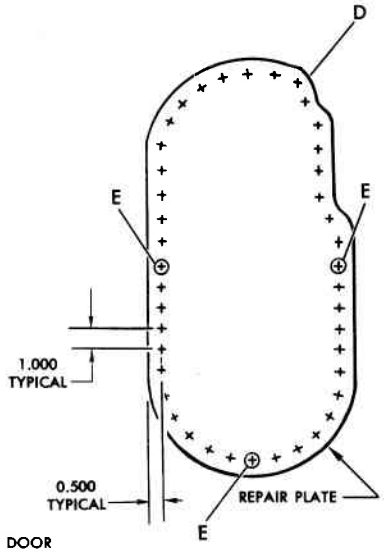
E. Layout and drill No. F (0.257) holes in repair plate for AN4 bolts as dimensioned. Adjust pattern to pick up three undamaged 4630H-048 nut plates in wing as indicated by ⊕.

F. Reinstall damaged access door with sufficient screws to hold in place.

G. Secure repair plate over damaged area with AN4-7A bolts picking up the three undamaged 4630H-048 nut plates. Using repair plate as a template, drill No. F (0.257) holes in wing skin and access door for installation of dome nuts.







NOTE:
THIS REPAIR IS RESTRICTED TO FUEL TANKS NO. 1, NO. 2, AND NO. 3.

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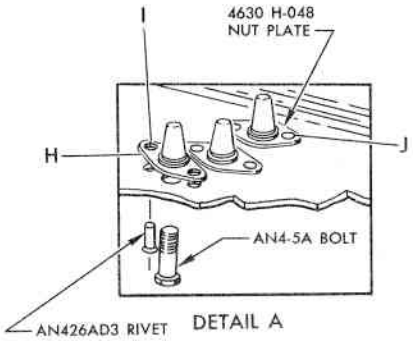
Figure 2-29. Wing Plating Repair — One-Time Flight (Sheet 1 of 2)



H. Position 4630 H-048 nut plates as shown and set I. up AN4 bolt to hold dome nut during installation process.

J. Drill No. 40 (0.098) holes through nut plate flanges and wing and access door skins. Countersink holes 100°x0.189 far side.

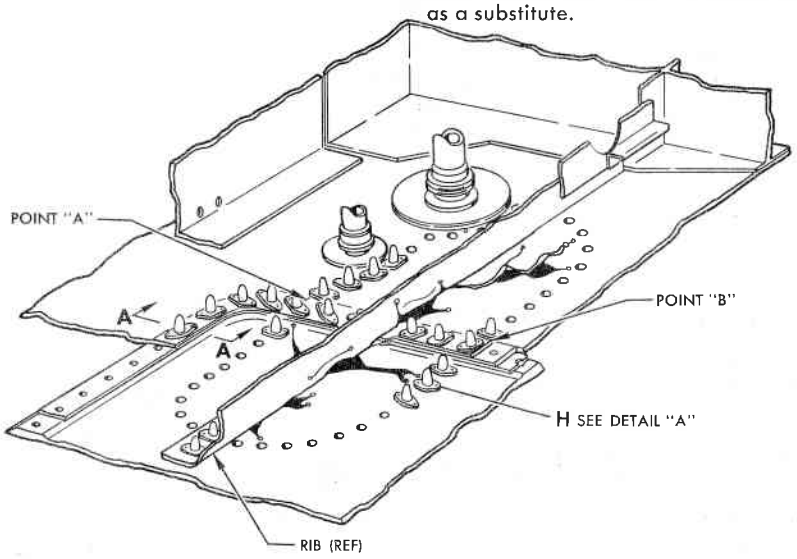
K. Install 4630 H-048 nut plates with AN426AD3 rivets.

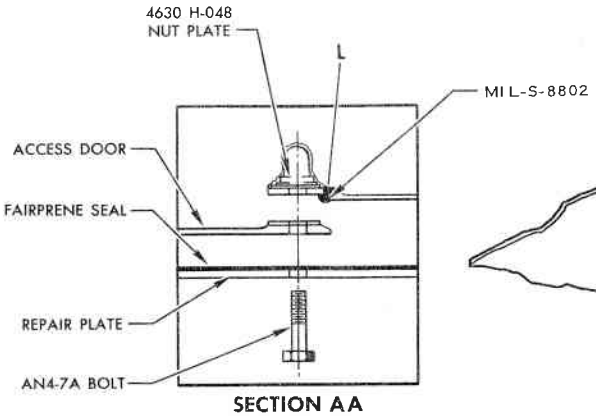
L. Use repair plate as template and fabricate 0.032 seal from Fairprene 5570.

M. Apply bead of sealant, Military Specification MIL-S-8802 to skin recess for access door attachment from point "A" to point "B".

N. Install access door with original attaching bolts.

Install Fairprene seal and repair plate with AN4-5A, AN4-7A bolts. If AN4 bolts are not available, AN525-416-9 and -10 screws may be used as a substitute.





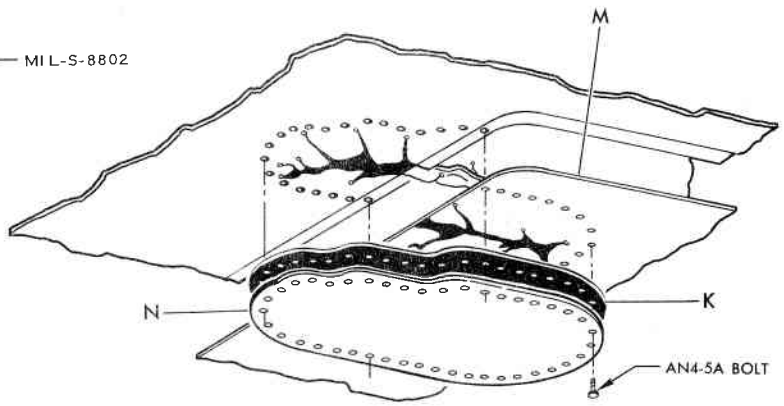


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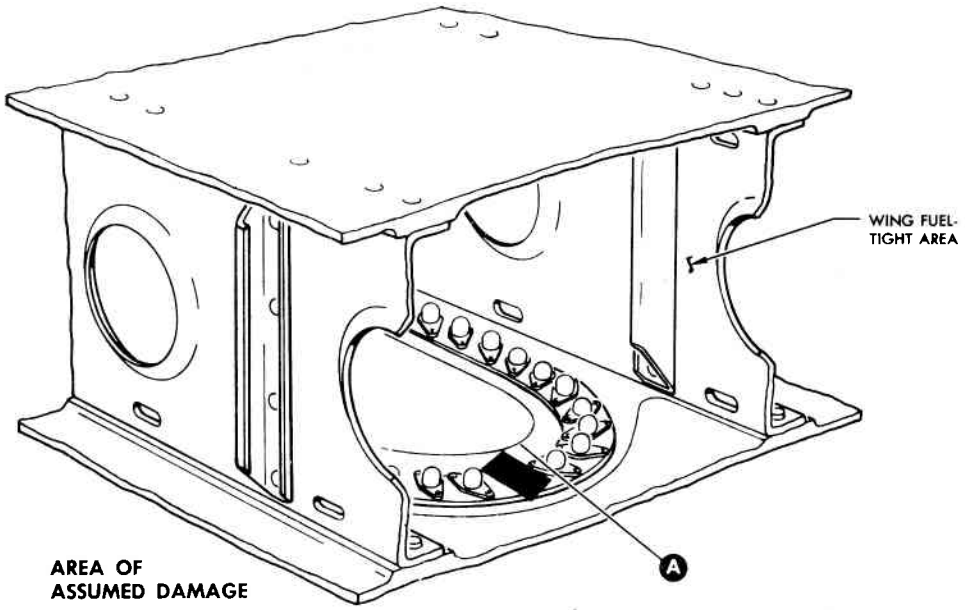
Figure 2–29. Wing Plating Repair–One-Time Flight (Sheet 2 of 2)



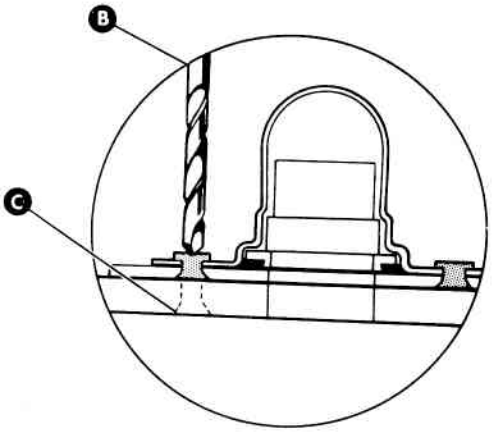
A Remove access door.

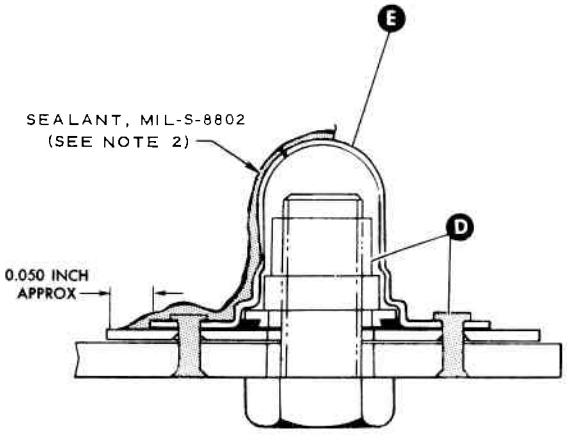
B Drill through rivet and wing plating using a No. 40 (0.098) drill. Remove dome nut.

C Countersink plating 100° x 0.189.

D Install new dome nut with AN426AD3 rivets. Use bolt to hold dome nut during riveting process.

E Cover dome nut installation with a coating of Military Specification MIL-S-8802.

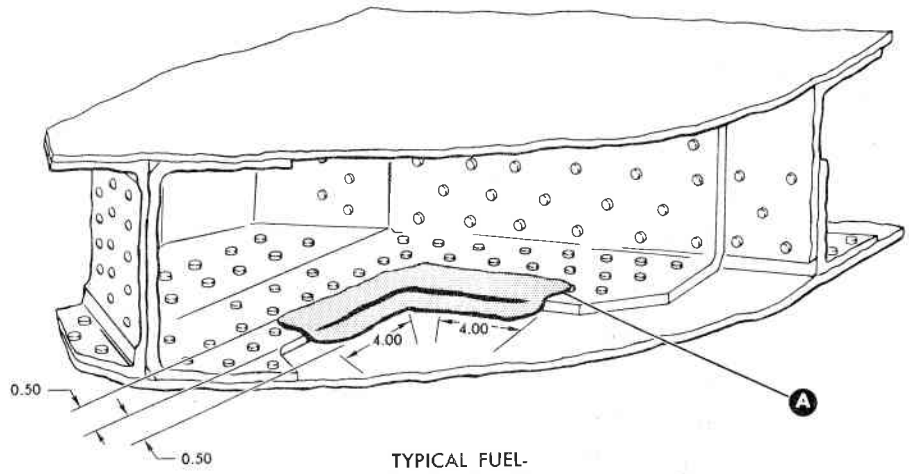




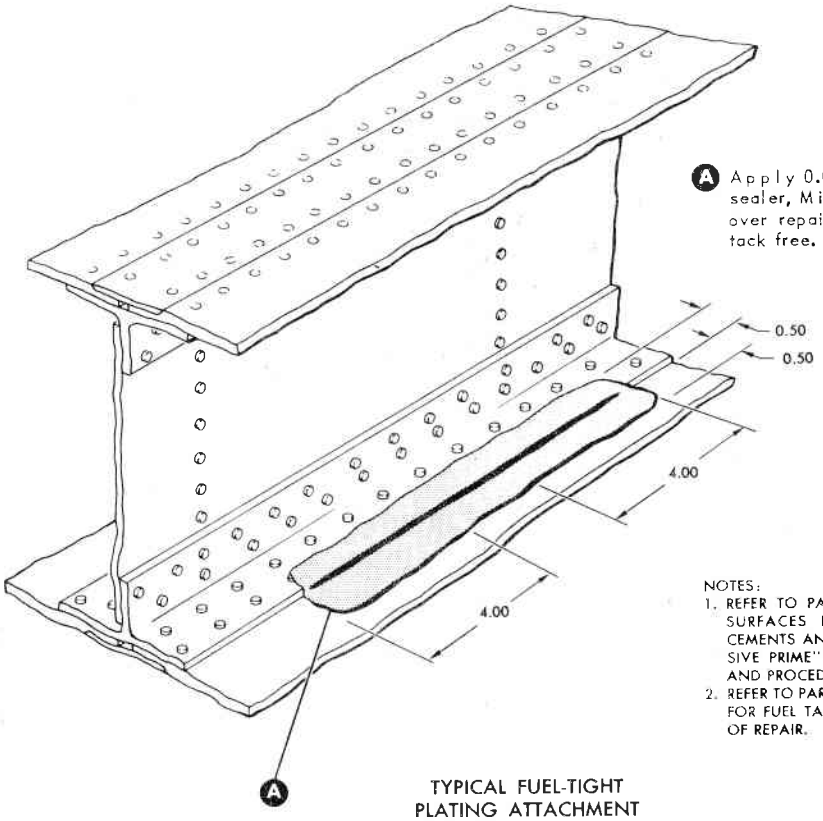
NOTES:

1. REFER TO PARAGRAPHS TITLED, "PREPARATION OF SURFACES FOR SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" FOR CORRECT SEALANT APPLICATION AND PROCEDURE.
2. TEMPORARY REPAIR TO CRACKED DOME NUT MAY BE MADE BY COATING DOME NUT INSTALLATION WITH 0.060 COAT OF SEALER, MILITARY SPECIFICATION MIL-S-8802. ALLOW SEALER TO DRY UNTIL TACK FREE.
3. REFER TO PARAGRAPH TITLED "FUEL TANK LEAK TEST" FOR FUEL TANK PRESSURE TEST AFTER COMPLETION OF REPAIR.

Figure 2–30. Dome Nut Replacement Repair



TYPICAL FUEL-TIGHT CORNER



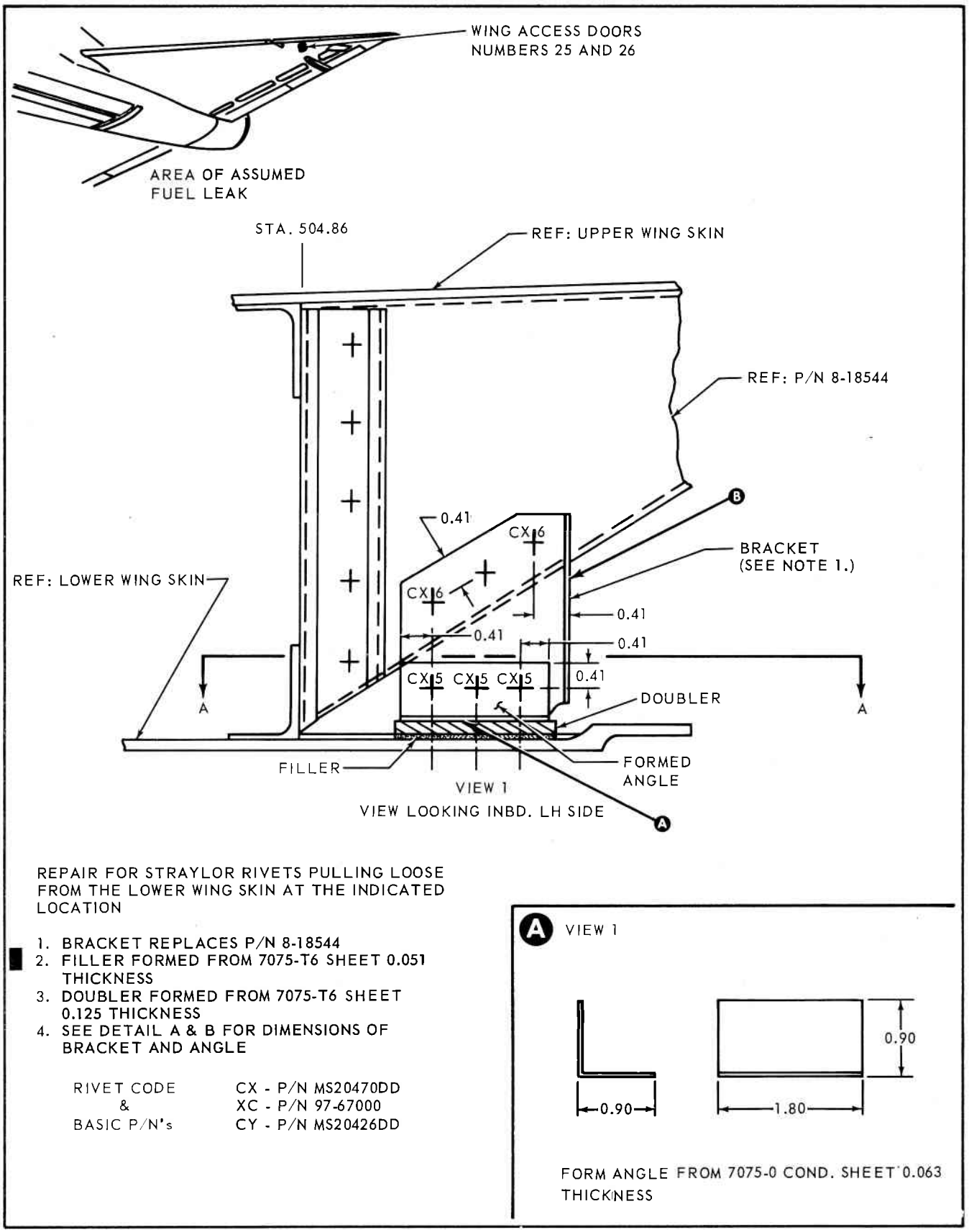
A Apply 0.060 inch thick coating of fillet sealer, Military Specification MIL-S-8802 over repair area. Allow sealer to dry until tack free.

NOTES:
1. REFER TO PARAGRAPHS TITLED, "PREPARATION OF SURFACES FOR SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" FOR CORRECT SEALANT APPLICATION AND PROCEDURE.
2. REFER TO PARAGRAPH TITLED "FUEL TANK LEAK TEST" FOR FUEL TANK PRESSURE TEST AFTER COMPLETION OF REPAIR.

TYPICAL FUEL-TIGHT PLATING ATTACHMENT

06.03.112 .57.02.03

Figure 2-31. Wing Fuel Leak Repair



REPAIR FOR STRAYLOR RIVETS PULLING LOOSE FROM THE LOWER WING SKIN AT THE INDICATED LOCATION

1. BRACKET REPLACES P/N 8-18544
2. FILLER FORMED FROM 7075-T6 SHEET 0.051 THICKNESS
3. DOUBLER FORMED FROM 7075-T6 SHEET 0.125 THICKNESS
4. SEE DETAIL A & B FOR DIMENSIONS OF BRACKET AND ANGLE

RIVET CODE & BASIC P/N's	CX - P/N MS20470DD
	XC - P/N 97-67000
	CY - P/N MS20426DD

Figure 2-31A Fuel Leak (Straylor Rivets) Wing B.L. 145.5 Repair (Sheet 1 of 5)

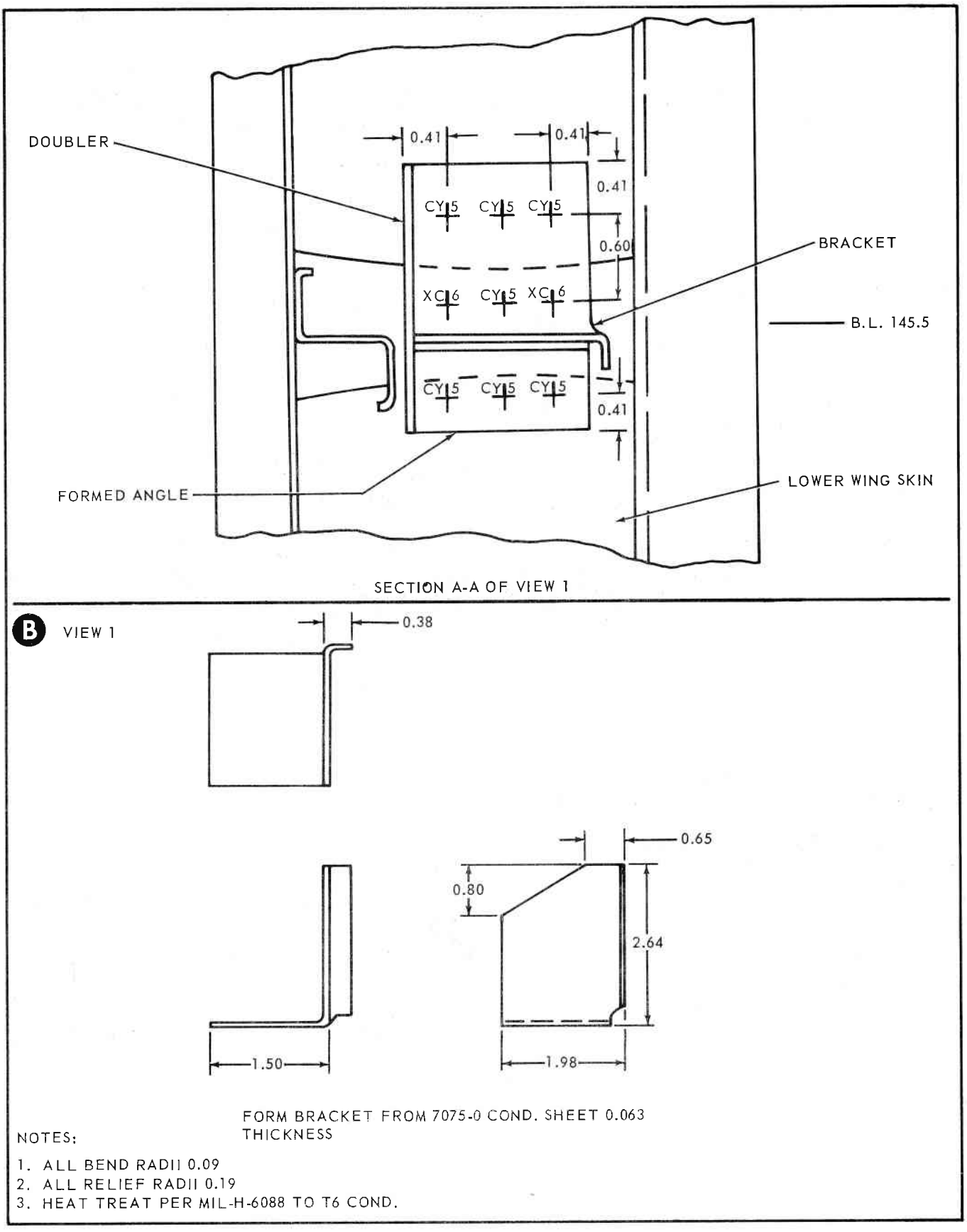
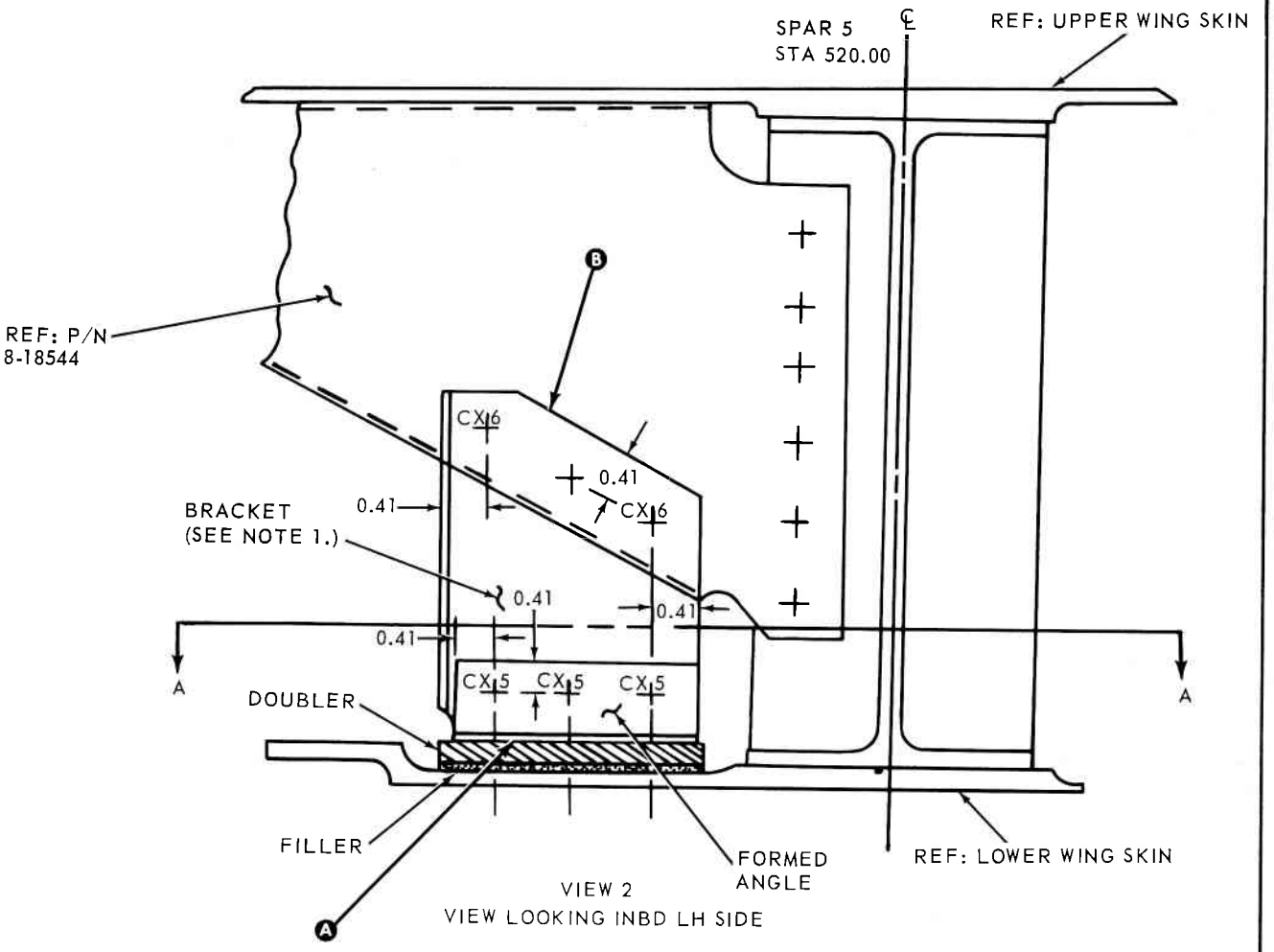


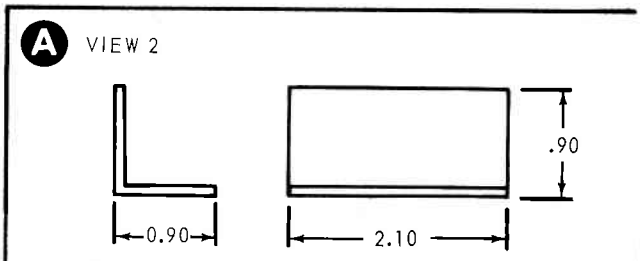
Figure 2-31A Fuel Leak (Straylor Rivets) Wing B.L. 145.5 Repair (Sheet 2 of 5)



REPAIR FOR STRAYLOR RIVETS PULLING LOOSE FROM THE LOWER WING SKIN AT THE INDICATED LOCATION

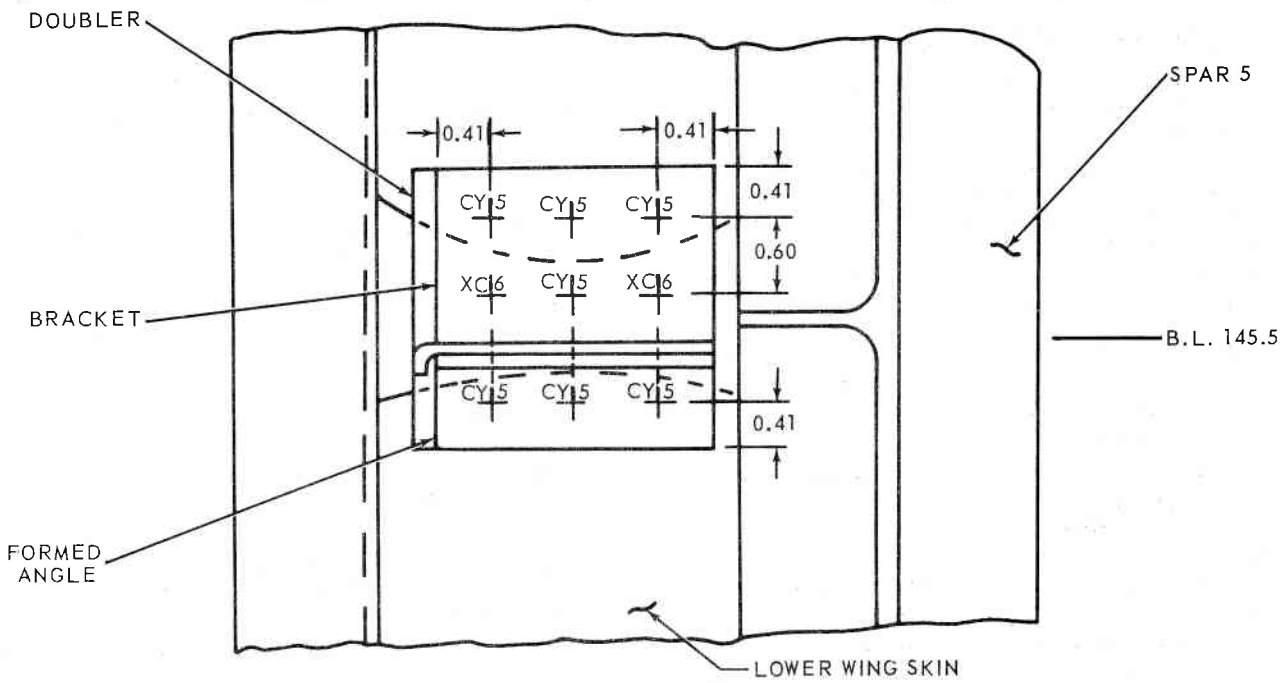
1. BRACKET REPLACES P/N 8-18544
2. FILLER FORMED FROM 7075-T6 SHEET 0.051 THICKNESS
3. DOUBLER FORMED FROM 7075-T6 SHEET 0.125 THICKNESS
4. SEE DETAIL A & B FOR DIMENSIONS OF BRACKET AND ANGLE

RIVET CODE & BASIC P/N's	CX - P/N MS20470DD XC - P/N 97-67000 CY - P/N MS20426DD



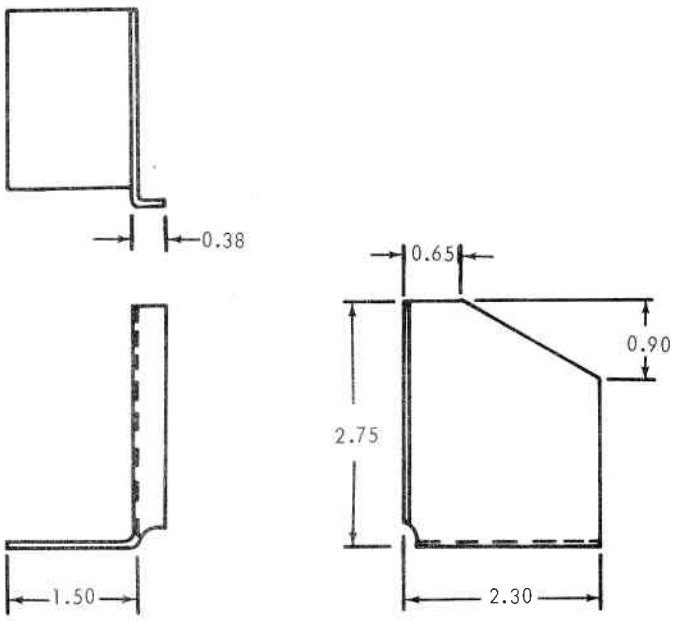
FORM ANGLE FROM 7075-0 COND. SHEET 0.063 THICKNESS

Figure 2-31A Fuel Leak (Straylor Rivets) Wing B.L. 145.5 Repair (Sheet 3 of 5)



SECTION A-A OF VIEW 2

B VIEW 2



FORM BRACKET FROM 7075-0 SHEET 0.063 THICKNESS

NOTES:

1. ALL BEND RADII 0.09
2. ALL RELIEF RADII 0.19
3. HEAT TRANT PER MIL-H-6088 TO T6 COND.

Figure 2-31A Fuel Leak (Straylor Rivets) Wing B.L. 145.5 Repair (Sheet 4 of 5)

FUEL LEAK REPAIR PROCEDURES, B. L. 145.5

1. Remove existing bracket and scotchweld tape in accordance with paragraph 2-35, T.O. 1F-106A-3.
2. Fabricate fillers to match contour of milled wing skin. Fabricate doubler from 7075-T6 0.125 thickness to fit flush over fillers and raised portion of milled wing skin.
3. Manufacture new bracket and angle as shown in Details A and B of Views 1 and 2.
4. Apply sealer MIL-S-8802 to all faying surfaces.
5. Attach fillers, doubler, angle and bracket to wing skin using (7) MS20426DD rivets as shown in Views 1 and 2.
6. Attach doubler and bracket to wing skin with (2) Straylor rivets P/N 97-67000 using existing rivet location.
7. Attach bracket to angle and former P/N 8-18544 using existing rivet holes in former and rivet pattern in Views 1 and 2 as a guide.
8. Apply 0.060 inch thick coating of fillet sealer MIL-S-8802 over entire repair. Allow sealer to dry until tack free.

NOTE

REFER TO PARAGRAPHS TITLED "PREPARATION OF SURFACES FOR SEALING," "APPLICATION OF CEMENTS AND SEALERS," AND "STRUCTURAL ADHESIVE PRIME" FOR CORRECT SEALANT APPLICATION AND PROCEDURE.

REFER TO PARAGRAPH TITLED "FUEL TANK LEAK TEST" FOR FUEL TANK PRESSURE TEST AFTER COMPLETION OF REPAIR.

RIVET HOLE LOCATIONS MAY VARY. LOCATE HOLES AS NECESSARY MAINTAINING GOOD SHOP PRACTICE.

Figure 2-31A Fuel Leak (Straylor Rivets) Wing B.L. 145.5 Repair (Sheet 5 of 5)

2-29. Rivet Substitution.

2-30. The Straylor fuel-tight rivet used to attach the wing plating to the wing internal structure in the wing fuel-tight areas has been especially designed for use on the F-106A/B airplanes and may not be substituted by any other type of rivet. See figures 1-34 and 1-35 for installation and removal of Straylor fuel-tight rivets. Rivets used in the wing leading edges, wing tips, and elevons may be substituted with different types of rivets according to the rivet substitution data given in Table 1-XXII.

CAUTION

Do not substitute screws for solid rivets in fuel tight repairs.

2-31. Interspar Structure Repairs (Spars, Ribs, and Wing Plating).

2-32. Interspar structure repairs involve the spars, ribs, and the plating covering these wing components. See figures 2-23, 2-24, 2-25, 2-27, and 2-29. All repairs in the fuel tank area will require sealing to provide fuel-tight seams. Figure 2-31 illustrates a typical fuel leak repair. Refer to paragraphs 2-35 through 2-50 for repair of wing plating areas that are bonded with Scotchweld tape. Refer to typical repair, Section X, for repairs to wing plating in non-fuel-tight areas. See figure 2-28 for replacement of damaged main landing gear side brace fitting.

2-33. Scotchweld Tape Application.

2-34. Scotchweld tape is applied to the faying surfaces of the wing structure in the fuel-tight areas during assembly. The completed wing assembly is then placed in a dry air circulating oven and is baked for one hour at 160°C (320°F). Any subsequent repairs made to the wing structure must be made with sealer, Military Specification MIL-S-8802,as shown on figure 2-31.
and baking process cannot be used for repairs to the wing structure. Separation of Scotchweld bonded components may be accomplished by the procedures given in paragraph 2-35.

2-35. Repairs Involving Scotchweld Tape.

2-36. Scotchweld is a very strong bonding medium which cannot readily be removed by any solvent currently available. Scotchweld bonded parts may be separated by using either one or a combination of the following methods:

1. First Method.
   a. Remove all fasteners from the parts to be separated.
   b. Fabricate a wedge from micarta or any non-metallic material that will not nick, dent or gouge the wing structure.
   c. Apply a layer of dry ice to the outside surface of the wing plating along the seam that is to be separated.
   d. Allow the dry ice to remain in contact with the outside surface of the wing plating until frost appears on the opposite or inside surface of the wing plating.
   e. Place the sharp edge of the wedge against the faying surface of the components to be separated.
   f. Using a leather or plastic mallet, strike the wedge with a single sharp blow.
   g. Repeat steps "e" and "f" at intervals of approximately 12 inches along the seam of the components being separated to assure positive breaking of the Scotchweld bond.

CAUTION

Do not attempt to drive the wedge completely between the components being separated.

2. Second Method.
   a. Same as step "a" in method one.
   b. Same as step "b" in method one.
   c. Apply CO_2 to the outer surface of the wing plating along the seam of the two components that are to be separated.
   d. Allow the CO_2 to remain in contact with the outer surface of the wing plating until frost appears on the opposite or inside surface of the wing plating.
   e. Same as step "e" in method one.
   f. Same as step "f" in method one.
   g. Same as step "g" in method one.

2-37. Identification of Leaks.

2-38. A discolored area around the source of trouble is usually a guide to the type of fuel leak. The discolored areas must be wiped dry and inspected frequently to evaluate and determine the exact source of the leak. The general types of fuel leaks are classified as follows:

a. Stain: A dry, discolored area.

b. Seep: A wet, discolored area.

c. Drip: Free droplets.

d. Run: A continuous stream.

2-39. Preparation for Fuel Leak Repair.

2-40. To prepare tank for fuel leak repair, proceed as follows:

a. Ground the airplane at four points: nose, tail, and each main landing gear.

NOTE

Use ohmmeter on each grounding connection; the resistance between any two grounding connections shall not exceed 10 ohms.

b. Defuel tank in accordance with T.O. 1F-106A-2-5-2-1.

c. Attach a portable ground blower duct to fuel access door area with a static bond connection as shown on figure 2-32.

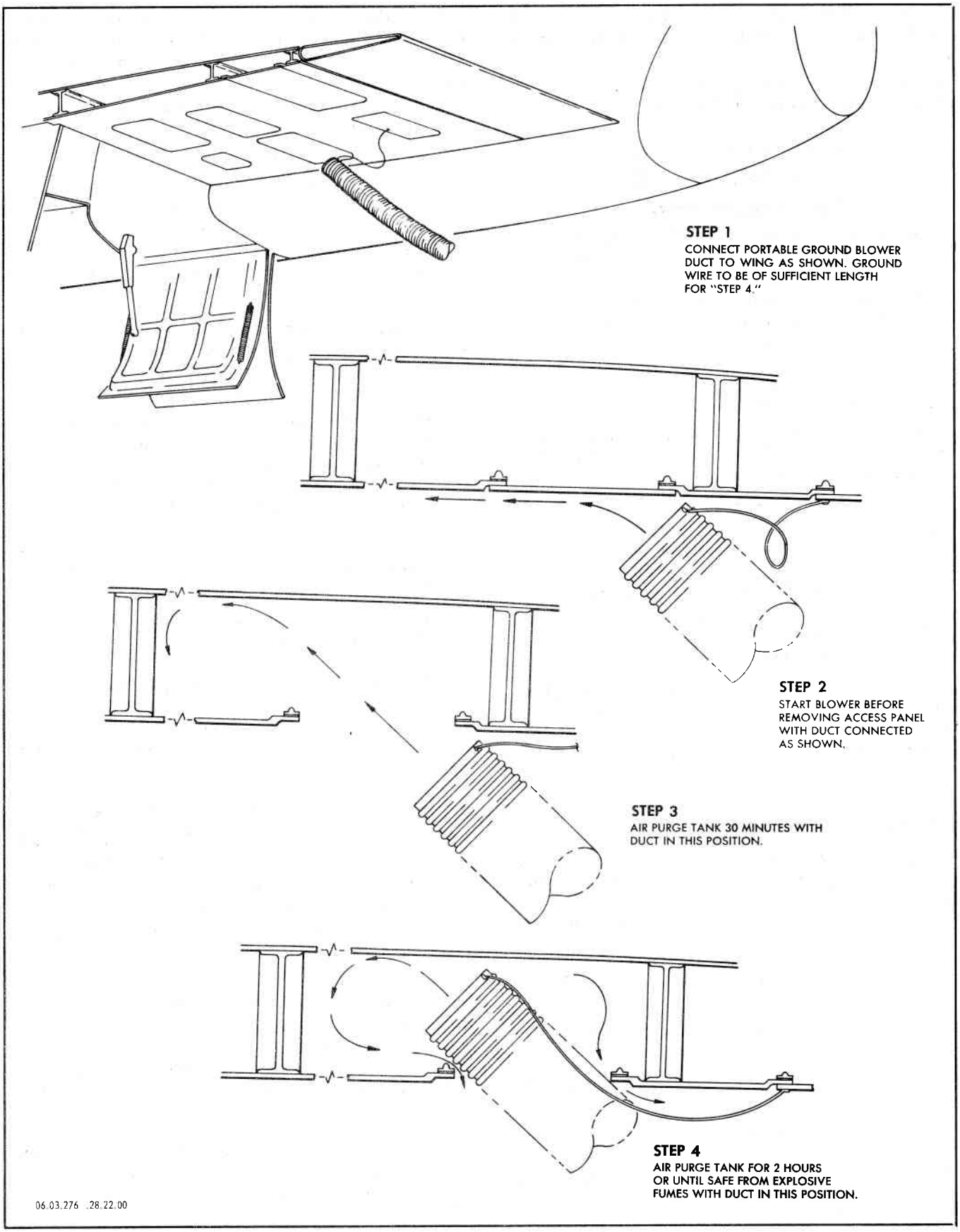


Figure 2-32. Air Purging of Fuel Tank

d. Start ground blower and remove access panel. Make sure the static bond between duct and airplane remains intact.

e. Allow blower to air purge tank for 30 minutes before mopping-up residual fuel in tank.

WARNING

JP-4 is a highly combustible fuel. It is also toxic when breathed for prolonged periods. Personnel working in fuel tank interior must wear a respirator connected to a fresh air supply, and an assistant must stand by at all times work is being performed in fuel tank interior.

f. Insert ground blower duct into tank as shown in figure 2-32 and air purge for two hours.

g. Stop blower and wait ten minutes; then check tank with combustible gas indicator, USAF Type R-1 (6665-530-0985) or equivalent.

NOTE

If the tank is safe, start the blower and begin repairs. If the tank is not safe, start the blower and continue air purging for two hours or until tank is free of explosive fumes when checked with the explosive vapor detector. Refer to T.O. 1-1-3 for additional information on air purging of fuel tanks.

h. Make repairs inside the fuel tank, observing the following precautions. Use an explosive-proof light. Use only air-powered drills and equipment. Refer to T.O. 1-1-3 for stock numbers of correct tools and equipment to be used in repair of fuel tanks.

2-41. Fuel System Purging.

2-42. Airplanes requiring a wing change or extensive maintenance to the fuel system should be purged with 100-octane aviation fuel Specification MIL-G-5572. Although the fuel system can be made explosion-proof by air purging, the toxious JP-4 fumes which remain when the airplane is placed in a closed hangar present a potential health hazard. To purge the fuel system, proceed as follows:

a. Defuel airplane in accordance with T.O. 1F-106A-2-5-2-1.

b. Refuel airplane with 100-octane aviation fuel, Specification MIL-G-5572.

c. Defuel airplane in accordance with T.O. 1F-106A-2-5-2-1.

d. Open all manual operated drain cocks, flush type drains, and filter drains.

e. Connect ground blower duct. Air-purge tanks as shown on figure 2-32.

f. Continue air-purging and enter "F" tank. Remove the manifold line between the CG fuel shutoff valve, the fuel check valve, and the refuel line to remove trapped fuel.

g. Use syphoning equipment and remove residual fuel trapped in tank areas.

NOTE

Any residual fuel which remains after syphoning may be mopped up, using only authorized lint free cloth, cotton only, cheesecloth, bleached, Type 2, Class 2, Stock Number 8305-205-3496, Specification Number CCC-C-440.

h. If airplane has CG fuel transfer system deactivated, remove flange from fuel transfer line in left and right "T" tanks.

NOTE

If CG transfer system is activated, attach a source of 5 to 10 psi dry air to one of the manifold check valves in the fuel pressurization and venting system to keep the CG fuel shutoff valve in each "T" tank open during purging operations.

i. Attach a source of 5 to 10 psi dry air at the left and right boost pump pressure switches, refueling adapter and the tank vent outlets.

j. Continue air purging precedure shown in figure 2-32 for approximately eight hours.

2-42A. Fuel System Purging, Alternate Procedure.

2-42B. The oil purge method can be used as an alternate for purging the fuel system. Refer to T.O. 1-1-3 for procedure.

2-43. Preparation of Surface for Sealing.

2-44. Prior to the initial mating of repair materials, all parts must be thoroughly cleaned. The parts must be completely free of moisture, grease, or other foreign matter to permit proper adhesion of the sealing materials. Suitable solvents and cleaners are listed in Table 11-X.

2-45. Application of Cements and Sealers.

2-46. All faying surfaces must be sealed at the time a repair is accomplished. Apply sealer, Military Specification MIL-S-8802, to the faying surfaces prior to riveting. After the riveting process, apply a smooth fillet of sealer, Military Specification MIL-S-8802, around the edges of the mated parts. The sealant should be tack free before the tank is filled with fuel. See figures 2-30 and 2-31 for examples of sealant application. Refer to Section XI for sealant material specifications.

2-47. Structural Adhesive Prime Repair In Fuel Tank.

2-48. The inner structure of the fuel tank is finished with structural adhesive prime EC-1290 at the time of fabrication. During the course of structural repair or inspection of the tanks, this prime may become scratched or portions of it removed. Scratched EC-1290 structural adhesive prime finish or exposed inner fuel tank structure, caused by removed finish, shall be coated with a thin brush coat of coating, MIL-S-4383 prior to refueling. Apply coating MIL-S-4383, as follows:

a. Thoroughly clean the surface to remove any moisture, grease, or foreign matter with clean cheesecloth dampened in aliphatic naphtha.

b. Spray or brush an even coat of MIL-S-4383 over the scratched or exposed area.

c. Do not disturb newly coated area for at least 55 minutes after application.

d. The MIL-S-4383 coating shall be allowed 12-hours drying time before the tank is filled with fuel.

2-48A. Corrosion Removal and Treatment, Integral Fuel Tank.

a. It is a permissible to mechanically remove corrosion pits from wings skins and access doors. Material removed shall not exceed 0.046 inch in depth. The following doors are exceptions:

(1) 8-18668 and 8-18667 doors -0.035 inch.

(2) 8-18664 door -0.039 inch.

Corrosion pits shall be ground out to form a saucer shaped depression within localized areas of one inch while maintaining nine inches between pit area centers.

b. Corrosion pits exceeding the permissible limits but not covering an area of more than 1/8 inch in diameter may be repaired by plugging with a MS20426DD6 rivet. Finish plug repair in accordance with Section II, paragraphs 2-44 and 2-46.

c. Remove residue from surfaces of secondary wing structure (tubing, clamps, fuel system components, etc.) using MEK, Specification TT-M-261.

d. Repair wing skin and access doors exceeding the above limits as per Section X, figure 10-1.

e. Treat and refinish all areas in accordance with T.O. 1F-106A-23 and this manual as applicable.

2-49. Repair of Leaks Around Rivets.

2-50. If leaks are found around rivets, the rivets must be replaced. Care must be exercised in drilling out the old rivet. When installing fuel-tight Straylor rivets, make certain that an undamaged 0.004-inch aluminum foil washer is installed under the head of the rivet. Refer to paragraphs 1-131 and 1-133, and see figures 1-34 and 1-35 for installation and removal of Straylor rivets.

2-51. Repair of Leaks Around Access Doors.

2-52. In the event that leaks occur around the fuel tank access door attachment screws, remove the screw in question and check the dome nut O-ring. If the dome nut O-ring has been damaged, the fuel tank will have to be drained, the access door removed and the dome nut in question removed and replaced with a new one. One of the most frequent causes of leaks around the fuel tank access doors is the insertion of overlength screws, thus causing damage to the dome nut. See figure 2-30 for dome nut replacement and leak sealing procedures.

2-53. Replacement of Access Door Gaskets.

2-54. When determining the source of fuel leaks around access doors, the gasket may be at fault. Two types of material are used for access door gaskets: neoprene and silicone rubber. Each of these materials has specific bonding requirements which must be met to ensure that access doors maintain a fuel-tight seal.

2-55. Replacement of Access Door Neoprene Gasket.

2-56. The following procedure is prescribed for replacement of the access door neoprene gasket:

a. Drain the fuel tank.

b. Remove access door.

c. Remove old gasket and thoroughly clean the door surface to which the new gasket will be applied. Refer to Section XI for list of cleaners, solvents, and repair materials.

d. Apply a thin, even coat of red or uncolored cement EC-776, Type I to surface of access door and to checked (cloth imprint) side of neoprene gasket.

e. Allow cement to dry until finger touch will not lift strings of cement.

f. Apply gasket to door, pressing firmly to assure positive contact.

g. Allow bond to cure approximately one hour before proceeding with step "h."

h. Using a hollow-end tool, cut screw holes through neoprene gasket from door face opposite gasket using existing screw holes in the door as a guide.

i. Trim excess neoprene neatly, avoiding ragged or torn edges that may cause splits to form under pressure.

2-57. Replacement of Access Door Silicone Rubber Gasket.

2-58. To replace access door silicone rubber gaskets, proceed as follows:

a. Perform steps "a" through "c" as outlined in paragraph 2-56.

b. Clean gasket with a lint-free cloth soaked with aliphatic naphtha, Specification TT-N-95.

c. Roughen gasket with 180-grit sandpaper.

d. Coat gasket with EC 1663 cement and allow to dry for one hour.

e. Spray or paint the seal faying surface of the access door with EC 1662 primer and allow to dry for at least three minutes.

f. Apply gasket to door and air cure for 24 hours.

g. Perform step "h," paragraph 2-56.

h. Install access door.

2-59. Air Pressure Test of Fuel Tank Structure.

2-60. For pressure testing purposes, after a completed repair in the main fuel tank area, wing fuel tanks No. 1, No. 2 and No. 3 must be tested as a single unit. If a repair is made in the wing transfer "T" tank, it must be pressure tested as an independent unit. Refer to paragraph 2-63 for pressure test procedures in the "T" tank. Refer to Section IV in this manual for repair and pressure testing information concerning the fuselage "F" tank.

2-61. Equipment Requirements.

FIGURE	NAME	TYPE	USE AND APPLICATION
Refer to T.O. 1F-106A-2-3-2-1.	High-Pressure Air Compressor.	MC-11 (4310-624-4457)	To provide air pressure to fuel tanks.
	Air pressure lines (3).	0 to 3,000 psi capacity.	To connect air pressure source and manometer to fuel tanks.
	CAUTION Mercury manometer shall not be used.		
	Gage (0 to 30 psi).	Calibrated in ¼-inch increments (6685-526-6881).	To measure air pressure in fuel tanks.

2-61. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	USE AND APPLICATION
2-34	Rubber Plug (2).		To plug vent lines.
	Bubble Fluid.	MIL-L-25567.	To detect leaks.
	Freon 12 Gas.		
	Freon Leak Detector.	Type H-1 General Electric (10312596-H-1) or Type H-6 (4940-630-7947).	
2-33	Air Test Dummy Door.		To provide entrance of air pressure and Freon gas into fuel tanks and to provide fuel tank over pressure relief.
	Pressure Cap (4).	AN292-6 (4730-277-6539).	To plug sense lines.
	Pressure Cap (2).	AN929A-4 (4730-278-5006).	
	Union Plug (4).	AN815-6 (4730-187-0486).	
	Union Plug (2).	AN815-4 (4730-278-3242).	

2-62. Procedure for Pressure Testing Main Fuel Tank After a Completed Repair.

a. Remove access door No. 11 from underside of No. 2 fuel tank. See figure 1-2 for exact location of main fuel tank access doors. Insure that all other main fuel tank access doors are properly secured. Replace damaged door gaskets as directed in paragraph 2-53.

b. Disconnect the 3.00-inch fuel transfer line in main wheel well and cap that portion of the line leading into the main fuel tank.

c. Insert a rubber plug into the 1.50-inch vent line. Compress rubber plug until vent line is completely sealed. See figure 2-34 for fabrication of rubber plug.

d. Cap the 0.25-inch sense line with an AN815-4 plug and an AN929A-4 pressure cap.

e. Mount an air test dummy door in place of fuel tank access door No. 11. See figure 2-33 for fabrication of air test dummy door.

f. Adjust regulator on compressed air source to insure supply of dry air at 10 psi. Close all valves before proceeding with the next step.

g. Connect 10-psi air pressure line from the air source to the inlet fitting on air test dummy door.

h. Deleted.

i. Deleted.

j. Slowly open the air pressure valve on 10-psi air source and pressurize tank to 7.50 (+0.0 -0.5) psi.

CAUTION

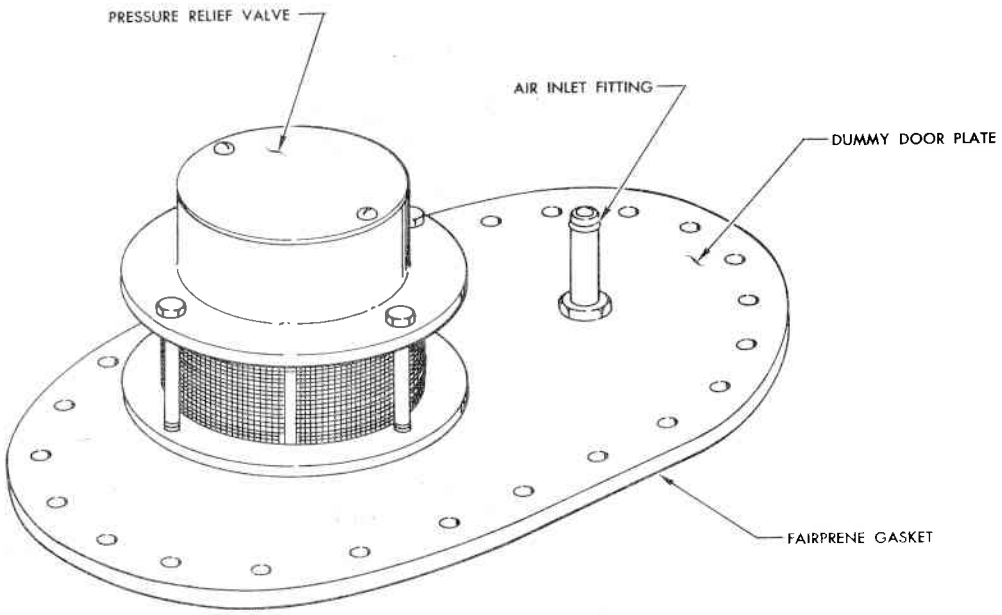
Open valve slowly to prevent movement and/or damage to air pressure gage.

k. Apply bubble fluid to repair area and check for leaks.

l. If a leak is detected, relieve all air pressure from fuel tank, remove air test dummy door, repair the leak, replace air test dummy door, and recheck for leaks according to steps "j" and "k." Repeat this process until no leaks are detected.

m. Upon completion of pressure test with no leaks detected, relieve the fuel tank of all air pressure and remove all test equipment.

n. Remove pressure cap from 3.00-inch fuel transfer line in main wheel well. Remove rubber plug from 1.50-inch vent line on under side of No. 2 tank. Remove



FABRICATION INSTRUCTIONS FOR MAIN FUEL TANK LEAK TEST DUMMY DOOR.

a. Fabricate dummy door from 0.125 7075-T6 sheet stock.
b. Use one of two existing doors, which are located in the number two tank at B.L. 145.00, Station 510.00 and B.L. 164.00, Station 547.00 as a pattern for door outline and screw hole attachment locations.
c. Fabricate 1.00-inch wide door flange seal from 0.032 Fairprene 5570. Cement seal to dummy door with red or uncolored EC-776.
d. Install AN807 hose fitting or equivalent in dummy door. Select fitting to match size of available air hose.
e. Secure fitting with AN-924 nut or equivalent.
f. Install pressure relief valve set to relieve pressure in excess of 7.5 psi. See Note 2 for relief valve size.
g. Install 0-30 psi pressure gage on dummy door.

NOTES:
1. REFER TO PARAGRAPH "FUEL TANK LEAK TEST" FOR TEST PROCEDURES.
2. ANY RELIEF VALVE USED MUST BE LARGE ENOUGH WHEN OPENED TO PERMIT A GREATER VOLUME OF AIR TO EXIT THROUGH THE VALVE THAN THE VOLUME OF AIR ENTERING THROUGH THE INLET FITTING. EXAMPLE: IF INLET FITTING HAS A 1.00-INCH INSIDE DIAMETER, THEN RELIEF VALVE SHOULD HAVE A 1.50-INCH OR GREATER INSIDE DIAMETER AT ITS SMALLEST OPENING.
3. USING EXAMPLE SHOWN ABOVE FOR MAIN TANK, FABRICATE AIR TEST DUMMY DOORS FOR TRANSFER TANK AND FUSELAGE TANK EXCEPT THAT RELIEF VALVES SHALL BE SET TO RELIEVE PRESSURE IN EXCESS OF 20 PSI.

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Figure 2-33. Fabrication of Main Fuel Tank Air Test Dummy Door

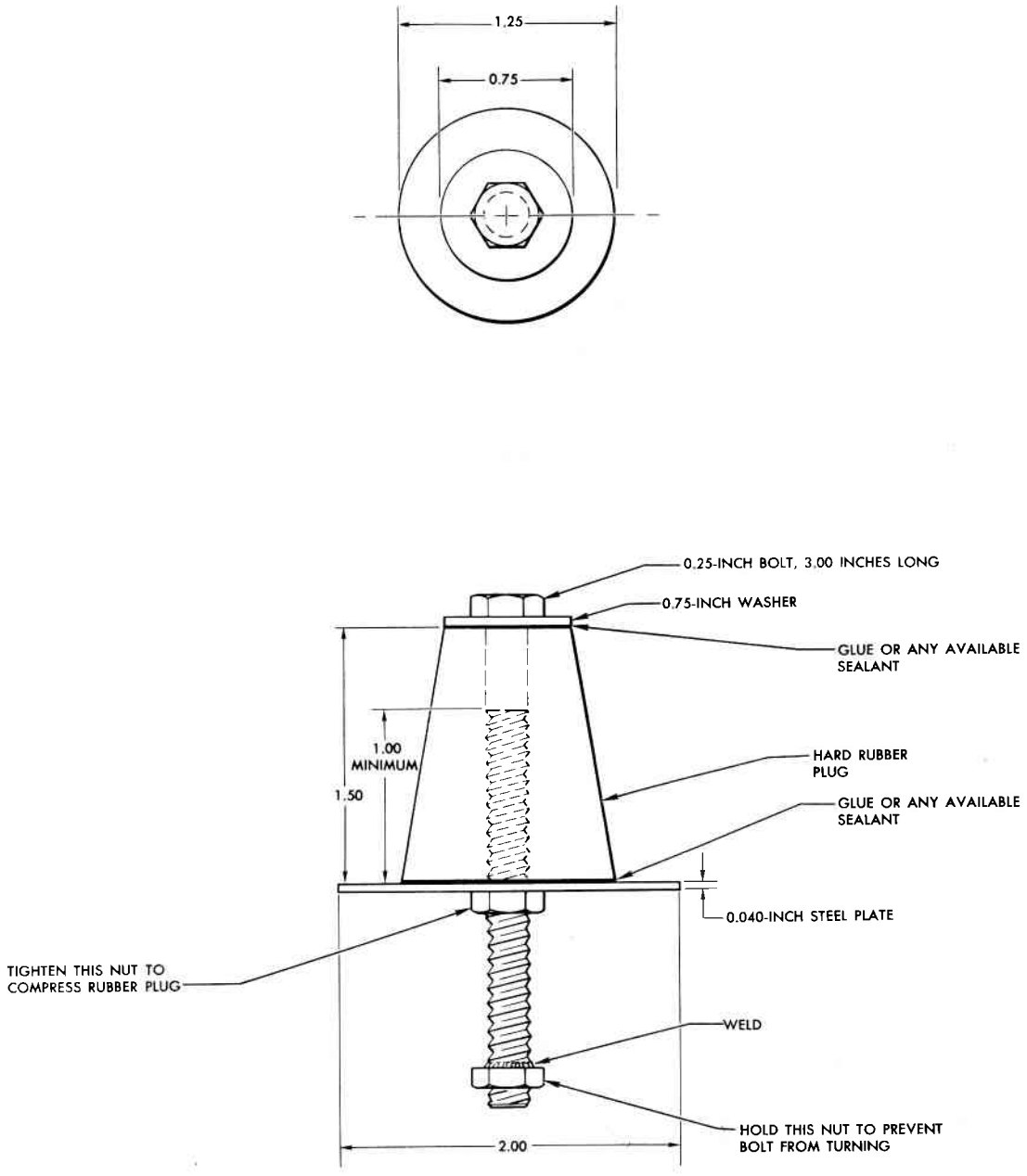

Figure 2-34. Rubber Plug

AN815-4 plug and AN929A-4 pressure cap from 0.25-inch sense line on underside of No. 2 tank.

CAUTION

Failure to remove all caps and plugs used during test could result in structural damage to fuel cell or failure of fuel system components during subsequent fueling, defueling and fuel system check out operations.

o. Reconnect 3.00-inch fuel transfer line in main wheel well.

p. A fuel system operational check must be performed after completion of step "o". Refer to T.O. 1F-106A-2-5-2-1 for procedure.

2-63. Procedure for Pressure Testing Wing Transfer "T" Tank After a Completed Repair.

a. Remove the engine. Refer to T.O. 1F-106A-2-4-2-1 for procedure.

b. Remove "T" tank access door No. 25 from underside of wing. See figures 1-2 and 1-3 for exact location of "T" tank access door No. 25.

c. Disconnect and cap the 3.00-inch fuel transfer line in main wheel well. Refer to paragraph 2-61 for equipment required for pressure testing and to T.O. 1F-106A-2-5-2-1 for a schematic of the fuel system.

d. Cap the following lines into the "T" tank with air pressure caps. These lines are centrally located on the inside of the fuselage between stations 556.75 and 593.46 at water line −16.00.

1. The 0.38-inch air pressure lines to the inboard and outboard CG fuel shutoff valves.
2. The 0.38-inch air pressure line to the inboard and outboard fuel low level pilot float valves.
3. The 0.25-inch air sense line from the "T" tank to the "T" tank air pressure regulator.
4. The 0.25-inch air sense line from the pressure relief valve to the "T" tank air pressure regulator.
5. The 0.38-inch air pressure lines to the emergency air pilot float valve (two lines for the left-hand side and one line for the right-hand side).
6. The 1.25-inch air pressure line.

CAUTION

Air pressure caps must have a red warning streamer at least one foot long.

e. Mount an air test dummy door in place of the No. 25 access door. See figure 2-33 for fabrication of air test dummy door. Insure that all other main fuel tank access doors are properly secured. Replace damaged door gaskets as directed in paragraph 2-53.

f. Adjust regulator on compressed air source to insure supply of dry air at 20 psi.

CAUTION

Close all valves before proceeding with the next step.

g. Connect 20-psi air pressure line from the air source to the inlet fitting on the air test dummy door.

h. Deleted.

i. Disconnect the 0.38-inch air pressure line to the vent valve line located on the inboard side of the "T" tank closing rib between stations 556.75 and 593.46 at water line −16.00.

j. Connect an air pressure line from second source of air pressure to vent valve.

k. Adjust safety relief valve on air test dummy door to relieve pressure at 20 (±0.5) psi.

l. Deleted.

m. Apply 15 (±1) psi from second source of air pressure to vent valve.

NOTE

Air pressure on vent valve to remain constant throughout pressure testing of "T" tank.

n. Slowly turn on primary air pressure and pressurize "T" tank to 7(±0.5) psi.

o. Apply bubble fluid over entire area of repair and check for leaks. If a leak is detected, relieve the "T" tank of all air pressure, remove the air test dummy door, repair the leak, replace the air test dummy door, and repeat steps "n" and "o" until no leaks are detected.

p. Repeat steps "n" and "o" using 10.0 (±0.5) psi. If a leak is detected, follow the process outlined in step "o". Recheck for leaks per steps "n" through "p" until no leaks are detected.

WARNING

High pressures are used in the following steps. Before proceeding with the remainder of test,

rope off the pressure test area and hang warning signs indicating that a pressure test is in progress. Remove all personnel not actually engaged in the pressure test. All safety precautions must be observed.

q. Introduce Freon 12 gas into "T" tank for remainder of test.

NOTE

Prior to testing "T" tank for leaks, make a check of air inlet and pressure relief valves for escaping Freon gas, since escaped gas may contaminate the surrounding air and make the test invalid.

r. Increase pressure to 15 (±0.5) psi.

s. Inspect thoroughly around repair area for leaks with General Electric H-1 leak detector.

NOTE

If a leak is detected at this step, repair should be completely reworked and a new pressure test started.

t. If no leaks were detected after step "s," increase pressure to 20 (±0.5) psi and hold for three minutes.

u. Reduce pressure in "T" tank to 10 (±0.5) psi and check for leaks with bubble fluid or General Electric H-1 leak detector.

NOTE

A leak detected at this point usually indicates a structural failure of the repair. If a structural failure is determined, repair must be reworked and a new pressure test started.

v. After all leak tests prove satisfactory, release all air pressure from "T" tank and vent valve. Remove all test equipment.

w. Remove air pressure caps from all lines which were capped in steps "c" and "d."

CAUTION

Failure to remove all caps and plugs used during test could result in structural damage to fuel cell or failure of fuel system components during subsequent fueling, defueling and fuel system check out operations.

x. Reconnect all lines that were disconnected in steps "c," "d" and "i."

y. A fuel system operational check must be performed before final sealing of the "T" tank. Refer to T.O. 1F-106A-2-5-2-1 for procedure.

z. Reinstall the engine. Refer to T.O. 1F-106A-2-4-2-1 for procedure.

2-64. Wing Drag Angle Repair.

2-65. The wing drag angles which assist in attaching the wings to the fuselage also provide a smooth aerodynamic contour between the wings and the fuselage. The drag angles must be kept structurally sound within the negligible damage limits, as stated in Table 2-I. See figure 2-35 for repair of wing drag angles.

2-66. Wing Leading Edge Repairs.

2-67. The leading edge is the most critical part, aerodynamically, of the entire wing. The boundary layer is thinnest at this point, becoming progressively deeper downstream. As the boundary layer deepens, the wing becomes less critical aerodynamically. Consequently the least critical area of the wing is at the trailing edge. All repairs to the leading edge outer plating must be of the flush type to restore the aerodynamic contour. For information concerning repairs, see figures 2-36 through 2-38. When damage to a leading edge section exceeds 30 percent, it is considered more efficient to replace the component. Refer to Table 2-I for allowable limits of negligible damage.

2-68. Wing Tip Repairs.

2-69. See figure 2-39 for repair of the wing tip structure. Refer to Table 2-I for negligible damage limits.

2-70. Wing Attachment Repairs.

2-71. Repairs to the wing attachment section are shown on figure 2-7. Original installation of the wing does not require bushings in the wing attachment fittings and they are required only if tolerances are not met because of wear or damage. All new bushings shall receive a coating of zinc chromate primer before installation. Caution must be taken to insure that the attaching bolt and inside surface of the bushing are kept free of foreign matter. When possible, ream the inside diameter of the bushing after installation.

2-72. Elevon Repairs.

2-73. See figures 2-16 through 2-20 for repairs to the elevon structure other than the honeycomb section. Refer to Table 2-I to determine the negligible damage limits for wing group components. Repairs made on the elevon assemblies will not require rebalancing of the elevons. Refer to paragraph 2-76 for repairs to the honeycomb structure of the elevon.

2-74. Elevon Fairing Repairs.

2-75. Refer to Table 2-I for negligible damage limits to elevon fairing plating. See figure 2-17 for repair of actuator fairing skin.

2-76. Elevon Honeycomb Repairs.

2-77. Figure 2-21 illustrates the method of rebonding separation of the elevon honeycomb section from the upper or lower skin. See figure 2-22 for the procedure used to remove moisture from the honeycomb sections of the elevon. See figures 10-11 through 10-46 for general honeycomb repairs.

2-77A. Repair or Replacement of Skin and Core of Elevon Trailing Edge Wedges—Depot Level Only.

a. Materials.

(1) Core filler, meeting FMS 1026, Class VI, Type B.

(2) Film adhesive, meeting FMS 1013, Form III.

(3) Aluminum Sheet, 2024-T6, clad x 0.025".

(4) See Table 2-0 for substitute adhesives.

b. Equipment.

(1) The elevon has an inboard and outboard section (see figures 2-13 and 2-14). Each section consists of a covered torque box and a metal honeycomb trailing edge. The trailing edge is the item to be repaired.

(2) A tooling fixture for assembly of inboard and outboard elevons, RH and LH, bears the number 60SCJ2048. This fixture aligns the trailing edge with the torque box.

WARNING

- Accomplish all work in authorized areas with proper protection devices to safeguard health. Work involving application of potentially harmful materials must be accomplished in an exhaust ventilated area as required by SGB. Environment assesment of this process has been made.
- The solvents listed in this process order are hazardous. They evaporate quickly, producing toxic vapors in the air. They can cause dermatitis if skin contact occurs. T.O. 42A1-1-3 should be consulted for the proper handling and storage of these solvents.
- Use protective eye or face shields and rubber gloves when working with solvents. Use proper safety container for solvent to prevent splashes and continuing emanation of vapors. Adequate ventilation must be available.
- The sealant and adhesive materials listed in paragraph 3.0 contain chemicals and violatile materials known to be toxic and irritating to the skin and eyes. These sealants and adhesives can also cause dermatitis if skin contact occurs.
- The following protective actions should be taken in mixing sealants and adhesives.

  (a) Wear gloves, a rubber apron and protective eye glasses or a plastic face shield. Coveralls are recommended. Apply protective hand cream on the hands before putting on gloves. SGB recommends that cotton gloves be worn under the rubber or PVC gloves.

  (b) Mixing operations should be in accordance with SM-ALC MAOI 65-4.

  (c) If sealant or adhesive gets on the outer clothes, they should be immediately changed. The sealants and adhesives if left on may cause local skin irritation and dermatitis.

- At the end of the day or after completion of the adhesive or solvent handling operations for the day, wash hands thoroughly and then apply skin conditioner. Remember, cleanliness is the best defense against dermatitis.

c. Process.

(1) Replacement of one skin.

(a) Removal of elevon wedges from elevon assembly is described in paragraph 2-18A.

(b) Remove the damaged skin as follows:

1. Remove fasteners.

2. Remove the skin using dry ice and wooden wedges.

(c) Clean any fuel contaminated honeycomb with trichloroethylene; invert and dry for 8 hours at 180°F.

(d) Repair the core as necessary. Pot with core filler (Epocast 1310 + hardener 9228).

(e) Vapor degrease the assembly.

(f) Make a new skin from 2024-T6, clad, 0.025". Use the old skin as a template.

(g) Clean the skin for bonding in the plating shop.

(h) Bond the skin as follows:

1. Use FMS 1013 film adhesive. Align the skin to the wedge with tack rivets.

2. Using a flat plate as a bond form, vac-bag and put into the autoclave.

3. Retain in the autoclave for 1 hour at 350°F and 15 psig net.

4. Cool for 1 hour. Discard all the vac-pac materials except the bleeder cloth.

(i) Grind off the excess adhesive.

(j) Install rivets.

(k) Inspect the wedge for honeycomb bond integrity using tap test.

(2) Replacement of two skins requires a repeat of steps c(1)(b) throu c.(1)(k).

(3) Replacement of two skins and a core requires the following steps:

(a) Replace one skin as specified above.

(b) Remove the second skin and replace the core as required. Cut the wedge-shaped core on the Do-all saw, insert it into place, and pot it according to the process specified in paragraph c.

(c) Repeat steps c(1)(b) through c(1)(k).

d. Inspection and Testing.

(1) Subject all the skins to the "tap" test to determine the quality of honeycomb bonding.

(2) Make a random selection of wedges for other NDI inspection by the appropriate quality organization.

(3) Lay up a lap shear specimen in accordance with T.O. 1F-111A-3. Prepare the specimen with the same adhesive used in the honeycomb repair and cure it simultaneously with the repair piece. Use the lap shear specimen tester in the shop. A minimum value of 2000 psi must be attained.

e. References.

(1) T.O. 1F-106A-3, Structural Repair Instructions.

(a) Paragraph 2-17 describes elevon structure.

(b) Paragraph 2-18 describes inspection and repair of surfaces containing honeycomb core.

(c) Figures 2-13 and 2-14 show elevon structure, inboard and outboard panel.

(d) Figure 2-21 shows elevon honeycomb separation repair.

(e) Figure 10-41 shows honeycomb repair on trailing edge.

(f) Table 10-1 lists honeycomb repair adhesives and processing.

(2) T.O. 1F-111A-3, Structural Repair Instructions.

2-78. External Fuel Tank Repairs.

2-79. All repairs to the external tank must be of the flush-patch type to provide aerodynamic smoothness. The repairs must also provide positive fuel-tight sealing. See figure 2-40A for repair of the external fuel tank. Tank dents that do not exceed 3/16 inch in depth or do not exceed three inches in diameter may be filled with MIL-S-38228 aerodynamic smoothing compound. Fill dent with compound and smooth to contour. Cure 24 hours at 77°F; sand to smooth surface.

2-80. Pylon Support Beam Elongated Hole Repair.

2-81. Pylon support beams and rib found with elongated holes will be repaired by reaming the elongated hole to the next bolt size and installing existing bolt with sleeves made from stainless steel tubing cut to size for proper fit. Bolts will be removed one at a time and elongated holes reamed as follows: Holes for NAS1103 bolts (3/16) will be reamed to 0.250/0.255, holes for NAS1105 bolts (5/16) will be reamed to 0.375/0.380, holes for NAS1106 bolts (3/8) will be reamed to 0.438/0.433. Holes will be reamed with a hand reamer from the existing oversize hole in increments of 1/32 inch. After reaming cut the tube to the grip length of the bolt and deburr both ends of sleeve. Reinstall the same bolt, nut and washer. The sleeves will be made from the following tubing specification: MIL-T-8606 0.250 outside diameter with 0.028 wall thickness. MIL-T-6845 0.375 outside diameter with 0.028 wall thickness, and MIL-T-8606 0.438 outside diameter with 0.028 wall thickness.

2-82. Replacement of Forward Pylon Support Beams.

2.83 Procedures for support beams, Part Nos. 65E33321-3 and -4 are as follows:

a. Remove external fuel tank/pylon assemblies from the aircraft (if installed) in accordance with instructions in T.O. 1F-106A-2-5-2-1.

b. Remove wing access doors, Nos. 51 and 52 (Part Nos. 65J33342-1, -2, -3, -4, -5, or -6). Retain door assembly and screws for reinstallation.

c. Remove vent tubes, Part Nos. 65A35901-1 (LH) and 66A40633-1 (RH). Retain for reinstallation. Plug all open ends of tubing to prevent entry of foreign material.

d. Drill out all attachment rivets from support angles, Part Nos. 65J33330-23 (LH) and -24 (RH), and remove angles from wing. Retain for reinstallation.

e. Remove support beams, Part Nos. 65E33321-3, and -4. Retain all attaching hardware, consisting of bolts, Part Nos. NAS1103-7 (3 each), NAS1103-6 (3 each), NAS1106-11 (6 each), nuts, Part No. H19300-3 (6 each), washers K19301-3 (6 each), K19301-6 (6 each), and AN960D10 (3 each); and shims Part No. 66C40784, for use in installation of support beams.

f. Remove nut plates, Part No. NAS1067A3 (4 each), channel nuts, Part No. NAS689P7-5 (2 each), and shims Part No. 66C40784 (2 each), from support beams, Part Nos. 65E33321-3 and -4, and retain for reinstallation on support beams.

NOTES

If unthreaded portion (shank) of bolts provided with locating tool Part Nos. 65J34870-1 or -2, does not extend into support beams, Part Nos. 65E33321-3 or -4, at least 1/4-inch, use bolts and barrel nuts, which attach pylon to aircraft with the locating tool to provide proper alignment of support beams.

g. Position and secure support beam, Part No. 65E33321-3, on upper forward end of locating tool, Part No. 65J34870-1 (LH), and support beam, Part No. 65E33321-4, on upper forward end of locating tool, Part No. 65J34870-2 (RH), using the bolts and nuts (without washers) supplied with the tool.

h. Position locating tool, Part Nos. 65J34870-1 (LH) and 65J34870-2 (RH), with support beam attached, in the approximate location where old support beams were removed. Install bolts and nuts provided with tool in rear support fitting, Part Nos. 65E33322-1 (LH) and 65E33322-2 (RH), using the indexing bolts at the existing door attachment hole in the wing (aft inboard hole).

NOTE

If will be necessary to hold the forward end of the locating tool up until the locating tool, Part No. 65J34870-3, is installed. Bolts in rear support beam to rib may be loosened as required to allow alignment without deforming or deflecting the locating fixture.

i. Temporarily install support angles, Part Nos. 65J33330-23 (LH) and -24 (RH) in their original locations.

j. Install locating tool, Part No. 65J34870-3, under aft flange of support beams, Part Nos. 65E33321-3 and -4. Temporarily place shim, Part No. 66C40784, between support beam, Part Nos. 65E33321-3 and -4 aft flange and locating tool, Part No. 65J34870-3, thick end outboard. Secure locating tool Part No. 65J34870-3 to the existing door attachment holder, clamp support beams, Part No. 65E33321-3 and -4 to locating tool Part No. 65J34870-3.

k. Locate and mark holes (where bolts, Part Nos. NAS1103 and NAS1106, were removed in step e) through wing ribs onto new support beams, Part Nos. 6533321-3 and -4.

l. Remove locating tool, Part No. 65J34870-3, support angles, Part Nos. 65J33330-23 and -24, locating tools Part Nos. 65J34870-1 and -2, and support beams, Part Nos. 65E33321-3 and -4.

m. Drill and ream holes in support beams, Part Nos. 65E33321-3 and -4, which were marked in step k; rear holes 0.380/0.375 inch (6 places each beam), forward holes 0.196/0.191 inch (6 places each beam).

n. Install support beams, Part No. 65E33321-3 and -4, using the attachment hardware removed in step e. Fabricate shim (laminated shim stock), Part No. 65J33330-3, to extend to the lower edge of the support beam. Locating fixture must be installed while the support beam to rib hardware is being tightened.

NOTE

Trim the self aligning 3/8 inch diameter washer, Part No. K19301-6, in the lower outboard location in the support beam, as required, to permit the washer to seat on the flange and eliminate fillet radii interference.

o. Install support angles, Part Nos. 65J33330-23 (LH) and -24 (RH). Add a shim (laminated shim stock) 2.85 inches by 1.20 inches in gap between support beam and angle. Secure shim by applying MIL-S-8802 sealant to shim just prior to installation.

p. Temporarily install access doors, numbers 51 and 52. Drill 0.196/0.191-inch diameter holes (14 each) in support beams, Part Nos. 65E33321-3 and -4, to correspond with appropriate holes in the door. Remove doors from wing. Retain for reinstallation.

q. Position the nut plates, Part No. NAS1067A3, and channel nuts Part No. NAS689P7-5, on the upper surface of each flange of the support beams. Position the shims, Part No. 66C40784, to correspond with the holes on the lower side in each flange of the support beam. Attach the nut plates, channel nuts, and shims with rivets Part No. MS20426AD3.

r. Reinstall vent tube, Part Nos. 65A35901-1 (LH), and 66A40633-1 (RH).

s. Reinstall access doors numbers 51 and 52, utilizing attachment screws removed in step b.

t. Reinstall external fuel tank/pylon assemblied in accordance with instructions in T.O. 1F-106A-2-5-2-1.

2-84. Replacement of AFT Pylon Support Beams.

2-85. Procedures for Support Beam Part Nos. 65E333221-1 and -2 are as follows:

a. Remove external fuel tank/pylon assemblies from the aircraft (if installed) in accordance with instructions in T.O. 1F-106A-2-5-2-1.

b. Remove wing access doors, numbers 51 and 52 (Part Nos. 65J3334-1, -2, -3, -4, -5, or -6). Retain door assembly and screws for reinstallation.

c. Remove support beams Part Nos. 65E333322-1 and -2. Retain all attaching hardware consisting of bolts, NAS1103-11 (3 ea), NAS1105-9 (2 ea) NAS1105-10 (5 ea), NAS1105-11 (1 ea); nuts MS21059-L3 (3 ea), H19300-5 (5 ea), MS21061-L5 (3 ea), washers AN960D106 (3 ea) K19301-5 (5 ea), AN960D516 (1 ea); and shims Part No. 66C40784, for use in installation of new support beams.

d. Remove nut plates, Part No. MS21075L3 (3 ea), channel nuts, Part No. NAS689P7-3 (4 ea), and shims Part No. 66C40784 (4 ea) and retain for reinstallation on new support beams.

NOTE

If unthreaded portion (shank) of bolts provided with locating tool, Part Nos 65J34870-1 or -2, does not extend into support beams, Part Nos. 65E33322-1 or -2 at least 1/4 inch, use bolts and barrel nuts, which attach pylon to aircraft with the locating tool to provide proper alignment of support beams.

e. Position and secure support beam Part No. 65E33322-1, on upper aft end of locating tool, Part No. 65J34870-1 (LH), and support beam, Part No. 65E33322-2, on upper forward end of locating tool, Part No. 65J34870-2 (RH) using the bolts and nuts (without washers).

f. Position locating tool, Part Nos. 65J34870-1 (LH) and 65J34870-2 (RH), with support beam attached, in the approximate location where old support beams were removed. Install bolts and nuts provided with tool in front support fitting, Part Nos. 65E33321-3 (LH) and 65E33321-4 (RH), and install the indexing bolt at the existing door attachment hole in the wing (aft inboard hole).

NOTE

Bolts in forward support beam to rib may be loosened as required to allow alignment without deforming or deflecting the locating fixture.

g. Locate and mark holes (where bolts, Part Nos. NAS1103, and NAS1105, were removed in step c) through wing ribs onto new support beams Part Nos. 65E33322-1 and -3. Determine shim requirement between beams and ribs. Drill 0.191/0.196 holes (8 each) in aft of support beams to correspond with door attachment holes.

h. Remove locating tool, Part No.65J34870-3, locating tools Part Nos. 65J34870-1 and -2, and support beams, Part Nos. 65E33322-1 and -2.

i. Drill and ream holes in support beams, Part Nos. 65E33322-1 and -2, which were marked in step g forward holes 0.317/0.312 inch (5 places each beam) holes 0.196/0.191 inch (3 places each beam) and 0.317/0.312 inch (3 places each beam). Fabricate shims as required and drill to match support beams.

j. Install support beams, Part No. 65E33322-1 and -2 using the attached hardware removed in step c. Fabricate shim (laminated shim stock), Part No. 65J33330-3, to extend to the lower edge of the support beam. Locating fixture must be installed while the support beam to rib hardware is being tightened.

k. Temporarily install access doors, numbers 51 and 52. Drill 0.196/0.191 inch diameter holes (14 each) in support beams, Part Nos. 65E33322-1 and -2 to correspond with appropriate holes in the door. Remove doors from wing. Retain for installation.

l. Position the nut plates, Part No. NAS689P7-3 and channel nuts, Part No. MS21075L3 on the upper surface of each flange of the support beams. Position the shims, Part No. 66C40784, to correspond with the holes on the lower side in each flange of the support beam. Attach the nut plates, channel nuts, and shims with rivets Part No. MS20426AD3.

m. Reinstall access door numbers 51 and 52, utilizing attachment screws removed in step b.

n. Reinstall external fuel tank/pylon assemblies in accordance with instructions in T.O. 1F-106A-2-5-2-1.

TABLE 2-0. — MATERIALS USED IN ELEVON WEDGE (OLD AND NEW)

COMPONENT	ORIGINAL 1F-106A-3 MATERIAL	NEW REPAIR 1F-111A-3 MATERIAL
Skin	2024-T6 Clad sheet 0.025"	No change
Honeycomb, aluminum	Nonperforated 1/8" HEX, 0.0015" Foil	FMS-1019 Type I C (5052)
Primer for Honeycomb	FM-47	None required
Film Adhesive	AF-31	FMS 1013 Form III (AF-130)
Primer for Film Adhesive	FM-47	None required
Core Filler	E-3045	FMS 1026, Class VI Type B (Plastilock 654-HE)
Tape	Narmco	None required
Core Cleaner Solvent	MEK	Trico
Aerodynamic Smoother	EC 1653	FMS 1048 (EA-934)
Injection Adhesive for Delaminated Honeycomb	Epon VIII Epon 3119, Epon 1469	FMS 1102, FMS 1104 (Aerobond 2185)

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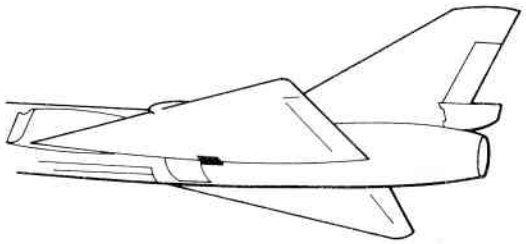


AREA OF ASSUMED DAMAGE

REPAIR PROCEDURE

a. Remove rivets and screws from damaged wing drag angle.

b. Insert 0.016 stainless steel strip under drag angle at cut line to protect wing/fuselage skin.

c. Cut away damages portion of wing drag angle.

d. Fabricate a repair angle from 7178-T6 bare sheet to match cutaway portion of wing drag angle, as shown in detail.

e. Install repair angle and drill holes to match existing holes in fuselage and wing, as shown in installation view.

f. Remove repair angle and machine countersink all holes.

g. Refer to Paragraph 1-185 for finish requirements. Seal fraying surfaces with MIL-S-81733 sealant.

h. Reinstall repair angle and rivet to wing. (NAS 1670 Blind bolts may be substituted for MS20426 rivets)

i. Install screws through repair angle and fuselage.

j. **Fill all gaps in repair with MIL-S-38228 fairing compound.**

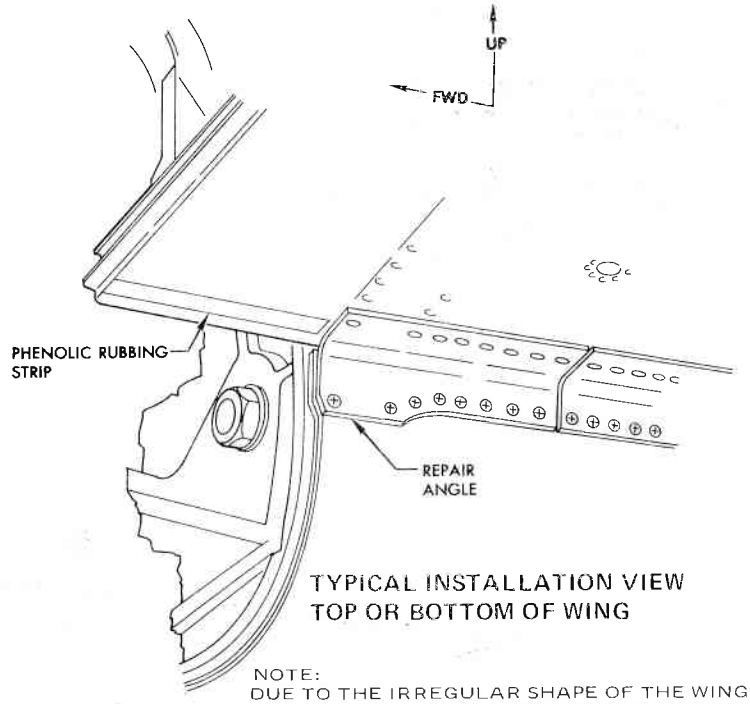
k. Deleted

l. Paint repair area according to applicable paint schedule.

m. Cracks up to 1 inch in length running along the radius and not closer than 6 inches to each other or the end of part may be stop drilled using a 1/8 inch drill. Cracks exceeding these limits or running across the angle shall be repaired per above repair procedure.

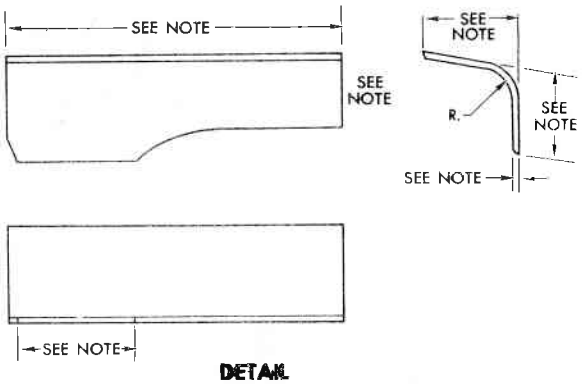
NOTE

IF PHENOLIC RUBBING STRIP SHOWN IN INSTALLATION VIEW IS DAMAGED, INSTALL A NEW STRIP OF THE SAME DIMENSIONS. INSTALL NEW STRIP WITH MIL-S-38228 SEALER. CLEAN INSTALLATION AREA BEFORE APPLICATION.



TYPICAL INSTALLATION VIEW TOP OR BOTTOM OF WING

NOTE:
DUE TO THE IRREGULAR SHAPE OF THE WING DRAG ANGLE, ALL DIMENSIONS FOR THE REPAIR PARTS MUST BE TAKEN BY ACTUAL MEASUREMENT OF THE DAMAGED ANGLE. REPAIR PROCEDURE CAN BE USED ANYWHERE ON DRAG ANGLE.



DETAIL
REPAIR ANGLE
(7178-T6 BARE SHEET)

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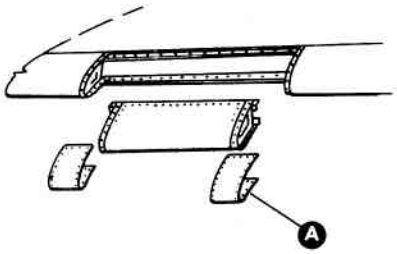
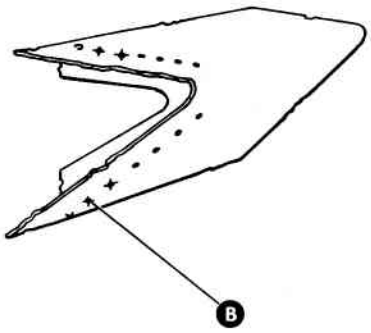
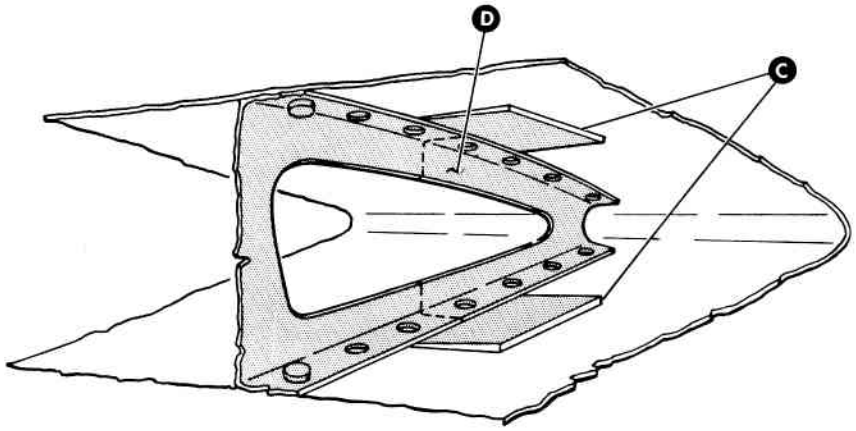
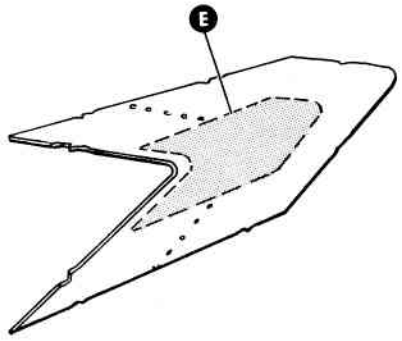
Figure 2-35. Wing Drag Angle Repair









(A) Remove attaching screws, panel assemblies, and damaged leading edge section.

(B) Drill out rivets in damaged portion of rib and skin as shown, and four additional rivets as indicated by (+).

(C) Wedge thin micarta blocks between skin and rib as shown.

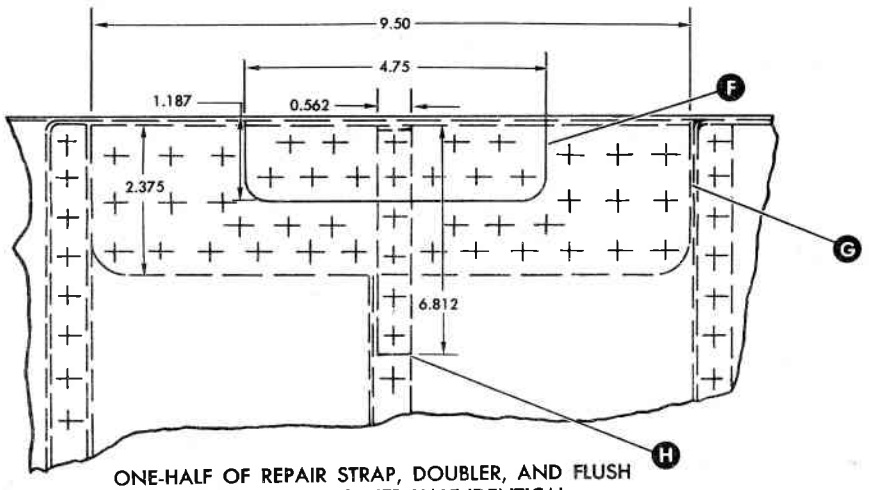
(D) Cut away damaged portion of rib. Maximum trim allowance on rib 2.50 inches. Remove micarta blocks.

(E) Clean up damaged area in wing leading edge to regular shape. Break all sharp edges and round all corners.

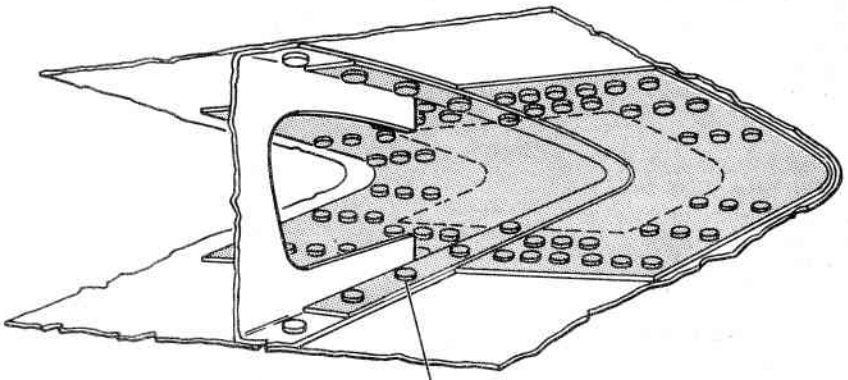
NOTE:
WHEN DAMAGE TO RIB EXCEEDS 2.50 INCHES, REPLACE RIB.

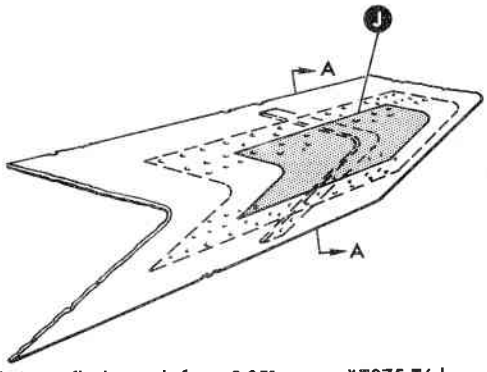
06.03.126-1 .57.01/03

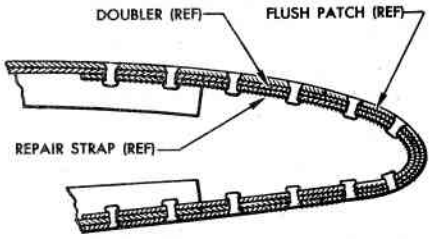
Figure 2-36. Wing Leading Edge Repair (Sheet 1 of 2)



ONE-HALF OF REPAIR STRAP, DOUBLER, AND FLUSH PATCH SHOWN; OTHER HALF IDENTICAL.







SECTION A-A

(F) Fabricate flush patch from 0.051 gage, *7075-T6 bare material as per dimensions shown. Shape flush patch to fit contour of leading edge skin.

(G) Fabricate doubler from 0.051 gage, *7075-T6 bare material as dimensions shown. Shape doubler to fit inside contour of leading edge skin.

(H) Fabricate repair strap from 0.072 gage, *7075-T6 bare material as per dimensions shown. Shape strap to fit inside contour of doubler and rib flange

(I) Position and attach doubler and repair strap with AN426-AD5 flush-head rivets as shown.

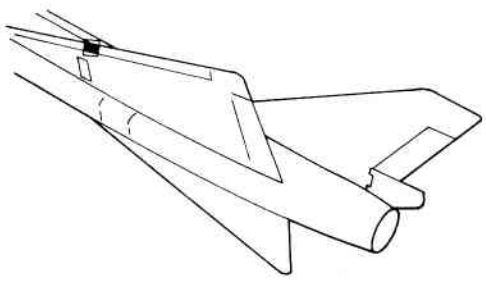
(J) Position and attach flush patch with AN426-AD5 flush-head rivets as shown.

(K) Reinstall leading edge section and panel assemblies in reverse order of removal.

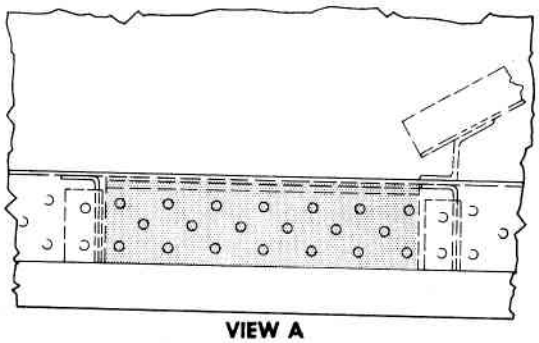
* IF NECESSARY FABRICATE PART FROM 7075-O, SHAPE TO FIT CONTOUR, AND HEAT TREAT TO 7075-T6 CONDITION PER SPECIFICATION MIL-H-6088 TO PREVENT CRACKS.

06.03.126-2 .57.04.01

Figure 2-36. Wing Leading Edge Repair (Sheet 2 of 2)



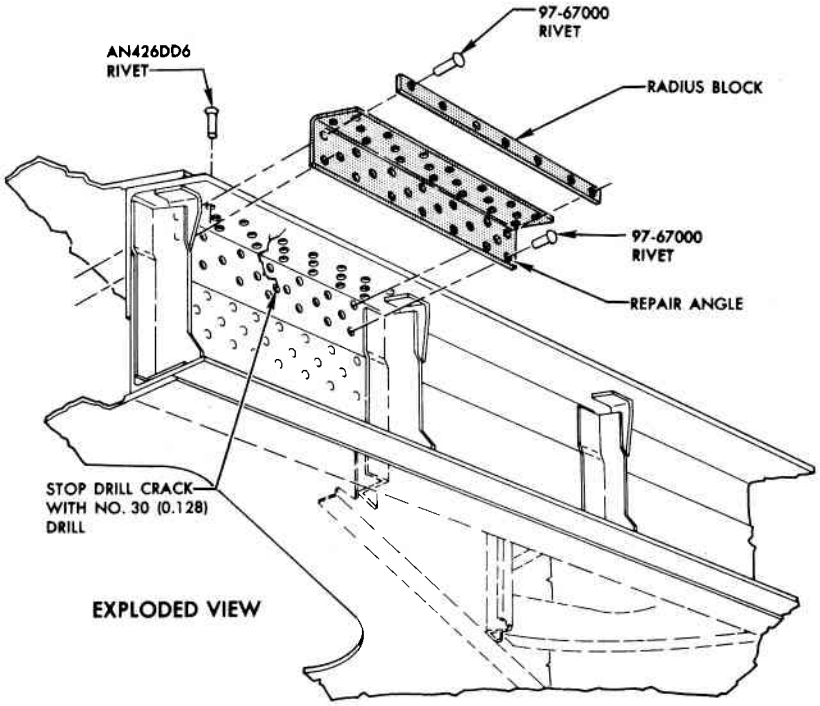
AREA OF ASSUMED DAMAGE



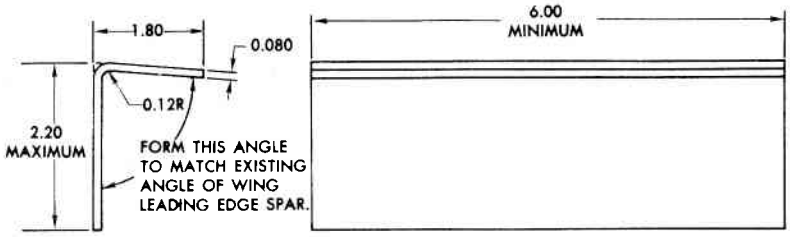
VIEW A
PLAN VIEW OF WING UPPER SURFACE

REPAIR PROCEDURE

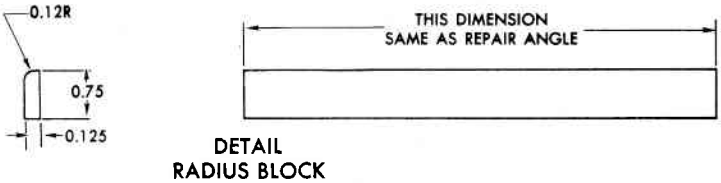
a. Remove damaged leading edge panel.
b. Remove all paint and primer from damaged area of leading edge spar. Use a clean cloth dampened with MEK, Federal Specification TT-M-261 for cleaning.
c. Inspect damaged leading edge spar and surrounding structure with fluorescent penetrant to determine extent of damage.
d. Stop-drill crack with a No. 30 (0.218) drill.
e. Fabricate repair angle from 7075-0 material using dimensions shown. Repair angle must be heat treated per Specification MIL-H-6088 to a -T6 condition after forming. Fabricate radius block from 7075-T6 sheet as shown.
f. Remove an access door from lower surface of wing plating to gain access to inner side of damaged area.
g. Using a No. 10 (0.1935) drill, remove rivets from upper surface of wing plating as indicated.
h. Install repair parts as shown and hold in place with clamps.
i. Using existing holes in wing plating as a guide, drill holes through repair angle. Use a No. 10 (0.1935) drill.
j. Layout and drill holes as indicated through repair parts and leading edge spar. Use a No. 10 (0.1935) drill.
k. Remove repair parts, then remove all drill chips and burrs from repair parts and from wing repair area.
l. Apply a protective coating to wing repair area and parts. See figure Primer and Paint Coatings in Section I.
m. Apply a coat of sealer, Military Specification MIL-S-8802, to faying surfaces of repair parts. Refer to T.O. 1-1-3 for mixing and application procedures for sealer.
n. Reinstall repair parts and hold in place with clecos.



EXPLODED VIEW



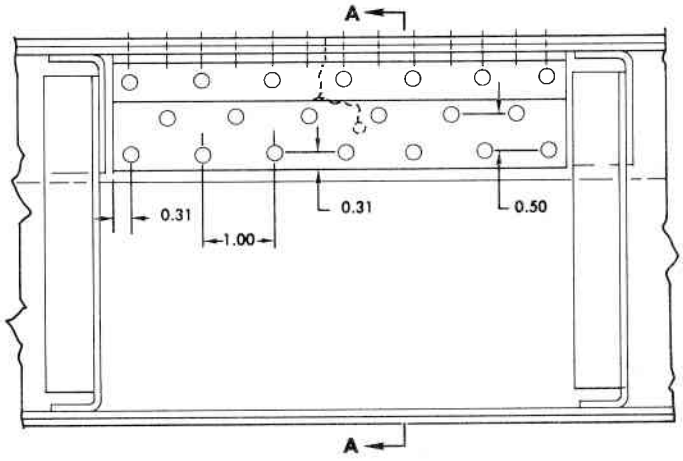
DETAIL
REPAIR ANGLE



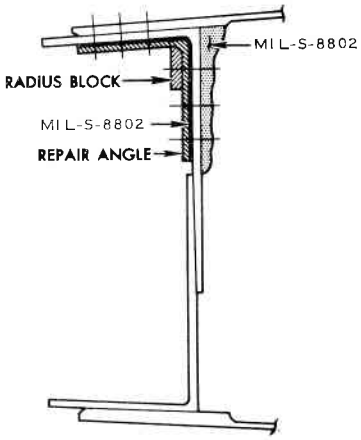
DETAIL
RADIUS BLOCK

06.03.231-1B

Figure 2–37. Repair of Wing Leading Edge Spar (Sheet 1 of 2)



ASSEMBLED VIEW



SECTION A-A

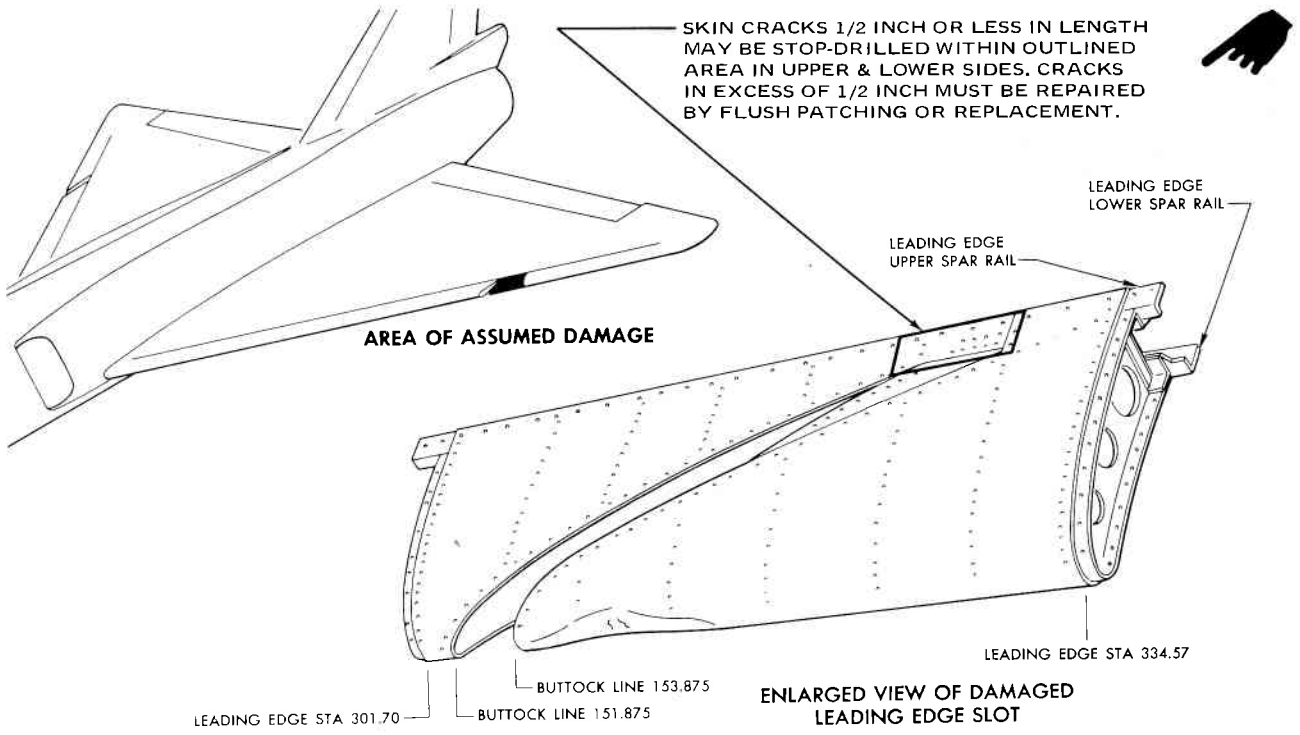
o. Rivet repair parts to wing plating with CY rivets. Refer to Table 1-XXIII for rivet basic code information.
p. Rivet repair parts to wing leading edge spar with XC rivets.
q. Apply a coat of sealer, Military Specification MIL-S-8802 over repair area on inside of wing fuel tank as shown.
r. Deleted.
s. Reinstall fuel-tight access door. Refer to paragraph Replacement of Access Door Gaskets in this section for fuel-tight access door sealing procedures.
t. Replace or repair wing leading edge panel and install with original screws. Replace any screws with damaged or stripped threads.

NOTE
IF DAMAGED WING LEADING EDGE SECTION IS REPARABLE, MAKE REPAIR ACCORDING TO PROCEDURES OUTLINED IN FIGURE 2-36.

u. Perform a fuel tank leak test according to procedures outlined in this section.
v. Finish exterior surface of repair area according to procedures outlined in Section I.

.06.03.231-2B

Figure 2–37. Repair of Wing Leading Edge Spar (Sheet 2 of 2)



LEADING EDGE SLOT REMOVAL PROCEDURE

a. Remove aerodynamic smoothing compound from recessed heads of wing leading edge attaching screws.
b. Remove screws attaching leading edge slot section to wing and adjacent portions of leading edge. Hold screws for reinstallation.
c. Remove leading edge slot section.

TOOL BUILDUP PROCEDURE

a. Build tool base from steel pipe to dimensions shown. Secure pipes together by welding.
b. Using the outside surface of doubler at each end of leading edge slot section as a guide, form end locating plates. Locating plates are to be made from 0.125 gage 301 one-quarter hard steel.

NOTE

EXTEND ENDS OF LOCATING PLATES PAST LEADING EDGE SPAR RAILS TO ALLOW FOR WORKING SPACE.

c. Using existing holes in doublers as a guide, drill a minimum of three holes through each side of end locating plates.

CAUTION

USE AN UNDERSIZED DRILL TO PICK UP HOLES THROUGH NUTPLATES TO PREVENT DAMAGE TO NUTPLATE THREADS.

d. Secure end locating plates to doublers with AN526-1032 screws.
e. Attach an angle plate to each end of locating plate as shown and hold in place with clamps.
f. Drill holes through the locating brake and angle plate as shown. Use a No. 12 (0.189) drill.
g. Secure angle plates to locating plates with AN3-5 bolts and AN365-1032 nuts.
h. Place leading edge slot assembly, with locating and angle plates attached on tool base, and secure in place by welding angle plates to base.
i. Weld two 0.125 gage 301 one-quarter hard steel brace plates across each end of locating plates as shown.
j. Weld a holding channel to outside surface of end locating plates along top center line as shown. Holding channels are to be made from 0.125 gage, 301 one-quarter hard steel.
k. Place a locating channel on top of end holding channels as shown and hold in place with clamps.
l. Attach the outboard end of locating channel to the outboard holding channel with tooling pin and wing nut as shown.
m. Attach the inboard end of locating channel to inboard channel by welding hinge halves to channels as shown.
n. Attach, by welding, a hinge to side of locating channel. Attach to locating channel on concave side of leading edge.
o. Using an undamaged leading edge slot section as a guide, form drill plates for all ribs outboard of and including outboard diagonal slot closing rib. Drill plates are to be made from 0.125 gage 301 one-quarter hard steel.
p. Attach drill plates to tool by welding as shown.
q. Remove leading edge slot section from tool.
r. Using a No. 20 (0.161) drill remove all rivets from outboard skin panel. Remove skin panel.
s. Fabricate rib spacers from 0.050 gage soft aluminum alloy.
t. Form spacers to match contour of exposed ribs.
u. Install leading edge section in tool and place spacers between ribs and drill plates.
v. Using existing holes in undamaged ribs as a guide, drill holes in drill plates.

NOTE

HOLES FOR DAMAGED SECTION OF LEADING EDGE MUST BE LAID OUT BY PHYSICAL MEASUREMENT AND MUST MATCH ORIGINAL HOLE PATTERN.

w. Remove leading edge from tool.

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Figure 2-38. Wing Leading Edge Slot Repair (Sheet 1 of 4)

DAMAGE REMOVAL PROCEDURE

a. Remove three bolts and three nuts which attach outboard diagonal slot closing rib to slot wedge.
b. Using a No. 20 (0.161) drill, remove rivets attaching plug to slot closing rib. Remove plug and hold for reinstallation if not damaged.
c. Using a No. 20 (0.161) drill, remove rivets attaching damaged vertical ribs to attaching clips. Remove damaged ribs.
d. Using a No. 20 (0.161) drill, remove rivets attaching rib clips to diagonal rib. Remove ribs and clips and hold for reinstallation.
e. Using a 3/16" (0.187) drill, remove rivets attaching diagonal rib to spar clips. Remove diagonal rib.

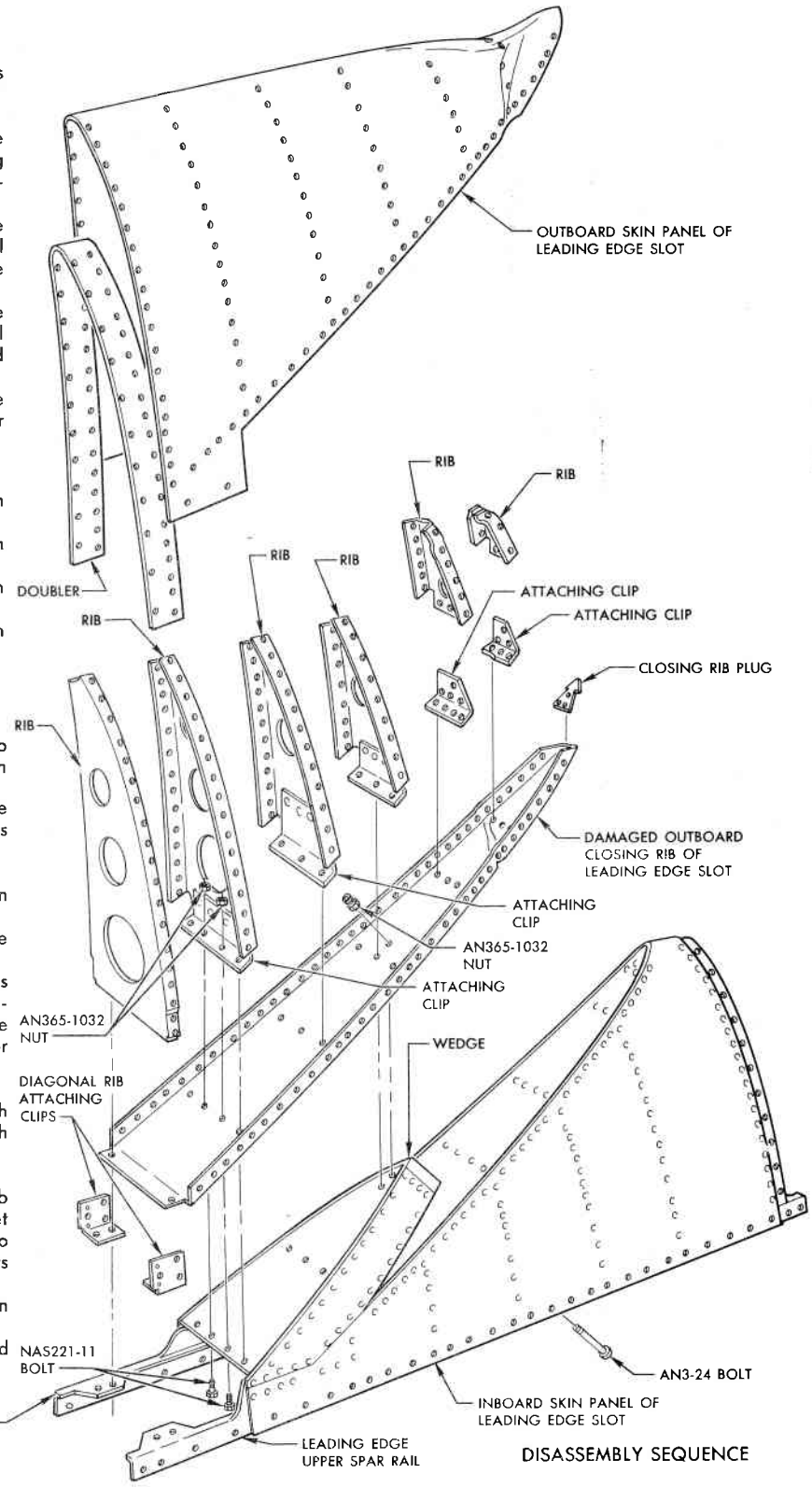
INSTALLATION PROCEDURE

a. Fabricate new diagonal rib from 0.063 gage 7075-0 bare sheet.
b. Fabricate new vertical ribs from 0.050 gage 7075-0 bare sheet.
c. Fabricate new rib attach clips from 0.063 gage 7075-0 bare sheet.
d. Fabricate a new skin panel from 0.050 gage 7075-0 bare sheet.

NOTE

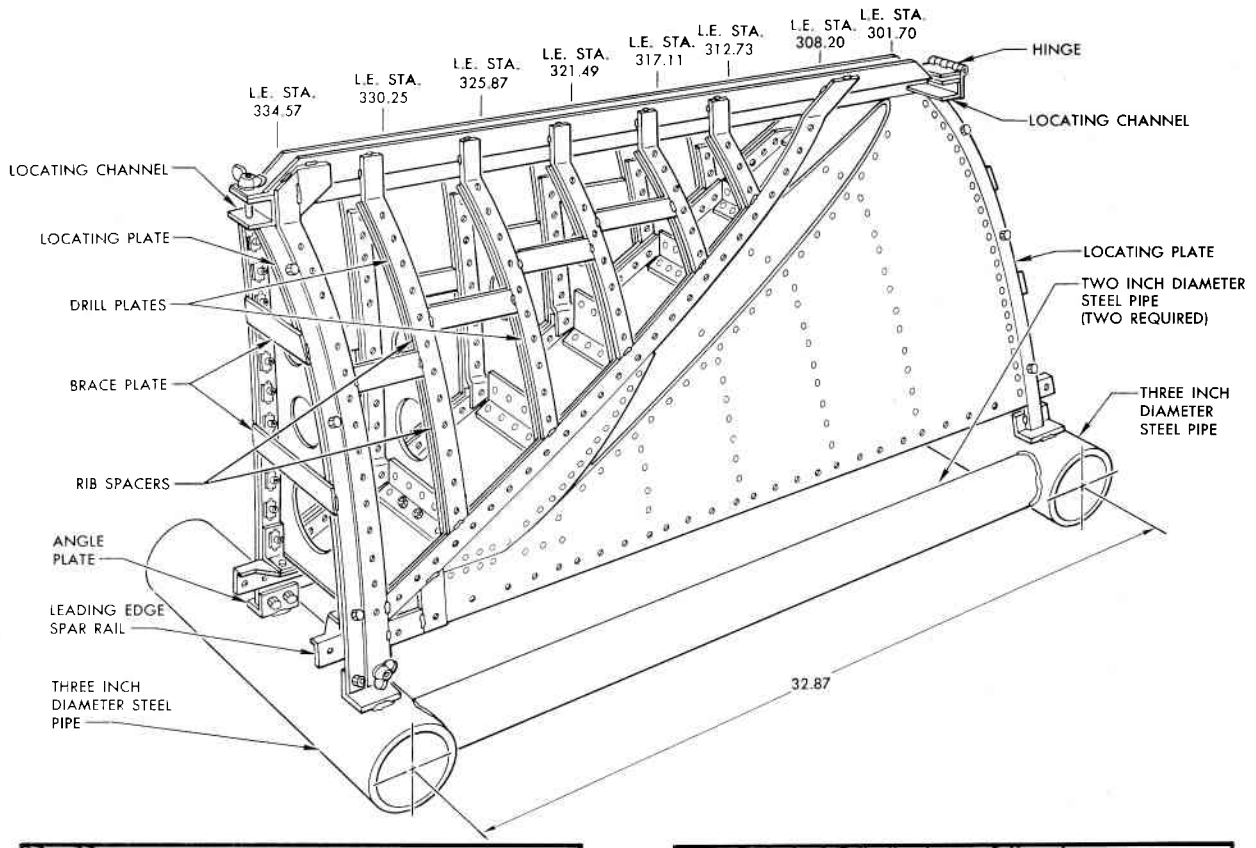
ALL FABRICATED PARTS MUST BE HEAT TREATED TO T6 CONDITION PER SPECIFICATION MIL-H-6088 AFTER FORMING.

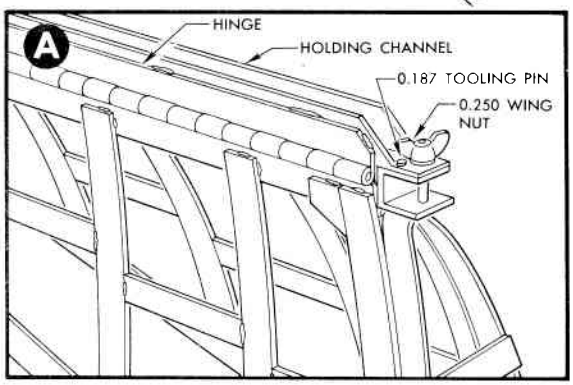
e. Apply one coat of wash primer to all repair parts per Specification MIL-C-8514.
f. Apply one coat of zinc chromate to all repair parts per Specifications MIL-P-8585 or MIL-P-6808.
g. Install leading edge in tool.
h. Install ribs and spacers and hold in place with clecos.
i. Using holes in drill plates as a guide drill holes through new ribs.
j. Predrill holes in new rib attach clips with a No. 20 (0.161) drill. Use damaged clips for determining, edge distance, hole spacing and number of holes required per clip.
k. Install predrilled clips.
l. Using predrilled holes in rib attach clips as a guide, drill holes through ribs. Use a No. 20 (0.161) drill.
m. Remove leading edge from tool.
n. Rivet vertical ribs to diagonal rib and slot wedge as shown. Use Rivet Table shown in this illustration to determine types and sizes of rivets to be used.
o. Reinstall leading edge section in tool.
p. Install new skin panel; close and lock hinged portion of tool.

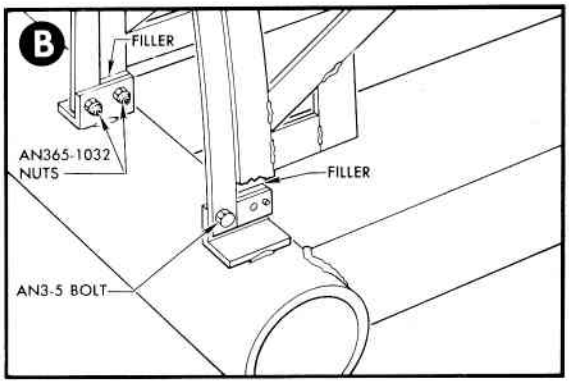


06.03.245-2A

Figure 2-38. Wing Leading Edge Slot Repair (Sheet 2 of 4)







q. Using holes in drill plates as a guide, drill holes through new skin panel.

CAUTION

USE A NO. 39 (0.099) DRILL IN PRIMARY DRILLING OF SKIN PANEL. TO ASSURE ALIGNMENT BETWEEN HOLES IN DRILL PLATE AND HOLES IN RIBS, REAM HOLES WITH A NO. 20 (0.161) DRILL AFTER ALIGNMENT IS ASSURED.

r. Remove leading edge section from tool.
s. Disassemble new skin panel and remove all burrs from leading edge.
t. Countersink all holes in exterior surface of new skin 100 degree X 0.286 −0.004.
u. Install plug in leading edge of diagonal rib and hold in place with clamps.
v. Using existing holes in plug as a guide, drill holes through diagonal rib. Use a No. 20 (0.161) drill.
w. Remove plug and remove all burrs.
x. Reinstall plug and rivet in place. Refer to Rivet Table shown in this illustration for type and size of rivets.
y. Reinstall new skin panel and hold in place with clecos.
z. Rivet skin panel in place. Refer to Rivet Table shown in this illustration for types and sizes of rivets to be used.
aa. Fill all cracks between slot closing rib and new skin with MIL-S-38228 aerodynamic smoothing compound.
ab. Paint the new portion of leading edge as required according to applicable paint schedule given in Section I.
ac. Install leading edge slot section to wing.
ad. Reinstall screws which were removed in "b" of Leading Edge Slot Removal Procedure.
ae. Fill all recessed heads of screws with MIL-S-38228.

06-03-245-38

Figure 2-38. Wing Leading Edge Slot Repair (Sheet 3 of 4)

RIVET TABLE		
RIVETS THROUGH-	TYPE OF RIVET	DIAMETER OF RIVET
SKIN AND RIB NO'S 1, 2, 3, 4, 5, AND 6	AN426AD	5/32
RIB NO'S 1 AND 7 AND SPAR RAIL ATTACH CLIPS	AN470AD	5/32
SKIN AND RIB NO. 7	AN426DD	5/32
END HOLES IN RIB ATTACH CLIP NO. 2 AND RIB NO. 7	AN470DD	3/16
END HOLES IN RIB ATTACH CLIP NO. 3 AND RIB NO. 7	AN470DD	3/16
MIDDLE HOLE IN RIB ATTACH CLIP NO. 3 AND RIB NO. 7	Q4310	3/16
END HOLES IN RIB ATTACH CLIP NO. 4 AND RIB NO. 7	AN426DD	3/16
MIDDLE HOLE IN RIB ATTACH CLIP NO. 4 AND RIB NO. 7	Q4310	3/16
RIB ATTACH CLIP NO'S 5 AND 6 AND RIB NO. 7	AN426DD	3/16
RIB ATTACH CLIP NO'S 5 AND 6 AND RIB NO. 5 AND 6	AN470DD	3/16
PLUG AND RIB NO. 7	AN426AD	1/8

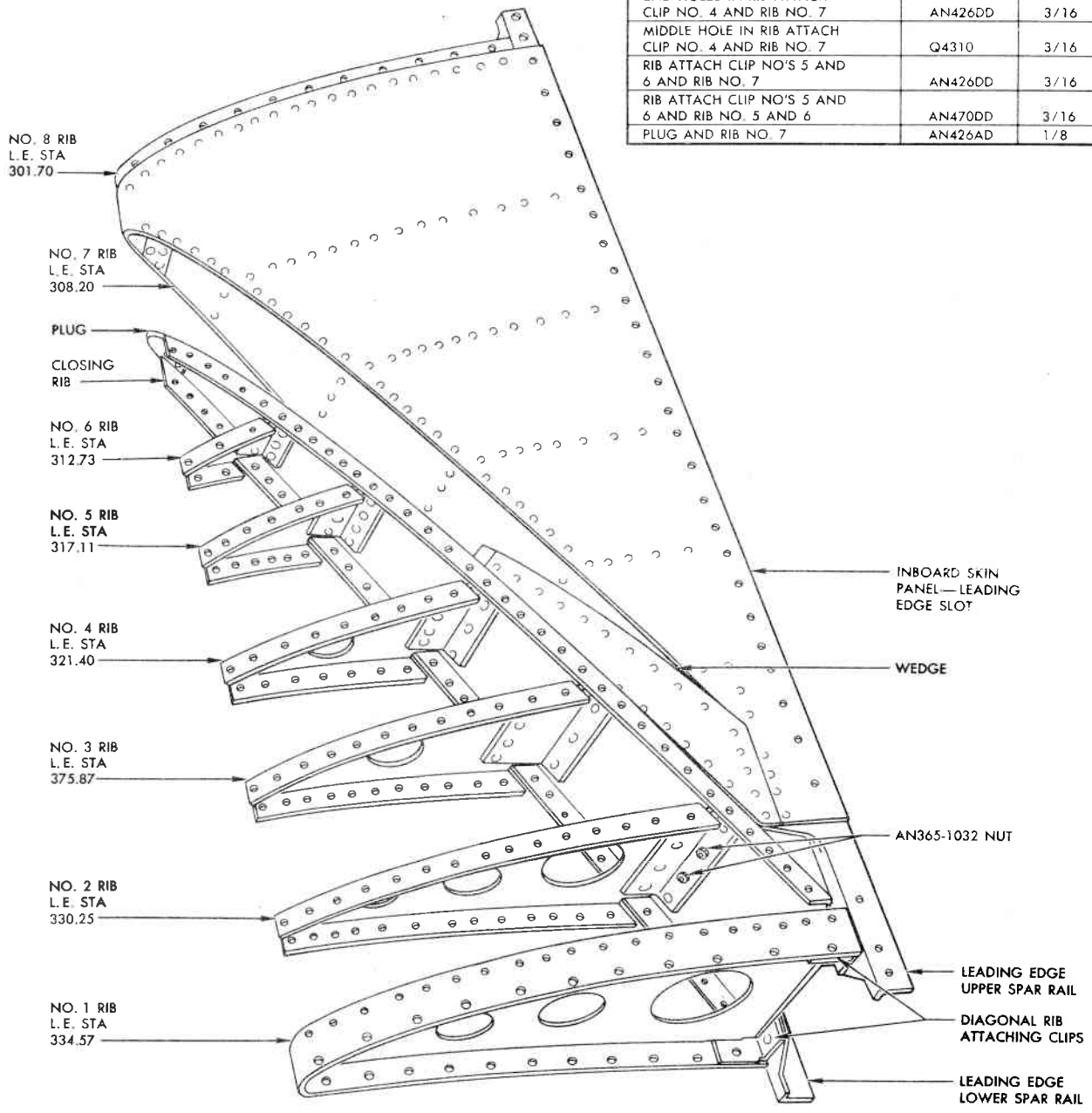


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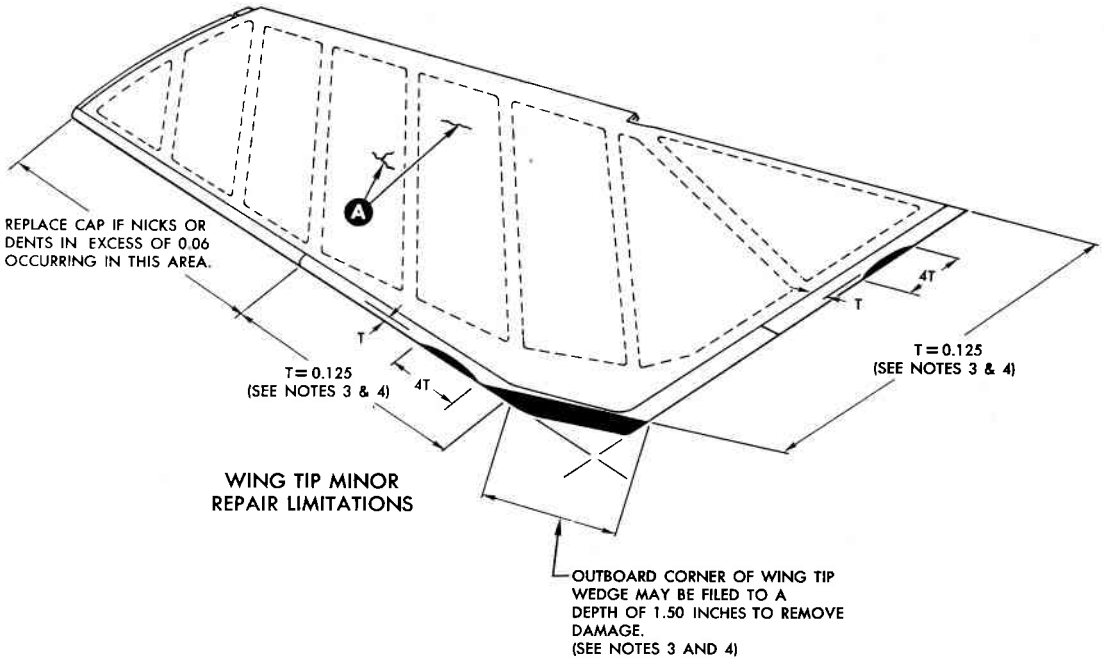
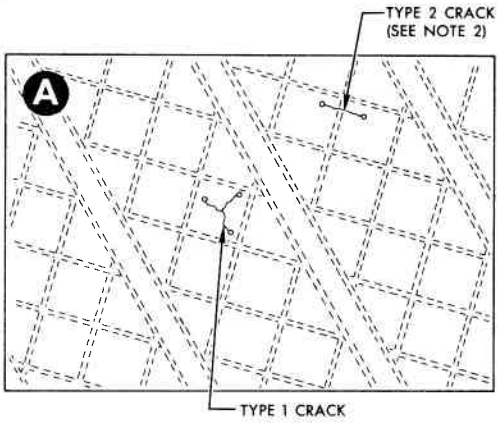
Figure 2-38. Wing Leading Edge Slot Repair (Sheet 4 of 4)



WING TIP MINOR REPAIR LIMITATIONS



REPAIR OF CRACKED WING TIP SKINS—TYPE 1

a. Remove all paint and primer from cracked area of wing tip skin.
b. Perform a fluorescent penetrant inspection to determine length of crack.
c. Stop drill crack at each end of crack with a No. 30 (0.1285) drill.
d. Rout out crack with a 0.128 router bit.
e. Fill routed area with MIL-S-38228 aerodynamic smoothing compound.
f. Apply primer and paint to repair area according to directions given in Section I.

NOTES:
1. DAMAGE IN EXCESS OF DIMENSIONS SHOWN WILL REQUIRE REPLACEMENT OF DAMAGED COMPONENT.
2. CRACKS ACROSS INTEGRAL WEBS OF WING TIP SKINS WILL REQUIRE REPLACEMENT OF SKIN.
3. WEDGES MAY BE FILED AS INDICATED TO REMOVE MINOR DAMAGE.
4. MAXIMUM ALLOWABLE MATERIAL TO BE REMOVED FROM LEADING EDGE OR TRAILING EDGE OF WING TIP WEDGES IS NOT TO EXCEED 2.50 SQUARE INCHES.
5. TOTAL AREA OF WING TIP WEDGES TO BE REMOVED BY FILING NOT TO EXCEED 15.00 SQUARE INCHES.

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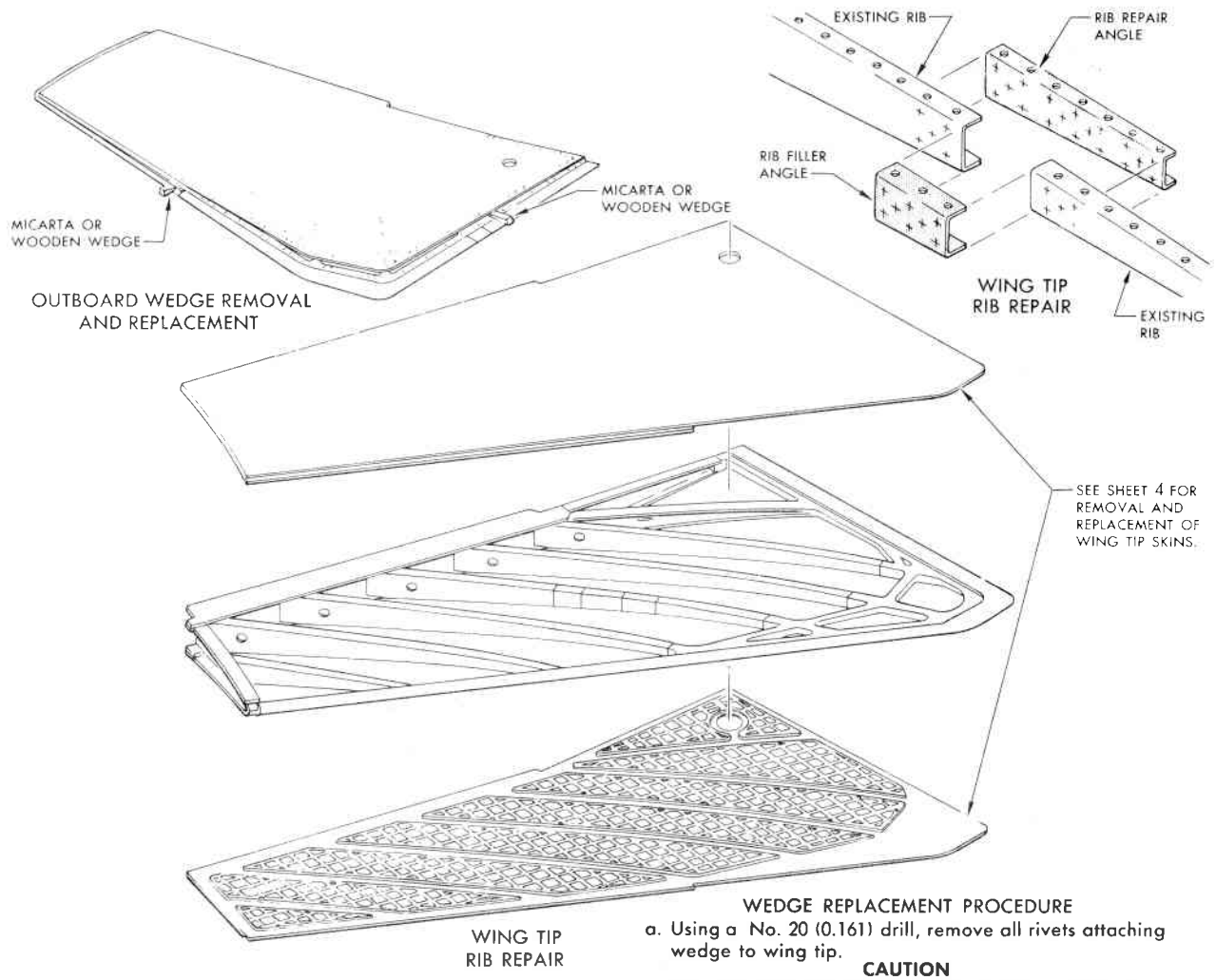
Figure 2-39. Wing Tip Repairs — Limitations and Procedures (Sheet 1 of 6)



WING TIP RIB REPAIR PROCEDURE

a. Remove either the upper or lower wing tip skin.
b. Cutout the damaged portion of wing tip rib.
c. Fabricate rib repair channels from 7075-0 bare sheet as shown. Repair angles must be heat treated to the -T6 condition per Specification MIL-H-6088 after forming.
d. Install rib repair channel and hold in place with clamps.
e. Install rib filler channel and hold in place with clamps.
f. Using predrilled holes in vertical flange of repair parts as a guide, perform drilling operation. Use a No. 30 (0.128) drill.
g. Ream holes drilled in step "f" with a No. 20 (0.161) drill.
h. Remove repair parts and remove all burrs from repair parts and wing tip.
i. Apply one coat of wash primer to repair parts per Specification MIL-C-8514.
j. Apply four coats of Zinc Chromate Primer to repair parts per Specification MIL-P-8585 or MIL-P-6808.
k. Reinstall rib repair parts and hold in place with clecos.
l. Rivet rib repair parts in place with AN370AD-5 rivets.
m. Complete repair of rib by wing tip skin replacement procedure.

WEDGE REPLACEMENT PROCEDURE

a. Using a No. 20 (0.161) drill, remove all rivets attaching wedge to wing tip.

CAUTION

DO NOT ATTEMPT TO DRILL COMPLETELY THROUGH WING TIP TO REMOVE RIVETS. DRILL OUT MANUFACTURED HEAD OF RIVET, THEN REMOVE REMAINDER OF RIVET WITH A PUNCH.

b. Fabricate two wedges as shown and insert between wing tip wedge and skin.
c. Remove wing tip wedge.
d. Install new wing tip wedge.
e. Remove fabricated wedges.
f. Align new wing tip wedge and hold in place with clamps.
g. Using existing holes in wing tip skins as a quide, drill holes through new wing tip wedge.

NOTE

TO MAINTAIN ALIGNMENT BETWEEN EXISTING HOLES IN UPPER AND LOWER WING TIP SKINS; DRILL HOLES THROUGH WEDGE WITH A NO. 39 (0.099) DRILL FIRST, THEN REAM HOLES TO PROPER SIZE WITH A NO. 20 (0.161) DRILL.

h. Remove wing tip wedge and remove all burrs from wedge and wing tip.
i. Reinstall wing tip wedge and align by placing AN426B-5 rivets through holes drilled in step "g".
j. Secure rivets in place by standard riveting methods.
k. Mill shop formed rivet heads flush with wing tip skin.
l. Apply paint to wing tip according to applicable schedule given in Section I.

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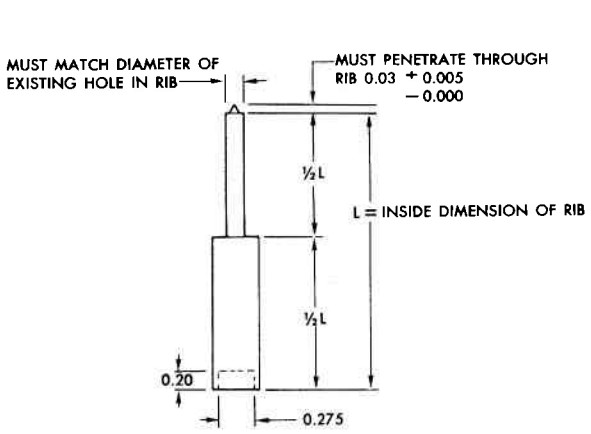
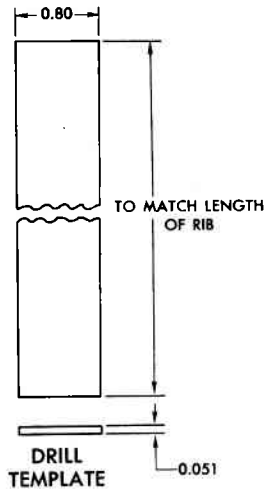
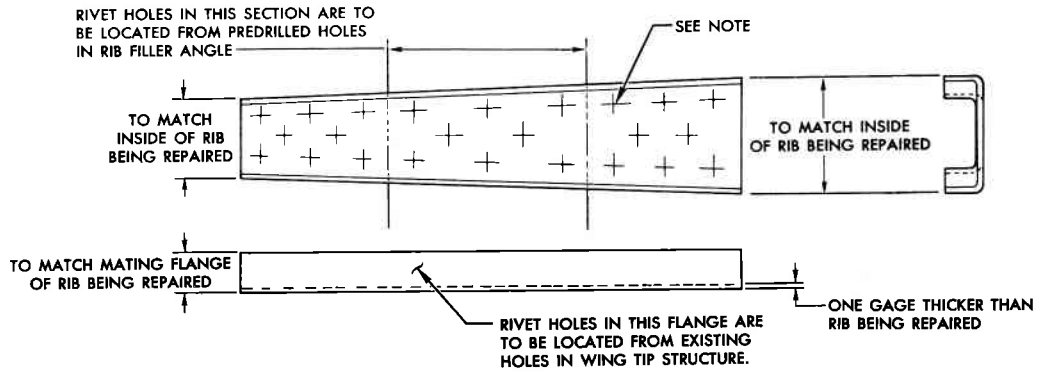
Figure 2-39. Wing Tip Repairs — Limitations and Procedures (Sheet 2 of 6)



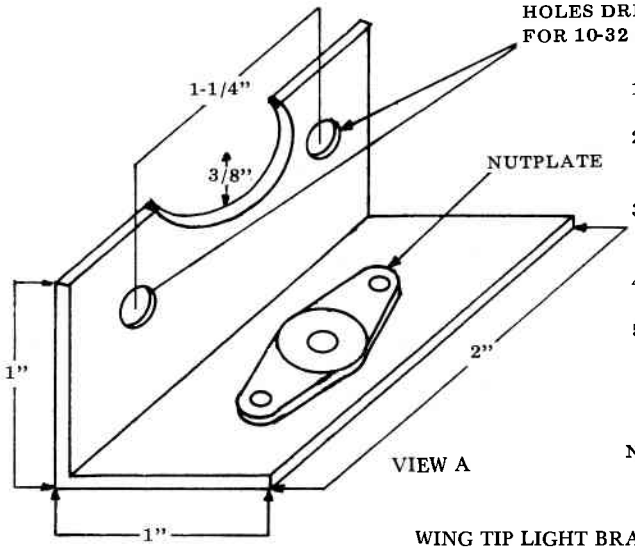
HOLE LOCATING PUNCH



DRILL TEMPLATE



RIB REPAIR ANGLE



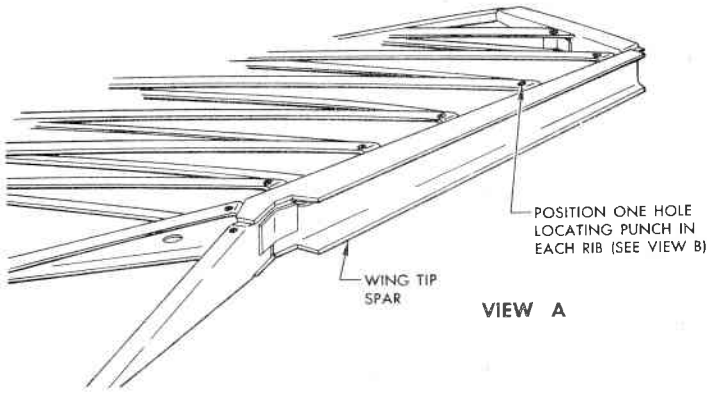
REPAIR PROCEDURE

1. REMOVE THE BROKEN OR STRIPPED LUGS THAT THE LIGHT SOCKET IS ATTACHED TO.
2. FABRICATE A BRACKET FROM A SECTION OF 1-INCH BY 1-INCH EXTRUDED ANGLE 2 INCHES LONG APPROXIMATELY .062 THICK.
3. MAKE A CUTOUT IN ONE LEG OF THE ANGLE TO ACCOMMODATE SOCKET AND DRILL 2 HOLES AS SHOWN IN VIEW A FOR ATTACHING SOCKET.
4. DRILL AND INSTALL A 10-32 NUTPLATE ON OTHER LEG OF ANGLE.
5. ATTACH TO WING TIP BY REMOVING ONE EXISTING RIVET FROM THE FORWARD EDGE OF ORIGINAL RETAINER. DRILL AND COUNTERSINK RIVET HOLE FOR A 10-32 SCREW. ATTACH TO WING TIP WITH A 10-32 SCREW.

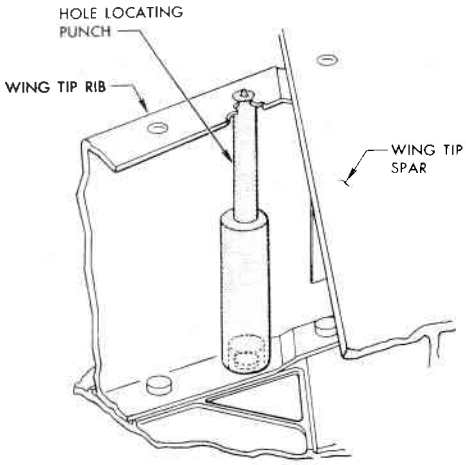
NOTE:
ATTACH LIGHT SOCKET TO BRACKET PRIOR TO INSTALLING ON WING TIP.

WING TIP LIGHT BRACKET REPAIR

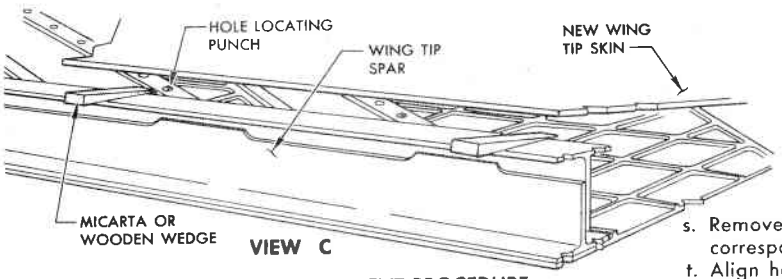
Figure 2-39. Wing Tip Repairs — Limitations and Procedures (Sheet 3 of 6)



VIEW A



VIEW B



VIEW C

WING TIP SKIN REPLACEMENT PROCEDURE

a. Remove the screws attaching the wing tip to the wing and hold for reinstallation.
b. Remove the wing tip. Disconnect position light wiring as wing tip is removed.
c. Using a No. 20 (0.161) drill, remove all rivets from damaged wing tip skin.

NOTE

DO NOT ATTEMPT TO DRILL COMPLETELY THROUGH WING TIP TO REMOVE RIVETS. DRILL OUT MANUFACTURED RIVET HEADS, THEN REMOVE REMAINDER OF RIVET WITH A PUNCH.

d. Remove damaged wing tip skin.
e. Make hole locating punches as shown from 0.375-inch diameter drill rod.
f. Make four wedges from micarta or wood.
g. Install hole locating punches in ribs as shown in views A and B.
h. Place wedges along spar as shown in view C.
i. Install new wing tip skin; align skin and hold in place place with clamps.
j. Using existing holes along outboard edge of wing tip as a guide, drill holes through new wing tip skin. Use a No. 39 (0.099) drill.
k. Remove wedges from between new skin and wing tip spar.

NOTE

REMOVE WEDGES CAREFULLY TO PREVENT NEW SKIN FROM BECOMING MISALIGNED.

l. Hold new skin firmly in place along wing tip spar with clamps.
m. Using a leather or plastic mallet, tap the new skin lightly over each of the hole locating punches.
n. Remove all clamps and remove the new skin.
o. Remove the hole locating punches from ribs.
p. Fabricate drill template strips to locate remainder of rib holes from soft aluminum as shown.
q. Place drill template strips in grooves of wing tip skin inner surface.
r. Using holes in new skin as a guide, drill holes through drill template strips. Use a No. 39 (0.099) drill.
s. Remove drill template strips from skin and place over corresponding ribs in wing tip.
t. Align holes in drill template strips over corresponding holes in wing tip ribs and hold securely in place with clamps.
u. Using existing holes in wing tip ribs and spar as a guide, drill holes in drill template strips. Use a No. 39 (0.099)
v. Remove drill template strips from ribs and spar. drill.
w. Place drill template strips in corresponding grooves of wing tip skin.

NOTE

ALIGN DRILL TEMPLATE STRIPS IN PLACE BY MATCHING HOLES IN SKIN WITH HOLES IN DRILL TEMPLATE STRIPS.

x. Using holes in drill template strips as a guide, drill holes through skin. Use a No. 39 (0.099) drill.
y. Remove drill template strips from skin.
z. Reinstall new skin on wing tip and hold securely in place with clamps.
aa. Ream holes in new skin with a No. 30 (0.128) drill.

CAUTION

CHECK EACH HOLE FOR ALIGNMENT BEFORE REAMING.

ab. Enlarge holes in skin to final size with a No. 20 (0.161) drill.
ac. Remove new skin and remove all burrs from skin and wing tip.
ad. Machine countersink all holes in skin 78 degrees.
ae. Reinstall skin and align by placing rivets through holes. Use DL rivets through blind area and CY rivets in non-blind area.

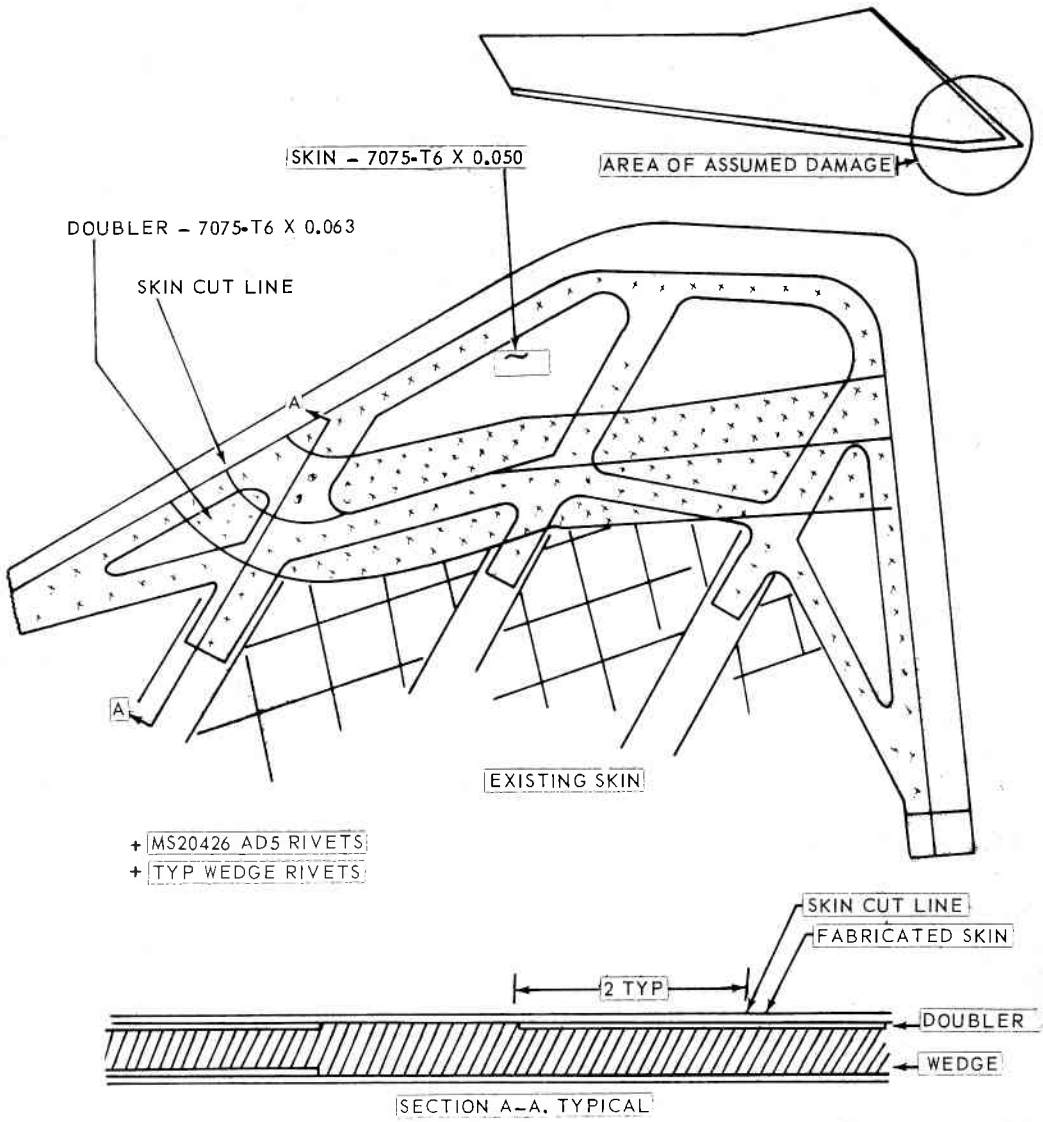
NOTE

REFER TO TABLE 1-XXIII FOR RIVET BASIC CODE.

af. Secure rivets in place by standard riveting methods.
ag. Apply paint to wing tip according to applicable paint schedule given in Section I.
ah. Reconnect position light wires.
ai. Reinstall wing tip with screws removed in step "a."
aj. Fill screw heads and gaps between wing tip and wing with aerodynamic smoothing compound. Refer to Table 11-VII for application of aerodynamic smoothing compound.

06.03.247-4B

Figure 2-39. Wing Tip Repairs — Limitations and Procedures (Sheet 4 of 6)



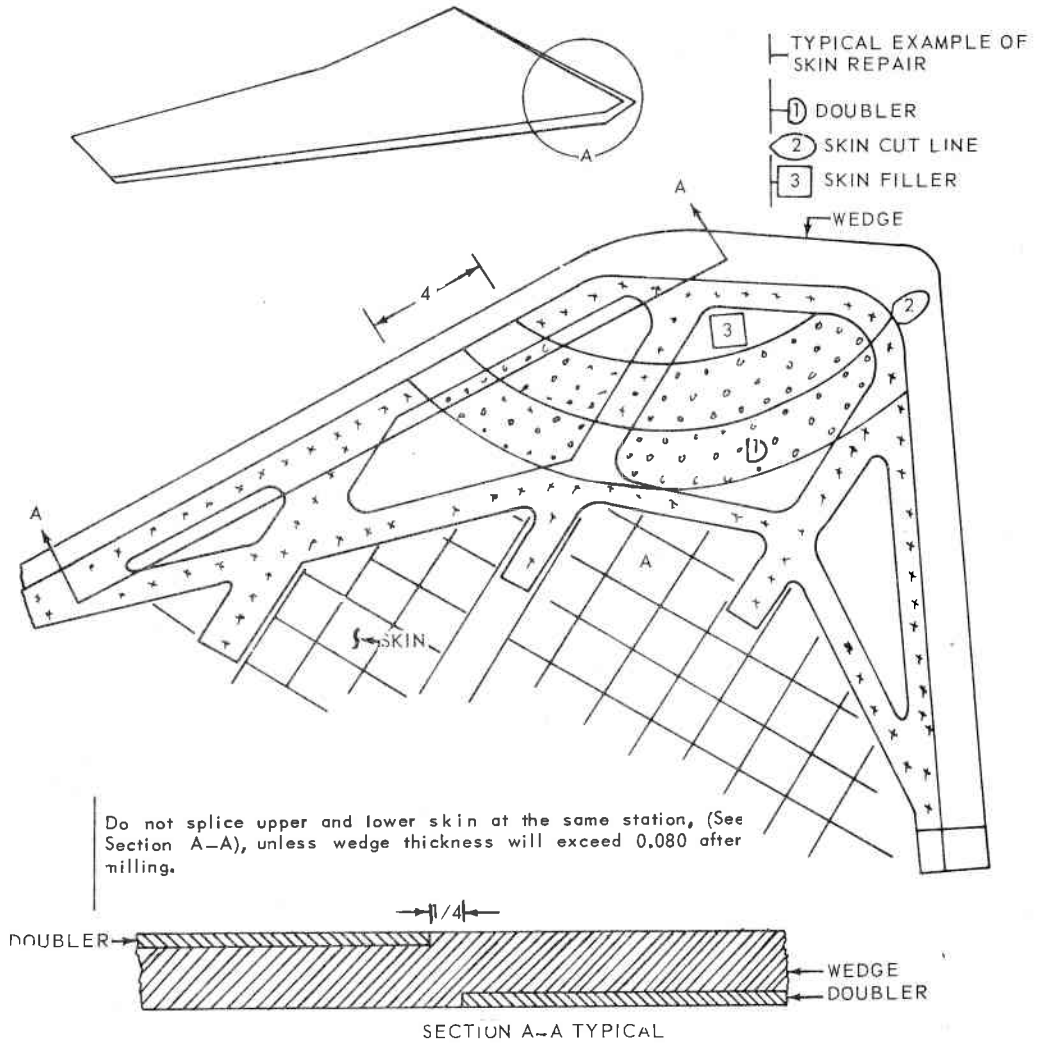
REPAIR PROCEDURE

a. Remove rivets in wedge and -10 lower skin as required to facilitate repair. Reference (Sheet 2 of 6) and (Sheet 4 of 6).
b. Cut broken and torn skin to approximate shape as shown.
c. Remove grid portion of -8 skin as required to maintain a flush surface under doubler. Apply protective coating per MIL-C-5541, wash primer MIL-C-8514, and primer MIL-P-8585, to exposed metal.
d. Fabricate doubler from 7075-T6 x 0.064 aluminum alloy sheet to fit contours, and as shown.
e. Fabricate skin filler from 7075-T6 x 0.051 aluminum alloy. Trim to fit contours of wedge and skin cut line.
f. Insert a new wedge in place using clecos. Temporarily install -10 skin, reference (Sheet 4 of 6). Drill holes in wedge from existing holes in skin. Drill holes in fabricated skin rod doubler as shown in figure 1-32 and table 1-11.
g. Remove fabricated skins, doublers and wedge. Temporarily locate doublers on wedge. Mark doubler location. Mill wedge surface 0.064 deep to recess doubler flush with wedge contour. Apply MIL-M-3171, Type 1, prepaint surface treatment to milled area followed by Primer to all mating surfaces. (Reference T.O. 1F-106A-23).
h. Countersink holes in skins. Install doubler to skin using MS20426AD5 rivets.
i. Reinstall skin and wedge.
j. Prime and paint wing tip surfaces as directed in T.O. 1F-106A-23.

NOTE

ALL MACHINED SURFACES TO BE 125 MIN. PER MIL-STD-10.

Figure 2-39. Wing Tip Repairs — Limitations and Procedures (Sheet 5 of 6)



SECTION A–A TYPICAL

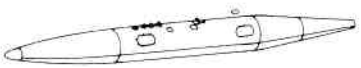
REPAIR PROCEDURE

a. Remove rivets in wedge and skin as required to facilitate repair. Reference (Sheet 2 of 6) and (Sheet 4 of 6).
b. Cut broken and torn skins not to exceed limits as shown.
c. Grid portion of skin may be removed to provide a smooth skin surface. Apply protective coating per MIL-C-5541, wash primer MIL-C-8514, and primer MIL-P-8585 to exposed skin.
d. Fabricate reinforcing doubler and skin filler from 7075-T6, same guage as thickness of milled skin at cut line.
e. Insert a new wedge in place. Drill holes in wedge from existing holes in skin. Drill holes in fabricated doubler, filler and skin as per figure 1-32, and table 1-IV. (Rivet size and pattern in wedge shown on Drawing 8-18411.
f. Remove fabricated skins, doublers and wedge. Temporarily locate doubler on wedge. Mark doubler location. Mill wedge surfaces to recess doublers flush with wedge contour. Apply MIL-M-3171, Type 1, prepaint surface treatment to milled areas followed by primer to all mating surfaces, as per T.O. 1F-106A-23.
g. Countersink holes in skins. Install doublers and filler using MS-20426AD5 rivets. FA200 Jo-Bolts may be used as required. One row Jo-Bolts equal to two (2) rows of MS-20426-AD5 rivets. Maintain 2D edge distance.
h. Reinstall skins and wedge.
i. Prime and paint wing tip surfaces as directed in T.O. 1F-106A-23.

NOTE

ALL MACHINE FINISHES TO BE 125 MIN. PER MIL-STD-10.

Figure 2-39. Wing Tip Repairs – Limitations and Procedures (Sheet 6 of 6)



NOTE:
UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES.

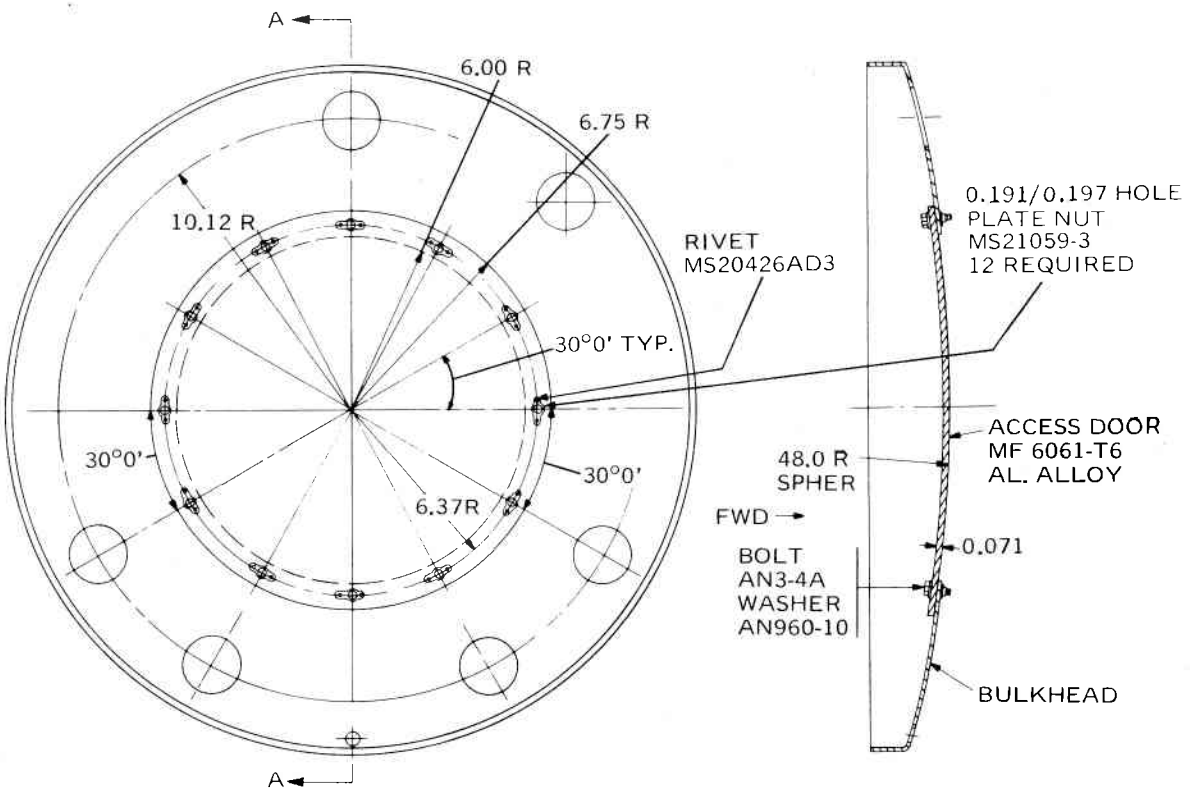
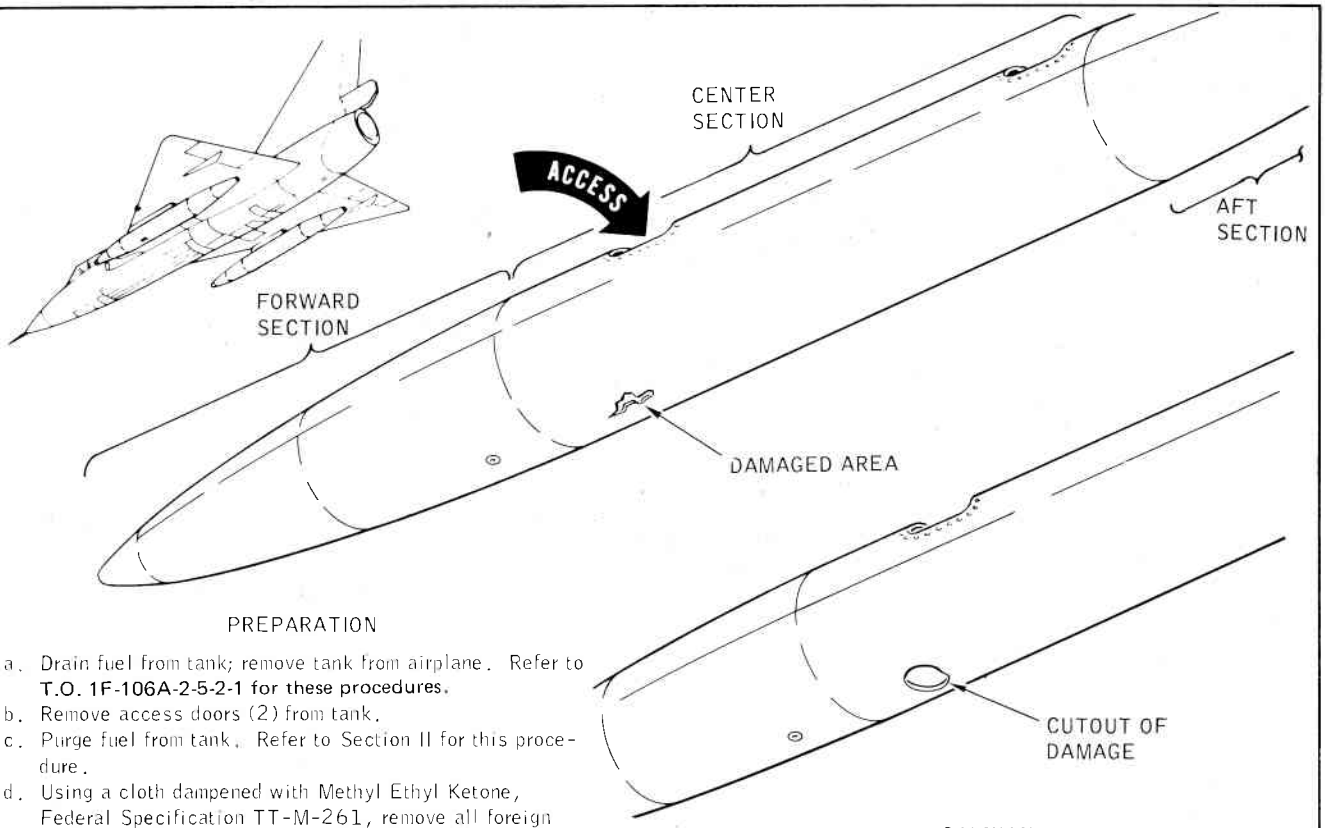


Figure 2-40. Nose Section Access for Internal Repairs. Applicable after Incorporation of TCTO 1F-106-958.

All data on pages 2-79 and 2-80 deleted.



PREPARATION

a. Drain fuel from tank; remove tank from airplane. Refer to T.O. 1F-106A-2-5-2-1 for these procedures.
b. Remove access doors (2) from tank.
c. Purge fuel from tank. Refer to Section II for this procedure.
d. Using a cloth dampened with Methyl Ethyl Ketone, Federal Specification TT-M-261, remove all foreign material from damaged area.
e. Perform dye penetrant inspection to determine extent of damage. Refer to Section I for dye penetrant inspection procedures.

CENTER SECTION REPAIR

a. Cut out damaged material to leave a regular shape in existing skin.
b. Fabricate a doubler from 6061 T6 bare sheet, 0.090 inch thick. Doubler to be of sufficient size to allow 3 rivet diameters edge distance on outer row of rivets, 3/4 inch separation between inner and outer rows of rivets, and 3/4 inch edge distance on inner row of rivets.
c. Fabricate a flush skin patch from 6061 T6 bare sheet, 0.090 inch thick.
d. Predrill doubler as shown using a No. 20 (0.161) drill.
e. Install doubler and hold in place with clamps.
f. Using predrilled holes in doubler as a guide, drill holes in tank skin using a No. 10 (0.193) drill.
g. Remove clamps and install clecos to hold doubler in place.
h. Position flush patch in place.
i. Using doubler predrilled holes as a guide, drill holes in flush patch using a No. 10 (0.193) drill.

NOTE

INSTALL CLECOS THROUGH DOUBLER AND PATCH AS HOLES ARE DRILLED TO MAINTAIN HOLE ALIGNMENT.

j. Remove patch and doubler; remove all burrs.
k. Reinstall doubler and patch using clecos.
l. Countersink all holes using a 100° countersink.
m. Remove patch and doubler. Thoroughly clean repair parts and tank skin using the following procedure:

CAUTION

ALL PERSONNEL HANDLING REPAIR PARTS DURING AND AFTER THE FOLLOWING TREATMENT MUST WEAR CLEAN WHITE GLOVES TO PREVENT CONTAMINATION OF FAYING SURFACES.

1. Perform initial cleaning with a clean, lint-free cheese cloth dampened with Methyl Ethyl Ketone, Federal Specification TT-M-261.
2. Finish cleaning with a clean, lint-free cheese cloth dampened with Aliphatic Naphtha, Federal Specification TT-N-95.
3. Apply Deoxidine to faying surfaces of repair parts and existing skin. Application may be made with a clean, lint-free cheese cloth or a nylon bristle brush.

NOTE

DO NOT ALLOW DEOXIDINE TO DRY DURING APPLICATION.

4. Apply Alodine 1200 to faying surfaces of repair parts and existing skin. Application may be made with a clean, lint-free cheese cloth or a nylon bristle brush.

NOTE

DO NOT ALLOW ALODINE 1200 TO DRY DURING APPLICATION.

5. Rinse faying surfaces of repair parts and existing skin with a clean, lint-free cheese cloth dampened with clean, room temperature tap water.

NOTE

USE SEVERAL PIECES OF CLEAN CHEESE CLOTH FOR RINSING.

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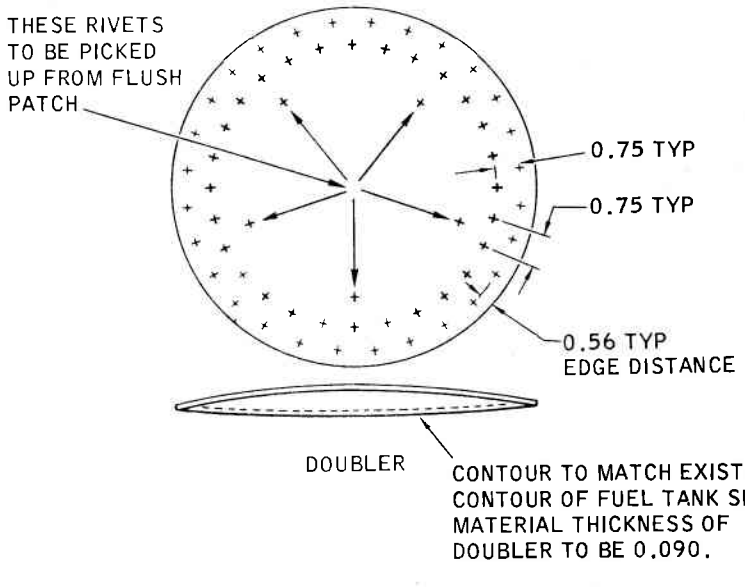
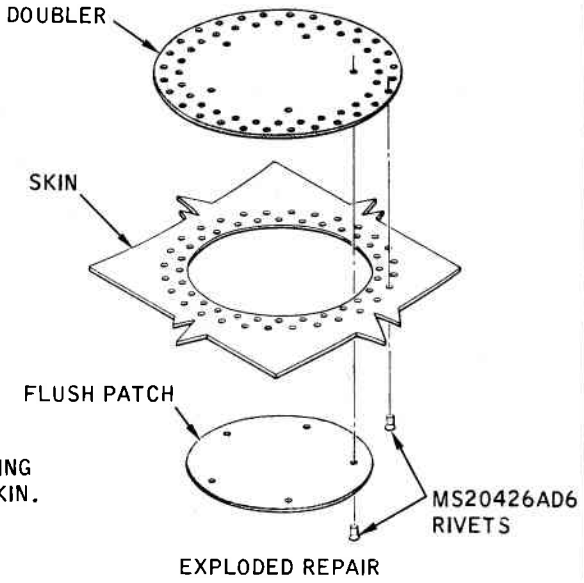
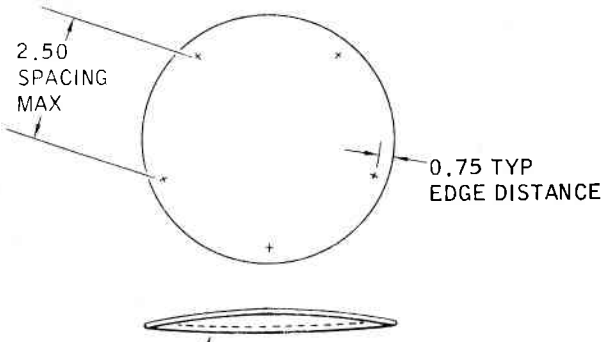
Figure 2-40A. External Fuel Tank Repairs (Sheet 1 of 3)
Applicable after incorporation of TCTO 1F-106-958.

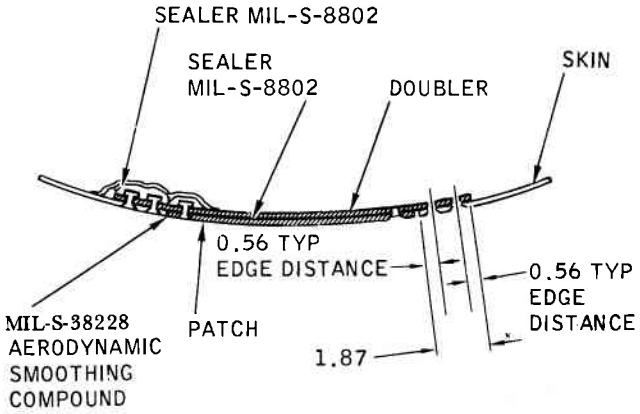




EXPLODED REPAIR



FLUSH PATCH



CROSS SECTION OF REPAIRED DAMAGE

n. Apply a coat of sealer, Specification MIL-S-8802, to faying surfaces of repair parts and existing skin. Refer to T.O. 1-1-3 for application procedures for sealer.

o. Install repair parts and hold in place with clecos. Rivet doubler to existing skin and flush patch to doubler with MS20426AD6 rivets.

NOTE

WIPE ALL MOISTURE FROM RIVET AND APPLY A COAT OF SEALER, SPECIFICATION MIL-S-8802 TO SHANK OF RIVET BEFORE EACH RIVET IS INSTALLED.

p. Apply a coat of sealer, Specification MIL-S-8802, to interior surface of repair as shown. Refer to T.O. 1-1-3 for application procedures for sealer.

q. Fill gap between flush patch and existing skin with MIL-S-38228.

FORWARD OR AFT SECTION REPAIR

a. Perform steps of preparation procedure.

b. Cut out damaged material. Make cutout enough of a rectangular or oval shape to permit insertion of doubler. Radius of cutout corners not to be less than two inches.

NOTE

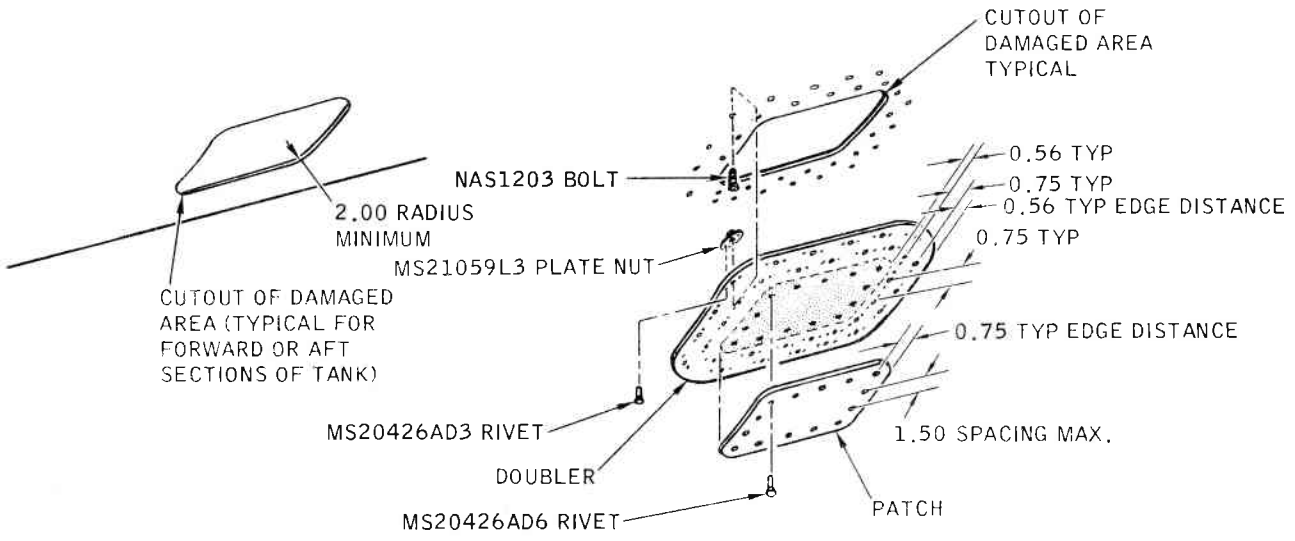
POSITION TANK SO THAT DAMAGE AREA IS AT THE LOW POINT. THIS IS TO KEEP CUTTINGS AND SHAVINGS CONCENTRATED NEAR THE CUT-OUT AND TO FACILITATE TANK CLEANING.

c. Fabricate doubler from 6061 T6 bare sheet, 0.090 inch thick. Doubler to be of sufficient size to allow 3 bolt diameters edge distance on outer row of bolts, 3/4 inch separation between inner and outer row of bolts, and 3/4 inch edge distance on inner row of bolts.

d. Fabricate a flush skin patch from 6061 T6 bare sheet, 0.090 inch thick.

Figure 2-40A. External Fuel Tank Repairs (Sheet 2 of 3)

Applicable after incorporation of TCTO 1F-106-958.



e. Predrill bolt hole pattern in tank using a No. 20 (0.161) drill.
f. Position doubler in tank and clamp in position.
g. Using tank predrilled holes as a guide, drill holes in doubler using a No. 10 (0.193) drill.

NOTE

INSTALL CLECOS THROUGH TANK AND DOUBLER AS HOLES ARE DRILLED TO MAINTAIN HOLE ALIGNMENT.

h. Using a soft lead pencil, lightly mark outline of tank cutout on doubler.
i. Remove doubler; remove burrs from tank and doubler.
j. Reinstall doubler using clecos.
k. Countersink holes using a 100° countersink; remove doubler.

NOTE

A SLIGHT PROTRUSION OF SCREW HEADS TO A MAXIMUM OF 0.002 INCH IS DESIRABLE.

l. Position patch on doubler; hold together with clamps.
m. Drill rivet pattern in patch and doubler using a No. 10 (0.193) drill.

NOTE

INSTALL CLECOS THROUGH DOUBLER AND PATCH AS HOLES ARE DRILLED TO MAINTAIN HOLE ALIGNMENT.

n. Remove clecos and clamps; remove all burrs.
o. Position patch on doubler; hold together with clecos.
p. Countersink rivet holes in patch using 100° countersink.
q. Remove clecos; separate patch and doubler.
r. Perform cleaning procedure in step m of center section repair procedure.
s. Apply a coat of sealer, Specification MIL-S-8802, on faying surfaces of doubler and patch. Refer to T.O. 1-1-3 for sealer application procedures.
t. Position patch on doubler and hold with clecos. Rivet patch to doubler using MS20426AD6 rivets.

NOTE

WIPE ALL MOISTURE FROM RIVETS AND APPLY A COAT OF MIL-S-8802 TO RIVET SHANK BEFORE RIVET INSTALLATION.

u. Attach MS21059L3 plate nuts to inside of doubler using setup bolts. Drill plate nut rivet holes using No. 40 (0.098) drill. Countersink holes using a 100° countersink. Remove burrs and shavings.
v. Install plate nuts on inside of doubler using MS20426AD3 rivets. Apply sealer, Specification MIL-S-8802, to faying surfaces of doubler and plate nuts.

NOTE

WIPE ALL MOISTURE FROM RIVETS AND APPLY A COAT OF MIL-S-8802 TO RIVET SHANK BEFORE RIVET INSTALLATION.

w. Apply coat of sealer, Specification MIL-S-8802, over rivets on inner surface of doubler and patch.
x. Apply coat of sealer, Specification MIL-S-8802, on faying surfaces of tank and doubler assembly. Position doubler assembly in tank and install bolts NAS1203 using sealer, Specification MIL-S-8802, applied to threads of bolts.
y. Fill gap between patch and tank skin with MIL-S-38228.

CONCLUSION

a. Verify that inside of tank is clean and free of foreign materials.
b. Reinstall tank access doors.
c. Install tank on airplane. Refer to T.O. 1F-106A-2-5-2-1 for this procedure. ■

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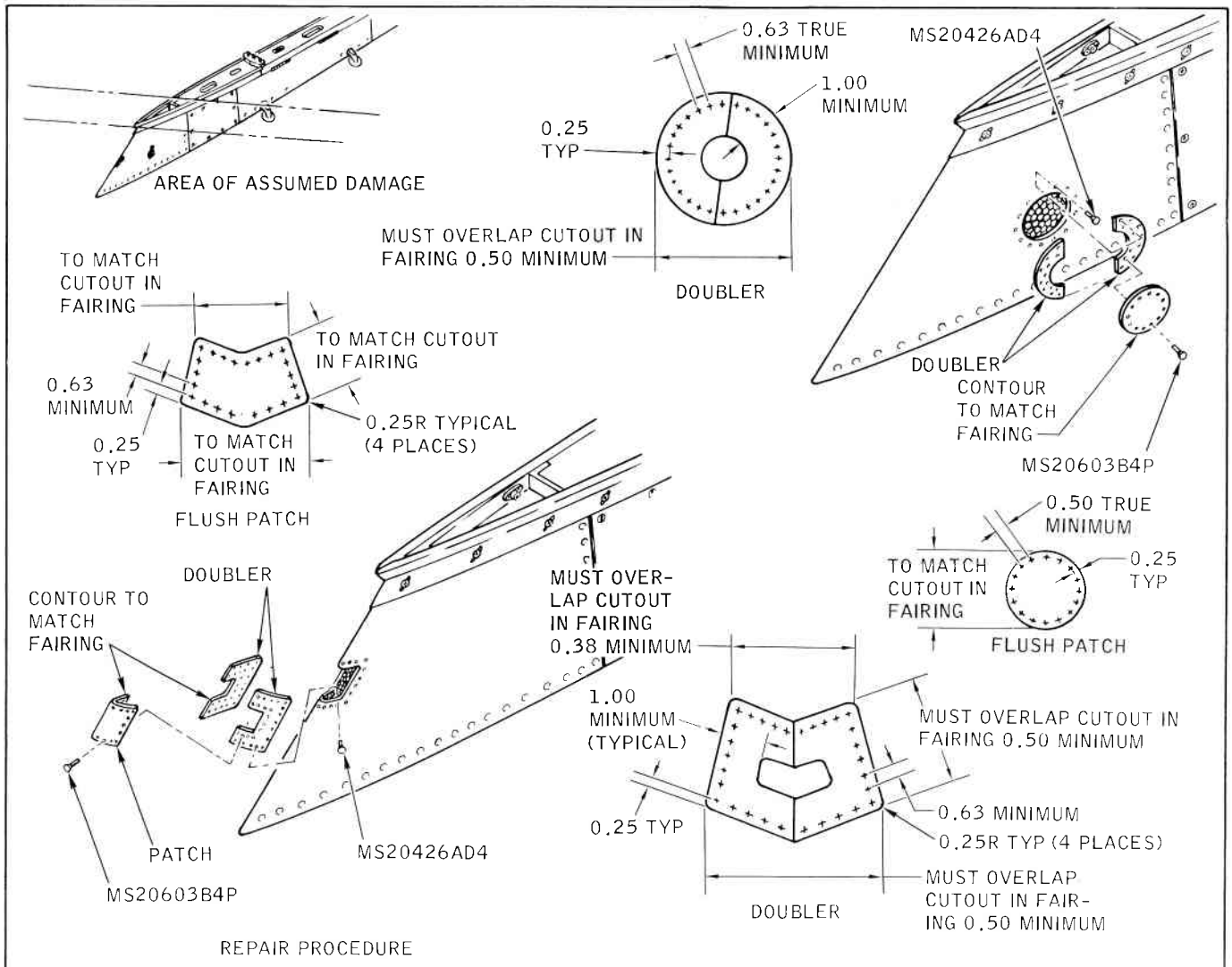
Figure 2-40A. External Fuel Tank Repairs (Sheet 3 of 3)

All data on pages 2-80D through 2-81, including figure 2-41 deleted.



a. Perform a fluorescent penetrant inspection to determine extent of damage. Refer to Section I for this inspection procedure.
b. Cut out damaged area to leave a regular shape in existing skin. Cutout must be of sufficient size for insertion of doubler halves.
c. Working through cutout area, remove sufficient amount of the foam filler material to facilitate installation of repair parts.
d. Fabricate repair parts from 2024 T3 stock, 0.040 inch thick, as shown.

NOTE

FOR EASE OF FORMING, A SQUARE OR RECTANGULAR PATCH IS PREFERRED ALONG THE LEADING EDGE OF THE FAIRING. THE SHAPE OF THE CUTOUT FOR DAMAGE REMOVAL WILL DETERMINE THE PATCH SHAPE FOR THE FLAT AREAS OF THE FAIRING.

e. Install doubler halves and hold in place with clamps.
f. Drill in doubler attachment rivet pattern on 1/2 inch centers using a No. 30 (0.128) drill.
g. Remove doubler halves. Remove burrs from fairing and doubler halves.
h. Clamp flush patch to doubler halves and drill patch rivet pattern using a No. 30 (0.128) drill.
i. Remove clamps and remove burrs from repair parts.
j. Assemble doubler halves to patch and hold together using clecos.
k. Countersink patch-doubler holes using a 100° countersink.
l. Install doubler halves in fairing and hold with clecos.
m. Countersink fairing-doubler holes using 100° countersink.
n. Rivet doubler halves in place as shown.
o. Install flush patch as shown.
p. Fill gaps between fairing and patch using aerodynamic smoothing compound according to applicable schedule given in Table II-VII.

6SR-958-3

Figure 2-41A. External Fuel Tank Pylon Fairing Repair

All data on pages 2-83 thru 2-98 including Figure 2-42 thru 2-49 are deleted.

2-86. . **Packing and Crating.**

2-87. Packing and crating of the elevon, wing tip, and drop tank assemblies for shipping or storage may be accomplished as shown on figures 2-48 through 2-50. The airplane component being packaged and the materials used shall conform to the following specifications:

a. Preservation of airplane components shall be accomplished according to Specification MIL-P-116, Method III.

b. Packing of airplane components shall be accomplished according to Specification MIL-C-25731. Crates shall be Type I, Class II.

c. Components packed for air shipment shall be packed in open crates conforming to Specification MIL-C-25731, Type I, Class I.

d. Marking of crates shall be in accordance with Specification MIL-STD-129. In addition to marking required by MIL-STD-129, the words "Removable End" and "Reusable Crate" shall be stenciled on both ends of the crate. The words "Sling Here" and "Center of Balance" shall be stenciled in their proper place. See table 1-LII for center of balance data.

2-88. **PREPARATION OF WING FOR AIRLIFT.**

2-89. Preparation of a wing for airlift requires three major operations. The wing must be defueled and purged, removed from the airplane, and installed on a shipping stand. Since JP-4 is both toxic and flammable, it is of the utmost importance that all fumes be removed from the wing before airlift operation.

a. Defuel airplane in accordance with T.O. 1F-106A-2-5-2-1.

b. Purge wing with 100-octane gasoline. Refer to paragraph 2-41 for procedure.

c. Remove wing tip and leading edge. Refer to T.O. 1F-106A-2-2-2-2 for procedure.

d. Package all removed parts and components, other than elevon and main landing gear, in accordance with instructions contained in T.O. 00-85-16, or stow in boxes provided with the shipping stand for shipment with the wing. This includes all access doors and attaching screws.

e. Remove wing from fuselage. See figure 2-7 for procedure.

f. Cap all hydraulic and fuel lines; stow or remove all loose lines and electrical connectors.

g. Place wing on dolly or mattresses.

NOTE

The right wing must be inverted (turned upside down) prior to installation on shipping stand. The No. 2 and No. 6 spar adapters, provided with the shipping stand, can be used to invert the right wing. Shipping stand shown in Figure 2-51.

h. Attach the No. 2 spar adapter, AF Dwg. 58SAC589, to No. 2 spar and secure with lock pins.

i. Attach the No. 6 spar adapter, AF Dwg. 58SAC588, to No. 6 spar and secure with lock pins.

j. Attach the universal lifting eye, provided with the shipping stand, to the wing lift point. If the left wing is to be air shipped, attach universal lifting eye to the wing tiedown point. See figure 2-51.

k. Attach hoisting sling, AF Dwg. 58SAB591, to spar adapters and lifting eye. Attach two 15-foot lengths of rope, as shown in figure 2-51, to guide wing into place on shipping stand.

l. Hoist wing until No. 6 spar adapter clears the curved pivot hook at the top of the shipping stand. Lower and guide the wing until the pivot hook enters the 1½-inch diameter hole in the No. 6 spar adapter. Continued lowering will cause the wing to pivot into position on the shipping stand. See figure 2-51.

m. Bolt No. 6 spar adapter to shipping stand with four AN 12-24A bolts, four AN 960-1216 washers, and four AN 365-1216 nuts. Secure the No. 2 spar adapter to the shipping stand using four AN 960-1216 washers and four AN 365-1216 nuts.

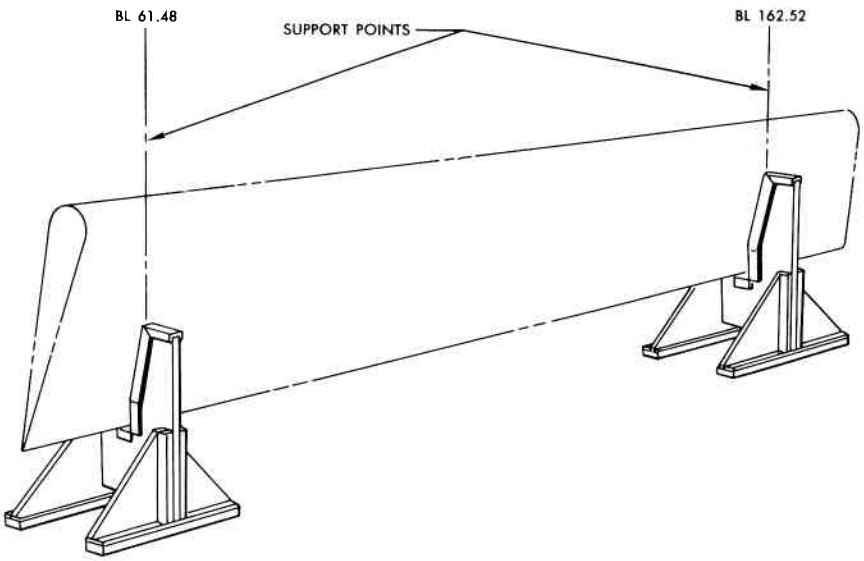
n. Attach the wing support pad to the elevon attach fitting as shown on figure 2-51 and adjust to insure that the wing clears the shipping stand.

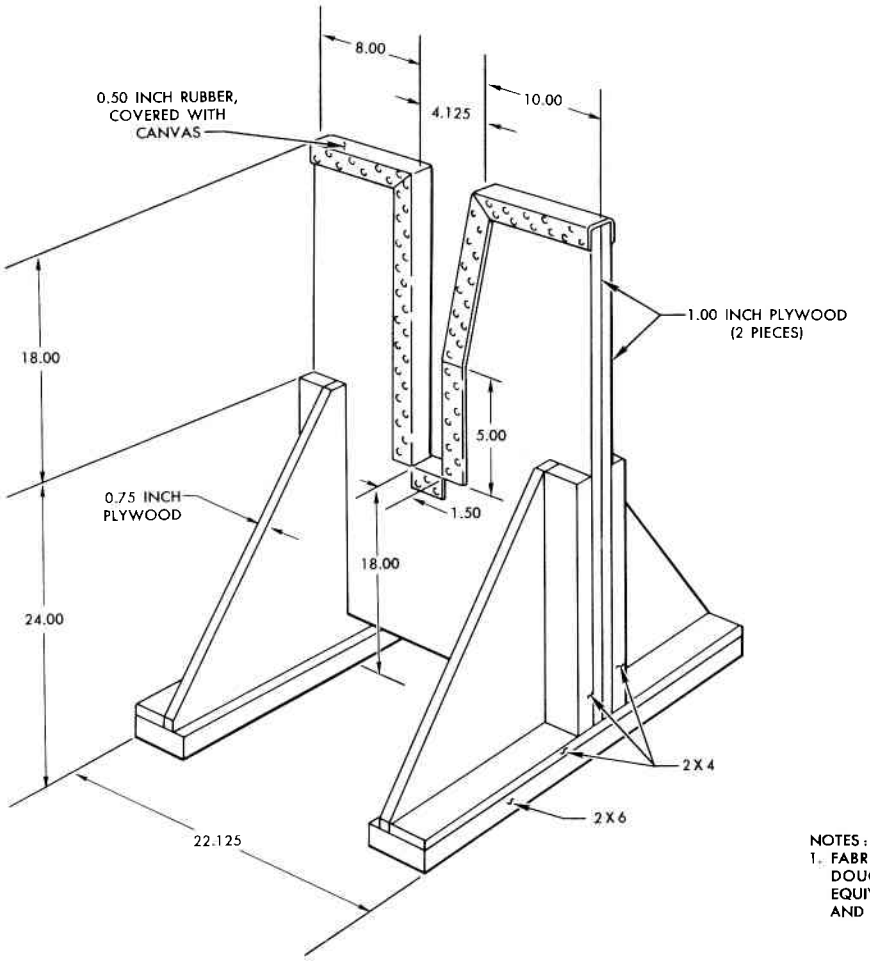
NOTE

The canted position of the wing, when installed on the shipping stand, may cause trapped fuel to drain into the lower portion of the tanks. Since all residual fuel must be removed prior to airlift, the wing should be placed on the shipping stand at least eight hours prior to airlift to allow for fuel drainage and subsequent mopping. Should the shipping stand not be available prior to arrival of transport aircraft, the intent of the foregoing shall be accomplished by otherwise devising a means of propping the wing in a canted position.

2-90. **JIGS.**

2-91. Figure 2-42 shows the jig used to support the elevon during a typical repair operation. Figures 2-43 and 2-44 show the master tooling fixture for the inboard and outboard elevon assembly. Figure 2-45 shows the master tooling fixture for the Case XIV wing assembly, and figure 2-46 shows the master tooling fixture for the Case XXIX wing assembly. Figure 2-47 shows the elevon contour boards used for checking elevon alignment.

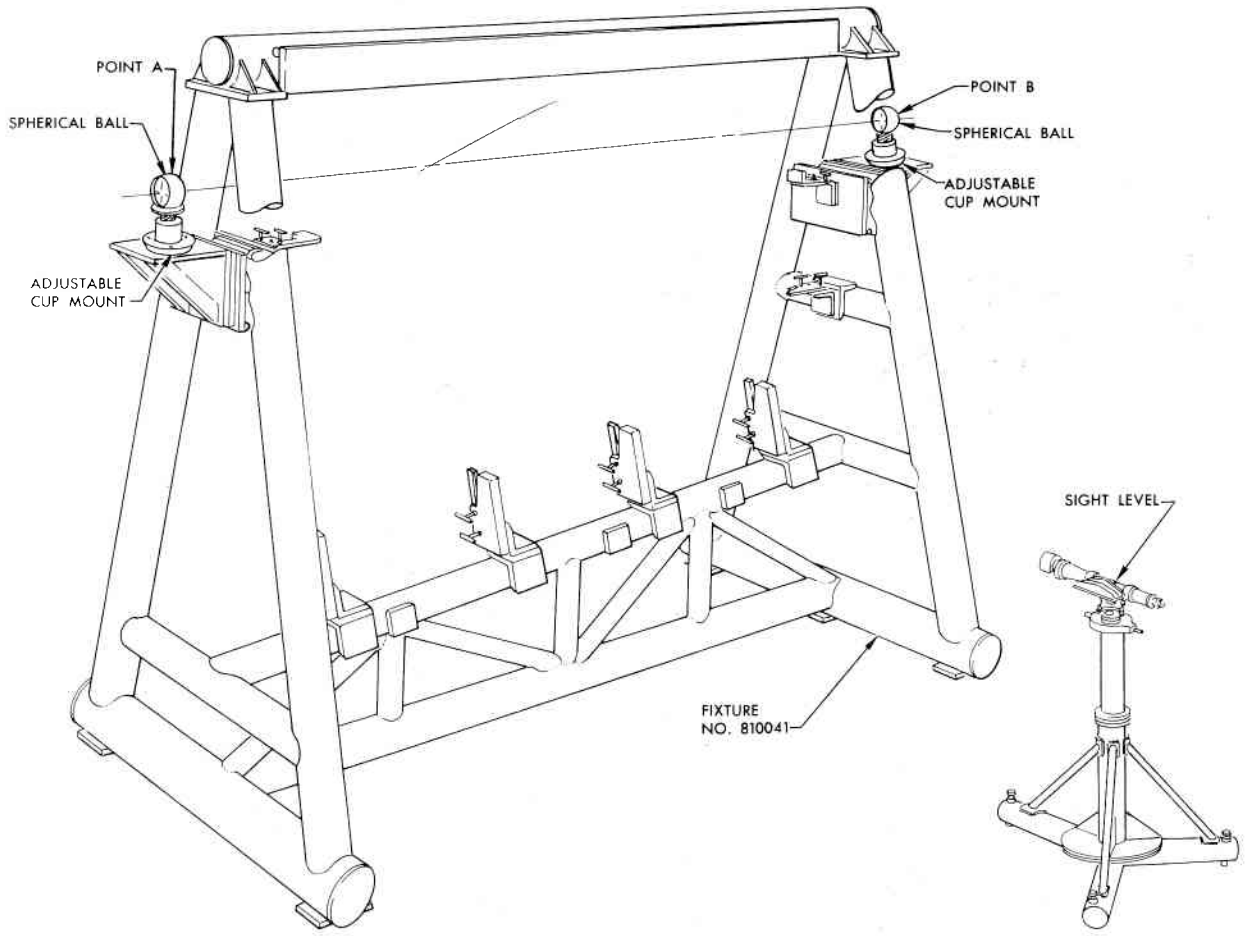




NOTES:
1. FABRICATE FIXTURE FROM DOUGLAS FIR OR LOCAL EQUIVALENT, USING BOLTS AND SCREWS.

.06.03.116 .57.04.01

Figure 2-42. Elevon Repair Support Fixture



TOOL FUNCTION

To assemble elevon spar assembly, ribs, hinge fittings, wedge assembly and skins.

OPTICAL TOOLING EQUIPMENT REQUIRED

a. One sight level.
b. One alignment telescope.
c. One 60-inch inside micrometer.
d. Two spherical balls with 2¼-inch plastic targets.
e. One 1½-inch plastic target.
f. One 6-inch master spirit level.

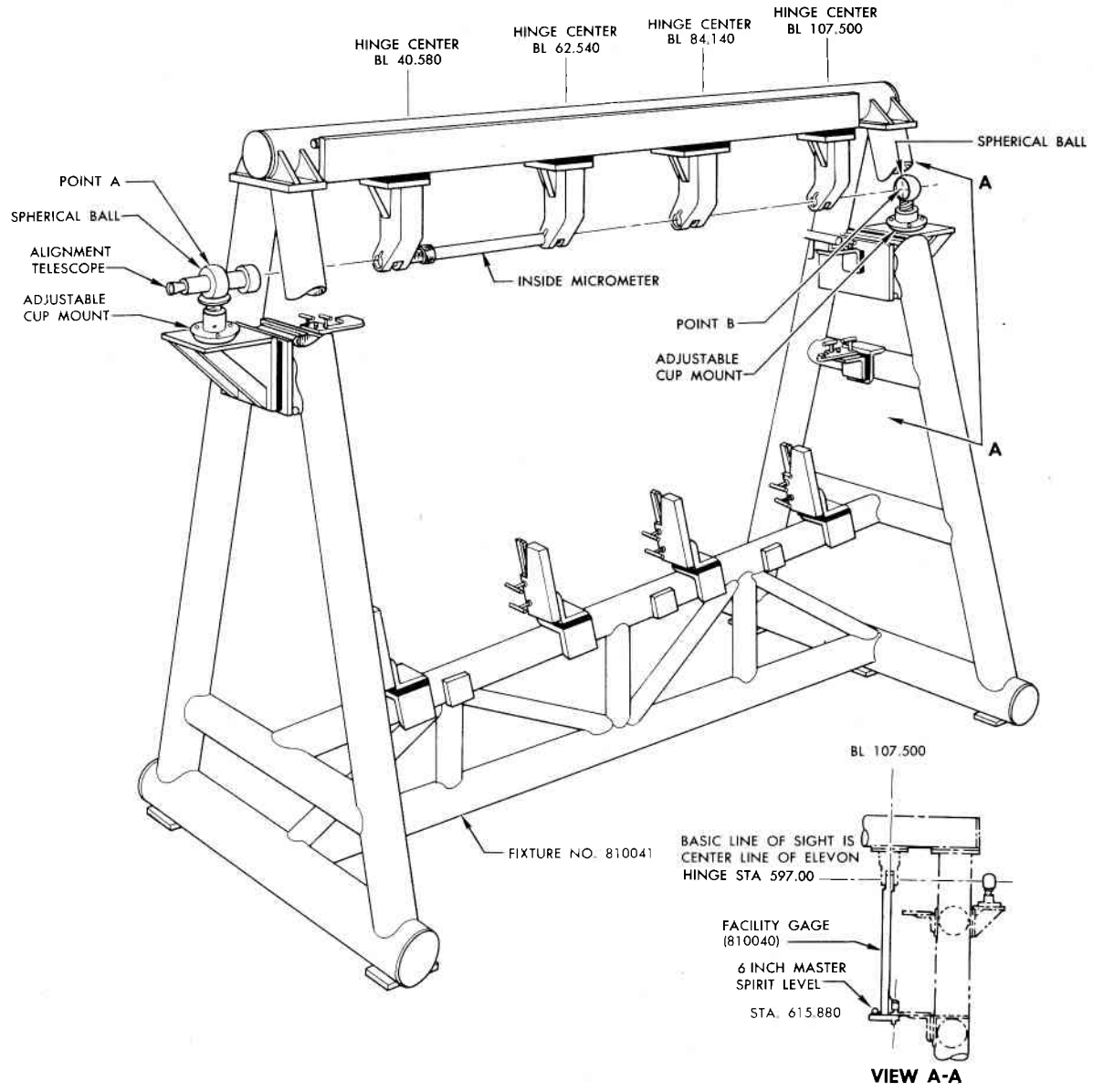
FABRICATION PROCEDURE

a. Level fixture as follows:
   (1) Set up sight level away and to one side of fixture.
   (2) Refer to Section I for leveling procedure using sight level.

(NOTE: PROCEDURE CONTINUED ON SHEET 2).

06.03.206-1C

Figure 2-43. Master Tooling — Elevon Assembly, Inboard Left-Hand (Sheet 1 of 2)



b. Establish basic line of sight:
   (1) Mount alignment telescope at point A.
   (2) Mount 2¼-inch plastic target at point B.
   (3) Refer to Section I for use of alignment telescope.

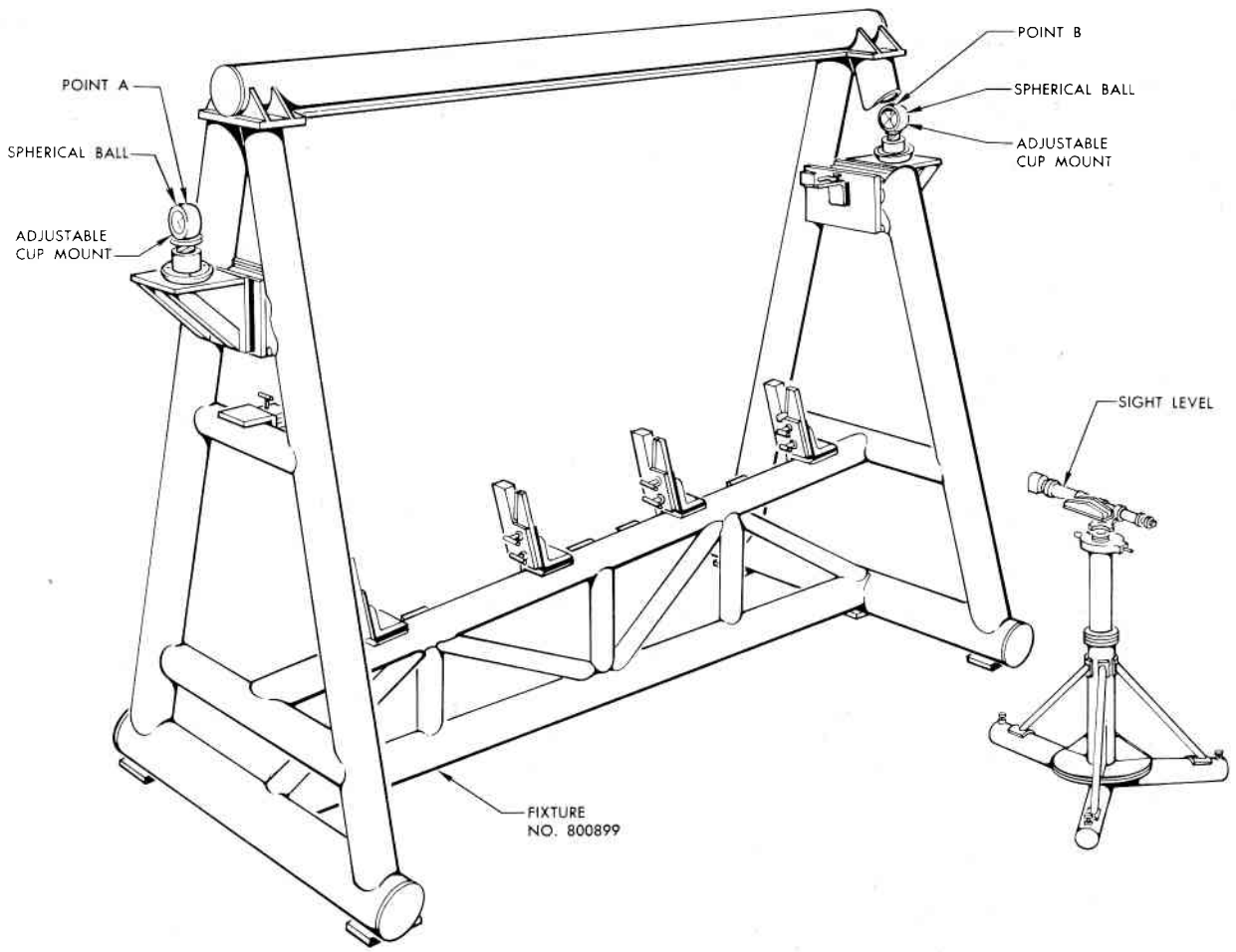
NOTE

BASIC LINE OF SIGHT IS CENTERLINE OF ELEVON HINGE AT FUSELAGE STATION 597.000, WATER LINE -16.000.

c. Mount hinge locators as follows:
   (1) Set hinge locators in basic line of sight with 1½ inch plastic target.
   (2) Mount facility gage, 810040, then level gage with six-inch master spirit level to control rotation of gage. Leveling gage will establish centerline of hinge locator at buttock line 107.500.
   (3) Using the 60-inch inside micrometer, position the remaining hinge locators at buttock lines 84.140, 62.540 and 40.580 (position hinge locators in this order).

.06.03.206.2C

Figure 2-43. Master Tooling — Elevon Assembly, Inboard Left-Hand (Sheet 2 of 2)



TOOL FUNCTION

To assemble elevon spar assembly, ribs, hinge fittings, wedge assembly and skins.

OPTICAL TOOLING EQUIPMENT REQUIRED

a. One sight level.
b. One alignment telescope.
c. One 60-inch inside micrometer.
d. Two spherical balls with 2¼-inch plastic targets.
e. One 1½-inch plastic target.
f. One 6-inch master spirit level.

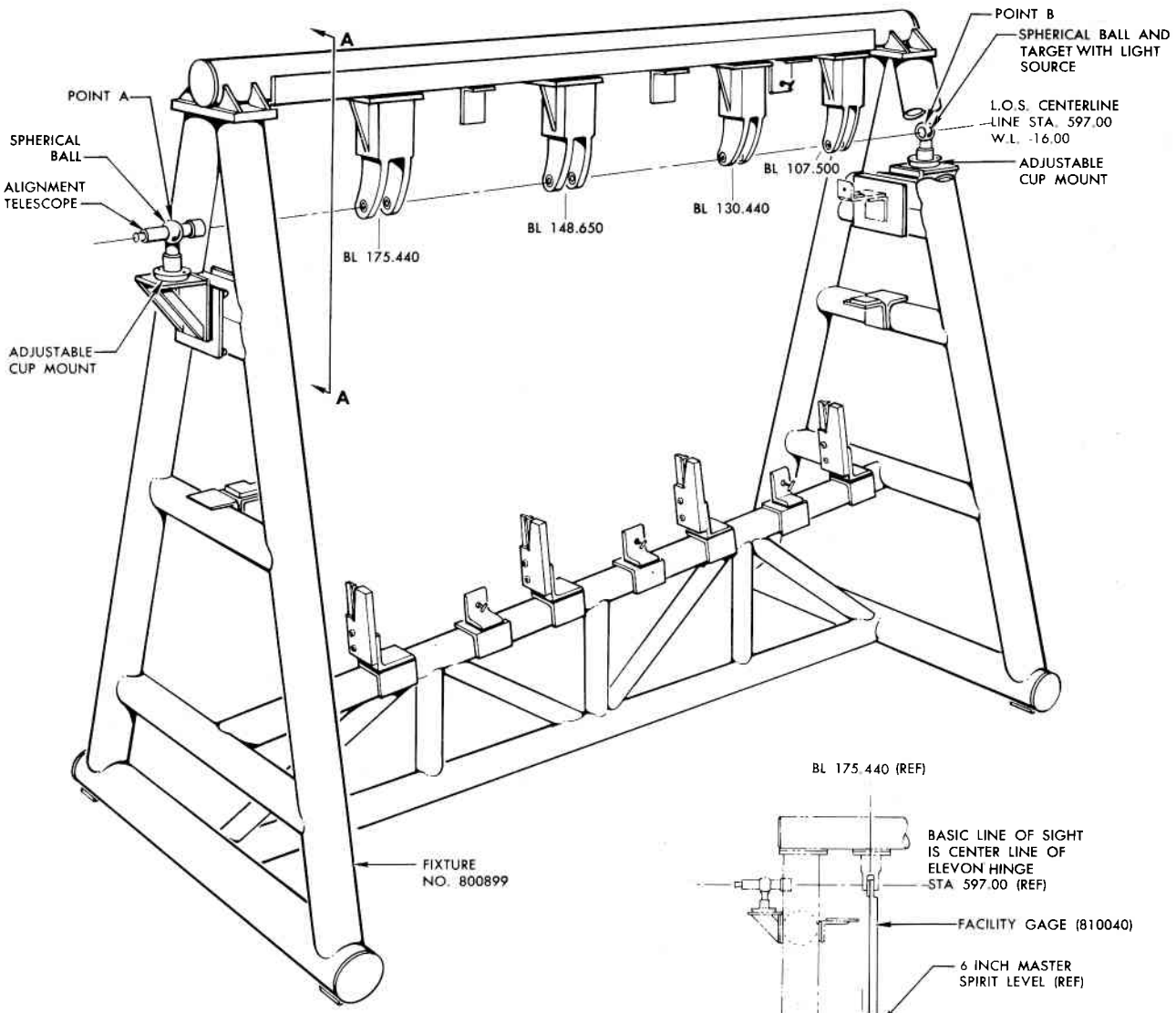
FABRICATION PROCEDURE

a. Level fixture as follows:
   (1) Set up sight level away and to one side of fixture.
   (2) Refer to Section I for leveling procedure using sight level.

NOTE: PROCEDURE CONTINUED ON SHEET 2.

06.03.207-1C

Figure 2-44. Master Tooling — Elevon Assembly, Outboard Left-Hand (Sheet 1 of 2)



VIEW A-A

b. Establish basic line of sight as follows:
   (1) Mount alignment telescope at point A.
   (2) Mount 2¼-inch plastic target at point B.
   (3) Refer to Section I for use of alignment telescope.

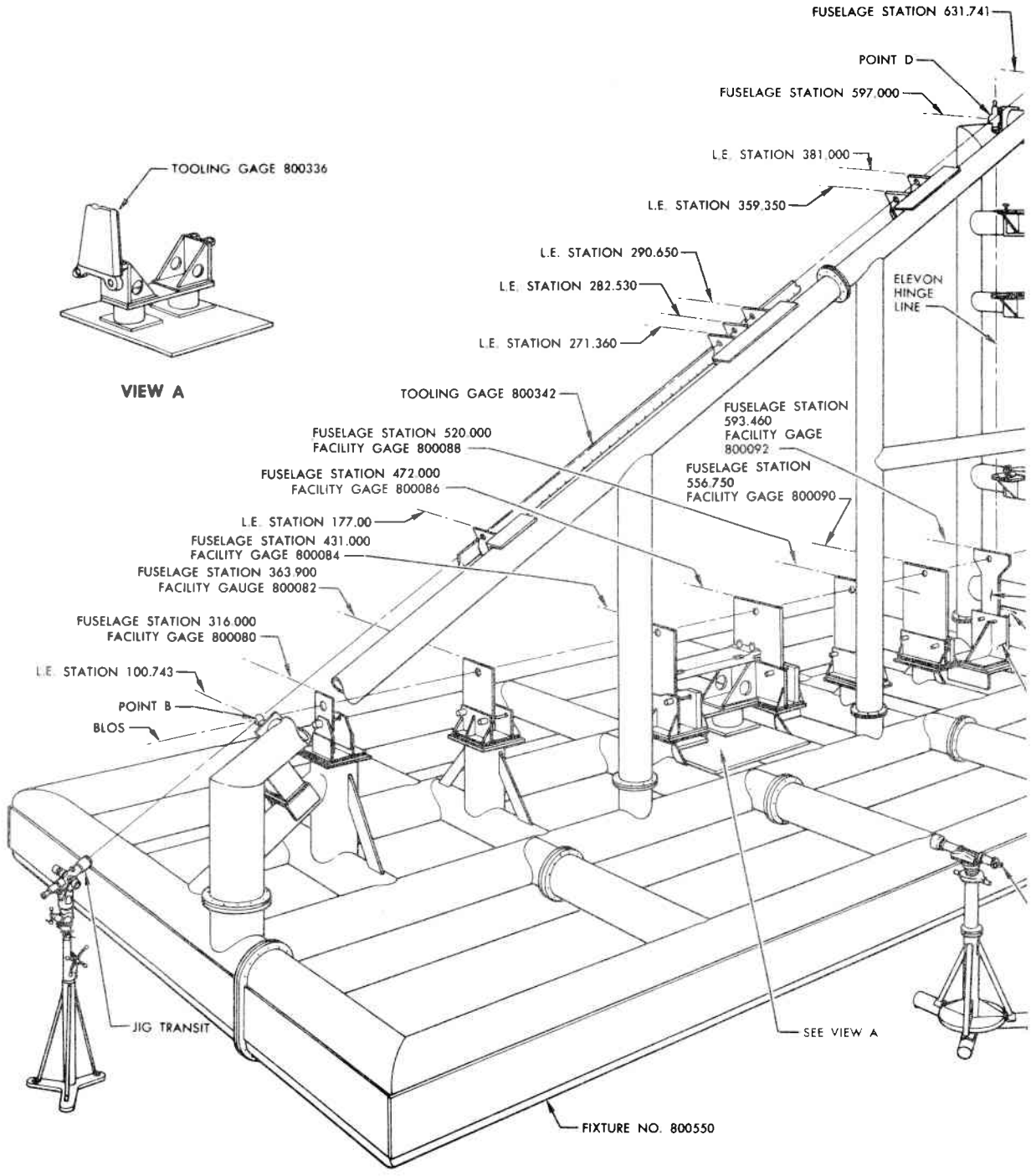
NOTE

BASIC LINE OF SIGHT IS CENTERLINE OF ELEVON HINGE AT FUSELAGE STATION 597.000, WATER LINE -16.000.

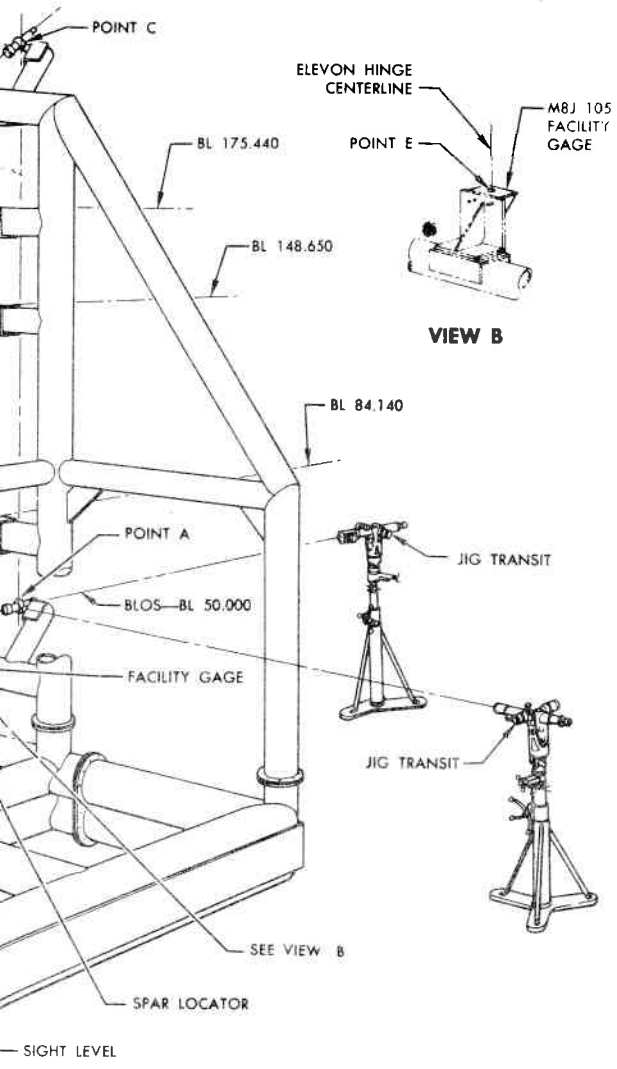
c. Mount hinge locators as follows:
   (1) Set hinge locators in basic line of sight with 1½ inch plastic target.
   (2) Mount facility gage, 810040, then level gage with 6-inch master spirit level to control rotation of gage. Leveling gage will establish centerline of hinge locator at buttock line 107.500.
   (3) Using the 60-inch inside micrometer, position the remaining hinge locators at buttock lines 130.440, 148.650, and 175.440 (hinge locators to be positioned in this order).

06.03.207-2C

Figure 2-44. Master Tooling — Elevon Assembly, Outboard Left-Hand (Sheet 2 of 2)


FUSELAGE STATION 631.741
POINT D
FUSELAGE STATION 597.000
L.E. STATION 381.000
L.E. STATION 359.350
L.E. STATION 290.650
L.E. STATION 282.530
L.E. STATION 271.360
ELEVON HINGE LINE
TOOLING GAGE 800336
VIEW A
TOOLING GAGE 800342
FUSELAGE STATION 520.000 FACILITY GAGE 800088
FUSELAGE STATION 472.000 FACILITY GAGE 800086
L.E. STATION 177.00
FUSELAGE STATION 431.000 FACILITY GAGE 800084
FUSELAGE STATION 363.900 FACILITY GAUGE 800082
FUSELAGE STATION 316.000 FACILITY GAGE 800080
L.E. STATION 100.743
POINT B
BLOS
FUSELAGE STATION 593.460 FACILITY GAGE 800092
FUSELAGE STATION 556.750 FACILITY GAGE 800090
JIG TRANSIT
SEE VIEW A
FIXTURE NO. 800550

06.03.208.1C



TOOL FUNCTION

a. To check wing alignment.
b. To check alignment of elevon attach points.

OPTICAL TOOLING EQUIPMENT REQUIRED.

a. Two alignment telescopes.
b. Two jig transits.
c. One sight level.
d. Two 2¼-inch diameter targets with light sources.
e. Two 1½-inch diameter plastic targets.
f. One 12-inch master spirit level.
g. One 6-inch master spirit level.
h. Four 3½-inch diameter spherical balls.
i. One set of 30-foot inside micrometers.
j. One auto-reflection mirror.

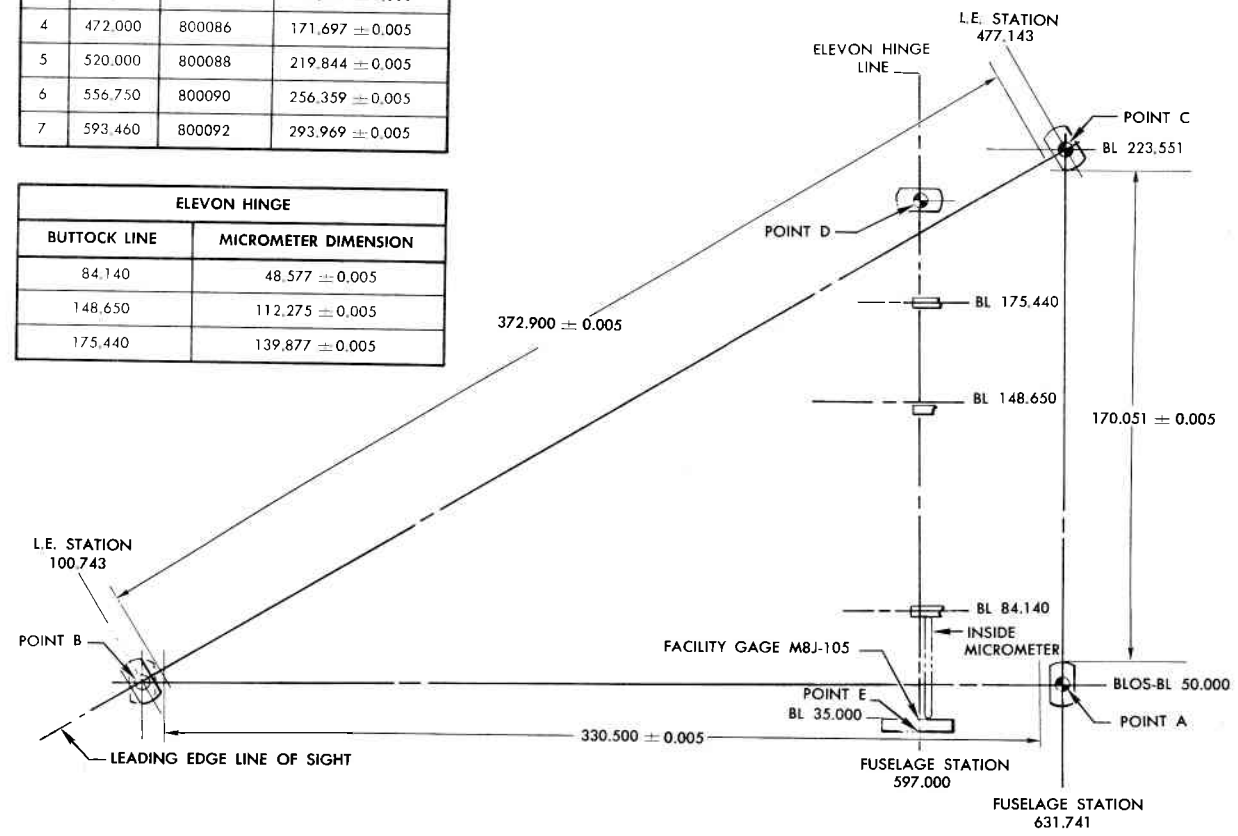
MASTER TOOLING PROCEDURE

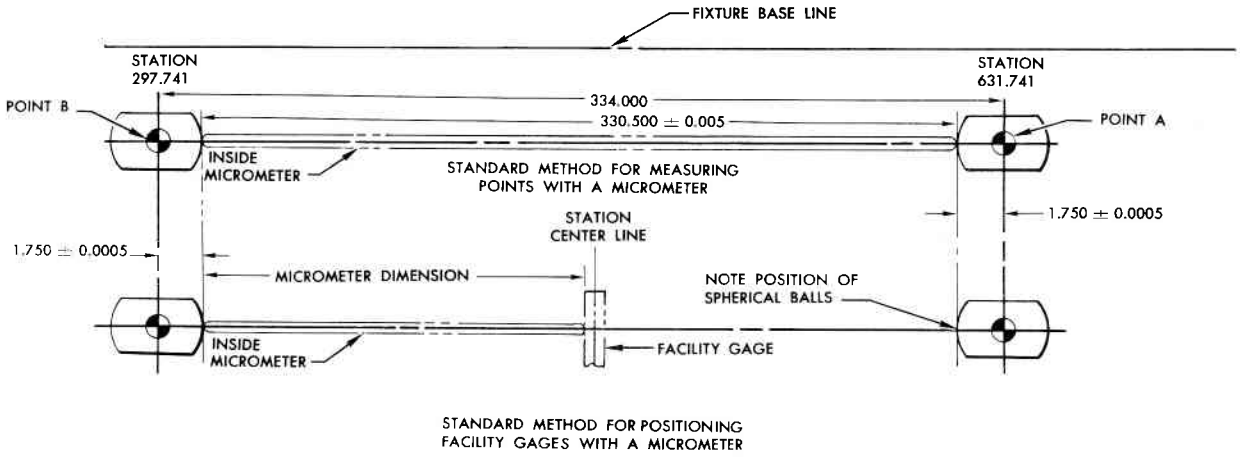
a. Level fixtures as follows:
   (1) Set up sight level away from and to one side of fixture.
   (2) Refer to Section I for leveling procedure using a sight level.
b. Establish basic line of sight (BLOS) as follows:
   (1) Mount spherical balls at points A and B on adjustable cup mounts.
   (2) Establish a level horizontal plane between points A and B with sight level.
   (3) Using the 30-foot inside micrometer, adjust spherical balls at points A and B to dimension shown on sheet 2.
c. Establish point C as follows:
   (1) Set up one jig transit away from and to one side of fixture at an approximate 90 degree angle from point A. This jig transit establishes a true vertical plane between points A and C. Refer to Erection of a Vertical Plane from a Horizontal Plane using the Jig Transit in Section I.
   (2) Set up a second jig transit away from fixture and in line with points A and B. Use method referred to in previous step and move point C into vertical plane in line with points A and B.
d. Establish the linear distance between points B and C as follows:
   (1) Using the 30-foot inside micrometer, adjust the spherical ball at point C in its proper relation with point A, as shown on sheet 2.
   (2) Again using the 30-foot inside micrometer, measure the distance between points B and C. If this dimension agrees with the dimension given on sheet 2, proceed with setting up wing geometry. If dimension does not check, repeat steps "b" through "d" and recheck dimension between points B and C.
e. Establish points D and E as follows:
   (1) Mount an alignment telescope at point A.
   (2) Mount a 2¼-inch diameter target with light source at point B.
   (3) Set spar locator at fuselage station 593.46 using facility gage, 800092. Measure distance from point B to facility gage as shown on Sheet 2 to establish the correct location of the facility gage. Insert 1½-inch plastic target in facility gage and align gage with BLOS.
   (4) Mount the M8J 105 facility Gage on locator at station 593.46, as shown in view B. Centerline of the M8J 105 facility gage establishes point E at fuselage station 597.000.
   (5) Set up a jig transit away from fixture and opposite point E.
   (6) Mount an alignment telescope at point C.
   (7) Mount a 2¼-inch diameter target with light source at point B.
   (8) Using the jig transit, establish a vertical plane parallel to the line of sight between points A and C.
   (9) Establish a line of sight between points C and B.
   (10) Establish point D where the vertical plane from point E intersects the line of sight between points B and C.
f. Establish the elevon hinge points by using the 30-foot inside micrometer and measuring the distances shown on Sheet 2. All dimensions are taken from the upper surface of the M8J 105 facility gage (point E).
g. Set remaining spar locators in the BLOS by method used in step "e". (3) and maintain correct dimensions between them with an inside micrometer, as shown on Sheet 2.

Figure 2-45. Master Tooling — Case XIV Wing Assembly (Sheet 1 of 2)
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

JIG DIMENSIONS			
SPAR NO.	FUSELAGE STATION	FACILITY GAGE NO.	MICROMETER DIMENSION
1	316.000	800080	16.919 ±0.005
2	363.900	800082	63.909 ±0.005
3	431.000	800084	130.659 ±0.005
4	472.000	800086	171.697 ±0.005
5	520.000	800088	219.844 ±0.005
6	556.750	800090	256.359 ±0.005
7	593.460	800092	293.969 ±0.005

ELEVON HINGE	
BUTTOCK LINE	MICROMETER DIMENSION
84.140	48.577 ±0.005
148.650	112.275 ±0.005
175.440	139.877 ±0.005





.06.03.208-2 .57.02.01

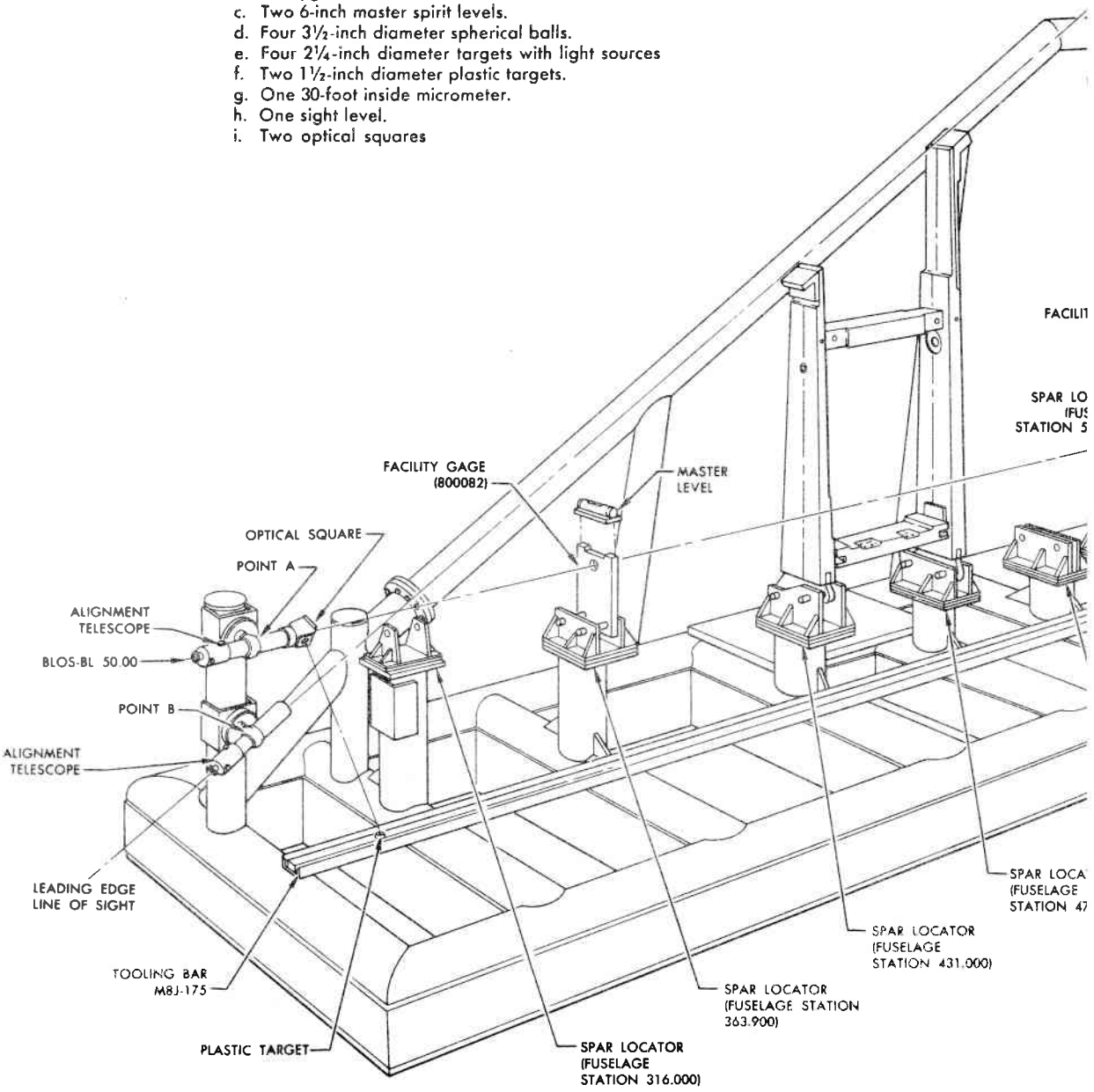
Figure 2-45. Master Tooling — Case XIV Wing Assembly (Sheet 2 of 2)
Applicable to F-106A airplanes 56-453 thru 56-466, and F-106B airplane 57-2507

TOOL FUNCTION

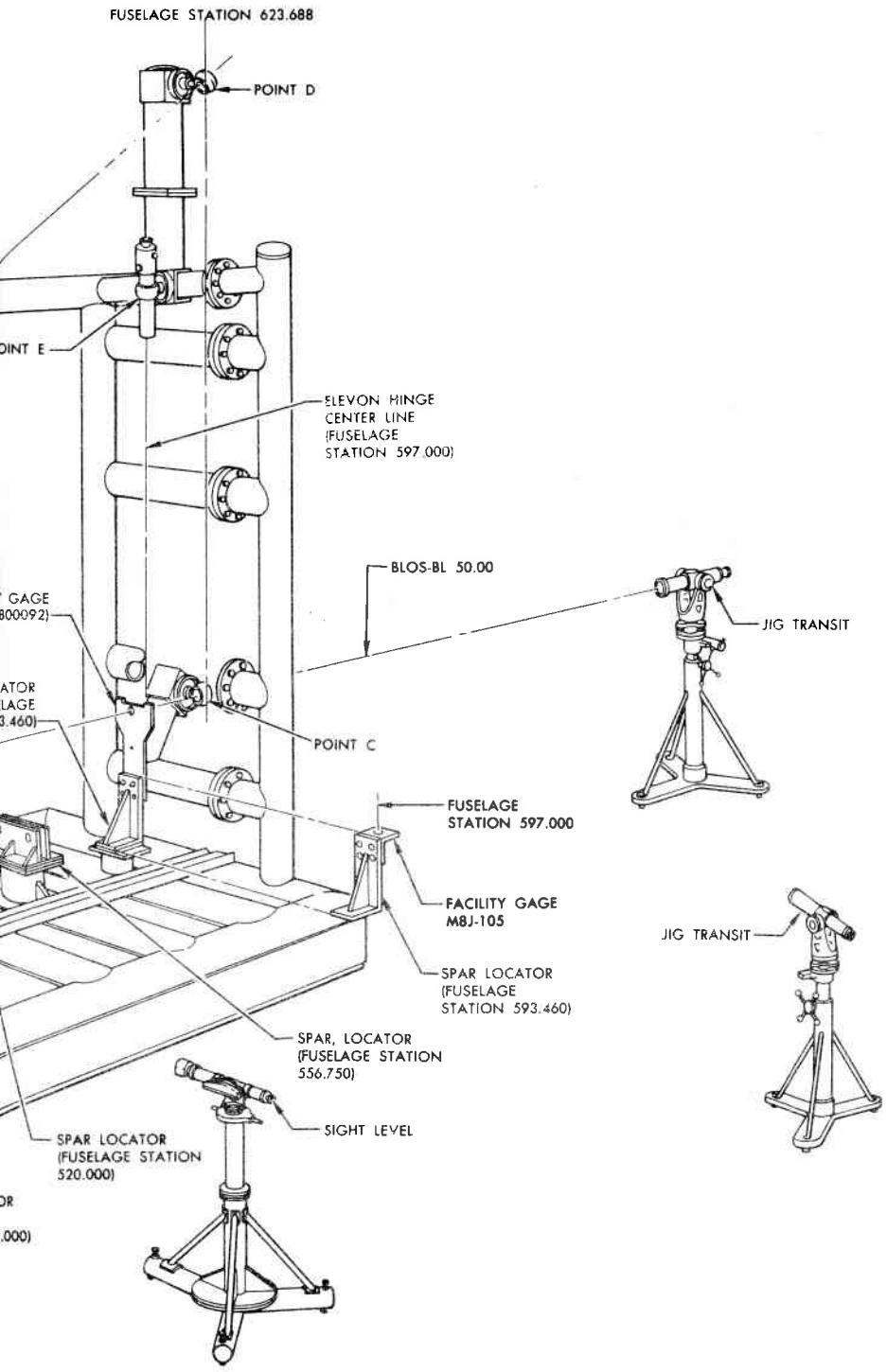
To check alignment of wing.

OPTICAL TOOLING EQUIPMENT REQUIRED.

a. Two alignment telescopes.
b. Two jig transits.
c. Two 6-inch master spirit levels.
d. Four 3½-inch diameter spherical balls.
e. Four 2¼-inch diameter targets with light sources
f. Two 1½-inch diameter plastic targets.
g. One 30-foot inside micrometer.
h. One sight level.
i. Two optical squares



06.03.209.1C



MASTER TOOLING PROCEDURE

a. Level fixture and establish a basic line of sight (BLOS) as follows:
   (1) Set up sight level away from and to one side of fixture.
   (2) Refer to Section I for leveling procedure using sight level.
   (3) Mount spherical balls with targets and light source at points A and C.
   (4) Establish horizontal alignment of points A and C.
   (5) Remove target with light source at point A and insert an alignment telescope.
   (6) Align point A with point C.
   (7) Using the 30-foot inside micrometer, establish point C as shown on sheet 2.

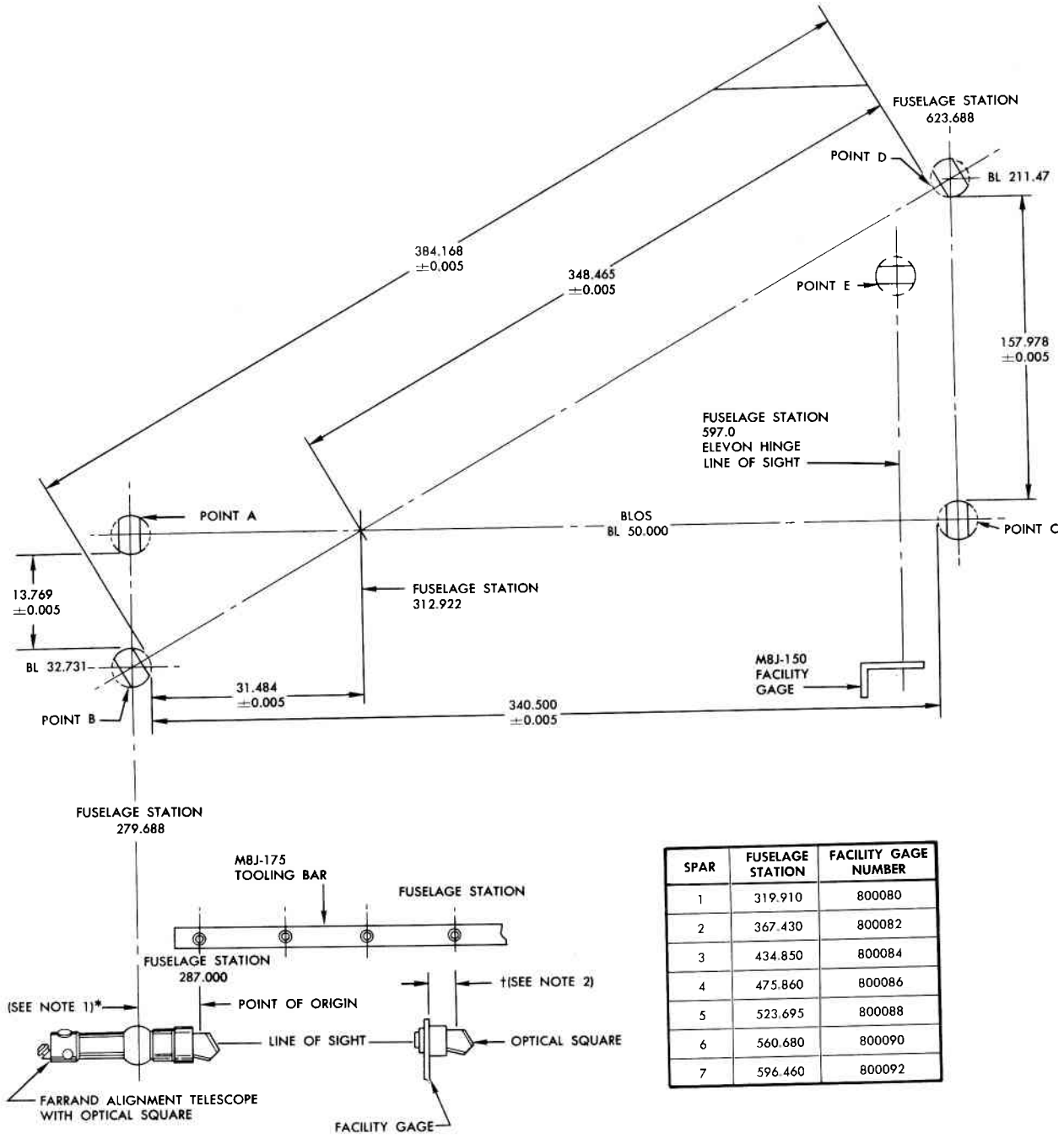
b. Establish points B and D as follows:
   (1) Set up one jig transit away from fixture and approximately halfway between points A and C.
   (2) Set up second jig transit away from fixture and in line with points A and C.
   (3) Refer to Section I for Erection of a Vertical Plane from a Horizontal Plane using the Jig Transit.

NOTE

USE THE 30-FOOT INSIDE MICROMETER TO ESTABLISH THE TRUE DIMENSIONS BETWEEN POINTS. USE THE JIG TRANSIT SET UP AWAY FROM AND TO ONE SIDE OF THE FIXTURE TO ESTABLISH A TRUE VERTICAL PLANE. USE THE JIG TRANSIT SET UP AWAY FROM FIXTURE AND IN LINE WITH POINTS A AND C TO HOLD ALL POINTS IN A PARALLEL PLANE.

c. Establish the spar reference points as follows:
   (1) Mount an alignment telescope with an optical square at point A.
   (2) Establish the location of the M8J-175 tooling bar.
   (3) Rough set the spar No. 1 locator.
   (4) Mount the facility gage, 800080 within the spar locator and insert a plastic target in the facility gage line-of-sight hole.
   (5) Bring the facility gage and spar locator into line of sight of optical square and control rotation with 6-inch master spirit level.
   (6) Repeat steps "c. (1)" through "c. (5)" to locate spars No. 2, No. 3, No. 4, No. 5, No. 6 and No. 7 using the facility gages and station call-outs shown on sheet 2.

Figure 2-46. Master Tooling — Case XXIX Wing Assembly (Sheet 1 of 2)
Applicable to F-106A airplanes 56-467, 57-229 and subsequent, and F-106B airplanes 57-2508 and subsequent

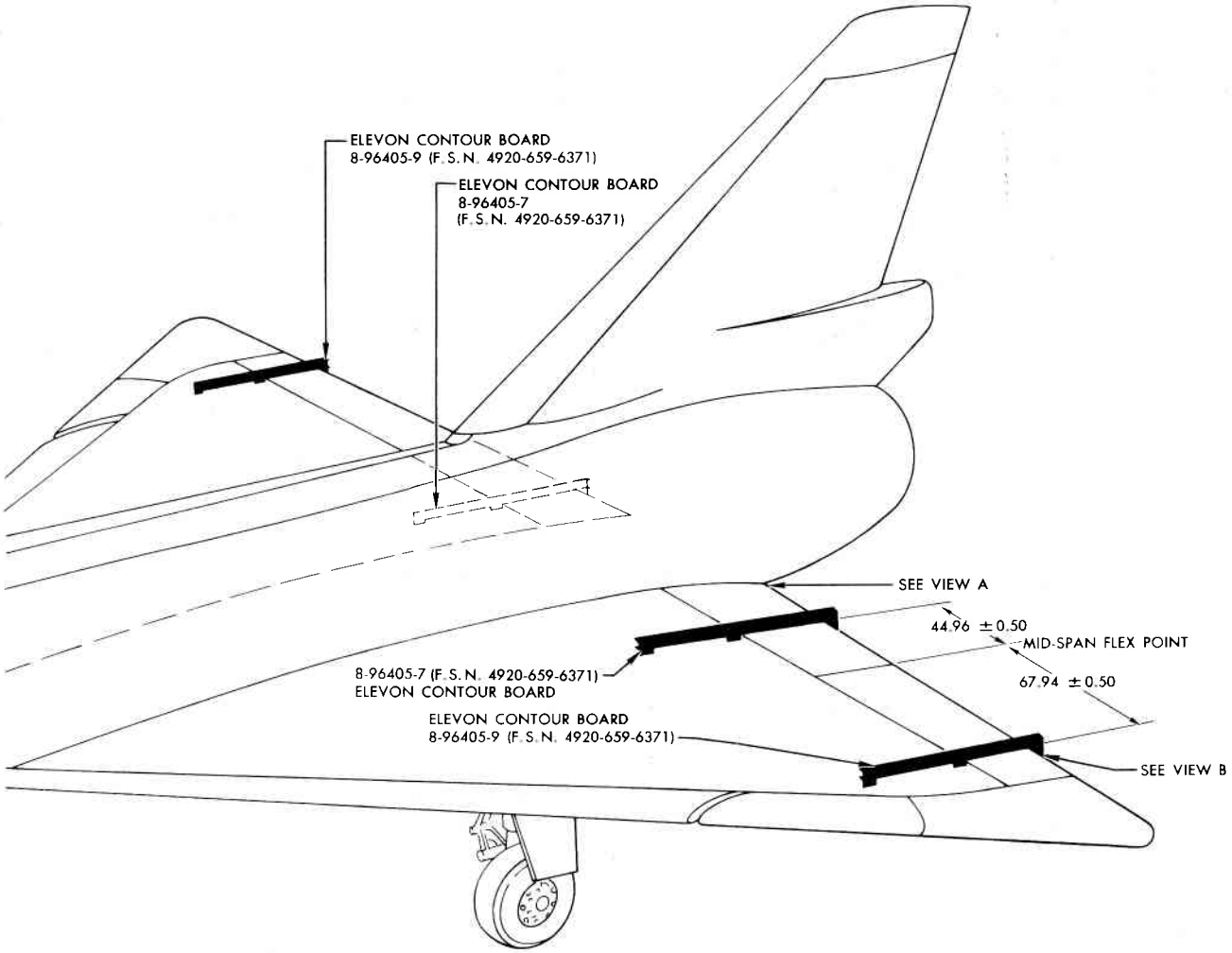


SPAR	FUSELAGE STATION	FACILITY GAGE NUMBER
1	319.910	800080
2	367.430	800082
3	434.850	800084
4	475.860	800086
5	523.695	800088
6	560.680	800090
7	596.460	800092

NOTES:
1. * DENOTES THE STANDARD DISTANCE (7.312 INCHES) FROM THE EXIT LINE OF SIGHT OF THE OPTICAL SQUARE AND THE CENTERLINE OF THE INTEGRAL SPHERICAL BALL ON THE FARRAND ALIGNMENT TELESCOPE.
2. † DENOTES THE STANDARD DISTANCE (3.000 INCHES) FROM THE EXIT LINE OF SIGHT OF THE OPTICAL SQUARE AND ITS MOUNTING FACE.
3. REFER TO PARAGRAPH "THE OPTICAL SQUARE" IN SECTION 1 FOR INFORMATION REGARDING THE USE OF THE OPTICAL SQUARE.

.06.03.209-2 A .57.02.01

Figure 2-46. Master Tooling — Case XXIX Wing Assembly (Sheet 2 of 2)
Applicable to F-106A airplanes 56-467, 57-229 and subsequent, and F-106B airplanes 57-2508 and subsequent



CONTOUR BOARD ALIGNMENT CHECK PROCEDURE:

a. Prepare airplane as required for elevon operation procedure given in T.O. 1F-106A-2-7-2-1.

b. Trim elevons to neutral (streamline position). Elevons are in neutral when inboard tips are in line with positioning rivets on fuselage (see view A) under the following conditions: hydraulic power on, engine not installed, no fuel in tanks and elevator and aileron mixer rig pin holes aligned.

c. Position the 8-96405-7 (F.S.N. 4920-659-6371) contour board 44.96 (±0.50) inches inboard from the centerline of the mid-span flex point of both elevons.

NOTE
WITH ENGINE INSTALLED AND FUEL IN TANKS, TRAILING EDGE MAY DROOP ONE-EIGHTH INCH BELOW CENTER OF POSITIONING RIVET.

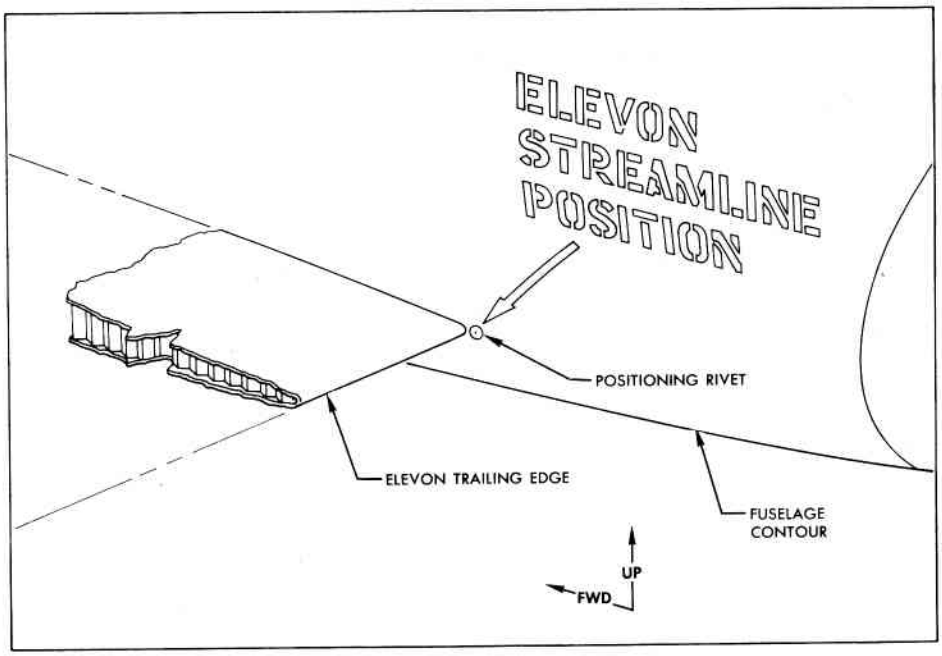
d. Position the 8-96405-9 (F.S.N. 4920-659-6371) contour board 67.94 (±0.50) inches outboard from the centerline of the mid-span flex point of both elevons.

NOTE
CONTOUR BOARDS MUST BE PLACED PARALLEL TO LINE OF FLIGHT.

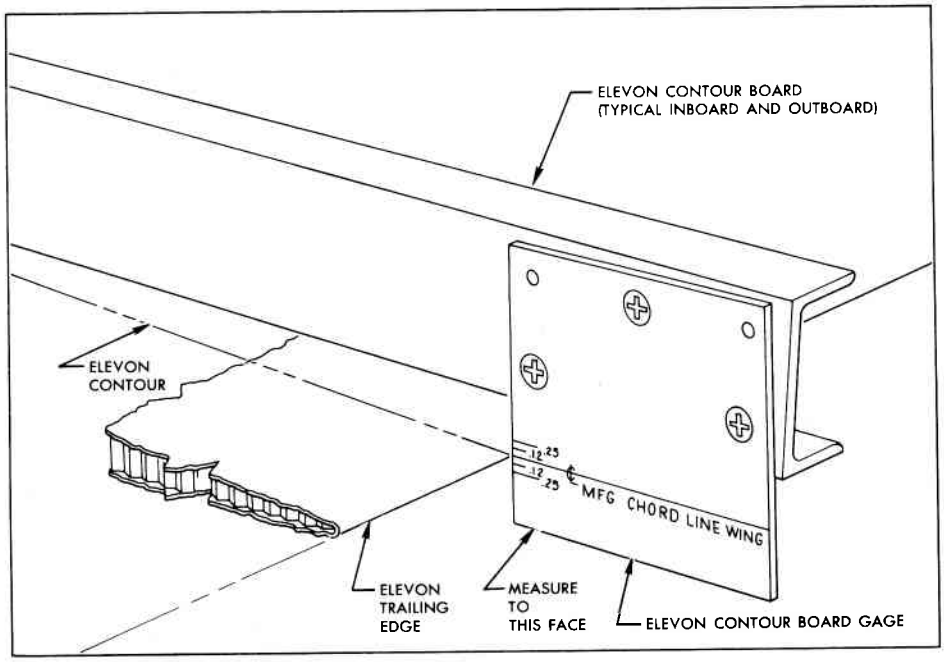
e. Check and record deviation from wing chord line as calibrated on plate at aft end of each contour board (see view B). Total deviation between inboard and outboard contour board readings should not exceed ±0.25 inch on either wing.

06.03.243-1A 57.04.01

Figure 2-47. Elevon Contour Boards (Sheet 1 of 2)



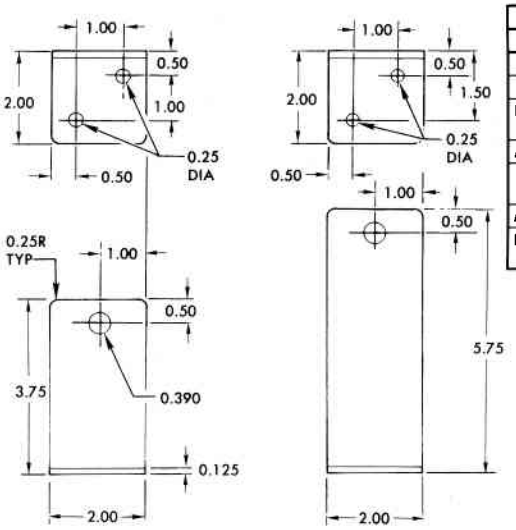
VIEW A



VIEW B

.06.03.243-2 .57.04.01

Figure 2-47. Elevon Contour Boards (Sheet 2 of 2)

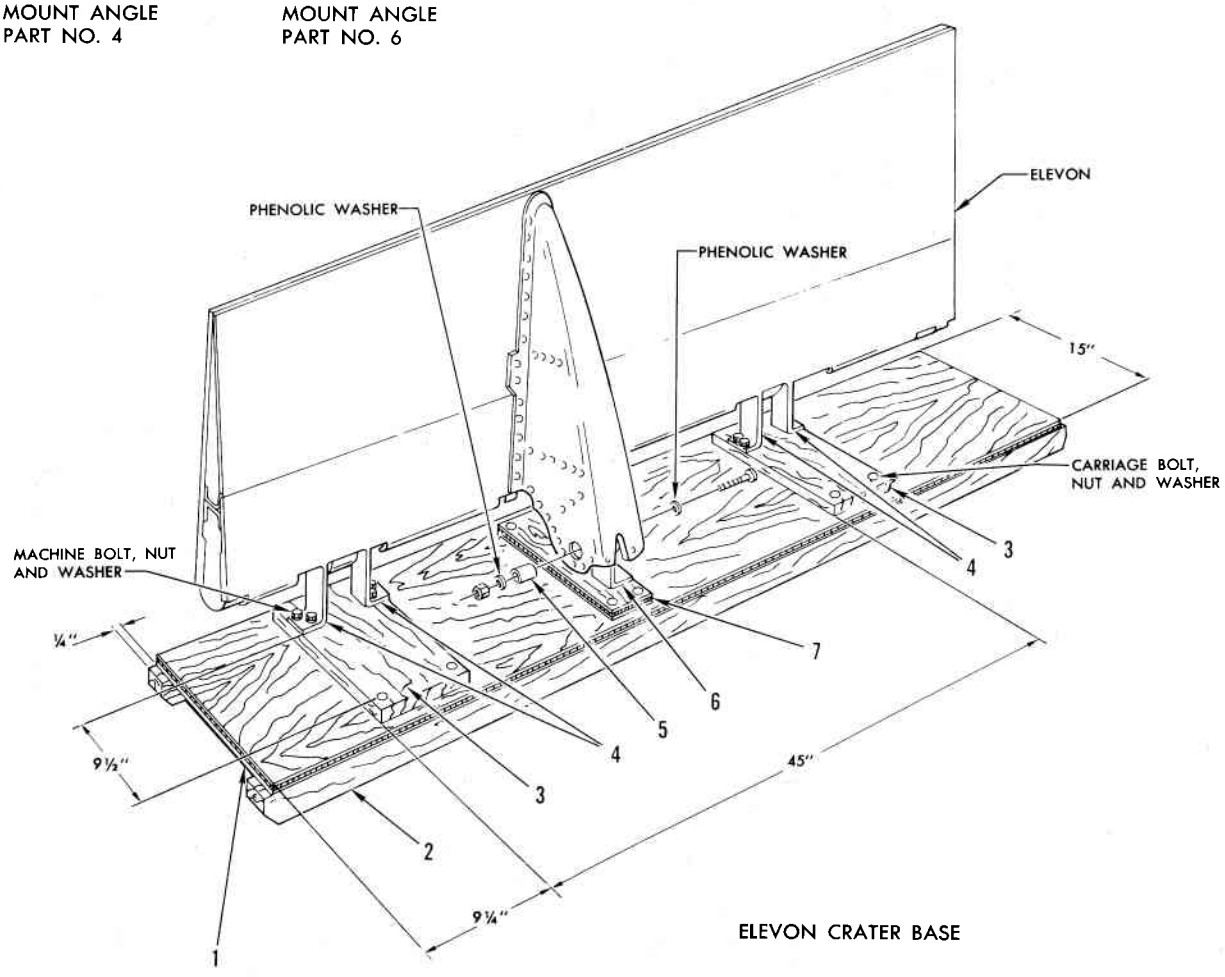


MOUNT ANGLE PART NO. 4

MOUNT ANGLE PART NO. 6

TABLE I

NAME	DESCRIPTION	TYPE	PART NO.	NO. REQUIRED
FLOOR	¼ x 15 x 83	PLYWOOD	1	1
SKID	1¾ x 1¾ x 83½	LUMBER	2	2
LOAD BEARING MEMBER	¾ x 7½ x 13½	LUMBER	3	2
MOUNT ANGLE	0.125 x 2.00 x 8.00	STEEL	4	4
PHENOLIC BUSHING	$^{+0.750}_{-0.740}$ O.D. x 0.359 I.D. x 1.00	PHENOLIC	5	3
MOUNT ANGLE	0.125 x 2.00 x 6.00	STEEL	6	1
LOAD BEARING MEMBER	½ x 4 x 13½	PLYWOOD	7	1



ELEVON CRATER BASE

.06.03.253-1 .57.04.04

Figure 2-48. Packing and Crating — Elevon (Sheet 1 of 2)

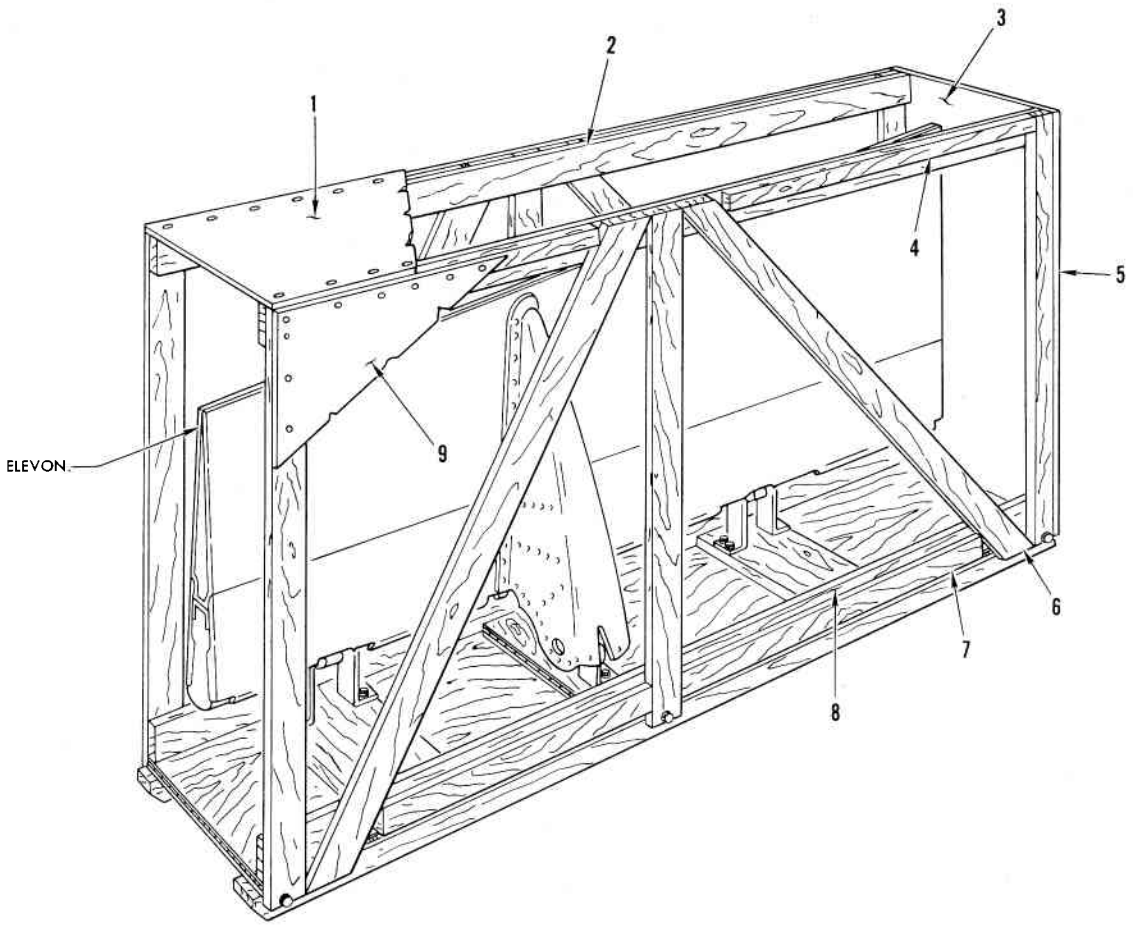
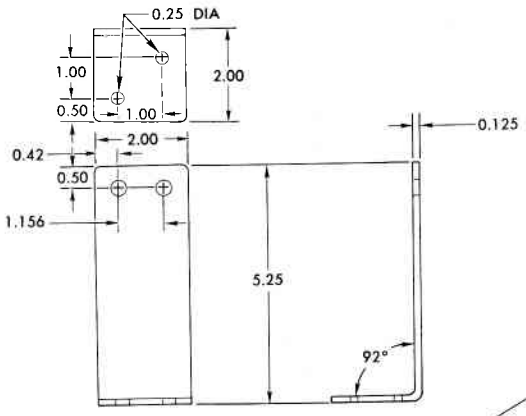


TABLE II				
NAME	DESCRIPTION	TYPE	PART NO.	NO. REQUIRED
SHEATHING	¼ x 16½ x 83½	PLYWOOD	1	1
LONGERON CLEAT	¾ x 3⅜ x 83	LUMBER	2	2
SHEATHING	¼ x 16½ x 38¼	PLYWOOD	3	2
FILLER CLEAT	¾ x 1¾ x 32	LUMBER	4	4
VERTICAL CLEAT	¾ x 2⅜ x 39¾	LUMBER	5	6
DIAGONAL CLEAT	¾ x 2⅜ x 55¼	LUMBER	6	4
FILLER CLEAT	¾ x 1¾ x 31	LUMBER	7	4
LONGERON CLEAT	¾ x 2⅜ x 83	LUMBER	8	2
SHEATHING	⅛ x 38¼ x 83½	PAPER-OVERLAID VENEER	9	2

TABLE III			
NAME	SIZE	TYPE	NO. REQUIRED
NUT	AN365-624	STEEL	2
WASHER	0.375	PHENOLIC	8
LAG SCREW	0.312 x 2.00	STEEL	6
WASHER	0.312	STEEL	6
CARRIAGE BOLT	0.312 x 3.00	STEEL	12
MACHINE BOLT	0.312 x 1.50	STEEL	10
WASHER	0.250	STEEL	22
NUT	0.250	STEEL	22
BOLT	AN6-20	STEEL	2
MACHINE BOLT	0.375 x 3.50	STEEL	1
NUT	0.375	STEEL	1

06.03.253-28

Figure 2-48. Packing and Crating — Elevon (Sheet 2 of 2)



MOUNT ANGLE
PART NO. 1

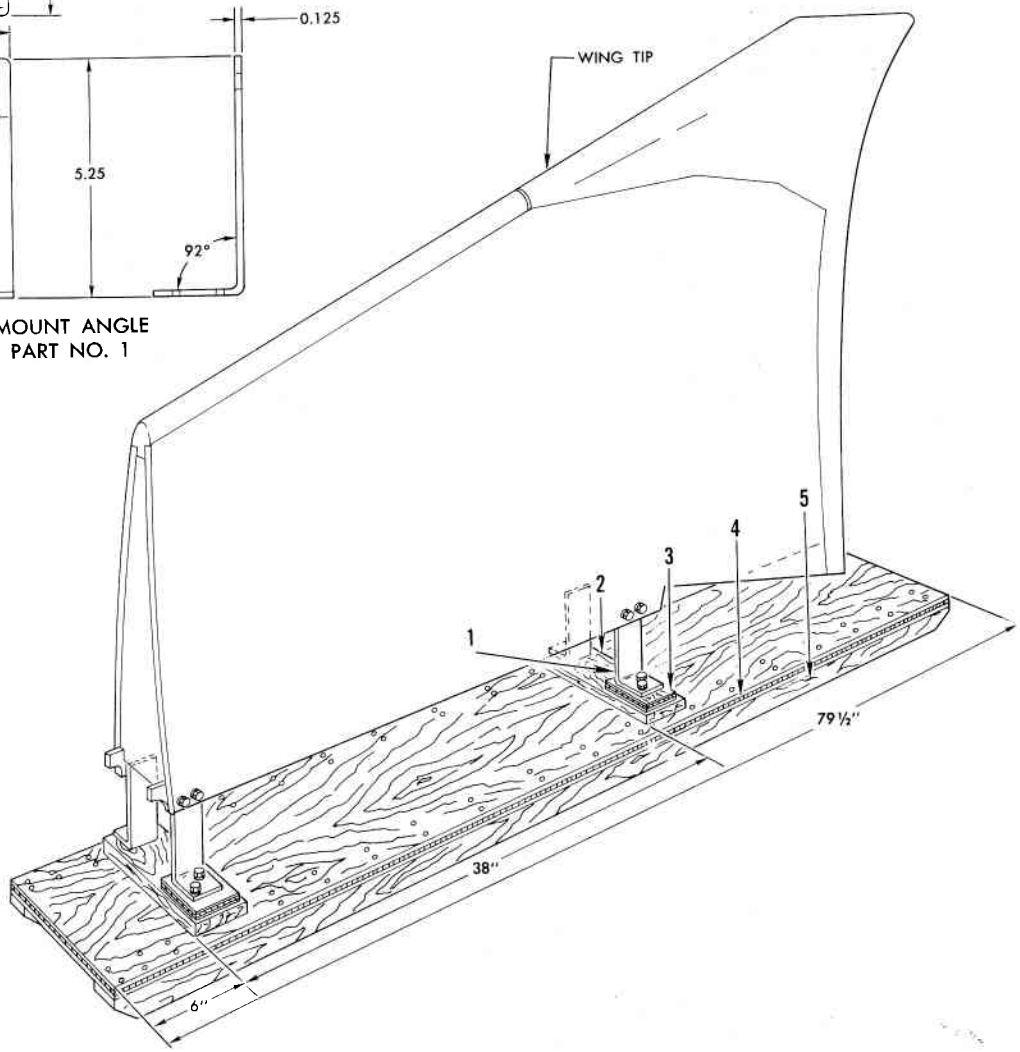


TABLE I

NAME	DESCRIPTION	TYPE	PART NO.	NO. REQUIRED
MOUNT ANGLE	0.125 x 2.00 x 7.375	STEEL	1	4
LOAD BEARING MEMBER	¾ x 3⅜ x 9½	LUMBER	2	2
BLOCK	5/16 x 3 x 3⅜	PLYWOOD	3	2
FLOOR	¼ x 11 x 79	PLYWOOD	4	1
SKID	1¾ x 1¾ x 79½	LUMBER	5	2

.06.03.255-1B

Figure 2-49. Packing and Crating — Wing Tip (Sheet 1 of 2)

TABLE II				
NAME	DESCRIPTION	TYPE	PART NO.	NO. REQUIRED
SHEATHING	¼ x 12½ x 79½	PLYWOOD	1	1
LONGERON CLEAT	¾ x 3⅝ x 79	LUMBER	2	2
SHEATHING	⅛ x 46½ x 79	PAPER-OVERLAID VENEER	3	2
VERTICAL CLEAT	¾ x 2⅝ x 48½	LUMBER	4	6
DIAGONAL CLEAT	¾ x 2⅝ x 60	LUMBER	5	4
FILLER CLEAT	¾ x 1¾ x 30	LUMBER	6	4
LONGERON CLEAT	¾ x 2⅝ x 79	LUMBER	7	2
CONTOUR BOARD	2 x 6 x 18	LUMBER	8	1
CONTOUR BOARD	2 x 8 x 18	LUMBER	9	1
FILLER CLEAT	¾ x 3⅝ x 31	LUMBER	10	4
SHEATHING	¼ x 12½ x 46½	PLYWOOD	11	2

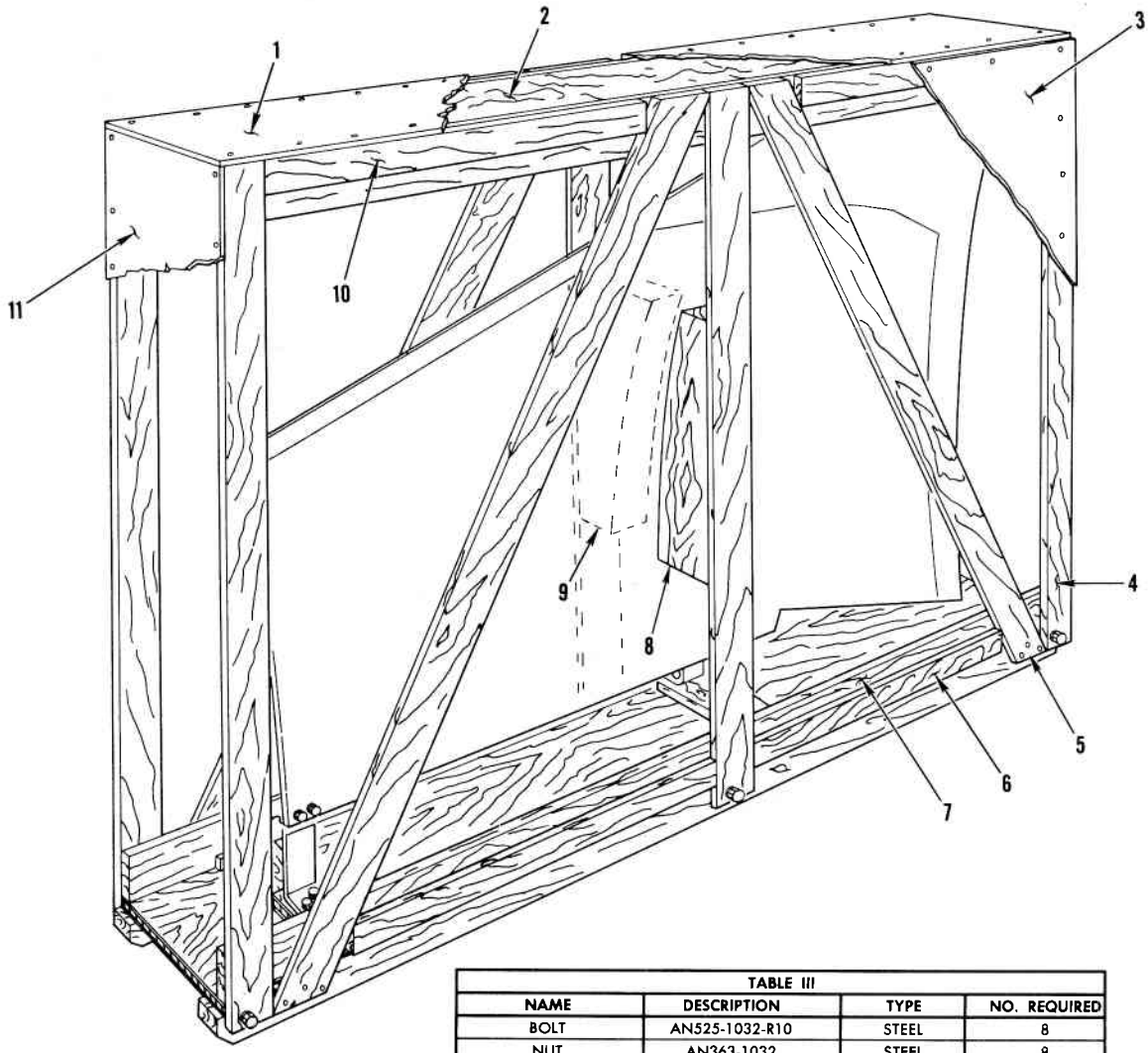


TABLE III			
NAME	DESCRIPTION	TYPE	NO. REQUIRED
BOLT	AN525-1032-R10	STEEL	8
NUT	AN363-1032	STEEL	8
WASHER	AN960-10	STEEL	8
LAG SCREW	0.312 x 2.00	STEEL	6
WASHER	0.312	STEEL	6
CARRIAGE BOLT	0.250 x 3.00	STEEL	4
MACHINE BOLT	0.250 x 2.00	STEEL	14
WASHER	0.250	STEEL	10
NUT	0.250	STEEL	10
MACHINE BOLT	0.250 x 1.50	STEEL	2

.06.03.255-2 .57.03.04

Figure 2-49. Packing and Crating — Wing Tip (Sheet 2 of 2)

 1 March 1974 ALL DATA ON PAGES 2-99 THRU 2-101 INCLUDING FIGURE 2-50 DELETED.

2-86. PREPARATION OF WING FOR AIRLIFT.

2-87. Preparation of a wing for airlift requires three major operations. The wing must be defueled and purged, removed from the airplane, and installed on a shipping stand. Since JP-4 is both toxic and flammable, it is of the utmost importance that all fumes be removed from the wing before airlift operation.

a. Defuel airplane in accordance with T.O. 1F-106A-2-5-2-1.

b. Purge wing with 100-octane gasoline. Refer to paragraph 2-41 for procedure.

c. Remove wing tip and leading edge. Refer to T.O. 1F-106A-2-2-2-2 for procedure.

d. Package all removed parts and components, other than elevon and main landing gear, in accordance with instructions contained in T.O. 00-85-16, or stow in boxes provided with the shipping stand for shipment with the wing. This includes all access doors and attaching screws.

e. Remove wing from fuselage. See figure 2-7 for procedure.

f. Cap all hydraulic and fuel lines; stow or remove all loose lines and electrical connectors.

g. Place wing on dolly or mattresses.

NOTE

The right wing must be inverted (turned upside down) prior to installation on shipping stand. The No. 2 and No. 6 spar adapters, provided with the shipping stand, can be used to invert the right wing. Shipping stand shown in Figure 2-51.

h. Attach the No. 2 spar adapter, AF Dwg. 58SAC589, to No. 2 spar and secure with lock pins.

i. Attach the No. 6 spar adapter, AF Dwg. 58SAC588, to No. 6 spar and secure with lock pins.

j. Attach the universal lifting eye, provided with the shipping stand, to the wing lift point. If the left wing is to be air shipped, attach universal lifting eye to the wing tiedown point. See figure 2-51.

k. Attach hoisting sling, AF Dwg. 58SAB591, to spar adapters and lifting eye. Attach two 15-foot lengths of rope, as shown in figure 2-51, to guide wing into place on shipping stand.

l. Hoist wing until No. 6 spar adapter clears the curved pivot hook at the top of the shipping stand. Lower and guide the wing until the pivot hook enters the 1½-inch diameter hole in the No. 6 spar adapter. Continued lowering will cause the wing to pivot into position on the shipping stand. See figure 2-51.

m. Bolt No. 6 spar adapter to shipping stand with four AN 12-24A bolts, four AN 960-1216 washers, and four AN 365-1216 nuts. Secure the No. 2 spar adapter to the shipping stand using four AN 960-1216 washers and four AN 365-1216 nuts.

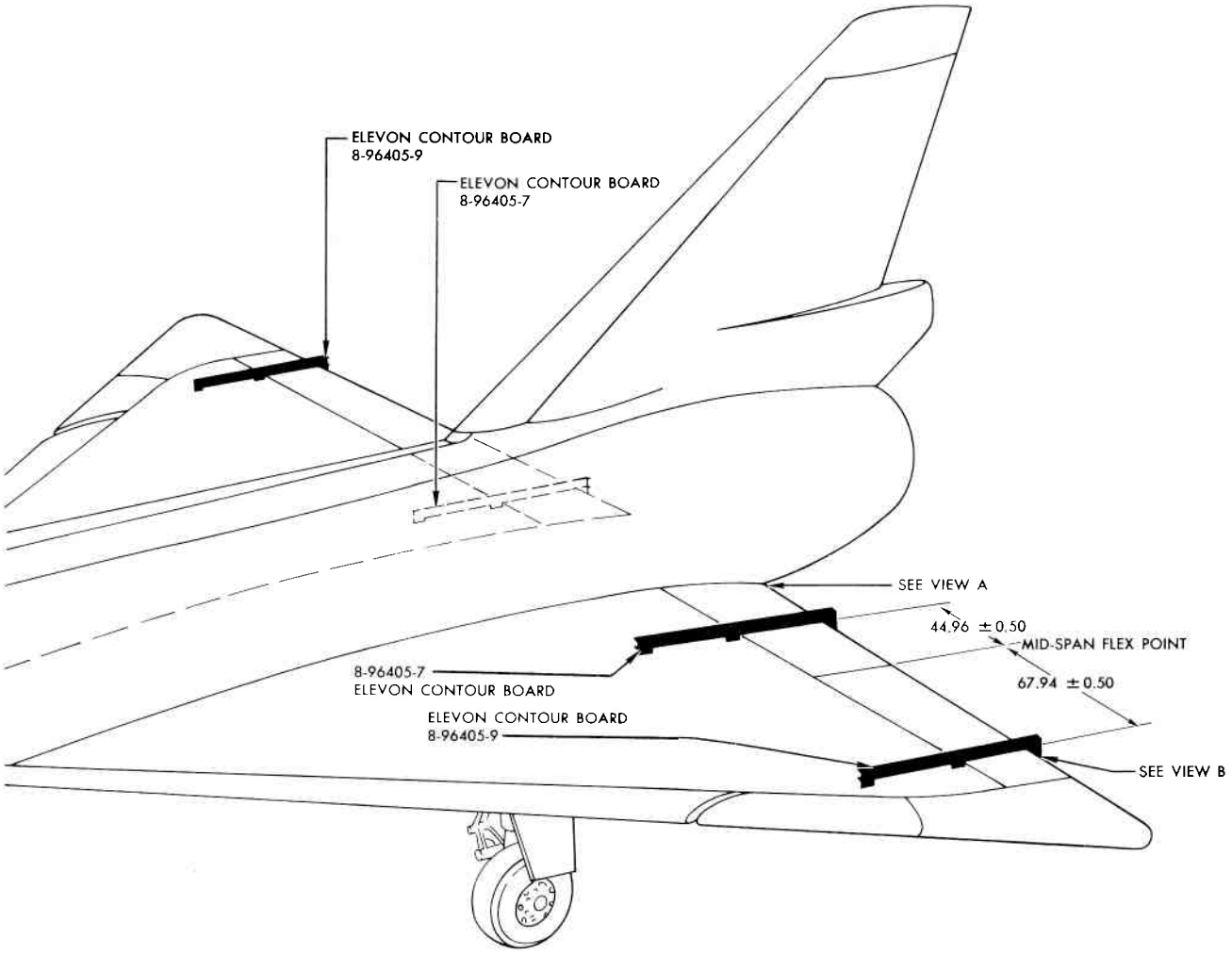
n. Attach the wing support pad to the elevon attach fitting as shown on figure 2-51 and adjust to insure that the wing clears the shipping stand.

NOTE

The canted position of the wing, when installed on the shipping stand, may cause trapped fuel to drain into the lower portion of the tanks. Since all residual fuel must be removed prior to airlift, the wing should be placed on the shipping stand at least eight hours prior to airlift to allow for fuel drainage and subsequent mopping. Should the shipping stand not be available prior to arrival of transport aircraft, the intent of the foregoing shall be accomplished by otherwise devising a means of propping the wing in a canted position.

2-88. ELEVON ALIGNMENT.

2-89. Figure 2-50 shows the elevon contour boards used for checking elevon alignment.



CONTOUR BOARD ALIGNMENT CHECK PROCEDURE:

a. Prepare airplane as required for elevon operation procedure given in T.O. 1F-106A-2-7-2-1.

b. Trim elevons to neutral (streamline position). Elevons are in neutral when inboard tips are in line with positioning rivets on fuselage (see view A) under the following conditions: hydraulic power on, engine not installed, no fuel in tanks and elevator and aileron mixer rig pin holes aligned.

c. **Position the 8-96405-7 contour board 44.96 (±0.50) inches inboard from the centerline of the mid-span flex point of both elevons.**

NOTE
WITH ENGINE INSTALLED AND FUEL IN TANKS, TRAILING EDGE MAY DROOP ONE-EIGHTH INCH BELOW CENTER OF POSITIONING RIVET.

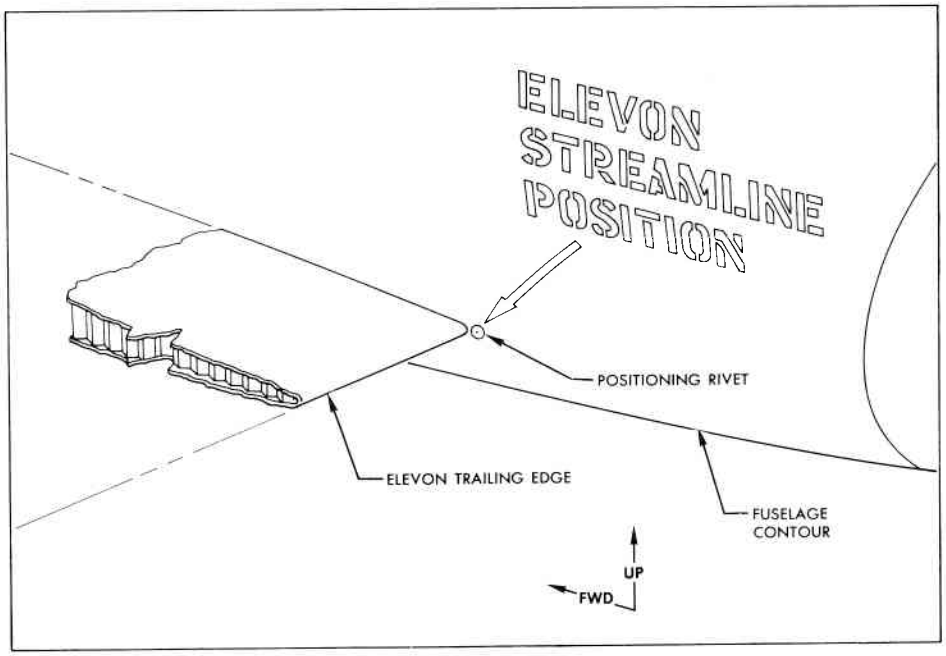
d. **Position the 8-96405-9 contour board 67.94 (±0.50) inches outboard from the centerline of the mid-span flex point of both elevons.**

NOTE
CONTOUR BOARDS MUST BE PLACED PARALLEL TO LINE OF FLIGHT.

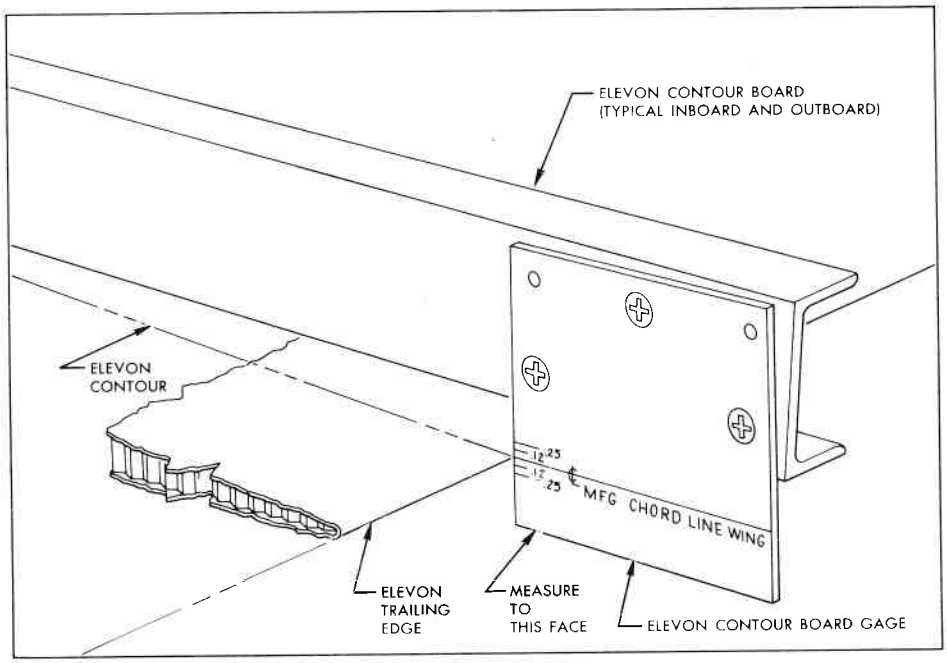
e. Check and record deviation from wing chord line as calibrated on plate at aft end of each contour board (see view B). Total deviation between inboard and outboard contour board readings should not exceed ±0.25 inch on either wing.

06.03.243-1A 57.04.01

Figure 2-50. Elevon Contour Boards (Sheet 1 of 2)



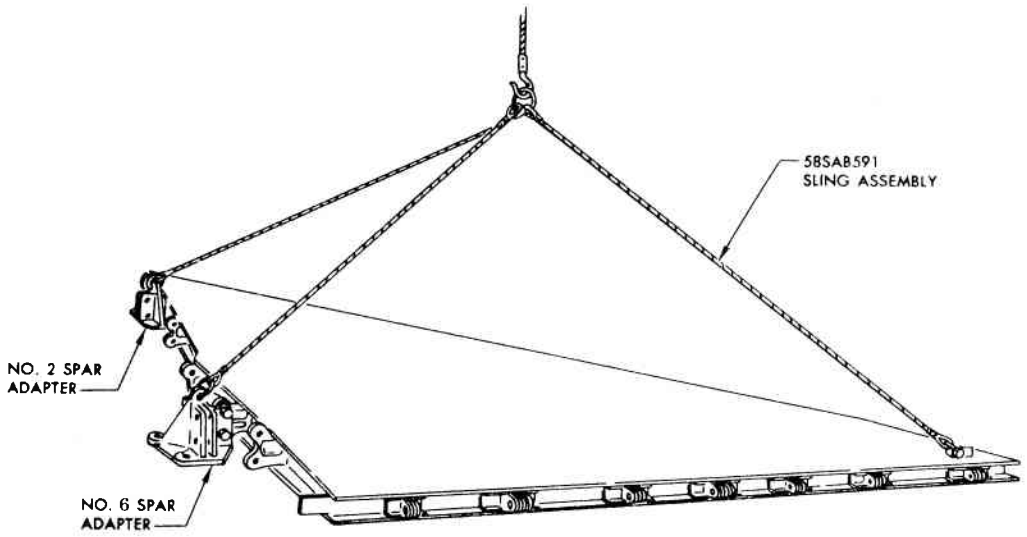
VIEW A

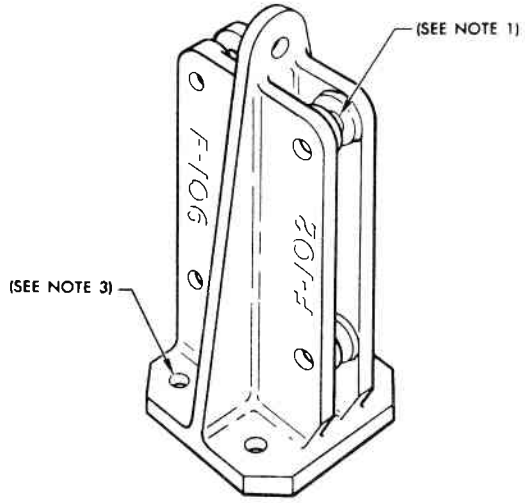


VIEW B

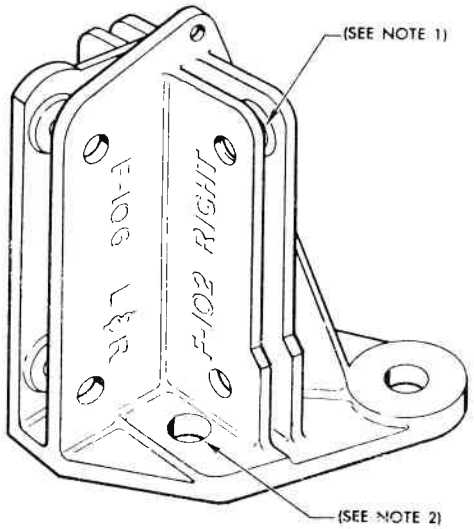
06.03.243-2 .57.04.01

Figure 2-50. Elevon Contour Boards (Sheet 2 of 2)





NO. 2 SPAR ADAPTER
(58SAC589)



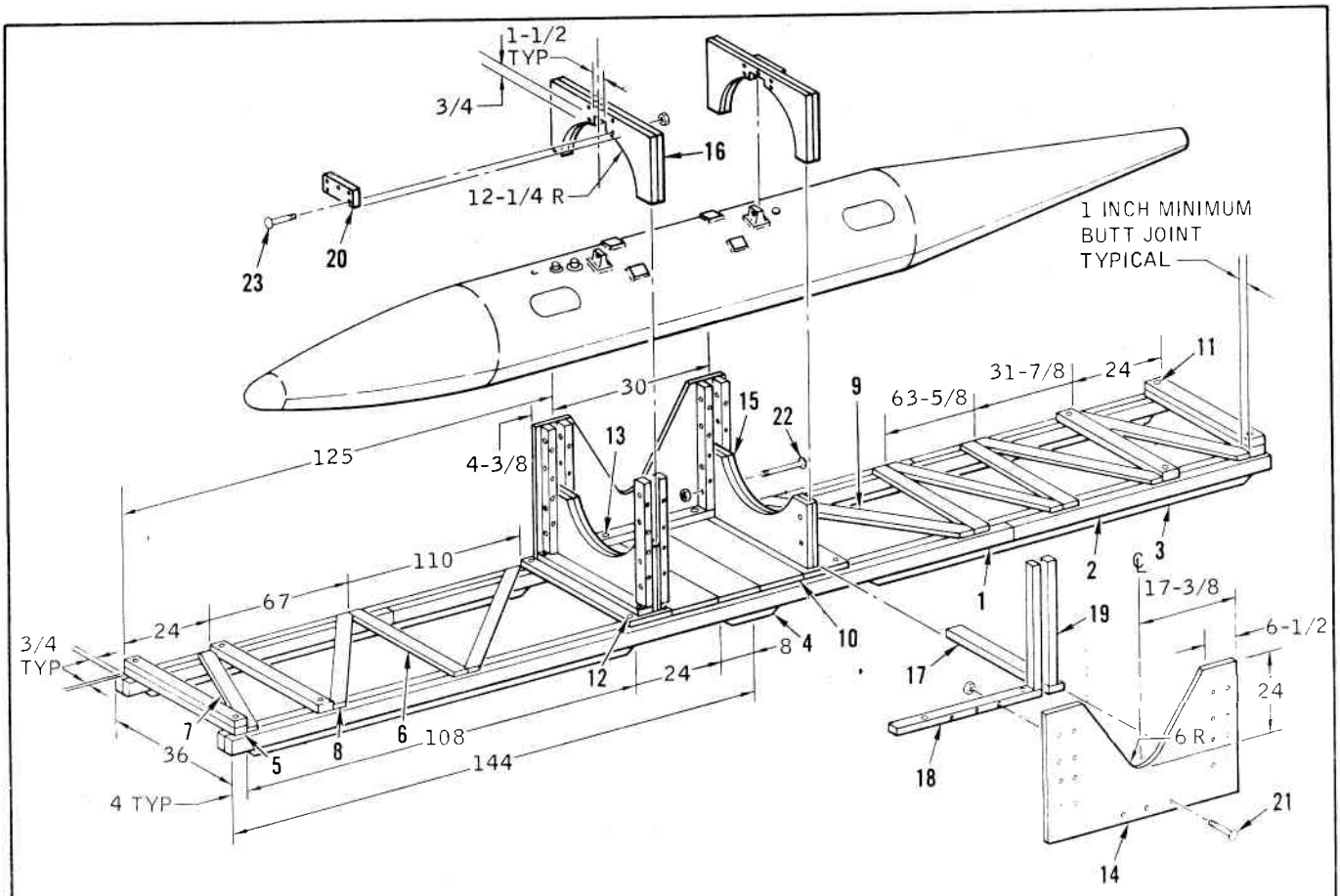
NO. 6 SPAR ADAPTER
(58SAC588)

NOTES:
1. COTTER PINS MUST BE INSTALLED IN ALL ATTACHING PINS.
2. USE AN315-12R NUTS (4) AN960-1216 WASHERS (4) AND AN12-24A BOLTS (4) TO ATTACH WING TO STAND.
3. USE AN315-12R NUTS (4) AND AN960-1216 WASHERS (4) TO ATTACH WING TO STAND.

06.03.306-1 .57.00.04

Figure 2-51. Preparation of Wing Airlift (Sheet 1 of 3)

 All data on page 2-102A and 2-102B, including figures 2-50A and 2-50B are deleted.

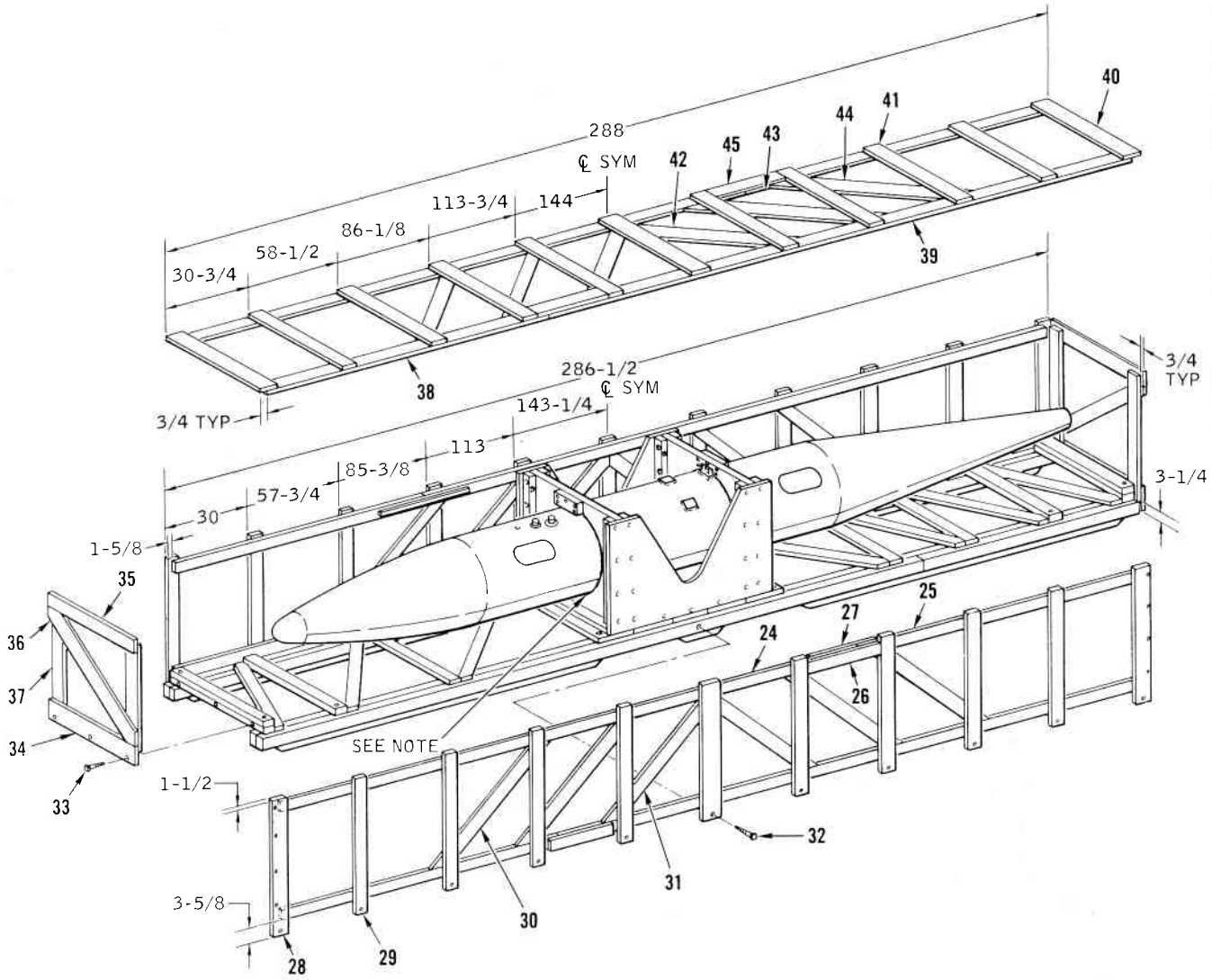


MATERIAL TABLE				
NAME	DESCRIPTION	TYPE OF MATERIAL	PART NO.	NO. REQUIRED
SKID	2 x 4 x 192	LUMBER	1	4
SKID	2 x 4 x 96	LUMBER	2	4
RUBBING STRIP	2 x 4 x 108	LUMBER	3	4
RUBBING STRIP	2 x 4 x 16	LUMBER	4	2
HEADER & FLOOR MEMBER	2 x 4 x 34-1/2	LUMBER	5	6
FLOOR MEMBER	1 x 4 x 34-1/2	LUMBER	6	3
DIAGONAL	1 x 4 x 40	LUMBER	7	2
DIAGONAL	1 x 4 x 52-3/8	LUMBER	8	2
DIAGONAL	1 x 4 x 44-1/2	LUMBER	9	3
LOAD BEARING MEMBER	2 x 12 x 34-1/2	LUMBER	10	5
CARRIAGE BOLT	3/8 x 7-1/2	STEEL	11	12
CARRIAGE BOLT	3/8 x 6	STEEL	12	4
CARRIAGE BOLT	3/8 x 9	STEEL	13	16
GUSSET	3/8 x 35 x 34-3/4	PLYWOOD	14	2
CRADLE	3/4 x 16 x 32-3/4	PLYWOOD	15	4
CRADLE	3/4 x 19 x 32-3/4	PLYWOOD	16	4
LAG STRIP (LATITUDE)	2 x 4 x 33	LUMBER	17	2
LAG STRIP (LONGITUDE)	2 x 2 x 28-1/2	LUMBER	18	2
UPRIGHT	2 x 2 x 33-3/8	LUMBER	19	8
END PAD	3/4 x 5-3/4 x 10	PLYWOOD	20	2
CARRIAGE BOLT	1/4 x 3	STEEL	21	30
CARRIAGE BOLT	1/4 x 5	STEEL	22	16
CARRIAGE BOLT	1/4 x 2-1/2	STEEL	23	10

NOTE: PAD ALL POINTS OF CONTACT WITH TANK USING CELLULOSE OR RUBBER CUSHIONING.

6SR-958-A-1

Figure 2-50A. Packing and Crating-Drop Tank (Sheet 1 of 2)
Applicable after incorporation of TCTO 1F-106-958

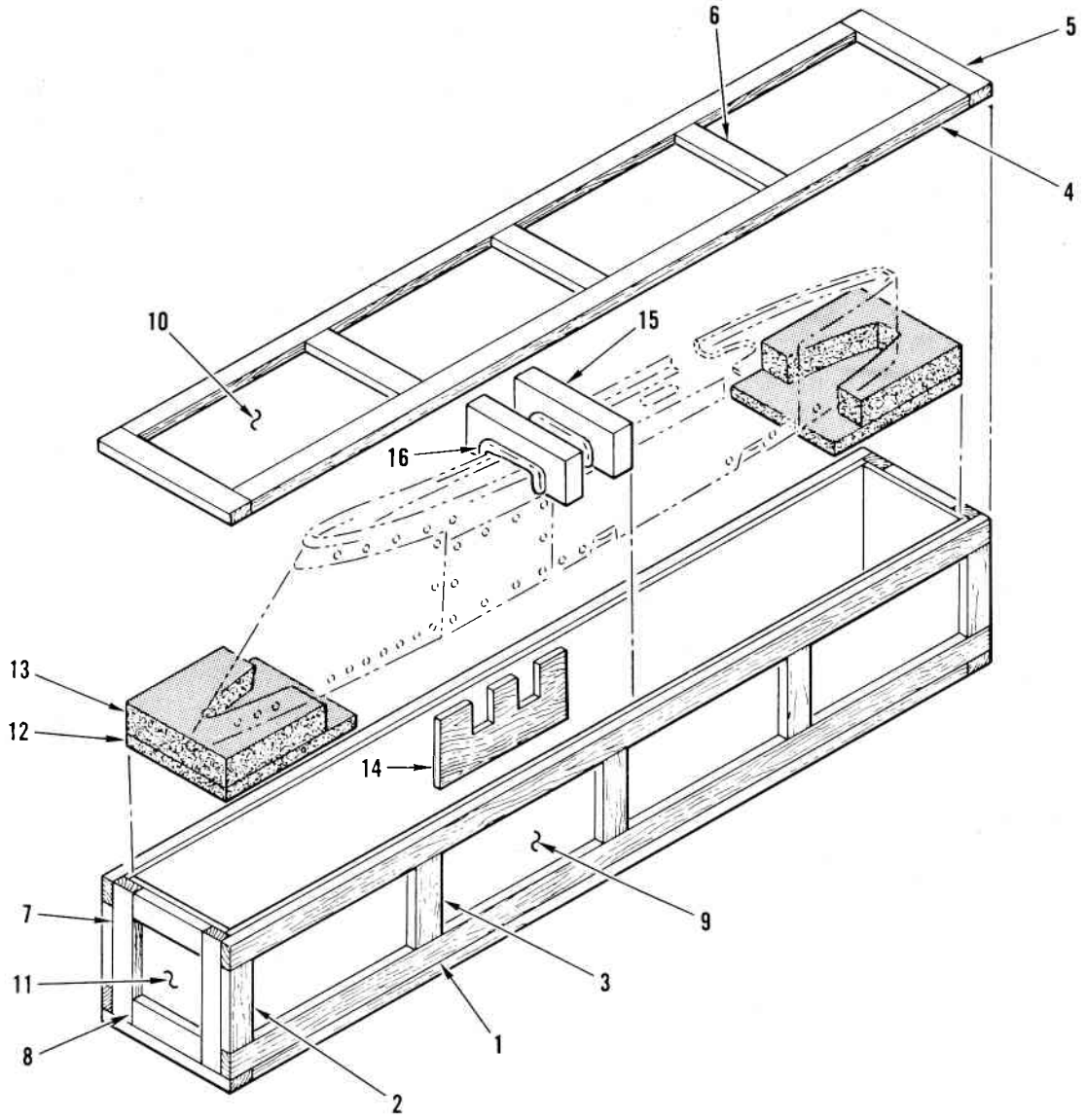


MATERIAL TABLE (CONTINUED)				
NAME	DESCRIPTION	TYPE OF MATERIAL	PART NO.	NO. REQUIRED
LONGERON CLEAT	1 x 6 x 192	LUMBER	24	4
LONGERON CLEAT	1 x 6 x 96-1/4	LUMBER	25	4
FACE SPLICE PLATE	1 x 6 x 24	LUMBER	26	4
REAR SPLICE PLATE	1 x 4 x 24	LUMBER	27	4
CENTER & END STRUT	1 x 6 x 42-3/4	LUMBER	28	6
INTERMEDIATE STRUT	1 x 4 x 42-3/4	LUMBER	29	16
DIAGONAL	1 x 6 x 50	LUMBER	30	8
DIAGONAL	1 x 6 x 44-5/8	LUMBER	31	4
LAG SCREW	3/8 x 4	STEEL	32	22
LAG SCREW	5/16 x 3	STEEL	33	11
HORIZONTAL FRAME	1 x 6 x 37-1/2	LUMBER	34	2
HORIZONTAL FRAME	1 x 4 x 37-1/2	LUMBER	35	2
DIAGONAL	1 x 6 x 48	LUMBER	36	2
VERTICAL CLEAT	2 x 4 x 34-3/8	LUMBER	37	4
LONGERON CLEAT	1 x 6 x 192	LUMBER	38	2
LONGERON CLEAT	1 x 6 x 94-1/2	LUMBER	39	2
CENTER & END STRUT	1 x 6 x 36	LUMBER	40	3
INTERMEDIATE STRUT	1 x 4 x 36	LUMBER	41	8
DIAGONAL	1 x 6 x 43-1/2	LUMBER	42	2
DIAGONAL	1 x 6 x 49-1/2	LUMBER	43	4
SPLICE CLEAT	1 x 4 x 24	LUMBER	44	2
SPLICE CLEAT	1 x 6 x 24	LUMBER	45	2

6SR-958-4-2

Figure 2-50A. Packing and Crating-Drop Tank (Sheet 2 of 2)

Applicable after incorporation of TCTO 1F-106-958.

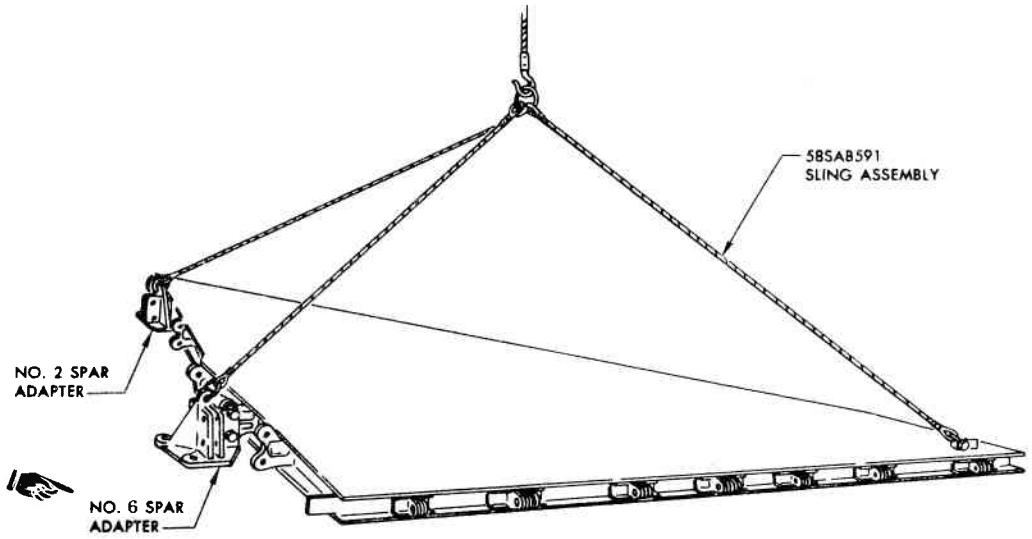


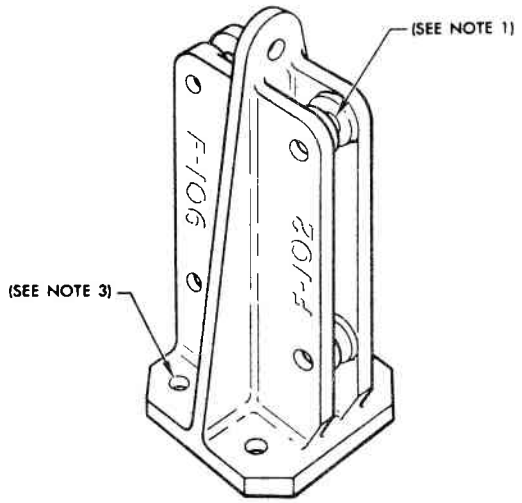
MATERIAL TABLE				
NAME	DESCRIPTION	TYPE OF MATERIAL	PART NO.	NO. REQUIRED
LONGERON CLEAT	1 x 2 x 82	LUMBER	1	4
FILLER CLEAT	1 x 2 x 11-1/4	LUMBER	2	4
INTERMEDIATE CLEAT	1 x 2 x 11-1/4	LUMBER	3	6
LONGERON CLEAT	1 x 2 x 78-3/4	LUMBER	4	4
HORIZONTAL CLEAT	1 x 2 x 14	LUMBER	5	4
FILLER CLEAT	1 x 2 x 10-3/4	LUMBER	6	6
VERTICAL CLEAT	1 x 2 x 12-1/2	LUMBER	7	4
FILLER CLEAT	1 x 2 x 8-3/4	LUMBER	8	4
SHEATHING	1/8 x 82 x 12-1/2	PAPER-OVERLAID VENEER	9	2
SHEATHING	1/8 x 82 x 14	PAPER-OVERLAID VENEER	10	2
SHEATHING	1/8 x 12 x 12	PAPER-OVERLAID VENEER	11	2
FILLER	1 x 8-3/4 x 14	CANE AND WOOD FIVER	12	2
CONTOUR FILLER	2 x 8-3/4 x 12	CANE AND WOOD FIBER	13	2
SOCKET	3/4 x 12 x 6	PLYWOOD	14	2
RETAINER	2 x 4 x 12	LUMBER	15	2
WADDING	UU-C-843	CELLULOSE	16	AS REQUIRED

6SR-958-5

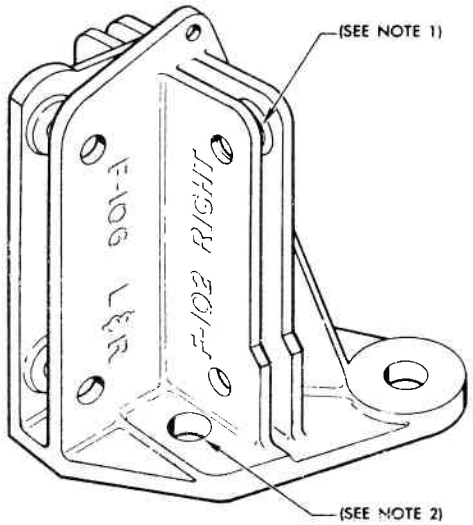
Figure 2-50B. Packing and Crating-External Tank Pylon

Applicable after incorporation of TCTO 1F-106-958





NO. 2 SPAR ADAPTER
(58SAC589)



NO. 6 SPAR ADAPTER
(58SAC588)

NOTES:
1. COTTER PINS MUST BE INSTALLED IN ALL ATTACHING PINS.
2. USE AN315-12R NUTS (4) AN960-1216 WASHERS (4) AND AN12-24A BOLTS (4) TO ATTACH WING TO STAND.
3. USE AN315-12R NUTS (4) AND AN960-1216 WASHERS (4) TO ATTACH WING TO STAND.

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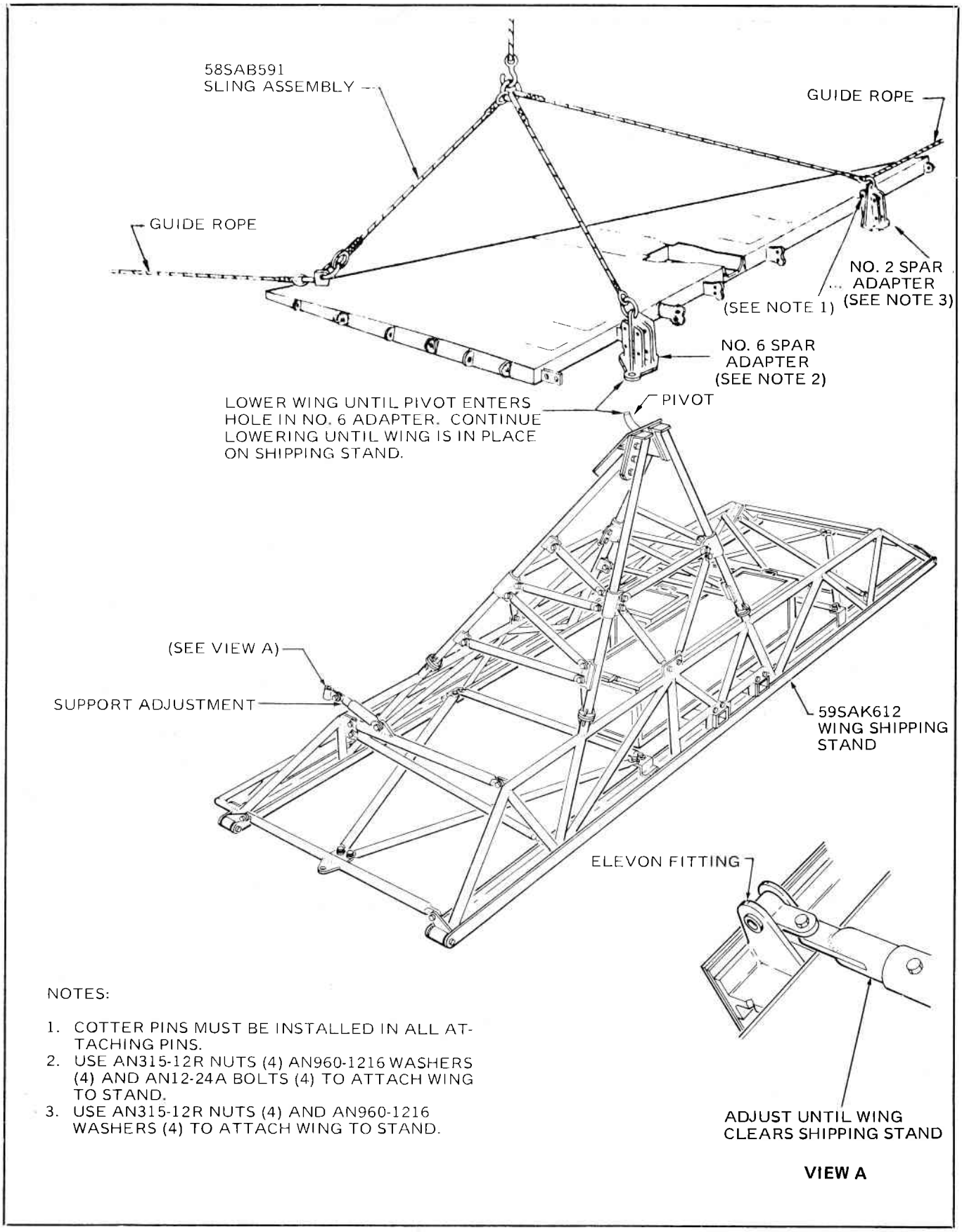
Figure 2-51. Preparation of Wing Airlift (Sheet 1 of 3)



NOTES:

1. COTTER PINS MUST BE INSTALLED IN ALL ATTACHING PINS.
2. USE AN315-12R NUTS (4) AN960-1216 WASHERS (4) AND AN12-24A BOLTS (4) TO ATTACH WING TO STAND.
3. USE AN315-12R NUTS (4) AND AN960-1216 WASHERS (4) TO ATTACH WING TO STAND.

Figure 2-51. Preparation of Wing Airlift (Sheet 2 of 3)

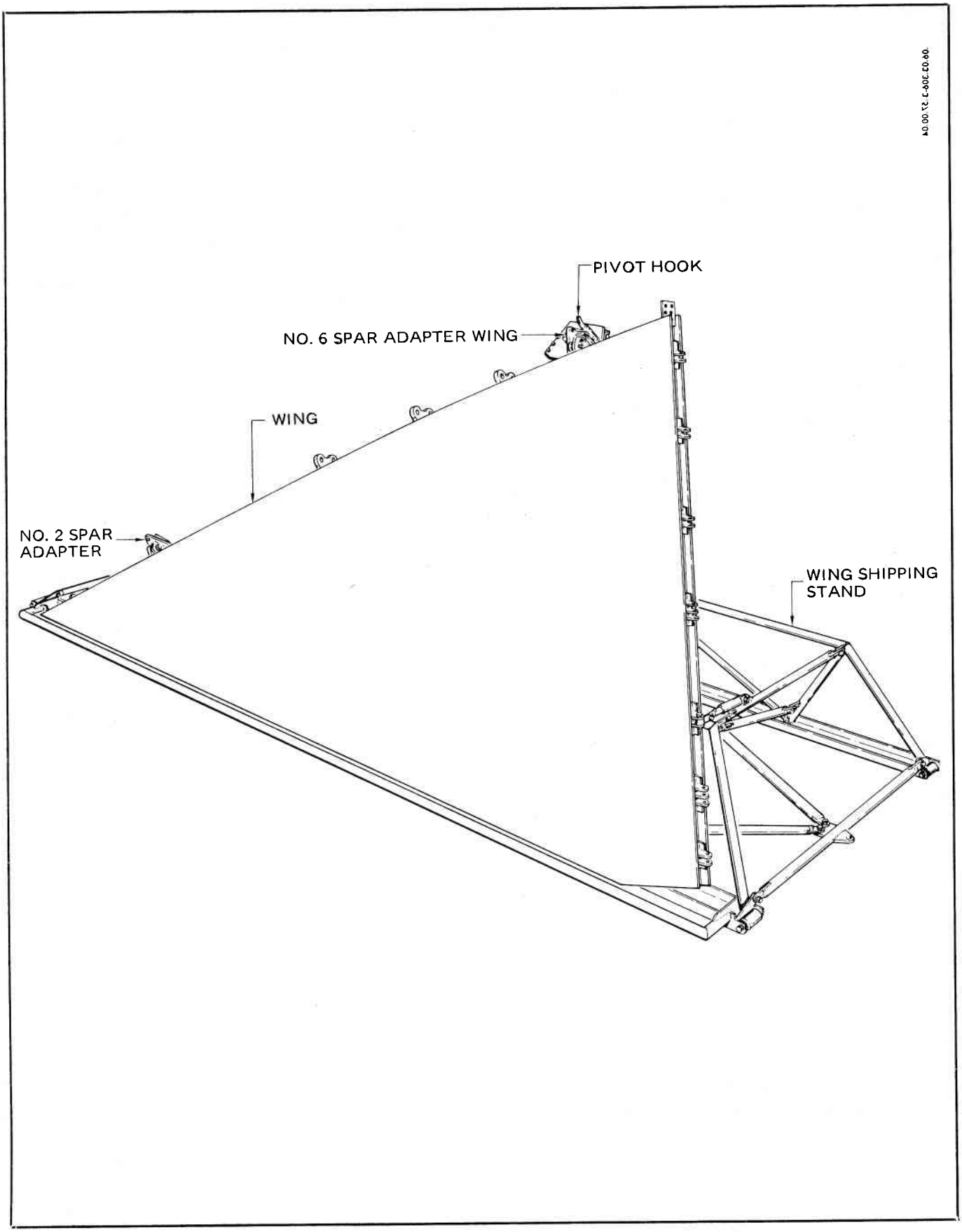


Figure 2-51. Preparation of Wing Airlift (Sheet 3 of 3)

TABLE 2-I

Negligible Damage Limits — Wing Group

COMPONENT	TYPE AND CLASS OF DAMAGE ALLOWED AFTER REWORK					REMARKS
	Scratch	Nick	Dent	Hole	Crack	
WING STRUCTURE						
Plating—Upper	I	I	I	*	*	
Plating—Lower	I	I	I	*	*	
Leading Edge Spar Rail	I	I	*	I	*	
Leading Edge Spar Web	II	II	I	I	*	
Spar Attachment Fittings, Nos. 1 thru 6	I	I	*	*	*	
Spars, Nos. 1 thru 6 Flange	I	I	*	I	*	
Spars, Nos. 1 thru 6 Web	II	II	I	I	*	
Bulkhead Wing Fuselage Intersection	II	II	II	II	II	
Rib Rails	II	II	II	II	I	
Rib Webs	III	III	III	III	II	
Rib Stiffeners	III	III	III	III	II	
Fuel-Tight Corners	III	III	III	*	*	
Drag Angles	II	II	II	*	*	
LEADING EDGE STRUCTURE						
Plating	II	II	I	*	*	
Doublers	II	II	I	I	I	
Ribs	III	III	III	III	II	
Attachment Angles	II	II	II	II	I	
TRAILING EDGE AND TRIM TANK STRUCTURE						
Spar No. 7 Flange	I	I	*	I	*	
Spar No. 7 Web	I	II	I	*	*	
Spar No. 7 Attachment	I	I	*	*	*	
Plating	I	I	I	*	*	
Integral Stiffeners	I	I	*	*	*	
Rib Rails	I	I	*	*	*	
Truss Members	I	I	*	*	*	
Transverse Stiffeners B.L. 170.00 to 188.00	I	I	*	*	*	
Hinge Fittings		Refer to an Aeronautical Structural Engineer				
Actuator Fitting		Refer to an Aeronautical Structural Engineer				
Actuator Fairing Skin	III	III	III	II	II	

*Component must be repaired or replaced.

TABLE 2-I

Negligible Damage Limits — Wing Group (Cont)

COMPONENT	TYPE AND CLASS OF DAMAGE ALLOWED AFTER REWORK					REMARKS
	Scratch	Nick	Dent	Hole	Crack	
ELEVON STRUCTURE—INBOARD AND OUTBOARD						
Plating	I	I	I	*	*	
Spar Assembly Rail	I	I	*	I	*	
Spar Assembly Web	II	II	I	I	I	
Ribs	III	III	II	II	I	
Hinge Fittings		Refer to an Aeronautical Structural Engineer				
Outboard Horn Fitting		Refer to an Aeronautical Structural Engineer				
Actuator Fitting		Refer to an Aeronautical Structural Engineer				
Actuator Fairing	III	III	III	II	II	
Trailing Edge Wedges	II	II	*	*	I	
WING TIP STRUCTURE—BUILT-UP TYPE						
Spar	I	I	I	*	*	
Plating	I	I	I	*	*	
Ribs	II	II	II	II	II	
Leading Edge Slug	II	II	II	II	I	
Trailing Edge Slug	II	II	II	II	I	
EXTERNAL FUEL TANK STRUCTURE						
Skin	II	II	III	Refer to an Aeronautical Structural Engineer		
Fairing	II	II	III	Refer to an Aeronautical Structural Engineer		
Pylon Ribs	II	II	I	II	II	
Pylon Post	II	II	I	II	II	
Pylon Angles	II	II	I	II	II	
Rails	II	II	I	Refer to an Aeronautical Structural Engineer		
Rings	II	II	Refer to an Aeronautical Structural Engineer			

*Component must be repaired or replaced.