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HANDBOOK
STRUCTURAL REPAIR INSTRUCTIONS

USAF SERIES
B-26B AND B-26C
AIRCRAFT

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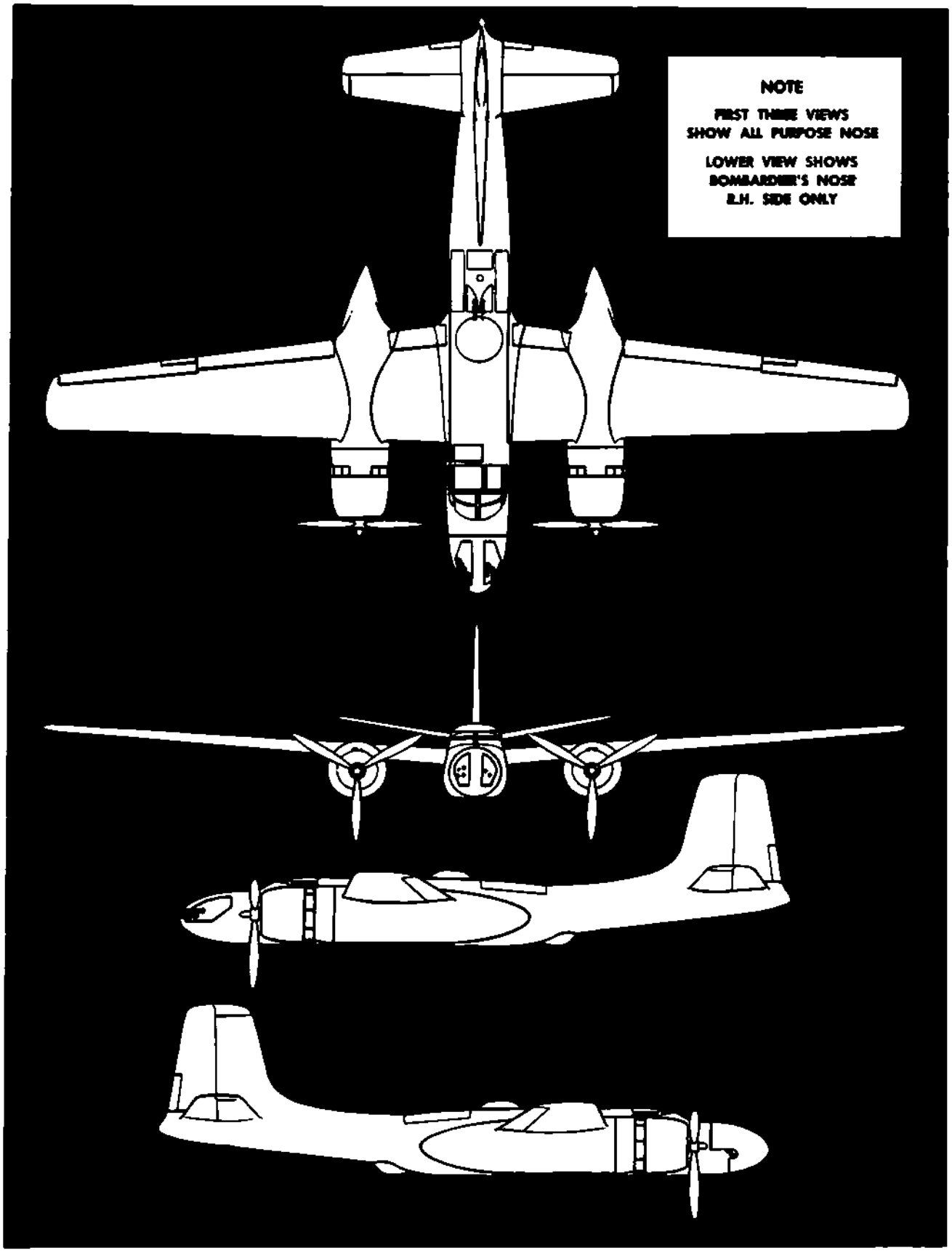


Figure 1—Views of Complete Airplane

SECTION I General

INTRODUCTION

1. TYPE OF CONSTRUCTION.

a. AIRPLANE.—The A-26B and A-26C airplanes are two-engine, full cantilever, high wing monoplanes constructed almost entirely of aluminum alloy.

b. FUSELAGE.—The fuselage is a semi-monocoque all metal structure made up of a series of channel type frames spaced twelve to twenty-four inches apart. In highly stressed points these channel type frames are replaced by frames built up of extruded sections and webs. The frames are connected together by aluminum alloy longitudinal stiffeners that also support the fuselage skin. These stiffeners are spaced four to six inches apart and extend the entire length of the fuselage.

c. WING.—The wing is an aluminum alloy structure, each half fabricated in two parts, namely: the main wing panel and the wing tip. The main wing panel is a two spar structure covered with an all metal skin which is supported by skin stiffeners placed in a fore and aft direction.

d. FIXED CONTROL SURFACES.—The fixed control surfaces, i.e., vertical and horizontal stabilizers, are two piece full cantilever all metal structures and are attached to the fuselage by means of tension bolts located at the front spar and the closing channel.

e. MOVABLE CONTROL SURFACES.—The movable control surfaces are constructed of an aluminum alloy frame work covered with a doped fabric. The spar is a deep box type structure located in the leading edge.

f. NACELLE.—The nacelle is a semi-monocoque all metal structure. It is made up of channel type frames, extruded longitudinal stiffeners, skin, and a stainless steel firewall.

g. ENGINE MOUNT.—The engine mount is made up of steel and aluminum alloy stressed skin which is reinforced by dural forgings. This mount extends from the engine proper to the nacelle firewall.

h. ALIGHTING GEAR.—The tricycle type alighting gear is fully retractable, and operates hydraulically.

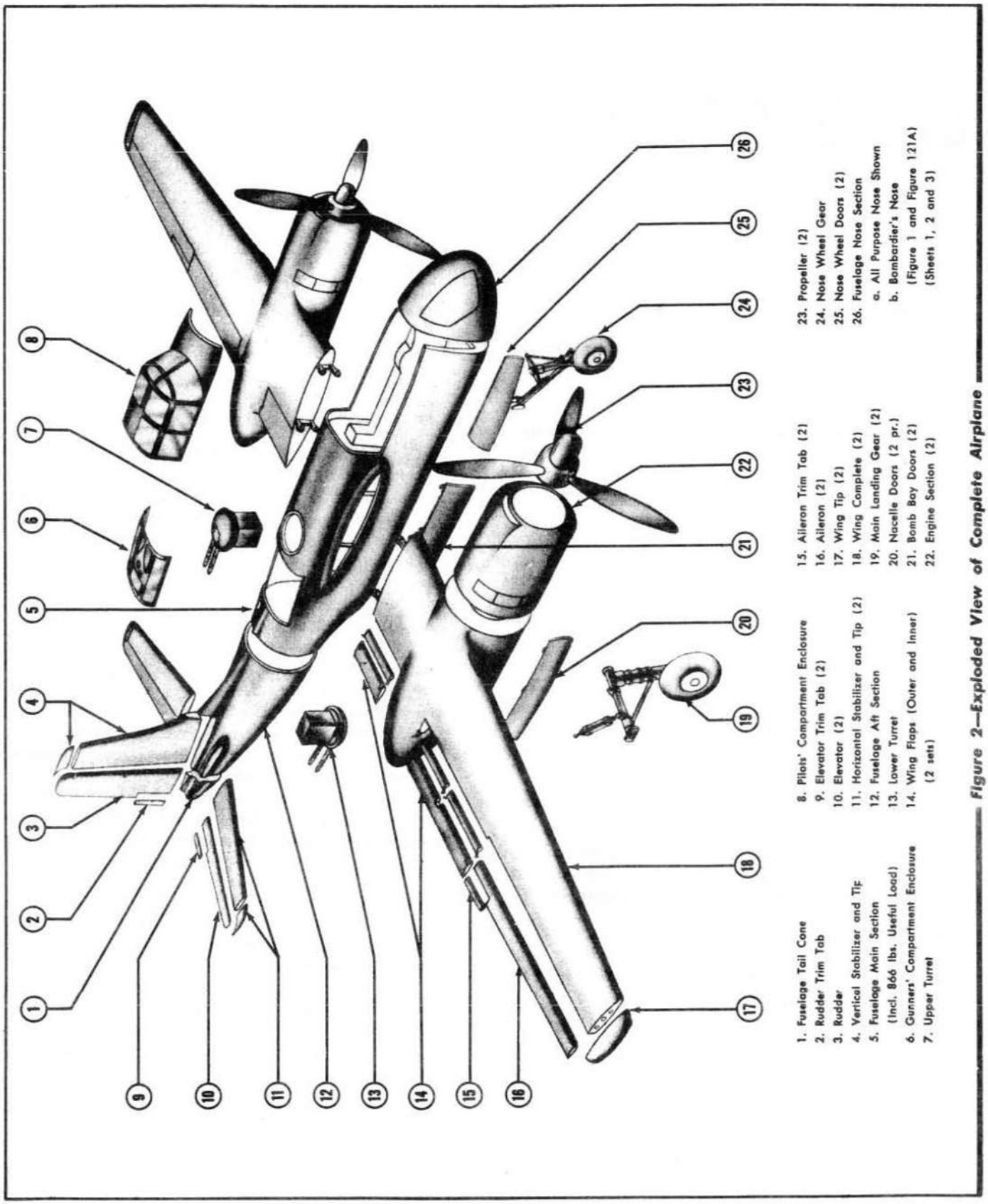
2. INVESTIGATION OF DAMAGE.

a. USING THIS HANDBOOK.—This Handbook has been compiled for use in the repair of the primary structure (airframe) of A-26B and A-26C airplanes. All repair procedures given must be closely followed in order that all damaged parts may be restored to their original strength. Structural illustrations and parts lists are included in each section devoted to repair. They are to be used for the purpose of selecting new material to replace parts damaged beyond repair and serve as a complete picture of the structure referred to in that particular section of the book. The illustrations showing repairs are, in most cases, keyed to a master drawing. The master drawing gives the location and extent of the damage for which the repairs have been shown. Throughout the book damages have been separated into three groups to clarify the different methods of repair. In many cases, availability or lack of materials and time may be considered as determining whether parts should be replaced or repaired. The classification and general description of the damages is as follows:

(1) NEGLIGIBLE DAMAGE.—Damage such as small dents, scratches, cracks or small holes that can be repaired without the use of repair material is considered negligible damage.

(2) REPAIRABLE DAMAGE.—Damage that may be repaired by the use of patching, splicing and insertion without loss to the original strength is considered repairable damage.

(3) DAMAGE NECESSITATING REPLACEMENT.—Any part that cannot be restored to its original strength, or any part which would require the use of more repair material than is practicable, should be replaced.



1. Fuselage Tail Cone
2. Rudder Trim Tab
3. Rudder
4. Vertical Stabilizer and Tip
5. Fuselage Main Section (Incl. 866 lbs. Useful Load)
6. Gunners' Compartment Enclosure
7. Upper Turret
8. Pilots' Compartment Enclosure
9. Elevator Trim Tab (2)
10. Elevator (2)
11. Horizontal Stabilizer and Tip (2)
12. Fuselage Aft Section
13. Lower Turret
14. Wing Flaps (Outer and Inner) (2 sets)
15. Aileron Trim Tab (2)
16. Aileron (2)
17. Wing Tip (2)
18. Wing Complete (2)
19. Main Landing Gear (2)
20. Nacelle Doors (2 pr.)
21. Bomb Bay Doors (2)
22. Engine Section (2)
23. Propeller (2)
24. Nose Wheel Gear
25. Nose Wheel Doors (2)
26. Fuselage Nose Section
    a. All Purpose Nose Shown
    b. Bombardier's Nose (Figure 1 and Figure 121A) (Sheets 1, 2 and 3)

Figure 2—Exploded View of Complete Airplane

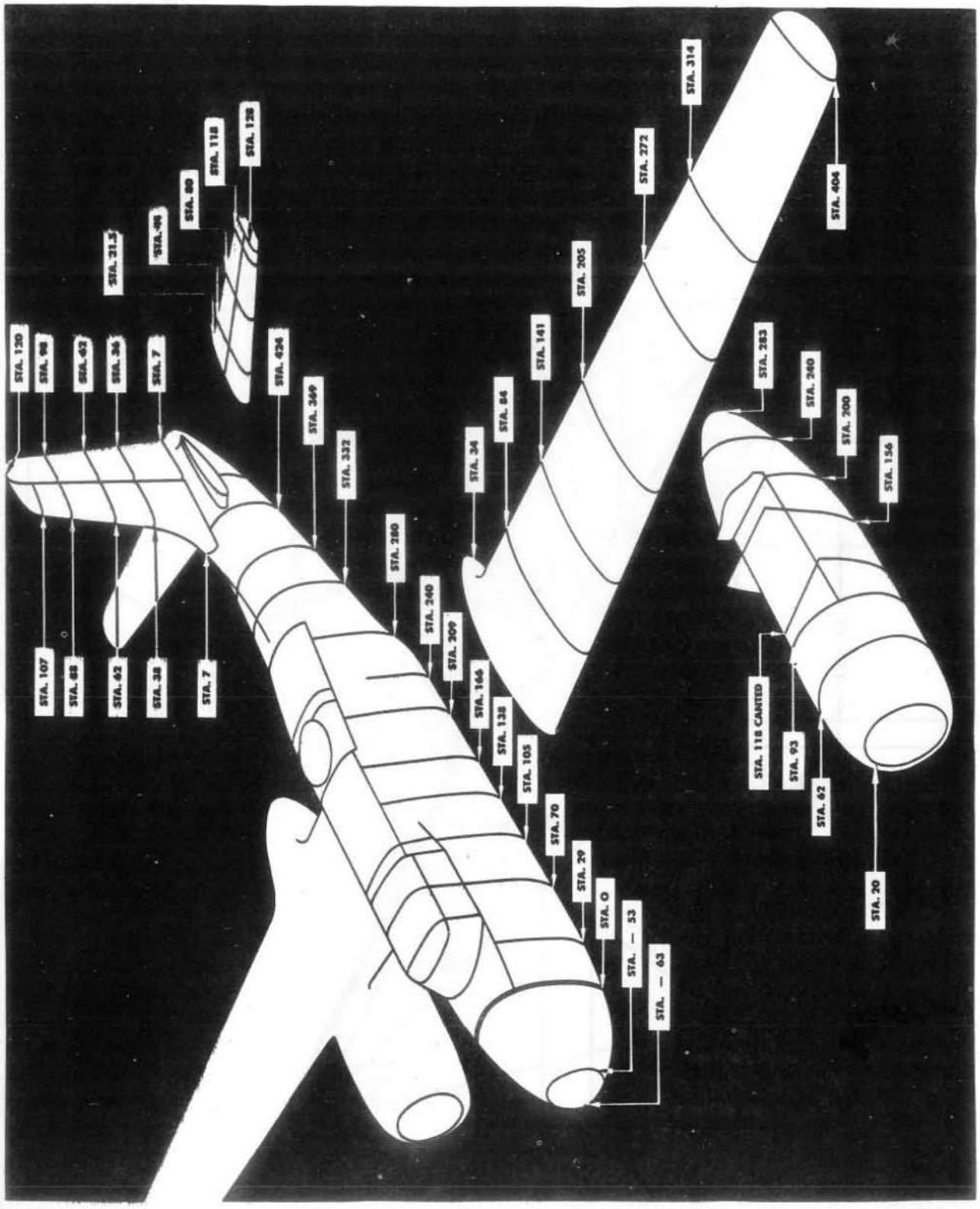


Figure 3 —Stations Identification Diagram

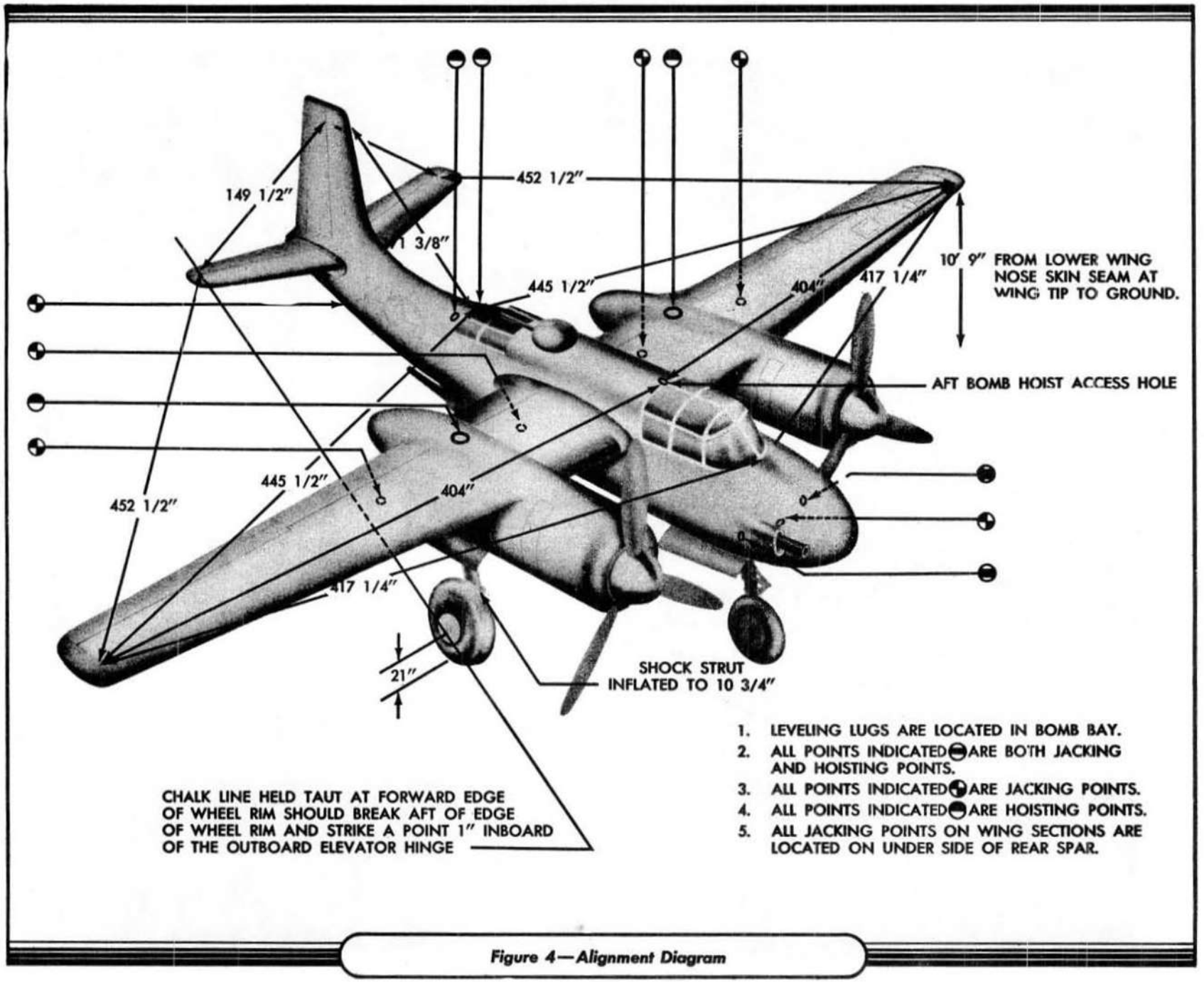


Figure 4—Alignment Diagram

b. INVESTIGATION OF DAMAGE RESULTING FROM EXTREME LOADS.—In addition to a visual inspection a thorough check for damage can be made by using the alignment procedures given on figure 4. In making a visual inspection it may be well to remember that each structural member of the airplane is designed to carry a certain percentage of the design load. Therefore not only the local damaged area, but the surrounding structure must be examined to make certain that other damage does not exist. This is especially true of damage to the alighting gear and wing structures. A shock occuring at one end of a member will be transmitted throughout its length, therefore, all rivets, bolts and attaching structure should be inspected thoroughly. A close examination should be made for rivets that have partially failed and holes that have been elongated.

c. INVESTIGATION OF DAMAGE RESULTING FROM CORROSION.—Aluminum corrosion can be detected by a white crystalline deposit that may be found around loose rivets, scratches, or any portion of the structure that may form a natural container for moisture. Where visual inspection of the inside skin surfaces cannot be accomplished without disassembly, inspection may be made by rapping the outside skin in various places with the knuckles. The presence of severe corrosion will become evident when the light rapping causes slight dents in the material.

d. INVESTIGATION OF REPAIRED DAMAGE.—At time of DIR or in-service reconditioning, all structural repairs will be inspected. Repairs not conforming to those outlined in this handbook will be reworked accordingly.

3. METHODS OF REPAIR.

a. STRAIGHTENING AND WORKING OF SHEET METAL.

(1) ALCLAD SHEET. — Alclad sheet may be shaped cold with a soft faced hammer over hard wood forms. Heat must never be used in this process as its application will destroy the temper and anti-corrosive properties of the material.

(2) STAINLESS STEEL. — The straightening of stainless steel, such as that used in the nacelle firewalls, may be aided by the use of a torch if the material is not heated beyond the dark red stage.

CAUTION

Prevent the adjacent aluminum structure from being overheated during this procedure.

STEEL SHEET *Annealed*		ALUMINUM ALLOY SHEET				
		Annealed Aluminum Alloy (Dural)		*H. T. Aluminum Alloy (Dural)*	
		Minimum Radius		*Minimum Radius*	
Gage	*Min. Radius*	*Gage*	*Standard*	*Special*	*Standard*	*Special*
.025	1/32	.016	1/64		3/32	3/64
.031	1/32	.020	1/64		3/32	3/64
.038	1/32	.025	1/32	1/64	1/8	1/16
.050	1/16	.032	1/32	1/64	1/8	1/16
.063	1/16	.040	1/16	1/32	3/16	3/32
.078	1/8	.051	1/16	1/32	3/16	3/32
.094	1/8	.064	1/8	1/16	1/4	1/8
.125	1/8	.072	1/8	1/16	1/4	1/8
.188	3/16	.081	1/8	3/32	1/4	
2.50	1/4	.091	5/32	3/32	3/8	
		.102	3/16	3/32	3/8	
		.125	1/4	1/8	1/2	
		.188	3/8	3/16	3/4	
		.250	1/2	1/4	1	

The "Special" minimum radii for aluminum-alloy sheet may be used where the bend is 90 degrees or less in special cases, as, for example, where clearance for rivet of bolt heads or attached parts is necessary.

Figure 5—Minimum Bend Radii for Forming of Sheet

b. SPOT WELD REPAIR.—The repair of a spot welded structure is best accomplished in the field by cleaning up any ragged edges or cracks and replacing the weld with rivets. In this handbook, this information will be given in the repair procedures for all structures originally spotwelded.

c. BUCK RIVETING ROUND HEAD RIVETS.—Buck riveting is to be used for making all repairs of the structure and skin plating of the airplane, and should conform to the following instructions:

(1) The head of the rivet should be on the outside surface in the case of skin repair. The riveting of internal structure should be governed entirely by ease of access.

(2) In order to form a well peened head, the portion of the rivet shank that protrudes beyond the material to be repaired, should be at least one and one-half times the diameter of the shank. This is only applicable to joints where the combined material to be riveted measures less than one-half inch in thickness. For a joint of one-half inch or more, add one sixteenth inch to the shank length for each additional one-half inch of joint thickness.

(3) The cup on the driving set should be slightly wider and more shallow than the manufactured head of the rivet so that the initial contact of the driving force, supplied by either a heavy hand hammer, or a riveting machine, will be on the center of the head and directly in line with the rivet shank. This will prevent the shank from being driven under the manufactured head, and greatly facilitate the upsetting of the shank into a flat head on the opposite end. A bucking bar of sufficient weight and with a smooth flat surface should be held against the shank end of the rivet to produce a well formed rivet head.

d. BUCK RIVETING 100 DEGREE FLUSH HEAD RIVETS.—The riveting of 100 degree flush head rivets follows the working procedure as described under paragraph *c.*, with the following exceptions:

(1) The edges of the hole drilled for a flush type rivet should be punched slightly inward. This forms a natural cup, allowing the rivet head to be set flush with the skin without being forced. *(Refer to figure 6.)*

(2) The driving set should be slightly convex and two or three times the diameter of the rivet head. Care should be taken to prevent the driving set from slipping off the head of the rivet and marring the adjacent skin.

e. RIVET EDGE, PITCH AND ROW DISTANCES.—The distance from the edge of the material for all rivets should be twice the diameter of the rivet shank. The pitch (distance between rivet centers) of the rivets in a single row should not be less than four times the diameter of the rivet shank. Where a rivet schedule calls for more than a single row, the rivets should be staggered so that those in adjacent rows do not appear in the same cross-section of the material. The distance between rows should be no less than three times the diameter of the rivet shank.

f. RECOMMENDED RIVETS.—The three types of aluminum alloy rivets used throughout the airplane structure are the 17ST (designation D), the A17ST (designation AD), and the 24ST (designation DD). In the repair illustrations in this Handbook, A17ST rivets have been called out for replacement purposes, principally because this type of rivet is more generally available. However, if 17ST (D) or 24ST (DD) type rivets are available, original rivets of these designations should be replaced by 17ST (D) or 24ST (DD) rivets rather than A17ST (AD) rivets. The "AD" type may be identified by an indentation in the center of the head; the "DD" type by two raised lines on each side of the head; the "D" type by a raised tit in the center of the head.

NOTE

Cherry rivets may be used only in places where regular rivets cannot be bucked and should never be used where there is excessive vibration. If such riveting is necessary, the correct length rivet should be selected to insure a well upset head.

g. REMOVAL OF RIVETS.—Care should be taken in the removal of round head and flush head type solid rivets to prevent damaging the hole which necessitates the use of larger rivets for replacement. Rivets should be removed as follows:

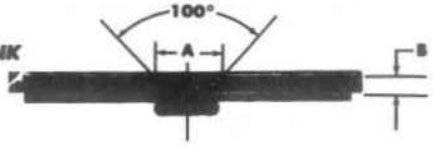
(1) Mark the rivet head with a center-punch and drill just through the head, using a drill no larger than the diameter of the rivet shank. Do not allow the drill to turn the rivet or hit the skin, as this may cause considerable damage to the rivet hole.

(2) Normally, the head will come off during the drilling; if it does not, *carefully* shear off the drilled head with a sharp chisel.

CAUTION

Never attempt to shear off rivet heads without first drilling out the head. This is especially true of the removal of flush type rivets, since

METHOD 1 — *MACHINE C'SINK*



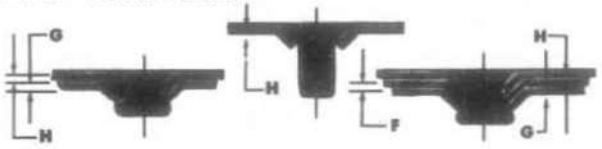
Use this method where "B" thickness is great enough to conform with figures given in table.

RIVET SIZE	A	B MIN.	DRILL NO.	DRILL SIZE
1/16		.032	51	.067
3/32	.191	.040	40	.098
1/8	.238	.051	30	.128
5/32	.302	.064	20	.161
3/16	.368	.072	11	.191
1/4	.493	.091	F	.257
5/16		.128	O	.316
3/8		.144	W	.386

Use "Method 2" when "C" thickness is below "B" thickness specified in "Method 1". Form C'Sink by using rivet head as a form punch.

RIVET SIZE	C MAX.	D MIN. MAX.	E MAX.	DRILL NO.	DRILL SIZE
1/16	.065	-.032	.032	51	.067
3/32	.073	.025-.036	.036	40	.098
1/8	.093	.032-.051	.051	30	.128
5/32	.101	.040-.064	.064	20	.161

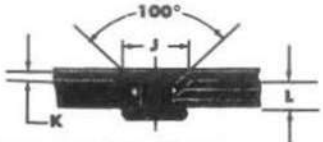
METHODS 2 & 3 — *FORM C'SINK*



Use "Method 3" whenever skin thicknesses exceed those specified in "Method 2". Form C'Sink by punch and die.

RIVET SIZE	F MAX.	G MIN. MAX.	H MIN. MAX.	DRILL NO.	DRILL SIZE
1/16		-.032		51	.067
3/32	.064	.020-.064	.020-.064	40	.098
1/8	.081	.025-.081	.020-.081	30	.128
5/32	.081	.032-.081	.020-.081	20	.161
3/16	.081	.040-.081	.020-.081	11	.191
1/4	.093	.051-.093	.020-.093	F	.257
5/16				O	.316
3/8				W	.386

Use this method where "L" thickness is below "B" thickness as in "Method 1" and "L" thickness is great enough to conform to figures in table.



METHOD 4 — *COMBINATION FORM C'SINK AND MACHINE C'SINK*

Use 3/32 rivets for anchor nuts. Form C'Sink skin to .032; machine C'Sink skin .032 and over.

RIVET SIZE	DRILL NO. & SIZE	C'SINK DIAMETERS FOR VARIOUS "K" THICKNESSES							
		.020 & .025		.032 & .040		.051 & .064		.072 & .081	
		C'SINK DIA. J	L MIN.	C'SINK DIA. J	L MIN.	C'SINK DIA. J	L MIN.	C'SINK DIA. J	L MIN.
1/16	51-.067								
3/32	40-.098	.200	.051	.204	.051	.208	.051	.208	.051
1/8	30-.128	.250	.064	.258	.064	.265	.064	.265	.064
5/32	20-.161	.291	.093	.312	.093	.312	.093	.312	.093
3/16	11-.191	.382	.125	.386	.125	.390	.125	.390	.125
1/4	F-.257	.500	.187	.512	.187	.525	.187	.525	.187
5/16	O-.316								
3/8	W-.386								

NOTE: "L" minimum may consist of one solid part, or may be divided into several different thicknesses. "K" may consist of one thickness or more, provided any individual thickness does not exceed the maximum figures specified in table.

Refer to this drawing to obtain the correct method for the installation of 100° rivets.

Figure 6 —Method Drawing for Rivets

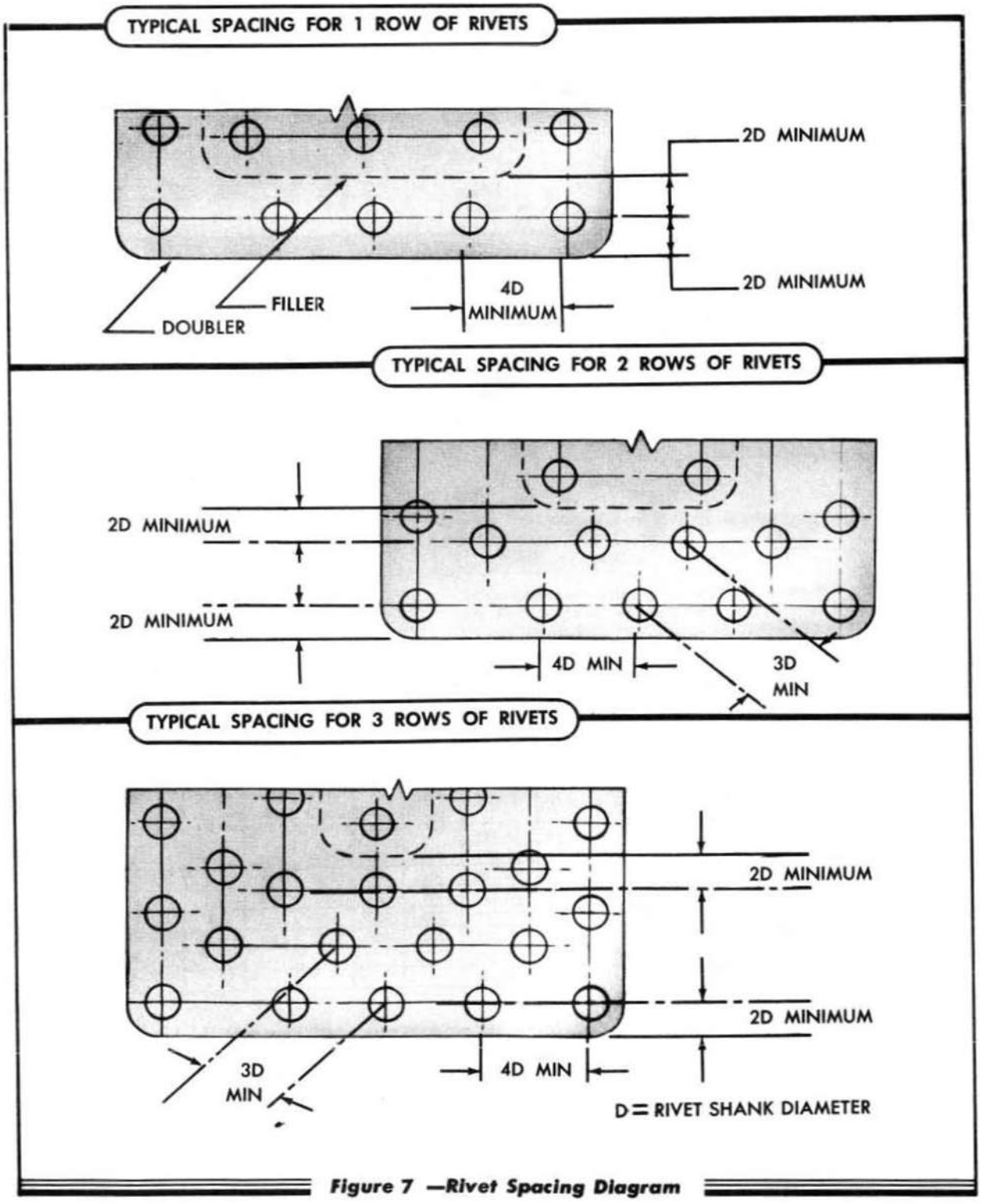


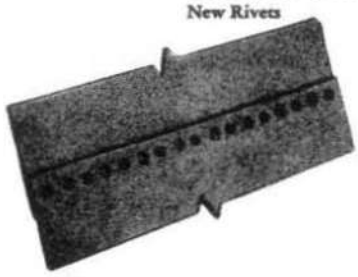
Figure 7 —Rivet Spacing Diagram

	FORM C'SUNK SHEETS	COMBINATION FORM AND MACHINE C'SUNK SHEETS	MACHINE C'SUNK SHEETS
METHOD 1	Method 1, if spacing is close, is used if Method 2 does not apply.	New rivet is next size larger than original. Machine to match size of the original rivet head. Same for 3 repair phases shown.	Drill and mach. c'sk thicker sheet for larger rivet size. Applies to last 2 repair phases. Refer to Methods Dwg. Fig. 6.
			
	Use a drill one size smaller than the new rivet diameter. Applies to first repair phase.	Draw two sheets to fit by rivet head–Methods Dwg. Fig. 6. Same for 3 repair phases shown.	**CAUTION:** Method 1 used when not more than 3 elongated holes occur in 10 consecutive rivets.
METHOD 2			
			
	Method 2 is preferred for the repair of elongated holes.	All elongated holes plugged by new (original size) rivets. Similar 3 repair phases shown.	Use original size rivet between elongated rivet holes maintaining min. 3d spacing on center. Similar 3 repair phases shown.
METHOD 3	Use Method 3 when the use of a larger rivet causes insufficient edge distance. (Min.=2D.)	Draw thin sheets together with rivet head–Methods Dwg. Fig. 6. Similar 3 repair phases shown.	Rivet damaged top sheet to a doubler of same gauge and material. Similar 3 repair phases shown.
			
	Use Method 3 if hole is elongated to next size rivet only.	Undamaged bottom sheet. Similar for the 3 repair phases shown.	Replace elongated holes in top sheet with original size rivets. Similar for 3 repair phases shown.

FOR BRAZIER HEAD RIVET AND SHEET REPAIR

METHOD 4

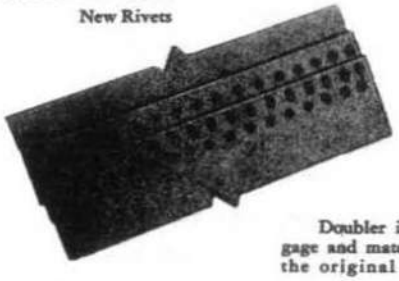
New Rivets



Where space permits, install a rivet of same material and size between elongated holes.

Plug elongated holes with rivets.

New Rivets



Doubler is same gage and material as the original sheet.

Where space does not permit, install a doubler and stagger rivets as shown above.

Figure 8 —Repair Method for Elongated Rivet Holes

the possibility of tearing the riveted material is much greater.

(3) Drill out about three quarters of the rivet shank. Drive out the remainder with a small punch taking care to properly back up the opposite side to prevent forcing or bending the riveted material.

b. ELONGATED RIVET HOLES. – If sufficient pitch (distance between rivet centers) and row distance exist, enlarged rivet holes may be used with a size larger rivet, or new rivets may be driven between the damaged holes. Holes enlarged beyond this type of repair, should be considered an open tear, and repaired with a doubler or patch.

NOTE

An oversized flush type rivet must not be used in an oversized hole without first having the head turned down to the size of the existing dimple or countersink. In some instances, flush rivets may be placed lengthwise in a bench vise and compressed enough to swell the shank to fit the hole.

4. STATIC AND DYNAMIC BALANCE OF MOVABLE CONTROL SURFACES.

a. GENERAL.–The movable control surfaces must be balanced in a closed room, free from air currents and with a level floor. The control surface assemblies should be mounted on a stand equipped with eyebolt or knife-edge bearings. The bearings must attach at the hinge brackets to allow the surface to turn freely through a 60 degree angle, 30 degrees above and 30 degrees below the horizontal.

b. RUDDER AND ELEVATOR BALANCE.–The rudder and elevator must have a minimum nose heavy balance of five inch-pounds. The trailing edge, when put in a level position with the hinge line (position "B," figure 9), must remain level or rotate upward with a 0.25 pound weight placed on the surface 20 inches aft of the hinge line. (0.25 lbs. x 20 in. = 5 inch-pounds.) Should the trailing edge of the control surface rotate downward, compensation must be made.

c. AILERON BALANCE.–The aileron must have a minimum nose heavy balance of 30 inch-pounds. The trailing edge, when put in a normal position with the hinge line *(refer to figure 10),* must remain in that position or rotate upward with a 2.00 pound weight placed fifteen inches aft of the hinge line. (2.00 lbs. x 15 in. = 30.00 inch-pounds.) Should the trailing edge of the control surface rotate downward, compensation must be made.

d. CONTROL SURFACE BALANCE PROCEDURE. –The balance of a control surface about its hinge line is expressed in terms of inch-pounds (moment) nose heavy or tail heavy. In other words, a control surface that is nose heavy has a negative moment, and a control surface that is tail heavy has a positive moment. The following method of balance correction is based on the assumption that all surfaces to be reworked will have a balance less than the required minimum nose heavy balance. To correct this condition, it is necessary to first determine the actual balance of the control surface, and then the amount of counterbalance weight that will be added to the surface to meet the required minimum balance.

(1) Mount the control surface on a balance stand and suspend an empty bag from the trailing edge if the surface is nose heavy, or from the leading edge if the surface is tail heavy. *(See figures 9 and 10.)*

NOTE

While the rudder and elevators may be balanced with either side placed up, the ailerons must be placed on the balancing stand upside down.

(2) Drop lead shot into the bag until the control surface assumes a level position.

(3) Measure "D," the distance from the hinge line to the suspended bag of weights.

(4) Weigh the bag of lead shot "W."

(5) Multiply the weight of the bag and shot by the figure obtained in (3).

(6) Subtract the value obtained in (5) from the required nose heavy balance for the surface.

(7) Divide this figure by the given distance from the hinge line to the leading edge balance weights. *(See figures 9 and 10.)*

(8) The value obtained from (7) represents the additional weight required to statically balance the surface.

(9) Divide the figure representing the additional weight required (from (8)) by the total balance weight required for the surface *(figures 9 and 10)* to obtain the amount of weight to be added to each pound of weight in each bay of the surface.

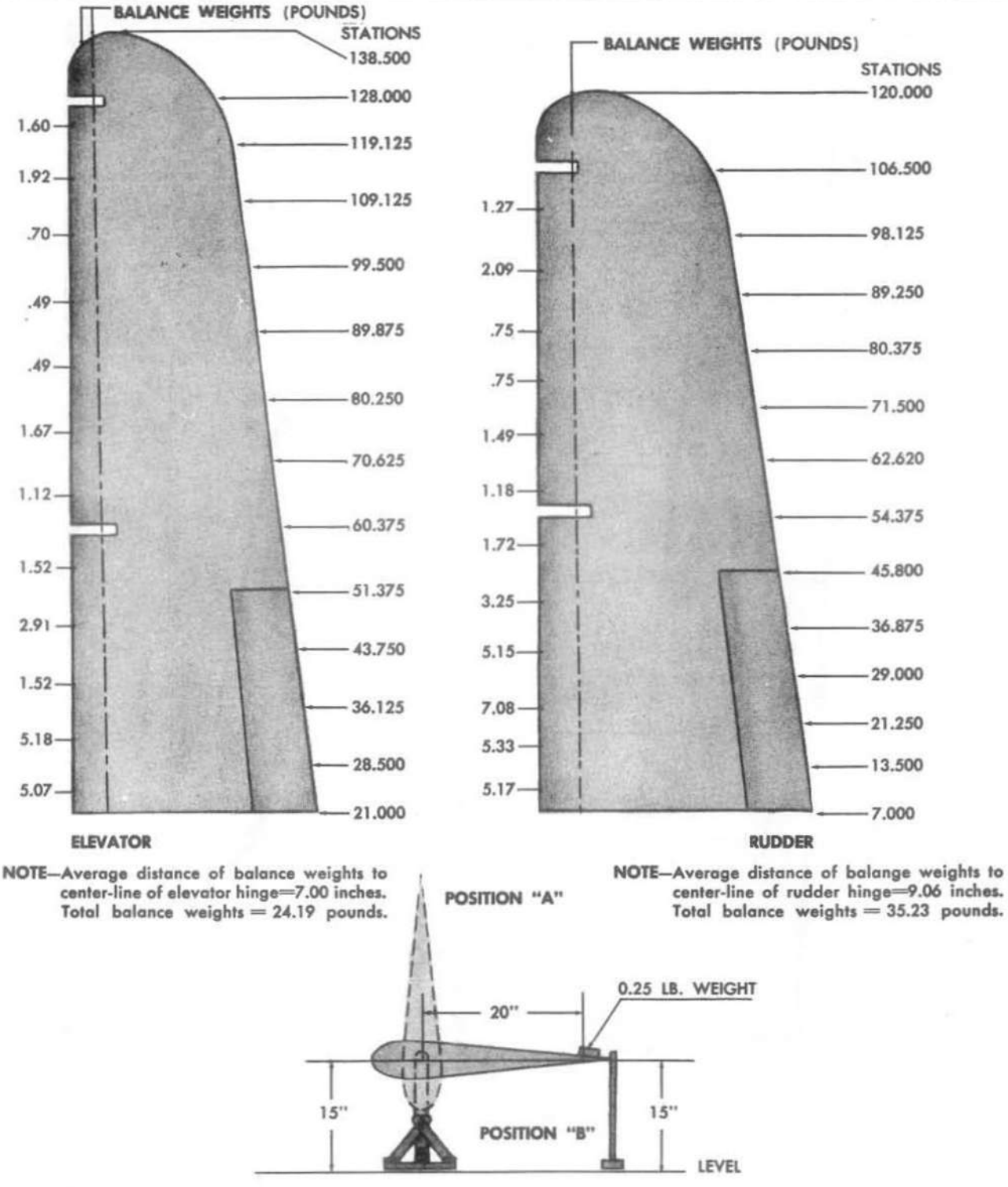


Figure 9—Static and Dynamic Balance of Elevator and Rudder

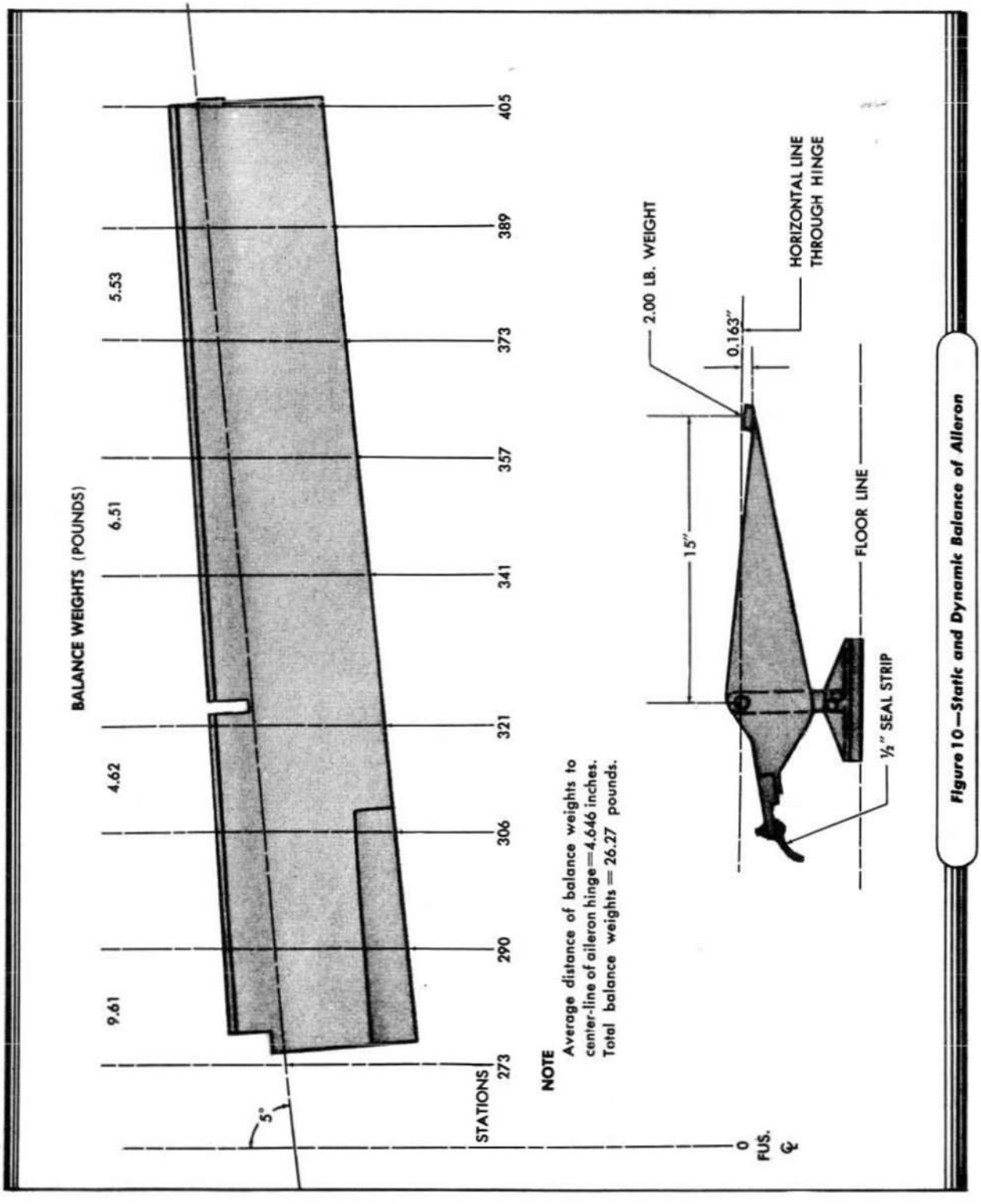


Figure 10—Static and Dynamic Balance of Aileron

SECTION II Wing Group

1. WING.

a. DESCRIPTION. – The wing is a full cantilever all metal structure. It is made up of spars, ribs and skin. Two spars extend the full length of each main wing panel. They are constructed of dural sheet web and extruded dural spar caps. The wing ribs form the airfoil of the wing and provide attaching points for the skin. The ribs are constructed of a dural sheet web, reinforced with formed or extruded dural caps. The skin is constructed of alclad sheet stiffened with chordwise dural hat sections.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. GENERAL REPAIR PROCEDURE. – Before any repairs are made to the main wing structure, supports must be placed under the wing to maintain the alignment dimensions specified on figure 4; this will prevent causing a permanent set in the wing after the repair is made. It is suggested that several measuring points be selected adjacent to the damage to be used to locate the repair material during the repair procedure. Repairs made to the leading edge must be flush and must fair with the original contour since any disturbances in this section of the airfoil will seriously affect the aerodynamic characteristics of the wing. On the center section and trailing edge of the wing external patching may be used when a flush patch would not be practical.

c. WING LEADING EDGE CONSTRUCTION. – The leading edge of the wing is considered to be that section of airfoil forward of the front spar. It is fabricated in three parts, namely: armor plate removable section, oil cooler removable section and a fixed section. The armor plate section on early airplanes *(figure 13)* is made of three-eighths inch dural plate. It is located between wing stations 32 and 84 and is attached by flush head bolts. Later airplanes have the armor plate installed internally with conventional dural outer skin. The oil cooler section *(figure 16)* is a riveted and spot welded assembly constructed of formed alclad sheet heat treated to 24 ST. It is located between wing stations 143 and 179 and is attached by flush head bolts. The fixed section *(figure 12)* is located between wing stations 180 and 405. It is constructed of alclad sheet reinforced with chordwise hat section formers which are spaced approximately five inches on center. Access for repairs to this section may be made through hand holes provided on the lower wing surface.

(1) NEGLIGIBLE DAMAGE.

(a) Smooth dents in the skin that show no signs of cracks or abrasions may be considered negligible. Smooth isolated holes in the skin up to one inch in diameter need not be repaired structurally; however, they should be covered with a doped fabric patch to maintain the aerodynamic characteristics of the wing. The procedure to be used in the application of this patch is as follows:

1. A pinked edge fabric patch should be cut large enough to extend at least one inch past the edges of the hole.

2. Remove the existing paint around the damaged area and apply a coat of clear nitrate dope.

3. Saturate the fabric patch with dope and place it over the hole with the warp of the fabric parallel to the line of flight. Rub the patch down with the fingers to remove bubbles and excess dope. Let dry.

4. Apply four coats of dope to the patch, allowing each coat to thoroughly dry. Smooth the surface of each coat with fine sandpaper.

5. When the last coat is dry, apply a finish coat to match the existing surface color.

(b) Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the armor plate section which can be repaired by patching is shown on figure 14. The repairs shown for the hole are to be used when the damage is not larger than ten inches spanwise or four inches chordwise. The repairs shown for the cracks are to be used when the damage is greater than two inches in length. One eighth inch stop holes are drilled at each end of the cracks to prevent their lengthening. Patches constructed of three-eighths inch dural plate are attached to the underside of these damages by one-quarter inch flush head bolts. To maintain the aerodynamic characteristics of the wing, a filler is inserted to replace the lost material.

b. Damage to the fixed section which can be repaired by patching is shown on figure 21. These repairs are accomplished by using patches constructed of the same gage and material as the existing skin. The patches are attached chordwise by two rows of rivets and spanwise by one row. A filler of the same gage and material as the existing skin is inserted to replace the lost material. One-eighth inch stop holes are drilled at each end of the cracks to prevent their lengthening.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION. – When the damage is so large that repair by patching is no longer practical, repairs may be accomplished by either splicing or insertion.

(a) Damage to the armor plate section which can be repaired by insertion is shown on figure 15. The damaged area is trimmed smooth and splice doublers constructed of three-eighths inch dural plates are placed along each side of the cutout. They are attached by two rows of one-quarter inch flush head bolts. An insert constructed of three-eighths inch dural plate is formed to fit into the cutout. It is attached to the splice doublers by two rows of one-quarter inch flush head bolts.

(b) Damage to the oil cooler section which can be repaired by splicing and insertion is shown on figures 17, 18 and 19. Figure 19 shows the repair of damage to the skin by insertion. The damaged area is trimmed smooth and a splice plate constructed of the same gage and material as the skin is placed along the underside of the cutout. It is attached along each side by two rows of rivets. A filler of the same gage and material as the skin is attached to the splice doubler to maintain the aerodynamic characteristics of the wing. Figure 17 shows the repair of damage to the oil cooler section channel. Splice plates are formed to fit into the inside of the channel where they are attached by two rows of rivets. Fillers are used where necessary to replace the lost material. Figure 18 shows the repair of damage to the oil cooler section skin doubler. Splice plates are formed to fit into the doubler channels and are attached by rivets making use of the original rivet holes.

c. Damage to the fixed section which can be repaired by splicing is shown on figure 22. The damaged area is cut out and an insert and two splice doublers are constructed for the repair. The splice doublers are attached to the inner surface of the skin along each side of the cutout by two rows of rivets. The gage of the splice doublers should equal the gage of the nose doubler at the location of the repair. The insert is attached to the splice doublers by two rows of rivets.

(4) DAMAGE NECESSITATING REPLACEMENT. – No repairs have been shown for the armor plate section doubler or the fixed section formers. It is recommended that they be replaced since their repair is not practical.

d. WING CENTER SECTION CONSTRUCTION. – The center section of the wing is made up of spars, ribs and skin. The two spar structures (front and rear) consist of a dural sheet web and extruded dural caps. These caps are constructed to incorporate fittings that attach the wing to the fuselage. They extend as one piece from the fuselage attaching points to wing station

335. At this point a different section of cap is spliced to the main section and extends to station 405. The center section rib structures incorporate a sheet web and extruded or formed sheet caps. These caps are placed along the upper and lower edges of the rib and provide attachment for the skin. The center wing skin is constructed of alclad sheet provided with chordwise expansion joints. These expansion joints are provided to prevent the skin from buckling when the wing is subjected to extreme loads. Chordwise hat section stiffeners are placed side by side throughout the entire length of the center section. These stiffeners are riveted to the skin and to skin doublers placed spanwise along the forward and aft edges of the skin plate.

(1) NEGLIGIBLE DAMAGE. – Negligible damage to the wing center section skin may be considered the same as that outlined for the wing leading edge. Inboard of station 360, no damage to the spar cap can be considered negligible. Outboard of station 360, slight damage such as small holes, nicks or cracks no more than one-quarter inch in width and one-half inch in length may be neglected after being smoothed up. Holes in the rib webs that may be cleaned up to not more than one inch in diameter and cracks up to one inch in length which have had one-eighth inch stop holes drilled at each end, need not be repaired to any greater extent. Damage to the rib caps to be considered negligible, must be no larger than the dimensions specified in the following table and must not come within two diameters of any rivet or six inches of any other damage.

Wing Sta. No.	*Rib Upper Caps Dia. or Depth*	*Rib Lower Caps Dia. or Depth*
32	¼	¼
84	½	⅛
140	½	½
181	⅛	⅛
205	¼	½
241	½	½
273	¼	¼
314	½	½
325	½	½
405	⅛	⅛
84 to 140 spanwise	⅛	⅛

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) The center section skin may be repaired in approximately the same manner as that of the leading edge. Cracks that are over two inches in length and holes that are larger than one inch in diameter are repaired by patching. When necessary, external patches may be used in this section providing their edges are beveled to prevent unnecessary aerodynamic drag. The repairs shown on figures 27, 28, and 29 may be used with the rivet tables given on figure 26 for the repair of the skin in any area.

(b) Damage to the spar webs which can be repaired by patching is shown on figure 30. The rivets to be used for repair in different locations are specified in the tables shown on this figure.

(c) Damage to the wing center section rib caps which can be repaired by patching is shown on figures 36 and 37. The repair shown on figure 36 is to be used for damage that is no larger than three inches in length and not extending into a radius. A plate type patch constructed of dural is attached to the rib cap lip by means of rivets. The repair shown on figure 37 is to be used for damage extending into a radius of greater than three inches in length. An angle type patch constructed of dural plate is used in this repair. Its thickness should equal the thickness of the cap lip in the location of the repair.

(d) Damage to the rib webs which can be repaired by patching is shown on figure 35. Figure 35 shows the repair for damage up to five inches in diameter. A patch constructed of material one gauge heavier than the web is attached by two rows of rivets. The table shown specifies the rivets to be used for the repair of damage at different locations.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

(a) Damage to the hat section skin stiffeners which can be repaired by splicing and insertion is shown on figures 46 and 47. This splice repair may be used when damage is not greater than five inches in length. When damage exceeds five inches in length it must be repaired by insertion. The insertion is accomplished by replacing the damaged area with a new piece of hat section. Attachment is made at each end using a splice patch.

(b) Damage to the wing center section rib webs and cap which can be repaired by splicing and insertion is shown on figures 38 and 39. Figure 38 shows the repair of a complete break in the webs and caps that exceeds three inches in length. The damaged area is trimmed and two splice doublers are attached to each side of the web cutout by two rows of rivets. An insert constructed from the same gage and material as the web is fitted into the cutout and attached to the splice doublers. The caps are repaired by the use of splice angles constructed from dural plate one gage heavier than the caps. The rivets used for the attachment of these splice angles is selected from the table shown. Figure 39 shows the repair of a complete break in the caps not exceeding three inches in length and damage in the webs through a lightening hole. The damaged area is trimmed smooth and fillers are inserted where necessary to provide for attaching parts. The caps are repaired by the use of .128 dural plates which are attached by rivets selected from the table shown. The web is repaired by the use of a patch plate constructed from dural sheet one gage heavier than the web. When the lightening hole is not needed, it is attached to cover the hole and the strength lost in the removal of the lightening hole flange is replaced by the use of two five-eighths by five-eighths inch bulb angles. When it is necessary to retain the lightening hole, a hole is cut through the patch and the edges are boxed off by the use of five-eighths by five-eighths inch bulb angles.

(c) Ribs which cannot be repaired from the information given on the figures referred to in the paragraph above, are shown repaired by splicing on figures 40, 42, 43 and 44. Figure 40, sheet 1, shows the repair of a complete break in the angle type rib cap and partial damage in the rib web. Fillers are used in replacing the lost material to provide for the attachment of the wing skin and web patch. Splice plates constructed of dural are attached to the lip and fin. The splice plate used in the repair of the lip is filed to fit into the radius. This repair may be used for the repair of damage up to three inches in length. The repair shown on figure 40, sheet 2, is the repair of a complete break in the angle type cap exceeding three inches in length. The splice plates used for the repair of damage not exceeding three inches in length are substituted by a splice angle. This angle is constructed of dural plate the same thickness as the rib cap and heat treated to 24ST after being formed. The repair shown on figure 42 is the repair of the tee shaped caps at station 32. Angles constructed from .125 dural plate are used to make this repair. Figure 43 shows the repair of damage to the hat section rib cap at station 325. Bent up sheet splice doublers are used to make this repair. Figure 44 shows the repair of a complete break in the rib at station 404. The flange of the lightening hole is removed and a splice doubler is attached to the web by two rows of rivets at each edge. Two five-eighths by five-eighths inch bulb angles are attached to the splice doubler to replace the strength lost in the removal of the lightening hole flange.

(4) DAMAGE NECESSITATING REPLACEMENT. – No repairs have been shown for the spar cap body between wing stations 32 and 314 since any damage in this area will be cause for the replacement of the entire spar cap.

e. WING TRAILING EDGE CONSTRUCTION. – The trailing edge of the wing *(figure 12)* is that section of airfoil aft of the rear spar. It extends from wing station 37.5 to 89.5 and from 141.8 to 405. The structure consists of skin plating reinforced with formed sheet ribs. Fairing doors provided for the flaps are attached by piano hinges to the lower surface of the trailing edge and extend from wing station 37.5 to 89.4 and from 146 to 268.5.

(1) NEGLIGIBLE DAMAGE. – Smooth holes in the skin up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the skin which can be repaired by patching is shown on figure 52. One-eighth inch stop holes are drilled at each end of the crack and the damaged material around the hole is trimmed smooth. Patches constructed from alclad sheet one gage heavier than the skin are attached by rivets to the inner surface.

(b) The lower fixed skin and the flap fairing door are shown repaired by surface patches on figures 49 and 53. The fixed skin is repaired with a patch and filler of the same gage as the existing material. The filler is provided as a spacer for the attaching parts. The damage shown in the flap fairing door is repaired with surface patches and requires no filler.

(3) DAMAGE REPAIRABLE BY SPLICING.

(a) Damage to the trailing edge skin larger than eight inches in diameter is shown repaired by splicing on figure 51. The damaged area is trimmed leaving a cutout between the trailing edge extrusion and the spar cap. A splice doubler of the same gage as the skin is placed along the inside surface. It is attached to the under side of the spar lip, along each side of the cutout and to the under side of the trailing edge extrusion. A filler is placed in the cutout and attached to the splice doubler to fair in the repair.

(b) The rib channel is repaired with a splice channel and filler. The splice channel is made from the same gage and material as the rib channel, and is formed to fit along the inside surface. The filler is used as a spacer for the attaching parts.

(4) DAMAGE NECESSITATING REPLACEMENT. – No repairs have been shown for damage to the trailing edge extrusion, the flap fairing door hinge, or the trailing edge ribs. It is recommended that they be replaced if damaged.

2. FLAPS.

a. DESCRIPTION. – The flaps form the rear portion of the wing airfoil and are provided to give increased lift and drag. They are placed two in each wing where they are attached to hinge brackets located on the aft face of the rear spar. The inboard flap extends from wing station 37.5 to 89.4 and the outboard flap extends from wing station 141.8 to 272.6.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. CONSTRUCTION. – The two flaps are of the same type construction, each including a spar, ribs, trailing edge, skin plating and longitudinal stiffeners. The spar extends the entire length of the flap and is constructed of extruded dural channel. It is provided with lightening holes and attaching points for the hinge brackets and ribs. The nose ribs attach to the forward face of the spar and are constructed of formed dural sheet. They form the contour of the nose section, and are reinforced with longitudinal hat section stiffeners. The trailing edge ribs are constructed of formed dural sheet and extend aft from the spar to the trailing edge extrusion. The skin is made from alclad and is attached to the ribs, spar and longitudinal stiffeners.

(1) NEGLIGIBLE DAMAGE. – Smooth holes in the skin up to one inch in diameter and dents that shown no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the flap spar lips which may be repaired by patching is shown on figures 60 and 62. A plate type patch is used in the repair of the spar cap lip where the damage is not larger than three inches in length and not extending into a radius. The plate is made from dural the same gage as the lip. An angle type patch is used where damage exceeds that specified above for the plate type patch. The angle is constructed of dural sheet the same gage as the spar and heat treated to 24 ST after being formed. Damage to the spar web which may be repaired by patching is shown on figure 59. The patch is made from dural plate and is attached to the web by rivets.

(b) Damage to the ribs which may be repaired by patching is shown on figure 62. An angle type patch constructed of .051 dural plate is used for this repair. A filler is used in replacing the lost material to provide for the attachment of the skin.

(c) Damage to the longitudinal stiffener lips which can be repaired by patching is shown on figure 59. An angle type patch constructed of .040 dural plate is used for this repair. A filler is used in replacing the lost material to provide for the attachment of the skin.

(d) Damage to the longitudinal stiffeners which can be repaired by patching is shown on figure 57. Bent up dural sheet of the next heavier gage than the stiffeners is used to make this repair.

(e) The repair of cracks in the skin over two inches in length is shown on figure 57. A surface patch is used for this repair. The repair of holes in the skin is given in the following, along with the repair of the spar by splicing.

(3) DAMAGE REPAIRABLE BY SPLICING.

(a) Damage to the spar which can be repaired by splicing is shown on figure 61. A bent up sheet splice channel constructed from .156 dural is attached to the back side of the spar forming an "I" section. It is formed in the 24SO condition and heat treated to 24ST. A hole in the skin is shown repaired by inserting a patch of the next heavier gage material than the skin between the spar and the skin. The lost material is replaced with fillers.

(b) Damage to the longitudinal hat section stiffeners which may be repaired by splicing is shown on figure 58. Two methods may be used in this repair.

(4) DAMAGE NECESSITATING REPLACEMENT.

(a) Where a complete break in the spar exceeds ten inches in length the spar must be replaced.

(b) Where damage in a rib extends over one-half of the cross sectional area the rib must be replaced.

(c) Where damage in the trailing edge extrusion is larger than one-half inch in diameter the extrusion must be replaced.

3. AILERONS.

a. DESCRIPTION. – The ailerons are statically and dynamically balanced, fabric covered aluminum structures. They are attached to hinge brackets located on the aft face of the rear wing spars, and extend from wing station 273 to station 405.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. CONSTRUCTION. – The two ailerons are of the same type construction each including a spar, ribs, closing channel, trailing edge and counterbalance weights. The spar makes up the main longitudinal strength and provides for the attachment of the ribs. The ribs are placed chordwise and are spaced intermittently through the entire length of the aileron. The closing channel provides for the attachment of the trim tab which is located between wing stations 273 and 306. The trailing edge extends from wing stations 306 to 405. It is constructed of flattened aluminum tubing, and is attached to the aft end of the ribs. The counterbalance weights are located in the leading edge. They are placed between the nose ribs and extend the entire length of the aileron.

(1) NEGLIGIBLE DAMAGE. – Cracks up to one inch in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the spar which can be repaired by patching is shown on figures 68, 69 and 70. The repair of damage in the spar lip which is no greater than three inches in length and not extending into a radius is accomplished by the use of a splice bar. The repair of damage greater than this can be accomplished by the use of an angle type patch. The angle is attached to the lip and web, and is constructed of one-eighth inch C.M. steel plate heat treated to 125,000 psi after being formed. An angle constructed of .187 aluminum plate heat treated to 24 ST after being formed may be used as an alternate. The spar web is repaired by the use of a plate patch constructed of .040 dural sheet.

(b) Damage to the nose skin which can be repaired by patching is shown on figure 71. This patch must be kept flush and include a filler to prevent the covering fabric from fraying on the sharp edges of the hole.

(3) DAMAGE REPAIRABLE BY SPLICING. — Damage to the trailing edge which can be repaired by splicing is shown on figure 66. The damaged material is removed and a splice bar is formed to fit into the inside of the tube. A filler is used to replace the lost material and provide a smooth surface for the covering fabric.

(4) DAMAGE NECESSITATING REPLACEMENT. — Damage to the spar which is larger than ten inches in length will be cause for the replacement of the entire part. Ribs must be replaced when damaged.

NOTE

After repairs have been made to any of the movable surfaces, they must be rebalanced. Refer to paragraph 4, Section I. Fabric repair and covering procedure is given in Section VII.

(5) WARPAGE IN HINGE ALIGNMENT NECESSITATING REPLACEMENT.

(a) The permissible allowable warpage of the three aileron hinges shall not exceed ±1/8 inch in the horizontal dimension and/or ±1/4 inch in the vertical dimension.

(b) Horizontally warped ailerons that exceed the permissible 1/8 inch limit may be corrected by the use of shims under the misaligned hinge supports. Warped ailerons, requiring shims of a total thickness greater than 1/8 inch under any one hinge support to bring it within the permitted 1/8 inch limit, shall be condemned.

(c) Ailerons warped vertically in excess of the permissible 1/4 inch shall be rebuilt or condemned, depending on the severity of the warpage.

(6) REPAIR OF AILERON COUNTERWEIGHTS. When elongated or improperly located holes occur, the following method of repair shall be used:

(a) Heli-arc welding will be the only acceptable welding method, as ordinary methods of welding have a tendency to heat and warp the contour of the counterweights.

(b) Holes will be countersunk at top and bottom to permit more efficient filling and weld adhesion.

(c) When more than one hole is to be welded in the length of the counterweight, the heat of welding will be alternated to prevent warpage.

(d) Heat treating, annealing and dressing of the weld area will be accomplished after welding.

(e) Upon installation, the counterweights will be drilled to pick up existing holes in attaching parts.

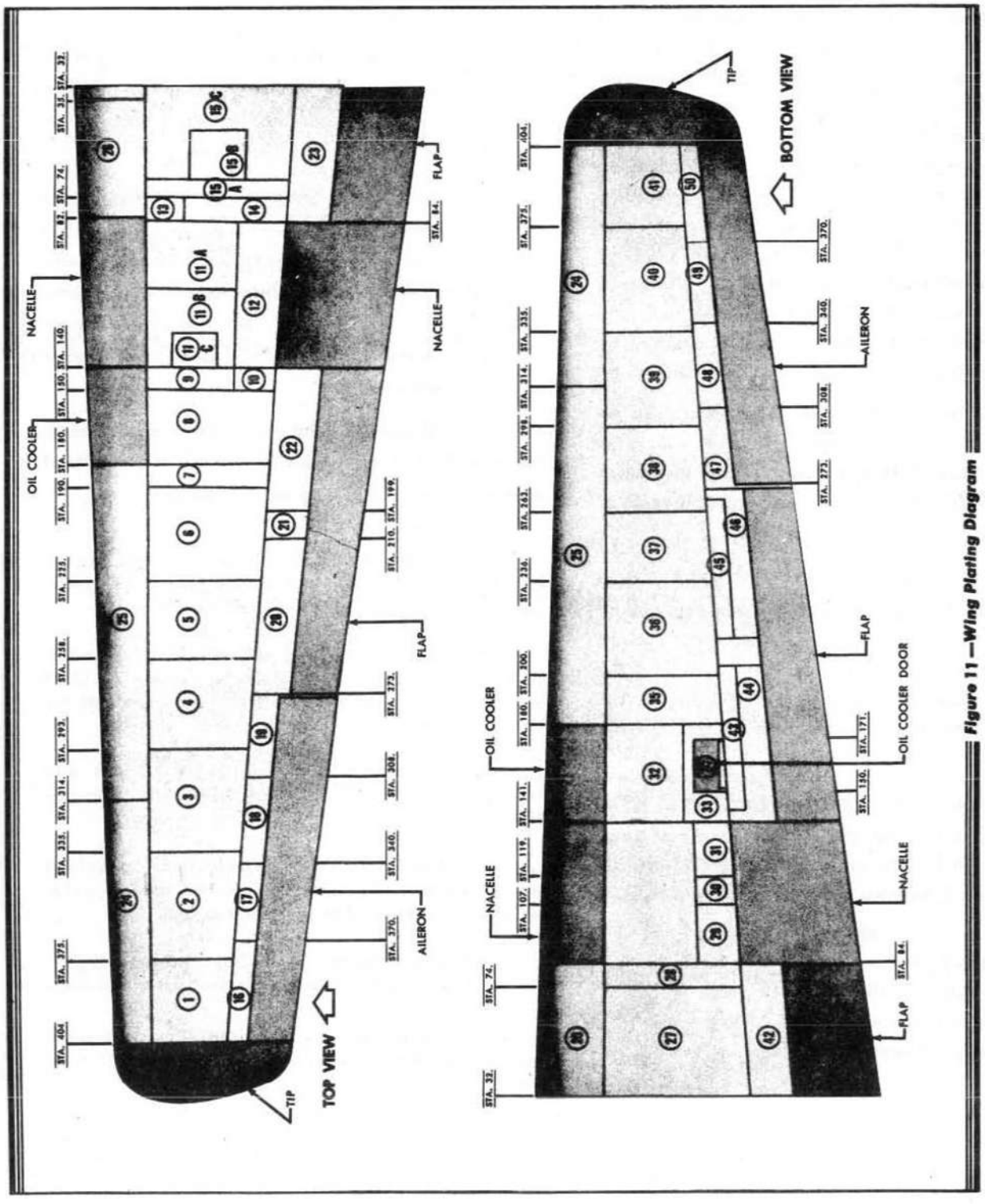


Figure 11—Wing Plating Diagram

KEY TO FIGURE 11

MATERIAL LIST OF WING PLATING *(Topside View)*

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	Station to Station Points	Douglas Part Number	Size	Material	Gage	Spanwise Rivets	Attachment Location	Chordwise Rivets	Attachment Location
1	404.938 375	5190543-2 L.H. 5190543-3 R.H.	30½x31	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
2	375 375	5190543-362 L.H. 5190543-363 R.H.	33¾x40½	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
3	335 293	5190544-4 L.H. 5190544-5 R.H.	37x42½	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD5 @ 1" on Center	
4	293 258	5190544-512 L.H. 5190544-513 R.H.	35¼x39½	24ST	.040	1 Row AN426 AD5 @ ¾" on Center		1 Row AN426 AD5 @ 1" on Center	
5	258 225	5190545-8 L.H. 5190545-9 R.H.	37⅜x39	24ST	.051	1 Row AN426 AD5 @ ¾" on Center		1 Row AN426 AD5 @ 1" on Center	
6	225 190.5	5190545-370 L.H. 5190545-371 R.H.	30½x42	24ST	.051	1 Row AN426 AD5 @ ¾" on Center		1 Row AN426 AD5 @ 1" on Center	
7	190.5 180.86	5190545-24 L.H. 5190545-25 R.H.	9⅞x42	24ST	.051	1 Row AN426 AD5 @ ¾" on Center		1 Row AN426 AD5 @ 1" on Center 2 Rows AN426 AD6 @ 1" on Center	Sta. 190 Sta. 180
8	180.86	5190529-12 L.H.	30½x41	24ST	.051	1 Row AN426 AD5 @ 29/32" on Center		2 Rows AN426 AD6 @ 1¾" on Center	Sta. 180
	150.25	5190529-13 R.H.				1 Row AN426 AD6 @ 2½" on Center		1 Row AN426 AD6 @ 1" on Center	Sta. 150
9	150.25	5190529-250 L.H.	10x27⅜	24ST	.051	1 Row AN426 AD5 @ 29/32" on Center		1 Row AN426 AD6 @ 1" on Center	Sta. 150
	140.86	5190529-251 R.H.				1 Row AN426 AD6 @ 2½" on Center		2 Rows AN426 AD6 @ 11/16" on Center	Sta. 141
10	150.25 140.86	5190529-10 L.H. 5190529-11 R.H.	10x19		.051	1 Row #10 Screws @ ¾" on Center		1 Row #10 Screws @ ¾" on Center	
11	140.86 84.86	5190527	Removable	Panel		1 Row ¼" Screws @ 1" on Center		1 Row ¼" Screws @ ¾" on Center	
11A	84.86 107.84	5190527-272 L.H. 5190527-273 R.H.	23x53	24ST	.072	2 Rows AN426 AD6 @ 1 13/16" on Center		2 Rows AN426 AD6 @ ¾" on Center 1 Row AN426 AD5 @ 1½" on Center	Sta. 84 Sta. 107

KEY TO FIGURE 11 (Continued)

Ref. No.	Station to Station Points	Douglas Part Number	Size	Material	Gage	Spanwise Rivets	Attachment Location	Chordwise Rivets	Attachment Location
11B	107.84 140.86	5190527-8 L.H. 5190527-9 R.H.	34½x35	24ST	.012	2 Rows AN426 AD6 @ 1 13/16" on Center	Sta. 107- 124	1 Row AN426 AD6 @ ⅞" on Center	Sta. 124
						2 Rows AN426 AD6 @ 2¾" on Center	Sta. 124- 140	¼" Screws @ ¾" on Center	Sta. 140
11C	140.86 125	5190527-318 L.H. 5190527-319 R.H.	16x22	24ST	.064	¼" Screws @ ⅞" on Center		¼" Screws @ ⅞" on Center	
12	140.86 84.86	5190528-6 L.H. 5190528-7 R.H.	15x57	24ST	.072	2 Rows AN426 AD6 @ 13/16" on Center		1 Row ¼" Screws @ ¾" on Center	Thru Doubler
								2 Rows AN426 AD6 @ ⅞" on Center	Only
13	84.86 74.3	5153005-238 L.H. 5153005-329 R.H.	9¼x11	24ST	.125	1 Row ¼" Screws @ 1" on Center		2 Rows AN426 AD8 @ ⅞" on Center	
14	84.86 74.3	5153005-4 L.H. 5153005-5 R.H.	11x52	24ST	.125	1 Row ¼" Screws @ 1" on Center		2 Rows AN426 AD8 @ ⅞" on Center	
15	74.3 32	5190511	Panel	Assembly		1 Row ¼" Screws @ 1" on Center		1 Row ¼" Screws @ 1" on Center	
15A	74.3 66.35	5190511-268 L.H. 5190511-269 R.H.	8½x50	24ST	.091	1 Row AN426 DD8 @ 1¼" on Center		1 Row AN426 DD6 @ 9/16" on Center	Sta. 74
								1 Row AN426 DD8 @ ¾" on Center	Sta. 67
15B	66.375 50	5190511-300 L.H. 5190511-301 R.H.	15½x22	24ST	.125	1 Row ¼" Screws @ ¾" on Center		1 Row ¼" Screws @ ¾" on Center	
15C	66.375 33	5190511-2 L.H. 5190511-3 R.H.	39x55	24ST	.091	1 Row AN426 DD6 @ ½" on Center		1 Row AN426 DD @ 1" on Center	Sta. 40
						1 Row AN426 DD6 @ ½" on Center		1 Row AN426 AD8 @ ¾" on Center	Sta. 66.375
16	404.938 370	5190540-672 L.H. 5190540-673 R.H.	8¼x36	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
17	370 340	5190540-670 L.H. 5190540-671 R.H.	9x31	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
18	340 308.5	5190540-668 L.H. 5190540-669 R.H.	10x33	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
19	308.5 273	5190540-6 L.H. 5190540-7 R.H.	11x36½	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
20	273 210.2	5155387-62 L.H. 5155387-63 R.H.	66x17½	24ST	.040	1 Row AN426 AD4 @ ¾" on Center		1 Row AN426 AD4 @ ¾" on Center	

KEY TO FIGURE 11 (Continued)

Ref. No.	Station to Station Points	Douglas Part Number	Size	Material	Gage	Spanwise Rivets	Attachment Location	Chordwise Rivets	Attachment Location
21	210.2 199	5155387-60 L.H. 5155387-61 R.H.	11x18	24ST	.040	1 Row AN426 AD4 @ 3/4" on Center		1 Row AN426 AD4 @ 3/4" on Center	
22	199 140	5155387-2 L.H. 5155387-3 R.H.	18½x62	24ST	.040	1 Row AN426 AD4 @ 3/4" on Center		1 Row AN426 AD4 @ 3/4" on Center	
23	84.86 32	5155381-18 L.H. 5155381-19 R.H.	21x57	24ST	.040	1 Row AN426 AD4 @ 3/4" on Center		1 Row AN426 AD4 @ 3/4" on Center	
24	404.938 314	5190541-564 L.H. 5190541-565 R.H.	40x92	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
25	314 180.86	5190542-10 L.H. 5190542-11 R.H.	42x135	24ST	.040	1 Row AN426 AD5 @ 3/4" on Center		1 Row AN426 AD5 @ 3/4" on Center	
26	82.86 35.86	5153009 L.H. 5153009-1 R.H.	50x54	24ST	.375	#10 Screws @ 8" on Center		1 Row AN426 AD4 @ 1¼" on Center	

MATERIAL LIST OF WING PLATING *(Bottomside View)*

24	404.938 314	5195041-564 L.H. 5195041-565 R.H.	40x92	24ST	.040	1 Row AN466 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
25	314 180.86	5195042-10 L.H. 5195042-11 R.H.	42x135	24ST	.040	1 Row AN426 AD5 @ 3/4" on Center		1 Row AN426 AD5 @ 3/4" on Center	
26	82.86 35.86	5153009 L.H. 5153009-1 R.H.	50x54	24ST	.375	#10 Screws @ 8" on Center		1 Row AN426 AD4 @ 1¼" on Center	
27	32 74.3	5190530-14 L.H. 5190530-15 R.H.	55x56	24ST	.091	¼" Screws @ 11/16" on Center		2 Rows AN426 AD8 @ 1" on Center 1 Row AN426 AD6 @ 1½" on Center 1 Row AN426 AD6 @ 1½" on Center	Sta. 32 Thru Doubler Only Sta. 75
28	74.3 84.86	5153005-80 L.H.	2½x23	24ST	.091	¼" Screws @ 11/16" on Center		1 Row AN426 AD6 @ 1½" on Center ¼" Screws @ 2 1/32" on Center 2 Rows ¼" Screws @ 3/4" on Center	Sta. 75 Fwd. Panel 30 At Panel 30
29	84.86 107.448	5192569-16 L.H. 5192569-17 R.H.	25x26¼	24SO 24ST	.091	2 Rows AN426 AD6 @ 9/16" on Center		2 Rows ¼" Screws @ 3/4" on Center 1 Row AN426 AD5 @ 7/8" on Center	Sta. 85 Sta. 107

KEY TO FIGURE 11 (Continued)

Ref. No.	Station to Station Points	Douglas Part Number	Size	Material	Gage	Spanwise Rivets	Attachment Location	Chordwise Rivets	Attachment Location
30	107.448 119.227	5190531-18 L.H.	14x15	24ST	.040	2 Rows AN426 AD5 @ 1" on Center		1 Row AN426 AD5 @ 7/8" on Center	Sta. 107
								1 Row AN426 AD5 @ 5/8" on Center	Sta. 119
31	119.227 141	5192570-20 L.H. 5192570-22 R.H.	21½x65	24SO 24ST	.081	2 Rows AN426 AD6 @ 5/8" on Center		1 Row AN426 AD6 @ 5/8" on Center	Sta. 119
								1 Row AN426 AD6 @ 1 3/16" on Center	Sta. 141
32	141 180.86	5190532-24 L.H. 5190532-25 R.H.	27x39	24ST	.051	#10 Screws @ 1⅜" on Center	Fwd. End	#10 Screws @ 1½" on Center	Sta. 141
								1 Row AN426 AD6 @ ¾" on Center	Thru Doubler Only
32	141 180.86	5190532-24 L.H. 5190532-25 R.H.	27x39	24ST	.051	#10 Screws @ 1" on Center	Aft End	#10 Screws @ ¾" on Center	Sta. 180
						1 Row AN426 AD6 @ 1¼" on Center		2 Rows AN426 AD6 @ 7/8" on Center	Thru Doubler Only
						1 Row AN426 AD6 @ 13/16" on Center	Aft End	1 Row AN426 AD6 @ 7/8" on Center	Sta. 181
33	141 180.86	5192570-22 L.H. 5192570-23 R.H.	19½x39½	24ST	.051	1 Row AN426 AD5 @ 13/16" on Center	Fwd. End	1 Row AN426 AD6 @ 1 3/16" on Center	Sta. 141
						1 Row AN426 AD5 # 11/16" on Center		1 Row AN426 AD6 @ 5/8" on Center	
34	150 171.348	5153005-296 L.H.	4½	24ST	.125	1 Row AN426 AD6 @ 13/16" on Center			
35	180.86 200.2	5190539-1072 L.H. 5190539-1073 R.H.	21½x42	24ST	.051	1 Row AN426 AD6 @ ¾" on Center	Fwd.	2 Rows AN426 AD6 @ 11/16" on Center	Sta. 181
						1 Row AN426 AD4 @ ¾" on Center	Aft	1 Row AN426 AD5 @ 7/8" on Center	Sta. 200
36	200 236	5190539-1070 L.H. 5190539-1071 R.H.	36¼x42	24ST	.051	1 Row AN426 AD6 @ ¾" on Center	Fwd.	1 Row AN426 AD5 @ 7/8" on Center	
						1 Row AN426 AD4 @ ¾" on Center	Aft		
37	236 263	5190539-1068 5190539-1069	27½x39	24ST	.051	1 Row AN426 AD6 @ ¾" on Center	Fwd.	1 Row AN426 AD5 @ 7/8" on Center	
						1 Row AN426 AD4 @ ¾" on Center	Aft		

KEY TO FIGURE 11 (Continued)

Ref. No.	Station to Station Points	Douglas Part Number	Size	Material	Gage	Spanwise Rivets	Attachment Location	Chordwise Rivets	Attachment Location
38	263 298	5190538-1064 L.H. 5190538-1065 R.H.	35x38	24ST	.040	1 Row AN426 AD5 @ 1" on Center		1 Row AN426 AD5 @ 7/8" on Center 1 Row AN426 AD4 @ 1" on Center	Sta. 263 Sta. 298
39	298 335	5190538-18 L.H. 5190538-19 R.H.	36x37½	24ST	.040	1 Row AN426 AD4 @ ¾" on Center		1 Row AN426 AD4 @ 1" on Center	
40	335 375	5190537-16 L.H. 5190537-17 R.H.	33x40½	24ST	.040	1 Row AN426 AD4 @ ¾" on Center		1 Row AN426 AD4 @ 1" on Center	
41	375 404.938	5190537-14 L.H. 5190537-15 R.H.	30½x30½	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
42	32 84.86	5155381-30 L.H. 5155381-31 R.H.	5½x45	24ST	.040	1 Row AN426 AD4 @ 1" on Center		1 Row AN426 AD4 @ 1" on Center	
43	278. 200.70	5155387-22 L.H. 5155387-23 R.H.	4¾x60½	24ST	.020	1 Row AN426 AD3 @ ½" on Center			
44	273 200.70	5155387-6 L.H. 5155387-7 R.H.	2¾x62¾	24ST	.040	2 Rows AN426 AD4 @ 1½" on Center			
45	199.539 145.1	5155387-24 L.H. 5155387-25 R.H.	4¾x55	24ST	.020	1 Row AN426 AD3 @ ½" on Center			
46	200.539 145.1	5155387-8 L.H. 5155387-9 R.H.	3½x58	24ST	.040	2 Rows AN426 AD4 @ 1½" on Center			
47	273 308.5	5190536-666 L.H. 5190536-667 R.H.	10x36	24ST	.040	1 Row AN426 AD4 @ 1½" on Center		1 Row AN426 AD4 @ 1" on Center	
48	308.5 304	5190536-676 L.H. 5190536-677 R.H.	9x32½	24ST	.040	1 Row AN426 AD4 @ 1½" on Center		1 Row AN426 AD4 @ 1" on Center	
49	304 370	5190536-674 L.H. 5190536-675 R.H.	8½x31	24ST	.040	1 Row AN426 AD4 @ 1½" on Center		1 Row AN426 AD4 @ 1" on Center	
50	370 404.938	5190536-366 L.H. 5190536-367 R.H.	8x36	24ST	.040	1 Row AN426 AD4 @ 1½" on Center		1 Row AN426 AD4 @ 1" on Center	

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

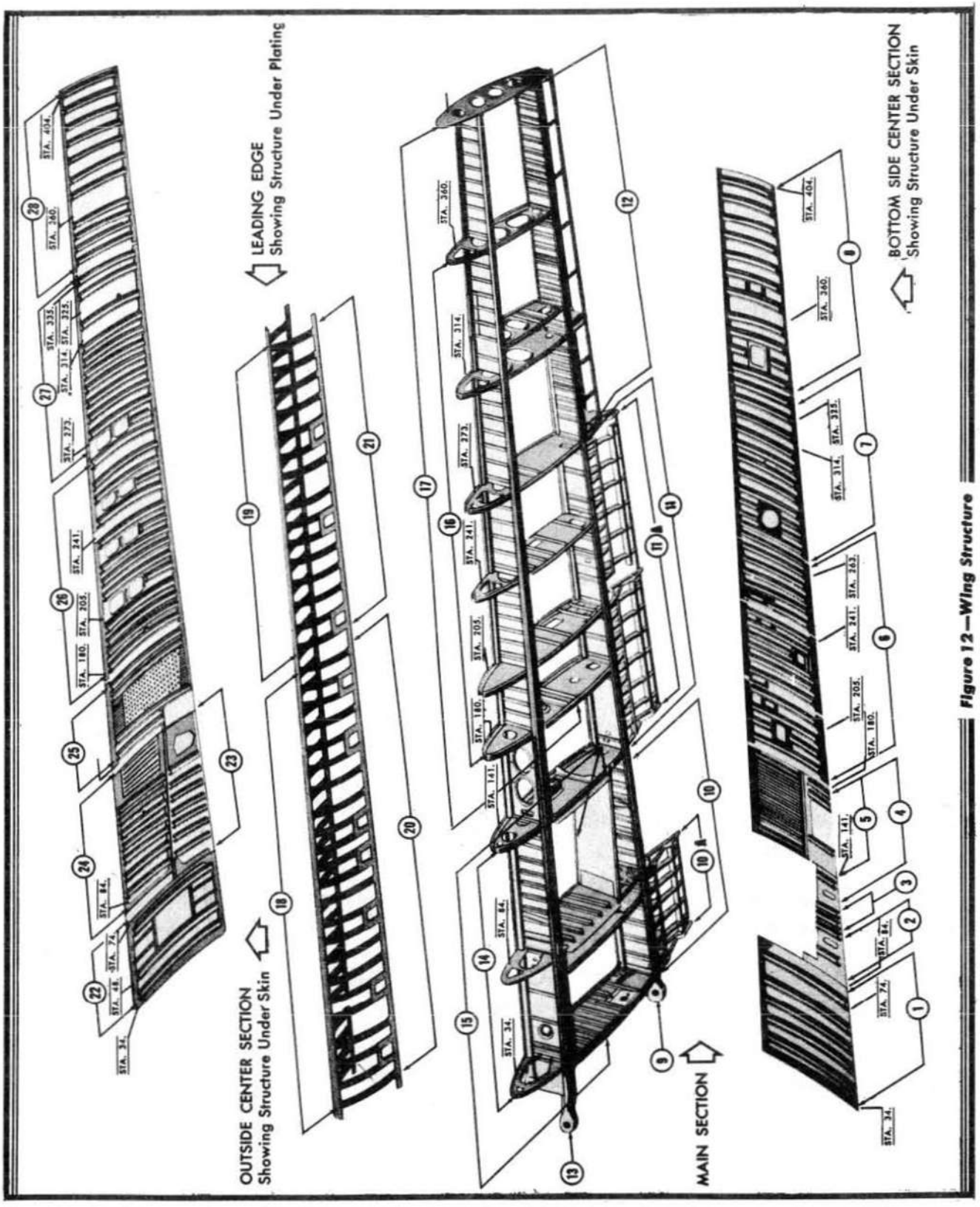


Figure 12—Wing Structure

KEY TO FIGURE 12

Left hand assembly listed only.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5190530	Lower Panel Assem. Sta. 32-84.86					
	5190530-200	Doubler	5½x54½	.125	24ST		1
	1093798	Hat Section Stiffener	6-5/8x54	.091	24ST		1
	1093798	Hat Section Stiffener	6-5/8x53	.091	24ST		1
	1093798	Hat Section Stiffener	6-5/8x52	.091	24ST		1
	1093798	Hat Section Stiffener	6-5/8x51	.091	24ST		1
	5190530-16	Doubler	9x52	.091	24ST		1
	2062620	Hat Section Stiffener	5-7/32x50	.072	24ST		1
2	5129569	Lower Rear Panel Assem.					
	2062620	Hat Section Stiffener	5-7/32x14	.072	24ST		1
3	5190531	Lower Panel Assem. Sta. 107.428-119.227					
	2062620	Hat Section Stiffener	5-7/32x13	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x14	.072	24ST		1
	5192570-168	Hat Section Stiffener	5-7/32x15	.072	24ST		1
4	5192570	Lower Panel Sta. 119.227-180.86					
	2062620	Hat Section Stiffener	5-7/32x11	.072	24ST		1
	5192570-168	Hat Section Stiffener	6x17	.072	24ST		1
	5192570-248	Hat Section Stiffener	6x13½	.072	24ST		1
	2062620 1093790	Hat Section Stiffener	5-7/32x13¼	.072	24ST		1
	Alcoa #30248	Channel	Length 37		24ST Extrusion		1
5	5190532	Front Lower Panel Sta. 140.86-180.86					
	2062620	Hat Section Stiffener	5-7/32x24	.072	24ST		2
	5190532-160	Doubler	25x41¾	.051	24ST		1
	1093791	Doubler	Length 37½		24ST Extrusion		1
	5190532-202	Doubler	4¾x23	.081	24ST		1
	5190532-208 1125508	Doubler	3x22	.081	24ST		1
	Alcoa #30268	Doubler	Length 25¾		24ST Extrusion		1

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
6	5190539	Lower Panel Assem. Sta.180.86-263.5					
	5190539-12	Doubler	4½x26½	.081	24ST		1
	2062620	Hat Section Stiffener	5-7/32x13¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x13-5/8	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38-9/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38	.051	24ST		1
	5190539-702	Doubler	2¼x22	.081	24ST		1
	5190539-704	Doubler	2¼x20¾	.081	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38⅜	.051	24ST		1
	5190539-1080	Doubler	1½x14	.051	24ST		1
	5190539-1082	Doubler	15⅞x21⅛	.064	24ST		1
	5190539-700	Doubler	2¼x32½	.081	24ST		1
	2062620	Hat Section Stiffener	5-7/32x22-5/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x37⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x36⅝	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x22⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35¾	.051	24ST		1
	5190539-26	Doubler	2¼x26½	.081	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35-5/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x36⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35½	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x37⅝	.051	24ST		1
7	5190538	Lower Panel Assem. Sta.263.5-335					
	2062620	Hat Section Stiffener	5-7/32x35¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x34⅜	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x10¾	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x9	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x10½	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x9	.040	24ST		1
	5190538-692	Doubler	2½x70¾	.072	24ST		1
	5190538-690	Doubler	2¼x35	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33⅜	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33½	.040	24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	2062620	Hat Section Stiffener	5-7/32x33⅛	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x32¾	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x32⅛	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x31⅜	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x31	.040	24ST		1
8	5190537	Lower Panel Assem. Sta. 335-404.938					
	2062620	Hat Section Stiffener	5-7/32x30¾	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x9¼	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x9½	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x30	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x29⅝	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28⅞	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28½	.040	24ST		1
	5190537-688	Doubler	2¼x67	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28⅛	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x27⅝	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x27¼	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x26¾	.040	24ST		1
	2062620	Hat Section Stiffener	5-7/32x26¼	.040	24ST		1
9	5153017	Rear Spar Assem.					
	5153017-2	Spar Web	8⅞x120¾	.125	24ST		1
	5153017-4	Spar Web	8½x44¾	.091	24ST		1
	5153017-6	Spar Web	8½x55	.072	24ST		1
	5153017-8	Spar Web	7¾x79⅝	.064	24ST		1
	5153017-10	Spar Web	7½x62⅝	.051	24ST		1
	5153017-12	Spar Web	6⅝x44⅞	.032	24ST		1
	2062642	Spar Cap. — Rear Lower Inbd.	S.L. 333¼		14ST Rolled Bar		1
	1152396	Spar Cap — Rear Lower Outboard	Length 73		24ST		1
	2062642	Spar Cap —Rear Upper Inboard	Length 332		14ST Rolled Bar		1
	1152399	Spar Cap — Rear Upper Outboard	Length 73		24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
10	5155381	Trailing Edge Structure (Inboard)					
	4155900	Trailing Edge Rib Sta. 40.125	13½x17½	.051	24SO	24ST	1
	4155901	Trailing Edge Rib Sta. 48.875	13½x17½	.051	24SO	24ST	1
	4155902	Trailing Edge Rib Sta. 57.625	13½x16⅞	.051	24SO	24ST	1
	4155903	Trailing Edge Rib Sta. 66.375	13x16½	.051	24SO	24ST	1
	4155904	Trailing Edge Rib Sta. 75.75	13x16½	.051	24SO	24ST	1
	1125567 Alcoa #30232	Trailing Edge	Length 60		24 ST		
10A	5153006	Panel Assem. Wing Structure					
	5128025	Flap Support Sta. 81.438 Inbd.	20-39/64x11-1/16		14ST		1
	5128026	Flap Support Sta. 33.812 Inbd.	20⅓x11-1/16		14ST		1
11	5155387	Trailing Edge Structure (Outbd.)					
	1125567 Alcoa Die #30232	Trailing Edge	Length 62		24ST		1
	4155811	Trailing Edge Rib Sta. 150.314	12x14	.040	24SO	24ST	1
	4155812	Trailing Edge Rib Sta. 159	12x14½	.040	24SO	24ST	1
	4155813	Trailing Edge Rib Sta. 167.625	11½x13¾	.040	24SO	24ST	1
	4155814	Trailing Edge Rib Sta. 176.550	11½x13½	.040	24SO	24ST	1
	4155815	Trailing Edge Rib Sta. 185.700	11x13½	.040	24SO	24ST	1
	4155816	Trailing Edge Rib Sta. 195.400	11x13	.040	24SO	24ST	1
	4155817	Trailing Edge Rib Sta. 210.2	11x13	.040	24SO	24ST	1

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	4155818	Trailing Edge Rib Sta. 220.600	10½x12½	.040	24SO	24ST	1
	4155819	Trailing Edge Rib Sta. 230.90	10½x12½	.040	24SO	24ST	1
	4155820	Trailing Edge Rib Sta. 241.31	10x11¾	.040	24SO	24ST	1
	4155821	Trailing Edge Rib Sta. 253.4	10x11¾	.040	24SO	24ST	1
	4155822	Trailing Edge Rib Sta. 263	10x11½	.040	24SO	24ST	1
	1125567 Alcoa Die #30232	Trailing Edge	Length 60		24ST		1
11A	5153006	Panel Assem. Wing Structure			Forging		
	5128029	Flap Support Sta. 142.625 Outbd.	9-5/32x27-1/32		14ST		1
	5128012	Flap Support Sta. 204 Outbd.	7-5/32x18-13/32		C.M. Steel Forging	Norm. AC-98-10025	1
	5128020	Flap Support Sta. 270.531 Outbd.	6-5/16x16-15/32		14ST Forging		1
12	5153020	Struct. Assem. Wing Panel Outbd.					
	1093759	Lower Trailing Edge Ribs	Length 32x36		24ST		2
	1093759	Lower Trailing Edge Ribs	Length 30¾x35¼		24ST		2
	1093759	Upper Trailing Edge Ribs	Length 36¼x31		24ST		2
	1093759	Upper Trailing Edge Ribs	Length 15x36¼x15½		24ST		2
	5159563-2	Trailing Edge Ribs Sta. 404.375	8x8	.064	24SO.	24ST	1
	4159563-2	Trailing Edge Rib Sta. 325	7⅛x9	.064	24ST		1
	4159562-2	Trailing Edge Rib Sta. 321	10x10	.032	24SO	24ST	1
	4157736-2	Trailing Edge Rib Cant. Sta. 272.812	10x13¼	.040	24SO	24ST	1
	4190297	Lower Inbd. Channel Stiffener	7x10½	.032	24SO	24ST	2
	4190289	Lower Outbd. Channel Stiffener	7x10	.032	24SO	24ST	2
	4190299	Upper Inbd.	7x9½	.032	24SO	24ST	2

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	4190298	Upper Outbd. Channel Stiffener					
13	5153014	Spar Assem. Wing Front					
	2062642	Spar Cap Upper Inbd.	Length 335¾		14ST Rolled Bar		1
	1152397	Spar Cap Upper Outbd.	Length 70		24ST Extrusion		1
	2062642	Spar Cap Lower Inbd.	Length 355½		14ST Rolled Bar		1
	1152397	Spar Cap Lower Outbd.	Length 70		24ST Extrusion		1
	5153014-2	Spar Web	12x61½	.081	24ST		1
	5153014-4	Spar Web	12x70	.064	24ST		1
	5153014-6	Spar Web	12x38	.081	24ST		1
	5153014-8	Spar Web	12x39	.072	24ST		1
	5153014-10	Spar Web	11x72	.064	24ST		1
	5153014-12	Spar Web	10x65	.051	24ST		1
	5153014-14	Spar Web	9x14	.032	24ST		1
14	5153006	Wing Structure Outbd.					
	4157877-2	Nose Rib Sta. 34.11	17x26	.064	24ST		1
	4157877-4	Nose Rib Sta. 34.11	1½x46	.072	24ST		1
	4157880-2	Nose Rib Sta. 84.11	17x24½	.040	24ST		1
	4157880-6	Nose Rib Sta. 84.11	1-7/16x44	.072	24ST		1
	4157879-2	Nose Rib Sta. 141.798	15½x23	.032	24ST		1
	4157879-4	Doubler Sta. 141.798	1⅜x40	.051	24ST		1
15	5153005	Wing Structure Outbd.					
	5157742-6	Doubler	6½x14½	.064	24ST		1
	1125524	Doubler	Length 56		24ST Extrusion		1
	5157742-2	Rib	16½x56	.064	24ST		1
	1093774	Doubler	Length 56		24ST Extrusion		1
	5157742-4	Doubler	6½x13	.064	24ST		1
	5155374-2	Rib Sta. 32 Wing	8x56½	.091	24ST		1
	5155374-4	Upper Outbd. Rib Cap	7½x52½	.125	24SO	24ST	1
	5155374-6	Upper Outbd. Rib Cap	6½x52½	.125	24SO	24ST	1
	5155374-8	Lower Outbd. Rib Cap	8x56½	.125	24SO	24ST	1
	5155374-10	Lower Inbd. Rib Cap	7½x52½	.125	24SO	24ST	1
	5155375-2	Rib Sta. 74.3	18x52	.064	24ST		1
	1070108	Rib Cap Lower	Length 49		24SO	24ST	1
	Alcoa #1730				Extrusion		

KEY TO FIGURE 12 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
	1073775 Alcoa #30266	Rib Cap Upper	Length 49		24SO Extrusion	24ST	1
	5155396-2	Rib Cap Sta. 140.86	18x37¾	.064	24ST		1
	5155396-16	Rib Cap Lower	6x44	.156	24SO	24ST	1
	1125527 Alcoa #39730	Rib Cap Lower	Length 44		24ST Extrusion		1
16	5153020	Wing Structure Nose Section					
	4157780-2	Nose Rib Sta. 180.860	10½x19	.040	24ST		1
	1093782 Alcoa #30240	Rib Cap	Length 24		24SO Extrusion	24ST	2
	4157779-2	Nose Rib Sta. 205	10x19	.032	24ST		1
	.093776 Alcoa #30283	Rib Cap	Length 21		24SO Extrusion	24ST	2
	4157776-2	Nose Rib Sta. 314	10¼x16	.051	24SO	24ST	1
	1093761	Rib Cap	Length 16		24SO Extrusion	24ST	2
	4157777-2	Nose Rib Sta. 273	10¾x17-11/16	.051	24SO	24ST	1
	1093761	Rib Cap	Length 17		24SO Extrusion	24ST	2
	4157774-2	Nose Rib Sta. 360	8x13	.040	24SO	24ST	1
	1093762 Alcoa #K22008	Rib Cap	Length 13½ Length 13¼		24SO Extrusion	24ST	2
17	5153020	Structure Assem. Outbd.					
	5157773-2	Rib Wing Sta. 180.86	14⅜x43½	.032	24ST		1
	1093782 Alcoa #30240	Rib Caps	Length 45½		24SO Extrusion	24ST	1
	5157772-4	Rib Sta. 205	14½x43	.040	24ST		1
	1093776	Rib Caps	Length 43		24SO	24ST	2
	5157771-2	Rib Wing Sta. 241	14x40	.072	24ST		1
	5157771-6	Rib Cap	2½x40	.125	24SO	24ST	1
	142266	Rib Cap	Length 40		24SO Extrusion	24ST	1
	5157770-2	Rib Wing Sta. 273	13x37	.040	24ST		1
	1093761	Rib Caps	Length 36 Length 36¼		24SO Extrusion	24ST	2
	5157769-6	Rib Wing Sta. 314	16x40	.051	24SO	24ST	1
	1093760 1093761	Rib Caps	Length 36½		24SO Extrusion	24ST	2

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	5157775-2	Rib Wing Sta. 325	15x34	.051	24SO Extrusion	24ST	1
	1125515	Rib Cap	Length 33½		24SO Extrusion	24ST	1
	2062620 5157767-13	Hat Section Stiffener Spot Weld Assem.	5-7/32x29	.064	24ST		1
18	5190542	Structure Assem. Sta. 180.860-314	Top				
	5190542-344	Doubler	3⅝x16	.064	24ST		1
	2062620	Hat Section Former	4-23/36x17-3/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x17⅛	.040	24ST		1
	2062620	Hat Section Former	4-23/32x17	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16⅞	.040	24ST		1
	5190542-590	Doubler	2¼x24	.072	24ST		1
	5190542-388	Nose Stiffener	1¾x133	.091	24ST		1
	2062620	Hat Section Former	4-23/32x16⅝	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-9/16	.040	24ST		1
	5190542-592	Doubler	2¼x59	.072	24ST		1
	2062620	Hat Section Former	4-23/32x16½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-7/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-3/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-1/16	.040	24ST		1
	2062620	Hat Section Former	4-23-32x16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-15/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15⅝	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-9/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-5/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15⅛	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14-15/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅞	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14¾	.040	24ST		1
19	5190541	Structure Assem. Sta. 314-404.938	Top				
	2062620	Hat Section Former	4-23/32x14-15/32	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅛	.040	24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	2062620	Hat Section Former	4-23/32x14	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13-13/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13-1/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12⅞	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12¼	.040	24ST		1
	5190541-340	Nose Stiffener	5x53	.081	24ST		1
	5190541-526	Doubler	2¼x11⅝	.072	24ST		1
	5190541-338	Nose Stiffener	5x43½	.064	24ST		1
	5190541-596	Doubler	2½x78	.072	24ST		1
20	5190542	Structure Assem. Sta. 180.860-314 Nose	Bottom				
	5190542-566	Doubler	3⅜x16	.064	24ST		1
	5190542-600	Doubler	8x50⅜	.072	24ST		1
	5190542-602	Doubler	8x58	.072	24ST		1
	5190542-604	Doubler	8x22½	.072	24ST		1
	2062620	Hat Section Former	4-23/32x17⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x17¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x17-3/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x17⅛	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-15/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16⅞	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-11/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-9/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-15/32	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16-3/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-15/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-9/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15-3/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x15⅛	.040	24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
	2062620	Hat Section Former	4-23/32x15-1/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅞	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14-13/16	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14¾	.040	24ST		1
21	5190541	Structure Assem. Sta. 314-404.938 Nose	Bottom				
	5190541-542	Doubler	8x11⅝	.072	24ST		1
	2062620	Hat Section Former	4-23/32x14⅝	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14⅛	.040	24ST		1
	2062620	Hat Section Former	4-23/32x14	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x13	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12¾	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12½	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12⅜	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12¼	.040	24ST		1
	2062620	Hat Section Former	4-23/32x12	.040	24ST		1
	2062620	Hat Section Former	4-23/32x11¾	.040	24ST		1
	5190541-598	Doubler	2½x78	.072	24ST		1
22	5190511	Upper Panel Assem. Sta. 32-74.3					
	1093798	Hat Section Stiffener	6⅝x50	.128	24SO	24ST	1
	1093798	Hat Section Stiffener	6⅝x49	.128	24SO	24ST	1
	1093798	Hat Section Stiffener	6⅝x48	.091	24SO	24ST	1
	142266	Stiffener	Length 13		24SO Extrusion	24ST	1
	142266	Stiffener	Length 13½		24SO Extrusion	24ST	1
	142266	Stiffener	Length 14		24SO Extrusion	24ST	2
	5190511-154	Doubler	44x52	.125	24ST		1
	5190511-298	Doubler	2⅜x52	.091	24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
23	5190528	Upper Panel Sta. 84.86-140.86					
	2062620	Hat Section Stiffener	5-7/32x13½	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x13	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x12½	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x11½	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x11	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x10½	.072	24ST		1
	5190528-146	Doubler	11x17	.187	24ST		1
24	5190527	Upper Panel Assem. Sta. 84.86-140.86					
	5190527-314	Doubler	22x22	.064	24SO	24ST	1
	2062620	Hat Section Stiffener	5-7/32x32	.072	24ST		1
	2062620	Hat Section Stiffener	5-7/32x32	.072	24ST		7
	5190527-344	Doubler	2⅜x3	.051	24ST		1
	5190527-228	Doubler	36x56	.125	24ST		1
	5190529-228	Doubler	22x22	.064	24SO	24ST	1
25	5190529	Upper Panel Assem. Sta. 140.86-180.86					
	2062620	Hat Section Stiffener	5-7/32x26	.064	24ST		1
	5190529-84	Hat Section Stiffener	7x45	.064	24ST		1
	2062620	Hat Section Stiffener	5-7/32x42	.091	24ST		1
	2062620	Hat Section Stiffener	5-7/32x42	.064	24ST		1
	5190529-274	Doubler	2½x41	.081	24ST		1
	5190529-244	Doubler	2½x38	.081	24ST		1
	5190529-234		17x37½	.051	24ST		1
	5190529-182	Doubler	30x45	.051	24SO	24ST	1
26	5190545	Upper Panel Assem. Sta. 180.86-258					
	2062620	Hat Section Stiffener	5-7/32x39⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38-15/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x38-5/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x16-3/16	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x37⅝	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x37¼	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x37	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x15	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x36⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x36	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x14¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x35½	.051	24ST		1

KEY TO FIGURE 12 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
	2062620	Hat Section Stiffener	5-7/32x35¼	.051	24ST		1
	5190545-612	Doubler	2¼x23	.081	24ST		1
	5190545-614	Doubler	2¼x23	.081	24ST		1
	5190545-616	Doubler	2¼x23	.081	24ST		1
	5190545-618	Doubler	2¼x53½	.081	24ST		1
	5190545-620	Doubler	2¼x18	.081	24ST		1
	5190545-792	Doubler	12¾x38	.051	24ST		1
27	5190544	Upper Panel Assem. 258-335					
	2062620	Hat Section Stiffener	5-7/32x35⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x12¼	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x34	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33½	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33¼	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x33	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x32¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x32	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x31⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x31	.051	24ST		1
	5190544-622	Doubler	2¼x47	.072	24ST		1
	5190544-684	Doubler	2¼x11	.072	24ST		1
	5190544-624	Doubler	2¼x78	.072	24ST		1
	5190544-784	Doubler	2¼x34¼	.051	24ST		1
28	5190543	Upper Panel Assem. Sta. 335-404.938					
	2062620	Hat Section Stiffener	5-7/32x30½	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x30⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x29¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x29½	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28⅜	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x28⅛	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x27½	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x27¼	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x26¾	.051	24ST		1
	2062620	Hat Section Stiffener	5-7/32x26⅜	.051	24ST		1
	5190543-626	Doubler	2¼x67	.072	24ST		1
	5190543-628	Doubler	2¼x67	.072	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

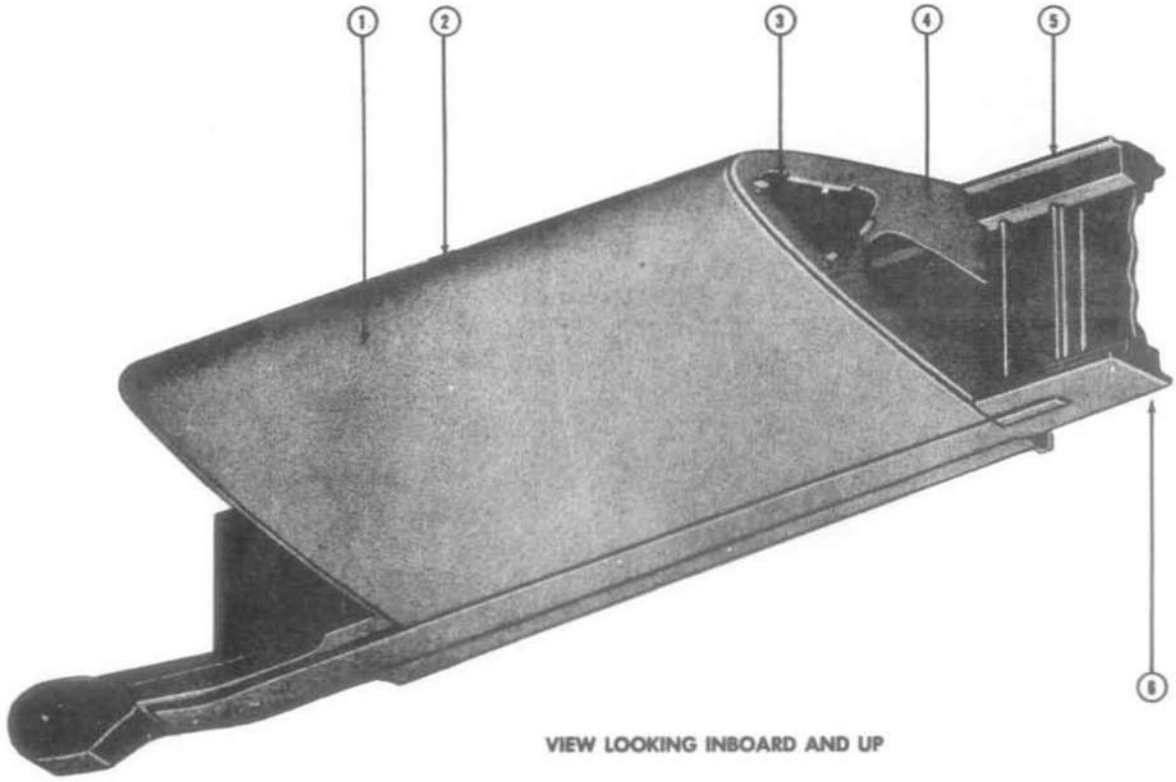


Figure 13—Armor Plate Removable Nose Structure

KEY TO FIGURE 13

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5153009-4 L.H. 5153009-5 R.H.	Armor Plate	27x50	.3125	Comm. Dural		1
2	5153009-2 L.H. 5153009-3 R.H.	Armor Plate	27x50	.3125	Comm. Dural		1
3	5153009-6 L.H. 5153009-7 R.H.	Doubler	6½x50	.3125	Comm. Dural		1
4	4157880-2 L.H. 4157880-3 R.H.	Nose Rib	17x24½	.040	24SO	24ST	1
5	5153604	Spar Cap					
6	5153568	Spar Cap					

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

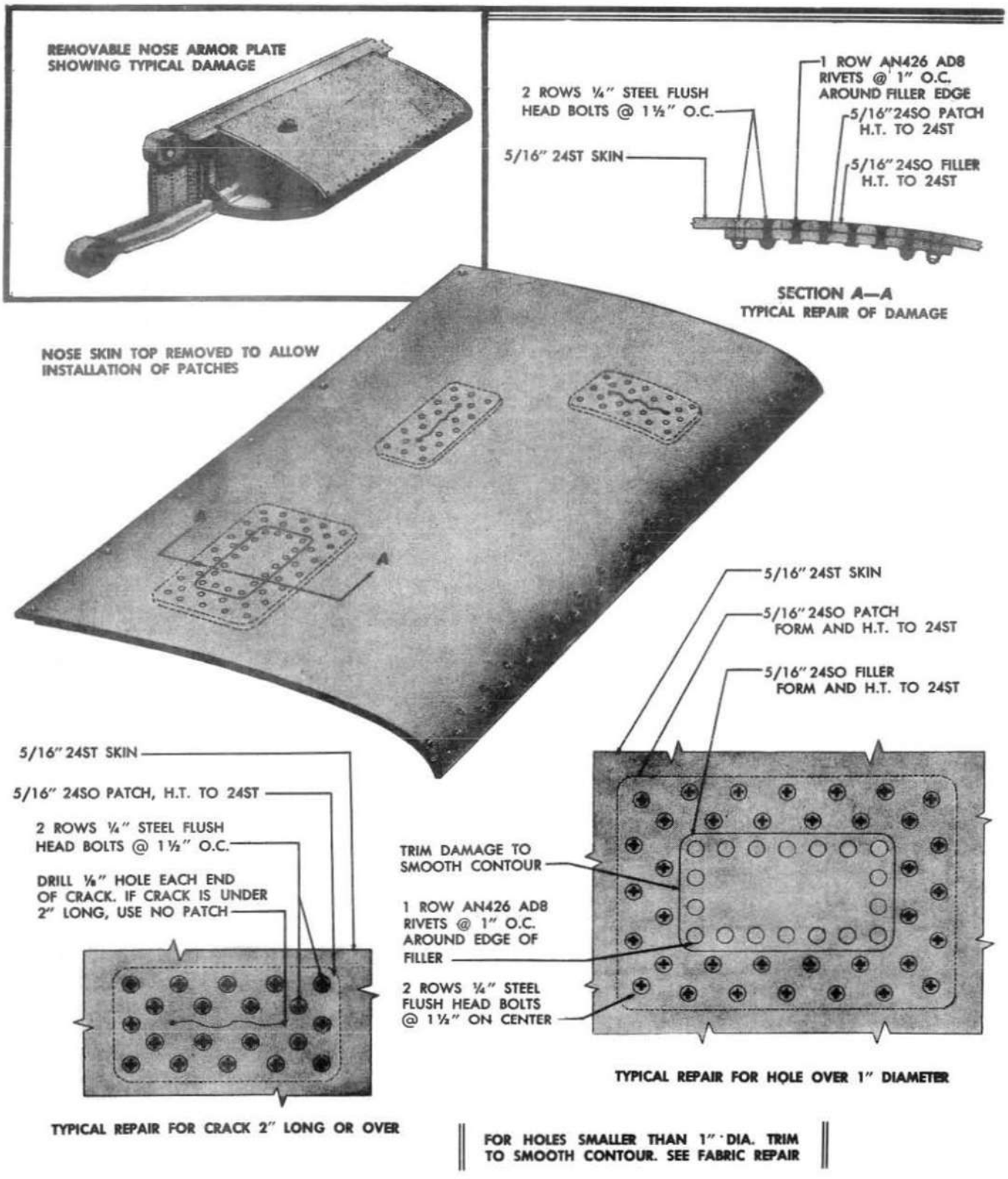


Figure 14 —Patch Repair of Leading Edge Armor Plate

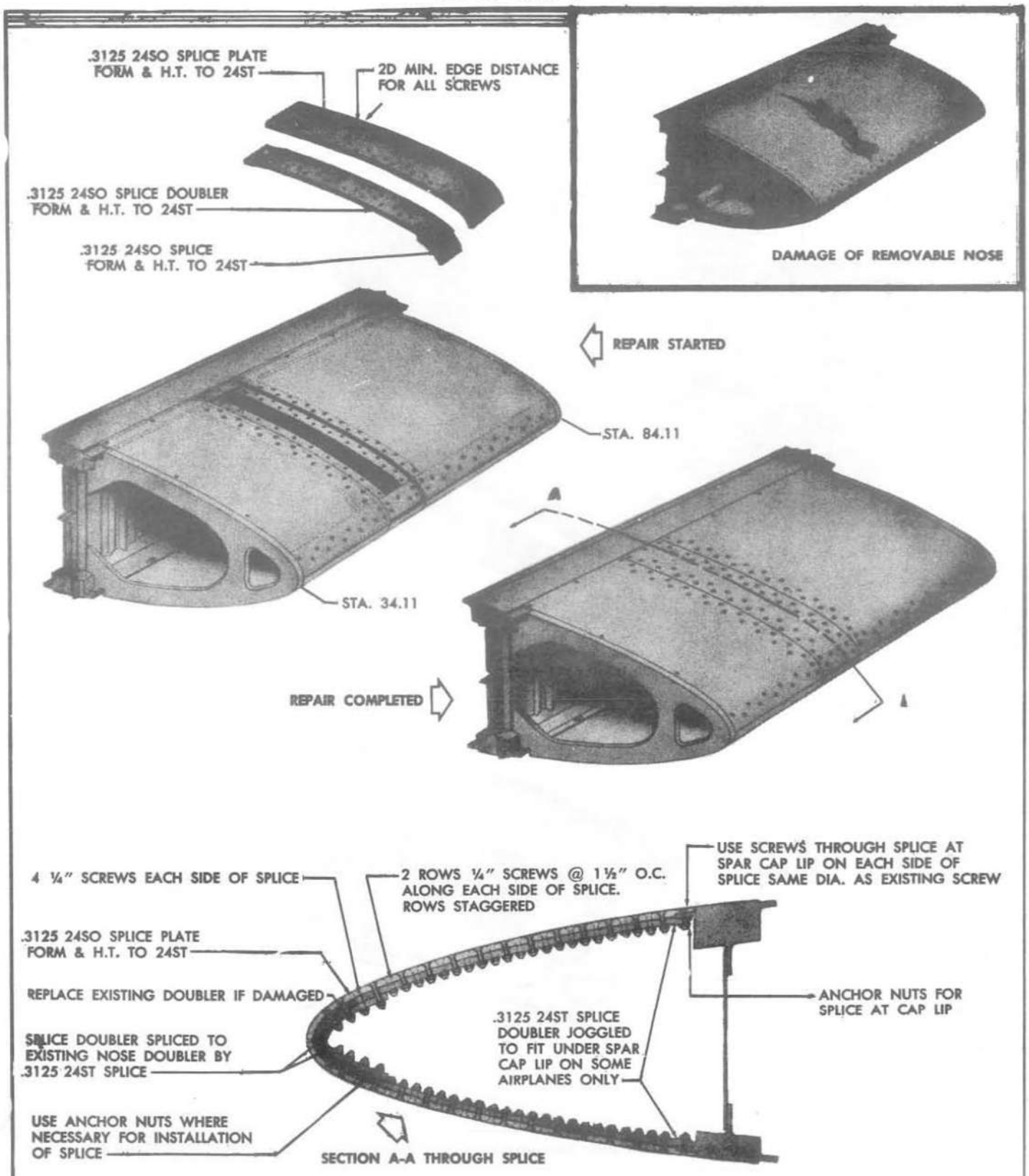


Figure 15—Insert Repair of Leading Edge Armor Plate

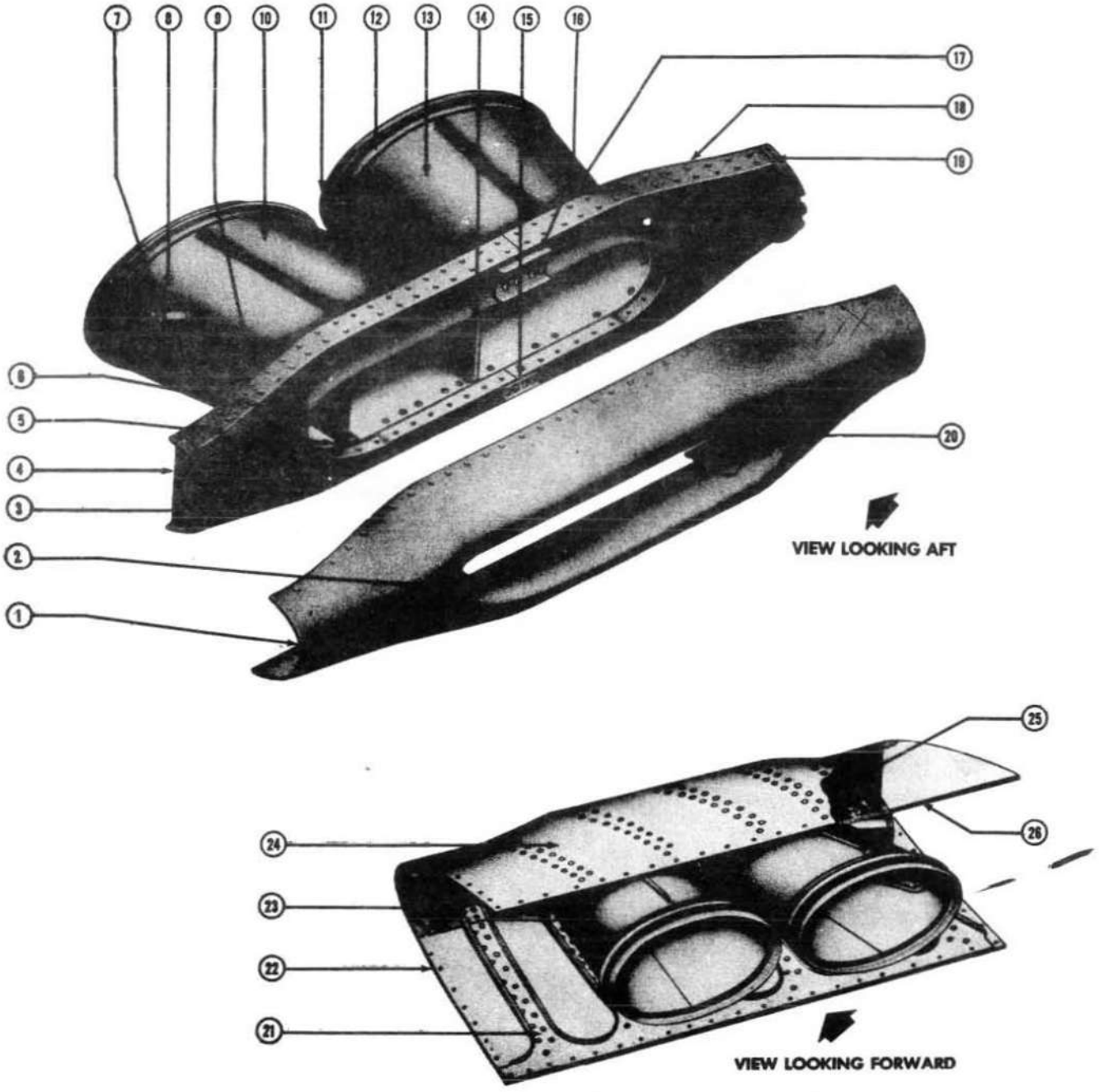


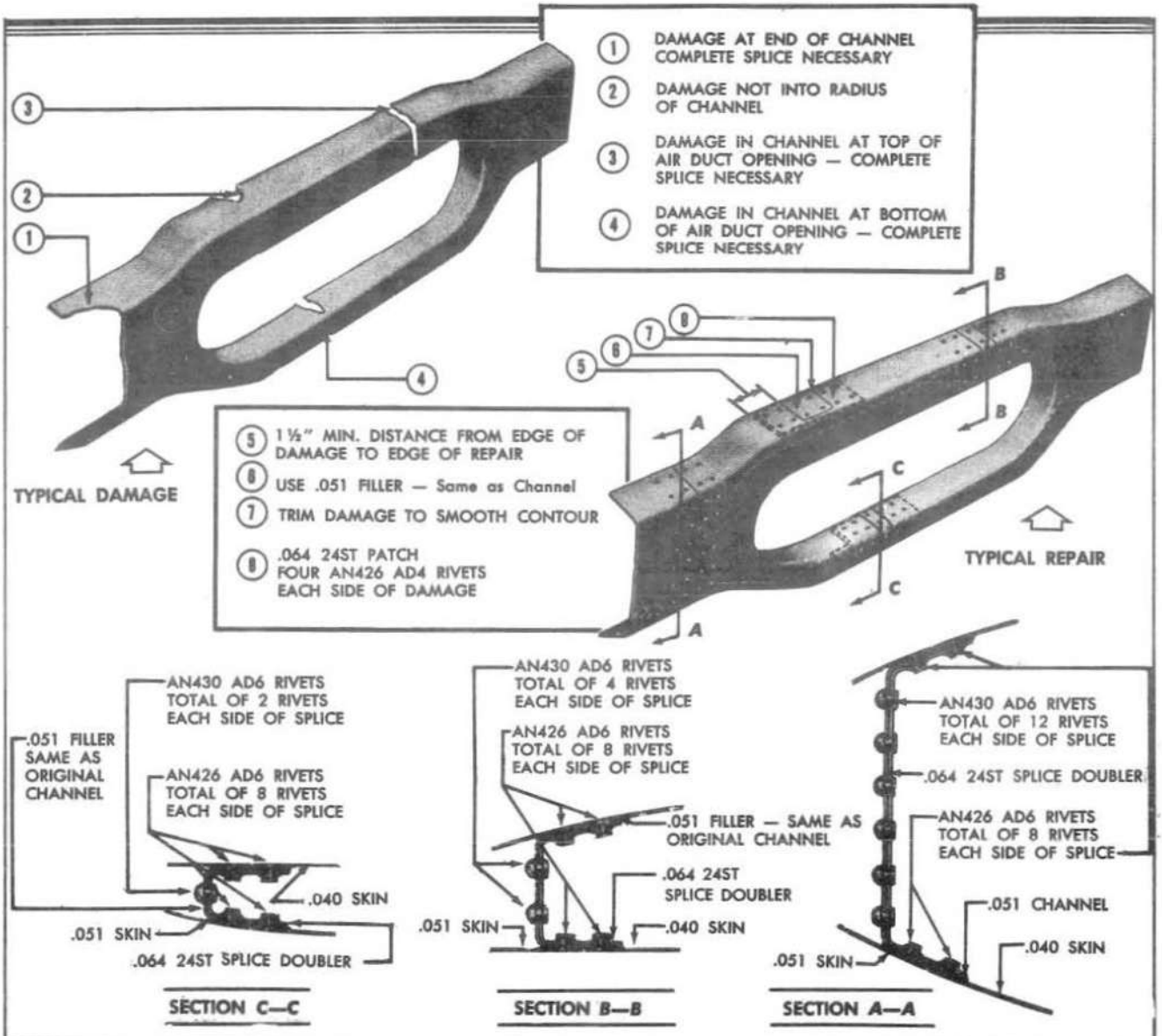
Figure 16—Oil Cooler Removable Nose Structure

KEY TO FIGURE 16

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5153012-4 L.H. 5153012-5 R.H.	Skin	8x19½	.051	24SO	24ST	1
2	5153012-98 L.H. 5153012-99 R.H.	Doubler	3x10	.051	24SO	24ST	1
3	5153012-20 L.H. 5153012-21 R.H.	Channel	11¼x19	.051	24SO	24ST	1
4	5153012-28 L.H. 5153012-29 R.H.	Rib	5⅝x7¾	.032	24SO	24ST	1
5	1152395	Stiffener	4¼ S.L.	AL.AL. Extrusion	24ST		1
6	5153012-90	Baffle	5½x16½	.040	24SO	24ST	1
7	5153012-108	Tube	½ O.D.x.049x4 S.L.	Alum.Tube	25½H		1
8	5153012-10 L.H. 5153012-11 R.H.	Duct	16x18	.064	24SO	24ST	1
9	5153012-86	Tube	2½ O.D.x.065x4¼ S.L.	Alum. Tube	25½H		1
10	5153012-12 L.H. 5153012-13 R.H.	Duct	18x18	.064	24SO	24ST	1
11	1159949	Seal	33 S.L.	Extruded Hycar			2
12	5153012-22 L.H. 5153012-23 R.H.	Angle	1-1/16x33	.032	24SO	24ST	1
13	5153012-14 L.H. 5153012-15 R.H.	Duct	18x18	.064	24SO	24ST	1
14	1125549	Stiffener	5⅛ S.L.	AL.AL. Extrusion	24ST		1
15	5153012-36	Channel	1½x3-5/16	.051	24ST		1
16	5153012-34	Channel	2⅜x3-5/16	.051	24ST		1
17	5153012-16 L.H. 5153012-17 R.H.	Duct	16x18	.064	24SO	24ST	1
18	5153012-18 L.H. 5153012-18 R.H.	Channel	11x15½	.051	24SO	24ST	1
19	5153012-26 L.H. 5153012-27 R.H.	Rib	5x7	.032	24SO	24ST	1
20	5153012-100 L.H. 5153012-101 R.H.	Doubler	4x12	.051	24SO	24ST	1
21	5153012-94 L.H. 5153012-95 R.H.	Doubler	15x37	.064	24SO	24ST	1
22	5153012-8 L.H. 5153012-9 R.H.	Skin	17x37½	.040	24SO	24ST	1
23	5153012-38	Channel	2-13/16x5½	.040	24ST		1
24	5153012-2 L.H. 5153012-3 R.H.	Skin	17x37½	.040	24SO	24ST	1
25	5153012-40 L.H. 5153012-41 R.H.	Channel	2-13/16x6¾	.040	24ST		1
26	5153012-96 L.H. 5153012-97 R.H.	Doubler	15x37	.091	24SO	24ST	1

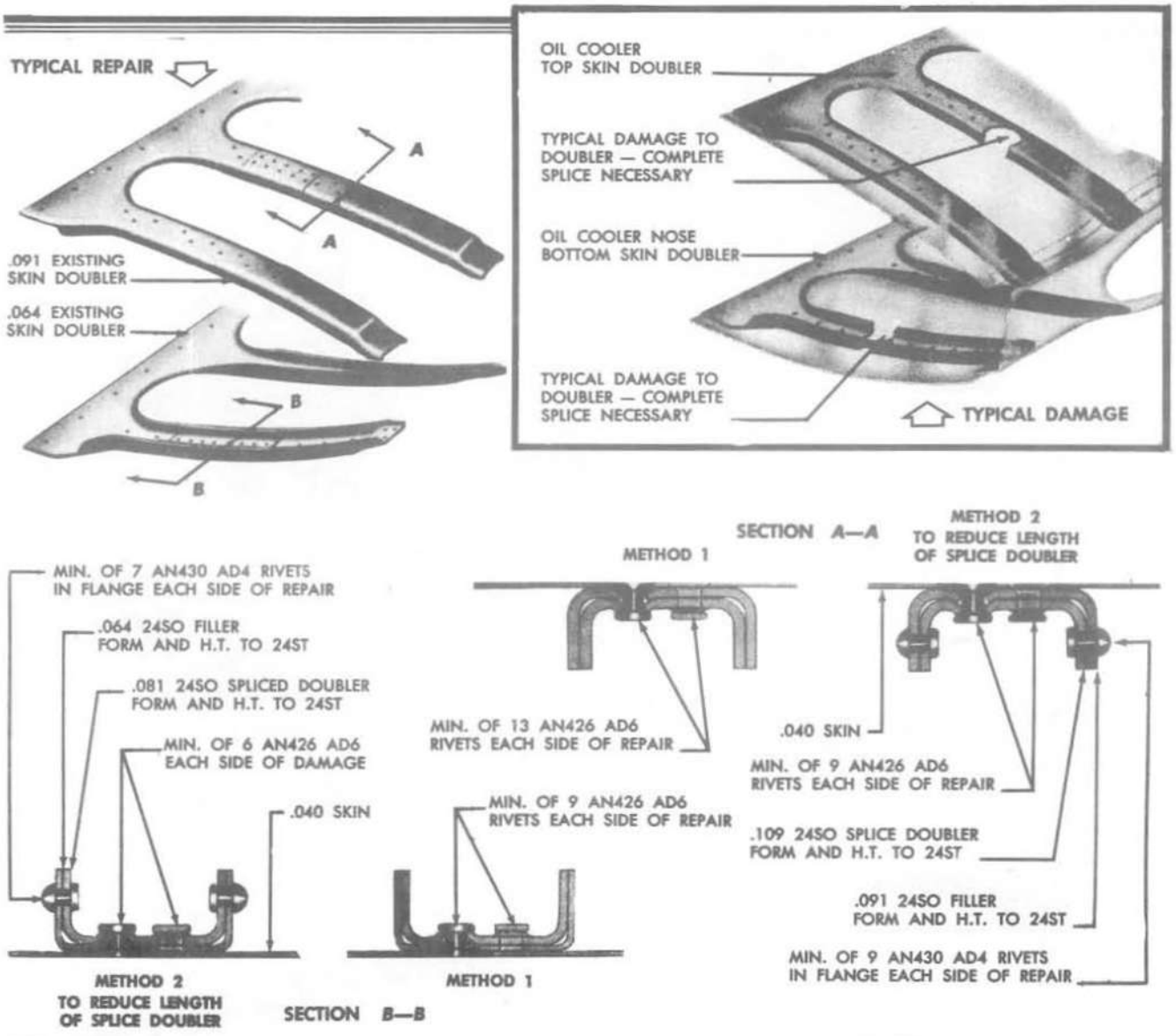
Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



NOTES

1. Remove all interfering rivets and trim damage.
2. Make filler and splice channel from 24SO sheet the same gage as the skin doubler. Heat treat to 24ST after forming.
3. Assemble repair using rivet schedule as shown above.
4. When possible use existing rivet holes.
5. For minimum bend radii of sheet material, see Figure 5, Section I.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

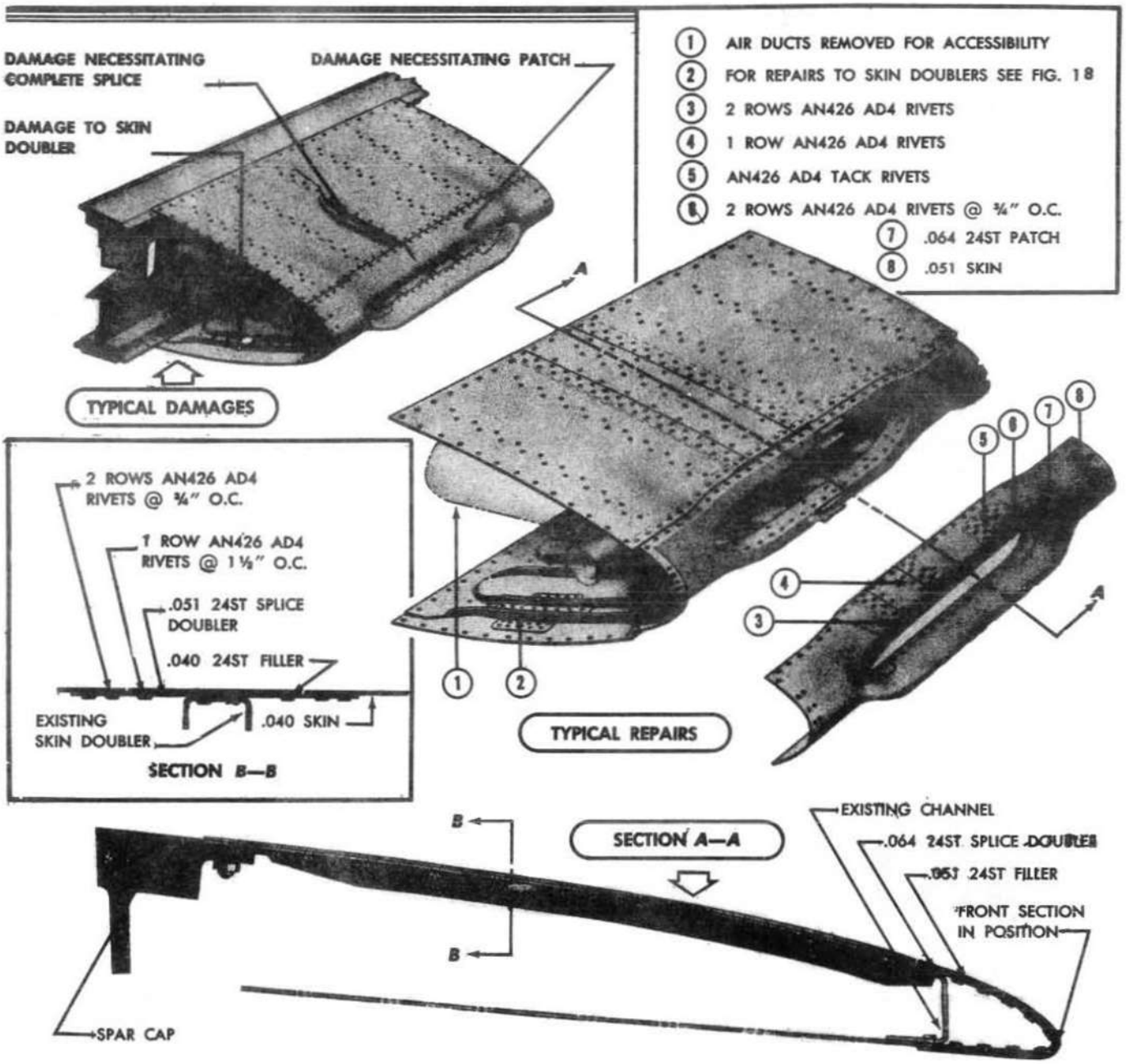
Figure 17—Repair of Oil Cooler Leading Edge Channel



NOTES

1. Remove interfering rivets and trim damage leaving no radius smaller than 1/2 inch.
2. Make filler from 24ST sheet the same gage as the nose doubler.
3. Make patches and splices from 24SO .064 sheet. Heat treat to 24ST after forming.
4. Assemble repair using rivet schedules as shown above.
5. For minimum bend radii of sheet material, see Figure 5, Section I.
6. For flush riveting, see Figure 6, Section 1.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 18—Repair of Oil Cooler Leading Edge Skin Doubler



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice plate and patch from material one gage heavier than the skin.
4. Construct fillers from the same gage and material as the skin.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 19—Repair of Oil Cooler Leading Edge Skin

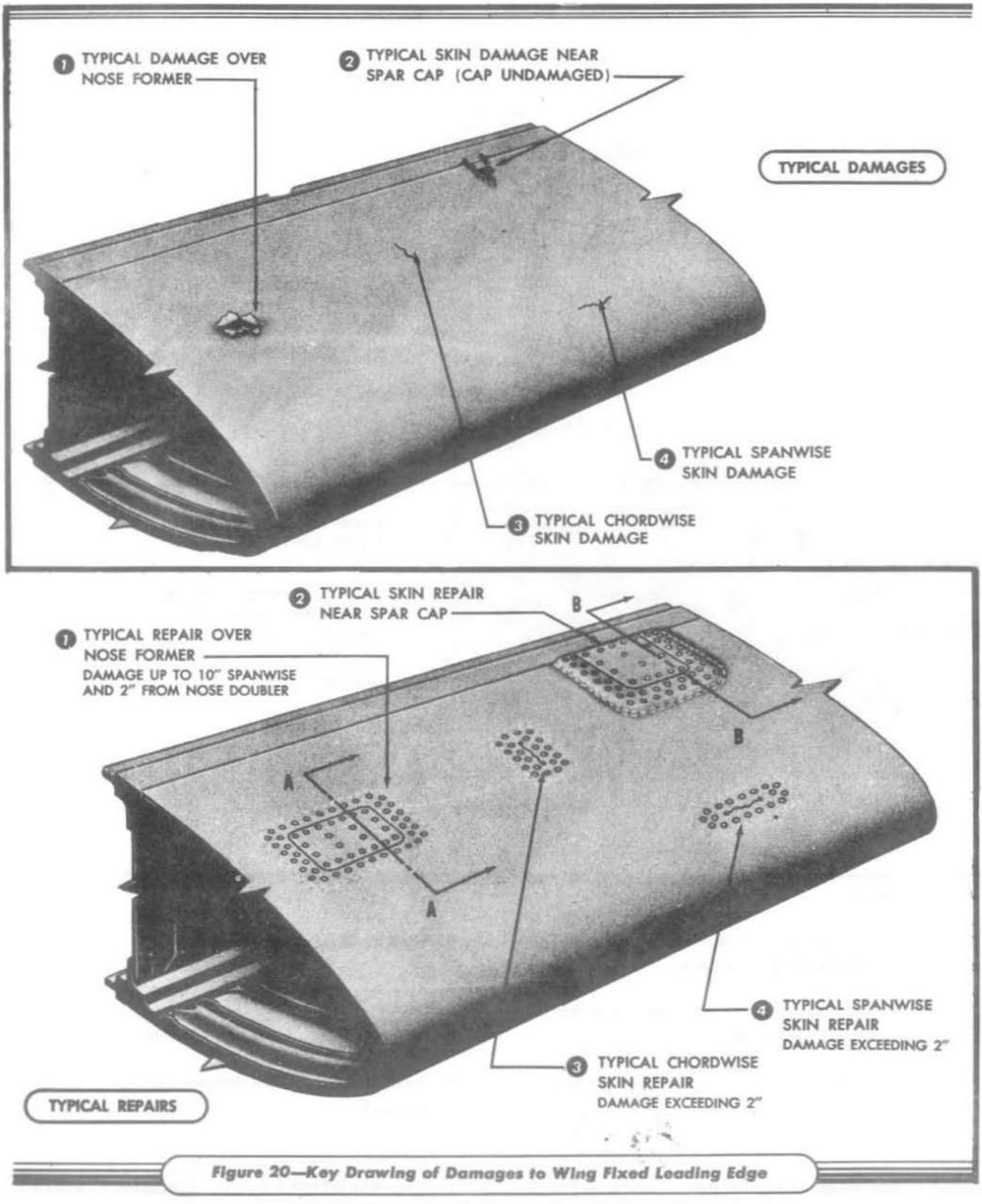
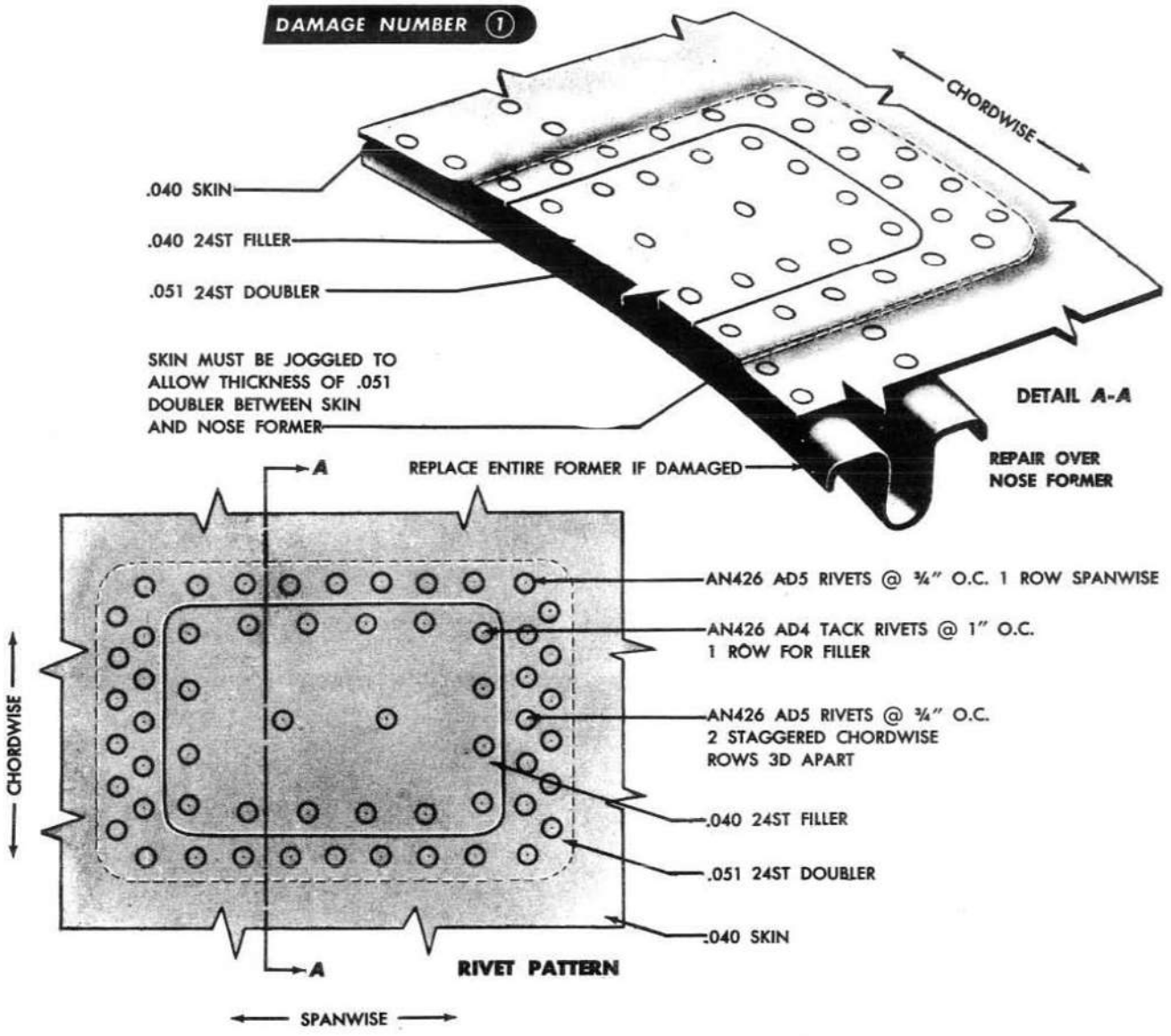


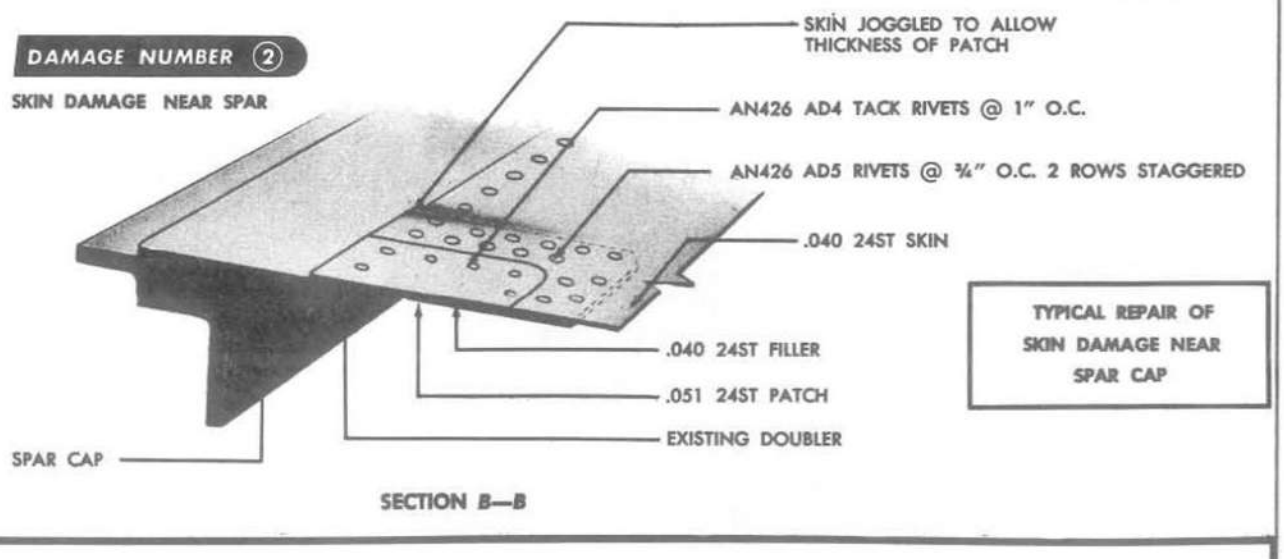
Figure 20—Key Drawing of Damages to Wing Fixed Leading Edge

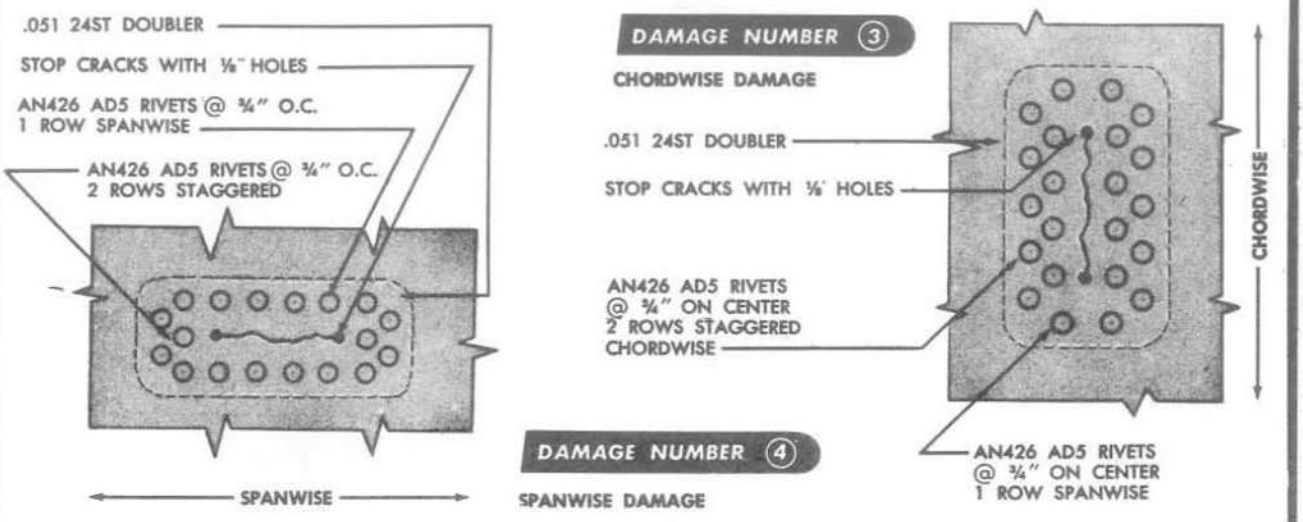


NOTES

1. Trim damage smooth leaving no radius less than three-eighths of an inch.
2. Construct filler from the same gage and material as the existing skin.
3. Construct patch from material the next heavier gage than the existing skin.
4. Replace all damaged stiffeners.
5. Assemble repair material as shown.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 21—Patch Repair of Fixed Edge Skin (Sheet 1 of 2)

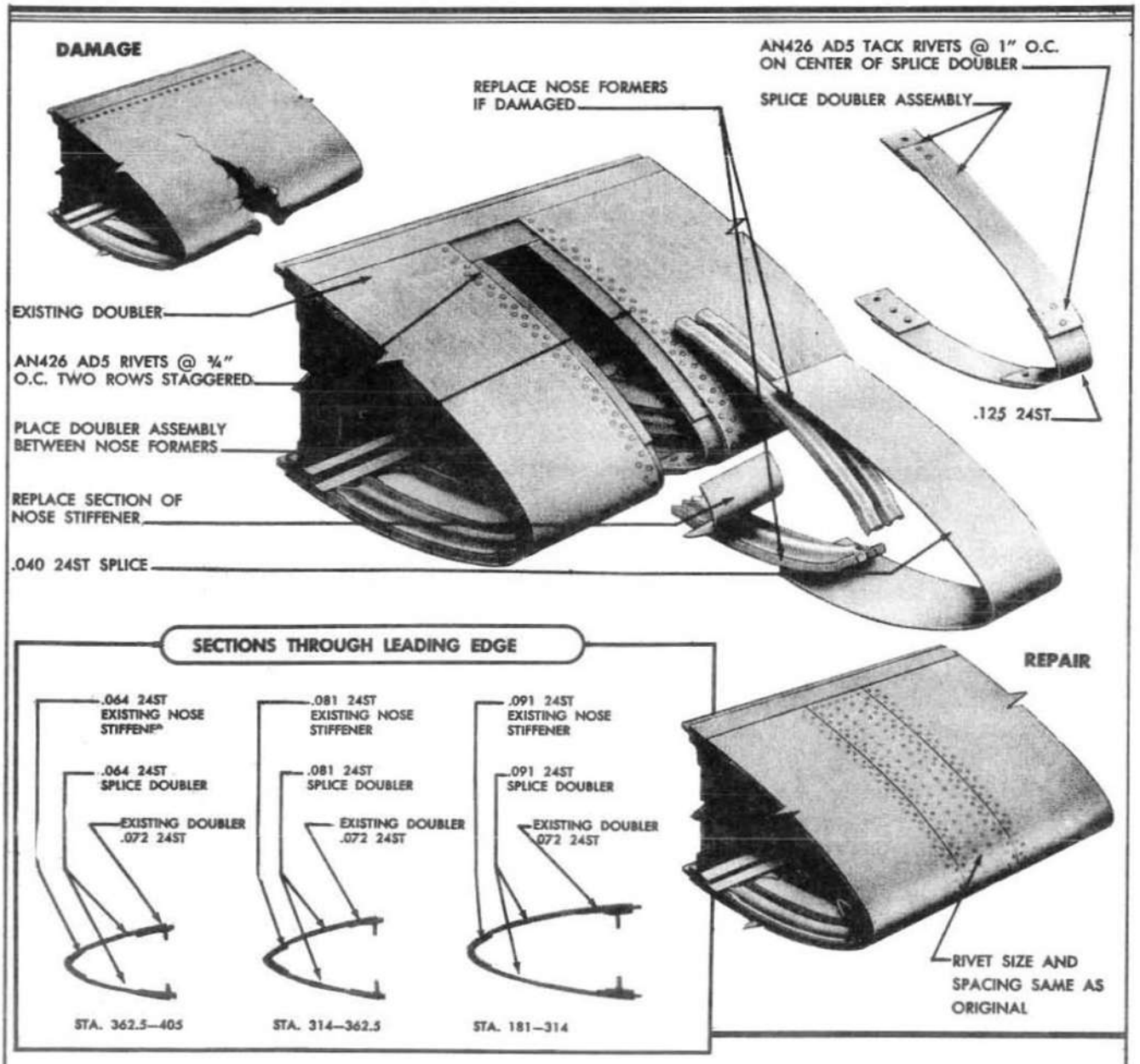




NOTES

1. Drill one-eighth inch stop holes at each end of crack.
2. Trim damage smooth leaving no radius less than three-eighths of an inch.
3. Construct filler from the same gage and material as the existing skin.
4. Construct patches from material the next heavier gage than the existing skin.
5. Replace all damaged stiffeners.
6. Assemble repair material as shown.
7. When possible use existing rivet holes.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

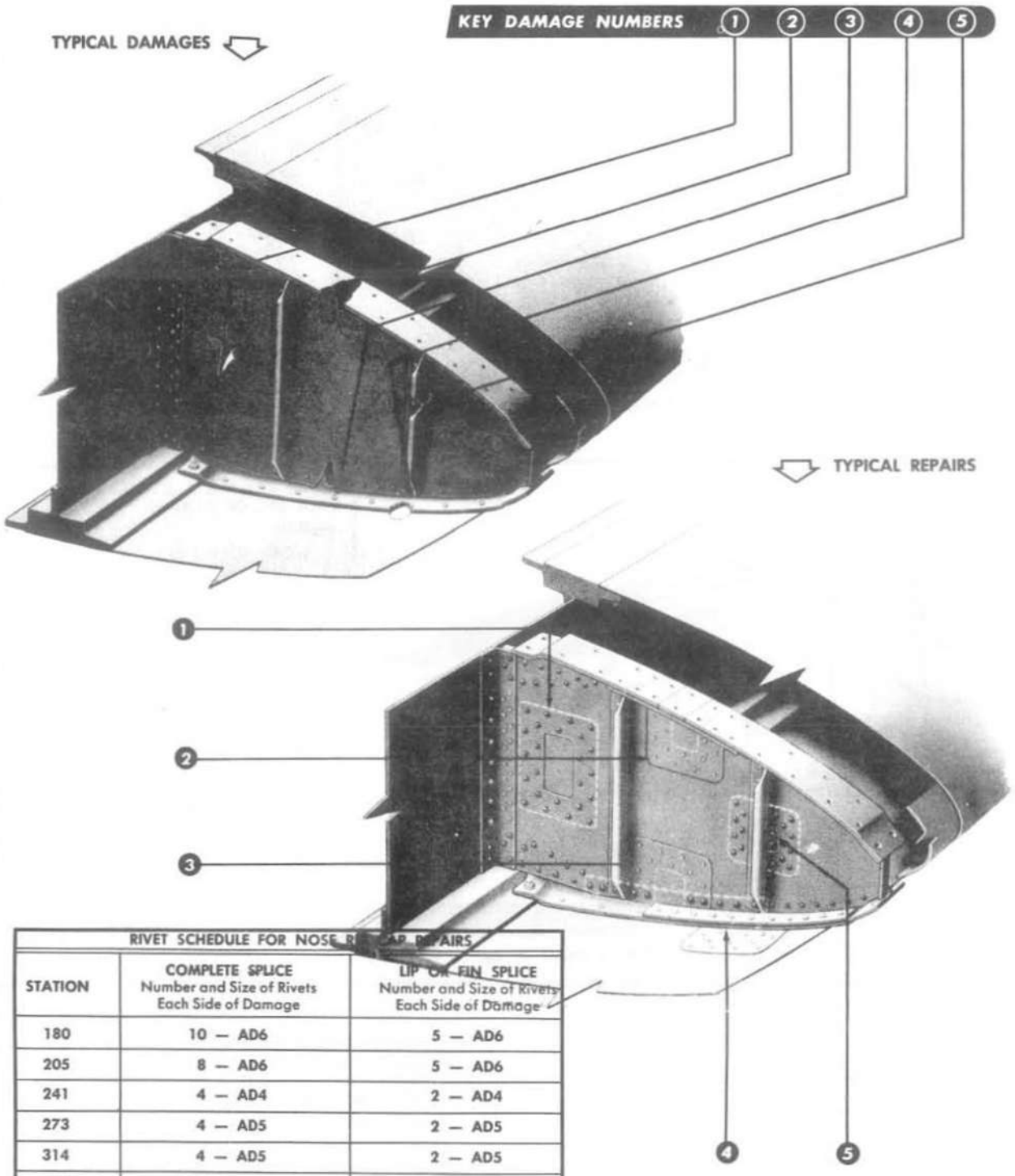
Figure 21—Patch Repair of Fixed Edge Skin (Sheet 2 of 2)



NOTES

1. Remove all interfering rivets.
2. Trim damage to provide clean straight edges for repair.
3. Construct splice doublers from the same gage and material as the existing nose stiffener.
4. Assemble as shown and attach along each side of cutout.
5. Construct nose stiffener insert from the same gage and material as the nose stiffener.
6. Replace damaged stiffeners.
7. Construct skin insert from the same gage and material as the skin.
8. When possible use existing rivet holes.
9. For flush riveting, see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

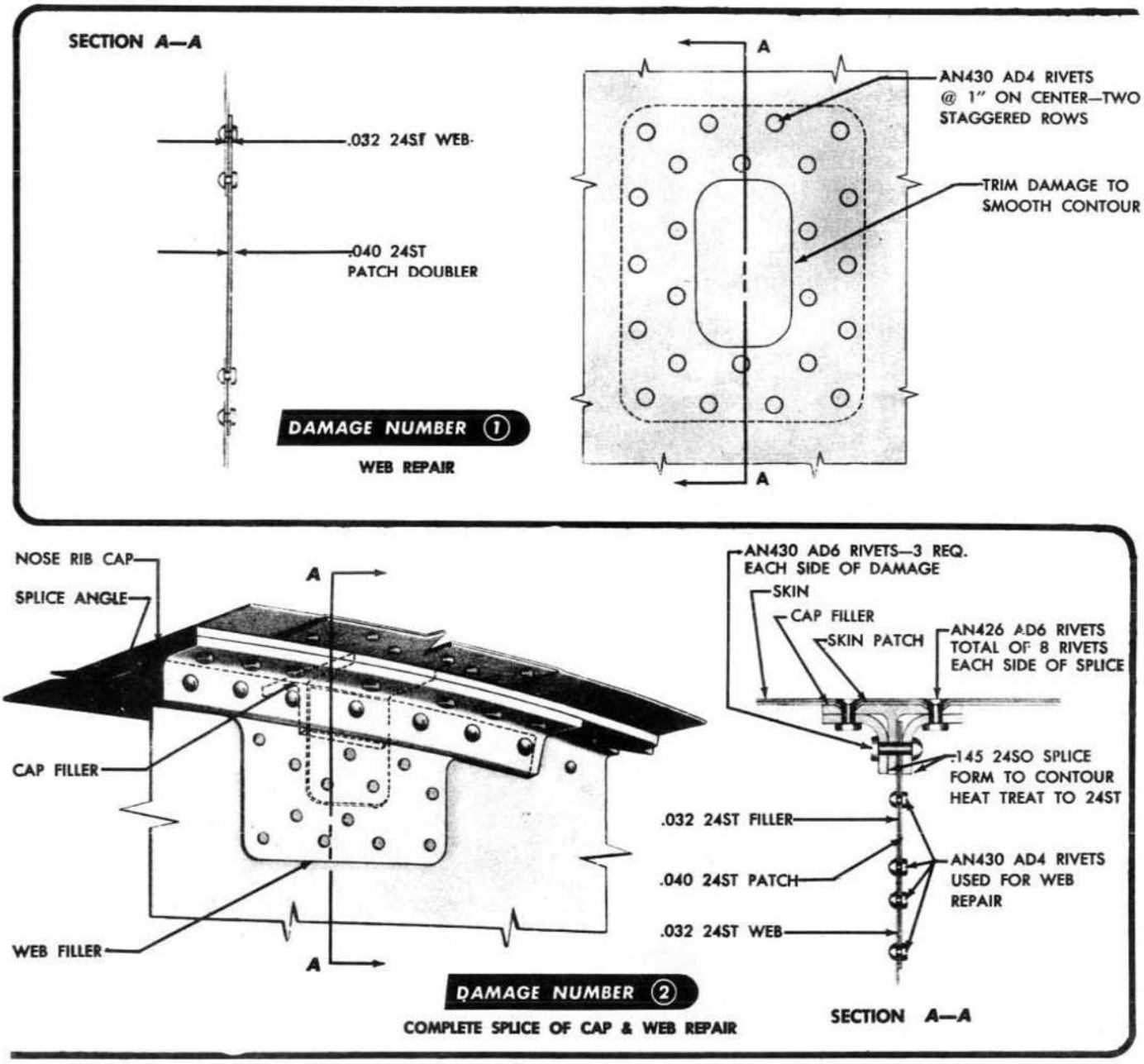
Figure 22—Insert Repair of Fixed Leading Edge



RIVET SCHEDULE FOR NOSE RIB STRAP REPAIRS

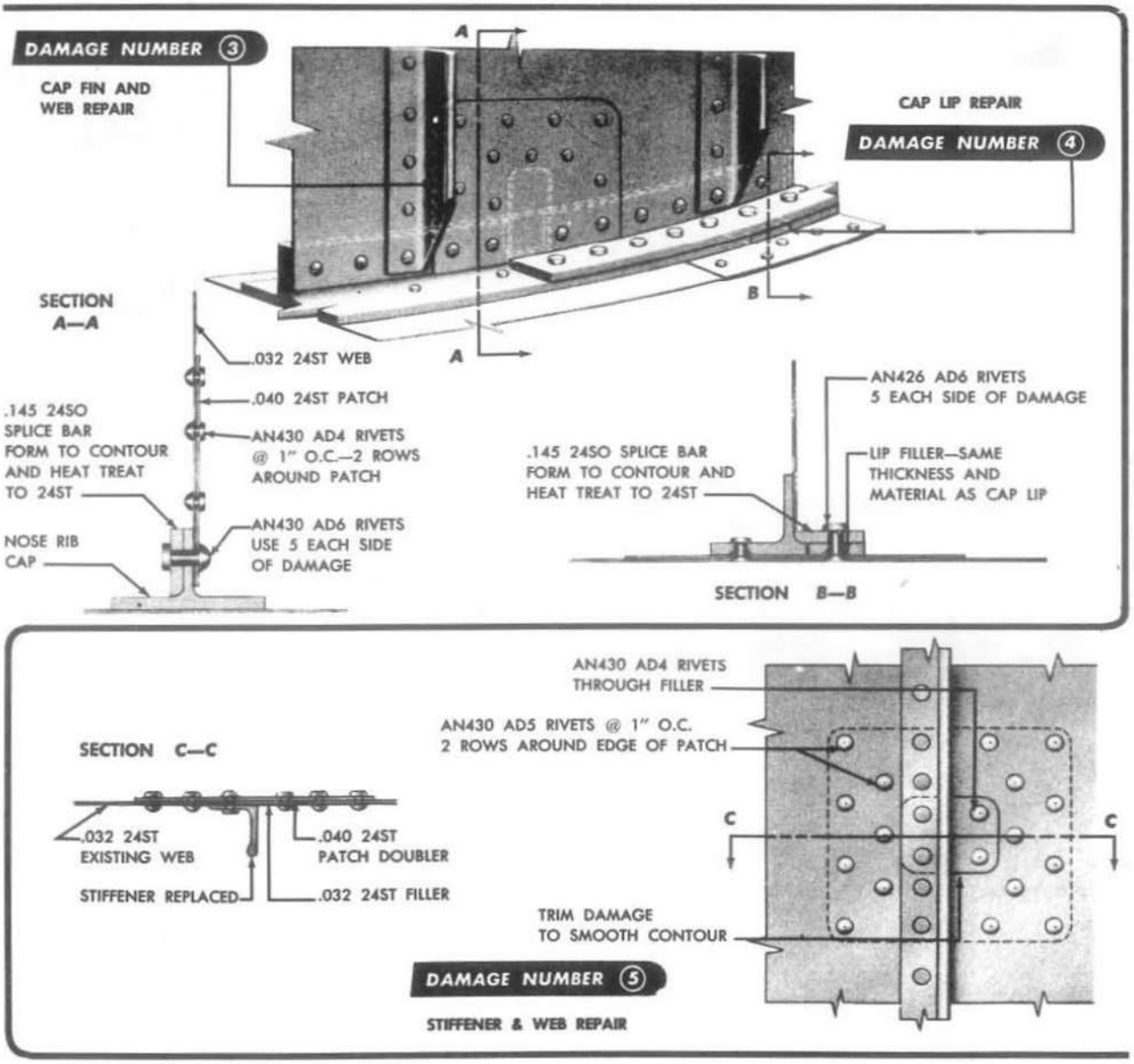
STATION	COMPLETE SPLICE Number and Size of Rivets Each Side of Damage	LIP OR FIN SPLICE Number and Size of Rivets Each Side of Damage
180	10 — AD6	5 — AD6
205	8 — AD6	5 — AD6
241	4 — AD4	2 — AD4
273	4 — AD5	2 — AD5
314	4 — AD5	2 — AD5
360	4 — AD5	2 — AD5

Figure 23—Key Drawing of Damages to Wing Leading Edge Nose Rib



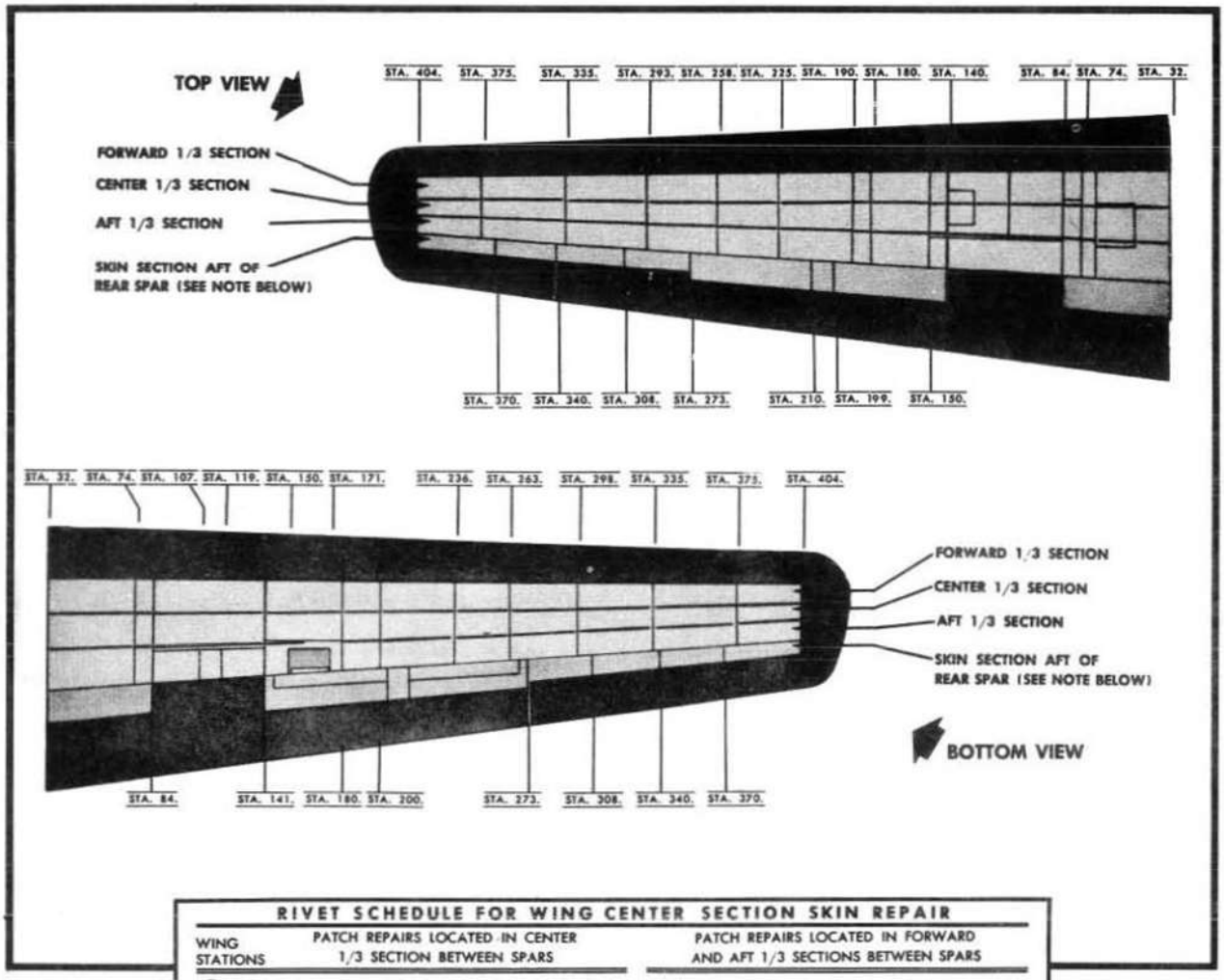
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than ½ inch.
3. Construct filters from the same gage and material as the existing material.
4. Construct splice angles from .145 24SO plate. Heat treat to 24ST after forming.
5. Construct web patch from material one gage heavier than the web.
6. Refer to wing leading edge skin repair for damage in skin.
7. For rivet edge and row distance, see Figure 7, Section I.
8. For flush riveting, see Figure 6, Section I.

Figure 24—Repair of Wing Leading Edge Nose Rib Cap and Web



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than ½ inch.
3. Construct filters from the same gage and material as the existing material.
4. Construct splice bars from .145 24ST plate.
5. Construct web patch from material one gage heavier than the web.
6. Refer to wing leading edge skin repair for damage in skin.
7. For rivet edge and row distance, see Figure 7, Section I.
8. For flush riveting, see Figure 6, Section I.

Figure 25—Repair of Damage to Wing Leading Edge Nose Rib



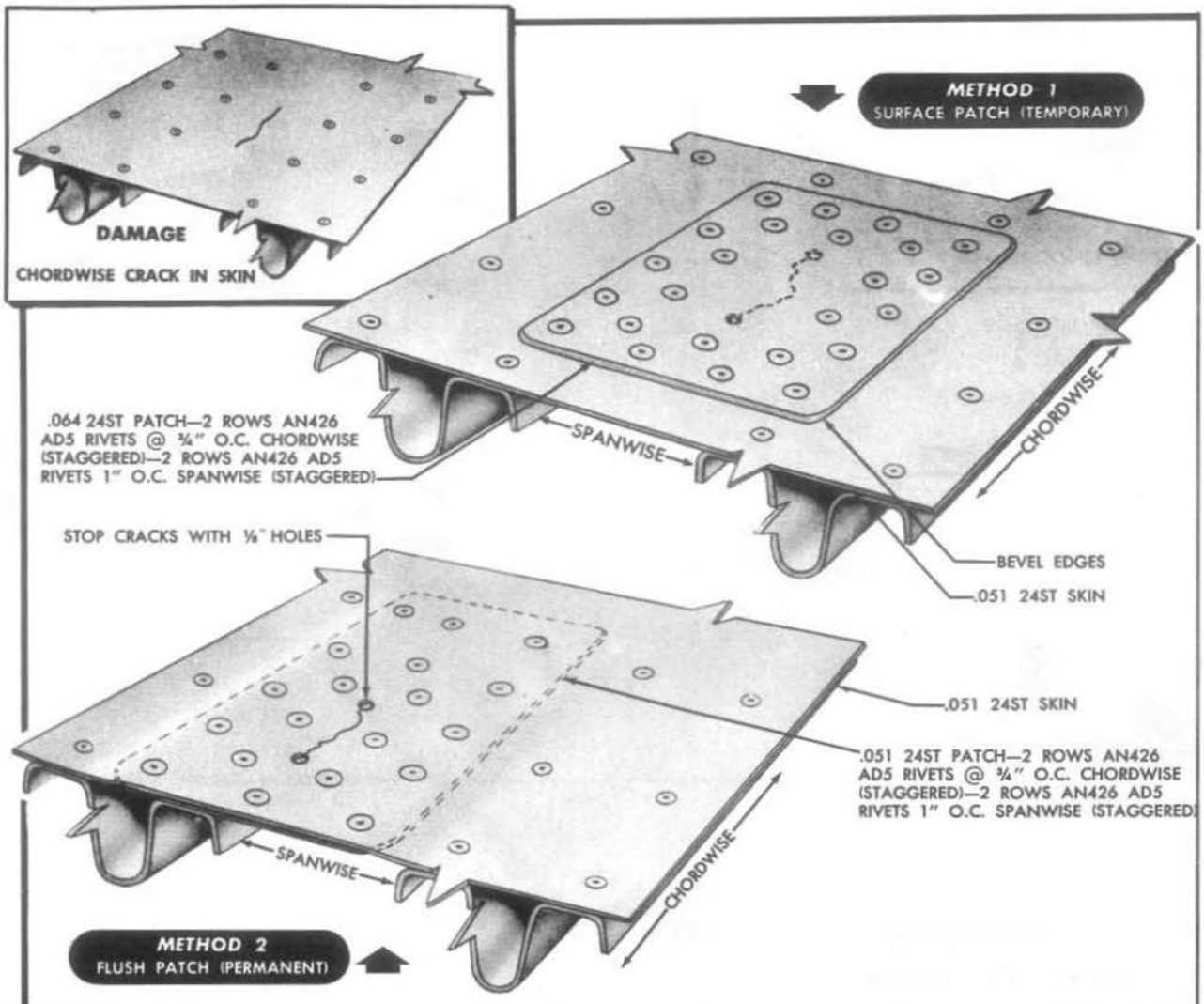
RIVET SCHEDULE FOR WING CENTER SECTION SKIN REPAIR

WING STATIONS	PATCH REPAIRS LOCATED IN CENTER 1/3 SECTION BETWEEN SPARS		PATCH REPAIRS LOCATED IN FORWARD AND AFT 1/3 SECTIONS BETWEEN SPARS	
Top Surface	Spanwise	Chordwise	Spanwise	Chordwise
32-74	AD6 2 ROWS @ 5/8" O.C.*	*AD6 2 ROWS @ 5/8" O.C.	AD6 2 ROWS @ 5/8" O.C.	AD8 3 ROWS @ 1" O.C.
74-85	AD6 2 ROWS @ 9/16" O.C.	AD6 2 ROWS @ 9/16" O.C.	AD6 2 ROWS @ 9/16" O.C.	AD8 3 ROWS @ 3/4" O.C.
85-141	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD8 2 ROWS @ 7/8" O.C.
141-181	AD5 2 ROWS @ 1-1/8" O.C.	AD5 2 ROWS @ 1-1/8" O.C.	AD5 2 ROWS @ 1-1/8" O.C.	AD6 2 ROWS @ 5/8" O.C.
181-258	AD5 2 ROWS @ 1-1/4" O.C.	AD5 2 ROWS @ 1-1/4" O.C.	AD5 2 ROWS @ 1-1/4" O.C.	AD6 2 ROWS @ 5/8" O.C.
258-375	AD4 2 ROWS @ 1" O.C.	AD4 2 ROWS @ 1" O.C.	AD4 2 ROWS @ 1" O.C.	AD6 2 ROWS @ 3/4" O.C.
375-405	AD4 2 ROWS @ 1-1/4" O.C.	AD4 2 ROWS @ 1-1/4" O.C.	AD4 2 ROWS @ 1-1/4" O.C.	AD6 2 ROWS @ 3/4" O.C.
Bottom Surface	Spanwise	Chordwise	Spanwise	Chordwise
32-108	AD6 2 ROWS @ 9/16" O.C.	AD6 2 ROWS @ 9/16" O.C.	AD6 2 ROWS @ 9/16" O.C.	AD8 3 ROWS @ 7/8" O.C.
108-119	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD6 2 ROWS @ 7/8" O.C.
119-141	AD6 2 ROWS @ 5/8" O.C.	AD6 2 ROWS @ 5/8" O.C.	AD6 2 ROWS @ 5/8" O.C.	AD8 2 ROWS @ 3/4" O.C.
141-181	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD6 2 ROWS @ 11/16" O.C.
181-263	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD5 2 ROWS @ 1" O.C.	AD6 2 ROWS @ 3/4" O.C.
263-375	AD4 2 ROWS @ 1" O.C.	AD4 2 ROWS @ 1" O.C.	AD4 2 ROWS @ 1" O.C.	AD6 2 ROWS @ 3/4" O.C.
375-405	AD4 2 ROWS @ 1-1/4" O.C.	AD4 2 ROWS @ 1-1/4" O.C.	AD4 2 ROWS @ 1-1/4" O.C.	AD6 2 ROWS @ 3/4" O.C.

NOTE: All patches in Skin aft of rear spar use AD4 2 ROWS 1-1/4" Spanwise—AD4 2 Rows 1-1/4" Chordwise.
* On Center.

Refer to Figure 11 —Wing Plating Diagram, Section II for panel identification and rivet attachment schedule.

Figure 26 —Schedule for Repair of Wing Center Section Skin

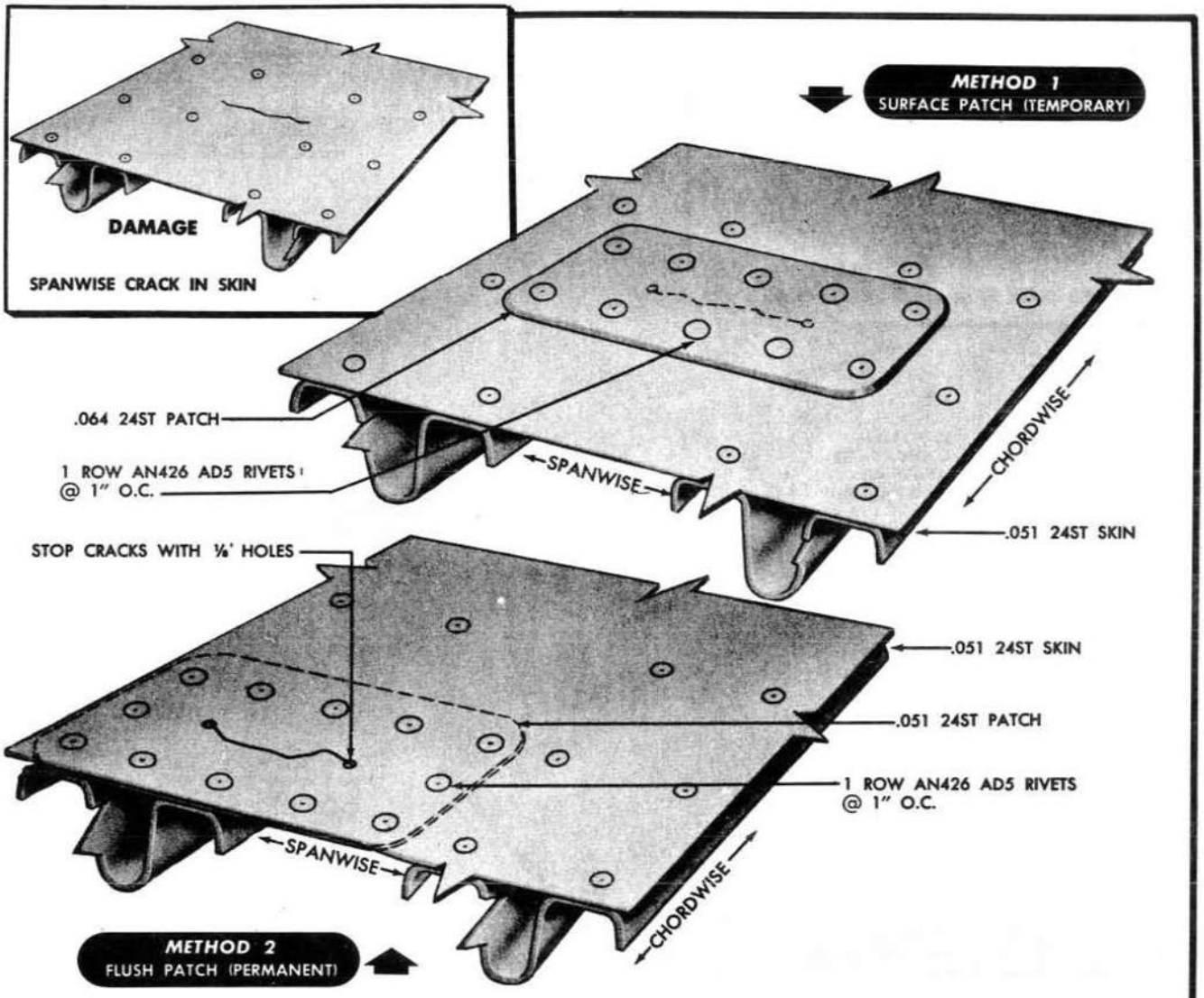


SKIN	CHORDWISE LENGTH OF PATCH
.040	2" LONGER THAN CRACK
.051	1.3 × LENGTH OF CRACK + 2"
.064	1.6 × LENGTH OF CRACK + 2"
.072	1.8 × LENGTH OF CRACK + 2"
.081	2.1 × LENGTH OF CRACK + 2"
.091	2.3 × LENGTH OF CRACK + 2"

SKIN	CHORDWISE	SPANWISE
.040 – .051	AD5 2 ROWS @ ¾" O. C.	AD5 2 ROWS @ 1" O. C.
.064 AND UP	AD6 2 ROWS @ ¾" O. C.	AD5 2 ROWS @ ¾" O. C.

1. These repairs are to be used for chordwise cracks greater than 2 inches in length. Cracks under 2 inches in length after having had one-eighth inch stop holes drilled at each end may be neglected.
   Method 1 (surface patch) may be used when access to interior is extremely difficult. Make patch from material one gage heavier than the material in the panel. Bevel edges and attach to outside surface.
   Method 2 (flush patch) is more satisfactory and should be used when possible.
   (a) When stiffeners do not interfere construct patch from material of the next heavier gage than the skin and attach to the inside surface. Place filler in cutout area.
   (b) When stiffeners interfere with patch, remove rivets to provide for the placement of the patch between stiffeners and skin as shown. Use .051 material and increase size to cover damage as shown in table.
2. For flush riveting, see Figure 6, Section I.
3. For rivet edge and row distance, see Figure 7, Section I.

Figure 27—Repair of Chordwise Crack in Wing Center Section Skin

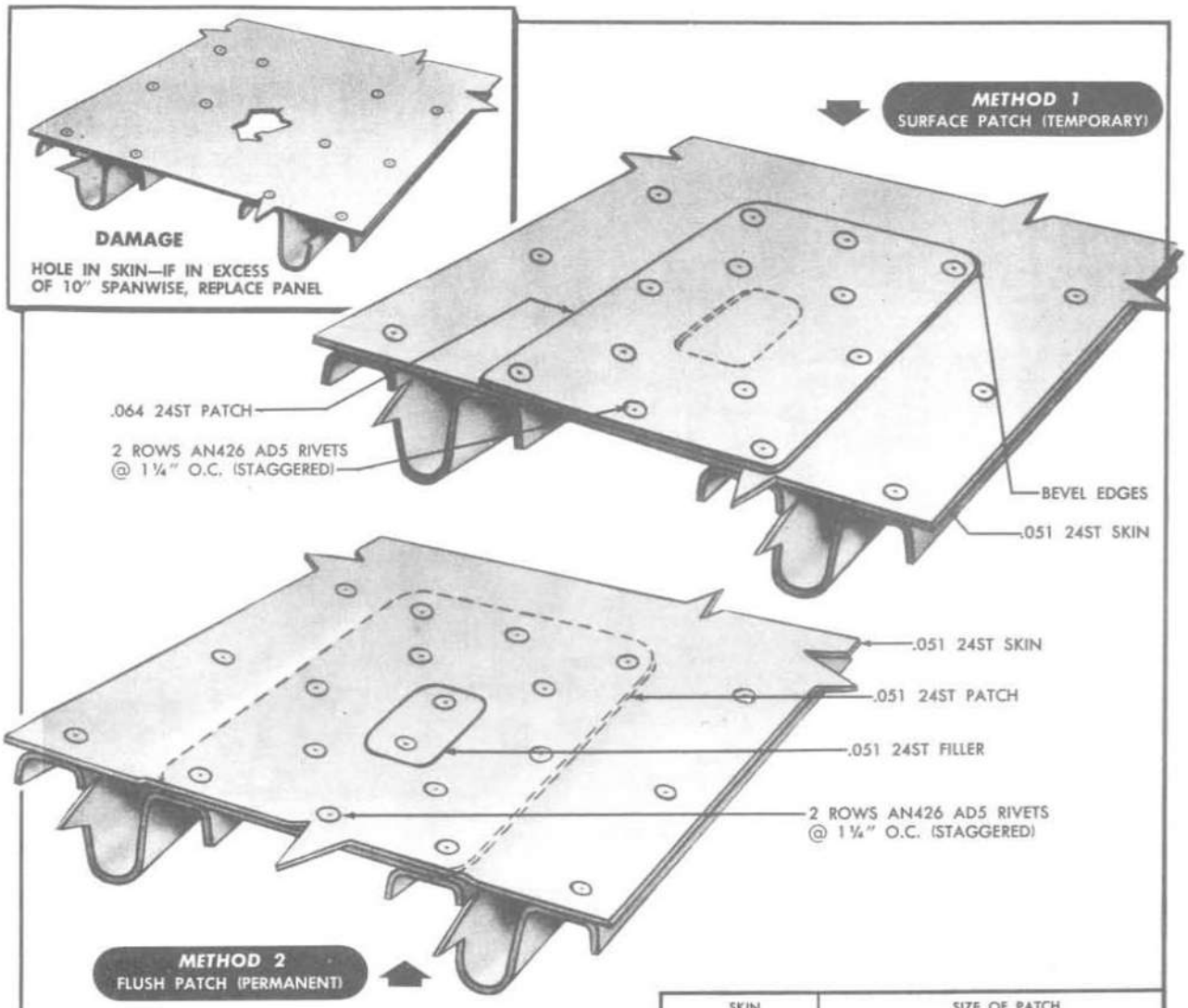


SKIN	SPANWISE LENGTH OF PATCH
.040	2" LONGER THAN CRACK
.051	1.3 × LENGTH OF CRACK + 2"
.064	1.6 × LENGTH OF CRACK + 2"
.072	1.8 × LENGTH OF CRACK + 2"
.081	2.1 × LENGTH OF CRACK + 2"
.091	2.3 × LENGTH OF CRACK + 2"

SKIN	CHORDWISE	SPANWISE
.040 – .051	AD5 1 ROW @ 1" O. C.	AD5 1 ROW @ 1" O. C.
.064 AND UP	AD6 1 ROW @ ¾" O. C.	AD5 1 ROW @ ¾" O. C.

1. These repairs are to be used for spanwise cracks greater than 2 inches in length. Cracks under 2 inches in length after having had one-eighth inch stop holes drilled at each end may be neglected.
   Method 1 (surface patch) may be used when access to interior is extremely difficult. Make patch from material one gage heavier than the material in the panel. Bevel edges and attach to outside surface.
   Method 2 (flush patch) is more satisfactory and should be used when possible.
   (a) When stiffeners do not interfere construct patch from material of the next heavier gage than the skin and attach to the inside surface. Place filler in cutout area.
   (b) When stiffeners interfere with patch, remove rivets to provide for the placement of the patch between stiffeners and skin as shown. Use .051 material and increase size to cover damage as shown in table.
2. For flush riveting, see Figure 6, Section I.
3. For rivet edge and row distance, see Figure 7, Section I.

Figure 28—Repair of Spanwise Crack in Wing Center Section Skin



SKIN	SIZE OF PATCH
.040	2" LONGER THAN DAMAGE
.051	1.3 × LENGTH OF DAMAGE + 2"
.064	1.6 × LENGTH OF DAMAGE + 2"
.072	1.8 × LENGTH OF DAMAGE + 2"
.081	2.1 × LENGTH OF DAMAGE + 2"
.091	2.3 × LENGTH OF DAMAGE + 2"

1. These repairs are to be used for damage up to 10 inches spanwise. For greater damage replace entire panel.
2. Method 1 (surface patch) may be used when access to interior is extremely difficult. Make material patch from material one gage heavier than the material in the panel. Bevel edges and attach to outside surface.
3. Method 2 (flush patch) is more satisfactory and should be used when possible.
   (a) When stiffeners do not interfere construct patch from material of the next heavier gage than the skin and attach to the inside surface. Place filler in cutout area.
   (b) When stiffeners intertere with patch, remove rivets to provide for the placement of the patch between stiffeners and skin as shown. Use .051 material and increase size to cover damage as shown in table.
4. When possible use existing rivet holes.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 29—Repair of Hole Damage in Wing Center Section Skin

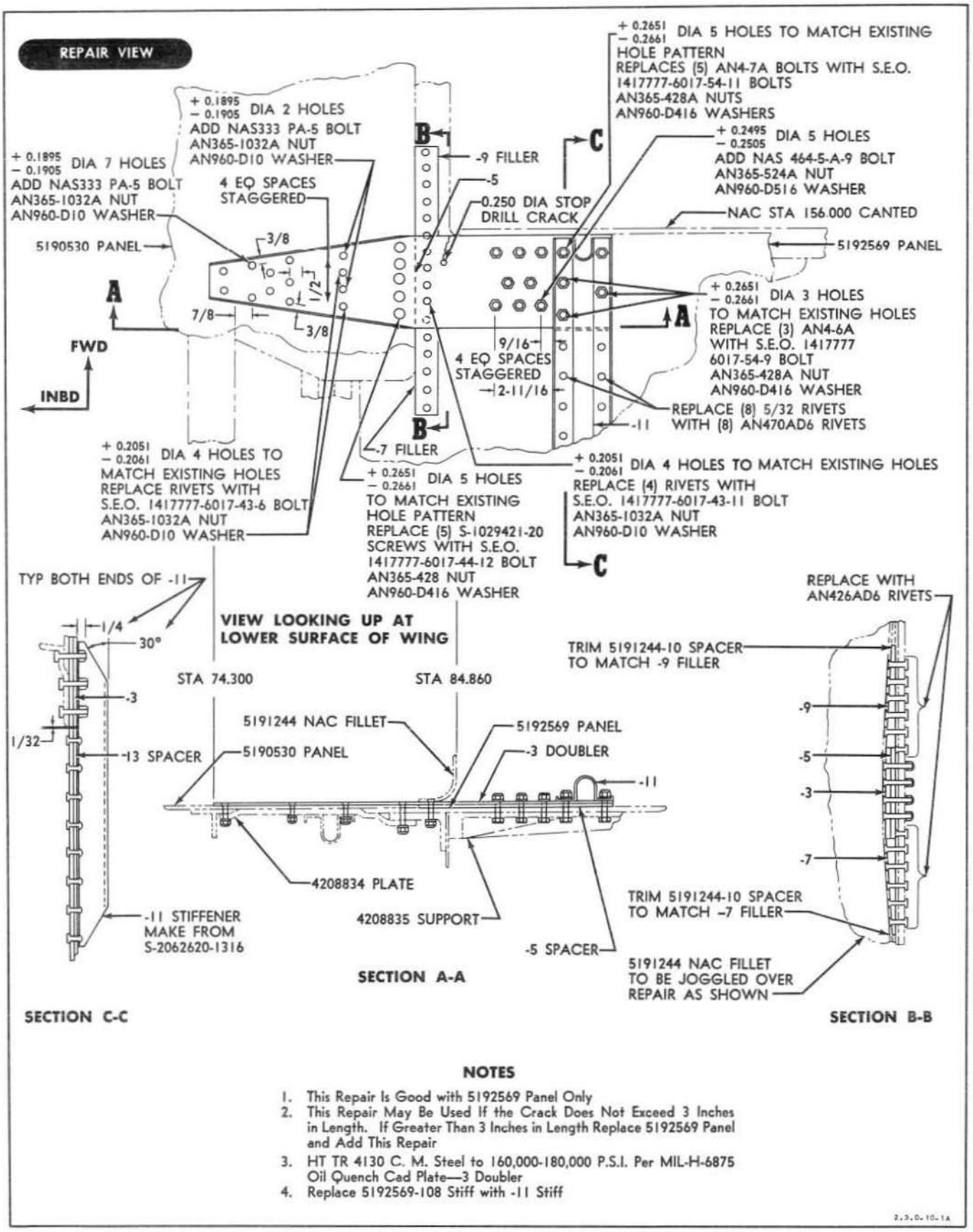


Figure 30–Repair of Chordwise Crack in Lower Wing Skin Panel, Part No. 5192569 (Sheet 1 of 2)

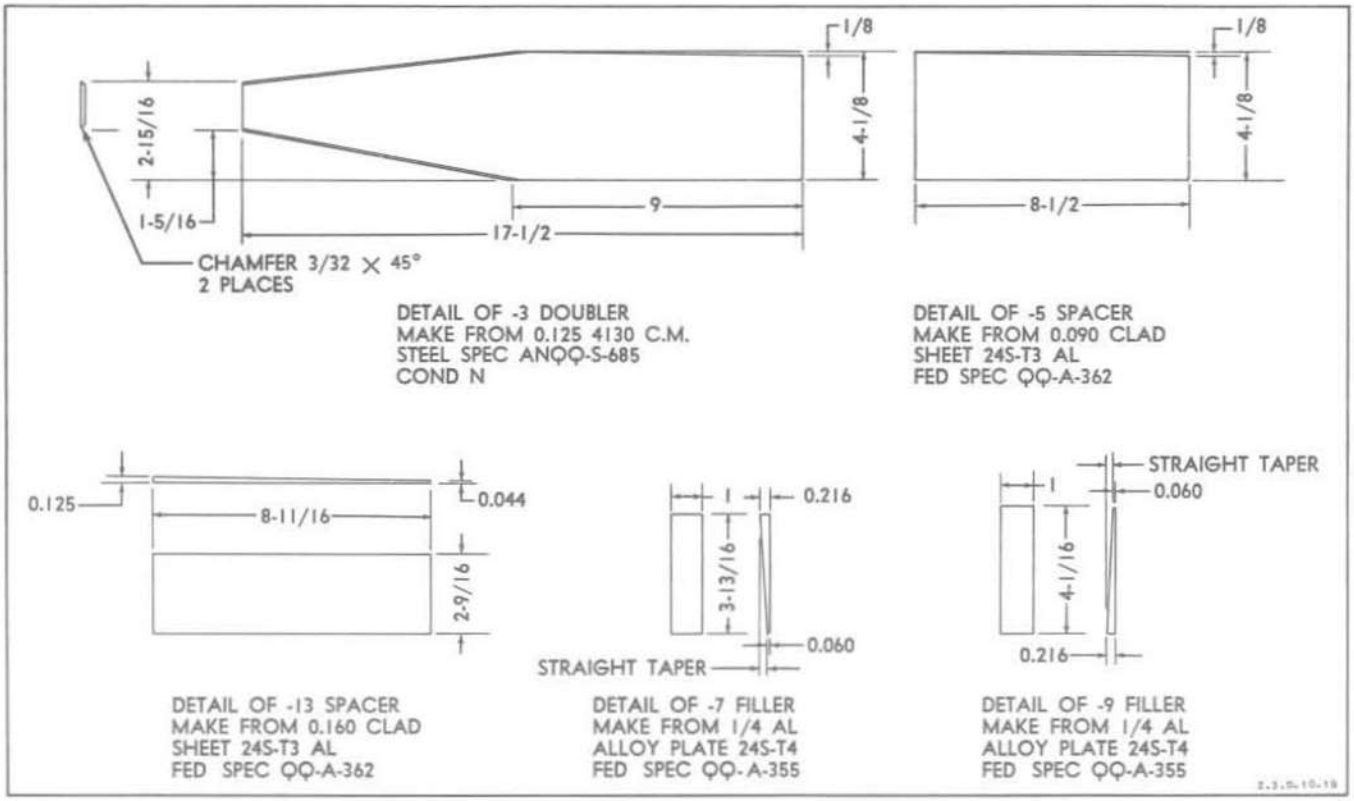
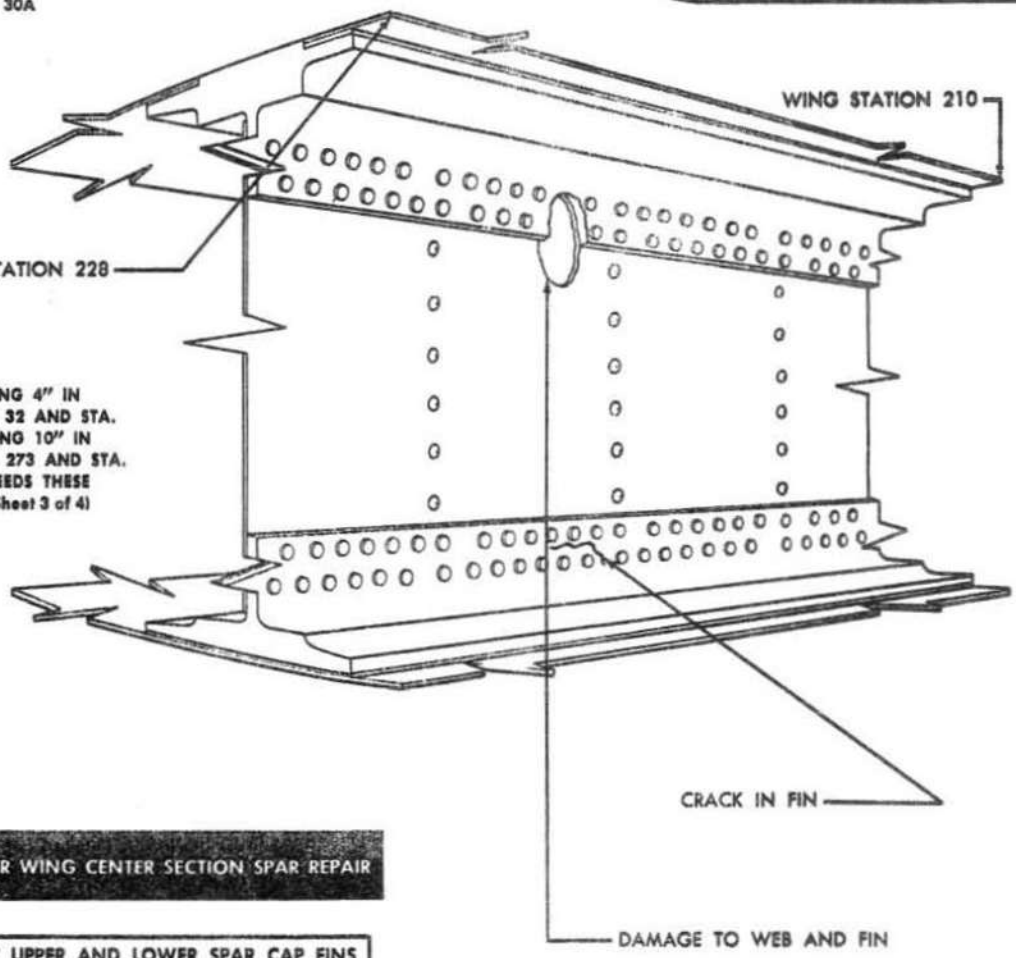


Figure 30–Repair of Chordwise Crack in Lower Wing Skin Panel, Part No. 5192569 (Sheet 2 of 2)

FOR REPAIR DRAWINGS AND NOTES SEE FIG. 30A (Sheet 2 of 4)

DAMAGE DRAWING



DAMAGE NOT EXCEEDING 4" IN LENGTH BETWEEN STA. 32 AND STA. 273 AND NOT EXCEEDING 10" IN LENGTH BETWEEN STA. 273 AND STA. 405 — IF DAMAGE EXCEEDS THESE LIMITS, SEE FIG. 30A (Sheet 3 of 4) FOR REPAIR

RIVET SCHEDULE FOR WING CENTER SECTION SPAR REPAIR

TABLE I FRONT UPPER AND LOWER SPAR CAP FINS

Station	Rivet	Number of Rivets on Each Side of Damage
32 to 141	AD8	18
141 to 181	AD8	27
181 to 335	AD6	25
	*AD8	14
335 to 405	AD6	19
	*AD8	11

TABLE II REAR UPPER SPAR CAP FIN

Station	Rivet	Number of Rivets Each Side of Damage
32 to 85	DD8	11
85 to 141	DD8	15
141 to 181	AD8	13
181 to 273	AD6	25
	*AD8	14
273 to 314	AD8	13
314 to 405	AD6	22
	*AD8	12

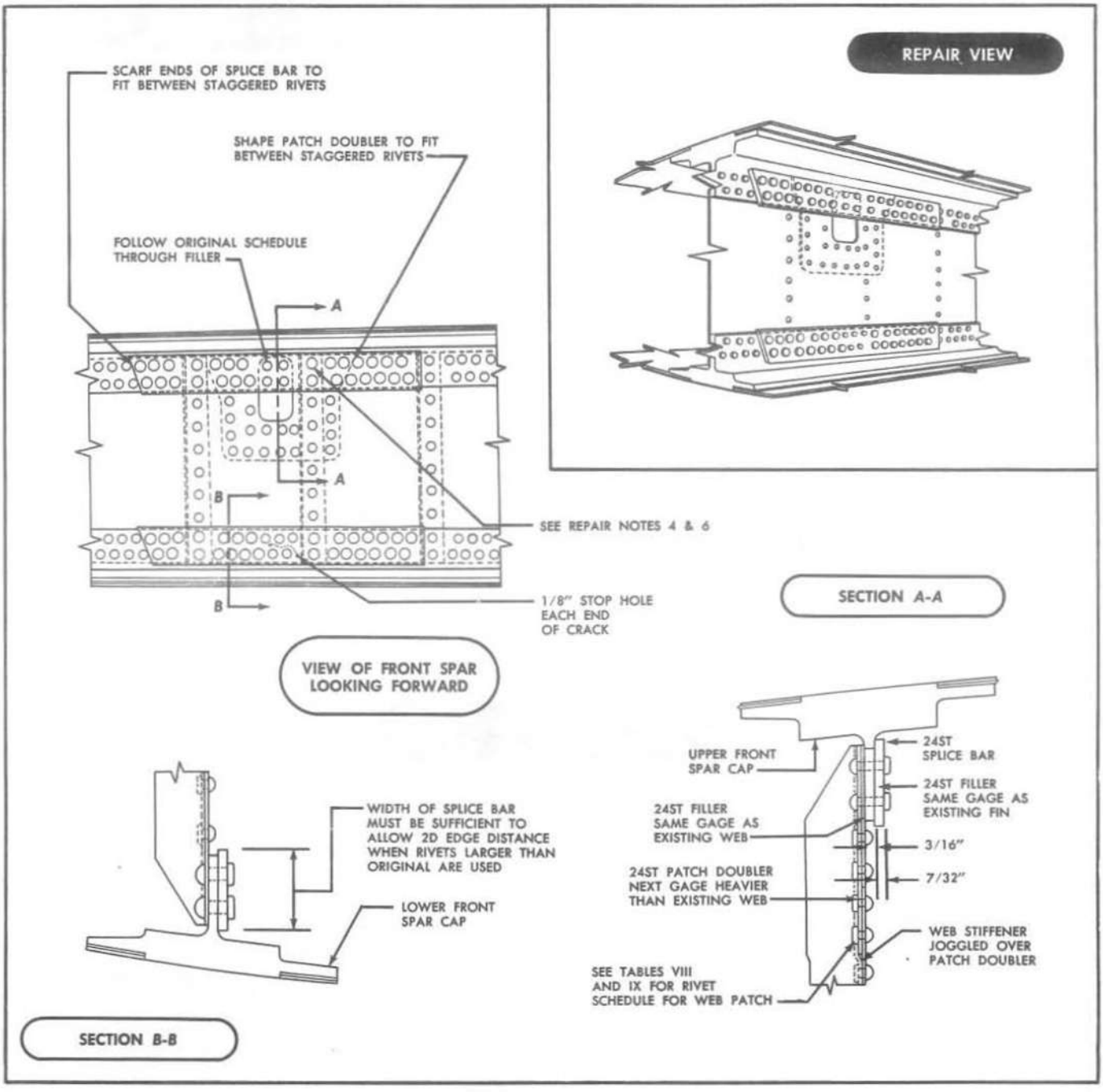
TABLE III REAR LOWER SPAR CAP FIN

Station	Rivet	Number of Rivets Each Side of Damage
32 to 85	DD8	13
85 to 141	DD8	25
141 to 181	AD8	33
181 to 360	AD6	22
	*AD8	12

*ALTERNATE SIZE AND NUMBER OF RIVETS THAT MAY BE USED AT SOME LOCATIONS TO REDUCE LENGTH OF SPLICE.

**SEE SPECIAL REPAIR—FIG. 33 (Sheets 1 and 2 of 4) IF DAMAGE IS IN THE LOWER FRONT SPAR CAP FIN BETWEEN STA. 32 AND STA. 84.

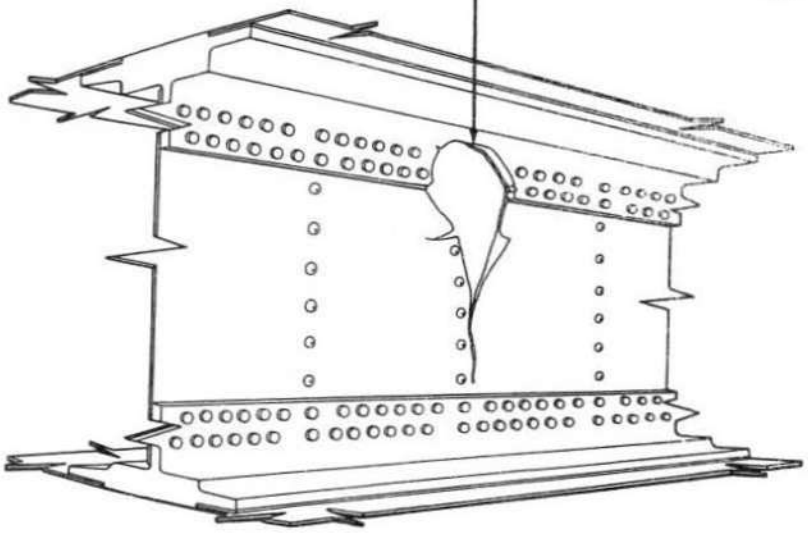
Figure 30A—Patch Repair of Wing Spar Fin (Sheet 1 of 4)



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar from dural plate which exceeds the thickness of the fin by one thirty-second inch. Splice bar must not be less than three and one-half times the length of the damage, and of sufficient length to accommodate the required number of rivets on each side of the damage.
4. Tables I, II, and III indicate the size and minimum number of rivets required through patch on each side of damage.
5. Use existing rivet holes.
6. Construct web patch from material one gage heavier than original web.
7. Tables VIII and IX indicate the rivet schedule for web patches at any wing station.
8. Replace any damaged web stiffener.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

Figure 30A—Patch Repair of Wing Spar Fin (Sheet 2 of 4)

DAMAGE DRAWING



SEE SPECIAL REPAIR — FIG. 33 (Sheets 1 and 2 of 4) IF DAMAGE IS IN THE LOWER FRONT SPAR CAP FIN BETWEEN STA. 32 AND STA. 84.

Rivet Schedule for Repair of Wing Center Section Cap Fin

TABLE IV
FRONT UPPER SPAR CAP FIN

Station	Bolt Size	Number of Bolts
32 TO 141	1/4"	6
141 TO 181	1/4"	8
181 TO 314	1/4"	5

TABLE V
FRONT LOWER SPAR CAP FIN

Station	Bolt Size	Number of Bolts
32 TO 84	See Fig. 33 (Sheet 1 of 4)	
84 TO 141	1/4"	7
141 TO 181	1/4"	10
181 TO 314	1/4"	5

TABLE VI
REAR UPPER SPAR CAP FIN

Station	Bolt Size	Number of Bolts
32 TO 225	1/4"	7

TABLE VII
REAR LOWER SPAR CAP FIN

Station	Bolt Size	Number of Bolts
32 TO 85	1/4"	6
85 TO 181	1/4"	12
181 TO 225	1/4"	6

TABLE VIII
FRONT SPAR WEB

Station	No. of Rows Around Patch	Rivet	Rivet Spacing
32 TO 360	2	AD6	3/4" O.C.
360 TO 400	2	AD4	1" O.C.

TABLE IX
REAR SPAR WEB

Station	No. of Rows Around Patch	Rivet	Rivet Spacing
32 TO 84	2	AD8	3/4" O.C.
84 TO 128	4	AD8	7/8" O.C.
128 TO 140	2	AD8	3/4" O.C.
140 TO 360	2	AD6	11/16" O.C.
360 TO 404	2	AD4	1" O.C.

NOTES

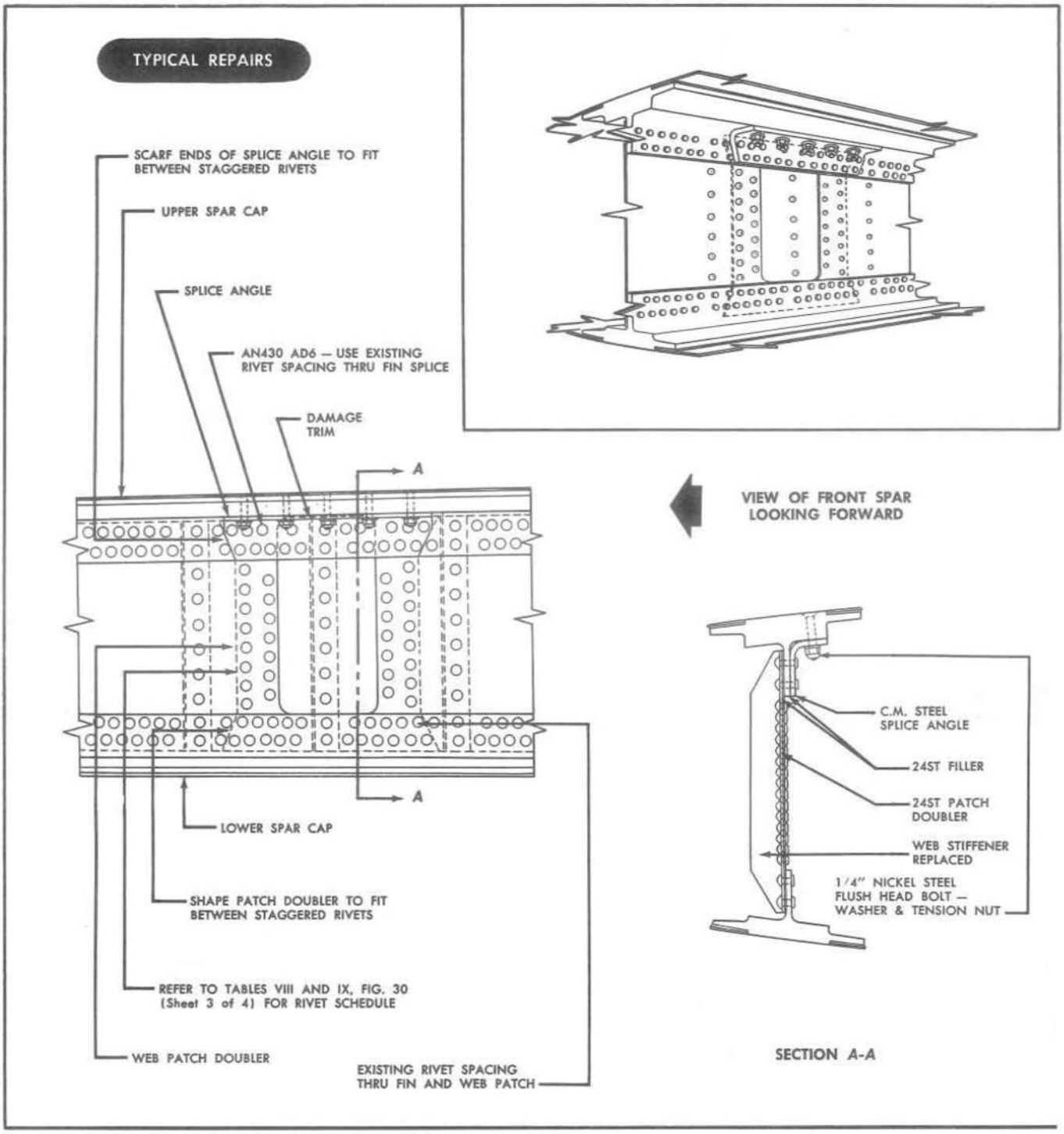
CAUTION

If damage in front lower spar cap requires repair angle to extend inboard of station 84, use only repairs shown in Figure 33

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct the splice angle from CM steel of the same thickness as the fin. Heat for bending.
4. The splice angle must be of sufficient length to accommodate the required number of bolts.
5. Tables IV, V, VI, and VII specify the minimum number of bolts required to attach the splice angle to the spar cap body at different locations.
6. Construct web patch from material one gage heavier than original web.

(Continued on next page)

Figure 30A—Patch Repair of Wing Spar Fin (Sheet 3 of 4)



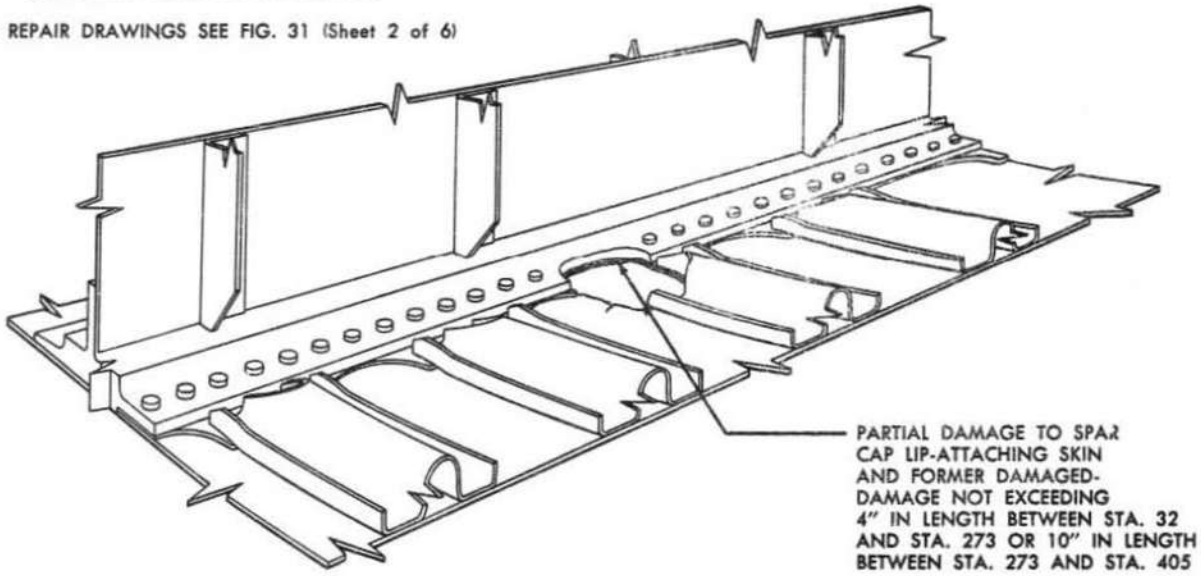
NOTES—(Continued from preceding page)

7. Tables VIII and IX, Figure 30, indicate the rivet schedule for web patches at any wing station.
8. Construct fillers from the same gage and material as the original web and fin. A web filler is necessary only between the fin and web patch.
9. Replace any damaged web stiffener.
10. For minimum bend radii of sheet material see Figure 5, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

Figure 30A—Patch Repair of Wing Spar Fin (Sheet 4 of 4)

DAMAGE DRAWING

FOR REPAIR DRAWINGS SEE FIG. 31 (Sheet 2 of 6)



VIEW OF LOWER REAR SPAR CAP LOOKING AFT AND OUTBOARD

RIVET SCHEDULES FOR WING CENTER SECTION REAR SPAR CAP

TABLE X FRONT UPPER SPAR CAP—FORWARD AND AFT LIPS

Station	Rivets	Number of Rivets Each Side of Damage
141 to 181	AD8	12
181 to 273	AD8	14
273 to 314	AD8	11
314 to 405	AD8	10

TABLE XI FRONT LOWER SPAR CAP—FORWARD AND AFT LIPS

Station	Rivets	Number of Rivets Each Side of Damage
85 to 273	AD8	16
273 to 335	AD8	12
335 to 405	AD8	9

TABLE XII REAR UPPER SPAR CAP—FORWARD LIP

Station	Rivets	Number of Rivets Each Side of Damage
141 to 335	AD8	12
335 to 405	AD8	9

TABLE XIII REAR UPPER SPAR CAP—AFT LIP

Station	Rivets	Number of Rivets Each Side of Damage
32 to 273	AD8	12
273 to 405	AD8	10

TABLE XIV REAR LOWER SPAR CAP—FORWARD LIP

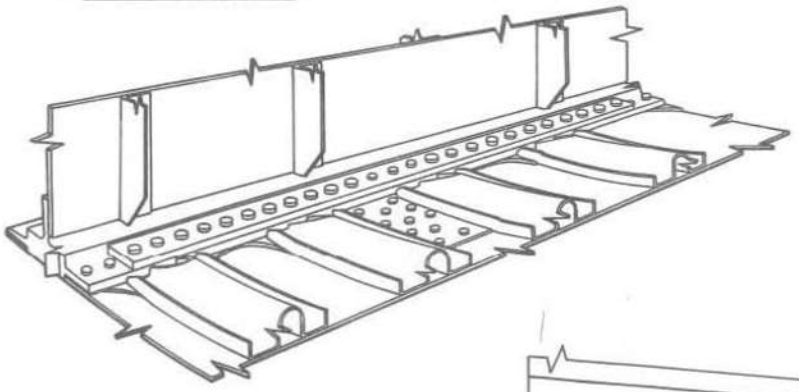
Station	Rivets	Number of Rivets Each Side of Damage
85 to 225	AD8	14
225 to 335	AD8	11
335 to 405	AD8	7

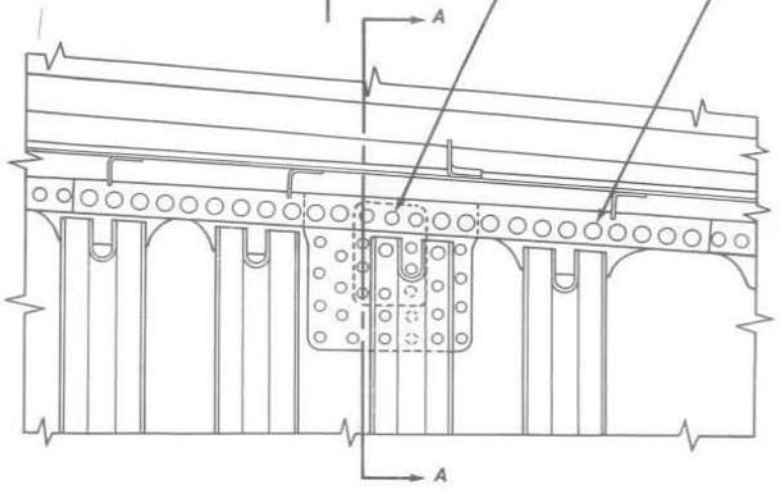
TABLE XV REAR LOWER SPAR CAP—AFT LIP

Station	Rivets	Number of Rivets Each Side of Damage
32 to 181	AD8	14
181 to 273	AD8	11
273 to 335	AD8	10
335 to 405	AD8	6

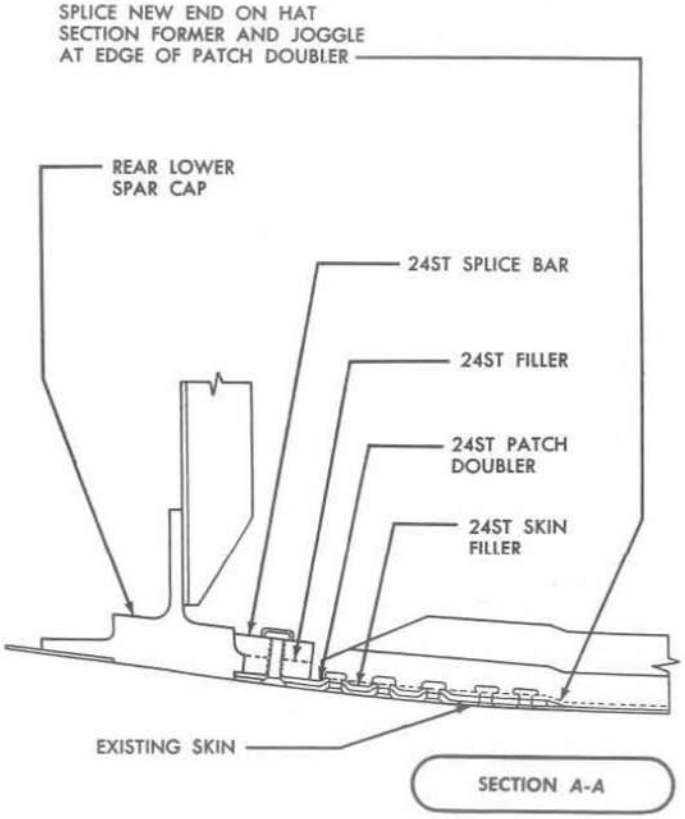
Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 1 of 6)

TYPICAL REPAIRS





VIEW OF LOWER REAR SPAR CAP AND ATTACHING SKIN LOOKING DOWN



SECTION A-A

THIS TYPE OF REPAIR USED ONLY AT LOCATIONS INDICATED IN TABLES X-XI-XII-XIII-XIV-XV SEE FIG. 31 (SHEET 1 OF 6)

NOTES

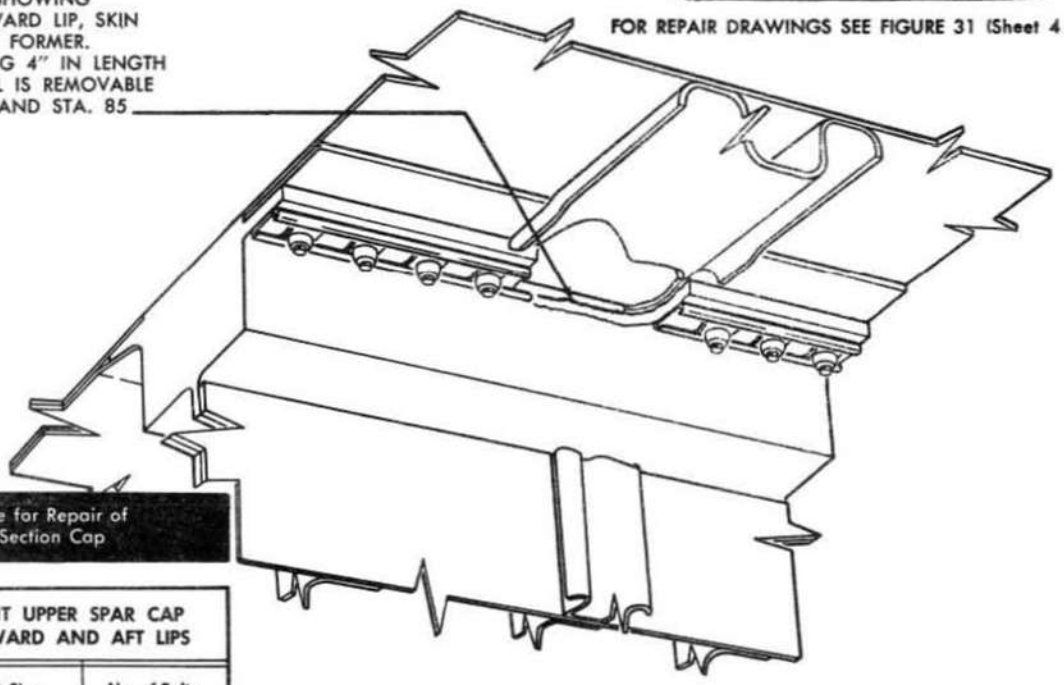
1. For wing stations not indicated in tables X to XV, refer to repairs shown on Figure 31 (Sheet 4 of 6).
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than three-eighths inch.
4. Construct splice bar from dural plate which exceeds the thickness of the lip by one thirty-second inch. Splice bar must not be less than three and one-half times the length of the damage, and of sufficient length to accommodate the required number of rivets on each side of the damage.
5. Tables X, XI, XII, XIII, XIV, and XV indicate the size and minimum number of rivets required on each side of the damage.
6. When possible use existing rivet holes.
7. Construct skin patch from 24ST material the same gage as existing doubler. Refer to skin repairs, this Section.
8. Construct filler for lip from 24ST material the same thickness as the lip.
9. For repair of hat section former refer to paragraph 1.d(3), this Section.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 2 of 6)

DAMAGE DRAWING

FOR REPAIR DRAWINGS SEE FIGURE 31 (Sheet 4 of 6)

REAR UPPER SPAR CAP AND ATTACHING SKIN SHOWING DAMAGE TO FORWARD LIP, SKIN AND HAT SECTION FORMER. DAMAGE EXCEEDING 4" IN LENGTH WHERE SKIN PANEL IS REMOVABLE BETWEEN STA. 32 AND STA. 85



Rivet Schedule for Repair of Wing Center Section Cap

TABLE XVI FRONT UPPER SPAR CAP FORWARD AND AFT LIPS

Station	Bolt Size	No. of Bolts
32 to 141	1/4"	5

TABLE XVII FRONT LOWER SPAR CAP FORWARD AND AFT LIPS

Station	
32 to 84 — See Special Repairs, Fig. 33	

TABLE XVIII REAR UPPER SPAR CAP FORWARD AND AFT LIPS

Station	Bolt Size	No. of Bolts
32 to 141	1/4"	5

TABLE XIX REAR LOWER SPAR CAP FORWARD LIP

Station	Bolt Size	No. of Bolts
32 to 85	1/4"	5

TABLE XX REAR LOWER SPAR CAP AFT LIP

Station	Bolt Size	No. of Bolts
32 to 141	1/4"	5

NOTE—

IT IS CONSIDERED THAT THIS REPAIR CAN BE USED FOR ANY LENGTH DAMAGE BETWEEN STATION LOCATIONS INDICATED IN THE TABLES ON THIS PAGE

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct the splice angle from CM steel of the same thickness as the lip. Heat for bending.
4. The splice angle must be of sufficient length to accommodate the required number of bolts.
5. Tables XVI, XVIII, XIX, and XX indicate the size and minimum number of bolts required to attach the splice angle to the spar cap body, and the wing stations at which this repair can be used.
6. Spacing of bolts must be one inch on center minimum to two inches on center maximum. Holes for bolts must be reamed for light drive fit.
7. Construct skin patch from 24ST material the same gage as existing doubler. Construct skin filler from the same gage and material as the existing skin. Refer to wing skin repairs, this Section.
8. Attachment of skin to spar cap lip must be the same as the original.
9. Use existing rivet and bolt holes.
10. For minimum bend radii of sheet material, see Figure 5, Section I.
11. For flush riveting see Figure 6, Section I.
12. For rivet edge and row distance see Figure 7, Section I.

Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 3 of 6)

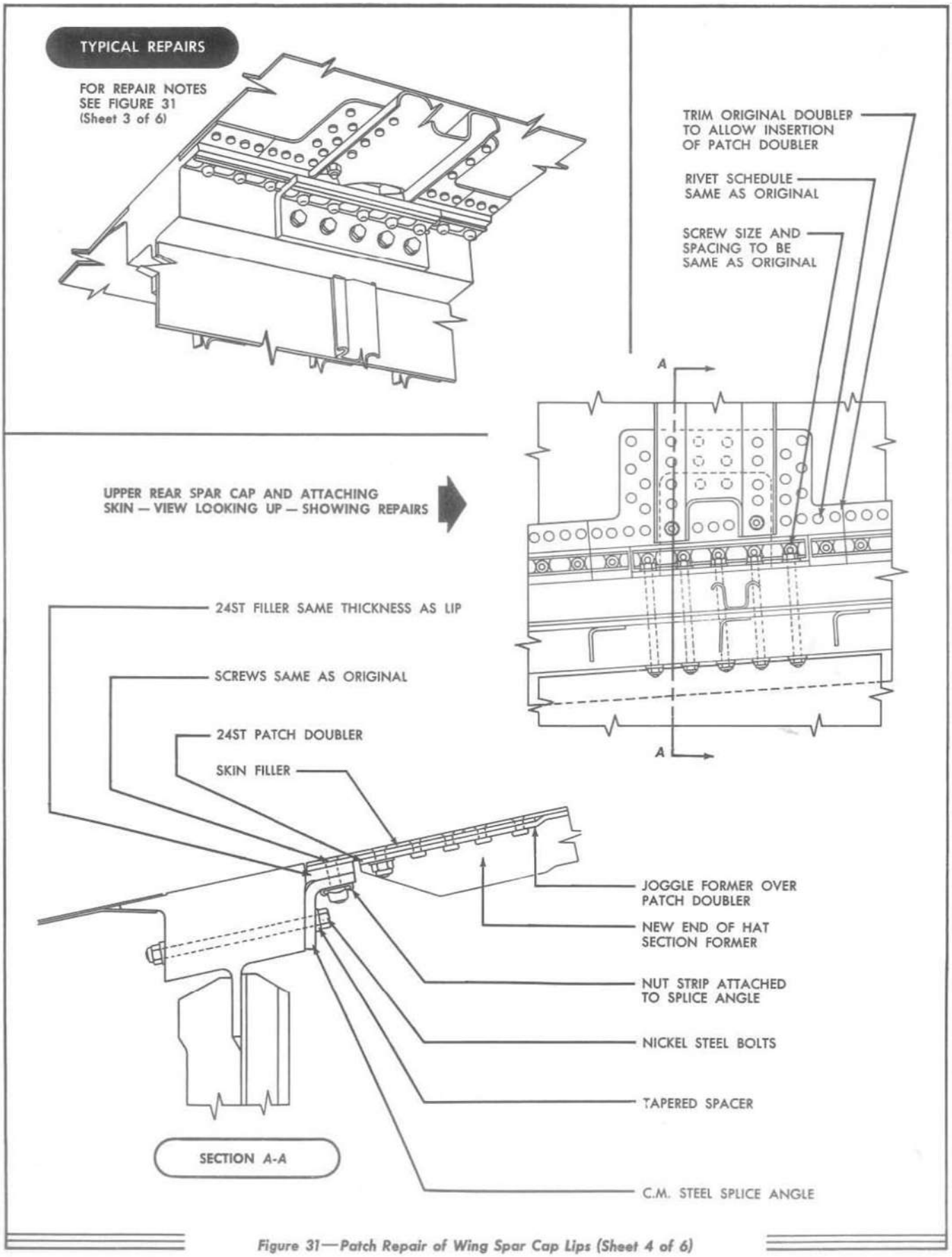
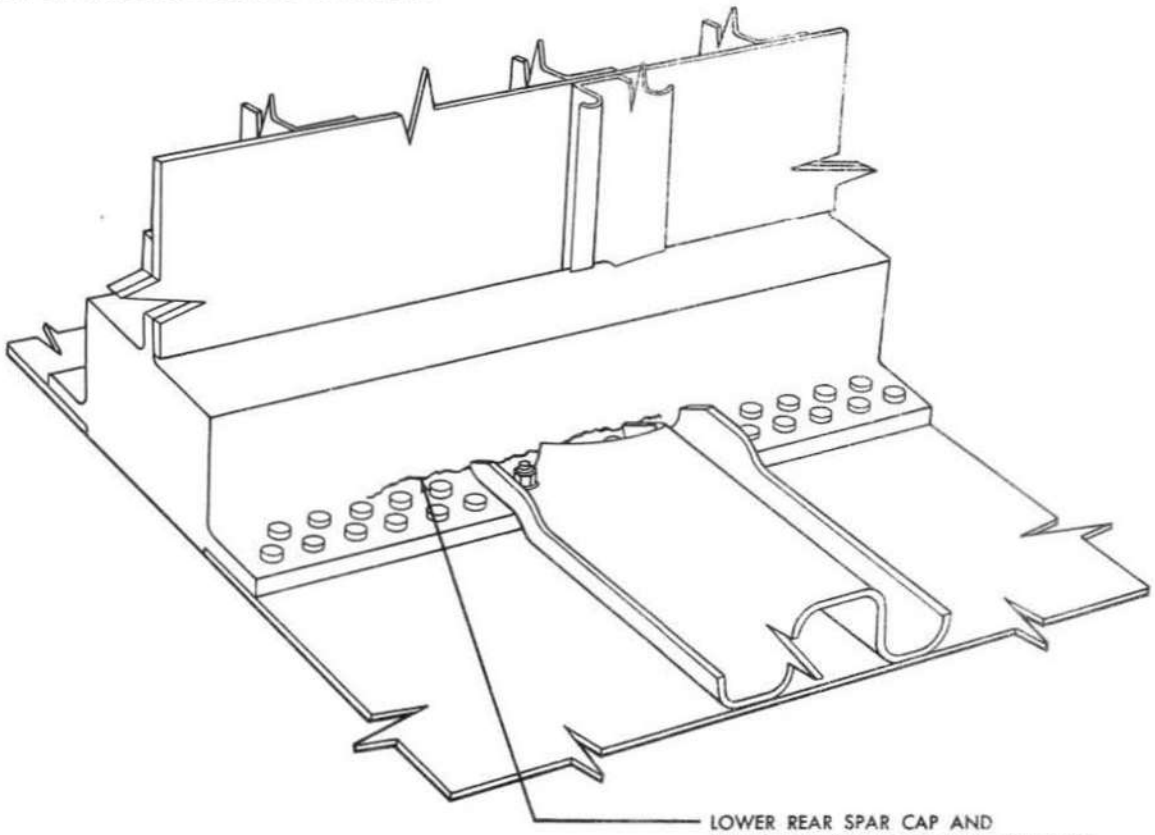


Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 4 of 6)

DAMAGE DRAWING

FOR REPAIR DRAWINGS SEE FIGURE 31 (Sheet 6 of 6)



NOTES

1. Remove all interfering rivets.
2. Drill one-eighth inch holes at each end of crack.
3. Construct splice angle from CM steel of the same thickness as the spar cap lip. Heat for bending.
4. Length of splice angle must be adequate for the spacing of the minimum required number of bolts and at least the same length as the damage.
5. Tables XVIII and XIX, Figure 31, specify the size and minimum number of bolts required to attach the splice angle to the spar cap body.
6. Spacing of bolts must be one inch on center minimum to two inches on center maximum.
7. Rivet holes in original inside row in spar cap lip cannot be used due to the thickness of the splice angle. The splice angle must be made to extend one inch beyond the edge of the lip to allow an additional row of rivets. This necessitates the use of a filler between the splice angle and the skin. Construct the filler from 24ST material the same thickness as the spar cap lip.
8. When a hat section former is attached to the spar cap lip in the repair area, it must be re-joggled to fit over the splice angle and attach as shown in Section A-A.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 5 of 6)

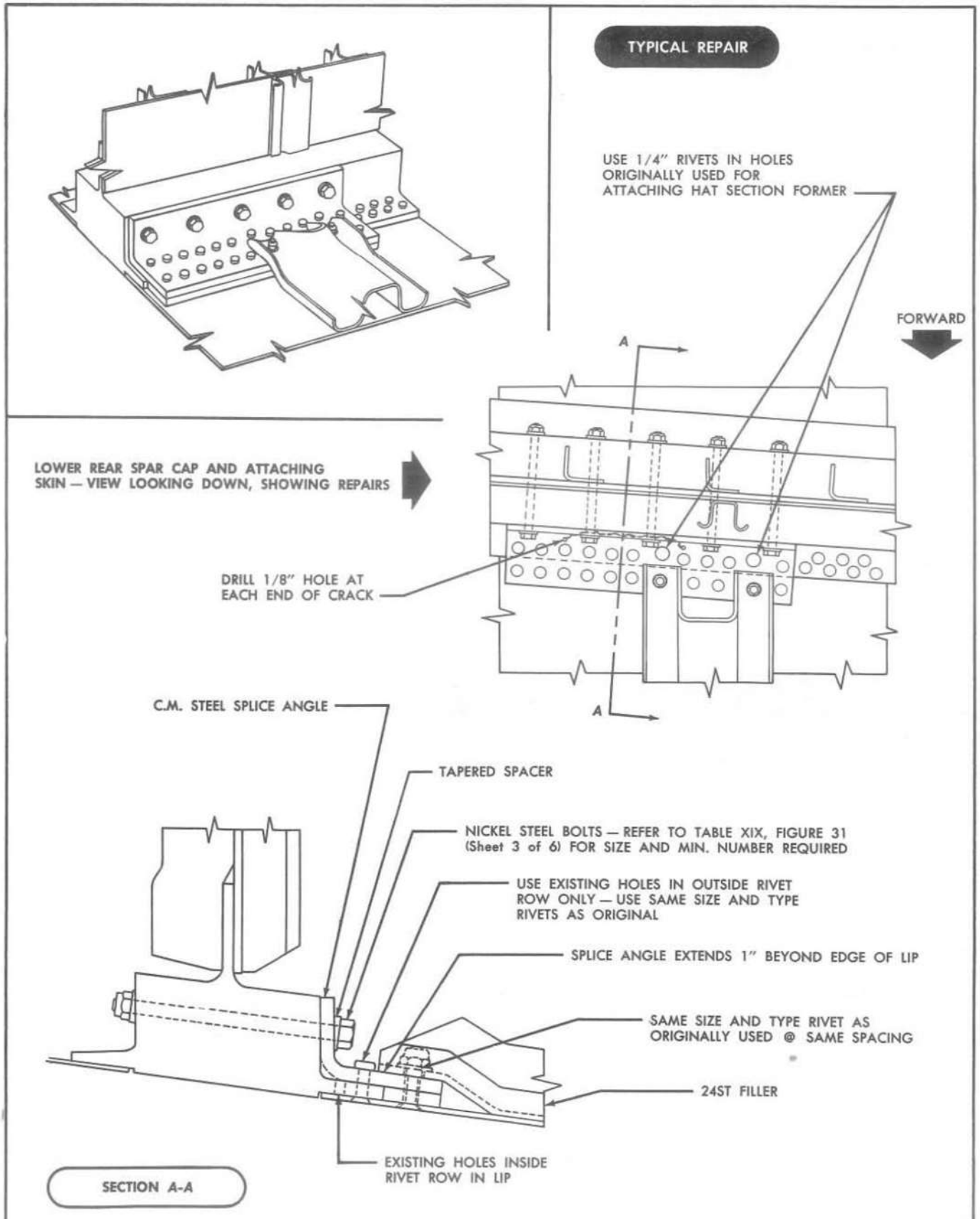
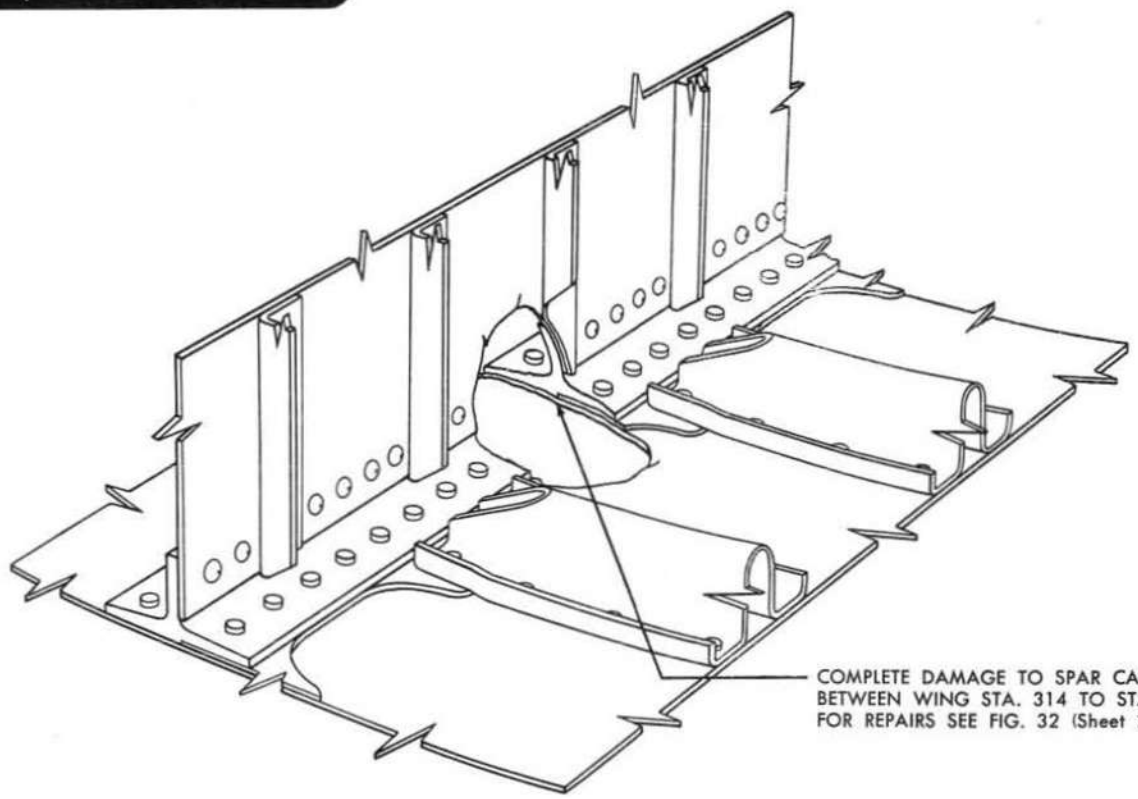


Figure 31—Patch Repair of Wing Spar Cap Lips (Sheet 6 of 6)

DAMAGE DRAWING



RIVET SCHEDULES FOR REPAIR OF COMPLETE DAMAGE TO WING SPAR CAP

TABLE XXI FRONT UPPER SPAR CAP

Station	Rivets	No. Rivets Each Side	Min. Gage Splice Angle	Material of Splice Angle
314 to 335	LIP AD5	29	5/32"	C. M. STEEL
	FIN AD6	25		
335 to 368	LIP AD5	24	5/32"	C. M. STEEL
	FIN AD6	16		
368 to 405	LIP AD4	13	5/32"	24SO — FORM H. T. to 24ST
	FIN AD5	13		

TABLE XXII FRONT LOWER SPAR CAP

Station	Rivets	No. Rivets Each Side	Min. Gage Splice Angle	Material of Splice Angle
314 to 335	LIP AD5	21	5/32"	C. M. STEEL
	FIN AD6	21		
335 to 368	LIP AD5	14	5/32"	C. M. STEEL
	FIN AD6	14		
368 to 405	LIP AD5	7	5/32"	24SO — FORM H. T. to 24ST
	FIN AD6	7		

TABLE XXIII REAR UPPER SPAR CAP

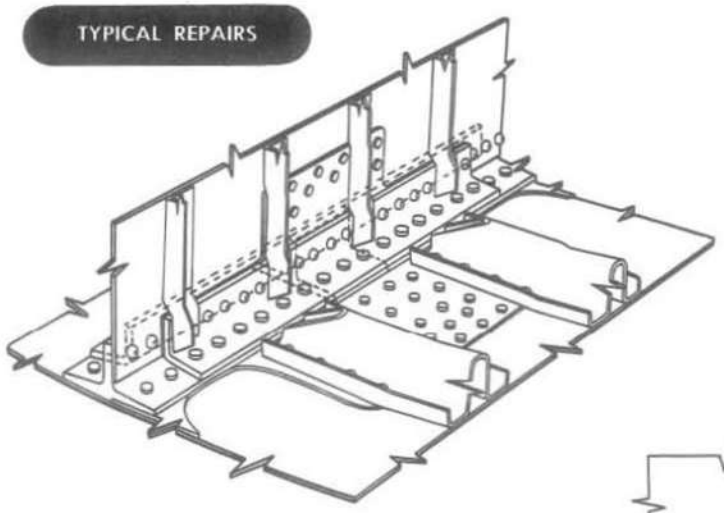
Station	Rivets	No. Rivets Each Side	Min. Gage Splice Angle	Material of Splice Angle
314 to 332	LIP AD5	20	5/32"	C. M. STEEL
	FIN AD6	20		
332 to 355	LIP AD5	16	5/32"	C. M. STEEL
	FIN AD6	16		
355 to 360	LIP AD5	14	5/32"	24SO — FORM H. T. to 24ST
	FIN AD5	7		
360 to 405	LIP AD5	12	5/32"	24SO — FORM H. T. to 24ST
	FIN AD5	6		

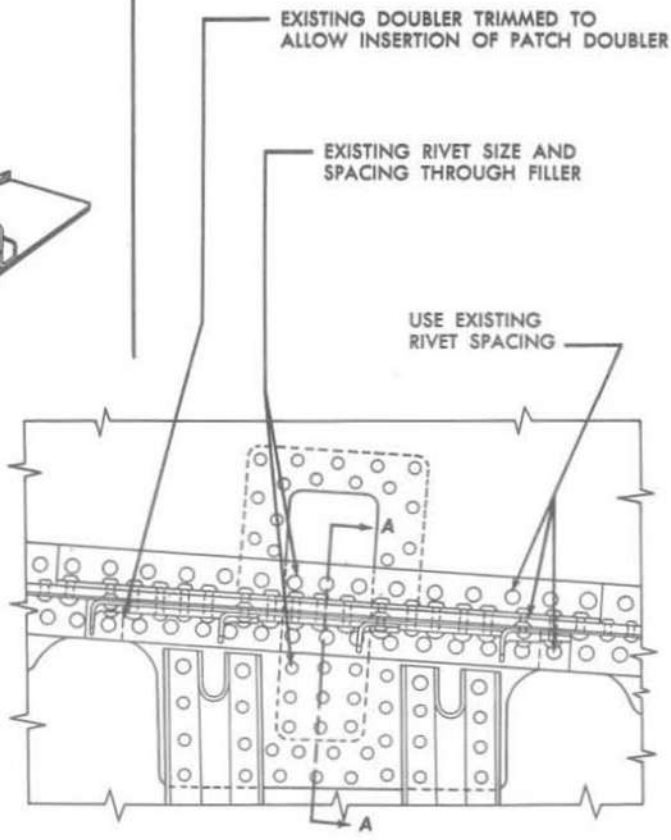
TABLE XXIV REAR LOWER SPAR CAP

Station	Rivets	No. Rivets Each Side	Min. Gage Splice Angle	Material of Splice Angle
314 to 332	LIP AD5	18	5/32"	C. M. STEEL
	FIN AD6	18		
332 to 355	LIP AD5	16	5/32"	24SO — FORM H. T. to 24ST
	FIN AD6	16		
355 to 360	LIP AD5	14	5/32"	24SO — FORM H. T. to 24ST
	FIN AD5	7		
360 to 405	LIP AD5	12	1/8"	24SO — FORM H. T. to 24ST
	FIN AD5	6		

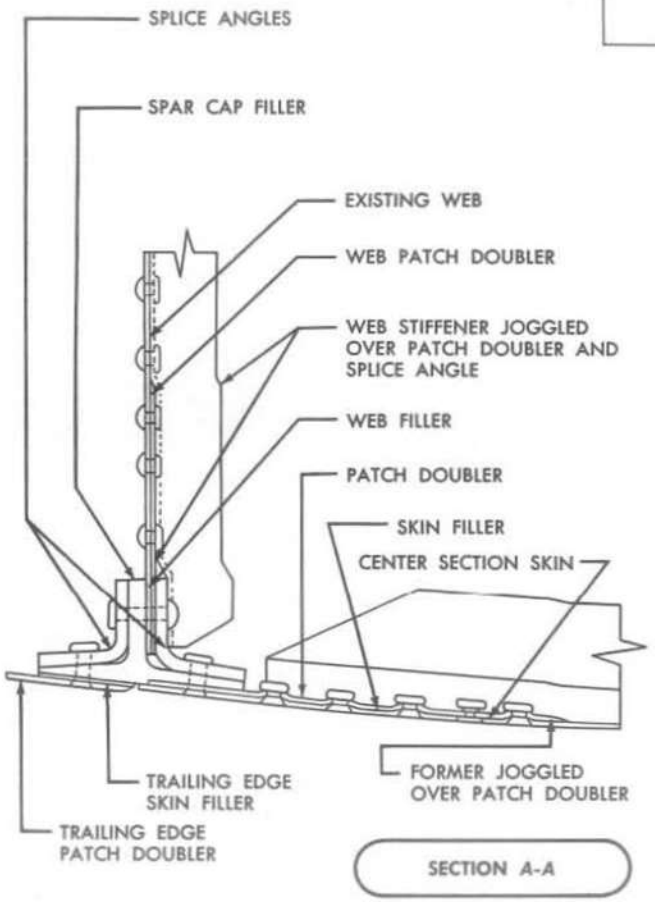
Figure 32—Splice Repair of Complete Break in Spar Cap (Sheet 1 of 2)

TYPICAL REPAIRS





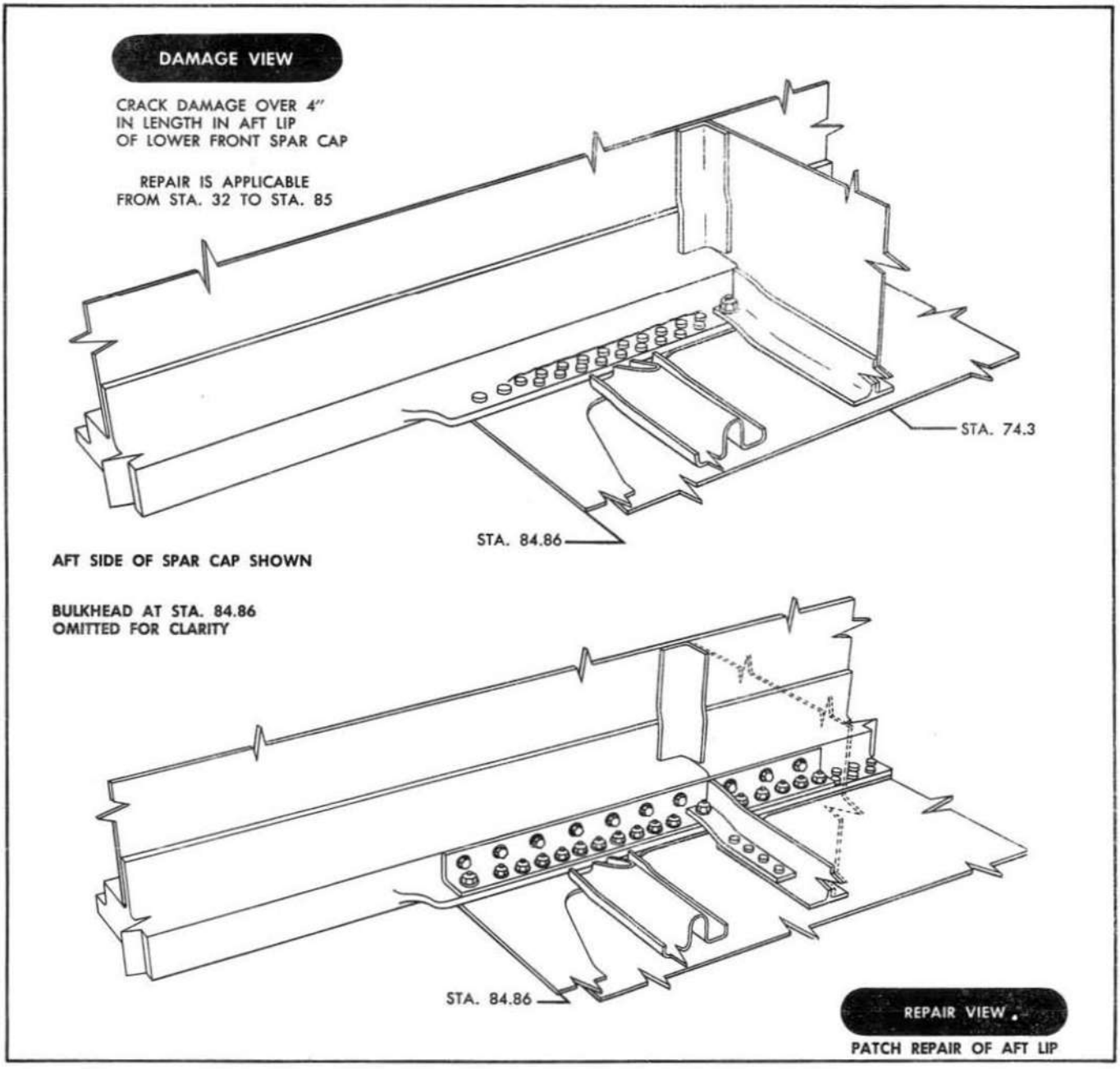
VIEW LOOKING DOWN ON REAR LOWER SPAR CAP AND ATTACHING SKIN



SECTION A-A

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angles from material specified in tables XXI, XXII, XXIII, and XXIV. Splice angle must be of sufficient length to accommodate the required number of rivets each side of damage and at least three and one-half times the length of damage.
4. Size and minimum number of rivets required on each side of damage is indicated in tables XXI, XXII, XXIII, and XXIV.
5. Use existing rivet holes.
6. Construct filler in spar cap from 24ST material of the same cross sectional design as the spar cap.
7. For repair of skin where a doubler exists between the skin and spar cap lip, construct skin patch from 24ST material of the same gage as existing doubler. Refer to Wing Skin Repairs, this Section.
8. Where no doubler exists between skin and spar cap lip, use a surface patch. Construct patch from 24ST material of the same gage as existing skin. Refer to paragraph 1.e., this Section.
9. For web repair refer to Figure 30A (Sheet 4 of 4).
10. For minimum bend radii of sheet, see Figure 5, Section I.
11. For flush riveting see Figure 6, Section I.
12. For rivet edge and row distance, see Figure 7, Section I.

Figure 32—Splice Repair of Complete Break in Spar Cap (Sheet 2 of 2)



1. Remove all interfering rivets.
2. Drill three one-eighth inch holes at each end of crack and trim into one elongated hole.
3. Make two repair angles from .125 sheet 4130 C.M. steel. One angle each required for aft (damaged) lip and forward (undamaged) lip. Refer to cross sectional details for forming and heat treat.
4. Attachment of the repair angle for the aft (damaged) lip is by bolts thru lip and into the spar cap body as shown in section A-A. For bolts refer to bolt detail: Fig. 33—sheet 4 of 4.
5. Attachment of the repair angle to forward (undamaged) lip is by bolts thru cap lip only.
6. Attachment of repair angles to spar cap lips requires 11 bolts (min.) on each side of the damage. This minimum bolt requirement inboard and outboard of damage may be divided between the forward and aft spar cap lips in any proportion to facilitate the repair. For example, since the repair shown is for damage at the outboard end of the aft lip, the required 11 bolts (outboard) must all go through the forward lip and angle. Inboard of the damage 11 bolts are also required, but may be divided as follows: 6 bolts through the forward lip and angle; 5 bolts through the aft lip and angle.
7. Attachment, within the repair area, of a rib to the spar cap lip, as at Sta. 74.3, may necessitate cutting the rib cap. Assembly of the rib to the spar cap lip and repair angle will be shown in section B-B.

REPAIR DETAILS SHOWN ON FIG. 33—SHEET 2 OF 4

Figure 33—Special Repair of Lower Front Spar Cap (Sheet 1 of 4)

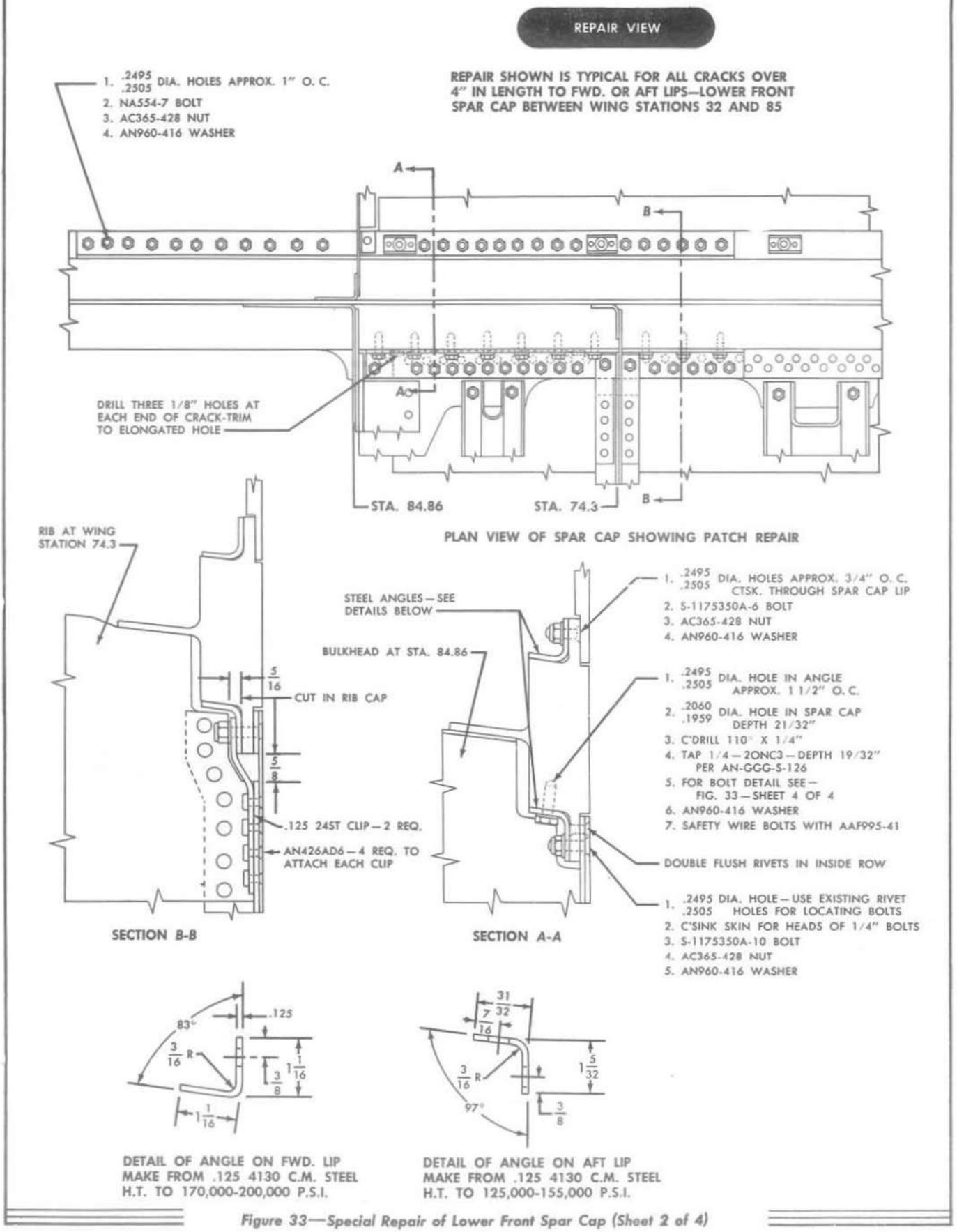
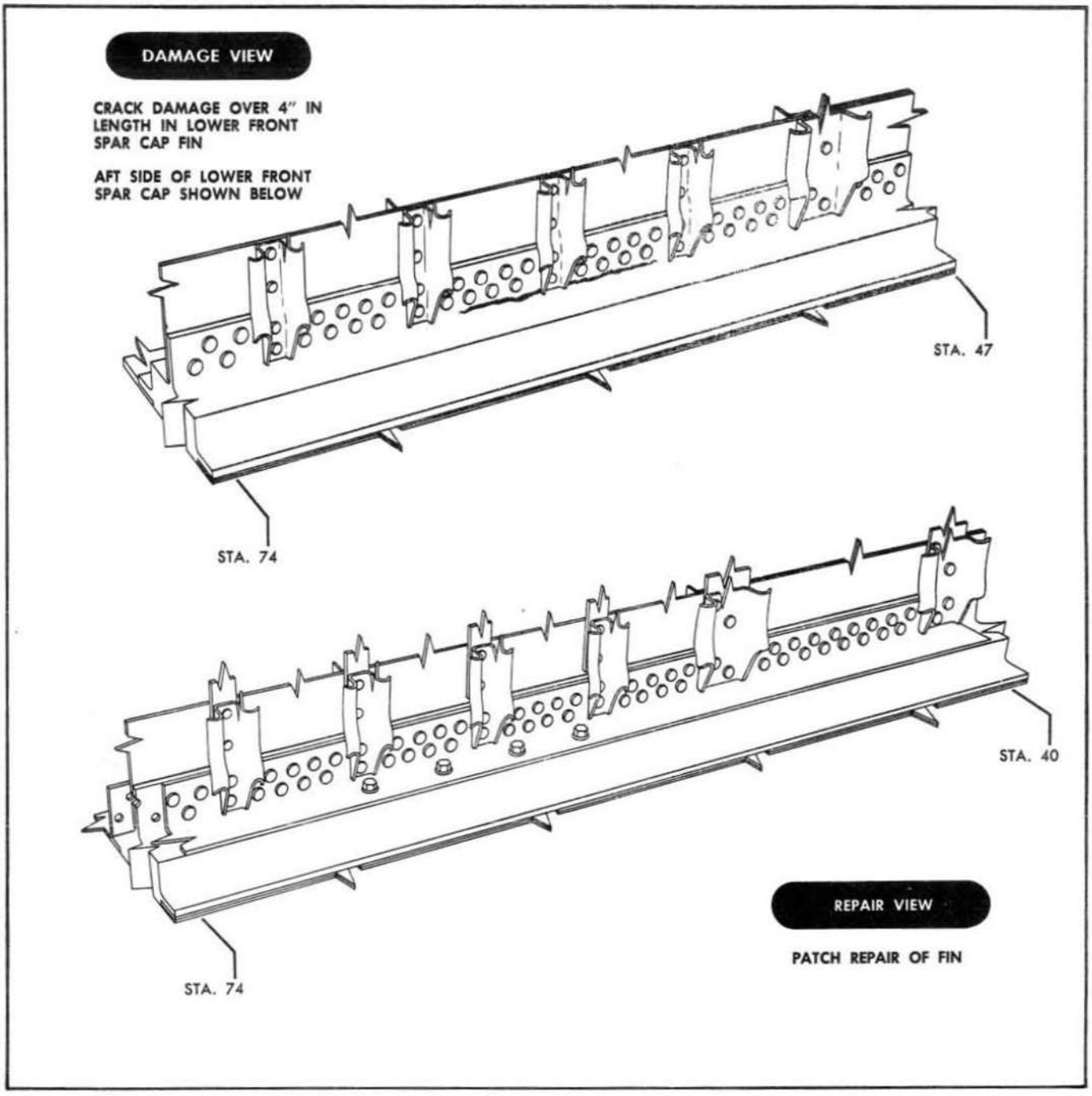


Figure 33—Special Repair of Lower Front Spar Cap (Sheet 2 of 4)



NOTES:

1. Remove all interfering rivets.
2. Drill one-eighth or larger stop hole at each end of crack.
3. Make repair angles from .093 sheet 4130 C.M. steel. See section A-A for forming and heat treat.
4. Attach angles to the spar cap body using bolts which start approximately one inch beyond the inboard end of damage and continue to a point approximately one inch beyond the outboard end of damage. Use special bolts as shown in bolt detail; Fig. 33-sheet 4 of 4.
5. Attach angles to the fin with AN430AD8 rivets. Such attachment must include 28 rivets minimum each side of damage.
6. If rejoggling of web stiffeners proves impractical, a filler may be used between web and stiffener as shown in section A-A.
7. Use existing rivet holes in assembling parts.

REPAIR DETAILS SHOWN ON FIG. 33—SHEET 4 OF 4

Figure 33—Special Repair of Lower Front Spar Cap (Sheet 3 of 4)

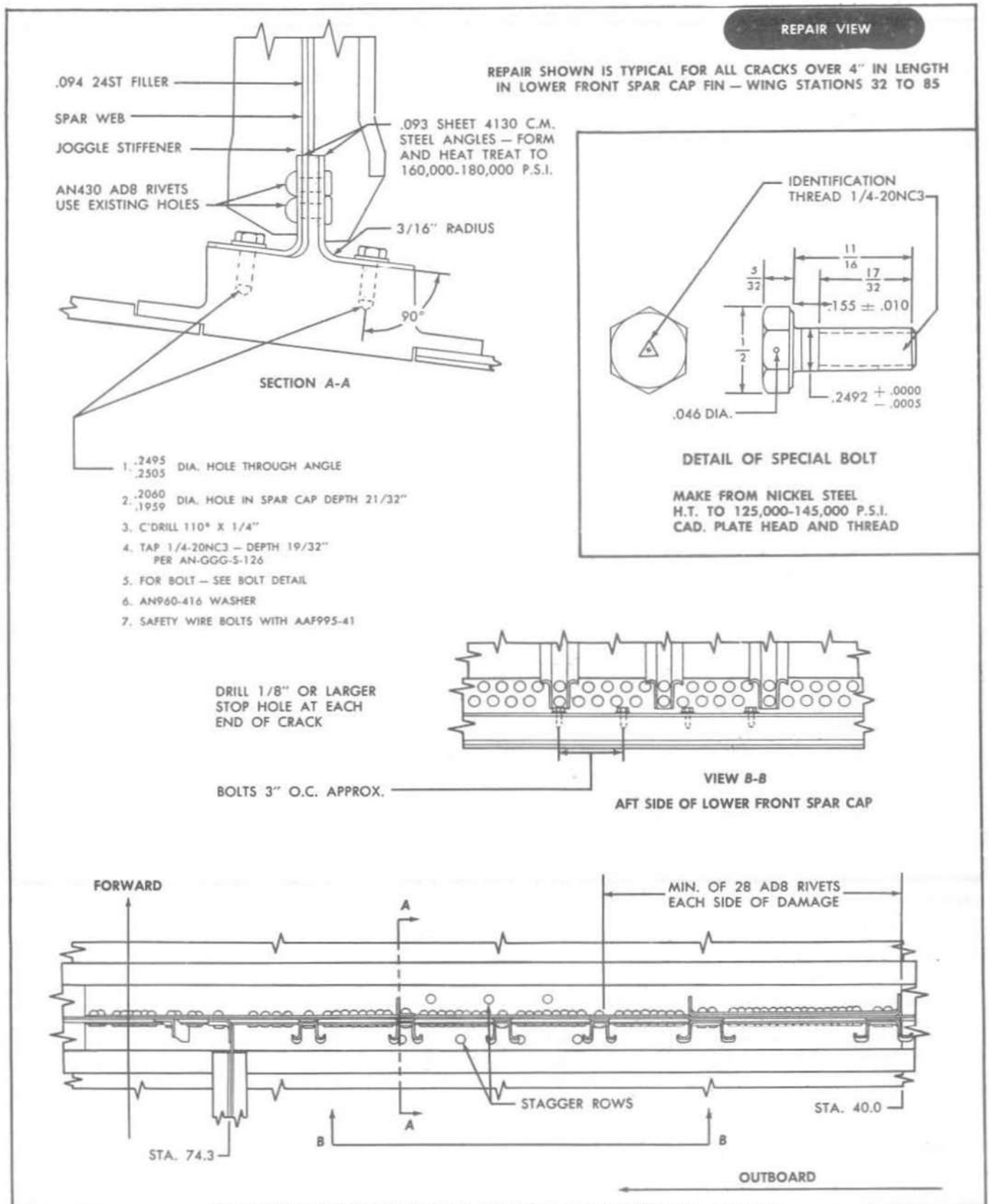
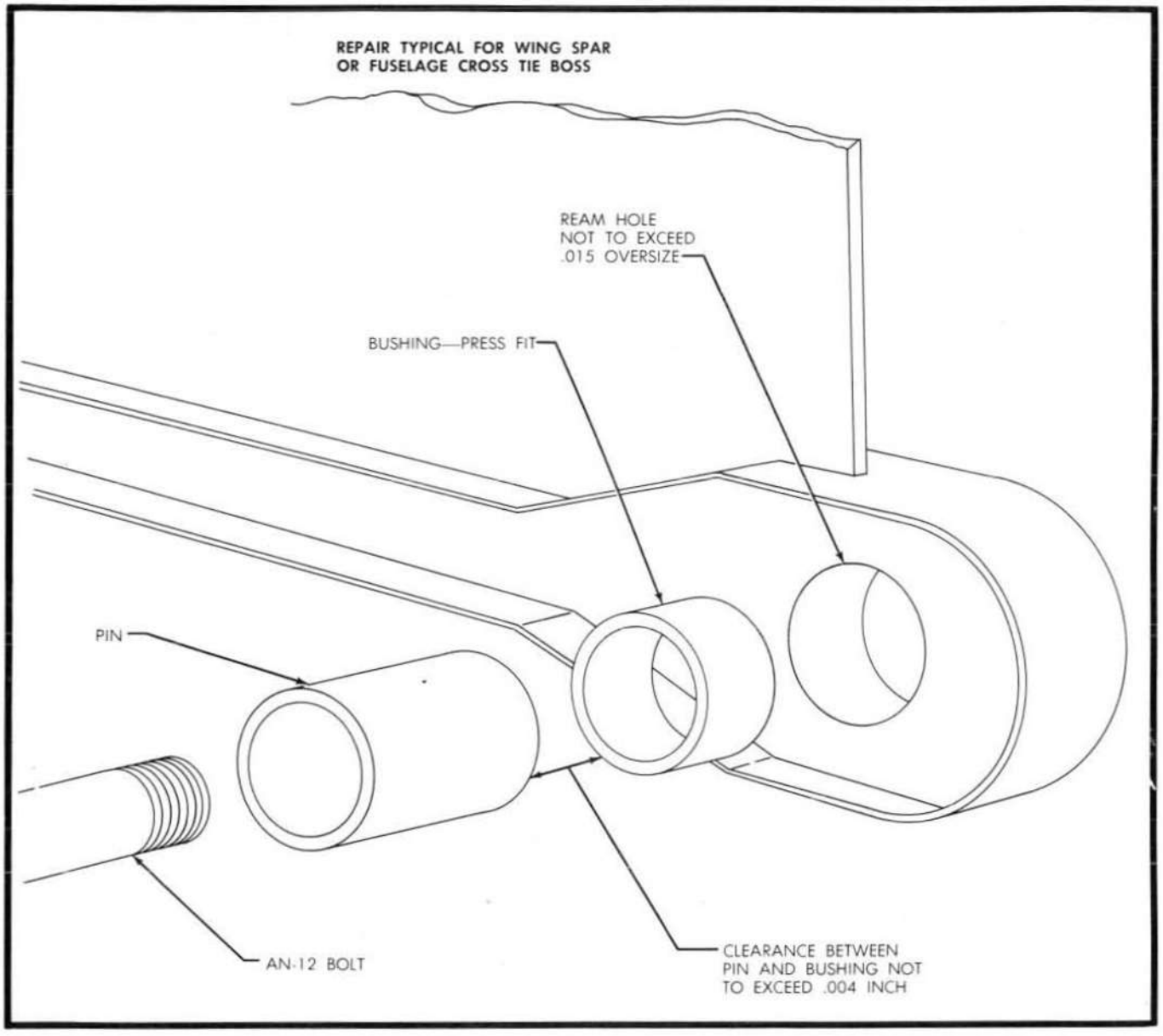


Figure 33—Special Repair of Lower Front Spar Cap (Sheet 4 of 4)



NOTES

1. Check the periphery of wing spar cap and cross tie bushings with a feeler gage to determine if any clearance exists between the bushing and the boss. Make a visual check at this time for the existence of corrosion.
2. If any clearance is noted, remove and magnaflux the bushings. Zyglo the cross tie or wing spar boss, whichever the case may be, to check for possible cracks caused by impact loading due to excessive movement of the bushings. If any cracks or scored marks are noted in either the cross tie boss or the wing spar bushing boss they will be reamed .015 inch oversize in an attempt to clean up the cracks or marks.
3. If any cracks or marks exist after reaming .015 inch oversize, a reject tag will be attached to the wing or cross tie and any further rework will require authorization by the prime Air Materiel Area.
4. Wing spar or cross tie boss found satisfactory after reaming can be repaired by manufacturing a new bushing of proper OD for a press fit in the boss.
5. If clearance between the wing pins and bushings exceed .004 inch, the pins and/or bushings will require rework. Chromeplating of the pin and/or bushings may be resorted to for dimensional build up. Plating must be accomplished in accordance with Specification MIL-P-6871. The pin may be re-chrome plated to no more than the original chrome thickness .005 to .006 inch. The ID of the bushings may be plated to a thickness of .010 inch. Pins and/or bushings should not exceed the design dimensions after chrome plating. Plating of the OD of the bushings is not recommended.

2.3.1-5-3

Figure 33A—Repair of Wing Spar or Fuselage Cross Tie Boss, Bushings and Pins

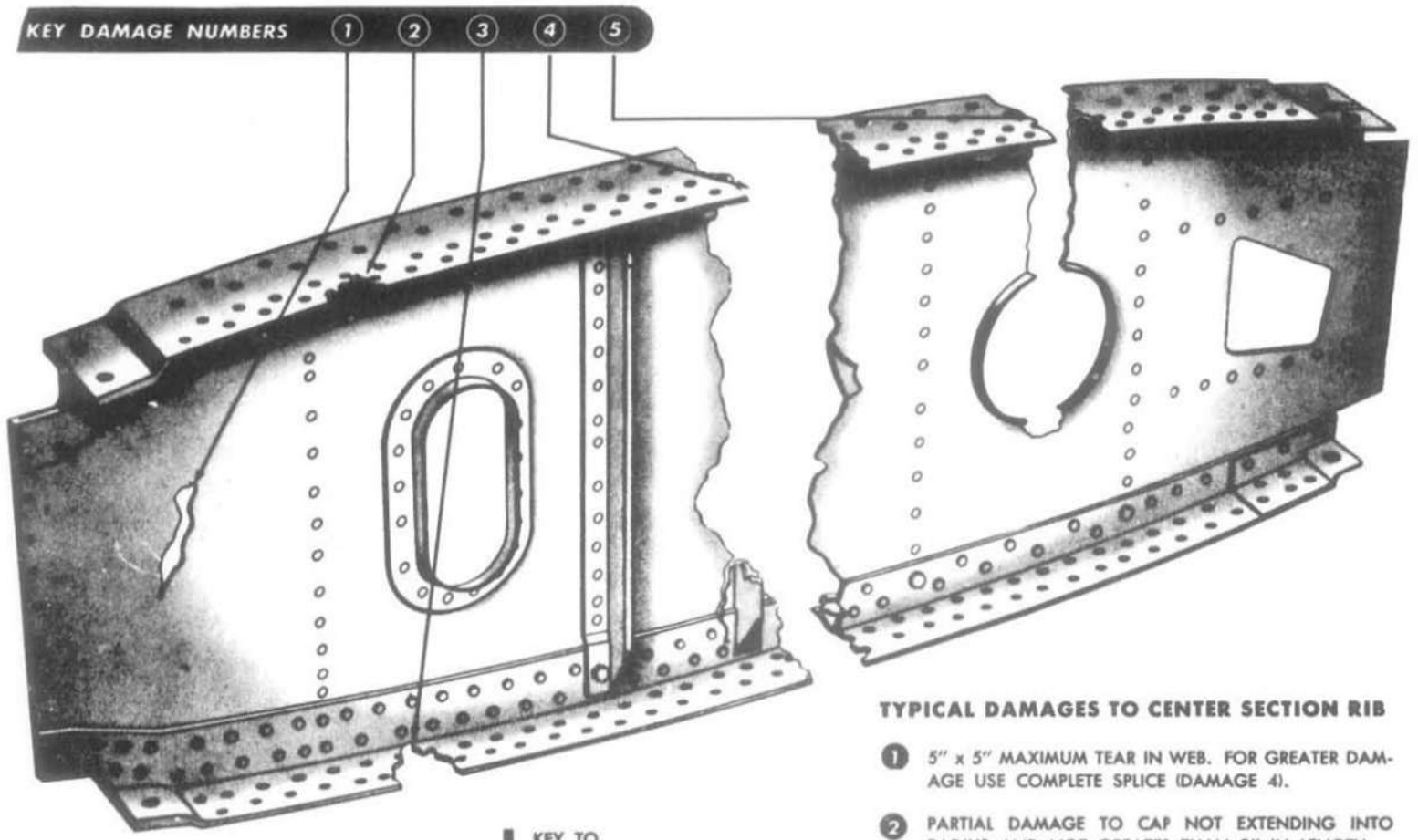
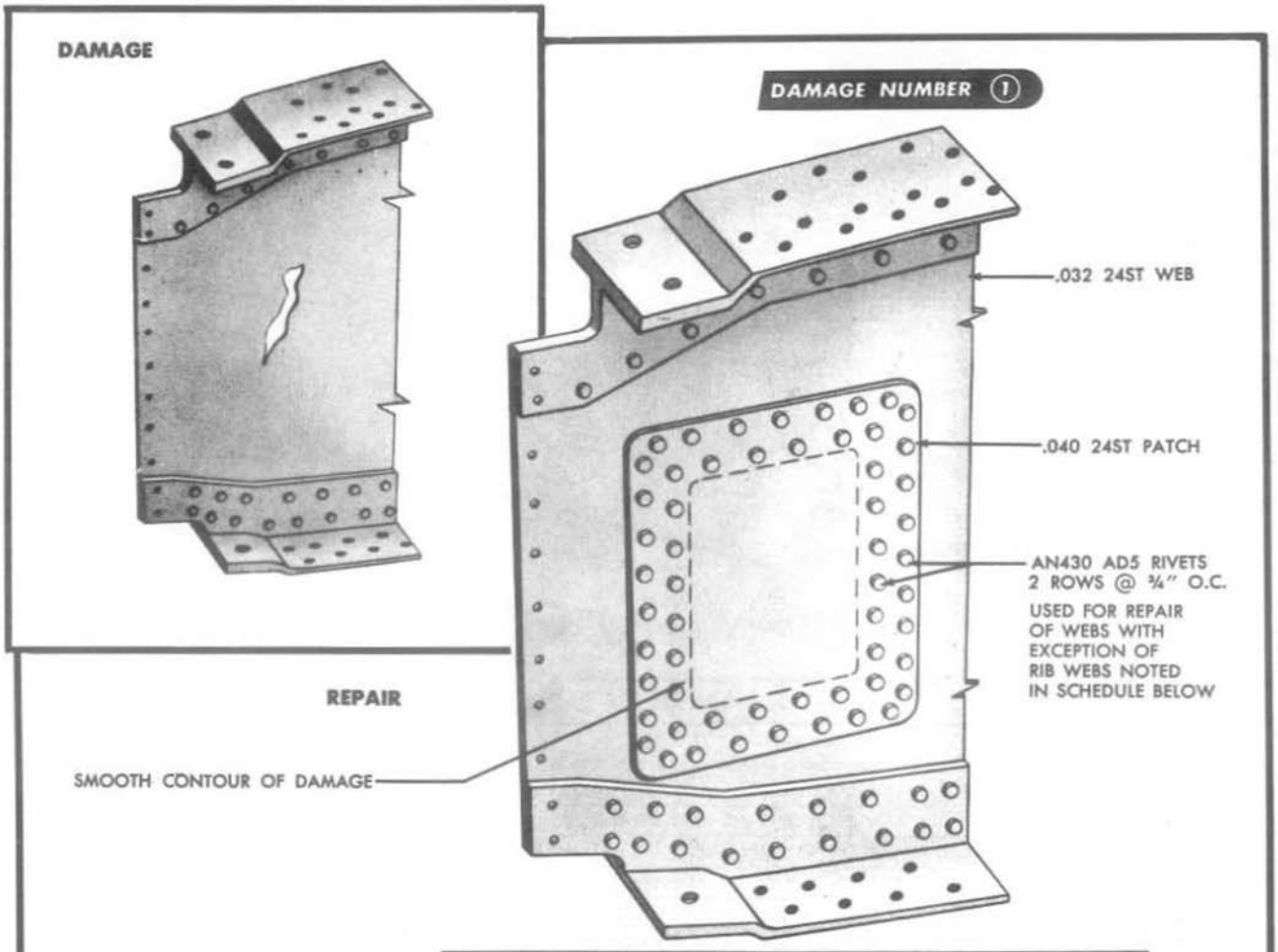


Figure 34—Key Drawing of Typical Damages to Wing Center Section Rib

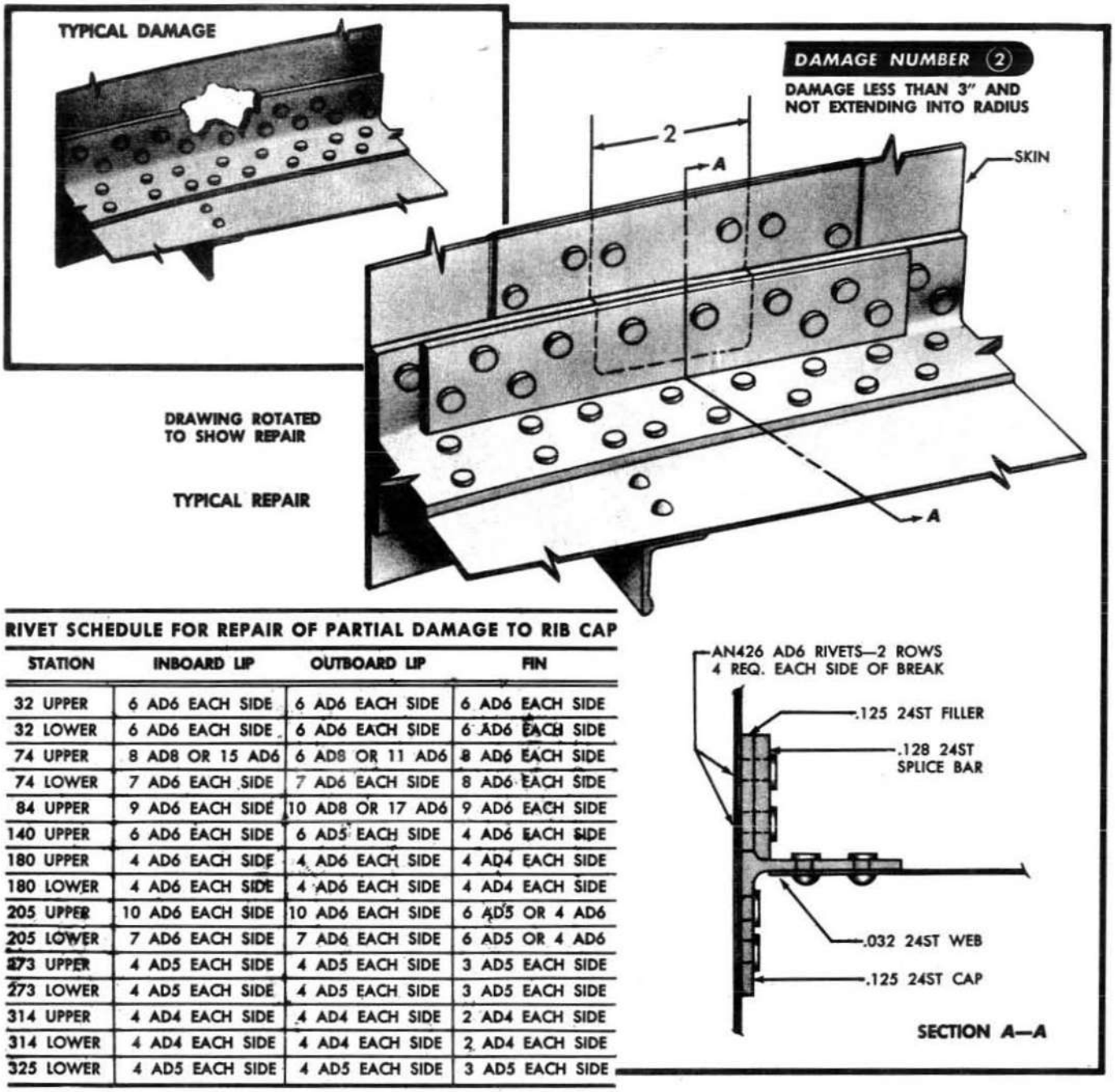


RIVET SCHEDULE FOR REPAIR OF TEAR IN WEB			
STATION	RIB NO.	PANEL	RIVETS
140	5155396	AFT PANEL	AN430 AD8 2 ROWS @ ⅞" O.C. OR AN430 AD6 3 ROWS @ ¾" O.C.
85-140	5157742		AN430 AD8 2 ROWS @ ¾" O.C. OR AN430 AD6 3 ROWS @ ⅝" O.C.
85	5155383	FWD PANEL	AN430 AD8 2 ROWS @ ¾" O.C. OR AN430 AD6 3 ROWS @ ⅝" O.C.
32	5155374		AN430 AD6 2 ROWS @ 9/16" O.C.
32	5155374	AT DOUBLER	AN430 AD8 2 ROWS @ ¾" O.C.

NOTES

1. Trim damage smooth leaving no radius less than one-half inch.
2. Construct patch from material which is one gage heavier than the web.
3. See table shown for the correct size and spacing of rivets.
4. For rivet edge and row distance, See Figure 7, Section I.
5. This repair may be used for damage which is no greater than five inches in diameter.

Figure 35—Typical Web Patch Repair of Wing Center Section Rib



RIVET SCHEDULE FOR REPAIR OF PARTIAL DAMAGE TO RIB CAP

STATION	INBOARD LIP	OUTBOARD LIP	FIN
32 UPPER	6 AD6 EACH SIDE	6 AD6 EACH SIDE	6 AD6 EACH SIDE
32 LOWER	6 AD6 EACH SIDE	6 AD6 EACH SIDE	6 AD6 EACH SIDE
74 UPPER	8 AD8 OR 15 AD6	6 AD8 OR 11 AD6	8 AD6 EACH SIDE
74 LOWER	7 AD6 EACH SIDE	7 AD6 EACH SIDE	8 AD6 EACH SIDE
84 UPPER	9 AD6 EACH SIDE	10 AD8 OR 17 AD6	9 AD6 EACH SIDE
140 UPPER	6 AD6 EACH SIDE	6 AD5 EACH SIDE	4 AD6 EACH SIDE
180 UPPER	4 AD6 EACH SIDE	4 AD6 EACH SIDE	4 AD4 EACH SIDE
180 LOWER	4 AD6 EACH SIDE	4 AD6 EACH SIDE	4 AD4 EACH SIDE
205 UPPER	10 AD6 EACH SIDE	10 AD6 EACH SIDE	6 AD5 OR 4 AD6
205 LOWER	7 AD6 EACH SIDE	7 AD6 EACH SIDE	6 AD5 OR 4 AD6
273 UPPER	4 AD5 EACH SIDE	4 AD5 EACH SIDE	3 AD5 EACH SIDE
273 LOWER	4 AD5 EACH SIDE	4 AD5 EACH SIDE	3 AD5 EACH SIDE
314 UPPER	4 AD4 EACH SIDE	4 AD4 EACH SIDE	2 AD4 EACH SIDE
314 LOWER	4 AD4 EACH SIDE	4 AD4 EACH SIDE	2 AD4 EACH SIDE
325 LOWER	4 AD5 EACH SIDE	4 AD5 EACH SIDE	3 AD5 EACH SIDE

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than ⅛ inch.
3. Construct splice bar from material which is one gage heavier than the cap lip.
4. Construct filler from the same gage and material as the cap.
5. Select rivets for cap repair from table shown.
6. When possible use existing rivet holes.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.
9. Repairs shown may be used for damage not extending into the radius and not exceeding three inches in length.

Figure 36—Typical Repair of Partial Damage to Wing Rib or Bulkhead Cap

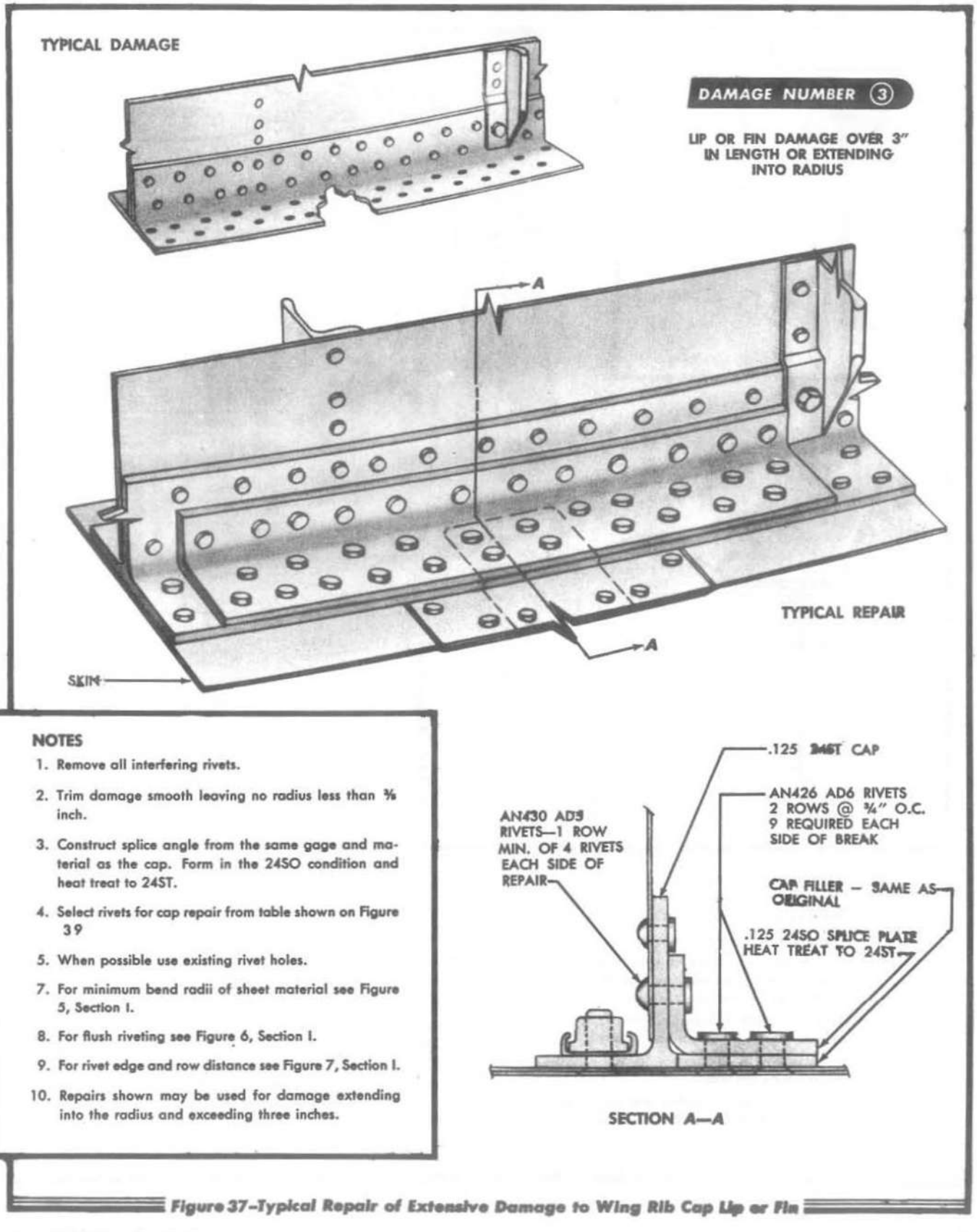
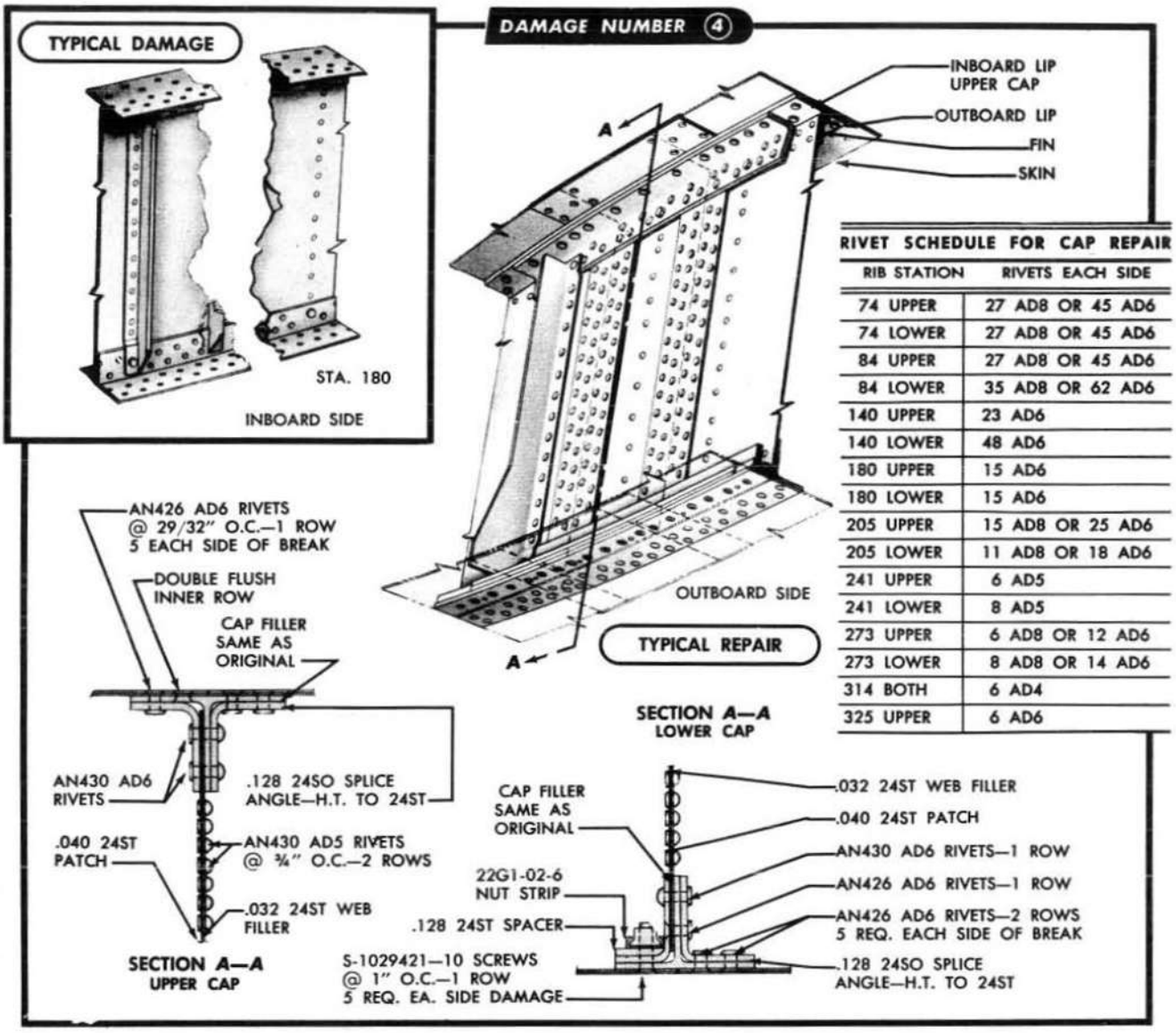


Figure 37–Typical Repair of Extensive Damage to Wing Rib Cap Lip or Fin



RIVET SCHEDULE FOR CAP REPAIR	
RIB STATION	RIVETS EACH SIDE
74 UPPER	27 AD8 OR 45 AD6
74 LOWER	27 AD8 OR 45 AD6
84 UPPER	27 AD8 OR 45 AD6
84 LOWER	35 AD8 OR 62 AD6
140 UPPER	23 AD6
140 LOWER	48 AD6
180 UPPER	15 AD6
180 LOWER	15 AD6
205 UPPER	15 AD8 OR 25 AD6
205 LOWER	11 AD8 OR 18 AD6
241 UPPER	6 AD5
241 LOWER	8 AD5
273 UPPER	6 AD8 OR 12 AD6
273 LOWER	8 AD8 OR 14 AD6
314 BOTH	6 AD4
325 UPPER	6 AD6

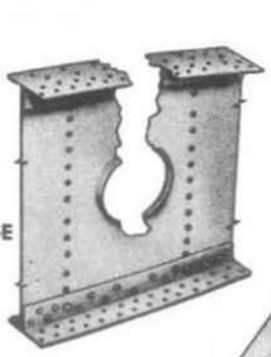
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth to provide for insert.
3. Construct cap splice angles from material which is one gage heavier than the cap. Form in the 24SO condition and heat treat to 24ST.
4. Construct web splice doublers from material which is one gage heavier than the web.
5. Construct web insert from the same gage and material as the web.
6. Attach web splice plates and insert two rows of AN426 AD5 rivets @ ¾ inch on center.
7. Select rivets for cap repair from table shown.
8. When possible use existing rivet holes.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.
12. Repairs shown may be used for damage in the web which is greater than five inches in width and damage in the caps which is greater than three inches in length.

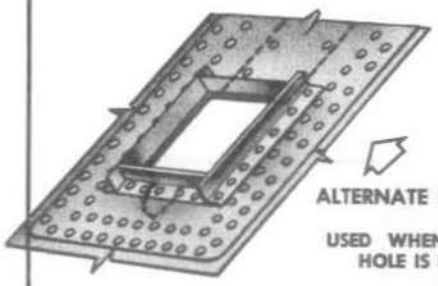
Figure 38—Typical Insert Repair of Extensive Damage to Rib or Bulkhead Cap and Web

DAMAGE NUMBER (5)

COMPLETE BREAK THRU CAP, WEB AND LIGHTENING HOLE

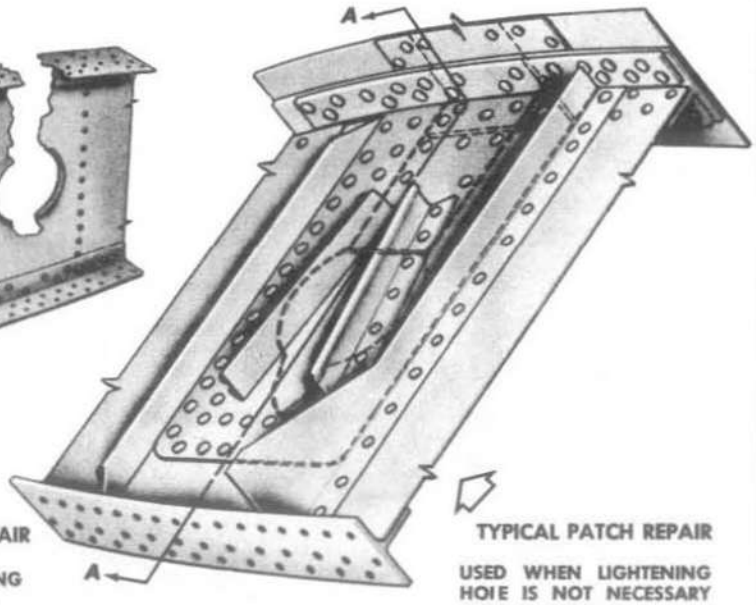


TYPICAL DAMAGE



ALTERNATE PATCH REPAIR

USED WHEN LIGHTENING HOLE IS NECESSARY



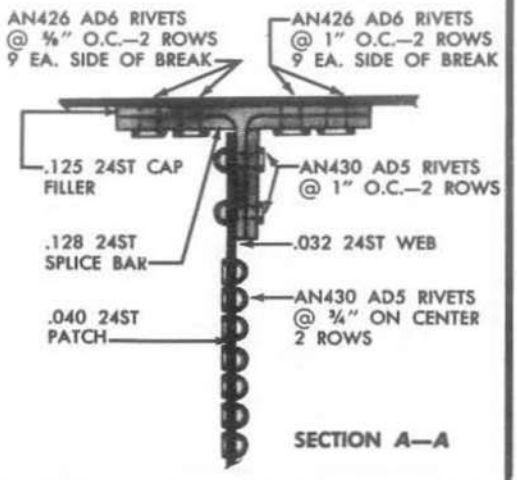
TYPICAL PATCH REPAIR

USED WHEN LIGHTENING HOLE IS NOT NECESSARY

DRAWING ROTATED FOR CLARITY

RIVET SCHEDULE FOR 3" MAXIMUM BREAK IN WING CENTER RIB CAP			
STATION	OUTBOARD LIP	INBOARD LIP	FIN
74 UPPER	24 AD8 OR 40 AD6	16 AD8 OR 29 AD6	7 AD6 OR 10 AD5
74 LOWER	6 AD8 OR 11 AD6	6 AD8 OR 11 AD6	6 AD6 OR 8 AD5
84 UPPER	16 AD6 OR 24 AD5	34 AD8 OR 62 AD6	10 AD6 OR 14 AD5
140 UPPER	13 AD6 OR 19 AD5	12 AD6 OR 16 AD5	8 AD6 OR 12 AD5
180 UPPER	9 AD6	9 AD6	4 AD5
180 LOWER	9 AD6	9 AD6	4 AD5
205 UPPER	11 AD8 OR 19 AD6	11 AD8 OR 19 AD6	4 AD6 OR 6 AD5
205 LOWER	7 AD8 OR 12 AD6	7 AD8 OR 12 AD6	4 AD6 OR 6 AD5
273 UPPER	6 AD6 OR 8 AD5	6 AD6 OR 8 AD5	4 AD5
273 LOWER	7 AD6 OR 10 AD5	7 AD6 OR 10 AD5	4 AD5
314 UPPER	4 AD4	4 AD4	2 AD4
314 LOWER	4 AD4	4 AD4	2 AD4
325 LOWER	3 AD6 OR 6 AD5	3 AD6 OR 6 AD5	3 AD5

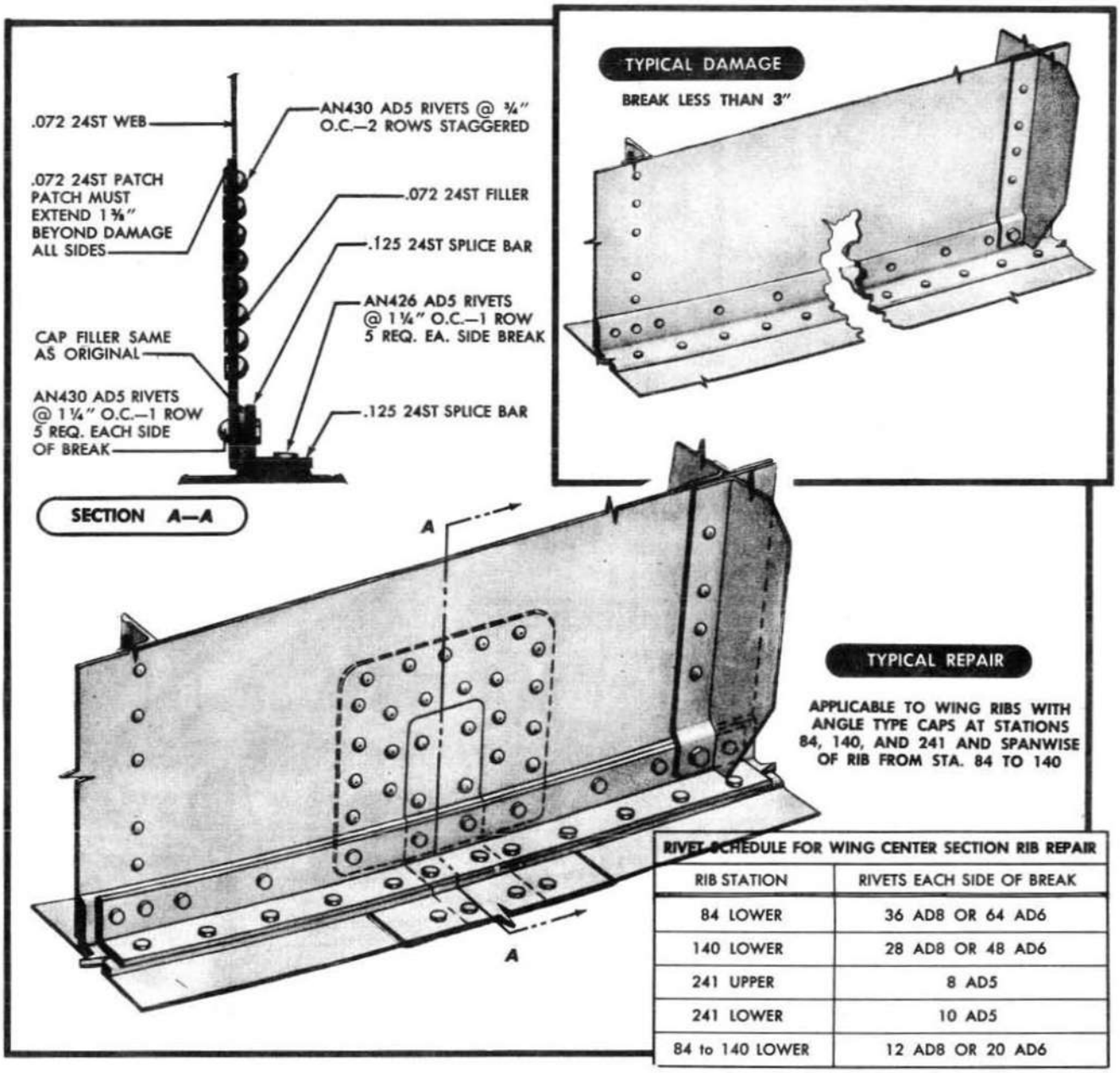
NOTES—See special repairs for rib caps at Station 32 and Station 325. At Station 84 to 140 spanwise lower cap, use rivets as follows: 13 AD8 or 29 AD6 in aft lip; 16 AD8 or 24 AD6 in forward lip; 8 AD6 or 12 AD5 in fin.



NOTES

1. Remove all interfering rivets.
2. Trim damage leaving no radius less than one-half inch.
3. Construct rib cap splice bars from material which is one gage heavier than the cap.
4. Construct rib cap fillers from the same gage and material as the cap.
5. Construct web patches from material one gage heavier than the web.
6. When possible use existing rivet holes.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.
9. Repairs shown may be used for damage in the web which is no greater than five inches in width, and damage in the caps which is no greater than three inches in length.

Figure 39—Typical Lightening Hole Repair in Wing Center Section Ribs



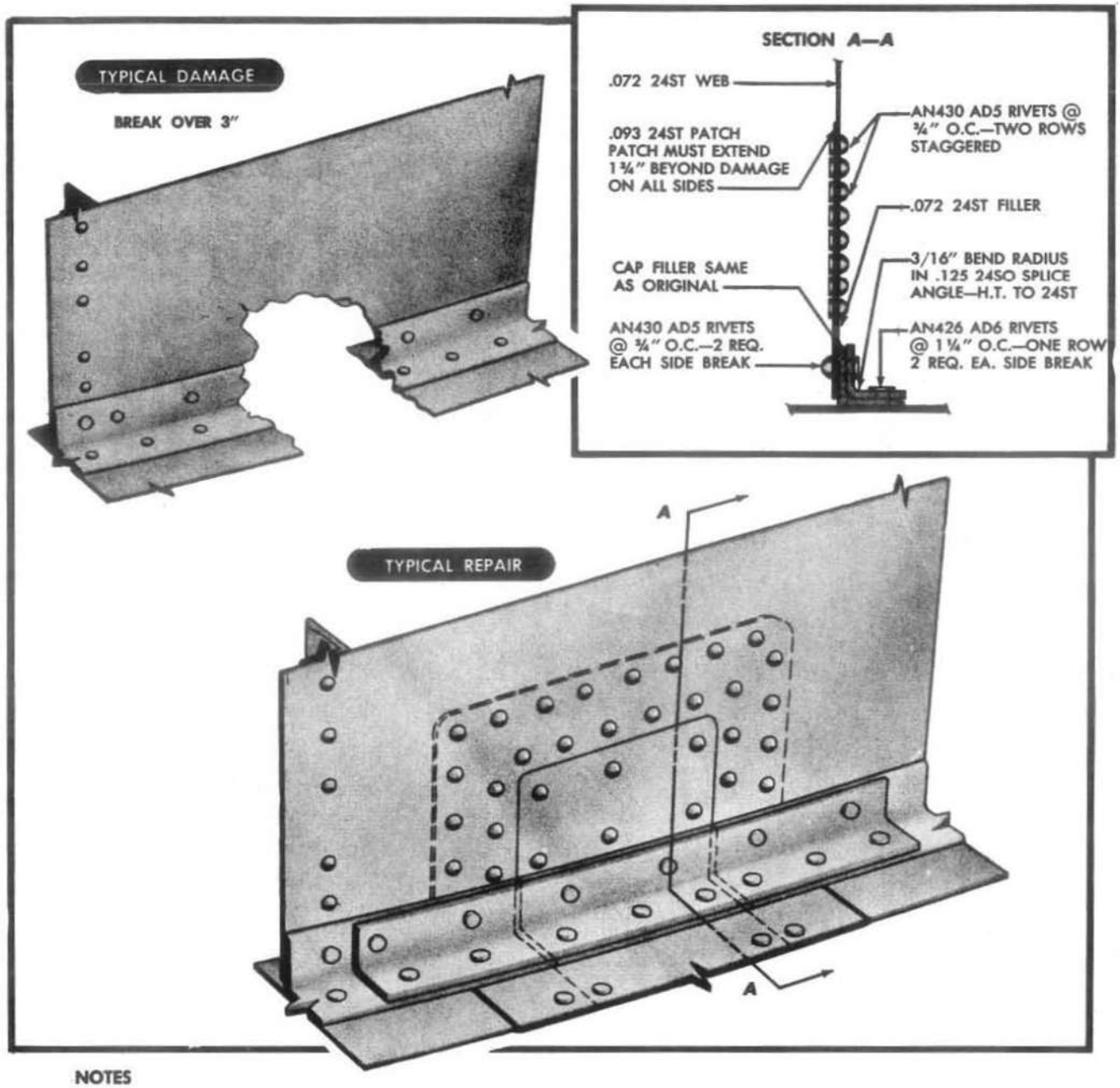
RIVET SCHEDULE FOR WING CENTER SECTION RIB REPAIR

RIB STATION	RIVETS EACH SIDE OF BREAK
84 LOWER	36 AD8 OR 64 AD6
140 LOWER	28 AD8 OR 48 AD6
241 UPPER	8 AD5
241 LOWER	10 AD5
84 to 140 LOWER	12 AD8 OR 20 AD6

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when cap damage is no greater than three inches in length.
4. Construct fillers from the same gage and material as the web and cap.
5. Construct web patch from the same gage and material as the web.
6. Construct cap splice bars from same gage material as original cap.
7. Select correct size and number of rivets to be used from table.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure 40—Splice Repair of Wing Rib Cap — Angle Type (Sheet 1 of 2)



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when damage exceeds three inches in length.
4. Construct fillers from the same gage and material as the existing web and cap.
5. Construct web patch from material one gage heavier than original web.
6. Construct cap splice angle from same gage material as original cap. Form in the 24SO condition and heat treat to 24ST.
7. For correct rivet size and spacing, see rivet schedule in Figure 38 Section II.
8. For minimum bend radii of sheet material, see Figure 5, Section I.
9. For flush riveting, see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

Figure 40—Splice Repair of Wing Rib Cap — Angle Type (Sheet 2 of 2)

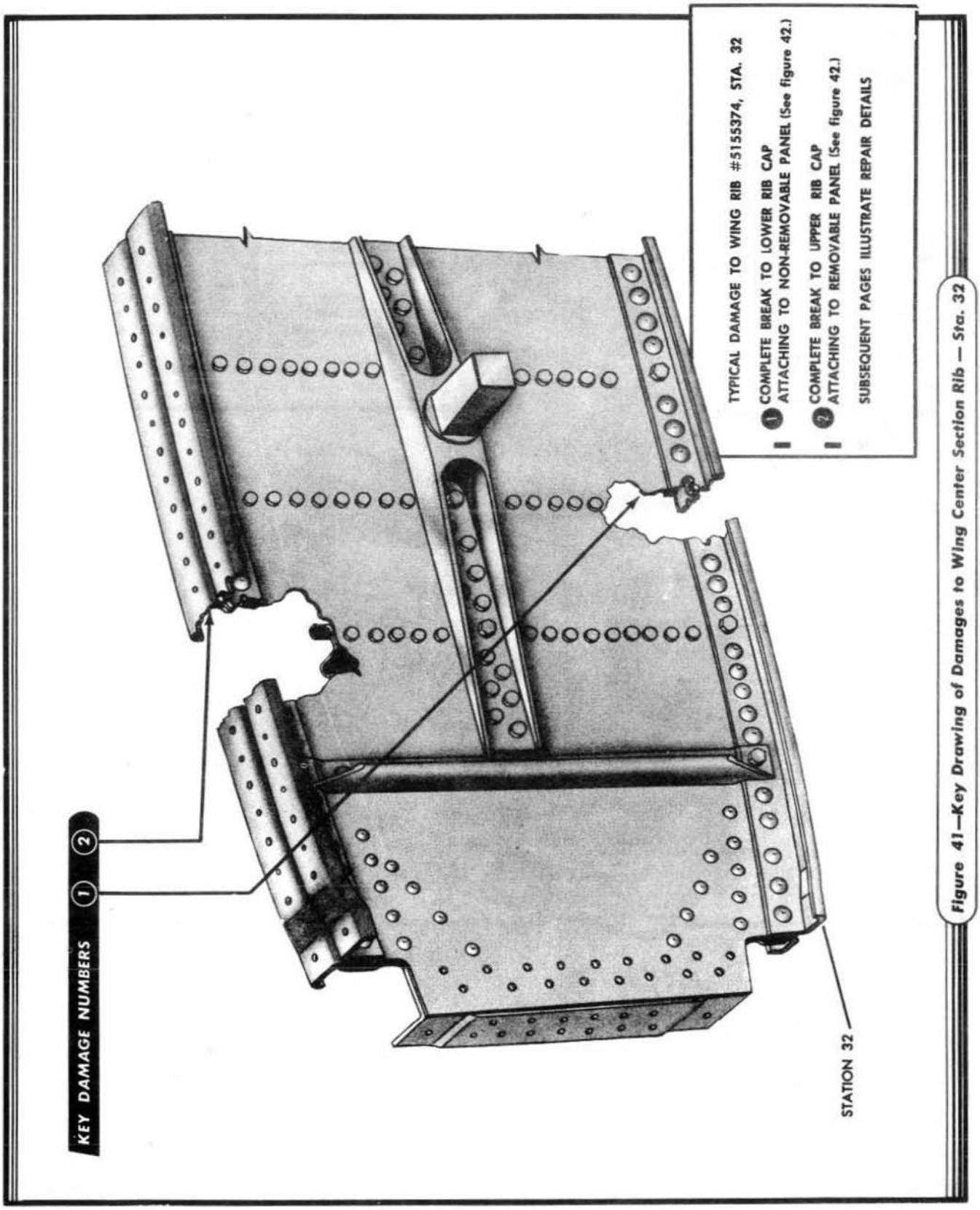
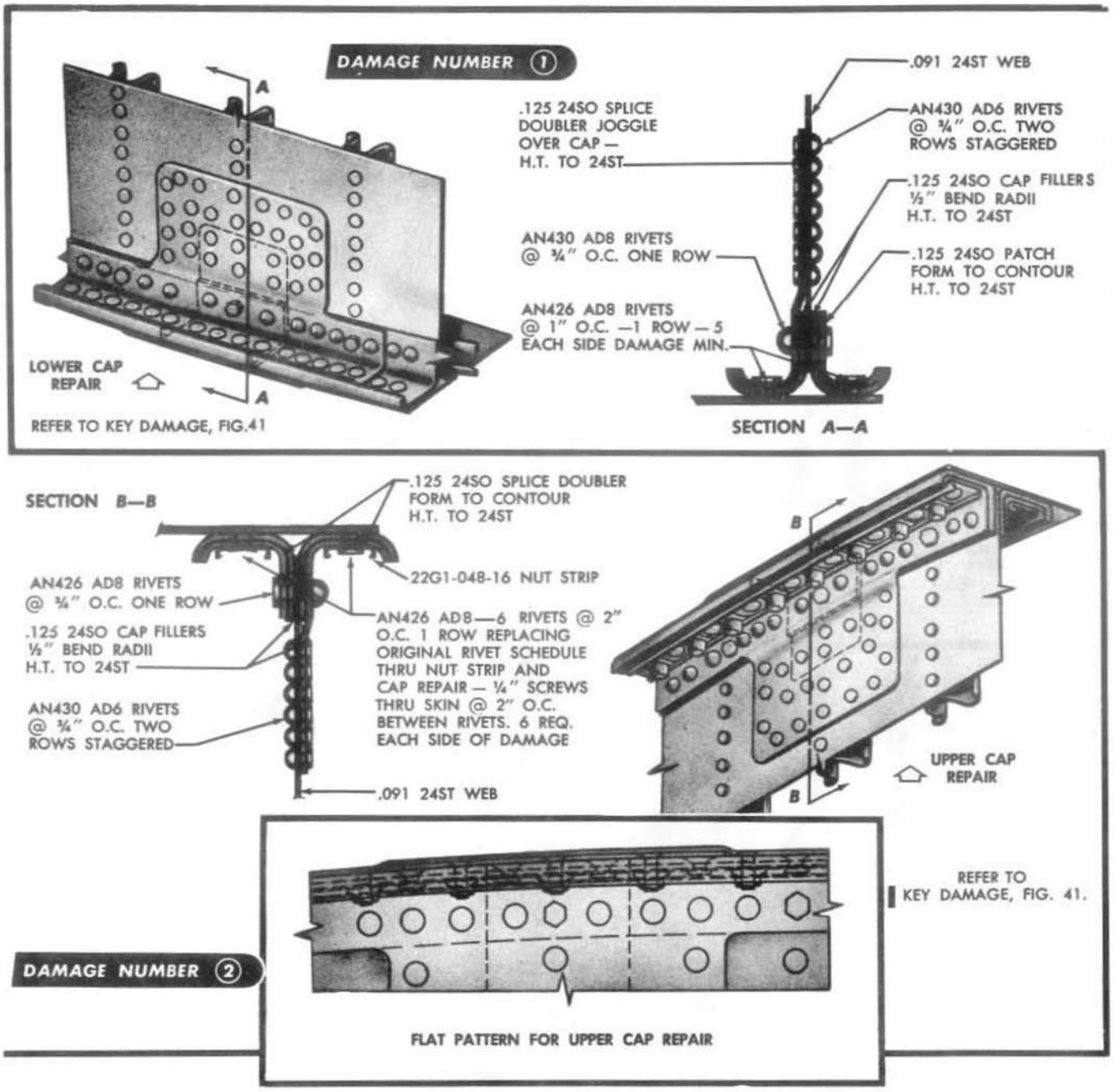
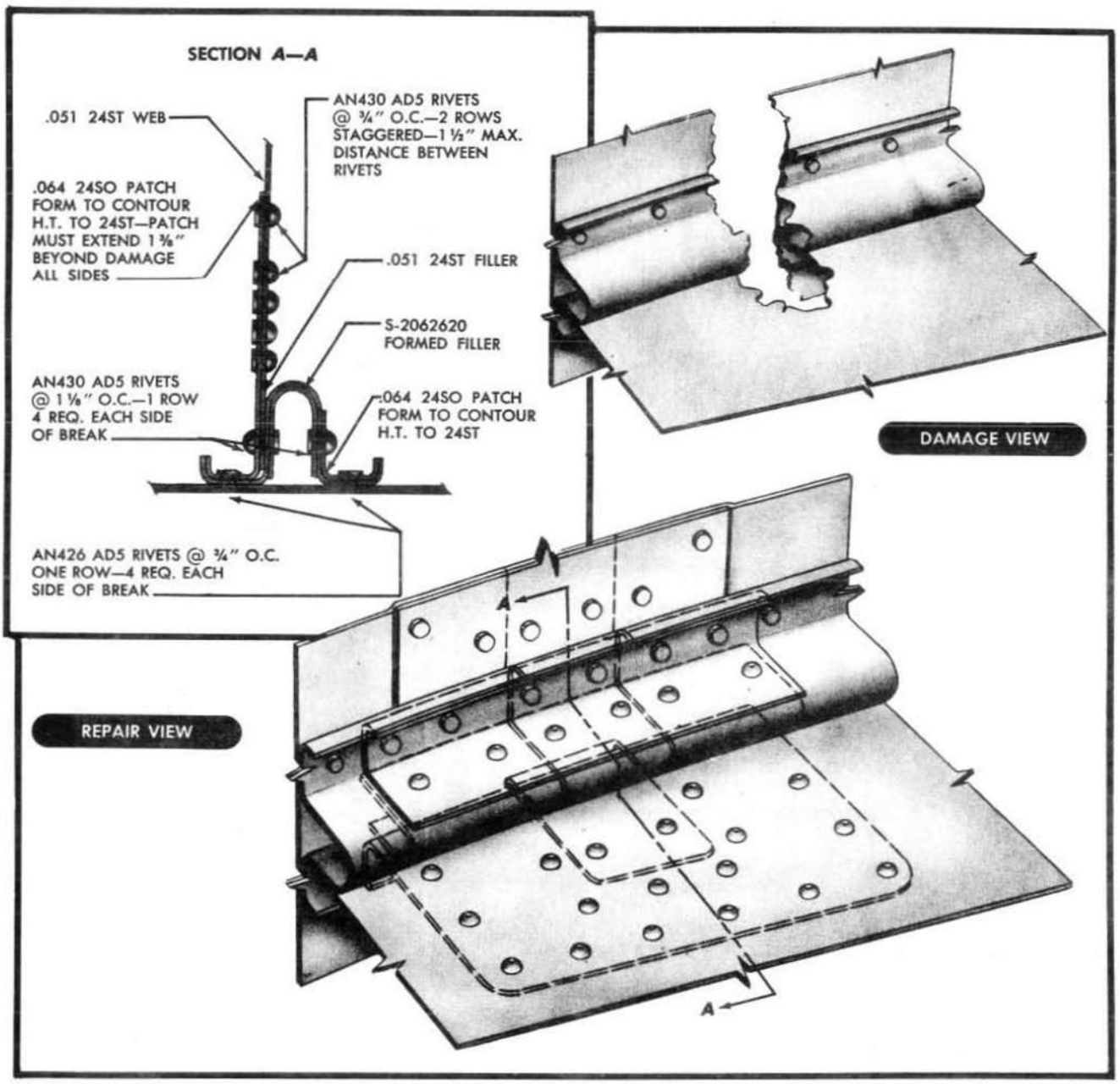


Figure 41—Key Drawing of Damages to Wing Center Section Rib — Sta. 32



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct fillers from the same gage and material as the web and cap.
4. Construct patches from .125 dural sheet. Form in 24SO condition and heat treat to 24ST.
5. For minimum bend radii of sheet material, see Figure 5, Section I.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

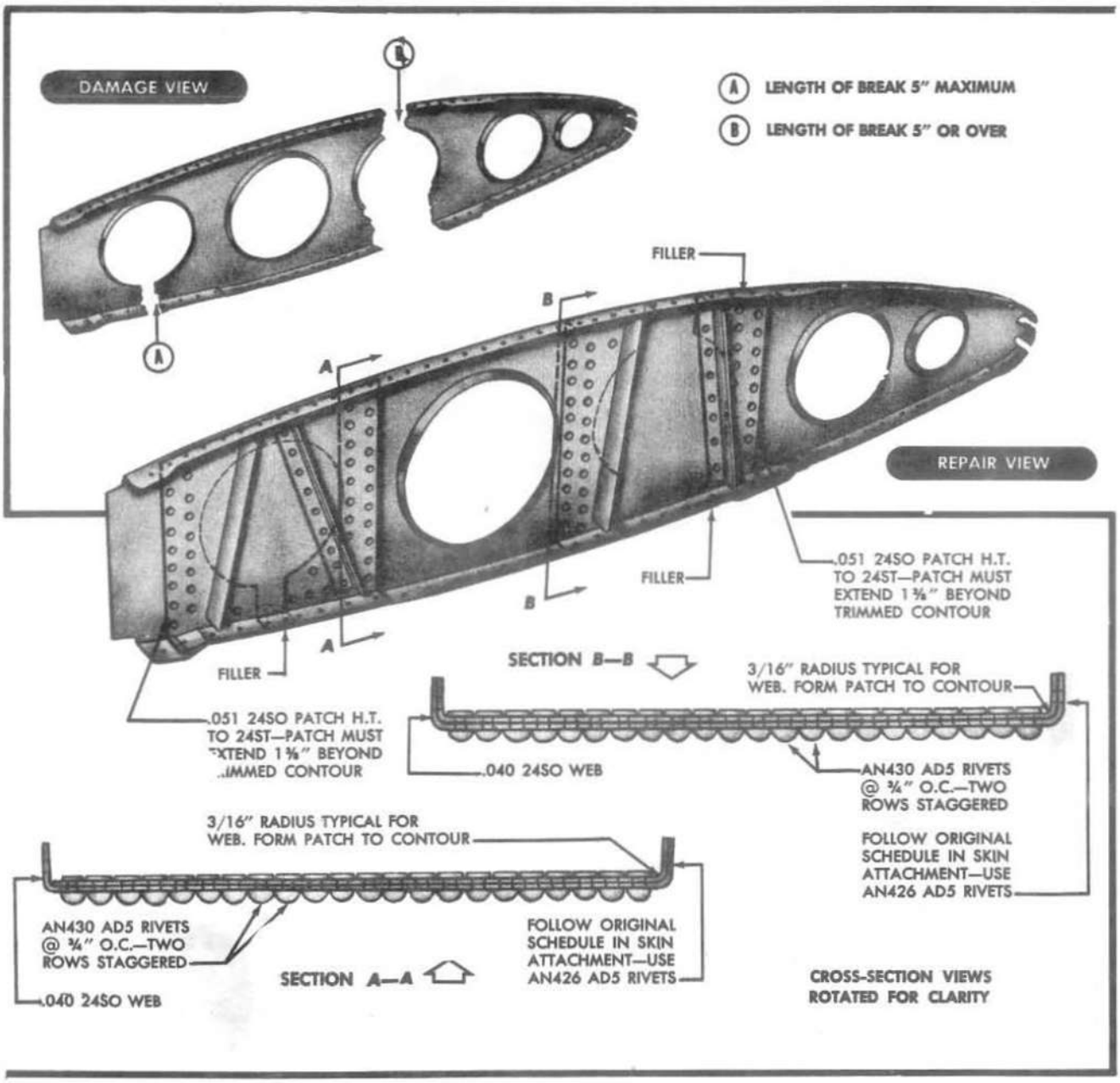
Figure 42 —Splice Repair of Wing Rib Cap at Station 32



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct fillers from the same gage and material as the web and cap.
4. Construct patches from .064 dural sheet. Form in 24SO condition and heat treat to 24ST.
5. For minimum bend radii of sheet material, see Figure 5, Section I.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

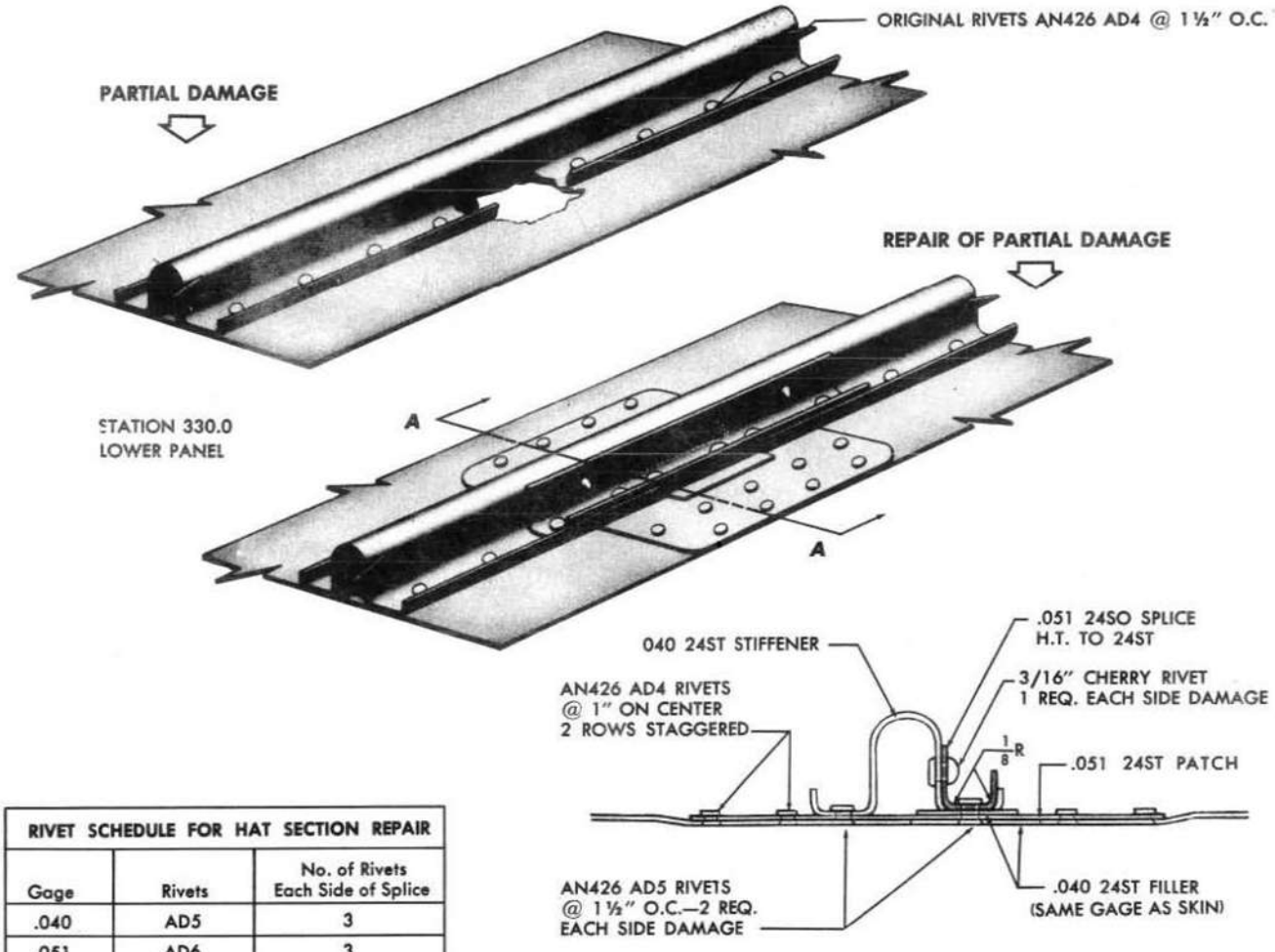
Figure 43 —Splice Repair of Wing Upper Rib Cap at Station 325



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth. Remove flanges from lightening holes.
3. Construct fillers from the same gage and material as the web where needed for attachment of skin.
4. Construct patch from .051 dural sheet. Form in 24SO condition and heat treat to 24ST.
5. Restore web strength with ⅝ x ⅝ .040 24SO stiffener type angle. Form and heat treat to 24ST.
6. If lightening hole is needed, refer to Figure 39 Section II.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 44 — Splice Repair of Damage to Wing Rib at Station 404

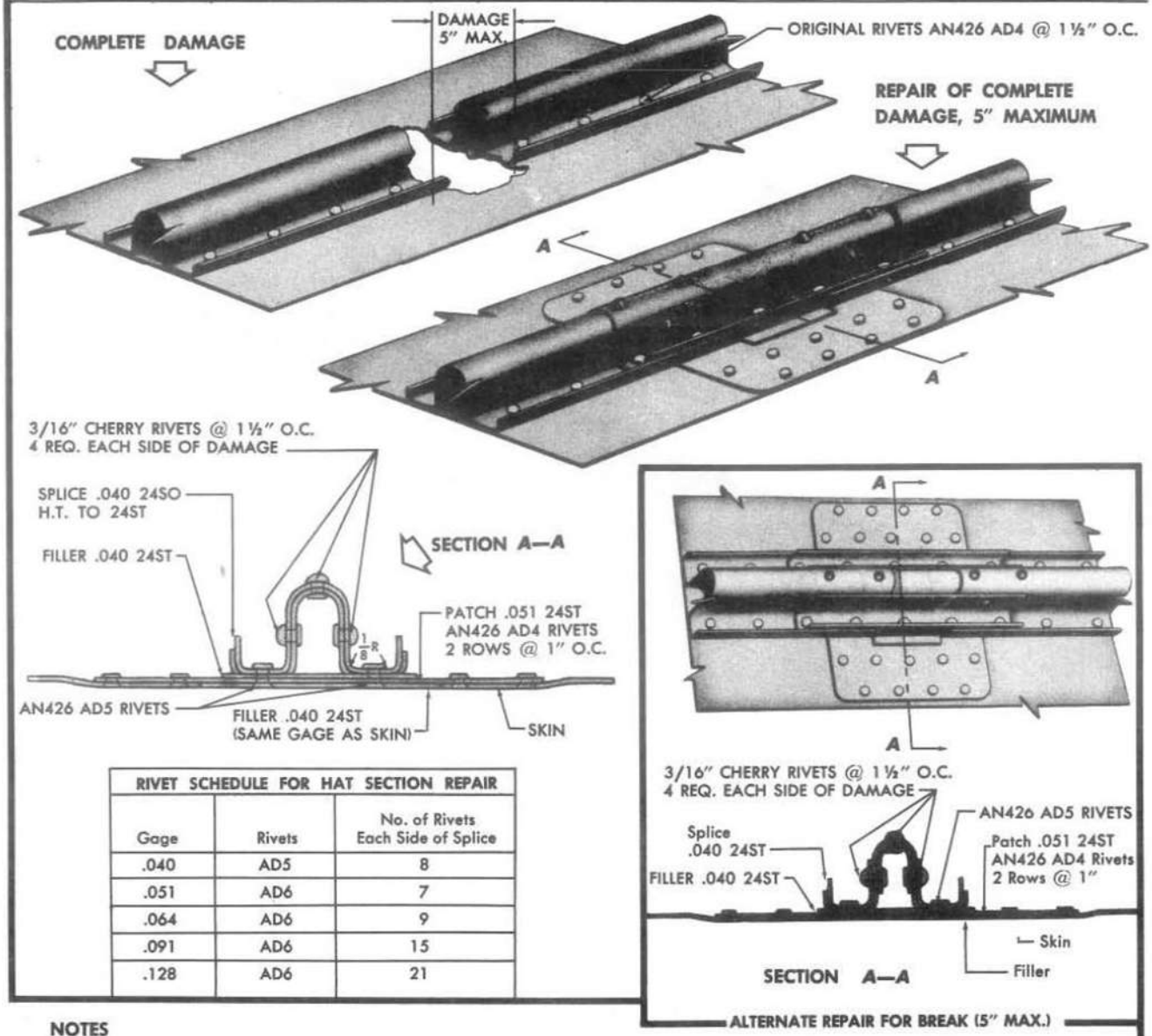


RIVET SCHEDULE FOR HAT SECTION REPAIR		
Gage	Rivets	No. of Rivets Each Side of Splice
.040	AD5	3
.051	AD6	3
.064	AD6	4
.091	AD6	5
.128	AD6	7

NOTES

1. Drill out all rivets in repair area in order that hat section may be lifted and blocked up to facilitate removal of damaged portion without injury to adjacent parts.
2. Trim and smooth all damaged material. Allow a minimum radius trim at corners of damage and repair material of ¼" for AD4 rivets, 5/16" for AD5 rivets, ⅜" for AD6 rivets, ½" for AD8 rivets.
3. Locate damaged stiffener on Wing Structure drawing, Fig. 12 , Section II. Determine gage of damaged part through reference to material parts list. Use accompanying Rivet Schedule to determine rivet size and number required per the gage of stiffener.
4. Select filler material of same gage as original material. Trim and form to fit.
5. Select next heavier gage of material and form repair section splice as shown.
6. Use existing rivet holes for repair where possible.
7. For skin repair refer to skin repair drawings Section II.
8. For minimum bend radii of sheet material, see Fig. 5, Section I.
9. For flush riveting, see Fig. 6, Section I.
10. For rivet edge and row distance, see Fig. 7, Section I.

Figure 45— Patch Repair of Wing Hat Section (Partial Damage)

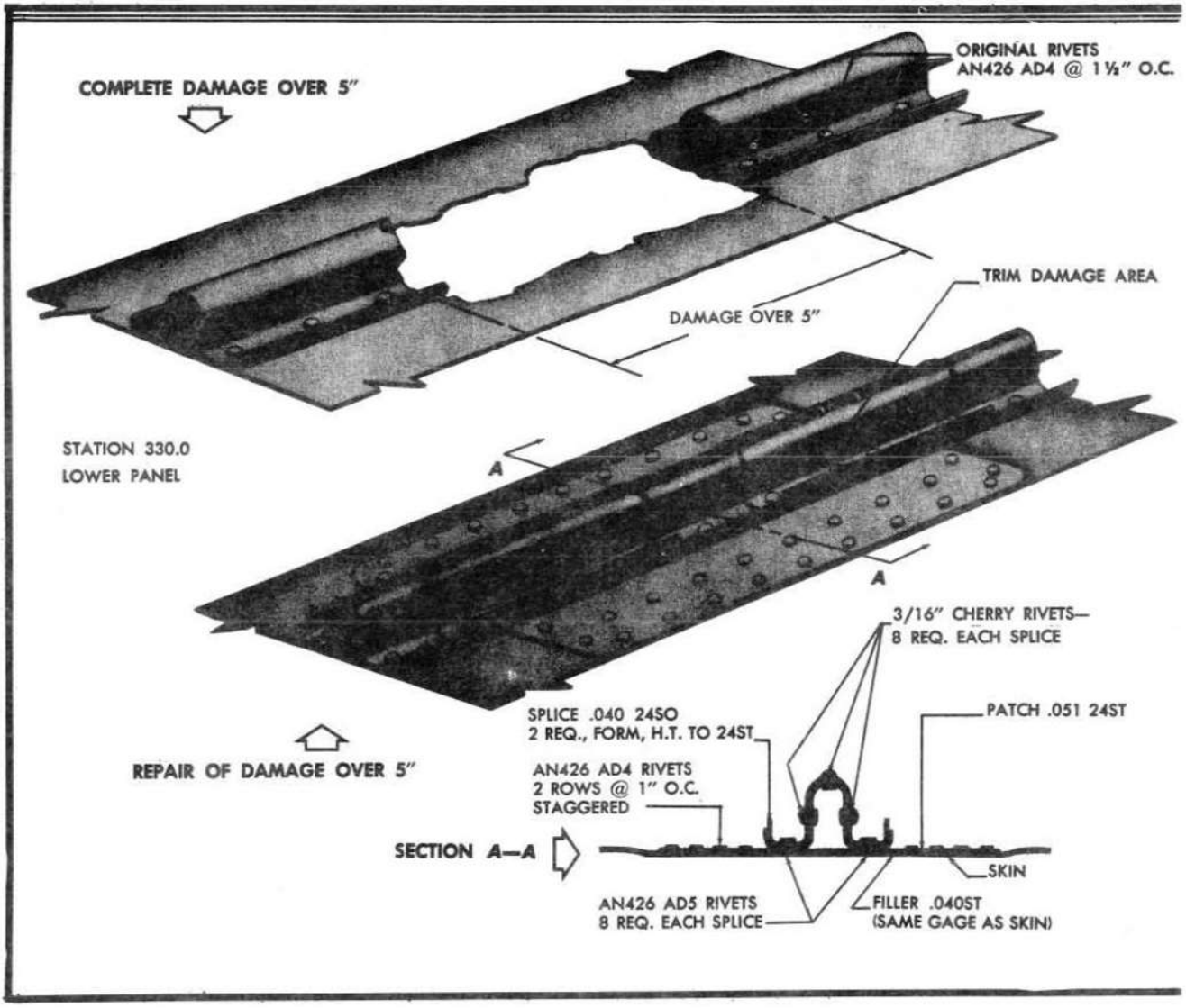


RIVET SCHEDULE FOR HAT SECTION REPAIR		
Gage	Rivets	No. of Rivets Each Side of Splice
.040	AD5	8
.051	AD6	7
.064	AD6	9
.091	AD6	15
.128	AD6	21

NOTES

1. Drill out all rivets in repair area so that the hat section may be lifted and blocked up to facilitate removal of damaged portion and insertion of repair material without injury to adjacent parts.
2. Cut-off damaged portion of hat section at right angles. Allow a minimum radius trim at corners of damage and repair material of ¼" for AD4 rivets, 5/16" for AD5 rivets, ⅜" for AD6 rivets, ½" for AD8 rivets.
3. Locate damaged stiffener on wing structure drawing, Fig. 12 , Section II. Determine gage of damaged part by reference to material parts list. Use accompanying rivet schedule to determine rivet size and number required per the gage of stiffener.
4. Select a filler material of same gage as the original material. Trim and form to fit. Insert a filler for skin attachment only.
5. For damage less than 5" in length, select next heavier gage material and splice damaged section as shown, or use next gage heavier and form a repair section and splice as shown by the alternate method.
6. Use existing rivet holes for the repair where possible.
7. For skin repair, refer to skin repair drawings, Section II.
8. For minimum bend radii of sheet material, see Fig. 5, Section I.
9. For flush riveting, see Fig. 6, Section I.
10. For rivet edge and row distance, see Fig. 7, Section I.

Figure 46 — Splice Repair of Wing Hat Section Break (Less than 5 Inches)



NOTES

1. Drill out all rivets in repair area so that the hat section may be lifted and blocked up to facilitate removal of damaged portion and insertion of repair material without injury to adjacent parts.
2. Cut-off damaged portion of hat section at right angles. Allow a minimum radius trim at corners of damage and repair material of ¼" for AD4 rivets, 5/16" for AD5 rivets, ⅜" for AD6 rivets, ½" for AD8 rivets.
3. Locate damaged stiffener on wing structure drawing, Fig. 12 , Section II. Determine gage of damaged part by reference to material parts list. Use accompanying rivet schedule to determine rivet size and number required per the gage of stiffener.
4. Select a filler material of same gage as the original material. Trim and form to fit. Insert a filler for skin attachment only.
5. For damage over 5" in length, use a splice and insertion repair as shown. Select the next heavier gage of either pre-formed or sheet material for this repair.
6. Use existing rivet holes for the repair where possible.
7. For skin repair, refer to skin repair drawings, Section II.
8. For minimum bend radii of sheet material, see Fig. 5, Section I.
9. For flush riveting, see Fig. 6, Section I.
10. For rivet edge and row distance, see Fig. 7, Section I.

Figure 47—Insert Repair of Wing Hat Section Break (Over 5 Inches)

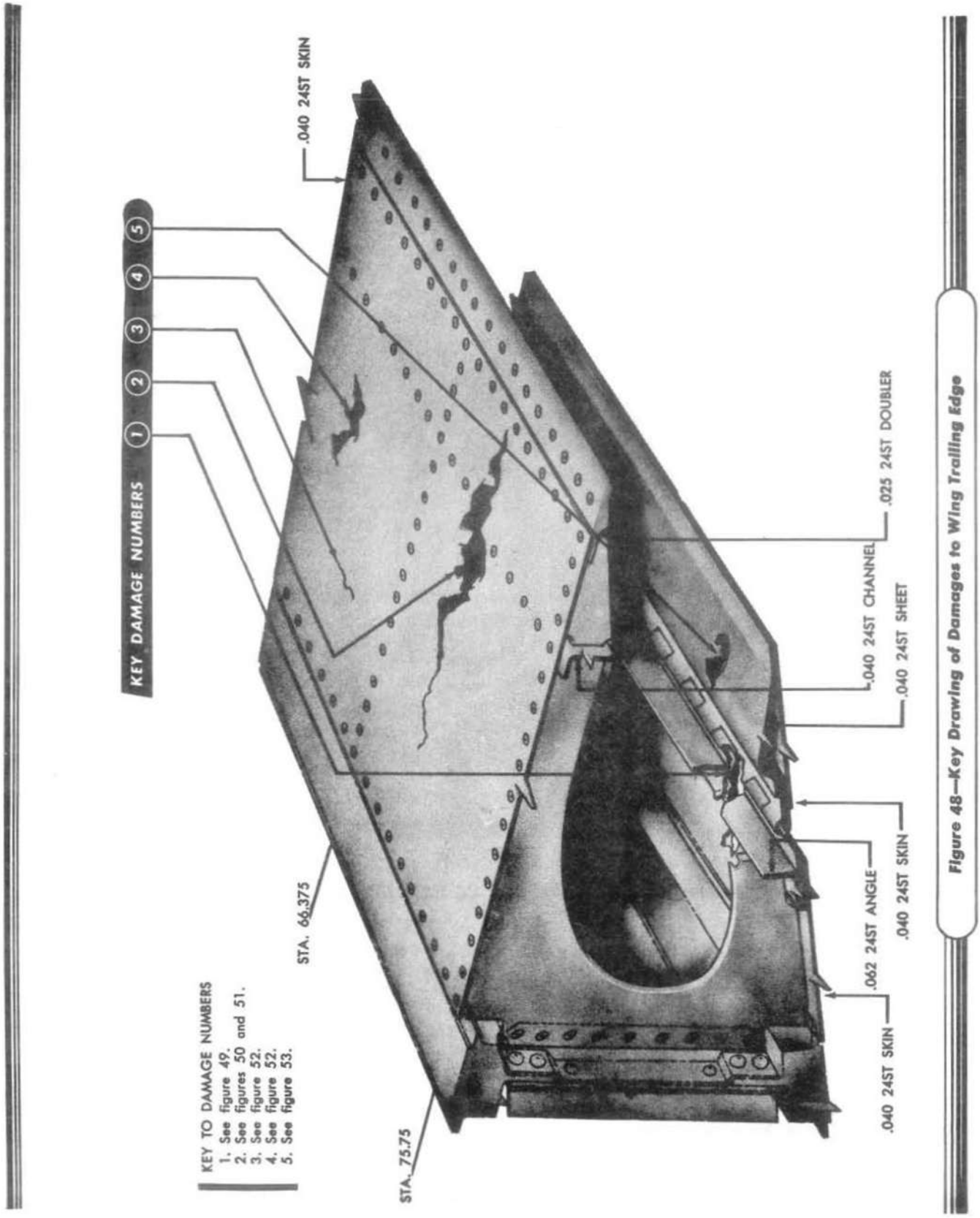
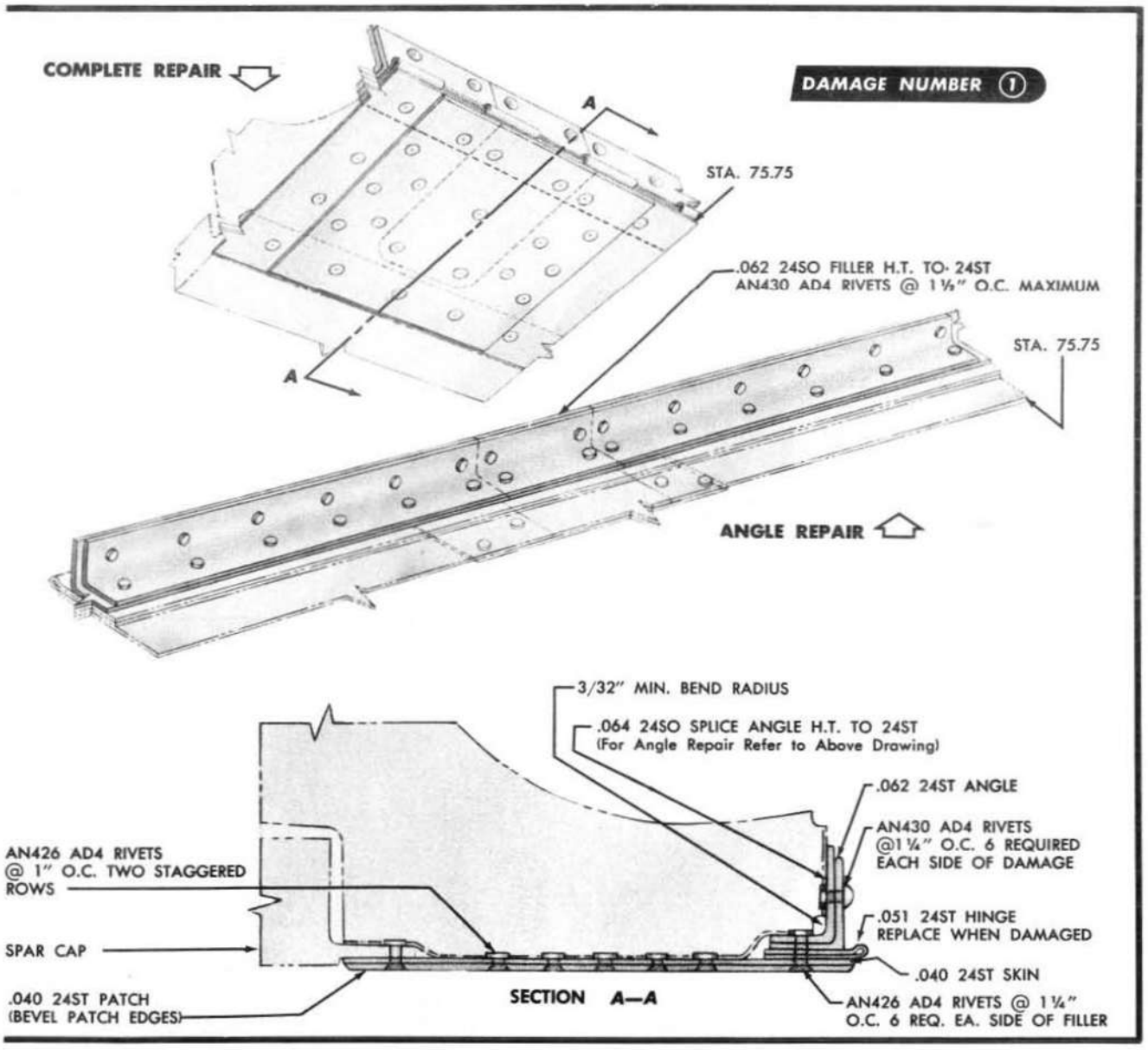


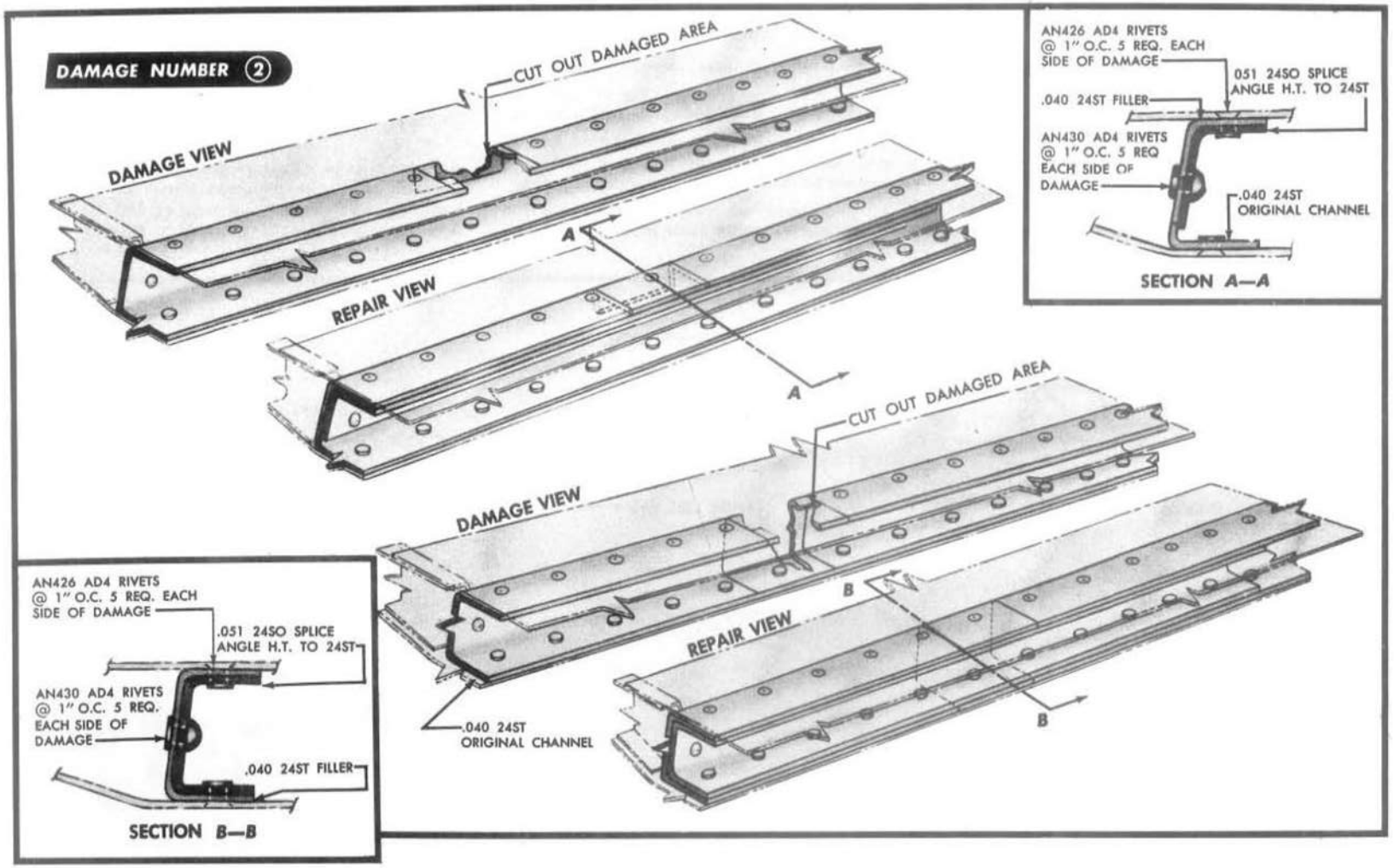
Figure 48—Key Drawing of Damages to Wing Trailing Edge



NOTES

1. Drill out all rivets in repair area.
2. Trim and smooth damaged material. Allow a minimum radius trim, at corners of damage and repair material, of 1/4" for AD4 rivets, 5/16" for AD5 rivets, 3/8" for AD6 rivets, or 1/2" for AD8 rivets.
3. Select filler of same gage and material as the original angle or skin. Trim and form to fit.
4. Select the same gage and material as the original angular or sheet splice patches. Bevel the edge on all skin surface patches.
5. Replace all damaged ribs, clips, and hinges. Rework Replaced ribs to fit.
6. Assemble repair material as per the rivet schedules noted on the drawing.
7. Use existing rivet holes for repair where possible.
8. For further notes on skin repair refer to Wing center section skin repair drawings, Section II.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

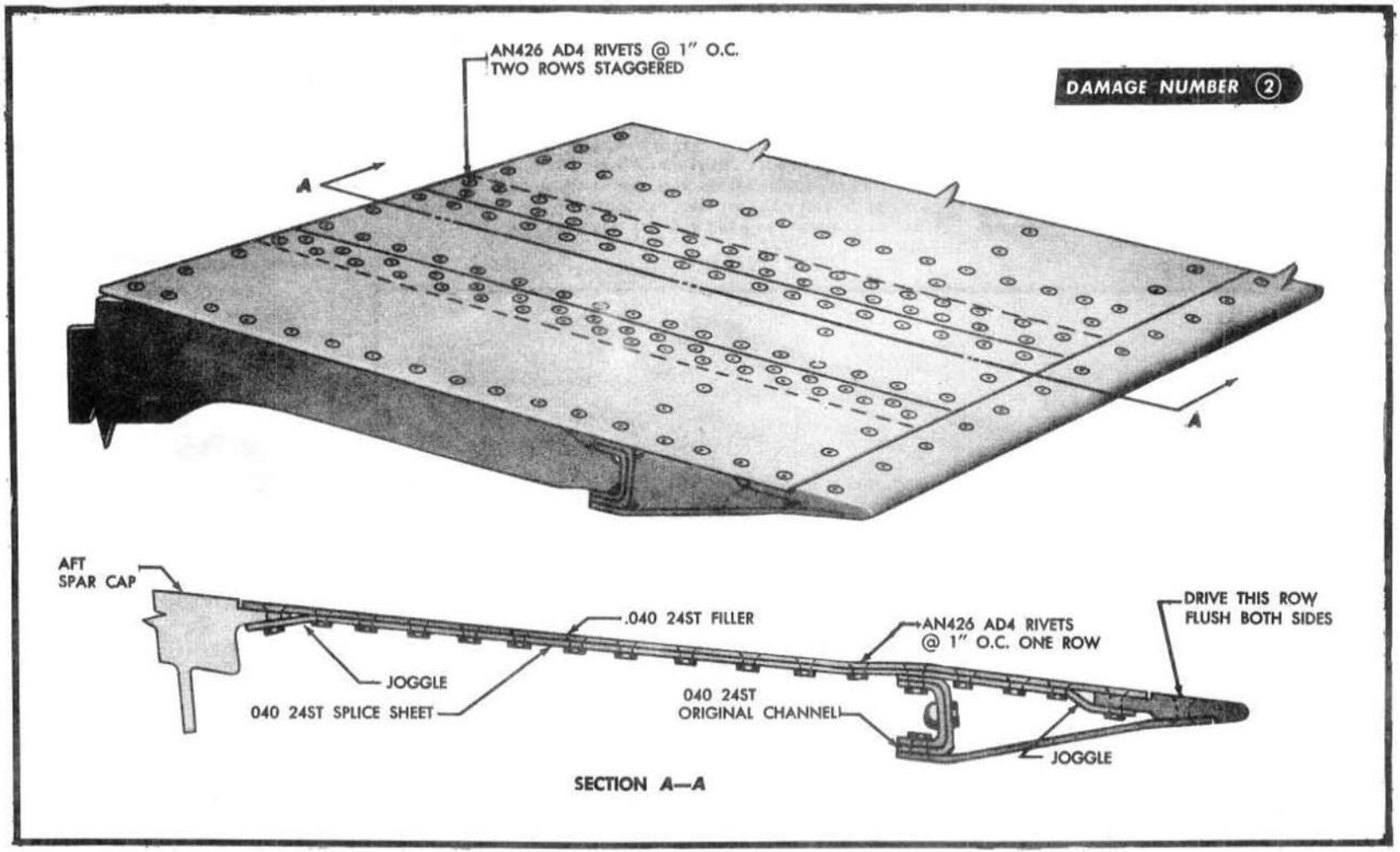
Figure 49—Skin Patch and Angle Splice Repairs — Wing Trailing Edge Bottom Section



NOTES

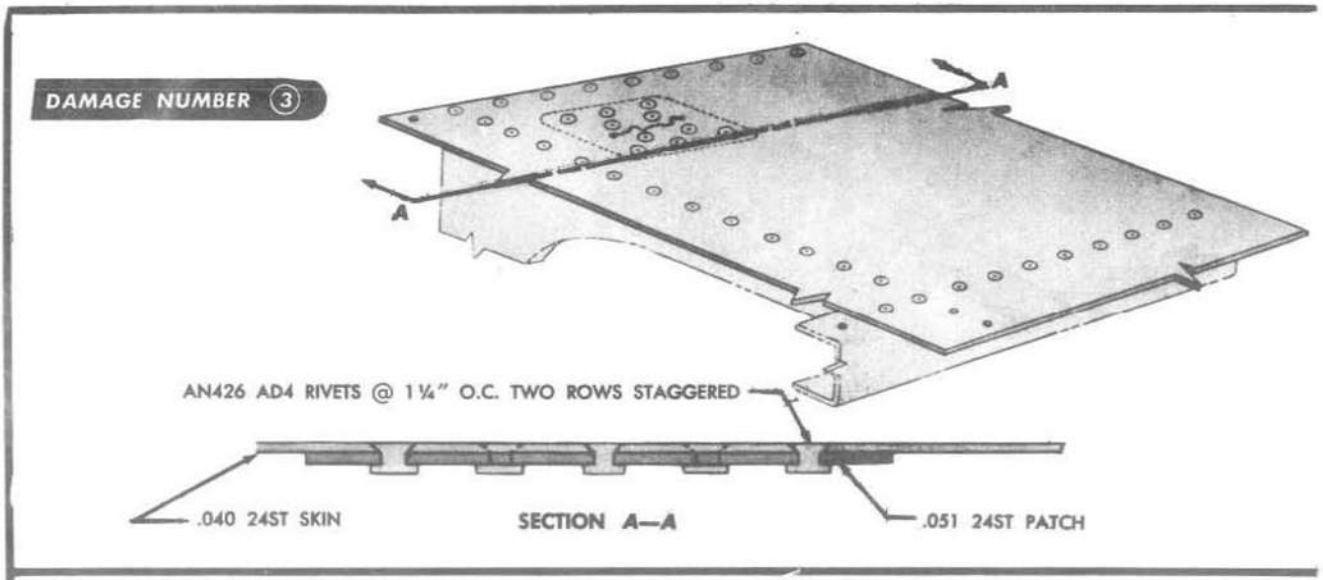
1. Drill out all rivets in repair area.
2. Trim and smooth damaged material. Allow a minimum radius trim at corners of damage and repair material, of 1/4" for AD4 rivets, 5/16" for AD5 rivets, 3/8" for AD6 rivets, or 1/2" for AD8 rivets.
3. Select filler of same gage and material as the original channel. Trim and form to fit.
4. Select angular and channel splices of next gage heavier and of same material as the original Form to fit.
5. Assemble repair material as per the rivet schedules noted on the drawing.
6. Use existing rivet holes for repair where possible.
7. For skin repair refer to next page showing complete splice to upper top section skin.
8. For minimum bend radii of sheet material, see Figure 5, Section I.
9. For flush riveting, see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

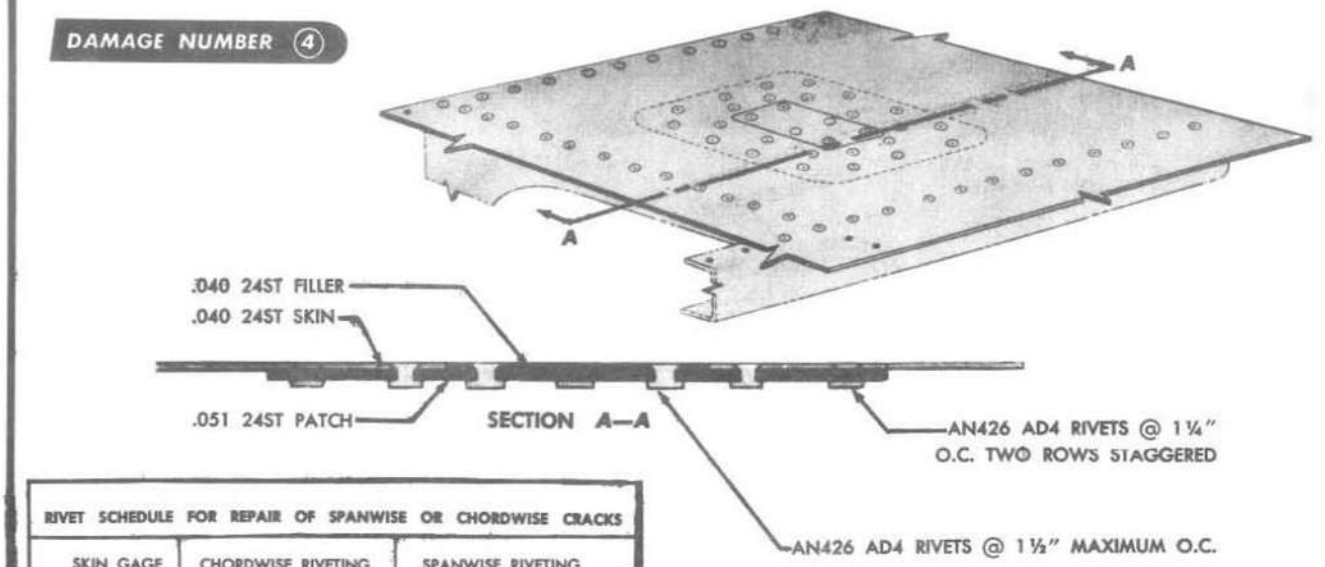
Figure 50—Patch and Splice Repair of Top Section Channel



1. Drill out all rivets in repair area so that skin may be lifted and blocked up to facilitate removal of damaged portion and insertion of repair material without injury to adjacent parts.
2. Trim and smooth damaged material.
3. Use the repair shown when damage exceeds one-half the panel width.
4. Select filler of same gage and material as the original material. Trim to fit.
5. Select splice doubler of same gage and material as the original material. Insert doubler between channel and plating.
6. Replace all damaged ribs and clips. Rework replaced ribs to fit.
7. Assemble repair material as per the rivet schedules noted on the drawing.
8. Use existing rivet holes for repair where possible.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 51—Splice Repair of Break in Top Section Skin



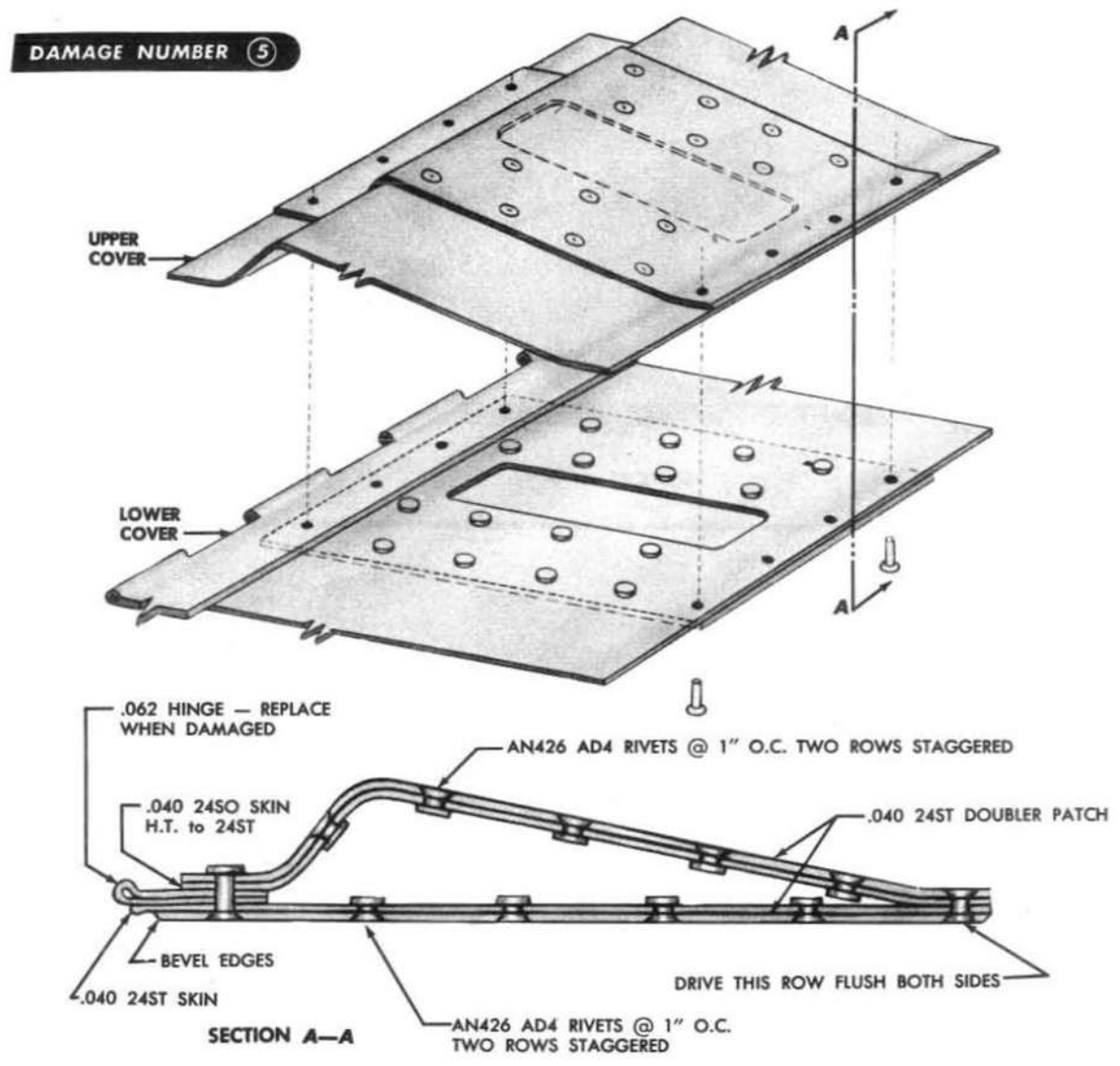


RIVET SCHEDULE FOR REPAIR OF SPANWISE OR CHORDWISE CRACKS		
SKIN GAGE	CHORDWISE RIVETING	SPANWISE RIVETING
.040 TO .051	AD5 2 ROWS @ ¾" O.C.	AD5 2 ROWS @ 1" O.C.
.064 AND UP	AD6 2 ROWS @ ¾" O.C.	AD5 2 ROWS @ ¾" O.C.

NOTES

1. Drill one-eighth inch stop holes at each end of crack.
2. Trim damage smooth leaving no radius less than five-sixteenth of an inch.
3. Construct filler from the same gage and material as the skin.
4. Construct patches from .051 material.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 52—Patch Repair of Typical Crack and Hole Damage in Top Section Skin



NOTES

1. Trim damage smooth leaving no radius less than one-half inch.
2. Construct patches from the same gage and material as the skin.
3. Bevel edges and attach to outside surface of the skin.
4. Replace damaged hinge.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 53—Patch Repair of Wing Trailing Edge Flap Door

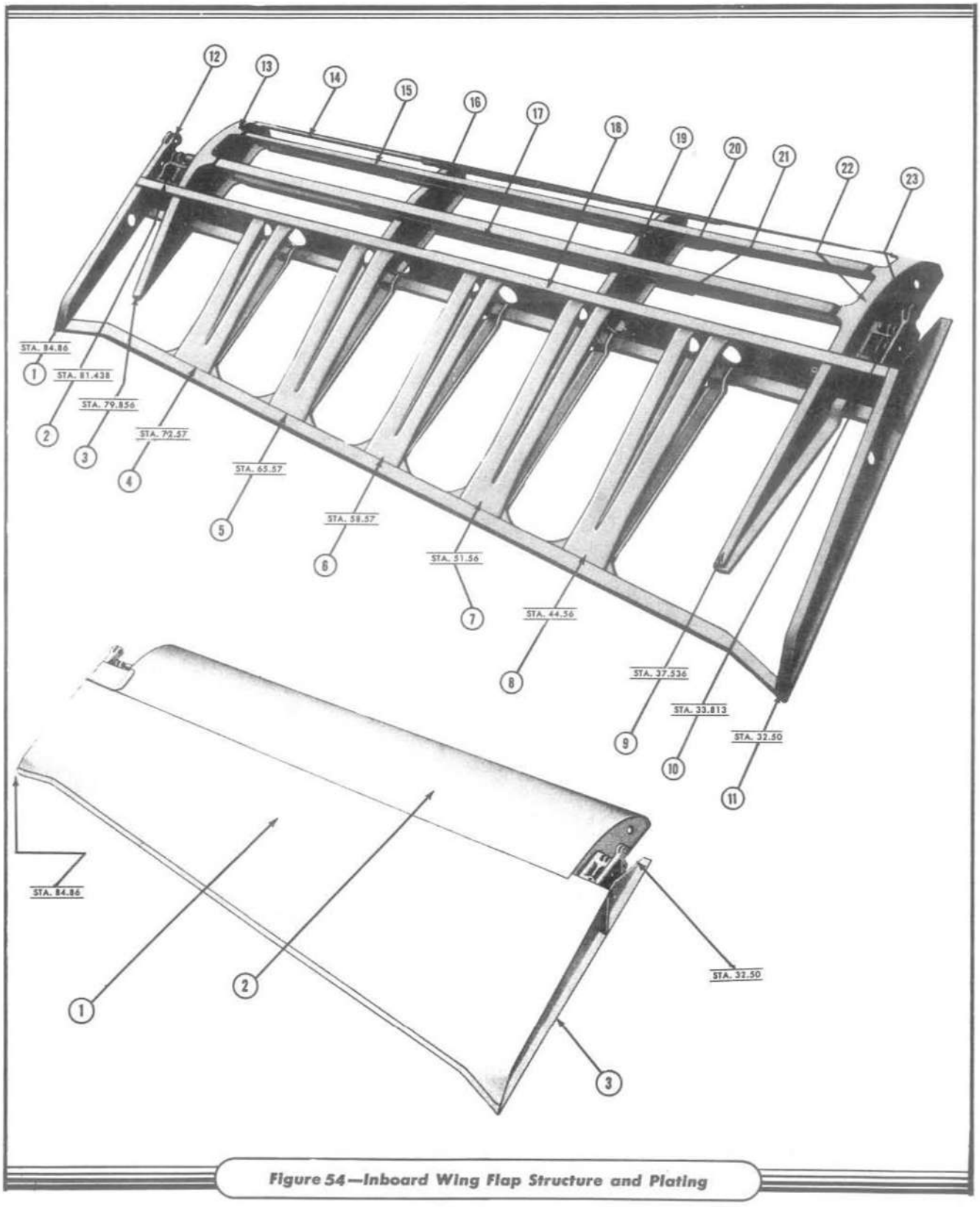


Figure 54—Inboard Wing Flap Structure and Plating

KEY TO FIGURE 54

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5153049-12 L.H. 5153049-13 R.H.	Rib	8x22	.064	24SO	24ST	1 L.H. 1 R.H.
2	4128106 L.H. 4128106-1 R.H.	Fitting	Forging Blank	4128107	AL.AL. 14ST		1 L.H. 1 R.H.
3	5153049-78 L.H. 5153049-79 R.H.	Rib	6⅛x16¼	.064	24SO	24ST	1 L.H. 1 R.H.
4	5153049-30	Rib	7½x17	.040	24SO	24ST	1
5	5153049-32	Rib	7½x17⅜	.040	24SO	24ST	1
6	5153049-34	Rib	7½x17⅝	.040	24SO	24ST	1
7	5153049-36	Rib	7½x17⅝	.040	24SO	24ST	1
8	5153049-28	Rib	7½x18	.040	24SO	24ST	1
9	5153049-76 L.H. 5153049-77 R.H.	Rib	6⅜x18	.064	24SO	24ST	1 L.H. 1 R.H.
10	4128106 L.H. 4128106-1 R.H.	Fitting	Forging Blank	4128107	AL.AL. 14ST		1 L.H. 1 R.H.
11	5153049-14 L.H. 5153049-15 R.H.	Rib	7½x21	.064	24SO AL.AL.	24ST	1 L.H. 1 R.H.
12	4128108	Fitting	Forging Blank	4128109	14ST		1
13	5153049-8 L.H. 5153049-8 R.H.	Rib	9x13	.064	24SO	24ST	1 L.H. 1 R.H.
14	2074330	Stiffener	42½ S.L.	.032	24ST		2
15	2074330	Stiffener	42½	.032	24ST		2
16	5153049-16 L.H. 5153049-17 R.H.	Rib	6¼x11¾	.032	24SO	24ST	1 L.H. 1 R.H.
17	2074330	Stiffener	42½	.032	24ST		2
18	5157812	Spar		.064	24SO	24ST	1
19	5153049-18 L.H. 5153049-19 R.H.	Rib	6x11¼	.032	24SO	24ST	1 L.H. 1 R.H.
20	2074330	Stiffener	42½	.032	24ST		2
21	2074330	Stiffener	42½	.032	24ST		2
22	5153049-10 L.H. 5153049-11 R.H.	Rib	10x13	.064	24SO	24ST	1 L.H. 1 R.H.
23	4129569 L.H. 4129569 R.H.	Fitting	Forging Blank	4128109	AL.AL. 14ST		1 L.H. 1 R.H.

MATERIAL LIST OF INBOARD WING FLAP PLATING

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5153049-2 L.H. 5153049-3 R.H.	Skin Plating	30x46	.032	Alclad	24ST	1
2	5153049-4 L.H. 5153049-5 R.H.	Upper Skin Plating	22¾x59	.025	Alclad	24ST	1
3	5153049-6 L.H. 5153049-7 R.H.	Lower Skin Plating	22x60	.025	Alclad	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

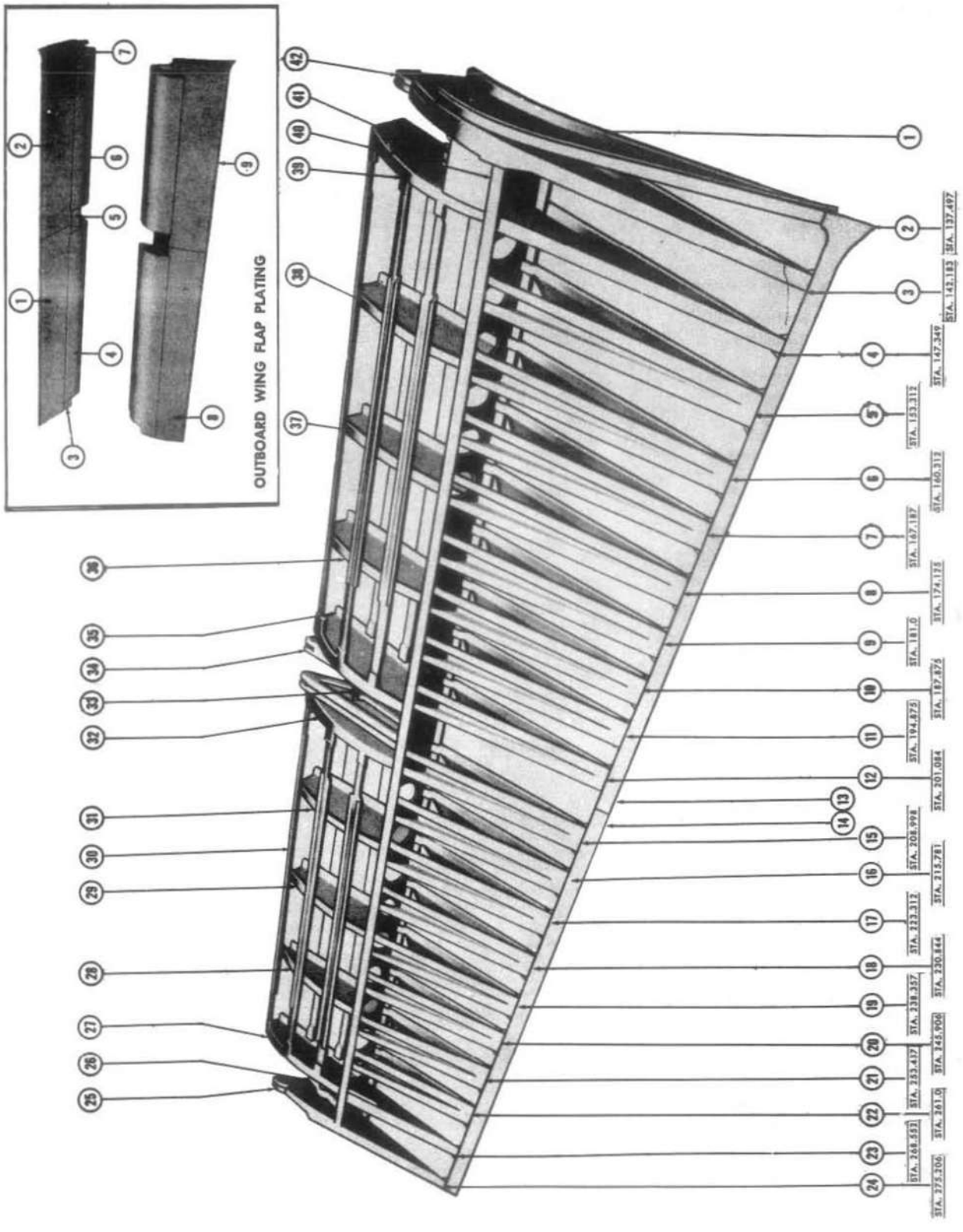


Figure 55—Outboard Wing Flap Structure and Plating

KEY TO FIGURE 55

Left hand assembly listed only.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5153050-200	Rib	6x25	.032	24SO	24ST	1
2	4157979	Fillet		Die Casting	Magnesium Alloy		1
3	5153050-176	Rib	7x22¼	.064	24SO	24ST	1
4	5153050-238	Rib	5½x15½	.064	24SO	24ST	1
5	5153050-38 5153050-40	Upper Rib Lower Rib	6½x16	.040	24SO	24ST	2
6	5153050-70 5153050-72	Upper Rib Lower Rib	6½x15½	.040	24SO	24ST	2
7	5153050-34 5153050-36	Upper Rib Lower Rib	6x15½	.040	24SO	24ST	2
8	5153050-66 5153050-68	Upper Rib Lower Rib	6x15	.040	24SO	24ST	2
9	5153050-30 5153050-32	Upper Rib Lower Rib	6x15	.040	24SO	24ST	2
10	5153050-62 5153050-64	Upper Rib Lower Rib	6x14½	.040	24SO	24ST	2
11	5153050-26 5153050-28	Upper Rib Lower Rib	5½x14	.040	24SO	24ST	2
12	5153050-58 5153050-60	Upper Rib Lower Rib	5½x14	.040	24SO	24ST	2
13	S-1125585	Tiller	Length 69		24ST		1
14	S-1125585	Tiller	Length 65		24ST		1
15	5153050-54 5153050-56	Upper Rib Lower Rib	5½x13½	.040	24SO	24ST	2
16	5153050-22 5153050-24	Upper Rib Lower Rib	5½x13½	.040	24SO	24ST	2
17	5153050-50 5153050-52	Upper Rib Lower Rib	5½x13	.040	24SO	24ST	2
18	5153050-18 5153050-20	Upper Rib Lower Rib	5x13	.040	24SO	24ST	2
19	5153050-46 5153050-48	Upper Rib Lower Rib	5x12½	.040	24SO	24ST	2
20	5153050-14 5153050-16	Upper Rib Lower Rib	5x12½	.040	24SO	24ST	2
21	5153050-42 5153050-44	Upper Rib Lower Rib	5x12	.040	24SO	24ST	2
22	5153050-10 5153050-12	Upper Rib Lower Rib	5x12	.040	24SO	24ST	2
23	5153050-226	Rib	4x11	.064	24SO	24ST	1
24	5153050-180	Rib	5x16¾	.064	24SO	24ST	1

KEY TO FIGURE 55 (Continued)

Left hand assembl, listed only.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
25	4127482	Hinge	Made from Forging Blank 4127483	Press Forging	Alum. Alloy 14 ST or Eq.		1
26	4127480	Hinge	Made from Forging Blank 5128365	Forging	Alum. Alloy 14 ST or Eq.		1
27	5153050-174	Rib	9x9½	.064	24SO	24ST	1
28	5153050-126	Rib	5x9	.032	24SO	24ST	1
29	5153050-128	Rib	5x9	.032	24SO	24ST	1
30	S-2074330	Typ. Hat Section Former	3⅞x59¾	.032	24ST		10
31	5153050-130	Rib	5x9	.032	24SO	24ST	1
32	5153050-190	Rib	9x9	.064	24SO	24ST	1
33	5128419	Hinge	Made from Forging Blank 5128420	Forging	Alum. Alloy 14 ST or Eq.		1
34	4128102	Hinge	Made from Forging Blank 4128103	Forging	Alum. Alloy 24 ST or Eq.		2
35	5153050-186	Rib	9x9	.064	24SO	24ST	1
36	5153050-132	Rib	5x9	.032	24SO	24ST	1
37	5153050-134	Rib	5½x9	.032	24SO	24ST	1
38	5153050-136	Rib	5½x9	.032	24SO	24ST	1
39	5153050-234	Rib	7x8	.064	24SO	24ST	1
40	S-1125581	Spar	Length 131⅛		24ST		1
41	4127480	Hinge	Made from Forging Blank 5128365	Forging	Alum. Alloy 14 ST or Eq.		1
42	4127482	Hinge	Made from Forging Blank 4127483	Press Forging	Alum. Alloy 14 ST or Eq.		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

MATERIAL LIST OF OUTBOARD WING FLAP PLATING

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5153050-8	Skin Plating	15x69	.025	24ST		1
2	5153050-4	Skin Plating	24x70	.025	24ST		1
3	5153050-90	Skin Plating	5¾x5½	.032	24SO	24ST	1
4	5153050-172	Skin Plating	23x60	.032	24ST		1
5	5153050-140	Skin Plating	5x11	.032	24SO	24ST	1
6	5153050-150	Skin Plating	22½x54½	.032	24ST		1
7	5153050-84	Skin Plating	5x8⅛	.032	24ST		1
8	5153050-6	Skin Plating	15x69	.025	24ST		1
9	5153050-2	Skin Plating	24x70	.025	24ST		1

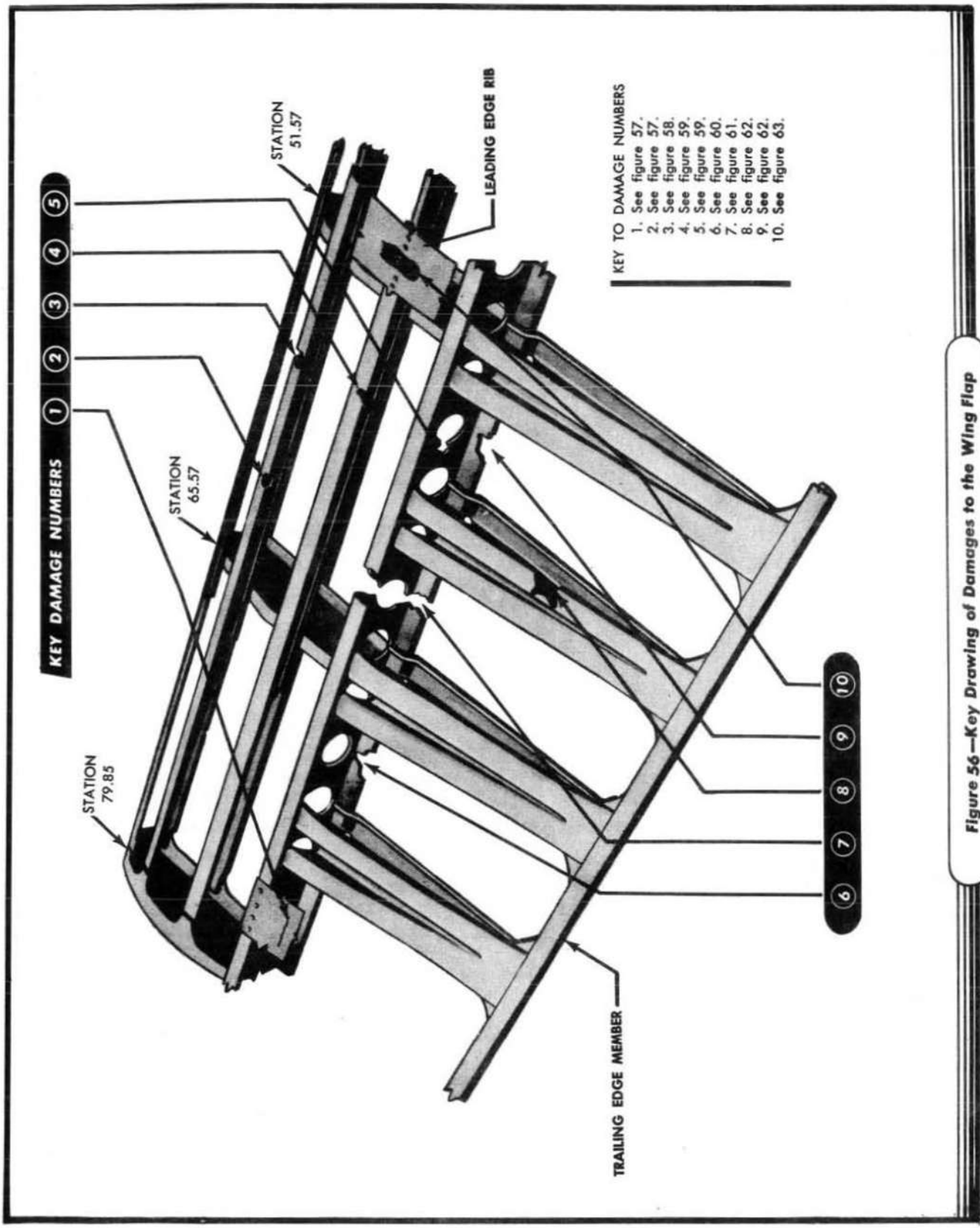
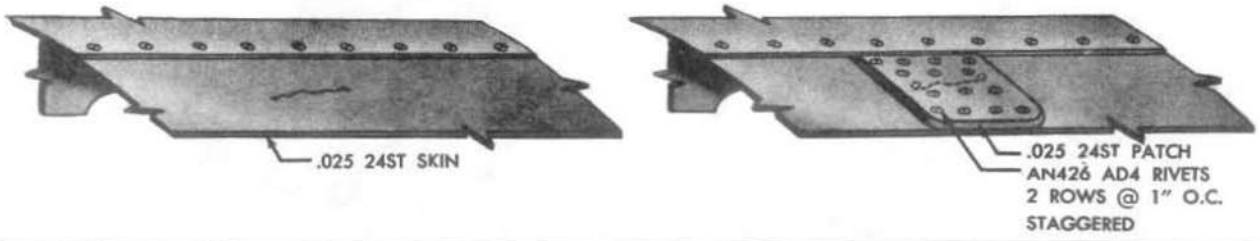


Figure 56—Key Drawing of Damages to the Wing Flap

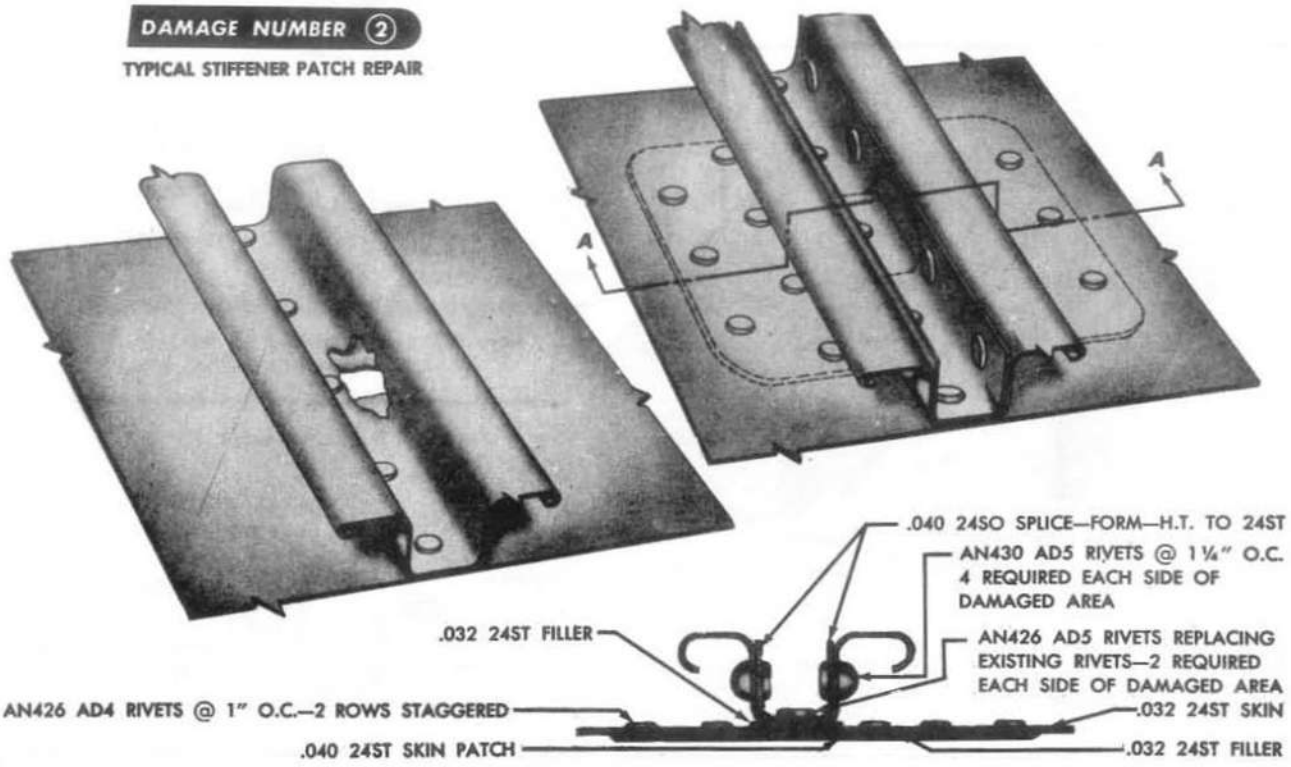
DAMAGE NUMBER ①

TYPICAL SKIN PATCH REPAIR



DAMAGE NUMBER ②

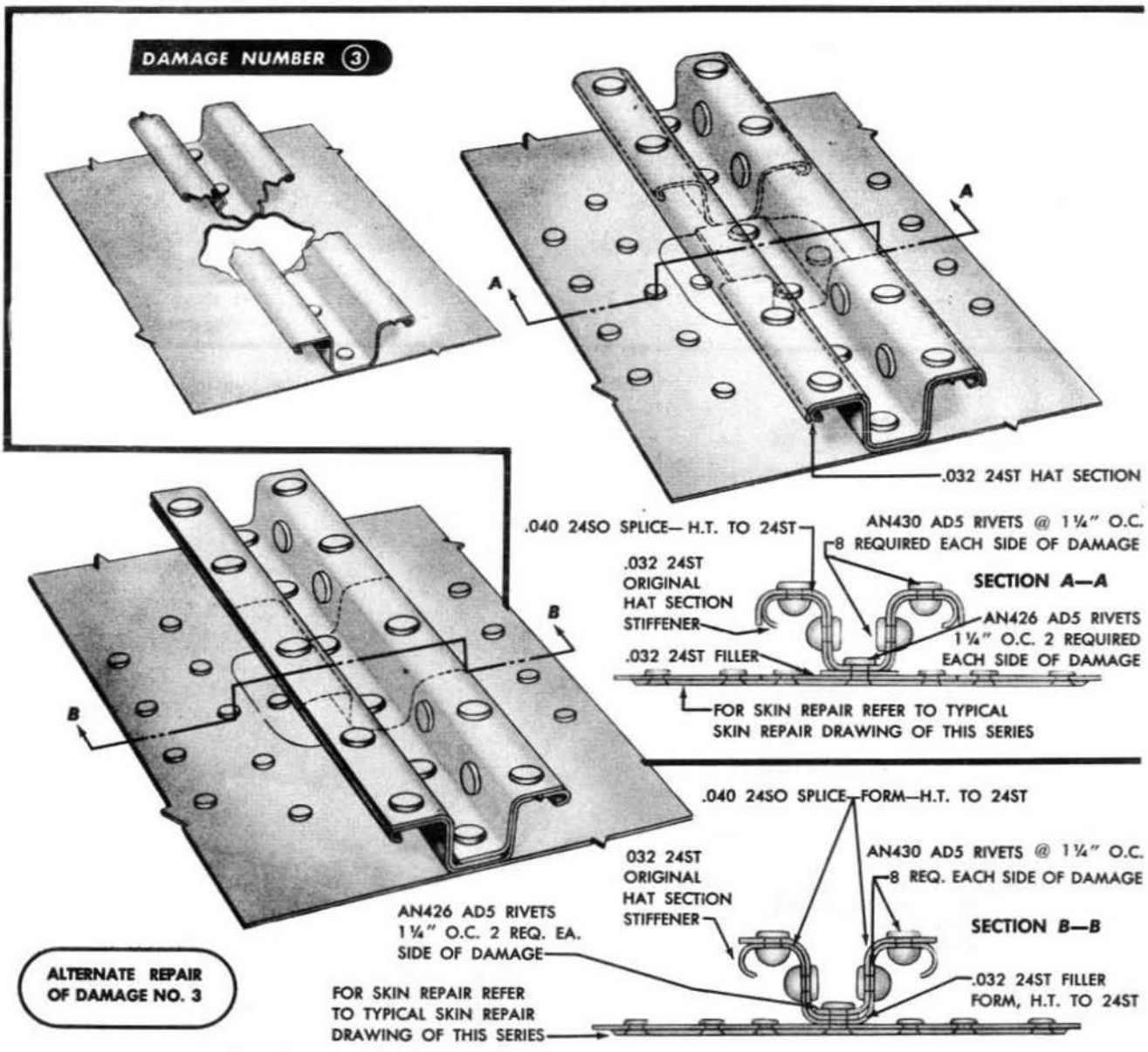
TYPICAL STIFFENER PATCH REPAIR



NOTES

1. Remove all interfering rivets.
2. Drill one-eighth inch stop holes at each end of crack.
3. Trim damage smooth leaving no radius less than three-eighths inch.
4. Construct skin patches from the same gage and material as the skin. Bevel edges to prevent any unnecessary aerodynamic drag.
5. Construct fillers from .032 dural sheet.
6. Construct splice channel from .040 dural sheet. Form in the 24SO condition and heat treat to 24ST.
7. When possible use existing rivet holes.
8. For minimum bend radii of sheet material, see Figure 5, Section I.
9. For flush riveting, see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

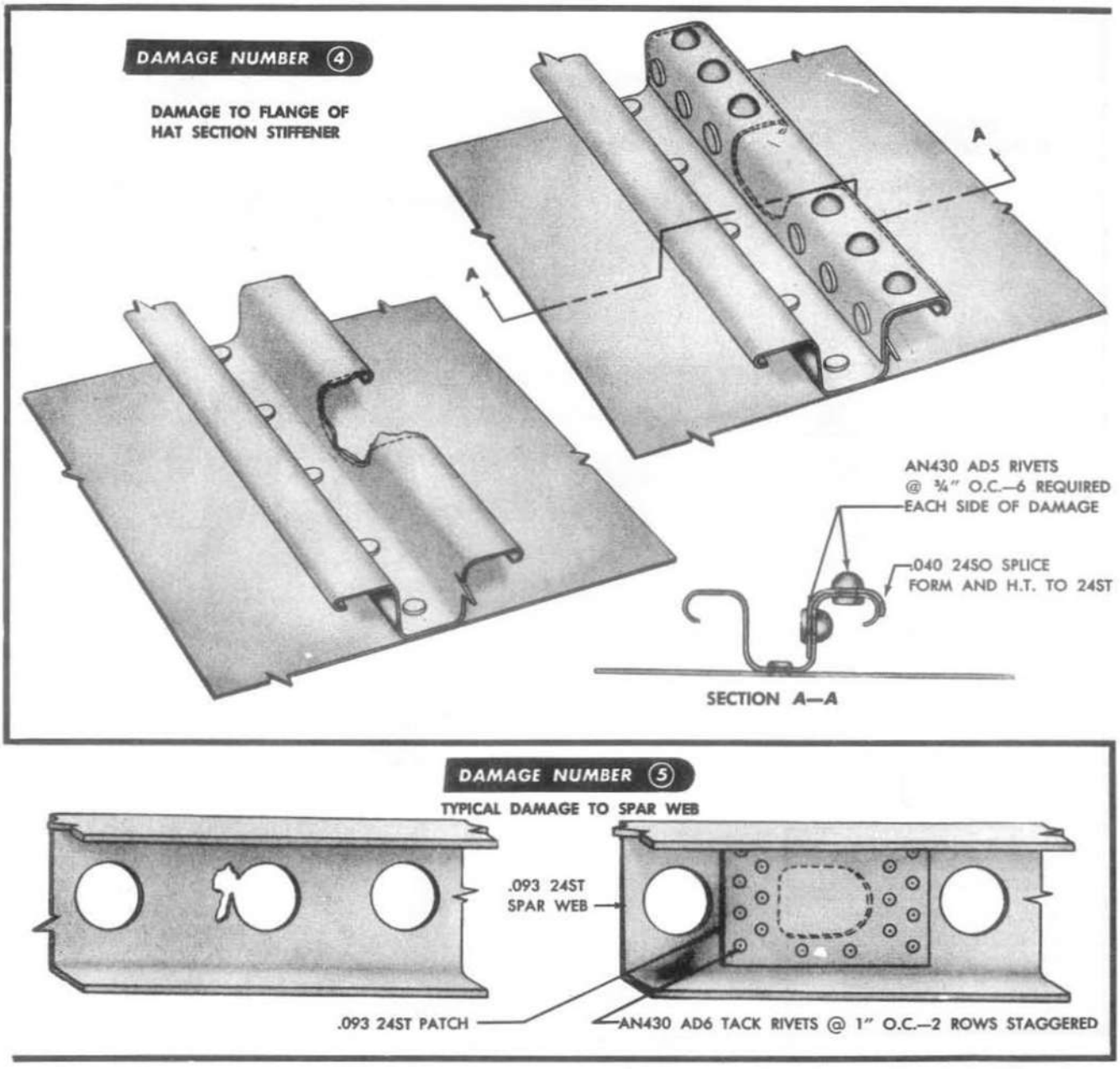
Figure 57—Patch Repair of Damages to Wing Flap Skin and Stiffener



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct skin patch from the same gage and material as the skin. Bevel edges to prevent any unnecessary aerodynamic drag.
4. Construct fillers from .032 dural sheet.
5. Construct splice channels from .040 dural sheet. Form in the 24SO condition and heat treat to 24ST.
6. When possible use existing rivet holes.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

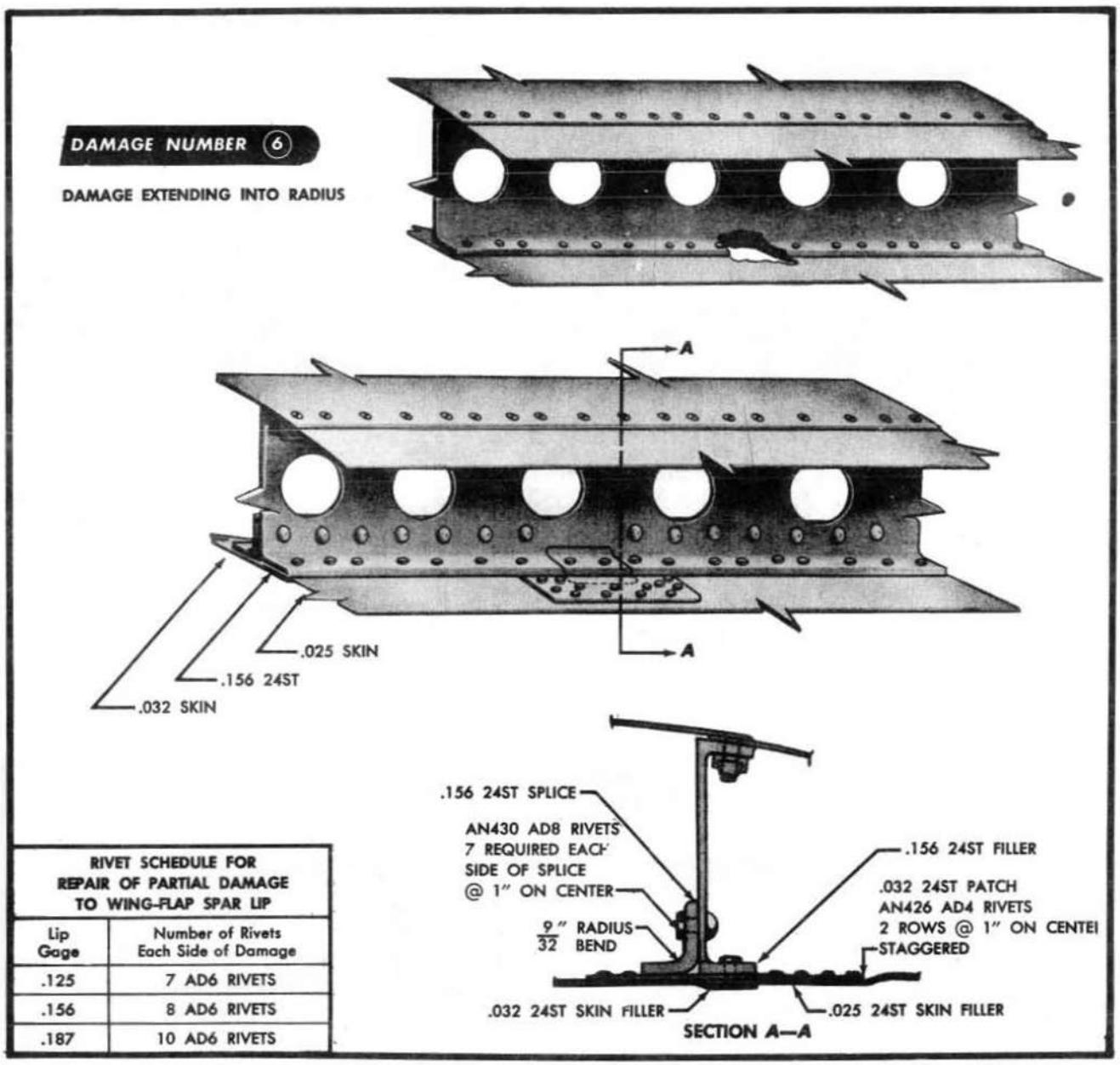
Figure 58 —Splice Repair of Complete Damage to Wing Flap Stiffener



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving nc radius less than three-eighths inch.
3. Construct hat section patch from .040 dural sheet. Form in the 24SO condition and heat treat to 24ST.
4. Construct spar web patch from .093 24ST dural plate.
5. For minimum bend radii of sheet material see Figure 5, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 59— Patch Repair of Damages to Wing Flap Stiffener and Spar Web

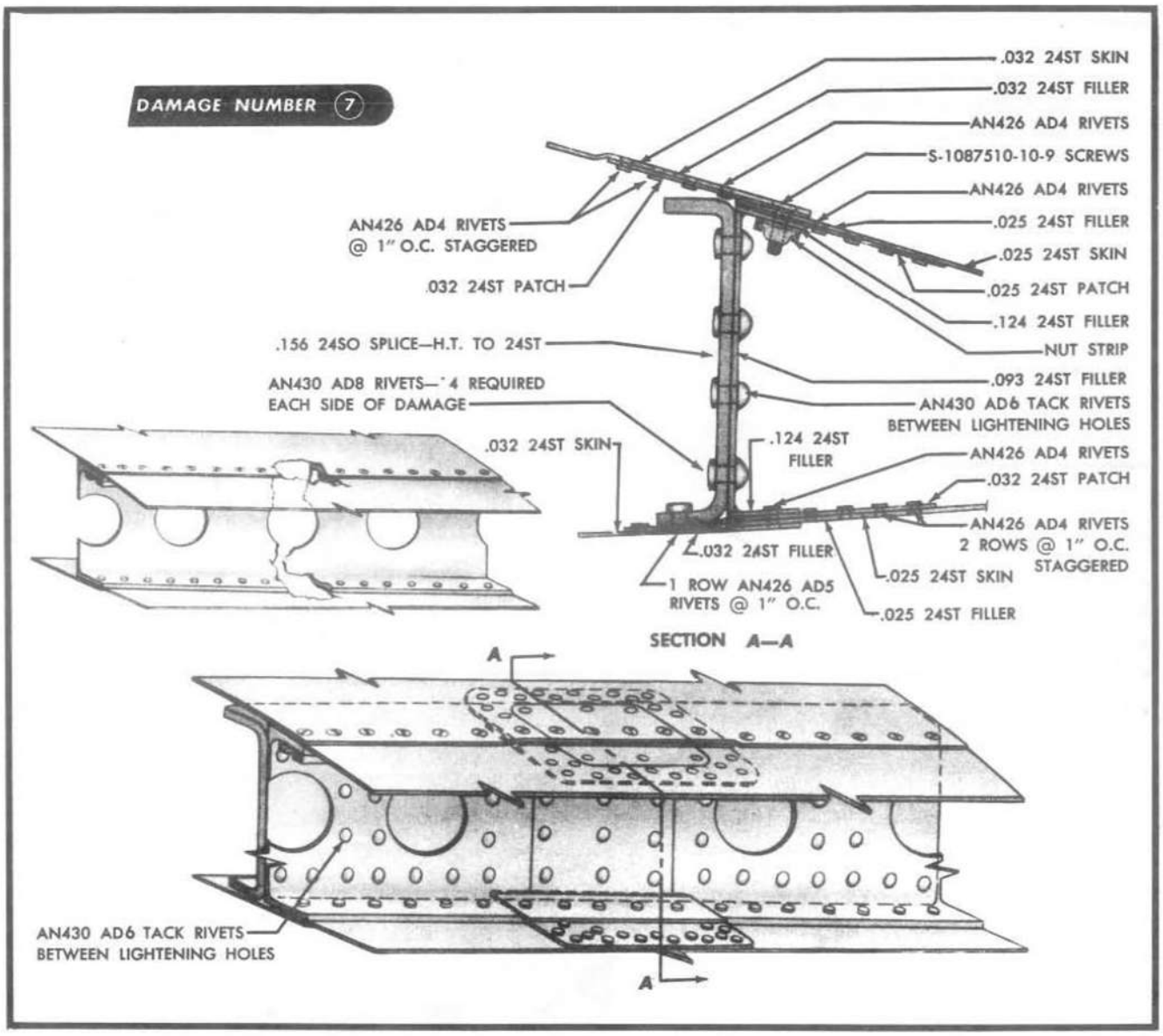


RIVET SCHEDULE FOR REPAIR OF PARTIAL DAMAGE TO WING-FLAP SPAR LIP	
Lip Gage	Number of Rivets Each Side of Damage
.125	7 AD6 RIVETS
.156	8 AD6 RIVETS
.187	10 AD6 RIVETS

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .156 dural plate. Form in the 24SO condition and heat treat to 24ST.
4. Construct filler from material the same gage as the lip.
5. When possible use existing rivet holes.
6. Select rivets from table shown.
7. For skin repairs, see Figure 57, this Section.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure 60—Patch Repair of Damage to Wing Flap Spar



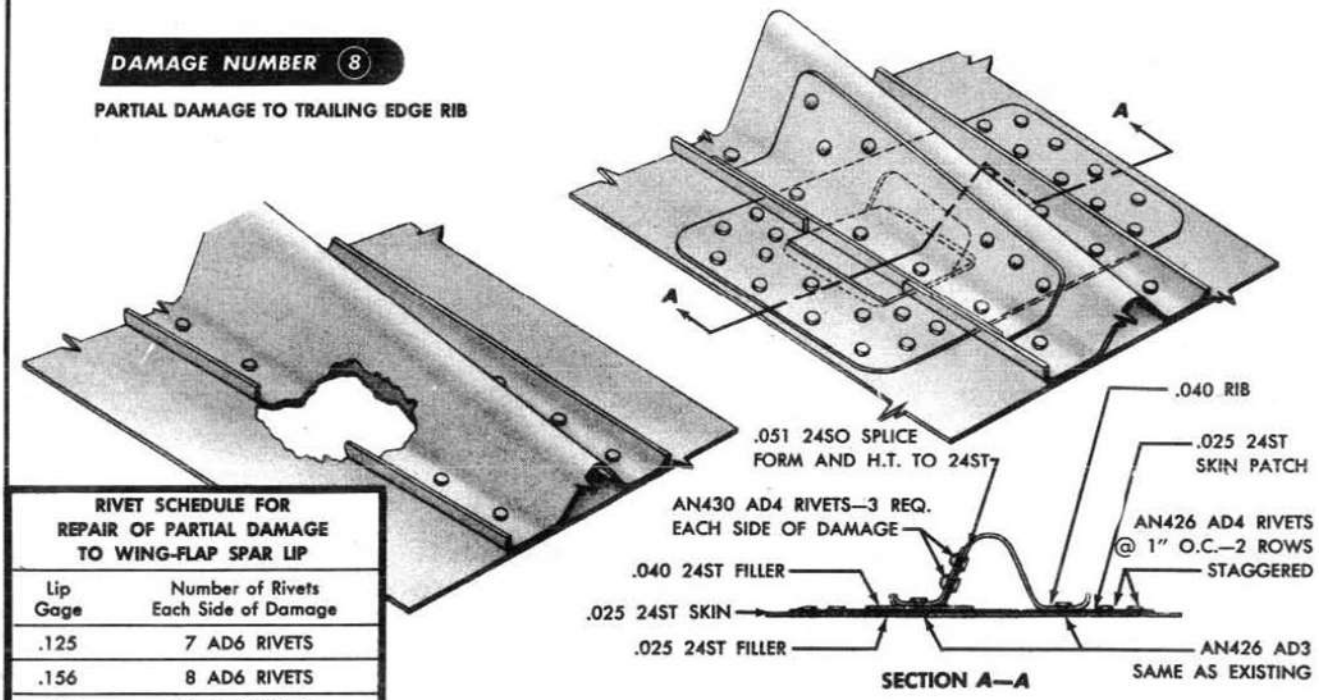
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct spar splice channel from .156 dural plate. Form in the 24SO condition and heat treat to 24ST.
4. Construct skin patches and fillers from the same gage and material as skin.
5. Replace damaged nut strips and screws.
6. For minimum bend radii of sheet material, see Figure 5, Section I.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 61 —Splice Repair of Complete Damage to Wing Flap Spar

DAMAGE NUMBER (8)

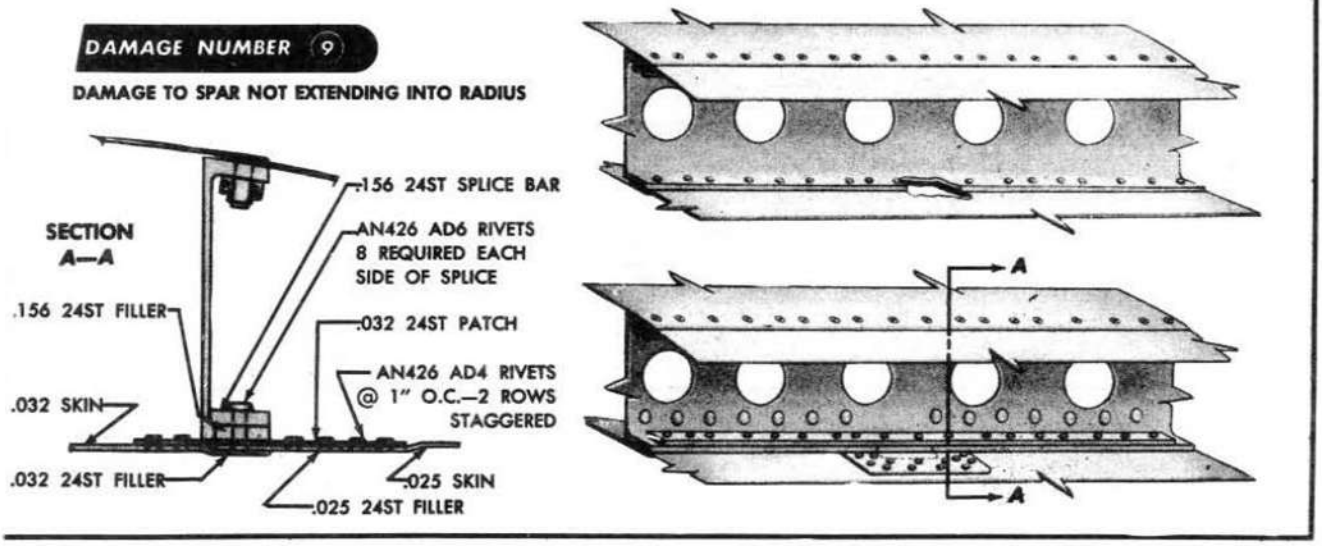
PARTIAL DAMAGE TO TRAILING EDGE RIB



RIVET SCHEDULE FOR REPAIR OF PARTIAL DAMAGE TO WING-FLAP SPAR LIP	
Lip Gage	Number of Rivets Each Side of Damage
.125	7 AD6 RIVETS
.156	8 AD6 RIVETS
.187	10 AD6 RIVETS

DAMAGE NUMBER (9)

DAMAGE TO SPAR NOT EXTENDING INTO RADIUS



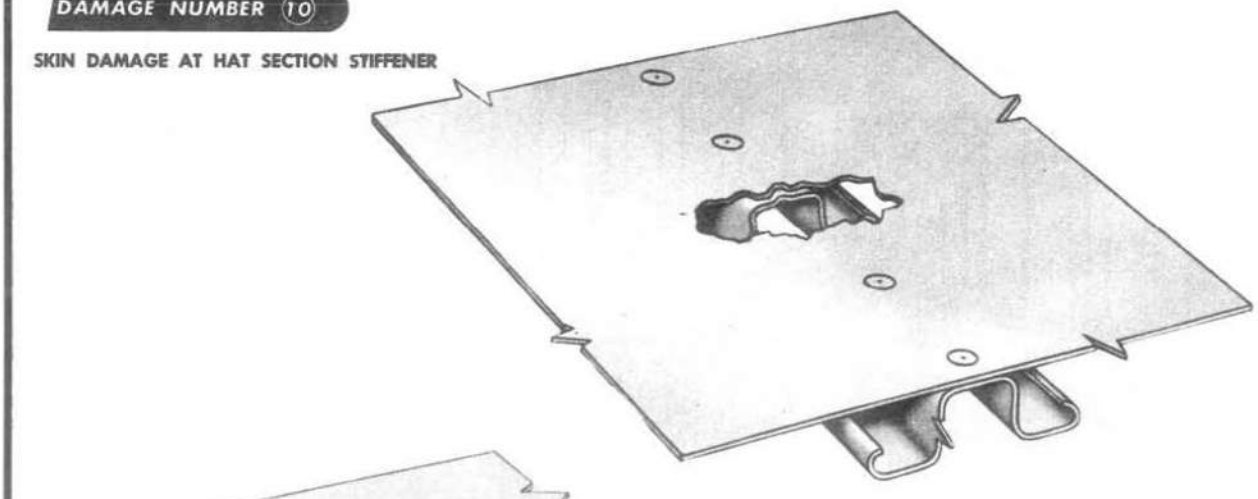
NOTES

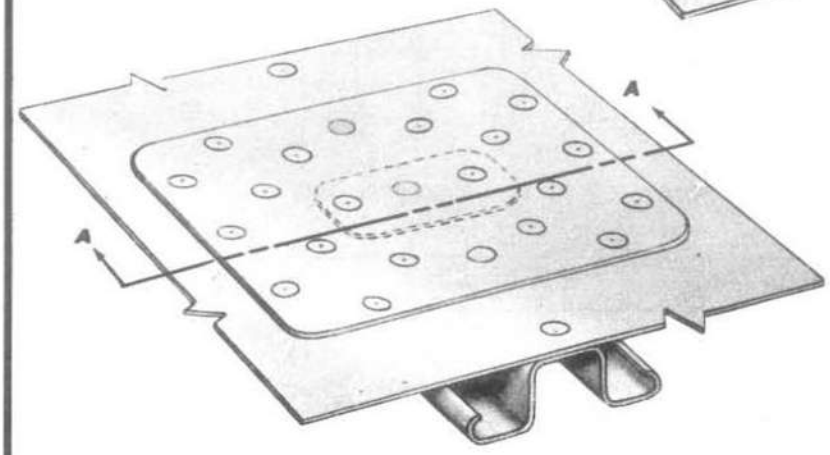
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct rib patch from .051 dural sheet. Form in the 24SC condition and heat treat to 24ST.
4. Construct fillers from material which is the same as existing.
5. Construct skin patches from material which is the same as existing.
6. Construct spar splice bar from .156 dural plate.
7. Select rivets for spar repair from table shown.
8. For minimum bend radii of sheet material, see Figure 5, Section I.
9. For flush riveting, see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

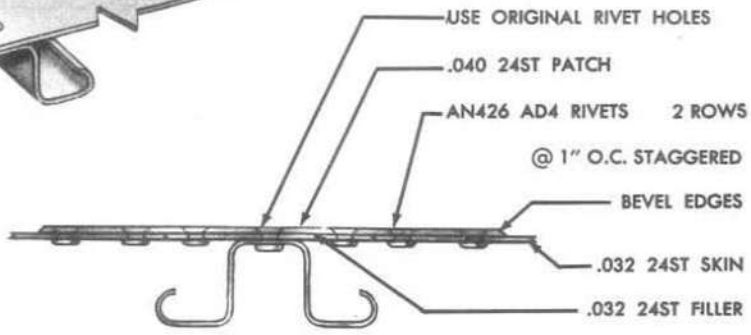
Figure 62—Patch Repair of Wing flap Spar and Trailing Edge Rib

DAMAGE NUMBER (10)

SKIN DAMAGE AT HAT SECTION STIFFENER







SECTION A—A

NOTE—
FOR REPAIR OF HAT SECTION STIFFENER, REFER TO TYPICAL SPLICE REPAIR OF WING FLAP STIFFENER, FIG. 58, SECTION II

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct filler from .032 alclad.
4. Construct patch from .040 alclad sheet. Bevel edges to prevent any unnecessary aerodynamic drag.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 63—Typical Patch Repair of Damage to Wing Flap Skin

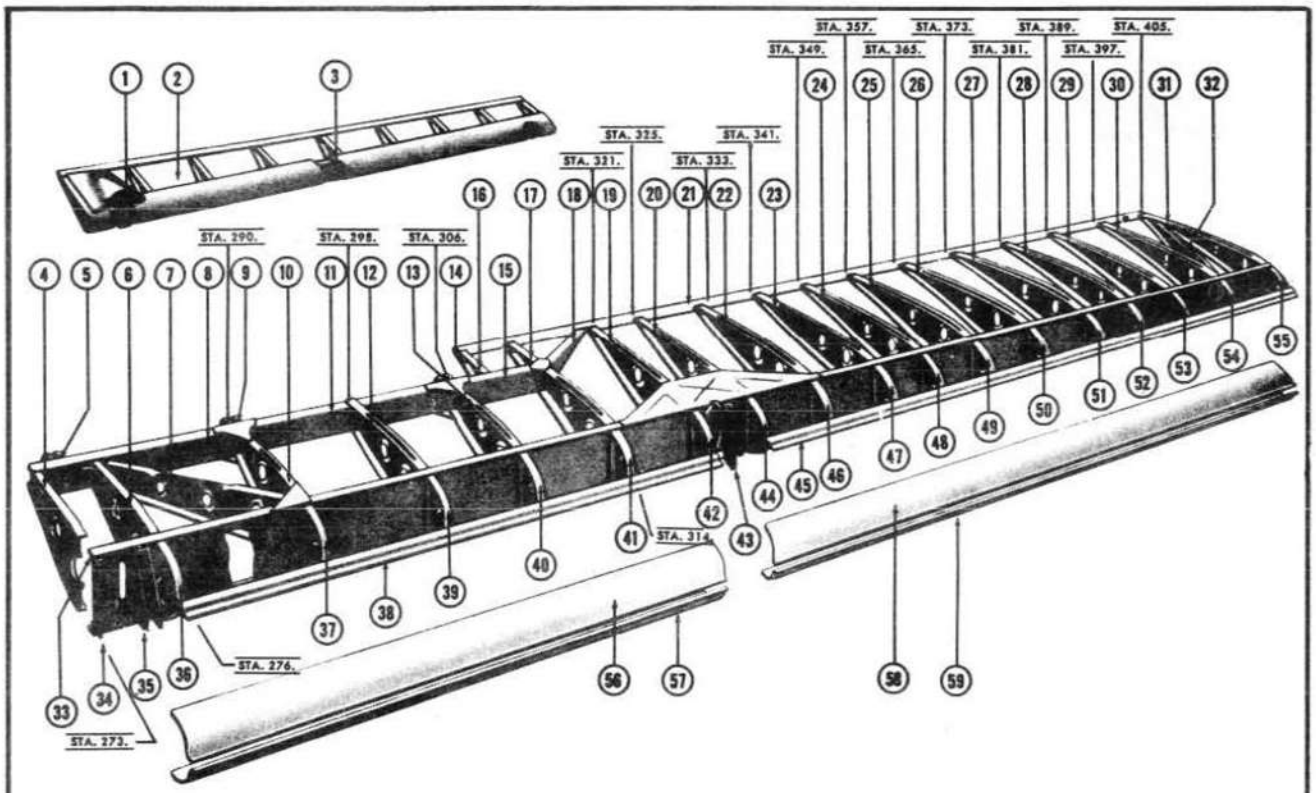


Figure 64—Aileron Structure (Left Hand Shown)

KEY TO FIGURE 64

Under reference numbers containing more than one part number, the even dash numbers indicate left hand; the odd numbers indicate right hand parts.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	4128168-2 4128168-3	Hinge Fitting	1-31/32x6-3/8	Pressed Forging	14ST		1
2	5122047-30 5122047-31	Tab	Spot Weld Assem.				1
3	4128166-2	Fitting	1⅜x1⅞	Pressed Forging	14ST		1
4	5153045-40 5153045-41	Rib	6¾x14	.040	24ST		1
5	2126602	Bracket	1-15/16x17-5/16	Forging	14ST		2
6	5153045-48 5153045-49	Rib	6¾x11	.032	24ST		1
7	5153045-38 5153045-39	Brace	6¾x14	.025	24ST		1
8	5153045-46	Channel	2½x10	.032	24ST		1
9	2126763	Bracket	1-5/16x17-5/16	Forging	14ST		2
10	5153045-48 5153045-49	Rib	6¾x11	.032	24ST		1
11	5153045-44	Spar Segment	2½x15½	.032	24ST		1

KEY TO FIGURE 64 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
12	5153045-158 5153045-159	Rib	7x11	.020	24ST		1
13	5153045-22 5153045-23	Rib	6½x10-5/16	.032	24ST		1
14	5153045-122	Filler S-1152369	⅜		24SO		14
15	5153045-42	Spar Segment	2½x7¾	.032	24ST		1
16	5153045-160 5153045-161	Rib	6⅜x6½	.020	24ST		1
17	5153045-16 5153045-17	Rib	6⅜x15½	.020	24ST		1
18	5153045-120 5153045-121	Brace	2½x10	.020	24ST		1
19	5153045-6 5153045-7	Rib	6¼x18½	.032	24ST		1
20	5153045-64 5153045-65	Rib	5¾x15½	.032	24ST Tube		1
21	5153045-122 5153045-123	Trailing Edge S-1093799	106		24ST		1
22	5153045-58 5153045-59	Rib	5¾x15½	.020	24ST		1
23	5153045-52 5153045-53	Rib	7x15	.020	24ST		1
24	5153045-68 5153045-69	Rib	6½x15	.020	24ST		1
25	5153045-88 5153045-89	Rib	6x14½	.020	24ST		1
26	5153045-86 5153045-87	Rib	5-13/16x14½	.020	24ST		1
27	5153045-80 5153045-81	Rib	5¾x14¼	.020	24ST		1
28	5153045-74 5153045-75	Rib	5-11/16x14	.020	24ST		1
29	5153045-102 5153045-103	Rib	5-9/16x13¾	.020	24ST		1
30	5153045-100 5153045-101	Rib	5½x13¼	.020	24ST		1
31	5153045-94 5153045-95	Rib	5⅜x12¼	.032	24SO	24ST	1
32	5153045-96 5153045-97	Brace	5½x15½	.020	24ST		1
33	5153045-152 5153045-153	Spar Cap S-1125509	134		24ST 24ST		1
34	5153045-150 5153045-151	Spar S-1125510	134		DIE No. 30245		1
35	2123286	Hinge Support	3¾x3-15/16.125		C.M. Steel x4130 H.T. Per ANQQ-H-201		1
36	5153045-32 5153045-33	Rib	5⅛x7½	.032	24ST		1

KEY TO FIGURE 64 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
37	5153045-28 5153045-29	Rib	5¼x6½	.032	24ST		1
38	3157805-2L 3157805-3R	Nose Weight	+.35 7.00—.00 Lbs.		Sand Castings		1
39	5153045-50 5153045-51	Rib	5⅜x6¾	.032	24SO	24ST	1
40	5153045-18 5153045-19	Rib	6x6½	.032	24SO	24ST	1
41	5153045-14 5153045-15	Rib	6x6¼	.032	24SO	24ST	1
42	5153045-4 5153045-5	Rib	5⅞x6½	.032	24SO	24ST	1
43	2123287	Support Hinge	4⅜		24ST DIE No. 30259		1
44	5153045-66 5153045-67	Rib	4½x6	.032	24ST		1
45	3155354-2L 3155354-3R 3155354-4L 3155354-5R	Nose Weight	+.31 6.22—.00 Lbs.		Sand Casting		1
46	5153045-62 5153045-63	Rib	4¼x6	.032	24SO	24ST	1
47	5153045-54 5153045-55	Rib	5x6¼	.032	24SO	24ST	1
48	5153045-72 5153045-73	Rib	5x5½	.032	24SO	24ST	1
49	5153045-90 5153045-91	Rib	5x5¾	.025	24SO	24ST	1
50	5153045-84 5153045-85	Rib	4½x5½	.025	24SO	24ST	1
51	5153045-78 5153045-79	Rib	4½x6	.025	24SO	24ST	1
52	5153045-76 5153045-77	Rib	4½x5½	.025	24SO	24ST	1
53	5153045-104 5153045-105	Rib	3½x5	.025	24SO	24ST	1
54	5153045-98 5153045-99	Rib	3⅞x5	.025	24SO	24ST	1
55	5153045-92 5153045-93	Rib	4⅛x5¼	.032	24SO	24ST	1
56	5153045-30 5153045-31	Nose Skin Inb'd Upper	8½x47	.032	24ST		1
57	5153045-26 5153045-27	Nose Skin Inb'd Lower	8½x47	.032	24ST		1
58	5153045-10 5153045-11	Nose Skin Outb'd Upper	7x80	.032	24ST		1
59	5153045-116 5153045-117	Nose Skin Outb'd Lower	8½x89	.032	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

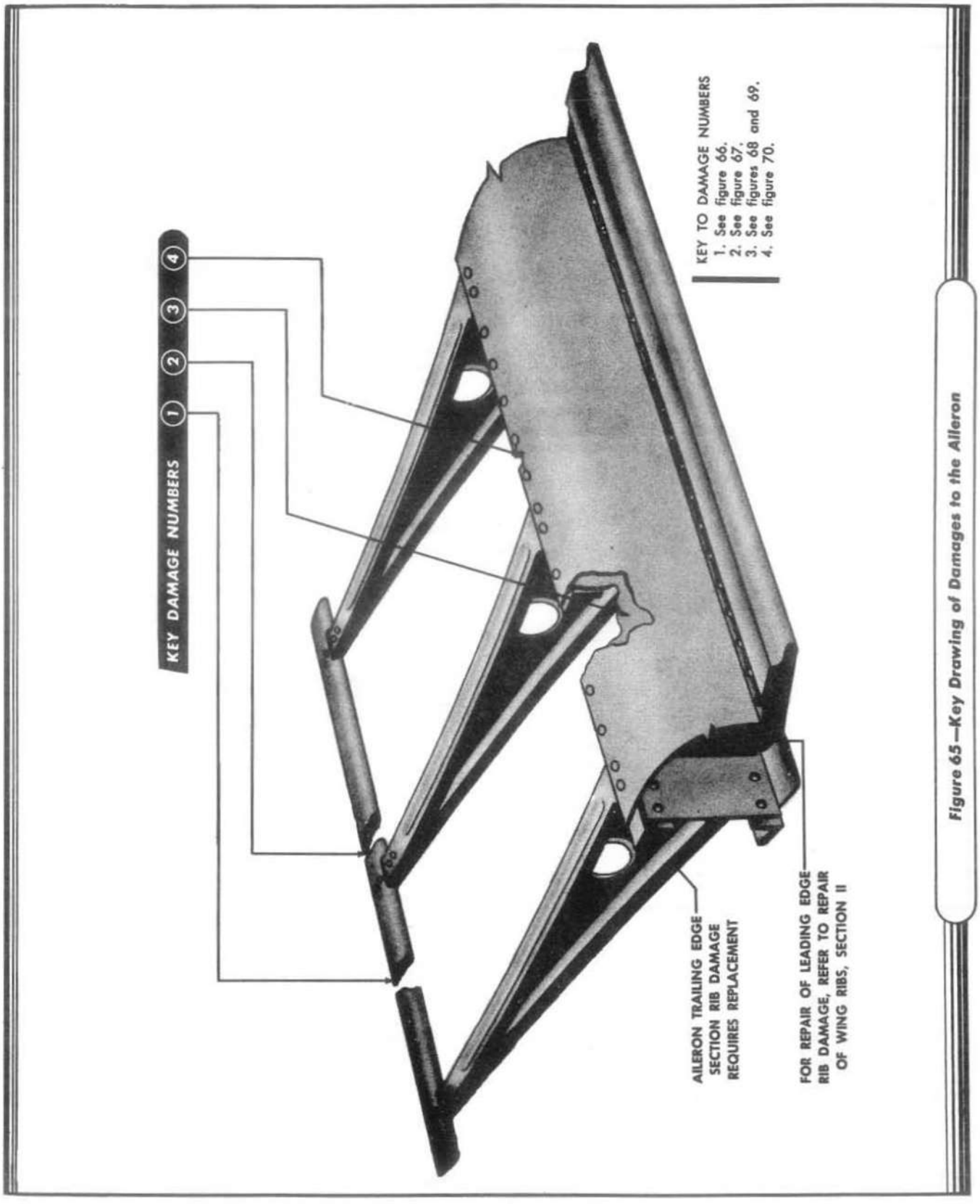
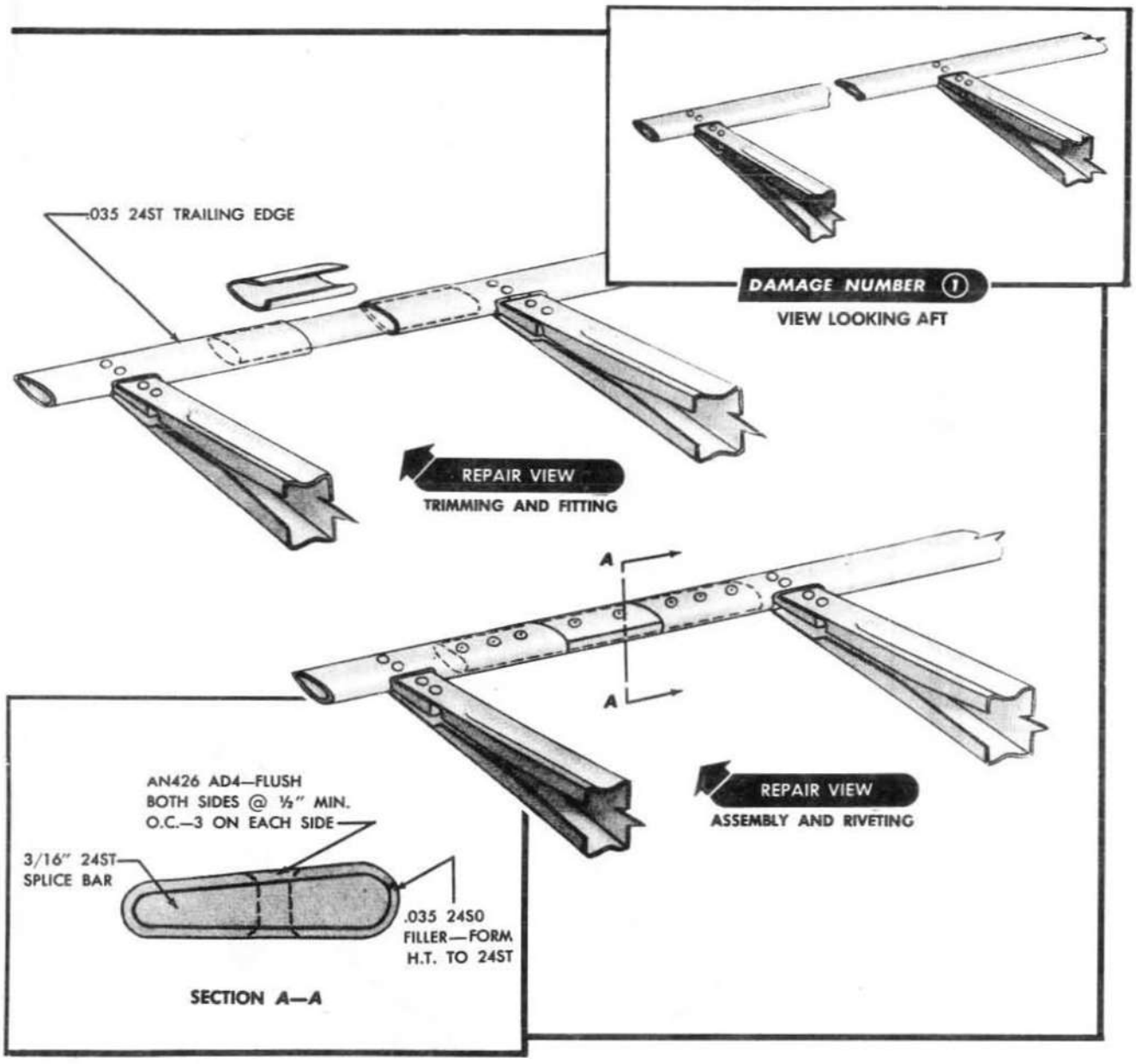
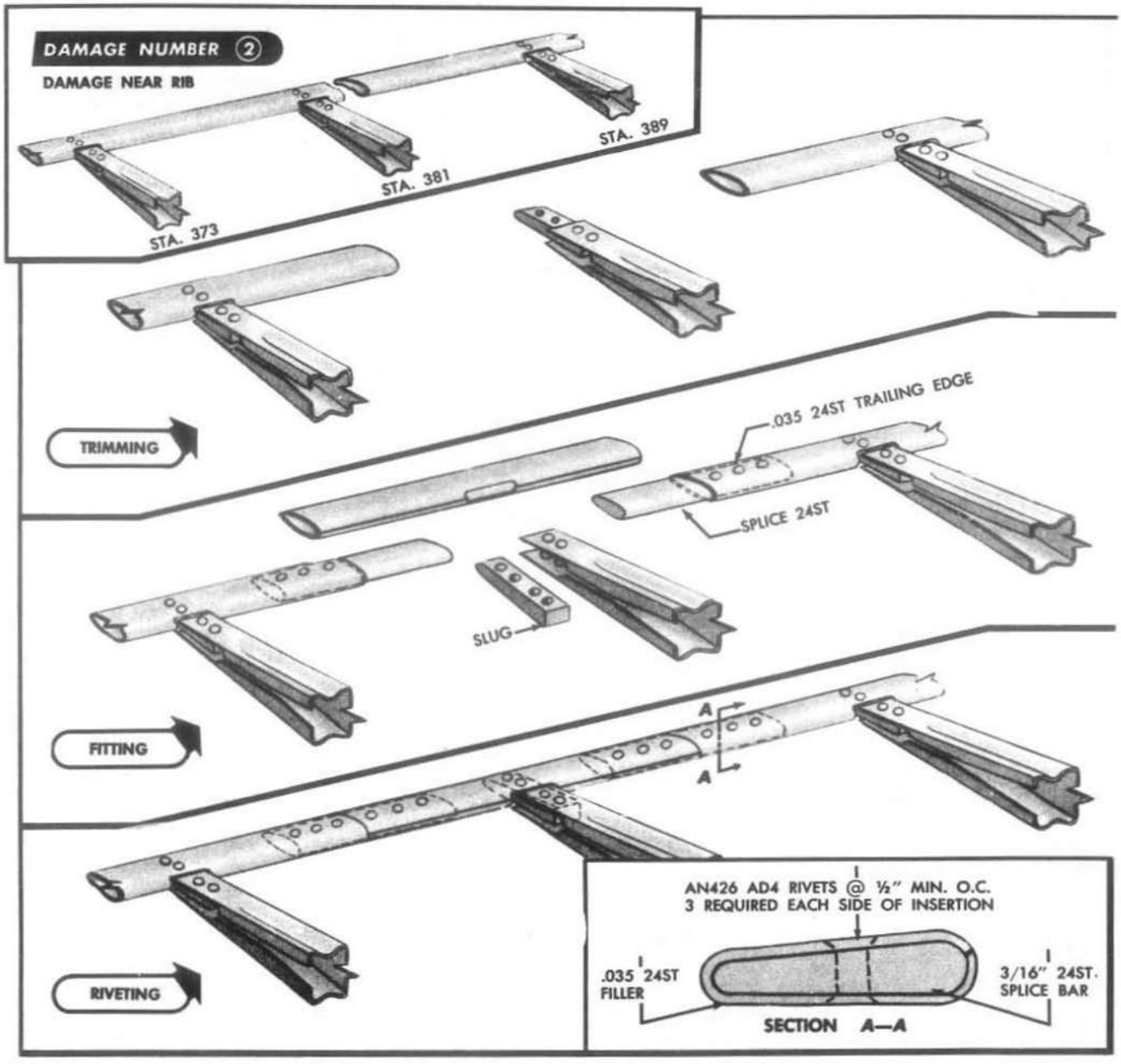


Figure 65—Key Drawing of Damages to the Aileron



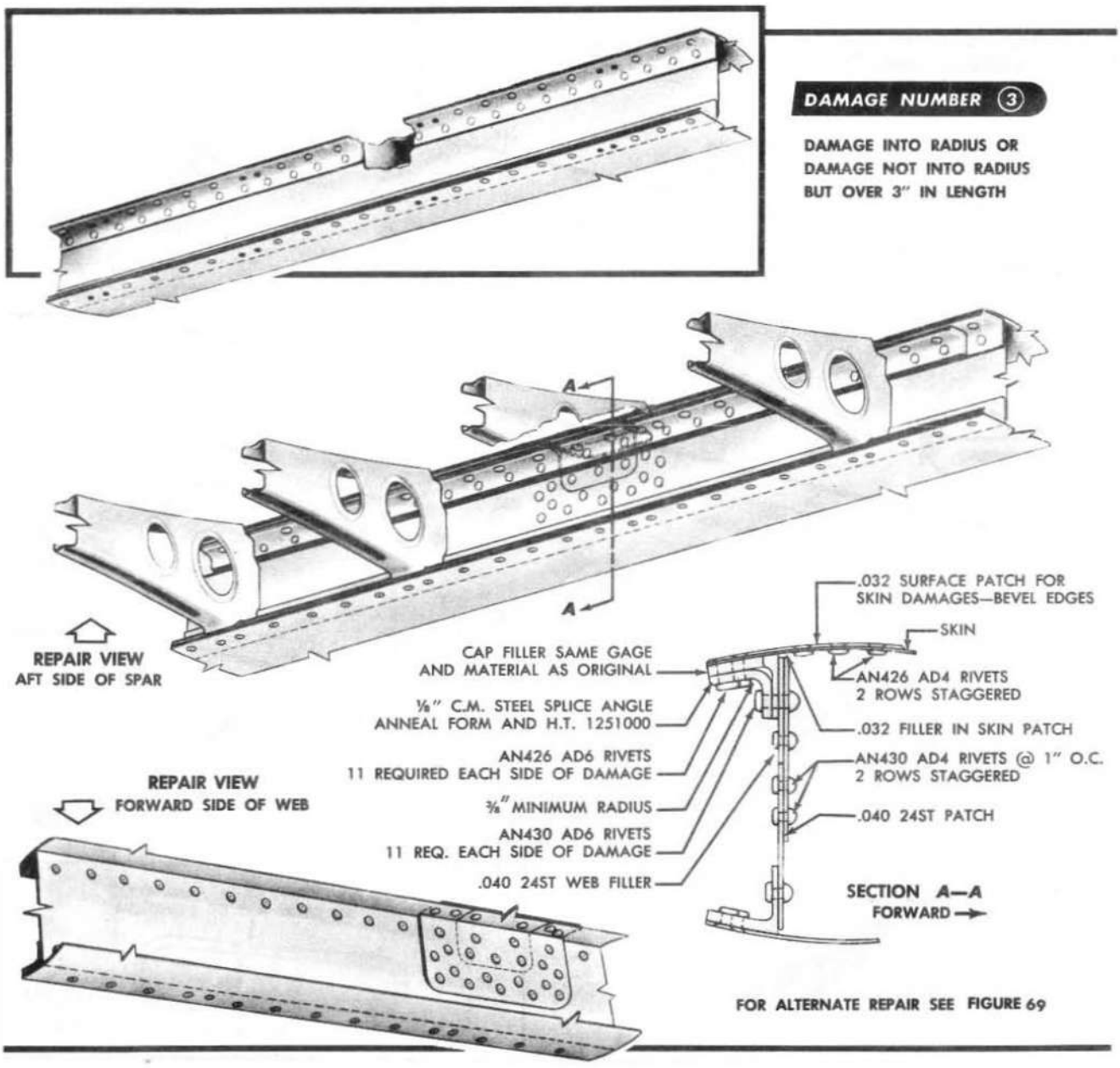
1. Trim damage smooth.
2. Construct splice bar from 3/16 dural plate. File to fit.
3. Construct filler from the same gage and material as the trailing edge.
4. Remove all sharp edges to prevent the covering fabric from fraying.
5. For flush riveting, see Figure 6, Section 1.
6. For rivet edge and row distance, see Figure 7, Section 1.

Figure 66—Splice Repair of Aileron Trailing Edge Member



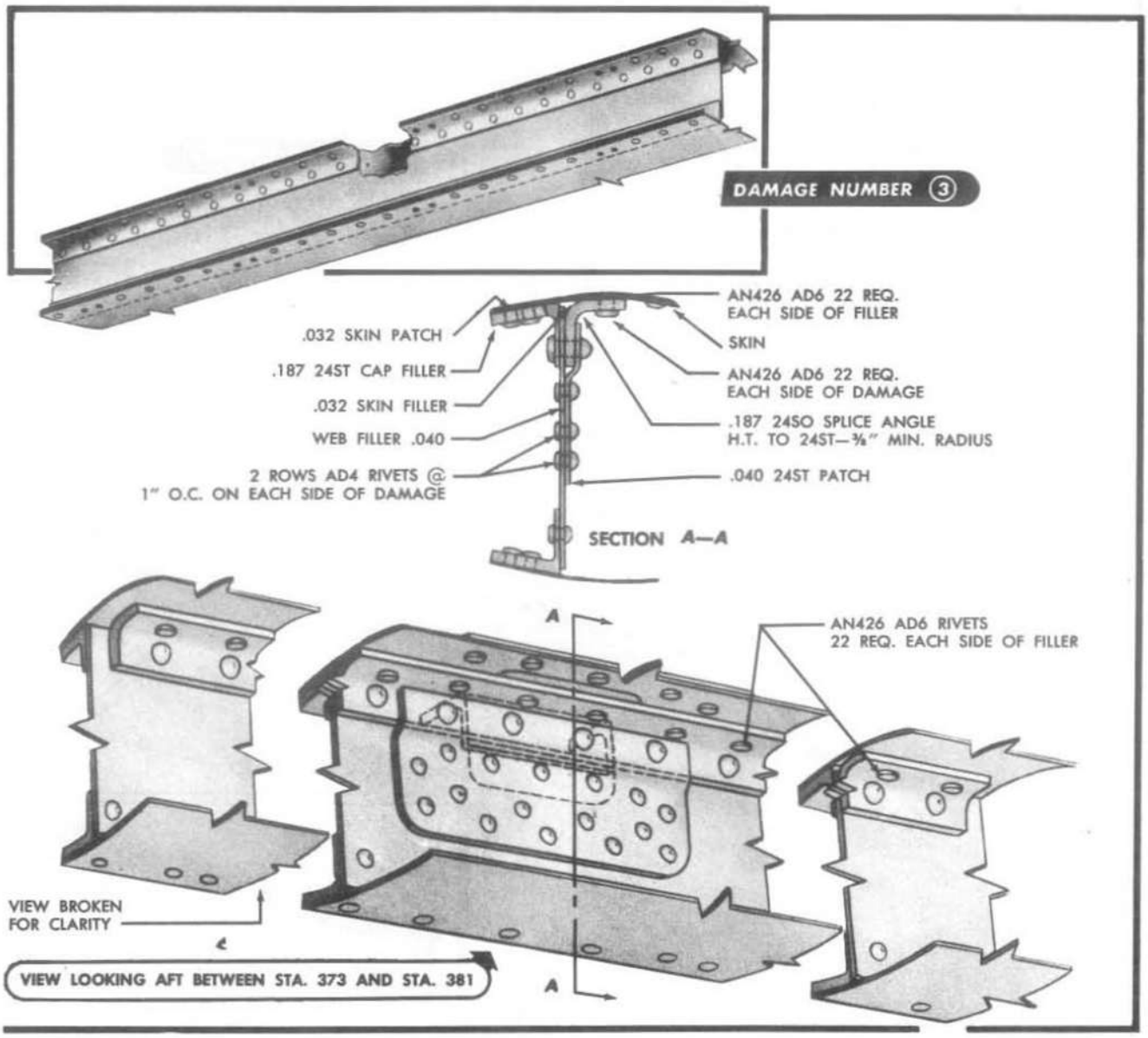
1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct insert from the same gage and material as the trailing edge.
4. Construct splice bars from 3/16 dural plate. File to fit.
5. Remove all sharp edges to prevent the covering fabric from fraying.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 67—Insert Repair of Aileron Trailing Edge Member



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than 1/2 inch.
3. Construct web patch and filler from the same gage and material as the web.
4. Construct cap filler from the same gage and material as the cap.
5. Construct splice angle from 1/8 inch C. M. steel. Form in the annealed condition and heat treat to 125,000 psi.
6. For minimum bend radii of sheet material, see Figure 5, Sec. I.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

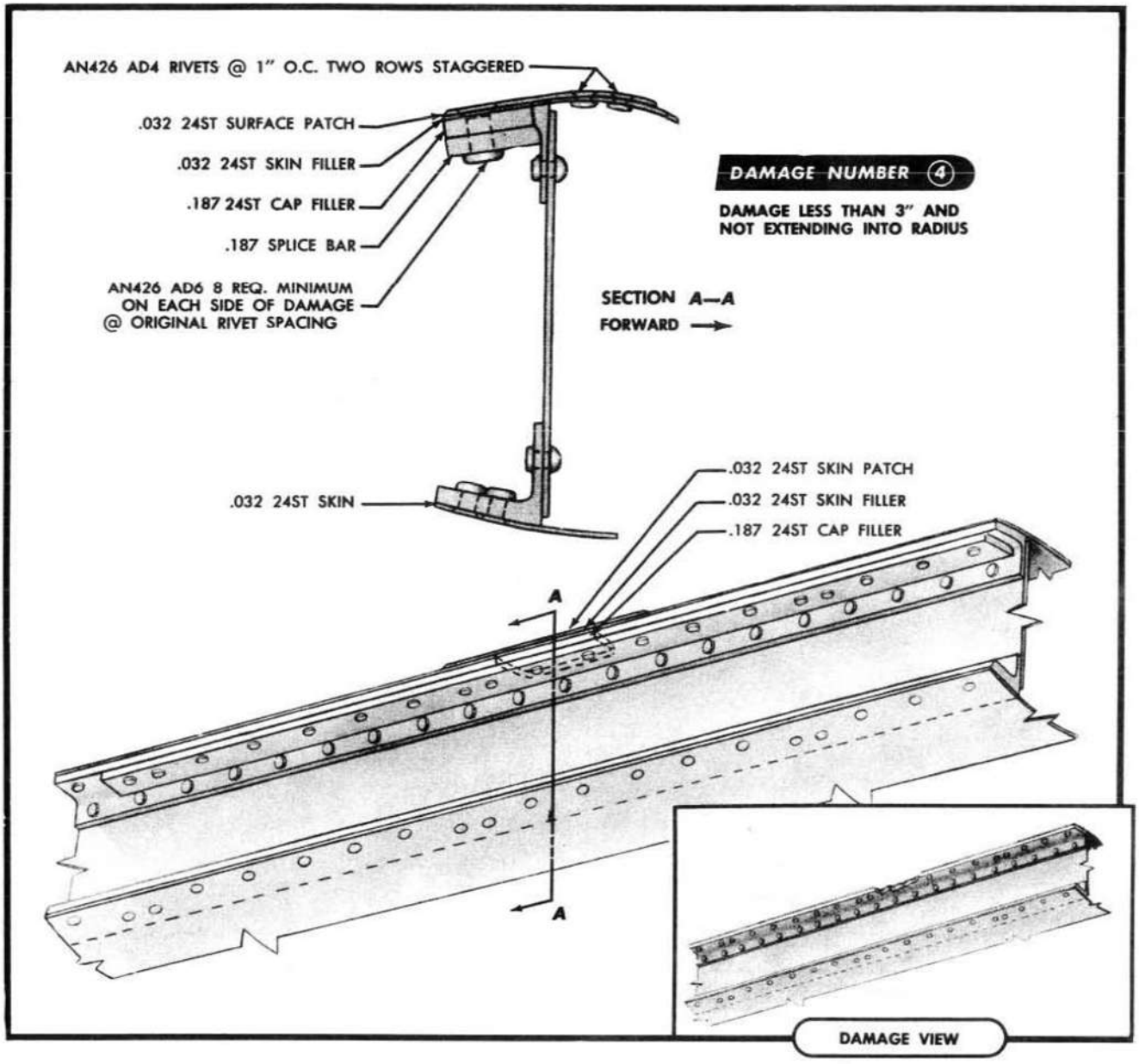
Figure 68 –Patch and SpliceRepair of Aileron Spar Cap (Over 3")



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice angle from .187 24SO plate. Heat treat to 24ST after forming.
4. Construct web patch and filler from the same gage and material as the web.
5. For minimum bend radii of sheet material, see Figure 5, Section I.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

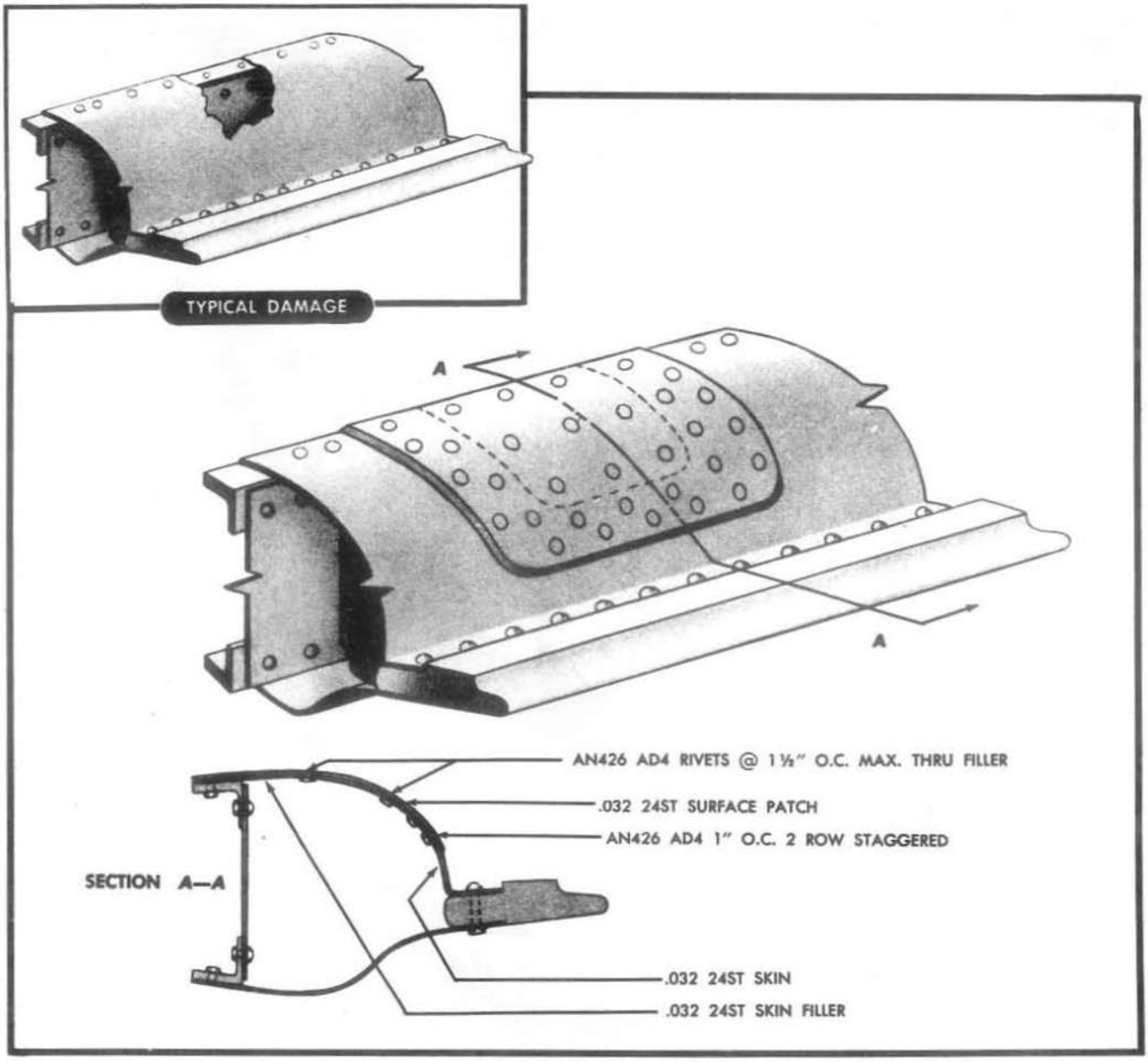
Figure 69—Alternate Patch and Splice Repair of Aileron Spar Cap (Over 3")



NOTES

1. Remove all interfering rivets.
2. Trim all damage leaving no radius less than 3/8 inch.
3. Construct splice bar from .187 dural plate.
4. Construct fillers from the same gage and material as existing.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

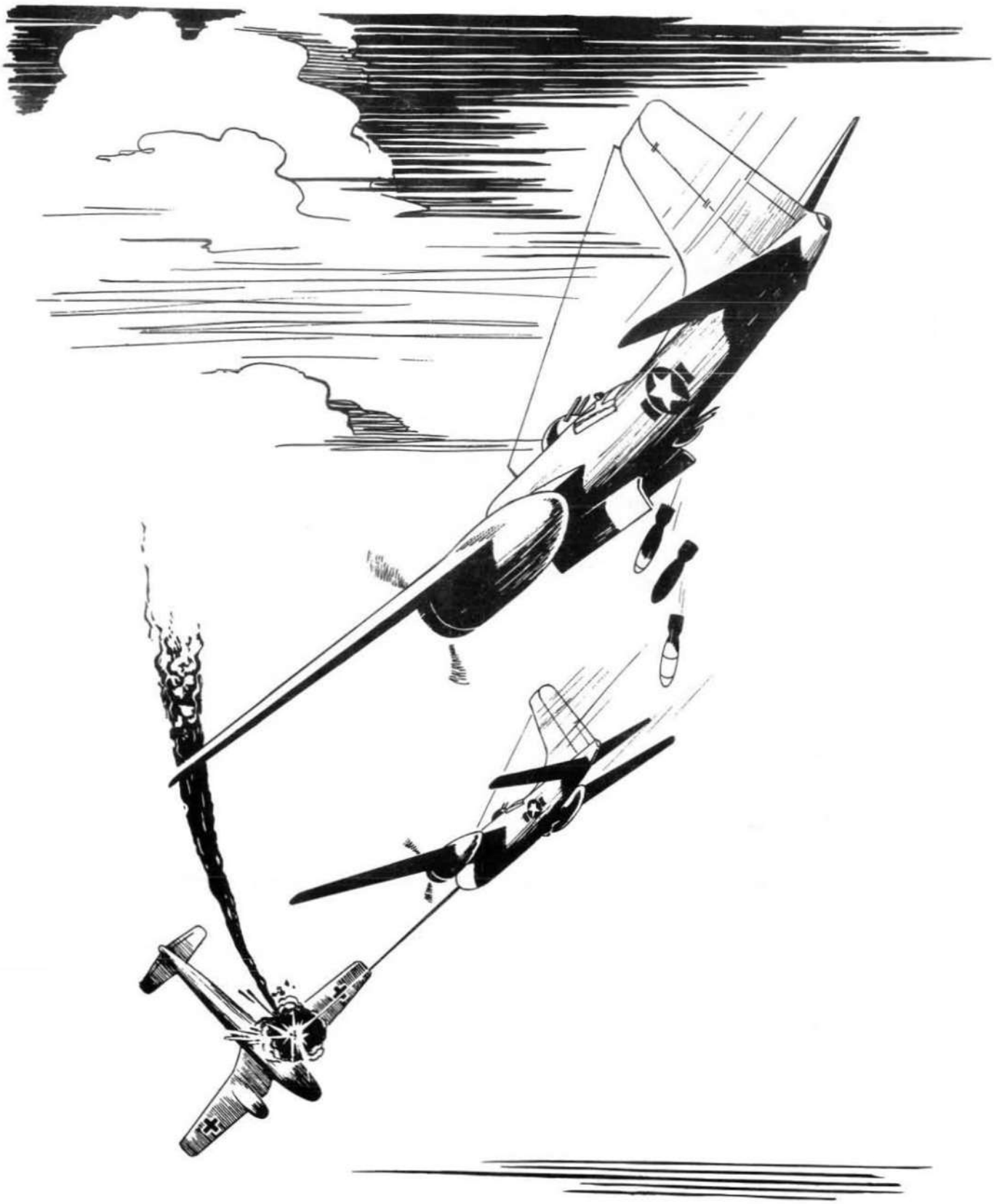
Figure 70—Patch Repair of Aileron Spar Cap (Less than 3")



NOTES

1. Remove all interfering rivets.
2. Trim all damage smooth leaving no radius less than one-half inch.
3. Construct patch and filler from the same gage and material as the skin.
4. Bevel edges of patch to reduce aerodynamic drag.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 71—Typical Patch Repair of Aileron Skin



SECTION III Tail Group

1. VERTICAL STABILIZER.

a. DESCRIPTION.—The vertical stabilizer is an all metal structure attached to the fuselage by means of tension bolts located at the front and rear spars. Hinge brackets are provided at the rear spar for the attachment of the rudder.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. CONSTRUCTION. — The vertical stabilizer is constructed of a front and rear spar, ribs, skin and hat section skin stiffeners. The spar and the closing channel are of similar construction, each incorporating a sheet web and extruded caps. The caps are attached to each edge of the web, and extend from the fuselage attaching points to station 107. The nose ribs are constructed of formed dural sheet provided with lightening holes and flanges for the attachment of the skin. They are attached to the forward face of the spar and are spaced intermittently through the entire length of the stabilizer. The center section ribs are of the same type construction as the nose ribs and are located between the front and rear spars at stations 7.25, 53.625 and 107. The skin is composed of alclad sheet formed to the contour of the surface. The hat section skin stiffeners, spaced from three to four and one-half inches apart, are located between the front and rear spars and are attached to the caps.

c. NEGLIGIBLE DAMAGE.—Smooth dents in the skin that show no sign of cracks or abrasions may be considered negligible. Smooth isolated holes up to one inch in diameter and cracks up to two inches in length which have had one-eighth inch stop holes drilled at each end, may be neglected.

d. DAMAGE REPAIRABLE BY PATCHING.

(1) Damage to the vertical stabilizer spar caps which can be repaired by patching is shown on figures 78 and 79. Figure 78 shows the repair for partial damage (damage not greater than three inches in length) in the front spar cap lips and fin between Stations 19 and 54, and in the rear spar cap lips and fin between stations 19 and 71. Patch plates constructed from 24ST dural plate are used to make this repair. Fillers are used where necessary to provide for attaching structure. Figure 79 shows the repair of partial dam age (damage not greater than three inches in length) in the front spar cap lips and fin between Stations 54 and 71. Patch plates are used to make this repair. Fillers are used where necessary to provide for attaching structure.

(2) Damage to the spar webs which can be repaired by patching is shown on figure 76. The patch is constructed from the same gage and material as the web. A filler is inserted where necessary to provide for attaching structure.

(3) Damage to the skin which can be repaired by patching is shown on figure 75. A surface type patch is used to make this repair. It is constructed from the same gage and material as the skin and is attached to the outside surface. The edges are beveled to prevent causing any unnecessary aerodynamic drag.

e. DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

(1) Damage to the spar caps which can be repaired by splicing is shown on figures 78 and 79. Figure 78 shows the repair of the front spar caps between Stations 19 and 54, and the rear cap between 19 and 71. Splice plates constructed from dural plate are used to make the repair where damage does not exceed three inches in length. Where damage exceeds three

inches in length a splice angle constructed from five thirty-seconds inch. C.M. steel is attached to the side of the cap having the widest lip. Figure 79 shows the repair of the front spar caps between Stations 54 and 71. Splice plates constructed from dural plate are used to make the repair where damage does not exceed three inches in length. Where damage exceeds three inches in length, a splice angle is used to make the repair. It is constructed from dural sheet heat treated to 24ST after being formed.

(2) Damage to the spar webs which can be repaired by insertion is shown on figure 77. The damaged area is trimmed smooth and a plate constructed from the same gage and material is inserted in the cutout. Two splice plates constructed from dural sheet are used to attach the insert to the web.

(3) Damage to the ribs which can be repaired by splicing is shown on figure 74. This repair is made at station 7.25 and is typical for all other rib repair. The splice plate is constructed of aluminum sheet backed up with one-half by one-half inch bulb angles provided to compensate for the damage to the lightening hole flange.

f. DAMAGE NECESSITATING REPLACEMENT.

(1) A complete break in the spar and closing channel caps between stations 7 and 19 will be cause for the replacement of the entire part.

(2) Where more than one-third of any nose rib is damaged, it should be replaced.

2. HORIZONTAL STABILIZER.

a. DESCRIPTION.—The horizontal stabilizer is an all metal structure attached to each side of the fuselage by means of tension bolts located at the front spar and closing channel. Hinge brackets are provided at the closing channel for the attachment of the elevator.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. CONSTRUCTION.—The horizontal stabilizer is constructed of a spar, closing channel, ribs, skin, and hat section skin stiffeners. The spar and closing channel are of similar construction, each incorporating a sheet web and extruded caps. The caps are attached to each edge of the web and extend from the fuselage attaching points at station 21.25 to station 128.5. The nose ribs are constructed of formed dural sheet provided with lightening holes and flanges for the attachment of the skin. They are attached to the forward face of the spar and are spaced intermittently through the entire length of the stabilizer. The center section ribs are of the same type construction as the nose ribs and are located between the spar and closing channel at stations 21.25, 60.375 and 128.5. The skin is composed of alclad sheet formed to the contour of the surface. The hat section skin stiffeners, spaced approximately three to five inches apart, are located between the spar and closing channel and are attached to the caps.

c. NEGLIGIBLE DAMAGE.—Smooth dents in the skin that show no signs of cracks or abrasions may be considered negligible. Smooth isolated holes in the skin up to one inch in diameter and cracks up to two inches in length with one-eighth inch stop holes drilled at each end, may be neglected.

d. DAMAGE REPAIRABLE BY PATCHING.

(1) Damage to the front and rear spar caps which can be repaired by patching is shown on figures 86, 88 and 89. Figure 86 shows the repair of damage not exceeding ten inches in length in the front spar between Stations 30 and 76. A plate type patch constructed from dural is attached to the lip and fin by rivets using the original spacing. A filler is used to replace the lost material and provide for the attaching structure. Figure 88 shows the repair of damage in the front spar caps between Stations 76 and 128. A patch plate constructed from dural is attached to the inside of the lip and the outside of the fin by rivets using the original spacing. A filler is used to replace the lost material and provide for the attaching structure. Figure 89 shows the repair of damage not exceeding ten inches in length in the rear spar caps between Stations 28 and 129. The material and the size and number of rivets to be used for the repair of the spar cap between stations 28 and 119 is given in the table shown on sheet 1 of 2. The repair material and the size and number of rivets to be used between stations 119 and 129 is given on the drawing shown on sheet 2 of 2.

(2) Damage to the skin which can be repaired by patching is shown on figure 82. A surface type patch constructed from the same gage and material

as the skin is attached to the outside surface. The edges are beveled to prevent causing any unnecessary aerodynamic drag.

(3) Damage to the spar webs which can be repaired by patching is shown on figure 84. A patch plate of the same gage and material as the web is attached by rivets. The damaged stiffener is replaced.

(4) Damage to the ribs which can be repaired by patching is shown on figure 83. This repair has been shown for the center section rib at station 61 and is a typical repair for all other ribs. Damage is shown to the rib cap and the lightening hole flange. The rib cap is shown repaired by the use of an angle type patch which is constructed of dural sheet heat treated to 24ST after being formed. The patch is attached to the inside of the original angle by means of rivets. If the lightening hole is not needed, the flange repair can be accomplished by removing the flange and riveting a patch of the same gage and material as the web over the hole. Five-eighths by five-eighths inch bulb angles are attached along the upper and lower edges of the patch to compensate for the removal of the flange. When the lightening hole is needed, the flange is trimmed away and the hole boxed off on all edges by five-eighths by five-eights inch bulb angles.

e. DAMAGE REPAIRABLE BY SPLICING.

(1) Damage to the spar caps which can be repaired by splicing is shown on figures 87, 88 and 90. The repair shown on figure 87 is to be used for the repair of a complete break in the front spar cap which is not more than three inches in length between stations 30 and 76. Splice plates constructed of dural sheet are attached to the cap, and fillers are used to replace the lost material. The splice plates are filed to fit into the radius and are attached to the forward lip by one-quarter inch bolts and to the aft lip by rivets. The splice plates at the fin are attached along both sides by means of rivets. The repair shown on figure 90 is to be used for the repair of a complete break not more than three inches in length in the rear spar caps between stations 28 and 129. Splice plates constructed of dural sheet are attached to the cap, and fillers are used to replace the lost material. The splice plates attaching to the lips are filed to fit into the radii to provide the minimum edge distance for the attaching rivets. Splice plates constructed of dural sheet are attached to each side of the fin. They are butted against the lip splice plates and are attached by rivets. The repair of partial damage to the lip and fin as shown on figure 88 may be used in the repair of a complete break in the front spar cap between stations 76 and 128.

(2) Damage to the ribs can be repaired by splicing, using the repair recommended for the vertical stabilizer ribs. *(See figure 74.)*

f. DAMAGE NECESSITATING REPLACEMENT. —Damage to the spar cap attaching fittings larger than one-quarter of an inch in length will be cause for replacement of the entire cap. Where there is a complete break in the cap over three inches in length, or partial damage over ten inches in length, the cap must be replaced.

3. RUDDER AND ELEVATOR.

a. DESCRIPTION.—The rudder and elevators are statically and dynamically balanced fabric covered metal structures. They are attached to hinges located at the closing channels of the vertical and horizontal stabilizers and are provided with trim tabs which are fitted into the trailing edge. Counterbalance weights are located in the leading edge of both the rudder and elevator to balance the control surfaces statically and dynamically.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN 01-1-40.

b. CONSTRUCTION.—The rudder and elevators are of the same type construction, each incorporating a spar, ribs, leading edge skin and a trailing edge. The spar is constructed of a formed sheet channel provided with lightening holes and attaching points for the ribs. The ribs are constructed of formed sheet and are in two parts, namely, the nose section and the center section. The leading edge skin covers the nose ribs and extends aft as far as the spar where it is attached by rivets. The trailing edge is attached to the aft end of the ribs and extends from the tip to the trim tab. The trim tab is a spot welded metal structure which incorporates a spar and formed sheet skin provided to support the covering fabric.

c. NEGLIGIBLE DAMAGE. — Smooth dents that show no signs of abrasions or cracks may be considered negligible. Small cracks up to one inch in length which

have had one-eighth inch stop holes drilled at each end, may be neglected.

d. DAMAGE REPAIRABLE BY PATCHING.

(1) Damage to the spar which may be repaired by patching is shown on figure 98. The repair shown on figure 98 is a repair for the spar flange and web. A patch constructed from .051 dural sheet it attached to the inner side of the spar. A filler is used to replace the lost material and provides an attachment for the nose skin.

(2) Damage to the leading edge skin which can be repaired by patching is shown on figures 94 and 97. The repair shown on figure 97 is the repair of the nose skin in the location of a nose rib. A surface patch constructed from .040 alclad sheet is attached to the outside surface of the nose skin. The edges are beveled to remove any sharpness that might damage the covering fabric. A filler is used to replace the lost material and provide attachment for the nose rib. The damage in the nose rib is shown repaired with a patch and filler. The patch may be attached to the side of the rib that is most accessible. The repair shown on figure 94 is the repair of damage to the nose skin using a flush type patch. A patch constructed from .040 alclad sheet is attached to the inside surface of the nose skin. A filler is used to replace lost material and provide a smooth surface for the covering fabric.

(3) Damage to the closing channel which can be repaired by patching is shown on figure 99. A patch is attached to the web of the channel and two fillers are used to replace the lost material.

e. DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

(1) Damage to the spar which can be repaired by splicing is shown on figure 96, (2 Sheets). The repairs shown are the repairs used for damage occurring in two different locations along the spar. The repair using the bent up sheet splice plate which is fitted into the spar is for the repair of any location where there is no reinforcing angle attached to the spar flange. The splice plate is constructed of dural sheet of the next heavier gage than the spar and heat treated to 24ST after being formed. A filler of the same gage and material is used to replace the lost material and provide for the attachment of the nose skin. The repair using the bent up sheet splice plate, reinforced with formed angle stiffeners, is used where the spar flange is reinforced with angle stiffeners. The splice plate and angles are made from dural sheet which is heat treated to 24ST after being formed.

(2) The leading edge is repaired by insertion as shown on figure 95. The damaged material is removed and an insertion of the same gage and material is made. A splice doubler is attached to the inside of the nose skin to provide for the attachment of the insertion.

(3) The center section ribs are repaired by splicing as shown in figure 101. The splice plate is formed to fit into the rib and is attached by rivets. It is constructed of dural sheet which is heat treated to 24ST after being formed. A filler is used to replace the lost material and provide a smooth attachment for the fabric.

(4) The trailing edge can be repaired by splicing as shown on figure 101. A dural splice bar in the 24SO condition is filed to fit into the trailing edge. A filler is used to provide a smooth surface for the fabric.

(5) The closing channel can be repaired by splicing as shown on figure 100. The damaged material is removed and fillers of the same gage and material are installed to provide for the attachment of the splice channels. The splice plates are constructed of dural sheet formed to fit into the closing channels. They are heat treated to 24ST after being formed and are attached to the channels by rivets.

f. DAMAGE NECESSITATING REPLACEMENT.

The torque tube is the only part of the rudder and elevators that may not be repaired; if damaged, it must be replaced. Elongated bolt holes may be reamed to a maximum of five-sixteenths inch in the event replacement tubes are not available. Damage to other parts so extensive that repair cannot be efficiently accomplished will be cause for replacement.

NOTE

After repairs have been made to any of the movable control surfaces, they must be rebalanced. Refer to Paragraph 4, Section I. Fabric repair and covering procedure is given in Section VII.

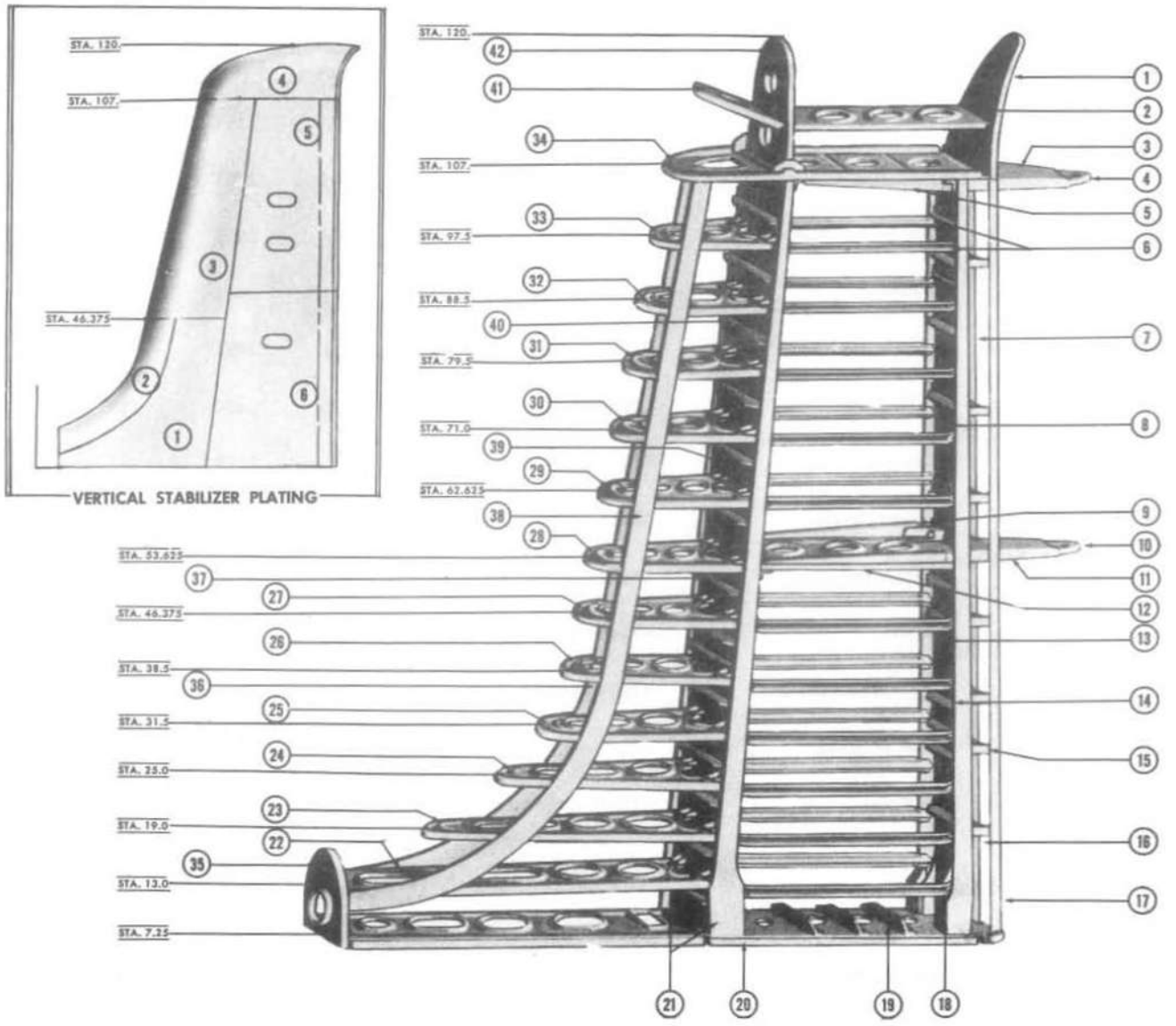


Figure 72—Vertical Stabilizer Structure and Plating

KEY TO FIGURE 72

VERTICAL STABILIZER STRUCTURE

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5128067-8	Rib	9x17	.032	24SO	24ST	1
2	5128067-6	Rib	9x25	.032	24SO	24ST	1
3	4128188-8	Hinge Covers	8x9¾	.020	61ST		2

KEY TO FIGURE 72 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
4	4128172-2-4	L.H. Bracket	4¾x11¼	1.00	24ST		1
5	5125462-5	R.H. Angle	2x17	.064	24ST		2
6	1125569	Hat Section Stiffener	4½ width	.032	24ST		22
7	5127893-36	Stiffener	3⅞x50¾	.051	24ST		1
8	5127893-4-4 L.H.	Web	7-11/16x50½	.051	24ST		1
9	5125477-5	R.H. Angle	2⅝x20½	.125	24SO	24ST	2
10	4128171-2	Bracket	6⅜x15	1.25	24ST		1
11	4128190-8	Hinge Covers	10x13	.020	61ST		2
12	5125477-2	Center Rib	9½x25	.040	24SO	24ST	1
13	5127893-2	Web	6⅜x59⅛	.032	24ST		1
14	5127893-10	Typ. Spar Stiffener	1¾x5-13/16	.064	24SO	24ST	1
15	5127893	Spar Blkhead.					14
16	5127893-64	Stiffener	3⅞x50¾	.051	24ST		1
17	1152357	Stiffener	1-5/16x100-7/16		24ST		3
18	1125571	Cap Assem.	3¼x100		24SO	24ST	2
19	5125475-2	Closing Rib	10⅜x77½	.040	24SO	24ST	1
20	5125475-4	L.H. Angle	3¼x32	.091	24SO	24ST	1
	5125475-5	R.H. Angle					1
21	1125571 Alcoa 30230	Cap Assem.	3¼x101		24SO	24ST	2
22	5125474-2	Rib	10x42½	.032	24SO	24ST	1
23	5125473-2	Rib	9⅞x38	.032	24SO	24ST	1
24	5125472-2	Rib	10x30	.032	24SO	24ST	1
25	5125471-2	Rib	9¾x25½	.032	24SO	24ST	1
26	5125470-2	Rib	10x22½	.032	24SO	24ST	1

KEY TO FIGURE 72 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
27	4125469-2	Rib	9¼x20¼	.032	24SO	24ST	1
28	4125468-2	Rib	9¼x19¼	.032	24SO	24ST	1
29	4125467-2	Rib	8⅜x19½	.032	24SO	24ST	1
30	4125466-2	Rib	8⅜x17⅞	.032	24SO	24ST	1
31	4125464-2	Rib	7½x16¼	.032	24SO	24ST	1
32	4125464-2	Rib	7½x16¼	.032	24SO	24ST	1
33	4125463-2	Rib	7½x15½	.032	24SO	24ST	1
34	5125462-2	Rib	8x37½	.064	24SO	24ST	1
35	4128142	Rib	9⅜x6¼	.040	24SO	24ST	1
36	5122117-10	L.H. Strip	2x58	.032	24ST		1
	5122117-11	R.H. Strip					1
37	5127892-4	Typ. Spar Stiffener	1⅜x6⅝	.064	24ST		1
38	5122117-8	Strip	2x62	.064	24ST		2
39	5127892-2	Web	8x100¼	.032	24ST		1
40	5127892-22	Typ. Spar Stiffener	1⅜x5¾	.072	24ST		1
41	5128067-2	Rib	8½x12	.051	24SO	24ST	1
42	5128067-4	Rib	8½x12½	.032	24SO	24ST	1

VERTICAL STABILIZER PLATING

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	Nc. Req.
1	5122117-60	L.H. Skin Plating	42x56	.032	24ST		1
	5122117-61	R.H. Skin Plating					1
2	5122117-6	Skin Plating	20x60	.032	24ST		1
3	5122117-4	Skin Plating	46x64	.032	24ST		1
4	5128067-10	L.H. Skin Plating	14x42	.032	52S½H		1
	5128067-24	R.H. Skin Plating					1
5	5122117-54	L.H. Skin Plating	31x57	.025	24ST		1
	5122117-58	R.H. Skin Plating					1
6	5122117-2	L.H. Skin Plating	38x48	.032	24ST		1
	5122117-56	R.H. Skin Plating					1

Note: L.H. and R.H. indicate opposite parts within the assembly.

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

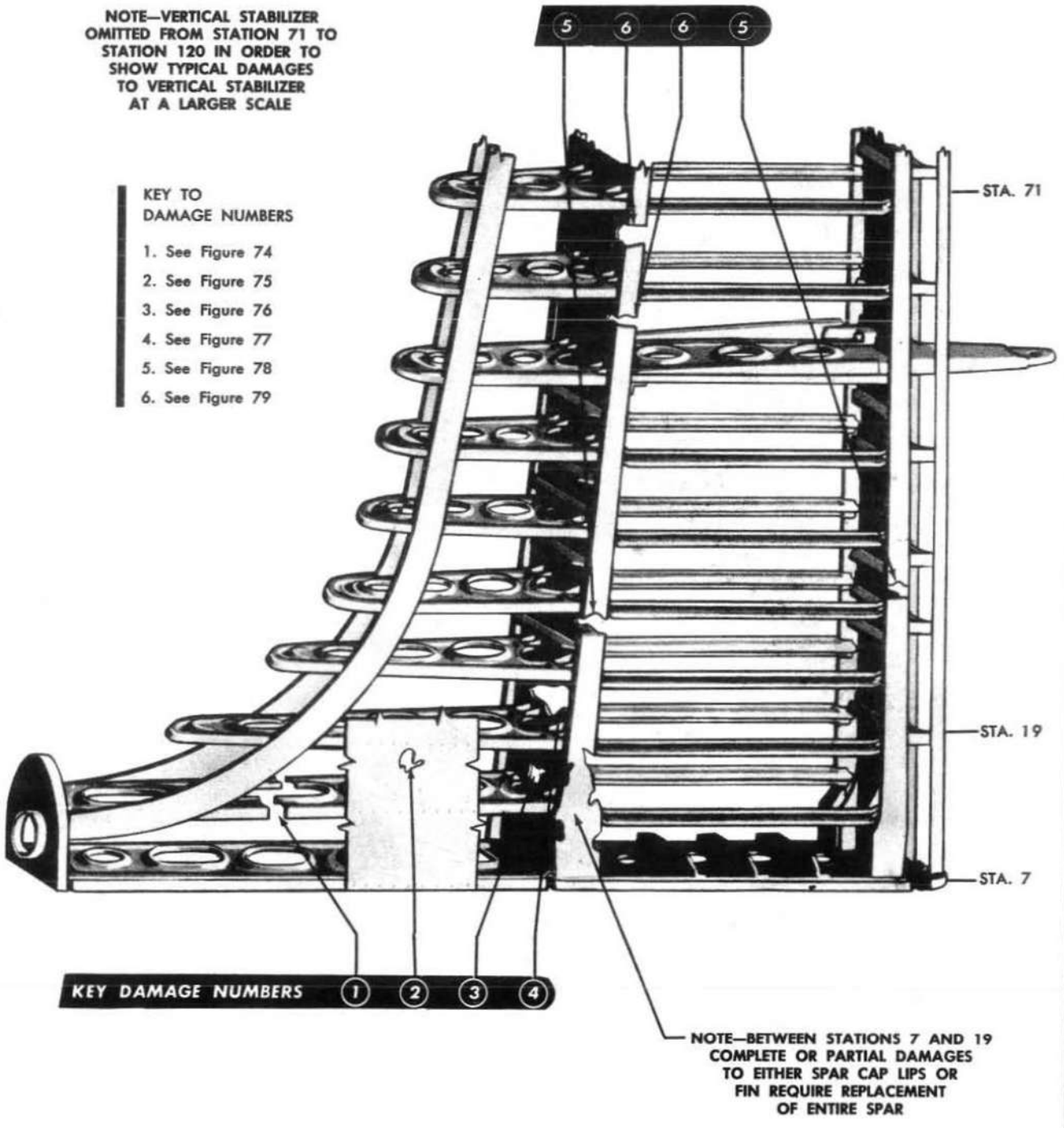
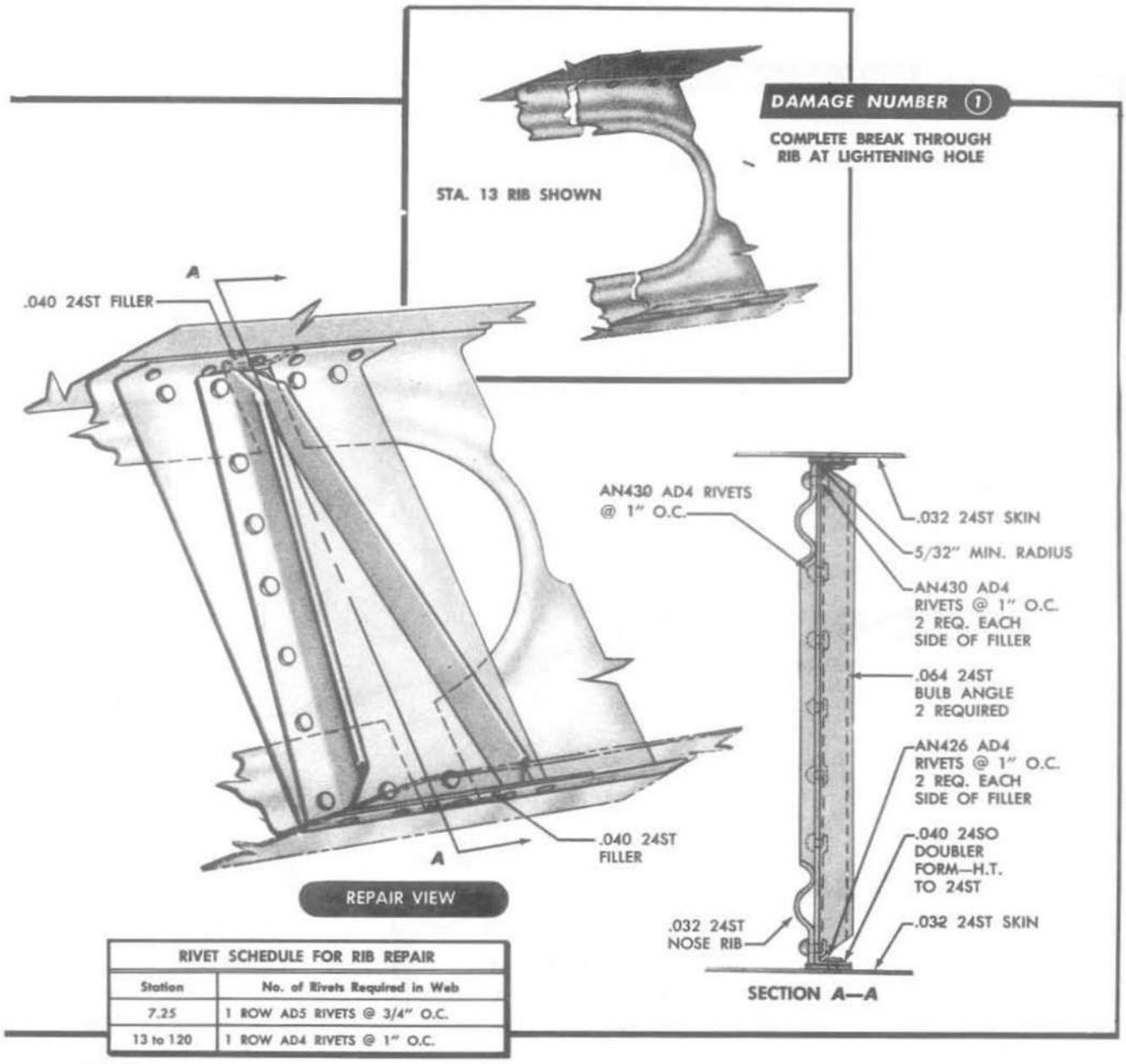


Figure 73 —Key Drawing of Damages to Vertical Stabilizer

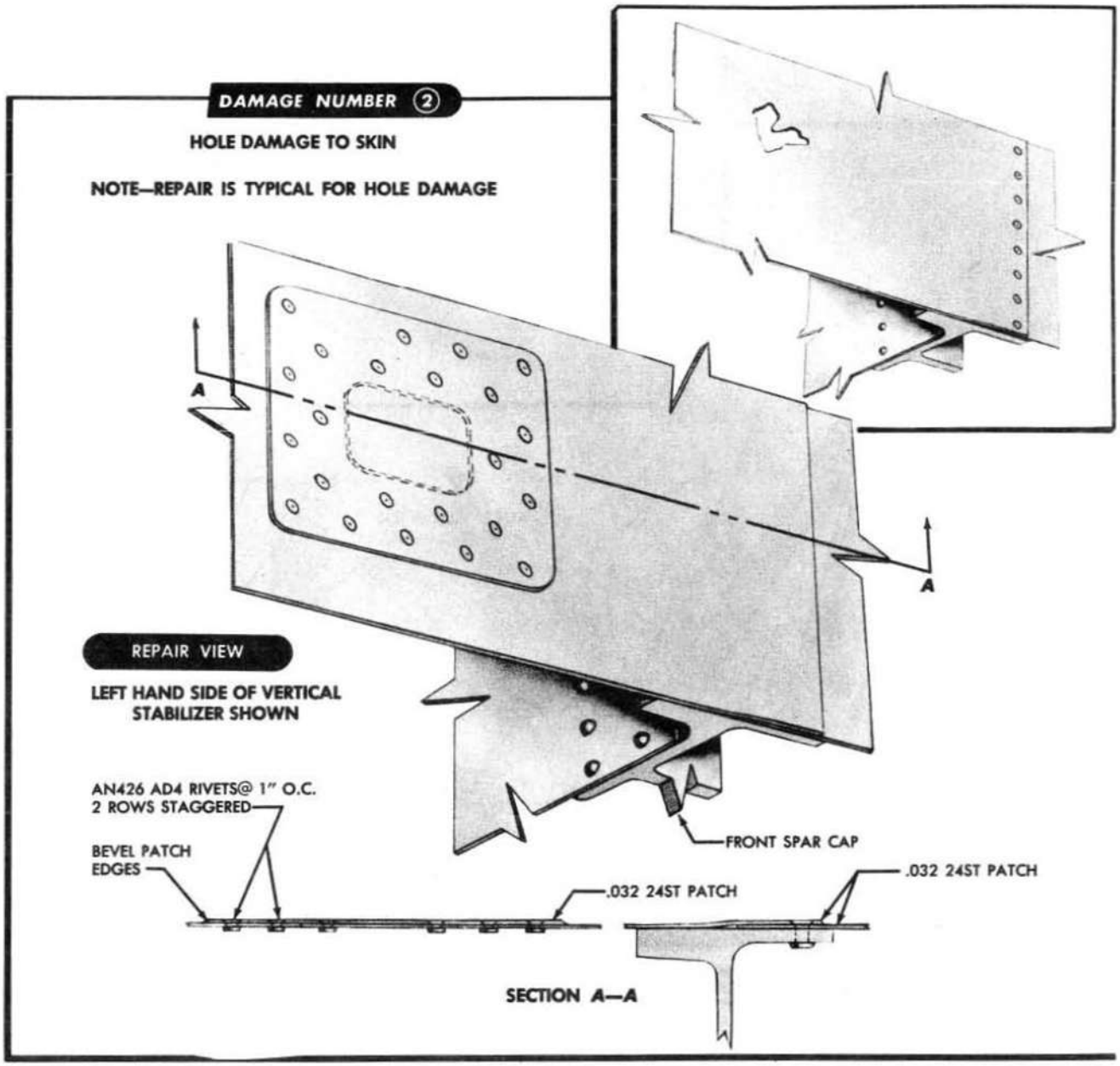


RIVET SCHEDULE FOR RIB REPAIR	
Station	No. of Rivets Required in Web
7.25	1 ROW AD5 RIVETS @ 3/4" O.C.
13 to 120	1 ROW AD4 RIVETS @ 1" O.C.

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct patch from .040 24SO material. Form and heat treat to 24ST.
4. Construct fillers from same gage and material as original.
5. Use bulb angle stiffeners as shown above to restore the original strength of rib.
6. See rivet schedule table on this page for size and spacing of rivets.
7. Use existing rivet holes where possible.
8. For skin repair see repair for Damage 2, Figure 75 in this series.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

Figure 74 —Splice Repair of Damage to Vertical Stabilizer Ribs



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct patch from .032 24ST. Bevel the edge of patch and attach to skin surface as shown. Rivet size and spacing is noted on drawing.
4. While repair shown is a surface type patch, a flush type patch should be used if possible.
5. When existing structural members are included in repair, use existing rivet holes.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

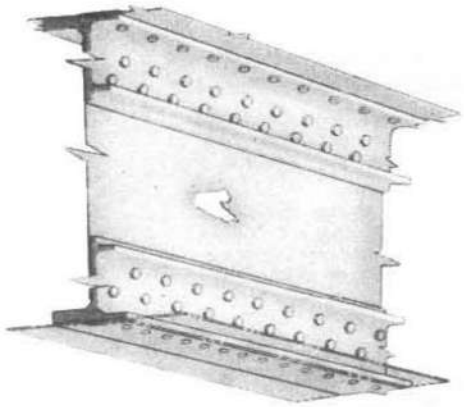
Figure 75 —Patch Repair of Damage to Vertical Stabilizer Skin

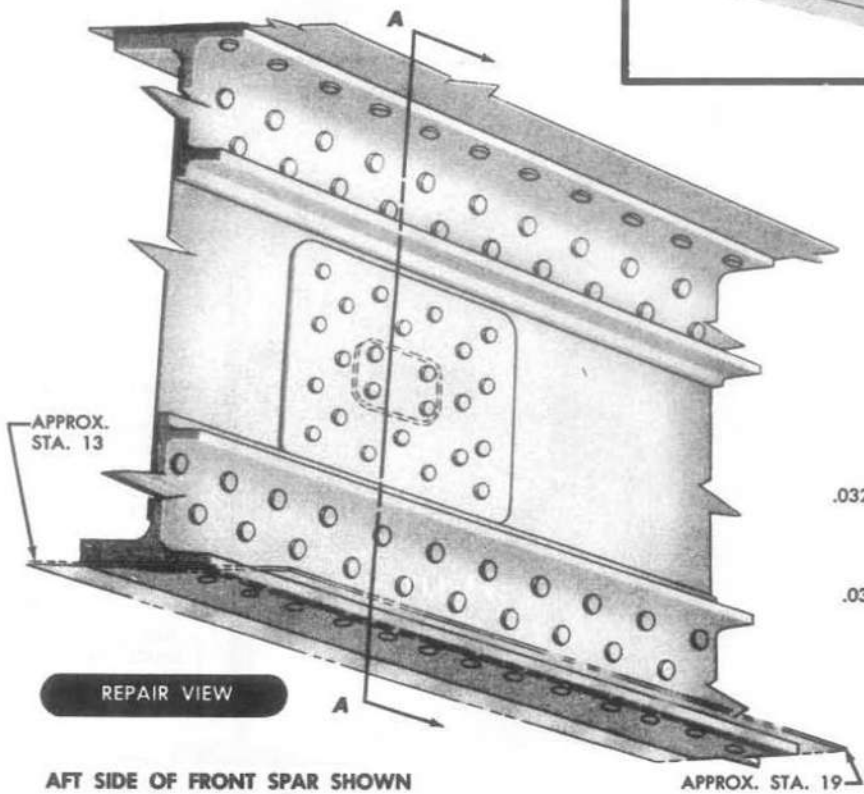
DAMAGE NUMBER (3)

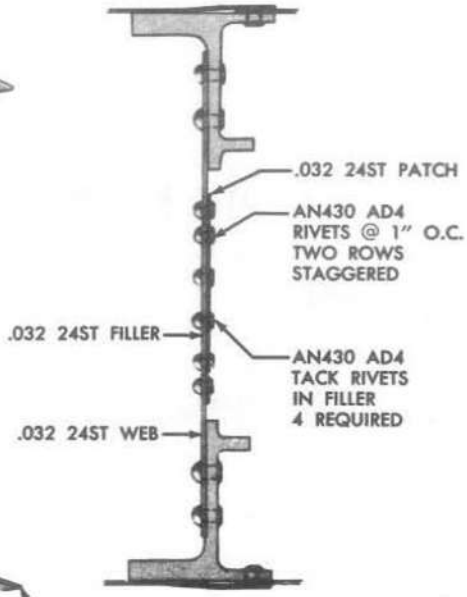
HOLE DAMAGE IN SPAR WEB ONLY

NOTE—REPAIR SHOWN IS TYPICAL FOR HOLE DAMAGE TO FORWARD OR REAR SPAR WEBS

HAT SECTION STIFFENER OMITTED FOR CLARITY



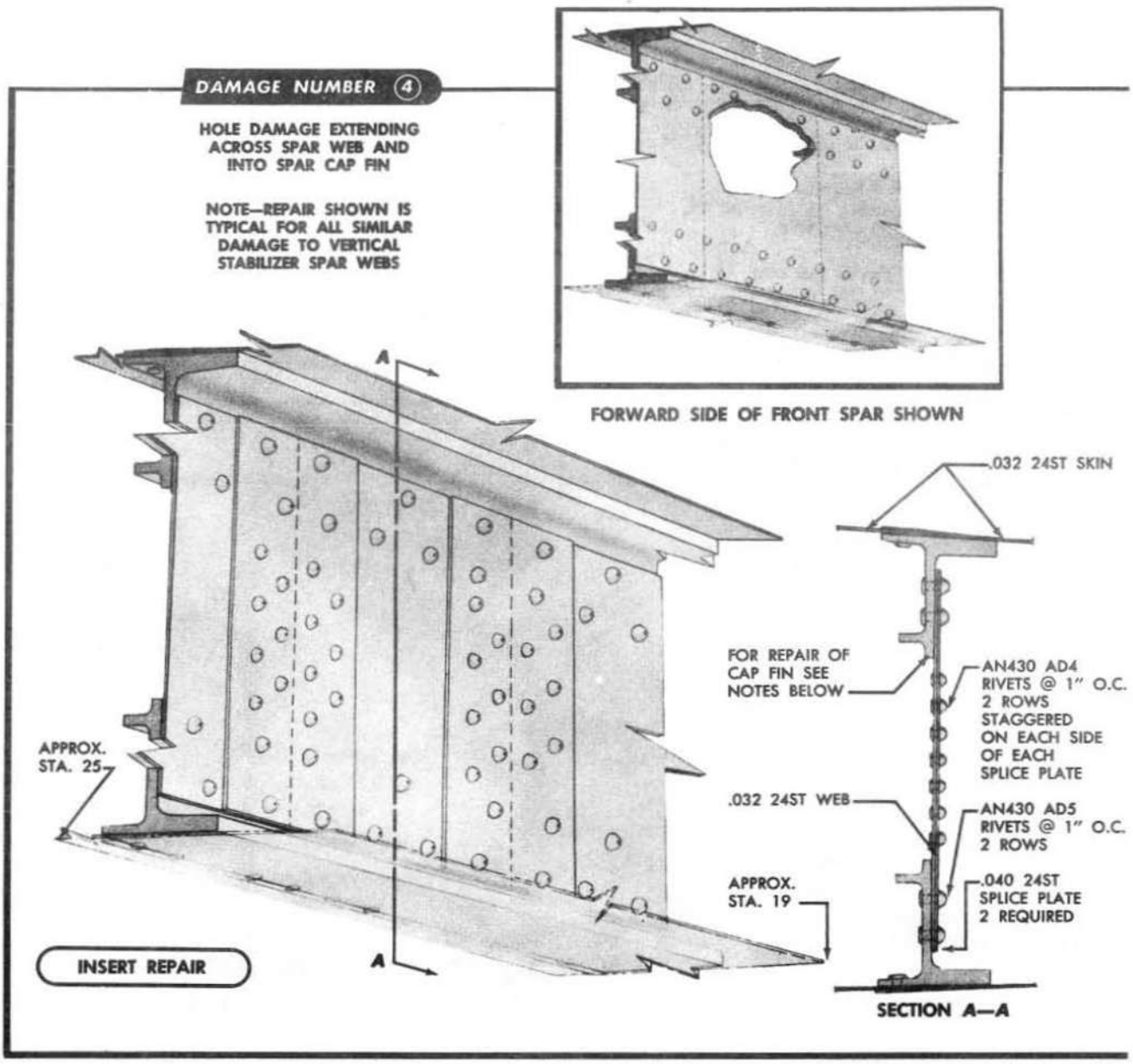




NOTES

1. When web stiffeners are included in damage drill out all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct patch from .032 24ST and attach to web as shown.
4. Construct filler from 24ST material same gage as web.
5. A filler is necessary only when a web stiffener is used across the damaged area.
6. Replace any damaged stiffener.
7. For rivet edge and row distance see Figure 7, Section I.

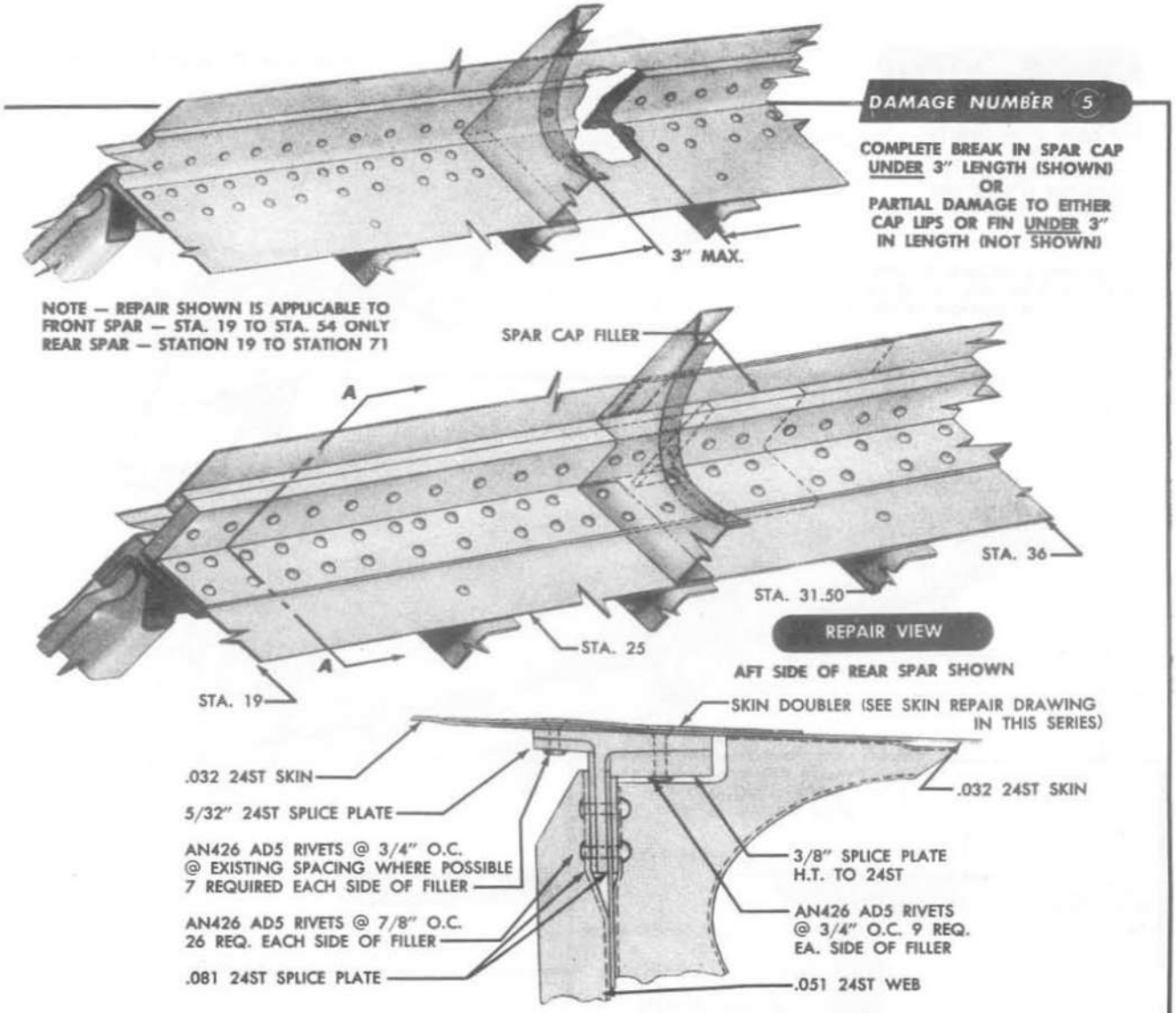
Figure 76 —Patch Repair of Damage to Vertical Stabilizer Spar Web



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. For spar cap fin repair, refer to cap fin repair drawings included in vertical stabilizer series in this section.
4. Construct splice plates from .040 24ST.
5. Construct web insert from 24ST material same gage as web.
6. Rivet size and spacing for web splice is noted on drawing. Use existing rivet holes in cap fins.
7. Replace any damaged web stiffener.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 77 —Insert Repair of Damage Extending Across Vertical Stabilizer Web into Cap



NOTES

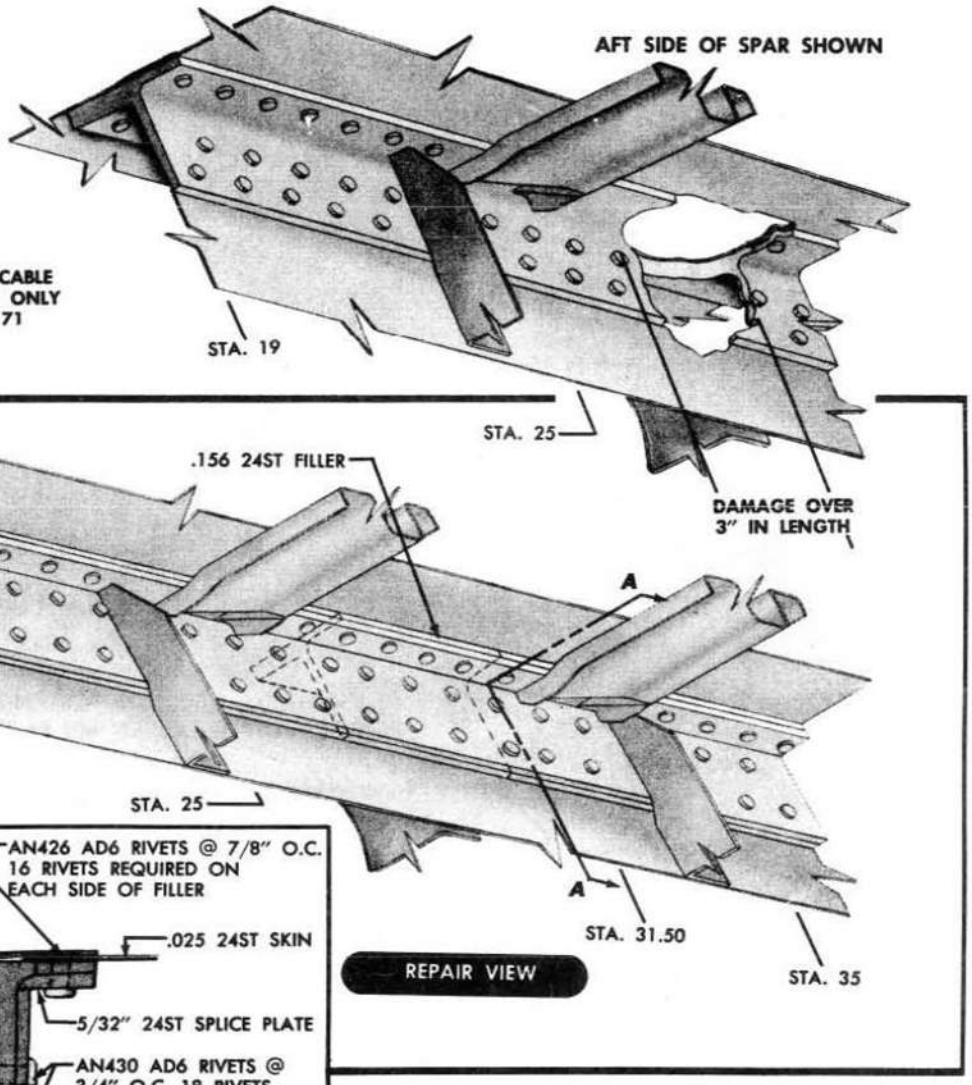
1. The above repair is limited to the following stations on each spar:
   Front spar: Station 19 to Station 54 only.
   Rear Spar: Station 19 to Station 71 only
2. Remove all interfering rivets.
3. Trim damage smooth.
4. Construct splice plates from 24ST material of gages noted on Section A-A.
5. The splice plates must be of sufficient length to accommodate the required number of rivets on each side of damage.
6. Use existing rivet holes where possible.
7. Construct filler in spar cap from 24ST material of same cross sectional design as original.
8. For repair of skin and web damage, refer to skin and web repairs, this section.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

Figure 78 —Splice Repair of Front and Rear Spar Caps—Vertical Stabilizer (Sheet 1 of 2)

DAMAGE NUMBER (5)

COMPLETE BREAK IN SPAR CAP OVER 3" IN LENGTH
OR
PARTIAL DAMAGE TO EITHER CAP LIPS OR FIN OVER 3" IN LENGTH

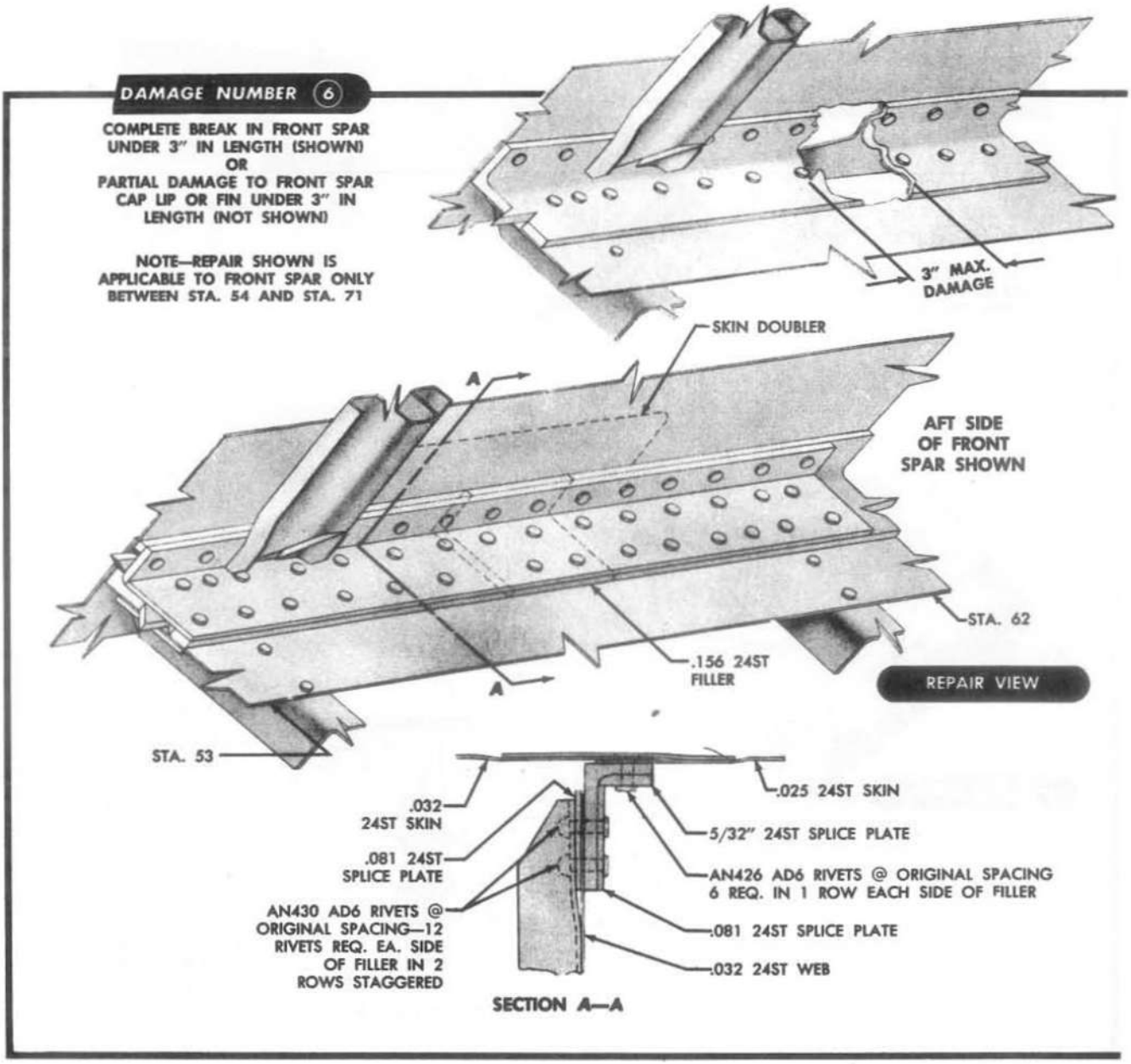
NOTE—REPAIR SHOWN IS APPLICABLE TO FRONT SPAR—STA. 19 TO 54 ONLY
REAR SPAR—STATION 19 TO 71



NOTES

1. The above repair is limited to the following stations on each spar:
   Front spar: Station 19 to station 54 only.
   Rear spar: Station 19 to station 71 only
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than three-eighths inch.
4. Construct splice plates from five thirty-seconds inch 24ST material.
5. Construct splice angles from five thirty-seconds inch C. M. steel. Form in the annealed condition and heat treat to 125,000 PSI.
6. The length of the splice plates and splice angles must not be less than three and one-half times the length of the damage.
7. Rivet size and minimum number required on each side of damage is noted on drawing. Use existing rivet holes where possible.
8. Construct filler in spar cap from 24ST material of the same cross sectional design as the original cap.
9. For repair of skin and web damage refer to skin and web repairs, this section.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

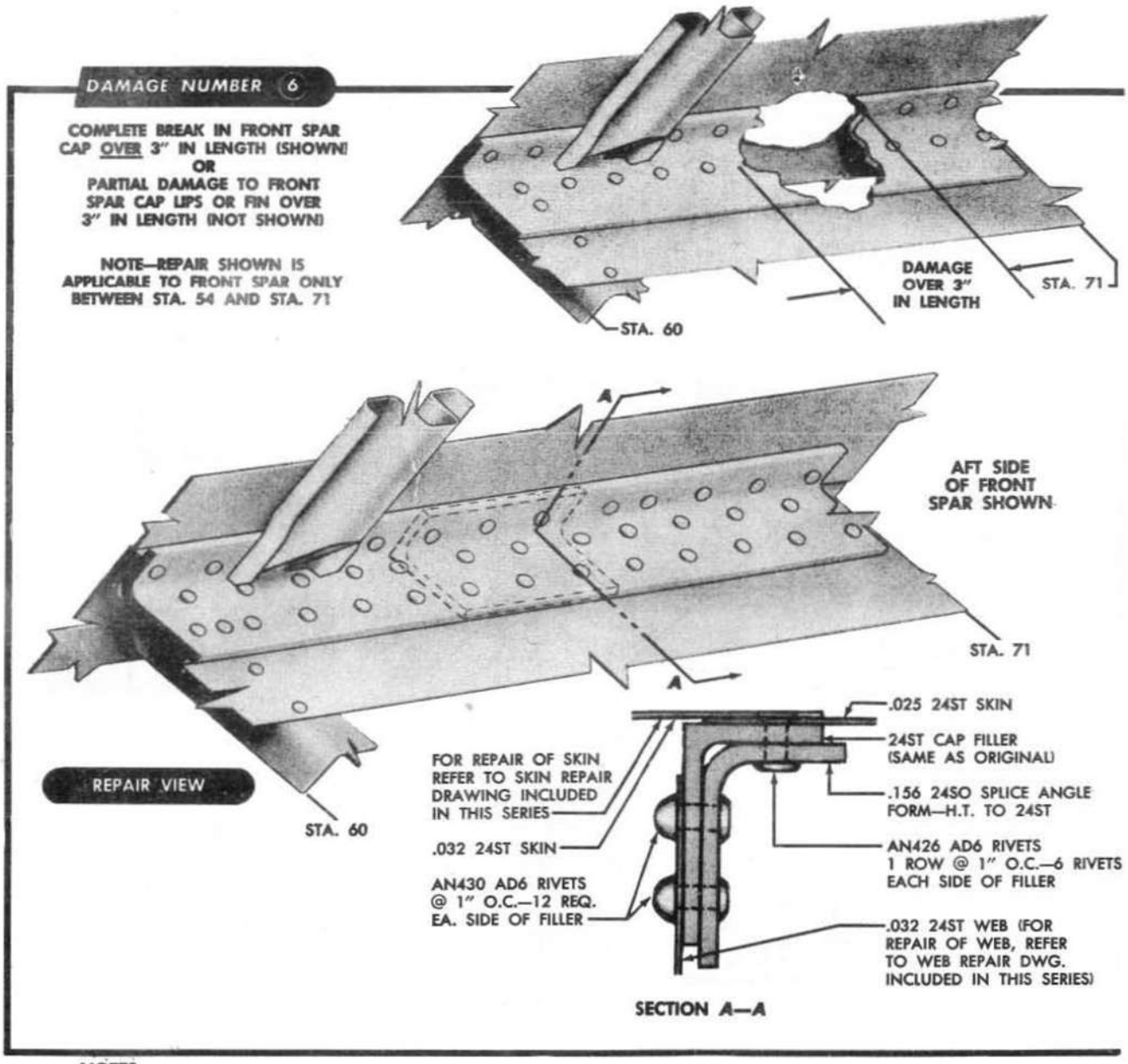
Figure 78 —Splice Repair of Front and Rear Spar Caps—Vertical Stabilizer (Sheet 2 of 2)



NOTES

1. The above repair applies only to the front spar between station 54 and station 71.
2. Remove all interfering rivets.
3. Trim damage smooth.
4. Construct splice plates from 24ST material of gages noted on Section A-A above.
5. The splice plates must be of sufficient length to accommodate the required number of rivets on each side of damage.
6. Use existing rivet holes where possible.
7. Construct filler in spar cap from 24ST material of the same cross sectional design as original cap.
8. For repair of skin and web refer to skin and web repairs, this section.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

Figure 79 —Splice Repair of Front Spar Cap—Sta. 54 to 71—Vertical Stabilizer (Sheet 1 of 2)



NOTES

1. The above repair applies only to the front spar between station 54 and station 71.
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than three-eighths inch.
4. Construct splice angle from .156 24SO material. Form and heat treat to 24ST.
5. The length of the splice angle must not be less than three and one-half times the length of damage.
6. Rivet size and minimum number required on each side of damage is noted on drawing. Use existing rivet holes where possible.
7. Construct filler in spar cap from 24ST material of same cross sectional design as original cap.
8. For repair of skin and web, refer to skin and web repairs, this section.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance. see Figure 7, Section I.

Figure 79 —Splice Repair of Front Spar Cap—Sta. 54 to 71—Vertical Stabilizer (Sheet 2 of 2)

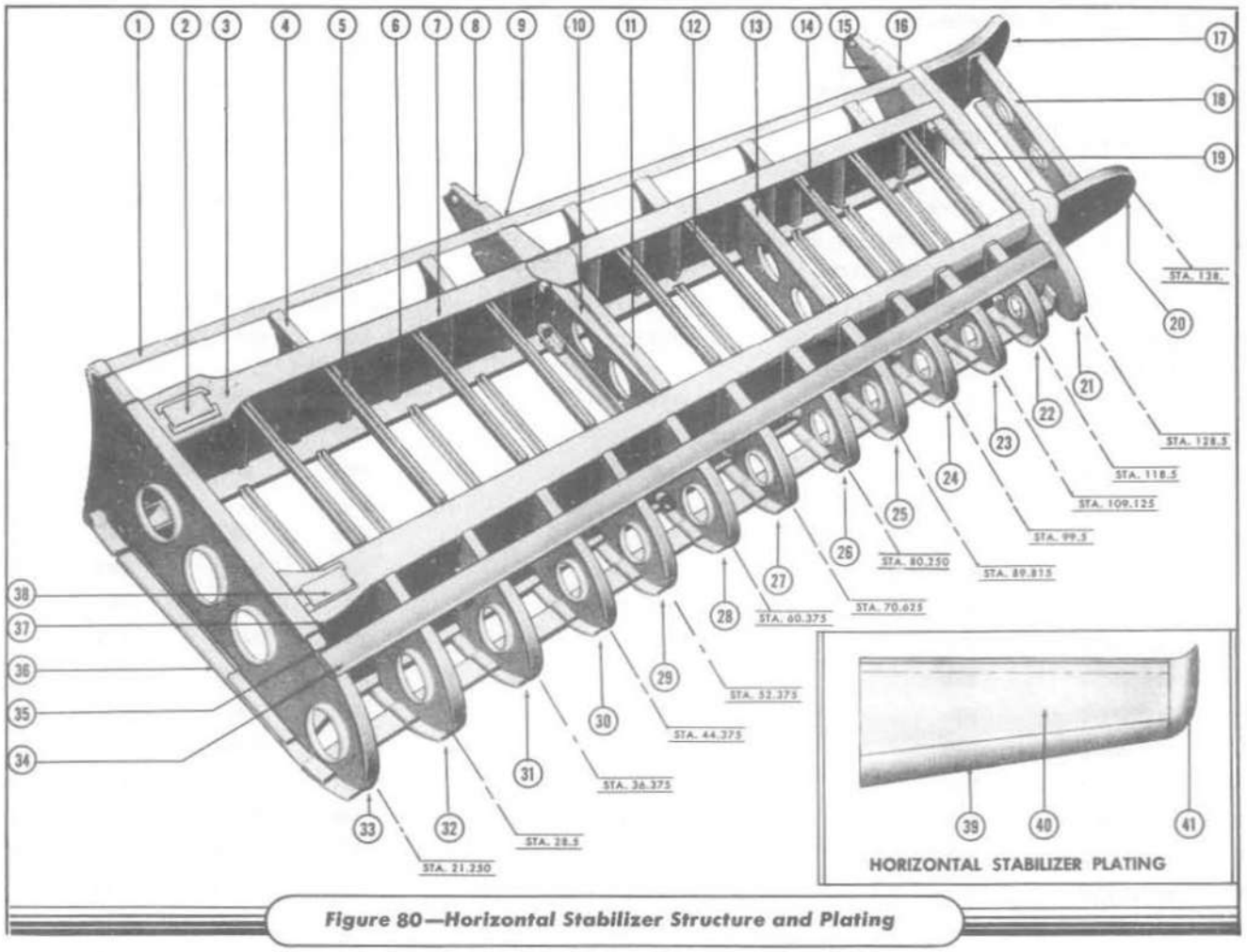


Figure 80—Horizontal Stabilizer Structure and Plating

KEY TO FIGURE 80

Note: L.H. or R.H. indicates left-hand or right-hand assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	1152357	Stiffener	108 S.L.		24ST		2
2	5122113-28	Cover	3-7/16x5-13/16	.025	24ST		1
3	4190325	Spar Cap	Length 110 Lower Cap		24ST		1
	Alcoa 28266		Length 110 Upper Cap				1
4	5128391	Typical Spar Bulkhead		.040	24SO	24ST	12
5	2074330	Typical Hat Sec. Stiffener Sta. 21 to 70	4⅜x24¾	.032	24ST		10
6	5128391	Typical Spar Stiffener		.064	24ST		18
7	5128391-6	Spar Web	6½x42⅝	.051	24ST		1
8	4128173	Bracket	5⅝x11⅞	1-3/16 inch Plate	24ST		1
9	4128189-2	Lower Hinge Covers	8½x10	.020	61ST		1
	4128189-4	Upper Hinge Covers					1
10	5125484-4	L.H. Angle	2⅝x20-5/16	.081	24SO	24ST	1
	5125484-5	R.H. Angle					1

KEY TO FIGURE 80 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
11	5125484-2	Center Rib	8⅜x22⅝	.040	24SO	24ST	1
12	5128391-8	Spar Web	6x65½	.032	24ST		1
13	4125482-2	Center Rib	7⅜x20¼	.032	24SO	24ST	1
14	1125569	Typical Hat Sec. Stiffener Sta. 70+0.128	4½x18½	.025	24ST		8
15	4128169	Bracket	3¾x8-7/16	1 inch Plate	24ST		1
16	4128187-2	Upper Hinge Covers	7x7	.020	61ST		1
	4128187-4	Lower Hinge Covers					
17	5127998-2	Rib	14x8	.032	24SO	24ST	1
18	5127998-6	Rib	8x19	.032	24SO	24ST	1
19	5125478-4	L.H. Angle	2x13⅝	.064	24ST		1
	5125478-5	R.H. Angle					1
20	5127998-4	Rib	7x10	.032	24SO	24ST	1
21	5125478-2	Closing Rib	6½x24	.032	24SO	24ST	1
22	4157994-2	Rib	6¼x7⅛	.032	24SO	24ST	1
23	2125480-2	Rib	6¼x7½	.032	24SO	24ST	1
24	4157993-2	Rib	6x7½	.032	24SO	24ST	1
25	2125481-2	Rib	3¾x8¼	.032	24SO	24ST	1
26	4157989-2	Rib	6⅜x8¼	.032	24SO	24ST	1
27	2125483-2	Rib	7¼x8⅞	.032	24SO	24ST	1
28	4125488-2	Rib	8¼x9¾	.040	24SO	24ST	1
29	4125485-2	Rib	7½x9⅜	.032	24SO	24ST	1
30	4151142-2	Rib	8x9¾	.032	24SO	24ST	1
31	4125486-2	Rib	7⅜x10	.032	24SO	24ST	1
32	4151141-2	Rib	7x10	.032	24SO	24ST	1
33	5125487-2	L.H. Closing Rib	42½x9¼	.040	24SO	24ST	1
	5125487-3	R.H. Closing Rib					1
34	5122113-32	L.H. Strip	2x112	.064	24ST		1
	5122113-33	R.H. Strip					1
35	5127993-2	Spar Web	5⅛x108½	.032	24ST		1
36	4125487-4	L.H. Angle	3x29½	.091	24SO	24ST	1
	4125487-5	R.H. Angle					1
37	4190326	Spar Cap	Length 111 Lower Cap		24ST		1
			Length 111 Upper Cap				1
38	5122113-26	Cover	4-3/16x5⅞	.032	24ST		1
39	5122113-6	Sta. 21 to 128 Skin	24x112	.032	24ST		1
40	5122113-2	L.H. Top Skin	32½x112	.032	24ST		1
	5122113-3	R.H. Top Skin					1
	5122113-4	L.H. Bottom Skin					1
	5122113-72	R.H. Bottom Skin					1
41	5127998-10	L.H. Sta.128 to 138 Skin	14x31	.032	52S½H		1
	5127998-11	R.H. Sta. 128 to 138 Skin			½H		

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

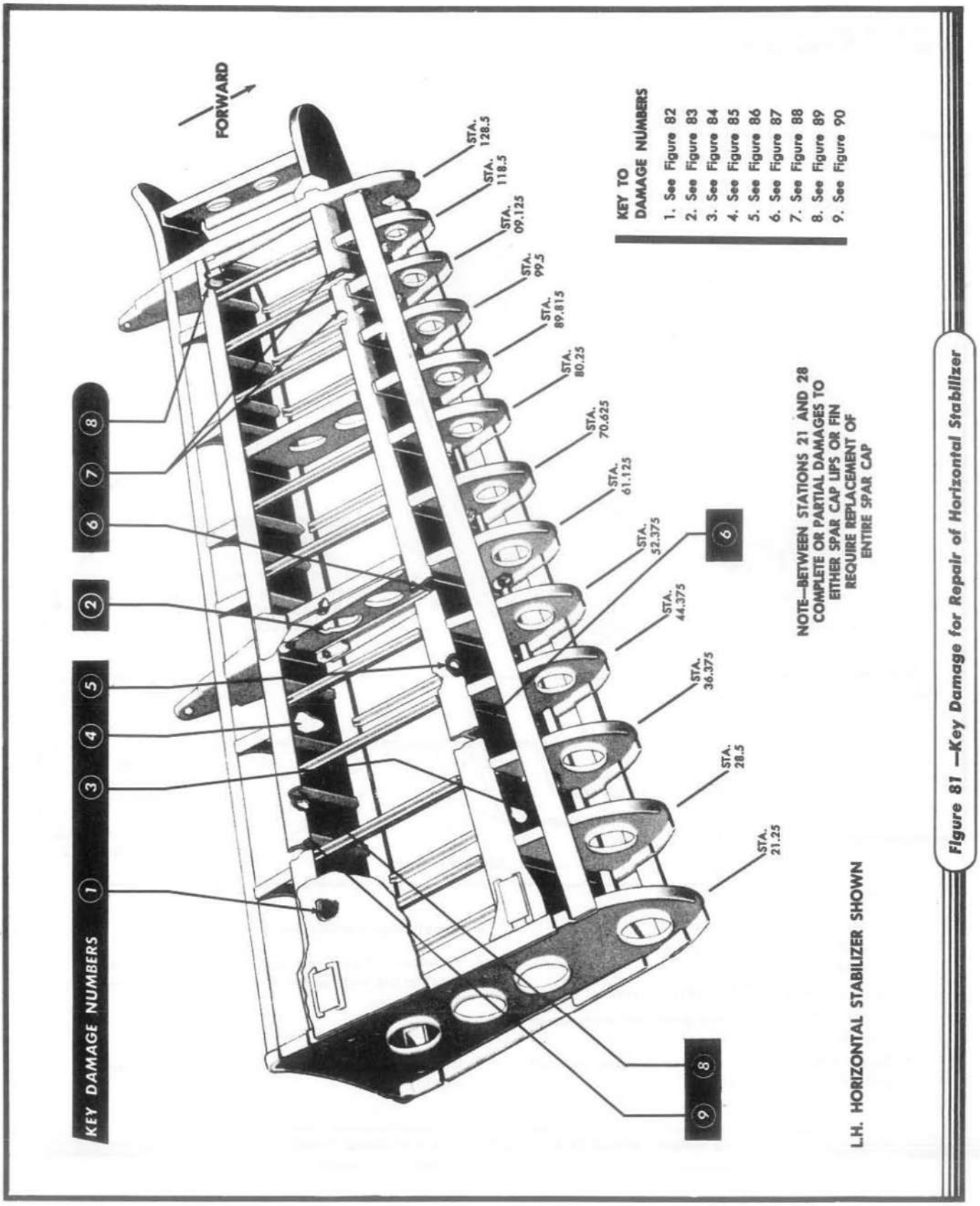
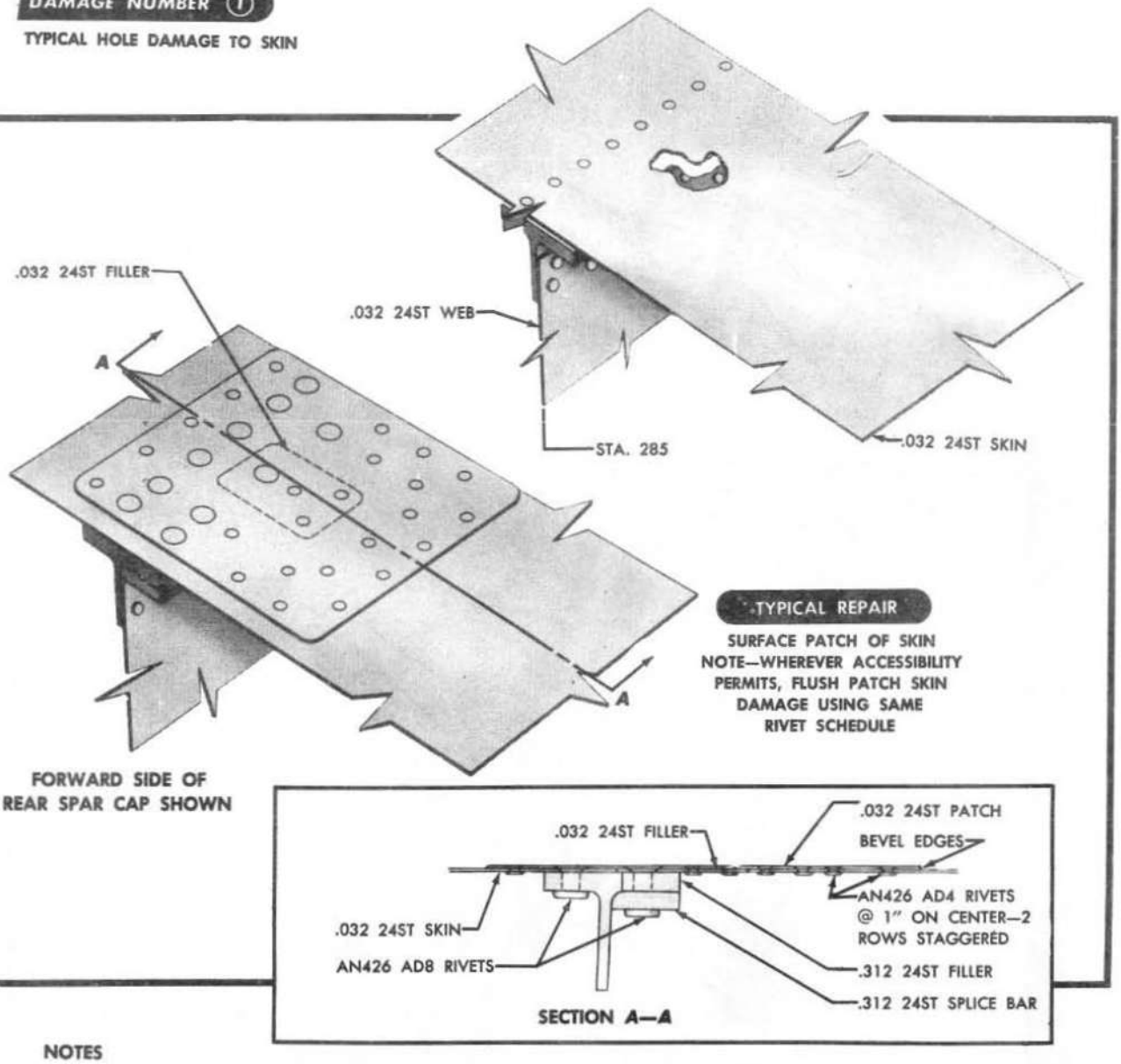


Figure 81 —Key Damage for Repair of Horizontal Stabilizer

DAMAGE NUMBER (1)

TYPICAL HOLE DAMAGE TO SKIN



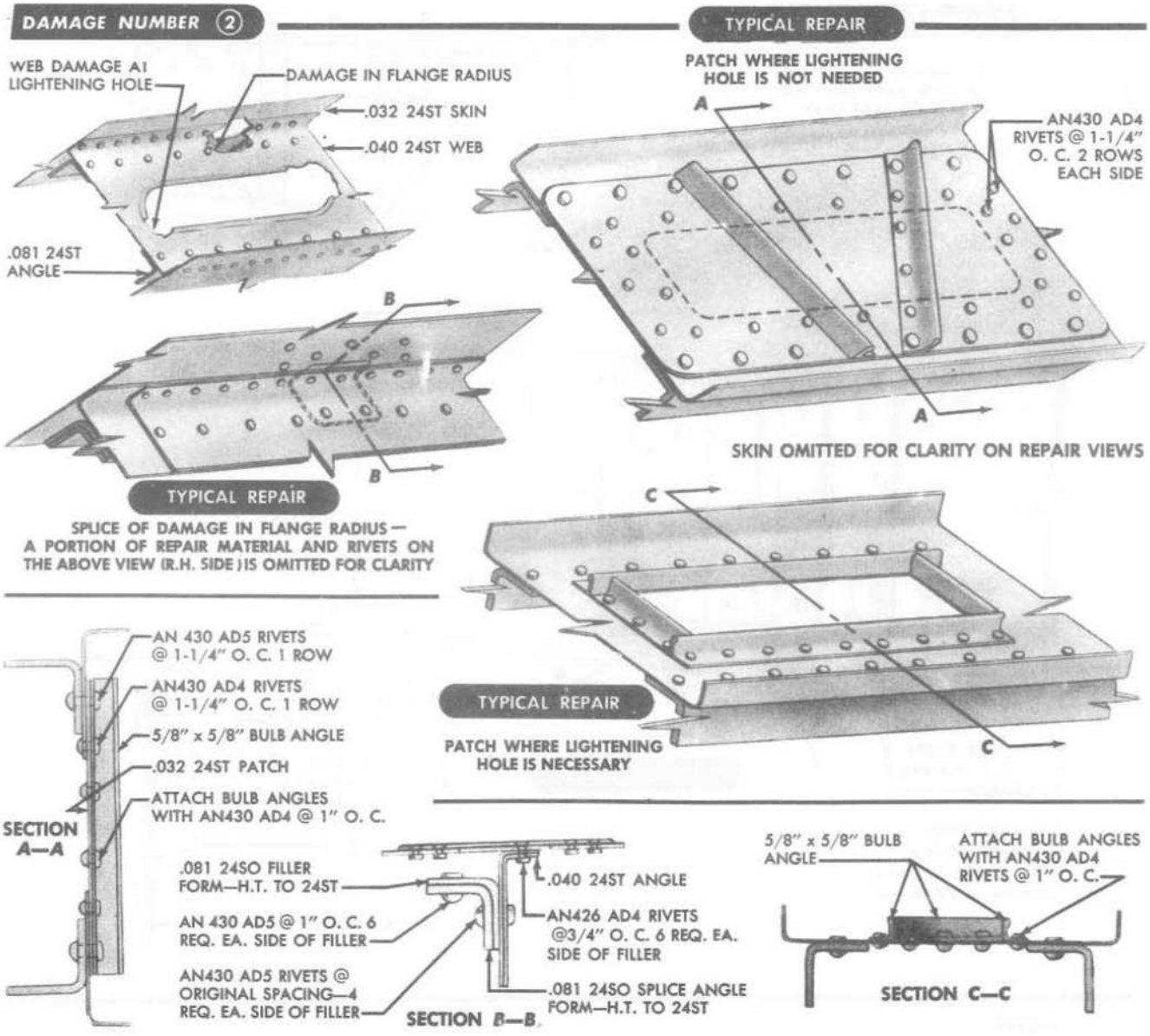
TYPICAL REPAIR

SURFACE PATCH OF SKIN
NOTE—WHEREVER ACCESSIBILITY PERMITS, FLUSH PATCH SKIN DAMAGE USING SAME RIVET SCHEDULE

NOTES

1. Remove all interfering rivets.
2. Trim all damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from .032 24ST material.
4. Construct filler from same gage and material as original.
5. Attach filler with tack rivets at one and one-half inch on center maximum.
6. Use existing rivet holes where possible.
7. For repair of spar cap and web, refer to typical spar cap and web repairs in the Horizontal Stabilizer Repair series.
8. For flush riveting see Figure 5, Section I.
9. For rivet edge and row distance see Figure 6, Section I.

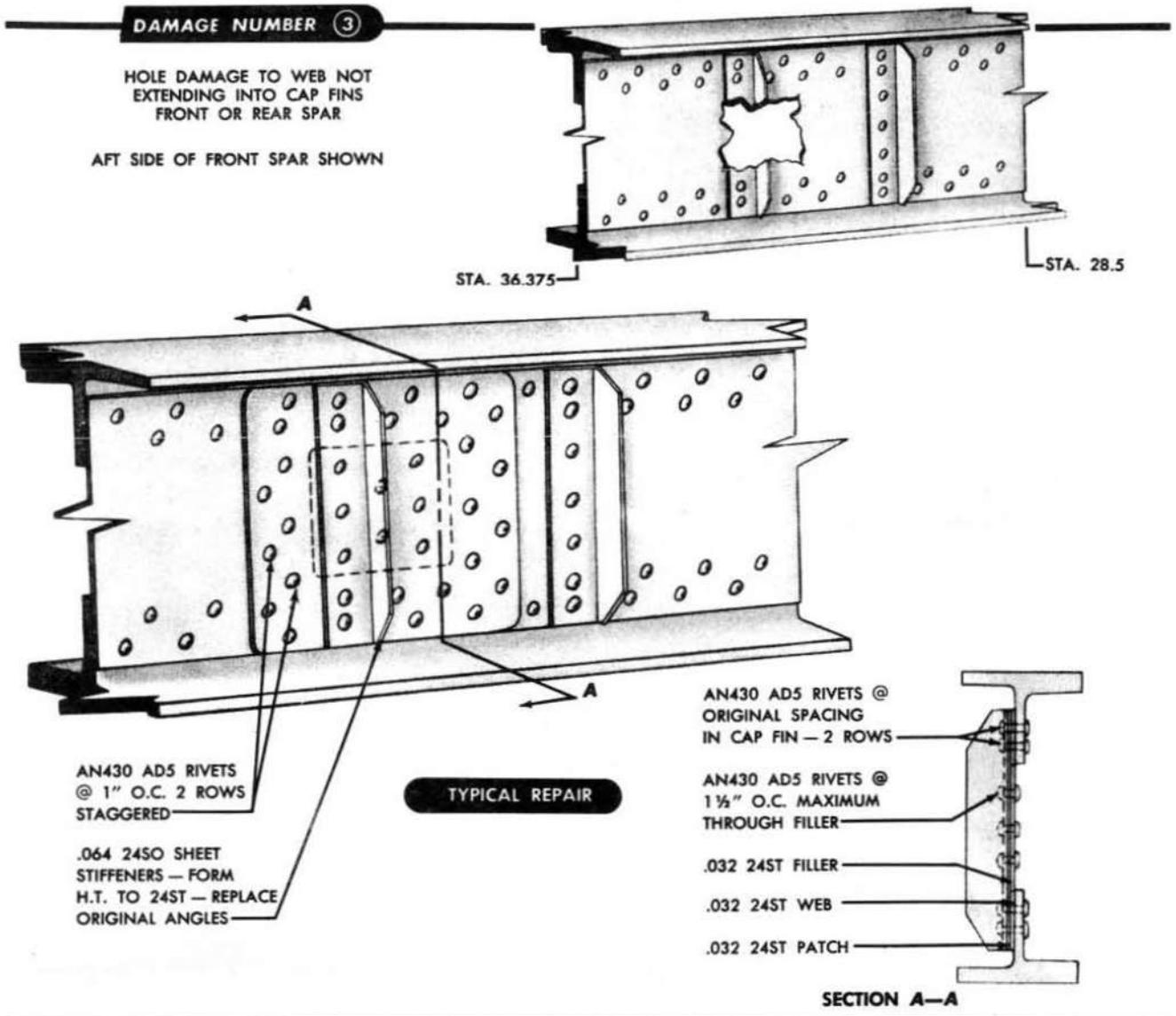
Figure 82 —Patch Repair of Hole Damage to Horizontal Stabilizer Skin



NOTES

1. Remove all interfering rivets.
2. Trim damage leaving no radius less than one-fourth inch.
3. For repair of rib flanges and angles see Section B-B. Construct splice angles from 24SO material of gages noted. Heat treat to 24ST. Construct fillers from 24SO material of same gage as original. Heat treat to 24ST.
4. For repair of lightening hole see Section A-A. This repair is used when lightening hole is not needed. Construct patch from .032 24ST material. Use bulb angle stiffeners as shown to restore strength lost by damage to lightening hole flange.
5. Section C-C shows repair used when lightening hole is needed. After trimming damage smooth, attach bulb angle stiffeners as shown to restore strength lost by damage to lightening hole flange.
6. Use existing rivet holes where possible.
7. Repairs are shown for rib at horizontal stabilizer station 61, but are typical for all similar damages in horizontal stabilizer ribs.
8. For skin repair see typical skin repair drawings included in Horizontal Stabilizer Repair series.
9. For minimum bend radii of sheet material see Fig. 5, Section I.
10. For rivet edge and row distance see Fig. 7, Section I.

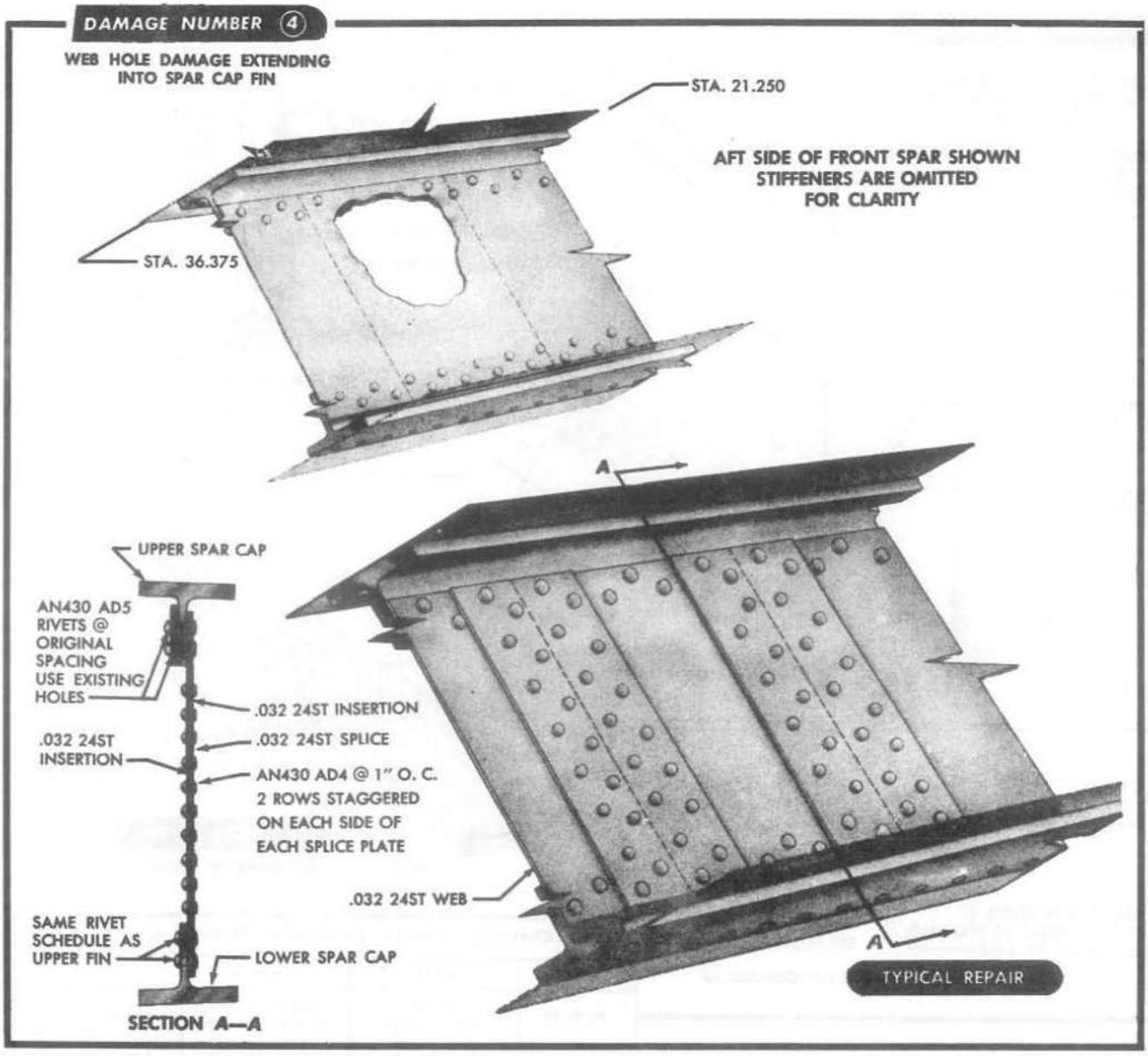
Figure 83 —Typical Patch and Splice Repair of Horizontal Stabilizer



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from .032 24ST.
4. Construct filler from .032 24ST.
5. Replace any damaged stiffener, clip, or fitting.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For rivet edge and row distance see Figure 6, Section I.
9. Repair shown is typical for all hole damage to either spar web when damage does not extend into spar cap fins.

Figure 84 —Patch of Spar Web Hole Damage Not In Cap Fin—Horizontal Stabilizer



NOTES

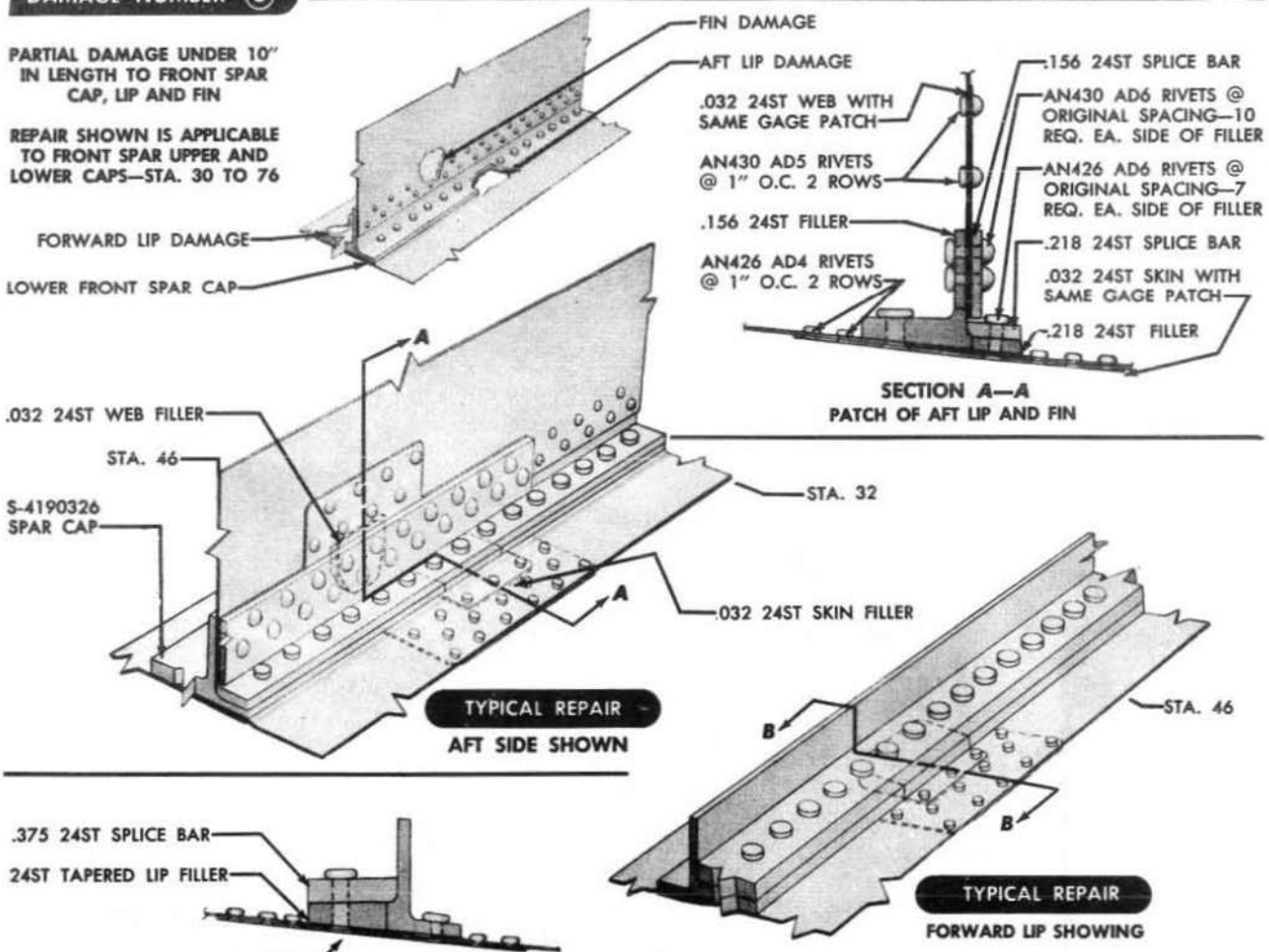
1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice plates from .032 24ST material.
4. Construct insert from .032 24ST material.
5. For spar cap fin repair, refer to cap fin repair drawings included in Horizontal Stabilizer Repair series.
6. Replace any damaged stiffener, clip, or fitting.
7. Use existing rivet holes where possible.
8. For rivet edge and row distance, see Figure 7, Section I.
9. Insert repair shown is typical for repair of similar damage to either front or rear spar webs.

Figure 85 —Insert Repair of Web Damage Extending Into Spar Cap—Horizontal Stabilizer

DAMAGE NUMBER (5)

PARTIAL DAMAGE UNDER 10" IN LENGTH TO FRONT SPAR CAP, LIP AND FIN

REPAIR SHOWN IS APPLICABLE TO FRONT SPAR UPPER AND LOWER CAPS—STA. 30 TO 76

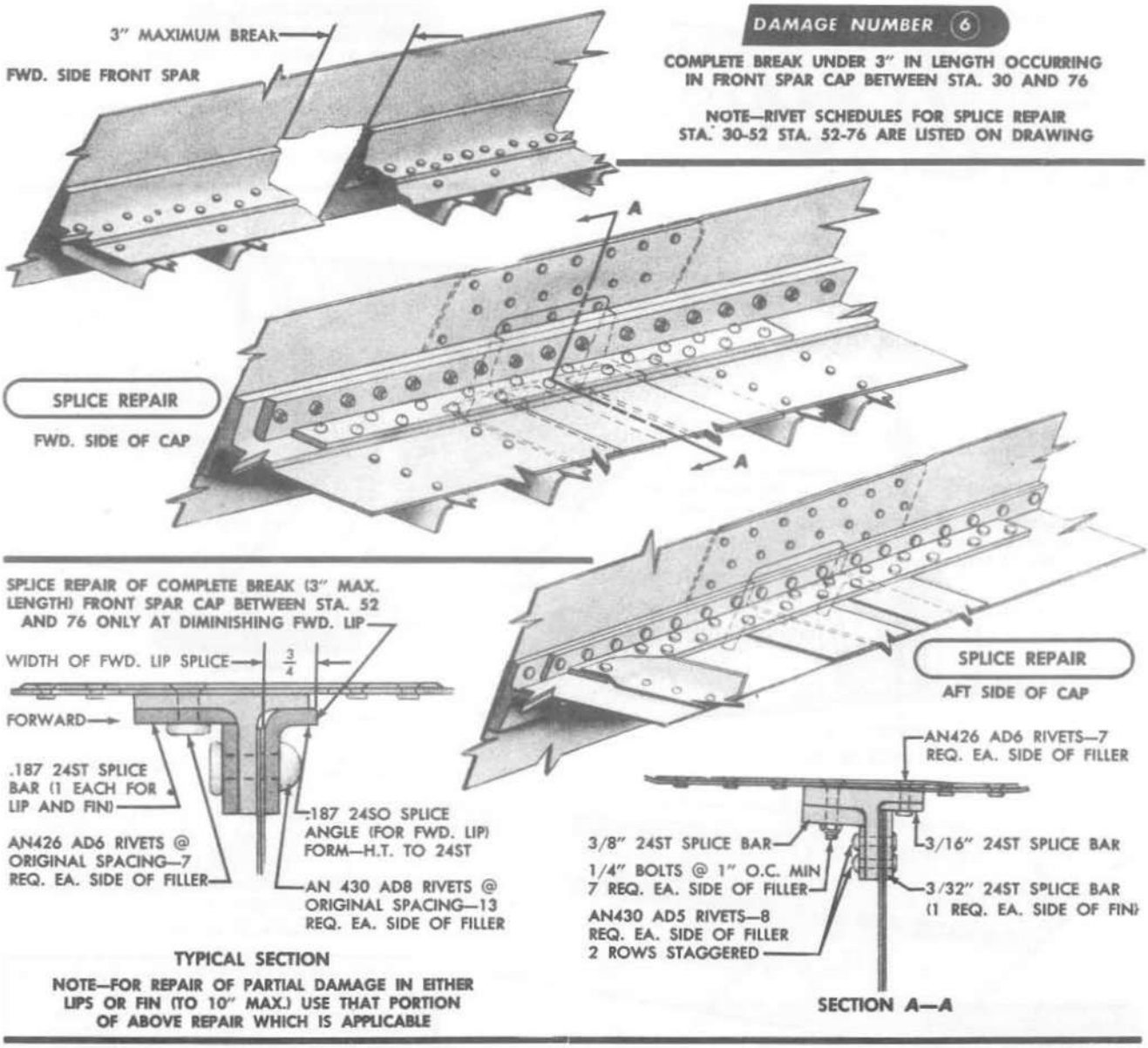


RIVET SCHEDULE — PARTIAL DAMAGE TO FRONT & REAR SPAR CAP			
Sta. Limits	Aft Lip	Forward Lip	Fin
30 TO 60	AD6 7 EACH SIDE OF FILLER	AD6 23 EA. SIDE OR AD8 13 EA. SIDE	AD6 10 EA. SIDE
60 TO 76	AD6 7 EA. SIDE	AD6 12 EA. SIDE	AD6 7 EA. SIDE

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch in spar cap.
3. Construct splice bars from 24ST material of gages noted on Section A-A and Section B-B.
4. Construct fillers from 24ST material of the same gage as original.
5. For skin and web repairs, refer to typical skin and web repair drawings included in Horizontal Stabilizer Repair series.
6. Use existing rivet holes where possible.
7. Rivet size and minimum number of rivets required on each side of damage at different spar stations are indicated in Repair Schedule above.
8. For flush riveting see Fig. 6, Section I.
9. For rivet edge and row distance see Fig. 7, Section I.
10. Replace any damaged stiffener, clip, or fitting.
11. When damage is over ten inches in length (spanwise) the spar cap must be replaced. When the damage extends into the radius, or when the spar cap is completely broken, see repair shown in Figure 87.

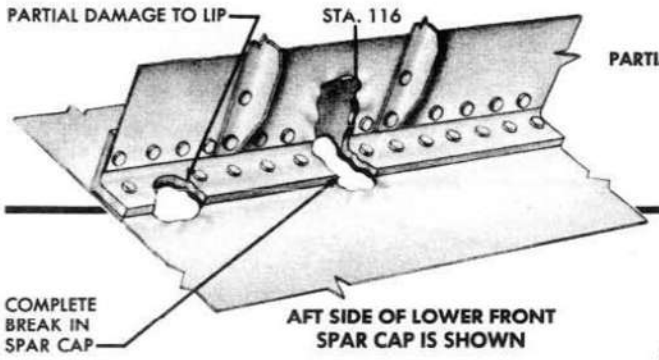
Figure 86 —Patch Repair of Front Spar Cap — Sta. 30 to 76 — Horizontal Stabilizer



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice bars from 24ST material of gages noted on Section A-A and Typical Section.
4. Construct splice angle from .187 24SO material. Heat treat to 24ST.
5. Construct fillers from same gage and material as original.
6. Joggle angle or hat section stiffeners to fit over splice bars.
7. Replace any damaged stiffener, clip, or fitting.
8. Use existing rivet holes where possible.
9. For repair of skin or web refer to typical skin and web repair drawings included in Horizontal Stabilizer Repair series.
10. When the damage exceeds three inches in length (spanwise), the spar cap must be replaced.

Figure 87—Splice of Complete Break Under 3" in Length in Horizontal Stabilizer Front Spar—Sta. 30 to 76



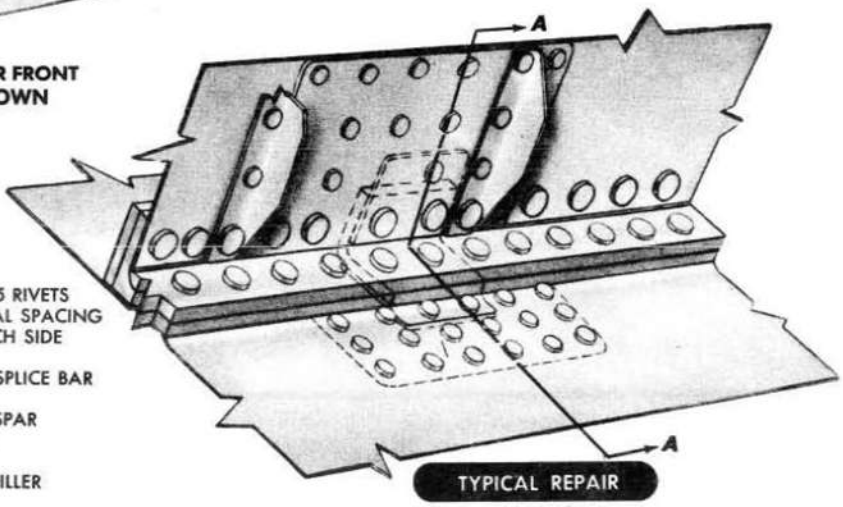
DAMAGE NUMBER (7)

PARTIAL DAMAGE UNDER 10" IN LENGTH TO FRONT SPAR CAP LIPS OR FIN

OR

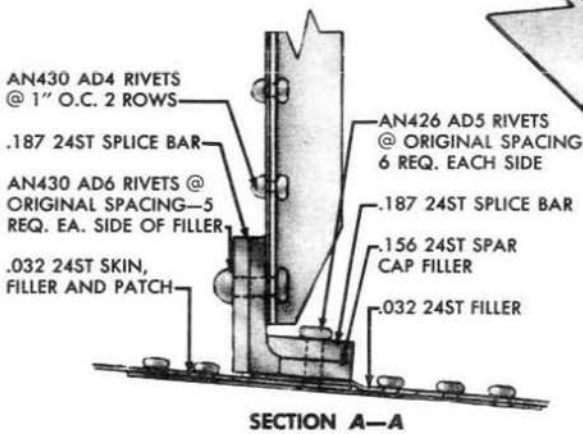
COMPLETE BREAK UNDER 3" IN LENGTH TO FRONT SPAR CAP

REPAIRS SHOWN APPLY ONLY TO FRONT SPAR—STA. 76 TO 128



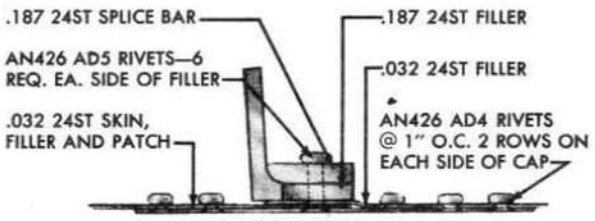
TYPICAL REPAIR

CAP SPLICE



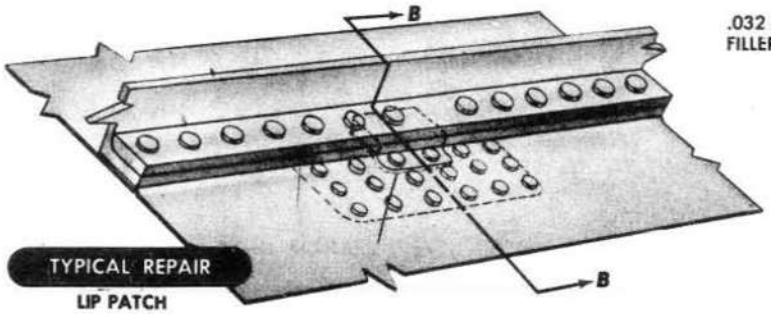
SECTION *A—A*

SPLICE OF CAP



SECTION *B—B*

PATCH OF AFT LIP



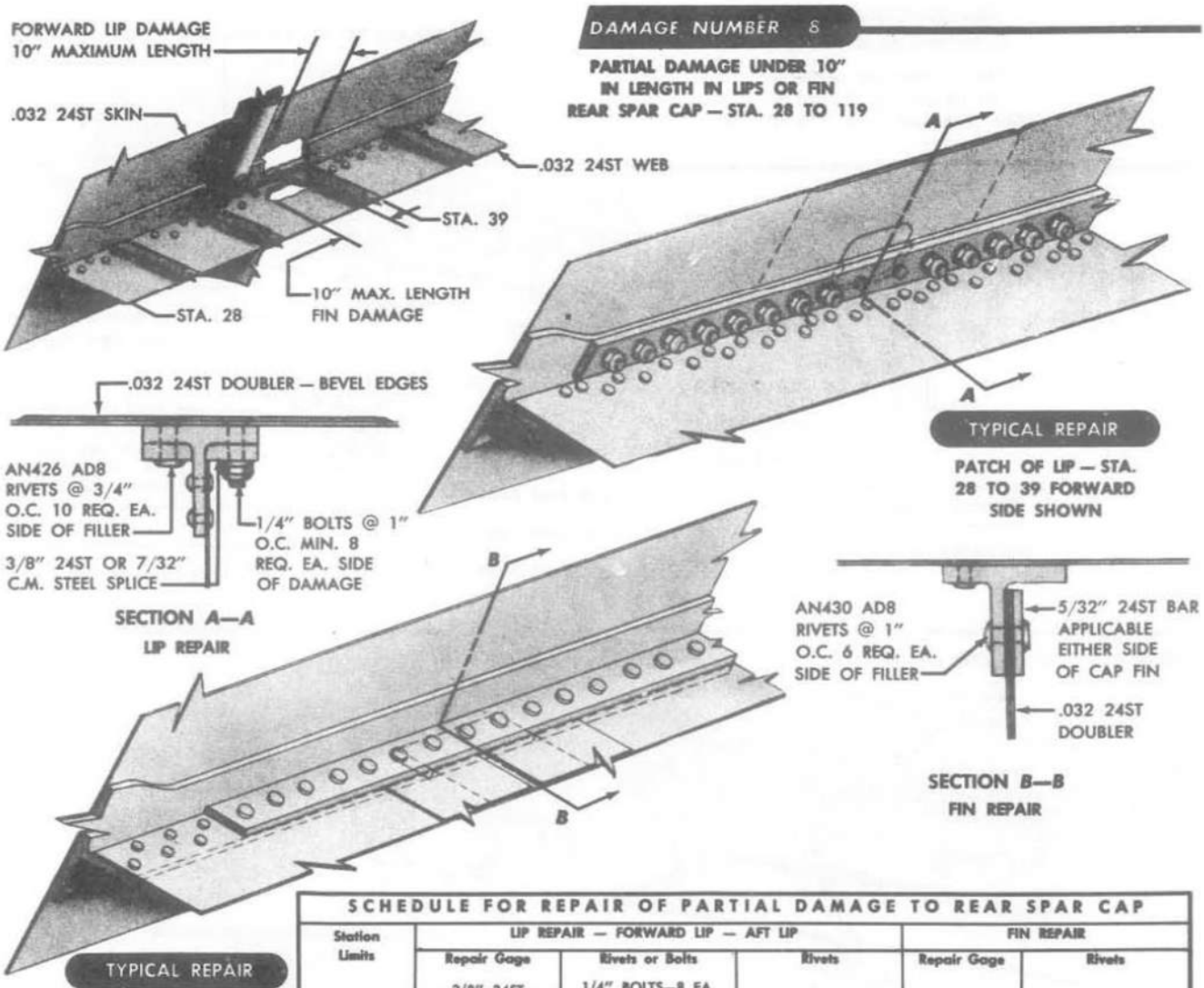
TYPICAL REPAIR

LIP PATCH

PATCH AND SPLICE REPAIR SCHEDULE FRONT SPAR CAP—STA. 76 TO 128		
Sta. Limits	**Lip Repair**	**Fin Repair**
76 to 100	AD5 10 EACH SIDE OF FILLER	AD6 10 EACH SIDE OF FILLER
100 to 128	AD5 6 EA. SIDE	AD6 5 EA. SIDE

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch in spar cap.
3. Construct splice bars from .187 24ST material.
4. Construct fillers from 24ST material of same gage as original.
5. For repair of skin and web refer to typical skin and web repair drawings included in Horizontal Stabilizer Repair Series.
6. Replace any damaged stiffener, clip, or fitting.
7. Use existing rivet holes where possible.
8. Damage to lip or fin which does not extend into the radius is repaired as shown in Section B-B. If the damage exceeds ten inches in length (spanwise) the spar cap must be replaced.
9. When the damage extends into the radius, or when the spar cap is completely broken, repair as shown in Section A-A. If damage exceeds three inches in length (spanwise), the spar cap must be replaced.
10. For flush riveting see Fig. 6, Section I.
11. For rivet edge and row distance see Fig. 7, Section I.

Figure 88 — Patch and Splice Repair of Partial and Complete Damage Horizontal Stabilizer Front Spar — Sta. 76 to 128



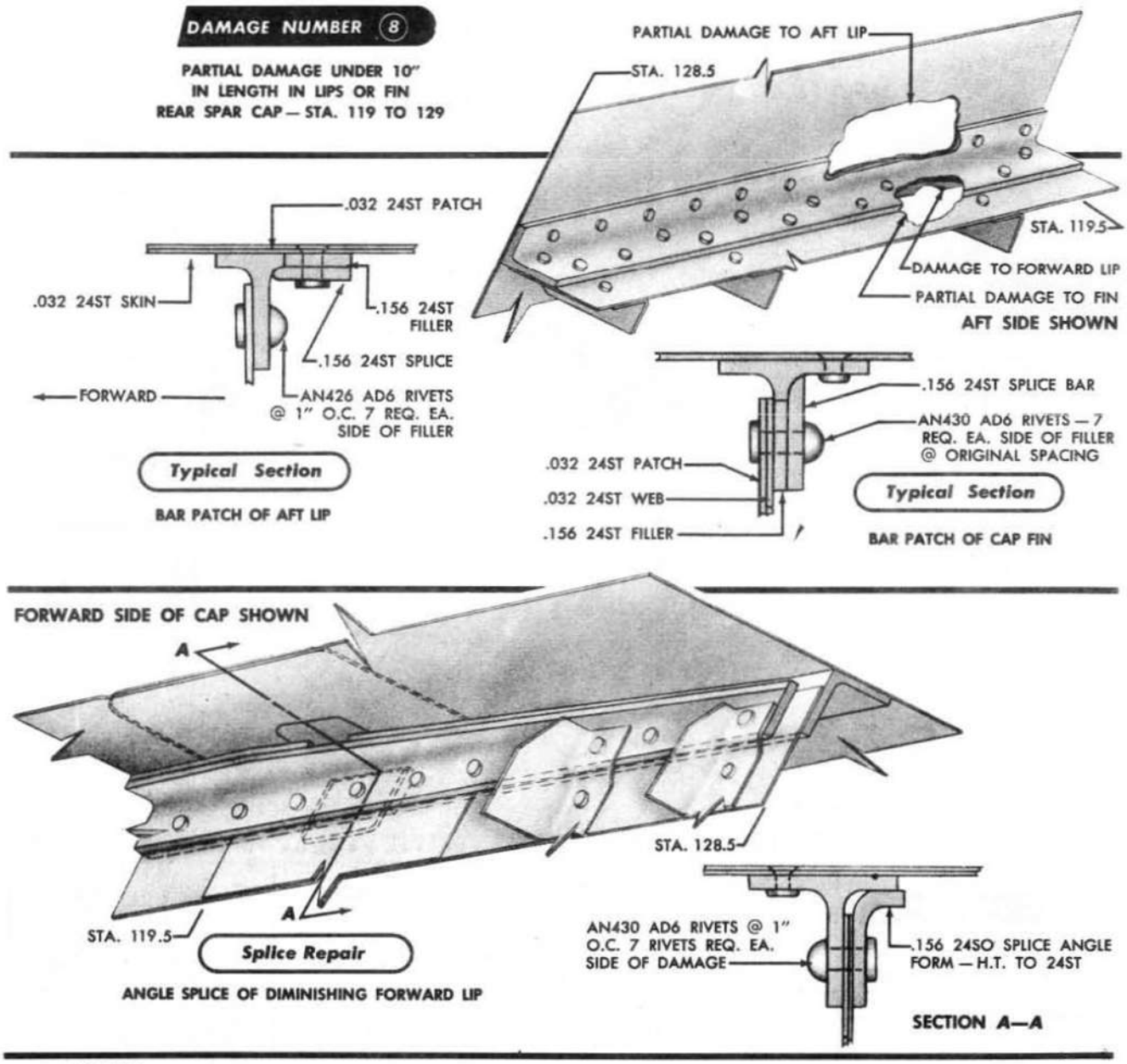
SCHEDULE FOR REPAIR OF PARTIAL DAMAGE TO REAR SPAR CAP

Station Limits	LIP REPAIR — FORWARD LIP — AFT LIP			FIN REPAIR	
	Repair Gage	Rivets or Bolts	Rivets	Repair Gage	Rivets
28 TO 39	3/8" 24ST OR 7/32" C.M. STEEL	1/4" BOLTS—8 EA. SIDE OR AD8 16 OUTB'D. & 1/4" BOLTS—8 INB'D.	AD8 10 EACH SIDE	5/32" 24ST	AD8 6 EACH SIDE
39 TO 52	.30 24ST	AD8 9 EA. SIDE	AD8 9 EA. SIDE	.156 24ST	AD8 7 EA. SIDE
52 TO 60	.21 24ST	AD8 6 EA. SIDE	AD8 6 EA. SIDE	.156 24ST	AD8 7 EA. SIDE
60 TO 119	.156 24ST	AD6 7 EA. SIDE	AD6 7 EA. SIDE	.156 24ST	AD8 7 EA. SIDE

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice bar for fin patch from five-thirty-seconds inch 24ST material. The splice bar may be attached to either side of the fin.
4. Construct splice bars for lip patch from three-eighths inch 24ST or seven-thirty-seconds inch C.M. steel.
5. Construct fillers from the same gage and material as the original.
6. Use existing rivet holes where possible.
7. When damage exceeds ten inches in length, the spar cap must be replaced.
8. For repair of skin or web, refer to typical skin and web repairs included in the Horizontal Stabilizer Repair series.
9. Refer to table above for rivet or bolt schedules at different spar stations.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

Figure 89 —Patch Repair of Partial Damage Under 10" in Length —Horizontal Stabilizer Rear Spar Cap—Sta. 28 to 119 (Sheet 1 of 2)



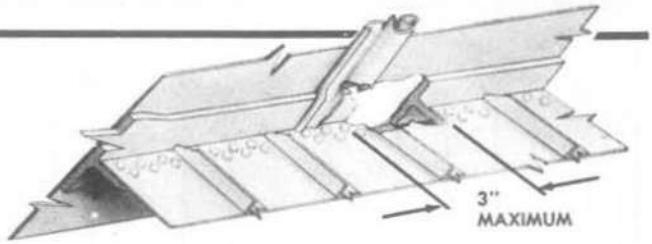
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar from .156 24ST material.
4. Construct splice angle from .156 24SO material. Heat treat to 24ST.
5. Construct filler in lip or fin from .156 24ST material.
6. Use existing rivet holes where possible.
7. For repair of web and skin, refer to typical web and skin reppirs included in the Horizontal Stabilizer series.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.
11. When damage exceeds ten inches in lenght, spar cap must be replaced.

Figure 89—Patch and Splice of Partial Damage Under 10" In Length —Horizontal Stabilizer Rear Spar Cap—Sta. 119 to 129 (Sheet 2 of 2)

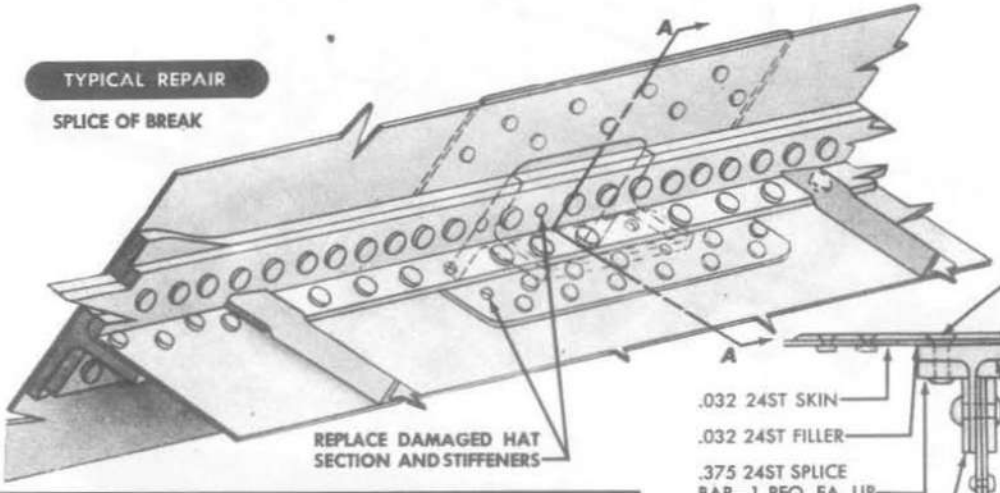
DAMAGE NUMBER (9)

COMPLETE BREAK UNDER 3" IN LENGTH—REAR SPAR CAP STA. 28 TO 129 INCLUSIVE

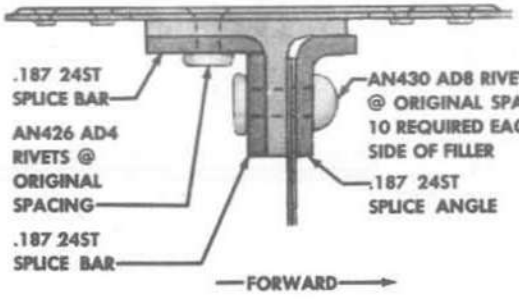


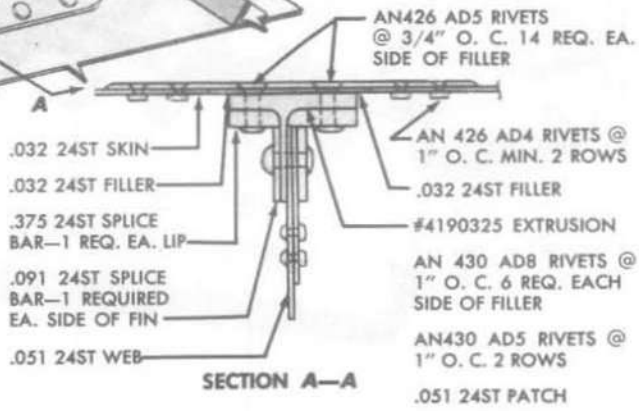
TYPICAL REPAIR

SPLICE OF BREAK



SPLICE REPAIR OF REAR SPAR CAP STA. 119 TO 129
COMPLETE BREAK UNDER 3" IN LENGTH





REPAIR SCHEDULE—REAR SPAR CAP—STA. 28 TO 129

Station Limits	Lip Rivets Ea. Side Filler	Lip Gage Repair	Fin Rivets Ea. Side Filler	Fin Gage Repair
28 TO 39	AD8—14 EA. SIDE	.375	AD8— 6 EA. SIDE	.091
39 TO 60	AD8—12 EA. SIDE	.3125	AD8— 6 EA. SIDE	.091
60 TO 119	AD6— 10 EA. SIDE	.187	AD8— 6 EA. SIDE	.191
119 TO 129	AD6—10 EA. SIDE	.187	AD8—10 EA. SIDE	.187

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch in spar cap, no radius less than one-fourth inch in skin, and no radius less than three-eighths inch in web.
3. Construct splice bars from 24ST material of gages noted on Section A-A and Typical Section above.
4. Construct splice angle for the forward side of spar cap between Station 119 and Station 129 from .187 24SO material. Heat treat to 24ST.
5. For repair of skin and web see Typical skin and web repair drawings included in Horizontal Stabilizer Repair series.
6. Construct all fillers from the same gage and material as original.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Fig. 5, Section I.
9. For flush riveting see Fig. 6, Section I.
10. For rivet edge and row distance see Fig. 7, Section I.
11. When damage is over three inches in length the spar cap must be replaced.
12. See Repair Schedule above for gage of repair material and size and minimum number of rivets required each side of damage at different spar stations.

Figure 90 —Splice of Complete Break in Rear Spar Cap Under 3" in Length Horizontal Stabilizer Stations 28 to 129

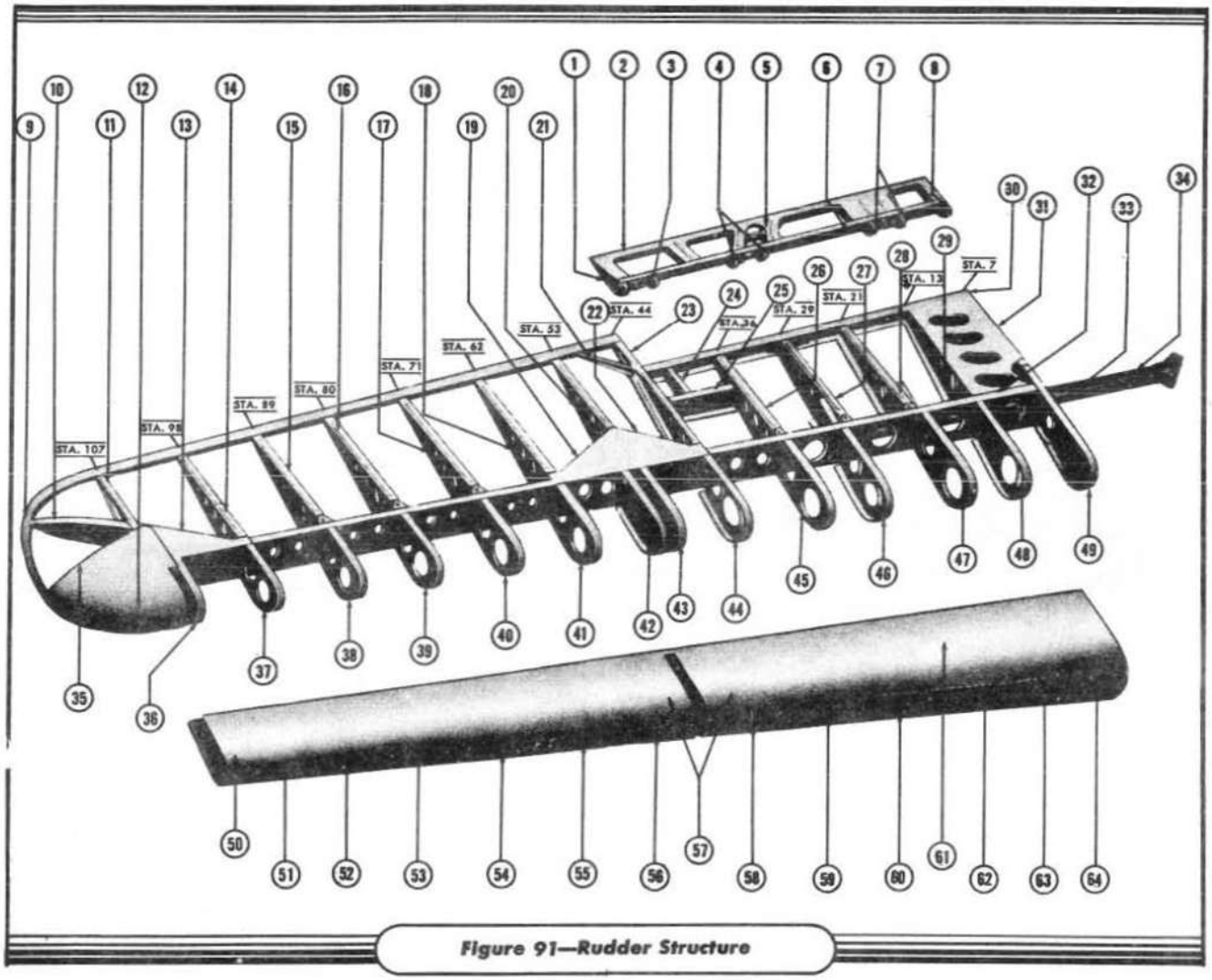


Figure 91—Rudder Structure

KEY TO FIGURE 91

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5122129-8	Closing Rib	3½x10	.032	24SO	24ST	1
2	5122129-2	Web	18x40	.016	24ST		1
3	5122129-16	Bulkhead	3x3	.025	24SO	24ST	1
4	5122129-18	Bulkhead	3x3	.025	24SO	24ST	1
5	5122129-10	Rib	3x8	.025	24SO	24ST	1
6	5122129-6	Channel	2⅞x38	.032	24SO	24ST	1
7	5122129-20	Bulkhead	3x3	.025	24SO	24ST	1
8	5122129-14	Closing Rib	4x11½	.025	24SO	24ST	1
9	5122127-72	Trailing Edge	3x36	.032	24SO	24ST	1
10	5122127-74	Brace	4½x14½	.025	24SO	24ST	1
11	5122127-26	Rib	6½x21½	.032	24SO	24ST	1
12	2129248	Access Door	4-5/16x5¼	.032	24ST		1
13	5122127-76	Brace	5x12	.025	24SO	24ST	1

KEY TO FIGURE 91 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
14	5122127-24	Rib	6¼x24½	.025	24SO	24ST	1
15	5122127-22	Rib	6½x25½	.025	24SO	24ST	1
16	5122127-20	Rib	7x27	.025	24SO	24ST	1
17	5122127-18	Rib	7x28	.025	24SO	24ST	1
18	5122127-16	Rib	7½x29½	.025	24SO	24ST	1
19	5122127-60	Doubler	15½x18	.032	24ST		1
20	5122127-14	Rib	7½x30½	.032	24SO	24ST	1
21	5122127-90	Brace	3⅓x11⅜	.025	24SO	24ST	1
22	5122127-58	Doubler	15½x18	.032	24SO	24ST	1
23	5122127-12	Rib	8x31½	.032	24SO	24ST	1
24	5122127-88	Rib	5⅛x6½	.025	24ST		1
25	5122127-86	Intercostal	4½x9¼	.025	24ST		1
26	5122127-10	Rib	8x24	.032	24SO	24ST	1
27	5122127-8	Rib	8½x26	.040	24SO	24ST	1
28	5122127-6	Rib	9x26	.040	24SO	24ST	1
29	5122127-4	Rib	9x26	.032	24SO	24ST	1
30	5122127-216	Seal	2⅜x40	.025	24ST		1
31	5122127-68	Sheet	3½x40	.032	24SO	24ST	1
32	5122127-54	Spar	8¼x101⅛	.040	24SO	24ST	1
33	5122127-124	Doubler	8⅜x10⅜	.081	24SO	24ST	1
34	3126961-2	Tube Assembly	2" O.D.x32⅞	.095	C.M. Steel Tube	125-145000 psi	1
35	5122127-76	Brace	4½x15	.025	24SO	24ST	1
36	5122127-28	Nose Rib	6½x10½	.032	24SO	24ST	1
37	5122127-30	Nose Rib	6⅜x10¾	.025	24SO	24ST	1
38	5122127-32	Nose Rib	6⅜x11¼	.025	24SO	24ST	1
39	5122127-34	Nose Rib	6⅞x11½	.025	24SO	24ST	1
40	5122127-36	Nose Rib	7⅛x11¾	.025	24SO	24ST	1
41	5122127-38	Nose Rib	7½x12⅛	.025	24SO	24ST	1
42	5122127-40	Nose Rib	7¾x12½	.051	24SO	24ST	1
43	5122127-42	Nose Rib	7-9/16x12⅜	.051	24SO	24ST	1
44	5122127-44	Nose Rib	7-13/16x12⅞	.032	24SO	24ST	1
45	5122127-46	Nose Rib	8½x13½	.032	24SO	24ST	1
46	5122127-48	Nose Rib	8¾x13⅜	.040	24SO	24ST	1
47	5122127-50	Nose Rib	8-7/16x14	.040	24SO	24ST	1
48	5122127-52	Nose Rib	8-7/16x14½	.032	24SO	24ST	1
49	5122127-2	Rib	9x41	.040	24SO	24ST	1
50	2129248	Access Door	5¼x4-5/16	.032	24ST		1
51	5158958-84	Weight Assembly					1
52	5158958-82	Weight Assembly					1
53	5158958-80	Weight Assembly					1
54	5158958-80	Weight Assembly					1
55	5158958-78	Weight Assembly					1
56	5158958-76	Weight Assembly					1
57	2129248	Access Door	4-5/16x5¼	.032	24ST		2
58	5158958-74	Weight Assembly					1
59	5158958-72	Weight Assembly					1
60	5122127-148	Cover	2⅜x2⅜	.032	24ST		1
61	5158958-70	Weight Assembly					1
62	5158958-68	Weight Assembly					1
63	5158958-66	Weight Assembly					1
64	5158958-64	Weight Assembly					1

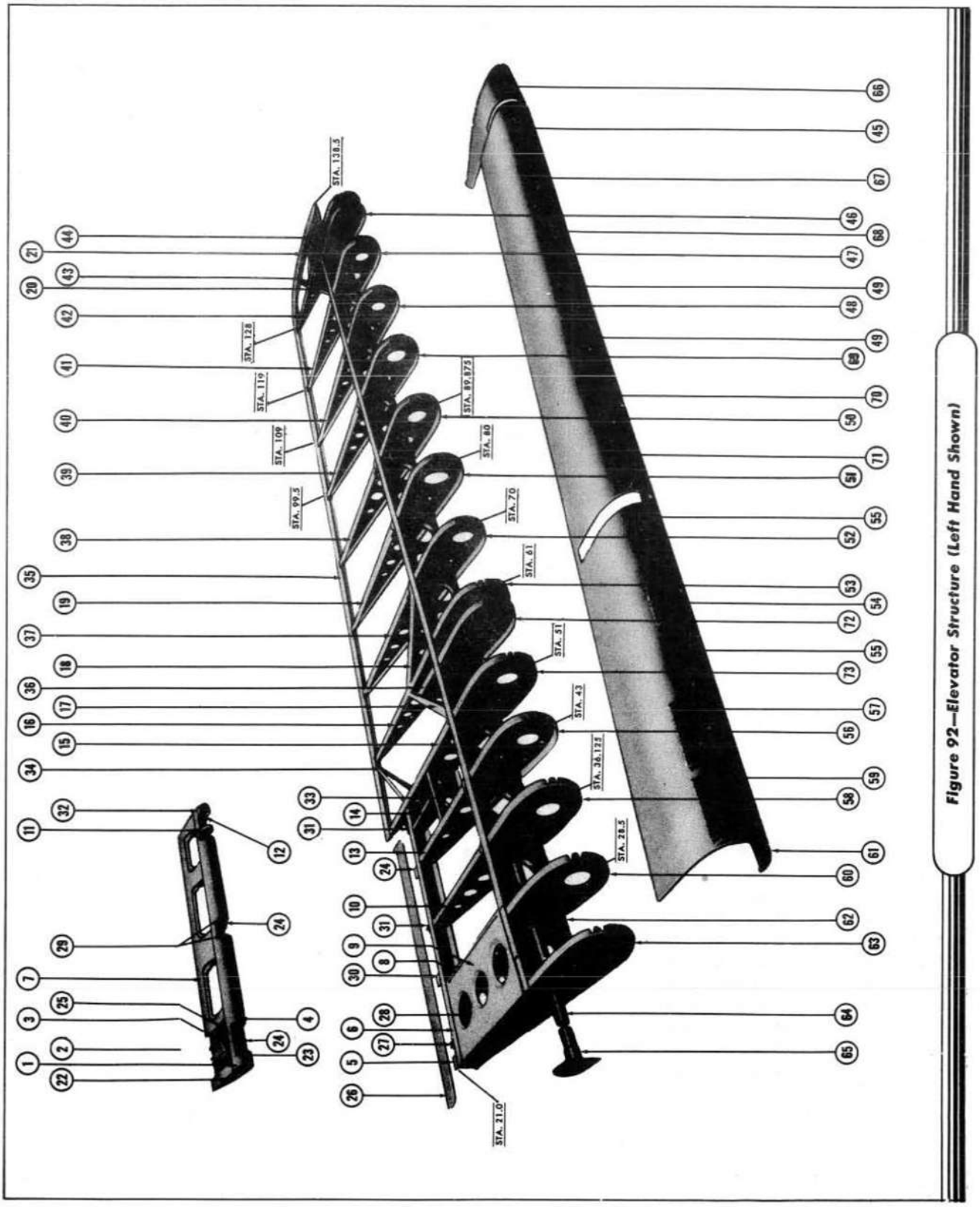


Figure 92—Elevator Structure (Left Hand Shown)

KEY TO FIGURE 92

Under reference numbers containing more than one part number, the even dash numbers indicate left hand; the odd numbers indicate right hand parts.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5122124-4	Skin (Nose)	5⅜x30½	.032	24ST		1
2	5122124-12	Rib	5⅛x2⅜	.025	24SO	24ST	1
3	2126761	Track (CM. Steel Forging)	2-29/64x23/32		Heat treat to 180,000-200,000 psi per A.C. 98-10025 NAF-PHS-10		1
4	5122124-22	Rib	3x3	.025	24SO	24ST	1
5	5122122-202	Clip	1x3½	.032	24ST		1
6	5122122-16	Channel	3½x34	.032	24ST		1
7	5122124-2	Skin (Web)	30½x12⅛	.016	24ST		1
8	5122122-82 5122122-83	Aft Rib	7⅛x18¾	.032	24SO	24ST	1 1
9	5122122-84 5122122-85	Sheet	9¼x17	.025	24SO	24ST	1 1
10	5122122-68	Aft Rib	7x17½	.040	24SO	24ST	1
11	5122124-16	Rib	3x3	.025	24SO	24ST	1
12	5122122-198	Clip	1½x3	.032	24ST		1
13	5122124-8	Closing Rib	8x3	.025	24SO	24ST	1
14	5122122-62	Rib	4⅜x6¾	.025	24SO	24ST	1
15	5122122-60	Aft Rib	6⅜x23¼	.032	24SO	24ST	1
16	5122122-56	Aft Rib	6⅜x22½	.032	24SO	24ST	1
17	5122122-76	Brace	7x13	.032	24SO	24ST	1
18	5122122-78	Brace	6½x13	.032	24SO	24ST	1
19	5122122-52	Aft Rib	6x20¼	.025	24SO	24ST	1
20	5122122-74	Brace	4x10	.025	24SO	24ST	1
21	5122122-14	Trailing Edge	5x28	.032	24SO	24ST	1
22	5122124-10	Closing Rib	3x8	.025	24SO	24ST	1
23	5122124-6	Spar	2¾x30⅞	.032	24ST		1
24	2126744 (Alcoa 30318)	Bracket	1-1/16x1¾		24SO	24ST	6
25	5122124-14	Rib	2⅜x5⅛	.025	24SO	24ST	1
26	5122122-196	Strip	2⅛x32	.025	24ST		1
27	2126745 (Alcoa 30327)	Bracket	2-1/16x1-13/32		24SO	24ST	2
28	5122122-118 5122122-119	L.H. Sheet R.H. Sheet	9¼x17	.025	24SO	24ST	1
29	5122124-18	Rib	3x3	.025	24SO	24ST	1
30	5122122-200	Clip	1½x3½	.032	24ST		1
31	1125551 (Alcoa 30327)	Bracket	1-7/16x1-13/32		24SO	24ST	4
32	5122122-66	Aft Rib	6¾x17	.032	24SO	24ST	1
33	5122122-64	Intercostal	4½x9¼	.025	24SO	24ST	1
34	5122122-58	Brace	3x13	.032	24SO	24ST	1
35	1152352-7700	Shape-Trailing Edge	1x77	.035	24ST		1
36	5122122-120	Aft Rib	6⅜x6½	.032	24SO	24ST	1
37	5122122-54	Aft Rib	6½x21¼	.032	24SO	24ST	1
38	5122122-50	Aft Rib	5⅜x17¼	.025	24SO	24ST	1
39	5122122-48	Aft Rib	5⅜x18¼	.025	24SO	24ST	1

KEY TO FIGURE 92 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
40	5122122-46	Aft Rib	5½x17¼	.025	24SO	24ST	1
41	5122122-44	Aft Rib	5¼x16¼	.025	24SO	24ST	1
42	5122122-8	Closing Rib	5½x21	.032	24SO	24ST	1
	5122122-9						1
43	5122122-72	Brace	4x10	.025	24SO	24ST	1
44	5122122-70	Brace	4x12	.025	24SO	24ST	1
	5122122-71						1
45	5158958-62	Weight Assem.					1
46	5122122-18	Nose Rib	8x12	.032	24SO	24ST	1
	5122122-19						1
47	5122122-20	Nose Rib	8x12	.040	24SO	24ST	1
	5122122-21						1
48	5122122-22	Nose Rib	8x11	.032	24SO	24ST	1
	5122122-23						1
49	5158958-56	Weight Assem.					2
50	5122122-26	Nose Rib	7½x11	.051	24SO	24ST	1
	5122122-27						1
51	5122122-28	Nose Rib	7½x11	.051	24SO	24ST	1
	5122122-29						1
52	5122122-30	Nose Rib	7x10	.032	24SO	24ST	1
53	5122122-32	Nose Rib	7x10	.025	24SO	24ST	1
54	5158958-50	Weight Assem.					2
55	5158958-48	Weight Assem.					1
56	5122122-38	Nose Rib	6⅜x9½	.025	24SO	24ST	1
57	5158958-46	Weight Assem.					1
58	5122122-40	Nose Rib	6⅜x8¾	.025	24SO	24ST	1
59	5158958-44	Weight Assem.					1
60	5122122-42	Nose Rib	8½x8¾	.032	24SO	24ST	1
	5122122-43						1
61	5122122-134	Skin	13x15	.032	525½H		1
	5122122-135						1
62	5122122-4	Spar	7⅜x110	.040	24SO	24ST	1
	5122122-5						1
63	5122122-6	Closing Rib	8x29	.040	24SO	24ST	1
	5122122-7						1
64	3126962	Torque Tube	1⅝ O.D. x 31-13/16	Steel Tube			1
65	2143098	Torque Tube					1
		(Forging) Fitting	2-5/16x3-1/16	Alum Alloy	14ST		1
66	5122122-134	Skin (Tip)	13x15	.032	525½H		1
	5122122-135						1
67	5158958-60	Weight Assem.					1
68	5158958-58	Weight Assem.					1
69	5122122-24	Nose Rib	7¾x11	.032	24SO	24ST	1
	5122122-25						1
70	5158958-54	Weight Assem.					1
71	5158958-52	Weight Assem.					1
72	5122122-34	Nose Rib	6⅞x9¼	.025	24SO	24ST	1
73	5122122-36	Nose Rib	6⅜x9½	.025	24SO	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

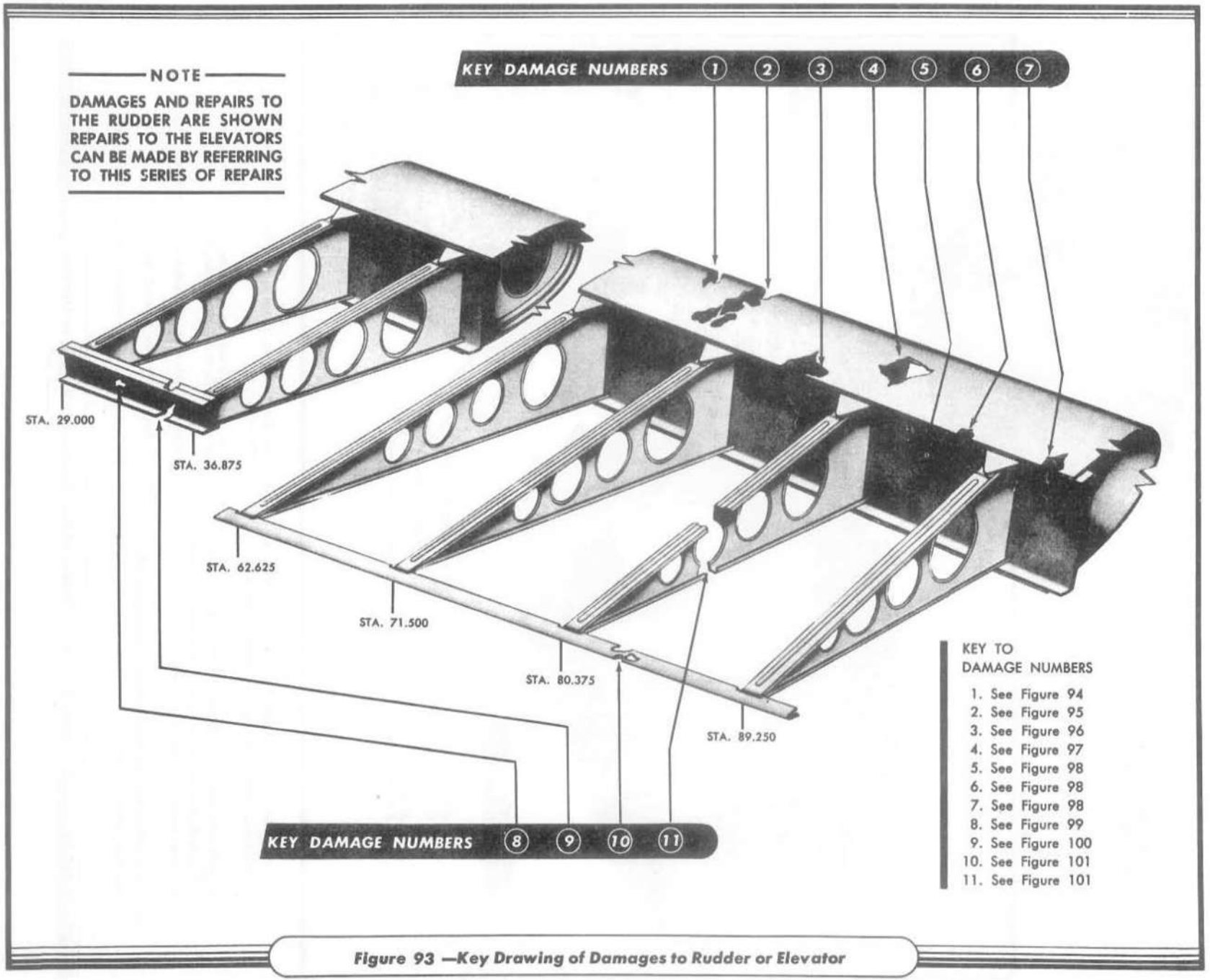
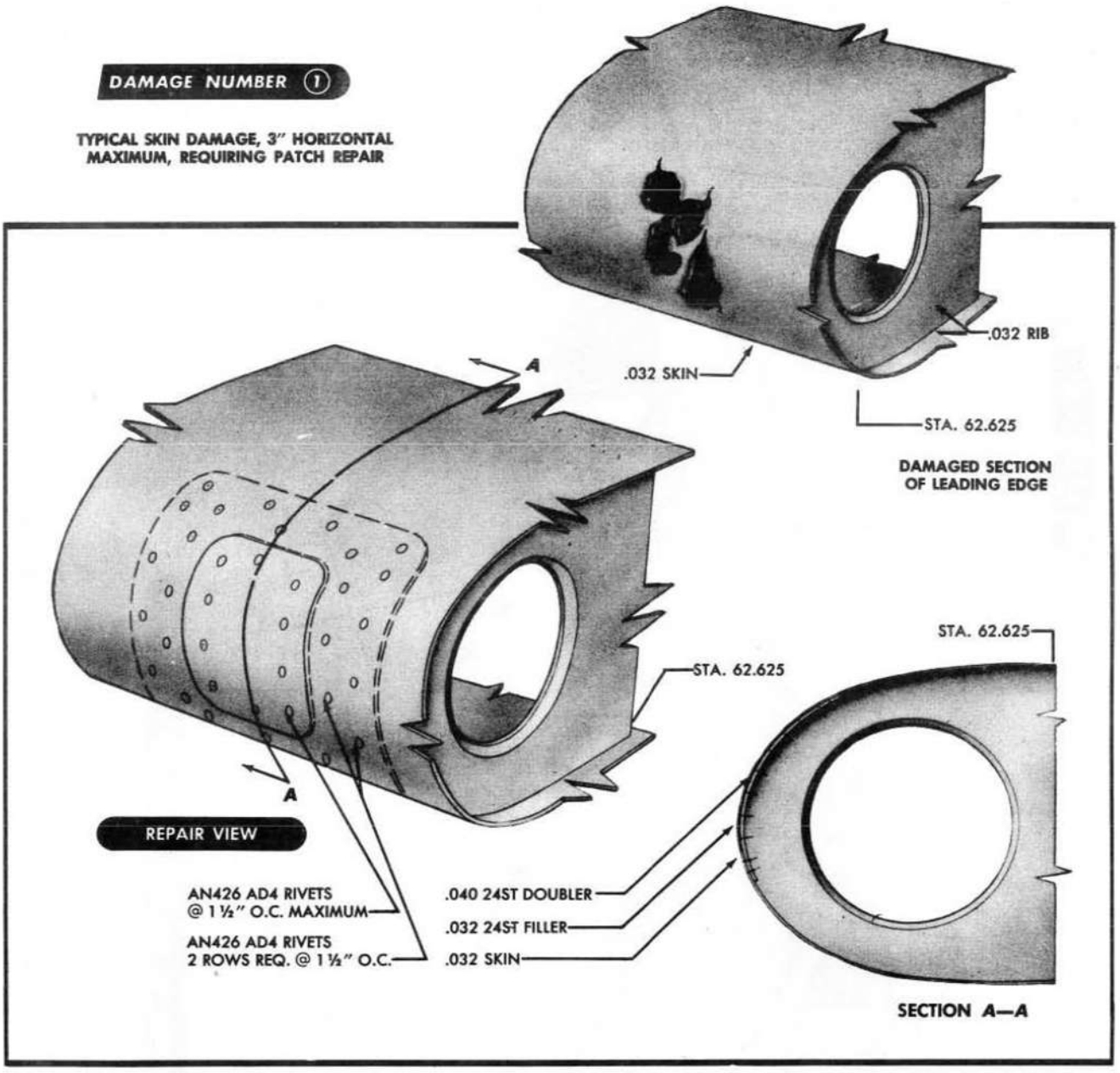


Figure 93 —Key Drawing of Damages to Rudder or Elevator

DAMAGE NUMBER (1)

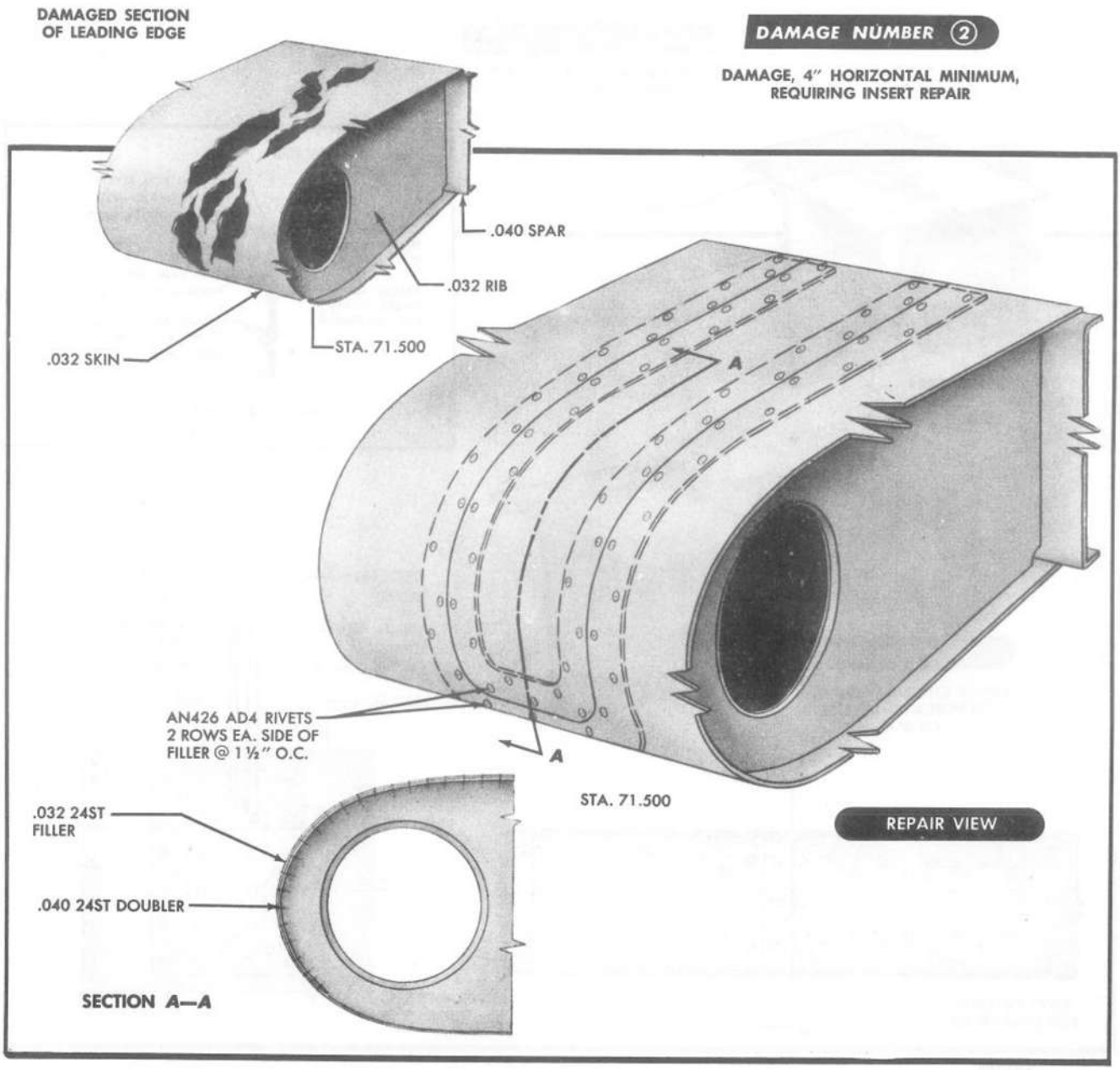
TYPICAL SKIN DAMAGE, 3" HORIZONTAL MAXIMUM, REQUIRING PATCH REPAIR



NOTES

1. A crack under one inch in length may be neglected after having a one-eighth inch stop hole drilled at each end.
2. A crack over one inch in length requires a patch repair. Drill one-eighth inch stop holes at each end of crack. Construct patch from .040 24ST material.
3. If skin is damaged, trim damage smooth, leaving no radius less than one-fourth inch.
4. Use filler as shown above to provide smooth surface for airstream.
5. A surface patch may be used if accessibility does not permit installation of a flush type patch.
6. Replace weights in leading edge when damaged.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

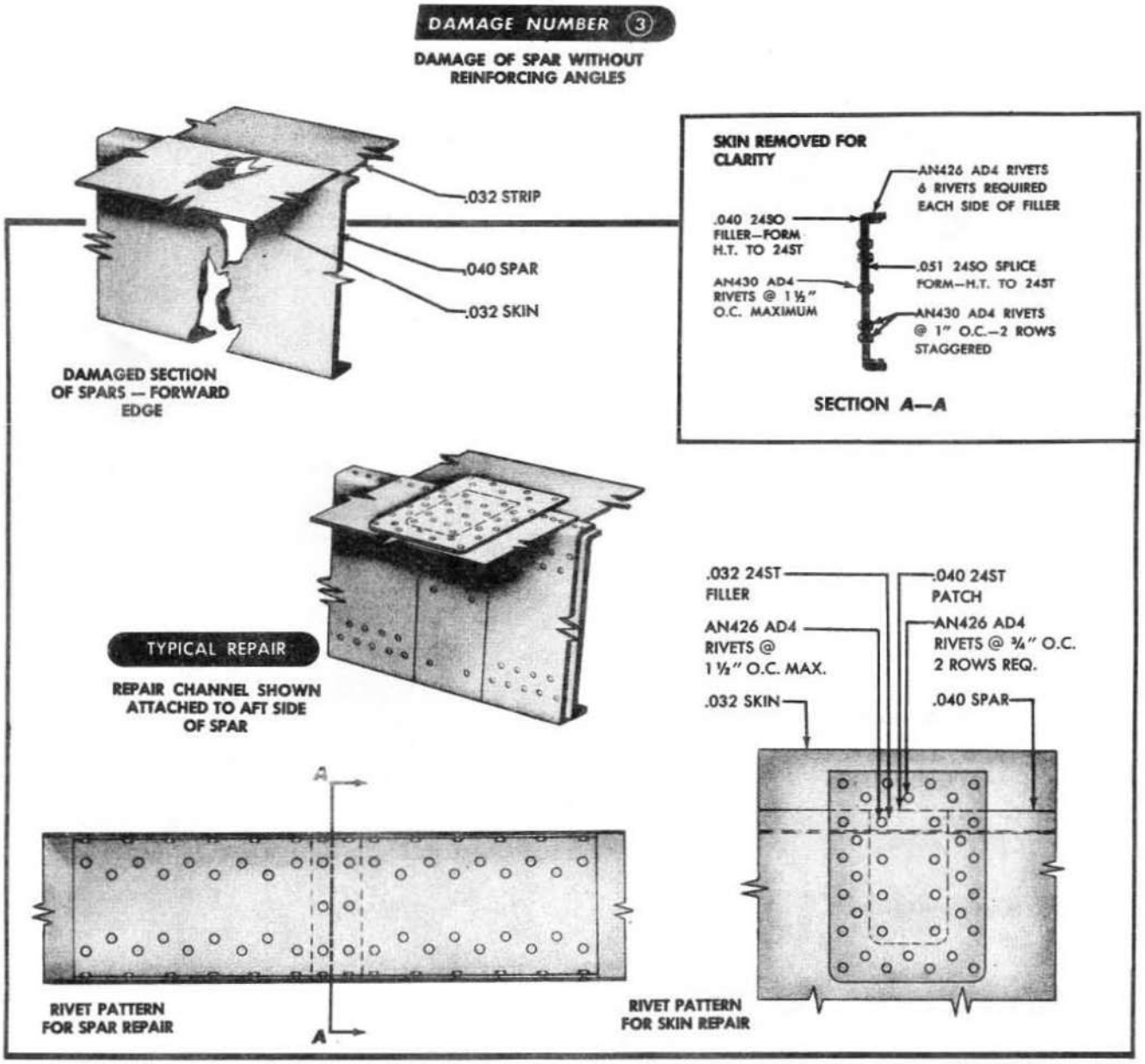
Figure 94 —Patch Repair of Skin Damage to Rudder or Elevator



NOTES

1. Trim damage smooth leaving no radius less than one-fourth inch.
2. Construct patch from .040 24ST material.
3. Construct filler from .032 24ST material.
4. For flush riveting, see Figure 6, Section I.
5. For rivet edge and row distance see Figure 7, Section I.

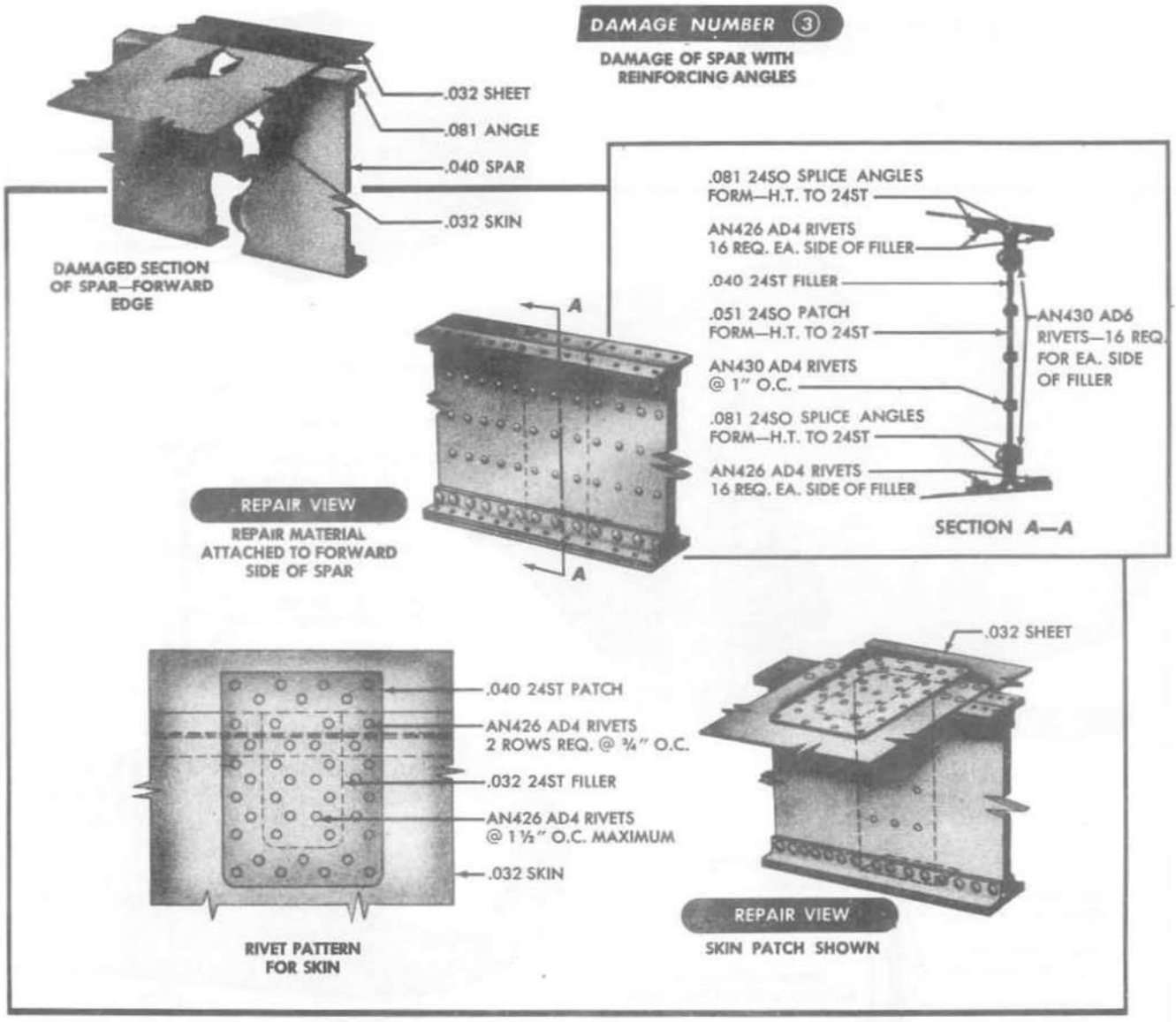
Figure 95 —Insert Repair of Skin Damage to Rudder or Elevator



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice from .051 24SO material. Form and heat treat to 24ST.
4. Construct filler from .040 24SO material. Form and heat treat to 24ST.
5. Construct skin patch from .040 24ST material.
6. Construct skin filler from .032 24ST material.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material, see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

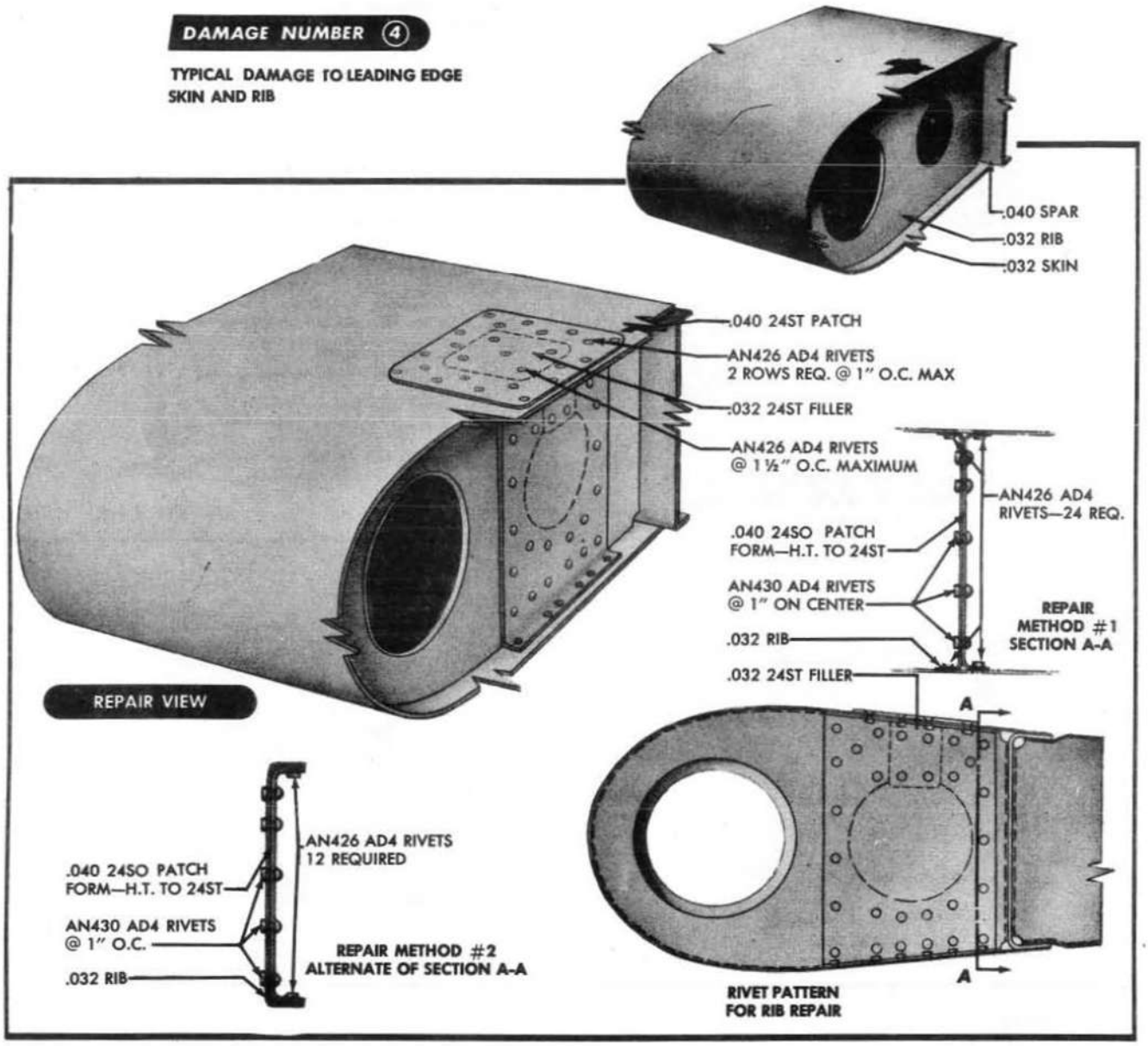
Figure 96 —Splice Repair of Rudder or Elevator Spar (Sheet 1 of 2)



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice angles from .081 24SO material. Form and heat treat to 24ST.
4. Construct patch from .051 24SO. Form and heat treat to 24ST.
5. Construct skin patch from .040 24ST material.
6. Construct skin filler from .032 24ST material.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

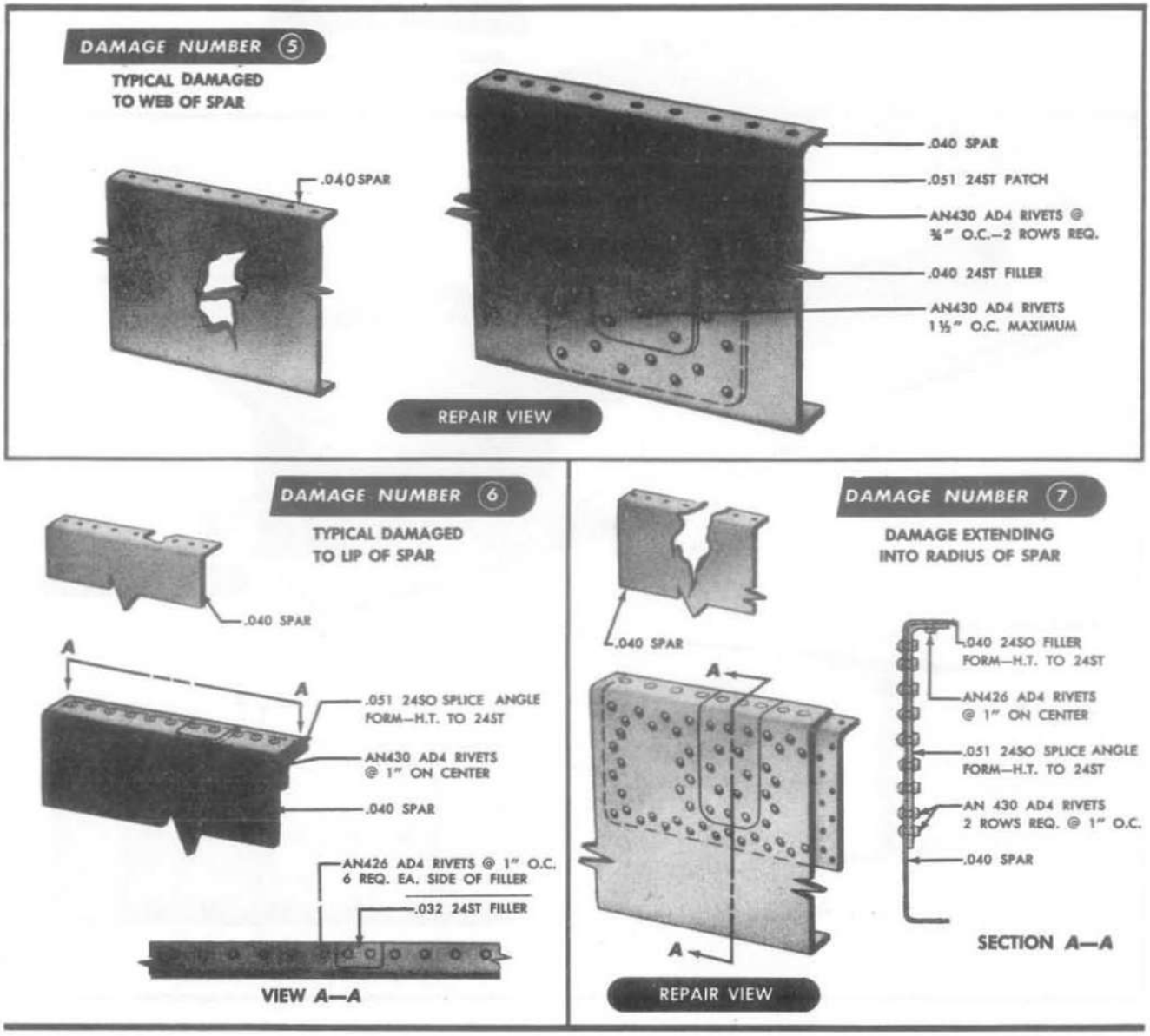
Figure 96 —Splice Repair of Rudder or Elevator Spar (Sheet 2 of 2)



NOTES

1. Trim damage smooth leaving no radius less than one-fourth inch.
2. Construct rib patch from .040 24SO material. Form and heat treat to 24ST.
3. Construct skin patch from .040 24ST material.
4. Construct rib and skin fillers from .032 24ST material.
5. Use existing rivet holes where possible.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.

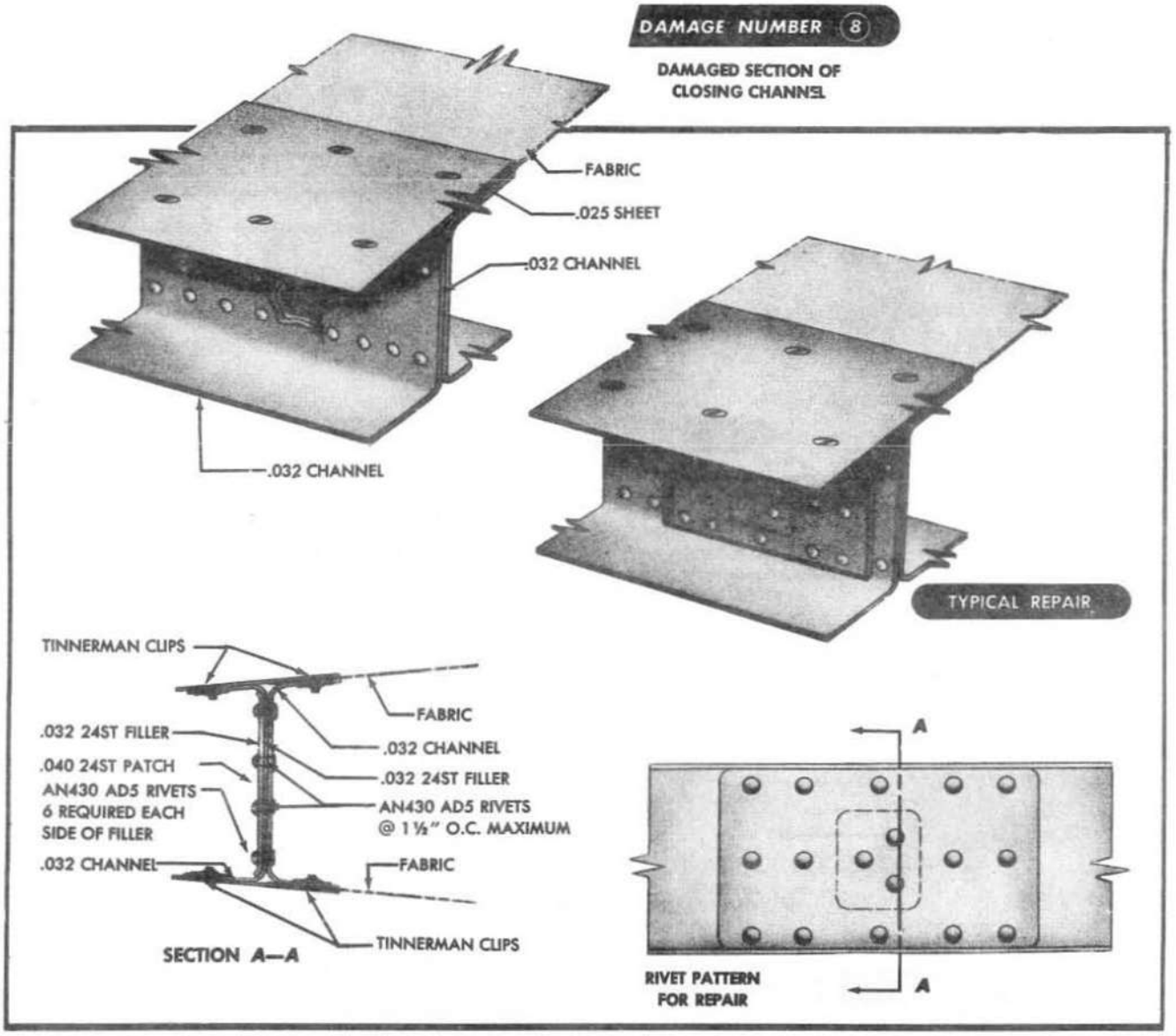
Figure 97—Patch Repair of Leading Edge Rib of Rudder or Elevator



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct patch from .051 24ST material.
4. Construct splice angles from .051 24SO material. Form and heat treat to 24ST.
5. Construct filler from .040 24ST material.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

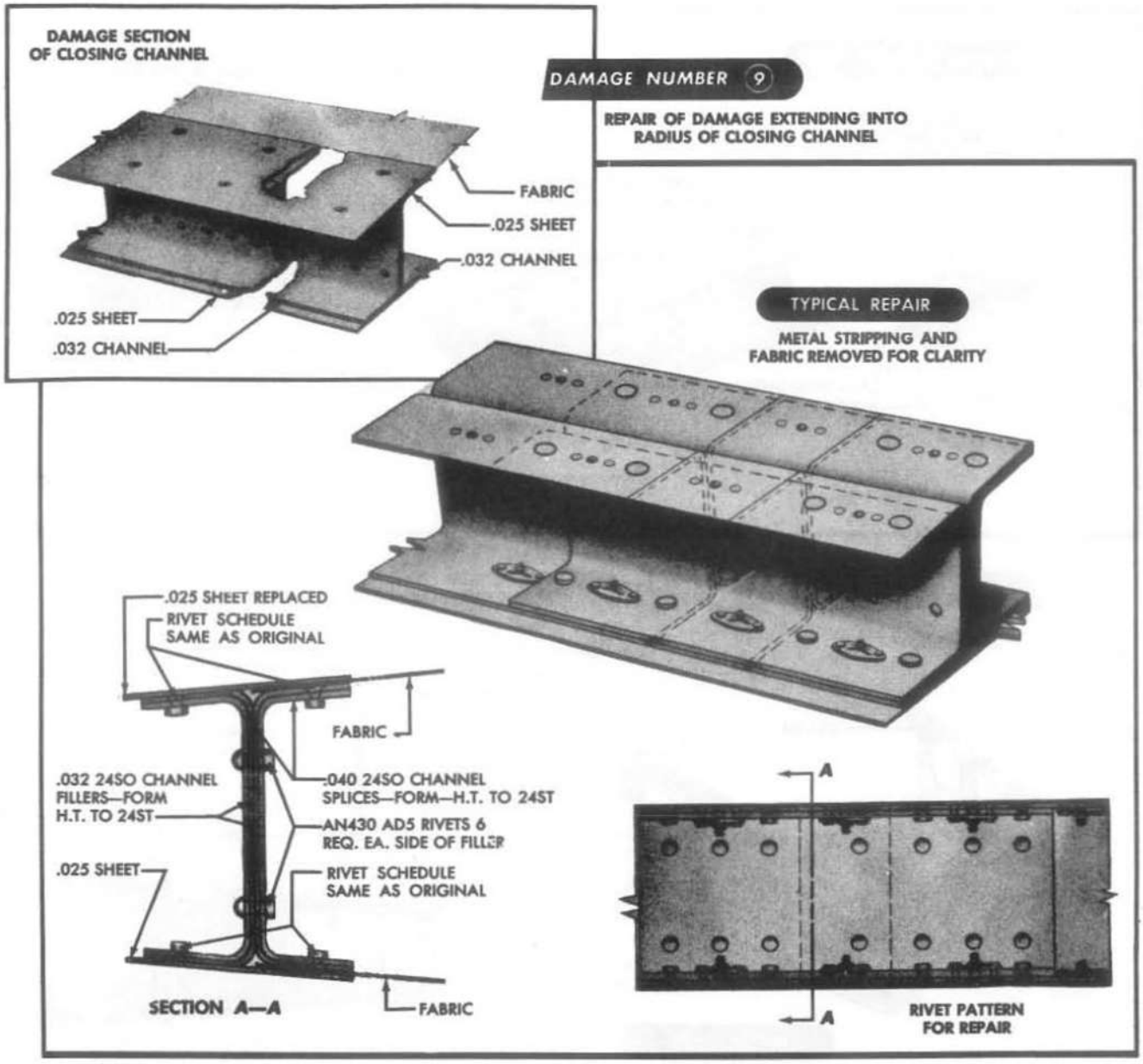
Figure 98 —Patch Repair of Rudder or Elevator Spar Web and Lip



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from .040 24ST material.
4. Construct filler from .032 24ST material.
5. Use existing rivet holes where possible.
6. For rivet edge and row distance see Figure 7, Section 1.
7. For fabric repair refer to Fabric Repair drawings, Section VII.

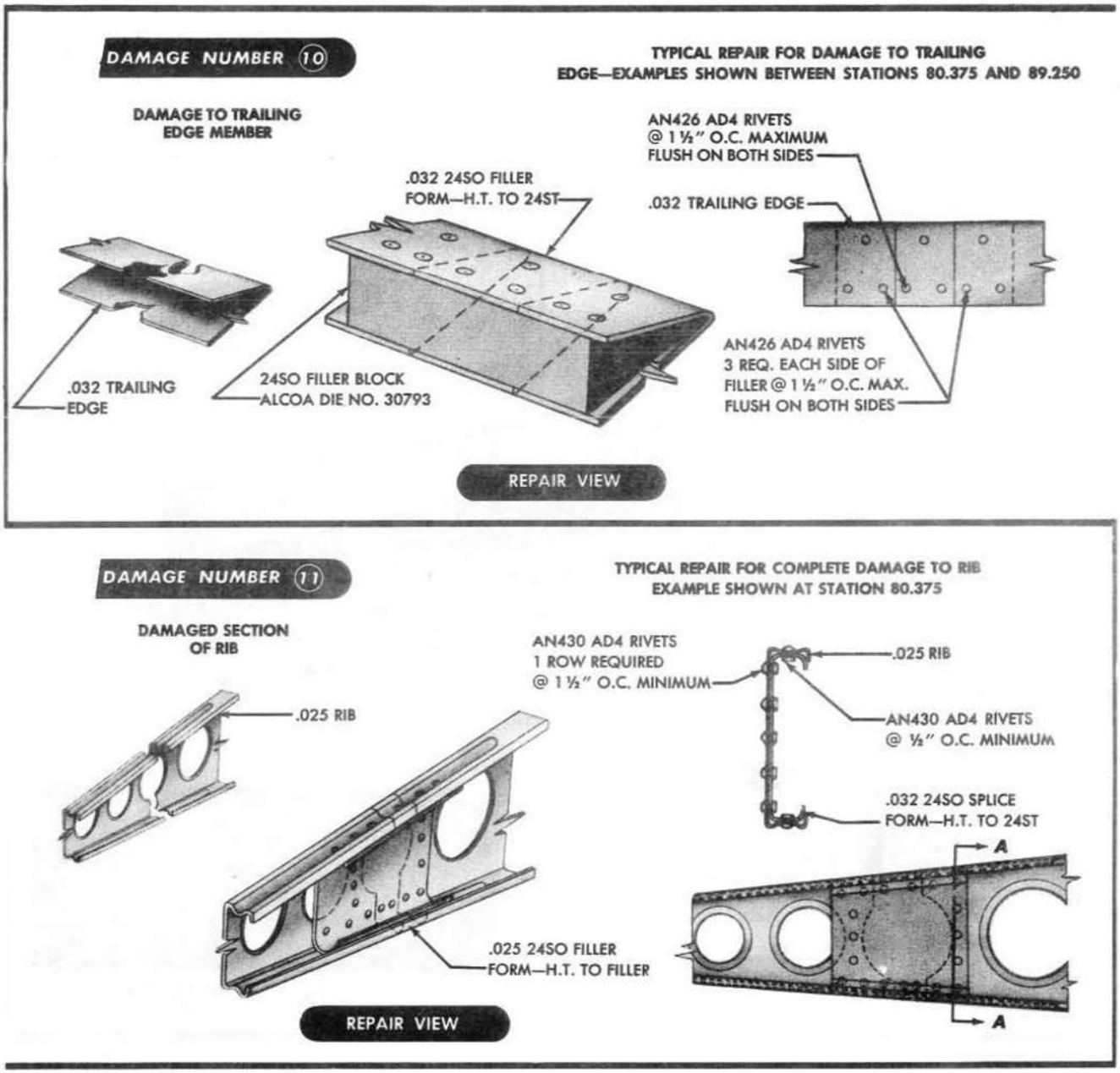
Figure 99 —Patch Repair of Closing Channel of Rudder or Elevator



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct channel splices from .040 24SO material. Form and heat treat to 24ST.
4. Construct channel fillers from .032 24SO material. Form and heat treat to 24ST.
5. Use existing rivet holes where possible.
6. For fabric repairs, refer to Fabric Repair drawings in Section VII.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 100—Splice Repair of Closing Channel of Rudder at Tab



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct trailing edge splice bar as shown in damage number 10, above.
4. Construct trailing edge filler from .032 24SO material. Form and heat treat to 24ST.
5. Construct rib splice from .032 24SO material. Form and heat treat to 24ST.
6. Construct rib filler from .025 24SO material. Form and heat treat to 24ST.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance, see Figure 7, Section I.

Figure 101 —Trailing Edge Rib and Spar Repairs for Rudder or Elevator

SECTION IV Body Group

1. DESCRIPTION.

The fuselage is a semi-monocoque all metal structure incorporating an all-purpose gun nose or a bombardier's compartment nose, a pilot's compartment, nose wheel bay, bomb bay and gunner's compartment. The all-purpose gun nose is an all metal structure with provisions for mounting several different gun combinations. Five skin panels, three for the right-hand side and two for the left-hand side, provide access for the gun mounting provisions. The bombardier's compartment nose is a combination plexiglas and aluminum alloy structure. It affords accommodations for a bombardier and his equipment. The pilots' compartment extends aft from Station 0 to Station 120. It affords accommodations for a pilot and one crew member. The nose wheel bay is located directly below the pilots' compartment floor. It is provided with doors that open and close with the extension and retraction of the nose wheel. The bomb bay extends aft from Station 120 to Station 260. It is divided into two sections by a bulkhead at Station 178. Two doors are attached along the bomb bay sides by hinges. The gunner's compartment is located aft of the bomb bay between Stations 260 and 293. The aft section of the fuselage is attached by tension bolts at Station 352. It extends aft from this point to Station 497 and provides for the attachment of the vertical and horizontal stabilizers. The tail cone is attached to the fuselage at Station 497 and extends aft to Station 538.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN01-1-40.

2. GENERAL REPAIR PROCEDURE.

Before any repairs are made to the fuselage structure, supports must be placed under it to maintain the alignment dimensions specified on figure 4; this will prevent causing a permanent set in the fuselage after repair is made. It is suggested that several measuring points be selected adjacent to the damage, to be used to locate the repair material during the repair procedure.

a. FUSELAGE FRAME AND BULKHEAD CONSTRUCTION.—Two different type frames are used in the construction of the fuselage; they are the channel type and the web type. The channel type, which is the most used, is constructed of formed dural sheet ranging in gage from .040 to .064. Depending upon location, the channel type frames vary in width from one to six inches. The web type frames are constructed of dural sheet webs reinforced with extruded caps. The gage of the webs range from .040 to .125.

(1) NEGLIGIBLE DAMAGE.—Where frames are no smaller than four inches in width the following damage may be considered negligible, provided that it does not extend into a radius or flange: Smooth, isolated, holes up to one inch in diameter may be neglected; cracks up to one inch in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the fuselage frame located at station O is shown repaired by patching on figures 134 and 136. Figure 134 shows the repair of damage which does not exceed one-half of the cross sectional area of the channel. An angle type patch constructed from the same gage and material as the original is formed to fit into the inside of the channel. It is formed in the 24SO condition and heat treated to 24ST. A filler is inserted to provide for the attaching structure. Figure 136 shows the repair of damage in the web. A patch constructed from .091 dural sheet is attached to the web by rivets. A filler constructed from the same gage and material as the web is used when necessary to provide for attaching structure.

(b) Damage to the fuselage frame located at station 447 is shown repaired by patching on figures 148 and 149. Figure 148 shows the repair of damage in the horizontal caps and web. The web is repaired by the use of a patch plate constructed from .229 dural plate. The cap lips are repaired by the use of patch plates constructed from .250 dural plate. Fillers are used where necessary to provide for attaching parts. Figure 149 shows the repair of damage in the angle stiffeners. Patch plates constructed from .125 dural plate are attached to the angle lips by rivets following the original pattern. Fillers are used when necessary to provide for attaching structure.

(c) Damage to frames other than those mentioned in paragraphs *(a)* and *(b)* above, are shown repaired by patching on figures 140 and 145. Figure 140 shows the repair of damage in the flange and web of the channel type frames. The patches are constructed from dural sheet which is heat treated to 24ST after being formed. The thickness of these patches and the size and number of rivets to be used is specified in the table shown on this figure. Figure 145 shows the repair of partial damage in the extruded angle type frame caps. Both the lip and the fin are shown repaired by the use of plate type patches constructed from .125 dural plate.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

(a) Damage to the fuselage frame located at station O is shown repaired by splicing on figure 135. This repair is made to a break in the channel section of the frame where damage exceeds one-half of the cross sectional area. Two angle type patches constructed from .125 dural plate are formed to fit into the inside of the channel. An additional plate constructed from .064 dural is attached to cover the repair on each side of the channel. A filler constructed from the same gage and material as the channel is inserted to provide for the attaching structure.

(b) Damage to the fuselage frame located at station 447 is shown repaired by splicing on figure 149. Repairs are shown made to a complete break through the web and caps. The caps are repaired by the use of splice angles constructed from .125 dural sheet. They are formed in the 24SO condition and heat treated to 24ST. The web is repaired by the use of a dural splice doubler constructed from .051 dural sheet. Fillers are used where necessary to provide for attaching structure.

(c) Damage to frames other than those mentioned in paragraphs *(a)* and *(b)* above, are shown repaired by splicing and insertion on figures 139, 141 and 146. Figure 139 shows three different repairs for a complete break in the channel type frames. The frame used in this example is located at station 49. The repair view shown at the top of the page is to be used when the lightening holes are not needed and when it is necessary to place the splice channel on the inside of the frame. The alternate repair view showing the splice channel attached to the outside of the frame is to be used when the surrounding structure does not interfere. The repair view showing the lightening holes through the splice channel is to be used when it is necessary to retain the lightening holes. The splice channels used to make these repairs are constructed from dural sheet which is heat treated to 24ST after being formed. The correct splice channel thickness and the size and number of rivets is selected from the table shown on figure 141. When the splice channel is attached to the inside of the frame, it is necessary to remove the interfering lightening hole flanges and replace the lost material by attaching one-half inch angle stiffeners to the repair. Figure 141 shows the insert repair of the channel type frame where lightening holes do not interfere. The frame used in this example is located at station 49. The splice channels are constructed from dural sheet which is heat treated to 24ST after being formed. The correct splice channel thickness and the size and spacing of the attaching rivets is selected from the table shown. The insert is constructed from the same gage and material as the original frame. The correct rivet pattern to follow is shown on figure 142. Figure 146 shows the splice and insert repair of the web type frames. When the lightening hole is not needed, the repair is accomplished by the use of a splice. The splice plate is constructed from 24ST dural sheet. The correct thickness of the splice plates and the size and number of the attaching rivets are selected from the table shown. The stiffness lost in the removal of the lightening hole flange is replaced by two one-half by one-half inch bulb angle stiffeners which are attached to the splice plate. When it is necessary to retain the lightening hole, the repair is accomplished by the use of an insert. The insert is constructed to include a lightening hole and replace the lost material.

(4) DAMAGE NECESSITATING REPLACEMENT.—Any fuselage frame or bulkhead requiring the use of more repair material than is practicable should be replaced.

b. FUSELAGE STRINGER CONSTRUCTION.—The fuselage stringers are spaced from four to six inches apart through the entire length of the fuselage. They are constructed of many different formed and extruded shapes.

(1) NEGLIGIBLE DAMAGE.—No damage to the fuselage stringers may be considered negligible.

(2) REPAIR.—The repair of the different sizes and types of fuselage stringers is shown on figures 152, 153, 154, 155 and 156. The repair material and attaching rivets to be used for patching or splicing is shown on these figures. When it is necessary to make an insertion, the damaged area should be replaced by an equivalent section and attached by the splice shown for that particular part.

(3) DAMAGE NECESSITATING REPLACEMENT.—Any damaged fuselage stringer requiring the use of more repair material than is practicable should be replaced. When it becomes necessary to replace an extruded stringer, refer to the extrusion tables shown in Section VIII. These tables are to be used for the determination of the proper part number for replacement purposes, or for the construction of an alternate part from sheet stock.

c. FUSELAGE SKIN CONSTRUCTION.—The fuselage skin is constructed from 24STAL sheet. It ranges in thickness from .032 to .064 and it attached to the frames and stringers.

(1) NEGLIGIBLE DAMAGE.—Smooth holes in the skin up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the fuselage skin where there is no interfering structure is shown repaired by patching on figure 126. A patch constructed from the same gage and material as the skin is attached to the inner side and a filler is used to maintain the smooth skin surface. The view showing the surface type patch is to be used as an alternate repair. The attaching rivets are selected from the table shown on figure 123.

(b) Damage to the fuselage skin in the location of a stringer is shown repaired by patching on figure 125. A surface patch constructed from the same gage and material as the skin is used to make this repair. All sharp edges are beveled to prevent causing any unnecessary aerodynamic drag. The attaching rivets are selected from the table shown on figure 123.

(c) Damage to the fuselage skin in the location of a seam and lap is shown repaired on figure 127. The original doubler is replaced and fillers are used to replace the lost skin material. A surface patch constructed from the same gage and material as the heaviest skin panel is attached to the outside surface of the skin. All sharp edges are beveled to prevent causing any unnecessary aerodynamic drag. The attaching rivets are selected from the table shown on figure 123.

(d) Damage to the fuselage skin when exceeding one-third of the area between the frames and longerons is shown repaired by patching on figure 129. A surface patch constructed from the same gage and material as the skin is placed over the damage and attached to the frames and longerons. The attaching rivets are selected from the table shown on figure 123.

(e) Cracks in the fuselage skin that are over two inches in length are shown repaired by patching on figure 128. One-eighth inch stop holes are drilled at each end of the cracks and patches constructed from the same gage and material as the skin are used to make the repair. The attaching rivets are selected from the table shown on figure 123.

(f) Damage in the fuselage skin in the location of a frame and longeron is shown repaired by patching on figure 130. A surface patch constructed from the same gage and material as the skin is used to make this repair. All sharp edges are beveled to prevent causing any unnecessary aerodynamic drag. The attaching rivets are selected from the table shown on figure 123.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—The repairs to the fuselage skin, as mentioned in the preceding paragraphs, are considered to be sufficient for the repair of all skin damage.

d. PILOTS' COMPARTMENT FLOOR CONSTRUCTION.—The pilots' compartment floor is constructed of dural sheet and reinforcing stiffeners. It is located between stations 0 and 88.

(1) NEGLIGIBLE DAMAGE.–Smooth, isolated holes up to one inch in diameter may be neglected. Cracks up to one inch in length may be neglected after having one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.–Damage to the pilot's compartment floor which can be repaired by patching is shown on figures 159 and 160. Figure 159 shows a typical repair for damage in the floor plating. The patch is constructed from the next heavier gage than the floor plating and is attached by rivets selected from the tables shown on figure 158. The angle shown passing through this damage is repaired by the use of a splice angle and splice bar. Figure 160 shows the repair of damage in a hole flange. A reinforcing ring patch is constructed from the same gage and material as the floor plating and is attached by rivets selected from the tables shown on figure 158.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.–The repairs to the pilots' compartment floor as mentioned in the preceding paragraph, are considered to be sufficient for the repair of all skin damage.

(4) DAMAGE NECESSITATING REPLACEMENT.–Any damaged floor panel requiring the use of more repair material than is practicable should be replaced.

e. NOSE WHEEL TUNNEL WALL AND CROSS TIE CONSTRUCTION.–The nose wheel tunnel wall and cross tie are constructed of dural sheet webs reinforced with extruded and formed cap which attach to the pilot's floor and the lower edge of the fuselage.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the left hand tunnel wall cap lip is shown repaired by patching on figure 164. A splice bar constructed from .094 dural is attached to the lip by rivets. A filler is inserted to provide for the attachment of the floor panel. This repair is to be used for damage which does not extend into a radius or exceed three inches in length.

(b) Damage to the upper right hand tunnel wall cap lips which can be repaired by patching is shown on figure 167. A splice bar constructed from .156 dural plate is attached to the lip by rivets. A filler is inserted to provide for the attachment of the floor panel. This repair is to be used for damage which does not extend into a radius or exceed three inches in length.

(c) Damage to the right-hand tunnel wall web and upper cap fin is shown repaired by patching on figure 169. A splice bar constructed from .156 dural plate is attached to the cap fin by rivets. A filler is inserted to provide for the attaching structure. The web patch is constructed from dural sheet one gage heavier than the web. The rivets used for the attachment are selected from the table shown.

(d) Damage to the cross tie web and upper cap which can be repaired by patching is shown on figure 174. A splice bar constructed from .125 dural plate is attached to the cap lip by rivets. A filler is used to provide for the attaching web. This repair is to be used for damage which does not extend into a radius. The web patch is constructed from dural sheet one gage heavier than the web.

(e) Damage to the cross tie lower cap which can be repaired by patching is shown on figure 173. A splice bar constructed from .125 dual plate is attached to the cap fin by rivets. A filler is inserted to provide for the attaching structure.

(f) Damage to the nose gear support beam which can be repaired by patching is shown on figure 101A. The nose gear support beam is attached to the nose wheel tunnel walls at station 39.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

(a) Damage to the left-hand tunnel wall which can be repaired by splicing is shown on figure 163. All damage is trimmed smooth and fillers are used to replace the lost material. The lower cap is repaired by the use of two splice angles. The splice angle attaching to the outboard side of the cap is constructed from .125 dural sheet. It is formed in the 24SO condition and heat treated to 24ST. The splice angle attaching to the inboard side of the cap is constructed from .069 dural sheet which is also formed in the 24SO condition and heat treated to 24ST. The web is repaired by the use of a splice plate which is constructed from material one gage heavier than the web. It is attached along each side by one row of rivets. The upper cap is repaired by the use of two splice angles. They are constructed from .094 dural sheet which is heat treated to 24ST after being formed.

(b) Damage to the upper cap lip of the left-hand tunnel wall which extends into the radius or exceeds three inches in length is shown repaired by splicing on figure 165. A splice angle constructed from .094 dural plate is attached to the fin and lip. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attaching floor panel.

(c) Damage to the upper cap lip of the right-hand tunnel wall which extends into the radius or exceeds three inches in length is shown repaired by splicing on figure 168. A splice angle constructed from .156 dural plate is attached to the lip. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attaching floor panel.

(d) Damage to the upper cap of the nose wheel tunnel cross tie is shown repaired by splicing on figure 172. All damage is trimmed smooth and fillers are used to replace the lost material. Two splice angles are used to make this repair. The angle attaching to the forward side is constructed from .125 dural plate. It is formed in the 24SO condition and heat treated to 24ST. The angle attaching to the aft side is constructed from .064 dural sheet. It is formed in the 24SO condition and heat treated to 24ST.

(4) DAMAGE NECESSITATING REPLACEMENT.—No repairs have been shown for the upper right-hand cap body since any damage in this area will be cause for the replacement of the entire cap.

f. ALL PURPOSE GUN NOSE AND BOMBARDIER'S COMPARTMENT NOSE CONSTRUCTION.—The All Purpose Gun Nose is constructed from formed and extruded stiffeners which give contour to the skin and provide for mounting of several different gun combinations. The Bombardier's Nose is constructed of plexiglas and formed and extruded stiffeners which give contour to the skin covering of plexiglas, dural, deflector plate (dural), and corrosion resistant steel.

(1) NEGLIGIBLE DAMAGE.—Smooth holes in the skin up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to one inch in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.

(a) Damage to the angle tip stiffeners in both the All Purpose Gun Nose and in the Bombardier's Compartment Nose can be repaired by patching as shown on Figures 107 and 108. These repairs are accomplished by the use of patch plates constructed from the same gage and material as the damaged parts. They are attached to the inside of the angles by rivets which follow the original pattern. Fillers constructed from the same gage and material as the original angles are used to replace the lost material.

(b) Damage to the All Purpose Gun Nose skin, gun floor and rib webs which can be repaired by patching is shown on Figure 106. Damage to the Bombardier's Compartment Nose Skin, deflector plate, shelves, panels, keel, channel frames, and floor which can be repaired by patching is shown on Figures 121D, 121H, 121I, 121J, 121M, 121N, 121O, 121Q, 121V, 121W, 121X, and 121Z. These repairs are accomplished by the use of patch plates constructed from the same gage and material as the damaged panel. Fillers constructed from the same gage and material as the panels are used to replace the lost material.

(c) Damage to the Bombardier's Compartment plexiglas nose which can be repaired by patching is shown on figure 121W. This repair is accomplished by the use of a plexiglas plug of the same gage as the damaged panel.

(d) Damage to the Bombardier's Nose blast tubes which can be repaired by patching is shown on figure 121M. This repair is accomplished by the use of patch plates constructed from .050 18-18 steel. Fillers constructed from the same gage and material as the original tubes are used to replace the lost material.

(e) Damage to the Bombardier's Nose armor plate which can be repaired by patching is shown on Figure 121P. This repair can be accomplished by the use of steel patch plates of 5/16" homogeneous steel. Refer to Figure 121P for repair material variations from the original plate. A filler constructed from the same gage and material as the original armor plate is used to replace the lost material.

(3) DAMAGE REPAIRABLE BY SPLICING.

(a) Damage to the All Purpose Gun Nose angle type stiffeners which can be repaired by splicing is shown on Figures 107 and 109. Figure 107 shows the repair of damage to the angles used in the construction on the gun floor. A splice angle constructed of .102 dural sheet is attached to the inside of the original angle. It is formed in the 24SO condition and heat treated to 24ST. A filler constructed of the same gage and material as the original angle is inserted to provide for the attaching structure. Figure 109 shows the repair of damage in the bulb angle skin stiffeners. This repair is accomplished by attaching a splice angle of the same size to the back side of the original angle. Figures 110 and 111 show the repairs of damage to the skin reinforcing angles of the forward part of the nose section. Splice angles constructed from .102 dural sheet are attached to the inside of the original angles. They are formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original angle is inserted to provide for the attaching structure. Figure 108 shows the repair of damage to the forward bulkhead reinforcing angles. A splice angle constructed from .125 dural plate is at-

tached to the inside of the original angle. It is formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original angle is inserted to provide for the attaching structure. Damage to the Bombardier's Nose angle type stiffeners repairable by splicing is shown on Figures 121G and 121N. Figure 121G shows the repair of damage to angle type skin stiffeners. A splice angle constructed of .072 dural sheet is attached to the inside of the original angle. It is formed in the 24SO condition and heat treated to 24ST. A filler constructed of the same gage and material as the original angle is inserted to provide for the attaching structure. Figure 121N shows the repair of damage in the skin re-inforcing angles of the forward part of the Bombardier's Compartment nose section. A splice angle constructed from .102 dural sheet is attached to the inside of the original angle. This angle is formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original angle is inserted to provide for the attaching structure.

(b) Damage to the All Purpose Gun Nose channel type stiffeners which can be repaired by splicing is shown on Figures 112, 113, 114, 115, 116, 117 and 118. Figures 112, 113 and 114 show the repairs of the frames. Splice channels constructed from dural sheet one gage heavier than the frames are attached to the inside by rivets. They are formed in the 24SO condition and heat treated to 24ST. Fillers constructed from the same gage and material as the frames are inserted to provide for the attaching structure. Figures 115 and 116 show the repairs of damage in the gun floor channels. Splice channels constructed from dural sheet one gage heavier than the original channels are attached to the inside by rivets. They are formed in the 24SO condition and heat treated to 24ST. Fillers constructed from the same gage and material as the original channels are inserted to provide for the attaching structure. Figures 117 and 118 show the repair of the upper longitudinal and beam channels. A splice channel constructed from .051 dural sheet is attached to the inside of the original channel. It is formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original channel is inserted to provide for the attaching structure. Damage to the Bombardier's Compartment Nose channel type stiffeners which can be repaired by splicing is shown on Figures 121C, 121D, 121E, 121F, 121I, and 121S. Figure 121I shows the repairs of damages to the frames. Spliced channels constructed from dural sheet one gage heavier than the frames are attached to the inside by rivets. They are formed in the 24SO condition and heat treated to 24ST. Fillers constructed from the same gage and material as the frames are inserted to provide for the attaching structure. Figure 121S shows the repair of damage to the Bombardier's Compartment Nose floor channels. Spliced channels constructed of the same gage dural sheet as the original are attached to the inside by rivets. They are formed in the 24SO condition and heat treated to 24ST. Fillers constructed from the same gage and material as the original channels are inserted to provide for the attaching structure. Figures 121D and 121E show the repair of the Bombardier's Nose Compartment upper longitudinal channel frames. Spliced channels constructed from .072 and .064 dural sheet respectively are attached to the inside of the original channel. It is formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original channel is inserted to provide for the attaching srtucture. Figures 121C and 121F show the repair of damage to the Bombardier's Compartment Nose upper and side longitudinal channels. A splice channel constructed from the next heavier gage dural sheet is attached to the inside of the original channel. Spliced channels are formed in the 24SO condition and heat treated to 24ST. A filler constructed from the same gage and material as the original channel is inserted to provide for the attaching structure.

(c) Damage to the All Purpose Gun Nose zee type stifteners which can be repaired by splicing is shown on Figures 119 and 120. A splice angle constructed from .051 dural sheet is attached to each side of the damaged stiffener. A filler is inserted to provide for the lost material. Damage to the Bombardier's Compartment Nose zee type stiffeners which can be repaired by splicing is shown on Figures 121F, 121I, and 121R. Splice angles constructed respectively from .072, .064, and .102 dural sheet are attached to the damaged stiffeners. A filler is inserted, in each case, to provide for the lost material.

(d) Damage to the All Purpose Gun Nose floor support frames which can be repaired by splicing is shown on Figure 121. A splice plate constructed from .064 sheet is attached to cover the damage. An angle constructed from .064 dural sheet is attached to the splice plate to restore the stiffness lost in the damaged lightening hole flange.

(e) Damage to the Bombardier's Compartment Nose floor support frames and keel are shown on Figures 121J, 121T, 121U, and 121K (keel). Splice plates constructed of .072 dural sheet, except for Figure 121U which requires .064, are attached to cover the damage. As shown on Figures 121J and 121K, angles con-

structed of .072 dural sheet are attached to the splice plates to restore the stiffness lost in the damaged lightening flange hole. Fillers are inserted in each repair to provide for the lost material.

(f) Damage to the Bombardier's Compartment Nose plexiglas structure which can be repaired by splicing is shown on figure 121L and 121Y. Figure 121L shows the repair of damage at the joining of the plexiglas and the deflector plate. A splice channel constructed of .064 dural sheet is attached to the plexiglas strip by bolts. A filler of plexiglas is inserted to provide for the lost material. Figure 121Y shows the repair of damage at the joining of the upper and lower plexiglas nose structure. Repair procedure is similar to that shown on figure 121L.

(g) Damage to the Bombardier's Compartment Nose armor (splash) plate which can be repaired by splicing is shown on figure 121P. A splice channel constructed from .125 C.M. steel is attached to the outside of the original channel. A filler constructed from the same gage and material as the original channel is inserted to provide for the attaching structure.

(4) DAMAGE NECESSITATING REPLACEMENT.–Damage requiring the use of more repair material than is practicable will necessitate replacement.

g. BOMB BAY DOOR CONSTRUCTION. – The bomb bay door is constructed from skin, ribs and a web.

(1) NEGLIGIBLE DAMAGE. – Smooth, isolated holes in the skin and web up to one inch in diameter and dents that show no sign of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING. – Damage to the bomb bay door which can be repaired by patching is shown on figures 177 and 180. Figure 177 shows the repair of damage in the web. Patch plates constructed from the same gage and material as the web are attached to cover the damage. Where the lightening hole flange is damaged, one-half by one-half inch angle stiffeners are attached to the patch. Figure 180 shows the repair of damage in the web and skin at the closing edge. The web patch is constructed from .051 alclad sheet. It is formed and attached to the outside surface of the web. The skin patch is constructed from .040 alclad sheet. It is attached to the outside surface of the skin and has had its edges beveled to prevent causing any unnecessary aerodynamic drag. Fillers are used where necessary to provide for the attaching structure.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.–Damage to the bomb bay door which can be repaired by splicing is shown on figures 178 and 179. Figure 178 shows the repair of a complete break in the ribs. A splice channel constructed from .081 dural sheet is attached to the inside of the rib. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to replace the lost material. Figure 179 shows the repair of a complete break in the closing rib. A splice channel constructed from .072 dural sheet is attached to the inside of the rib. It is formed in the 24SO condition and heat treated to 24ST. Fillers are used where necessary to provide for the attaching structure.

(4) DAMAGE NECESSITATING REPLACEMENT.–No repairs have been shown for damage in the bomb bay door hinges, since it is necessary that they be replaced if damaged.

h. WING SPAR CROSS-TIE ASSEMBLY CORROSION DAMAGE. – Corrosion damage may be removed from overall surface of wing spar cross-tie assemblies, part No. 5123892 and 5193143, to a maximum depth of 0.050 inch. Areas where portions of the surface are removed should then be cleaned and treated in accordance with applicable technical directives.

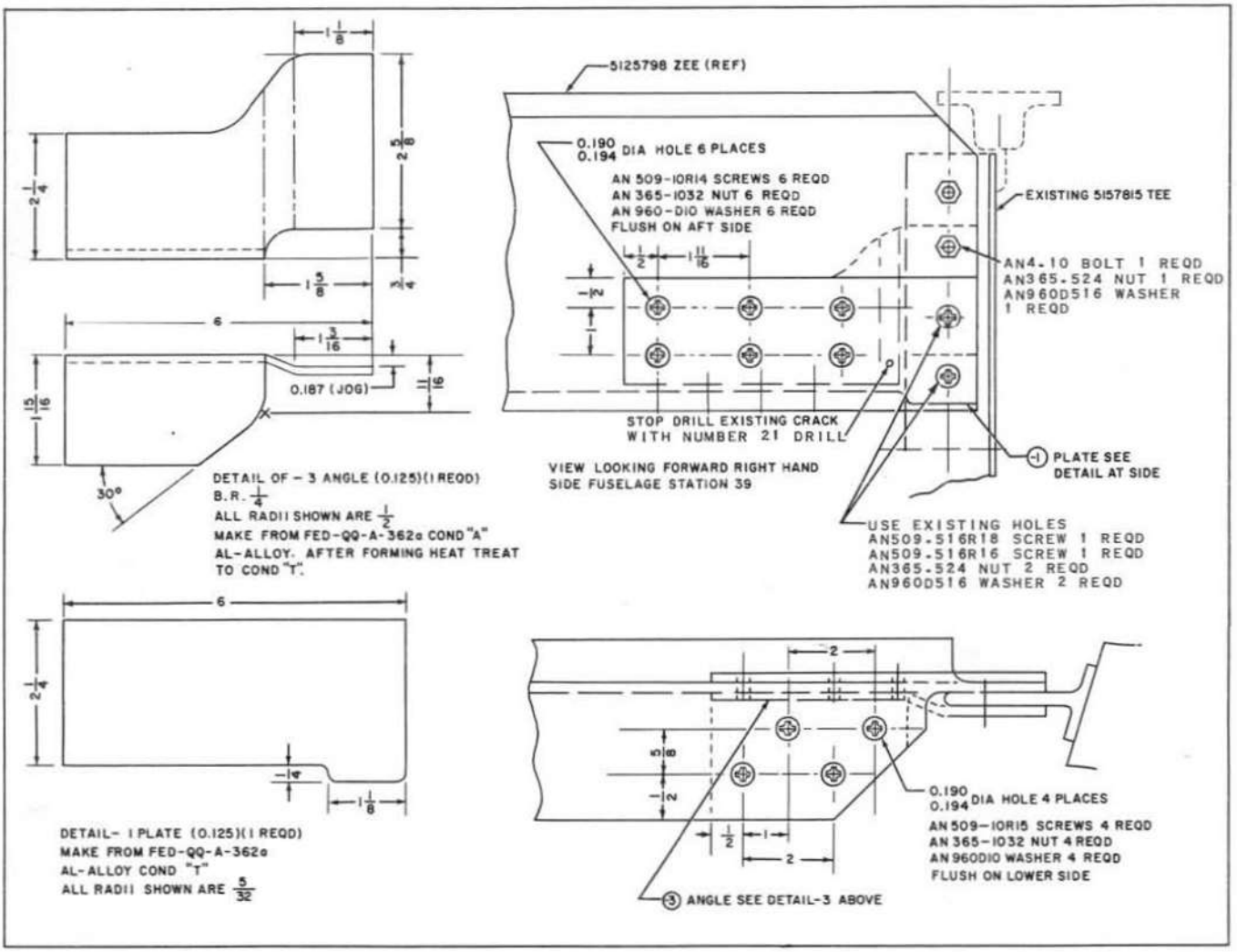


Figure 101A–Rework of Nose Gear Support Beam

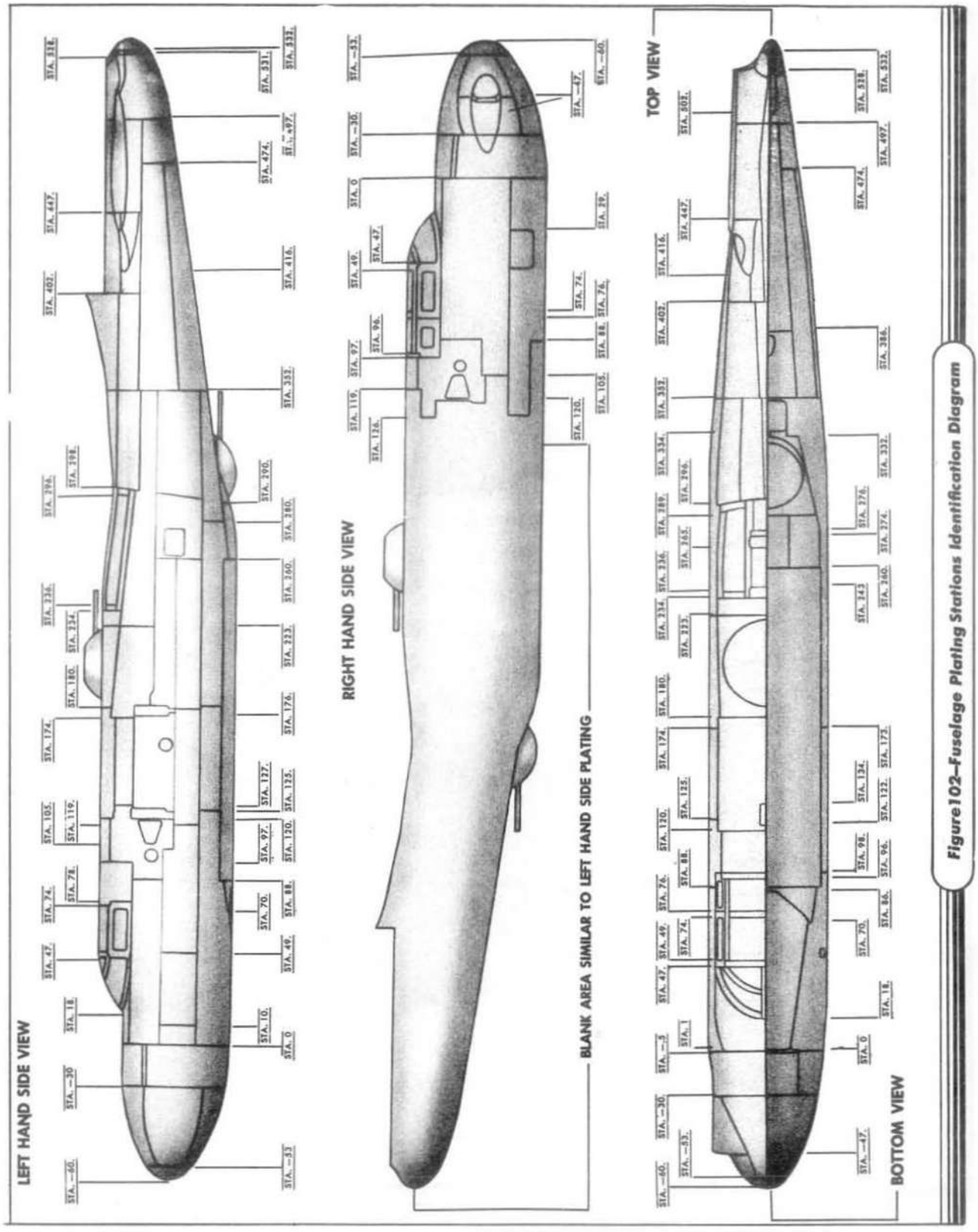
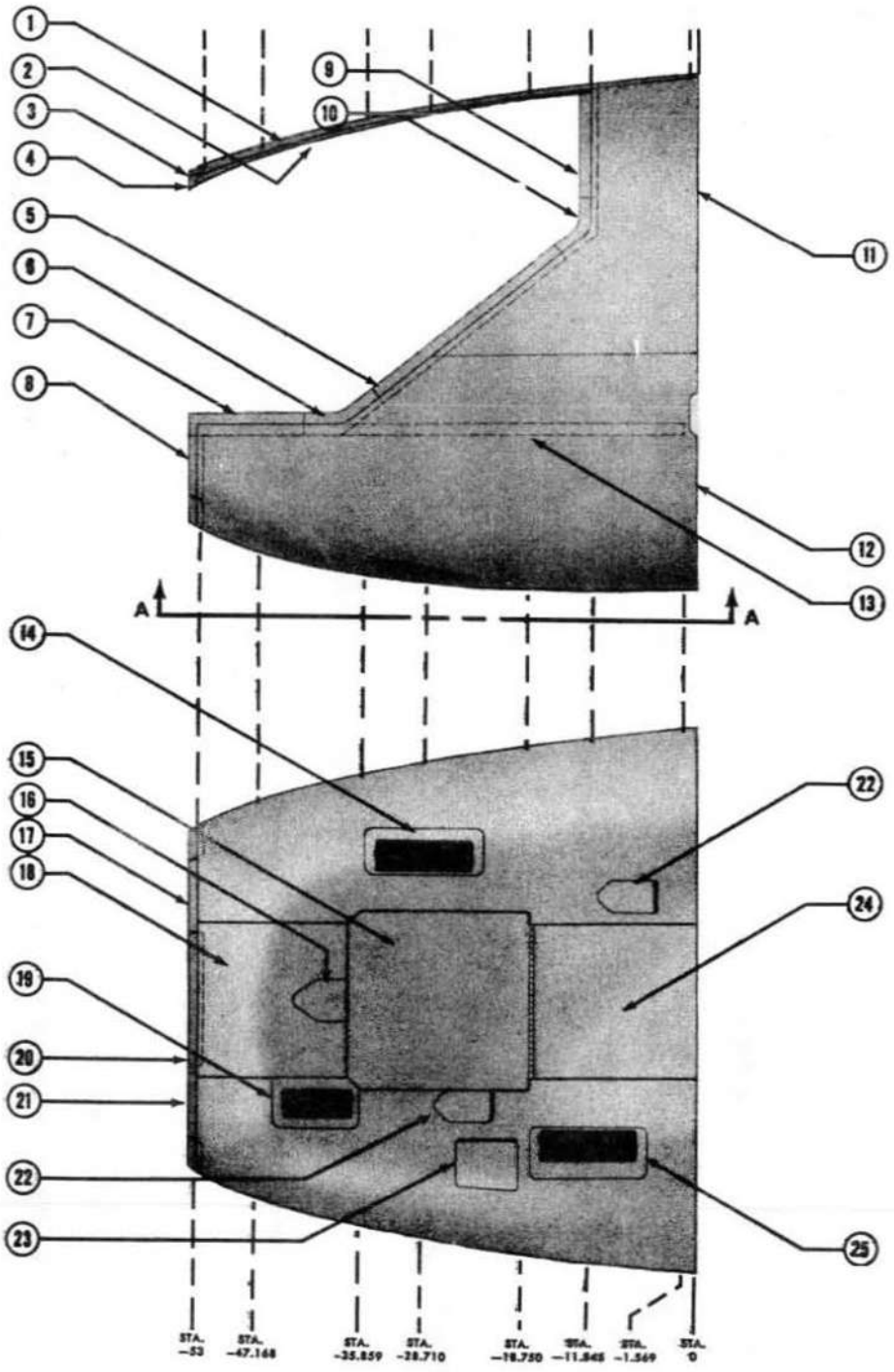


Figure 102–Fuselage Plating Stations Identification Diagram



VIEW A—A

Figure 103—Fuselage All-Purpose Nose Plating Diagram

KEY TO FIGURE 103

Note: L.H. and R.H. indicate opposite parts within the assembly.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5202545-2	Skin	17x55	.040	24SO	24ST	1
2	5202545-10 L.H. 5202545-11 R.H.	Doubler	2x50	.064	24SO	24ST	1 1
3	5202545-14	Splice Plate	1½x12	.064	24ST		1
4	5202545-12 L.H. 5202545-13 R.H.	Corner Plate	4x4	.064	24SO	24ST	1 1
5	5202545-20 L.H. 5202545-21 R.H.	Doubler	2x25	.064	24SO	24ST	1 1
6	5202545-22 L.H. 5202545-23 R.H.	Doubler	5½x8¼	.064	24SO	24ST	1 1
7	5202545-24 L.H. 5202545-25 R.H.	Doubler	2⅝x13½	.064	24SO	24ST	1 1
8	5202545-26 L.H. 5202545-27 R.H.	Splice Plate	1½x13	.051	24ST		1 1
9	5202545-16 L.H. 5202545-17 R.H.	Doubler	2x15	.064	24SO	24ST	1 1
10	5202545-18 L.H. 5202545-19 R.H.	Doubler	4½x7	.064	24SO	24ST	1 1
11	5202545-4 L.H. 5202545-5 R.H.	Skin	29x42	.040	24SO	24ST	1 1
12	5202545-50 L.H. 5202545-51 R.H.	Skin	25x54	.040	24SO	24ST	1 1
13	5202545-28 L.H. 5202545-29 R.H.	Doubler	15x19½	.040	24SO	24ST	1 1
14	5143833-2	Cuff Plate	4⅞x12½	.035	L.C. Steel 1020		1
15	5143627-4	Access Door Sheet	18⅞x19	.040	24SO	24ST	1
16	5202545-40	Door	5¼x5⅝	.040	24ST		1
17	5202545-30	Doubler	25x55	.051	24SO	24ST	1
18	5202545-8	Skin	16½x17	.040	24ST		1
19	5143835-2	Cuff Plate	5½x9¼	.035	L.C. Steel 1020		1
20	5202545-34	Splice Plate	1½x15	.051	24ST		1
21	5202545-32	Doubler	25x55	.051	24SO	24ST	1
22	5202545-36	Door	3½x6	.040	24ST		2
23	5202545-38	Door	6x6½	.040	24ST		1
24	5202545-6	Skin	16½x19	.040	24ST		1
25	5143834-2	Cuff Plate	5⅜x12½	.035	L.C. Steel 1020		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

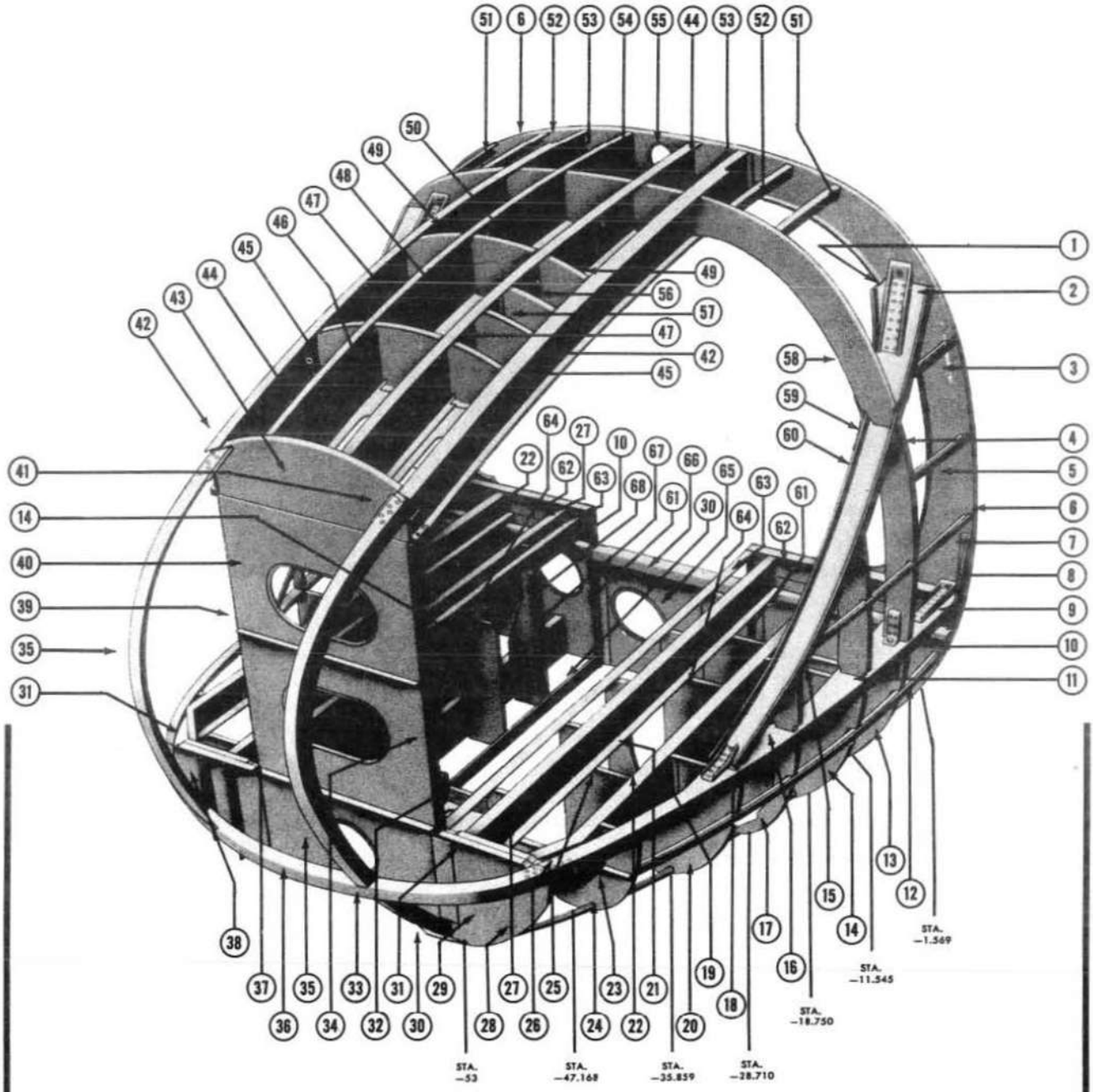


Figure104— Fuselage All Purpose Nose Structure Diagram (Sheet 1 of 2)

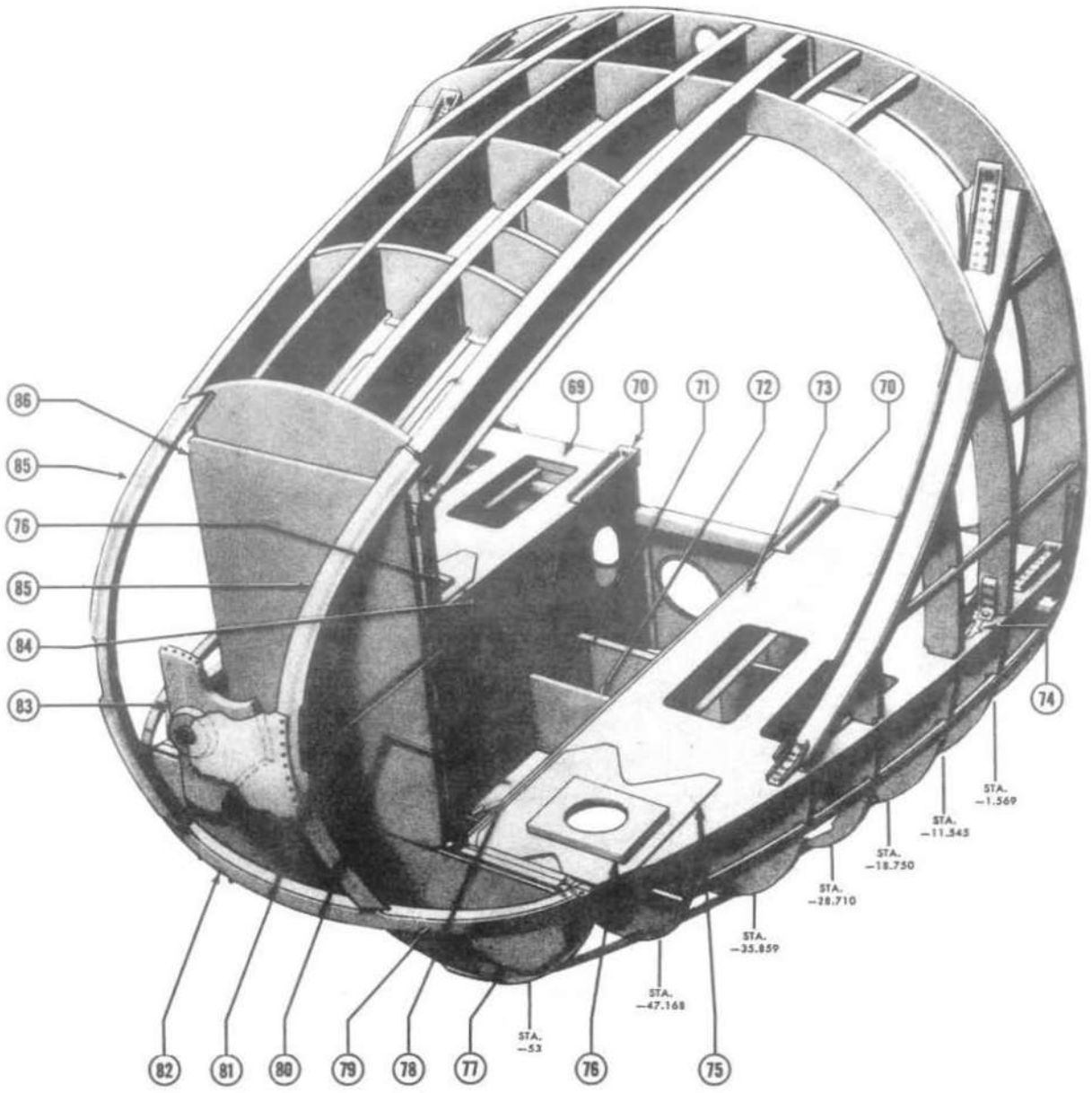


Figure 104 — Fuselage All Purpose Nose Structure Diagram (Sheet 2 of 2)

KEY TO FIGURE 104

Note: L.H. and R.H. indicate opposite parts within the assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5202519-4	Strip	¾x44	.091	24ST		2
2	4143314	Fitting	Made from 4143303 Blank Forg.		14ST		2
3	5202500-6 L.H.	Angle S-130893	Length 6½		24ST		1
	5202500-7 R.H.						1
4	2202234 L.H.	Frame	4¼x21	.051	24SO	24ST	1
	2202234-1 R.H.						1
5	5202500-8 L.H.	Angle S-130893	Length 9¾		24ST		1
	5202500-9 R.H.						1
6	5202323 L.H.	Panel	22x58	.064	24SO	24ST	1
	5202323-1 R.H.						1
7	5202500-10 L.H.	Angle S-130893	Length 25		24ST		1
	5202500-11 R.H.						1
8	5202519-10 L.H.	Angle	3¼x9¾	.062	24SO	24ST	1
	5202519-11 R.H.						1
9	4143463 L.H.	Fitting	Made from 4143303 Blank Forg.		24ST		1
	4143463-1 R.H.						1
10	5202519-8 L.H.	Zee	4x19½	.064	24SO	24ST	1
	5202519-9 R.H.						1
11	2202236 L.H.	Frame	4¼x15⅛	.051	24SO	24ST	1
	2202236-1 R.H.						1
12	5202500-12 L.H.	Angle S-130893	Length 48		24ST		1
	5202500-13 R.H.						1
13	4143511	Panel	19x21¼	.051	24SO	24ST	1
14	4143512 L.H.	Panel	20x20	.051	24SO	24ST	1
	4143512-1 R.H.						1
	2203051 L.H.	Tee S-1114110	Length 16¾		24ST		1
	2203052 R.H.	Tee S-1114110	Length 15-3/16		24ST		1
15	2203061	Angle S-167883	Length 18-7/16		24ST		1
16	2202239 L.H.	Frame	4x7¼	.051	24SO	24ST	1
	2202239-1 R.H.						1
17	2202238	Frame	4x15¾	.051	24SO	24ST	1
18	5203238 L.H.	Angle	13½x51⅜	.091	24SO	24ST	1
	5203238-1 R.H.						1

KEY TO FIGURE 104 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
19	2703052	Tee S-1114110	Length 15-3/16		24ST		1
20	4143397 L.H.	Panel	18x18	.051	24SO	24ST	1
	4143397-1 R.H.						1
21	2202237 L.H.	Panel	5-13/16x18¼	.051	24SO	24ST	1
	4143408 R.H.						1
22	2203093	Angle S-167883	Length 15-13/16		24ST		1
	5202500-26 L.H.	Channel	6¼x52½	.091	24SO	24ST	1
	5202500-27 R.H.						1
23	2202566 L.H.	Angle S-167883	Length 11-3/16		24ST		1
	2202566-1 R.H.						1
24	4143383 L.H.	Panel	15x15	.051	24SO	24ST	1
	4143383-1 R.H.						1
25	2203095 L.H.	Angle S-167883	Length 14-7/16		24ST		1
	2203095-1 R.H.						1
26	4143887 L.H.	Angle	2½x6	.091	24SO	24ST	1
	4143887-1 R.H.						1
27	5202500-28 L.H.	Channel	6¼x51	.091	24SO	24ST	1
	5202500-29 R.H.						1
28	5202500-14 L.H.	Angle S-130893	Length 53		24ST		1
	5202500-15 R.H.						1
29	2202352 L.H.	Panel	10⅞x12	.051	24SO	24ST	1
	2202352-1 R.H.						1
	5202520-12	Angle	1½x9⅝	.064	24ST		1
30	5202500-18 L.H.	Angle	2½x57	.091	24SO	24ST	1
	5202500-19 R.H.						1
31	5202520-8 L.H.	Angle	1⅝x19½	.051	24ST		1
	5202520-9 R.H.						1
32	5202170	Fitting Assem.			Dural Casting		1
33	5143713-10 L.H.	Angle	2½x17	.091	24SO	24ST	1
	5143713-11 R.H.						1
34	2143628 L.H.	Tee S-1203059	Length 32		24ST		1
	2143628-1 R.H.						1
35	5143713-8 L.H.	Angle	2½x34	.091	24SO	24ST	1
	5143713-9 R.H.						1
36	5143713-14	Angle	2½x50	.091	24SO	24ST	1
37	5202520-16	Angle	1⅝x15⅞	.051	24ST		1
38	5202520-14	Channel	3½x9½	.051	24ST		1
39	5202520-6	Angle	1½x16	.064	24ST		1

KEY TO FIGURE 104 (Continued)

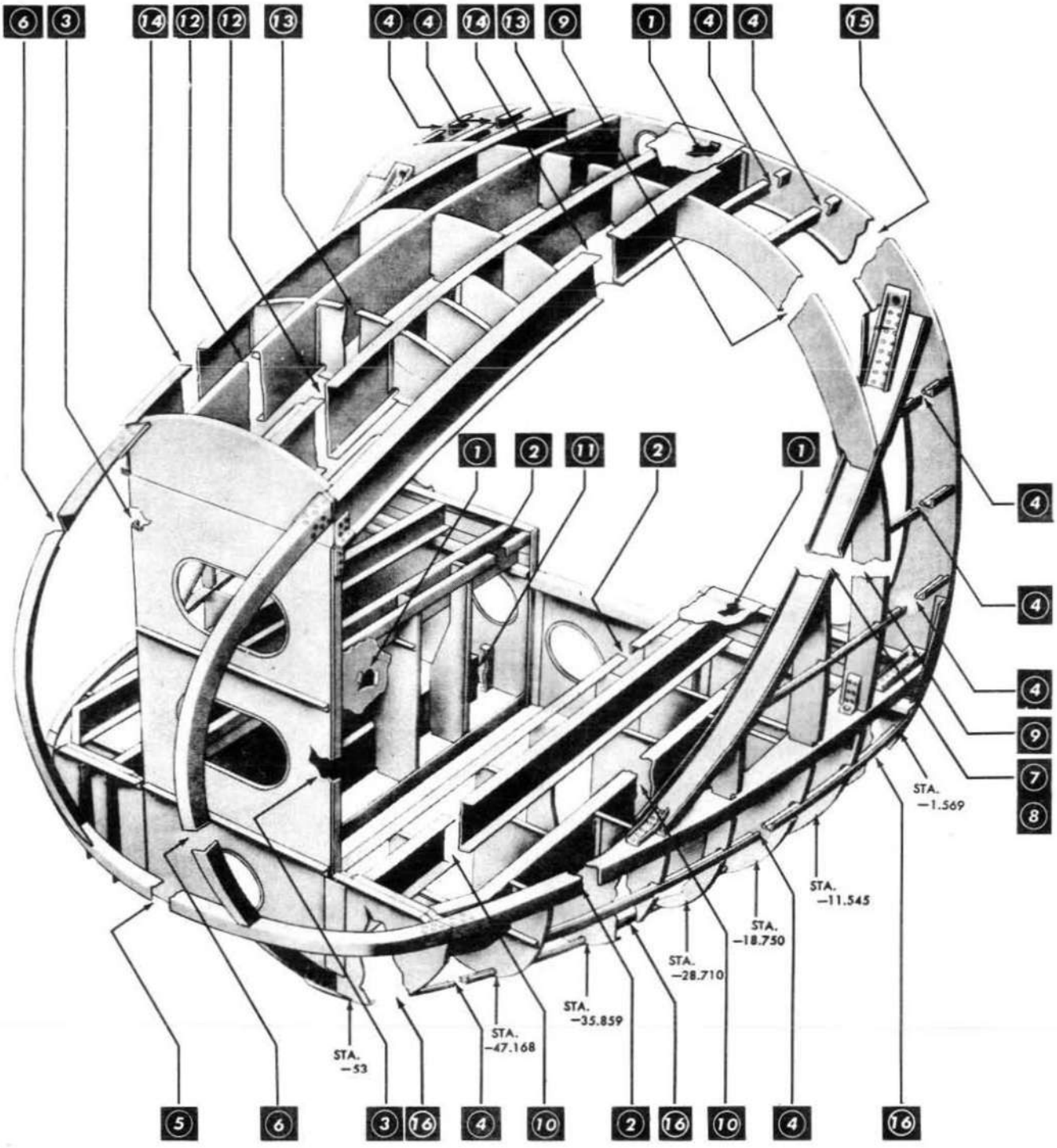
Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
40	5202520-4	Panel	16x33½	.051	24ST		1
	5143686-14	Angle	1¾x15¾	.051	24ST		1
	5202520-2	Angle	1½x16	.064	24ST		1
41	2143873 L.H.	Angle	3x8¼	.091	24SO	24ST	1
	2143873-1 R.H.						1
42	5202545-10 L.H.	Doubler	2x50	.064	24SO	24ST	1
	5202545-11 R.H.						1
43	5143686-12	Panel	6¼x17⅞	.040	24SO	24ST	1
44	5143686-16 L.H.	Channel	7x52½	.040	24SO	24ST	1
	5143686-17 R.H.						1
45	5143686-20 L.H.	Zee	5½x52½	.040	24SO	24ST	1
	5143686-21 R.H.						1
46	5143686-22	Panel	18x54	.032	24ST		1
47	5143686-28 L.H.	Panel	6x7	.040	24SO	24ST	1
	5143686-29 R.H.						1
48	5143686-32	Panel	6x6¾	.040	24SO	24ST	1
49	5143686-36 L.H.	Panel	6x7	.040	24SO	24ST	1
	5143686-37 R.H.						1
50	5143686-10	Panel	Length 9¾		24ST		1
51	5202500-4 L.H.	Angle S-130893	Length 9¾		24ST		1
	5202500-5 R.H.						1
52	5202500-2 L.H.	Angle S-130893	Length 9¾		24ST		1
	5202500-3 R.H.						1
53	5143686-8 L.H.	Panel	6x7	.040	24SO	24ST	1
	5143686-9 R.H.						1
54	5143686-2	Panel	6x6¾	.040	24SO	24ST	1
55	5143686-4	Panel	6x17⅞	.040	24SO	24ST	1
56	5143686-34	Panel	6x7	.040	24SO	24ST	1
57	5143686-40	Panel	6x7	.040	24SO	24ST	1
58	2202235 L.H.	Frame	17½x19	.051	24SO	24ST	1
	2202235-1 R.H.						1
59	2143683	Gusset	3x5¾	.064	24ST		2
60	5202543 L.H.	Channel	8x44	.091	24SO	24ST	1
	5202543-1 R.H.						1
61	2143624 L.H.	Tee S-1020195	Length 17⅛		24ST		1
	2143624-1 R.H.						1
62	5202519-6 L.H.	Angle	2⅛x20	.064	24SO	24ST	1
	5202519-7 R.H.						1

KEY TO FIGURE 104 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
63	3203233 L.H. 3203233-1 R.H.	Angle	4⅛x51¼	.091	24SO	24ST	1 1
64	2202565 L.H. 2202565-1 R.H.	Angle S-167883	Length 17-7/16		24ST		1 1
65	4202501	Panel Assem.	14½x16	.064	24ST		1
66	5202519-2	Channel	3½x16	.064	24SO	24ST	1
67	5203220 L.H. 5203220-1 R.H.	Channel	8⅝x46½	.091	24SO	24ST	1 1
68	2202232	Panel	5¾x19	.051	24SO	24ST	1
	2202233	Frame	10½x18⅛	.051	24SO	24ST	1
69	5202500-22	Floor	20½x53	.040	24ST		1
70	4143313 L.H. 4143313-1 R.H.	Fitting	Made from 4143312 Blank Forg. Made from 4143312-1 Blank Forg.		14ST 14ST		1 1
71	2202502	Panel	6¾x16	.051	24ST		1
72	2202508	Panel Assem.	6½x16	.051	24ST		1
73	5202500-20	Floor	20½x53	.040	24ST		1
74	5202500-24 L.H. 5202500-25 R.H.	Channel	6¼x16¾	.091	24SO	24ST	1 1
75	4143482	Doubler	11x14⅝	.091	24ST		1
76	2143473	Plate	6½x7	.500	24ST		2
77	4202167	Armor Plate Assem. (Lower)	9¾x32	.375	Face Hardened Steel		1
78	2205272	Angle S-130893	Length 15⅞		24ST		1
79	5143713-4 L.H. 5143713-5 R.H.	Strip	2⅝x14	.064	24SO	24ST	1 1
80	5202545-40	Door	5¼x5⅝	.040	24ST		1
81	4203277 L.H. 4203277-1 R.H.	Panel	17⅛x50-13/16	.040	24ST		1 1
82	5143713-12	Doubler	6x24	.064	24ST		1
83	1202539	Window	2x2	.250	Transparent Acrylate Base		1
	1202738	Seal			Molding Syn. Rubber		1
	1202538	Retainer	3¾x3¾	.051	24SO	24ST	1
	5202453	Support	9½x14	.051	24SO	24ST	1
84	4143722	Doubler	11x14-11/16	.091	24ST		1
85	5143713-6 L.H. 5143713-7 R.H.	Strip	2¾x32	.064	24SO	24ST	1 1
86	4143994	Armor Plate (Upper)	16¾x23¾	.375	Face Hardened Steel		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

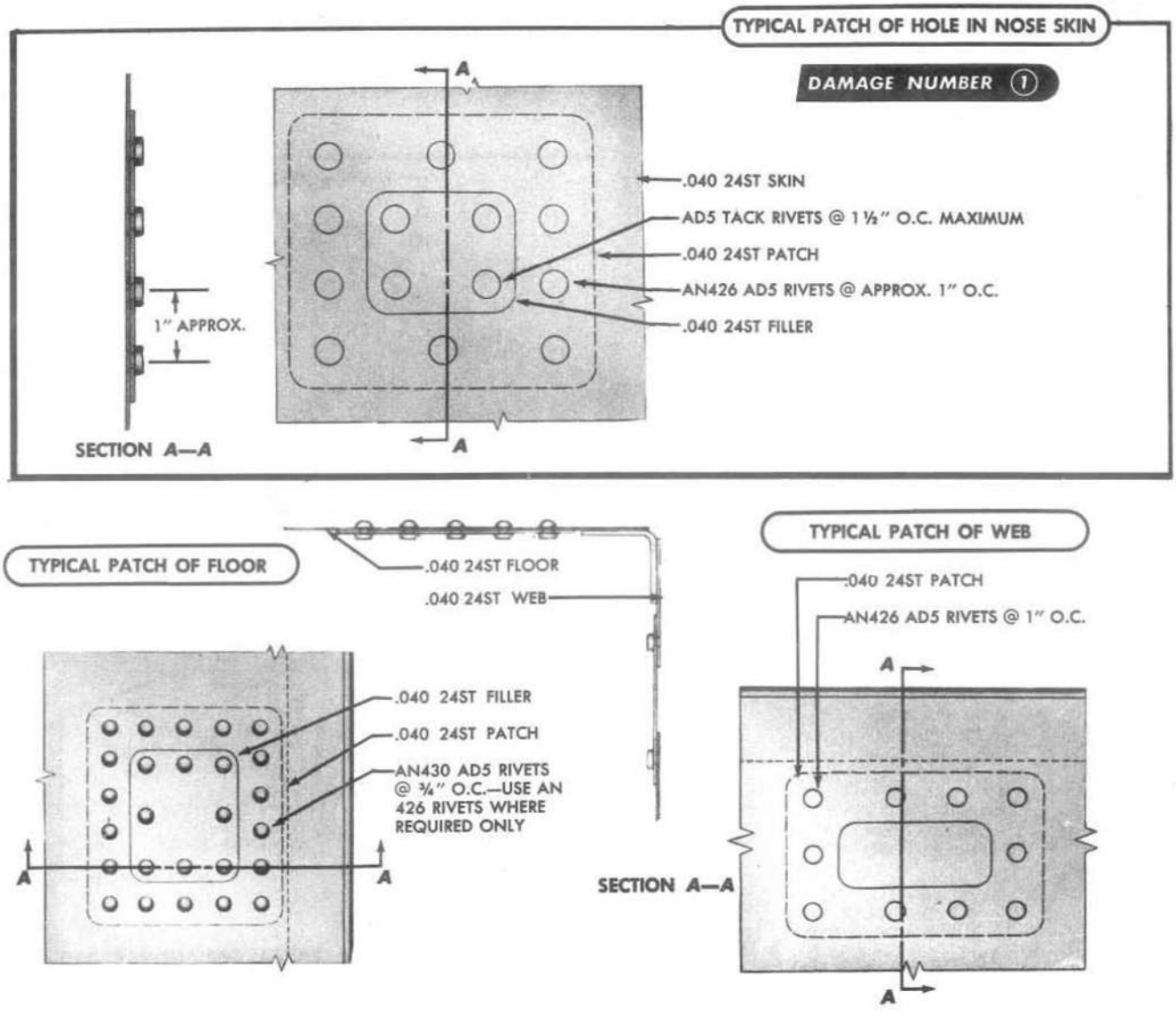
KEY DAMAGE NUMBERS



KEY TO DAMAGE NUMBERS

1. See Figure 106
2. See Figure 107
3. See Figure 108
4. See Figure 109
5. See Figure 110
6. See Figure 111
7. See Figure 112
8. See Figure 113
9. See Figure 114
10. See Figure 115
11. See Figure 116
12. See Figure 117
13. See Figure 118
14. See Figure 119
15. See Figure 120
16. See Figure 121

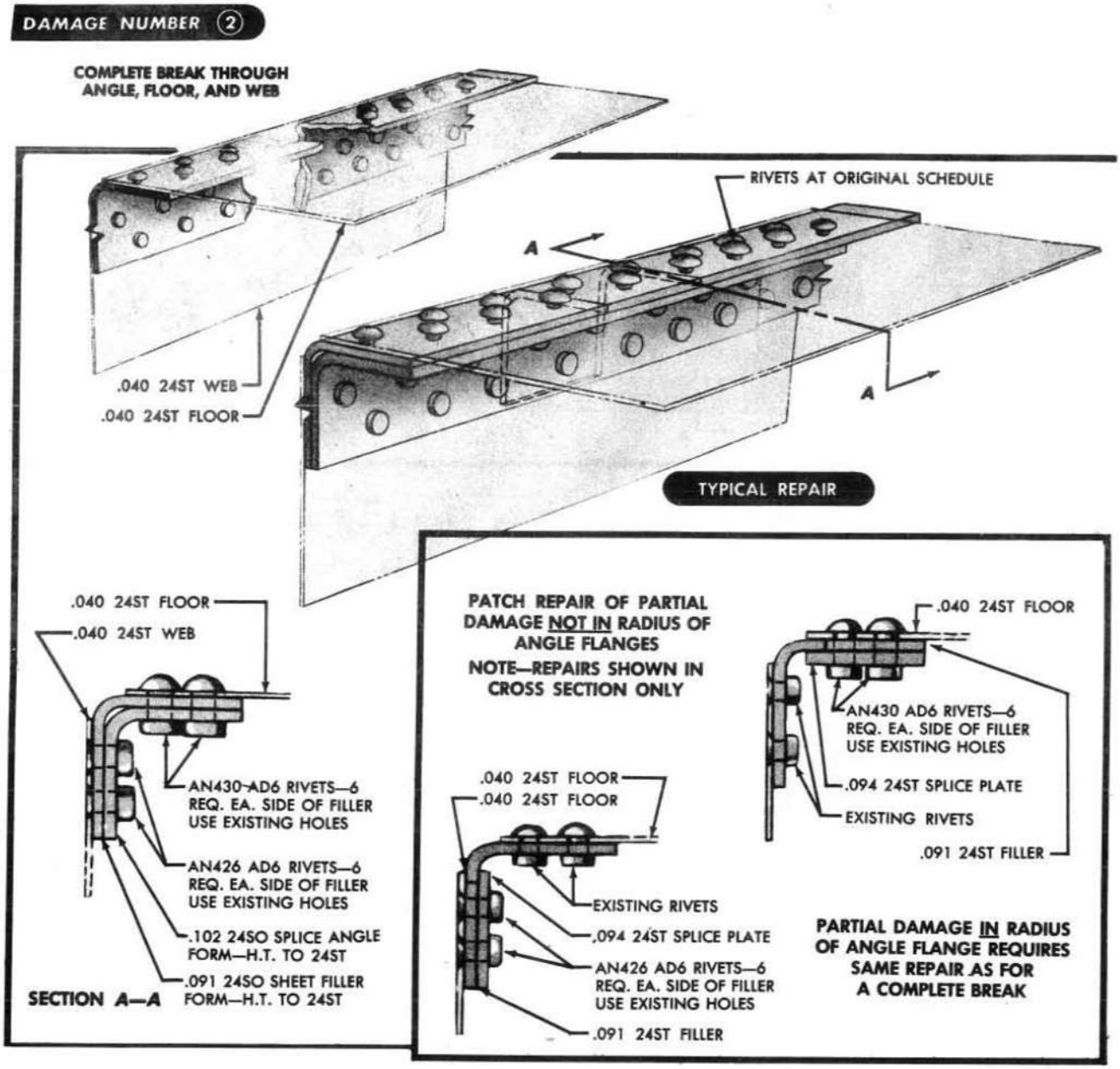
Figure 105–Key Drawing of Damages to Fuselage All-Purpose Nose



NOTES

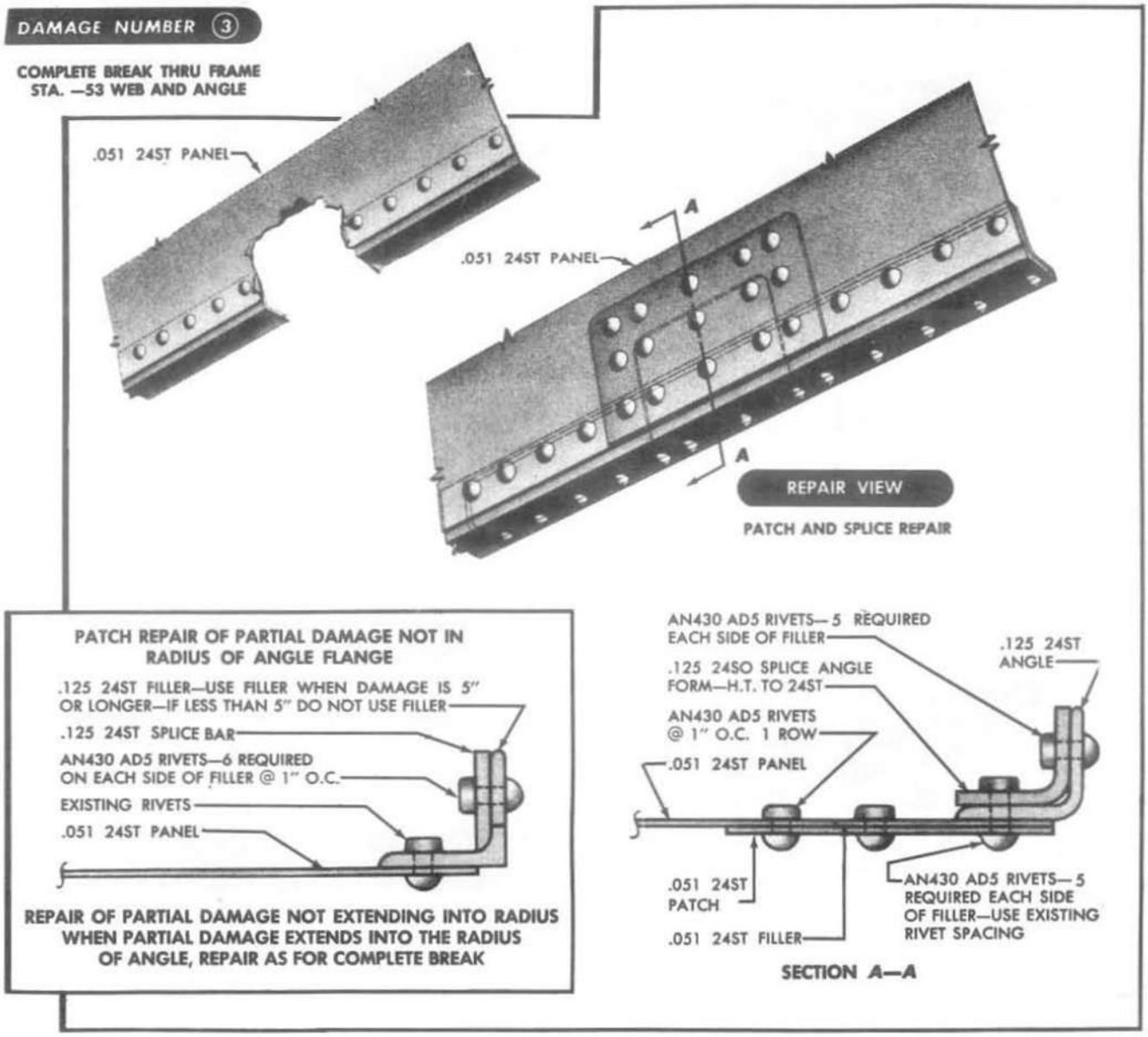
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from 24ST material of same gage as the skin, floor, or web being repaired. Trim corners of patches with a radius of five-eighths inch.
4. Where a filler is required, use the same gage and material as the original.
5. Use existing rivet holes where possible.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 106 —Typical Patch Repair of Hole Damage to Nose Skin, Floor and Web



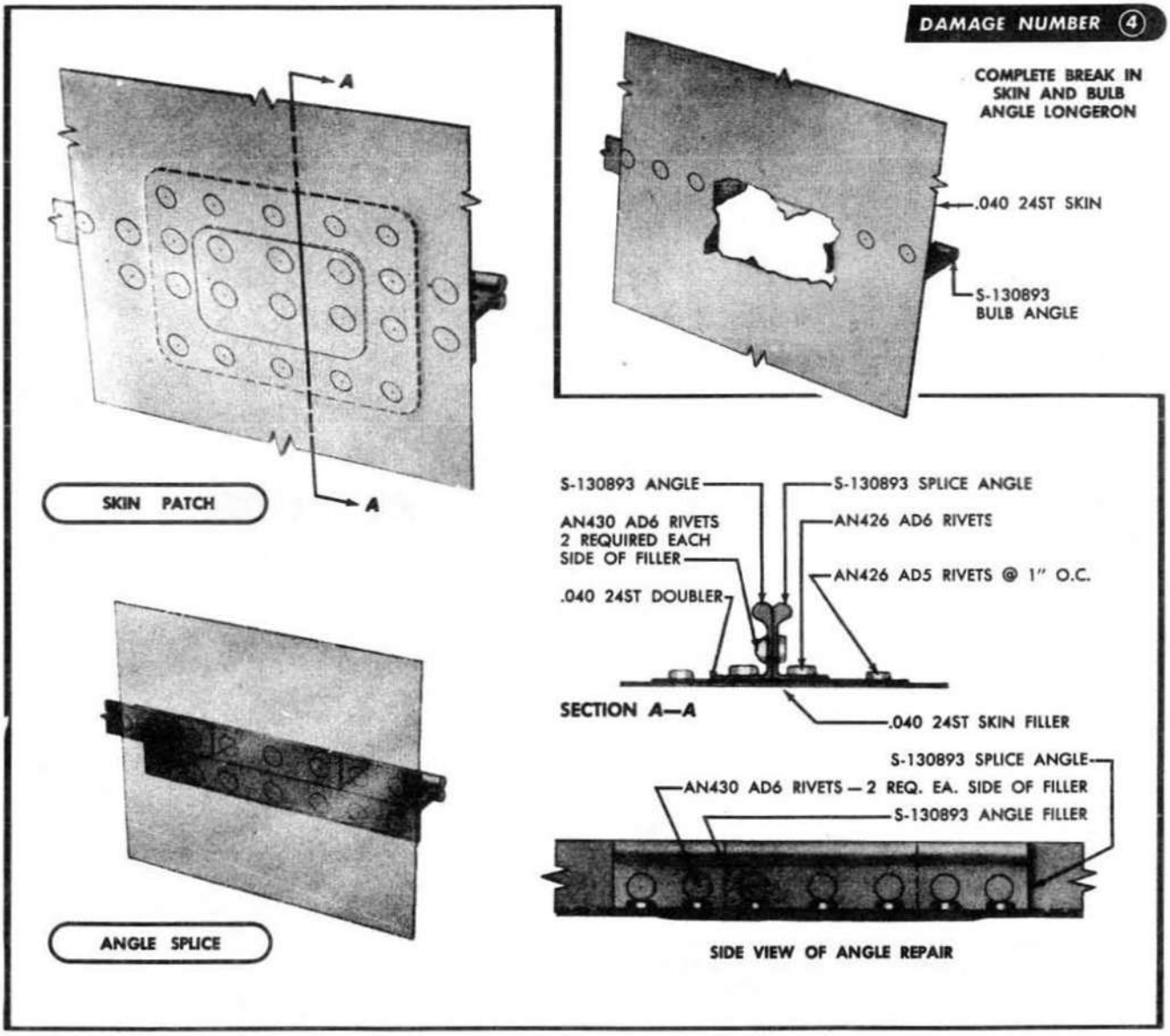
1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice plates for patch repair from .094 24ST material.
4. Construct splice angle for splice repair from .102 24SO material. Heat treat to 24ST.
5. Construct filler for patch repair from 24ST material
6. Construct filler for splice repair from 24SO material. Heat treat to 24ST.
7. Use existing rivet holes where possible.
8. For repair of web and floor, refer to typical skin repair drawings included in the All-Purpose Nose repair series.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 107—Typical Patch and Splice Repair of Nose Frame Angle



1. Remove all intertering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar for repair of partial damage from .125 24ST material.
4. Construct filler in frame from .125 24ST material when repair is for a partial damage.
5. Construct splice angle for splice repair from .125 24SO material. Heat treat to 24ST.
6. Construct filler in frame from .125 24SO material and heat treat to 24ST when repair is for a complete break.
7. Construct panel patch from .051 24ST material.
8. Construct panel filler from .051 24ST material.
9. Use existing rivet holes where possible.
10. For minimum bend radii of sheet material see Fig. 5, Section I.
11. For rivet edge and row distance see Fig. 7, Section I.

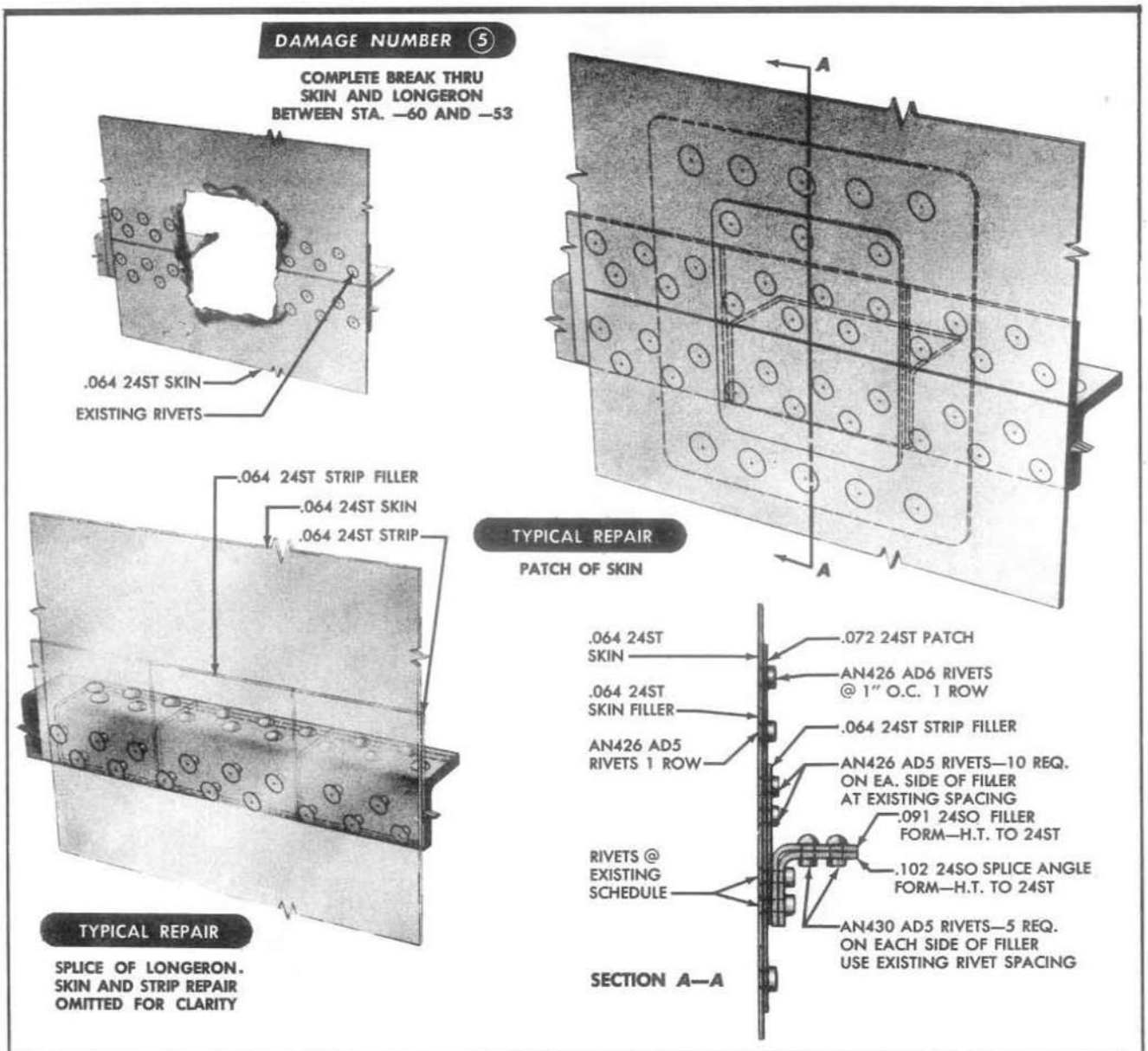
Figure 108—Patch and Splice Repair of All Purpose Nose Frame—Sta. —53



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angles from S-130893 24ST bulb angle and attach to damaged angle as shown in Section A-A.
4. Construct filler in longeron from S-130893 24ST bulb angle.
5. Construct skin patch from .040 24ST material.
6. Construct skin filler from .040 24ST material.
7. Use existing rivet holes.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

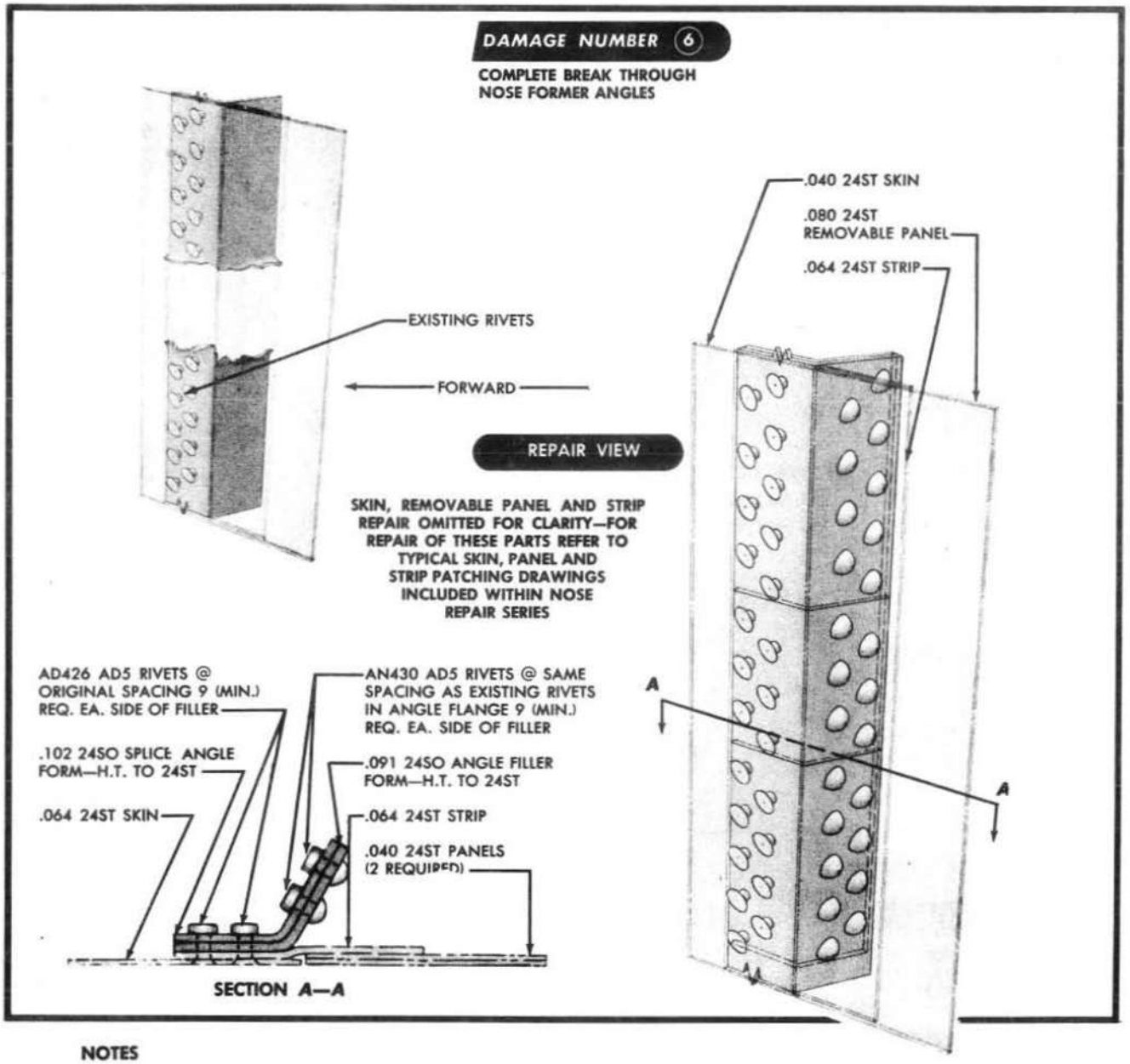
Figure 109—Typical Splice of All Purpose Nose Bulb Angle Longerons



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .102 24SO material. Heat treat to 24ST.
4. Construct filler in angle from .091 24SO material. Heat treat to 24ST.
5. Construct skin patch from .072 24ST material.
6. Construct fillers in skin and strip from .064 24ST material.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Fig. 5, Section I.
9. For flush riveting see Fig. 6, Section I.
10. For rivet edge and row distance see Fig. 7, Section I.

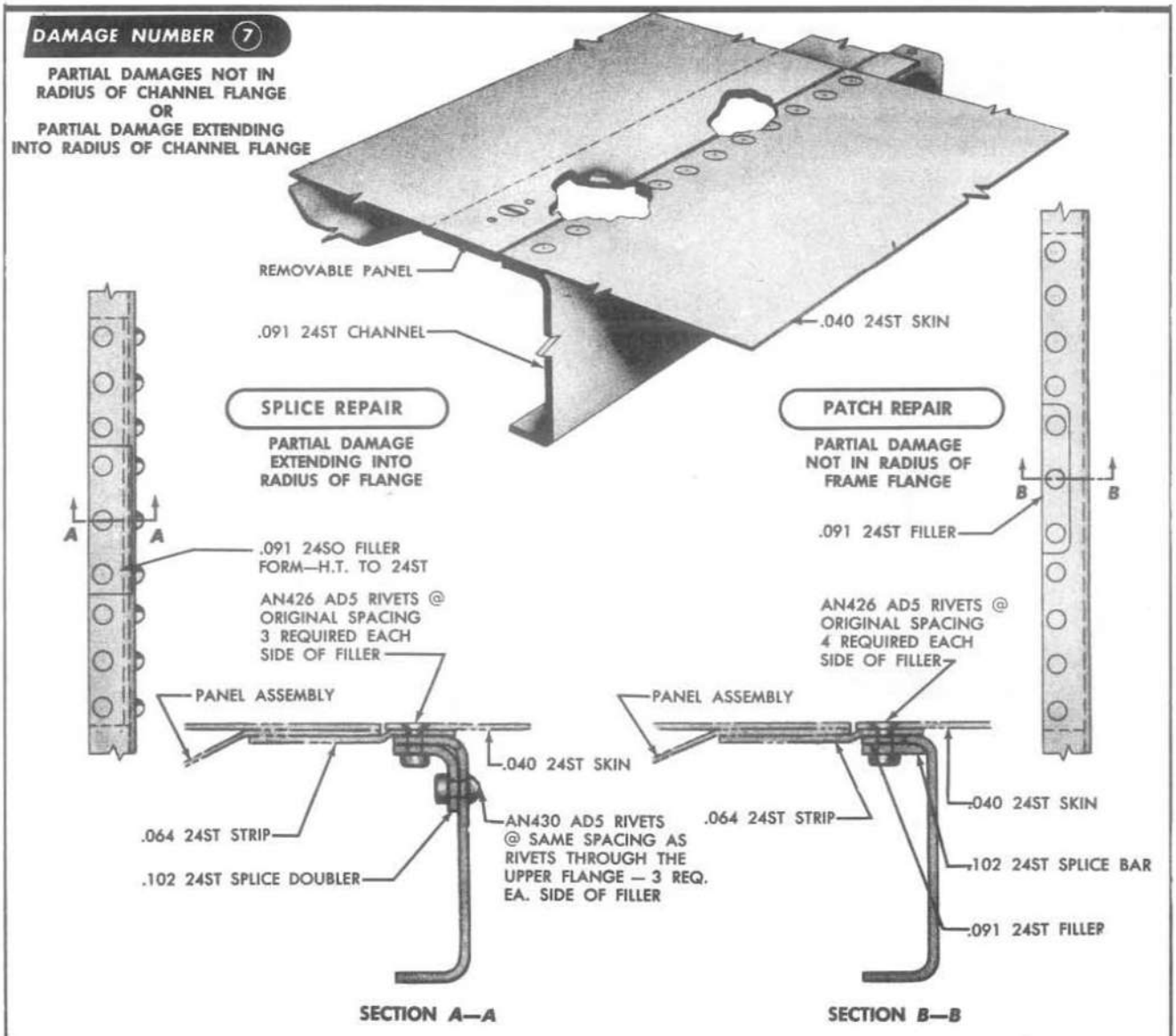
Figure 110—Patch and Splice Repair of Fuselage All Purpose Nose Skin and Frame



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice angle from .102 24SO material. Heat treat to 24ST.
4. Construct filler in angle from .091 24SO material. Heat treat to 24ST.
5. For skin and panel repair see typical skin repair drawings included in All-Purpose Nose repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Fig. 5, Section I.
8. For flush riveting see Fig. 6, Section I.
9. For rivet edge and row distance see Fig. 7, Section I.

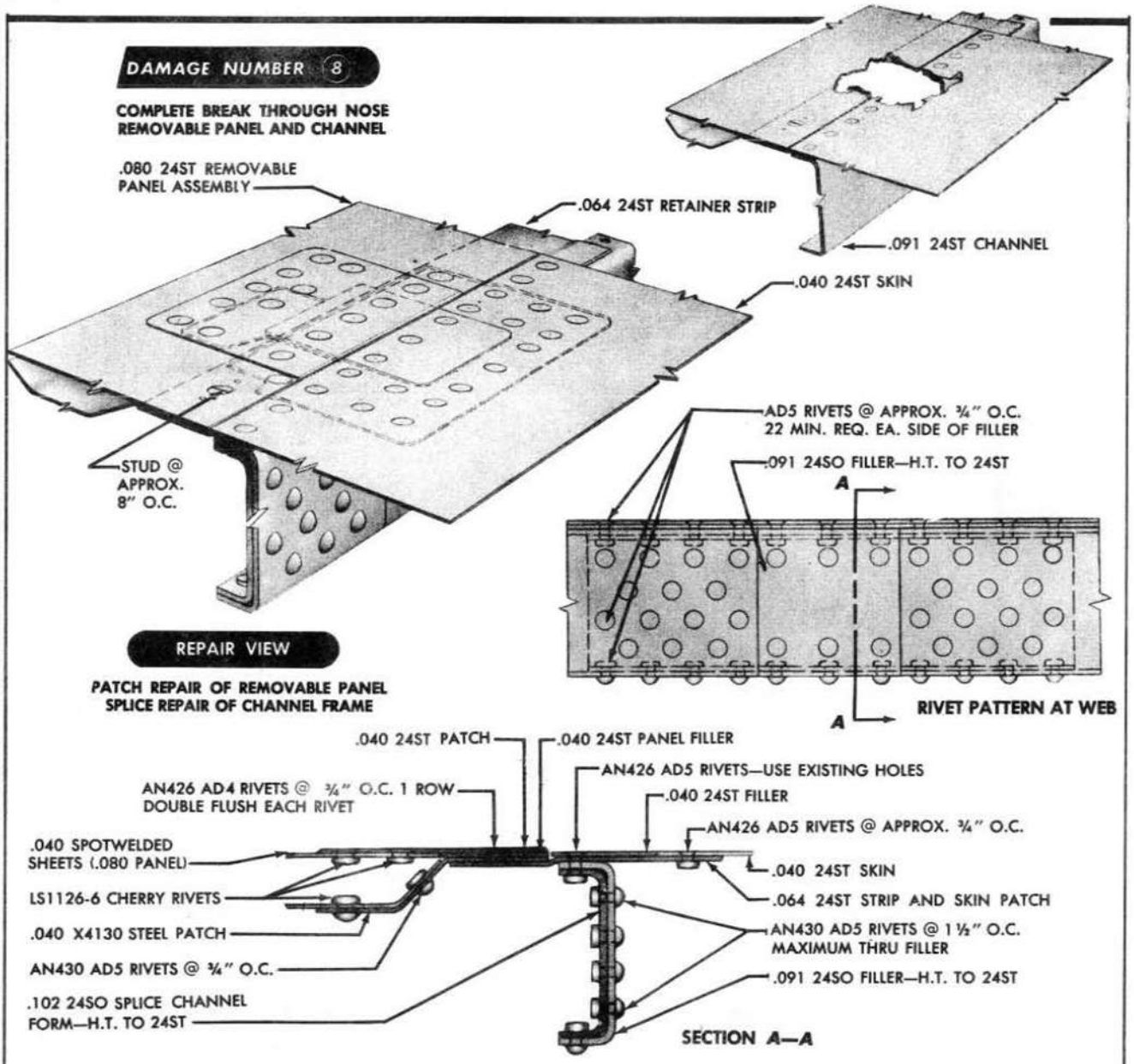
Figure 111—Splice Repairs of Nose Former Angle



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .102 24SO material. Heat treat to 24ST.
4. Construct splice bar from .102 24ST material.
5. Construct fillers from the same gage and material as the original.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.
10. For repair of skin and removable panels refer to Figure 113 included in All-Purpose Nose Repair series.

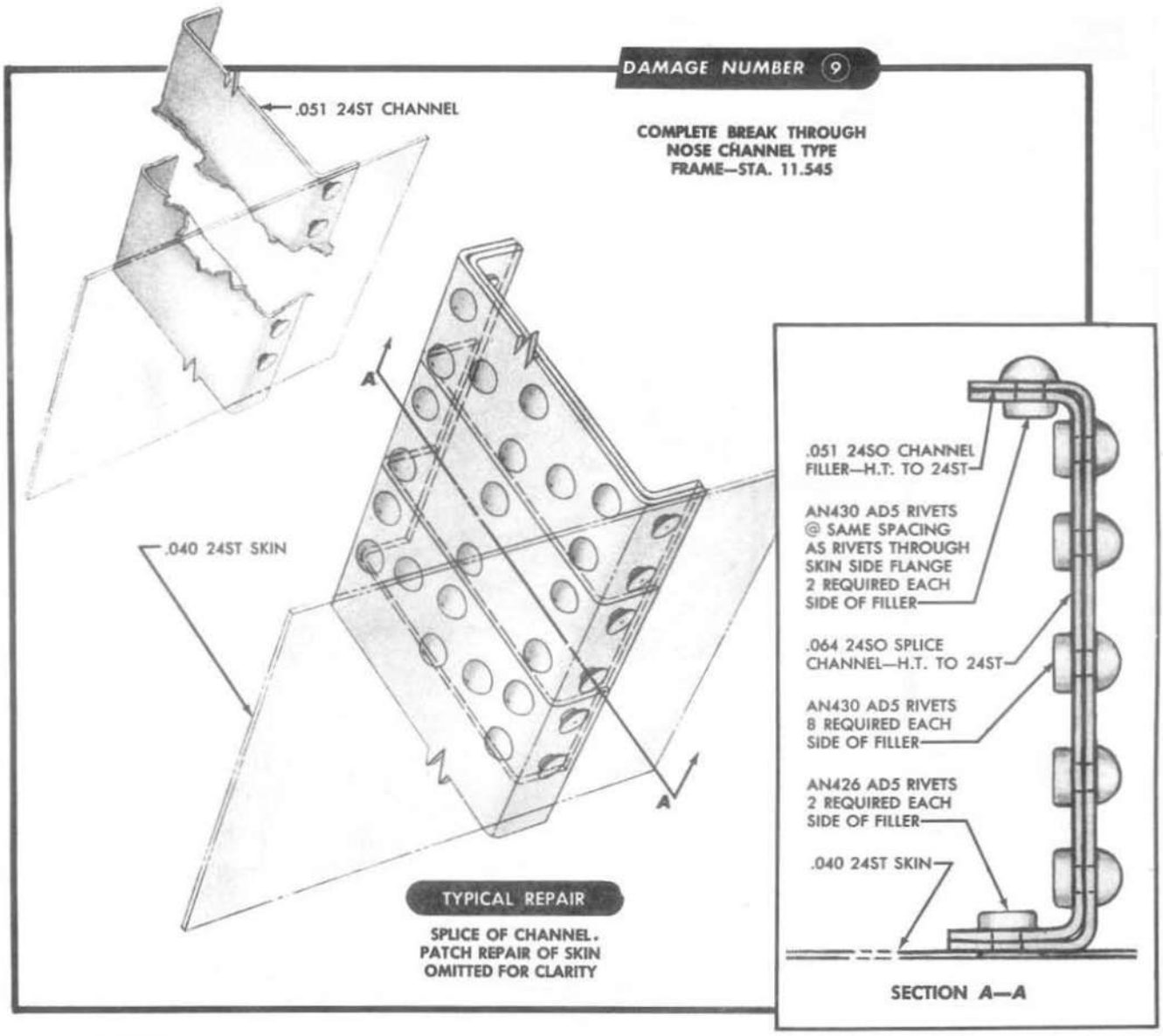
Figure 112—Patch and Splice Repair of Partial Damage to Nose Frame



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice angles from .072 24SO material. Heat treat to 24ST.
4. Construct filler from .064 24SO material. Heat treat to 24ST.
5. For repair of skin damage refer to typical skin repair drawings included in the All-Purpose Nose repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Fig. 5, Section I.
8. For flush riveting see Fig. 6, Section I.
9. For rivet edge and row distance see Fig. 7, Section I.

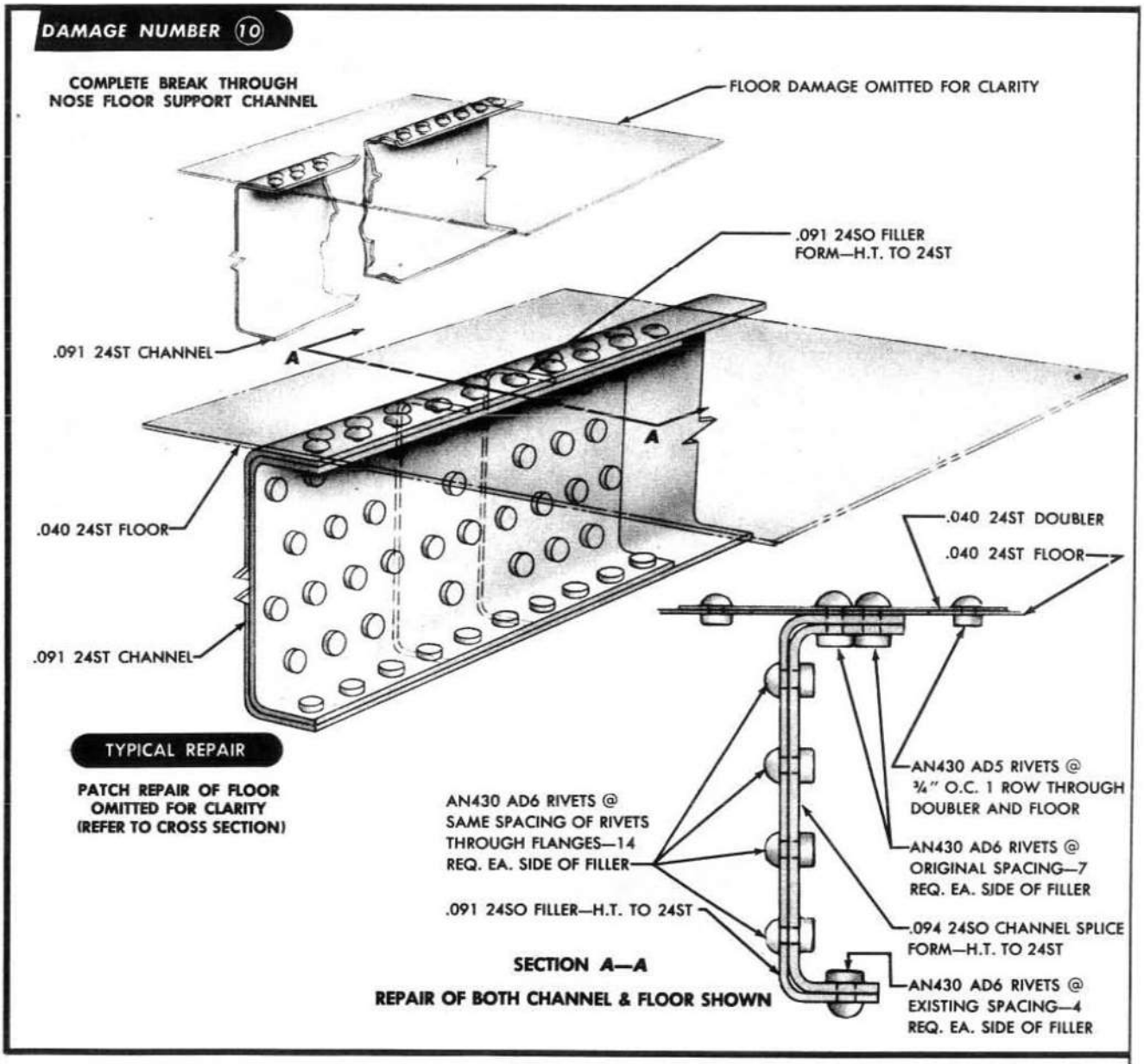
Figure 113—Patch and Splice of Nose Channel and Removable Panel



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice channel from .064 24SO material. Heat treat to 24ST.
4. Construct channel filler from .051 24SO material. Heat treat to 24ST.
5. For skin repair refer to typical skin repair drawings included in All-Purpose Nose repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting refer to Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 114—Splice Repair of Complete Break in Nose Frame—Sta. —11.545

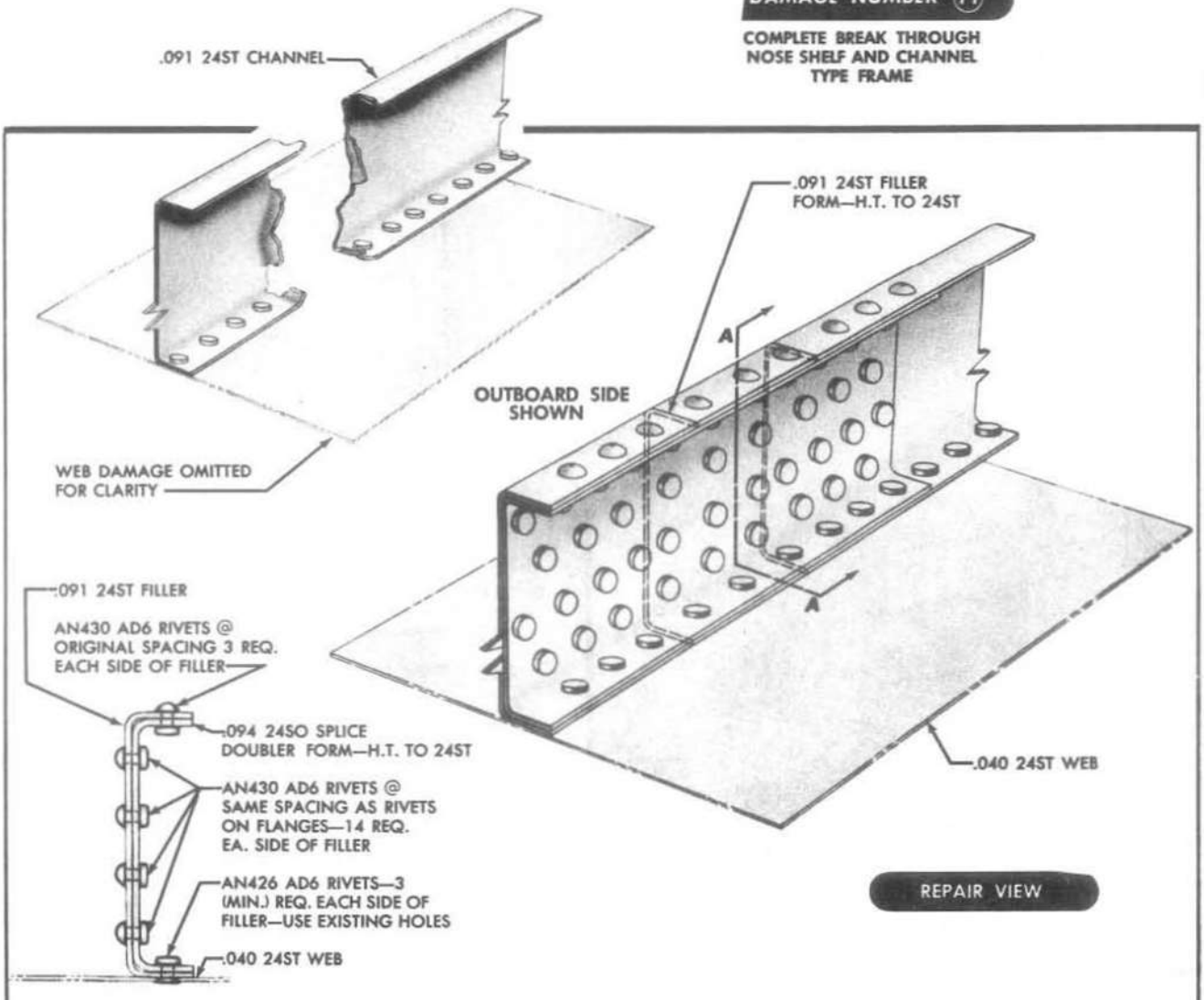


1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct channel splice from .094 24SO material. Heat treat to 24ST.
4. Construct filler in channel from .091 24SO material. Heat treat to 24ST.
5. Construct floor patch from .040 24ST material.
6. Construct filler in floor from .040 24ST material.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 115—Splice Repair of All Purpose Nose Floor Support Channel

DAMAGE NUMBER (11)

COMPLETE BREAK THROUGH NOSE SHELF AND CHANNEL TYPE FRAME

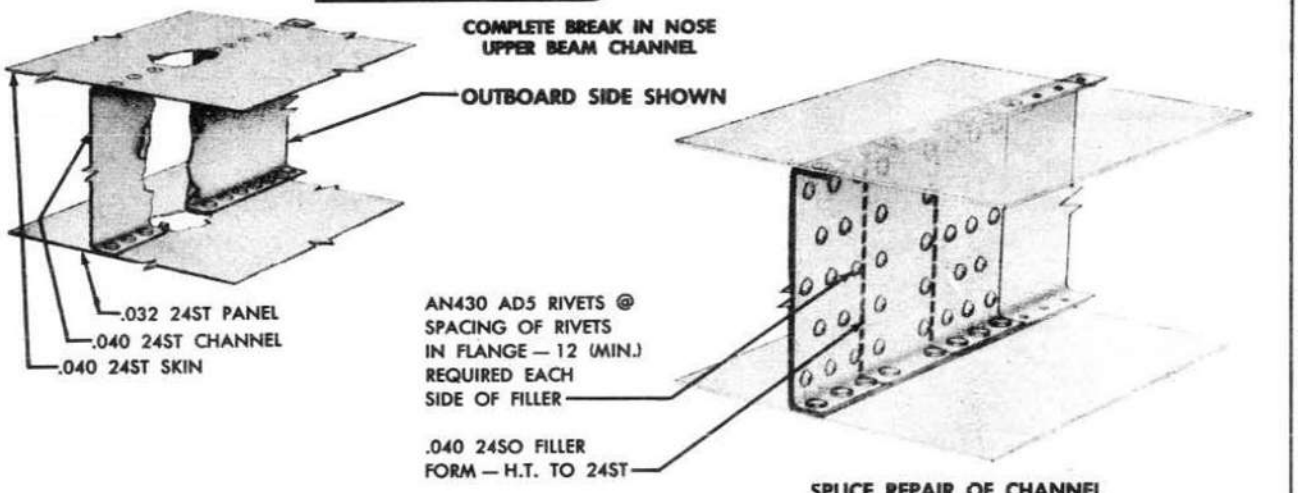


NOTES

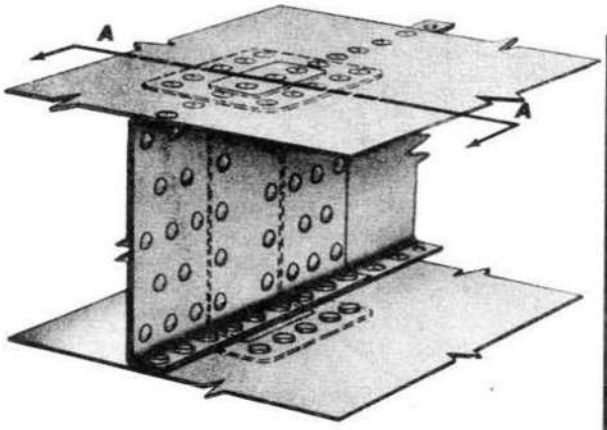
1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice channel from .094 24SO material. Heat treat to 24ST.
4. Construct filler in channel from .094 24SO material. Heat treat to 24ST.
5. For repair of web refer to typical web repair drawings included in the All-Purpose Nose Repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 116 —Splice Repair of Complete Break in Nose Channel Frame

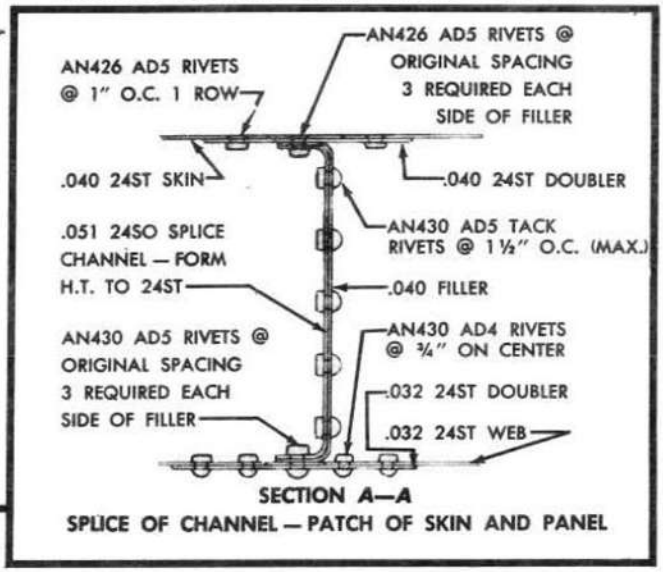
DAMAGE NUMBER 12



SPLICE REPAIR OF CHANNEL
PATCH OF SKIN AND PANEL OMITTED FOR CLARITY



VIEW OF COMPLETE REPAIR

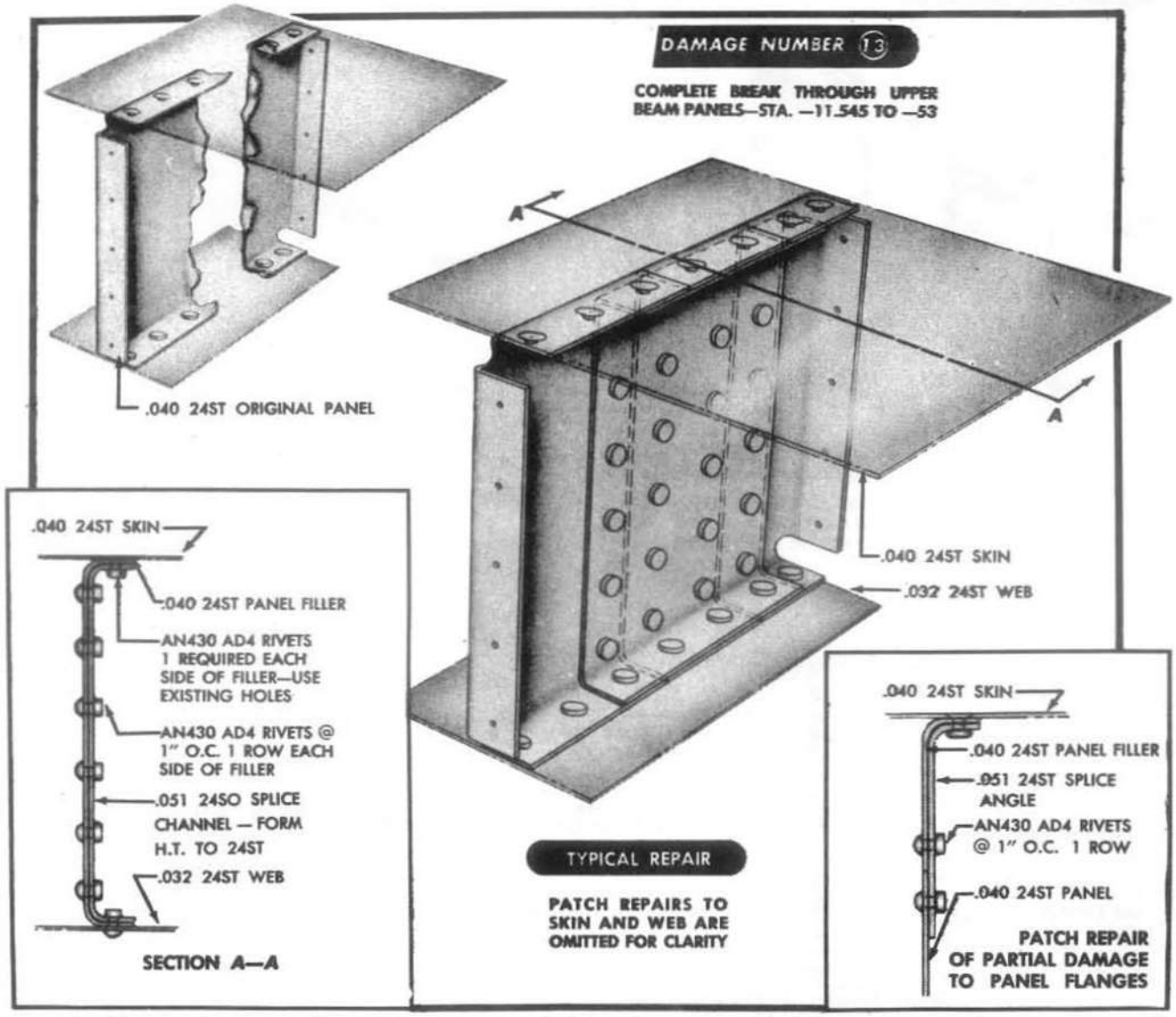


SECTION *A—A*
SPLICE OF CHANNEL — PATCH OF SKIN AND PANEL

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice channel from .051 24SO material. Heat treat to 24ST.
4. Construct channel filler from .040 24SO material. Heat treat to 24ST.
5. Construct skin patch from .040 24ST material.
6. Construct web patch from .032 24ST material.
7. Construct fillers for skin and web from the same gage and material as original.
8. Use flush type patch for skin repair. Insert patch between channel and skin, allowing skin to joggle over patch.
9. Use existing rivet holes where possible.
10. For minimum bend radii of sheet material see Figure 5, Section I.
11. For flush riveting see Figure 6, Section I.
12. For rivet edge and row distance see Figure 7, Section I.

Figure 117 — Splice and Patch Repair of Nose Upper Beam Channel, Skin and Panel



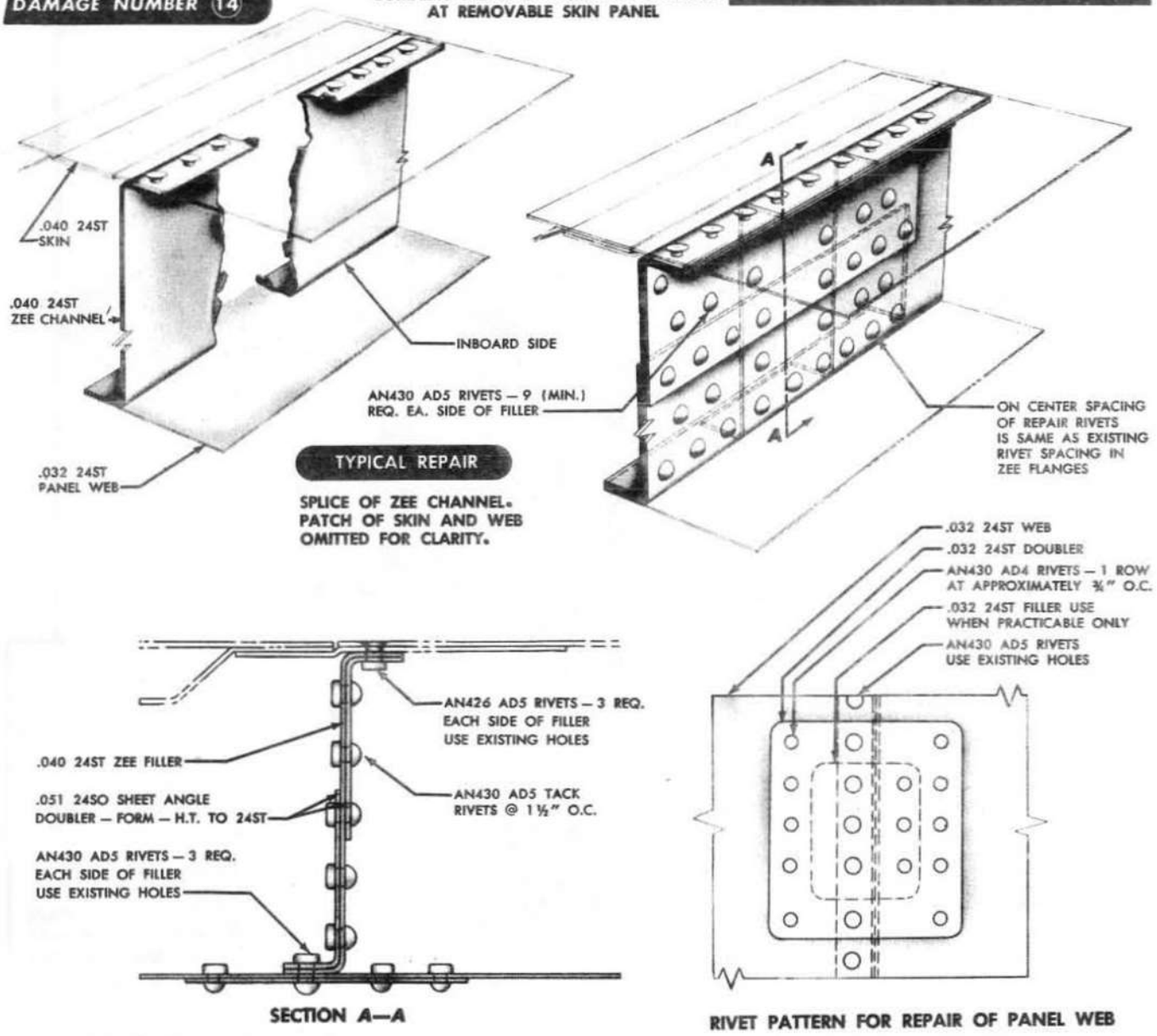
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice channel or splice angle from .051 24SO material. Heat treat to 24ST.
4. Construct panel filler from .040 24SO material. Heat treat to 24ST.
5. For skin and web repair refer to typical skin and web repair drawings included in All-Purpose Nose repair series.
6. For repair of partial damage in panel flanges, refer to Patch Repair of Partial Damage to Panel Flanges, above.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Fig. 5, Section I.
9. For flush riveting see Fig. 6, Section I.
10. For rivet edge and row distance see Fig. 7, Section I.

Figure 118—Splice of Nose Upper Beam Panels—Sta. —11 to —53 Inclusive

DAMAGE NUMBER (14)

COMPLETE BREAK IN NOSE ZEE CHANNEL AT REMOVABLE SKIN PANEL



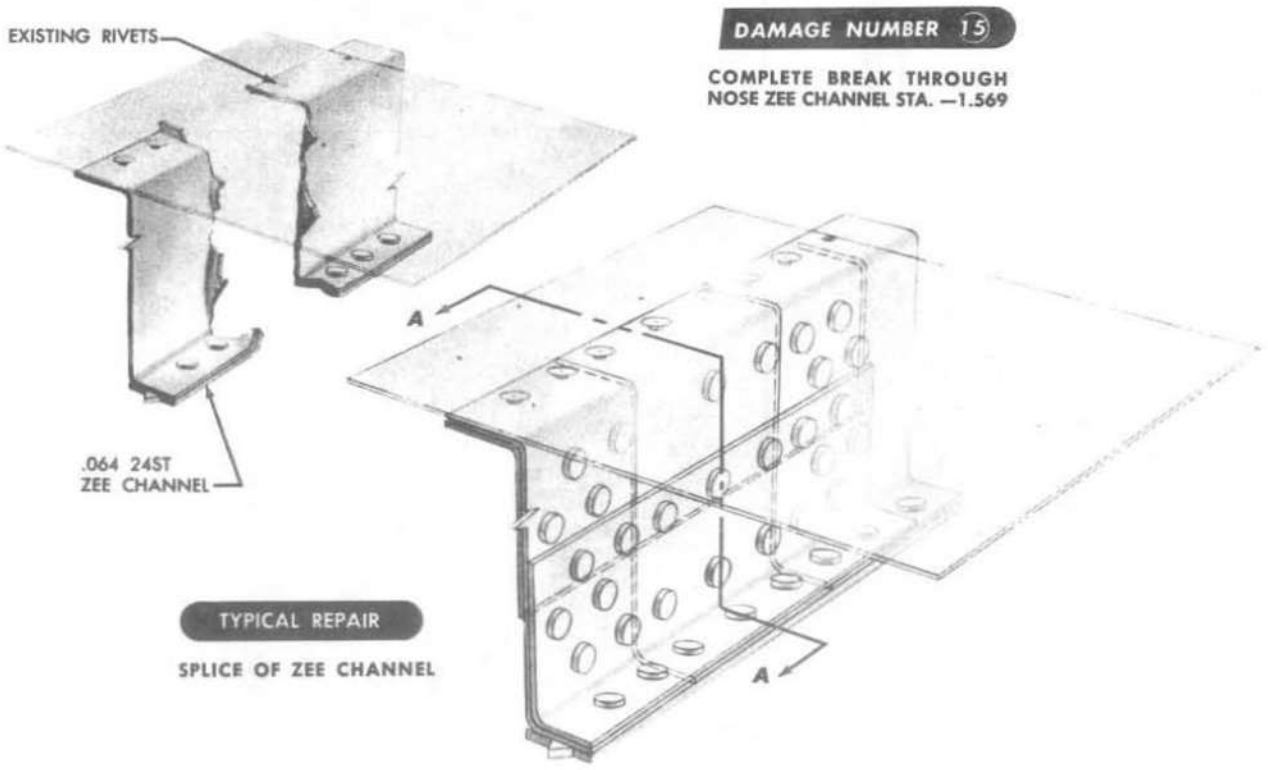
SECTION *A—A*

RIVET PATTERN FOR REPAIR OF PANEL WEB

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice angles from .051 24SO material. Heat treat to 24ST.
4. Construct filler from .040 24SO material. Heat treat to 24ST.
5. For repair of skin and removable panels refer to Figure 113 included in All-Purpose Nose Repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 119—Splice Repair of Zee Channel — All Purpose Nose



DAMAGE NUMBER 15

COMPLETE BREAK THROUGH NOSE ZEE CHANNEL STA. —1.569

TYPICAL REPAIR

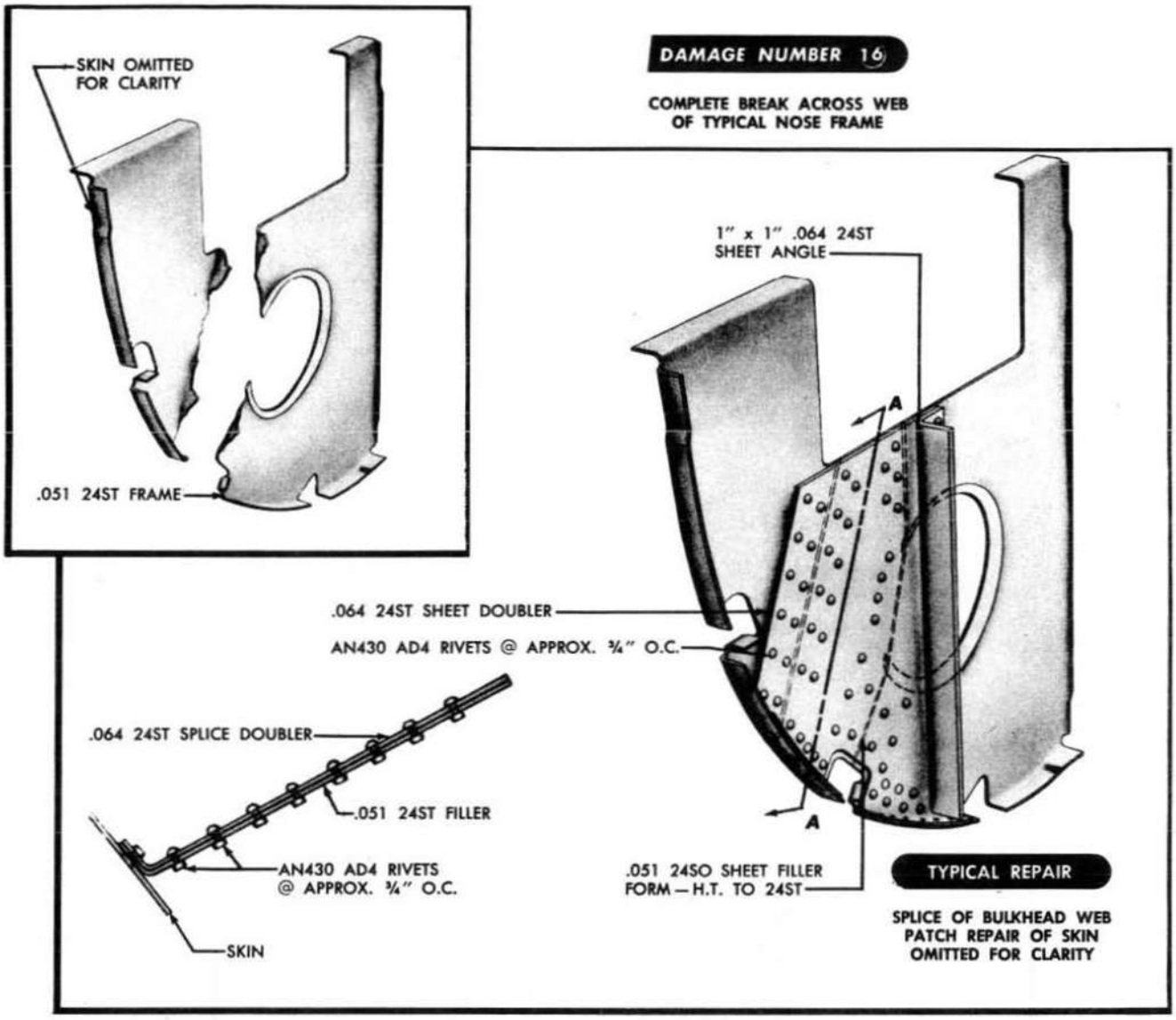
SPLICE OF ZEE CHANNEL

SECTION *A—A*

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct splice angles from .072 24SO material. Heat treat to 24ST.
4. Construct filler from .064 24SO material. Heat treat to 24ST.
5. For repair of skin damage refer to typical skin repair drawings included in the All-Purpose Nose repair series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Fig. 5, Section I.
8. For flush riveting see Fig. 6, Section I.
9. For rivet edge and row distance see Fig. 7, Section I.

Figure 120—Splice Repair of Nose Zee Channel—Sta. —1.569



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct patch from .064 24ST material.
4. Construct frame filler from .051 24ST material.
5. Use angle stiffener as shown to restore original strength lost by damaged lightening hole flange. Construct stiffener from .064 24SO material and heat treat to 24ST.
6. Use repair shown except when lightening hole is needed. See typical lightening hole repair in Fuselage Frame at Station 49, Figure 13 9, Section IV.
7. For patch repair of skin refer to typical skin repair drawing included in All-Purpose Nose Repair series.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

Figure 121 —Typical Splice Repair of Damage to All Purpose Nose Frame Web

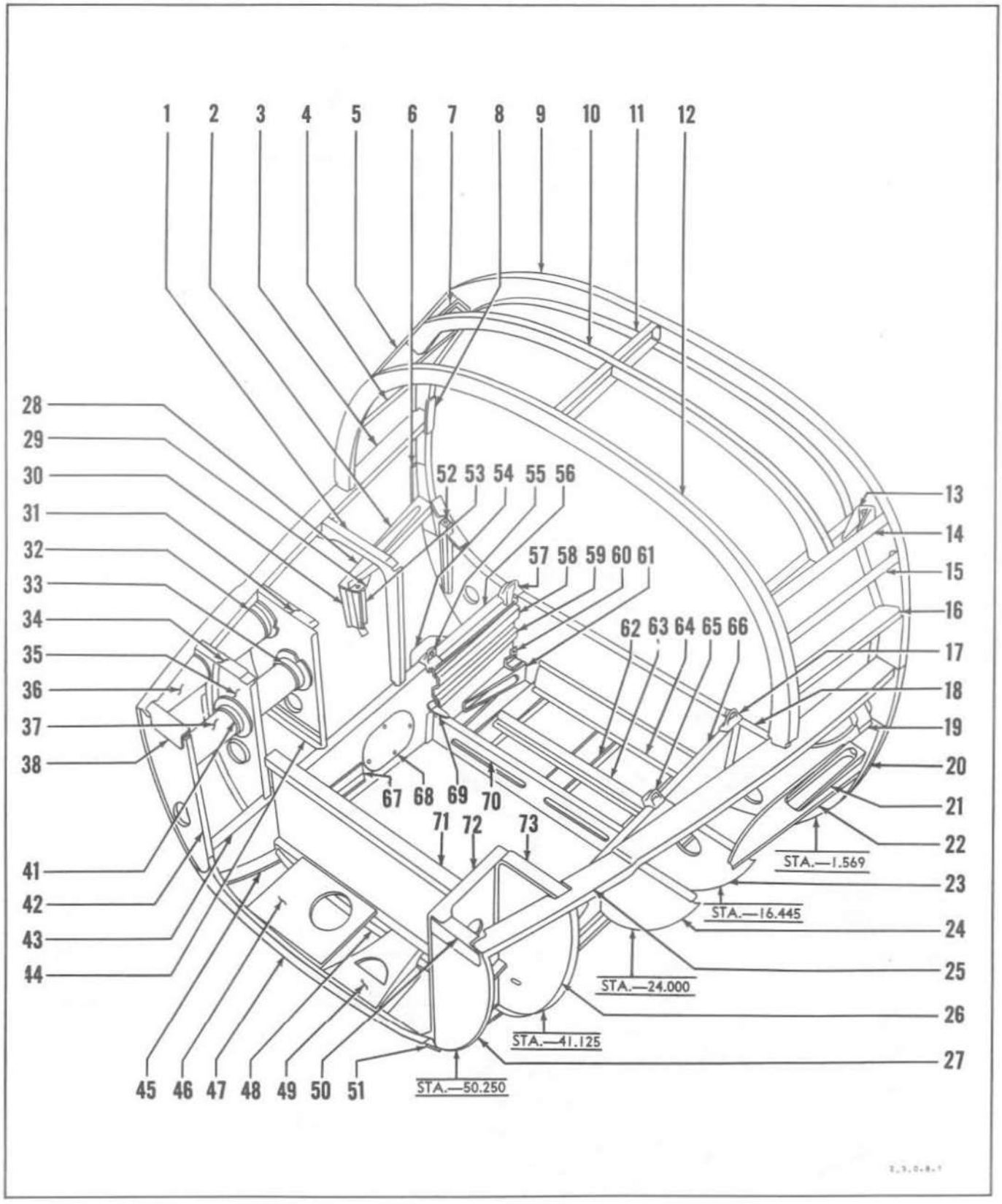


Figure 121A—Bombardier's Nose Structure (Sheet 1 of 3)

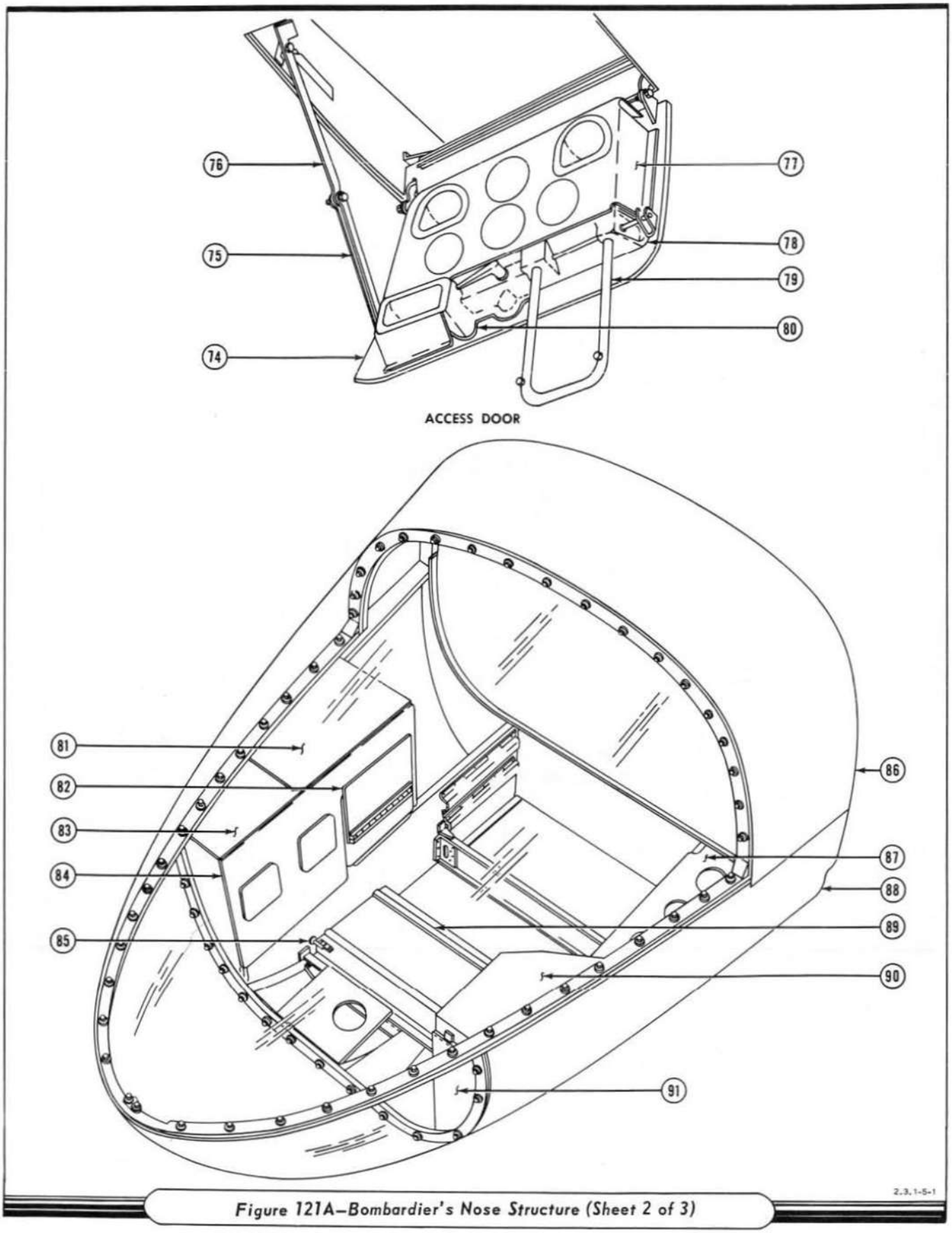


Figure 121A–Bombardier's Nose Structure (Sheet 2 of 3)

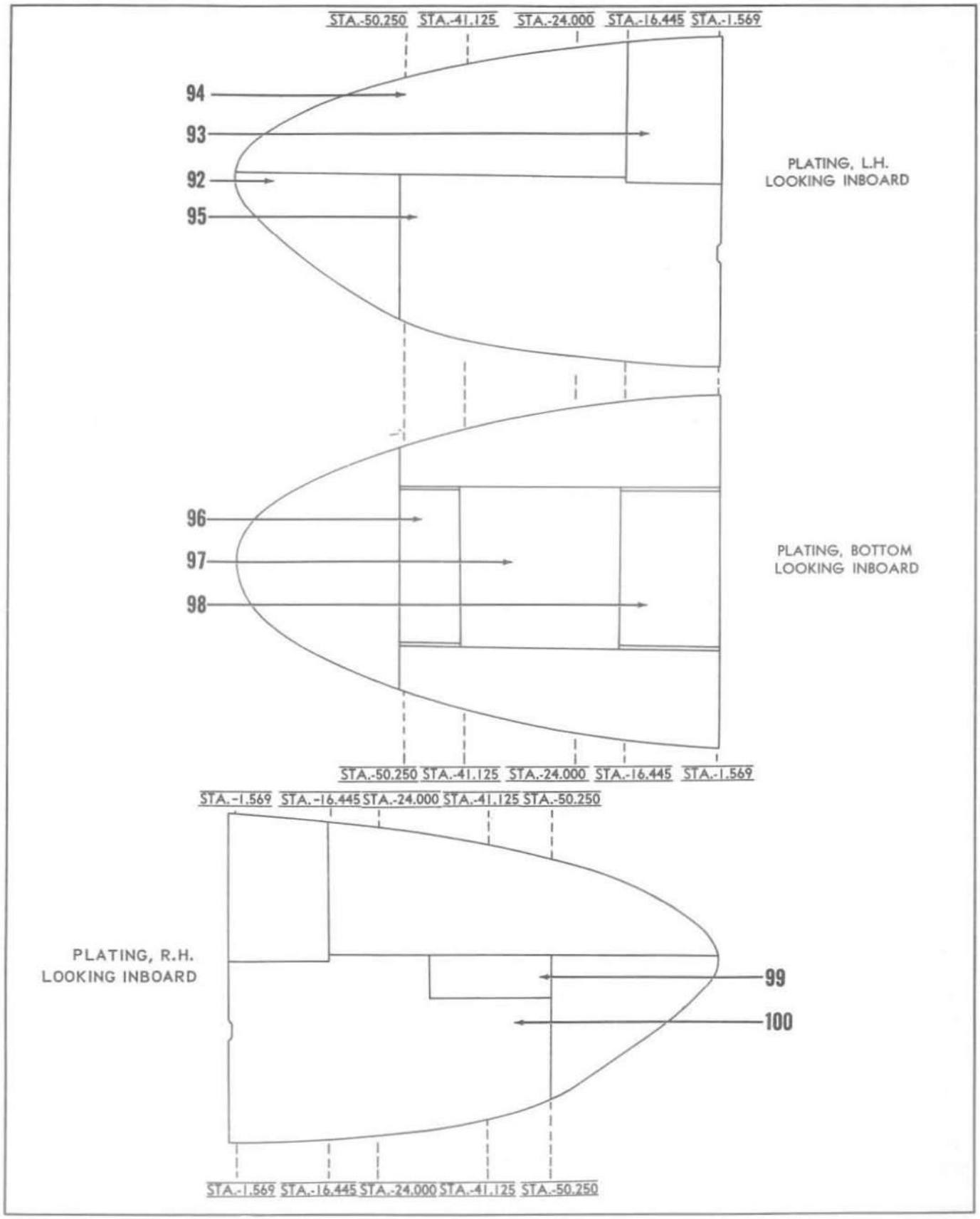


Figure 121A–Bombardier's Nose Structure (Sheet 3 of 3)

KEY TO FIGURES 121A, SHEETS 1, 2 AND 3

Item No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*No.*
1	5204289	Former	14 x 18½	.064	24SO	1
2	4204475	Fitting	Make 4204473 Forging			1 L.H. 1 R.H.
3	5203114	Channel R.H.	4⅜ x 63	.064	24SO	1
4	5202402-20	Angle	Make From S-1027673-1420			1
5	5204678-1	Channel R.H.	5⅛ x 16⅜	.040	24SO	1
6	5204277-13	Angle R.H.	4¼ x 8$\frac{13}{16}$	.064	24SO	1
7	4204474	Fitting R.H.	Make from 2204660 Forging			1
8	5204277-9	Clip R.H.	2¾ x 5½	.064	24ST	1
9	5204277-2	Upper Segment (Sta.-1.569)	25¾ x 61½	.064	24SO	1
10	5204239	Former	10¾ x 51	.064	24SO	1
11	4204270	Channel	4$\frac{3}{16}$ x 16⅜	.064	24SO	1
12	5204237	Former	25 x 56	.064	24SO	1
13	4204474	Fitting L.H.	Make from 2204660 Forging			
14	5204678	Channel L.H.	5⅛ x 16⅜	.040	24SO	1
15	5202402-2	Angle	1¼ x 15	.064	24SO	1
16	4204664	Channel	4 x 16⅞	.064	24SO	1
17	4205089	Support L.H.	Sand Casting Alum. Alloy 356-T6			1
18	5204277-4	Lower Segment (Sta.-1.569)	30½ x 61½	.064	24SO	1
19	4205548	Support	6½ x 3½	.051	24SO	1
20	5204277-12	Angle L.H.	4¼ x 8$\frac{13}{16}$	.064	24SO	1
21	4204476	Fitting	Make from 4204473 Forging			1
22	4204482	Channel	4 x 18	.064	24SO	1
23	5203333	Frame	15 x 16$\frac{3}{16}$ (Sta.-16.445) L.H.	.064	24SO	1
24	3205283	Former (Sta.-24.000)	12½ x 13⅞	.064	24SO	1
25	5203115	Channel	4¼ x 52	.064	24SO	1
26	5203321-2	Frame (Sta.-41.125)	10½ x 26¾	.064	24SO	1
27	5203077-2	Frame (Sta.-50.250)	7¾ x 22½	.064	24SO	1
28	4204483	Channel	5¼ x 16¼	.064	24SO	1
29	5202402-4	Gusset	3 x 4	.125	24ST	1
30	3207113	Box (Sta.-16.445)	7$\frac{3}{16}$ x 8$\frac{3}{16}$	.064	24SO	1
31	5204294	Former (Sta.-33.000)	12¼ x 16⅜	.064	24SO	1
32	2204436	Angle	1¼ x 12	.040	24SO	1
33	2204428-2	Flange	4⅜ x 5¼	.040	24SO	1
34	2205963	Angle	Make from S-1205311-730			1

NOTE—H.T. harden all SO material per AN-QQ-H-186.

Item No.	Part No.	Description	Size	Gage	Material	No.
35	5203322-2	Frame (Sta.-41.125 R.H.)	10¼ x 26½	.064	24SO	1
36	5204640	Tube (Sta.-33 to 50.250)	14½ x 16½	.050	18-8 Corr. Res. Steel	1
37	2204429-4	Tube	9 x 11⅞	.050	18-8 Corr. Res. Steel Annealed	1
38	2205938	Angle	Make from S-1205311-526			1
39	Deleted					
40	Deleted					
41	2204428-4	Flange	4⅜ x 5¼	.042	18-8 Corr. Res. Steel Annealed	1
42	520419	Frame (Sta.-50.250 R.H.)	8 x 21⅛	.064	24SO	1
43	5203117	Keel R.H.	16 x 51	.064	24SO	1
44	5202402-28	Angle	Make from S-1114111-0808			1
45	4205401-1	Splice Plate R.H.	2½ x 9⅞	.125	24SO	1
46	5205782-2	Panel	8 3/16 x 11⅛	.064	24ST	1
47	4204366	Former (Sta.-50.250)	28 x 5 3/16	.091	24SO	1
48	5203194	Former	5¼ x 30¼	.064	24SO	1
49	5205148-2	Bracket	8½ x 10⅜	.064	24SO	1
50	2205933	Angle (Sta.-50.250)	Make from S-1205311-514			1
51	4205401	Splice Plate L.H.	2½ x 9⅞	.125	24SO	1
52	4203048-2	Fitting	1 x 1 SQ. x 11½	BAR	24ST	1
53	4203045-2	Fitting	1 x 1 SQ. x 7 ⅛ S.L.	BAR	24ST	1
54	5202402-14	Plate	2½ x 5⅞	.125	24ST	1
55	4205090	Support	Sand Casting Alum. Alloy 356-T6			1
56	5203117	Keel (Ref. R.H.)	16 x 51	.064	24SO	1
57	4205089-1	Support R.H.	Sand Casting Alum. Alloy 356-T6			1
58	4205184	Stiffener (Sta.-1.569)	4¼ x 14⅜	.051	24ST	1 L.H. 1 R.H.
59	4205183-1	Stiffener R.H.	4¼ x 14⅜	.051	24ST	1
	4205183	Stiffener L.H.	4¼ x 14⅜	.051	24ST	1
60	2204949-1	Clip	2 3/16 x 3 3/16	.093	L.C. Steel	1
61	4204477	Fitting L.H.	Make from 420-4473 Forging			1
	4204477	Fitting R.H.	Make from 420-4473 Forging			1
62	4204388	Support	5 x 15¾	.064	24SO	1
63	4205206	Spacer	4 7/16 x 21 5/16	.051	24ST	1
64	4205205	Spacer	4 3/16 x 21 5/16	.051	24ST	1

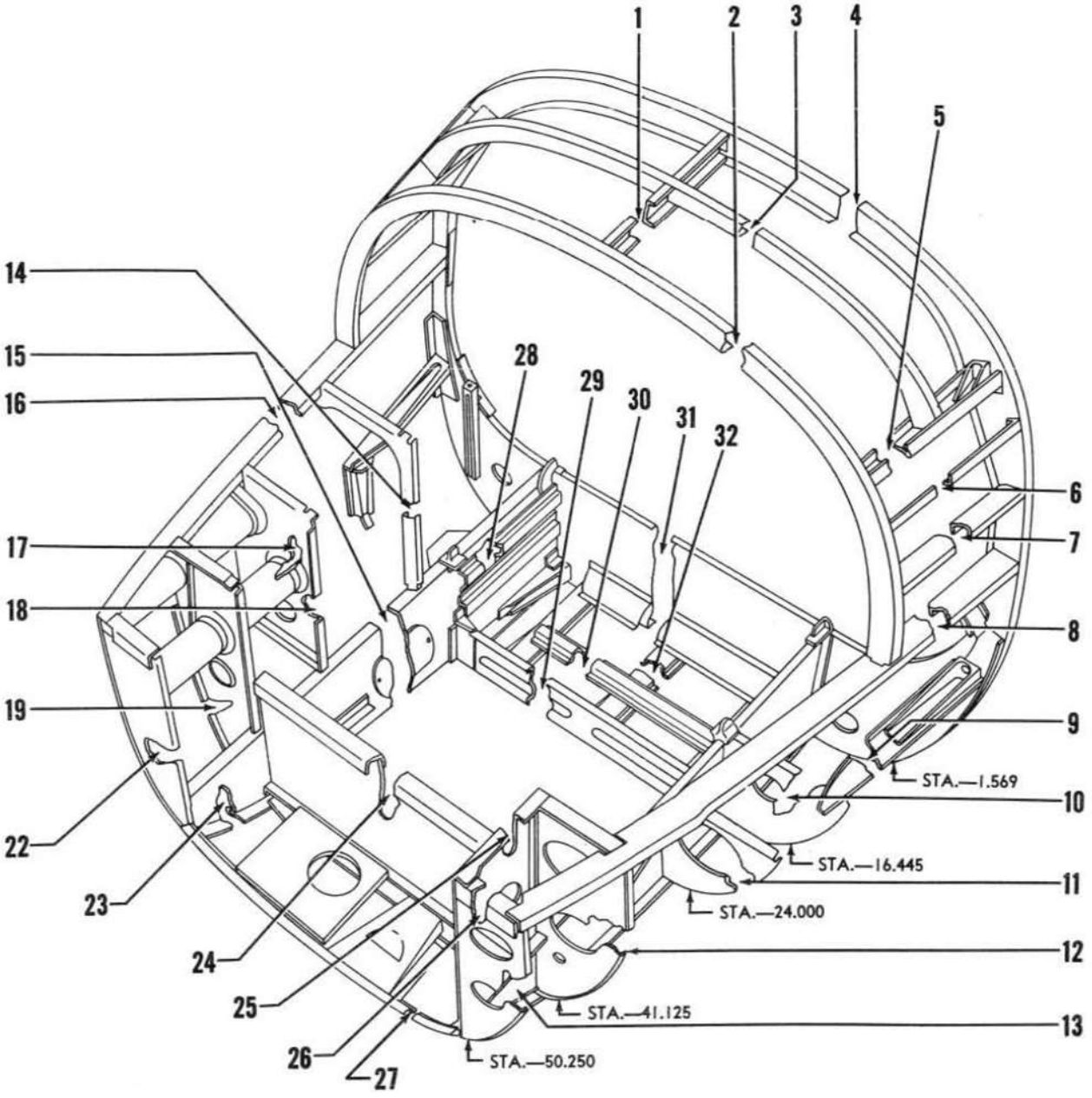
NOTE—H.T. harden all SO material per AN-QQ-H-186.

Item No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*No.*
65	4205090	Support	Sand Casting 356-T6			1
66	5203116	Keel L.H.	16 x 51	.064	24SO	1
67	5204854-4	Angle R.H.	Make from S-142266-0700			1
	5204854-2	Angle L.H.	Make from S-142266-1008			1
68	5202402-30	Ammun. Access Door	7¾ x 10¼	.064	24ST	1
69	5202402-24	Clip	1½ x 3	.125	24SO	1
70	5203332-2	Former Rail	1¾ x 26½	.128	24SO	1
	5203332-4	Former	8⅞ x 32 5/16	.064	24SO	1
	5203332-6	Doubler L.H.	2 33/64 x 5¼	.072	24SO	1
	5203332-7	Doubler R.H.	2 33/64 x 5¼	.072	24SO	1
71	3205469	Armor Plate (Sta.-41.125)	13⅜ x 27¾	5/16	Homo. Steel	1
	2205668	Splash Rail	4⅜ x 27⅛	.125	C.M. Steel 4130	1
72	5205349-2	Box	9 x 18⅞	.064	24ST	1
	2205210	Gasket	5½ x 5½	1/16	Wool Felt	1
	2205239	Cover	5½ x 5½	.064	24ST	1
73	2205932	Angle (Sta.-41.125 L.H.)	Make from S-1205311-730			1
74	3205298	Access Door Plate	26 x 31	5/16	Plate R301SO	1
75	2204958-2	Access Door Arm Lower	¾ x 13 3/32	.125	24ST	2
76	2204957-2	Access Door Arm Upper	2¾ x 19⅛	.188	24SO	1
77	5206271-4	Cover	21⅛ x 23 13/16	.064	24ST	1
78	3206265	Hanger	Sand Casting Alum. Alloy 356-T6			1
79	4204968	Access Door Step	⅞ O.D. x 46	.049	Tube C.M. Steel 4130	1
80	3207110-2	Cover	Sand Casting Alum. Alloy 356-T6			1
81	3205316	Plate Upper R.H.	12 x 18⅛	.064	24ST	1
82	5205419	Data Box Assem.				
	5205419-4	Sheet	12 x 13	.040	24ST	1
	5205419-6	Cover	8¼ x 11¼	.064	24ST	1
	520549-8	Spacer	7/16 x 11¼	.064	24ST	1
	520549-12	Hinge	Make from S-121874-D-1108			1
83	4205317	Plate R.H.	8¾ x 15½	.125	24ST	1
84	5205208-2	Sheet	18⅞ x 29½	.064	24SO	1
	2205210	Gasket	5½ x 5½	1/16	Sheet Wool Felt	1
	2205239	Cover	5½ x 5½	.064	24ST	1
85	2204774-2	Hinge Support	Perm. Mold Casting 356-T6			1
86	5202402-10	Skin	24 x 88⅜	.040	24ST	1
87	5205624	Equipment Shelf L.H.	15 x 42	.040	24SO	1
88	3204416	Deflector Plate L.H.	40 x 54	5/16	Plate R301SO	1
89	5204787-2	Cover	9¼ x 27	.032	24ST	1
	5204787-4	Sheet	27 x 28¼	.032	24ST	1

NOTE—H.T. harden all SO material per AN-QQ-H-186.

Item No.	Part No.	Description	Size	Gage	Material	No.
	5204787-6	Angle L.H.	Make from S-169097-1200			1
	5204787-7	Angle R.H.	Make from S-169097-1200			1
90	4205348	Plate L.H.	9-1/4 x 14-13/16	.125	24ST	1
91	4205551	Armor Plate (Sta. 50.250)	16-1/2 x 5-5/16 Plate Homo. Steel			1
92	5418740	Plexiglas Panel Assembly, Lower				
93	5202402-10	Skin (Ref.) See Item 86				
94	5305669-2	Plexiglas Panel Upper	76 x 70	.250	Transparent Acrylate Base	1
	5303669-4	Attaching Strip	1-1/8 x 142	5/8	Transparent Acrylate Base	1
	5303669-6	Attaching Strip	1-1/8 x 82	5/8	Transparent Acrylate Base	1
	5303669-8	Gusset	1-1/4 x 1-1/4	1"	Transparent Acrylate Base	1
95	3204416	Deflector Plate–L.H. (Ref.)–See Item 88				
96	3204400	Deflector Plate Lower	11 x 31-1/2	5/16	Plate R-301SO	1
97	5205298	Plate (Ref.)–See Item 74				
98	3204374	Deflector Plate Lower	17 x 30	5/16	Plate R-301SO	1
99	5204379-2	Blast Tube Assem. (Ref.)	15 x 32	.050	18-8 Corr. Res. Steel Annealed	1
	2204429-4	Tube (Ref.)–See Item 37				
	5204640	Tube (Ref.)–See Item 36				
100	3204417	Deflector Plate R.H. (Ref.)	40 x 54	5/16	Plate R-301SO	1

NOTE–H.T. harden all SO material per AN-QQ-H-186.

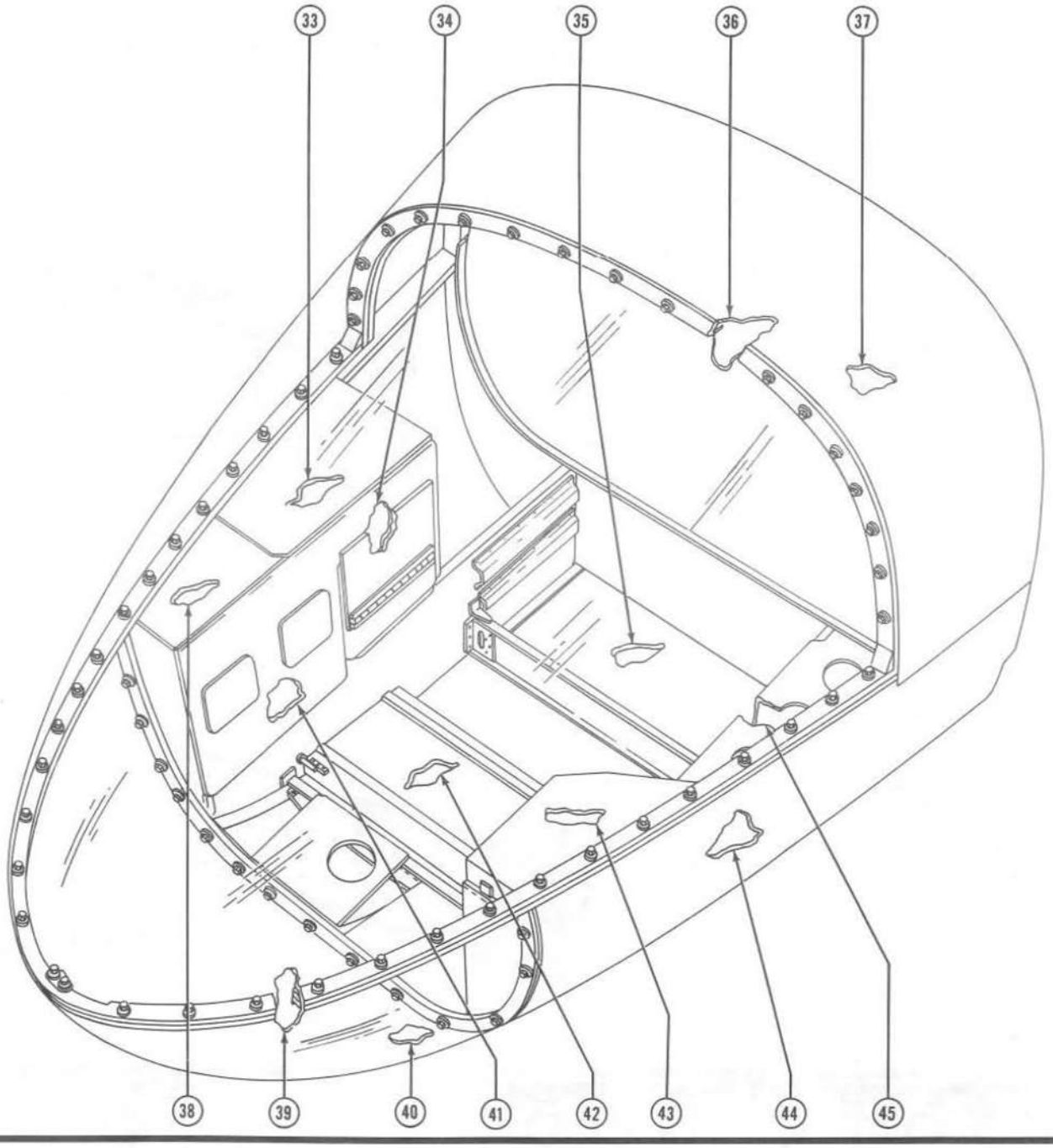


KEY TO DAMAGE NUMBERS

1. SEE FIGURE 121C
2. SEE FIGURE 121D
3. SEE FIGURE 121E
4. SEE FIGURE 121F
5. SEE FIGURE 121F
6. SEE FIGURE 121G
7. SEE FIGURE 121F
8. SEE FIGURE 121H
9. SEE FIGURE 121I
10. SEE FIGURE 121I
11. SEE FIGURE 121J
12. SEE FIGURE 121J (SIMILAR)
13. SEE FIGURE 121J (SIMILAR)
14. SEE FIGURE 121I & 121C (SIMILAR)
15. SEE FIGURE 121K
16. SEE FIGURE 121L
17. SEE FIGURE 121M
18. SEE FIGURE 121M REPAIR NO. 22 (SIMILAR)
19. SEE FIGURE 121J & 121O (SIMILAR)
22. SEE FIGURE 121M
23. SEE FIGURE 121O
24. SEE FIGURE 121P
25. SEE FIGURE 121O
26. SEE FIGURE 121J
27. SEE FIGURE 121R (SIMILAR) ALSO REPLACE ANGLE
28. SEE FIGURE 121S
29. SEE FIGURE 121T
30. SEE FIGURE 121S
31. SEE FIGURE 121U
32. SEE FIGURE 121T REPAIR NO. 30 (SIMILAR)

2.3.0.8.4

Figure 121B–Bombardier's Nose Key Damage Drawing (Sheet 1 of 2)



KEY TO DAMAGE NUMBERS

33. See Figure 121V
34. See Figure 121V
35. See Figure 121I Repair No. 9 (Similar)
36. See Figure 121W
37. See Figure 121W
38. See Figure 121X
39. See Figure 121Y
40. See General Manual for Structural Repair, Second Edition AN01-1A-1, Section XI, Repair of Transparent Plastics
41. See Figure 121M Repair No. 22 (Similar)
42. See Figure 121Z
43. See Figure 121X Repair No. 38 (Similar)
44. See Figure 121I Repair No. 9 (Similar)
45. See Figure 121X

2.3.1-5-2

Figure 121B—Bombardier's Nose Key Damage Drawing (Sheet 2 of 2)

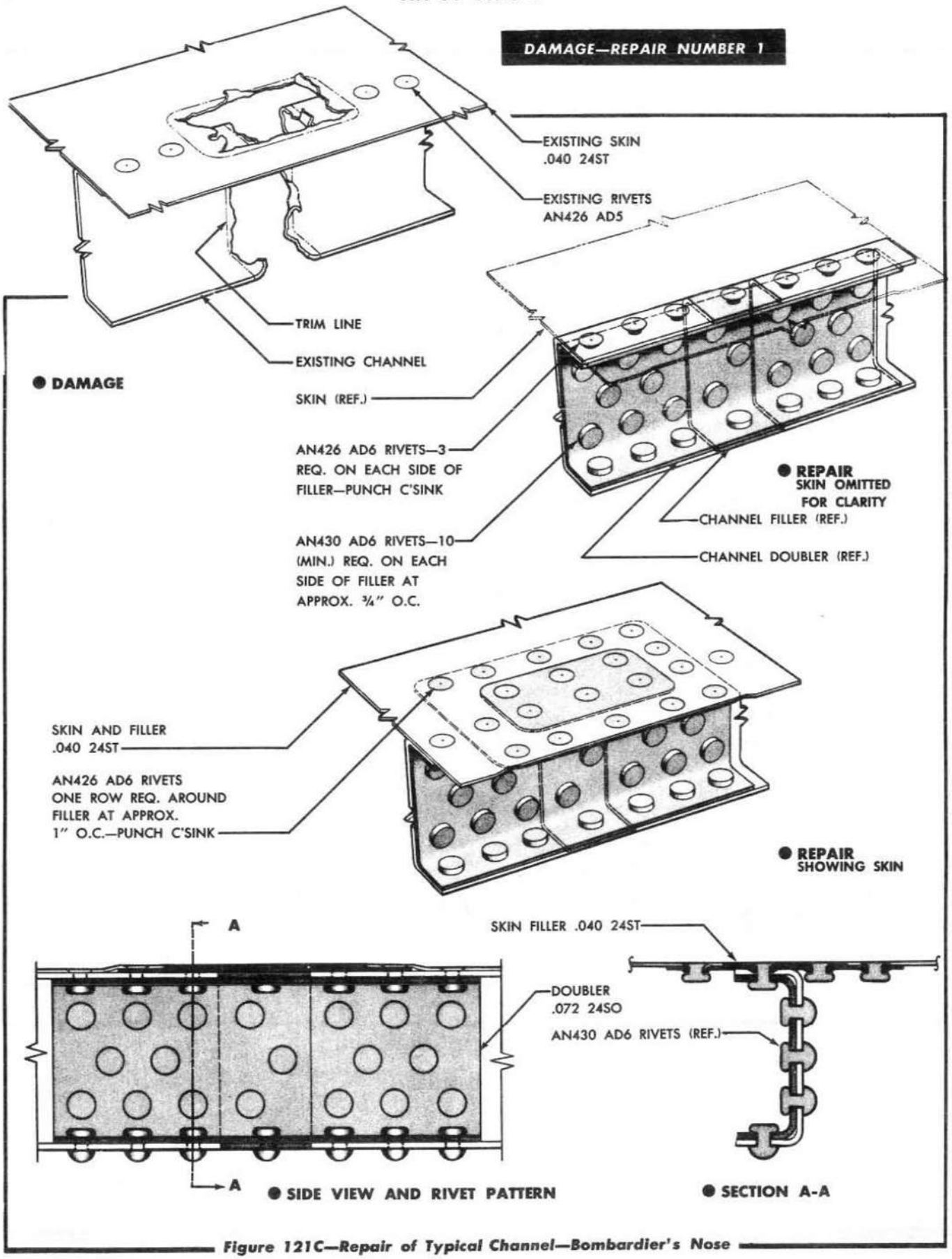
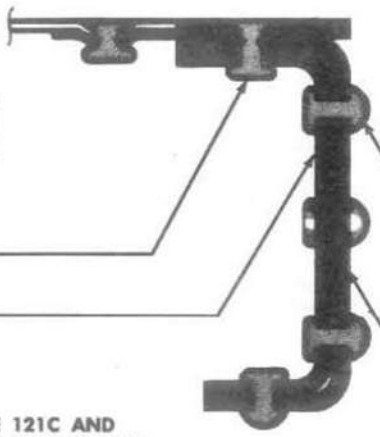


Figure 121C—Repair of Typical Channel—Bombardier's Nose

DAMAGE — REPAIR NUMBER 2



● **METHOD 1**
FOR COMPLETE BREAK

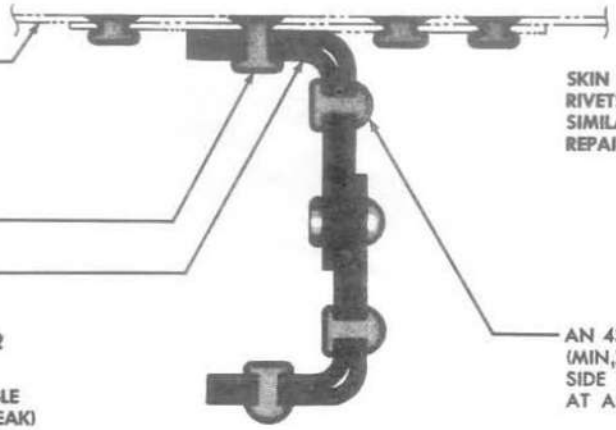
AN 426 AD6 RIVETS 3 (MIN.) REQ. ON EACH SIDE OF FILLER PUNCH AND MACHINE C'SINK

CHANNEL DOUBLER .072 24SO

SEE REPAIR NUMBER 1 FIGURE 121C AND NUMBER 37 FIGURE 121W FOR REPAIR OF SKIN

AN 430 AD6 RIVETS 10 (MIN.) REQ. ON EACH SIDE OF FILLER AT APPROX. 1" O. C.

EXISTING CHANNEL AND FILLER .064 24SO



SKIN (REF.) SEE REPAIR NUMBER 37 FIGURE 121W FOR REPAIR OF SKIN

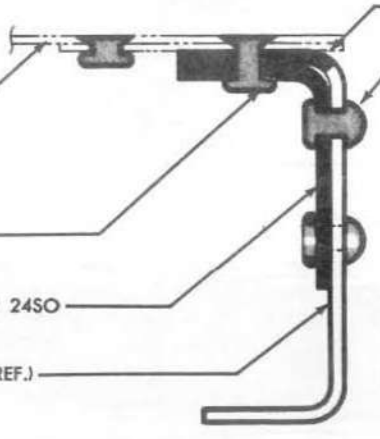
AN 426 AD6 RIVETS—3 (MIN.) REQ. ON EACH SIDE OF FILLER PUNCH AND MACHINE C'SINK

ANGLE DOUBLERS .072 24SO

● **METHOD 2**
(USE WHERE MORE PRACTICABLE FOR COMPLETE BREAK)

SKIN DOUBLER AND RIVETS SHOWN FOR SIMILAR TYPICAL REPAIRS

AN 430 AD6 RIVETS—10 (MIN,) REQ. ON EACH SIDE OF FILLER AT APPROX. 1" O. C.



SKIN (REF) SEE REPAIR NUMBER 37—FIGURE 121W FOR REPAIR OF SKIN

AN 426 AD6 RIVETS 3 (MIN.) REQ. ON EACH SIDE OF FILLER PUNCH AND MACHINE C'SINK

ANGLE DOUBLER .064 24SO

EXISTING CHANNEL (REF.)

FILLER .064 24SO

AN 430 AD6 RIVETS—5 (MIN.) REQ. ON EACH SIDE OF FILLER AT APPROX. 1" O. C.

● **TYPICAL SECTION**

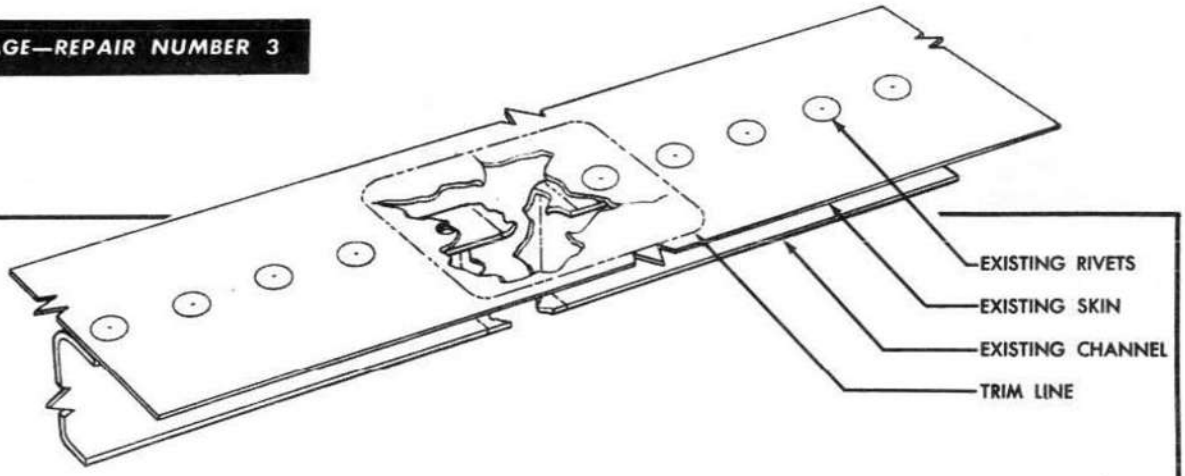
FOR DAMAGE EXTENDING INTO BEND RADIUS AT UPPER FLANGE

NOTE—FOR DAMAGE EXTENDING INTO BEND RADIUS OF LOWER FLANGE USE SIMILAR REPAIR—ONLY USE AN 430 AD6 RIVETS

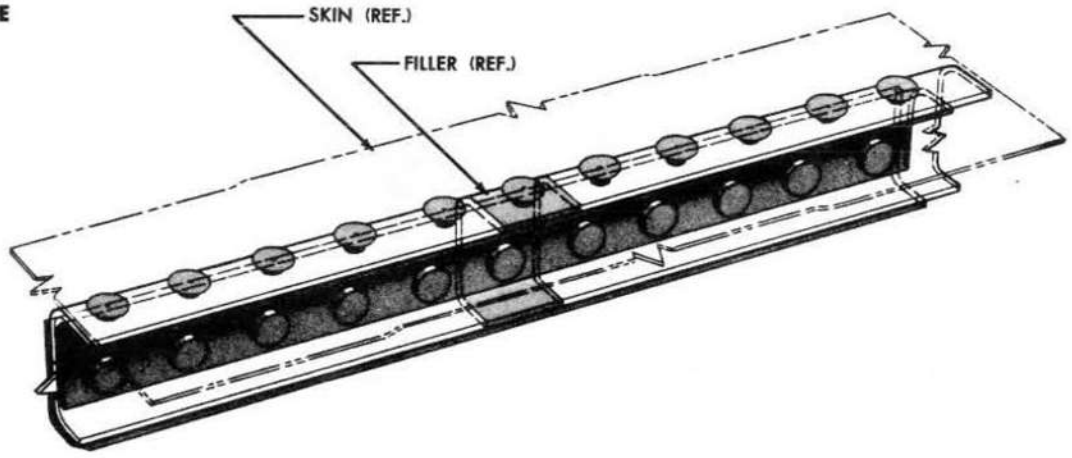
NOTE—SEE REPAIRS NUMBER 1 FIGURE 121C AND NUMBER 37 FIGURE 121W FOR REPAIR OF SKIN AND SIMILAR PERSPECTIVES

Figure 121D—Typical Repairs of Channels—Bombardier's Nose

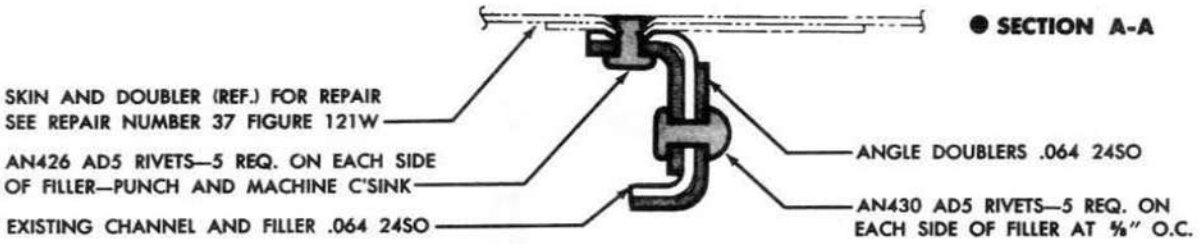
● **DAMAGE—REPAIR NUMBER 3**

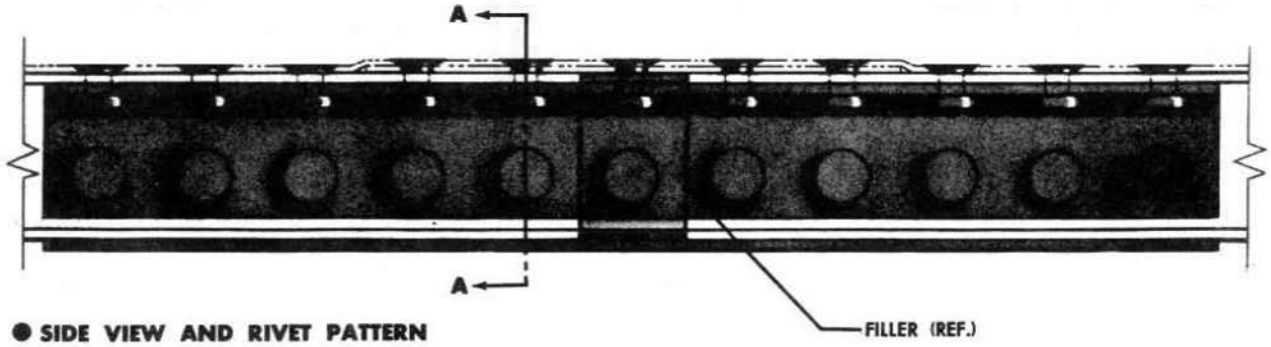


● **DAMAGE**



● **REPAIR**





● **SIDE VIEW AND RIVET PATTERN**

Figure 121E—Repair of Channel—Bombardier's Nose

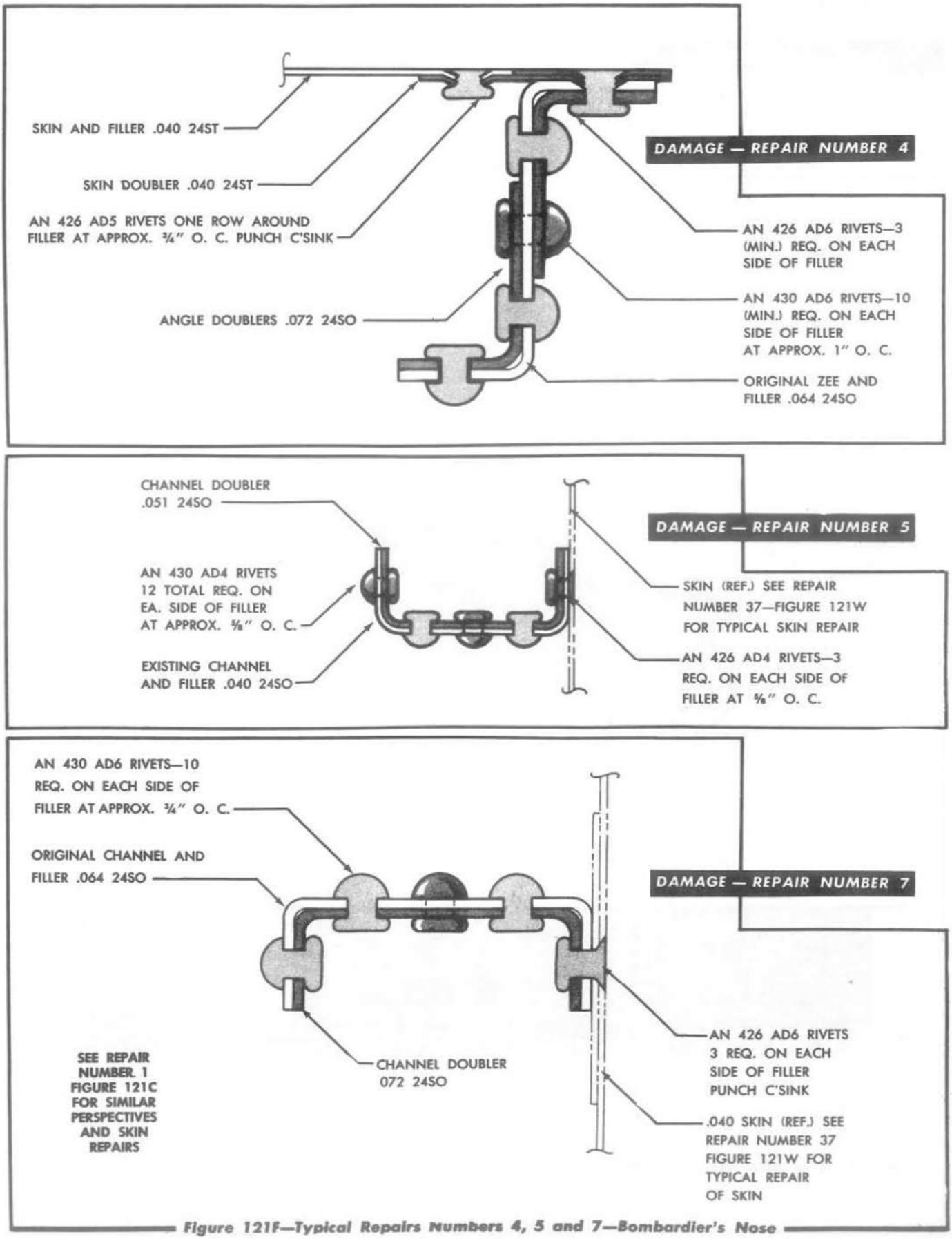


Figure 121F—Typical Repairs Numbers 4, 5 and 7—Bombardier's Nose

DAMAGE — REPAIR NUMBER 6

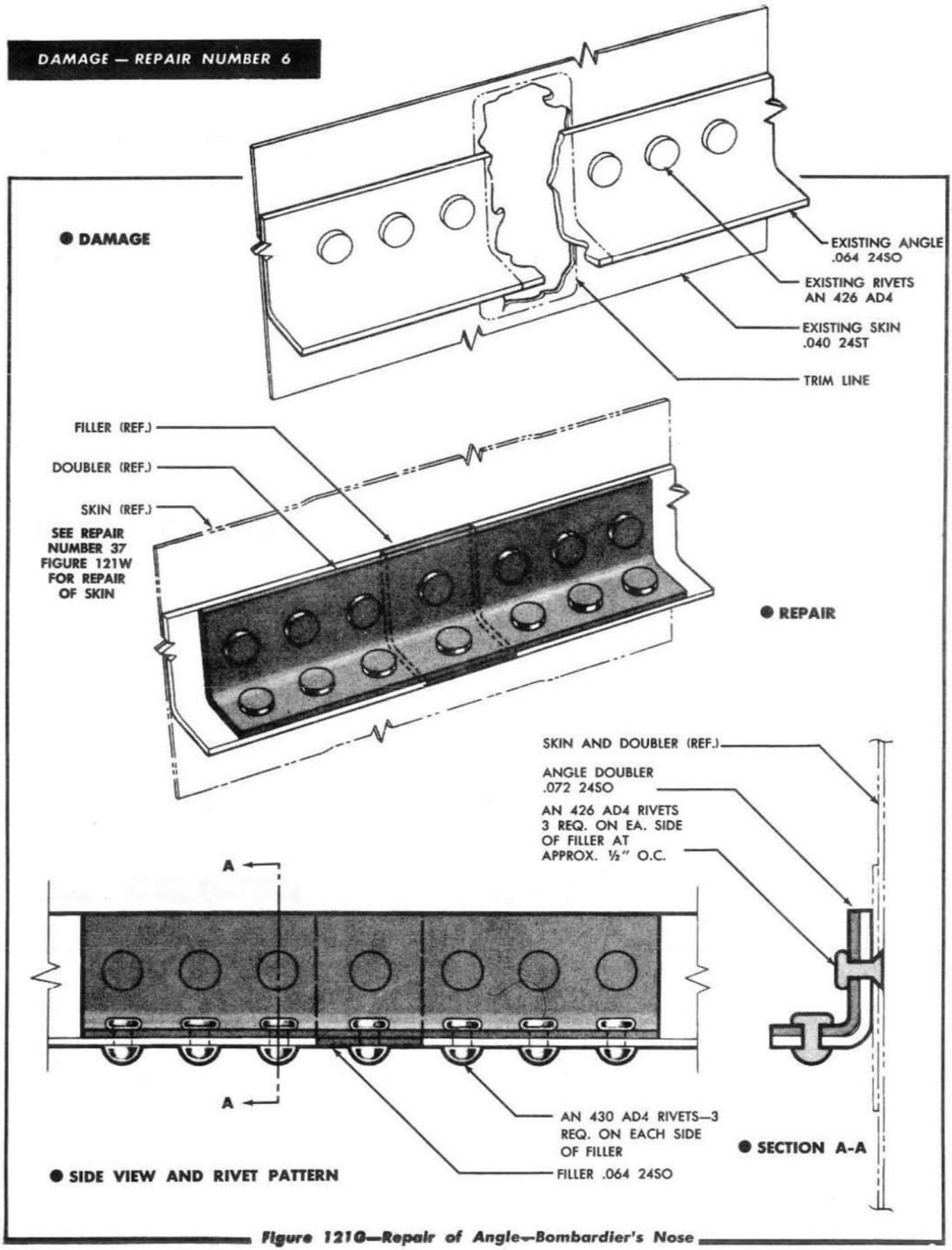


Figure 121G—Repair of Angle—Bombardier's Nose

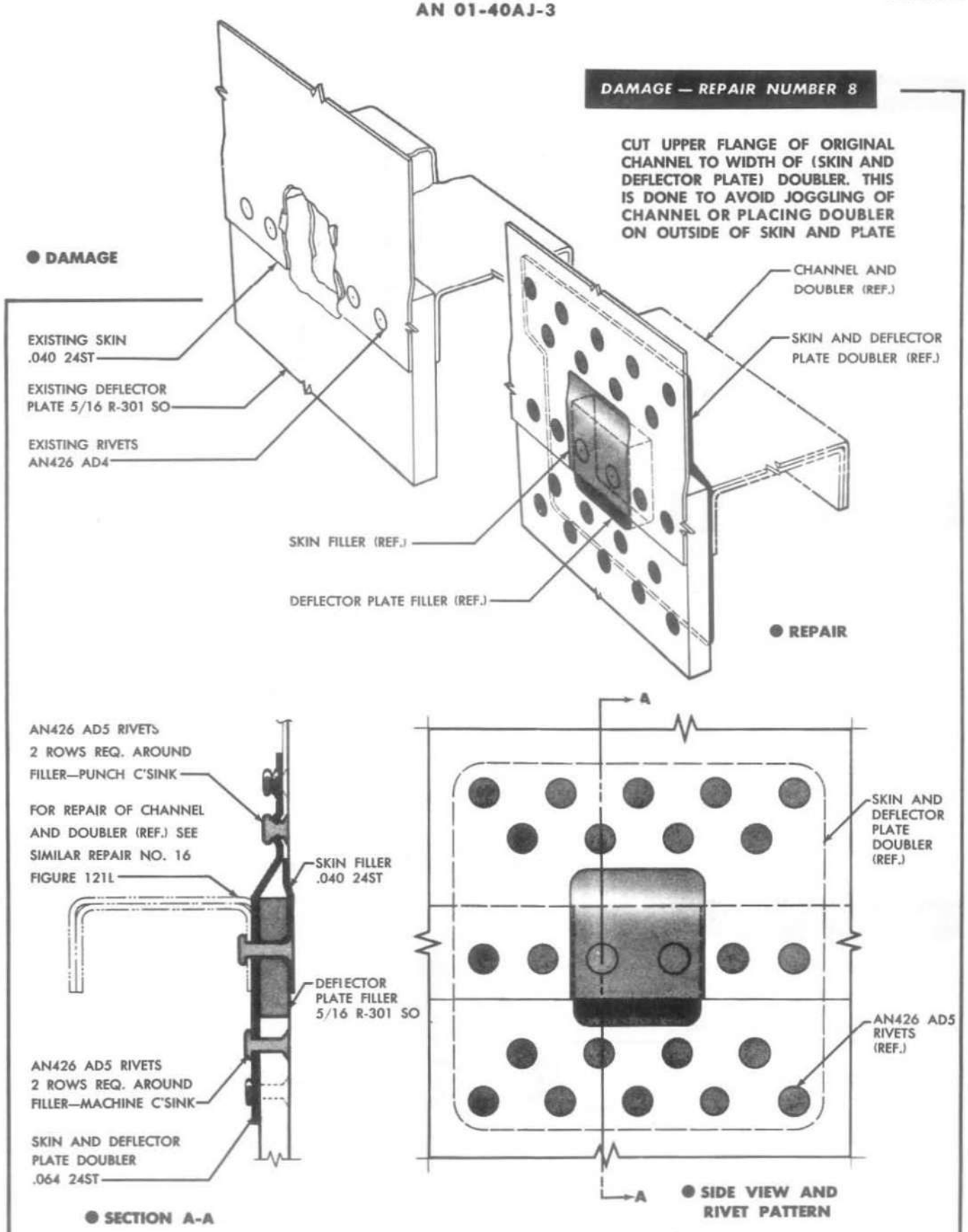
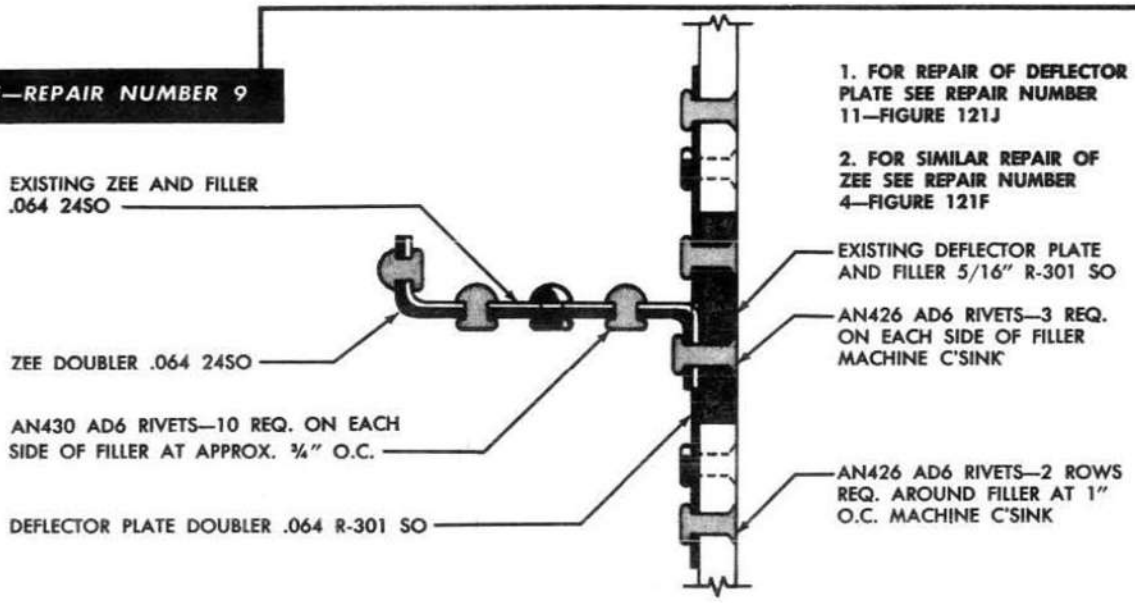
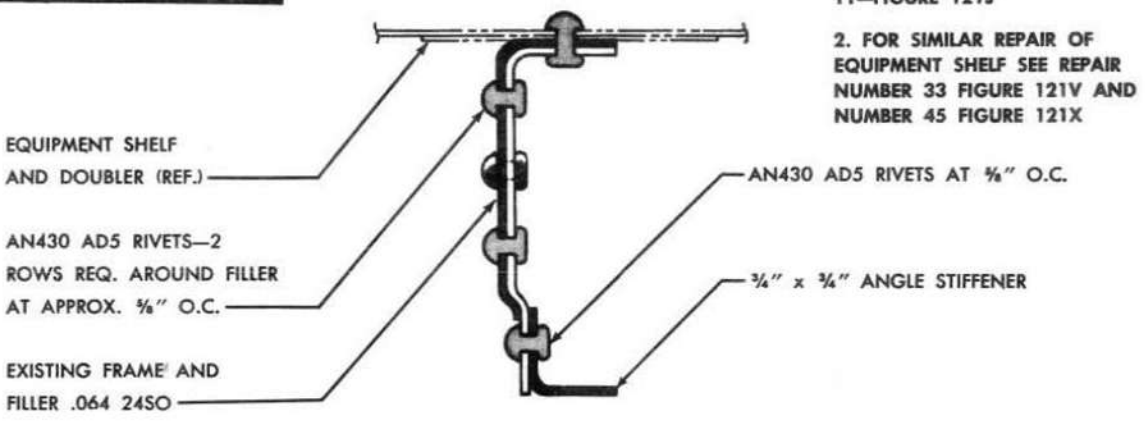


Figure 121H—Repair of Deflector Plate and Skin—Bombardier's Nose

DAMAGE—REPAIR NUMBER 9



DAMAGE—REPAIR NUMBER 10



DAMAGE—REPAIR NUMBER 14

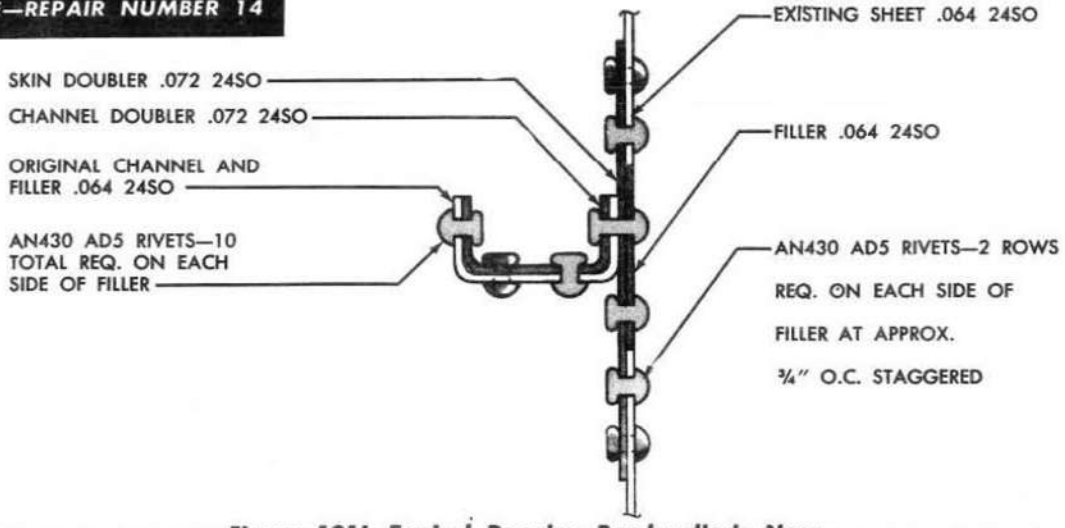


Figure 121I—Typical Repairs—Bombardier's Nose

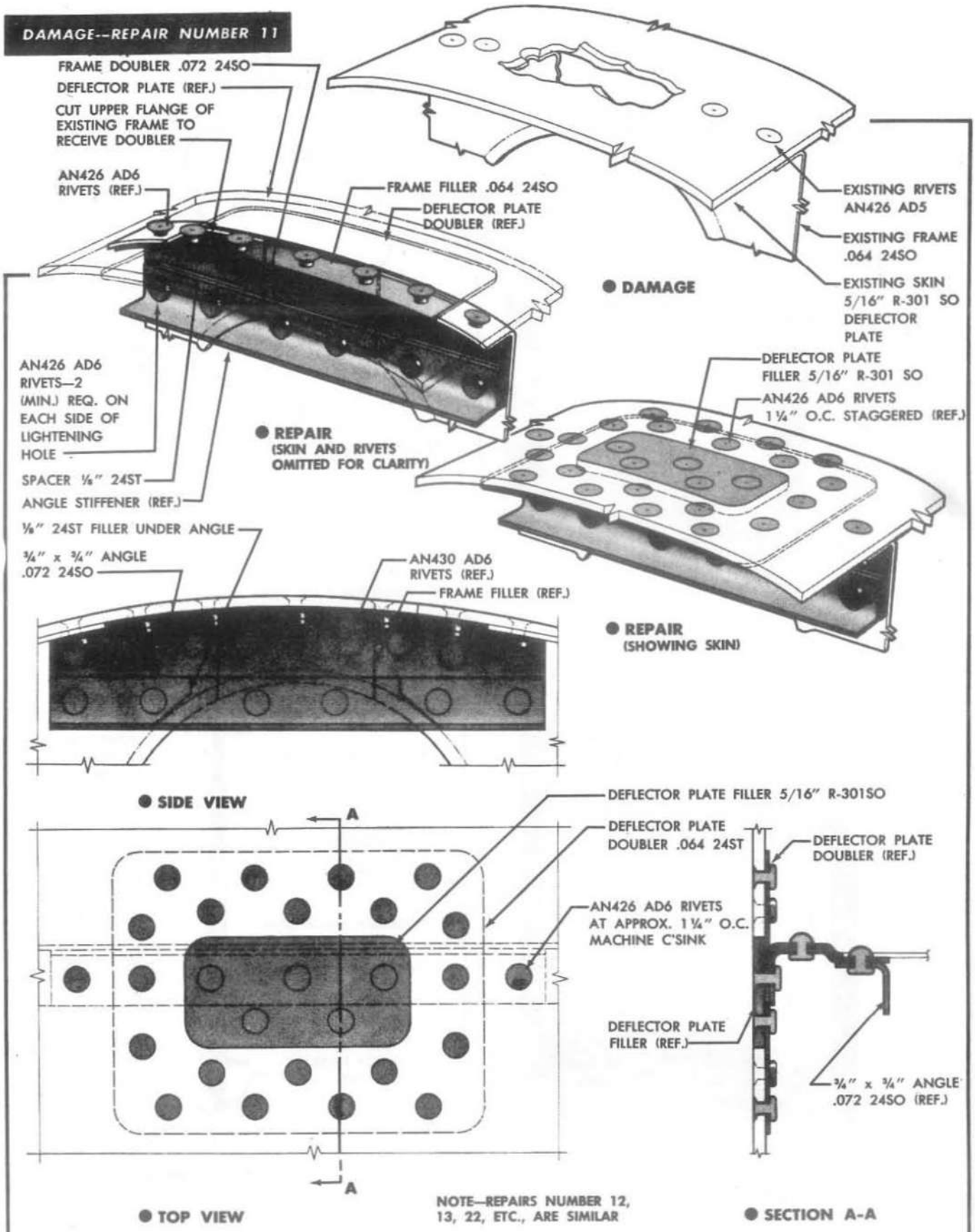


Figure 121J—Typical Repair of Frames—Bombardier's Nose

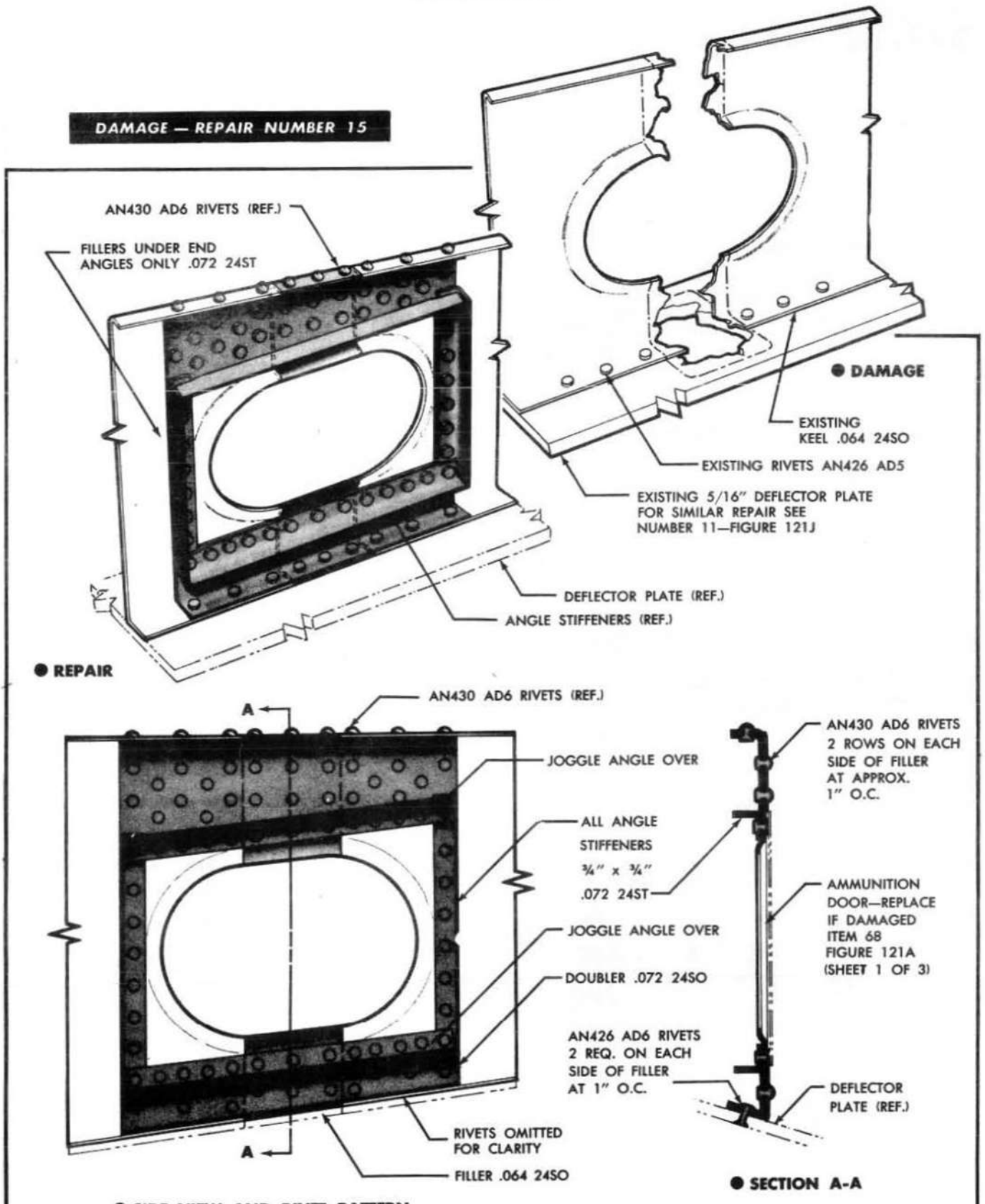
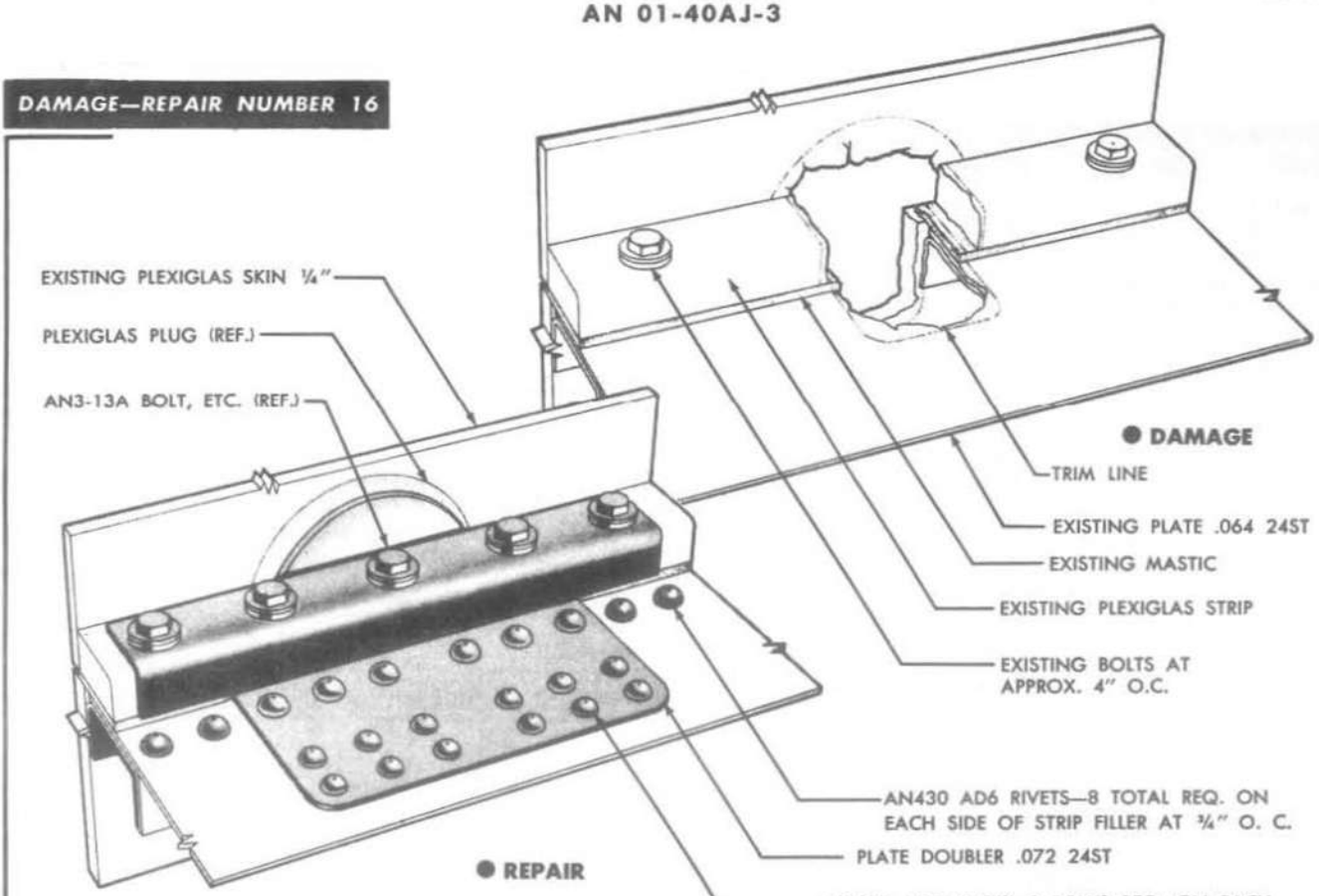


Figure 121K—Repair of Keel at Ammunition Door—Bombardier's Nose

DAMAGE—REPAIR NUMBER 16



FOR FURTHER DETAILS FOR REPAIR OF INDIVIDUAL COMPONENT PARTS, SEE THE FOLLOWING REFERENCES:

(1) For similar repair of deflector plate and channel, see Repair Number 8, Figure 121H.

(2) For similar repair of plexiglas, skin and strip, see Repair Number 39, Figure 121Y.

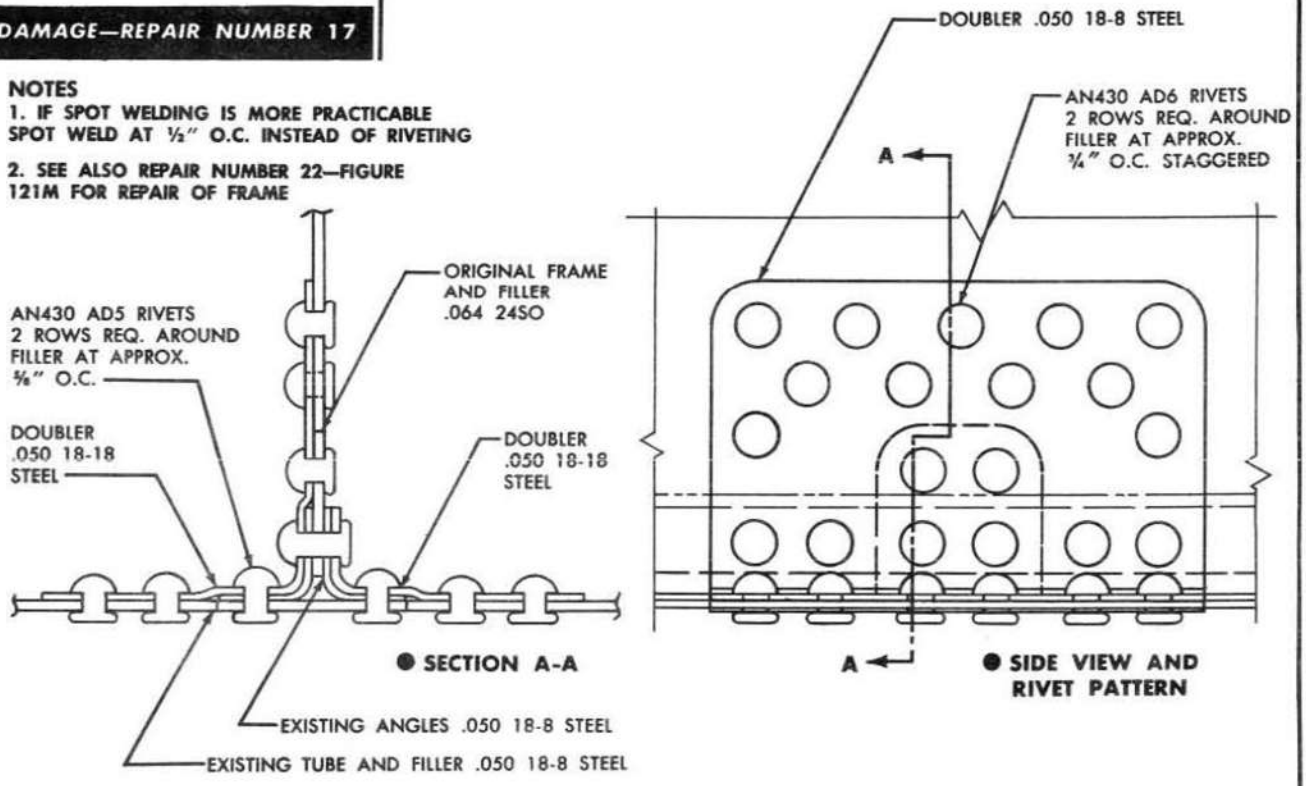
(3) For similar repair of plate, see Repair Number 33, Figure 121V.

See also the general manual for structural repair, second edition AN 01-1A-1, section XI, repair of transparent plastics.

Figure 121L—Repair of Plexiglas and Deflector Plate—Bombardier's Nose

DAMAGE—REPAIR NUMBER 17

NOTES
1. IF SPOT WELDING IS MORE PRACTICABLE SPOT WELD AT ½" O.C. INSTEAD OF RIVETING
2. SEE ALSO REPAIR NUMBER 22—FIGURE 121M FOR REPAIR OF FRAME



DAMAGE—REPAIR NUMBER 22

SEE REPAIR NUMBER 11 FOR SIMILAR REPAIR OF FRAME

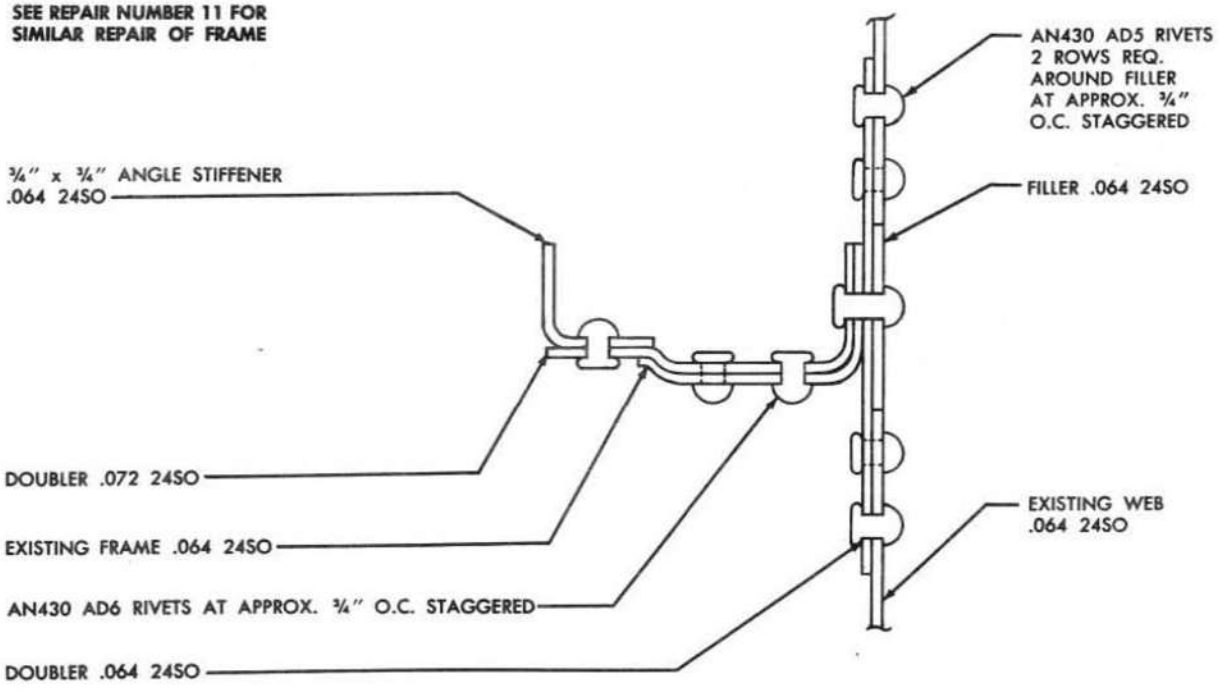


Figure 121M—Typical Repairs—Bombardier's Nose

Figure 121N deleted.

DAMAGE — REPAIR NUMBER 23

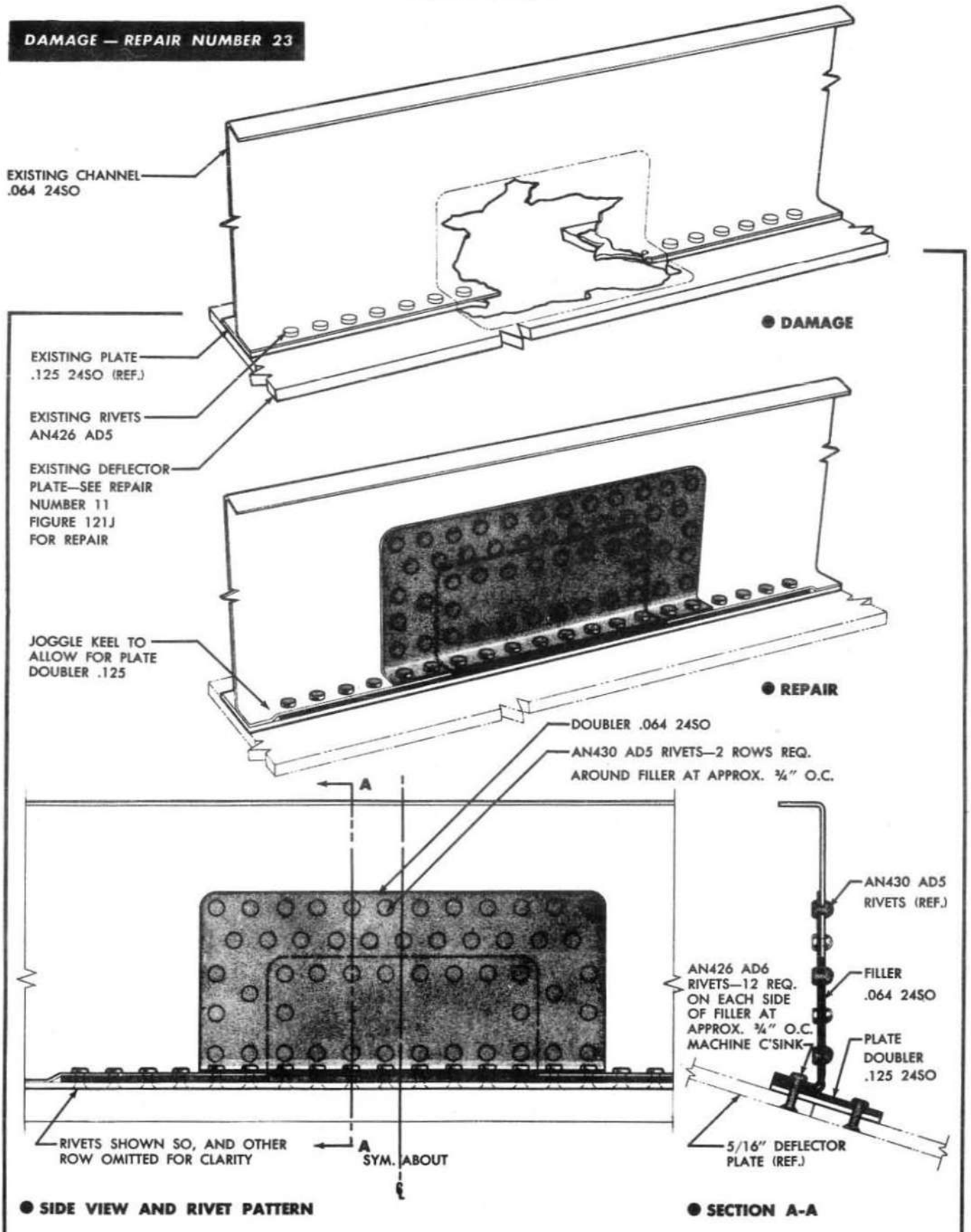


Figure 121O—Repair of Keel—Bombardier's Nose

AN 01-40AJ-3

DAMAGE — REPAIR NUMBER 24

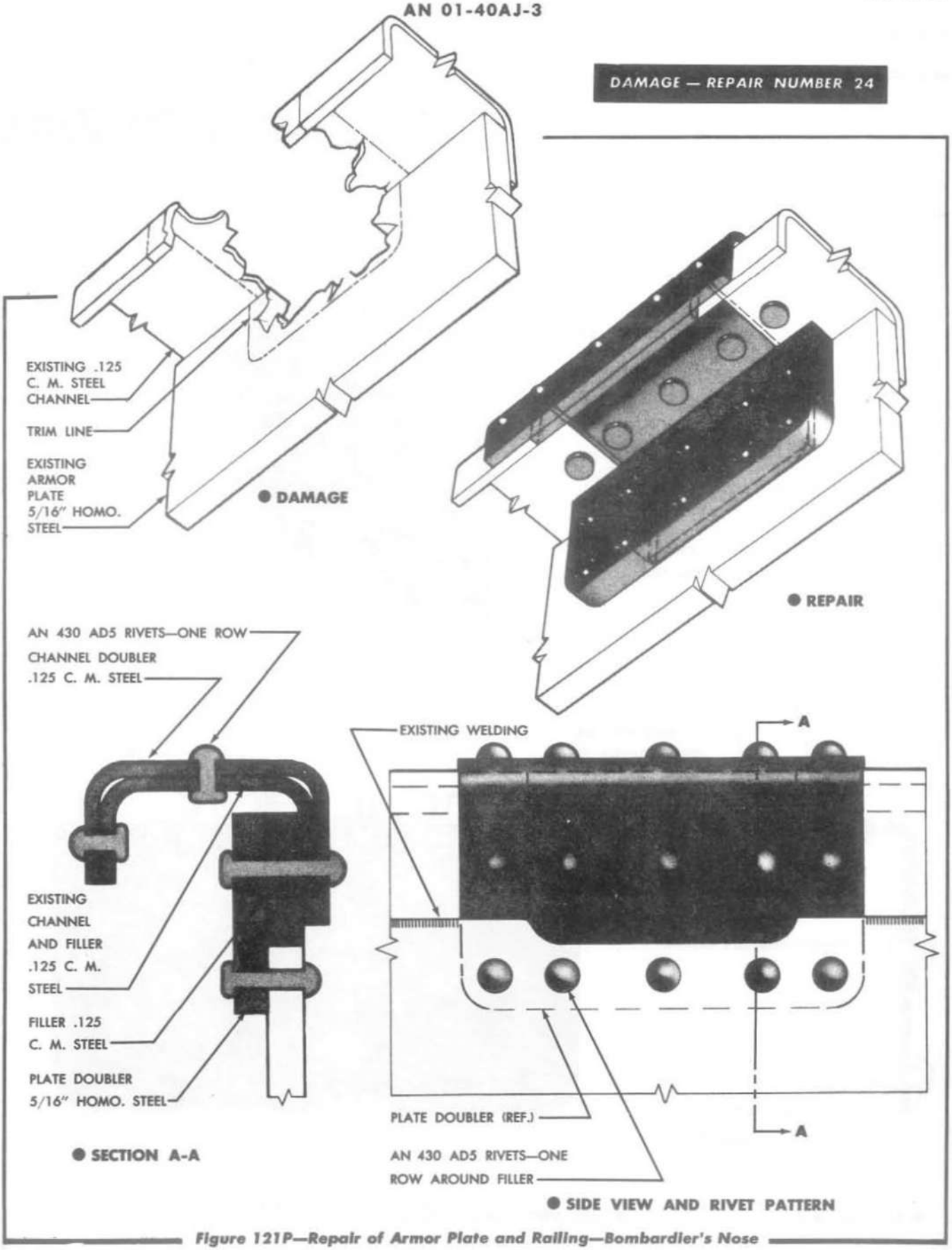


Figure 121P—Repair of Armor Plate and Railing—Bombardier's Nose

AN 01-40AJ-3

DAMAGE — REPAIR NUMBER 25

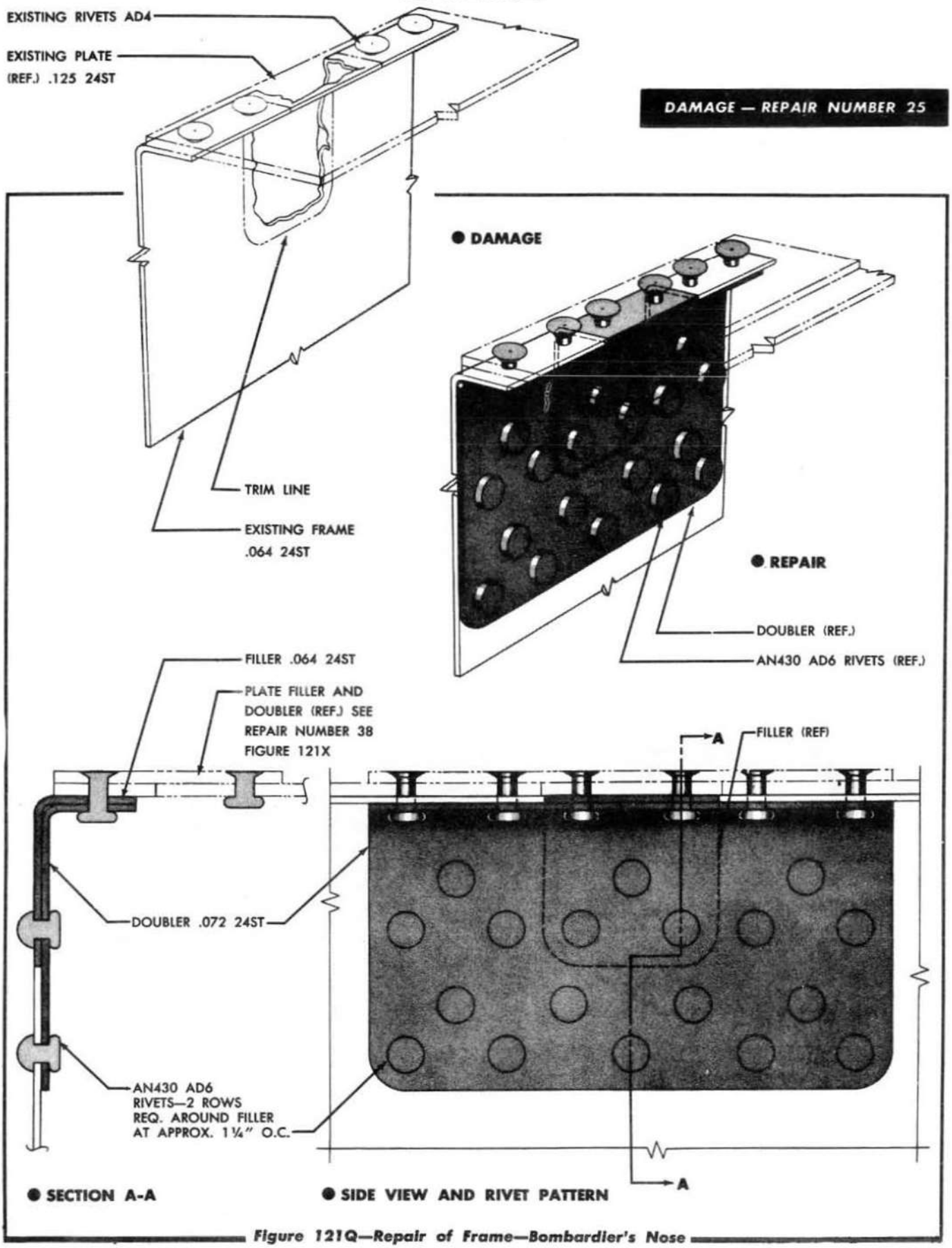


Figure 121Q—Repair of Frame—Bombardier's Nose

DAMAGE — REPAIR NUMBER 27

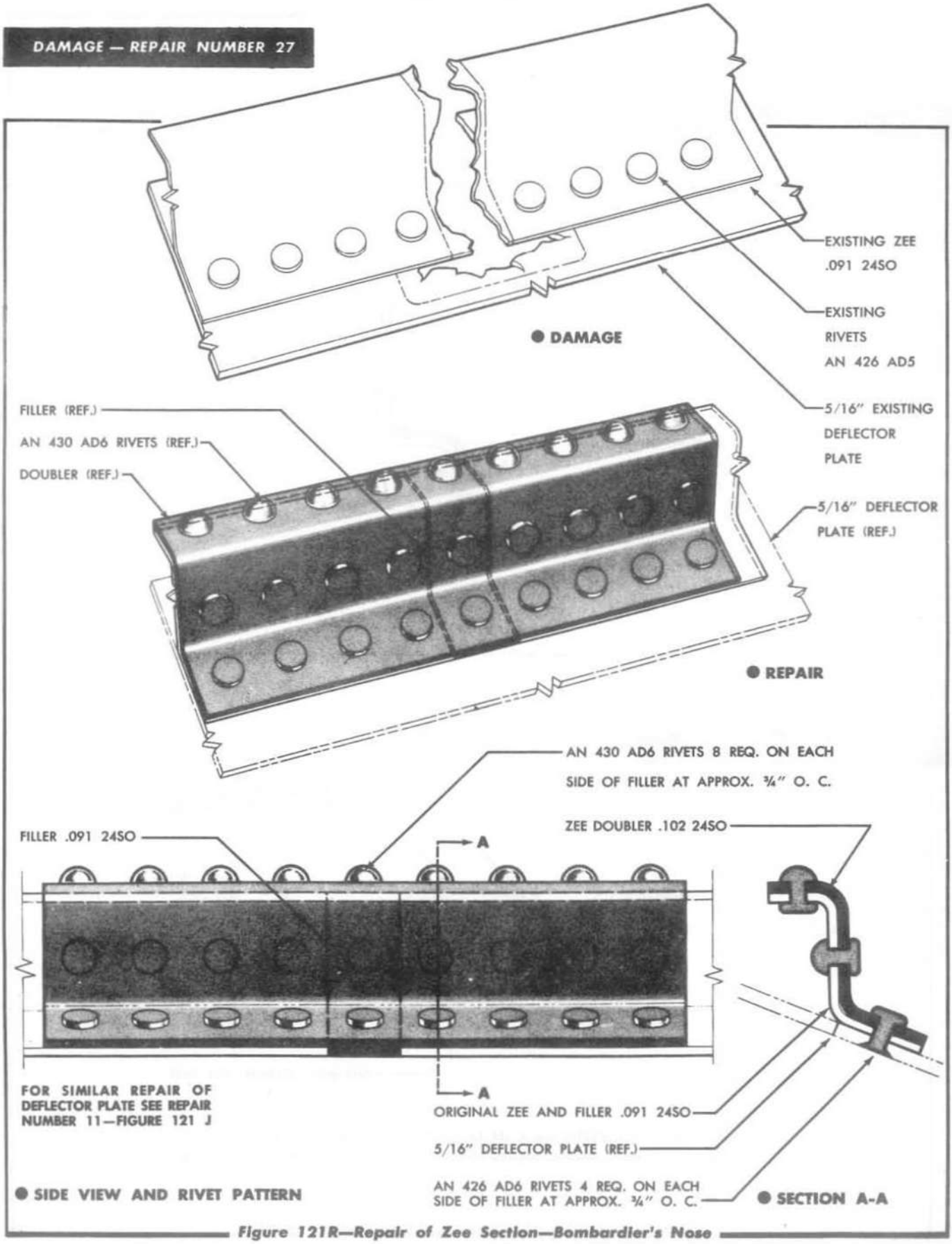
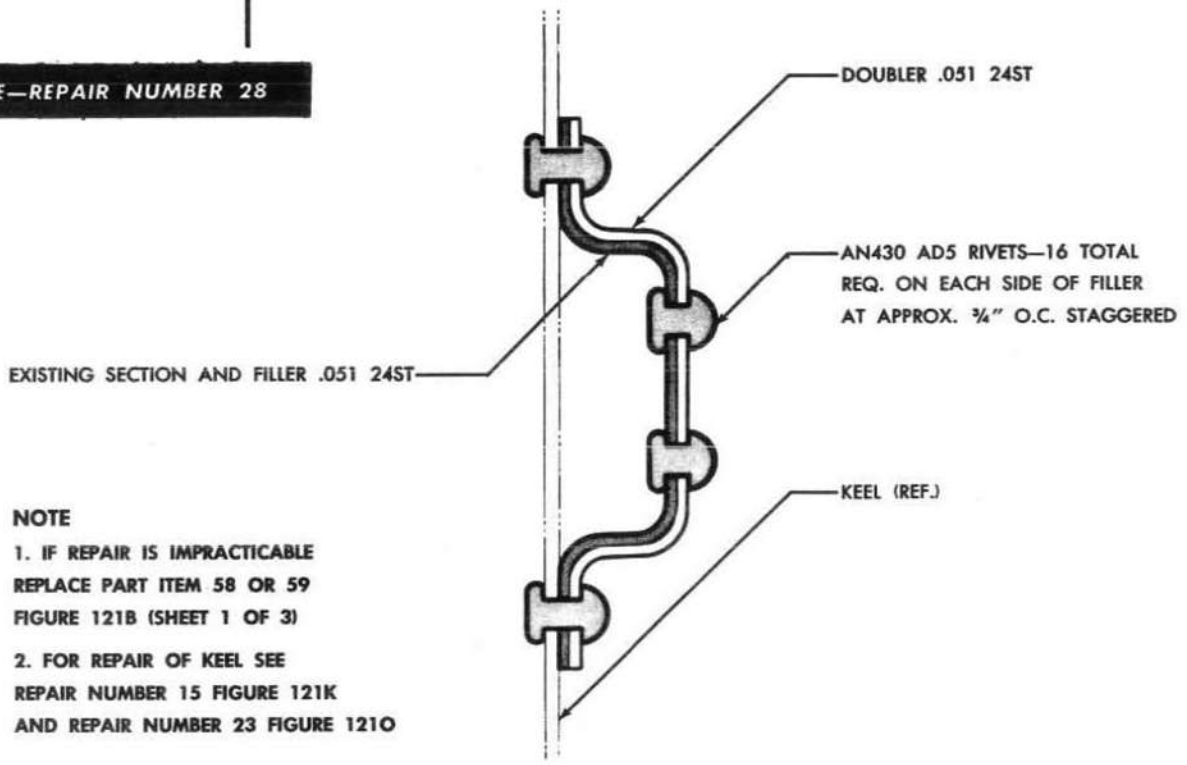


Figure 121R—Repair of Zee Section—Bombardier's Nose

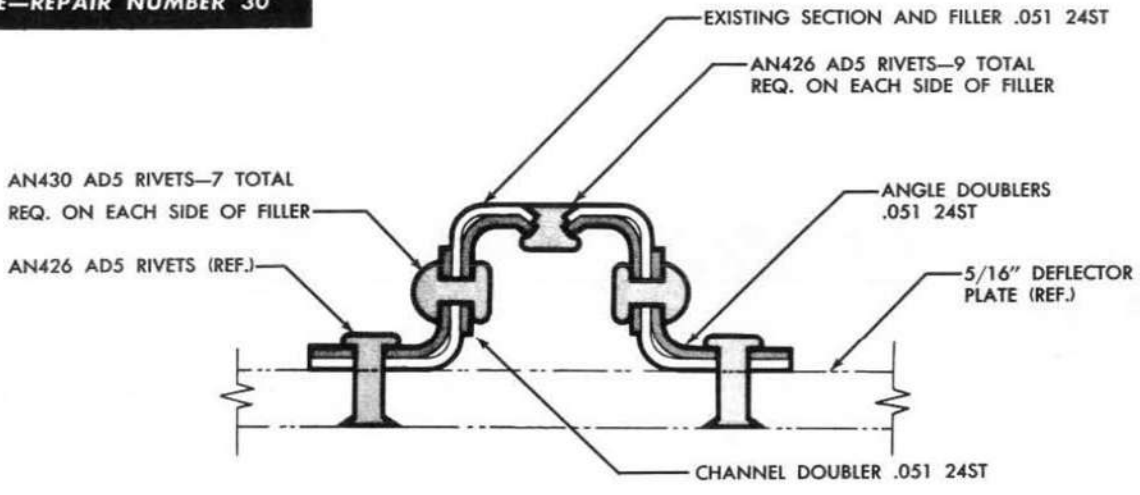
DAMAGE—REPAIR NUMBER 28



NOTE

1. IF REPAIR IS IMPRACTICABLE REPLACE PART ITEM 58 OR 59 FIGURE 121B (SHEET 1 OF 3)
2. FOR REPAIR OF KEEL SEE REPAIR NUMBER 15 FIGURE 121K AND REPAIR NUMBER 23 FIGURE 121O

DAMAGE—REPAIR NUMBER 30



NOTE

1. FOR REPAIR OF DEFLECTOR PLATE SEE REPAIR NUMBER 11 FIGURE 121J
2. IF REPAIR IS IMPRACTICABLE REPLACE PART—ITEM 63 FIGURE 121B (SHEET 1 OF 3)

Figure 121S—Typical Repairs—Bombardier's Nose

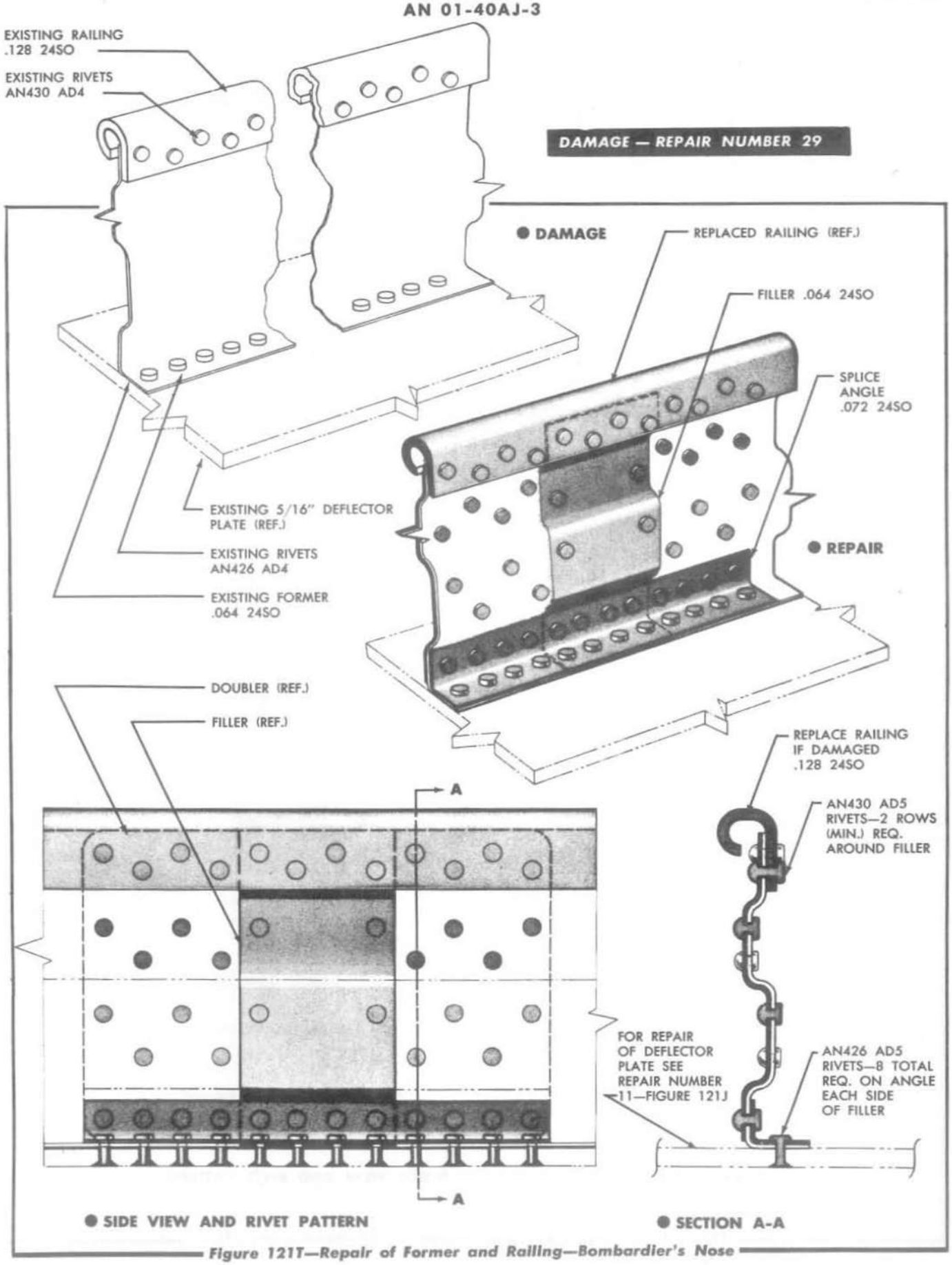


Figure 121T—Repair of Former and Railing—Bombardier's Nose

DAMAGE — REPAIR NUMBER 31

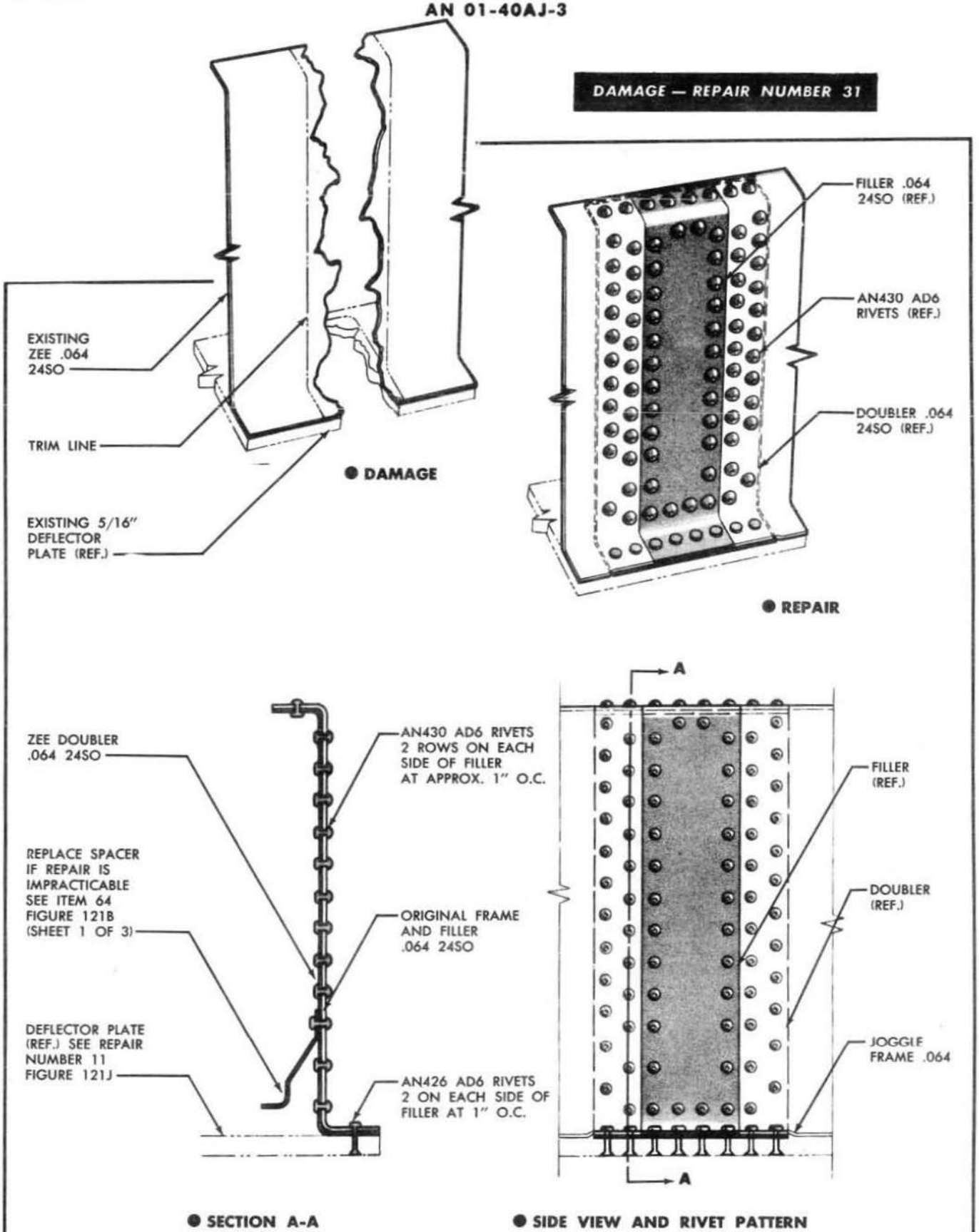
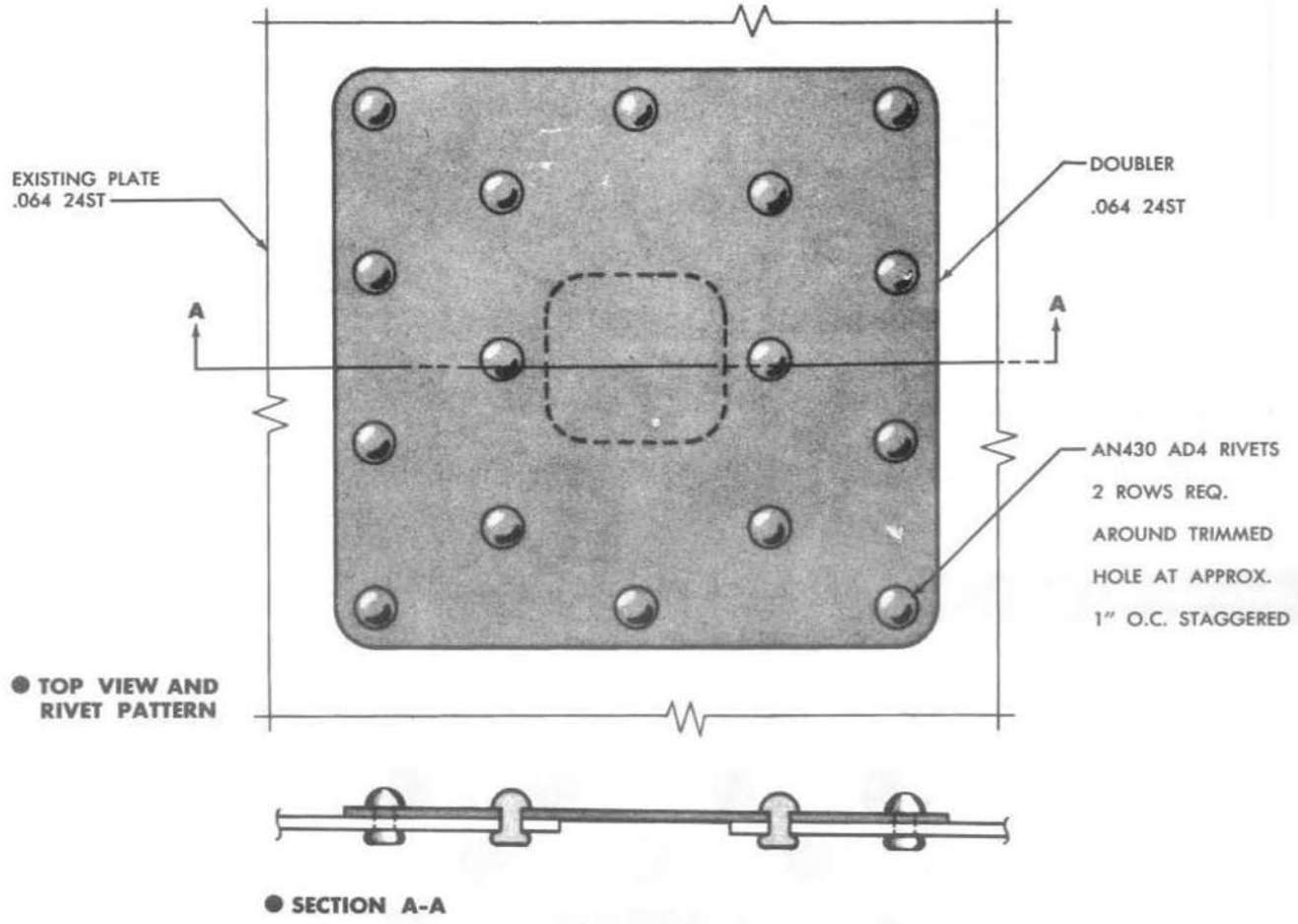


Figure 121U—Repair of Frame Station -1.569—Bombardier's Nose

DAMAGE—REPAIR NUMBER 33



DAMAGE—REPAIR NUMBER 34

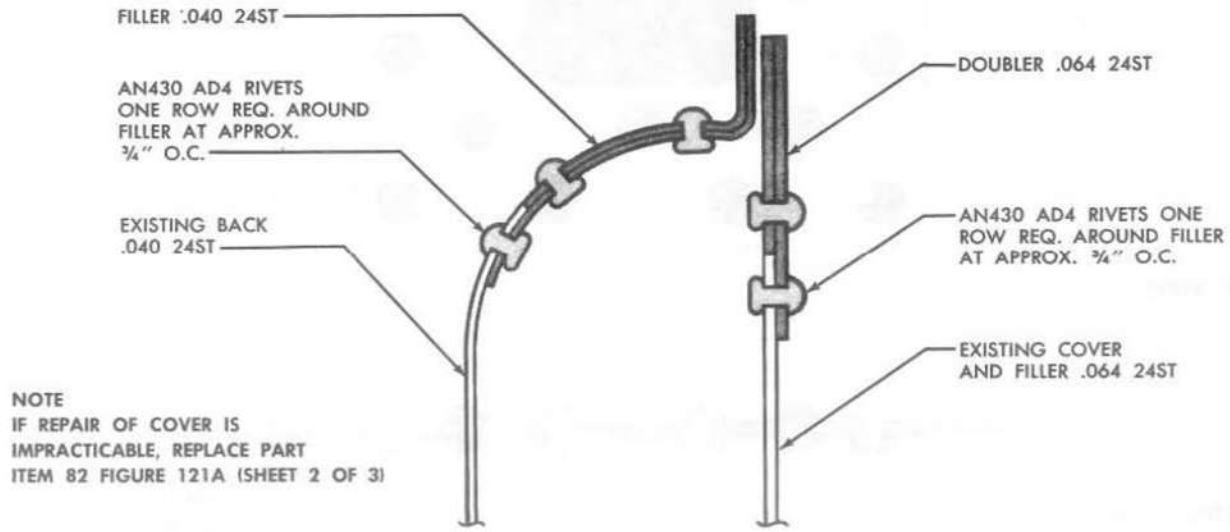
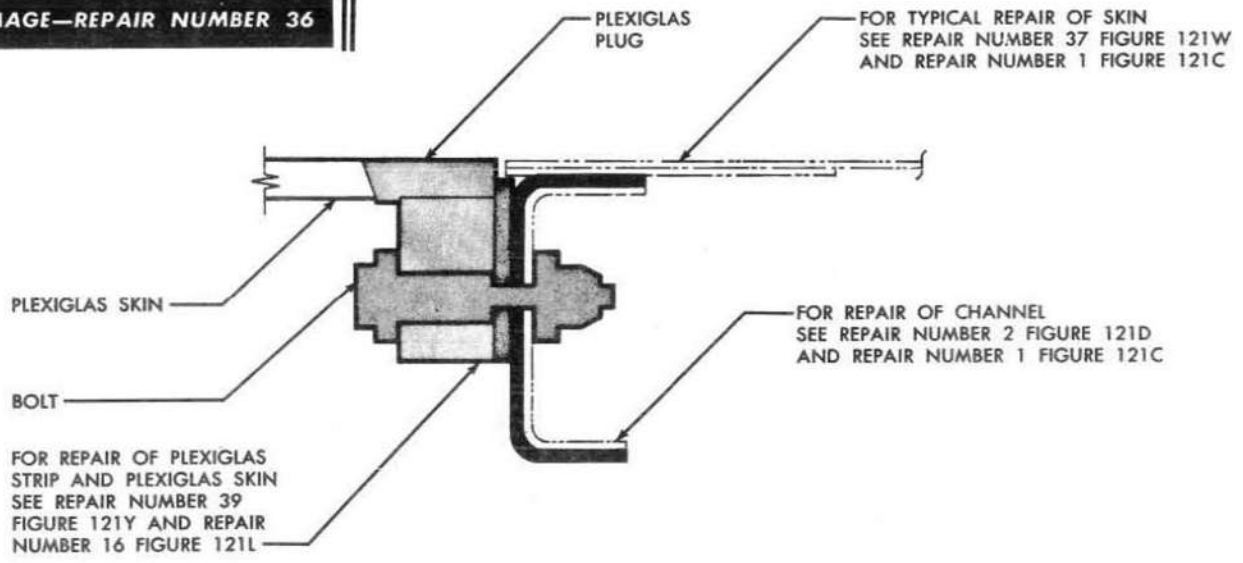
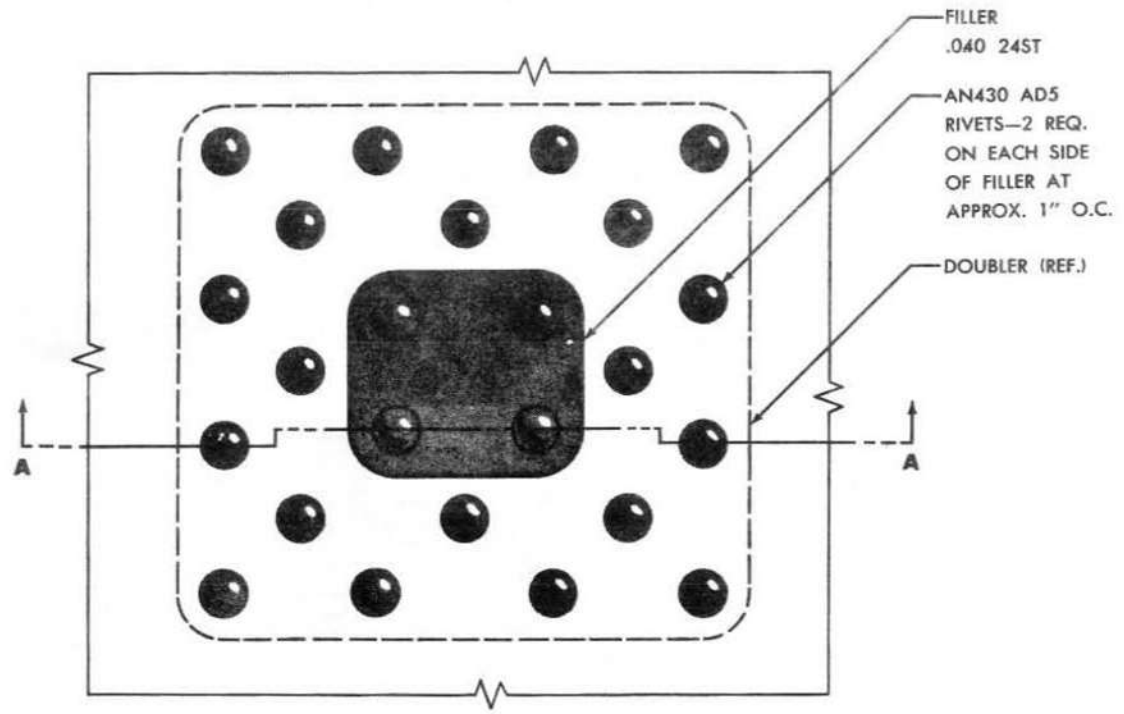


Figure 121V—Typical Repairs—Bombardier's Nose

DAMAGE—REPAIR NUMBER 36



DAMAGE—REPAIR NUMBER 37



● TOP VIEW

● SECTION A-A

Figure 121W—Typical Repairs—Bombardier's Nose

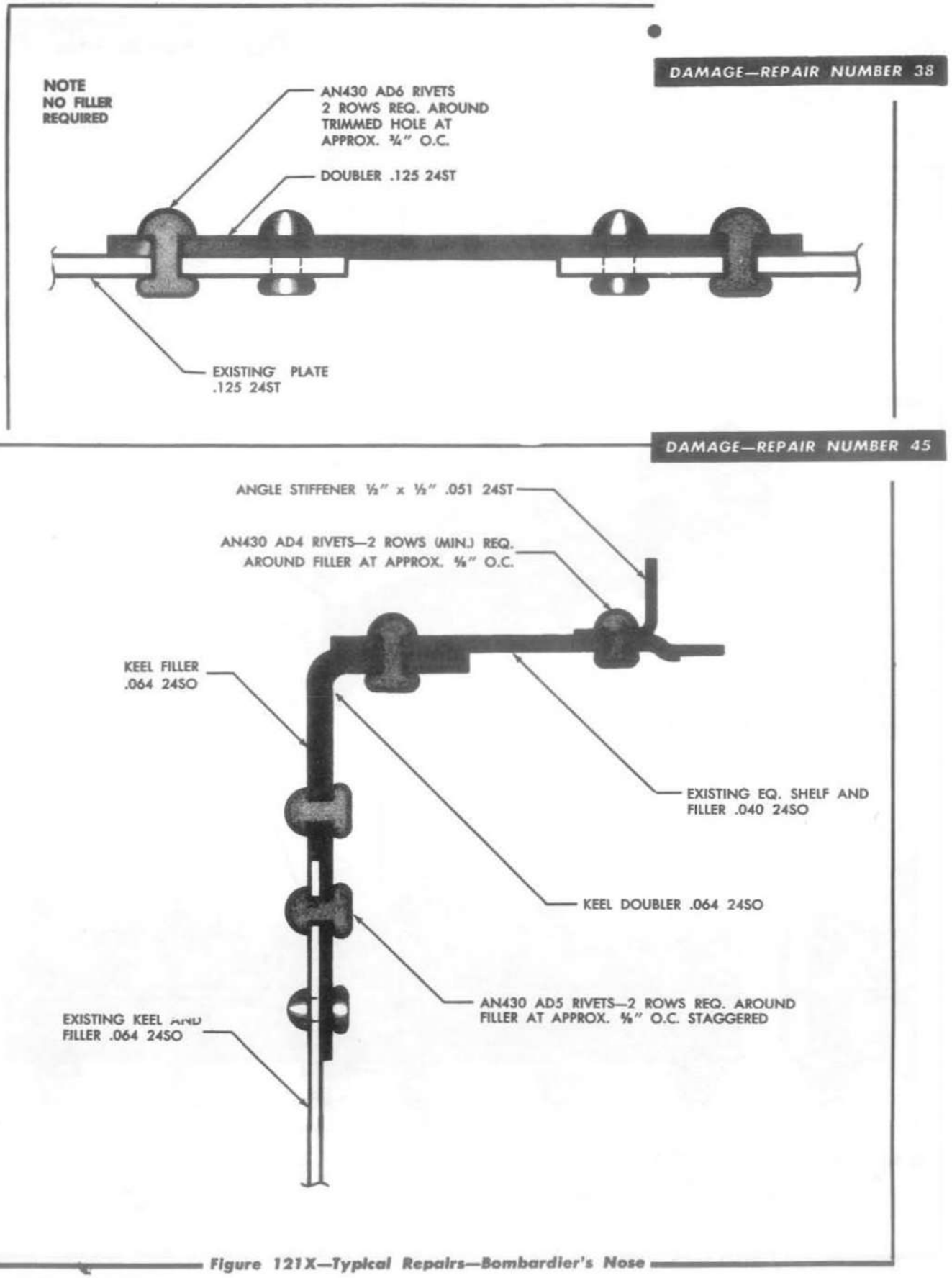


Figure 121X—Typical Repairs—Bombardier's Nose

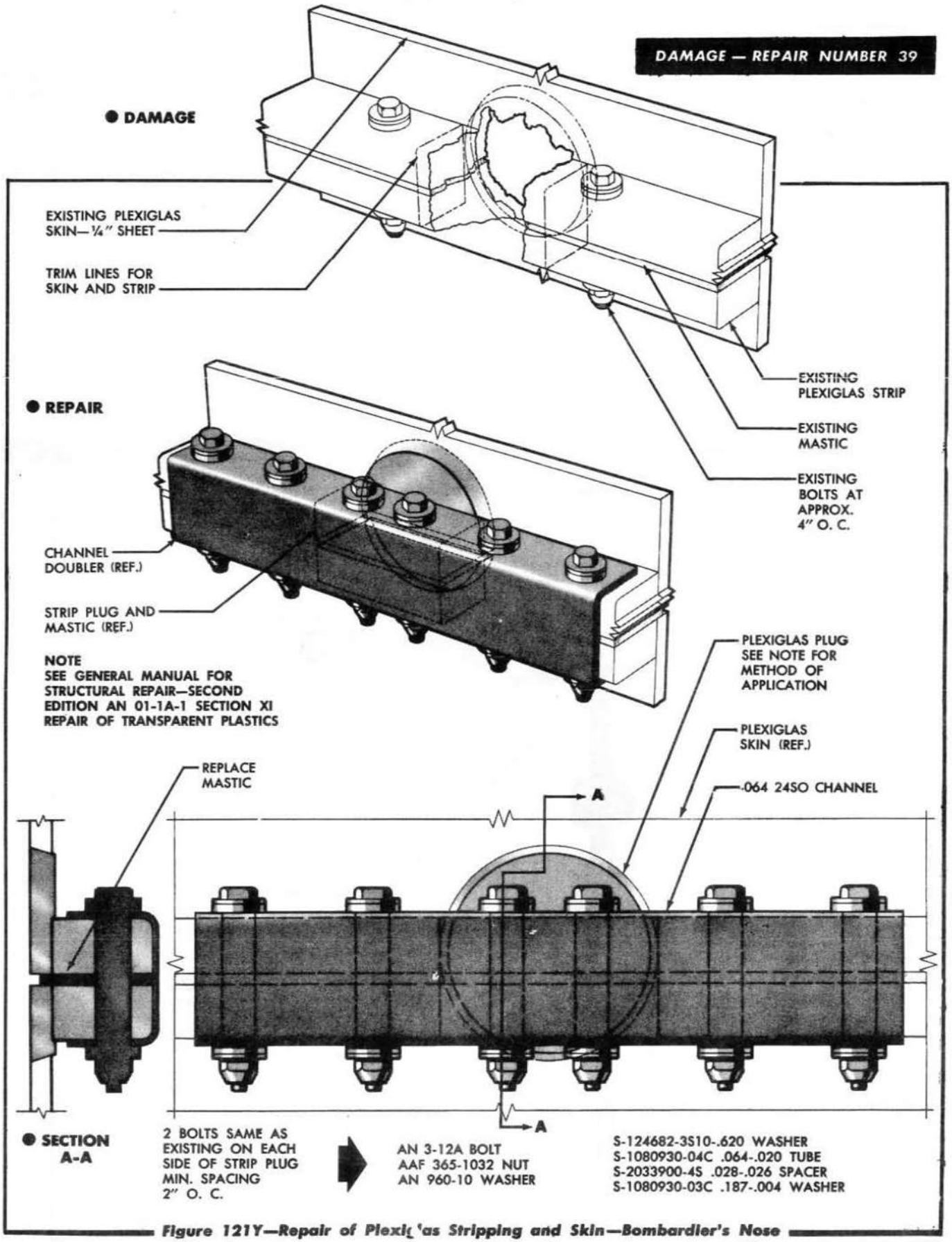


Figure 121Y—Repair of Plexiglas Stripping and Skin—Bombardier's Nose

DAMAGE—REPAIR NUMBER 42

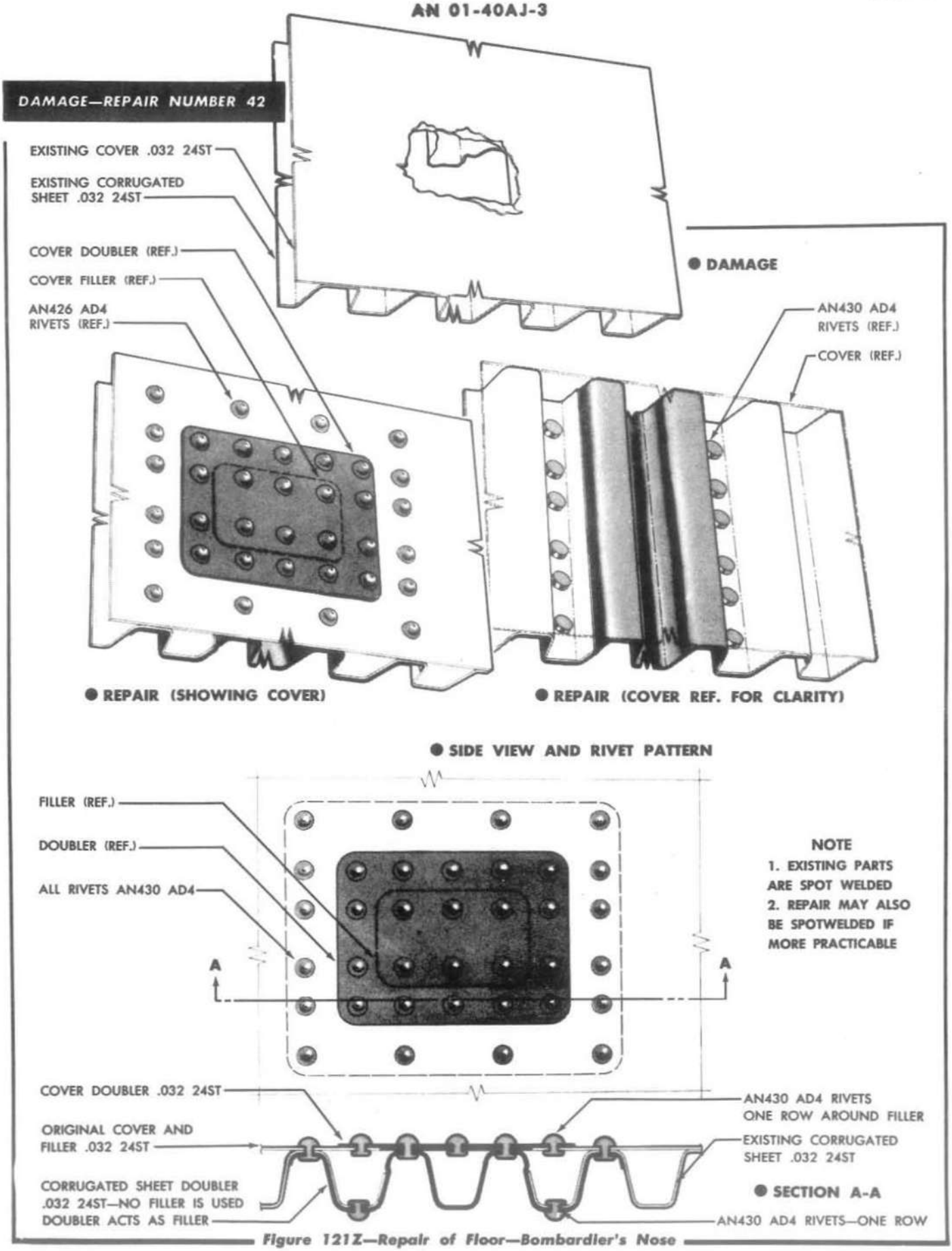


Figure 121Z—Repair of Floor—Bombardier's Nose

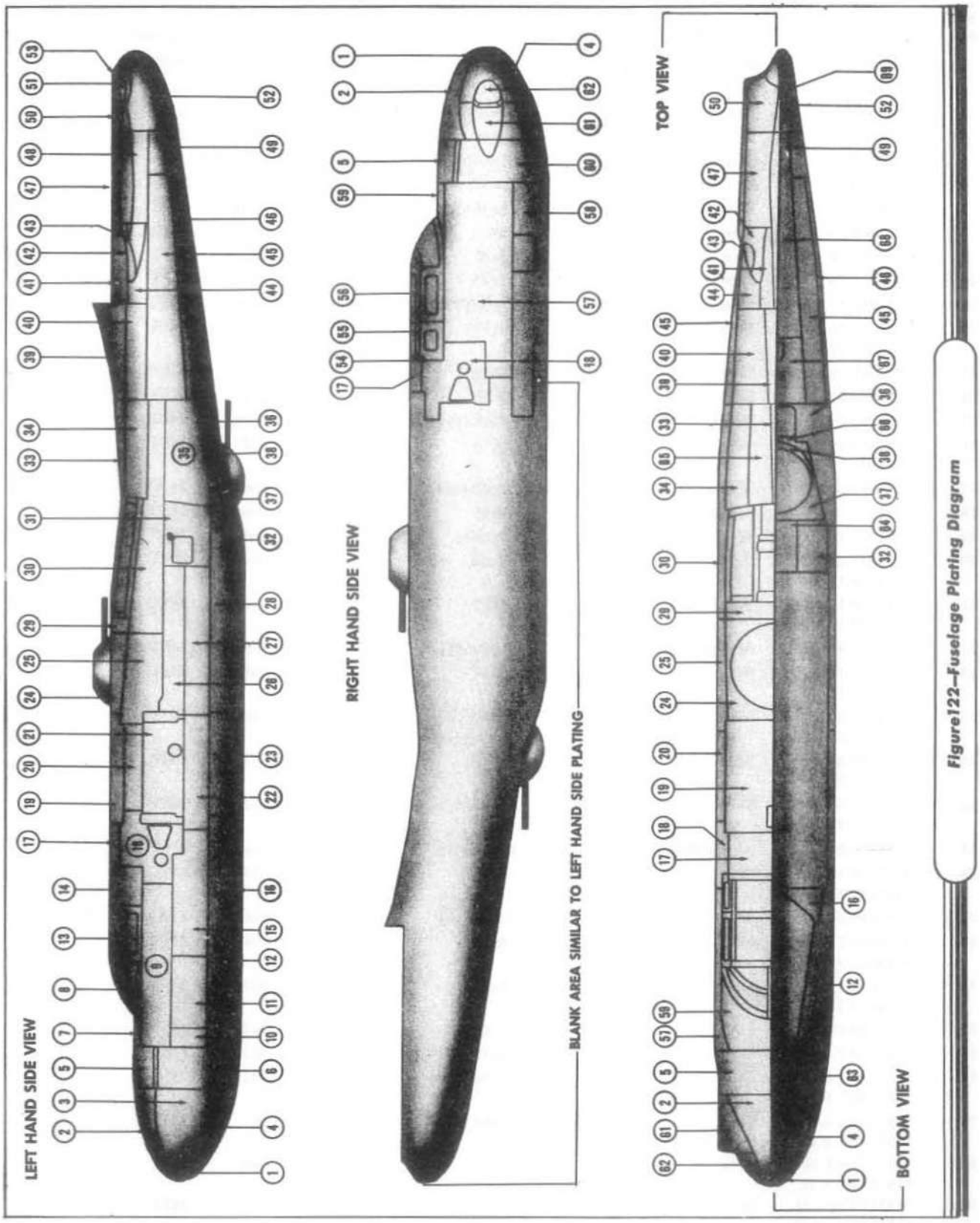


Figure122–Fuselage Plating Diagram

KEY TO FIGURE 122

Note: L.H. and R.H. indicate opposite parts within the assembly.

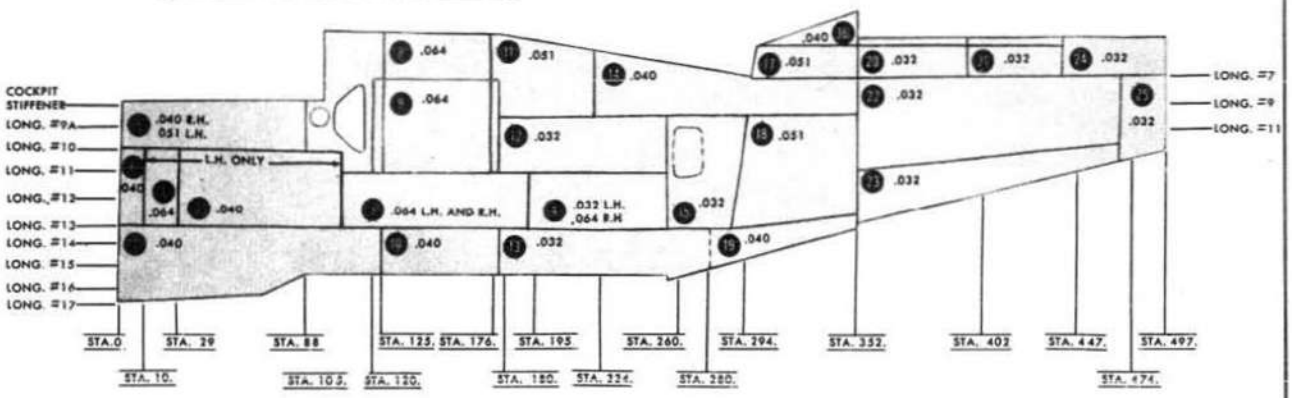
Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5194582-2	Nose Skin	34x34	.040	24SO	24ST	1
2	5194582-4	Skin	30x49	.032	61ST		1
3	5194582-6	Skin	30x32	.032	61ST		1
4	5194582-8	Skin	30x60	.032	61ST		1
5	5157243-30	Skin	35x60¼	.032	24ST		1
6	5157243-32	Skin	35x55½	.032	24ST		1
7	5191854-2	Door Skin	28x39½	⅜ Plate	24ST		1
8	5153688-56	Skin	2x7	.064	61ST		1
9	5153139-20	Skin	13x88	.051	24ST		1
10	5153139-18	Skin	11x19	.040	24ST		1
11	5153162-8	Skin	17⅛x38⅛	⅜ Plate	24ST		1
12	5153139-16 L.H. 5153139-17 R.H.	Skin	32x127	.040	24ST		1 1
13	5153688-58	Skin	16½x32	.064	61ST		1
14	5153688-62	Skin	20x38	.032	61ST		1
15	5153162-6	Skin	17⅛x71½	⅜ Plate	24ST		1
16	5153139-14 L.H. 5153139-15 R.H.	Skin	20x45	.032	24ST		1 1
17	5128682-4	Armor Plate	31-5/16x56	⅜ Plate	24SO	24ST	1
18	5193177	Armor Plate	33x45	⅜ Plate	24SO	24ST	1
19	5154715-2	Skin	60x62¾	.064	24ST		1
20	5154859-10 L.H. 5154859-11 R.H.	Skin	12x60	.064	24ST		1 1
21	5153139-12 L.H. 5153139-13 R.H.	Skin	16x62	.040	24ST		1 1
22	5153162-4	Armor Plate	13¾x60½	⅜ Plate	24ST		1
23	5153139-12 L.H. 5153139-13 R.H.	Skin	16x62	.040	24ST		1 1
24	5153146-20 L.H. 5153146-21 R.H.	Skin	30x42	.040	24ST		1 1
25	5154859-8 L.H. 5154859-9 R.H.	Skin	21x50	.051	24ST		1 1
26	5154859-6 L.H. 5154859-7 R.H.	Skin	15x80	.032	24ST		1 1
27	5153162-2	Armor Plate	13¾x80½	⅜ Plate	24ST		1
28	5153139-10 L.H. 5153139-11 R.H.	Skin	16x107	.032	24ST		1 1
29	5153146-80	Skin	10½x63¼	.040	24SO	24ST	1
30	5154859-2 L.H. 5154859-3 R.H.	Skin	18x132	.040	24ST		1 1
31	5154859-4 L.H. 5154859-5 R.H.	Skin	28x36	.032	24ST		1 1
32	5157548-106	Skin	21⅞x35	.032	24ST		1
33	5157668-8	Skin	14x55	.025	24SO	24ST	1
34	5153139-4 L.H. 5153139-5 R.H.	Skin	14x58	.051	24ST		1 1
35	5153139-6 L.H. 5153139-7 R.H.	Skin	30x64	.051	24ST		1 1
36	5153139-8 L.H. 5153139-9 R.H.	Skin	24x74	.040	24ST		1 1
37	5153139-30 L.H. 5153139-31 R.H.	Skin	28x32	.032	24ST		1 1

KEY TO FIGURE 122 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
38	5190405-2 L.H. 5190405-3 R.H.	Skin	24x50	.025	24ST		1 1
39	5157799-24	Skin	30x44	.032	24SO	24ST	1
40	5153179-2 L.H. 5153179-3 R.H.	Skin	28x52	.032	24ST		1 1
41	5153179-13 L.H. 5153179-14 R.H.	Skin	15x49½	.032	24ST		1 1
42	5152087-16 L.H. 5152087-17 R.H.	Skin	15x34	.032	24SO	24ST	1 1
43	5152087-18 L.H. 5152087-19 R.H.	Skin	12x32	.032	24SO	24ST	1 1
44	5153179-10 L.H. 5153179-11 R.H.	Skin	20x49½	.032	24ST		1 1
45	5153179-4 L.H. 5153179-5 R.H.	Skin	25x125	.032	24ST		1 1
46	5153179-6 L.H. 5153179-7 R.H.	Skin	22x128	.032	24ST		1 1
47	5153179-14 L.H. 5153179-15 R.H.	Skin	21x52	.032	24ST		1 1
48	5153179-16 L.H. 5153179-17 R.H.	Skin	12x52	.032	24ST		1 1
49	5153179-24 L.H. 5153179-25 R.H.	Skin	25x28	.032	24ST		1 1
50	5122173-8 L.H. 5122173-9 R.H.	Skin	24x42	.025	24SO	24ST	1 1
51	5122173-4 L.H. 5122173-5 R.H.	Skin	10x33	.032	24SO	24ST	1 1
52	5122173-44 L.H. 5122173-45 R.H.	Skin	36x54	.025	24SO	24ST	1 1
53	5122173-6	Skin	5x109	.032	24SO	24ST	1
54	5153688-40	Skin	32½ S.L.	.064	61ST		1
55	5153688-84	Skin	16⅝x20	.040	61ST		1
56	5153688-60	Skin	17-1/32x32	.064	61ST		1
57	5157243-28	Skin	35x60¼	.032	24SO	24ST	1
58	5153139-22	Skin	32x107	.040	24ST		1
59	5153688-22	Skin	39x40	Plate .312	R-301		1
60	5195457-6	Skin	21x36	.040	24SO	24ST	1
61	5195457-4	Skin	11x21	.051	52SO		1
62	5195457-2	Skin	14x27	.051	24SO	24ST	1
63	5153139-24	Skin	4x33	.051	24ST		1
64	5157548-4 L.H. 5157548-5 R.H.	Skin	20x38¾	.032	24SO	24ST	1 1
65	5153139-2 L.H. 5153139-3 R.H.	Skin	18x56	.040	24ST		1 1
66	5153139-28 L.H. 5153139-29 R.H.	Skin	18x28	.032	24ST		1 1
67	5153179-8	Skin	32x37	.064	24ST		1
68	5153179-18	Skin	26x115	.032	24ST		1
69	5122173-48	Skin	5x34	.025	24SO	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

FUSELAGE SKIN PLATING DIAGRAM



SCALE
HORIZONTAL 1" = 40"
VERTICAL 1" = 20"

FUSELAGE SKIN SPLICE RIVET SCHEDULE

PANEL NO.	SKIN GAGE	RIVET SIZE	LENGTHWISE SPACING	CROSSWISE SPACING
1	.064	AD5	5/8" ON CENTER	5/8" ON CENTER
2	.040	AD5	1/2" ON CENTER	1/2" ON CENTER
3	.064	AD5	2 ROWS @ 11/16" O.C.	2 ROWS @ 7/8" O.C.
4 L.H.	.032	AD4	5/8" ON CENTER	1/2" ON CENTER
R.H.	.064	AD5	1/2" ON CENTER	1/2" ON CENTER
5 L.H.	.051	AD5	1/2" ON CENTER	3/4" ON CENTER
R.H.	.040	AD5	1/2" ON CENTER	3/4" ON CENTER
6	.040	AD6	3/4" ON CENTER	5/8" ON CENTER
7	.040	AD5	7/16" ON CENTER	3/4" ON CENTER
8	.064	AD5	7/16" ON CENTER	2 ROWS @ 1" O.C.
9	.064	AD5	2 ROWS @ 11/16" O.C.	2 ROWS @ 11/16" O.C.
10	.040	AD5	9/16" ON CENTER	2 ROWS @ 3/4" O.C.
11	.051	AD5	9/16" ON CENTER	3 ROWS @ 5/8" O.C.
12	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
13	.032	AD4	3/4" ON CENTER	2 ROWS @ 3/4" O.C.
14	.040	AD5	5/8" ON CENTER	3 ROWS @ 5/8" O.C.
15	.032	AD4	5/8" ON CENTER	3 ROWS @ 5/8" O.C.
16	.040	AD5	5/8" ON CENTER	2 ROWS @ 15/16" O.C.
17	.051	AD5	1/2" ON CENTER	2 ROWS @ 13/16" O.C.
18	.051	AD5	1/2" ON CENTER	2 ROWS @ 1" O.C.
19	.040	AD5	1/2" ON CENTER	2 ROWS @ 1" O.C.
20	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
21	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
22	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
23	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
24	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.
25	.032	AD4	5/8" ON CENTER	2 ROWS @ 3/4" O.C.

Figure 123—Schedule for Repair of Fuselage Skin Plating

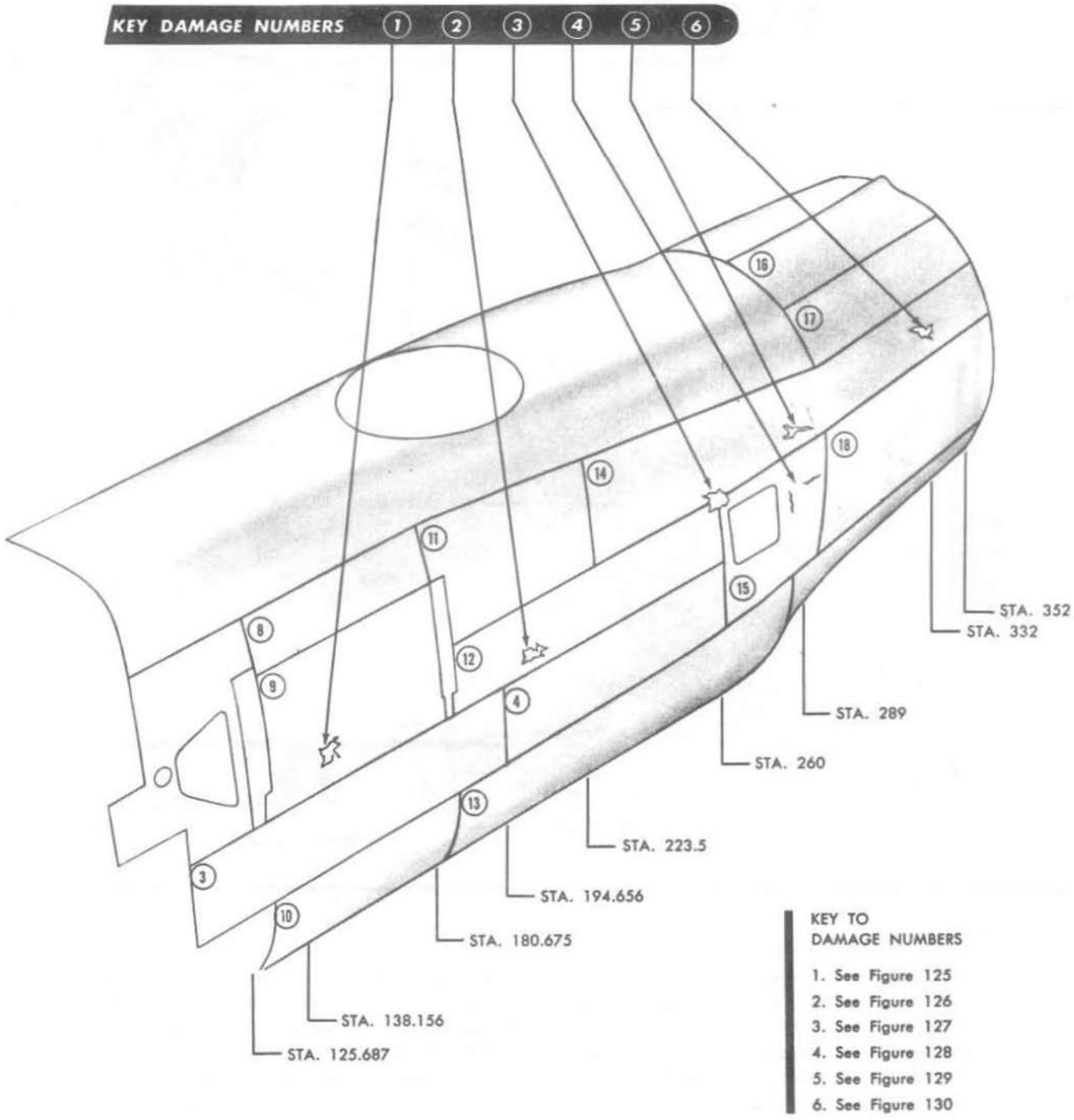
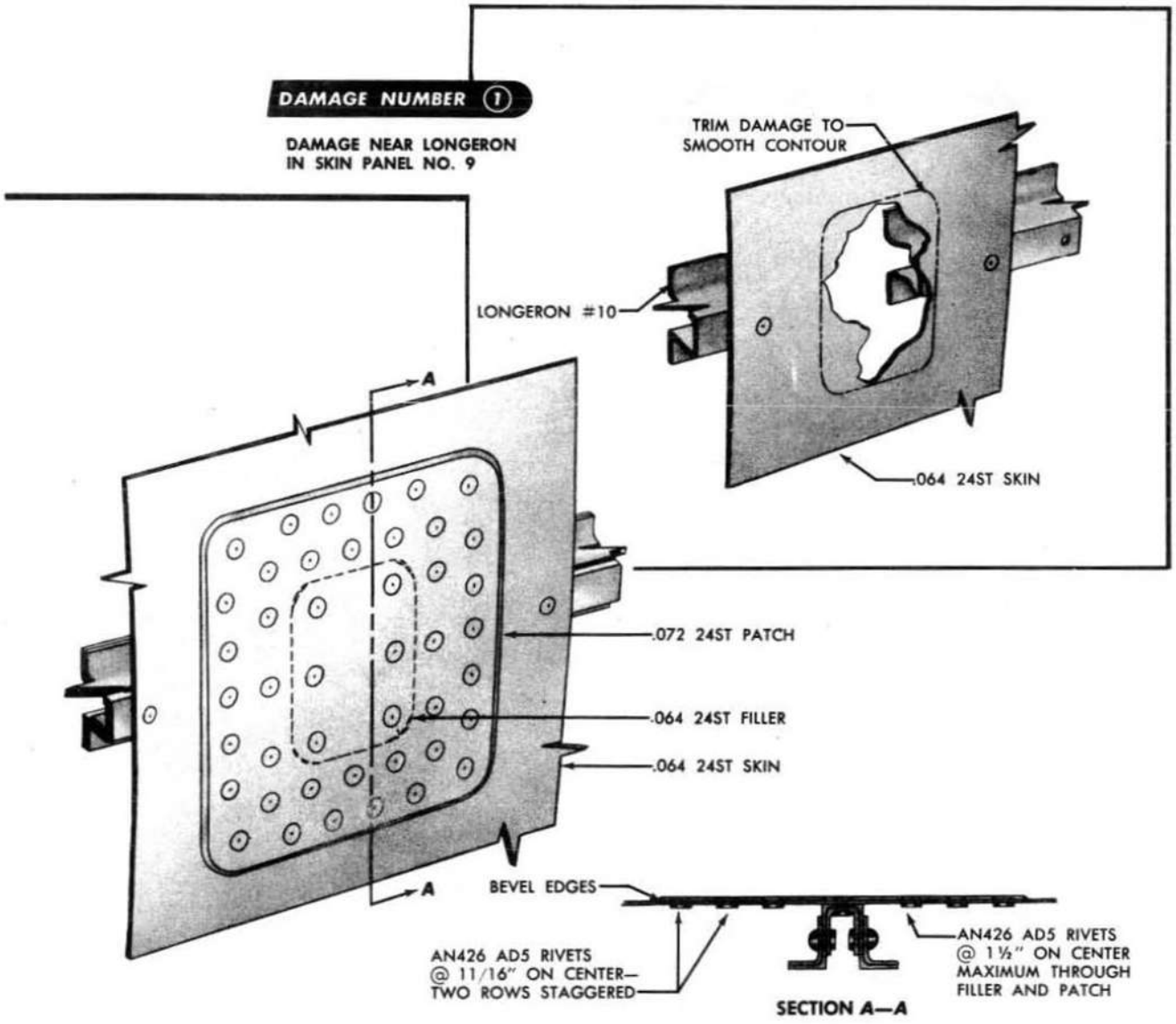


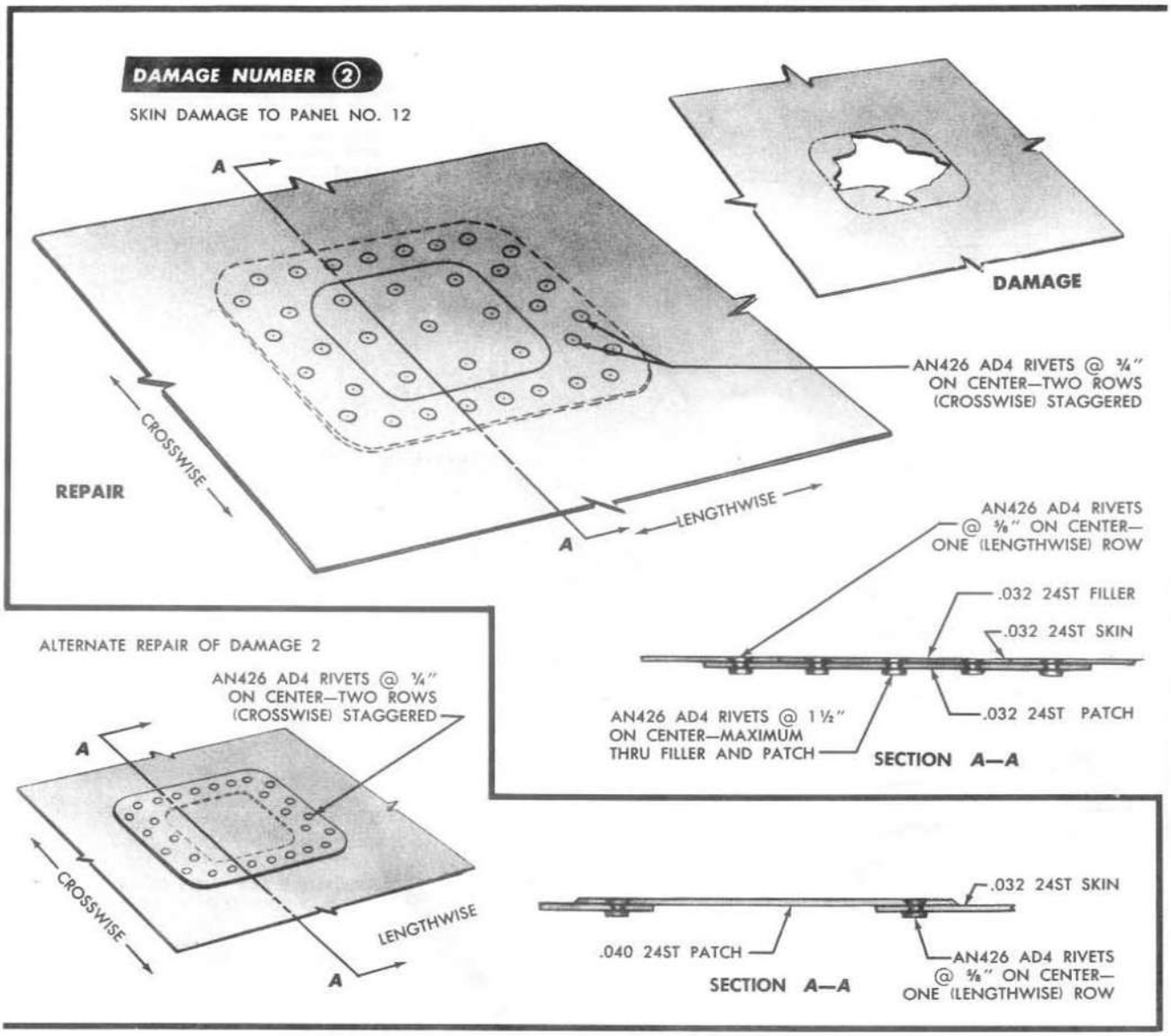
Figure124–Key Drawing of Damages to Fuselage Skin Plating



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Determine gage of damaged panel and the correct size and spacing of rivets from Figure 123
4. When convenient use flush patch.
5. For flush repair construct patch from alclad sheet of the sume gage as the skin. For surface repair construct patch from the next heavier gage and bevel edges to prevent any unnecessary aerodynamic drag.
6. Construct filler for flush patch from the same gage and material as the skin.
7. When possible use existing rivet holes.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

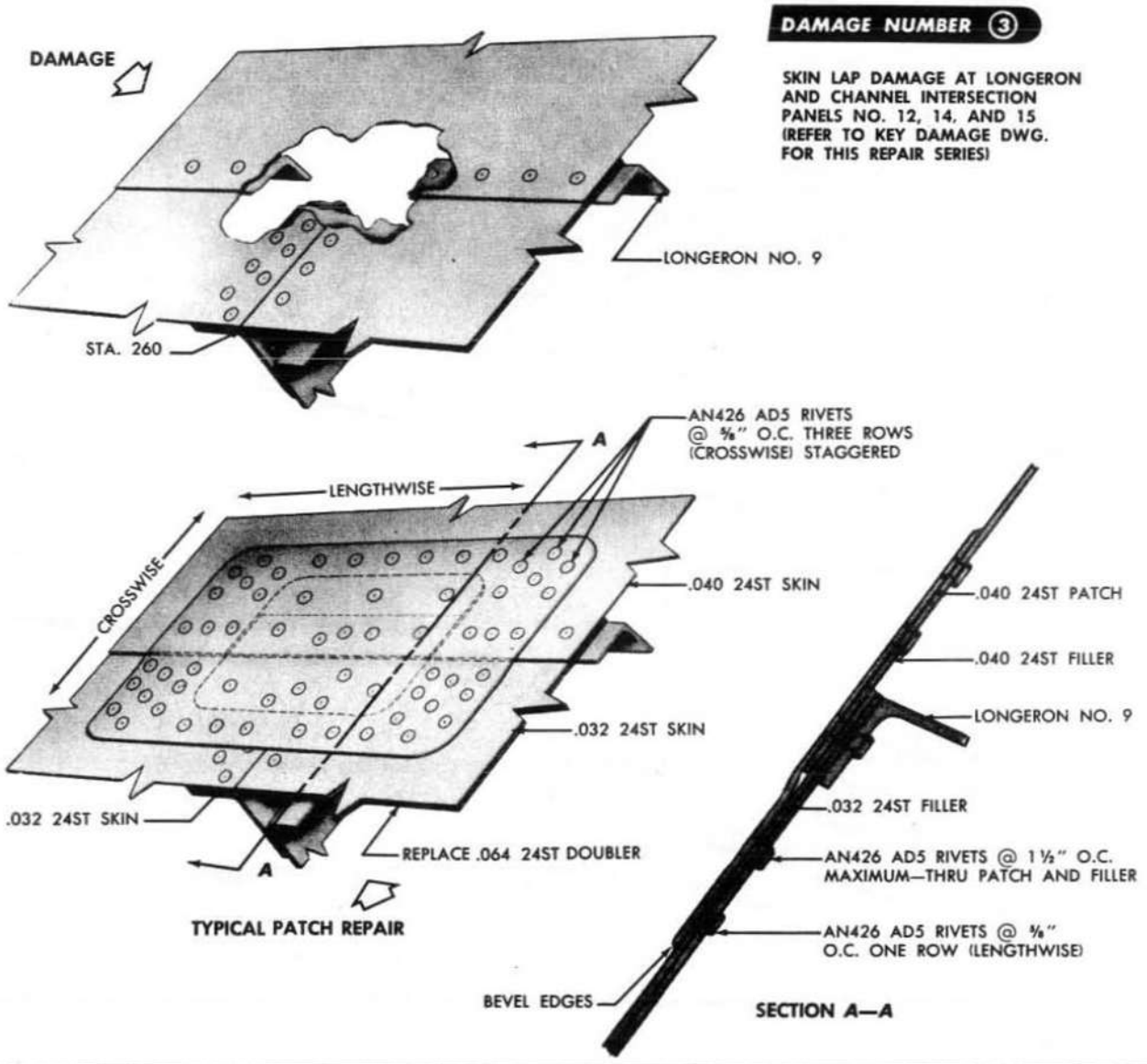
Figure 125–Typical Patch Repair of Fuselage Skin Damage Near Longeron



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Determine gage of damaged panel and the correct size and spacing of rivets from Figure 123
4. When convenient use flush patch.
5. For flush repair construct patch from alclad sheet of the same gage as the skin. For surface repair construct patch from the next heavier gage and bevel edges to prevent any unnecessary aerodynamic drag.
6. Construct filler for flush patch from the same gage and material as the skin.
7. When possible use existing rivet holes.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure 126–Typical Patch Repair of Fuselage Skin Damage



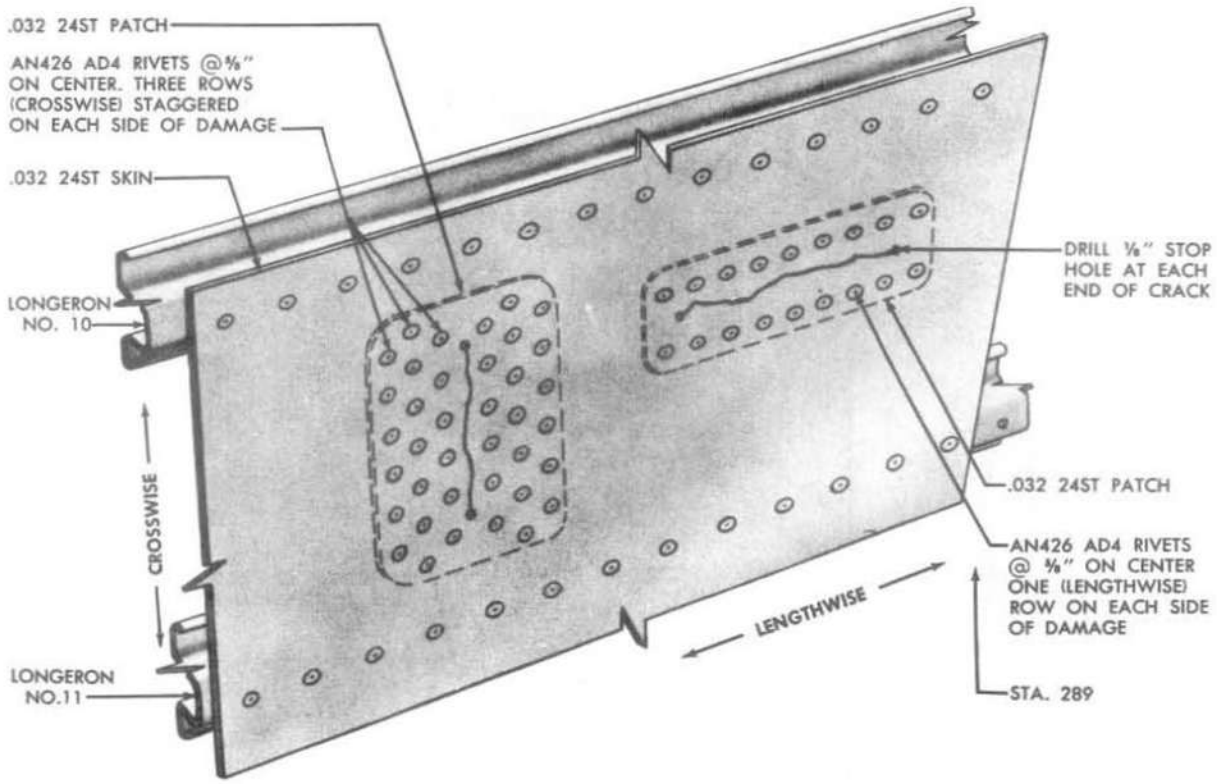
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Determine gage of heaviest skin plating in damaged area and the correct size and spacing of rivets from Figure 12 3
4. Construct patch from alclad sheet of the same gage as the heaviest skin panel. Bevel edges to prevent any unnecessary aerodynamic drag.
5. Construct fillers from the same gage and material as the damaged skin panels.
6. When possible use existing rivet holes.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 127–Typical Repair of Fuselage Skin Damage at Seam

DAMAGE NUMBER ④

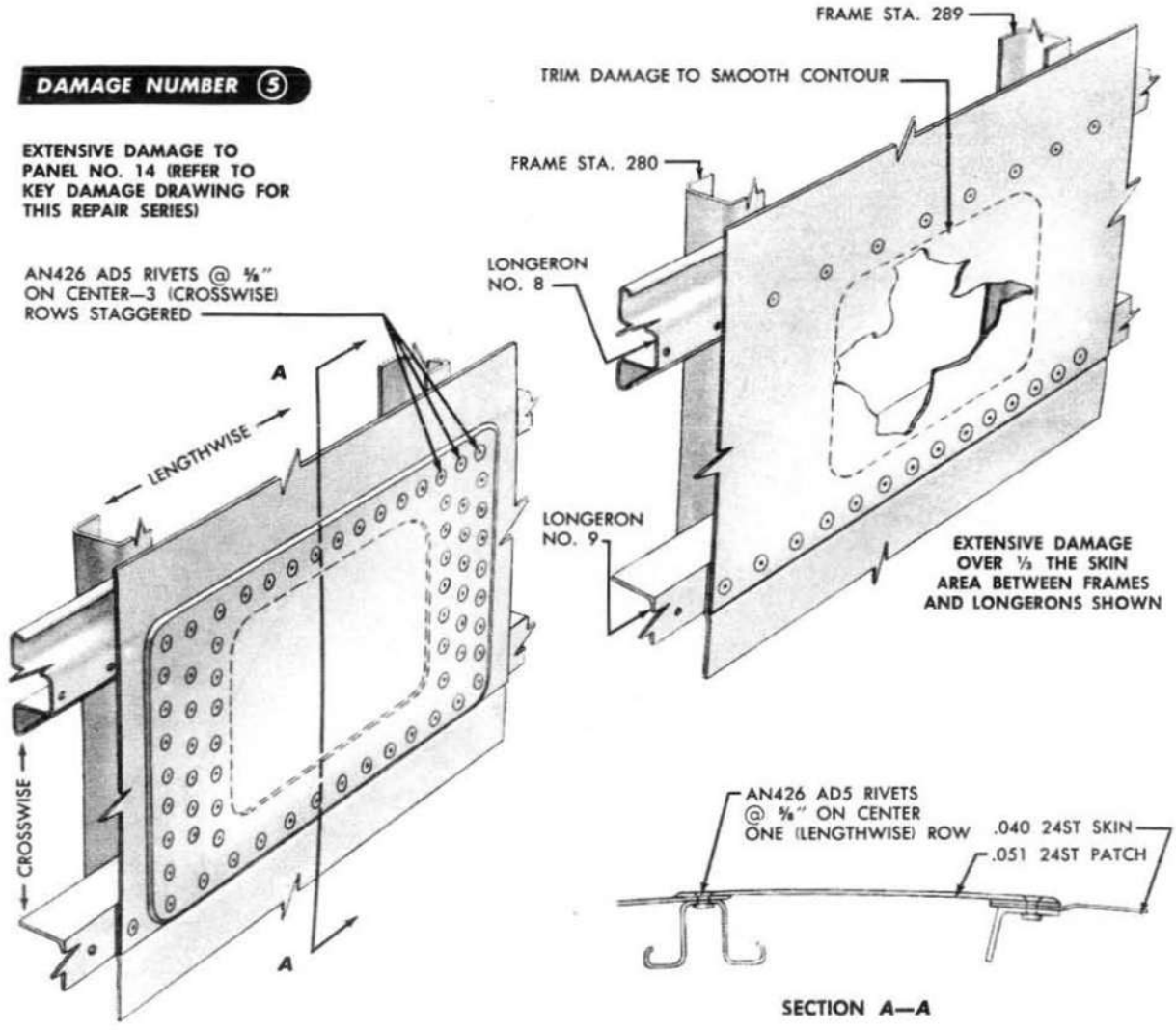
TYPICAL LENGTHWISE AND CROSS-WISE CRACK DAMAGE



NOTES

1. Drill one-eighth inch stop holes at each end of the crack.
2. Determine gage of damaged panel and the correct size and spacing of rivets from Figure 123
3. Construct patch from the same gage and material as the skin.
4. When possible use existing rivet holes.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure128—Typical Repair of Fuselage Skin Crack Damage



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Determine gage of damaged panel and the correct size and spacing of rivets from Figure 123
4. When convenient use flush patch.
5. For flush repair construct patch from alclad sheet of the same gage as the skin. For surface repair construct patch from the next heavier gage and bevel edges to prevent any unnecessary aerodynamic drag.
6. Construct filler for flush patch from the same gage and material as the skin.
7. When possible use existing rivet holes.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure 129—Repair of Extensive Fuselage Skin Damage Between Frames and Longerons

KEY TO FIGURE 131

BULKHEADS AND FRAMES

NOTE—Items 1 through 8 are applicable to All-Purpose Gun Nose only. See Figure 121A for structure of the Bombardier Compartment Nose.

Note: L.H. and R.H. indicate opposite parts within the assembly.

Ref. No.	*Station No.*	*Part Number*	*Fuselage Section*	*Gage*	*Type of Frame*
1	-60				
2	-53	2202352 L.H.	Panel	.051	
		2202352-1 R.H.			
3	-41.168	4143383 L.H.	Panel	.051	
		4143383-1 R.H.			
4	-35.859	4143397 L.H.	Panel	.051	
		4143397-1 R.H.			
5	-28.710	2202238 L.H.	Frame	.051	
		2202237 L.H.	Panel	.051	
		4143408 R.H.	Panel	.051	
6	-18.750	4143512 L.H.	Panel	.051	
		4143512-1 R.H.			
7	-11.545	4143511 L.H.	Panel	.051	
		2202232 R.H.	Panel	.051	
		2202233 R.H.	Frame	.051	
8	-1.569	5202323 L.H.	Panel	.064	Zee
		5202323-1 R.H.			
9	0	5157443	Main Frame Assembly	.125	Channel
		5157443-8	Web	.072	and
		5157443-10	Web	.072	Web
		5157443-12	Web	.072	
10	10.375	5157766	Main Frame Assembly	.040	Channel
11	29	5123404	Main Frame Assembly	.040	Channel
12	49	5123405	Main Frame Assembly	.040	Channel
13	70	5123406	Main Frame Assembly	.040	Channel
14	75	2192621	Main Frame Assembly	.064	Channel
15	88	5123407	Main Frame Assembly	.064	Channel

KEY TO FIGURE 131 (Continued)

Ref. No.	*Station No.*	*Part Number*	*Fuselage Section*	*Gage*	*Type of Frame*
16	97	5123450	Main Frame Assembly	.072	Channel
		5123450-2 & -3	Main Frame Assembly		
		5123450-10	Gusset	.091	Channel
		3126970	Former (Upper)	.064	Channel
17	103.25	3126958	Former–Upper Canopy (Fuselage)	.051	Channel
18	105	5123433	Main Frame Assembly	.040	Channel
19	108.75	2129273	Frame Stub	.040	Channel
20	114.75	3126969	Former–Canopy Station	.051	Channel
21	118.75	3126958	Former–Canopy Station	.051	Channel
22	120.375	5066744	Main Frame Assembly		
23	125.687	5066744	Main Frame Assembly		
24	130.3125	5129965	Former–Upper Fuselage	.081	Channel
25	134.281	3126990	Former–Upper Fuselage	.072	Channel
26	138.156	5121671	Main Frame Assembly	.064	Channel
		5121671-4 & -5	Rail S-2062618-5616		
		3126991	Former–Upper	.072	Channel
27	142.3125	3126996	Former–Upper Fuselage	.072	Channel
28	147.8125	5128676	Former–Upper Fuselage	.072	Channel
29	152.687	5123452	Main Frame Assembly	.064	Channel
		5123452-4 & -5	Rail S-2062619-4800		
30	156.562	5150162	Former–Upper Fuselage	.072	Channel
31	161.25	5150161	Former–Upper Fuselage	.072	Channel
32	166.75	5150161	Former–Upper Fuselage	.072	Channel
		5121523	Main Frame Assembly	.040	Channel
33	171.5	5150162	Former–Upper Assembly	.072	Channel
34	178.175	5123521-2	Main Frame Assembly	.125	Channel
		5123521-3	Center Frame		
		5123521-4	Upper Frame	.064	Channel
		5123892	Tie Assembly, Lower S-2062665-6000		
		5125636	Tie Assembly, Upper	.064	

KEY TO FIGURE 131 (Continued)

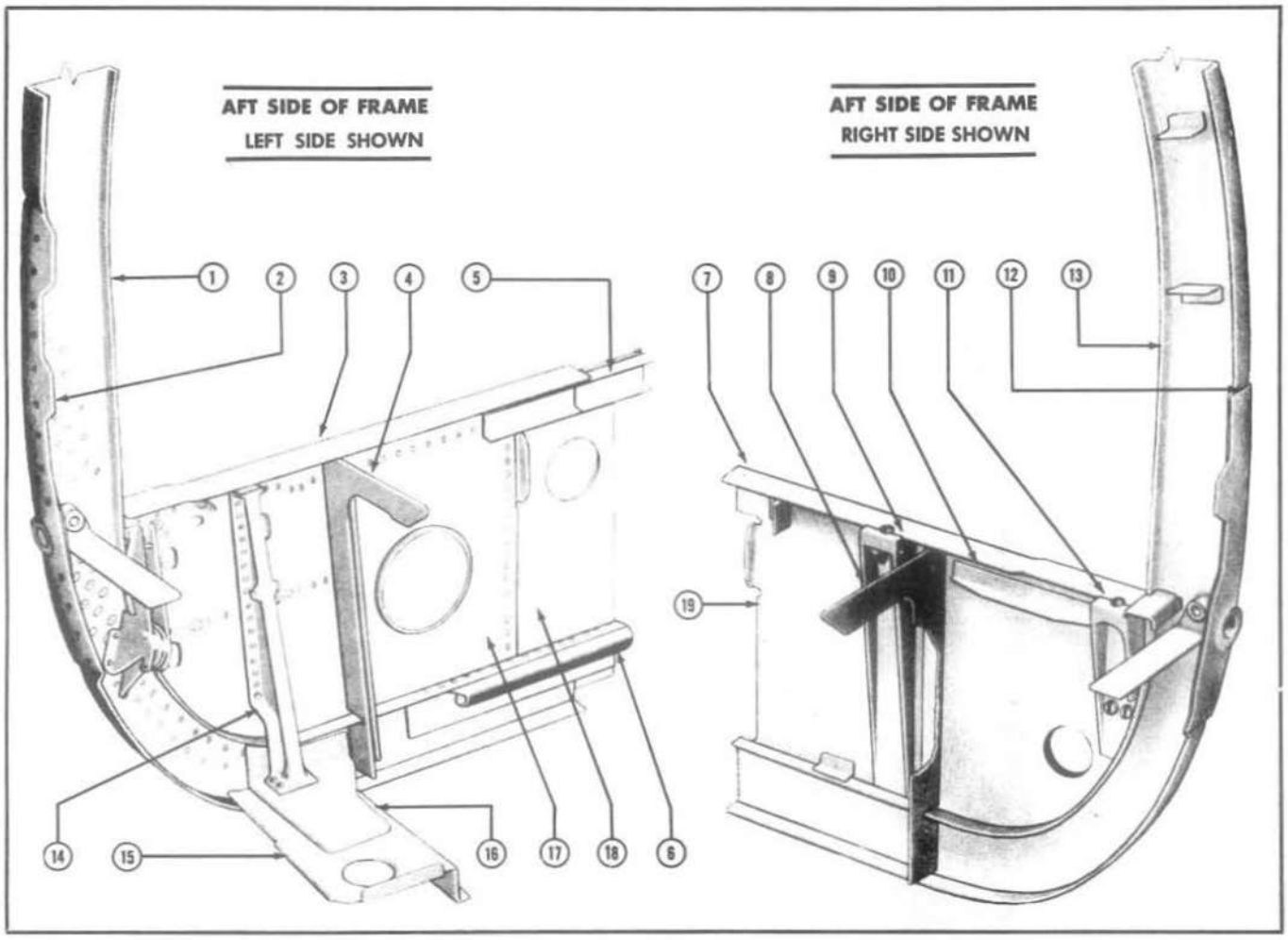
Ref. No.	Station No.	Part Number	Fuselage Section	Gage	Type of Frame
35	180.675	See Station 178.175 (Ref. #34–Same Parts List)			
36	194.656	5123408-2 & -3	Main Frame Asembly	.064	Channel
		5123408-4 & -5	Rail S-2062618-5408		
		5123408-8 & -9	Angle (Outer) S-1059651-S-4516		Former
37	209.177	5123409-2 & -26	Main Frame Assembly	.064	Channel
		5123409-12 & -13	Angle (Outer) S-1059651-4408		Former
		5123409-4 & -5	Rail S-2062619-4508		
38	223.5	5121572	Main Frame Assembly	.040	Channel
39	234	5121674-2	Former–Upper Fuselage	.040	Channel
		5121674-4	Angle S-1081111S-6400		Former
40	240	5121643	Main Frame Assembly	.040	Channel
41	253.687	5159567-50	At sides of Exit Door S-134904-5100 S.L.		
		5159567-54	At sides of Exit Door S-135311-5100 S.L.		
		5159567-10	Angle (Top)	.064	
		5159567-14	Angle At Top of Exit Door	.125	
		5159567-26	Angle At Bottom of Exit Door	.064	
		5159567-6	Angle (Bottom)	.064	
		5159567-74 & -28	Web (Outer Lower)	.051	
		5159567-4	Web (Inner Lower)	.032	
		5159567-2	Web (Upper)	.032	
42	260	5123436	Main Frame Assembly	.040	Channel
43	280	5157820	Main Frame Assembly	.040	Channel
44	298	5153692-10	Frame Channel (L.H. Side)	.051	
		5153692-2 & -3	Frame	.081	
		5153692-4 & -52	Frame	.040	
		5153692-24 & -25	Angle S-1076089-5408		
		5153692-58	Sheet (R.H. Side)	.064	
		5153692-30 & -31	Tee–Under Exit Door S-1111710-2720		
		5153692-28 & -29	Angle S-1159953-2227 (Upper)		
45	315	5157817	Main Frame Assembly	.051	Channel
		5157817-4 & -5	Former Upper	.040	Channel
		5157817-24	Former	.040	Channel
46	332	5157784	Main Frame Assembly	.040	Channel
47	342	5158956	Former Main Frame Assembly	.040	Channel

KEY TO FIGURE 131 (Continued)

Ref. No.	*Station No.*	*Part Number*	*Fuselage Section*	*Gage*	*Type of Frame*
48	352	5157635-2 & -20	Main Frame Assembly	.040	Web
		5157635-22	Stiffener (Inner) S-151776-5216 S.L.		
		5157635-24	Attach Angle (Outer) S-1159905-S-8324		Former
49	369	5157789-2 & -4	Aft Frame Assembly	.040	Channel
		5157789-6	Former	.040	Angle
50	386	5157790-2 & -4	Aft Frame Assembly	.040	Channel
		5157790-6	Channel	.040	Channel
51	402	5157791-2	Aft Frame Assembly (Lower)	.040	Channel
		5157791-4	Aft Frame Assembly (Upper)	.051	Channel
52	424.125	5157792-2	Aft Frame Assembly (Lower)	.040	Channel
		5157792-4	Aft Frame Assembly (Upper)	.040	Channel
53	447.125	5157792-2	Sheet (Lower)	.040	
		5157793-8	Angle S-1047872S-9500 (Outer)		
		5157793-36	Angle S-102553S-7200 (Inner)		
		5157793-4	Sheet (Upper)	.081	
		5157793-10 5157793-12	Upper Beam S-1125516-4024 (Upper) Upper Beam S-1125516-4124 (Lower)		
54	460.332	5157794	Aft Frame Assembly	.040	Channel
55	474	5157795-2	Sheet (Lower)	.040	
		5157795-4	Sheet (Upper)	.081	
		5157795-6	Angle (Inner) S-1125520-6800		
		5157795-8	Angle (Outer)S-1047872-8200		
		(5157795-10) Upper Beam	Lower Channel–S-1125516-4208		
		(5157795-12)	Upper Channel–S-1125516-4008		
56	497	5157844-2 (Upper)	Aft Frame Assembly	.051	Channel
		5157844-4 (Lower)	Frame	.125	Channel
57	498.500	5150063	Cone Assembly	.032	Zee
58	511.825	5150064	Cone Assembly	.032	Channel
59	526.656	5150065	Cone Assembly	.032	Channel
60	532	4152451	Cone Assembly	.040	Zee

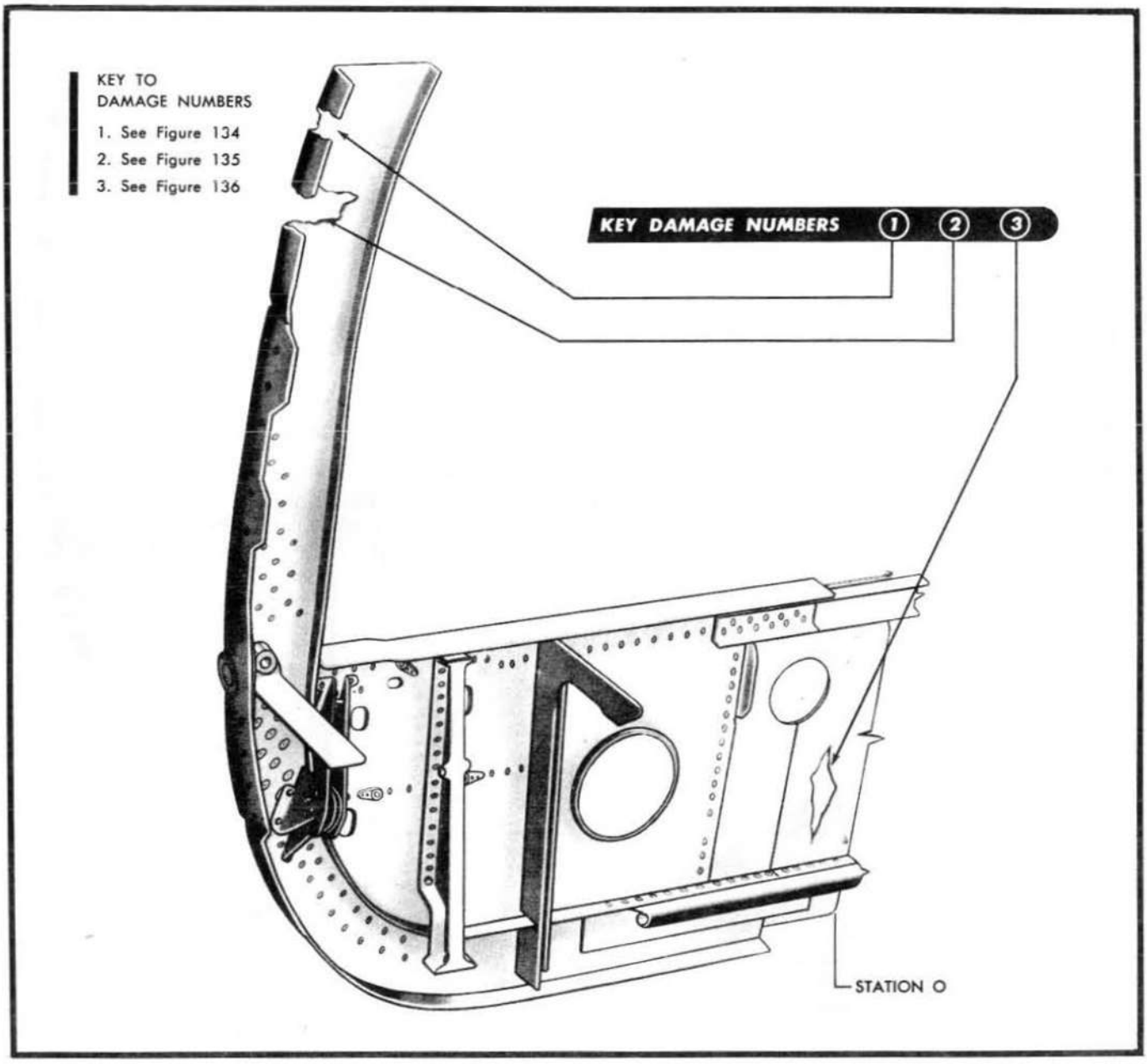
NOTE: *Only Major Members of Bulkheads Are Listed for Clarity See Specific Repairs for Other Involved Parts*

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5157443-2	Frame	23½x54½	.125	24SO	24ST	1
2	5157687	Fitting	10¼x23½	.109	C.M. Steel 150,000 to 180,000 psi		1
3	5157443-12	Tee S-1020195	Length 28		24ST		1
4	5157814-8	Channel	14x17	.072	24ST		1
5	5157443-16	Channel S-1070278	Length 10⅛		24ST		1
6	5157443-30	Channel	4⅜x17⅜	.091	24ST		1
7	5157443-14	Tee S-1020195	Length 28⅛		24ST		1
8	5157815-8	Channel	15x17	.072	24ST		1
9	4192864	Fitting	1½x1¼x13⅞	Bar	24ST		1
10	5157443-20	Angle S-167889	Length 7⅞		24ST		1
11	4192865	Fitting	Make from4143084 Blank Forg.		14ST		1
12	5193026	Fitting	13x17	.093	C.M. Steel 150,000 to 180,000 psi		1
13	5157443-4	Frame	23½x54½	.125	24SO	24ST	1
14	4127496	Jack Pad	Make from 4127497 Blank Forg.		14ST		1
15	5195607-2	Channel	10x11⅛	.072	24SO	24ST	1
16	5195607-4	Plate	6-3/16x8½	.072	24ST		1
17	5157443-6	Diaphragm	19⅜x28½	.072	24ST		1
18	5157443-10	Diaphragm	10½x17¼	.072	24SO	24ST	1
19	5157443-8	Diaphragm	17½x28½	.072	24ST		1

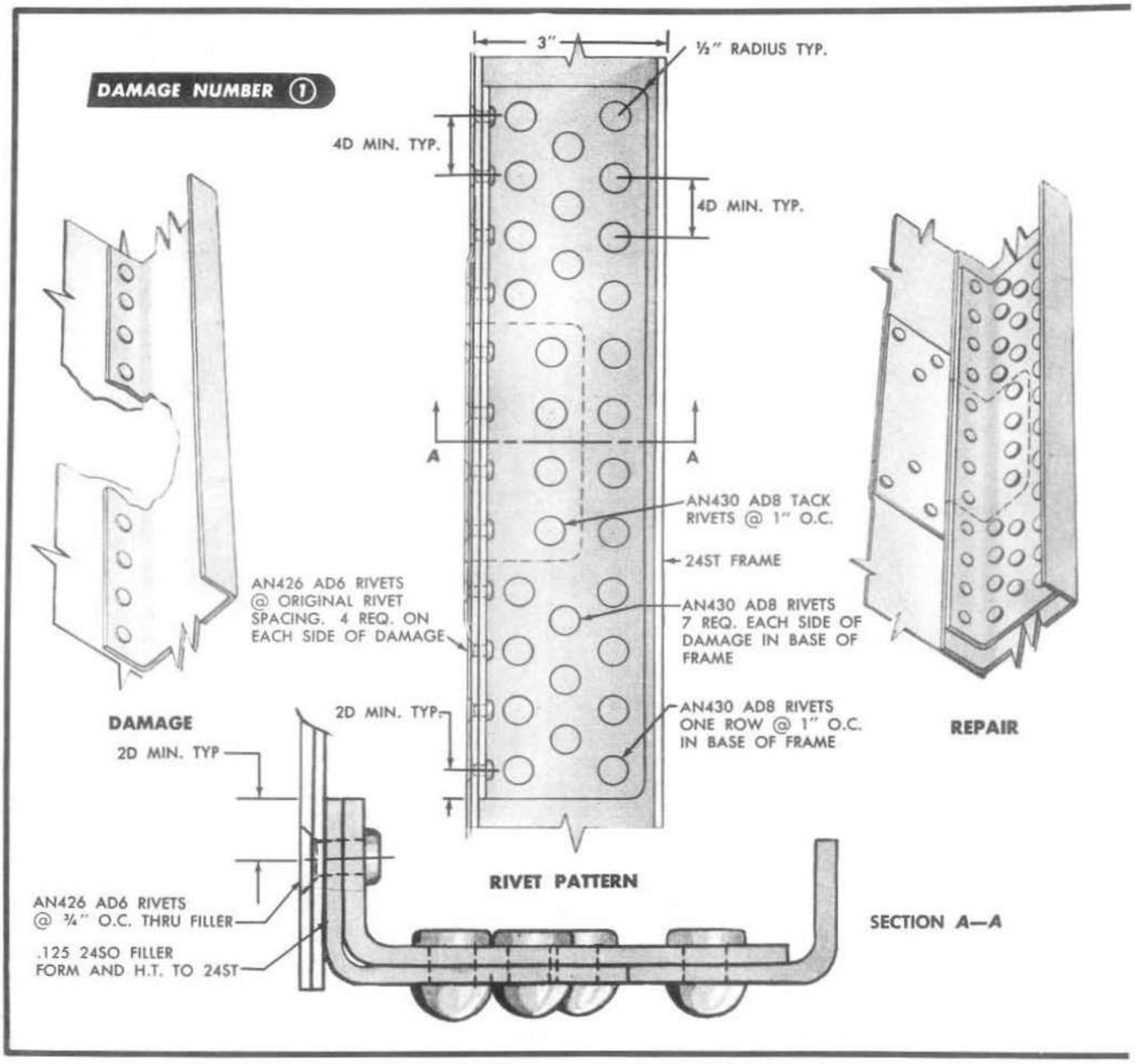
Figure 132—Fuselage Frame Assembly—Station O



NOTES

1. Repair information must be used only for damage in the frame shown.
2. No repairs have been shown for small stiffeners or fittings. It is suggested that they be replaced if damaged.
3. Trim all damage smooth, leaving no sharp corners.
4. Replace lost material with a filler when necessary to provide for attaching parts.
5. Use AN426AD countersunk rivets for all skin surfaces. Use AN430AD round head rivets for all other surfaces.
6. For rivet edge and row distance see Figure 7, Section I.
7. For flush riveting, see Figure 6, Section I.

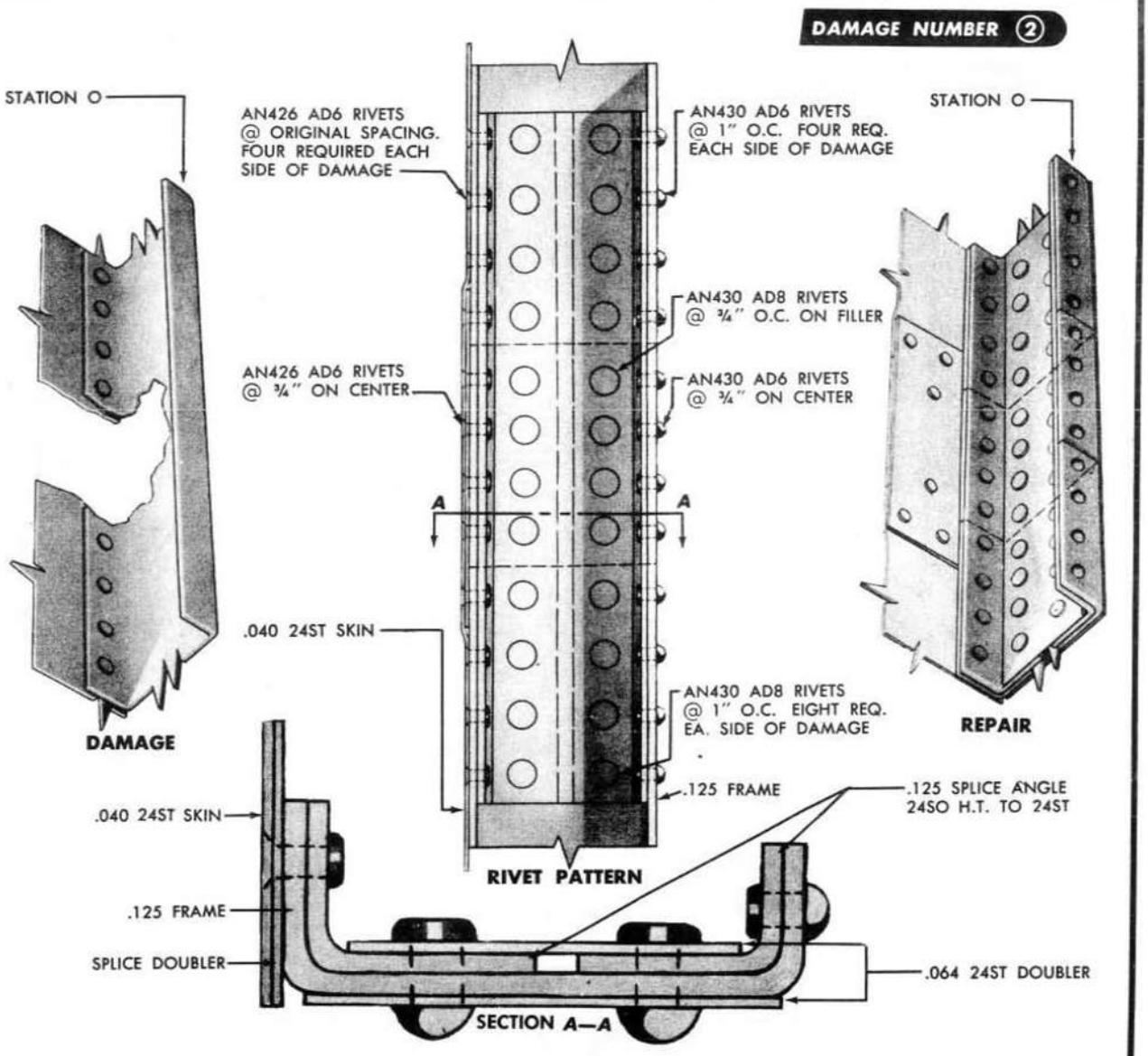
Figure133–Key Drawing of Damages to Station O Frame Assembly



NOTES

1. Use this repair when damage does not exceed one-half of the cross sectional area.
2. Remove interfering rivets and trim damage leaving no radius less than 1/2 inch.
3. Construct patch and filler from 24SO sheet the same gage as the channel. Heat treat to 24ST after forming.
4. Assemble repair using rivet schedule noted.
5. When possible use existing rivet holes.
6. For rivet edge and row distance, see Figure 7, Section I.

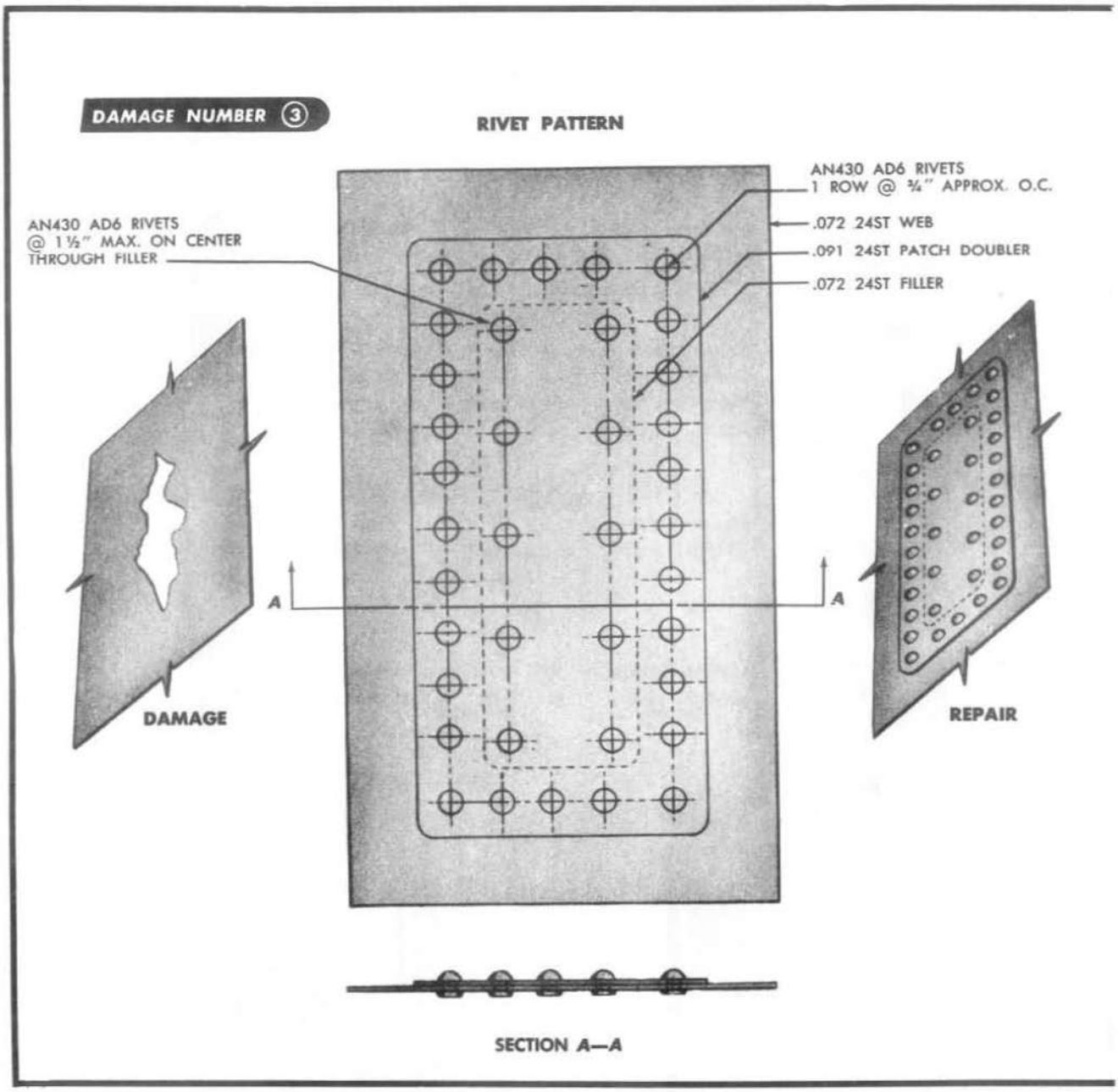
Figure 134–Repair of Partial Damage to Channel of Station O Frame Assembly



NOTES

1. Use this repair when damage exceeds one-half of the cross sectional area.
2. Remove interfering rivets and trim damage.
3. Construct patch and filler from 24SO sheet the same gage as the channel. Heat treat to 24ST after forming.
4. Assemble repair using rivet schedule as shown above.
5. When possible use existing rivet holes.
6. For rivet edge and row distance, see Figure 7, Section I.
7. For flush riveting, see Figure 6, Section I.

Figure 135–Repair of Complete Damage to Channel of Station O Frame Assembly



NOTES

1. Trim damaged material smooth leaving no radius less than 3 8 inch.
2. Use filler made from same gage and material as the web.
3. Use .091 patch made from the same material as the web.
4. For rivet edge and row distance, see Figure 7, Section I.

Figure1 36–Repair of Typical Damage to Web on Station O Frame Assembly

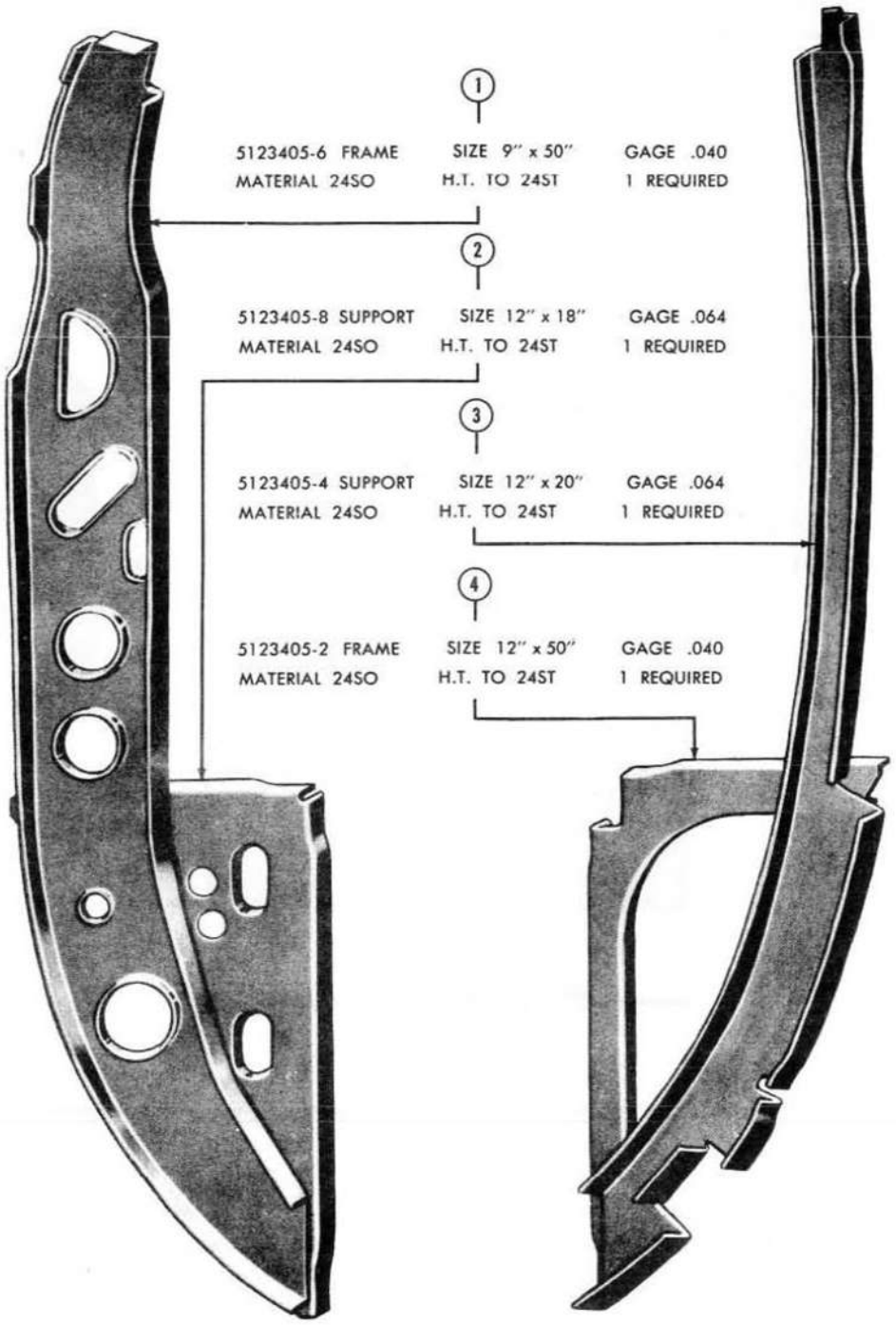
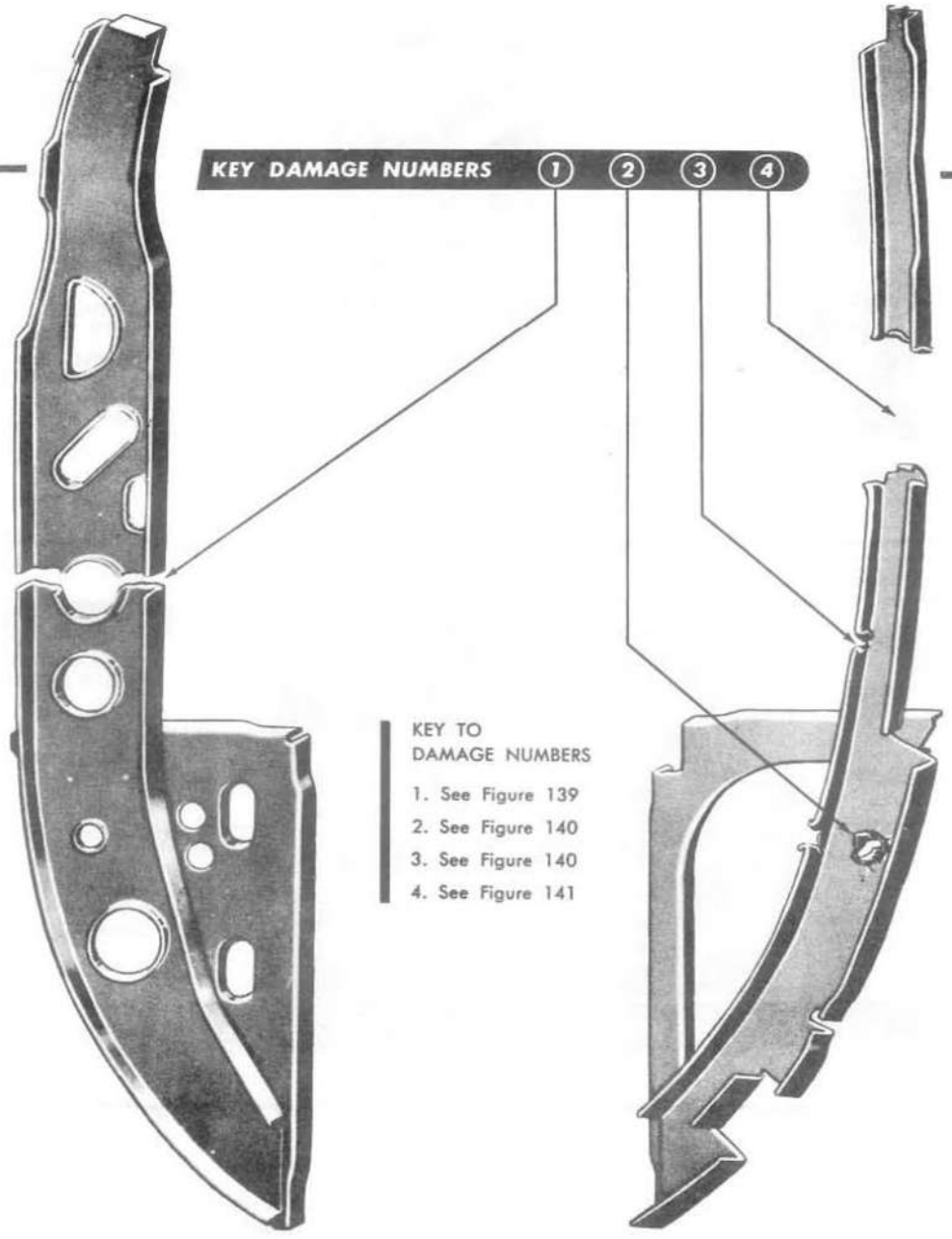
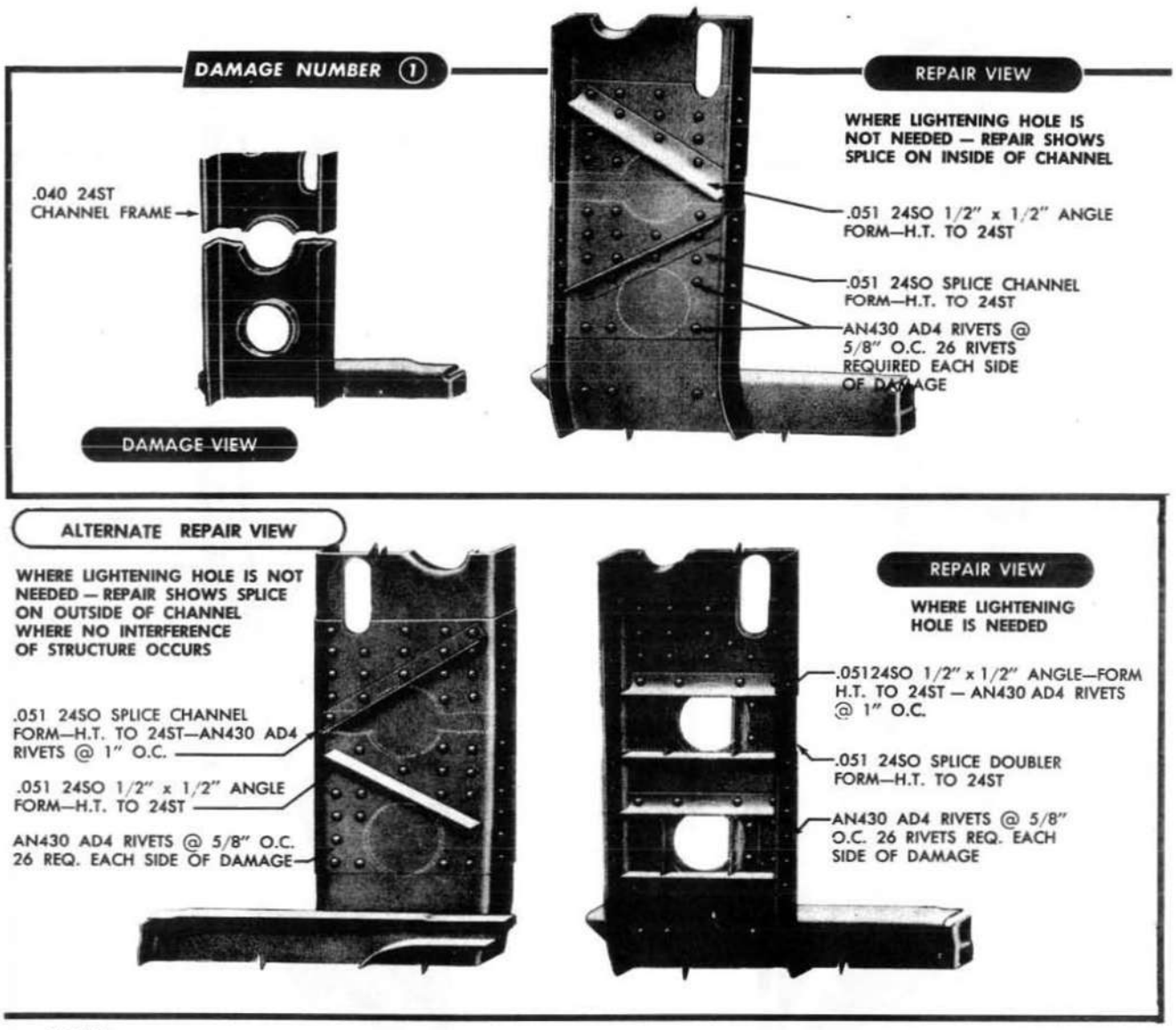


Figure 137 —Fuselage Frame Assembly—Station 49



Use of Station 49 frame repairs as typical for fuselage channel type frames is dependent upon information in two tables for repairs included in this series. Refer to Figure 140 and Figure 141. These tables show how the repairs for partial and complete damage to Station 49 frames may be applied to similar type fuselage channels of different gage and width.

Figure 138—Key for Damages to Fuselage Channel Type Frame, Station 49



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice channels from dural sheet one gage heavier than the frame.
4. Attach splice doublers to outside of frame channel when surrounding structure does not interfere.
5. For the correct number and size of rivets, see Figure 141
6. When lightening hole flanges interfere with splice doubler, remove flange and attach one-half by one-half inch angle stiffeners to splice doubler.
7. When lightening hole interferes with rivet pattern extend patch to provide for the specified minimum rivet schedule.
8. When it is necessary to retain lightening holes cut in splice doubler and box off with one-half by one-half inch angle stiffeners as shown above.
9. For minimum bend radii of sheet material, see Figure 5, Section I.
10. For flush riveting, see Figure 6, Section I.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 139—Splice Repair of Lightening Hole in Fuselage Frame, Station 49

DAMAGE NUMBER (3)

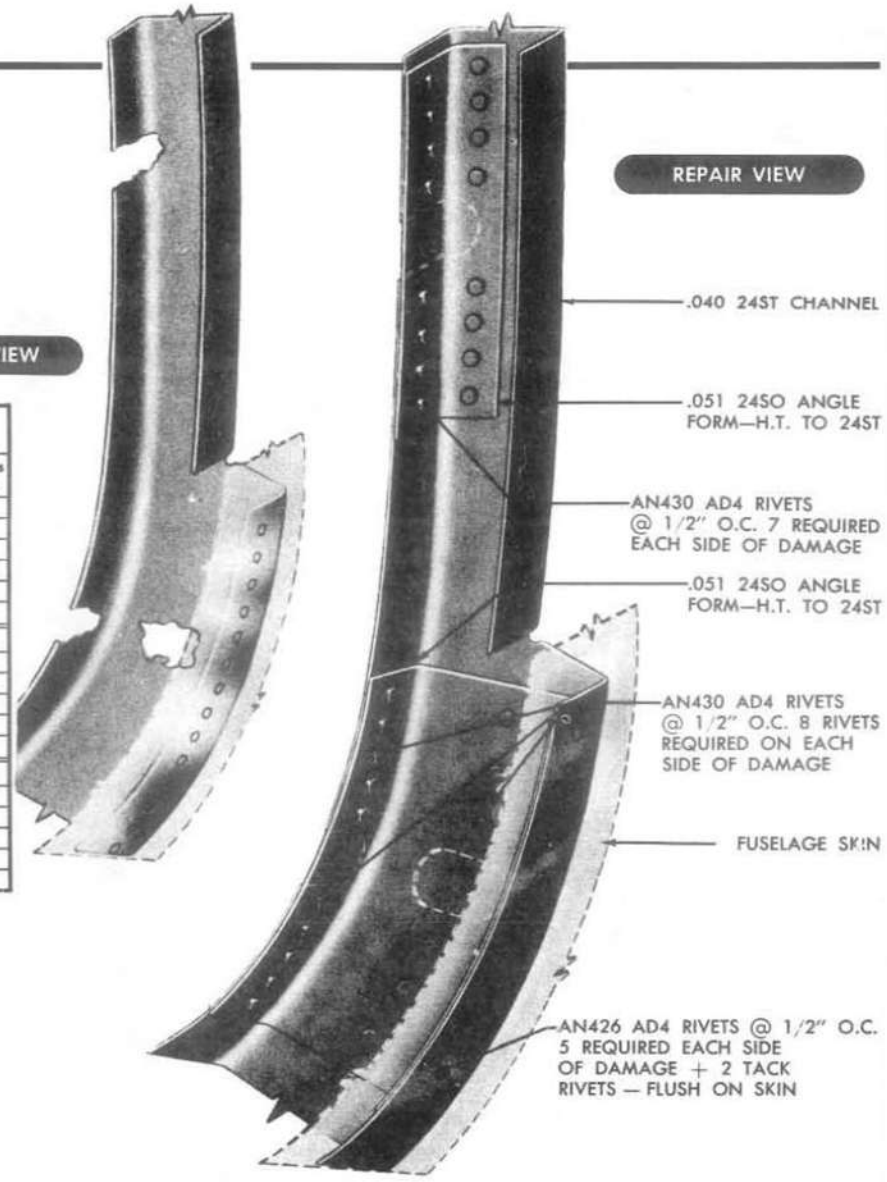
PARTIAL DAMAGE TO EITHER FLANGE OF CHANNEL WITH DAMAGE NOT EXTENDING PAST THE CENTER LINE OF THE FRAME

DAMAGE VIEW

RIVET SCHEDULE FOR REPAIR OF PARTIAL DAMAGE OF FUSELAGE CHANNEL TYPE FRAME				
Channel Gage	Repair Gage	Channel Width	Rivet Size	No. of Rivets Each Side
.040	.051	1"	AD4	6
		2"	AD4	7
		3"	AD4	10
		4"	AD4	12
		5"	AD4	14
		6"	AD4	16
.051	.064	1"	AD5	5
		2"	AD5	7
		3"	AD5	9
		4"	AD5	11
		5"	AD5	13
		6"	AD5	15
.064	.072	1"	AD5	6
		2"	AD5	9
		3"	AD5	12
		4"	AD5	14
		5"	AD5	16
		6"	AD5	19

DAMAGE NUMBER (2)

PARTIAL DAMAGE EXTENDING BEYOND THE CENTER LINE OF CHANNEL FRAME



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct patches from dural sheet. Select gage from table shown. Form in the 24SO condition and heat treat to 24ST.
4. When necessary to provide for attaching structure construct fillers from the same gage and material as the frame.
5. Select the correct size and spacing of rivets from the table shown.
6. For minimum bend radii of sheet material, see Figure 5, Section I.
7. For flush riveting, see Figure 6, Section I.

Figure 140—Patch Repair of Fuselage Channel Type Frame, Station 49

DAMAGE NUMBER ④

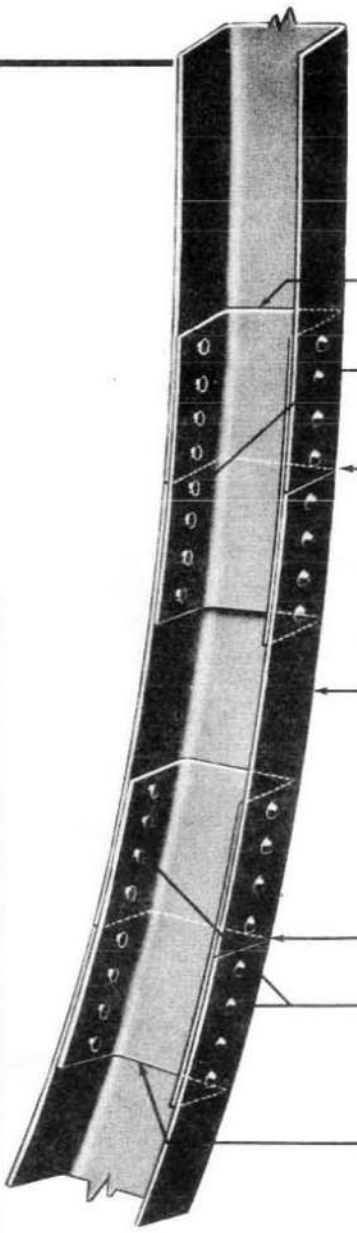
COMPLETE DAMAGE TO CHANNEL TYPE FRAME

DAMAGE VIEW

REFER TO FIGURE 142 FOR PATTERNS FOR VARIOUS WIDTH CHANNEL FRAMES

REPAIR VIEW

COMPLETE SPLICE REPAIR FOR COMPLETE BREAK IN CHANNEL TYPE FRAME

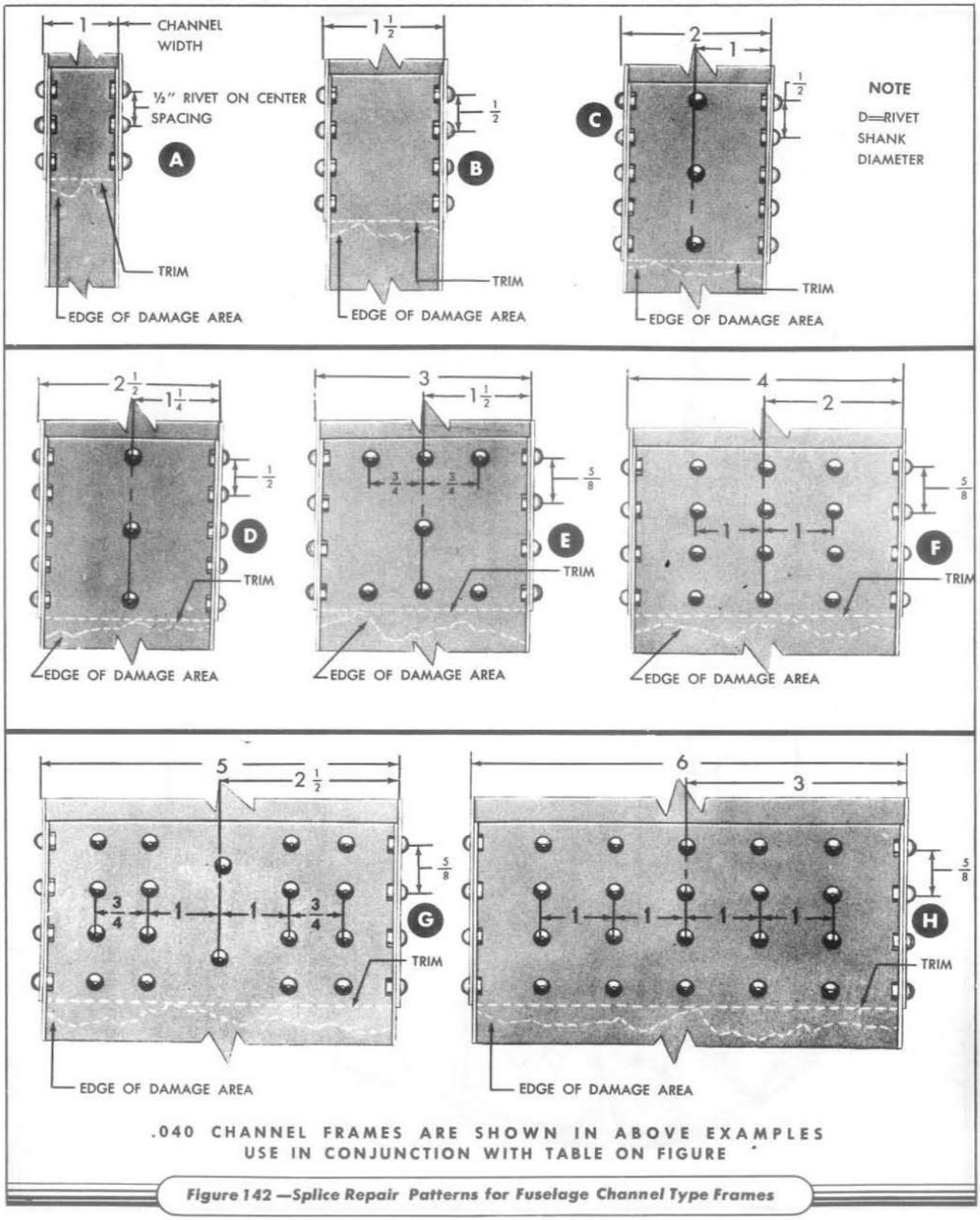


RIVET SCHEDULE FOR COMPLETE SPLICE REPAIR OF FUSELAGE CHANNEL TYPE FRAME

Channel Gage	Repair Gage	Channel Width	Rivet Size	Rivet Spacing	No. of Rivets Each Side	Pattern Re: Fig. 00
.040	.051	1"	AD4	½" O.C.	6	A
		1½"	AD4	½" O.C.	8	B
		2"	AD4	½" O.C.	13	C
		2½"	AD4	½" O.C.	13	D
		3"	AD4	⅝" O.C.	15	E
		4"	AD4	⅝" O.C.	20	F
		5"	AD4	⅝" O.C.	26	G
		6"	AD4	⅝" O.C.	28	H
.051	.064	2"	AD5	⅝" O.C.	13	C
		2½"	AD5	⅝" O.C.	13	D
		3"	AD5	⅝" O.C.	15	E
		4"	AD5	⅝" O.C.	20	F
		5"	AD5	⅝" O.C.	26	G
		6"	AD5	⅝" O.C.	28	H
.064	.072	2"	AD6	¾" O.C.	13	C
		2½"	AD6	¾" O.C.	13	D
		3"	AD5	⅝" O.C.	15	E
		4"	AD5	⅝" O.C.	20	F
		5"	AD5	⅝" O.C.	26	G
		6"	AD5	⅝" O.C.	28	H

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice channels from dural sheet. Select gage from table shown. Form in the 24SO condition and heat treat to 24ST.
4. Construct insert from the same gage and material as the frame.
5. Select the correct size and spacing of rivets from table shown.
6. Follow rivet pattern shown on Figure 142
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting, see Figure 6, Section I.

Figure141—Splice Repair of Fuselage Channel Type Frame, Station 49



.040 CHANNEL FRAMES ARE SHOWN IN ABOVE EXAMPLES
USE IN CONJUNCTION WITH TABLE ON FIGURE

Figure 142 —Splice Repair Patterns for Fuselage Channel Type Frames

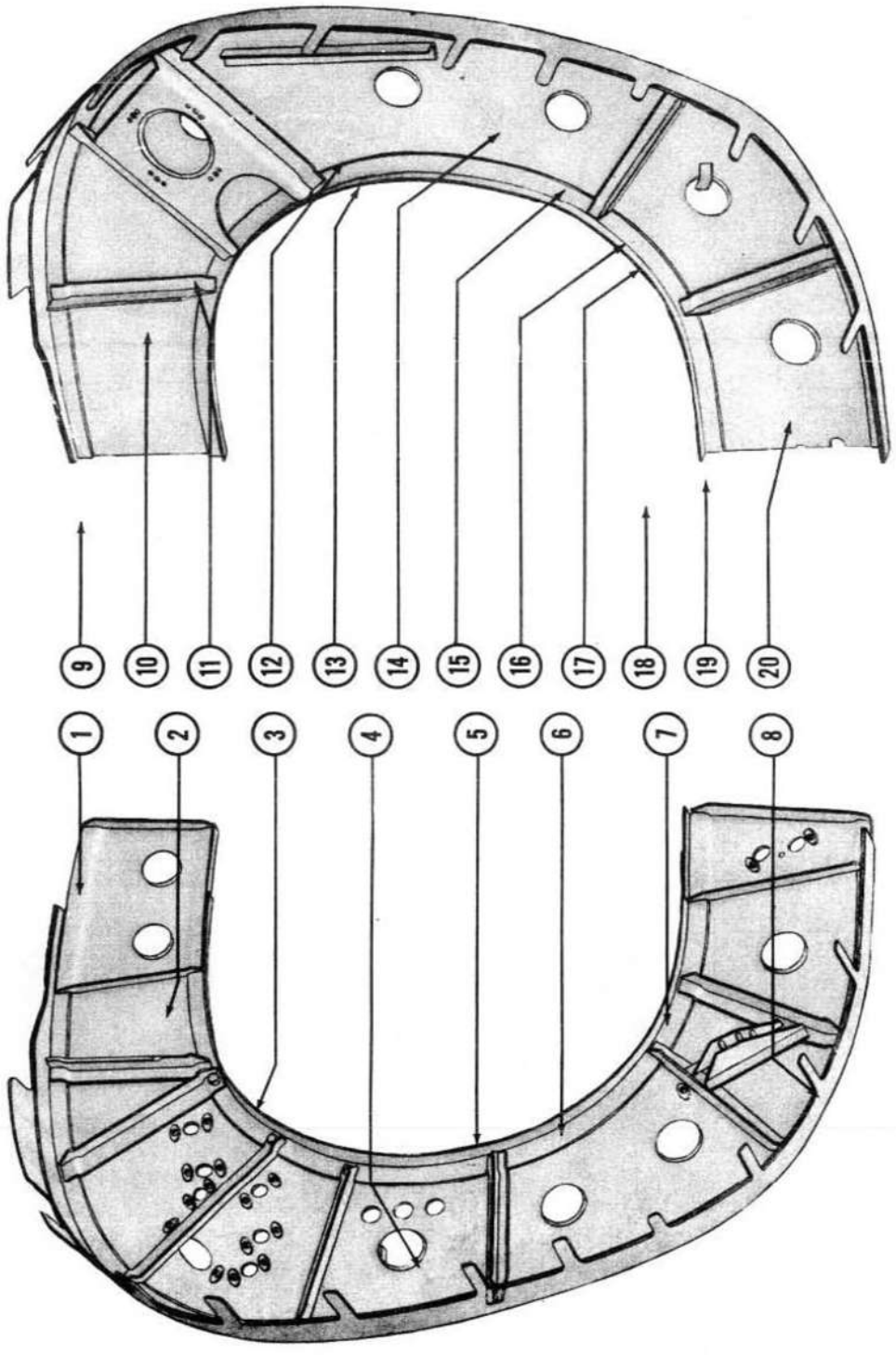
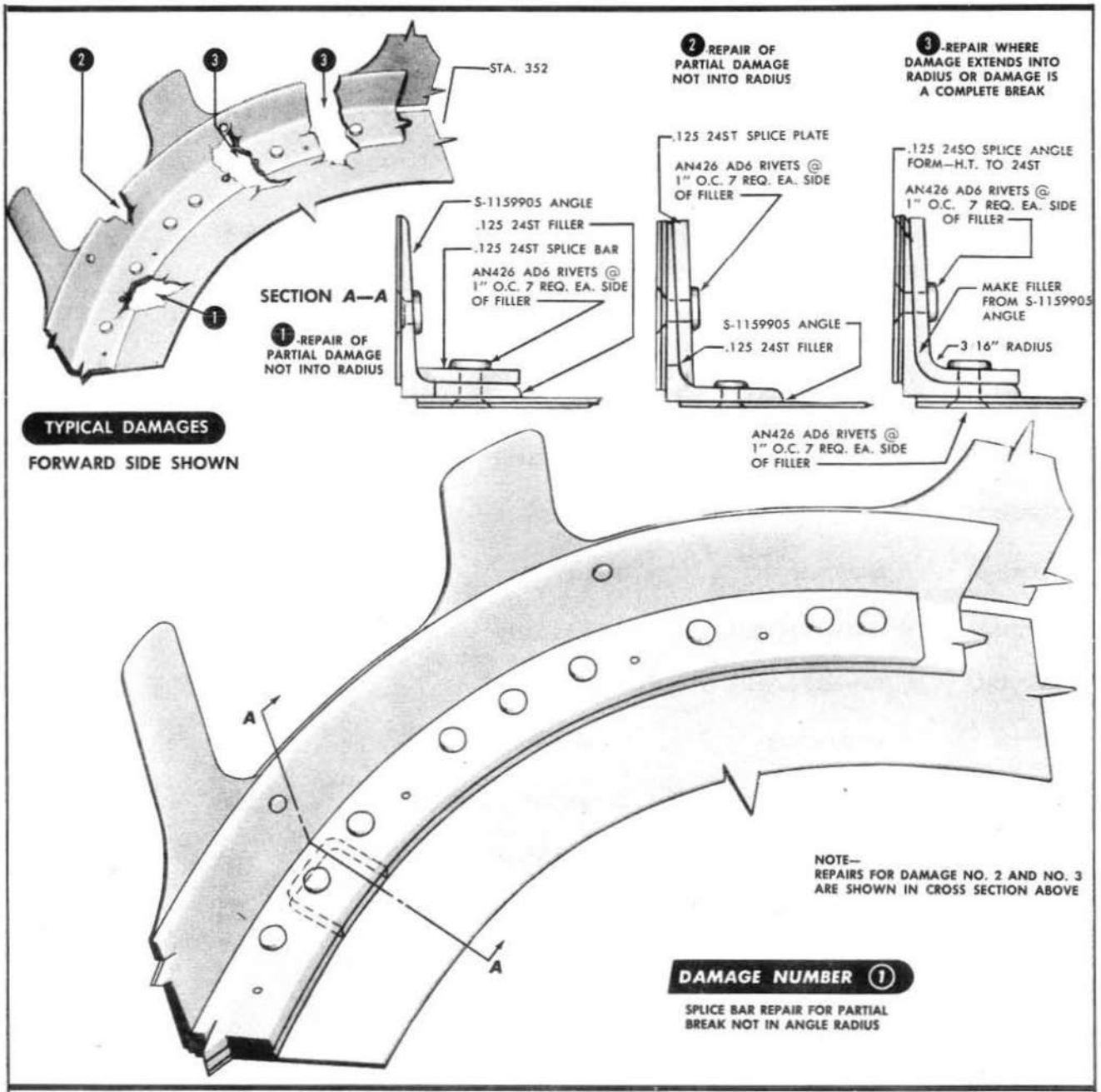


Figure 143–Fuselage (Web Type) Frame Assembly, Station 352

KEY TO FIGURE 143

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5157635-20	Web	27½x47	.040	24ST		1
2	5157635-30	Stiffener S-1075769	Length 9-9/16		24ST		1
3	5157635-32	Stiffener S-1075769	Length 10-3/16		24ST		1
4	2195150	Angle	1-11/16x10⅜	.051	61ST		1
5	5157635-22	Stiffener S-151776	Length 52½		24ST		1
6	5195545	Support Assembly	9¼x11	.051	61ST		1
7	5157635-15	Stiffener S-1114111	Length 9-13/16		24ST		1
8	5157635-24	Attach Angle S-1159905	Length 83¾		24ST		1
9	5157635-34	Splice Plate	1¼x10¼	.051	24SO		1
10	5157635-18	Stiffener S-1059614	Length 9-13/16		24ST		1
11	5157635-16	Stiffener S-1059614	Length 10¾		24ST		1
12	2195198	Tee S-1007018	Length 9-3/16		24ST		1
13	5157635-4	Stiffener S-151776	Length 52½		24ST		1
14	5157635-8	Stiffener S-1059614	Length 9-13/16		24ST		1
15	5157635-10	Stiffener S-1059614	Length 11-11/16		24ST		1
16	5157635-12	Stiffener S-1059614	Length 10-9/16		24ST		1
17	5157635-14	Stiffener S-1114111	Length 9-13/16		24ST		1
18	5157635-36	Splice Plate	9½x12	.051	24SO		1
19	5157635-2	Web	27½x47	.040	24ST		1
20	5157635-6	Attach Angle S-1159905	Length 83¾		24ST		1

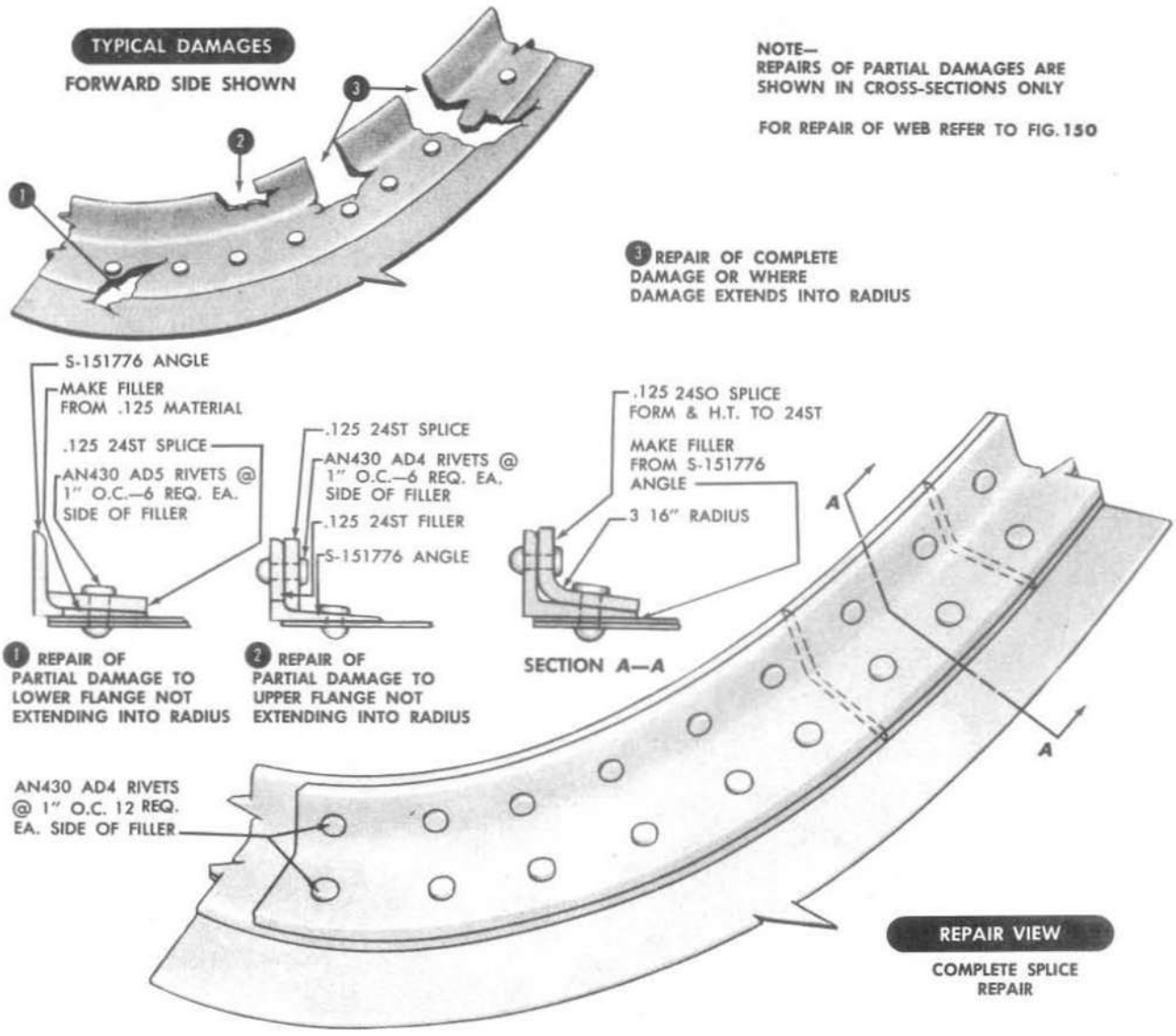
Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice plates from .125 24ST dural plate.
4. Construct splice angle from .125 dural plate. Form in the 24SO condition and heat treat to 24ST.
5. Construct filters from the same gage and material as the angle.
6. For minimum bend radii of sheet material, see Figure 5, Section I.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

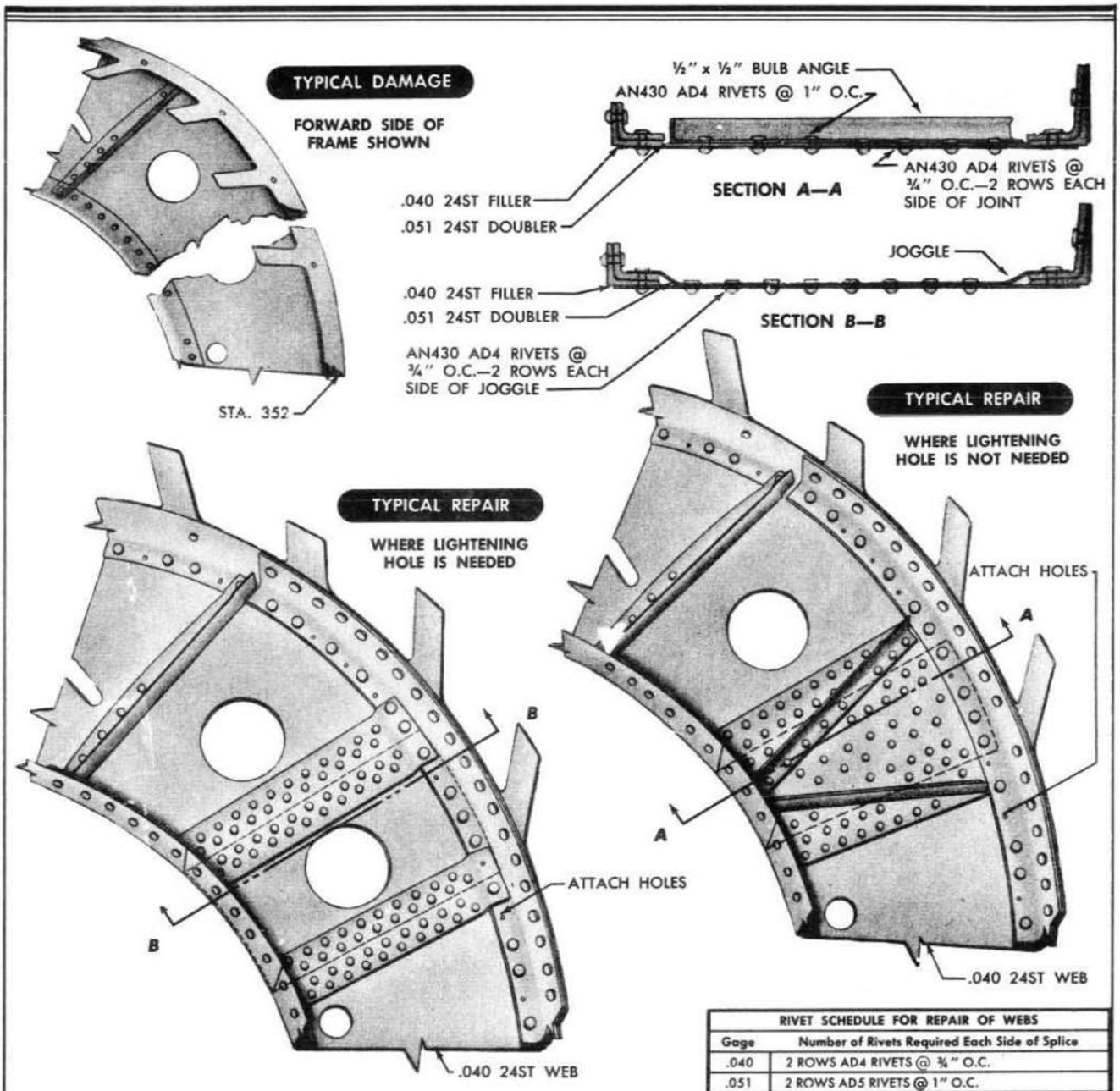
Figure144- Patch and Splice Repair of Outboard Angle—Sta. 352 Frame



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice plates from .125 24ST dural plate.
4. Construct splice angle from .125 dural plate. Form in the 24SO condition and heat treat to 24ST.
5. Construct fillers from the same gage and material as the angle.
6. For minimum bend radii of sheet material, see Figure 5, Section I.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 145—Patch and Splice Repair of Frame Angles, Station 352



RIVET SCHEDULE FOR REPAIR OF WEBS	
Gage	Number of Rivets Required Each Side of Splice
.040	2 ROWS AD4 RIVETS @ ¾" O.C.
.051	2 ROWS AD5 RIVETS @ 1" O.C.
.064	2 ROWS AD6 RIVETS @ 1" O.C.
.072	2 ROWS AD6 RIVETS @ ¾" O.C.
.084	3 ROWS AD6 @ 1" O.C. OR 2R AD8 @ 1 ¼" O.C.
.091	3 ROWS AD6 @ ⅞" O.C. OR 2R AD8 @ 1" O.C.
.102	3 ROWS AD6 RIVETS @ ¾" O.C.
.125	3 ROWS AD8 RIVETS @ 1" O.C.

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth to provide for insert.
3. Construct splice doublers from dural sheet one gage heavier than web.
4. Construct insert from the same gage and material as the web. Form flange along the edge of the lightening hole.
5. Select web rivets from table shown.
6. For minimum bend radii of sheet material, see Fig. 5, Section I.
7. For flush riveting, see Fig. 6, Section I.
8. For rivet edge and row distance, see Fig. 7, Section I.
9. For angle repairs, see Figs. 144 and 145

Figure 146-Insert and Splice Repair at Lightening Hole—Web Type Frame, Sta. 352

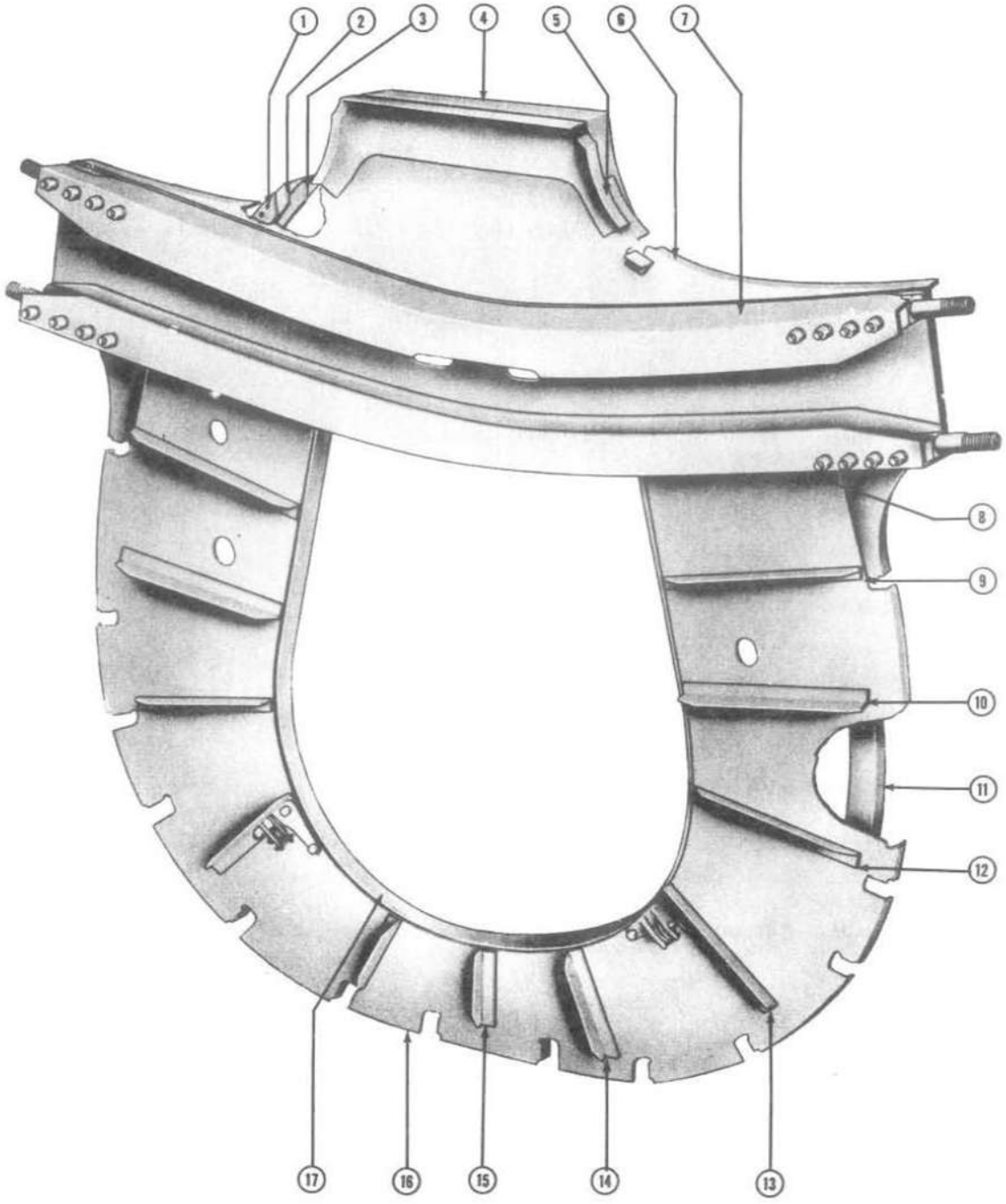


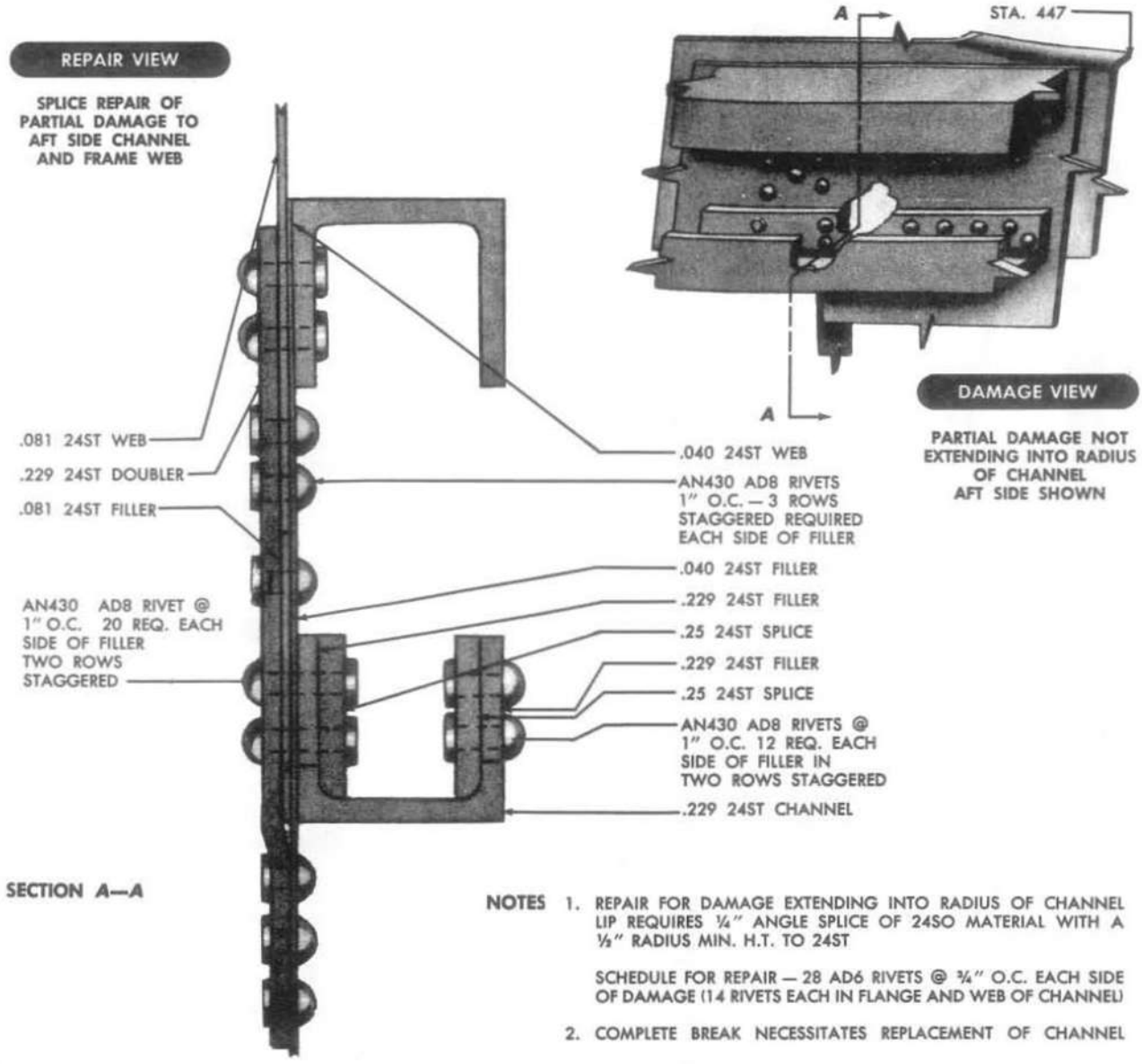
Figure 147—Fuselage Bulkhead Structure, Station 447

KEY TO FIGURE 147

Note: L.H. and R.H. indicate opposite parts within the assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5157793-34	Filler Strip	1½x10	.125	24ST		2
2	5157793-28 L.H.	Angle	3¾x15½	.072	24SO	24ST	1
	5157793-29 R.H.						1
3	5157793-30 L.H.	Angle S-1047299	Length 15½		24ST		1
	5157793-31 R.H.						1
4	5125602	Fitting					1
5	5157793-14	Clip	6x13¼	.051	24SO	24ST	1
6	5157793-4	Sheet	17½x44	.081	24SO	24ST	1
7	5157793-10	Channel S-1125516	Length 40¾		24ST		1
8	5157793-12	Channel S-1125516	Length 41¾		24ST		1
9	5157793-16 L.H.	Stiffener S-169097	Length 8⅝		24ST		1
	5157793-17 R.H.						1
10	5157793-18 L.H.	Stiffener S-169097	Length 8¼		24ST		1
	5157793-19 R.H.						1
11	5157793-8	Channel S-1047872	Length 95		24SO	24ST	1
12	5157793-20 L.H.	Stiffener S-169097	Length 7½		24ST		1
	5157793-21 R.H.						1
13	5157793-38 L.H.	Stiffener S-167881	Length 6-23/32		24ST		1
	5157793-39 R.H.						1
14	5157793-24 L.H.	Stiffener S-169097	Length 4½		24ST		1
	5157793-25 R.H.						1
15	5157793-26	Stiffener S-169097	Length 3½		24ST		1
16	5157793-2	Sheet	37½x42	.040	24SO	24ST	1
17	5157793-36	Angle S-1025503	Length 72		24SO	24ST	1

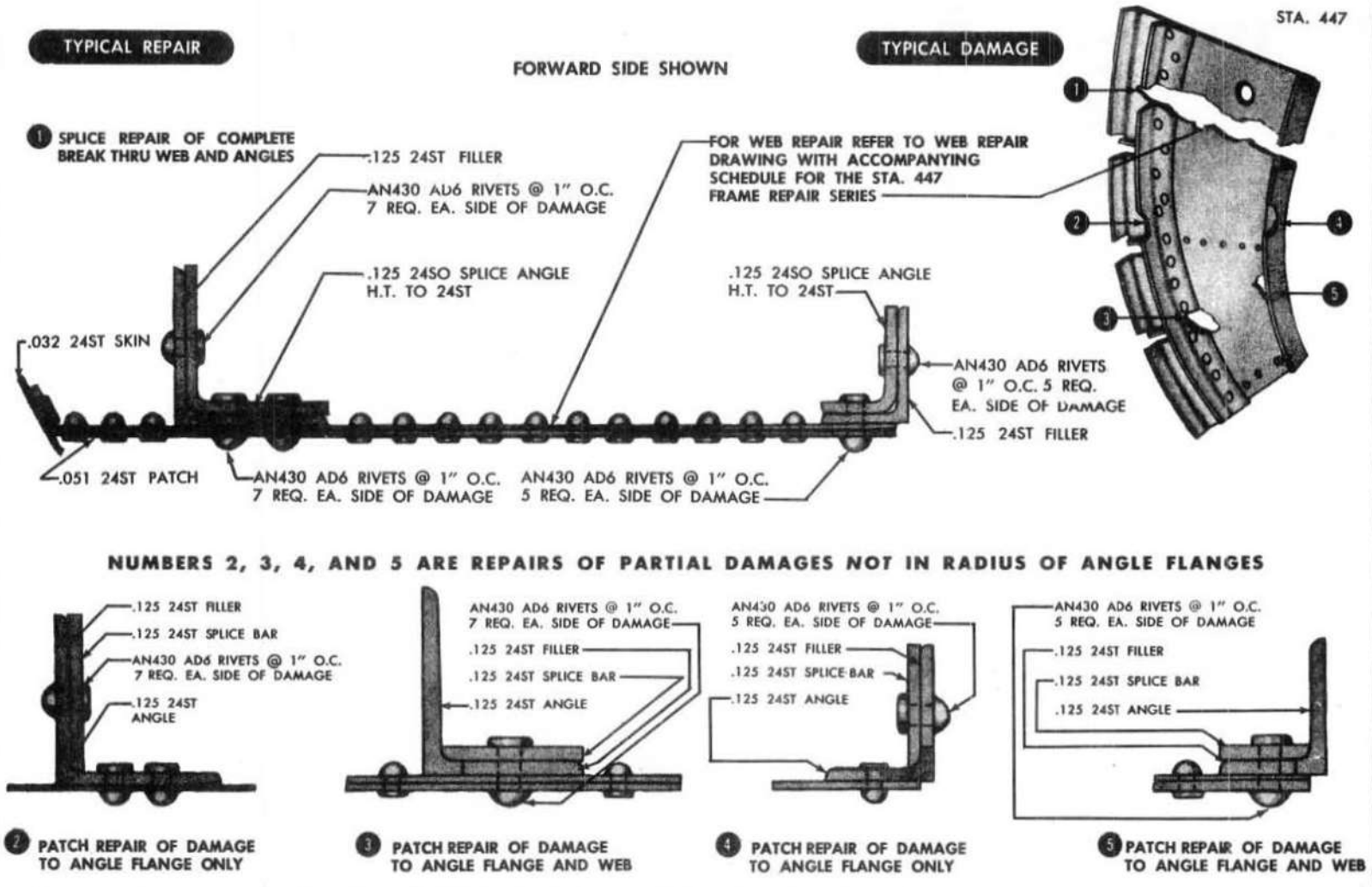
Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice bars from .25 24ST material.
4. Construct web patch from .229 24ST material.
5. Construct all fillers from the same gage and material as original.
6. Use existing rivet holes where possible.
7. For rivet edge and row distance, see Figure 7, Section I.

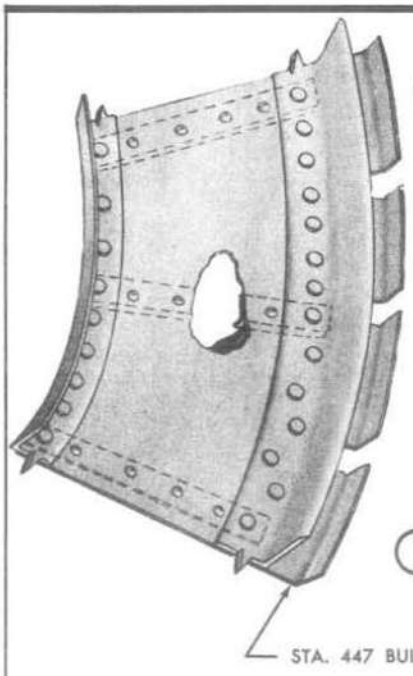
Figure 148 — Splice Repair of Aft Side of Channel-Fuselage Frame Sta. 447



NOTES

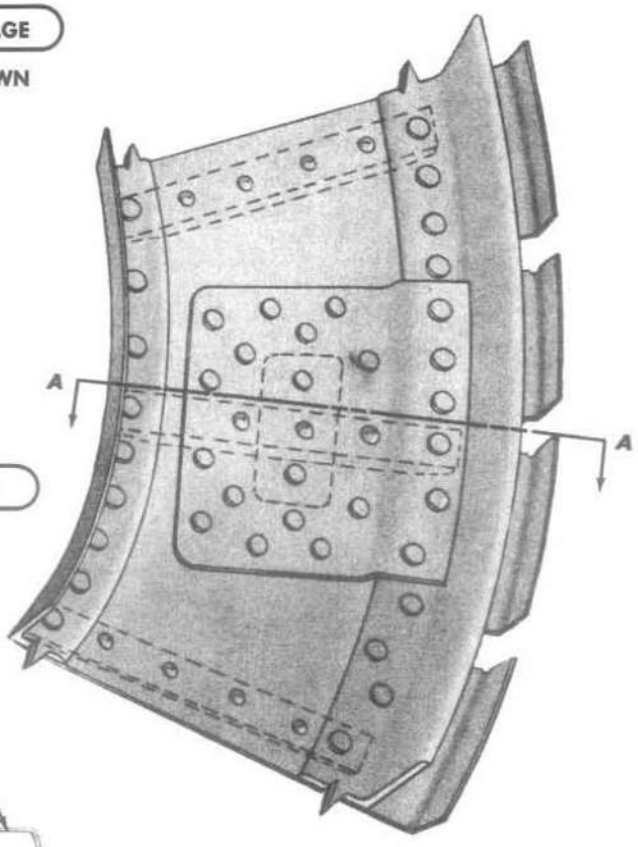
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angles from .125 24SO material. Form and heat treat to 24ST.
4. Construct splice bars from .125 24ST material.
5. Construct fillers from .125 24ST material. Use an extruded angle same as the original when making a filler for repair of complete break, as in Repair Number 1.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 149–Patch and Splice Repair of Damages to Angles —Sta. 447 Frame

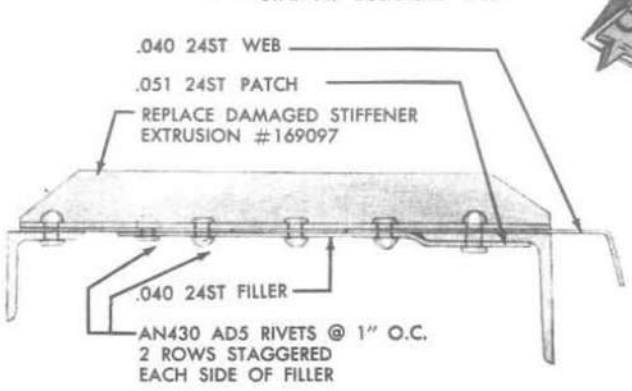


TYPICAL DAMAGE

AFT SIDE SHOWN



TYPICAL REPAIR



SECTION *A—A*

RIVET REQUIREMENTS FOR REPAIR OF FUSELAGE BULKHEAD WEBS		
Gage	Rivets	Number of Rivets Each Side of Damage
.040	AD4	TWO ROWS @ ¾" ON CENTER
.051	AD5	TWO ROWS @ 1" ON CENTER
.061	AD6	TWO ROWS @ 1" ON CENTER
.072	AD6	TWO ROWS @ ¾" ON CENTER
.084	AD6	3 ROWS @ 1" O.C. or 2 ROWS AD8 @ 1 ¼" O.C.
.091	AD6	3 ROWS @ ⅞" O.C. or 2 ROWS AD8 @ 1" O.C.
.102	AD6	THREE ROWS @ ¾" ON CENTER
.125	AD8	THREE ROWS @ 1" ON CENTER

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct web patch from 24ST material of the next gage heavier than the web.
4. Construct filler from the same gage and material as the web.
5. Rivet size and spacing for attachment of patches to webs of different gages are noted on above table.
6. Replace damaged stiffener with angle same as original.
7. Use existing rivet holes where possible.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 150—Patch Repair of Channel Web—Fuselage Frame—Sta. 447

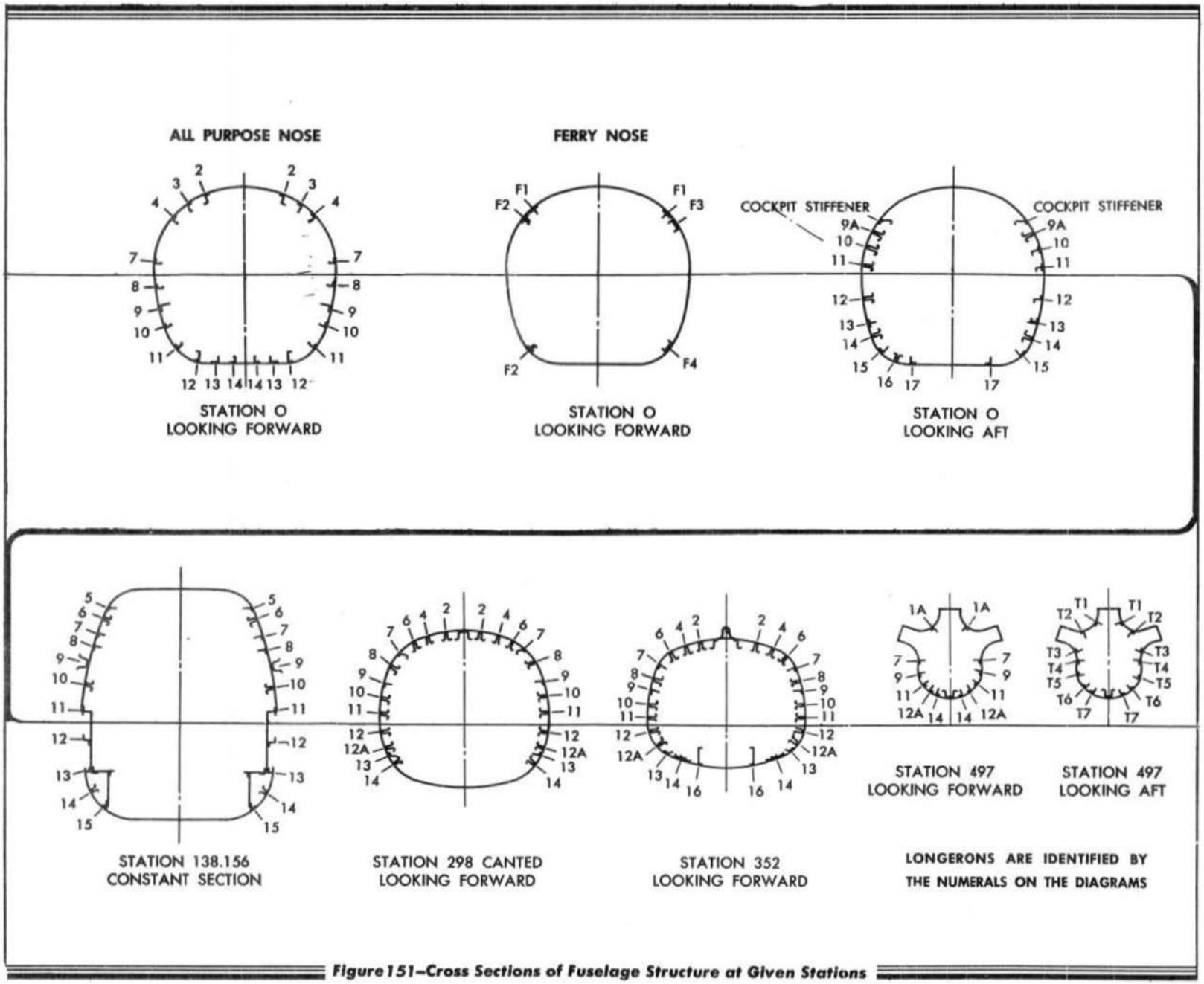


Figure 151–Cross Sections of Fuselage Structure at Given Stations

KEY TO FIGURE 151

NOTE: To Determine Gage, Material, and Heat Treat for Extrusions Refer to the Extrusion Chart, Section VIII

Longeron Ref. No.	*Description*	*Limits (Refer to Cross-Section Diagrams)*	*From Douglas Co. Print*	*Gage*	*Material*
1	S-1047299 Extrusion	From Sta. 402 to Sta. 497	5153178		
2	S-2074330 Hat Section	From Sta. 298 to Sta. 352	5153137	.020	24ST
2	S-130893 Extrusion	From Sta. 352 to Sta. 447.125	5153178		
3	S-1047299 Extrusion	From Sta. 447.125 to Sta. 474	5153178		
4	S-2074330 Hat Section	From Sta. 297.55 to Sta. 352	5153137	.020	24ST
4	S-1075769 Extrusion	From Sta. 352 to Sta. 447.125	5153178		
5	S-1125521 Extrusion	From Sta. 97 to Sta. 191.333	5153137		
6	S-2074330 Hat Section	From Sta. 97 to Sta. 209	5153137	.020	24ST
6	S-2074330 Hat Section	From Sta. 297 to Sta. 352	5153137	.020	24ST
6	S-1075769 Extrusion	From Sta. 352 to Sta. 442.125	5153178		
7	S-1093794 Extrusion	From Sta. 97 to Sta. 135.656	5153137		
7	S-1093794 Extrusion	From Sta. 127.187 to Sta. 280	5153137		
7	5157786-24-25 Channel	From Sta. 298 to Sta. 352	5157786	.097	24SO; H.T. to 24ST
7	S-130893 Extrusion	From Sta. 352 to Sta. 497	5153178		
8	S-1059659 Extrusion	From Sta. 125.687 to Sta. 175.675	5153137		
8	S-2074330 Hat Section	From Sta. 180.675 to Sta. 352	5153137	.020	24ST
8	S-1025769 Extrusion	From Sta. 352 to Sta. 442.125	5153178		
9	S-1093794 Extrusion	From Sta. 180.675 to Sta. 190.625	5153137		
9	S-1109270 Extrusion	From Sta. 186.625 to Sta. 352	5157786		
9	S-1075769 Extrusion	From Sta. 352 to Sta. 497	5153178		
9A	S-2074330 Hat Section	From Sta. 0 to Sta. 97	5153137	.020	24ST
10	S-1093768 Extrusion L.H.	From Sta. 0 to Sta. 120	5153137		
10	S-2074330 Hat Section R.H.	From Sta. 0 to Sta. 97	5153137	.020	24ST
10	S-1093771 Extrusion	From Sta. 125.687 to Sta. 158.187	5153137		
10	S-1093771 Extrusion	From Sta. 169.75 to Sta. 175.625	5153137		
10	S-2074330 Hat Section	From Sta. 280 to Sta. 352	5153137	.020	24ST
10	S-130893 Extrusion	From Sta. 352 to Sta. 474	5153178		

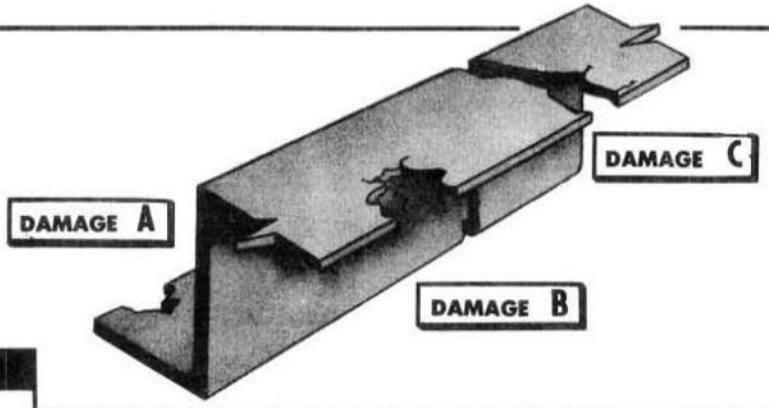
KEY TO FIGURE 151 (Continued)

Longeron Ref. No.	*Description*	*Limits (Refer to Cross-Section Diagrams)*	*From Douglas Co. Print*	*Gage*	*Material*
11	S-1093769 Extrusion L.H.	From Sta. 0 to Sta. 260	5123475		
11	S-2074330 Hat Section R.H.	From Sta. 0 to Sta. 80	5153137	.020	24ST
11	S-1093769 Extrusion R.H.	From Sta. 80 to Sta. 260	5123475		
11	S-2074330 Hat Section	From Sta. 280 to Sta. 352	5153137	.020	24ST
11	S-130893 Extrusion	From Sta. 352 to Sta. 447.125	5153178		
12	S-1093767 Extrusion L.H.	From Sta. 0 to Sta. 293	5153137		
12	S-2074330 Hat Section R.H.	From Sta. 0 to Sta. 75	5153137	.020	24ST
12	S-1093767 Extrusion R.H.	From Sta. 75 to Sta. 293	5153137		
12	S-2074330 Hat Section	From Sta. 293 to Sta. 352	5153137	.020	24ST
12	S-130893 Extrusion	From Sta. 352 to Sta. 474.125	5153187		
12A	S-2074330 Hat Section	From Sta. 0 to Sta. 352	5153137	.020	24ST
12A	S-130893 Extrusion	From Sta. 352 to Sta. 497	5153187		
Cockpit Stiffener	5157786-2	From Sta. 153.375 (Long. No. 5) to Sta. 304.809 (Long. No. 7)	5157786	.040	24ST
13	S-1093764 Extrusion	From Sta. 0 to Sta. 315	5143502 5143503		
13	S-130893 Extrusion	From Sta. 352 to Sta. 447.125	5153187		
14	S-2074330 Hat Section	From Sta. 0 to Sta. 270.87	5153137	.020	24ST
14	S-1152388 Extrusion	From Sta. 262 to Sta. 352	5153137		
14	S-130893 Extrusion	From Sta. 352 to Sta. 497	5153187		
15	S-1093763 Extrusion	From Sta. 0 to Sta. 290	5143470		
16	S-2074330 Hat Section R.H.	From Sta. 0 to Sta. 70	5153137	.020	24ST
16	S-2074330 Hat Section L.H.	From Sta. 10.375 to Sta. 70	5153137	.020	24ST
16	S-130893 Extrusion	From Sta. 386 to Sta. 474	5153187		
17	S-130893 Extrusion	From Sta. 252 to Sta. 369	5153187		
17	S-130893 Extrusion	From Sta. 386 to Sta. 474	5153187		

KEY TO FIGURE 151 (Continued)

Longeron Ref. No.	*Description*	*Limits (Refer to Cross-Section Diagrams)*	*From Douglas Co. Print*	*Gage*	*Material*
T.1	5122173-30-31 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 526	5122173	.040	24SO; H.T. to 24ST
T.2	5122173-32-33 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 526	5122173	.040	24SO; H.T. to 24ST
T.3	5122173-34-35 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 511.82	5122173	.040	24SO; H.T. to 24ST
T.4	5122173-36-37 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 526	5122173	.040	24SO; H.T. to 24ST
T.5	5122173-38-39 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 526	5122173	.040	24SO; H.T. to 24ST
T.6	5122173-40-41 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 511.82	5122173	.040	24SO; H.T. to 24ST
T.7	5122173-42-43 Angle (L.H.) (R.H.)	From Sta. 498 to Sta. 526	5122173	.040	24SO; H.T. to 24ST
FERRY NOSE					
F.1	S-1093707 Extrusion	From Sta. 0 to Sta. 30 (L.H. & R.H.)	5194582		
F.2	S-1152387 Angle	From Sta. 30 to Sta. 53.5 (L.H. & R.H.)	5194582	.040	24ST
F.3	5194582-28 Channel	From Sta. 30 to Sta. 53.5 (R.H.)	5194582	.040	24ST
F.4	5194582-26 Channel	From Sta. 30 to Sta. 53.5 (R.H.)	5194582	.040	24ST
ALL PURPOSE NOSE					
A.2	5143686-20-21 Zee Angle	From Sta. 1.569 to Sta. 53.5	5202500	.040	24SO; H.T. to 24ST
A.3	S-130893 Extrusion	From Sta. 1.569 to Sta. 11.545	5202500		
A.4	S-130893 Extrusion	From Sta. 1.569 to Sta. 11.545	5202500		
A.7	S-130893 Extrusion	From Sta. 1.569 to Sta. 11.545	5202500		
A.8	S-130893 Extrusion	From Sta. 1.569 to Sta. 11.545	5202500		
A.9	5203238 & -1 Channel	From Sta. 1.569 to Sta. 60	5202500	.091	24SO; H.T. to 24ST
A.10	S-130893 Extrusion	From Sta. 1.569 to Sta. 47.168	5202500		
A.11	S-130893 Extrusion	From Sta. 1.569 to Sta. 53.5	5202500		
A.12	5203220 & -1 Channel	From Sta. 1.569 to Sta. 47.168	5202500	.091	24SO; H.T. to 24ST
A.13	5202500-18-19 Angle	From Sta. 1.569 to Sta. 53.5	5202500	.091	24SO; H.T. to 24ST
A.14	S-130893 Extrusion	From Sta. 1.569 to Sta. 18.75	5202500		

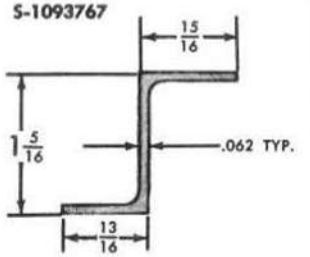
Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



NOTE—

The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE S-1093767



LONGERON #12—STA. 120 TO 280

ENGINEERING DRAWING #5123475

DAMAGE A

MATERIAL	RIVETS
11/16" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE

DAMAGE EXTENDING INTO RADIUS

MATERIAL	RIVETS
11/16" x 11/16" .064 24ST SPLICE ANGLE	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE

DAMAGE B

MATERIAL	RIVETS
7/8" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE

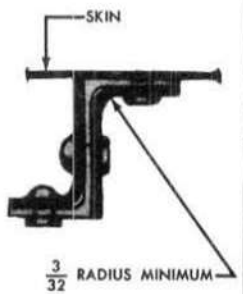
DAMAGE EXTENDING INTO RADIUS

MATERIAL	RIVETS
7/8" x 7/8" .064 24ST SPLICE ANGLE	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE

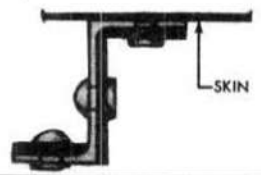
DAMAGE C

MATERIAL	RIVETS
7/8" x 1 1/4" .064 24ST SPLICE ANGLE 11/16" x 1 1/4" 24ST SPLICE ANGLE	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE

REPAIR FOR C

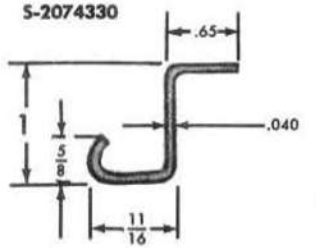


ALTERNATE FOR C



MATERIAL	RIVETS
7/8" .064 24ST SPLICE BAR 11/16" .064 24ST SPLICE BAR 1 1/8" .064 24ST SPLICE BAR	9 AD6 OR 12 AD5 RIVETS EACH SIDE OF SPLICE

TYPE S-2074330



LONGERON #½—STA. 315 TO 386

ENGINEERING DRAWING #5157799

DAMAGE A

MATERIAL	RIVETS
11/16" x 3/8" .040 24SO SPLICE ANGLE FORM & H.T. TO 24ST	3 AD5 OR 4 AD4 RIVETS EACH SIDE OF SPLICE

DAMAGE EXTENDING INTO RADIUS

MATERIAL	RIVETS
5/8" x 5/8" .040 24SO SPLICE ANGLE FORM & H.T. TO 24ST	6 AD5 OR 8 AD4 RIVETS EACH SIDE OF SPLICE

DAMAGE B

MATERIAL	RIVETS
5/8" .040 24ST SPLICE BAR	2 AD5 OR 3 AD4 RIVETS EACH SIDE OF SPLICE

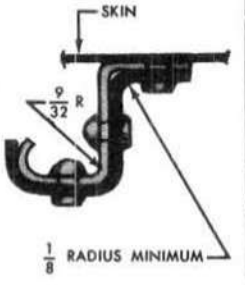
DAMAGE EXTENDING INTO RADIUS

MATERIAL	RIVETS
5/8" x 5/8" .040 24ST SPLICE ANGLE	4 AD5 OR 6 AD4 RIVETS EACH SIDE OF SPLICE

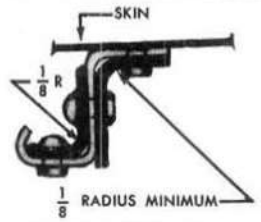
DAMAGE C

MATERIAL	RIVETS
.040 24ST NEST ZEE	6 AD5 OR 9 AD4 RIVETS EACH SIDE OF SPLICE

REPAIR FOR C

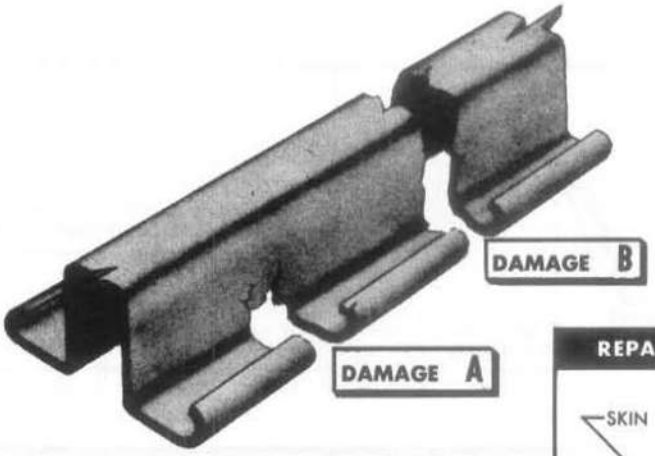


ALTERNATE FOR C



MATERIAL	RIVETS
.040 24ST SPLICE ANGLES 2 REQUIRED	6 AD5 OR 9 AD4 RIVETS EACH SIDE OF SPLICE

Figure 152-Repair of Damages to Fuselage Zee Type Longerons



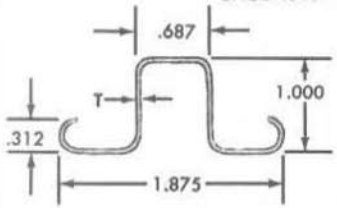
NOTE—

The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE

S-2074330

GAGE .032
GAGE .040

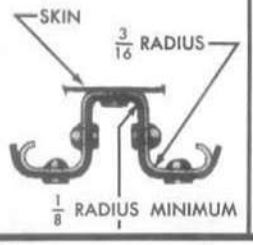


LONG.	STATION	LONG.	STATION
#2	315 to 332	#11	0 to 88
#4	315 to 332		298 to 332
#6	315 to 332	#12	0 to 97
#8	194 to 332		298 to 332
#9	0 to 88	#12A	280 to 332
#10 R.H.	0 to 88	#14	97 to 260
#10	194 to 240	#16	0 to 49

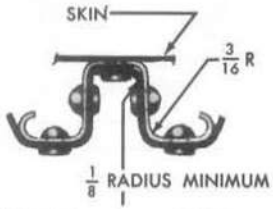
ENGINEERING DRAWING #5153137

DAMAGE A		DAMAGE B	
MATERIAL	RIVETS	MATERIAL	RIVETS
¾" x ⅜" .040 24ST SPLICE ANGLE	4 AD5 RIVETS EACH SIDE OF SPLICE	.040 24SO DOUBLER FORM & H.T. TO 24ST	10 AD5 RIVETS EACH SIDE OF SPLICE

REPAIR FOR B

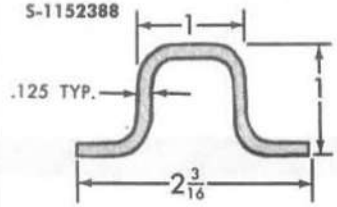


ALTERNATE FOR B



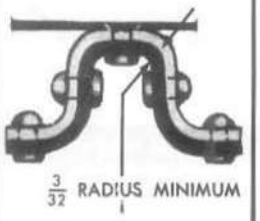
MATERIAL	RIVETS
.040 24SO SPLICE ANGLE FORM & H.T. TO 24ST	10 AD5 RIVETS EACH SIDE OF SPLICE

S-1152388



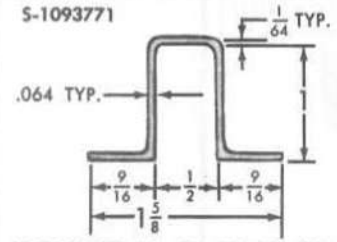
LONGERON #14—STA. 280 TO 352
ENGINEERING DRAWING #5157785

A		B	
MATERIAL	RIVETS	MATERIAL	RIVETS
.125 24SO SPLICE ANGLE FORM & H.T. TO 24ST—OR .091 CM STEEL SPLICE ANGLE	12 AD5 RIVETS EACH SIDE OF SPLICE	.091 CM STEEL SPLICE	20 AD6 RIVETS EACH SIDE OF SPLICE



NO ALTERNATE

S-1093771

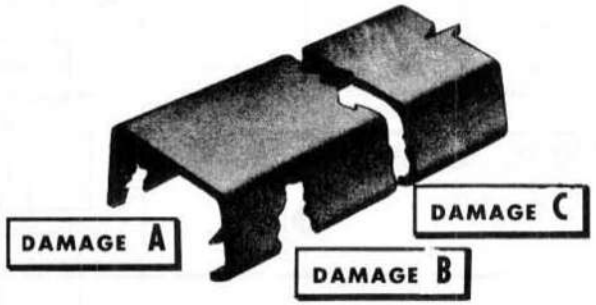


LONGERON #6—STA. 120 TO 194
ENGINEERING DRAWING #5153157

A		B	
MATERIAL	RIVETS	MATERIAL	RIVETS
.064 24SO SPLICE ANGLE FORM & H.T. TO 24ST	7 AD5 RIVETS EACH SIDE OF SPLICE	.064 24SO NEST CHANNEL FORM & H.T. TO 24ST .064 24ST SPLICE ANGLES, 2 REQ	10 AD6 RIVETS OR 15 AD5 RIVETS EACH SIDE OF SPLICE

NO ALTERNATE

Figure 153-Repair of Damages to Fuselage Longerons (Hat Type)



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

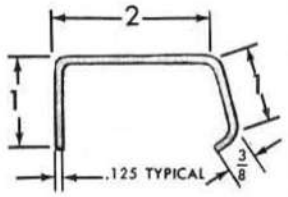
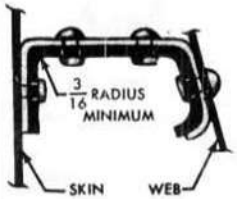
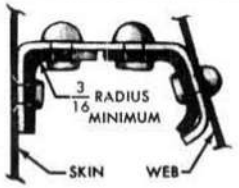
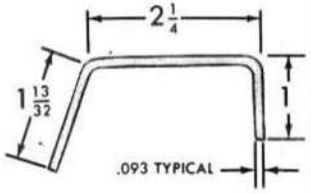
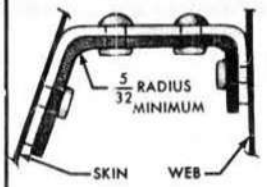
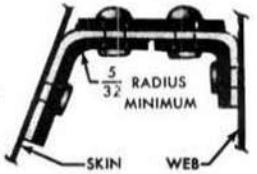
TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C	
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
 C.S.—STATION 0 TO 70 ENGINEERING DRAWING #5157786	1" x .125 24ST SPLICE BAR	7 AD6 RIVETS EACH SIDE OF SPLICE	1" x 3/8" x .125 24SO SPLICE ANGLE FORM—H.T. TO 24ST	7 AD6 RIVETS EACH SIDE OF SPLICE	.125 24SO DOUBLER FORM—H.T. TO 42ST	24 AD6 RIVETS EACH SIDE OF SPLICE			
	DAMAGE EXTENDING INTO RADIUS							.125 24SO SPLICE ANGLES—FORM—H.T. TO 24ST	24 AD6 RIVETS EACH SIDE OF SPLICE
	1" x 1" x .125 24SO SPLICE ANGLE FORM—H.T. TO 24ST	14 AD6 RIVETS EACH SIDE OF SPLICE	.125 24SO NEST CHANNEL FORM—H.T. TO 24ST	14 AD6 RIVETS EACH SIDE OF SPLICE					
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
 LONGERON #5—STA. 240 TO 298 ENGINEERING DRAWING #5157786	1 3/8" x .094 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	1" x .094 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	.094 24SO DOUBLER FORM—H.T. TO 24ST	20 AD6 RIVETS EACH SIDE OF SPLICE			
	DAMAGE EXTENDING INTO RADIUS							.094 24SO SPLICE ANGLES—FORM—H.T. TO 24ST—.094 24SO SPLICE BAR	20 AD6 RIVETS EACH SIDE OF SPLICE
	1 1/8" x 1 3/8" x .094 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 RIVETS EACH SIDE OF SPLICE	1" x 1 1/8" x .094 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 RIVETS EACH SIDE OF SPLICE					

Figure 154 —Repair of Damages to Fuselage Channel Type Longerons (Sheet 1 of 4)

NOTE—

The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

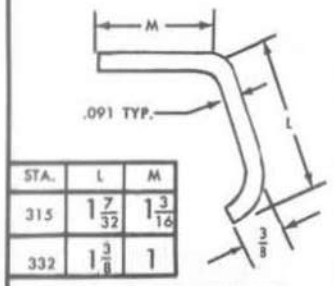
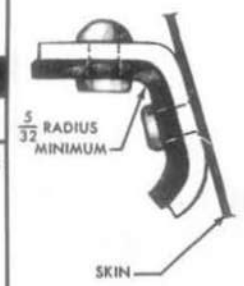
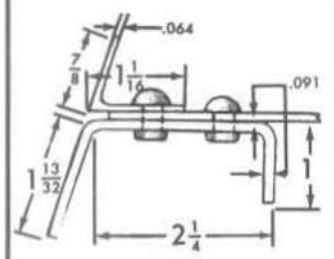
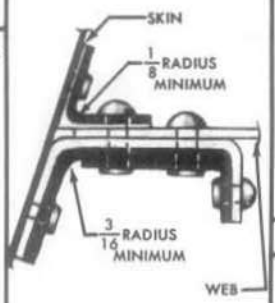
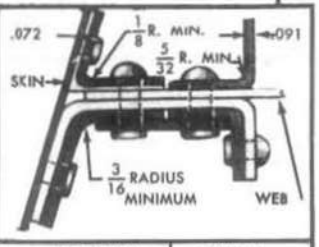
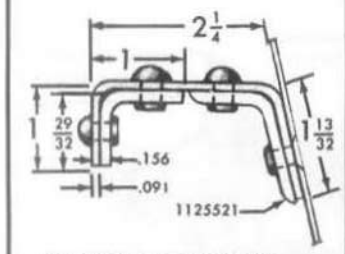
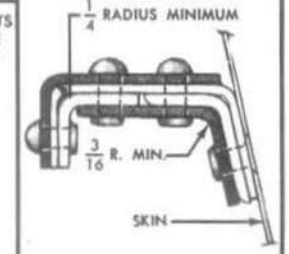
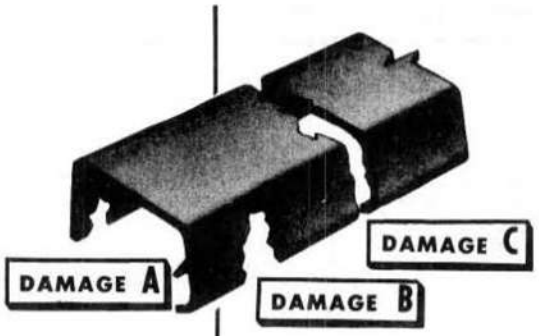
TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C	
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
 LONGERON #7—STA. 315 TO 332 ENGINEERING DRAWING #5157786	.091 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	.091 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 RIVETS EACH SIDE OF SPLICE	.091 24SO DOUBLER FORM—H.T. TO 24ST	12 AD6 RIVETS EACH SIDE OF SPLICE		 .094 24ST SPLICE BAR—.094 24SO SPLICE ANGLE—FORM H.T. TO 24ST	12 AD6 RIVETS EACH SIDE OF SPLICE
	DAMAGE EXTENDING INTO RADIUS								
	REPAIR SAME AS FOR DAMAGE C		REPAIR SAME AS FOR DAMAGE C						
 LONGERON #5—STATION 194 CHANNEL ENGINEERING DRAWING #5157786	1 3/8" x .091 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	1" x .094 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	.091 24ST SPLICE BAR .125 24SO CHANNEL DOUBLER .072 24SO SPLICE ANGLE FORM—H.T. TO 24ST	36 AD6 RIVETS EACH SIDE OF SPLICE			
	DAMAGE EXTENDING INTO RADIUS							MATERIAL	RIVETS
	1" x .091 24ST SPLICE BAR 1 3/8" x 1 1/8" x .125 24SO SPLICE ANGLE 3/8" x 1-1/16" x .072 24SO SPLICE ANGLE H.T. TO 24ST	21 AD6 RIVETS EACH SIDE OF DAMAGE AREA	1" x 3/8" x .125 24SO SPLICE ANGLE .091 24ST SPLICE BAR	14 AD6 RIVETS EACH SIDE OF DAMAGE AREA				.125 24SO ANGLE (2 REQ.) .072 24SO ANGLE FORM—H.T. TO 24ST .091 24ST ANGLE .091 24ST SPLICE BAR	36 AD6 RIVETS EACH SIDE OF SPLICE
 LONGERON #5—STATION 180 ENGINEERING DRAWING #5157786	1/4" x 1" 24ST SPLICE BAR	10 AD6 RIVETS EACH SIDE OF SPLICE	1/4" x 1 1/4" 24ST SPLICE BAR	10 AD6 RIVETS EACH SIDE OF SPLICE	.125 24SO SPLICE ANGLES 2 REQ.—FORM H.T. TO 24ST NOTE—REPLACE DAMAGED ANGLES	20 AD6 RIVETS EACH SIDE OF SPLICE		NO ALTERNATE	
	DAMAGE EXTENDING INTO RADIUS								
	1 1/8" x 1 3/8" x .125 24SO SPLICE ANGLE H.T. TO 24ST REPLACE DAMAGED ANGLE	10 AD6 RIVETS EACH SIDE OF SPLICE	1 1/8" x 1 1/4" .125 24SO SPLICE ANGLE H.T. TO 24ST REPLACE DAMAGED ANGLE	10 AD6 RIVETS EACH SIDE OF SPLICE					

Figure 154—Repair of Damages to Fuselage Channel Type Longerons (Sheet 2 of 4)

CONT. FROM PRECEDING PAGE



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

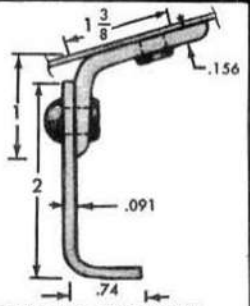
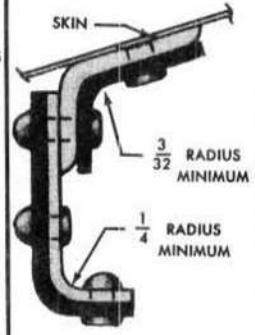
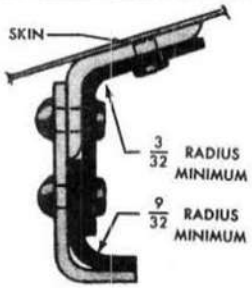
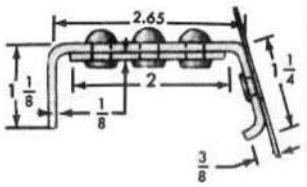
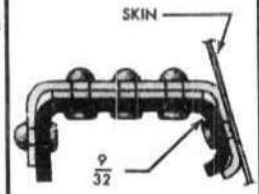
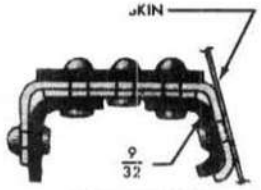
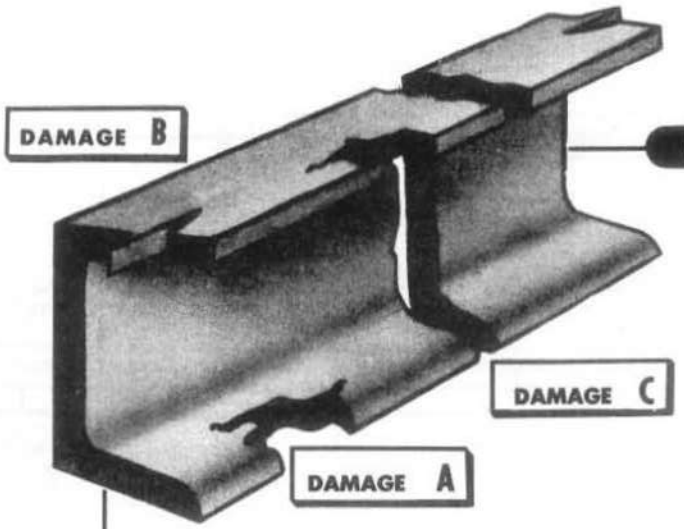
TYPE	DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE C	ALTERNATE FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
 LONGERON #5—STATION 164 ENGINEERING DRAWING #5157786	⅛" x .091 24SO SPLICE ANGLE—FORM—H.T. TO 24ST	7 AD6 RIVETS EACH SIDE OF SPLICE	5/32" x 1¼" 24ST SPLICE BAR	8 AD6 RIVETS EACH SIDE OF SPLICE	.091 ANNEALED C.M. STEEL ANGLE .091 24SO SPLICE ANGLE FORM—H.T. TO 24ST	30 AD6 RIVETS EACH SIDE OF SPLICE		
	DAMAGE EXTENDING INTO RADIUS							MATERIAL: .091 ANNEALED C.M. STEEL SPLICE ANGLE 5/32" 24SO SPLICE ANGLE—FORM—H.T. TO 24ST
	¾" x 1" x .091 24SO SPLICE ANGLE FORM—H.T. TO 24ST	15 AD6 RIVETS EACH SIDE OF SPLICE	.091 ANNEALED STEEL SPLICE ANGLE	15 AD6 RIVETS EACH SIDE OF SPLICE				RIVETS: 32 AD6 RIVETS EACH SIDE OF SPLICE
 COCKPIT STIFFENER—STATION 88 ENGINEERING DRAWING #5157782	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
	1" x .125 24ST SPLICE BAR	6 AD6 RIVETS EACH SIDE OF SPLICE	⅜" x 1" x .125 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 RIVETS EACH SIDE OF SPLICE	5/32" 24SO SPLICE CHANNEL	30 AD6 RIVETS EACH SIDE OF SPLICE	 RADIUS MINIMUM	 RADIUS MINIMUM
	DAMAGE EXTENDING INTO RADIUS							MATERIAL: 5/32" 24SO SPLICE ANGLES—2 REQ. 5/32" 24ST SPLICE BAR
	1" x 1" x .125 24SO SPLICE ANGLE FORM—H.T. TO 24ST	15 AD6 RIVETS EACH SIDE OF SPLICE	1" x 1" x ⅜" x .125 24SO SPLICE CHANNEL FORM—H.T. TO 24ST	15 AD6 RIVETS EACH SIDE OF DAMAGE				RIVETS: 30 AD6 RIVETS EACH SIZE OF SPLICE

Figure 154 —Repair of Damages to Fuselage Channel Type Longerons (Sheet 3 of 4)

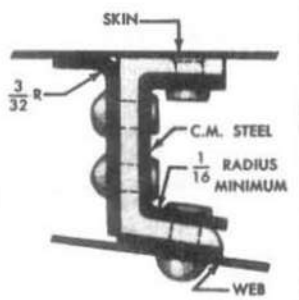


CHANNEL REPAIRS

NOTE—

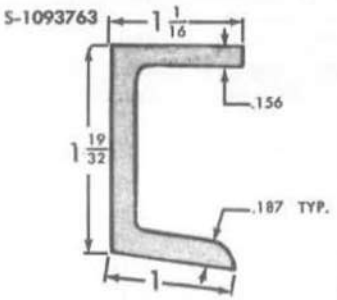
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

ALTERNATE FOR C



MATERIAL	RIVETS
.064 24SO SPLICE ANGLE—FORM—H.T. TO 24ST .064 24ST SPLICE BAR .064 C.M. STEEL SPLICE ANGLE .125 24ST SPLICE BAR	28 AD6 OR 40 AD5 RIVETS EACH SIDE OF SPLICE

TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	
S-1093763	3/4"-3/16" 24ST SPLICE BAR	7 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	7/8"-5/32" 24ST SPLICE BAR	7 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	.125 C.M. STEEL-NEST CHANNEL	28 AD6 OR 40 AD5 RIVETS EACH SIDE OF SPLICE	
	DAMAGE EXTENDING INTO RADIUS						
	3/4"x3/4" 3/16" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	14 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE	7/8"x7/8" 5/32" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	14 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE			



LONGERON #15—STATION 260
ENGINEERING DRAWING #5157785

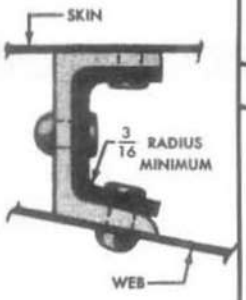
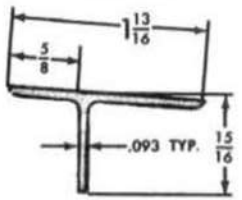


Figure 154—Repair of Damages to Fuselage Channel Type Longerons (Sheet 4 of 4)

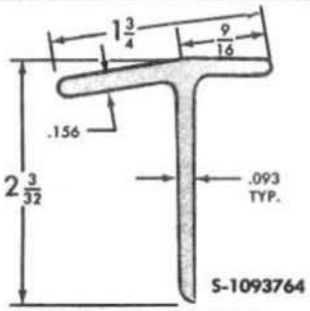
TYPE

S-1093769



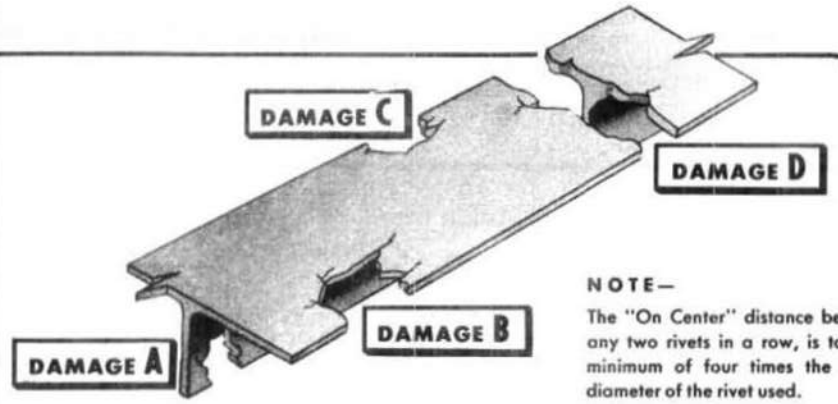
LONGERON #11 — STATION 97
ENGINEERING DRAWING #5123475

TYPE

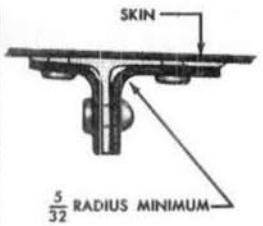
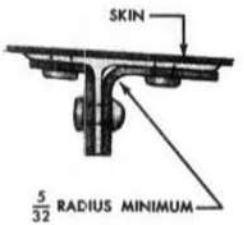


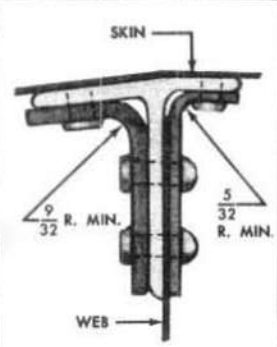
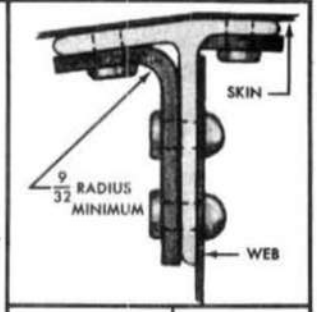
S-1093764

LONGERON #13 — STATION 97
ENGINEERING DRAWING #5123475



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

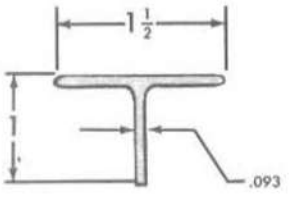
DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE D		REPAIR FOR D	ALTERNATE FOR D
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
1¼" .093 24ST SPLICE BAR	3AD6 RIVETS EACH SIDE OF SPLICE	1" .093 24ST SPLICE BAR	4 AD6 RIVETS EACH SIDE OF SPLICE	⅝" .093 24ST SPLICE BAR	2AD6 RIVETS EACH SIDE OF SPLICE	.093 24SO ½"x⅞" AND ⅞"x1¼" SPLICE ANGLES H.T. TO 24ST 2 REQ.	9 AD6 RIVETS EACH SIDE OF SPLICE		
		DAMAGE EXTENDING INTO RADIUS							
⅞"x1¼" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	9 AD5 OR 14 AD4 RIVETS EACH SIDE OF SPLICE	SAME AS DAMAGE — A		⅝"x⅞" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	5 AD6 RIVETS EACH SIDE OF SPLICE				

MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
1¾" .093 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	⅝" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	1" .156 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" x 1⅞" .156 24SO SPLICE ANGLE ⅝"x1⅞" .093 24SO SPLICE ANGLE FORM BOTH H.T. TO 24ST	18 AD6 OR 25 AD5 RIVETS EACH SIDE OF SPLICE		
		DAMAGE EXTENDING INTO RADIUS							
1"x1¾" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	13 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE	⅝"x1¾" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE	1"x1¾" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	13 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE				

MATERIAL	RIVETS
⅝" — .093 24ST SPLICE BAR 1"x1¾" — .156 24SO SPLICE BAR FORM—H.T. TO 24ST	18 AD6 OR 25 AD5 RIVETS EACH SIDE OF SPLICE

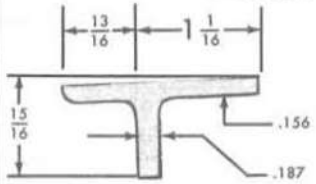
Figure 155—Repair of Damages to Fuselage Tee Type Longerons (Sheet 1 of 6)

TYPE S-1011464

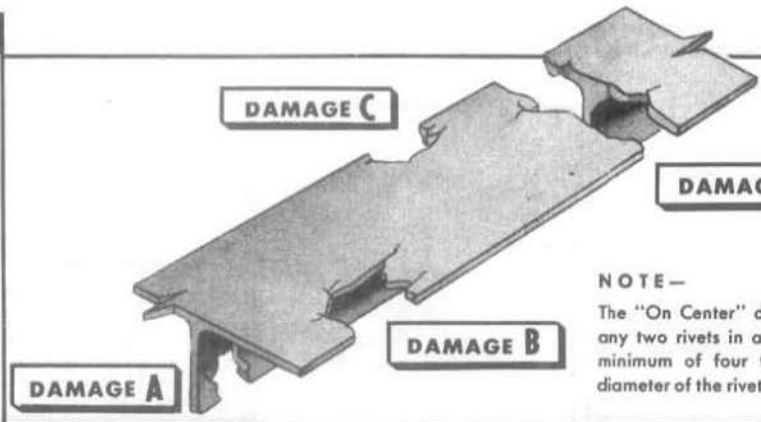


LONGERON #13A
STA. 0 TO STA. 88 (R.H. INCL.)
ENGINEERING DRAWING #5157814

TYPE S-1093763



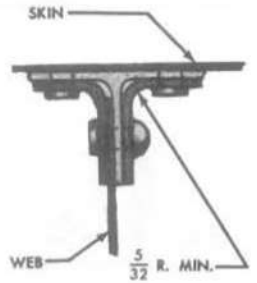
LONGERON #15
STA. 29 TO STA. 49, INCL.
ENGINEERING DRAWING #5143470



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE D	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
3/4" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	3/4" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	3/4" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 3/4" .093 24SO SPLICE ANGLES 2 REQ. FORM—H.T. TO 24ST	9 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE
DAMAGE EXTENDING INTO RADIUS							
3/4" x 3/4" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 3/4" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 3/4" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE		

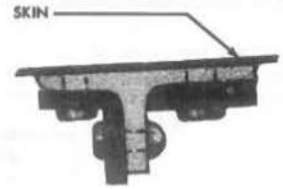
REPAIR FOR D



ALTERNATE FOR D

MATERIAL	RIVETS
3/4" .093 24ST SPLICE BARS—2 REQ. 7/8" .093 24ST SPLICE BAR	9 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE

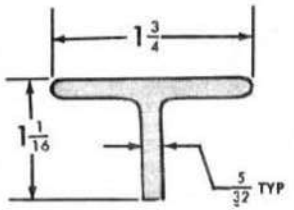
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
3/4" .187 24ST SPLICE BAR	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	13/16" .156 24ST SPLICE BAR	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	13/16" .156 24ST SPLICE BAR	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	13/16" .156 24ST SPLICE BARS—2 REQ. 13/16" .156 24SO SPLICE ANGLE — FORM H.T. TO 24ST	15 AD6 OR 21 AD5 RIVETS EACH SIDE OF SPLICE
DAMAGE EXTENDING INTO RADIUS							
13/16" x 13/16" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	12 AD6 OR 17 AD5 RIVETS EACH SIDE OF SPLICE	13/16" x 13/16" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	12 AD6 OR 17 AD5 RIVETS EACH SIDE OF SPLICE	13/16" x 13/16" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	12 AD6 OR 17 AD5 RIVETS EACH SIDE OF SPLICE		



MATERIAL	RIVETS
13/16" .156 24ST SPLICE BAR 13/16" .156 24ST SPLICE BAR 3/4" .187 24ST SPLICE BAR	15 AD6 OR 21 AD5 RIVETS EACH SIDE OF SPLICE

Figure 155—Repair of Damages to Fuselage Tee Type Longerons (Sheet 2 of 6)

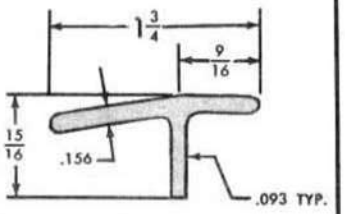
TYPE



LONGERON #13 — STA. 0 TO STA. 88, ENGINEERING DRAWING #5193140

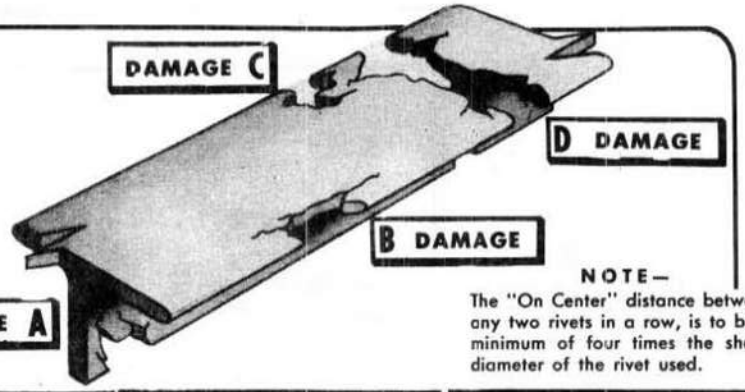
S-1159957

TYPE



LONGERON #13A — STATION 0 — R.H. ENGINEERING DRAWING #5143503

S-1093764

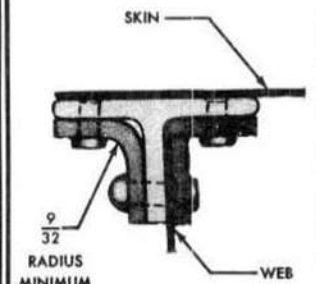


NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

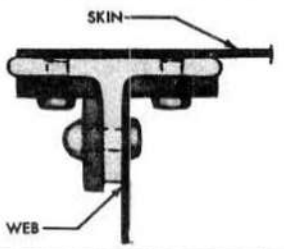
— S-1159957

DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE D	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
7/8" 3/32" 24ST SPLICE BAR	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE	3/4" 3/32" 24ST SPLICE BAR	5 AD6 OR 7 AD5 RIVETS EACH SIDE OF SPLICE	3/4" 3/32" 24ST SPLICE BAR	5 AD6 OR 7 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 7/8" 3/32" SPLICE ANGLE H.T. TO 24ST 3/4" 3/32" 24ST SPLICE BAR 7/8" 3/32" 24ST SPLICE BAR	12 AD6 OR 17 AD5 RIVETS EACH SIDE OF SPLICE
		DAMAGE EXTENDING INTO RADIUS					
3/4" x 7/8" 3/32" 24ST SPLICE BAR	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 7/8" 3/32" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE	3/4" x 7/8" 3/32" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE		

REPAIR FOR D



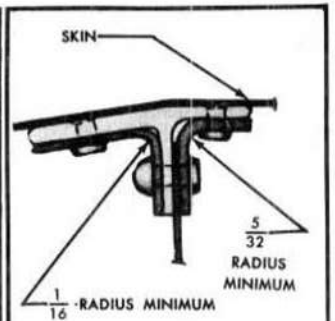
ALTERNATE FOR D

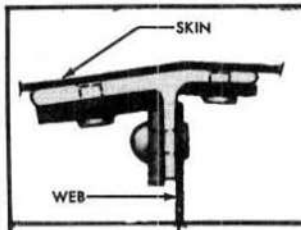


MATERIAL	RIVETS
3/4" 3/4" 24SO SPLICE BAR—2 REQ. 7/8" 3/4" 24ST SPLICE BAR	12 AD6 OR 17 AD5 RIVETS EACH SIDE OF SPLICE

S-1093764

MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
3/4" .093 24ST SPLICE BAR	4 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	5/8" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	1" 3/32" 24ST SPLICE BAR	4 AD6 OR 6 AD5 RIVETS EACH SIDE OF SPLICE	1" x 3/4" .064 C.M. STEEL SPLICE ANGLE 5/8" x 3/4" .093 24SO SPLICE ANGLE — FORM H.T. TO 24ST	15 AD6 OR 21 AD5 RIVETS EACH SIDE OF SPLICE
		DAMAGE EXTENDING INTO RADIUS					
1" x 3/4" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE	5/8" x 3/4" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" x 3/4" .156 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE		



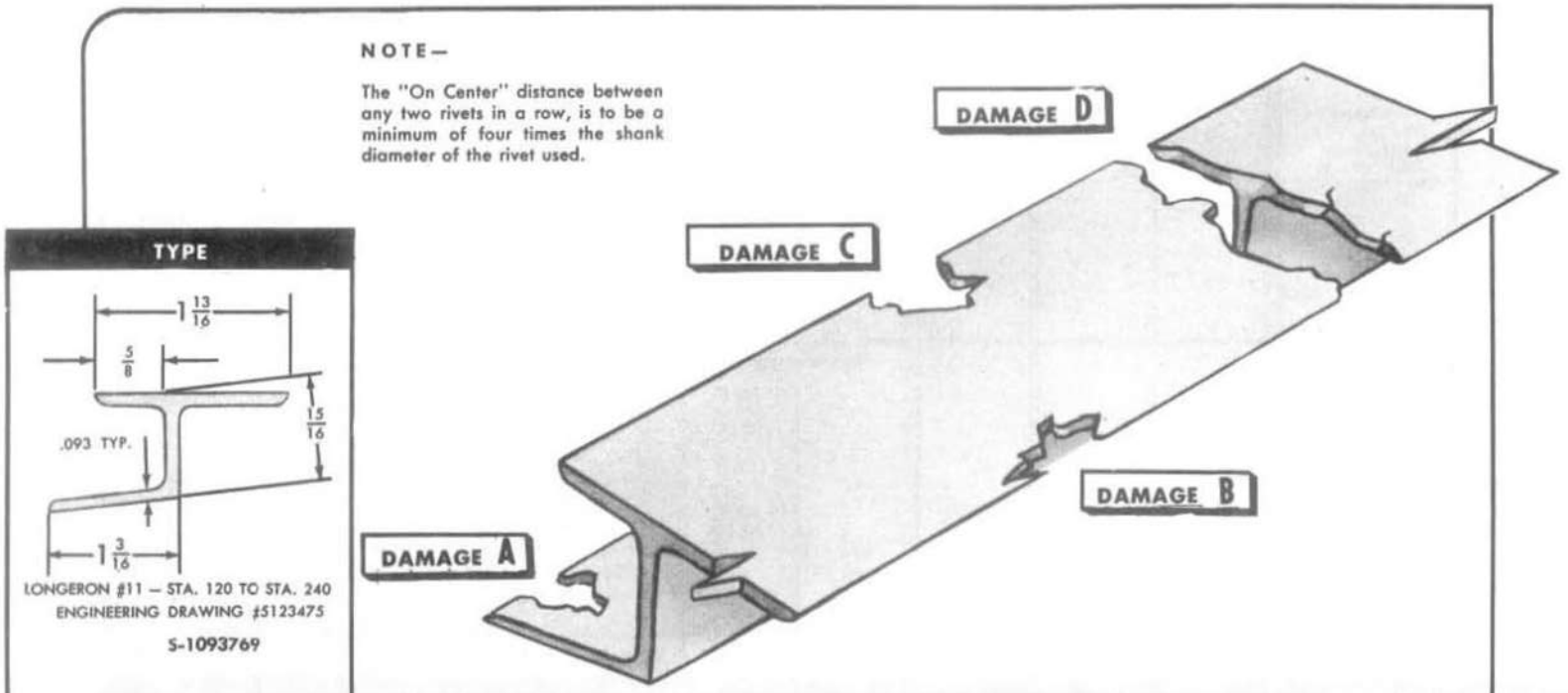


MATERIAL	RIVETS
5/8" .093 24ST SPLICE BARS—2 REQ. 1" 3/32" 24ST SPLICE BAR	15 AD6 OR 21 AD5 RIVETS EACH SIDE OF SPLICE

Figure 155 —Repair of Damages to Fuselage Tee Type Longerons (Sheet 3 of 6)

NOTE—

The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.



TYPE

LONGERON #11 — STA. 120 TO STA. 240
ENGINEERING DRAWING #5123475

S-1093769

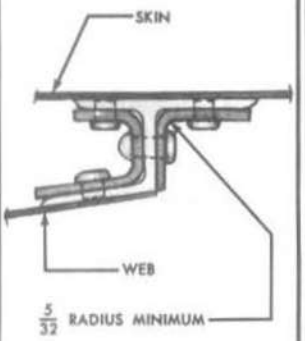
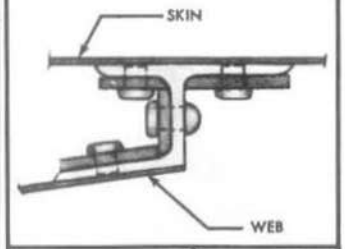
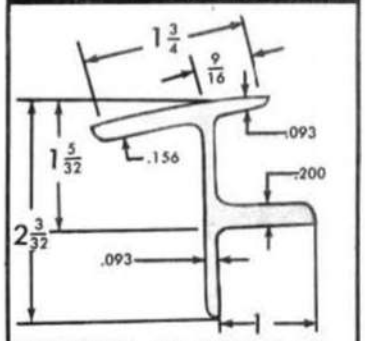
DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE D		REPAIR FOR D	ALTERNATE FOR D	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS			
1" .093 24ST SPLICE BAR	4 AD6 OR 6 AD5 RIVETS EACH SIDE OF SPLICE	1¼" .093 24ST SPLICE BAR	5 AD6 OR 7 AD5 RIVETS EACH SIDE OF SPLICE	⅝" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	⅞"x1¼" .093 24SO SPLICE ANGLE .093 24SO NEST CHANNEL FORM BOTH H.T. TO 24ST	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE			
DAMAGE EXTENDING INTO RADIUS									MATERIAL	RIVETS
1"x1" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE	1¼"x1" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE	⅝"x⅝" .093 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 9 AD5 RIVETS EACH SIDE OF SPLICE				⅜" .093 24ST SPLICE BAR 1¼" .093 24ST SPLICE BAR 1" .093 24ST SPLICE BAR ¾".093 24ST SPLICE BAR	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE

Figure 155—Repair of Damages to Fuselage Tee Type Longerons (Sheet 4 of 6)

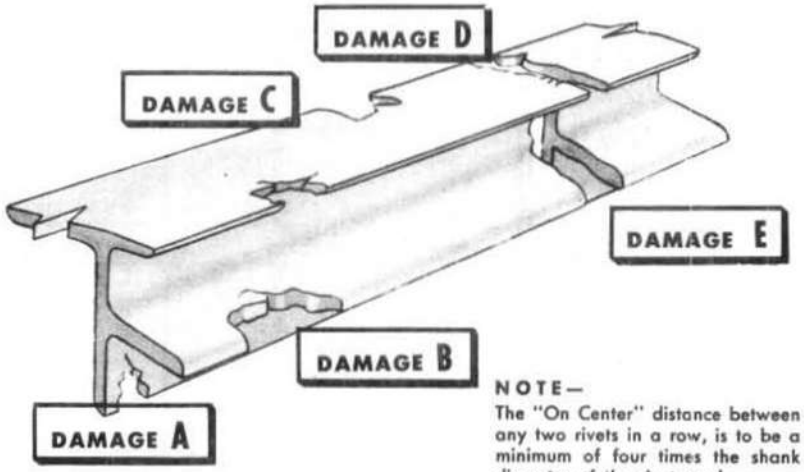
TYPE



LONGERON #13 — STA. 120 TO STA. 240

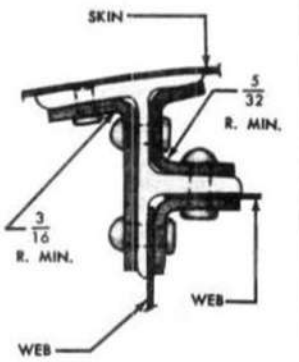
ENGINEERING DRAWING #5157785

S-1093764



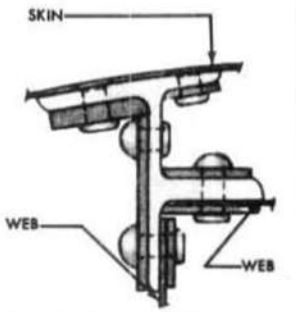
NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

REPAIR FOR E



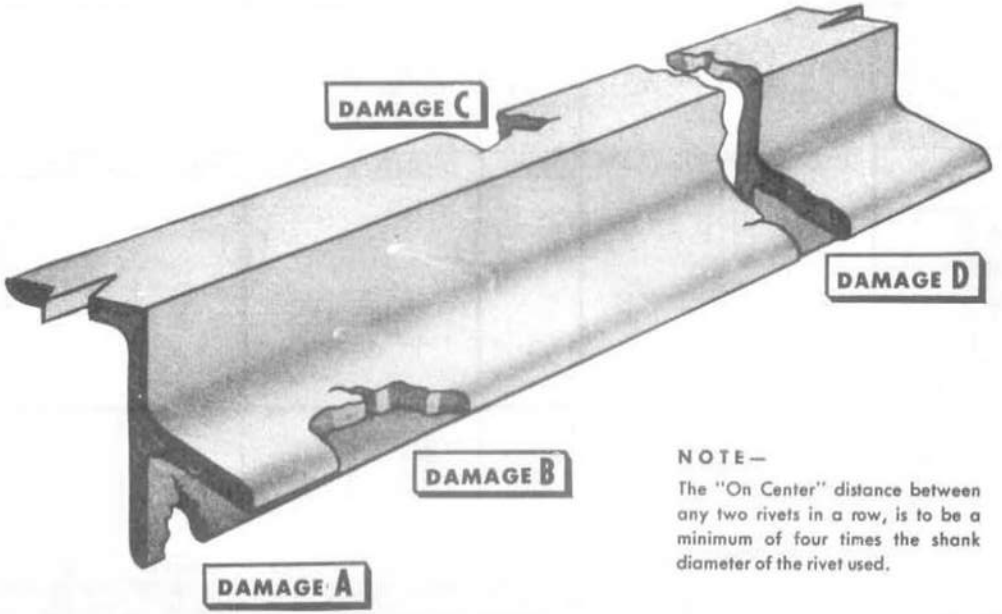
DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE E		DAMAGE D	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
¾" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	⅞" ¼" 24ST SPLICE BAR OR ¼" C.M. STEEL	10 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE	⅛" .093 24ST SPLICE BAR	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	1" ½" 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1"x⅞" .125 24SO SPLICE ANGLE 1"x¾" .093 24SO SPLICE ANGLE .093 24SO NEST CHANNEL FORM ALL HT. TO 24ST	26 AD6 OR 36 AD5 EACH SIDE OF SPLICE
DAMAGE EXTENDING INTO RADIUS									
¾"x¾" .093 24SO SPLICE ANGLE FORM AND H.T. TO 24ST	3 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	1"x¾" .125 24SO SPLICE ANGLE 1"x¾" .093 24SO SPLICE ANGLE .093 24SO SPLICE ANGLE FORM ALL H.T. TO 24ST	26 AD6 OR 36 AD5 RIVETS EACH SIDE OF SPLICE	⅝"x¾" .093 24SO SPLICE ANGLE FORM AND H.T. TO 24ST	6 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1"x1" ½" 24SO SPLICE ANGLE FORM AND H.T. TO 24ST	14 AD6 OR 20 AD5 RIVETS EACH SIDE OF SPLICE		

ALTERNATE FOR E



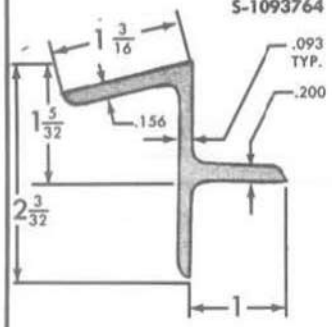
MATERIAL	RIVETS
1" ½" 24ST SPLICE BAR ⅝" .093 24ST SPLICE BAR 1" .093 24ST SPLICE BAR—2 REQ. ⅞" .093 24ST SPLICE BAR 1¾" .093 24ST SPLICE BAR	26 AD6 OR 36 AD5 RIVETS EACH SIDE OF SPLICE

Figure 155—Repair of Damages to Fuselage Tee Type Longerons (Sheet 5 of 6)



TYPE

S-1093764

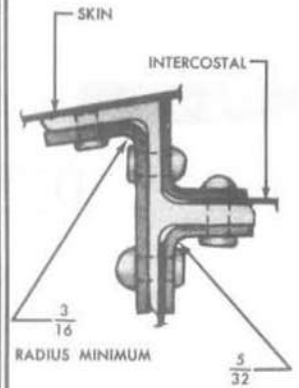


LONGERON #13 — STATION 260
ENGINEERING DRAWING #5157785

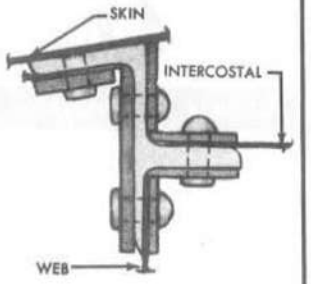
NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

DAMAGE A		DAMAGE B		DAMAGE C		DAMAGE D	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
¾" .093 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE	⅞" ¼" 24ST SPLICE BAR OR ¾" C.M. STEEL SPLICE BAR	10 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE	1" ½" 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1"x⅞" .125 24SO ⅞"x⅞" .093 24SO ¾"x⅞" .093 24SO SPLICE ANGLES 1 EA. REQ. H.T. TO 24ST	21 AD6 OR 29 AD5 RIVETS EACH SIDE OF SPLICE
DAMAGE EXTENDING INTO RADIUS							
¾"x¾" .093 24SO SPLICE ANGLE FORM AND H.T. TO 24ST	6 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE	1"x⅞" ½" 24SO ⅞"x⅞" .093 24SO ¾"x⅞" .093 24SO SPLICE ANGLES 1 EA. REQ. H.T. TO 24ST	21 AD6 OR 29 AD5 RIVETS EACH SIDE OF SPLICE	1"x1" ½" 24SO SPLICE ANGLE FORM AND H.T. TO 24ST	14 AD6 OR 20 AD5 RIVETS EACH SIDE OF SPLICE		

REPAIR FOR D



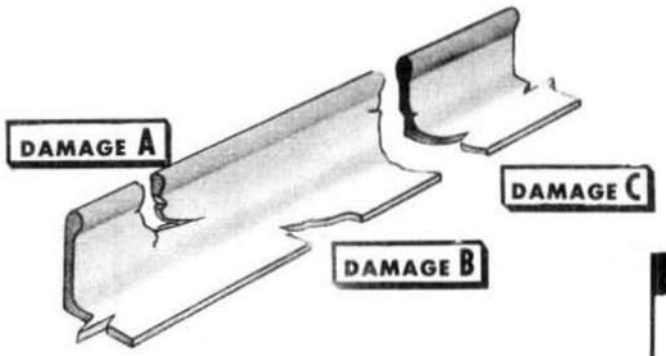
ALTERNATE FOR D



MATERIAL	RIVETS
1" ½" 24ST 1⅞" .125 24ST ¾" .093 24ST SPLICE BARS—1 EA. ⅞" .093 24ST SPLICE BAR—3 REQ.	21 AD6 OR 29 AD5 RIVETS EACH SIDE OF SPLICE

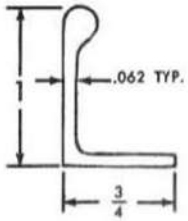
Figure 155 —Repair of Damages to Fuselage Tee Type Longerons (Sheet 6 of 6)

REPAIR OF ANGLES



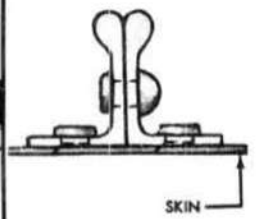
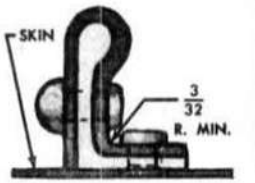
NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

S-1047299

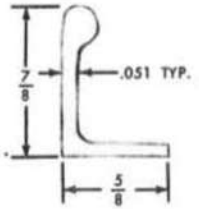


LONGERON #1A—STATION 424
ENGINEERING DRAWING #5153178

DAMAGE A		DAMAGE B		DAMAGE C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
1" 3/4" 24ST SPLICE BAR	5 AD5 OR 8 AD4 RIVETS EACH SIDE OF SPLICE	3/4" .064 24ST SPLICE BAR	5 AD5 OR 8 AD4 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE SCARF BOTH ENDS	8 AD5 OR 12 AD4 RIVETS EACH SIDE OF SPLICE

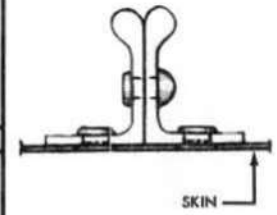
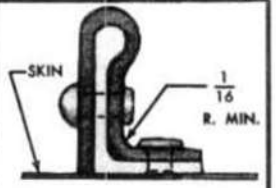
REPAIR FOR C	ALTERNATE FOR C	
		
	MATERIAL	RIVETS
	.064 245O DOUBLER FORM—H.T. TO 24ST	8 AD5 OR 12 AD4 RIVETS EACH SIDE OF SPLICE

S-1075769



LONGERON #4, 6, 8, & 9
STA. 352 TO STA. 424 INCL.
ENGINEERING DRAWING #5153178

A		B		C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
7/8" 3/4" 24ST SPLICE BAR	4 AD5 OR 7 AD4 RIVETS EACH SIDE OF SPLICE	7/8" .051 24ST SPLICE BAR	4 AD5 OR 7 AD4 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE SCARF BOTH ENDS	6 AD5 OR 9 AD4 RIVETS EACH SIDE OF SPLICE

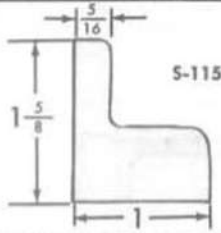
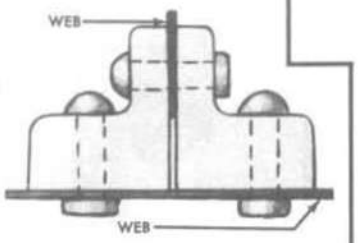
		
	MATERIAL	RIVETS
	.051 245O DOUBLER FORM—H.T. TO 24ST	6 AD5 OR 9 AD4 RIVETS EACH SIDE OF SPLICE

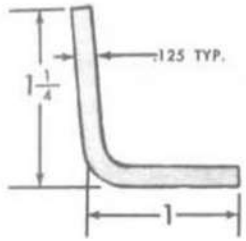
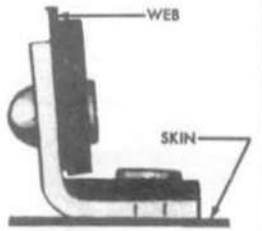
CONTINUED NEXT PAGE

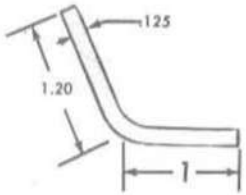
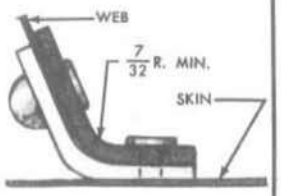
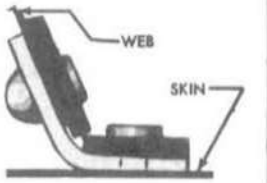
Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 1 of 8)

ANGLE REPAIRS (CONTINUED)

NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
 LONGERON #13A—SECTION TYPICAL BETWEEN STA. 88 TO STA. 97 INCL. ENGINEERING DRAWING #5157785 BOX STIFFENER	1⅛" 5/16" 24ST SPLICE BAR	22 AD6 OR 31 AD5 RIVETS EACH SIDE OF SPLICE	1" ⅛" 24ST SPLICE BAR	27 AD6 OR 38 AD5 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE	49 AD6 OR 69 AD5 RIVETS EACH SIDE OF SPLICE		NO ALTERNATE

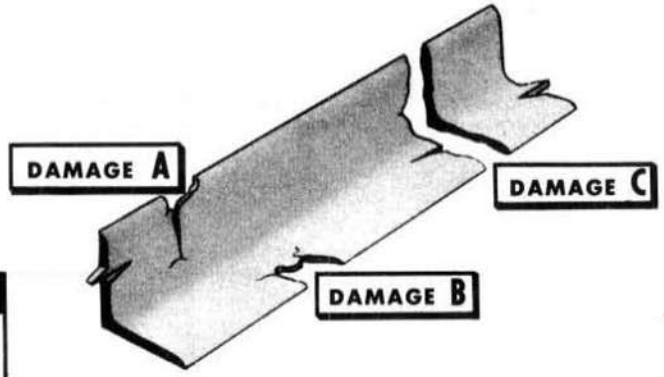
	A		B		C			
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
 LONGERON #17—STATION 29 ENGINEERING DRAWING #5157814	1¼" .125 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" .125 24ST SPLICE BAR	5 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE	.128 24SO SPLICE ANGLE FORM—H.T TO 24ST	12 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE		 MATERIAL: 1¼" .128 24ST SPLICE BAR; 1" .128 24ST SPLICE BAR; 1 EACH REQ. — RIVETS: 12 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE

	A		B		C			
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
 LONGERON #17—STATION 53 ENGINEERING DRAWING #5157814	1¼" .125 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" .125 24ST SPLICE BAR	5 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE	.128 24SO SPLICE ANGLE FORM—H.T. TO 24ST	12 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE		 MATERIAL: 1¼" .128 24ST SPLICE BAR; 1" .128 24ST SPLICE BAR; 1 EACH REQ. — RIVETS: 12 AD6 OR 18 AD5 RIVETS EACH SIDE OF SPLICE

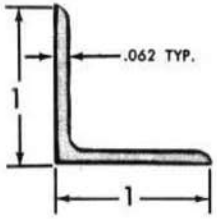
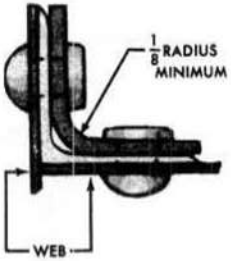
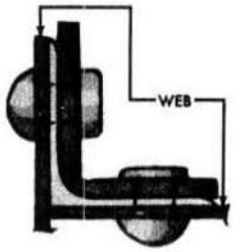
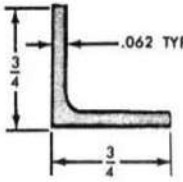
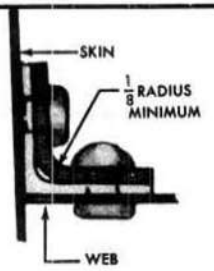
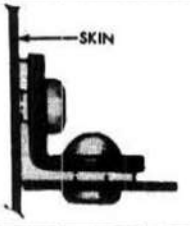
CONTINUED NEXT PAGE

Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 2 of 8)

REPAIR OF ANGLES (CONTINUED)



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C	
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
S-167881  LONGERON #9A—STA. 260 TO STA. 298 ENGINEERING DRAWING #5157786 BOX STIFFENER	1" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE	1" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE	.072 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE	 	 	1" .072 24ST SPLICE BARS 2 REQUIRED / 6 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE
S-167883  LONGERON #9A — STA. 223 TO STA. 240 ENGINEERING DRAWING #5157866 BOX STIFFENER	Ⓐ MATERIAL	RIVETS	Ⓑ MATERIAL	RIVETS	Ⓒ MATERIAL	RIVETS	 	 	MATERIAL / RIVETS .072 24ST SPLICE BARS 2 REQUIRED / 6 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE
	¾" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE	¾" .064 24ST SPLICE BAR	3 AD6 OR 4 AD5 RIVETS EACH SIDE OF SPLICE	.072 24SO SPLICE ANGLE FORM—H.T. TO 24ST	6 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE			

CONTINUED NEXT PAGE

Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 3 of 8)

ANGLE REPAIRS (CONTINUED)

NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

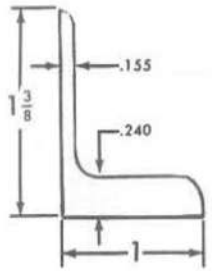
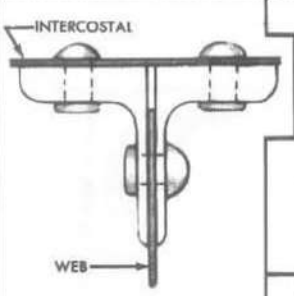
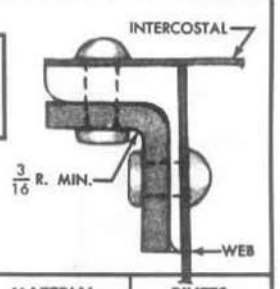
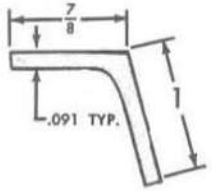
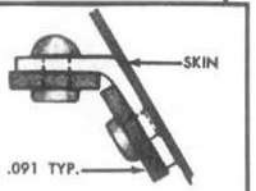
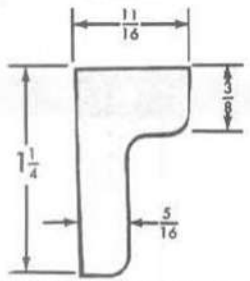
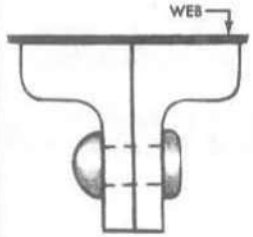
TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C	
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
S-1093766  LONGERON #13A — STATION 97 L.H. ENGINEERING DRAWING #5157785	1 3/8" 3/16" 24ST SPLICE BAR	9 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE	1" 1/4" 24ST SPLICE BAR	10 AD6 OR 15 AD5 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE	17 AD6 OR 25 AD5 RIVETS EACH SIDE OF SPLICE	 	 	3/16" C.M. STEEL SPLICE	17 AD6 OR 25 AD5 RIVETS EACH SIDE OF SPLICE
S-1093794  LONGERON #7—STA. 138 TO STA. 260 ENGINEERING DRAWING #5153137	A		B		C		 	 		
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		MATERIAL	RIVETS
	7/8" .091 24ST SPLICE BAR	4 AD6 OR 5 AD5 RIVETS EACH SIDE OF SPLICE	1" .091 24ST SPLICE BAR	4 AD6 OR 6 AD5 RIVETS EACH SIDE OF SPLICE	.094 24SO SPLICE ANGLE FORM—H.T. TO 24ST	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE		.094 24ST SPLICE BARS 2 REQUIRED	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE
S-1093766  LONGERON #13A — STA. 138 TO STA. 260 ENGINEERING DRAWING #5157785	A		B		C		 	NO ALTERNATE		
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS			
	SPLICE ANGLE SAME AS ORIGINAL ANGLE (SEE REPAIR OF DAMAGE C)	22 AD6 OR 32 AD5 RIVETS EACH SIDE OF SPLICE	1 1/4" 3/16" 24ST SPLICE BAR	17 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE	22 AD6 OR 32 AD5 RIVETS EACH SIDE OF SPLICE			

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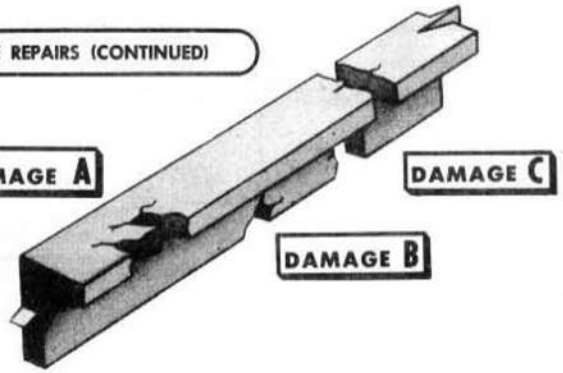
Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 4 of 8)

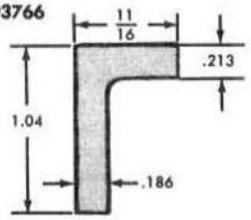
ANGLE REPAIRS (CONTINUED)



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE

S-1093766

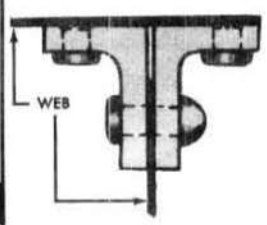


LONGERON #13A — STATION 315

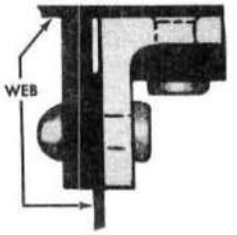
ENGINEERING DRAWING #5157785
BOX STIFFENER

DAMAGE A		DAMAGE B		DAMAGE C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
11/16" ¼" 24ST SPLICE BAR	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE	1.04 ¾" 24ST SPLICE BAR	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE	13 AD6 OR 19 AD5 RIVETS EACH SIDE OF SPLICE

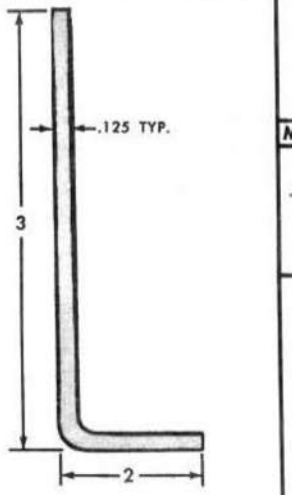
REPAIR FOR C



ALTERNATE FOR C



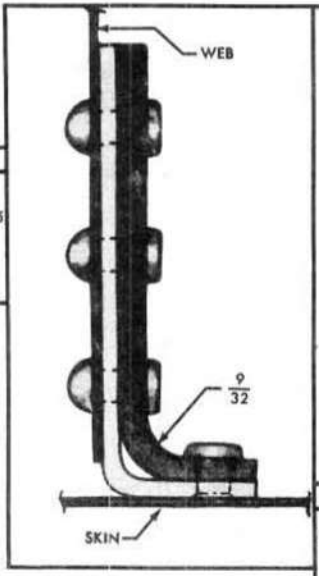
MATERIAL	RIVETS
1.04 ¾" 24ST SPLICE BAR ⅝" ⅞" 24ST SPLICE BAR	13 AD6 OR 1 AD5 RIVETS EACH SIDE OF SPLICE

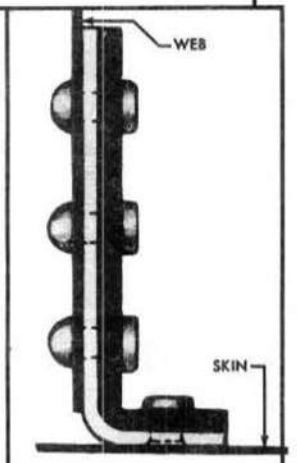


LONGERON #17 — STA. 0 TO STA. 10.375
ENGINEERING DRAWING #5157766

A		B		C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
3" .125 24ST SPLICE BAR	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE	1" .125 24ST SPLICE BAR	5 AD6 OR 8 AD5 RIVETS EACH SIDE OF SPLICE	½" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	21 AD6 OR 31 AD5 RIVETS EACH SIDE OF SPLICE

CONTINUED NEXT PAGE

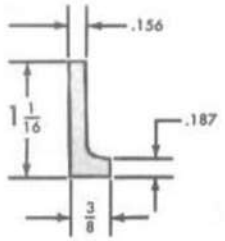




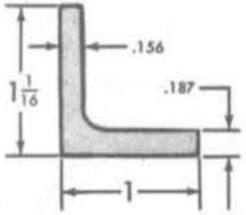
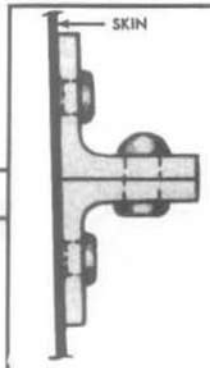
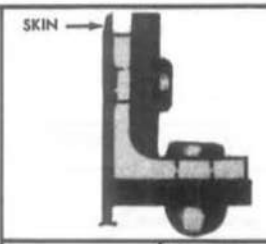
MATERIAL	RIVETS
2¾" ½" 24ST SPLICE BAR ⅞" ½" 24ST SPLICE BAR	21 AD6 OR 31 AD5 RIVETS EACH SIDE OF SPLICE

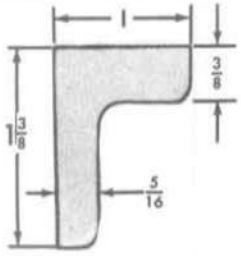
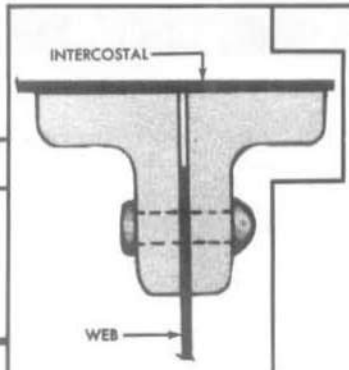
Figure 156 —Repair of Damages to Fuselage Angle Type Longerons (Sheet 5 of 8)

ANGLE REPAIRS CONTINUED

TYPE	DAMAGE A		DAMAGE B		DAMAGE C		REPAIR FOR C	ALTERNATE FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
S-1093763  LONGERON #15 — STATION 0 ENGINEERING DRAWING #3157785	1¼" ⅛" 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" ⅜" 24ST SPLICE BAR	9 AD6 OR 12 AD5 RIVETS EACH SIDE OF SPLICE	1" ⅜" 24ST SPLICE BAR	9 AD6 OR 12 AD5 RIVETS EACH SIDE OF SPLICE	 	NO ALTERNATE

NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

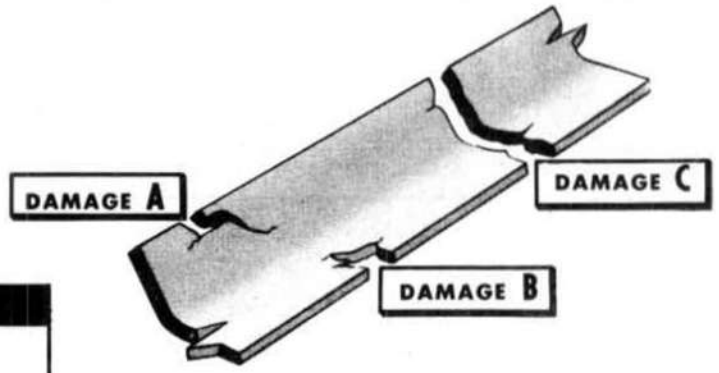
TYPE	A		B		C		REPAIR FOR C	ALTERNATE FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
S-1093763  LONGERON #15 — STATION 280 ENGINEERING DRAWING #3157785	1¼" ⅛" 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1" ¾" 24ST SPLICE BAR	8 AD6 OR 11 AD5 RIVETS EACH SIDE OF SPLICE	SPLICE ANGLE SAME AS ORIGINAL ANGLE	13 AD6 OR 19 AD5 RIVETS EACH SIDE OF SPLICE	 	 MATERIAL: 1" ¾" 24ST SPLICE BAR; 1¼" ¾" 24ST SPLICE BAR RIVETS: 13 AD6 OR 19 AD5 RIVETS EACH SIDE OF SPLICE

TYPE	A		B		C		REPAIR FOR C	ALTERNATE FOR C
	MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS		
S-1093766  LONGERON #13A — STA. 120 TO STA. 280 ENGINEERING DRAWING #5143460	1" ⅜" 24ST SPLICE BAR	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE	1 ⅜" ¼" 24ST SPLICE BAR	9 AD6 OR 13 AD5 RIVETS EACH SIDE OF ANGLE	REPAIR ANGLE SAME AS ORIGINAL	25 AD6 OR 36 AD5 RIVETS EACH SIDE OF SPLICE	 	NO ALTERNATE

ANGLE REPAIRS CONTINUED

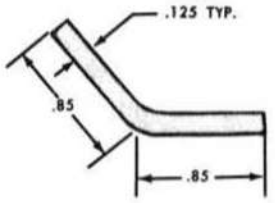
Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 6 of 8)

ANGLE REPAIRS ➡ CONTINUED



NOTE—
The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

TYPE

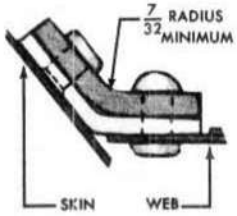


LONGERON #13 — STATION 332

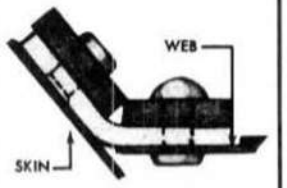
ENGINEERING DRAWING #5157785

DAMAGE A		DAMAGE B		DAMAGE C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
.85 .125 24ST SPLICE BAR	5 AD6 OR 7 AD5 RIVETS EACH SIDE OF SPLICE	.85 .125 24ST SPLICE BAR	5 AD6 OR 7 AD5 RIVETS EACH SIDE OF SPLICE	.128 24SO SPLICE ANGLE FORM—H.T. TO 24ST	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE

REPAIR FOR C



ALTERNATE FOR C



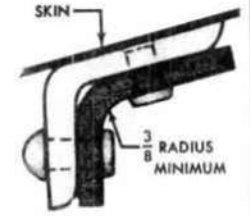
MATERIAL	RIVETS
.85 .128 24ST SPLICE BARS 2 REQUIRED	10 AD6 OR 14 AD5 RIVETS EACH SIDE OF SPLICE

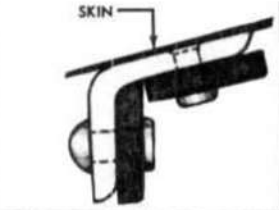
S-1125521

LONGERON #5 — STA. 120 TO STA. 138

ENGINEERING DRAWING #5157786

MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
1 3/8" 3/32" 24ST SPLICE BAR	9 AD6 OR 13 AD5 RIVETS EACH SIDE OF SPLICE	1" 3/32" 24ST SPLICE BAR	7 AD6 OR 10 AD5 RIVETS EACH SIDE OF SPLICE	1/4" 24SO SPLICE ANGLE FORM—H.T. TO 24ST	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE



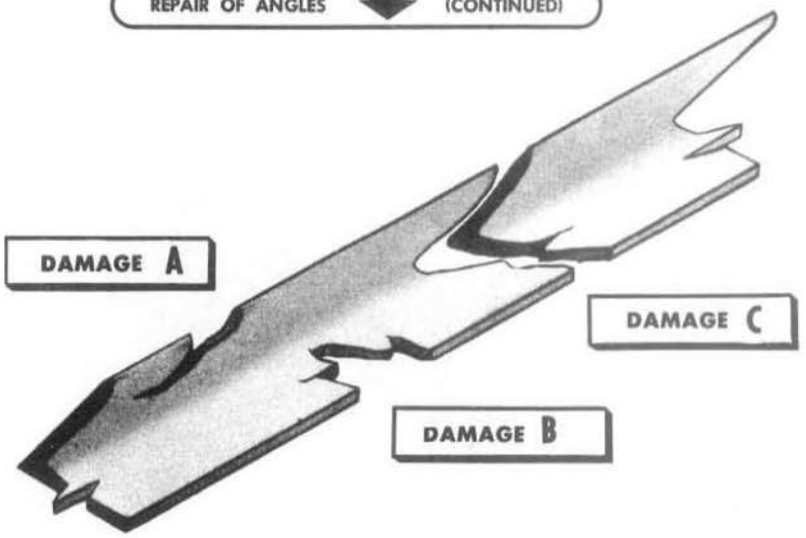


MATERIAL	RIVETS
1 3/8" 1/4" SPLICE BAR 1" 1/4" SPLICE BAR	16 AD6 OR 23 AD5 RIVETS EACH SIDE OF SPLICE

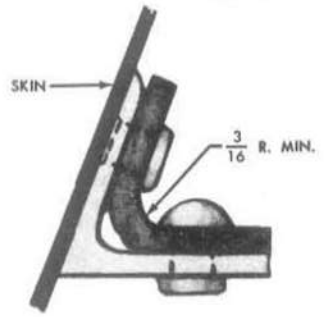
CONTINUED ➡ NEXT PAGE

Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 7 of 8)

REPAIR OF ANGLES (CONTINUED)

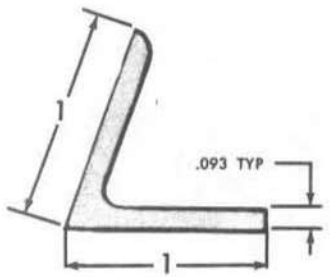


REPAIR FOR C



TYPE

S-1109270



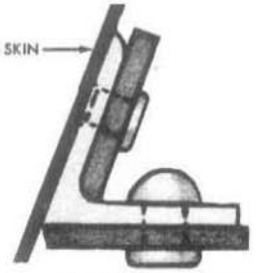
LONGERON #7 – STATION
ENGINEERING DRAWING #- 53137

NOTE—

The "On Center" distance between any two rivets in a row, is to be a minimum of four times the shank diameter of the rivet used.

DAMAGE A		DAMAGE B		DAMAGE C	
MATERIAL	RIVETS	MATERIAL	RIVETS	MATERIAL	RIVETS
1" .093 24S1 SPLICE BAR	4 AD6 OR 6 AD5 RIVETS EACH SIDE OF SPLICE	1" .093 24ST SPLICE BAR	4 AD6 OR 6 AD5 RIVETS EACH SIDE OF SPLICE	.125 24SO SPLICE ANGLE FORM—H.T. TO 24ST	8 AD6 OR 12 AD5 RIVETS EACH SIDE OF SPLICE

ALTERNATE FOR C



MATERIAL	RIVETS
1" .125 24ST SPLICE BARS 2 REQUIRED	8 AD6 OR 12 AD5 RIVETS EACH SIDE OF DAMAGE

Figure 156—Repair of Damages to Fuselage Angle Type Longerons (Sheet 8 of 8)

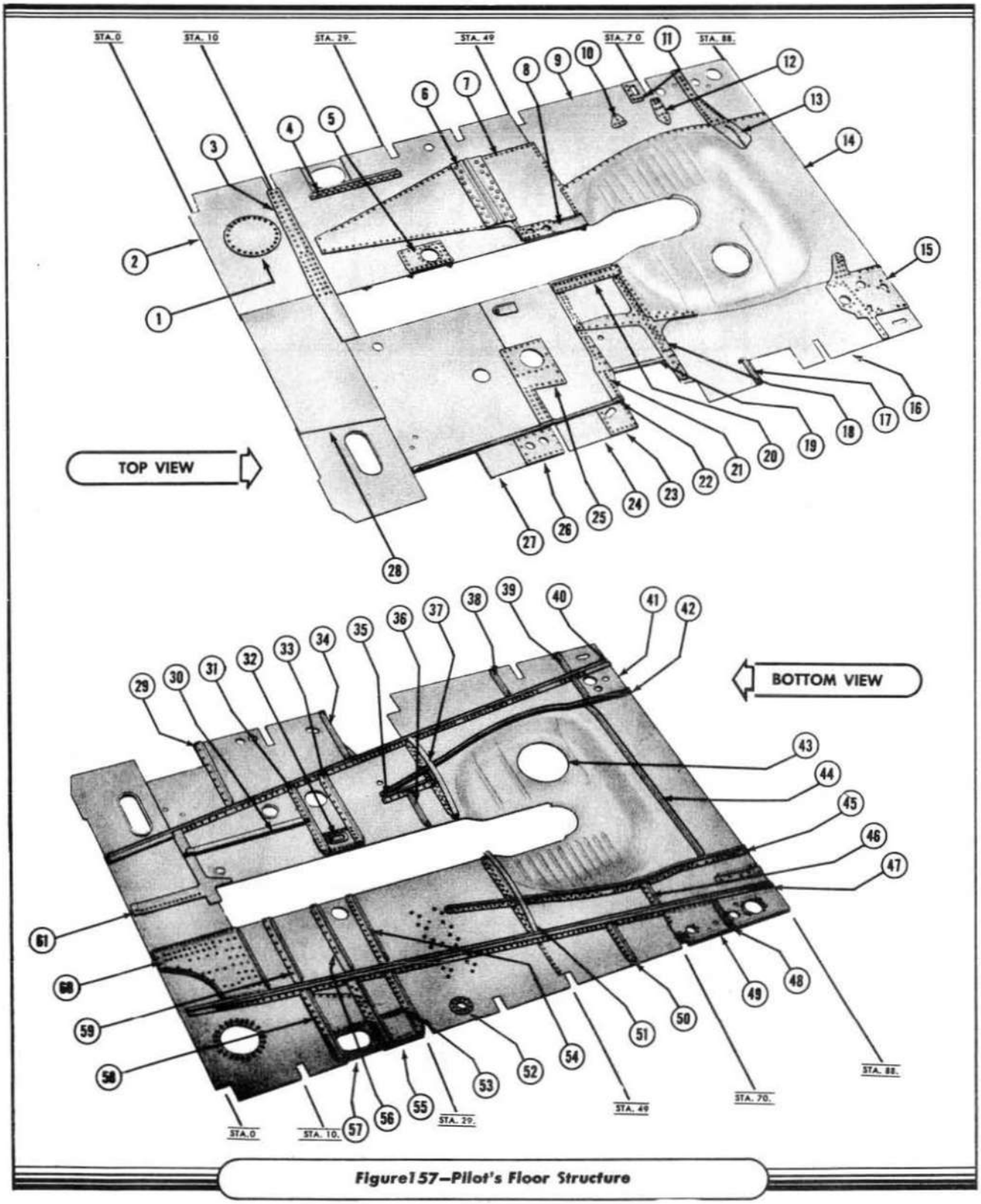


Figure 157—Pilot's Floor Structure

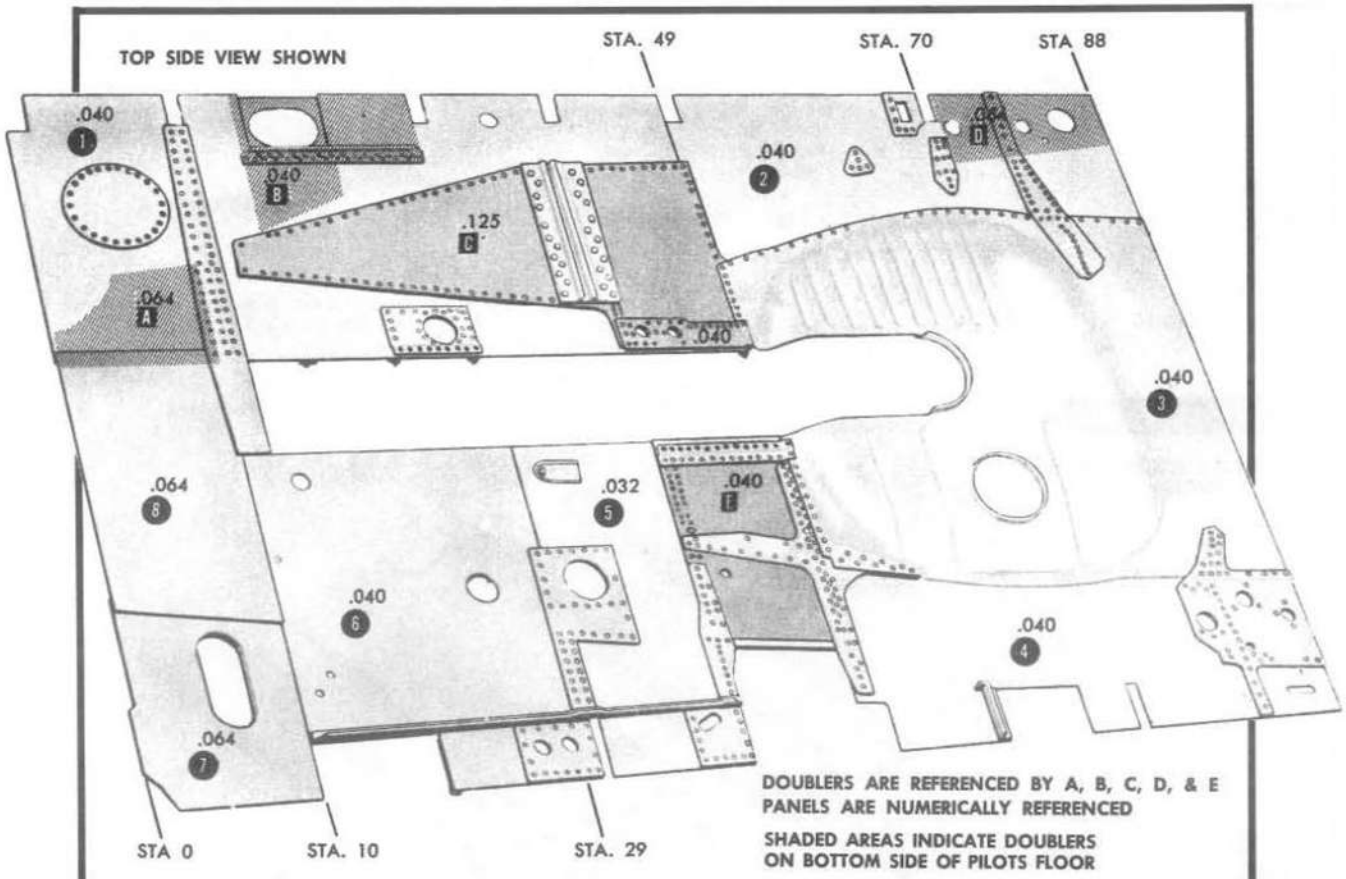
KEY TO FIGURE 157

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5157783-138	Cover Plate	6x6	.040	24ST		1
2	5157783-2	Floor Sheet	25½x51	.040	24ST		1
3	5157783-28	Gusset	3¼x30¾	.125	24ST		1
4	134904	Angle	Length 12-13/16				1
5	5157783-20	Doubler	4-5/16x6⅞	.051	24ST		1
6	1159955	Plate	Length 14				1
7	5157783-42	Gusset	17⅝x42-7/16	.125	24ST		1
8	5157783-46	Gusset	2x10⅝	.040	24ST		1
9	5157783-12	Floor Sheet	16½x40¾	.040	24ST		1
10	5157783-62	Gusset	2⅜x2⅝	.064	24ST		1
11	5157783-144	Gusset	2-11/16x3-7/16	.040	24ST		1
12	5157783-30	Gusset	2⅜x6-11/16	.064	24ST		1
13	5157783-22	Gusset	4¾x18¾	.091	24ST		1
14	5157783-8	Floor Sheet	40x44	.040	24ST		1
15	5157783-24	Gusset	11x17⅝	.091	24ST		1
16	5157783-10	Floor Sheet	15½x40¾	.040	24ST		1
17	5157783-120	Angle	1½x4-15/16	.064	24ST		1
18	5157783-40	Gusset	15½x18	.125	24ST		1
19	5157783-18	Doubler	12x17½	.040	24ST		1
20	5157783-48	Gusset	2x10⅝	.040	24ST		1
21	5157783-26	Gusset	2¼x11	.091	24ST		1
22	5151776	Angle	Length 29-7/16				1
23	5157783-64	Doubler	4¼x4-11/16	.040	24ST		1
24	5157783-52	Floor Sheet	20x25½	.032	24ST		1
25	5157783-32	Gusset	6-5/16x13	.064	24ST		1
26	5157783-6	Doubler	4-11/16x4-15/16	.040	24ST		1
27	5157783-4	Floor Sheet	19x25⅛	.040	24ST		1
28	5157783-16	Floor Sheet	12-15/16x22-7/16	.064	24ST		1
29	1047299	Angle	Length 12				1
30	1057232	Channel	Length 19⅜				1

KEY TO FIGURE 157 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
31	137058	Tee	Length 13⅞				1
32	5157783-124	Doubler	4⅛x6⅜	.051	24ST		1
33	1047299	Angle	Length 14-16/32				1
34	1047299	Angle	Length 10				1
35	1025503	Angle	Length 8-15/16				1
36	1025503	Angle	Length 7⅝				1
37	5157783-116	Channel	3-7/16x17		24ST		1
38	1047299	Angle	Length 6⅜				1
39	1047299	Angle	Length 4¾				1
40	1011464	Tee	Length 89				1
41	1047299	Angle	Length 8½				1
42	1048038	Angle	Length 50				1
43	5157783-130	Cover Plate	6x6	.051	24ST		1
44	1093708	Angle	Length 34½				1
45	1048038	Angle	Length 50				1
46	1047299	Angle	Length 5-5/16				1
47	1159957	Tee	Length 88				1
48	1047299	Angle	Length 5¼				1
49	5157783-34	Doubler	6¼x17-27/32	.064	24ST		1
50	1047299	Angle	Length 7-5/16				1
51	5157783-118	Channel	3-5/16x15	.064	24ST		1
52	5157783-14	Doubler	2¾x2¾	.064	24ST		1
53	5123404-12	Angle	14x18¾	.051	24ST		1
54	1047299	Angle	Length 11⅛				1
55	1130803	Angle	Length 12⅛				1
56	1047299	Angle	Length 10¼				1
57	5157783-136	Doubler	12¼x12⅞	.040	24ST		1
58	1047299	Angle	Length 12⅜				1
59	1047299	Angle	Length 9½				1
60	5157783-36	Channel	9¼x12⅜	.064	24ST		1
61	5157783-44	Gusset	14-15/16x15⅝	.125	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.



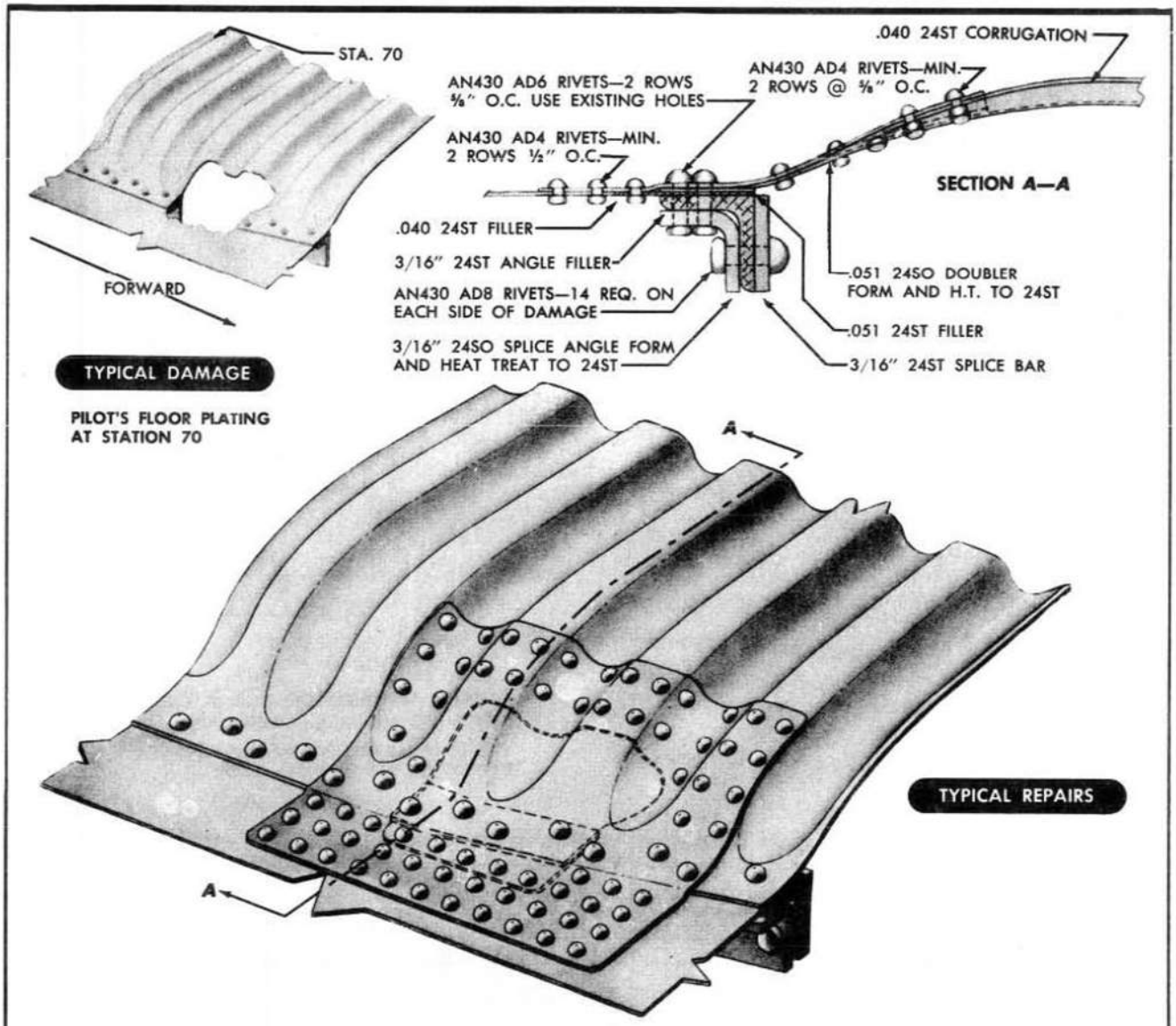
RIVET SCHEDULE FOR REPAIR OF FLOOR PANELS

Panel	Gage	Number of Rivets Required Each Side of Splice
1	.040	2 ROWS AD4 RIVETS @ 5/8" O.C.
2	.040	2 ROWS AD4 RIVETS @ 7/8" O.C.
3	.040	2 ROWS AD4 RIVETS @ 5/8" O.C.
4	.040	1 ROW AD4 RIVETS @ 3/4" O.C.
5	.032	1 ROW AD4 RIVETS @ 1" O.C.
6	.040	1 ROW AD4 RIVETS @ 1" O.C.
7	.064	2 ROWS AD5 RIVETS @ 3/4" O.C.
8	.064	2 ROWS AD4 RIVETS @ 5/8" O.C.

RIVET SCHEDULE FOR REPAIR OF FLOOR PANELS WITH DOUBLERS

Panel	Gage	Doubler	Gage	Total Gage	No. of Rivets Req. Ea. Side of Splice
1	.040	A	.064	.104	2 ROWS AD5 RIVETS @ 5/8" O.C.
1	.040	B	.040	.080	2 ROWS AD5 RIVETS @ 3/4" O.C.
1	.040	C	.125	.165	2 ROWS AD5 RIVETS @ 5/8" O.C.
2	.040	D	.064	.104	2 ROWS AD5 RIVETS @ 1" O.C.
5	.032	E	.040	.072	2 ROWS AD5 RIVETS @ 7/8" O.C.

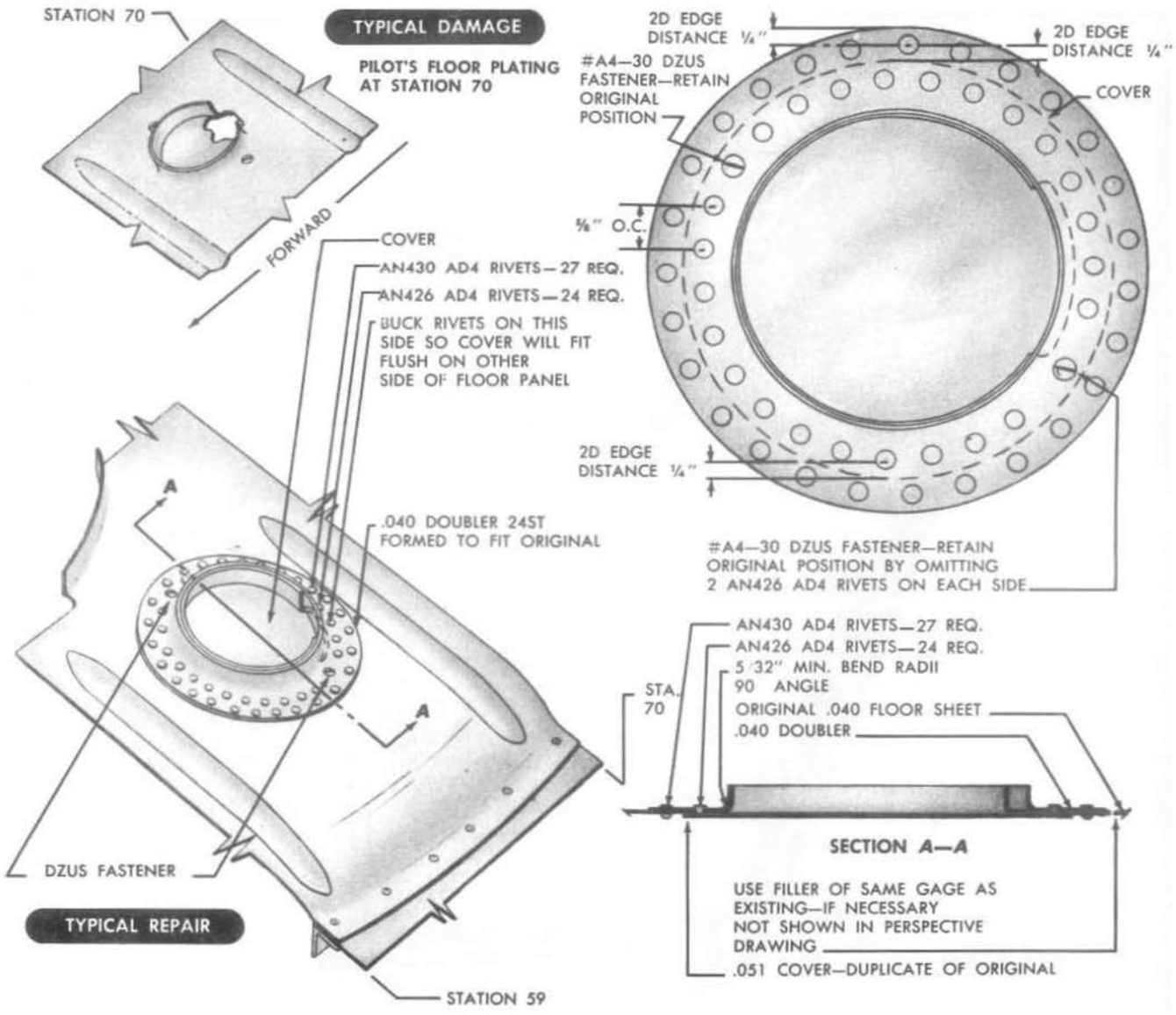
Figure 158 —Schedule for Repair of Pilot's Floor Plating and Doublers



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct patch from .051 dural sheet. Form in the 24SO condition and heat treat to 24ST.
4. Construct splice bar and splice angle from three-sixteenths dural plate. Form in the 24SO condition and heat treat to 24ST.
5. For minimum bend radii of sheet material, see Figure 4, Section I.
6. For flush riveting, see Figure 5, Section I.
7. For rivet edge and row distance, see Figure 6, Section I.

Figure159—Repair of Pilot's Floor Plating Near Edge of Corrugation



NOTES

1. Remove all interfering rivets.
2. Trim all damage smooth leaving no radius less than one-half inch.
3. Construct patch from .040 dural sheet. Form in the 24SO condition and heat treat to 24ST.
4. Construct new cover from the same gage and material as the original.
5. For minimum bend radius of sheet material, see Figure 5, Section I.
6. For flush riveting, see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 160—Repair of Pilot's Floor Plating at Access Hole

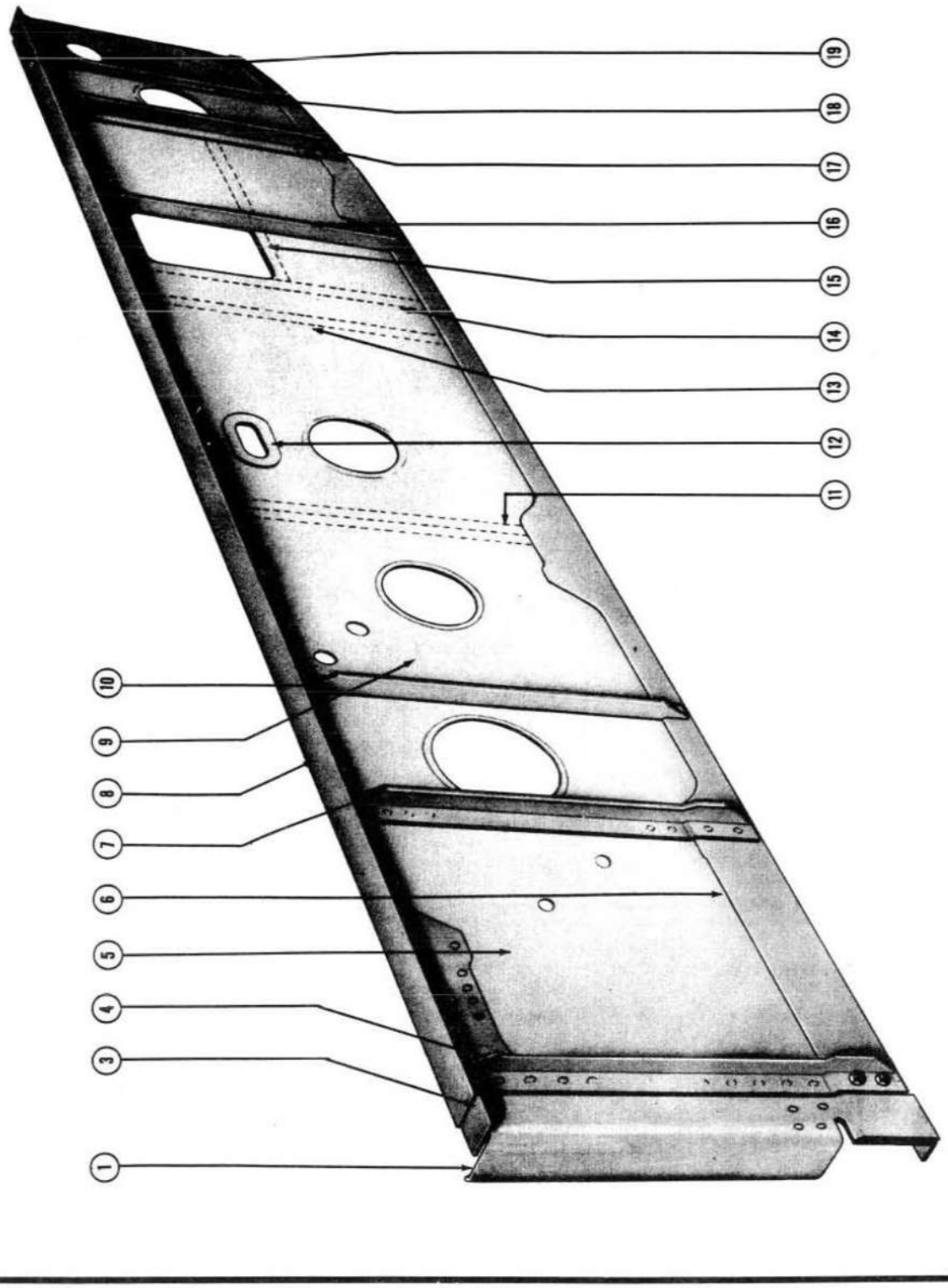


Figure 161—Nose Wheel Tunnel Wall Structure

KEY TO FIGURE 161

Note–L.H. and R.H. Indicate Left Hand or Right Hand Wall.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5157814-8 L.H.	Channel	14x17	.072	24ST		1
	5157815-8 R.H.	Channel	15x17	.072	24ST		1
3	5157814-38 L.H.	Clip S-1011464	Length 1-15/16		24ST		1
4	5157814-6 L.H.	Angle S-1059659	Length 17		24ST		1
	5157815-6 R.H.	Angle S-1059659	Length 17		24ST		1
5	5157814-30 L.H.	Web	18x24	.072	24ST		1
	5157815-28 R.H.	Web	18x25	.072	24ST		1
6	5157814-14 L.H.	Angle	10x90	.125	24SO	24ST	1
	5157815-14 R.H.	Angle	10x90	.125	24SO	24ST	1
7	5157814-10 L.H.	Angle S-1047299	Length 17		24ST		1
	5157815-10 R.H.	Angle S-1047299	Length 16-3/16		24ST		1
8	5157814-4 L.H.	Tee S-1011464	Length 89		24ST		1
	5193140 R.H.	Cap S-1159957	Length 88		24ST		1
9	5157814-2 L.H.	Web	18x70	.051	24ST		1
	5157815-2 R.H.	Web	18x70	.064	24ST		1
10	5157814-32 L.H.	Angle S-1047299	Length 16¾		24ST		1
	5157815-16 R.H.	Angle S-1047299	Length 16-3/16		24ST		1
11	5157814-26 L.H.	Tee S-1125506	Length 13-1/16		24ST		1
	5157815-26 R.H.	Tee S-1125506	Length 12¾		24ST		1
	5157815-4 R.H.	Tee S-1125506	Length 17		24ST		1
12	5157814-36 L.H.	Doubler	2½x4¼	.064	24ST		1
	5157815-34 R.H.	Doubler	2½x2⅞	.064	24ST		1
13	5157814-40 L.H.	Angle S-135311	Length 15¾		24ST		1
	5157815-18 R.H.	Angle S-1047299	Length 14⅝		24ST		1
14	5157814-16 L.H.	Angle S-135311	Length 15⅝		24ST		1
15	5157814-28 L.H.	Angle S-135311	Length 17⅞		24ST		1
16	5157814-18 L.H.	Angle S-1047299	Length 15¼		24ST		1
	5157815-20 R.H.	Angle S-1047299	Length 14		24ST		1
17	5157814-20 L.H.	Angle S-1047299	Length 14¼		24ST		1
	5157815-22 R.H.	Angle S-1047299	Length 13¼		24ST		1
18	5157814-22 L.H.	Angle	2¼x13⅜	.072	24SO	24ST	1
19	5157814-24 L.H.	Angle	6x13⅜	.064	24ST		1
	5157815-24 R.H.	Angle	6x13½	.064	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

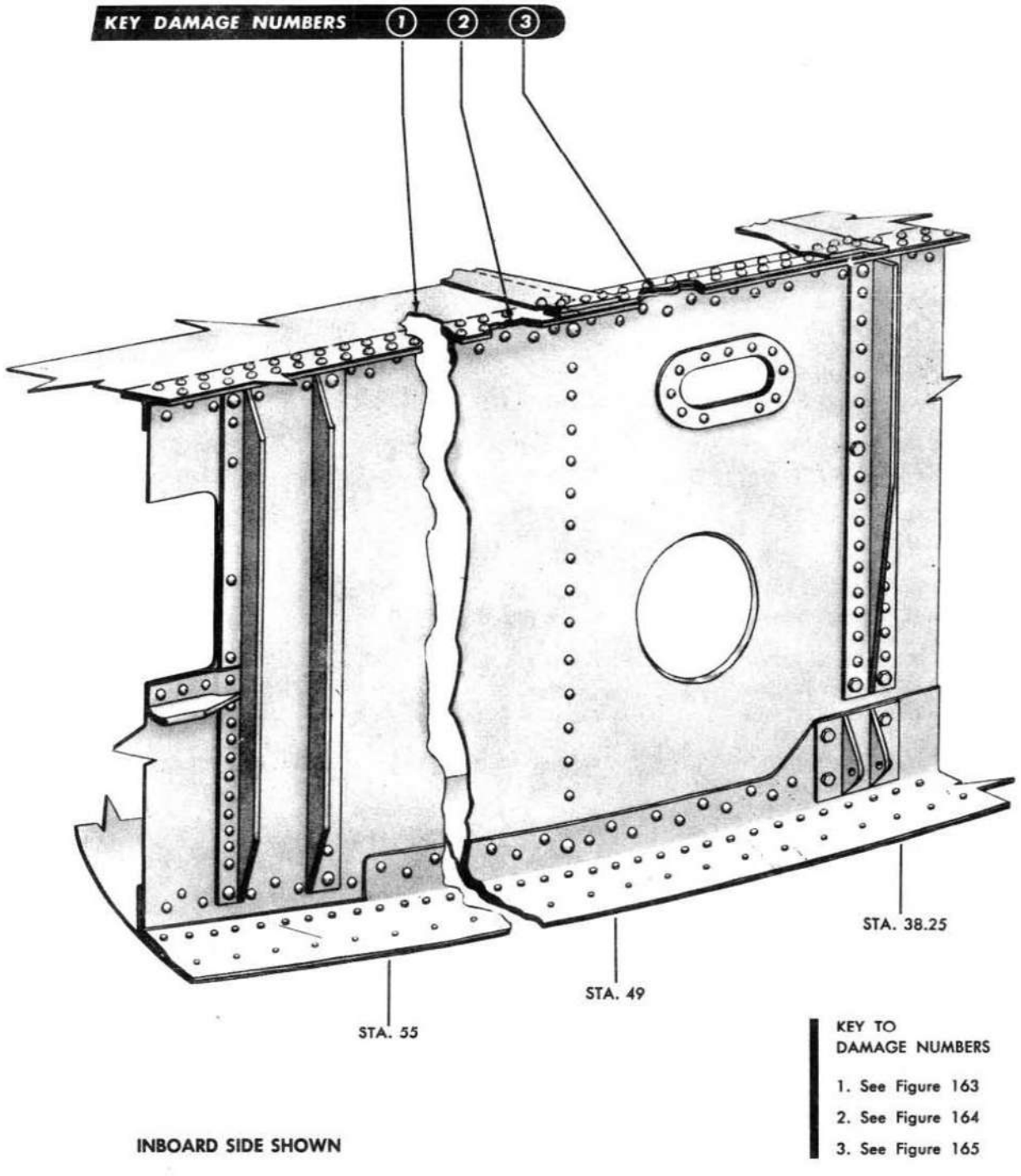
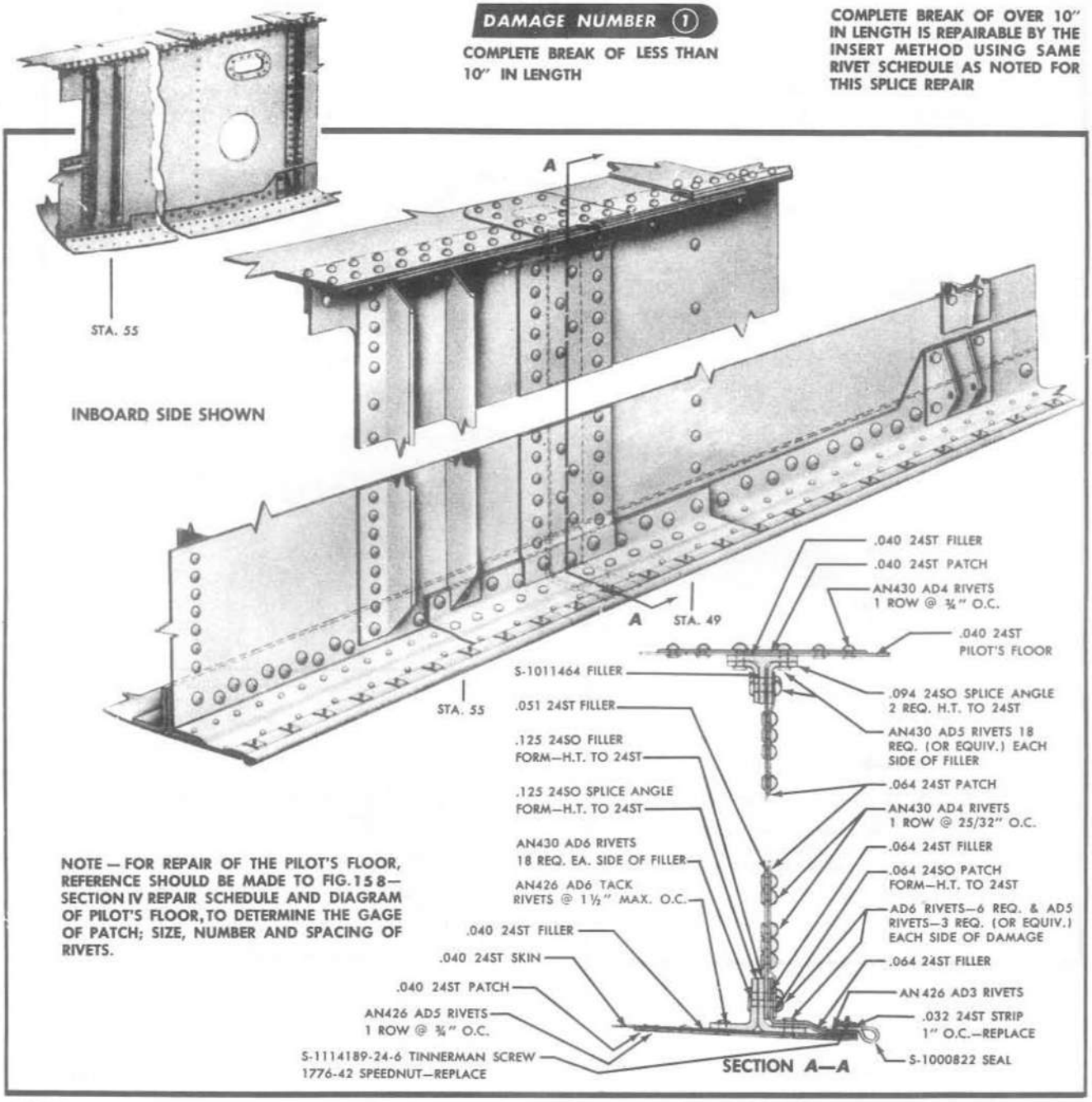


Figure 162—Key to Damage to Left Hand Nose Wheel Tunnel Wall

DAMAGE NUMBER (1)

COMPLETE BREAK OF LESS THAN 10" IN LENGTH

COMPLETE BREAK OF OVER 10" IN LENGTH IS REPAIRABLE BY THE INSERT METHOD USING SAME RIVET SCHEDULE AS NOTED FOR THIS SPLICE REPAIR

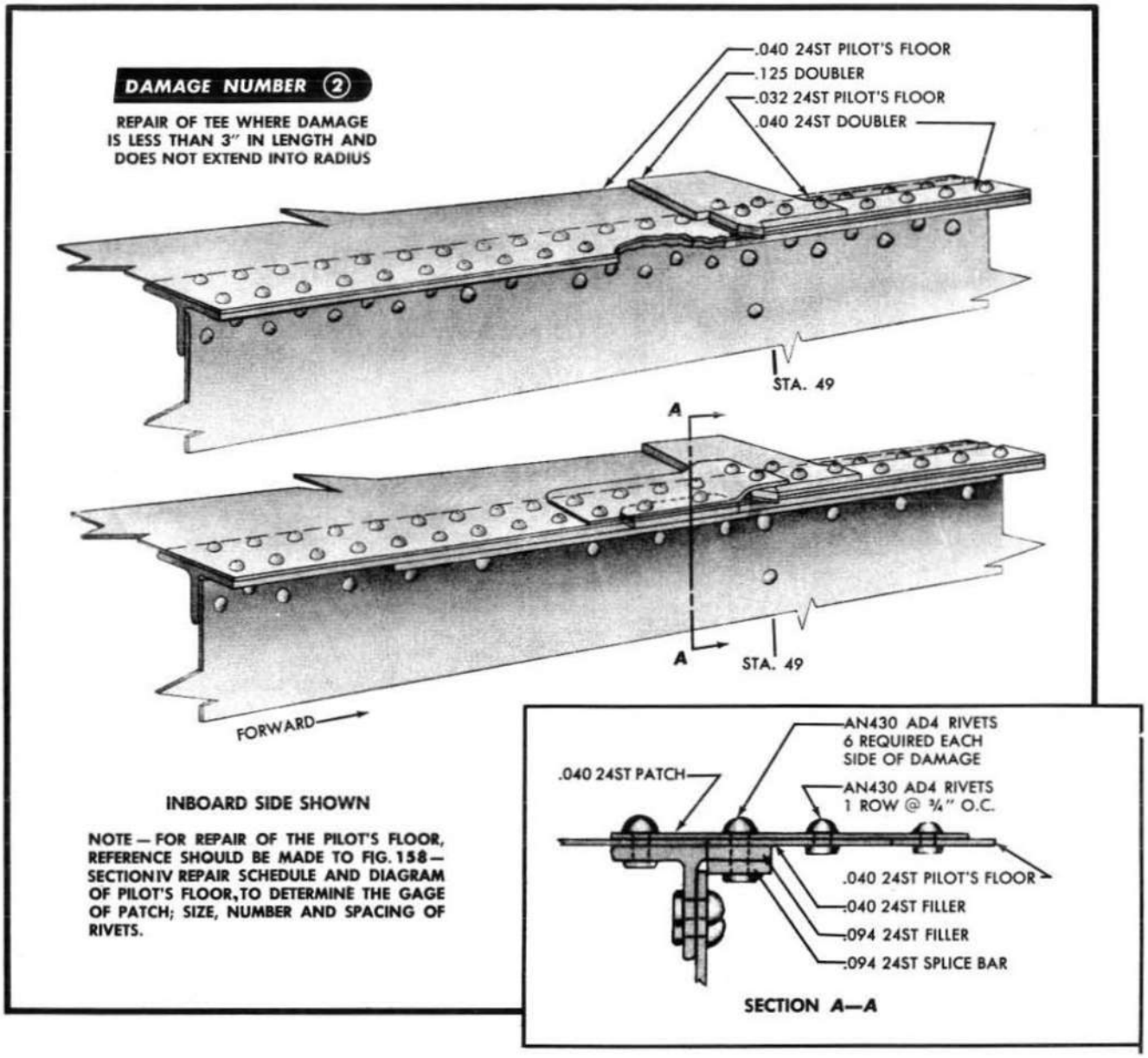


NOTE — FOR REPAIR OF THE PILOT'S FLOOR, REFERENCE SHOULD BE MADE TO FIG. 158—SECTION IV REPAIR SCHEDULE AND DIAGRAM OF PILOT'S FLOOR, TO DETERMINE THE GAGE OF PATCH; SIZE, NUMBER AND SPACING OF RIVETS.

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct fillers from the same gage and material as the existing web and caps.
4. Construct splice angles for upper cap from .094 24SO. Construct splice angle for lower cap from .125 24SO. Construct patches from .064 24SO. Form and heat treat to 24ST.
5. Use existing rivet holes where possible.
6. For correct rivet size and spacing on web repair, see rivet schedule in Figure 169 Section IV.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

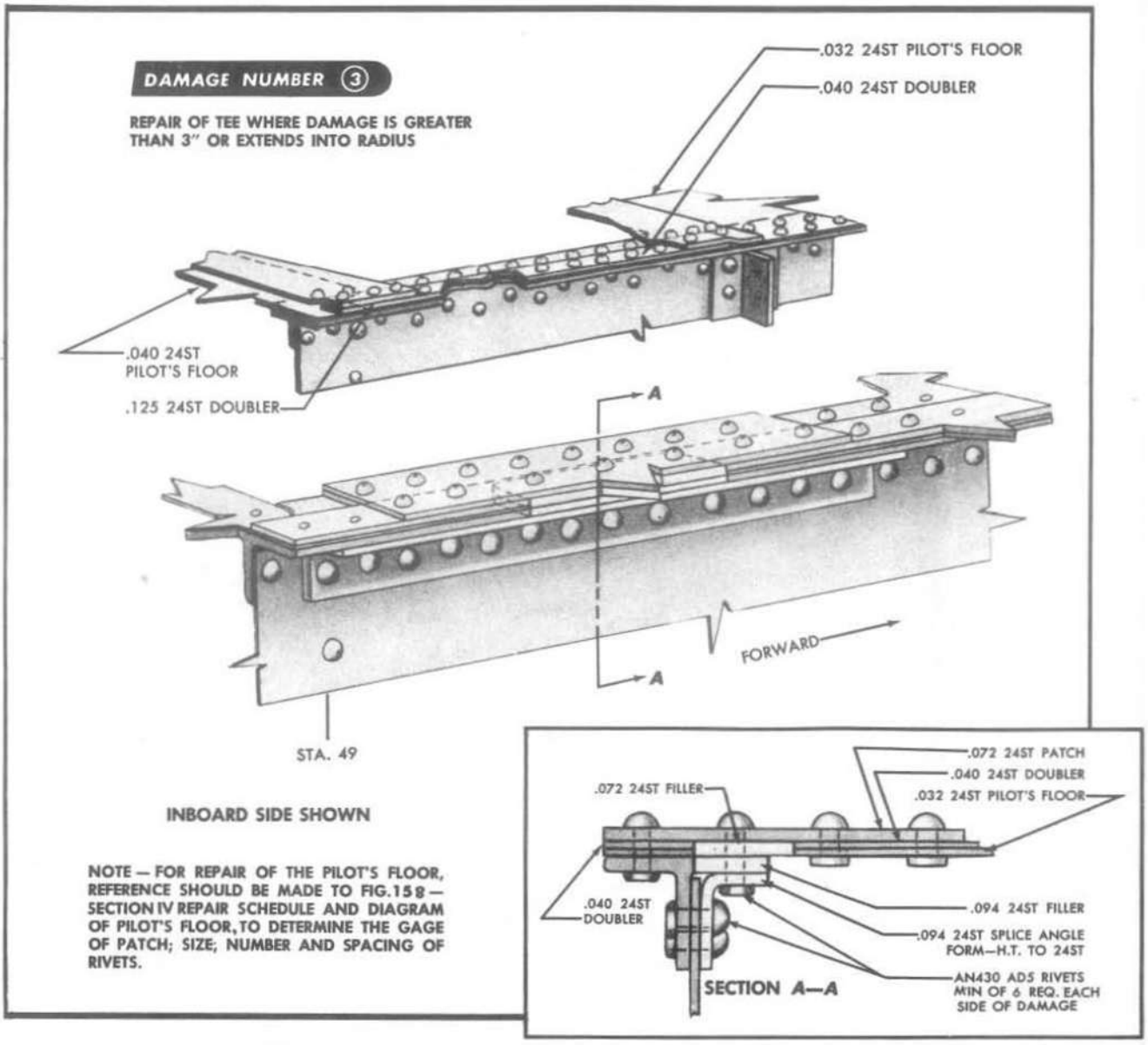
Figure 163 —Splice Repair of Break Through L.H. Nose Wheel Tunnel Wall



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when damage does not exceed three inches in length and does not extend into the radius.
4. Construct fillers from the same gage and material as the existing cap and floor.
5. Construct splice bar from the same gage and material as the cap lip.
6. Use original rivet holes where possible.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 164–Patch Repair of Damage to Cap—L.H. Nose Wheel Tunnel Wall



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when damage exceeds three inches in length or extends into the radius.
4. Construct fillers from the same gage and material as the existing web and cap.
5. Construct cap splice angle from the same gage material as original cap. Form in the 24SO condition and heat treat to 24ST.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 165—Splice Repair of Cap—L.H. Nose Wheel Tunnel Wall

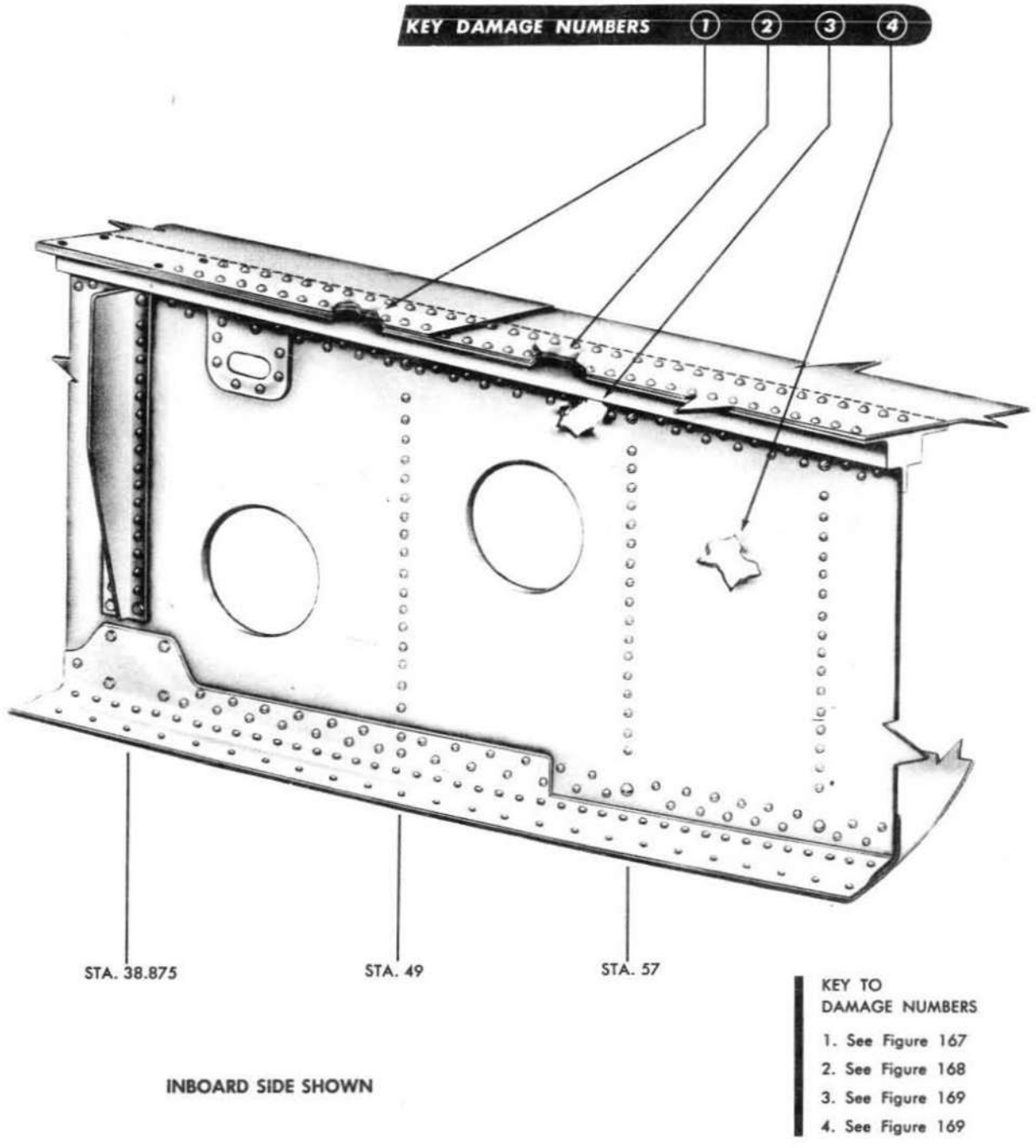
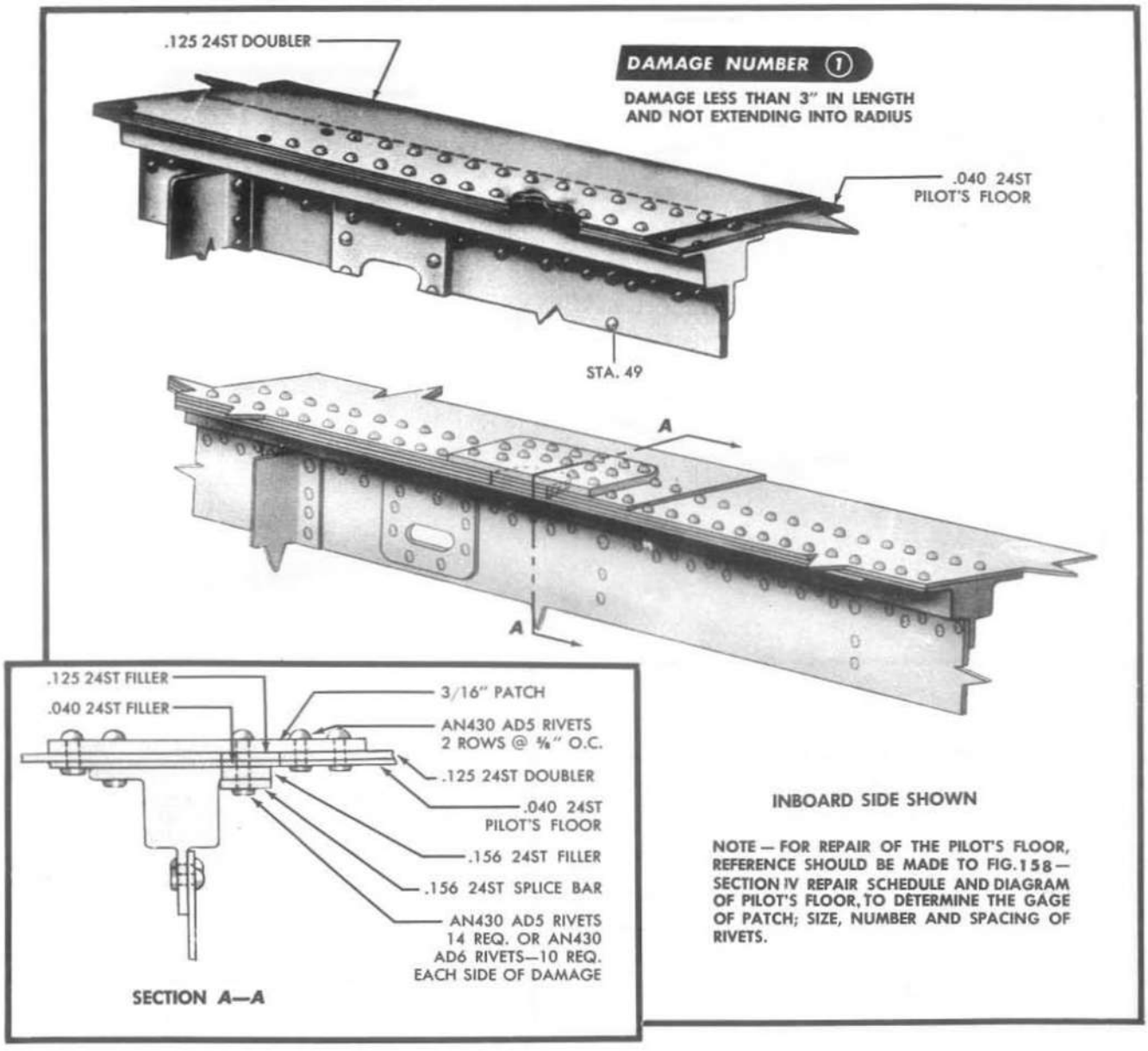


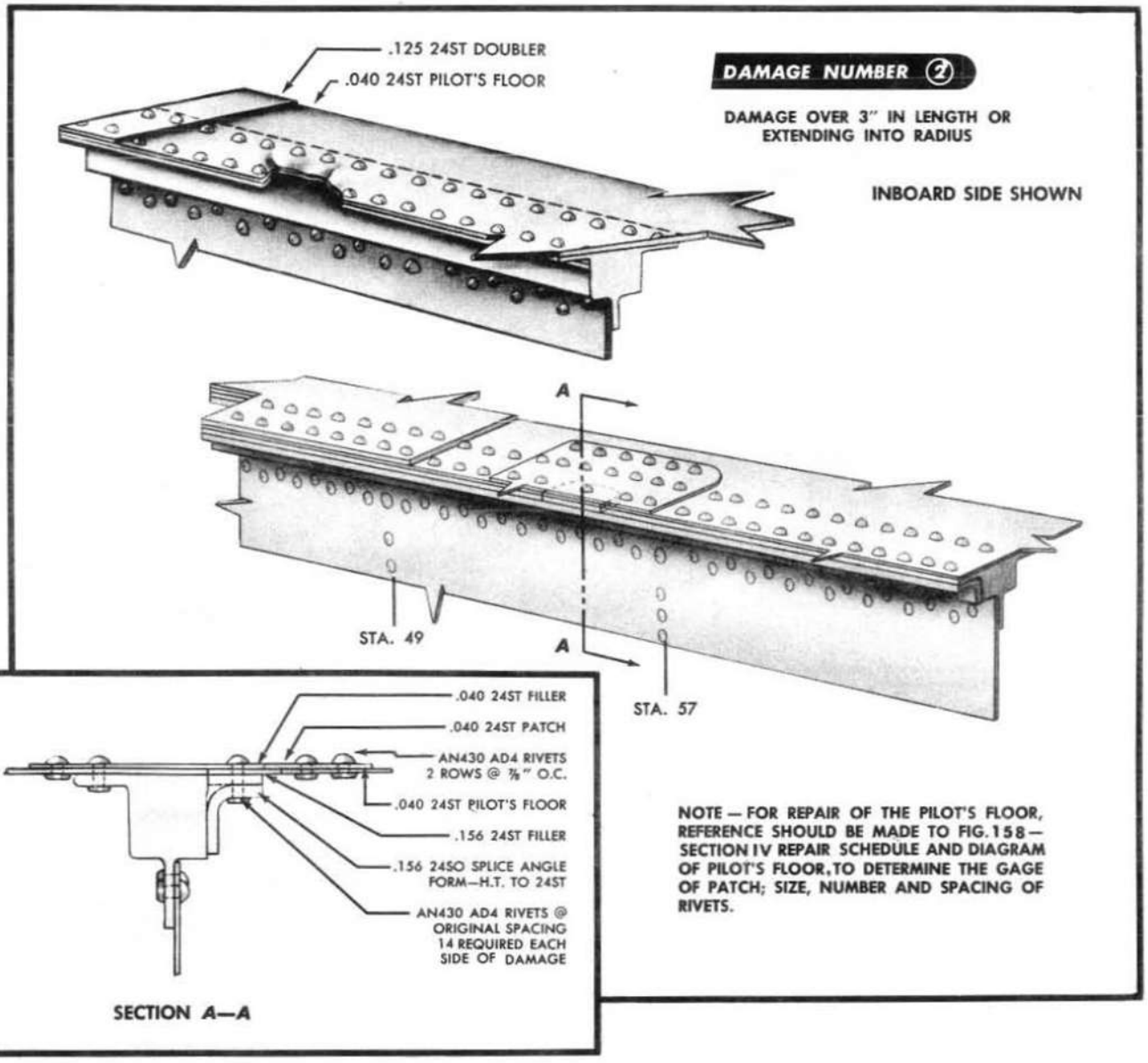
Figure 166—Key to Damages to Right Hand Nose Wheel Tunnel Wall



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when damage is less than three inches in length and does not extend into the radius.
4. Construct fillers from the same gage and material as the existing cap and floor.
5. Construct splice bar from the same gage and material as the cap lip.
6. For rivet edge and row distance, see Figure 7, Section I.

Figure 167-Patch Repair of Damage to Cap—R.H. Nose Wheel Tunnel Wall



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Use the repair shown when damage exceeds three inches in length or extends into the radius.
4. Construct fillers from the same gage and material as the existing cap and floor.
5. Construct splice angle from same gage material as the original cap lip. Form in the 24SO condition and heat treat to 24ST.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 168—Splice Repair of Damage to Cap—R.H. Nose Wheel Tunnel Wall

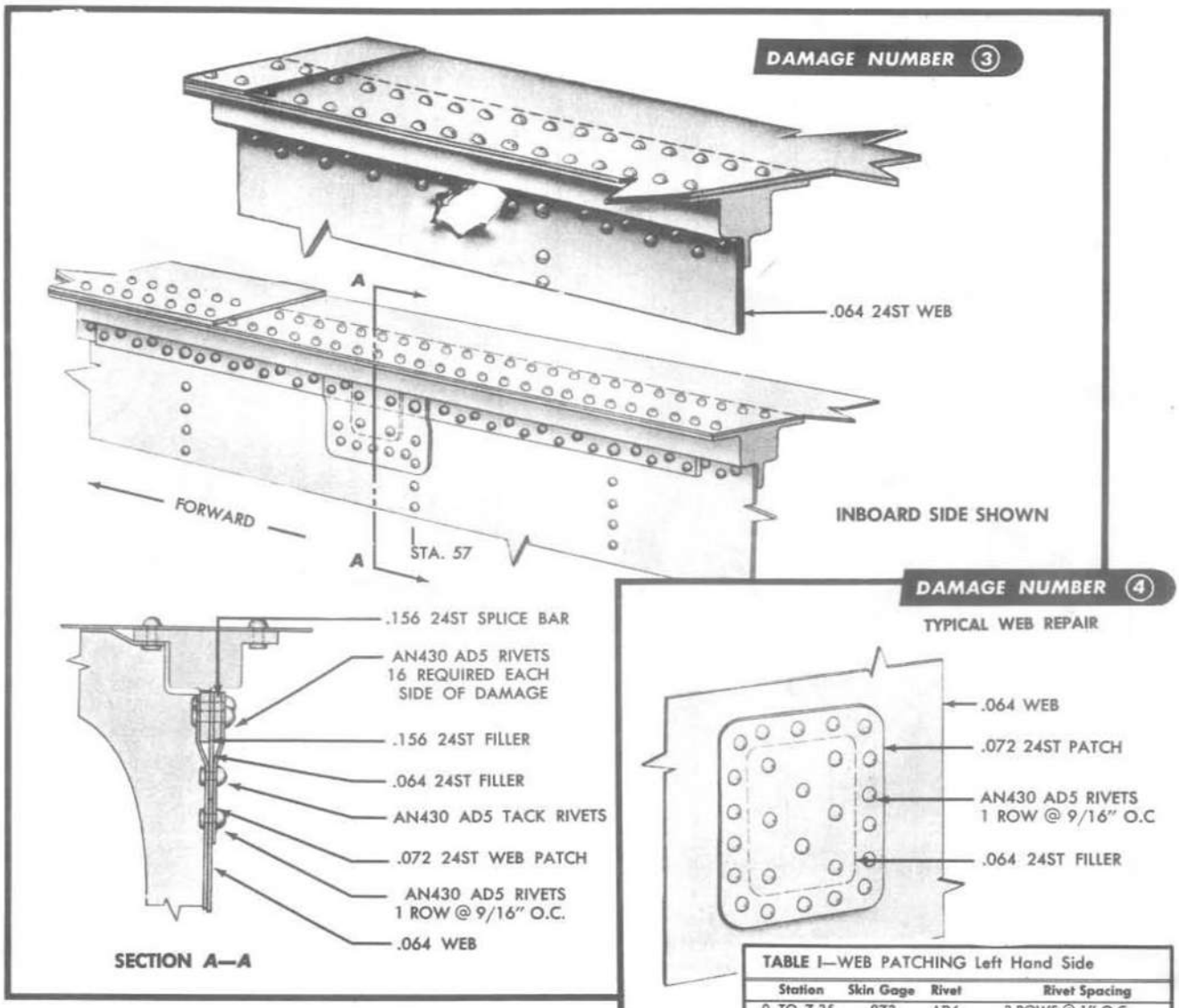


TABLE I—WEB PATCHING Left Hand Side

Station	Skin Gage	Rivet	Rivet Spacing
0 TO 7.25	.072	AD6	2 ROWS @ 1" O.C.
7.25 TO 23.5	.072	AD5	1 ROW @ 19/32" O.C.
23.5 TO 39	.051	AD5	1 ROW @ 19/32" O.C.
39 TO 88	.051	AD5	1 ROW @ 25/32" O.C.

TABLE II—WEB PATCHING Right Hand Side

Station	Skin Gage	Rivet	Rivet Spacing
0 TO 23.5	.072	AD5	1 ROW @ 19/32" O.C.
23.5 TO 88	.064	AD5	1 ROW @ 19/32" O.C.

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct fillers from the same gage and material as the existing web and cap.
4. Construct splice bar from the same gage and material as the existing cap lip. Construct web patch from material one gage heavier than original web.
5. Attach web fillers with tack rivets spaced at one and one-half inches on center maximum.
6. Use existing rivet holes where possible.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 169—Patch Repair of Cap Fin and Web—R.H. Nose Wheel Tunnel Wall

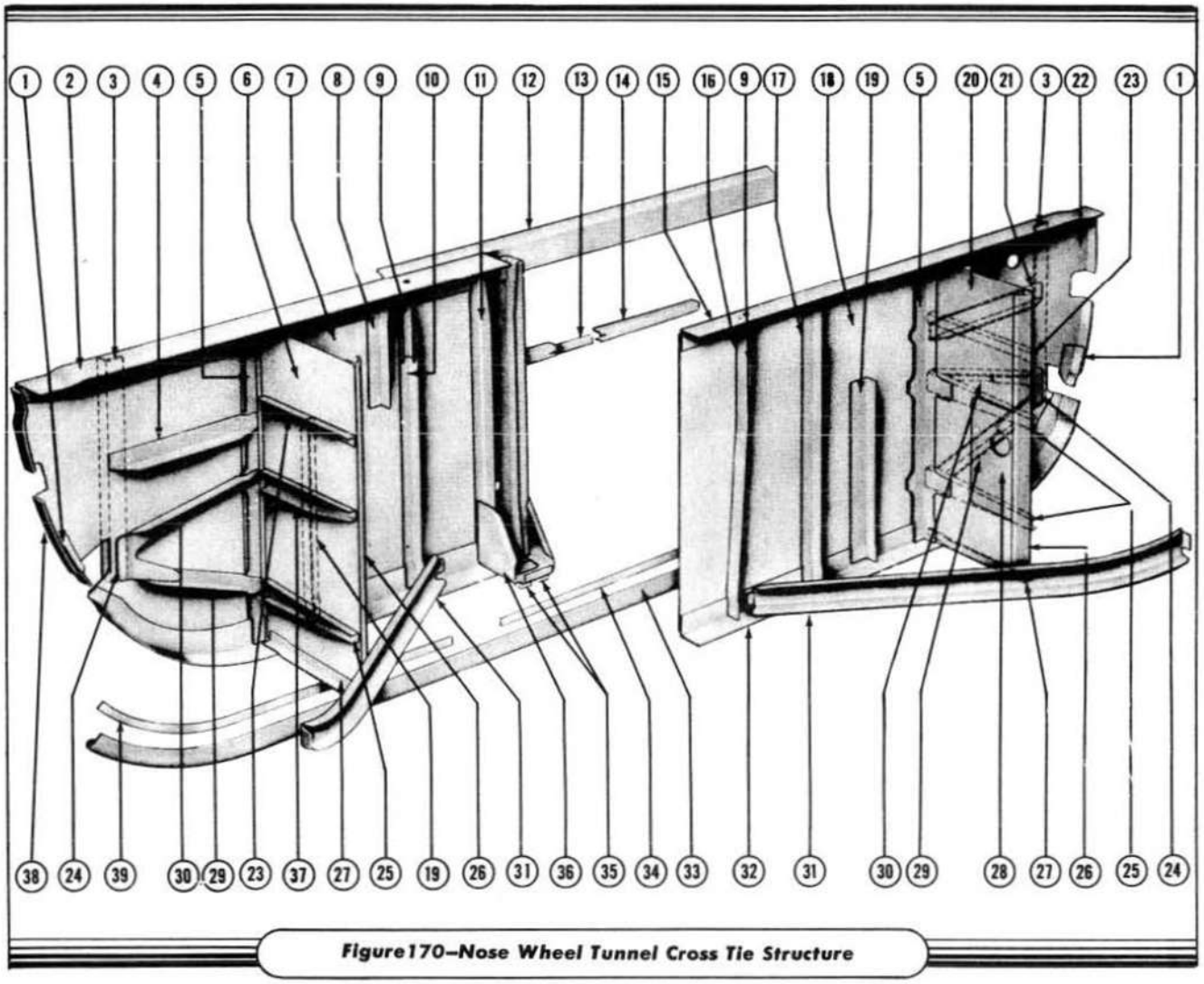


Figure 170—Nose Wheel Tunnel Cross Tie Structure

KEY TO FIGURE 170

Note: L.H. and R.H. indicate opposite parts within the assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5157401-68 L.H. 5157401-69 R.H.	Angle	1-11/16x2-3/16	.064	24SO	24ST	1 1
2	5157401-10	Upper Cap S-1073342	Length 30-7/32	Extrusion	24ST		1
3	5157401-60 L.H. 5157401-61 R.H.	Angle S-1025503	Length 10¾	Extrusion	24ST		1 1
4	5157401-56	Angle S-1059659	Length 9⅜		24ST		1
5	5157401-32 L.H. 5157401-33 R.H.	Fitting S-136967	Length 17⅛		24ST		1 1
6	5157401-62	Web	8⅛x16⅞	.025	24ST		1

KEY TO FIGURE 170 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
7	5157401-44	Web	17x17	.032	24ST		1
8	5157401-70	Angle	1⅜x5¾	.040	24ST		1
9	2129272	Fitting	Length 4-1/16	Forging	14ST		2
10	5157401-6	Angle S-167889	Length 16-11/16	Extrusion	24ST		1
11	5157401-36	Channel	7⅞x18½	.064	24SO	24ST	1
12	5157401-16	Angle	2⅜x31-9/16	.064	24ST		1
13	5157401-54	Doubler	¾x14	.091	24ST		1
14	5157401-2	Stiffener S-1059659	Length 32	Extrusion	24ST		1
15	5157401-8	Upper Cap S-1073342	Length 30-7/32	Extrusion	24ST		1
16	5157401-4	Angle S-167889	Length 15¾	Extrusion	24ST		1
17	5157401-38	Angle S-1045544	Length 16½	Extrusion	24ST		1
18	5157401-42	Web	17x17	.032	24ST		1
19	5157401-76 L.H. 5157401-77 R.H.	Angle	1½x11⅛	.051	24ST		1 1
20	5157401-26	Web	8⅛x16⅞	.025	24ST		1
21	5157401-24	Angle S-1059659	Length 9⅜	Extrusion	24ST		1
22	4129444	Former	16½x17	.051	24SO	24ST	1
23	5157401-58	Stiffener S-1000142	Length 8-3/32	Extrusion	24ST		2
24	5157401-18	Gusset	3⅞x4	.125	24ST		2
25	5157401-30	Stiffener	2¾x8⅛	.040	24ST		3
26	5157401-34 L.H. 5157401-35 R.H.	Channel	2⅜x16⅞	.040	24ST		1 1
27	5157401-28 L.H. 5157401-29 R.H.	Angle S-179364	Length 8½	Extrusion	24ST		1 1
28	5157401-66	Doubler	4-25/32x6⅞	.040	24ST		1
29	5157401-20 L.H. 5157401-21 R.H.	Angle S-167883	Length 9-1/16	Extrusion	24ST		1 1
30	5157401-22 L.H. 5157401-23 R.H.	Angle S-167883	Length 8⅝	Extrusion	24ST		1 1
31	5157401-40 L.H. 5157401-41 R.H.	Channel	6x28	.040	24SO	24ST	1 1
32	5157401-12	Lower Cap S-1073342	30-29/32	Extrusion	24ST		1
33	5122152-2	Seal S-1056716	Length 56	Synthetic	Rubber		1
34	5122152-8 L.H. 5122152-9 R.H.	Retainer	7/16x28	.032	24ST		1 1
35	5122157-24	Pad		7/16"	Sheet Phenolic		4
36	5122157-2	Stop	3⅜x9⅞	.064	24SO	24ST	1
37	5157401-72	Channel	3⅜x8⅛	.040	24ST		1
38	4129444-1	Former	16½x17	.051	24SO	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

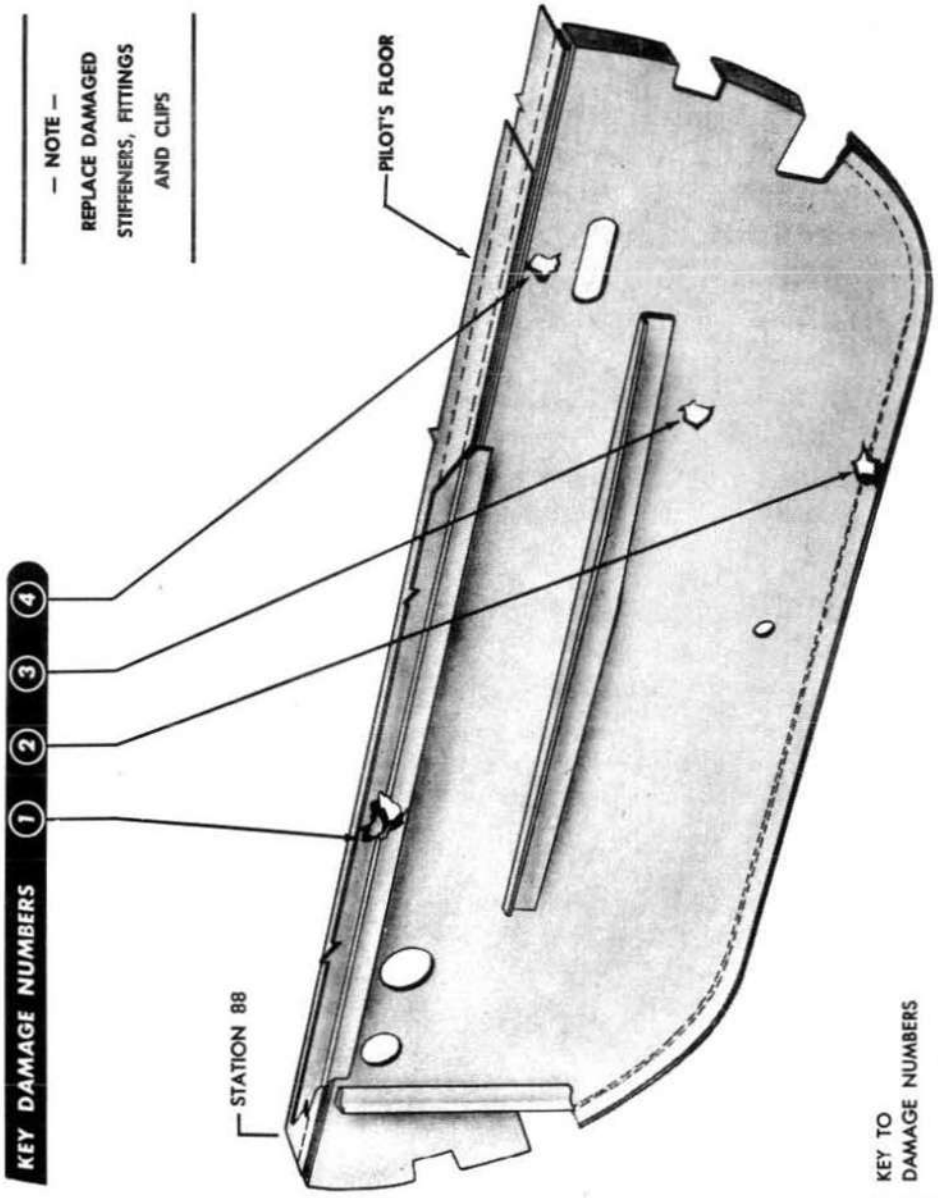
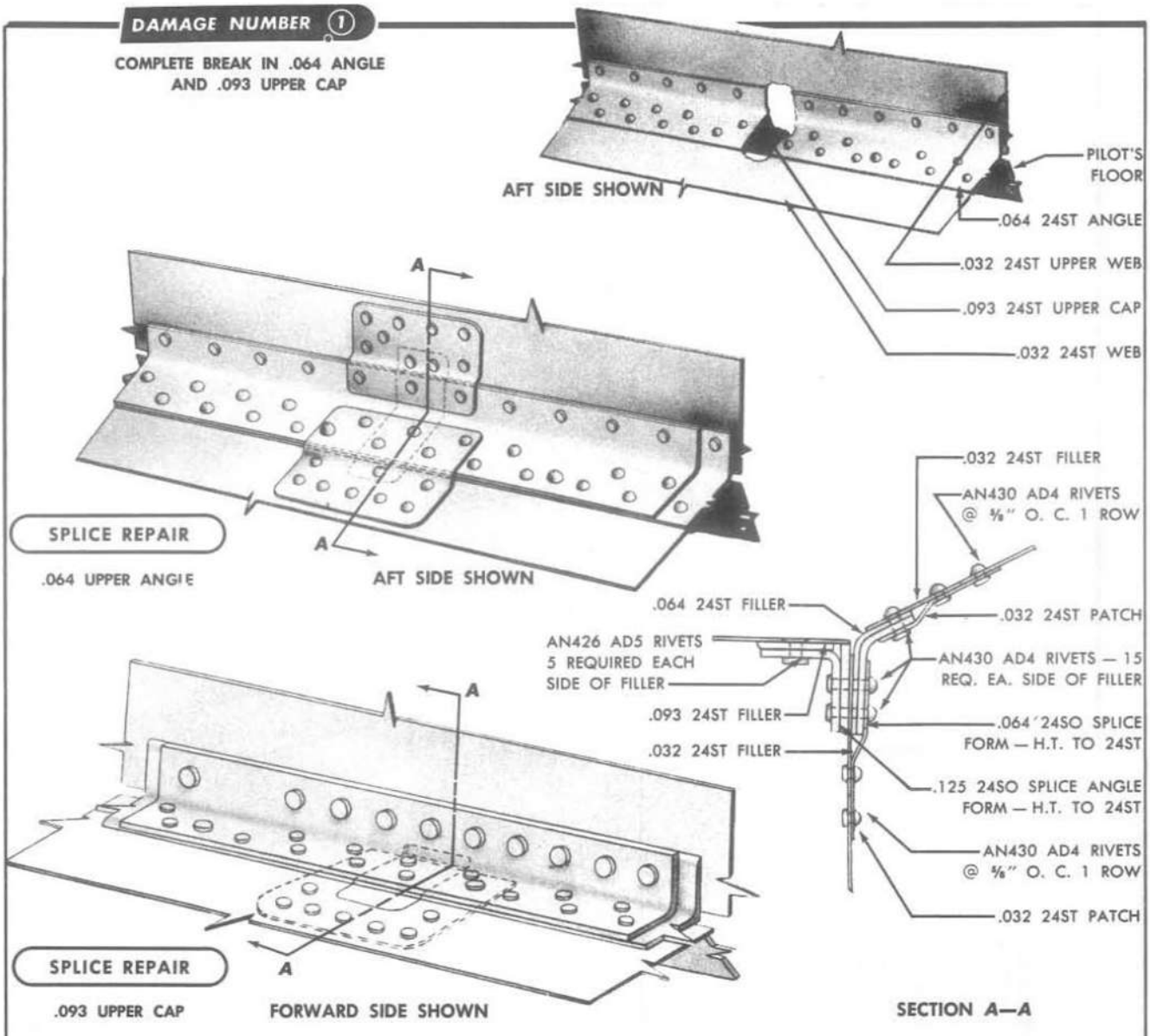


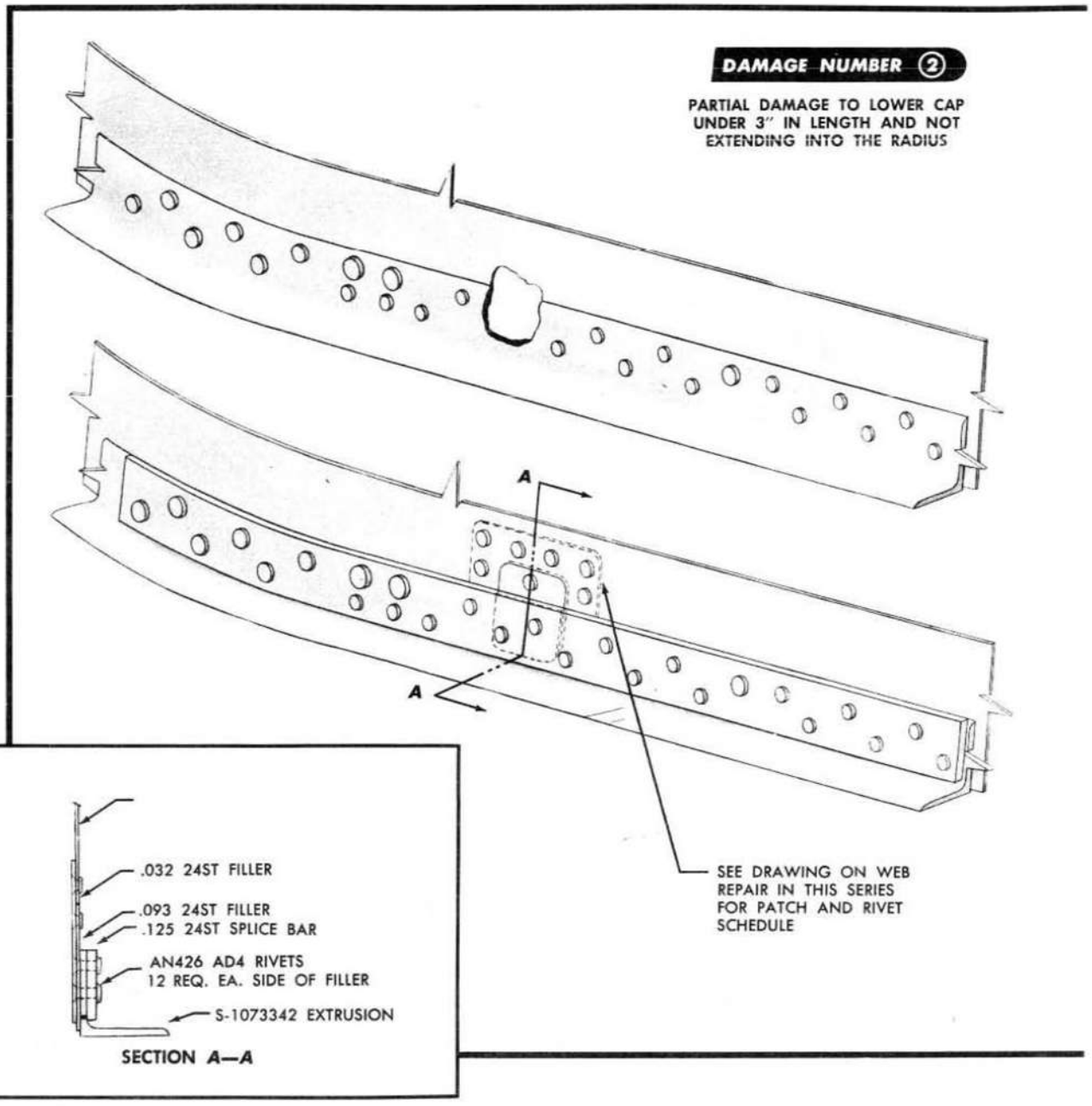
Figure 171—Key Drawing of Damages to Nose Wheel Tunnel Cross-Tie



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice angles from 24ST material of gages noted on Section A-A and Section B-B.
4. Construct web patch from .032 24ST material. (See typical web repair drawing, Figure 174.)
5. Construct fillers from the same gage and material as original.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

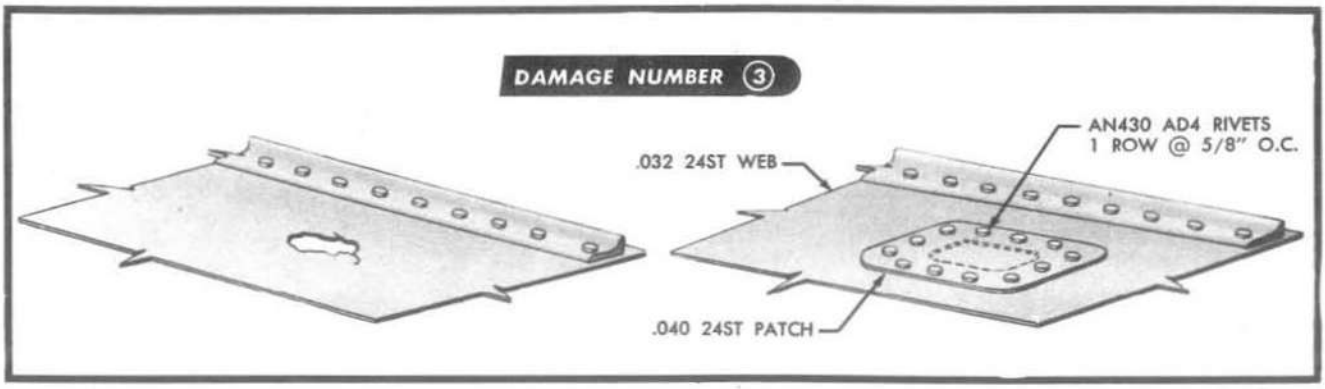
Figure 172—Splice Repair of Angle of Nose Wheel Tunnel Cross-Tie

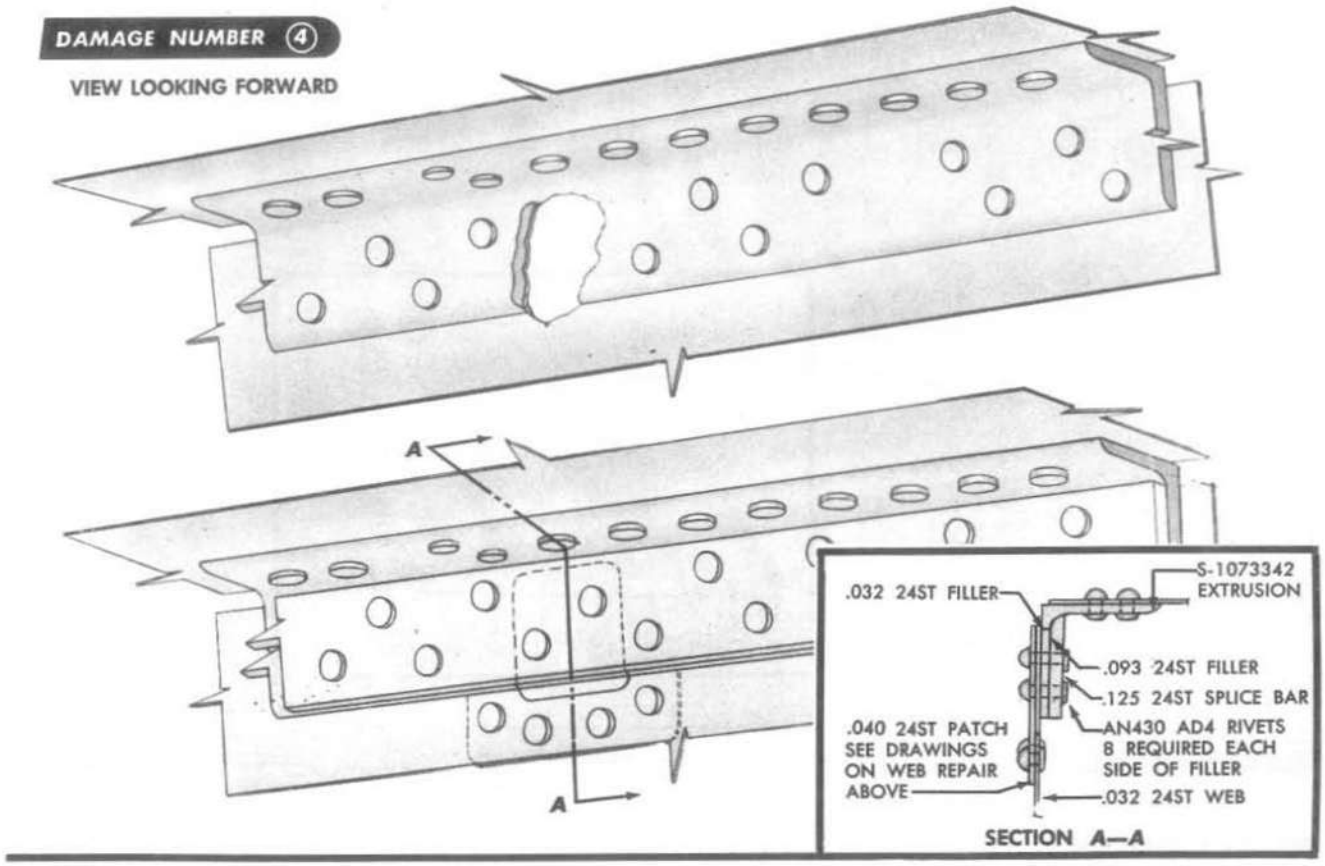


NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice bar from .125 24ST material.
4. Construct fillers from the same gage and material as original.
5. Use existing rivet holes where possible.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 173—Splice Repair of Lower Cap of Nose Wheel Tunnel Cross-Tie





NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice bar from .125 24ST material.
4. Construct web patch from .040 24ST material.
5. Construct fillers from the same gage and material as original.
6. Use existing rivet holes where possible.
7. Rivets through filler must be the same size as the rivets used in repair, spaced at one and one-half inch on center, maximum.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 174—Repair of Web and Upper Cap of Nose Wheel Tunnel Cross-Tie

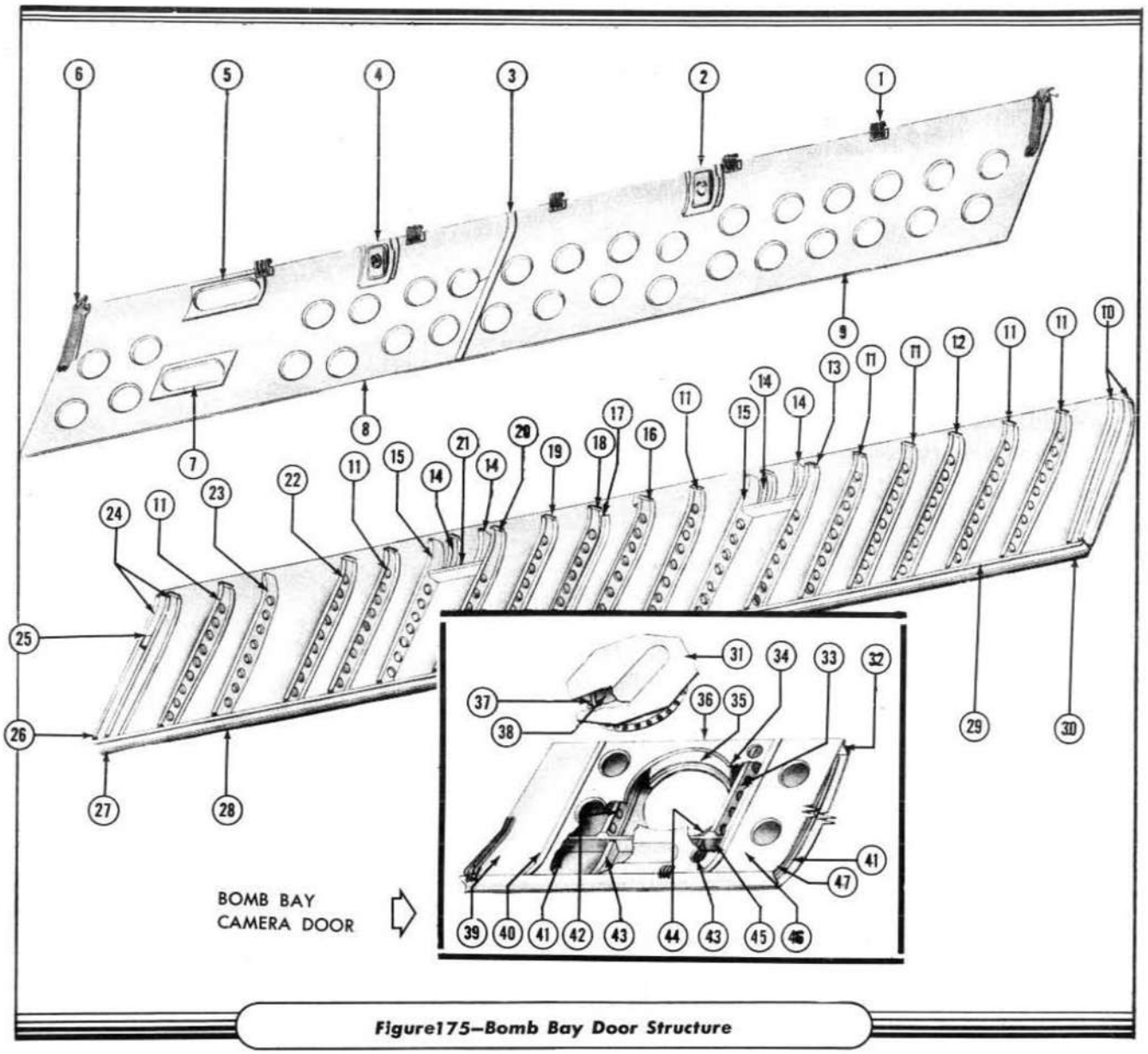


Figure175—Bomb Bay Door Structure

KEY TO FIGURE 175

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	2126714	Center Hinge	1-13/16x2-23/64	Make from 2129195 Blank Forging			5
2	4129520-4	Bomb Hoist Access Door	7x8	.040	24SO	24ST	1
3	5122153-36	Doubler	1-9/32x34	.051	24ST		1
4	4129520-2	Bomb Hoist Access Door	7x8	.040	24SO	24ST	1
5	5122153-46	Well	10x19	.051	24SO		1
6	5127984	End Hinge	1.438x12.5	3 inch	C.M. Steel Forging		2
7	5122153-48	Well	10x19	.051	24SO	24ST	1
8	5122153-22	Aft Inside Skin Panel	30x84	.051	24ST		1
9	5122153-24 L.H.	Fwd. Inside Skin Panel	30x92	.051	24ST		1

KEY TO FIGURE 175 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
10	5122153-74 L.H. 5122153-75 R.H.	Frame	8x28	.072	24SO	24ST	2
11	5122153-2 L.H. 5122153-3 R.H.	Frame	8x28	.051	24SO	24ST	16
12	5122153-66 L.H. 5122153-67 R.H.	Frame	8x28	.072	24SO	24ST	4
13	5122153-78 L.H.	Frame	8x28	.072	24SO	24ST	1
14	5122153-6 L.H. 5122153-7 R.H.	Frame	8x9	.051	24SO	24ST	4
15	5122153-76	Frame	8x28	.051	24SO	24ST	2
16	5122153-80 L.H.	Frame	8x28	.072	24SO	24ST	1
17	5122153-40 L.H. 5122153-41 R.H.	Doubler	1½x30	.064	24ST		2
18	5122153-82 L.H.	Frame	8x28	.051	24SO	24ST	1
19	5122153-84 L.H.	Frame	8x28	.051	24SO	24ST	1
20	5122153-86 L.H.	Frame	8x28	.072	24SO	24ST	1
21	5122153-8	Channel	5x12½	.051	24SO	24ST	2
22	5122153-88	Frame	8x28	.072	24SO	24ST	1
23	5122153-90	Frame	8x28	.051	24SO	24ST	1
24	5122153-4 L.H. 5122153-5 R.H.	Frame	8x28	.072	24SO	24ST	6
25	1152305	Channel	1¼x1-7/16x3½	.062	24SO	24ST	2
26	1196715	Seal	31/32x1-29/32	.125	Sheet Hycar Shore 40±5		1
27	1125592	Seal	15/32x6¾		Extruded Syn. Rubber		1
28	5122153-14	Aft Skin Plating	30x84	.040	24ST		1
29	5122153-42	Channel Stiffener	4x175	.064	24ST		1
30	5122153-16 L.H. 5122153-17 R.H.	Skin Plating Fwd. Outside	30x92	.040	24ST		2
31	5151986-6	Inner Plate	20¾x20¾	.051	24SO	24ST	1
32	1059682	Channel	391x.141x.175	.040	Alum Alloy Extrusion 53ST		1
33	5122153-54 L.H. 5122153-55 R.H.	Frame	5x21½	.051	24SO	24ST	2
34	5122153-60	Channel Stiffener	4x175	.064	24ST		1
35	5122153-58 R.H.	Doubler	1¼x29	.051	24SO	24ST	1
36	5122153-58 R.H.	Inside Skin Panel	12x30	.051	24ST		1
37	5151986	Center Ring Camera Door	23x23	.064	24SO	24ST	1
38	5151986-2	Outer Plate	18x18	.040	24SO	24ST	1
39	5122153-28	Inside Skin Panel	30x39	.051	24ST		1
40	5122153-92 R.H.	Doubler	1-9/32x34	.051	24SO	24ST	3
41	5122153-62 L.H. 5122153-63 R.H.	Frame	8x28	.051	24SO	24ST	2
42	5122153-54 L.H. 5122153-55 R.H.	Frame	5x21½	.051	24SO	24ST	2
43	5122153-52 L.H. 5122153-53 R.H.	Frame	5½x10½	.051	24ST		2
44	5122153-72 R.H.	Doubler	1¼x29	.051	24SO	24ST	1
45	5122153-56 R.H.	Channel	5x36	.051	24ST		1
46	5122153-50 R.H.	Inside Skin Panel	12x30	.051	24ST		1
47	5122153-30	Fwd. Inside Panel	30x92	.051	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

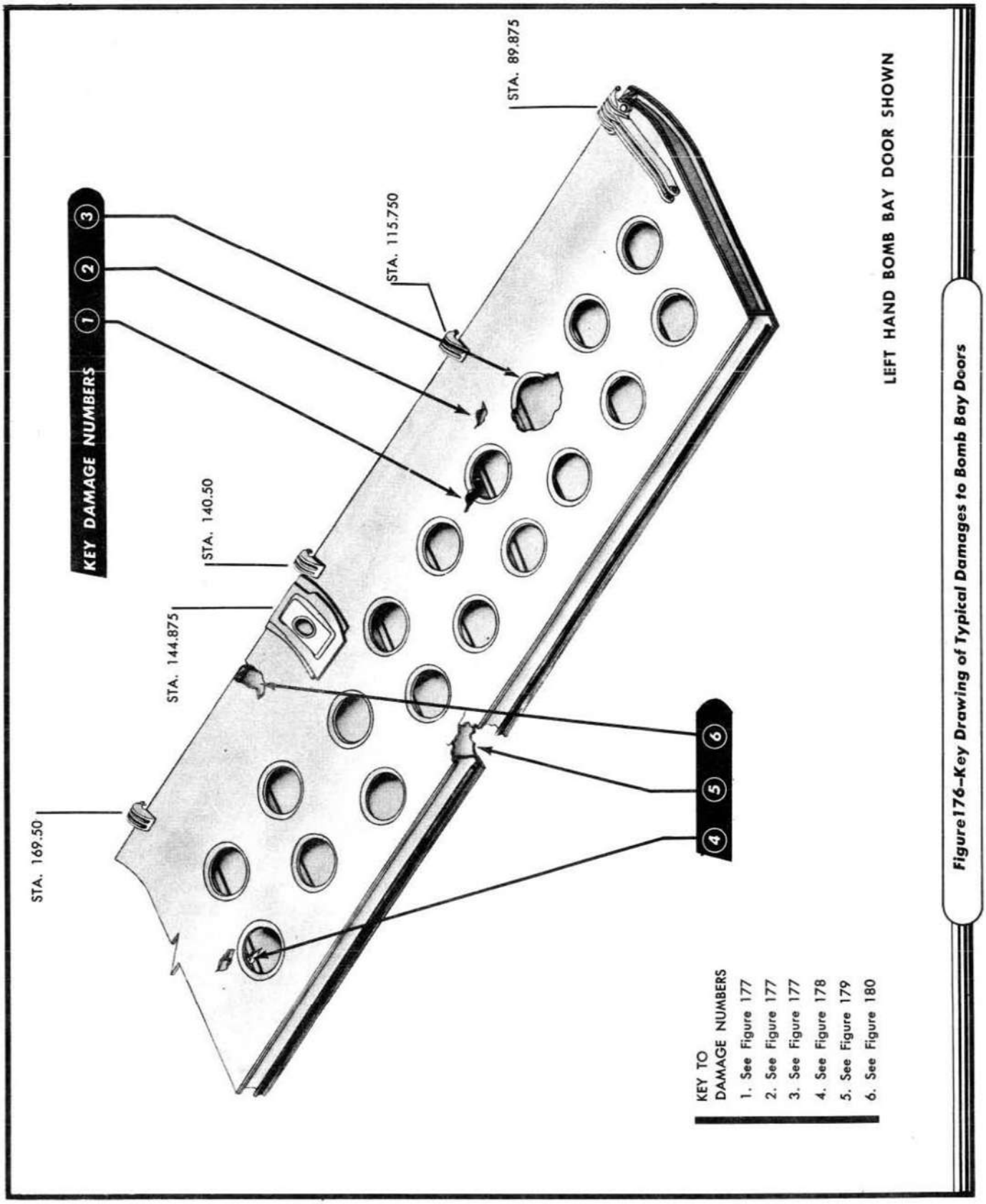
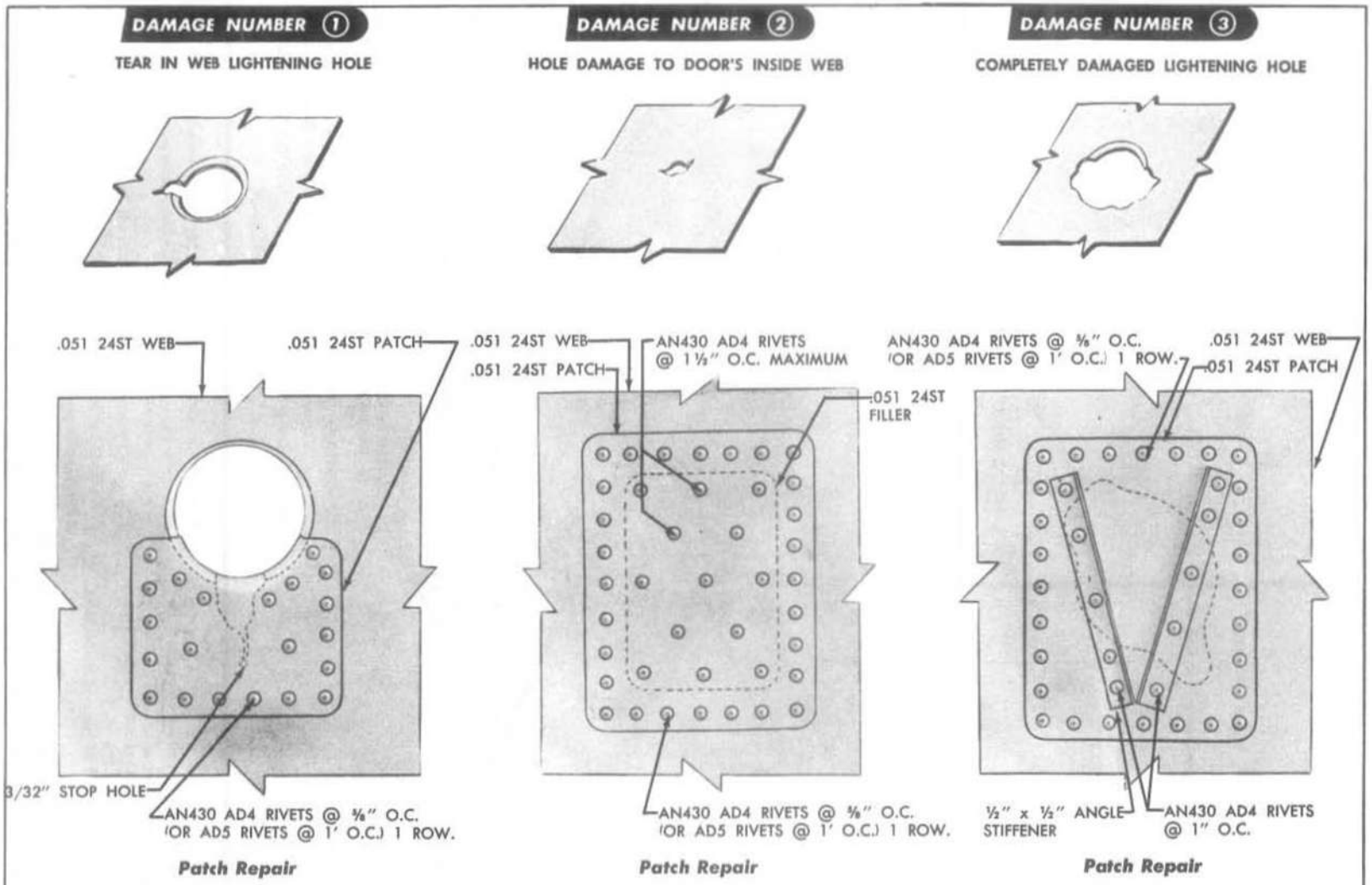


Figure176–Key Drawing of Typical Damages to Bomb Bay Doors

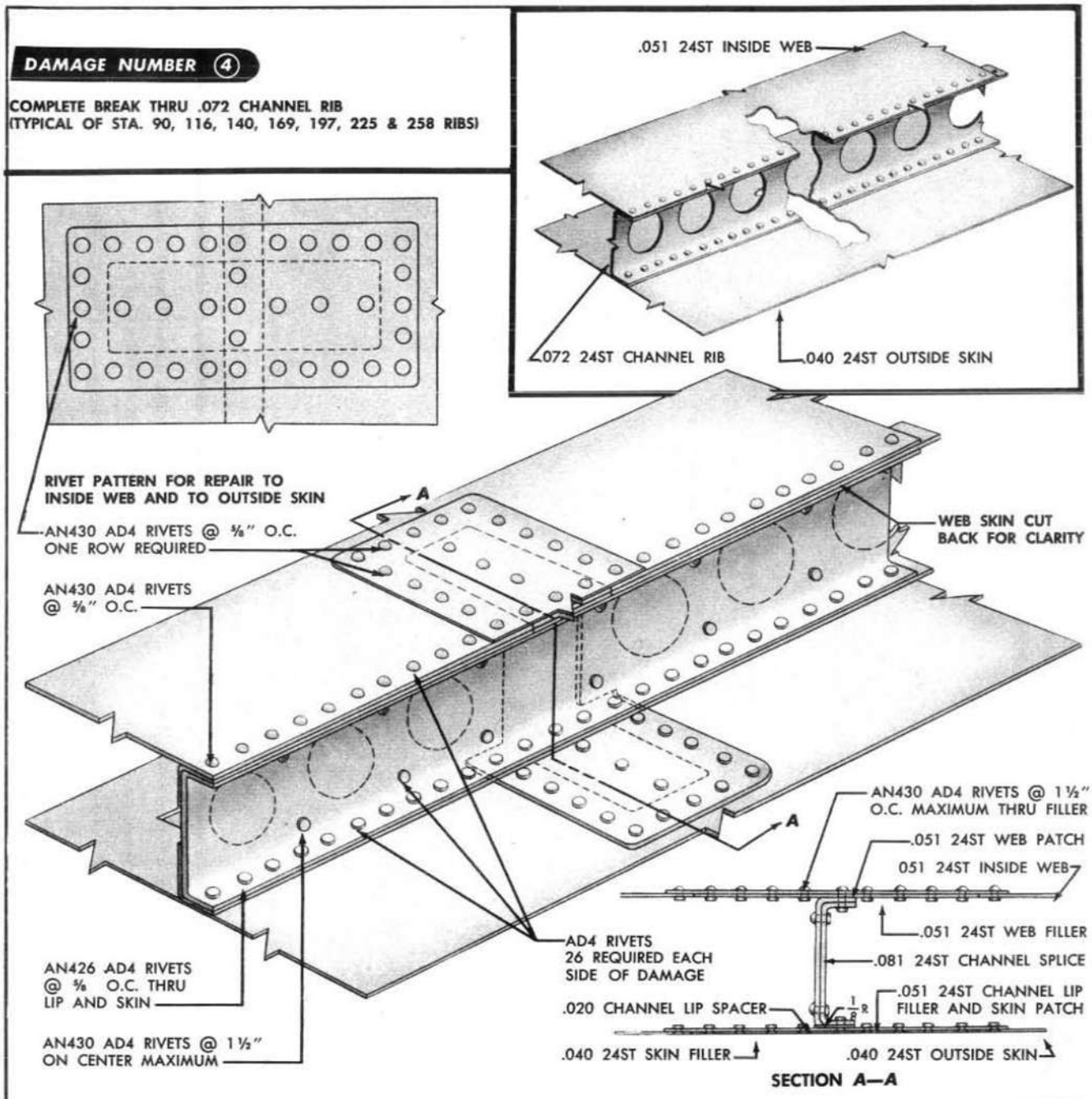


1. Trim damage smooth leaving no radius less than one-half inch.
2. Drill three thirty-seconds inch stop hole at end of crack.
3. Construct patches from the same gage and material as the web.
4. When lightening hole flange is completely lost use one-half by one-half inch bulb angle stiffeners as shown.
5. For rivet edge and row distance, see Figure 6, Section I.

Figure 177–Patch Repair of Lightening Hole and Web of Bomb Bay Door

DAMAGE NUMBER (4)

COMPLETE BREAK THRU .072 CHANNEL RIB (TYPICAL OF STA. 90, 116, 140, 169, 197, 225 & 258 RIBS)

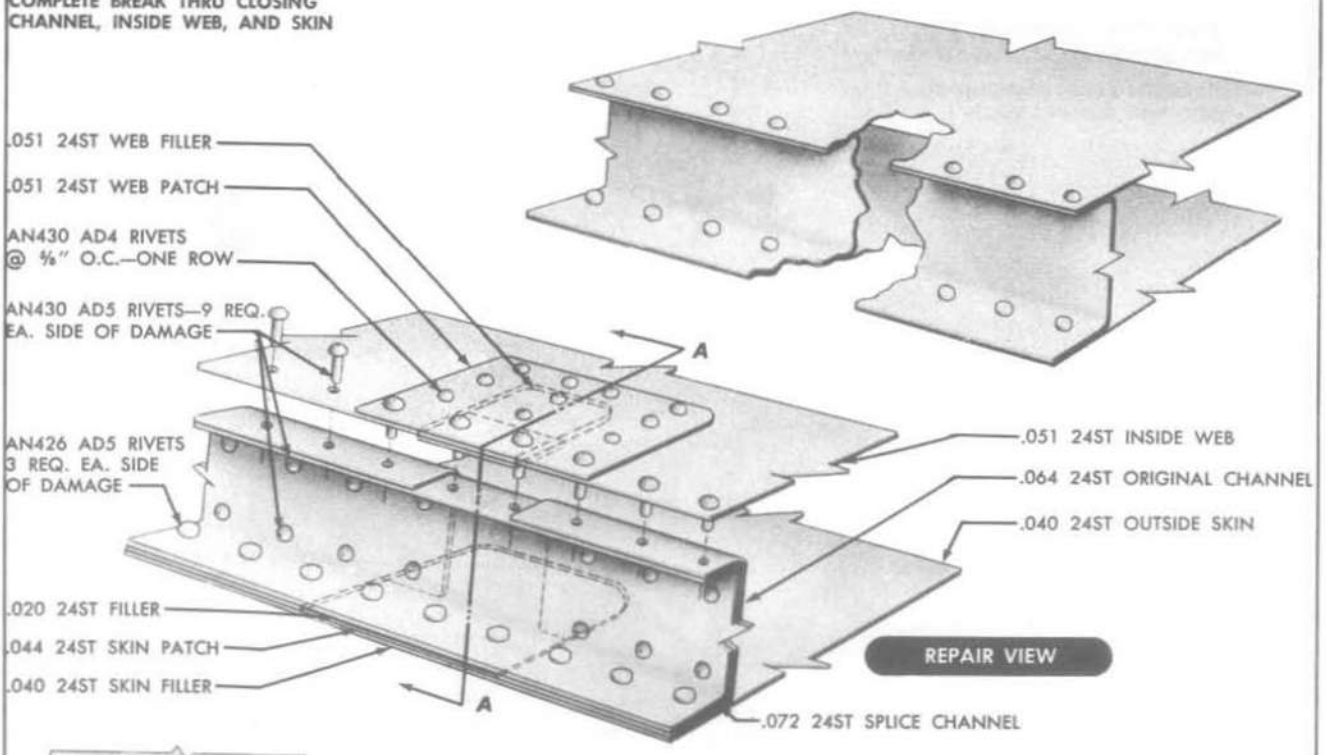


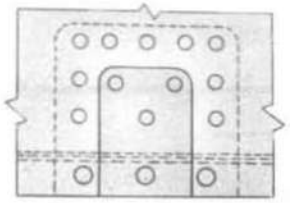
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct rib splice channel from dural sheet one gage heavier than the damaged rib. Form in the 24SO condition and heat treat to 24ST.
4. Construct fillers from the same gage and material as the damaged part.
5. Construct web patch from the same gage and material as the web.
6. Construct lower rib lip filler and skin patch from material which is one gage heavier than the skin.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure178–Splice Repair of Complete Break through Bomb Bay Channel Rib

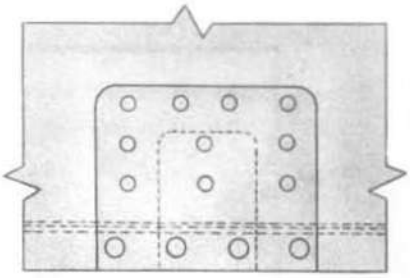
DAMAGE NUMBER (5)

COMPLETE BREAK THRU CLOSING CHANNEL, INSIDE WEB, AND SKIN

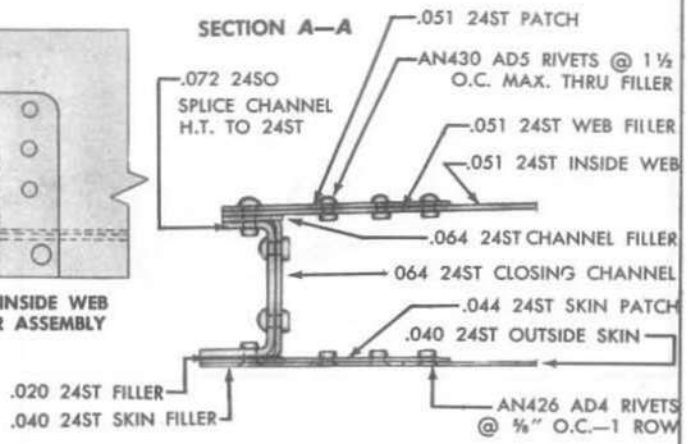




RIVET PATTERN FOR OUTSIDE SKIN FILLER AND DOUBLER ASSEMBLY

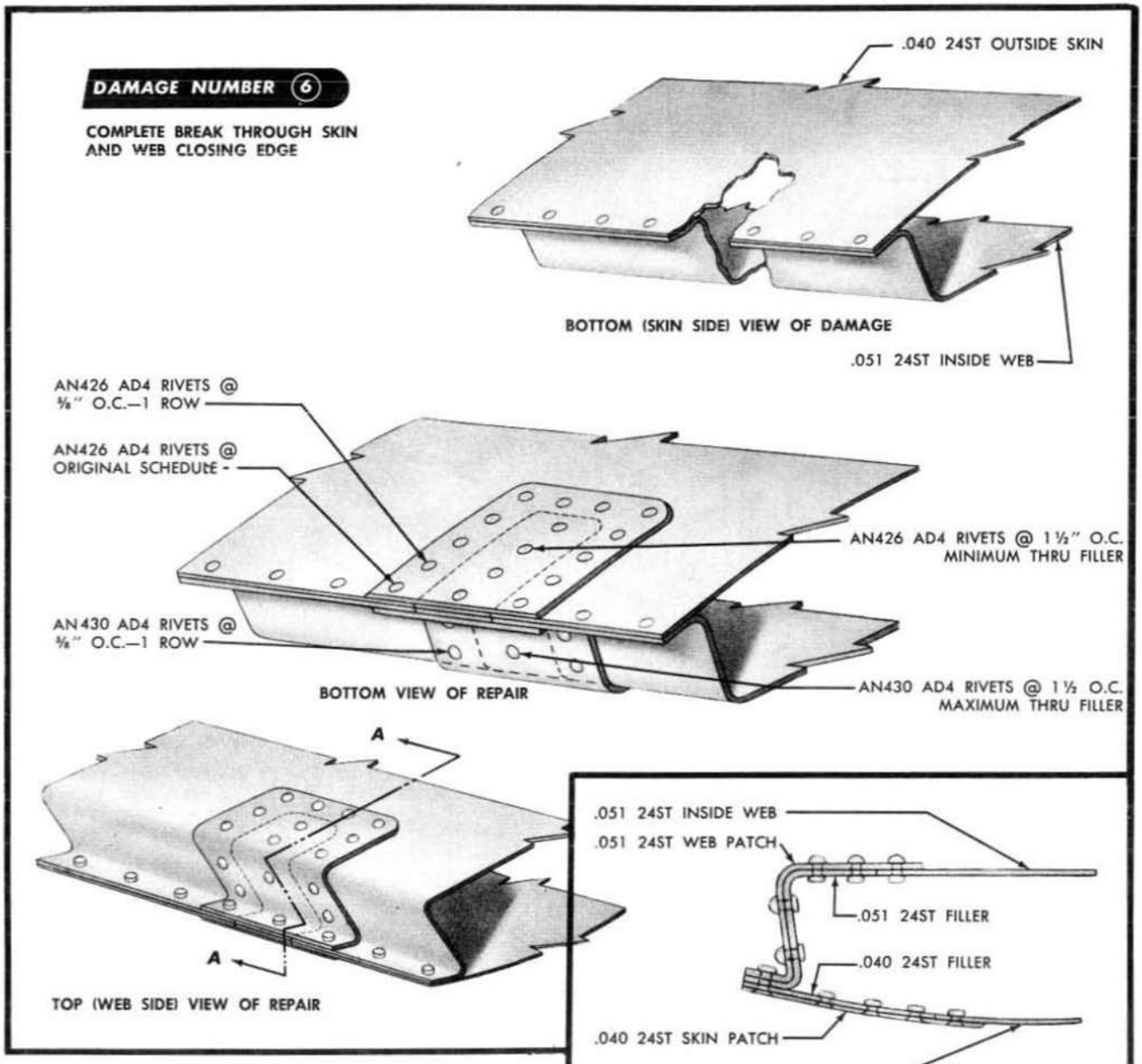


RIVET PATTERN FOR INSIDE WEB FILLER AND DOUBLER ASSEMBLY



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice channel from .072 dural sheet. Form in the 24SO condition and heat treat to 24ST.
4. Construct fillers from the same gage and material as the damaged parts.
5. Construct web patch from the same gage and material as the web.
6. Construct skin patch from alclad sheet one gage heavier than the skin.
7. For minimum bend radii of sheet material, see Figure 5, Section I.
8. For flush riveting, see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

Figure 179-Splice Repair for Damage to Bomb Bay Door Closing Channel



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct web patch from the same gage and material as the web. Form in the 24SO condition and heat treat to 24ST.
4. Construct skin patch from the same gage and material as the skin. Bevel edges to prevent any unnecessary aerodynamic drag.
5. When possible use existing rivet holes.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting, see Figure 6, Section I.
8. For rivet edge and row distance, see Figure 7, Section I.

Figure 180—Patch Repair of Bomb Bay Door's Skin and Web Closing Edge

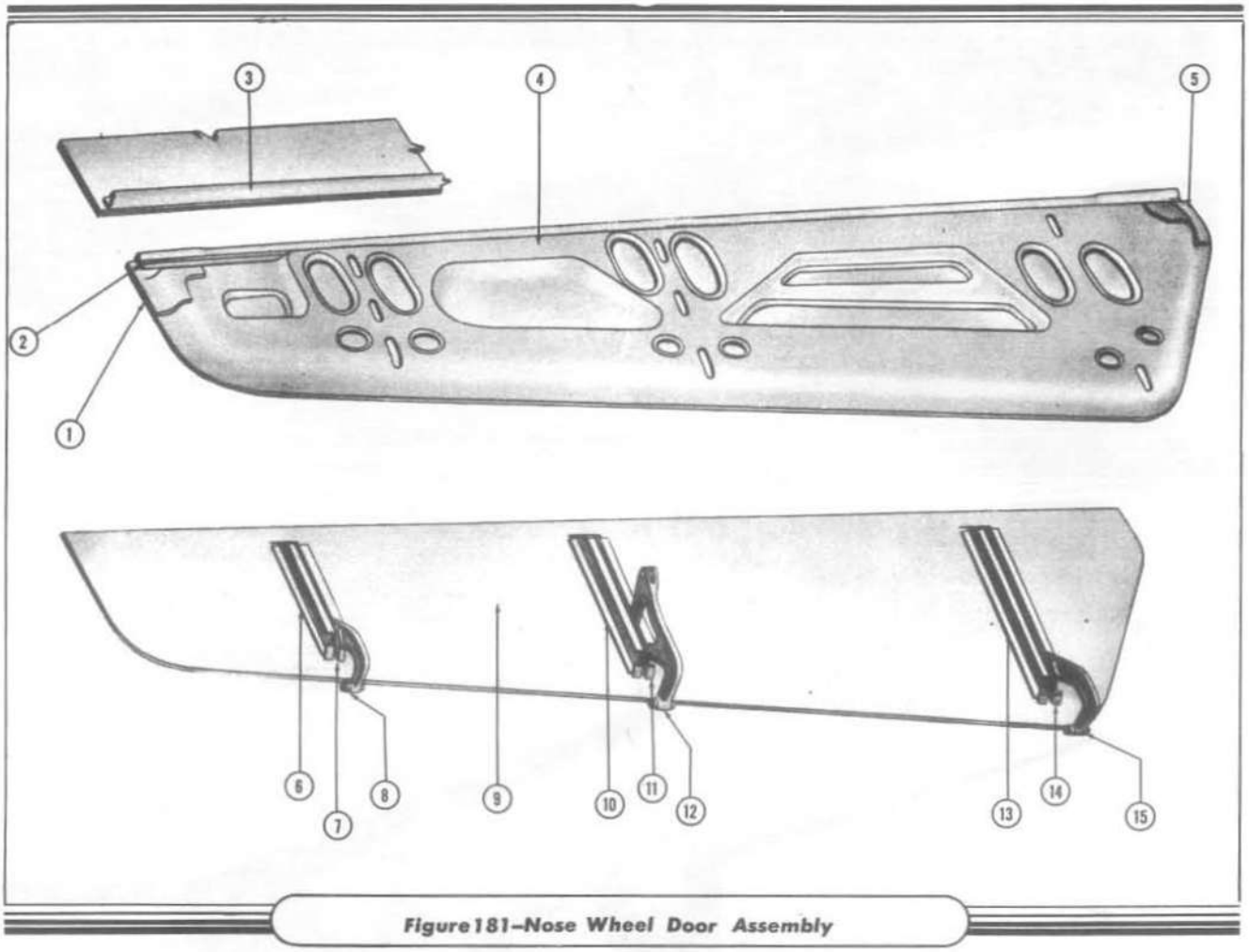


Figure 181–Nose Wheel Door Assembly

KEY TO FIGURE 181

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5122158-8	Gusset	6-5/16x6-5/16	.051	24SO	24ST	1
2	S-1159946	Seal	⅜ Dia.		Elastic Neoprene		1
	1093705	Retainer	7/10	.032	24ST		1
3	5122158-10	R.H. Door Angle Only	1-1/32x83-3/16	.032	24SO	24ST	1
4	5122158-4	Panel (Formed)	27x89½	.040	24SO	24ST	1
5	5122158-6	Gusset	5⅝x8½	.051	24SO	24ST	1
6	5122158-24	Rib	3⅜x13⅞	.051	24SO	24ST	1
7	5122158-26	Rib	3⅜x14	.051	24SO	24ST	1
8	4129484	Hinge			4129485 Forging		1
9	5122158-2	Skin	22x83½	.051	61ST		1
10	5122158-20	Rib	3⅜x17	.091	24SO	24ST	1
11	5122158-22	Rib	3⅜x17⅛	.091	24SO	24ST	1
12	4129492	Hinge			4129491 Forging		1
13	5122158-16	Rib	3⅜x21½	.051	24SO	24ST	1
14	5122158-18	Rib	3⅜x20¾	.051	24SO	24ST	1
15	4129484-2	Hinge			4129485 Forging		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

SECTION V Alighting Gear

1. DESCRIPTION.

The alighting gear is a fully retractable, hydraulically operated tricycle type equipped with oleo pneumatic shock struts. The two main gears are located in the nacelles where they are attached to each side of the nacelle well. They retract up and aft into the nacelles and are enclosed by nacelle doors when retracted. Each main gear assembly consists of a wheel assembly, shock strut, tubular braces and retracting mechanism. The nose wheel gear is located in the fuselage just aft of station 0 where it is attached to each side of the nose wheel tunnel wall. It retracts up and aft and at the same time rotating the wheel about the shock strut axis 90 degrees counterclockwise to provide for its positioning in the nose wheel tunnel. The nose wheel doors operate with the nose wheel to enclose the nose wheel when in the retracted position. The nose wheel gear assembly consists of a yoke assembly, tubular side braces, and the retracting linkage which is attached to the lower end of the shock strut and the nose wheel tunnel cross-tie.

2. DAMAGE.

The alighting gear after being subjected to extremely rough landings should be closely inspected for damage. The two main gears may be inspected for misalignment by using the procedure given on figure 4. Following this procedure a chalk line is held taut between the main gear wheel and the elevator surface at the tail of the airplane. Without any deflection the line should slightly touch each side of the wheel rim and pass approximately one inch inboard of the outboard elevator hinge. Should the line pass the elevator in a different position, the main gear should be thoroughly inspected for bent or fractured members. At the first sign of damage, such as cracked, bent or worn parts, an immediate replacement should be made.

Note

For the removal and disassembly of the alighting gear, refer to the A-26B Erection and Maintenance Handbook AN 01-40AJ-2. For replacement parts, refer to Parts Catalog AN 01-40AJ-4.

3. SPECIFIC REPAIR.

a. REPAIR OF NOSE WHEEL SNUBBER MANIFOLD, PART NO. 5150244. – The following is a repair procedure for manifolds with a stripped thread in the filler plug hole and a modification which eliminates the high torque now required to seal the filler plug.

(1) Drill 0.515 ± 0.002 inch in diameter and 0.787 ± 0.010 inch in depth.

(2) Tap 0.737 ± 0.010 inch in depth using appropriate helicoil tap.

(3) Install helicoil, part No. 1191-8CN x 1/2, 0.075 + 0.015 – 0.000 inch from surface of manifold.

(4) Countersink 120° x 0.625 + 0.015 – 0.000 inch.

b. MODIFICATION OF FILLER PLUG, PART NO. 1150917.

(1) Relieve thread under head of plug forming flat bottomed groove, 0.075 + 0.015 – 0.000 inch in width and 0.427 + 0.002 – 0.003 inch in diameter.

(2) Plug, part No. AN814-5DL, may be used as a suitable substitute for plug, part No. 1150917.

c. INSTALLATION OF PLUG.

(1) Clean all metal chips from interior of manifold.

(2) Install plug using gasket, part No. AN6290-5, or gasket, part No. AN902-5, as a substitute.

(3) Plug head shall bottom snugly when installed with either gasket.

d. SNUBBERS. – Snubbers received for overhaul may be modified in accordance with paragraphs *a.*(1)-(4), *b.*(1), *c.*(1)-(3), eliminating the high torque now required to seal the filler plug.

4. NOSE LANDING WHEEL CROSS-BEAM.

a. DESCRIPTION.– Nose landing wheel cross-beam assemblies are fabricated by flash welding two end fittings to a beam. If the cavities in the end fittings were drilled too far at time of manufacture, trunnion journal will fail in service. Repeated hard landings cause cracks in trunnion journal next to trunnion shoulder.

b. INSPECTION FOR DAMAGE TO CROSS-BEAM.

(1) DRILLED CAVITY.–X-ray cross-beam end fittings using 200KVP X-ray equipment as indicated in Figure 182. If dimension is less than 11/16 inch, the cavity is improperly drilled.

(2) CRACKS.–Use X-ray, magnaflux, or dye penetrant method of inspection to detect cracks in trunnion journals.

c. CLASSIFICATION OF DAMAGE.

(1) REPAIRABLE DAMAGE.–When inspection discloses improperly drilled end fittings or cracks adjacent to either one or both of the trunnion shoulders, rework the entire cross-beam as follows:

(a) Check the cross-beam assembly for centerline straightness in accordance with Douglas Drawing 5280335. Minor cold straightening is permissible.

(b) Clamp the machined surface of the cross-beam at the strut collar section to an angle support on a boring mill and machine off the trunnion journal.

(c) Drill and bore the trunnion journal pin cavity as follows:

1. Using a 7/8 (0.8750) inch drill, drill through face of trunnion shoulder, end fitting cavity, and flash weld bead only.

2. Ascertain the depth to the base of the beam cavity and the minimum diameter.

3. Bore the end fitting and beam cavity in accordance with Figure 183. At least 80 percent of trued surface of the cavity must be maintained.

(d) In the event that the portion of the cavity below the flash weld is approximately 7/8 (0.8750) inch diameter, bore only as necessary to true the surface in order to retain a maximum amount of stock at the externally turned surface. The minimum acceptable cavity wall thickness before boring shall be 0.189 inch.

(e) Manufacture new trunnion journal pins from 4130 steel bar stock heat treated to 150,000 to 170,000 psi. The length of stock shall be sufficient to bottom in the machined cavity and permit finishing the protruding ends in accordance with figure 183.

(f) The diameter of the bar will be as specified in figure 183 and, in the event the beam cavity is smaller than the end fitting cavity as described in step *(c)*, machine a shoulder as necessary to accommodate the different diameters.

(g) After insertion of the new trunnion journal pins in the cross-beam, drill one hole through each end fitting at right angles to the strut lug 1-1/8 inches from trunnion shoulder to provide a body-bound fit for an AN4-22 bolt, and secure with an AN363-428 nut and an AN960-4 washer as shown in figure 183.

(h) After completion of the rework, check alignment of assembly in accordance with Douglas Drawing 5280336.

5. REWORK OF NOSE WHEEL ROTATING MECHANISM ARM, PART NO. 5129977.

The following is a repair procedure for arms that are unserviceable because of worn keyways.

a. Broach existing keyway to 0.206 inch deep and 0.502 inch wide.

b. Manufacture an insert from 4130 chrome molybdenum steel, Specification AN-QQ-6-685, to required dimensions for a 0.002 to 0.003 inch press fit into the enlarged keyway.

c. Heat treat to 125,000 to 145,000 PSI, Rockwell C-45, and cadmium plate.

d. Heat the rotating arm, cool the insert, and install.

e. Broach a keyway in the insert and finish to dimensions called for on Douglas Drawing 5129977.

6. REWORK OF NOSE GEAR SUPPORT, PART NO. 5125796.

The following is a repair procedure for nose gear support, part No. 5125796, having hole for eyebolt, part No. 2126671 elongated beyond blueprint tolerances.

a. Ream hole for installation of a 0.937 inch (maximum outside diameter) bushing, for a class "7" fit.

b. Manufacture bushing from cadmium plate, 4130 chrome molybdenum steel, Specification MIL-S-6758.

c. Ream inside diameter of bushing to blueprint tolerance after installation.

Note

Original hole location must be maintained.

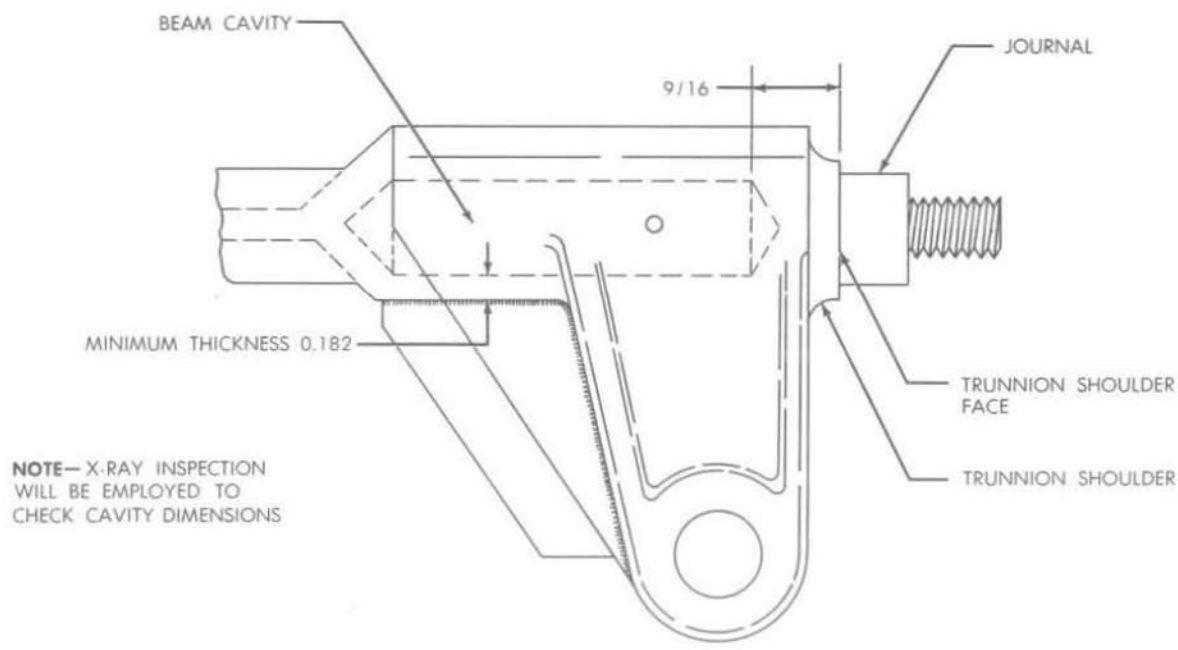


Figure 182—Correct Trunnion Cavity Dimensions

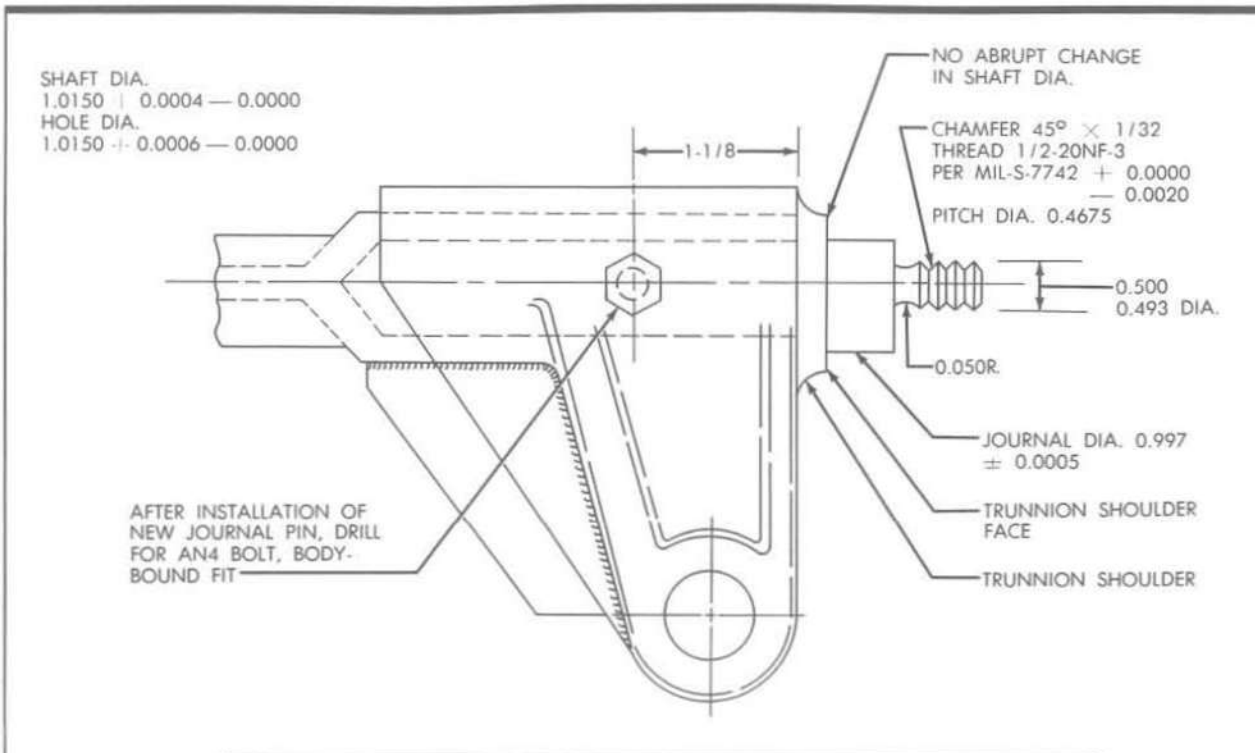


Figure 183—Repair Procedure for Replacing Trunnion Journal

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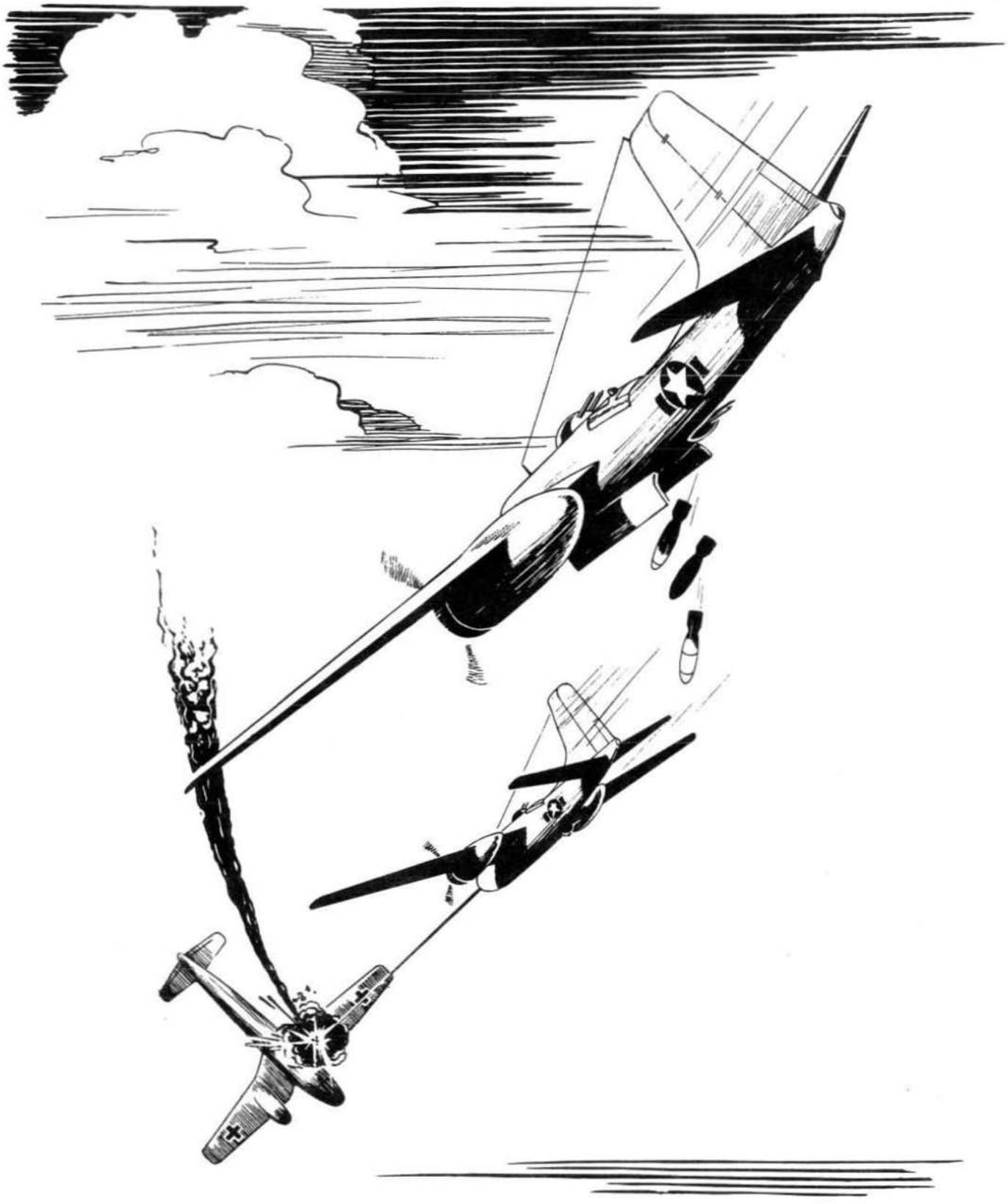


SECTION VI Nacelle Group

1. NACELLE.

a. DESCRITION.—Each of the two nacelles is a semi-monocoque all metal structure provided for the mounting of the engine and its accessories. They are located, one on the under side of each wing between stations 84 and 140.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN01-1-40.

b. GENERAL REPAIR PROCEDURE.—Before any repairs are made to the nacelle structure, it will be necessary to remove all loads to prevent causing a permanent set in the nacelle after the repair is made. It is suggested that several measuring points be selected adjacent to the damage to be used to locate the repair material during the repair procedure.

(1) NACELLE FRAME AND BULKHEAD CONSTRUCTION.—The channel type frames are constructed from formed dural sheet ranging in thickness from .025 to .051. The bulkheads are constructed from dural sheet which is reinforced with extruded dural caps. The aft bulkhead web is stiffened by hat section stiffeners which are placed along the forward side.

(*a*) NEGLIGIBLE DAMAGE—Damage to the bulkhead webs and frames (frames not smaller than four inches in width) that may be considered negligible is as follows: smooth, isolated, holes up to one inch in diameter that do not extend into a radius or flange may be neglected; cracks up to one inch in length may be neglected after having one-eighth inch stop holes drilled at each end.

(*b*) DAMAGE REPAIRABLE BY PATCHING.

1. Damage to the nacelle frames which can be repaired by patching is shown on figures 197, 198 and 199. Figure 197 sheets 1 and 2 of 3 shows the patch repair for damage in the channel type frames located between stations 172 and 283. The material for the patch and the size and number of rivets to be used is selected from the table shown on sheet 2 of 3. The correct rivet pattern to be used for the different width frames is also shown on sheet 2of 3. Figure 198 shows the repair of damage in the horizontal frame at station 283. The damage repaired extends through the flange and into the lightening hole. The patch is constructed from .025 dural sheet and is attached to the top side of the frame. A five-eighths inch bulb angle is attached to the patch to replace the stiffness lost in the damaged lightening hole flange. Figure 199 shows the repair of the web type frame located at station 172.25. The damage shown repaired is partial breaks in the cap lips and fin and a partial break in the web. Patch plates constructed from .072 dural are attached to the cap to repair the lips and fin. The web patch constructed from .072 dural sheet is assisted by a five-eighths by five-eights inch bulb angle provided to replace the stiffness lost in the damaged lightening hole flange.

2. Damage to the nacelle bulkheads which can be repaired by patching is shown on figures 188, 189, 194, 195 and 196. Figure 194 shows the repair of damage in station 156 bulkhead cap and web. Where damage in the cap does not extend into the radius .125 dural splice plates are used to make the repair. Where damage extends into the radius an angle type patch is used to make the repair. It is constructed from .125 dural plate which is formed in 24SO condition and heat treated to 24ST. The web is repaired by the use of a patch plate which is constructed from the same gage and material as the web. Fillers are used where

necessary to provide for attaching structure. Figure 195 shows the repair of damage in station 156 bulkhead vertical channel stiffener and web. The channel is repaired by the use of an angle type patch constructed from .125 dural plate. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attachment of the web. The web is repaired by the use of a patch plate constructed from the same gage and material as the web. Figure 196 shows the repair of damage in station 156 bulkhead web and doubler. Two angle type patches are used to make this repair. The patch used in the repair of the web is constructed of the same gage and material as the web. The patch used in the repair of the doubler is constructed from .125 dural plate. Fillers are used where necessary to replace the lost material. Figure 188 shows the repair of damage in station 118.875 bulkhead channel doubler. An angle type patch is used to make this repair. It is constructed from .072 dural sheet which is formed in the 24SO condition and heat treated to 24ST. Figure 189 shows the repair of damage in station 118.875 bulkhead cap and web. The repair of the cap is accomplished by the use of two patch plates constructed from three-sixteenths inch dural plate. Fillers are used where necessary to provide for attaching parts.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

1. Damage to the nacelle frames which can be repaired by splicing is shown on figures 197 and 199. Figure 197, sheets 1 and 3 of 3, shows the repair of damage in the channel type frames located between stations 172 and 283. The material for the splice and the size and number of rivets to be used is selected from the table shown on sheet 3 of 3. Figure 199 shows the repair of the frame cap located at station 172.25. Two splice angles constructed from .064 dural sheet are used to make this repair. They are formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attaching structure.

2. Damage to the nacelle bulkheads which can be repaired by splicing is shown on figures 193 and 187. Figure 193 shows the repair of damage in station 156 bulkhead cap and web. Two splice angles constructed from .125 dural plate are attached to the cap. They are formed in the 24SO condition and heat treated to 24ST. The web is repaired by the use of a patch plate constructed from the same gage and material as the web. Fillers are used where necessary to provide for attaching parts. Figure 187 shows the repair of damage in station 118.875 bulkhead web. A splice plate constructed from the same gage and material as the web is attached to cover the damage. A one-eighth inch stop hole is drilled at the end of the crack to prevent its lengthening.

(d) DAMAGE NECESSITATING REPLACEMENT.—Any nacelle frame or bulkhead requiring the use of more repair material than is practicable should be replaced.

(2) NACELLE FUEL TANK FLOOR CONSTRUCTION.—The nacelle fuel tank floor is located between stations 118.875 and 156. It is constructed from dual sheet, reinforcing angles and corrugated plate.

(a) NEGLIGIBLE DAMAGE.—Smooth holes in the floor plate up to one inch in diameter and dents that show no sign of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(b) DAMAGE REPAIRABLE BY PATCHING.—Damage to the nacelle fuel tank floor which can be repaired by patching is shown on figure 202. Sheet 1 of 3 shows the repair of the floor skin and corrugation. A patch constructed from .032 dural plate is formed to fit into the corrugation where it is attached by rivets. Fillers are used to replace the material lost in the floor skin and the corrugation. The floor skin is repaired by the use of a patch plate constructed from .081 dural sheet. Sheet 3 of 3 shows the repair of the fuel tank floor support. An angle type patch constructed from .064 dural sheet is attached to the aft side of the support. It is formed in the 24SO condition and heat treated to 24ST.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—Damage to the nacelle fuel tank floor which can be repaired by splicing is shown on figure 202. Sheet 1 of 3 shows the repair of a complete break in the angle stiffeners. A splice angle constructed from .128 dural plate is used to make this repair. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attachment of the floor skin. Sheet 2 of 3 shows the repair of a complete break in the floor channel stiffener. A splice channel constructed from .128 it attached to the inside of the original channel. It is formed in the 24SO condition and heat treated to 24ST. A filler is used to provide for the attachment of the floor skin. Sheet 3 of 3 shows

the repair of a complete break in the floor support web and cap. The cap is repaired by the use of a splice angle constructed from .072 dural sheet. The web is repaired by the use of a splice plate constructed from .064 dural sheet. Fillers are used where necessary to provide for attaching structure.

(d) DAMAGE NECESSITATING REPLACEMENT.—Damage to the fuel tank floor requiring the use of more repair material than is practicable will necessitate replacement.

(3) MECHANIC'S FLOOR CONSTRUCTION.—The mechanic's floor is located between station 93 and 118.75. It is constructed from dural sheet which is reinforced with a corrugated stiffener.

(a) NEGLIGIBLE DAMAGE.—Smooth holes in the floor plate up to one inch in diameter, and dents that show no sign of abrasions may be considered negligible. Cracks up to one and one-half inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(b) DAMAGE REPAIRABLE BY PATCHING.—Damage to the mechanic's floor which can be repaired by patching is shown on figure 203. Two patch plates constructed from the same gage and material as the damaged parts are used to make this repair.

(c) DAMAGE REPAIRABLE BY SPLICING & INSERTION.—It is considered that the repairs mentioned above will be sufficient for the repair of all damages to the mechanic's floor.

(d) DAMAGE NECESSITATING REPLACEMENT.—Damage to the mechanic's floor requiring the use of more repair material than is practicable will necessitate replacement.

(4) LANDING GEAR WELL WALL CONSTRUCTION.—The landing gear well walls are located along each side the well. They are constructed from .032 dural sheets which are riveted together, and stiffened by reinforcing angles.

(a) NEGLIGIBLE DAMAGE. — Smooth holes up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to one and one-half inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(b) DAMAGE REPAIRABLE BY PATCHING.—Damage to the well wall which can be repaired by patching is shown on figure 20. Patch plates constructed from .040 dural sheet are used in the repair of the web and shelf. A five-eighths inch bulb angle is attached to the shelf patch to restore the stiffness lost in the damaged lightening hole flange. The damaged angle stiffener is repaired by the use of a splice angle constructed from dural sheet. It is formed in the 24SO condition and heat treated to 24ST.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—It is considered that the repairs mentioned above will be sufficient for the repair of all damages in the landing gear well wall.

(d) DAMAGE NECESSITATING REPLACEMENT.—Damage to the well wall requiring the use of more repair material than is practicable will necessitate replacement.

(5) ENGINE MOUNT AND OIL TANK SUPPORT CONSTRUCTION.—The engine mount supports are located one along each side of the oil tank between the firewall and front spar. They are constructed from formed dural plate which provides for the attachment of the fixed skin and the removable oil tank cover. The oil tank support is located immediately forward of the front spar between the engine mount supports. It is constructed from formed dural sheet.

(a) NEGLIGIBLE DAMAGE.—No damage in the engine mount or oil tank supports can be considered negligible.

(b) DAMAGE REPAIRABLE BY PATCHING.

1. Damage to the engine mount supports which can be repaired by patching is shown on figure 209. The flanges are shown repaired by the use of angle type patches constructed from .125 dural plate. They are formed in 24SO condition and heat treated to 24ST. The damaged section of the nut strip is replaced and fillers are used where necessary to provide for attaching skin. The web of the engine mount supports is shown repaired by the use of a patch plate constructed from .125 dural plate. These repairs may be used for the repair of damage up to six inches in length.

2. Damage to the oil tank support which can be repaired by patching is shown on figure 211. The upper flange is shown repaired by the angle type patch constructed from .064 dural sheet. It is formed to fit into the inside of the flange where it is attached by rivets. Damage which extends into a lightening hole is shown repaired by the use of an .064 dural

patch plate and a five-eighths by five-eighths inch bulb angle stiffener. The angle is attached to the patch plate to replace the stiffness lost in the removal of the lightening hole flange.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

1. Damage to the engine mount supports which can be repaired by splicing is shown on figure 210. The damaged material is trimmed smooth and fillers are inserted to replace the lost material. A splice zee constructed from .125 dural plate is attached along the inside of the engine mount support. A splice angle constructed from .125 dural plate is attached to the under side of the upper angle. The damaged nut strip is replaced. The removable panel and the fixed skin are repaired by the use of flush type patches constructed from .032 sheet alclad. The fixed skin patch is attached to the skin and the engine mount support, and the removable panel patch is attached to the underside of the panel. Double flush rivets are used for attaching the panel patch where the engine mount support interferes. Fillers are used to maintain the smooth outside surface.

2. Damage to the oil tank support which can be repaired by splicing is shown on figure 211. A splice channel constructed from .064 dural sheet is formed to fit into the inside of the support. Two five-eighths inch bulb angles are attached to the splice channel to replace the stiffness lost in the removal of the lightening hole flange.

(d) DAMAGE NECESSITATING REPLACEMENT.—Damage to the engine mount or oil tank supports requiring the use of more repair material than is practicable will necessitate replacement.

(6) NACELLE SKIN AND SKIN STIFFENER CONSTRUCTION.—The nacelle skin is constructed from alclad sheet ranging in thickness from .020 to .081. The longitudinal skin stiffeners are constructed from extruded angles and hat sections.

(a) NEGILIGIBLE DAMAGE.—Smooth holes in the skin up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(b) DAMAGE REPAIRABLE BY PATCHING.

1. Damage to the skin which can be repaired by patching is shown on figure 205. A hole in the skin is shown repaired by the use of a flush type patch. The hole is trimmed smooth and a filler is inserted to replace the lost material. A patch constructed from the same gage and material as the skin is attached to the inside surface by rivets selected from the table shown. A crack that is greater than two inches in length is also shown repaired by the use of a flush type patch. One-eighth inch stop holes are drilled at each end of of the crack and a patch like that used in the repair of the hole, is attached to the inner surface.

2. Damage to the hat section skin stiffeners which can be repaired by patching is shown on figure 206. A patch plate is formed to fit into the inside of the hat section. The thickness of the patch plate and the size and number of attaching rivets to be used is given in the table shown.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.

1. Damage to the hat section skin stiffeners which can be repaired by splicing is shown on figure 207. Two repair methods are given; one employing the use of a one piece splice and the other employing the use of a two piece splice. The thickness of the splice material and the size and number of attaching rivets to be used is given in the table shown.

2. Damage to the bulb angle skin stiffeners which can be repaired by splicing is shown on figure 208. Method number one shows the angle repaired by the use of a splice angle which is attached to form a tee section. Method number two which is the alternate method shows the angle repaired by the use of a bent up sheet splice. This splice is constructed from .040 24SO dural sheet which is formed to fit around the angle. It is heat treated to 24ST after being formed.

(d) DAMAGE NECESSITATING REPLACEMENT.—Damage to the skin and skin stiffeners requiring the use of more repair material than is practicable will necessitate replacement.

(7) NACELLE DOOR CONSTRUCTION.—The nacelle doors are constructed from alclad sheet extruded reinforcing angles and formed dural ribs.

(a) NEGILIGIBLE DAMAGE.—Smooth holes in the skin or web up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(b) DAMAGE REPAIRABLE BY PATCHING.—Damage to the nacelle doors which can be repaired by patching is shown on figures 214, 216 and 217. Figure 214 shows the repair of damage in the web in the location of a lightening hole. The damage is trimmed smooth and a patch constructed from .040 alclad sheet is attached to the outside surface of the web. Two angle stiffeners constructed from .051 dural sheet are attached to the patch to replace the stiffness lost in the removal of the lightening hole flange. Figure 216 shows the repair of the closing edge angle. A patch plate constructed from .062 alclad is attached to the inside of the angle lip. Figure 217 shows the repair of damage in the web and skin in the location of the closing angle. The skin is repaired by the use of a patch plate constructed from .032 alclad sheet. It is attached to the inside surface of the skin. The web is repaired by the use of a patch plate constructed from .040 alclad sheet. It is attached to the outside surface of the web. Fillers are used where necessary to provide for attaching structure.

(c) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—Damage to the nacelle doors which can be repaired by splicing is shown on figures 215 and 218. Figure 215 shows the repair of damage in the channel ribs. A splice channel constructed from .051 dural sheet is attached to the inside of the rib. The skin and web are repaired by the use of .040 alclad patch plates which are attached to the inside surfaces. No filler is used in the rib since the web and skin patch plates replace the lost material. Figure 218 shows the repair of damage in the closing ribs. Two splice angles constructed from .091 dural sheet are used to make this repair. They are formed in the 24SO condition and heat treated to 24ST. Fillers are used where necessary to provide for the attaching structure.

(d) DAMAGE NECESSITATING REPLACEMENT.—No repairs have been shown for damage in the nacelle hinges, since it is necessary that they be replaced if damaged.

2. ENGINE MOUNT.

a. DESCRIPTION.—The engine mount is a semi-monocoque all metal structure which provides for the attachment of the engine to the nacelle.

b. CONSTRUCTION.—The engine mount is constructed of dural ribs, reinforcing angles and tees, dural skin and corrosion resistant steel skin. The ribs are placed in the mount longitudinally and are provided with fittings at the forward ends for the attachment of the engine to the mount and at the aft end for the attachment of the mount to the nacelle. The reinforcing angles and tees are placed longitudinally between the ribs. The dural skin covers the forward end of the mount and is constructed of .125 sheet. The corrosion resistant steel skin is attached to the aft end of the mount and is constructed from .035 sheet.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN01-1-40.

c. GENERAL REPAIR PROCEDURE.—Before any repairs are made to the engine mount it will be necessary to remove all loads to prevent causing a permanent set in the structure after the repair is made. It is suggested that several measuring points be selected adjacent to the damage to be used to locate the repair material during the repair procedure.

(1) NEGLIGIBLE DAMAGE.—No damage in the engine mount can be considered negligible. Damage to any part will necessitate either repair or replacement.

(2) DAMAGE REPAIRABLE BY PATCHING.—Damage to the engine mount which can be repaired by patching is shown on figures 222, 223, 224, 225 and 226. Figure 222 shows the repair of damage in the rib web and lips. The web is repaired by the use of two patch plates which are attached one on each side of the web. They are constructed from .125 C.M. steel plate which is heat treated to 125,000 psi. The lip is shown repaired by the use of an angle type patch which is constructed from .125 C.M. steel plate. It is formed in the annealed condition and heat treated to 125,000 psi. A filler is used in the lip to replace the lost material. Figure 223 shows the repair of damage in the longitudinal angle stiffeners. A splice bar constructed from .125 dural plate is attached to the inside of the angle. Figure 224 shows the repair of damage in the longitudinal tee stiffeners. Splice bars constructed from .125 dural plate are attached to the lip and fin. Figure 225 shows the repair of the angle ring. The small lip is repaired by the use of a splice bar constructed from .125 dural plate It is attached to the inside of the angle by rivets which follow the original pattern. A filler is used to replace the lost material. The large lip is repaired by the use of two splice bars constructed from

.125 dural plate. One is attached to each side of the lip. A filler is used to replace the lost material. Figure 226 shows the repair of damage in the skin. The hole in the dural is repaired by the use of a patch plate constructed from .125 dural. The crack in the corrosion resistant steel is repaired by the use of a patch plate constructed from .035 steel sheet. One-eighth inch stop holes are drilled at each end of the crack to prevent its lengthening.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—Damage to the engine mount which can be repaired by splicing is shown on figures 221 and 225. Figure 221 shows the repair of a complete break in the ribs. Two C.M. steel splice channels are used to make this repair. They are constructed from .125 plate and attached one along each side of the rib. They are formed in the annealed condition and heat treated to 125,000 psi. The lost material in the rib is replaced by the use of a filler which is formed to the shape of the rib in the location of the damage. Figure 225 shows the repair of a complete break in the angle ring. A splice angle constructed from .125 dural plate is formed to fit into the inside of the original angle. It is formed in the 24SO condition and heat treated to 24ST. A splice plate constructed from .125 dural plate is attached to the back side of the angle. A filler is used to replace the lost material.

(4) DAMAGE NECESSITATING REPLACEMENT.—No repairs have been shown for a complete break in the reinforcing angles or tees since this damage will be cause for replacement.

3. ANTIDRAG RING.

a. DESCRIPTION.—The antidrag ring is a two piece all metal structure mounted on the engine cowl flap bow supports. The upper shell is bolted at the top, forward of the carburetor air duct elbow and the lower shell is attached to the latch locks of the upper shell.

b. CONSTRUCTION.—The antidrag ring is constructed of alclad sheet, reinforcing webs, tees and angles. The alclad sheet is used for the airstream skin, the airstream supporting webs and the outside skin. The reinforcing angles and tees give form and contour to the skin and provide mounting surfaces for the shells.

NOTE

Structural repairs that change the weight of the airplane must be recorded in the Handbook of Weight and Balance Data, Technical Order AN01-1-40.

(1) NEGLIGIBLE DAMAGE. — Smooth isolated holes in the skin up to one inch in diameter and dents that show no signs of abrasions may be considered negligible. Cracks up to two inches in length may be neglected after having had one-eighth inch stop holes drilled at each end.

(2) DAMAGE REPAIRABLE BY PATCHING.—Damage to the antidrag ring which can be repaired by patching is shown on figures 230, 231 and 233. Figure 230 shows the repair damage in the airstream skin. A flush type patch is used to make this repair. It is constructed from .040 alclad sheet and attached to the inside surface. A filler is used to maintain the smooth airstream surface. Figure 231 shows the repair of damage to the outside skin. A flush type patch is used to make this repair. It is constructed from .051 alclad sheet and attached to the inside surface. A filler is used to maintain the smooth skin surface. Figure 233 shows the repair of partial damage in the rear stop tee. Patch plates constructed from .091 dural are used to repair the aft lip and the fin. Since the surfaces must be kept flush on the forward side of the tee no patches may be used in this area.

(3) DAMAGE REPAIRABLE BY SPLICING AND INSERTION.—Damage to the antidrag ring web which can be repaired by splicing is shown on figure 231. The lightening hole flanges are trimmed and a splice plate constructed from .040 is attached to the inside surface. One-half by one-half inch angle stiffeners constructed from .051 dural sheet are attached to the splice plate. The purpose of these angles is to restore the stiffness lost in the removal of the ligthening hole flanges.

(4) DAMAGE NECESSITATING REPLACEMENT.—No repairs have been shown for a complete break in the reinforcing tees or the latch angles since this damage would necessitate replacement.

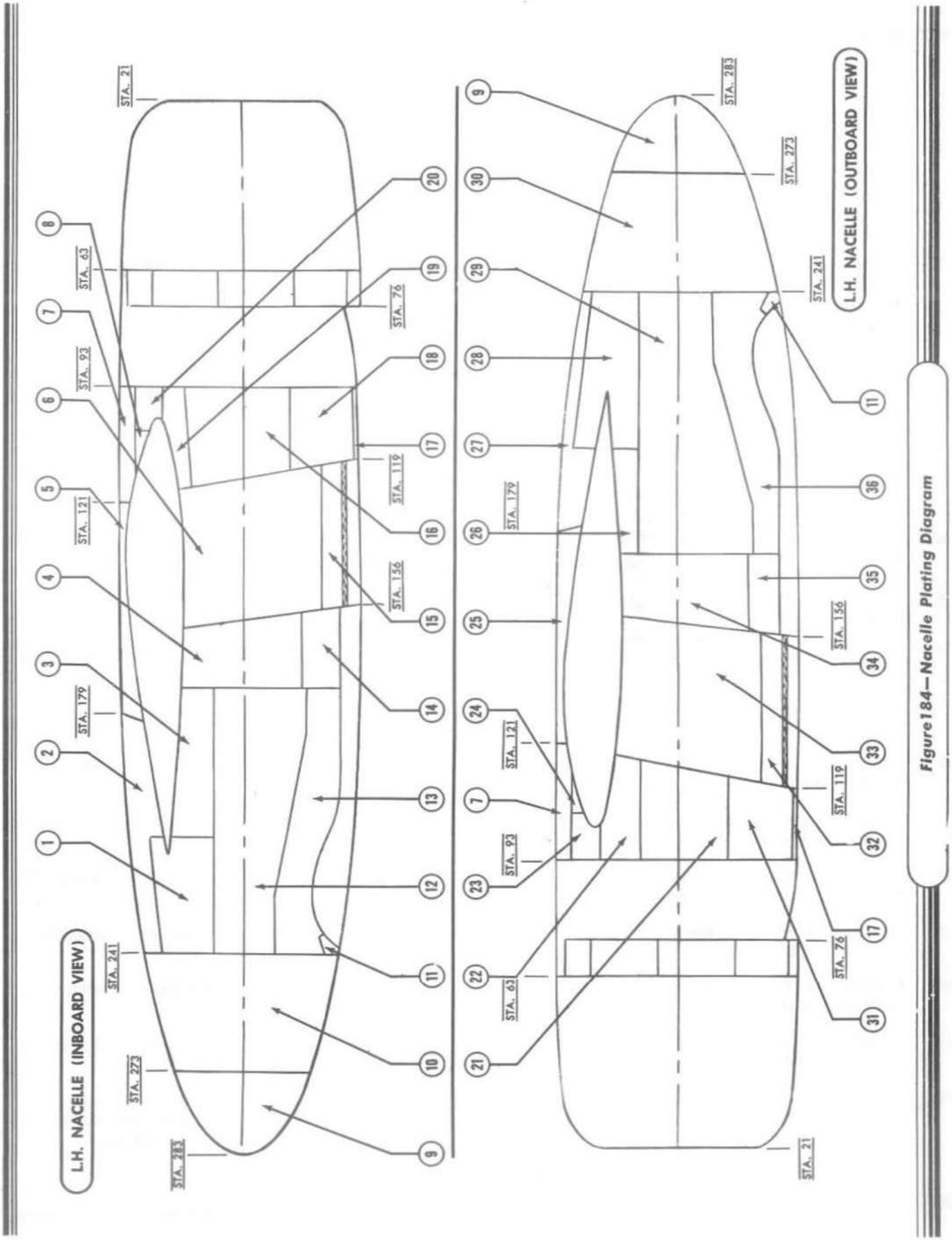


Figure 184—Nacelle Plating Diagram

KEY TO FIGURE 184

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.	Rivet Schedule Lengthwise	Rivet Schedule Crosswise
1	5153029-10 L.H. 5153029-11 R.H.	Skin Panel	18x30	.032	24SO	24ST	1	AN426AD4	AN426AD4
2	5153029-106 L.H. 5153029-107 R.H.	Skin Panel	36x68	.032	24ST		1	AN426AD3	AN426AD3
3	5153029-166 L.H. 5153029-167 R.H.	Skin Panel	10x44	.020	24SO	24ST	1	AN426AD3	AN426AD3
4	5153029-2 L.H. 5153029-3 R.H.	Skin Panel	20x26	.051	24ST		1	AN426AD5	AN426AD4
5	5158966-26 L.H. 5158966-27 R.H.	Fairing	34x63	.040	24ST		1	NOTE: Spotweld -2 &' -26; -3 & -27	
6	5153030-6 L.H. 5153030-7 R.H.	Skin Panel	32x42	.081	24ST		1	AN426AD6	AN426AD6
7	5153030-134 L.H. 5153030-146 R.H.	Skin Panel	34x36	.032	24SO	24ST	1	S1087510-10-10 Screw 5153030-110 Nut Strip	
8	5153030-48 L.H. 5153030-49 R.H.	Skin Panel	20½x24	.032	24SO	24ST	1	AN426AD4	AN426AD4
9	5153031-18 L.H. 5153031-19 R.H.	Skin Panel	13½x57	.032	52SO		1	AN426AD3	AN426AD3
10	5153031-4 L.H. 5153031-5 R.H.	Skin Panel	36x65	.032	24ST		1	AN426AD3	AN426AD4
11	5153029-150 L.H. 5153029-151 R.H.	Skin Panel	12x36	.040	24ST		1	AN426AD3	AN426AD4
12	5153029-108 L.H. 5153029-109 R.H	Skin Panel	26x72	.020	24ST		1	AN426AD3	AN426AD4
13	5153029-14 L.H. 5153029-15 R.H.	Skin Panel	17x72	.020	24ST		1	AN426AD3	AN426AD4
14	5153029-4 L.H. 5153029-5 R.H.	Skin Panel	13x21	.051	24ST		1	AN426AD5	AN426AD5
15	5153030-4 L.H. 5153030-5 R.H.	Skin Panel	17x41	.051	24ST		1	AN426AD5	AN426AD5
16	5153030-2 L.H. 5153030-3 R.H.	Skin Panel	26x27	.064	24ST		1	AN426AD5	AN426AD6
17	5153030-12 L.H. 5153030-13 R.H.	Skin Panel	17½x20¾	.040	24ST		1	AN426AD6	AN426AD5
18	5154632-2	Door	24x25½	.032	61ST		1	NOTE: Install with F6-½-250 Dzus Fast. GF6-½-250 Grommet	

KEY TO FIGURE 184 (Continued)

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*	*Rivet Schedule* *Lengthwise*	*Crosswise*
19	5153030-10 L.H. 5153030-11 R.H.	Skin Panel	16x28	.032	24SO	24ST	1	AN426AD4	AN426AD4
20	5153030-50 L.H. 5153030-51 R.H.	Skin Panel	10x21	.032	24SO	24ST	1	AN426AD4	AN426AD4
21	5153030-22 L.H. 5153030-23 R.H.	Skin Panel	26x27	.064	24ST		1	AN426AD5	AN426AD5
22	5153030-20 L.H. 5153030-21 R.H.	Skin Panel	14x28	.032	24SO	24ST	1	AN426AD4	AN426AD4
23	5153030-14 L.H. 5153030-15 R.H.	Skin Panel	10x21	.032	24SO	24ST	1	AN426AD4	AN426AD4
24	5153030-42 L.H. 5153030-43 R.H.	Skin Panel	16½x22	.032	24SO	24ST	1	AN426AD4	AN426AD4
25	5158966-2 L.H. 5158966-3 R.H.	Fairing	34x63	.040	24ST		1	Install with S-1029421-10-7, S-1029421-416-12, S-1029421-416-10, S-1029421-10-10 Screws	
26	5153029-104 L.H. 5153029-105 R.H.	Skin Panel	10x36	.020	24SO	24ST	1	AN426AD3	AN426AD4
27	5153029-12 L.H. 5153029-13 R.H.	Skin Panel	36x70	.032	24ST		1	AN426AD4	AN426AD5
28	5153029-8 L.H. 5153029-9 R.H.	Skin Panel	25x48	.032	24SO	24ST	1	AN426AD3	AN426AD4
29	5153029-164 L.H. 5153029-165 R.H.	Skin Panel	30x72	.025	24ST		1	AN426AD3	AN426AD4
30	5153031-2 L.H. 5153031-3 R.H.	Skin Panel	36x65	.032	24ST		1	AN426AD3	AN426AD4
31	5154635-2	L.H. Door	24x26	.032	61ST		1	NOTE: Install with F-6-45 Dzus Fast. GF6-250 Grommet	
32	5153030-18 L.H. 5153030-19 R.H.	Skin Panel	17x41	.051	24ST		1	AN426AD5	AN426AD5
33	5153030-16 L.H. 5153030-17 R.H.	Skin Panel	38x41	.072	24ST		1	AN426AD6	AN426AD6
34	5153029-6 L.H. 5153029-7 R.H.	Skin Panel	20x32	.051	24ST		1	AN426AD5	AN426AD5
35	5153029-52 L.H. 5153029-53 R.H.	Skin Panel	15x21	.051	24ST		1	AN426AD5	AN426AD5
36	5153029-16 L.H. 5153029-17 R.H.	Skin Panel	17x72	.025	24ST		1	AN426AD3	AN426AD4

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

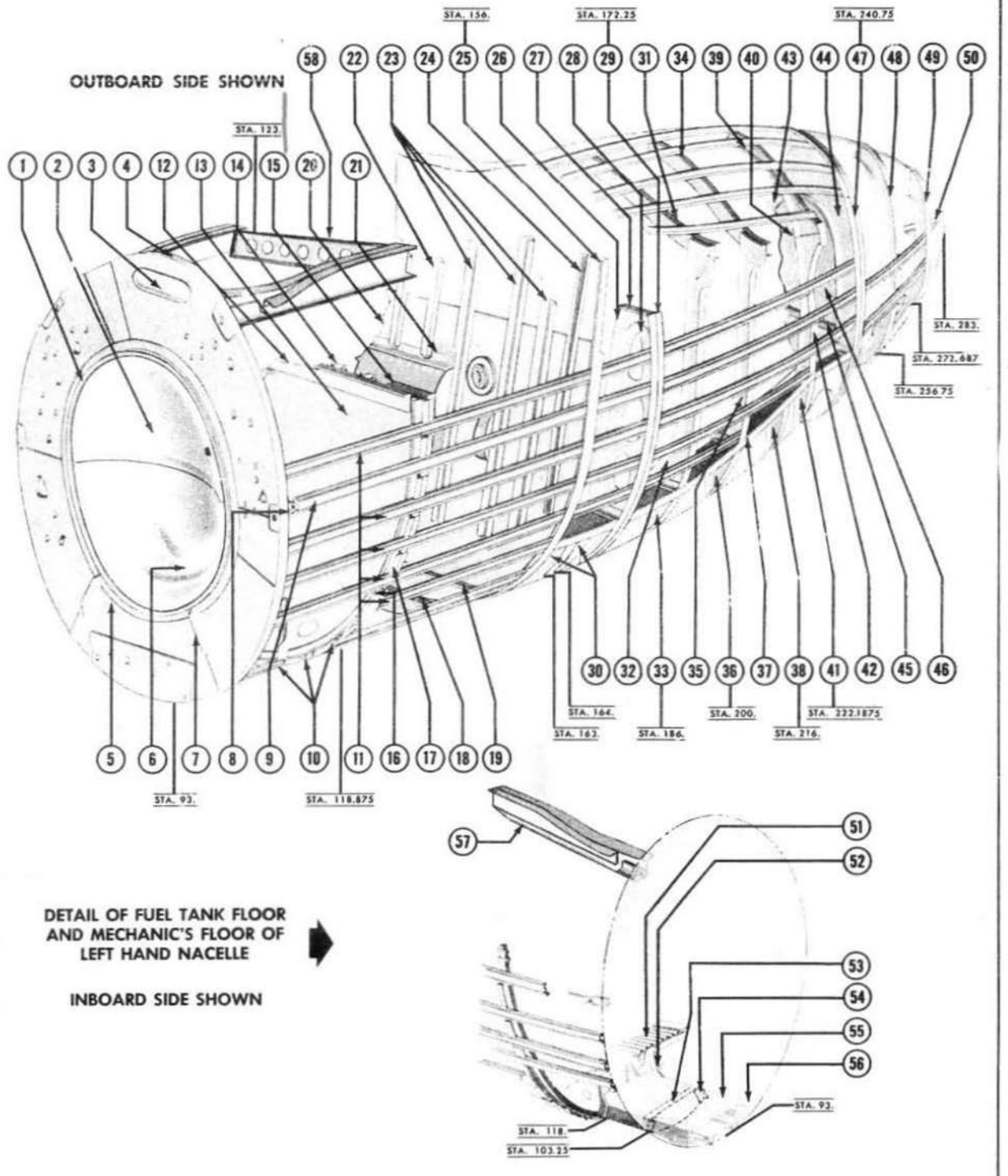


Figure185–Nacelle Structure (Left Hand Shown)

KEY TO FIGURE 185

L.H. and R.H. indicates Left Hand and Right Hand Nacelle. If no L.H. or R.H. follows the part number, such numbers are used on both nacelles.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req. Assem.
1	5202687-10 L.H.	Stiffener	2⅛x120	.062	Corr. Res. Steel		1
	5202688-10 R.H.	Stiffener	2⅛x120	.062	Corr. Res. Steel		1
2	5122034-2	Panel Assem. (Upper)	28x47	.020	Corr. Res. Steel		1
3	5202687-12 L.H.	Support	6½x10	.035	Corr. Res. Steel		1
	5202688-12 R.H.	Support	6½x10	.035	Corr. Res. Steel		1
4	5125627-2 L.H.	Angle S-167892	Length 133		24SO	24ST	1
	5125627-4 L.H.	Angle S-167892	Length 53		24SO	24ST	1
	5125489-2 R.H.	Angle S-167892	Length 133		24SO	24ST	1
	5125489-4 R.H.	Angle S-167892	Length 53		24SO	24ST	1
5	5202687-8 L.H.	Ring	9½x32	.062	Corr. Res. Steel		3
	5202688-8 R.H.	Ring	9½x32	.062	Corr. Res. Steel		3
6	5122034-4	Panel Assem. (Lower)	28x47	.020	Corr. Res. Steel		1
7	5202687-32 L.H.	Angle S-1081111	Length 10-11/16		24ST		2
	5202688-32 R.H.	Angle S-1081111	Length 10-11/16		24ST		2
8	4127449-2 R.H. Inbd.	Engine Mount Support Fitting (Lower) — Made from 4123169 14ST Blank Forging					1
	4127449-2 L.H. Outbd.	Engine Mount Support Fitting (Lower) — Made from 4123169 14ST Blank Forging					1
	4127449-4 R.H. Outbd.	Engine Mount Support Fitting (Lower) — Made from 4123169 14ST Blank Forging					1
	4127449-4 L.H. Inbd.	Engine Mount Support Fitting (Lower) — Made from 4123169 14ST Blank Forging					1
	4123170-10	Engine Mount Support Fitting (Side) — Made from 4123169 14ST Blank Forging					2
	4123168-2 L.H. Inbd.	Engine Mount Support Fitting (Upper) — Made from 4123167 Blank Forging					1
	4123168-3 R.H. Inbd.						1
	4123168-4 L.H. Outbd.	Engine Mount Support Fitting — Made from 4123167 Blank Forging					1
	4123168-5 R.H. Outbd.						1
9	5153030-58 L.H. Outbd.	Longeron	4-11/16x60¼	.091	24SO	24ST	1
	5153030-59 R.H. Outbd.						1
	5153030-38 L.H. Inbd.	Longeron	4-11/16x56½	.091	24SO	24ST	1
	5153030-39 R.H. Inbd.						1
10	5153030-68 L.H. Outbd.	Longeron	4-3/16x9¼	.064	24SO	24ST	1
	5153030-69 R.H. Outbd.						1
	5153030-34 L.H. Inbd.	Longeron	4-3/16x39½	.064	24SO	24ST	1
	5153030-35 R.H. Inbd.						1
	5153030-70 L.H. Outbd.	Longeron	4-3/16x39	.064	24SO	24ST	1
	5153030-71 R.H. Outbd.						1
	5153030-36 L.H. Inbd.	Longeron	4-3/16x39	.064	24SO	24ST	1
	5153030-37 R.H. Inbd.						1
	5153030-74 L.H. Outbd.	Longeron	4-3/16x20¾	.064	24SO	24ST	1
	5153030-75 R.H. Outbd.						1
	5153030-40 L.H. Inbd.	Longeron	4-3/16x20¾	.064	24SO	24ST	1
	5153030-41 R.H. Inbd.						1
11	5153030-56 L.H. Outbd.	Longeron	4-3/16x65	.091	24SO	24ST	1
	5153030-57 R.H. Outbd.						1
	5153030-174 L.H. Inbd.	Longeron	4-3/16x27	.091	24SO	24ST	1
	5153030-175 R.H. Inbd.						1
	5153030-60 L.H. Outbd.	Longeron	4-3/16x63	.091	24SO	24ST	1
	5153030-61 R.H. Outbd.						1
	5153030-26 L.H. Inbd.	Longeron	4-3/16x63½	.091	24SO	24ST	1
	5153030-27 R.H. Inbd.						1
	5153030-62 L.H. Outbd.	Longeron	4-3/16x62½	.091	24SO	24ST	1
	5153030-63 R.H. Outbd.						1
	5153030-28 L.H. Inbd.	Longeron	4-3/16x62¾	.091	24SO	24ST	1
	5153030-29 R.H. Inbd.						1
	5153030-64 L.H. Outbd.	Longeron	4-3/16x62	.091	24SO	24ST	1
	5153030-65 R.H. Outbd.						1
	5153030-30 L.H. Inbd.	Longeron	4-3/16x62¼	.091	24SO	24ST	1
	5153030-31 R.H. Inbd.						1
	5153030-66 L.H. Outbd.	Longeron	4-3/16x38½	.091	24SO	24ST	1
	5153030-67 R.H. Outbd.						1

KEY TO FIGURE 185 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req. Assem.
	5153030-32 L.H. Inbd.	Longeron	4-3/16x38½	.091	24SO	24ST	1
	5153030-33 R.H. Inbd.						1
12	5153648-24 L.H.	Angle	4x21½	.072	24ST		1
	5153648-25 R.H.						1
13	5153648-2 L.H.	Web	46x58	.072	24SO	24ST	1
	5153648-3 R.H.						1
14	5153648-14	Stiffener	3-3/16x34	.091	24SO	24ST	1
	5153648-16	Stiffener	3-3/16x34	.091	24SO	24ST	1
	5153648-18	Stiffener	3-3/16x33	.091	24SO	24ST	1
	5153648-20	Stiffener	3-3/16x32	.091	24SO	24ST	1
	5153648-22	Stiffener	3-3/16x31	.091	24SO	24ST	1
15	4123165 L.H. Outbd.	Fitting	Made from 4123155-1 14ST Blank Forging				1
	4123156 L.H. Inbd.	Fitting	Made from 4123155 14ST Blank Forging				1
	4123165-1 R.H.	Fitting	Made from 4123155 14ST Blank Forging				1
	4123156-1 R.H.	Fitting	Made from 4123155-1 14ST Blank Forging				1
16	5153648-12 L.H.	Angle S-1125517	Length 125		24SO	24ST	1
	5153648-13 R.H.						1
17	5153648-32 L.H. Inbd.	Angle	6x26½	.072	24SO	24ST	1
	5153648-33 R.H. Inbd.						1
	5153648-34 L.H. Outbd.	Angle	4⅞x22	.072	24SO	24ST	1
	5153648-35 R.H. Outbd.						1
	5153648-36 L.H. Bottom	Angle	5¼x8¾	.156	24SO	24ST	1
	5153648-37 R.H. Bottom						1
18	5157864-2 L.H.	Web	10x37½	.064	24ST		1
	5157864-3 R.H.						1
	5157864-4 L.H.	Angle	8x36	.051	24ST		1
	5157864-5 R.H.						1
19	5157865-2 L.H.	Web	10x37½	.064	24ST		1
	5157865-3 R.H.						1
	5157865-4 L.H.	Angle	8x36	.051	24ST		1
	5157865-5 R.H.						1
20	5154626-2	Web	44x57	.064			1
21	4123626	Main Tank Gage Collar			Dural Casting		1
22	5154626-14 Outbd.	Stiffener	4-3/16x23½	.064	24ST		1
	5154626-16 Inbd.	Stiffener	4-3/16x23½	.064	24ST		1
23	5154626-12 L.H. Outbd.	Stiffener	4-11/16x47	.091	24ST		1
	5154626-13 R.H. Outbd.						1
	5154626-10 L.H.	Stiffener	4-11/16x47		24SO	24ST	1
	5154626-11 R.H.						1
	5154626-8	Stiffener	4-11/16x38		24ST		1
	5154626-18 L.H. Inbd.	Stiffener	4-11/16x44		24ST		1
	5154626-19 R.H. Inbd.						1
24	5154626-6 L.H. Outbd.	Channel S-1125512	Length 44		24ST		1
	5154626-7 R.H. Outbd.						1
	5154626-20 L.H. Inbd.	Channel S-1125511	Length 39		24ST		1
	5154626-21 R.H. Inbd.						1
25	5154626-4 L.H.	Tee S-1152368	Length 146		24SO	24ST	1
	5154626-5 R.H.						1
26	5154629-8 L.H. Outbd.	Tee S-1093762	Length 40		24SO	24ST	1
	5154629-9 R.H. Outbd.						1
	5154629-4 L.H. Inbd.	Tee S-1093762	Length 34		24SO	24ST	1
	5154629-30 R.H. Inbd.	Tee S-1093762	Length 34		24SO	24ST	1
27	2190956 L.H. Outbd.	Angle S-1125575	Length 67⅞		24SO	24ST	1
	2190956-1 R.H. Outbd.						1
	2190957 L.H. Inbd.	Angle S-1125575	Length 63⅜		24SO	24ST	1
	2190957-1 R.H. Inbd.						1
28	5154629-12 L.H. Outbd.	Web	11x40	.025	24SO	24ST	1
	5154629-13 R.H. Outbd.						1

KEY TO FIGURE 185 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req. Assem.
	5154629-2 L.H. Inbd.	Web	9½x35		24SO	24ST	1
	5154629-34 R.H. Inbd.	Web	9½x35		24SO	24ST	1
29	5154629-6 L.H. Inbd.	Tee S-1093781	Length 38		24SO	24ST	1
	5154629-32 R.H. Inbd.	Tee S-1093781	Length 38		24SO	24ST	1
	5154629-10 L.H. Outbd.	Tee S-1093781	Length 45		24SO	24ST	1
	5154629-11 R.H. Outbd.						1
30	4154080 L.H. Outbd.	Bulkhead	9x9⅜	.040	24ST		1
	4154080-1 R.H. Outbd.						1
	4154079 L.H. Inbd.	Bulkhead	7½x8½	.040	24ST		1
	4154079-1 R.H. Inbd.						1
	4154081 L.H. Inbd.	Bulkhead	7½x8½	.040	24ST		1
	4154081-1 R.H. Inbd.						1
	4154082 L.H. Outbd.	Bulkhead	9x9½	.040	24ST		1
	4154082-1 R.H. Outbd.						1
31	5153554-2 L.H.	Former	11½x54¾	.040	24SO	24ST	1
	5153554-3 R.H.						1
32	5153554-4 L.H. Outbd.	Former	9½x40	.040	24SO	24ST	1
	5153554-5 R.H. Outbd.						1
	5153554-6 L.H. Inbd.	Former	7½x38	.040	24SO	24ST	1
	5153554-7 R.H. Inbd.						1
33	4154086 L.H. Inbd.	Former	6¾x8	.040	24SO	24ST	1
	4154086-1 R.H. Inbd.						1
	4154087 L.H. Outbd.	Former	8x9¼	.051	24SO	24ST	1
	4154087-1 R.H. Outbd.						1
34	5153509-2 L.H.	Former	14x50	.040	24SO	24ST	1
	5153509-3 R.H.						1
35	5153509-4 L.H. Outbd.	Former	7½x33	.040	24SO	24ST	1
	5153509-5 R.H. Outbd.						1
	5153509-6 L.H. Inbd.	Former	7x31	.040	24SO	24ST	1
	5153509-7 R.H. Inbd.						1
	5153509-8 L.H. Outbd.	Former	2-7/16x5½	.032	24ST		1
	5153509-9 R.H. Outbd.						1
36	4154085 L.H. Inbd.	Former	7½x10¾	.032	24SO	24ST	1
	4154085-1 R.H. Inbd.						1
	4154084 L.H. Outbd.		11¾x8½	.040	24SO	24ST	1
	4154084-1 R.H. Outbd.						1
37	5154628-2 L.H. Outbd.	Web	18¾x71⅜	.032	24SO	24ST	1
	5154628-3 R.H. Outbd.						1
	5154628-4 L.H.	Shelf	14½x71¼		24SO	24ST	1
	5154628-5 R.H.						1
	5154628-6 L.H.	Angle S-1677883	Length 73		24SO	24ST	1
	5154628-7 R.H.						1
	5154627-2 L.H. Inbd.	Web	19½x71⅜	.032	24SO	24ST	1
	5154627-3 R.H. Inbd.						1
	5154627-4 L.H. Inbd.	Shelf	14½x71¼	.032	24SO	24ST	1
	5154627-5 R.H. Inbd.						1
	5154627-6 L.H. Inbd.	Angle S-167883	Length 73		24SO	24ST	1
	5154627-7 R.H. Inbd.						1
38	4154077 L.H. Outbd.	Former	5¼x9⅜	.040	24SO	24ST	1
	4154077-1 R.H. Outbd.						1
	4154078 L.H. Inbd.	Former	5x8	.040	24SO	24ST	1
	4154078-1 R.H. Inbd.						1
39	5153547-4 L.H.	Former	15½x37½	.040	24SO	24ST	1
	5153547-5 R.H.						1
40	5153547-10 L.H. Outbd.	Bracket	2⅝x6	.040	24SO	24ST	1
	5153547-11 R.H. Outbd.						1
	5153547-8 L.H. Inbd.	Bracket	5x8¾	.040	24SO	24ST	1
	5153547-9 R.H. Inbd.						1

KEY TO FIGURE 185 (Continued)

Ref.	Part No.		Description	Size	Gage	Material	H.T.	No. Req.
41	4154088	L.H. Inbd.	Former	4¾x8¾	.032	24SO	24ST	1
	4154088-1	R.H. Inbd.						1
	4154089	L.H. Outbd.	Former	4½x9¼	.032	24SO	24ST	1
	4154089-1	R.H. Outbd.						1
42	5153547-2	L.H. Outbd.	Former	4¾x22	.040	24SO	24ST	1
	5153547-3	R.H. Outbd.						1
	5153547-6	L.H. Inbd.	Former	6½x19½	.040	24SO	24ST	1
	5153547-7	R.H. Inbd.						1
43	5153581-20	L.H. Inbd.	Angle	7x30	.032	24SO	24ST	1
	5153581-21	R.H. Inbd.						1
	5153581-4	L.H. Outbd.	Angle	14x30	.032	24SO	24ST	1
	5153581-5	R.H. Outbd.						1
44	5153581-2	L.H.	Web	30x48	.040	24SO	24ST	1
	5153581-3	R.H.						1
45	5153581-6	L.H.	Angle S-167883	Length 22		24ST		1
	5153581-7	R.H.						1
46	5153581-16	L.H.	Door Assembly			Canvas		1
	5153581-17	R.H.						1
47	5153680-2	L.H	Former	24x30	.032	24SO	24ST	1
	5153680-3	R.H.						1
	5153680-4	L.H.	Former	24x30	.032	24SO	24ST	1
	5153680-5	R.H.						1
	5153680-6	L.H.	Clip	2-1/16x3⅜		24SO	24ST	1
	5153680-7	R.H.						1
	5153680-8	L.H.	Clip	2-1/16x3⅜		24SO	24ST	1
	5153680-9	R.H.						1
	5153680-10		Seal S-1056284	Length 16		Synthetic Rubber		1
	5153680-12		Seal S-1056284	Length 22½		Synthetic Rubber		1
	5153680-14		Seal S-1056284	Length 22		Synthetic Rubber		1
	5153680-16		Seal S-1056284	Length 13¼		Synthetic Rubber		1
	5153680-18		Seal S-1056284	Length 18		Synthetic Rubber		1
	5153680-20		Seal S-1056284	Length 15		Synthetic Rubber		1
48	5153665	L.H.	Former	22x41	.032	24SO	24ST	1
	5153665-1	R.H.						1
49	4154068	L.H.	Former	11x26	.025	24SO	24ST	1
	4154068-1	R.H.						1
50	4154083	L.H.	Nacelle Cone Former	10x13	.025	24SO	24ST	1
	4154083-1	R.H.						1
51	Nacelle Fuel Tank Floor (Partial View) See figure 200 for detailed drawing.							
52	5153648-6		Angle	4x10	.072	24SO	24ST	1
	5153648-7							1
	5153648-8	L.H.	Angle	8½x17¼	.072	24ST		1
	5153648-9	R.H.						1
53	4154071-2		Web	7½x20½	.064	24SO	24ST	1
	4154071-4		Doubler	4-9/16x7-11/16	.064	24SO	24ST	1
54	4154073-4	L.H.	Angle	Length 3-9/16		24ST		1
	4154073-5	R.H.						1
55	5190445-2		Floor	17¾x21-17/32	.032	24ST		1
	5190445-4		Corrugation	18¾x22-9/16	.020	24ST		1
56	4154073-2		Intecostal	5¼x21	.040	24ST		1
	4154073-3							1
57	5157862-2	L.H. Inbd.	Support	9x31	.125	24SO	24ST	1
	5157862-3	R.H. Inbd.						1
	5157862-4	R.H. Inbd.	Angle	4½x19	.125	24SO	24ST	1
	5157862-5	L.H. Inbd.						1
	5157863-2	L.H. Outbd.	Support	9x31	.125	24SO	24ST	1
	5157863-3	R.H. Outbd.						1
	5157863-4	L.H. Outbd.	Angle	4¼x23	.125	24SO	24ST	1
	5157863-5	R.H. Outbd.						1
58	5192518-2	L.H.	Support	9x34¾	.051	24SO	24ST	1
	5192518-3	R.H.						1

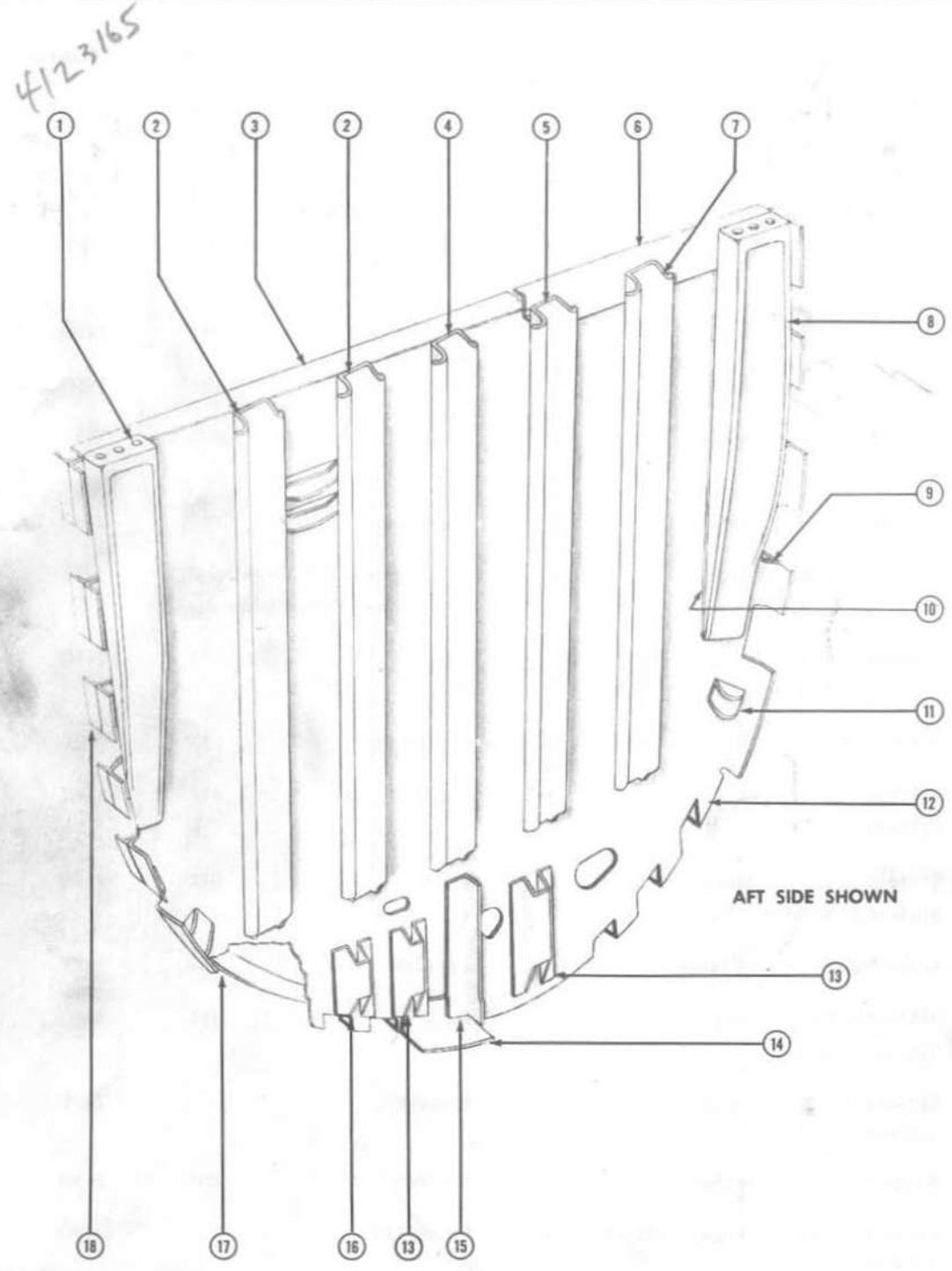


Figure 186—Nacelle Bulkhead Assembly—Sta. 118.875 (Sheet 1 of 2)

KEY TO FIGURE 186

Note: L.H. or R.H. indicates left-hand or right-hand assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	4123165 L.H.	Fitting	Made from 4123155-1 Blank Forg.		14ST		1
	4123165-1 R.H.		Made from 4123155 Blank Forg.				1
2	S-1074428	Stiffener	3-3/16x34	.091	24SO	24ST	2
3	5153648-26 L.H.	Channel	5x52¾	.072	24ST		1
	5153648-27 R.H.						1
4	S-1074428	Stiffener	3-13/16x33	.091	24SO	24ST	1
5	S-1074428	Stiffener	3-13/16x32	.091	24SO	24ST	1
6	5153648-24 L.H.	Angle	4x21½	.072	24ST		1
	5153648-25 R.H.						1
7	S-1074428	Stiffener	3-13/16x31	.091	24SO	24ST	1
8	4123156 L.H.	Fitting	Made from 4123155 Blank Forg.		14ST		1
	4123156-1 R.H.		Made from 4123155-1 Blank Forg.				1
9	5153648-34 L.H.	Angle	4⅞x22	.072	24SO	24ST	1
	5153648-35 R.H.						1
10	5153648-28	Filler	3⅛x20½	.072	24ST		1
11	1122835	Clip	1¾x5¼	.091	24SO		1
	1122835-1						1
12	5153648-2 L.H.	Sheet	46x58	.072	24SO	24ST	1
	5153648-3 R.H.						1
13	S-1093772	Stiffener	4-3/16x6	.064	24ST		2
14	5153648-36 L.H.	Angle	5¼x8¾	.156	24SO	24ST	1
	5153648-37 R.H.						1
15	5153648-10 L.H.	Angle S-169097	Length 6¼		24ST		1
	5153648-11 R.H.						1
16	S-1093772	Stiffener	4-3/16x5	.064	24SO	24ST	1
17	5153648-12 L.H.	Angle S-1125517	Length 125		24SO	24ST	1
	5153648-13 R.H.						1
18	5153648-32 L.H.	Angle	6x26½	.072	24SO	24ST	1
	5153648-33 R.H.						1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

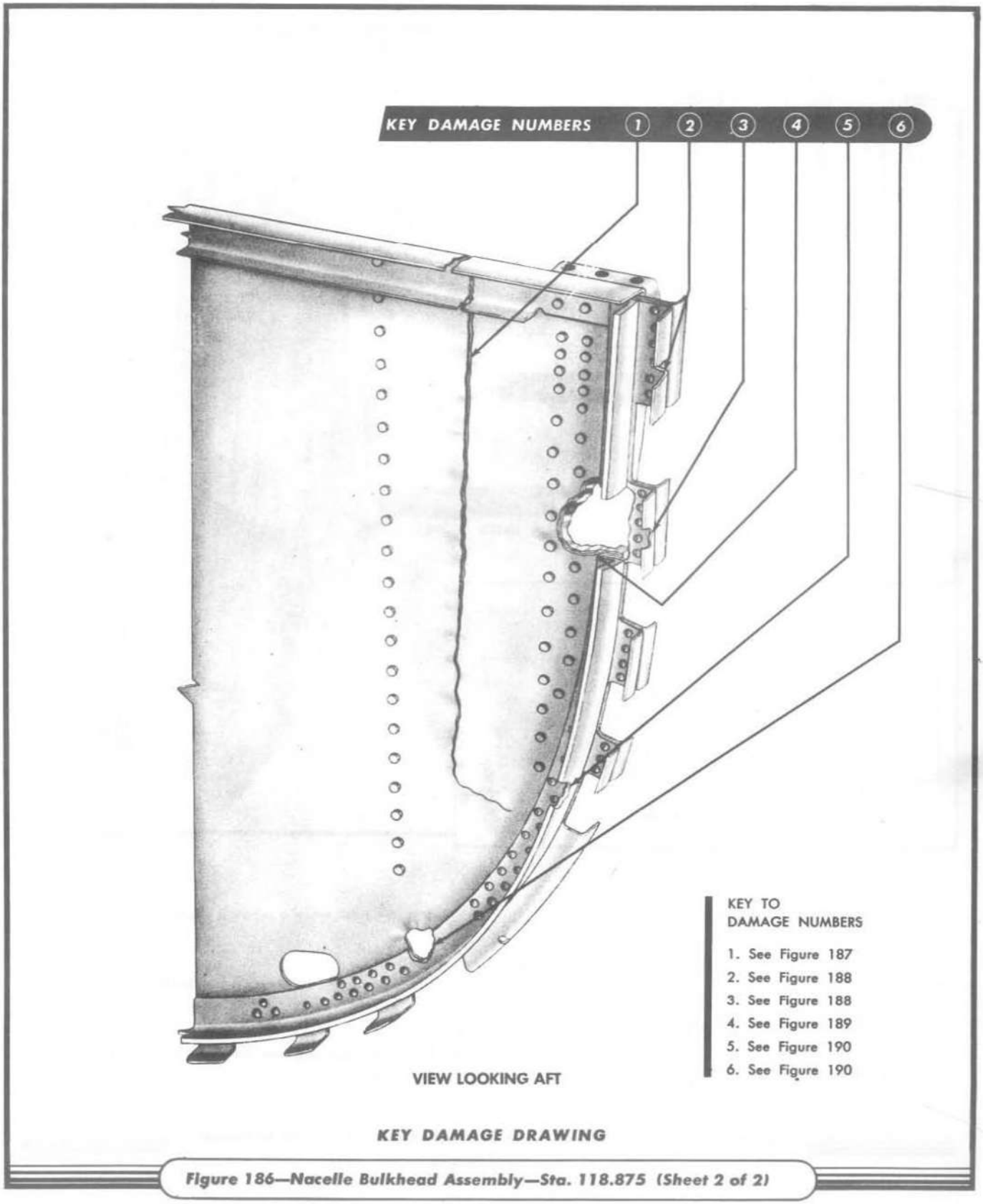
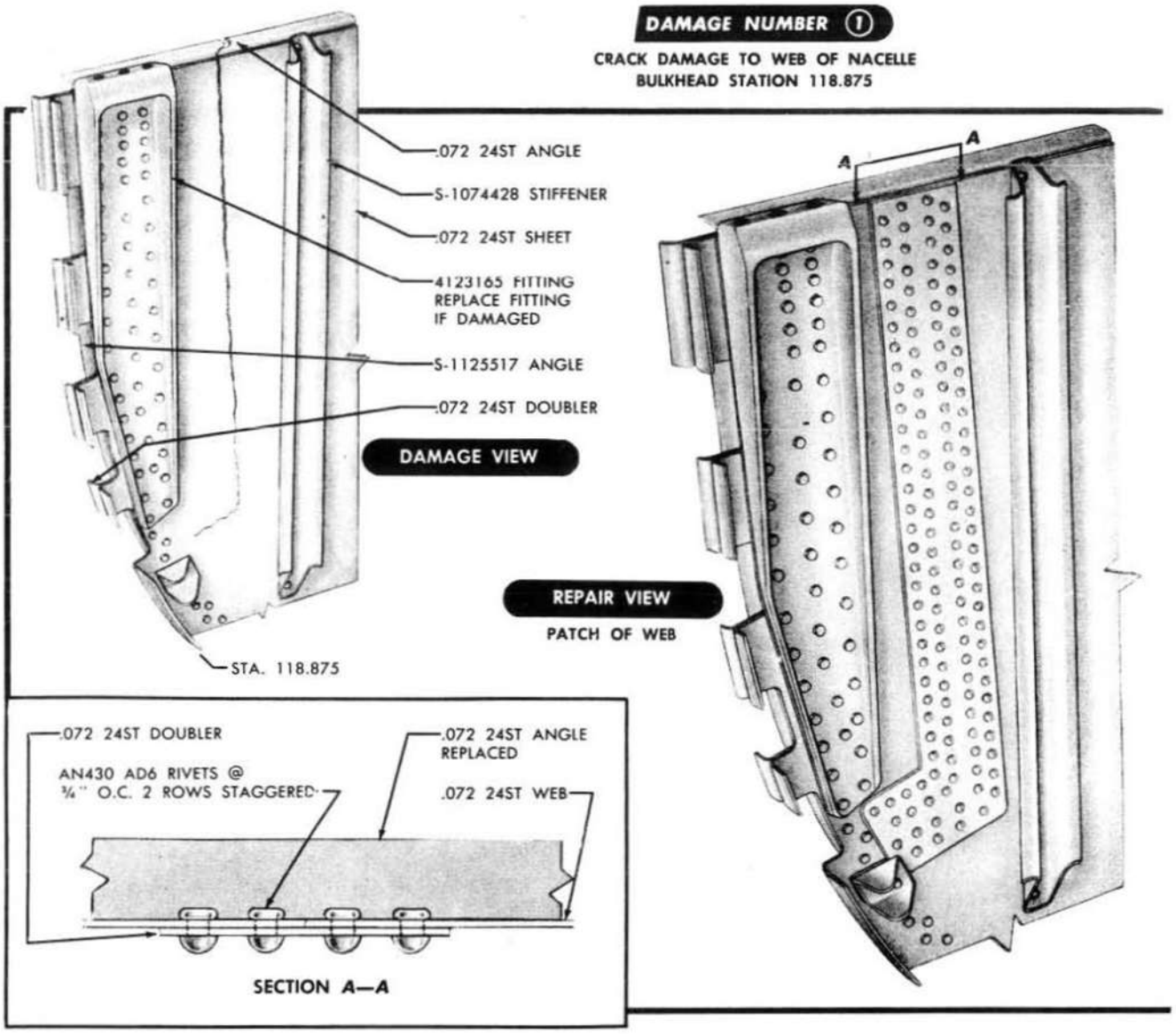


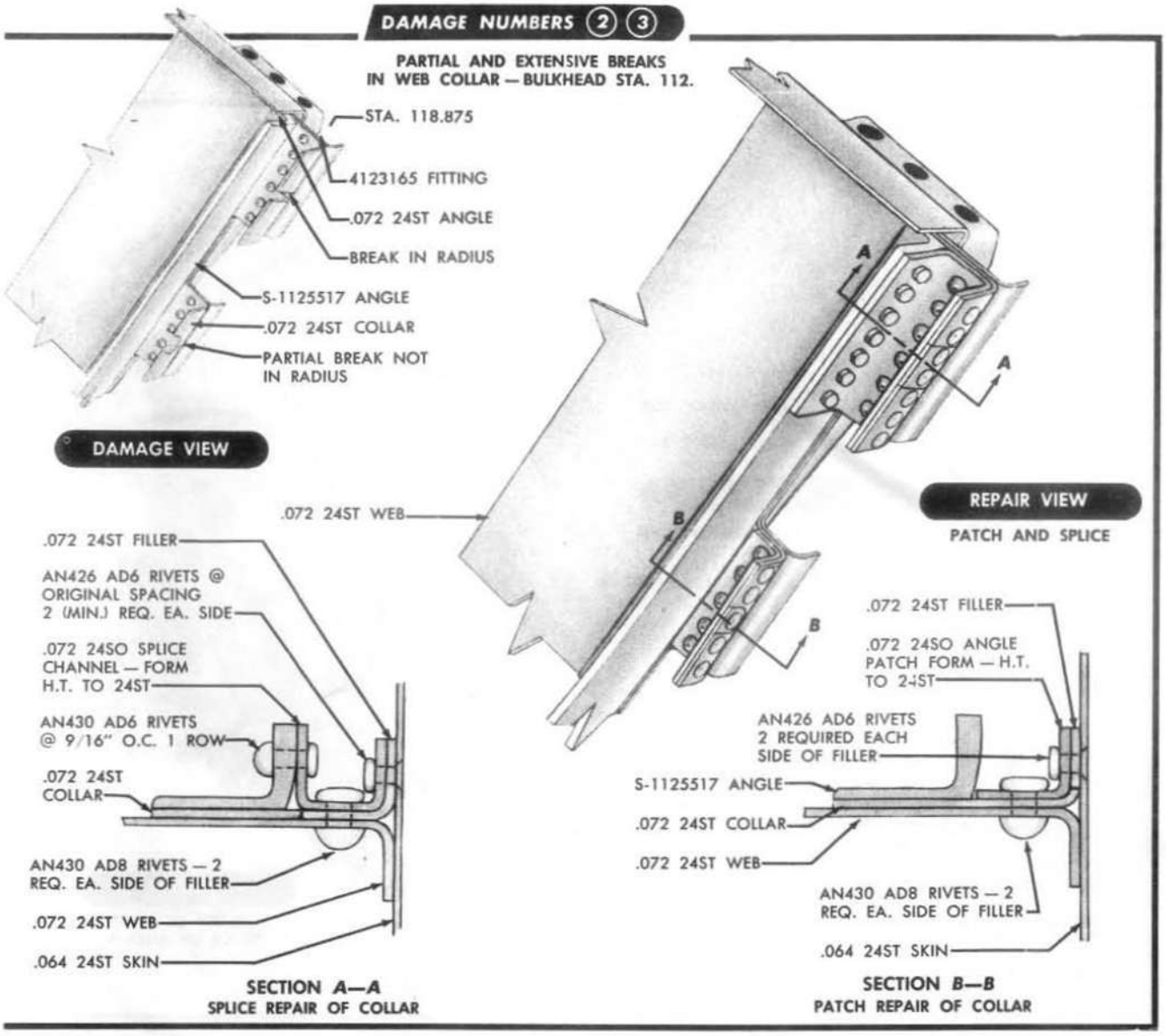
Figure 186—Nacelle Bulkhead Assembly—Sta. 118.875 (Sheet 2 of 2)



NOTES

1. Remove all interfering rivets.
2. Drill one-eighth inch stop holes at each end of crack.
3. Construct patch from .072 24ST material.
4. Replace all damaged clips, brackets, angles, and fittings except when a repair is shown.
5. Use existing rivet holes where possible.
6. For rivet edge and row distance, see Figure 7, Section I.

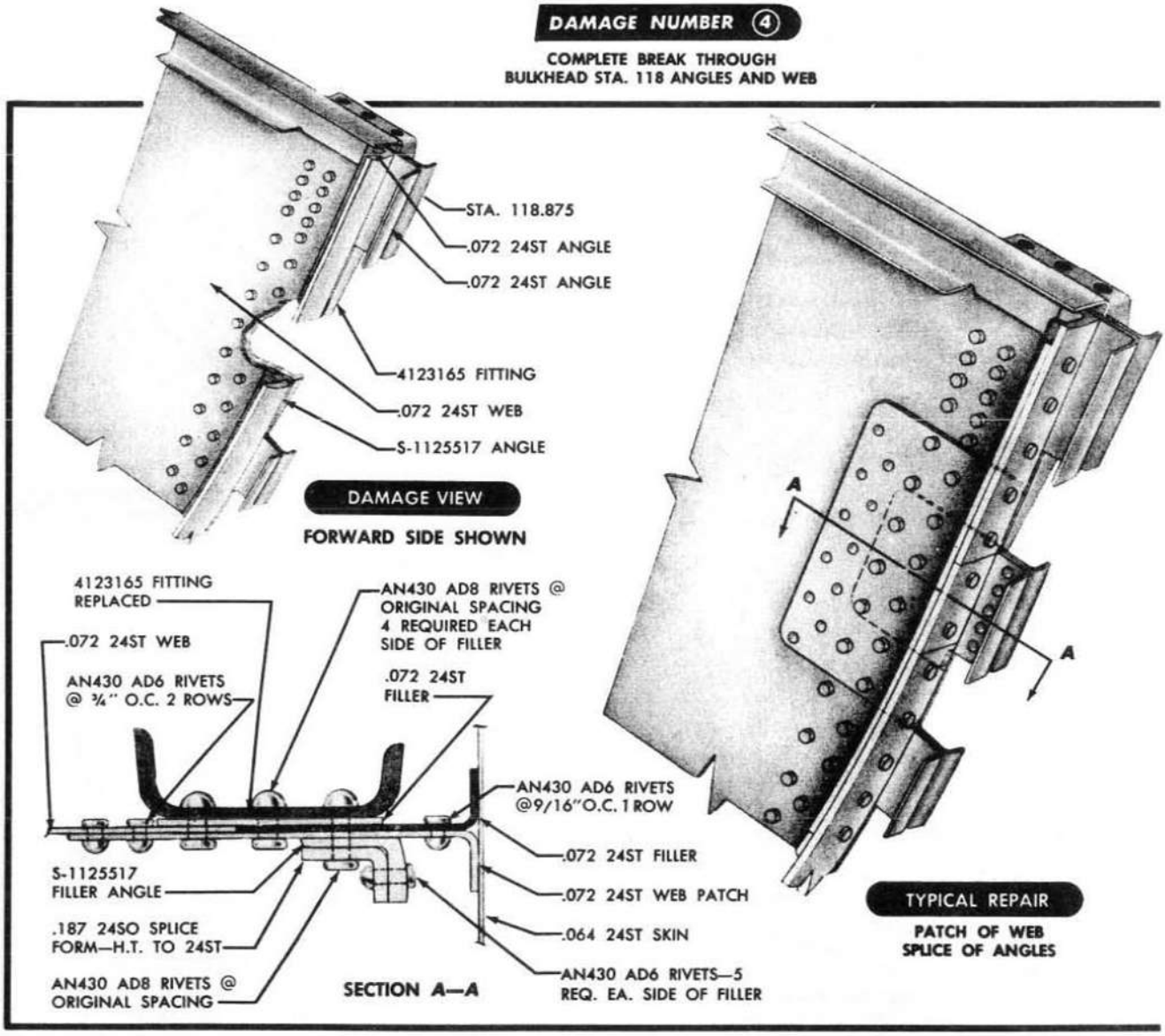
Figure 187 — Patch Repair of Crack Damage to Web — Nacelle Bulkhead — Sta. 118.875



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice angle or splice channel from .072 24SO material. Heat treat to 24ST.
4. Construct fillers from the same gage and material as original part.
5. For skin repair see typical skin repair drawings in this series.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance, see Figure 7, Section I.

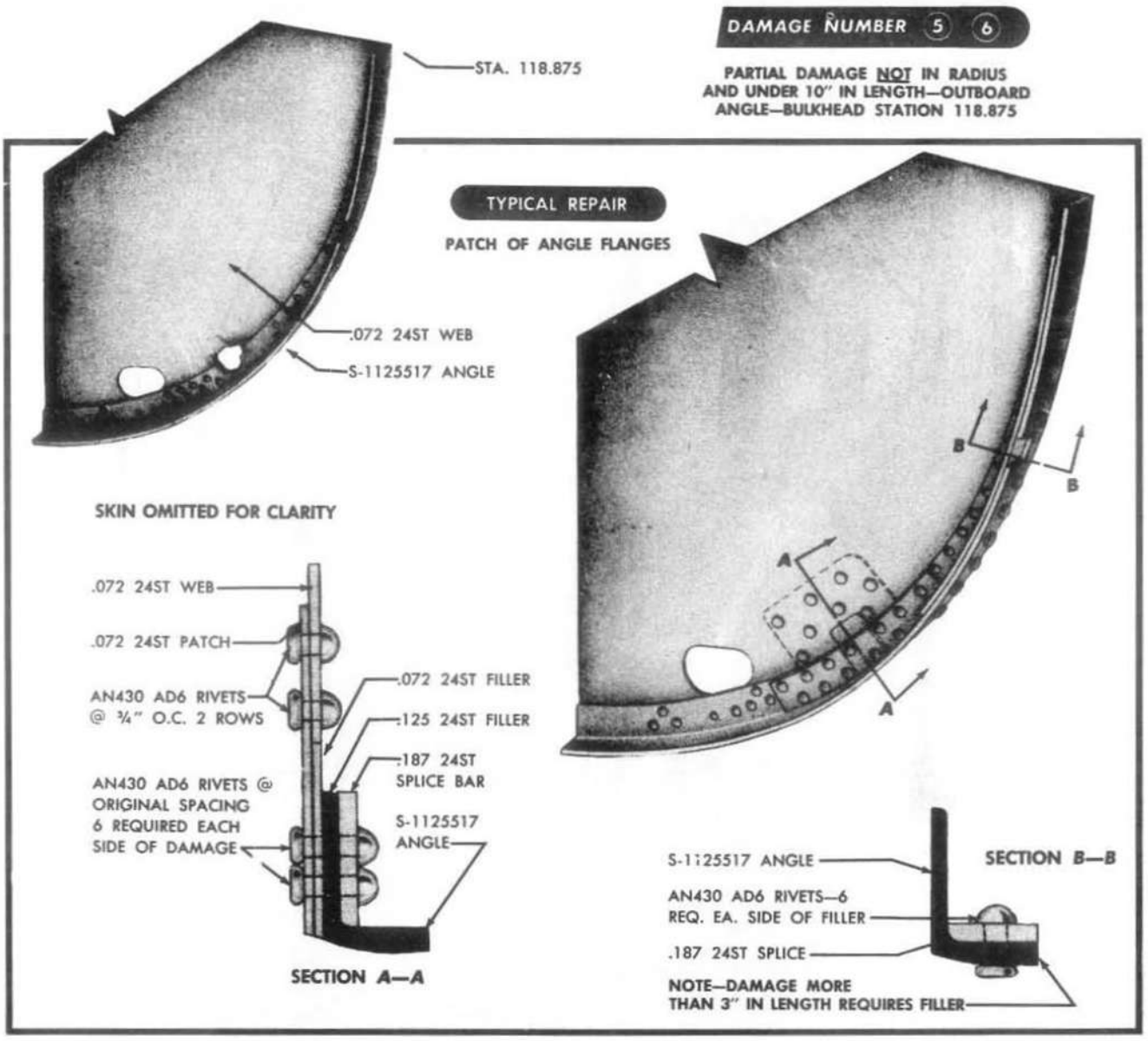
Figure 188 — Patch and Splice Repair of Damages in Web Collar — Nacelle Bulkhead — Sta. 118.875



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. Construct splice angle from three-sixteenths inch 24SO material. Heat treat to 24ST.
4. Construct web patch from 24ST material of same gage as web.
5. Construct all fillers from the same gage and material as original.
6. Use existing rivet holes where possible.
7. Replace all damaged clips, brackets, and fittings.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For rivet edge and row distance see Figure 7, Section I.
10. For skin repair see typical skin repair drawings in this series.

Figure 189—Patch and Splice Repair of Web and Angles—Nacelle Bulkhead—Sta. 118.875



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar from three-sixteenth inch 24ST material.
4. Construct web patch from 24ST material of same gage as web.
5. Construct all fillers from the same gage and material as original.
6. Use existing rivet holes where possible.
7. For rivet edge and row distance see Figure 7, Section I.
8. For skin repairs see typical skin repair drawings in this series.

Figure 190—Patch Repair of Partial Damage to Angle—Nacelle Bulkhead—Sta. 118.875

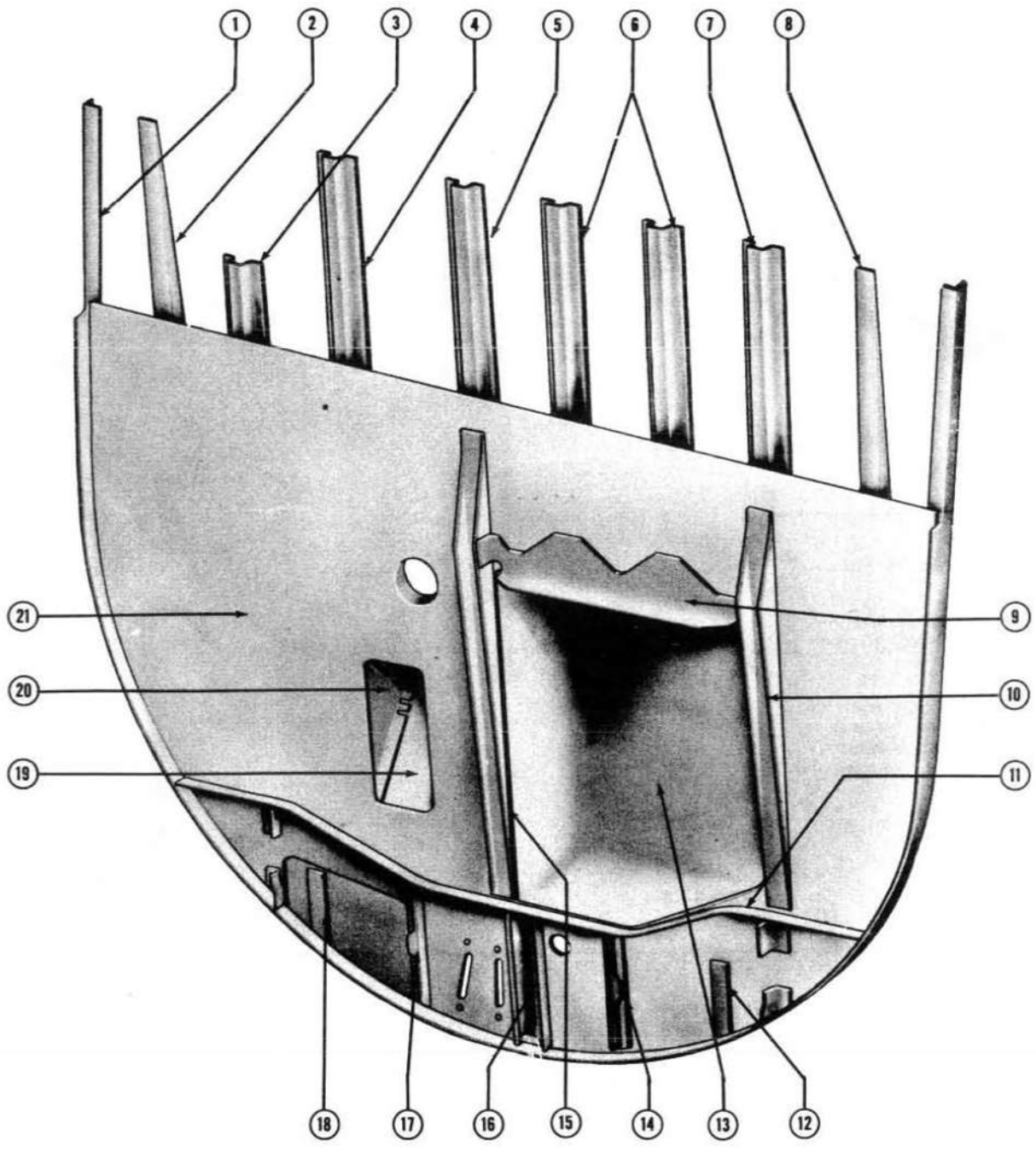


Figure 191—Nacelle Bulkhead Assembly, Sta. 156

KEY TO FIGURE 191

Note: L.H. or R.H. indicates left-hand or right-hand assembly.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5154626-4 L.H. 5154626-5 R.H.	Tee S-1152368	Length 146		24SO	24ST	1 1
2	5154626-6 L.H. 5154626-7 R.H.	Channel S-1125512	Length 44		24SO	24ST	1 1
3	1093773	Stiffener	4-11/16x38	.091	24ST		1
4	1093773	Stiffener	4-11/16x47	.091	24SO	24ST	1
5	1093773	Stiffener	4-11/16x44	.091	24ST		1
6	1093772	Stiffener	4-3/16x23½	.064	24ST		1
7	1093773	Stiffener	4-11/16x44	.091	24ST		1
8	5154626-20 L.H. 5154626-21 R.H.	Channel S-1125511	Length 39		24ST		1 1
9	5154626-34 L.H. 5154626-35 R.H.	Angle	4⅛x19½	.125	24ST		1 1
10	5154626-44 L.H. 5154626-45 R.H.	Channel S-1125518	Length 25		24ST		1 1
11	5154626-22 L.H. 5154626-23 R.H.	Doubler	15x47	.064	24SO	24ST	1 1
12	5154626-36	Spacer	1½x6	.188	24ST		1
13	5154626-24 L.H. 5154626-25 R.H.	Box	30x30	.064	24SO	24ST	1 1
14	5154626-46 L.H. 5154626-47 R.H.	Channel	3⅝x8¼	.125	24SO	24ST	1 1
15	5154626-42 L.H. 5154626-43 R.H.	Channel S-1125518	Length 31		24ST		1 1
16	1093772	Stiffener	4-3/16x9⅜	.064	24ST		1
17	5154626-56 L.H. 5154626-57 R.H.	Channel	3⅝x3¾	.125	24SO	24ST	1 1
18	5154626-58	Spacer	1½x5½	.250	24ST		1
19	5154626-32	Cover	3¼x15½	.064	24SO	24ST	1
20	5154626-48 L.H. 5154626-64 R.H.	Gusset	4½x8	.064	24SO	24ST	1 1
21	5154626-2	Web	44x57	.064	24ST		1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

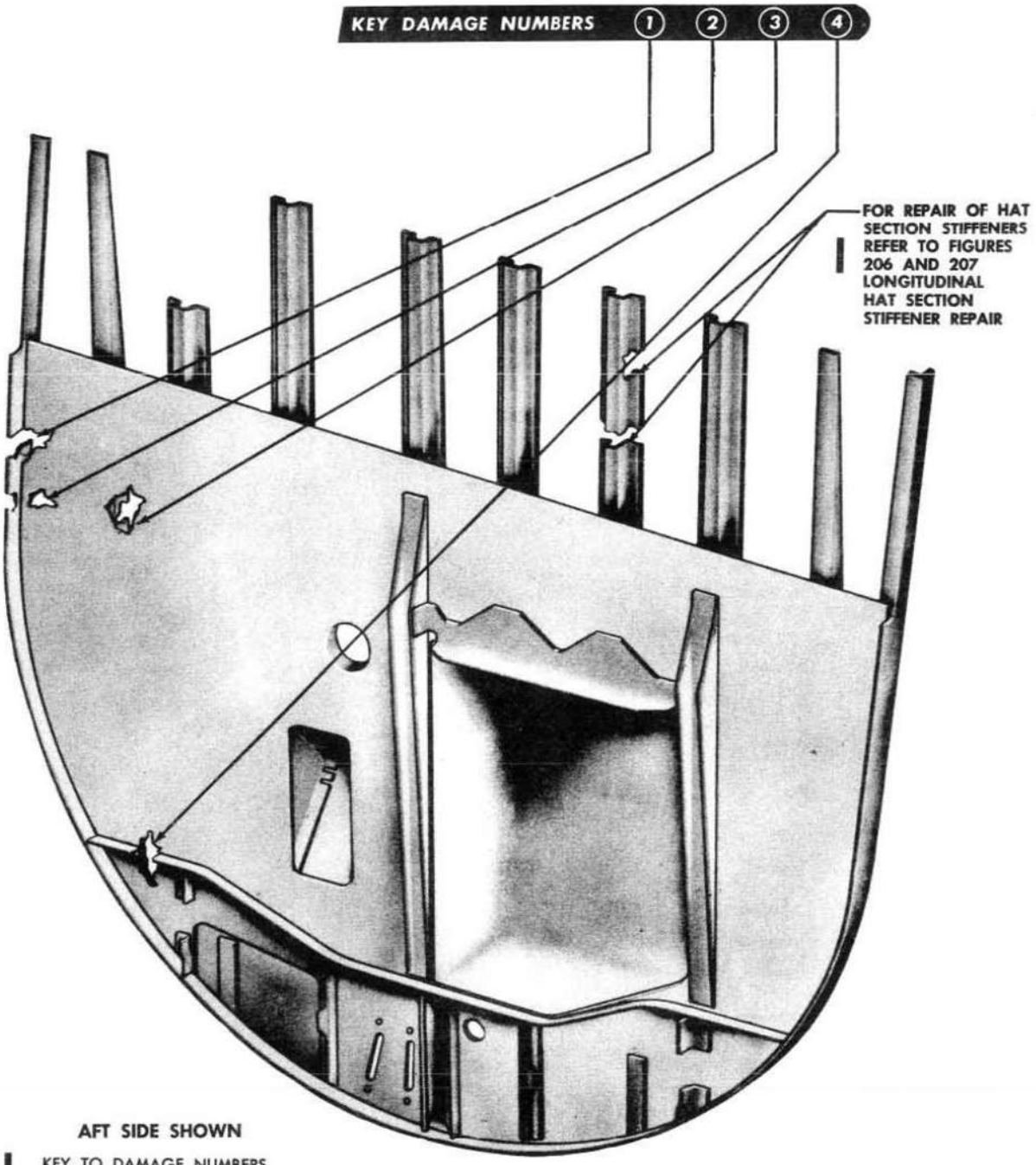
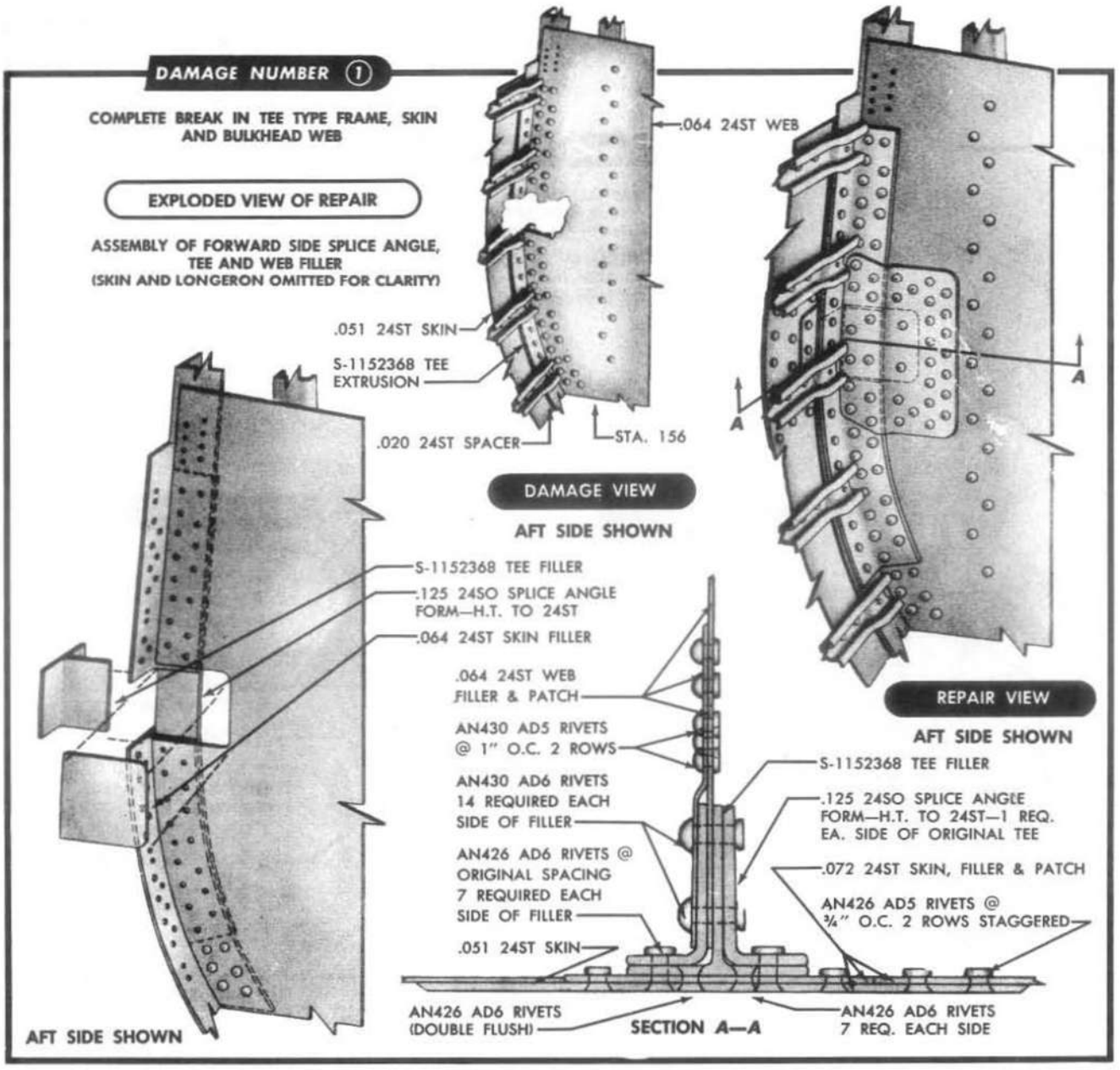


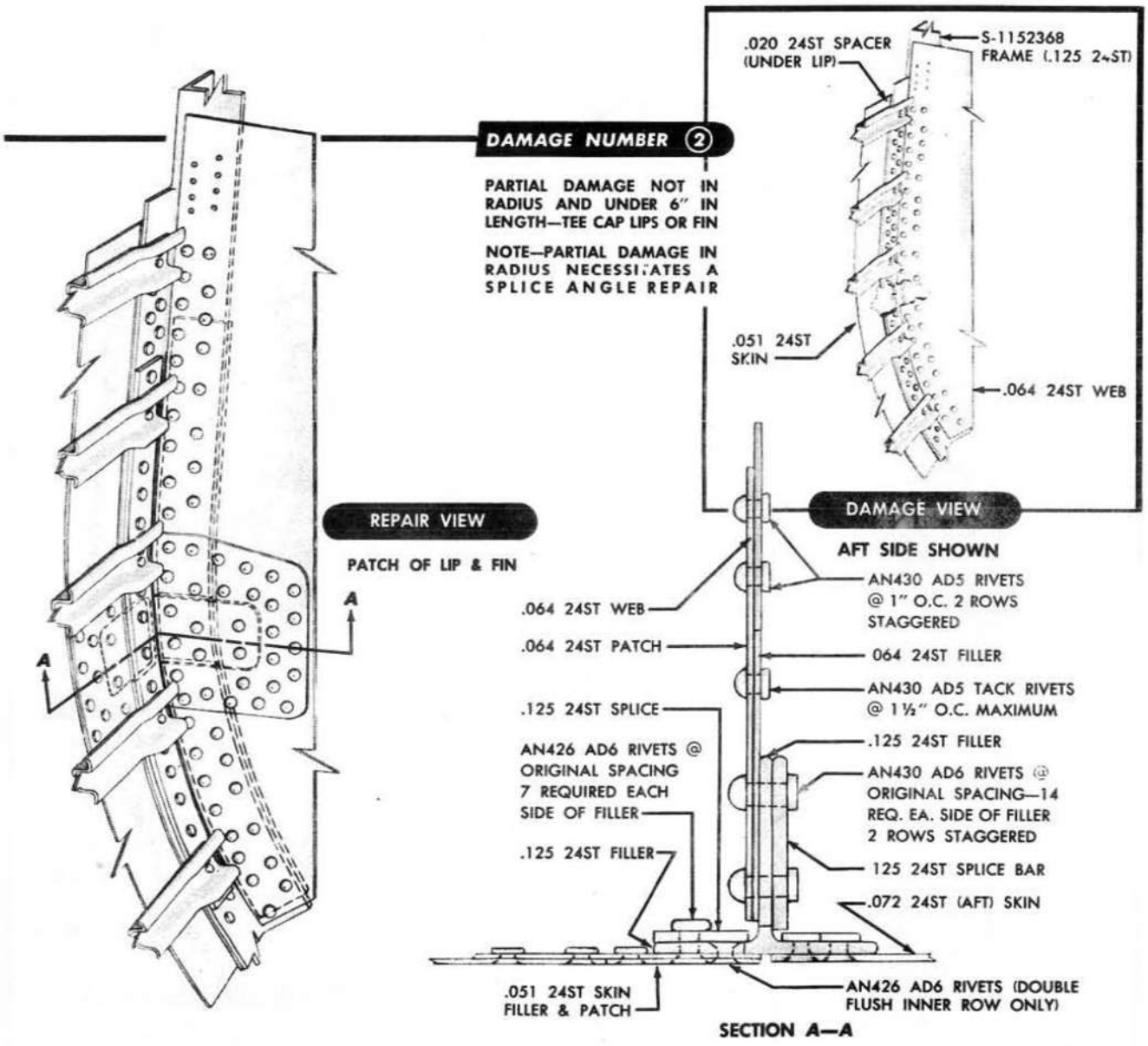
Figure 192—Key Drawing of Damages to Nacelle Bulkhead—Sta. 156



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angles from .125 24SO material. Heat treat to 24ST.
4. Construct filler in Tee from a 24ST extrusion of the same cross-sectional dimensions as original Tee.
5. Construct web patch from .064 24ST material.
6. Construct skin patch from .072 24ST material.
7. Construct fillers from the same gage and material as the original web and skin.
8. Hat section stringers must be rejoggled to fit over splice angles.
9. For minimum bend radii of sheet material see Fig. 5, Section I.
10. For flush riveting see Fig. 6, Section I.
11. For rivet edge and row distance see Fig. 6, Section I.
12. Use existing rivet holes where possible.

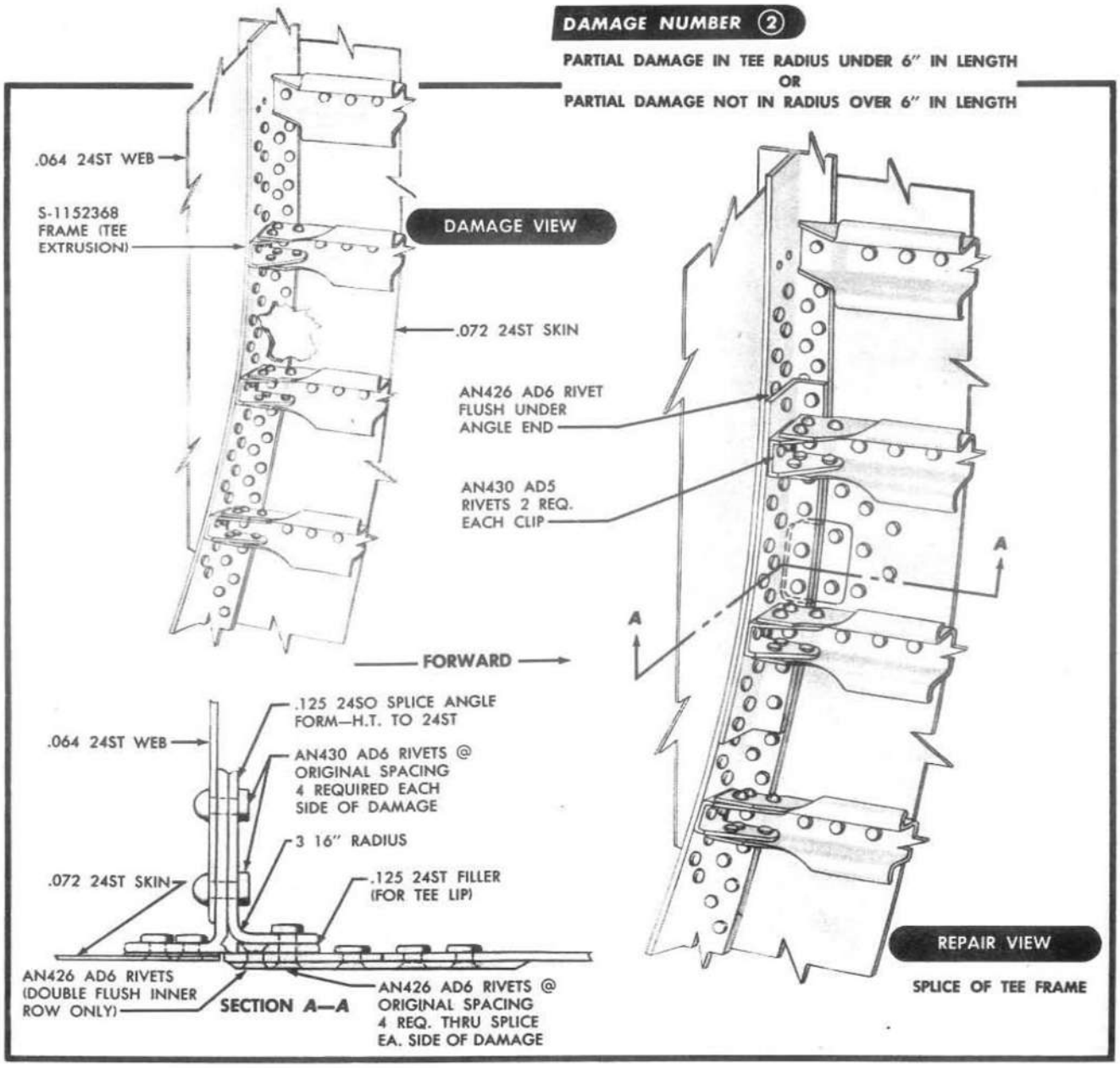
Figure 193—Splice Repair of Complete Break in Tee—Nacelle Bulkhead—Sta. 156



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bars from .125 24ST material.
4. Use a .125 24ST filler in frame.
5. Construct web patch from .064 24ST material.
6. Use a .054 24ST filler in web.
7. For repair of skin damage see typical skin repair drawings in this series.
8. Use existing rivet holes where possible.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

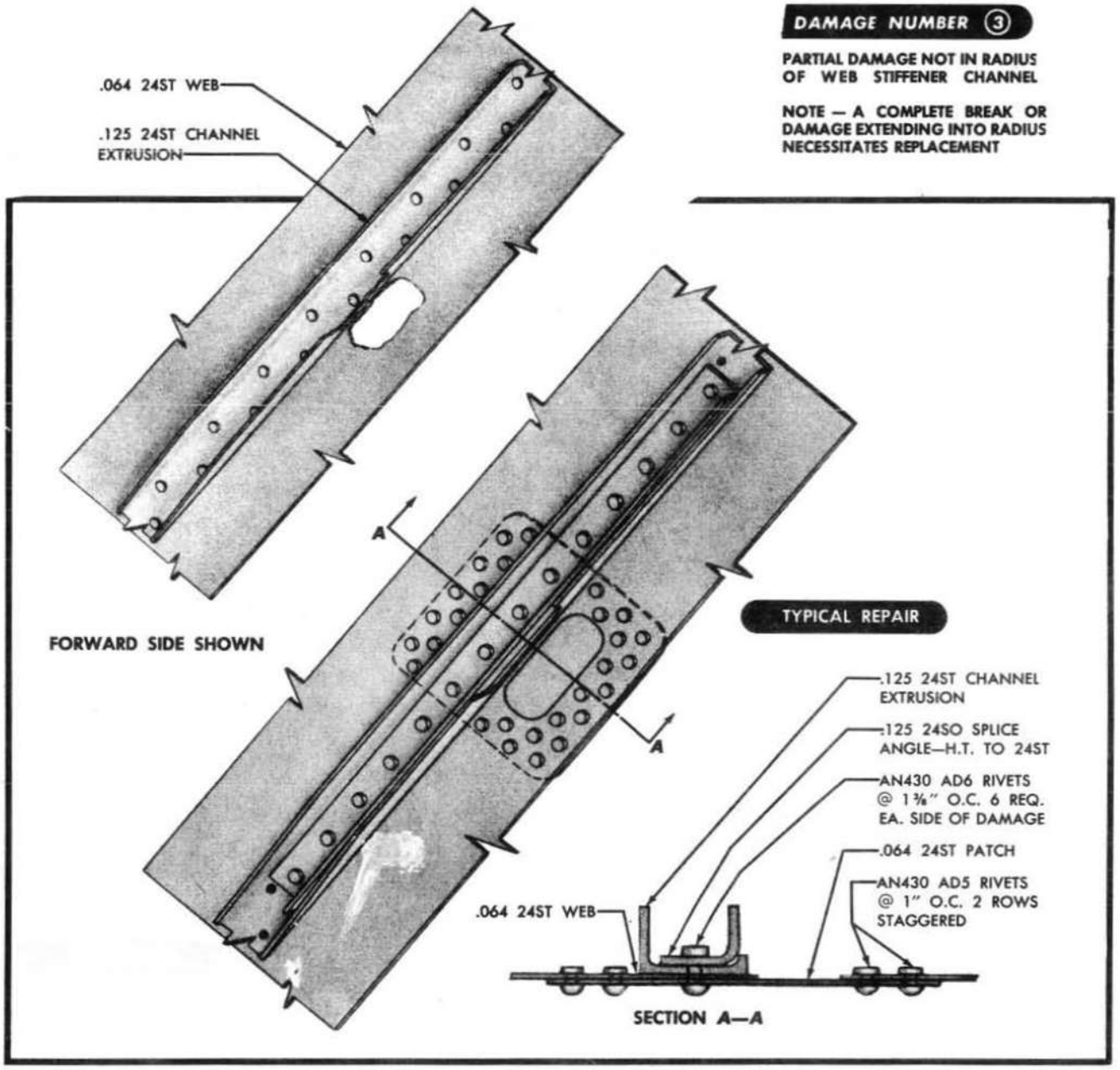
Figure 194—Patch Repair of Partial Damage to Tee—Nacelle Bulkhead—Sta. 156 (Sheet 1 of 2)



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .125 24SO material. Heat treat to 24ST.
4. Use a .125 24ST filler frame.
5. For repair of web damage see web repairs included in Repair of Partial Damage Under 6" in Length. (Sheet 1 of this series.)
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Fig. 5, Section I.
8. For rivet edge and row distance see Fig. 7, Section I.

Figure 194—Patch Repair of Partial Damage to Tee—Nacelle Bulkhead—Sta. 156 (Sheet 2 of 2)



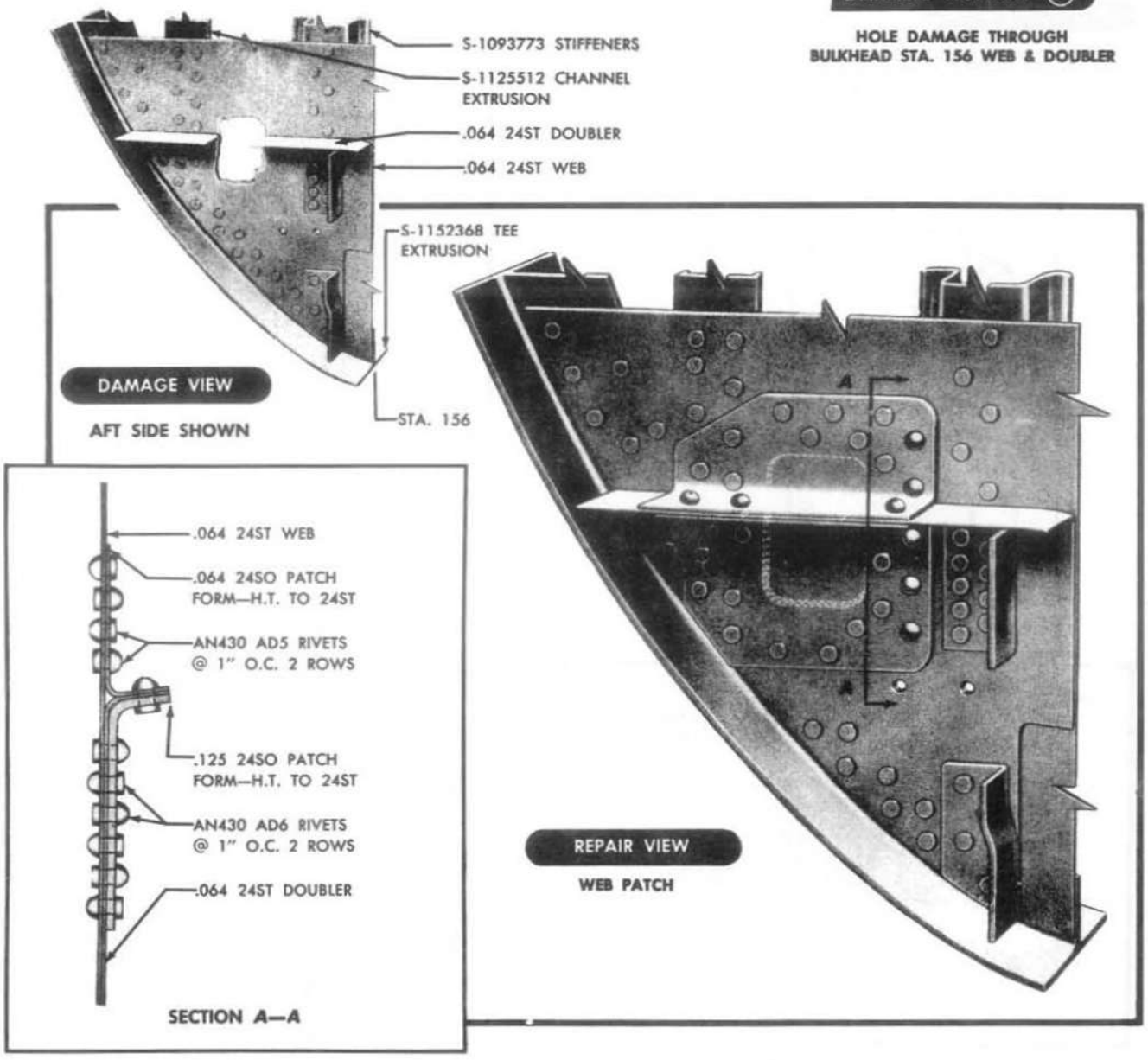
NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .125 24SO material. Heat treat to 24ST.
4. Construct skin patch from .064 24ST material.
5. When damage extends into the radius of channel, the channel must be replaced.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For rivet edge and row distance see Figure 7, Section I.
8. Use existing rivet holes where possible.

Figure 195—Patch Repair of Partial Damage to Stiffener Channel—Nacelle Bulkhead—Sta. 156

DAMAGE NUMBER ④

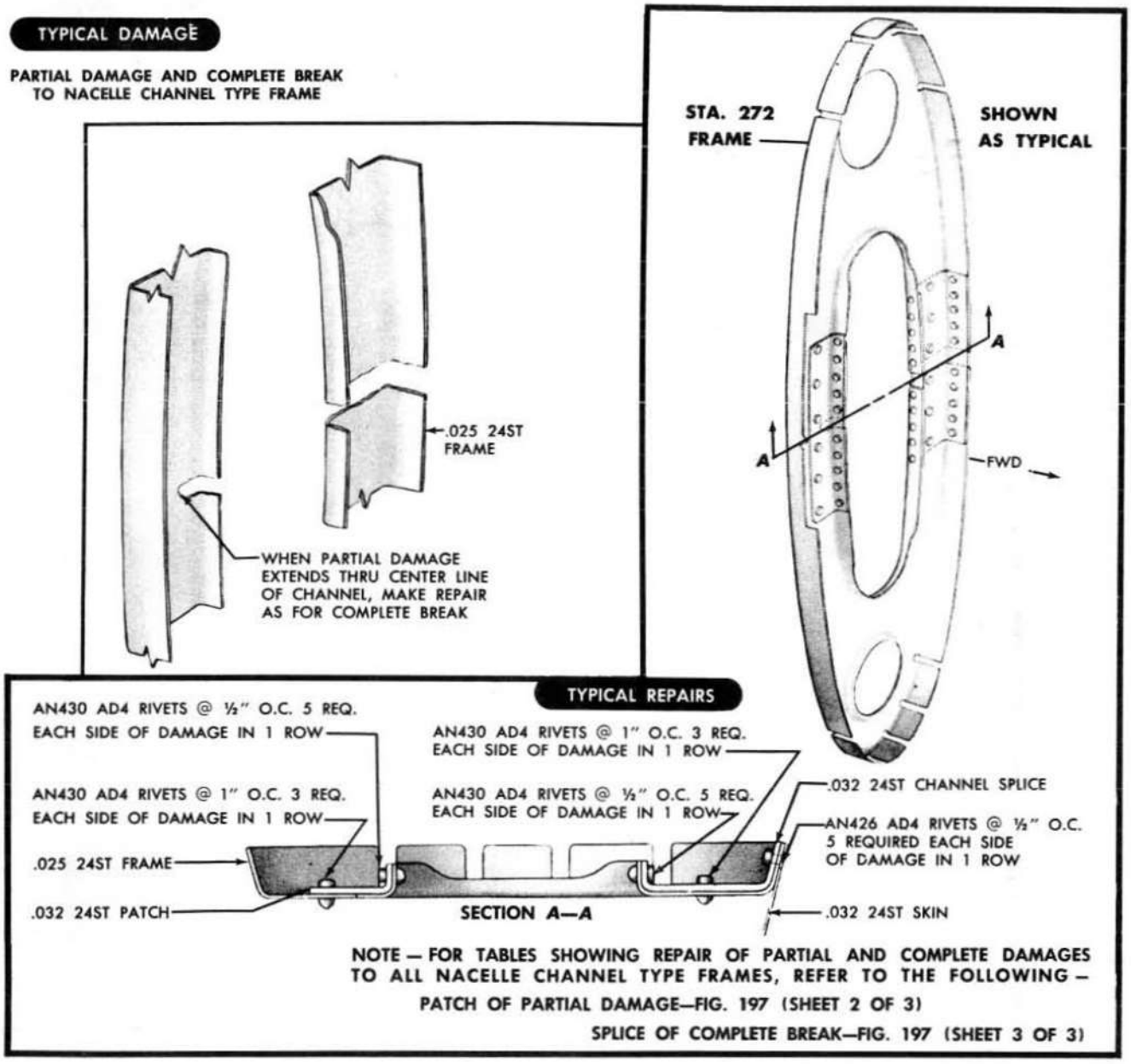
HOLE DAMAGE THROUGH BULKHEAD STA. 156 WEB & DOUBLER



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius tess than three-eighths inch.
3. Construct patches from 24SO material ot gages noted on Section A-A. Heat treat to 24ST.
4. Use existing rivet holes where possible.
5. For minimum bend radii of sheet material see Figure 5, Section I.
6. For rivet edge and row distance see Figure 7, Section I.

Figure 196—Patch Repair of Web Hole Damage-Nacelle Bulkhead—Sta. 156



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct patch or splice channel from .032 24SO material. Heat treat to 24ST.
4. A filler is necessary only where skin attaches to the frame. Use the same gage and material as original frame for filler.
5. Use existing rivet holes where possible.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.
9. For repair of skin damage see typical nacelle skin repair drawings.

Figure 197—Repair of Nacelle Channel Type Frame—Sta. 172 to 283 (Sheet 1 of 3)

RIVET PATTERNS FOR PATCH REPAIR OF NACELLE FRAMES

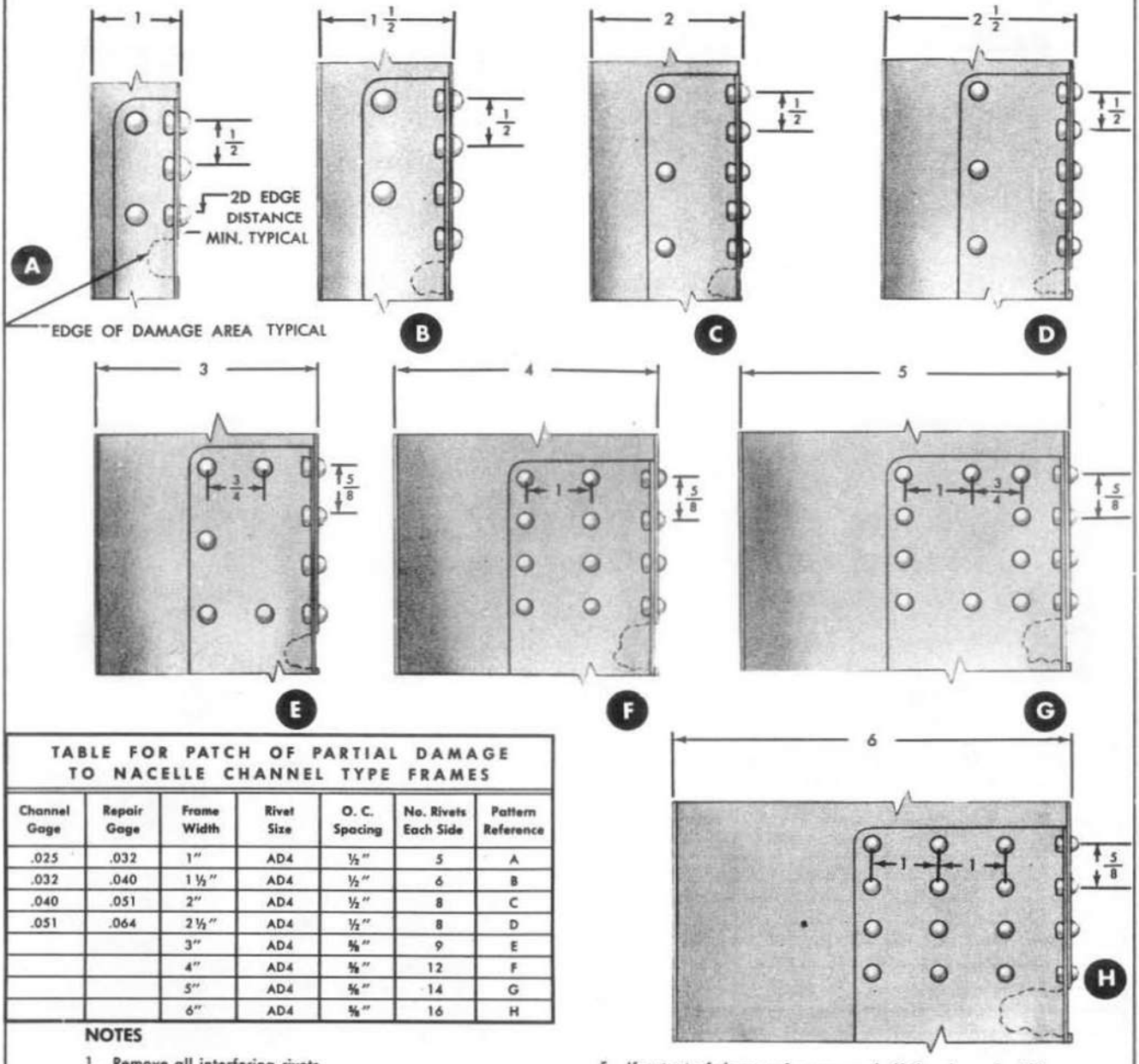


TABLE FOR PATCH OF PARTIAL DAMAGE TO NACELLE CHANNEL TYPE FRAMES

Channel Gage	Repair Gage	Frame Width	Rivet Size	O. C. Spacing	No. Rivets Each Side	Pattern Reference
.025	.032	1"	AD4	½"	5	A
.032	.040	1½"	AD4	½"	6	B
.040	.051	2"	AD4	½"	8	C
.051	.064	2½"	AD4	½"	8	D
		3"	AD4	⅝"	9	E
		4"	AD4	⅝"	12	F
		5"	AD4	⅝"	14	G
		6"	AD4	⅝"	16	H

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice angles from 2450 material of the next heavier gage than the part being repaired. Heat treat to 24ST.
4. Refer to table above for rivet size, number of rivets required on each side of damage, rivet spacing, and rivet pattern for repair of channels of different widths.
5. If extent of damage is over one-half the channel width, use same repair as for complete break.
6. For minimum bend radii of sheet material see Fig. 5, Section I.
7. For flush riveting see Fig. 6, Section I.
8. For rivet edge and row distance see Fig. 7, Section I.
9. For repair of skin damage see typical nacelle skin repair drawings.

Figure 197—Repair of Nacelle Channel Type Frame—Sta. 172 to 283 (Sheet 2 of 3)

RIVET PATTERNS FOR SPLICE REPAIR OF NACELLE FRAMES

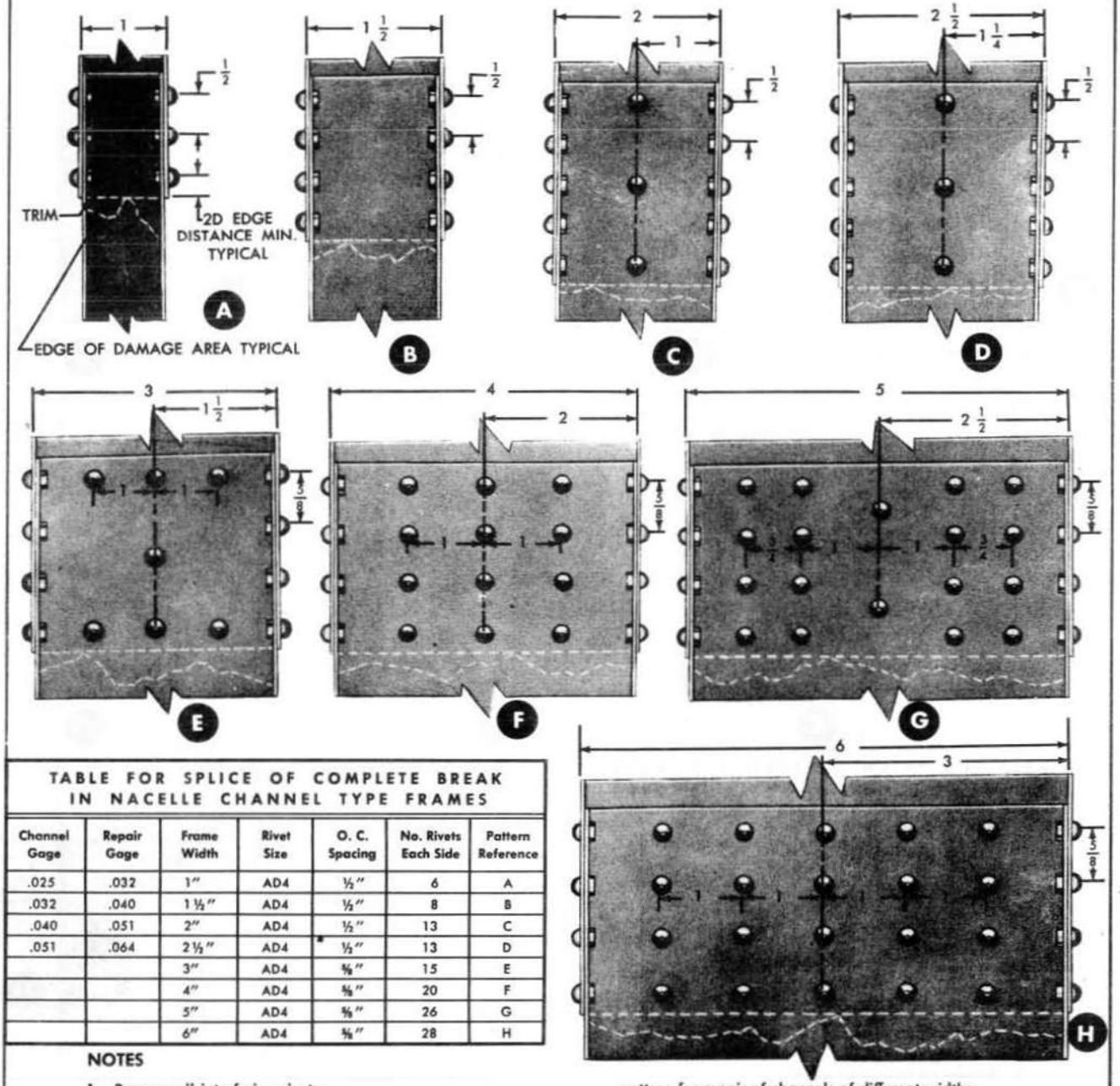


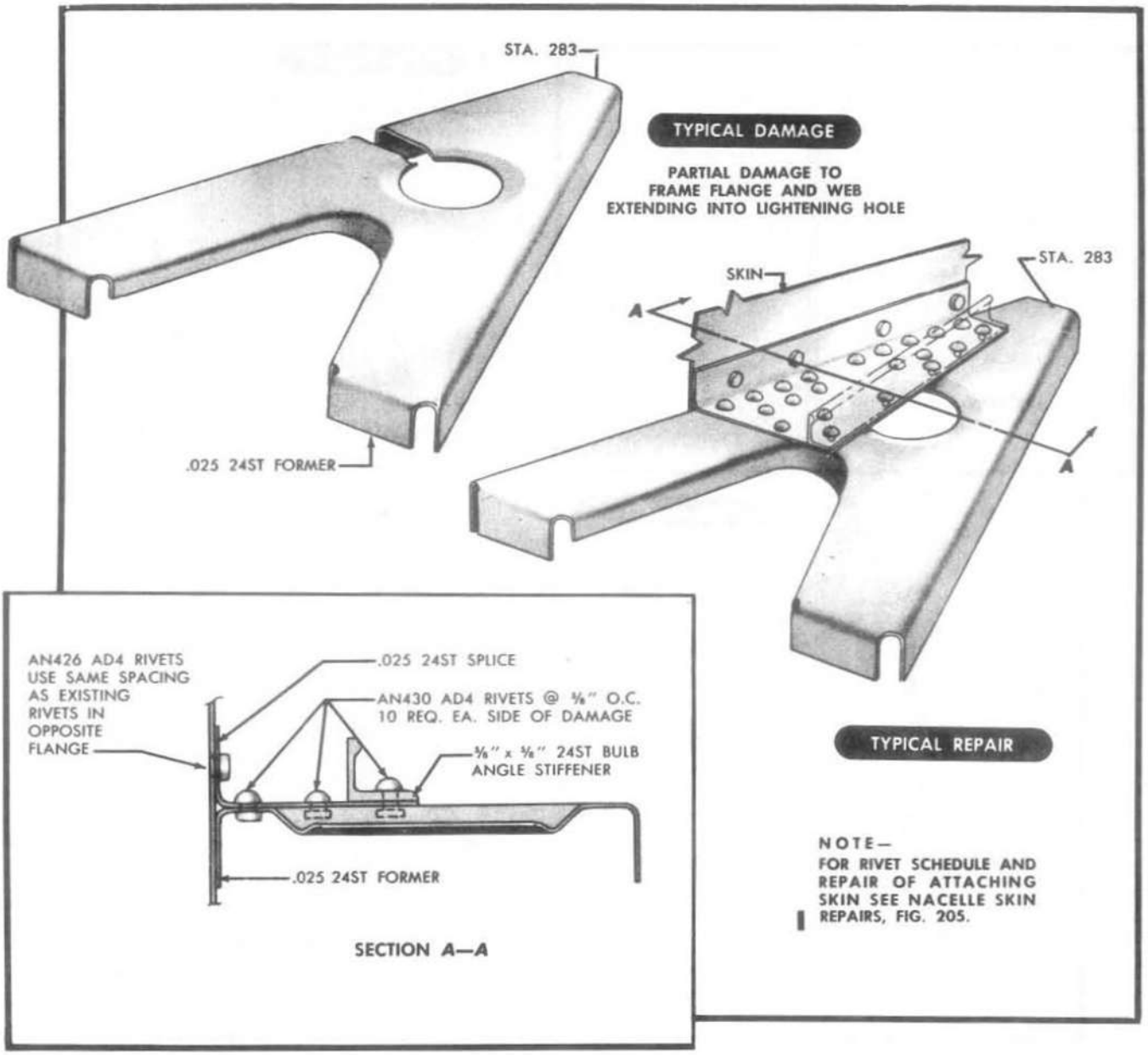
TABLE FOR SPLICE OF COMPLETE BREAK IN NACELLE CHANNEL TYPE FRAMES

Channel Gage	Repair Gage	Frame Width	Rivet Size	O. C. Spacing	No. Rivets Each Side	Pattern Reference
.025	.032	1"	AD4	½"	6	A
.032	.040	1½"	AD4	½"	8	B
.040	.051	2"	AD4	½"	13	C
.051	.064	2½"	AD4	½"	13	D
		3"	AD4	⅜"	15	E
		4"	AD4	⅜"	20	F
		5"	AD4	⅜"	26	G
		6"	AD4	⅜"	28	H

NOTES

1. Remove all interfering rivets.
2. Cut out damaged part.
3. Construct splice channels from 24SO material of next gage heavier than the original channel. Heat treat to 24ST.
4. Refer to table above for rivet size, number of rivets required on each side of damage, rivet spacing, and rivet pattern for repair of channels of different widths.
5. For minimum bend radii of sheet material see Fig. 5, Section I.
6. For flush riveting see Fig. 6, Section I.
7. For rivet edge and row distance see Fig. 7, Section I.
8. For repair of skin damage see typical nacelle skin repair drawings.

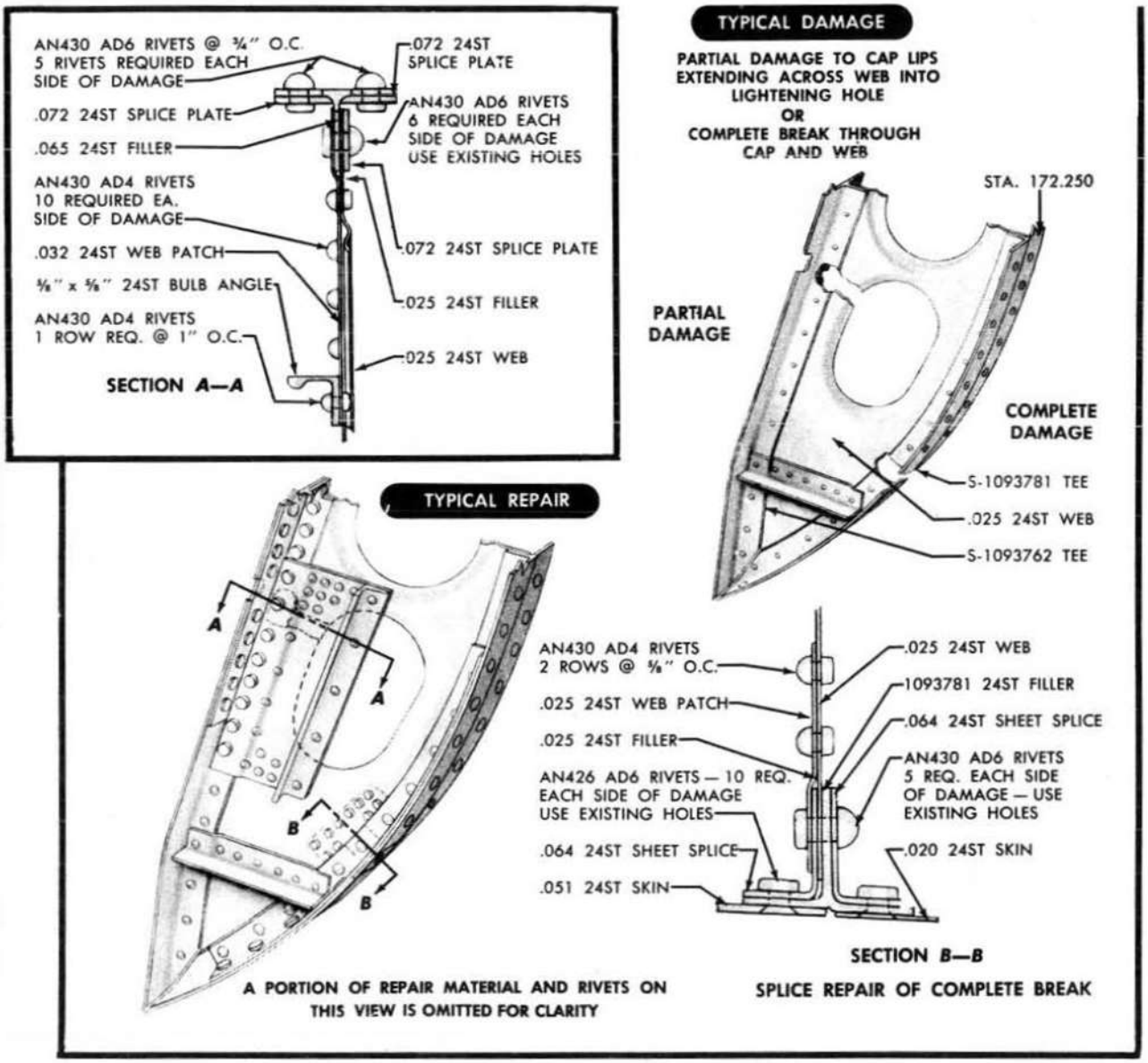
Figure 197—Repair of Nacelle Channel Type Frame—Sta. 172 to 283 (Sheet 3 of 3)



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth.
3. Construct patch from .025 24ST material.
4. Use bulb angle stiffener as shown above to restore strength lost by damaged lightening hole flange.
5. For skin repair refer to typical skin repair drawings in this series.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 198—Patch Repair of Partial Damage to Nacelle Cone Frame—Sta. 283



NOTES

1. Patch and splice repairs shown are typical for similar damages to frames within the nacelle.
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than three-eighths inch.
4. Construct splice bars and splice angles from 24ST material of gages noted on Sections A-A and B-B.
5. Construct all fillers from the same gage and material as original.
6. Use bulb angle stiffeners as shown on Section A-A above to restore strength lost by damaged lightening hole flange.
7. Use existing rivet holes where possible.
8. Replace damaged brackets and stiffeners.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.
12. For skin repair see typical skin repair drawings included in this series.

Figure199—Typical Patch and Splice Repair to Typical Nacelle Frame

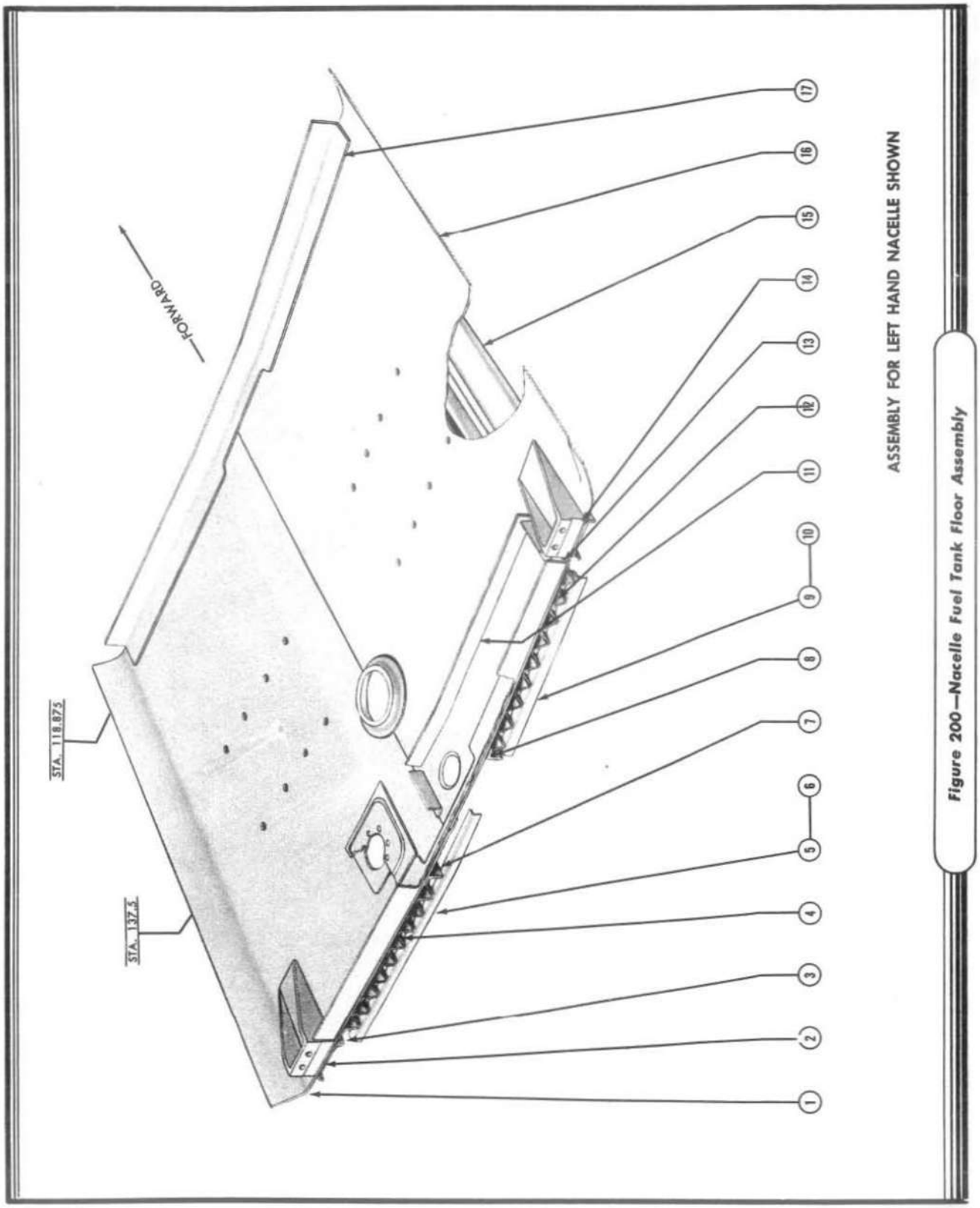


Figure 200—Nacelle Fuel Tank Floor Assembly

KEY TO FIGURE 200

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5153030-104 L.H.	Sheet	24x38½	.072	24ST		1
	5153030-105 R.H.						1
2	4157996 L.H.	Fitting					1
	4157996-1 R.H.						1
3	5153030-154	Channel	4⅜x38½	.125	24SO	24ST	1
4	5153030-94 L.H.	Corrugation	18⅜x38½	.032	24ST		1
	5153030-95 R.H.						1
5	5153030-186 L.H. Fwd.	Angle	2x14½	.072	24SO	24ST	1
	5153030-187 R.H. Fwd.						1
6	5153030-164 L.H. Aft	Angle	1¾x15	.072	24ST		1
	5153030-165 R.H. Aft						1
7	5153030-185	Angle S-133193	Length 38		24ST		1
8	5153030-184 L.H.	Angle S-133193	Length 38		24ST		1
	5153030-185 R.H.						1
9	5153030-188 L.H. Fwd.	Angle	2x13¼	.072	24SO	24ST	1
	5153030-189 R.H. Fwd.						1
10	5153030-168	Angle	1¾x10¾	.072	24ST		1
11	5153030-190 L.H.	Angle	1½x16½	.064	24ST		1
	5153030-191 R.H.						1
12	5153030-96 L.H.	Corrugation	20⅝x38	.032	24ST		1
	5153030-97 R.H.						1
13	5153030-178 L.H.	Angle	3⅛x32¼	.072	24ST		1
	5153030-179 R.H.						1
14	4157997 L.H.	Fitting					1
	4157997-1 R.H.						1
15	5153030-156 L.H.	Channel	4⅜x38½	.125	24SO	24ST	1
	5153030-157 R.H.						1
16	5153030-92 L.H.	Sheet	24x38½	.072	24ST		1
	5153030-93 R.H.						1
17	5153030-182 L.H.	Angle	3x40	.072	24ST		1
	5153030-183 R.H.						

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

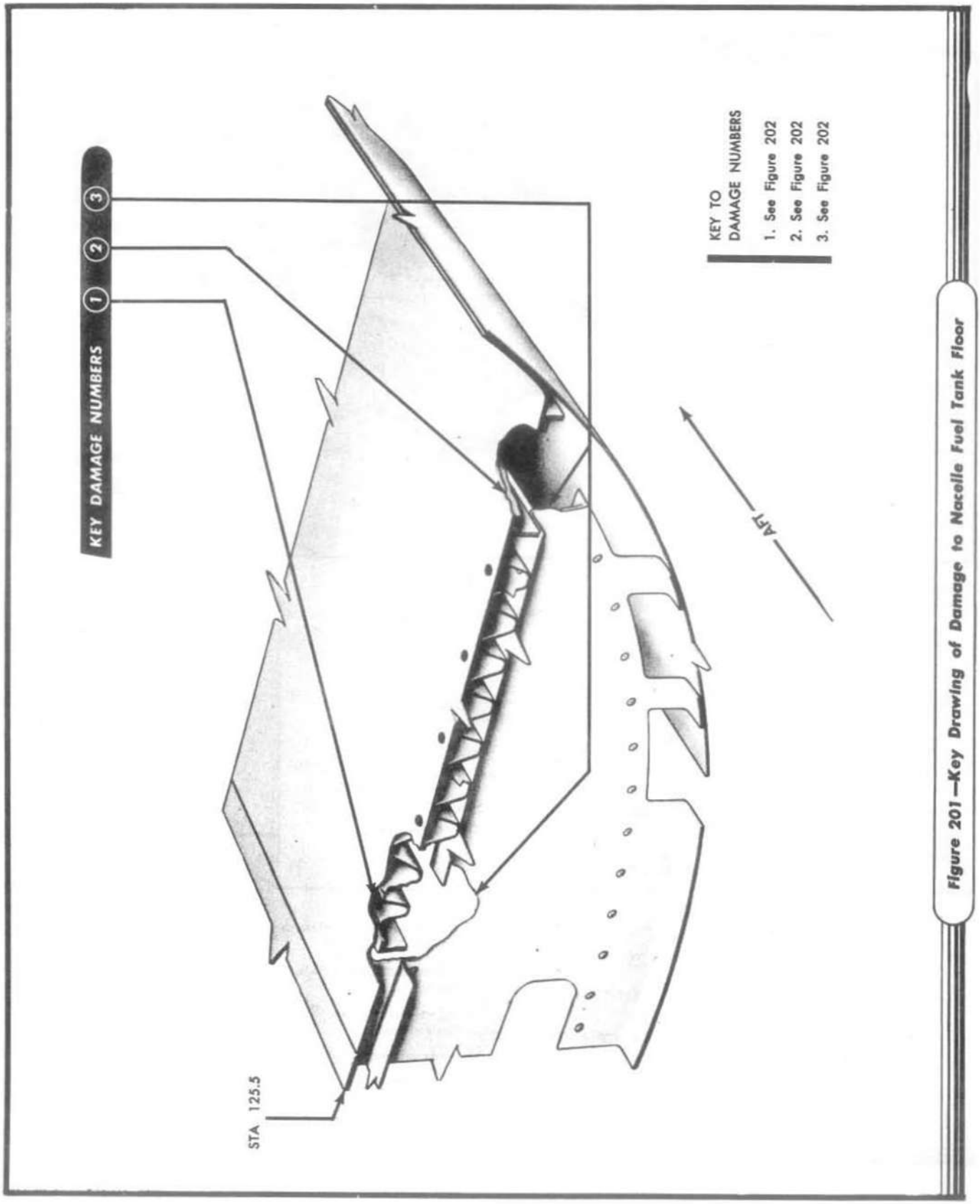
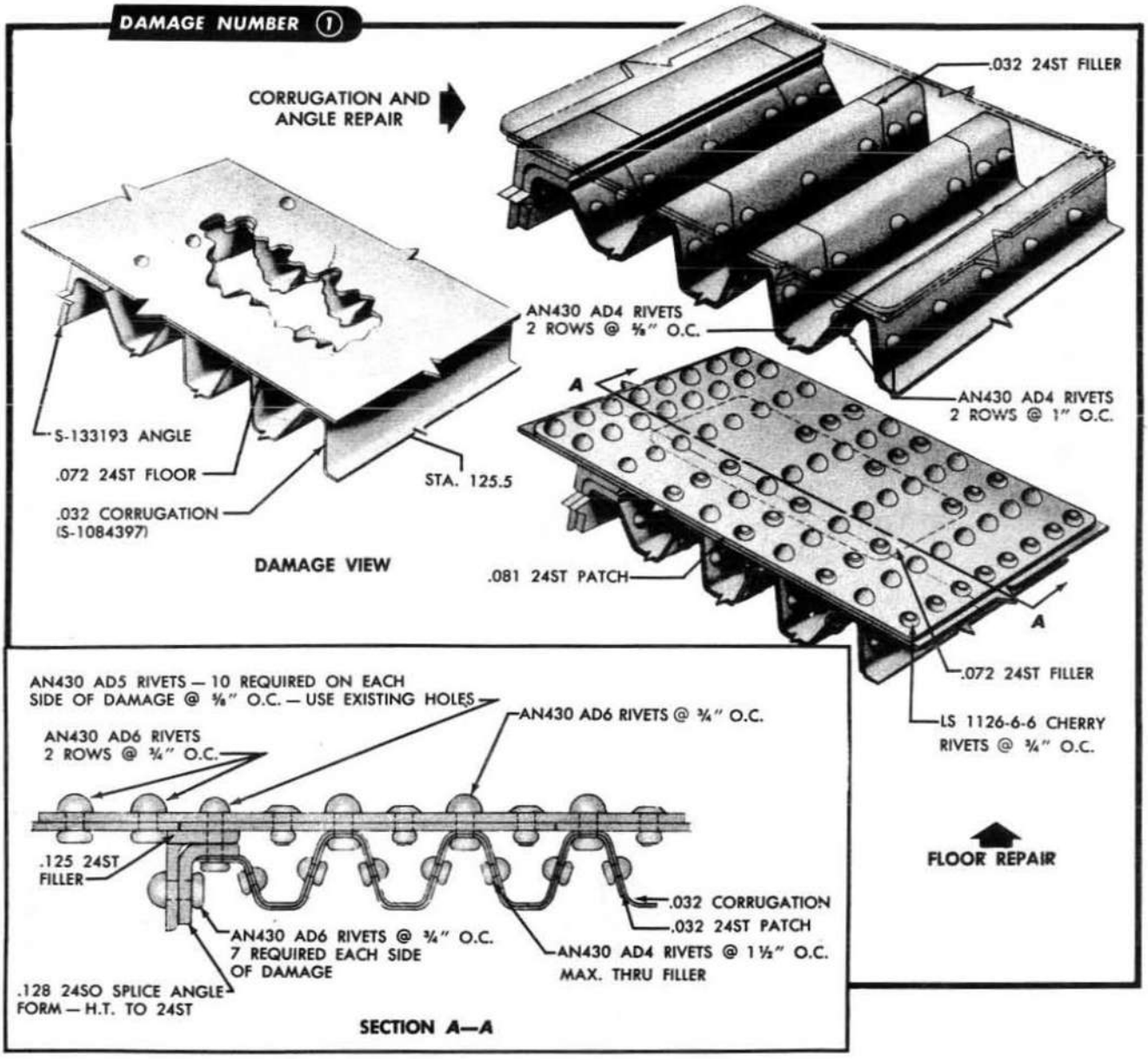
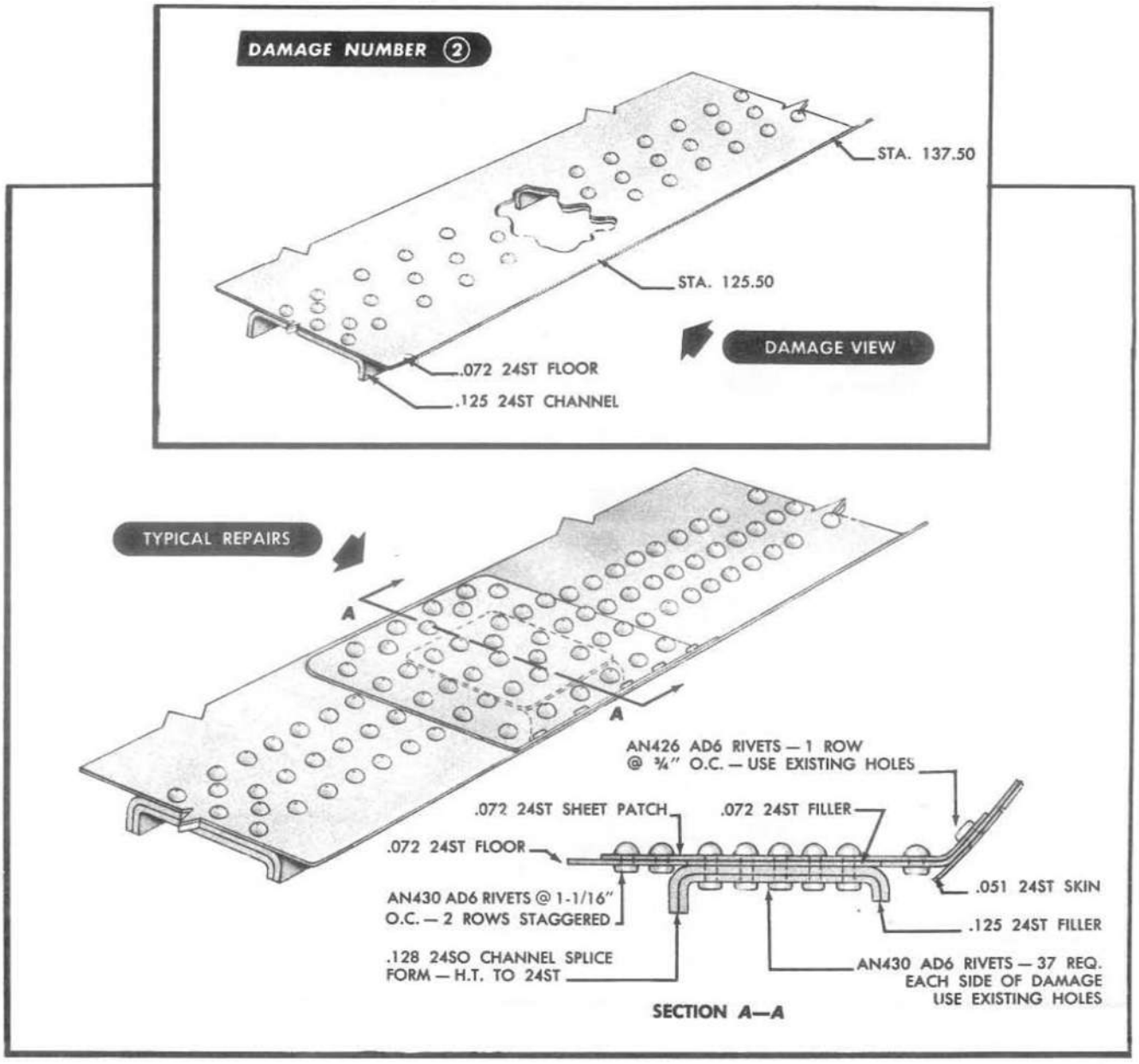


Figure 201—Key Drawing of Damage to Nacelle Fuel Tank Floor



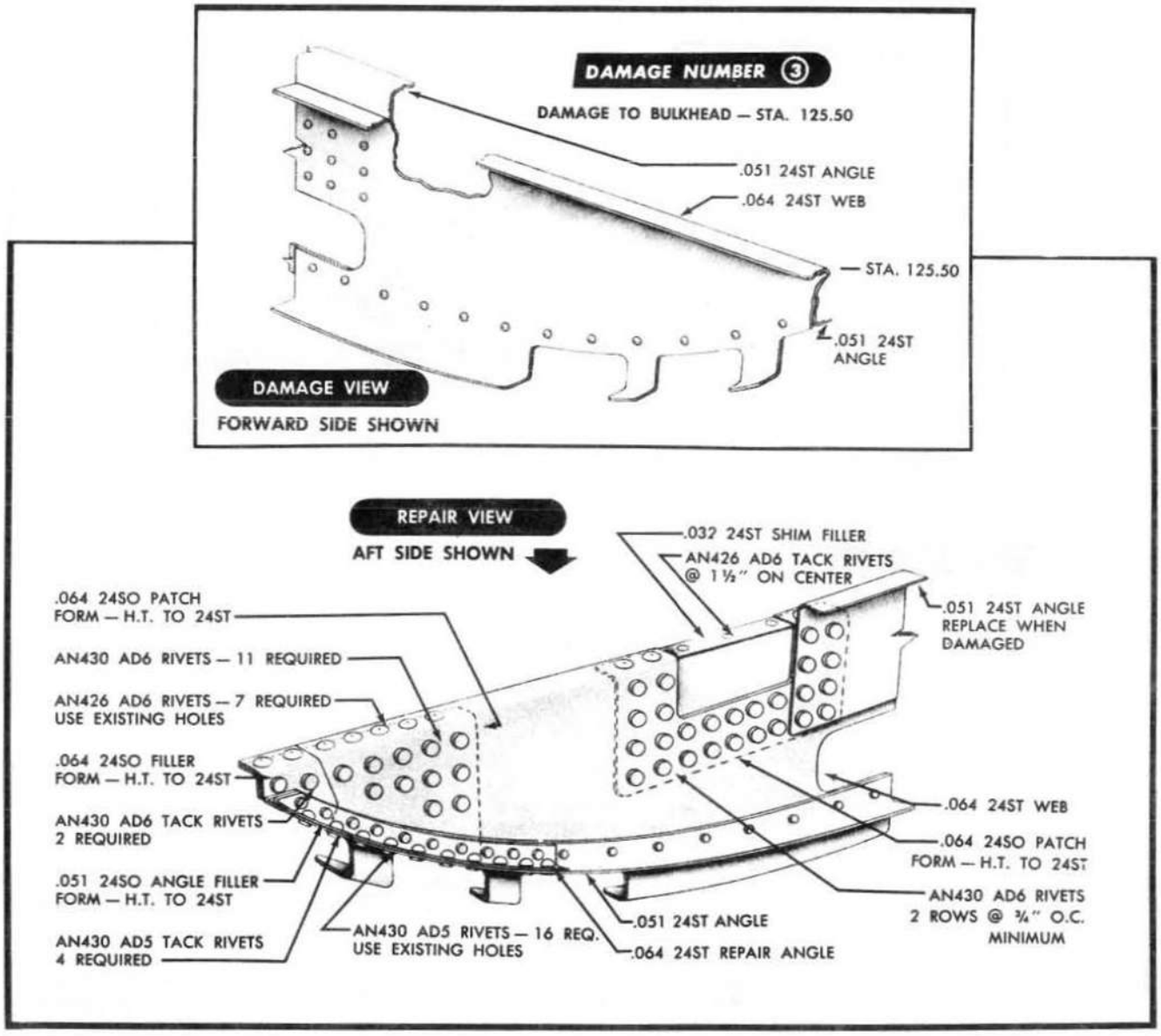
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice angle from .128 24SO material. Heat treat to 24ST.
4. Use an extruded angle of the same material and cross-sectional dimensions as existing angle for filler.
5. Construct floor patch from .081 24ST material.
6. Construct filler in floor from .072 24ST material.
7. Construct corrugation patch from .032 24ST material.
8. Construct Corrugation filler from .032 24ST material.
9. Cherry rivets are shown in repair where bucking is impossible.
10. Use existing rivet holes where possible.
11. For rivet edge and row distance, see Figure 7, Section I.

Figure 202 Patch and Splice Repair to Nacelle Fuel Tank Floor (Sheet 1 of 3)



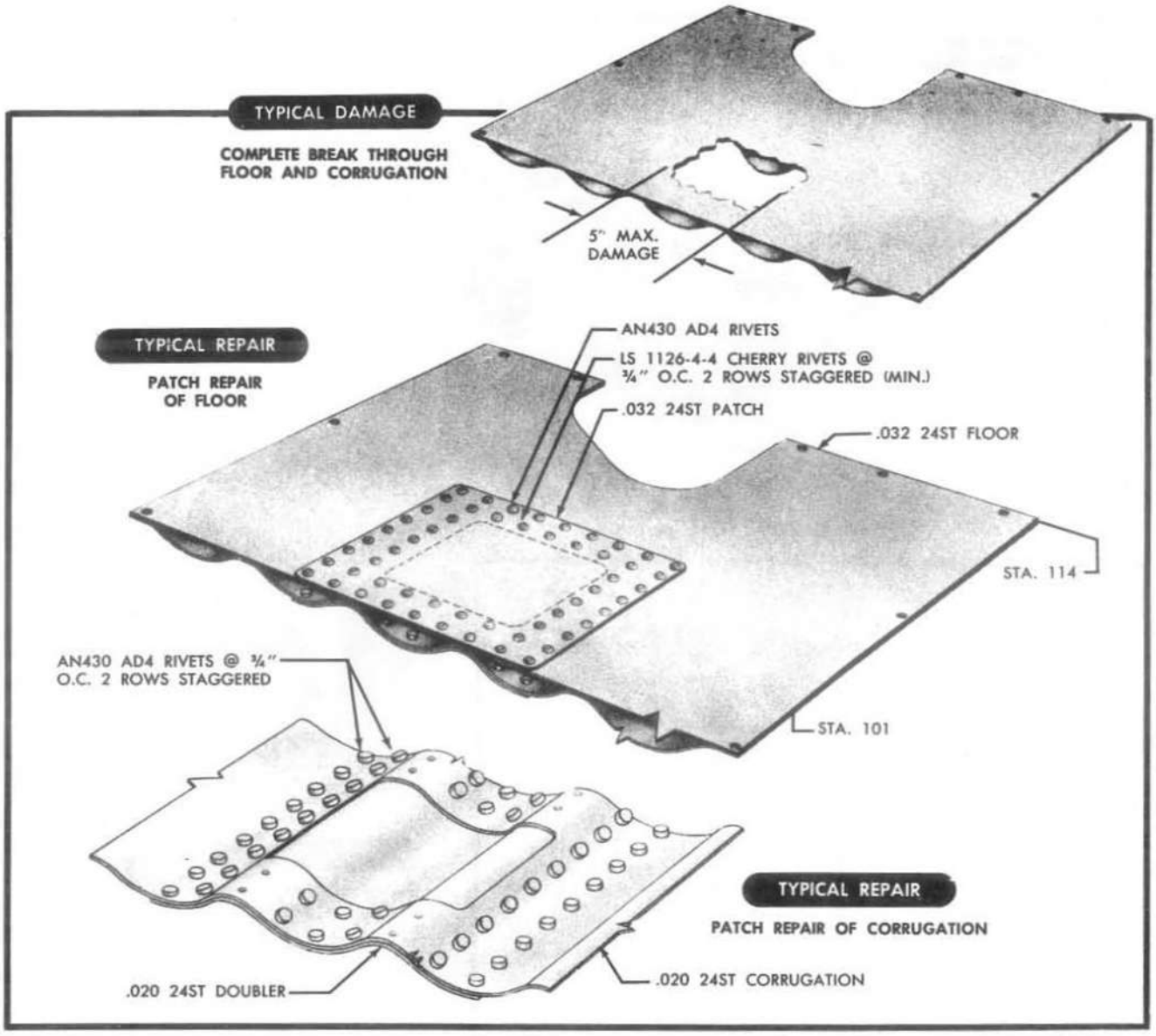
1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct channel splice from .128 24SO material. Heat treat to 24ST.
4. Construct channel filler from .125 24SO material. Heat treat to 24ST.
5. Construct floor patch from .072 24ST material.
6. Construct floor filler from .072 24ST material.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Figure 5, Section I.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

Figure 202 Patch and Splice Repair to Nacelle Fuel Tank Floor (Sheet 2 of 3)



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patches from .064 24SO material. Heat treat to 24ST.
4. The filler used between the web flange patch and the fuel tank floor corrugation must be of .032 gage to allow for the .032 corrugation patch.
5. Use existing rivet holes where possible.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.

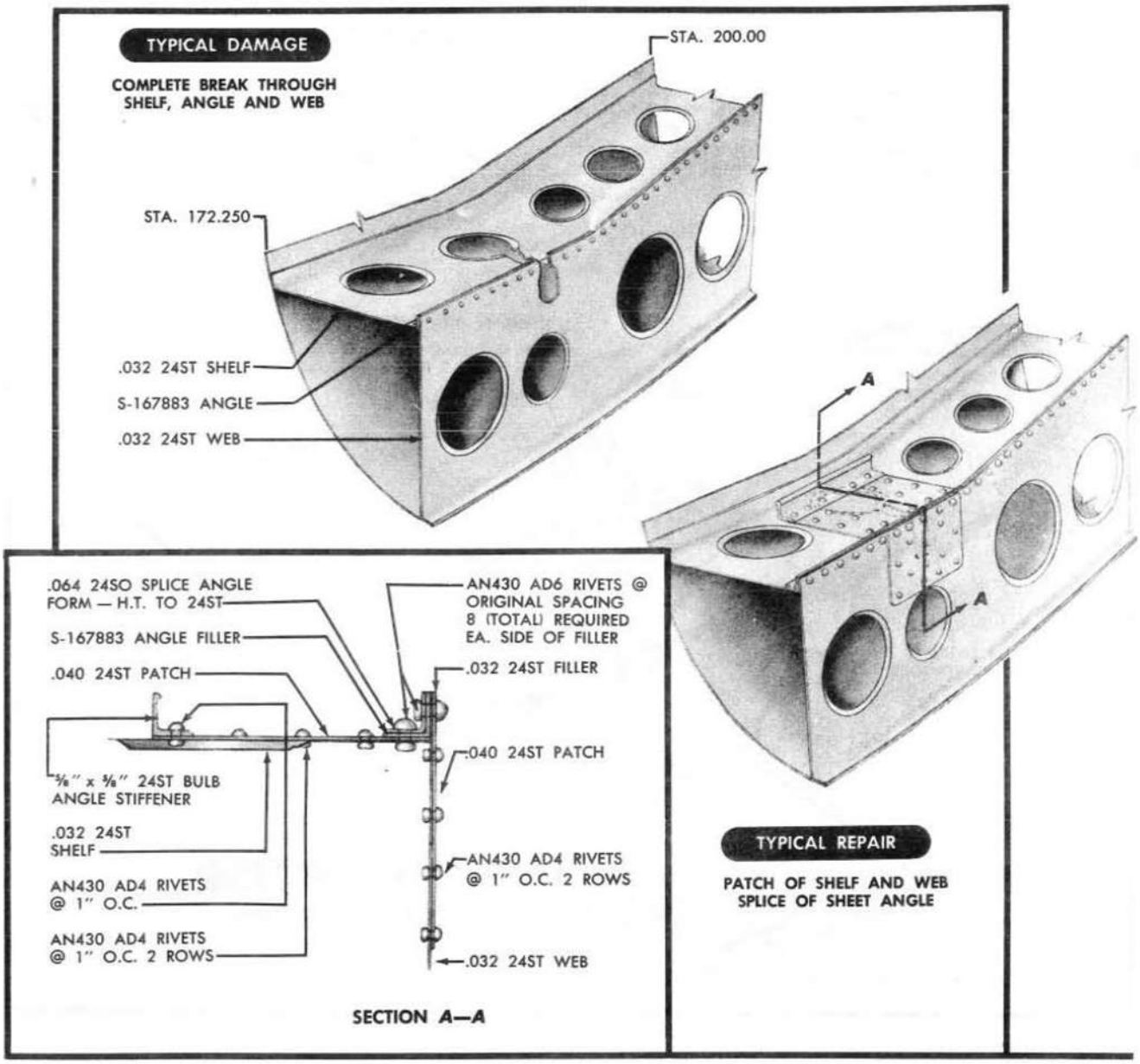
Figure 202 Patch and Splice Repair to Nacelle Fuel Tank Floor (Sheet 3 of 3)



NOTES

1. Patch repair shown is typical for all similar structure in the nacelle.
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than one-fourth inch.
4. A damage not over two inches in diameter requires a floor patch only. Damage in corrugation must be trimmed smooth, and cracks must be stopped with one-eighth inch holes at each end.
5. A damage over two inches but not over five inches in diameter is repaired as shown above. Construct patches for floor and corrugation from the same gage and material as original.
6. A damage over five inches in diameter is repaired as shown above. Patches must be one gage heavier than original material.
7. Cherry rivets are shown in repair drawings where bucking is impossible.
8. For rivet edge and row distance, see Fig. 7, Section I.

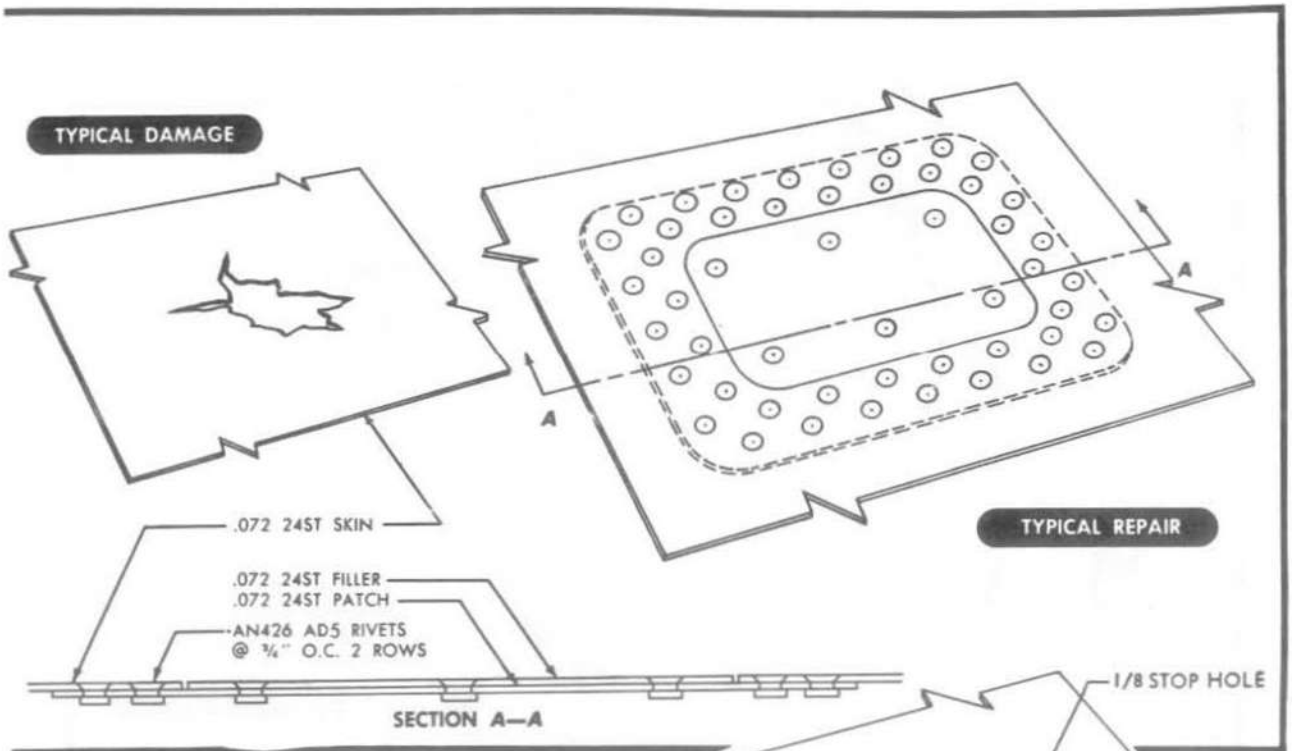
Figure 203—Patch Repair of Damage to Mechanics Floor and Corrugation

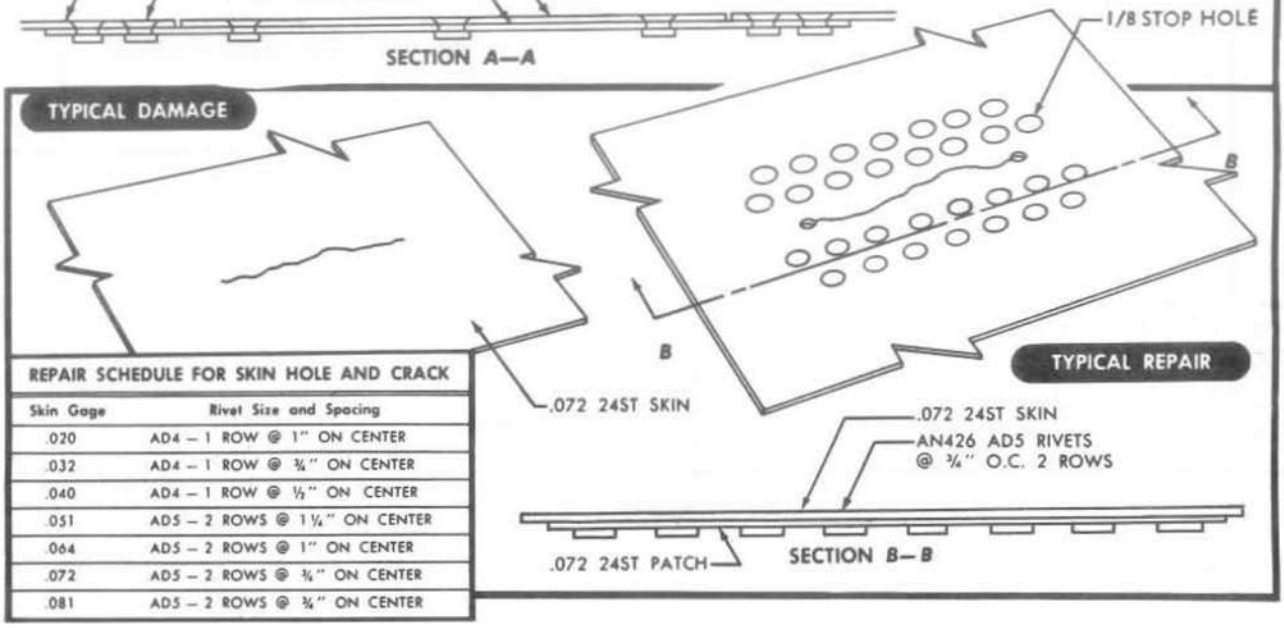


NOTES

1. Repair is shown at Station 188 but is typical for all similar structures within the nacelle.
2. Remove all interfering rivets.
3. Trim damage smooth leaving no radius less than one-fourth inch.
4. Construct splice angle from .064 24SO material. Heat treat to 24ST.
5. Construct web and shelf patches from .040 24ST material.
6. Construct fillers from same gage and material as original.
7. Use bulb angle stiffener as shown to restore strength lost by damaged lightening hole flange.
8. Use existing rivet holes where possible.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

Figure 204—Patch and Splice Repair of Shelf, Web and Angle—Nacelle Shelf at Sta. 188





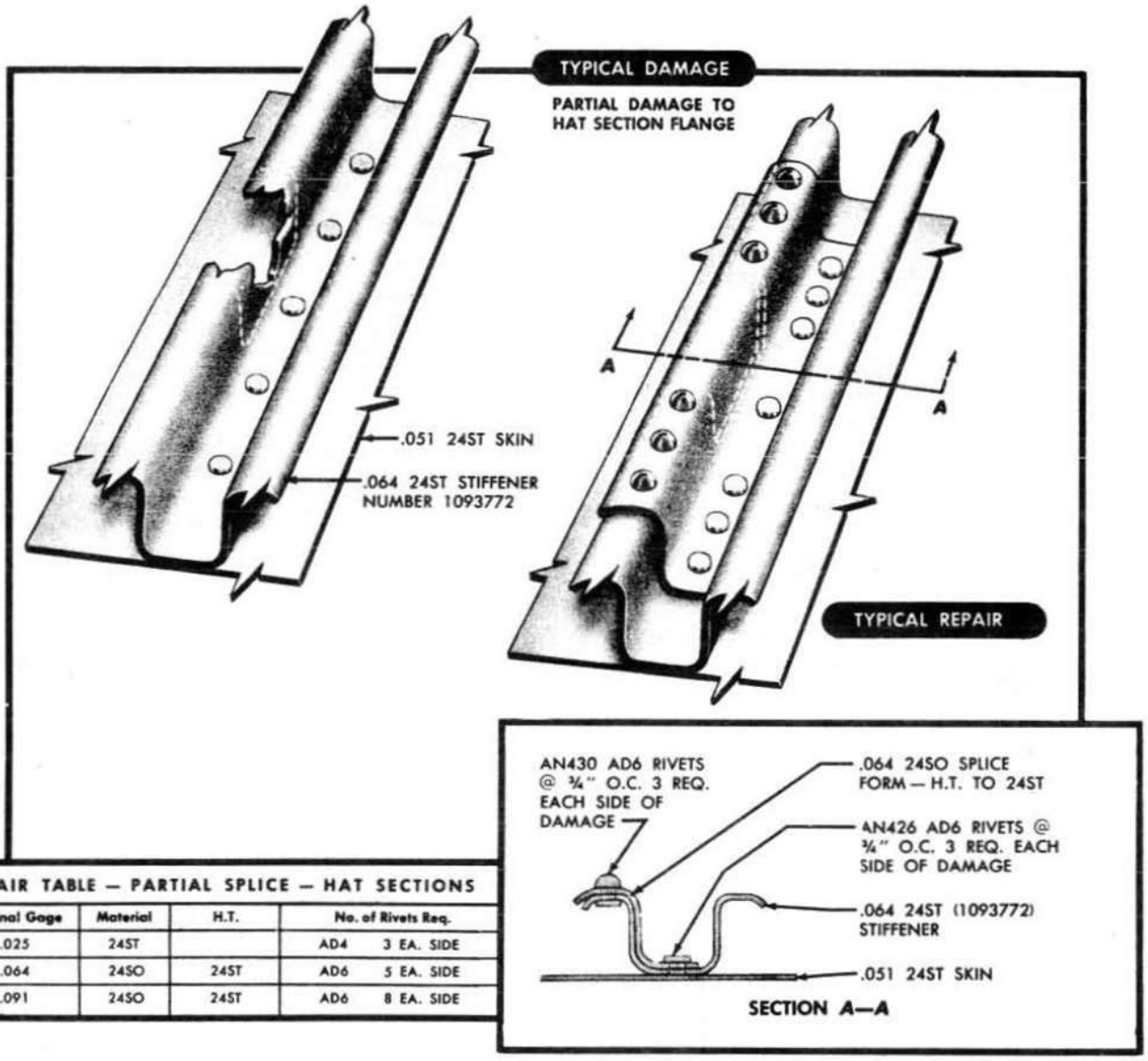
REPAIR SCHEDULE FOR SKIN HOLE AND CRACK

Skin Gage	Rivet Size and Spacing
.020	AD4 – 1 ROW @ 1" ON CENTER
.032	AD4 – 1 ROW @ ¾" ON CENTER
.040	AD4 – 1 ROW @ ½" ON CENTER
.051	AD5 – 2 ROWS @ 1¼" ON CENTER
.064	AD5 – 2 ROWS @ 1" ON CENTER
.072	AD5 – 2 ROWS @ ¾" ON CENTER
.081	AD5 – 2 ROWS @ ¾" ON CENTER

NOTES

1. Trim damage smooth leaving no radius less than one-fourth inch.
2. Drill one-eighth inch stop holes at each end of crack.
3. Construct patch from 24ST material of same gage as skin.
5. Rivet size and spacing for attaching patches to skin of different gages are noted on table above.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

Figure 205—Typical Patch Repair of Holes and Cracks in Nacelle Skin



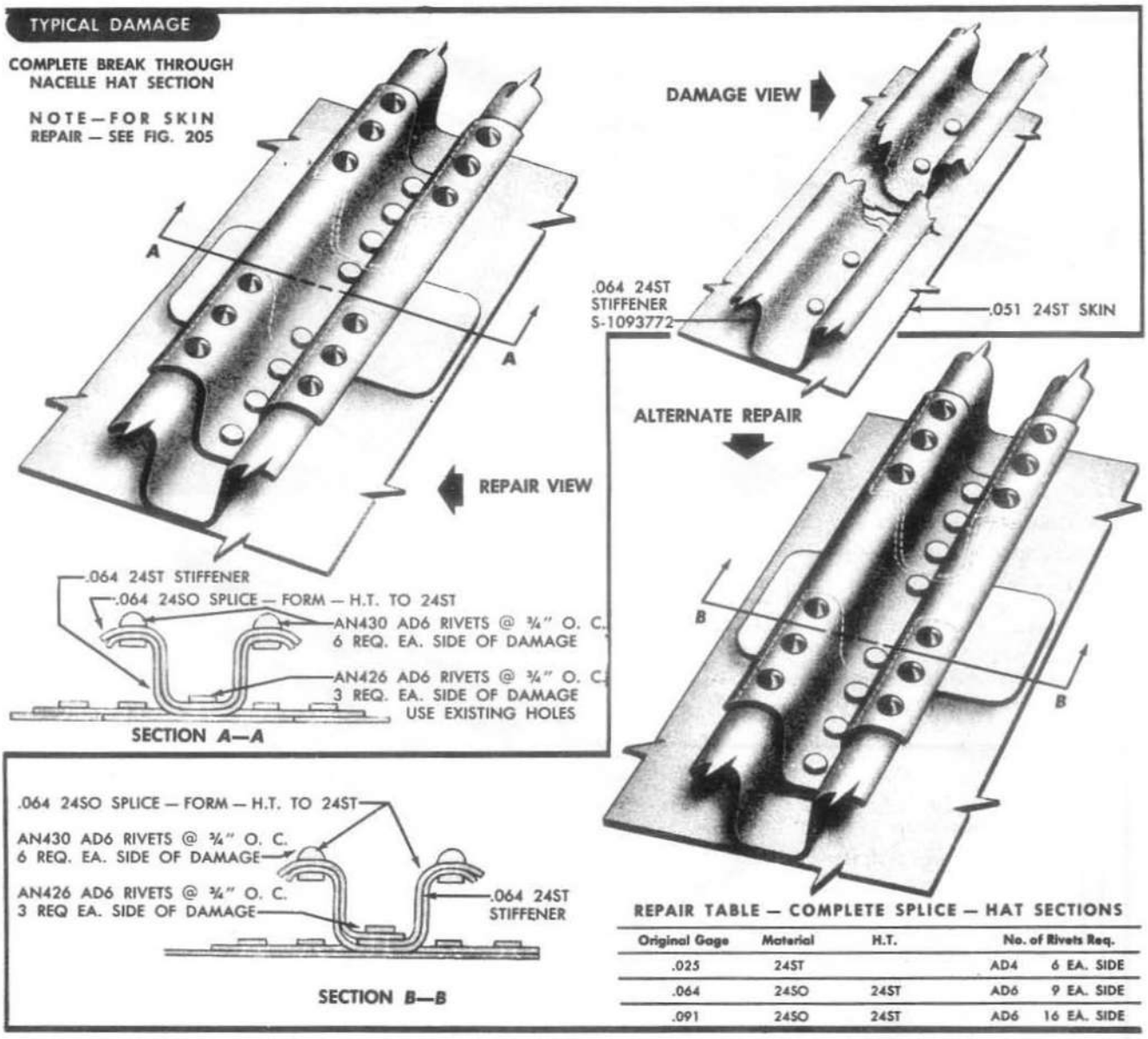
REPAIR TABLE — PARTIAL SPLICE — HAT SECTIONS

Original Gage	Material	H.T.	No. of Rivets Req.
.025	24ST		AD4 3 EA. SIDE
.064	24SO	24ST	AD6 5 EA. SIDE
.091	24SO	24ST	AD6 8 EA. SIDE

NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from .064 24SO material. Heat treat to 24ST.
4. Use existing rivet holes where possible.
5. For minimum bend radii of sheet material see Figure 5, Section I.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

Figure 206 — Patch Repair of Partial Damage to Nacelle Hat Sections



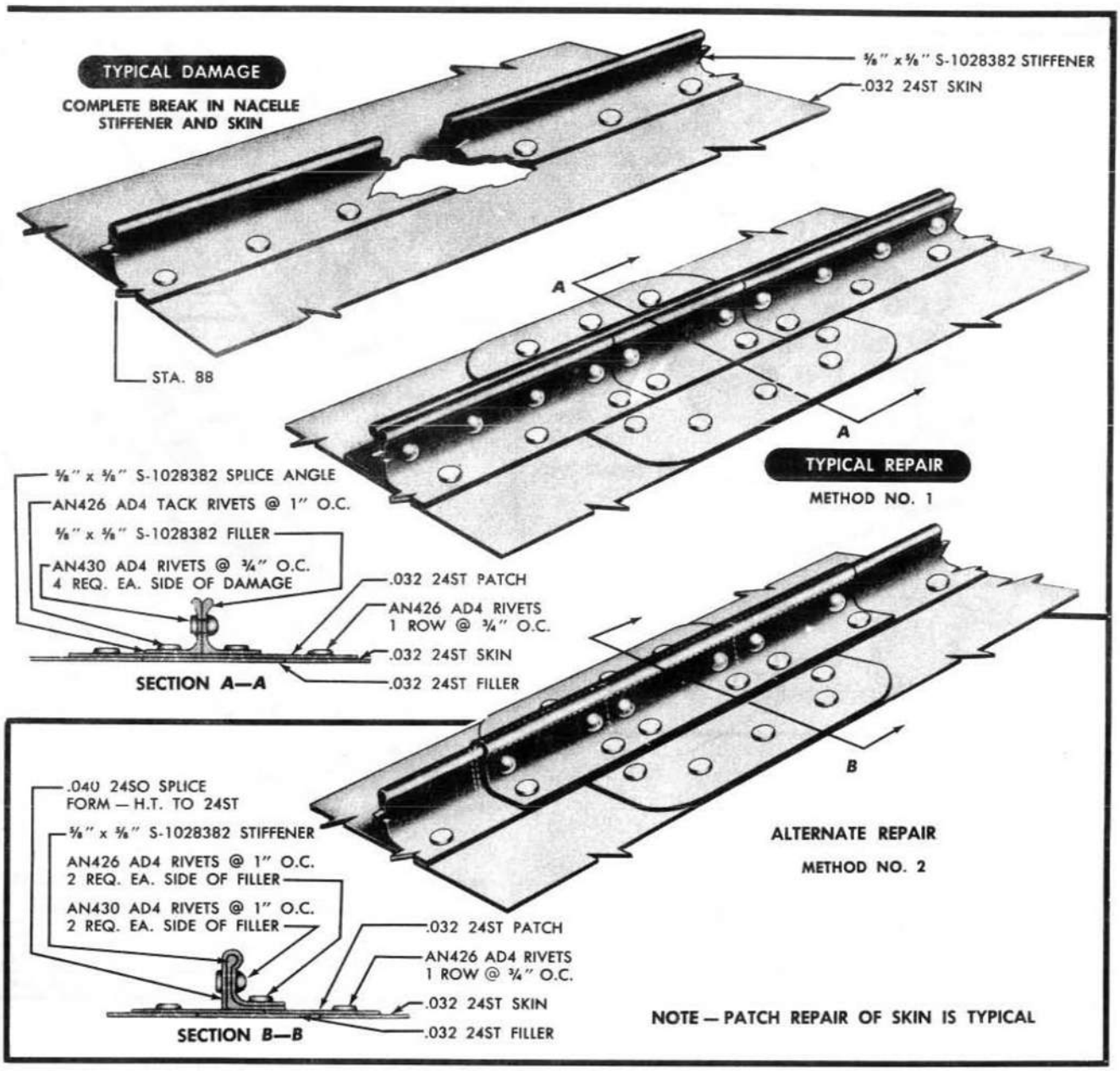
REPAIR TABLE — COMPLETE SPLICE — HAT SECTIONS

Original Gage	Material	H.T.	No. of Rivets Req.
.025	24ST	AD4	6 EA. SIDE
.064	24SO	24ST	AD6	9 EA. SIDE
.091	24SO	24ST	AD6	16 EA. SIDE

NOTES

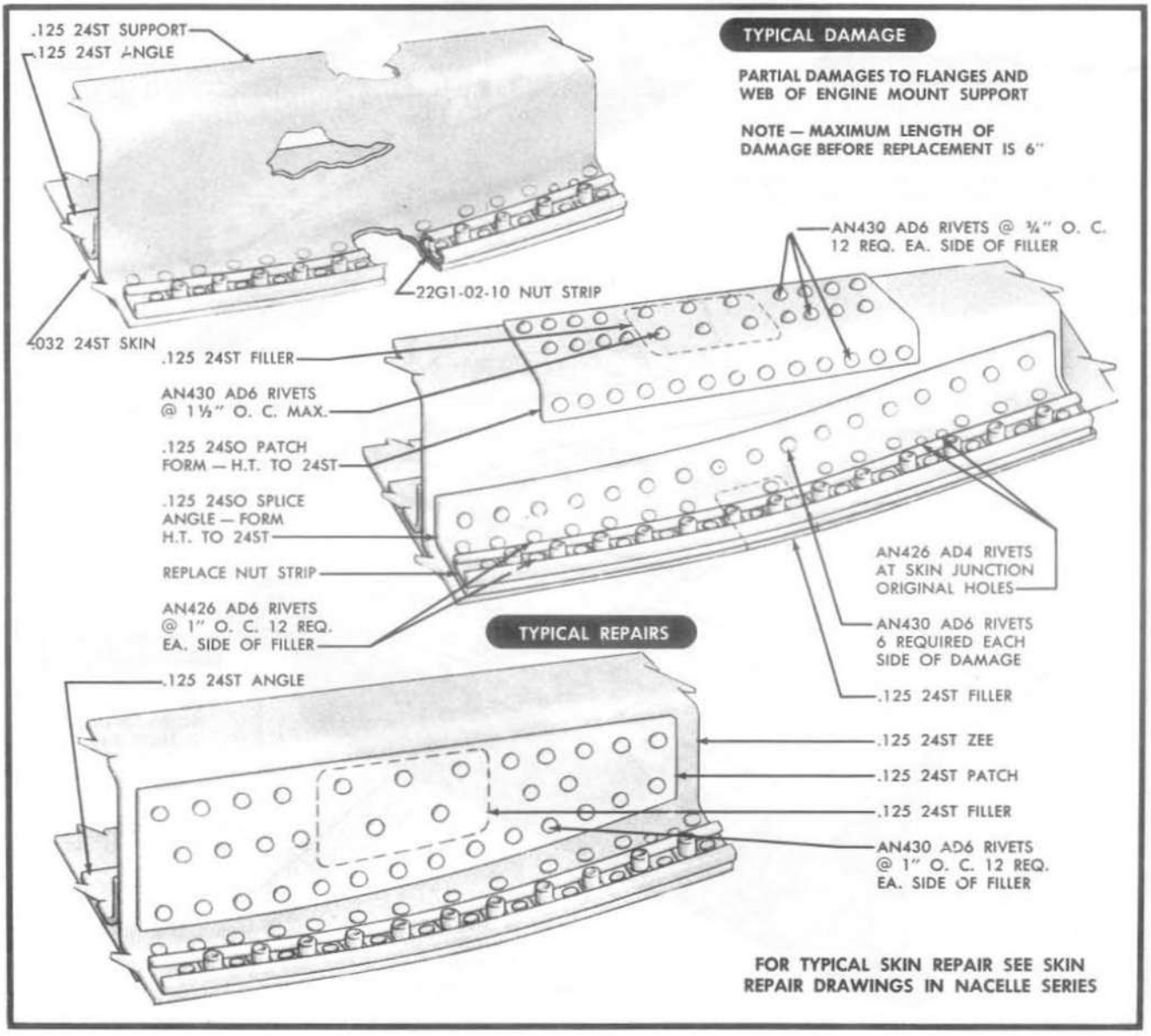
1. Remove all interfering rivets.
2. Cut out damaged part of stiffener and trim damage smooth in attaching skin.
3. Construct splice from .064 24SO material. Heat treat to 24ST.
4. A filler is necessary only where skin is attached to the stiffener. Use .125 24ST material for filler.
5. For minimum bend radii of sheet material see Figure 5, Section I.
6. For rivet edge and row distance see Figure 7, Section I.
7. For repair of skin damage see typical nacelle skin repairs, this section.

Figure 207 — Spliced Repair of Complete Break — Nacelle Hat Section



1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice angle from an extruded angle of same dimensions and material as existing stiffener.
4. Construct filler from an extruded angle of the same dimensions and material as existing stiffener.
5. An alternate repair may be used as shown by method number two, above. Construct splice as noted on Section B-B.
6. For skin repair see typical skin repair drawings in this series.
7. Use existing rivet holes where possible.
8. For minimum bend radii of sheet material see Fig. 5, Section I.
9. For flush riveting see Fig. 6, Section I.
10. For rivet edge and row distance see Fig. 7, Section I.

Figure 208—Typical Splice of Complete Break in Nacelle Stiffener and Skin

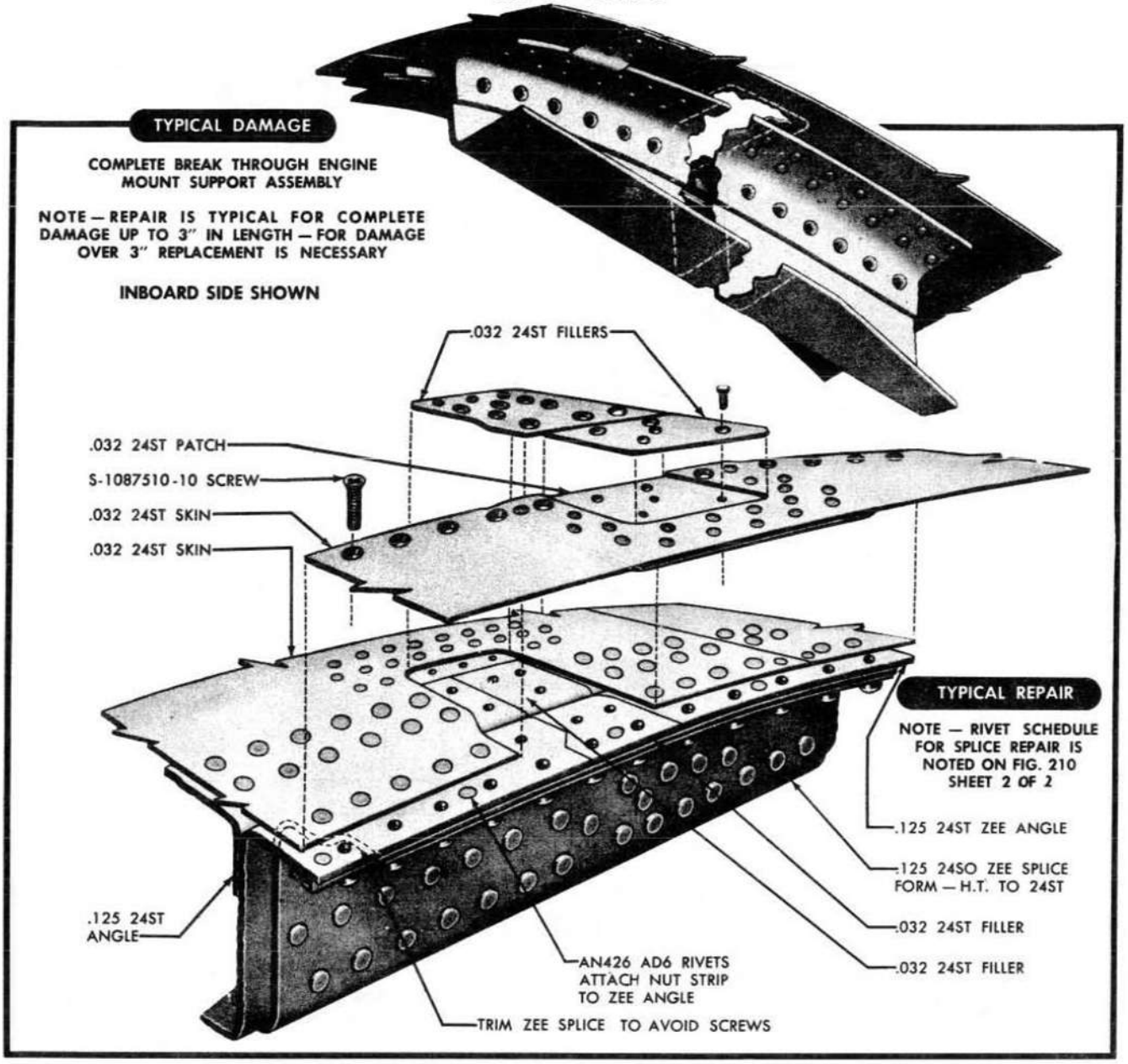


NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch or splice angle from .125 24SO material. Heat treat to 24ST.
4. Construct fillers from same gage and material as original.
5. Use existing rivet holes where possible.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

Figure 209 — Patch Repair of Partial Damage in Engine Mount Support Assembly

AN 01-40AJ-3



NOTES

1. Remove all interfering rivets and screws.
2. Cut out damaged part of support and trim damage smooth in attaching skin.
3. Construct splice angles from .125 24SO material. Heat treat to 24ST.
4. A filler is necessary only where skin is attached to the support. Use .125 24ST material for filler.
5. Use existing rivet holes where possible.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

Figure 210 — Repair of Nacelle Engine Mount Support Assembly (Sheet 1 of 2)

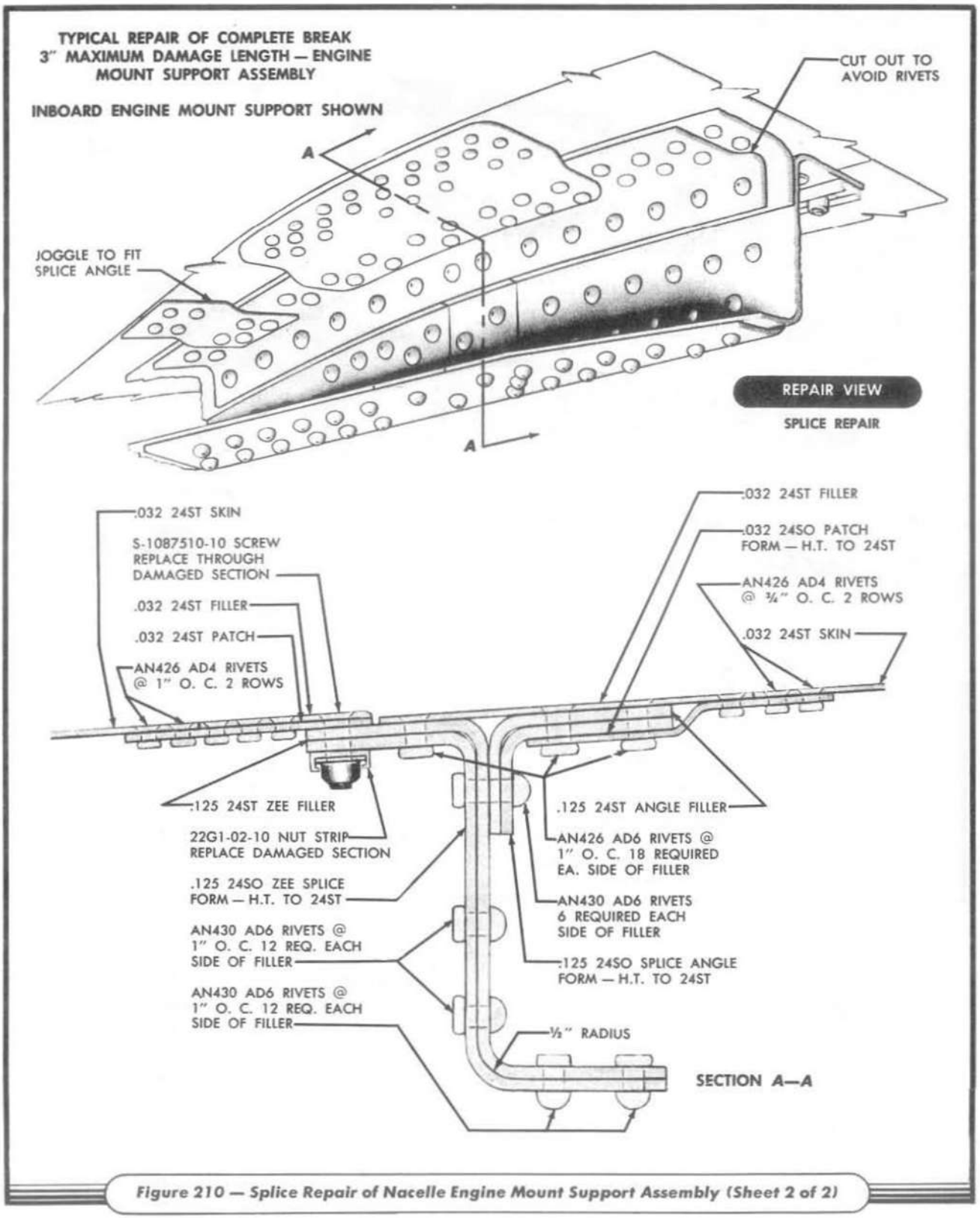
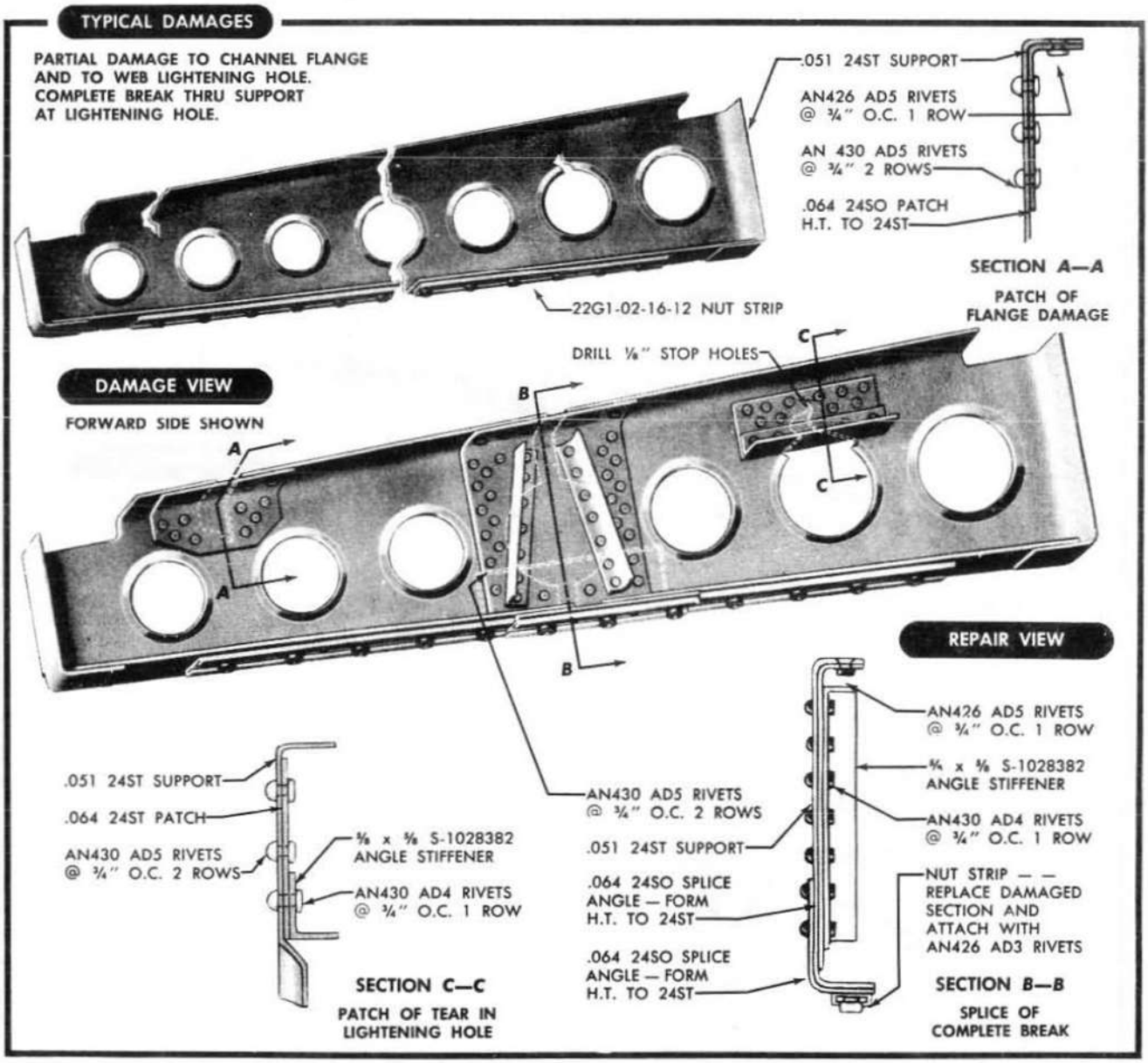


Figure 210 — Splice Repair of Nacelle Engine Mount Support Assembly (Sheet 2 of 2)



NOTES

1. Remove all interfering rivets and screws.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patches from .064 24SO material where bending is necessary. Heat treat to 24ST.
4. When bending is not necessary use .064 24ST material for patch.
5. Use angle stiffeners as shown to restore strength lost by damaged lightening hole flange.
6. Use existing rivet holes where possible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 211—Patch and Splice of Damages to Nacelle Oil Tank Support—Sta. 121

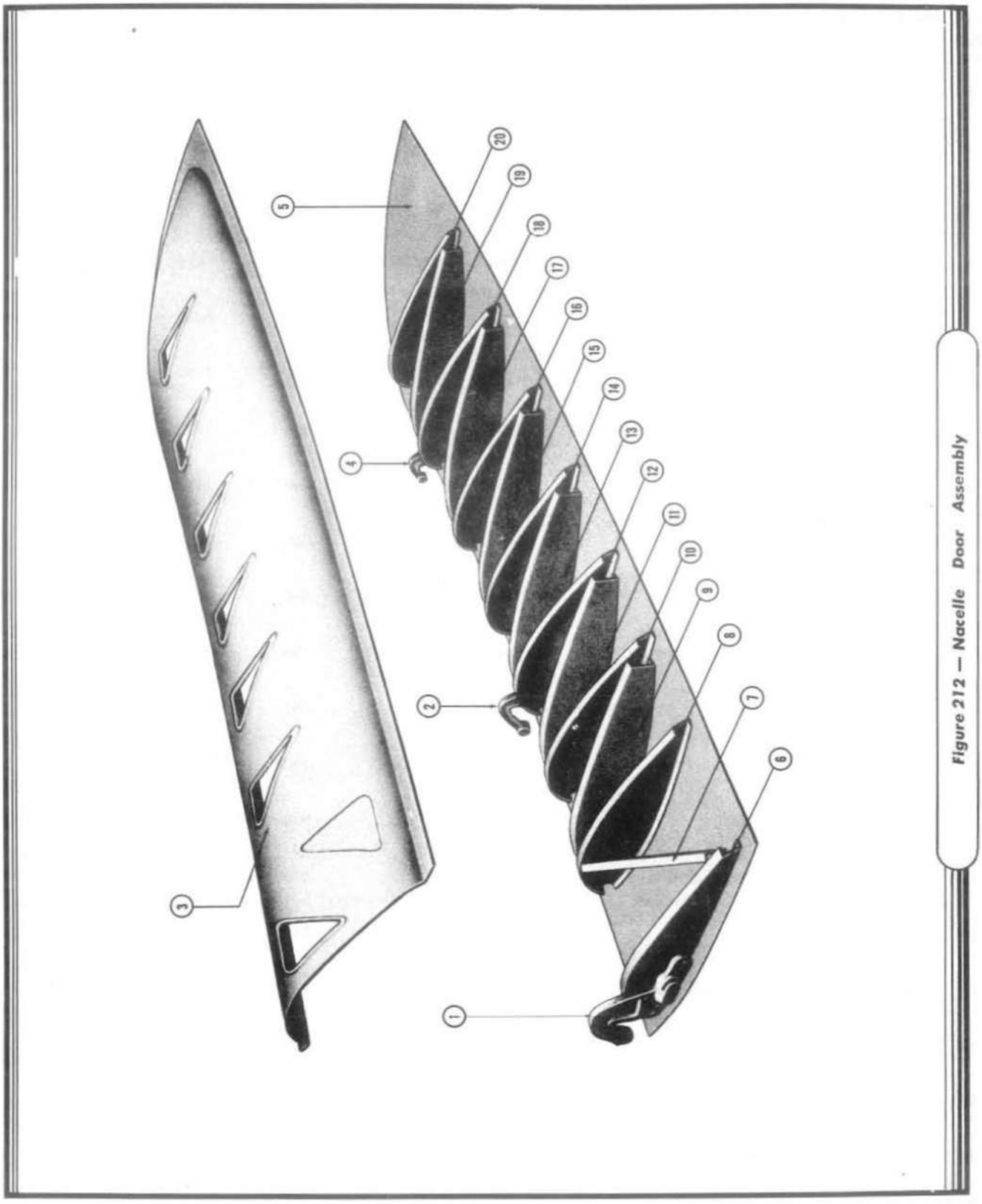


Figure 212 — Nacelle Door Assembly

KEY TO FIGURE 212

L.H. and R.H. indicate left and right hand assemblies.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	4127526-2 L.H.	Hinge Fitting	Make from 4127525 Blank Forg.		14ST		1
	4127526-3 R.H.						1
2	2159796-2 L.H.	Hinge Fitting	Make from 4127527 Blank Forg.		14ST		1
	2159796-3 R.H.						1
3	5153035-4 L.H.	Cover	23x100	.040	24SO	24ST	1
	5153035-5 R.H.						1
4	2159795 L.H.	Hinge Fitting	Make from 4127508 Blank Forg.		14ST		1
	2159795-1 R.H.						1
5	5153035-2 L.H.	Skin	21x90	.032	24ST		1
	5153035-3 R.H.						1
6	5153035-34 L.H.	Rib	8x20	.091	24SO	24ST	1
	5153035-35 R.H.						1
7	5153035-32 L.H.	Diagonal Rib	8x23	.040	24SO	24ST	1
	5153035-33 R.H.						1
8	5153035-30 L.H.	Rib	9½x17½	.040	24SO	24ST	1
	5153035-31 R.H.						1
9	5153035-28 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-29 R.H.						1
10	5153035-26 L.H.	Rib	9½x17½	.040	24SO	24ST	1
	5153035-27 R.H.						1
11	5153035-24 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-25 R.H.						1
12	5153035-22 L.H.	Rib	9½x17½	.051	24SO	24ST	1
	5153035-23 R.H.						1
13	5153035-20 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-21 R.H.						1
14	5153035-18 L.H.	Rib	9½x17½	.040	24SO	24ST	1
	5153035-19 R.H.						1
15	5153035-16 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-17 R.H.						1
16	5153035-14 L.H.	Rib	9½x17½	.040	24SO	24ST	1
	5153035-15 R.H.						1
17	5153035-12 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-13 R.H.						1
18	5153035-10 L.H.	Rib	9½x17½	.051	24SO	24ST	1
	5153035-11 R.H.						1
19	5153035-8 L.H.	Diagonal Rib	9½x19½	.040	24SO	24ST	1
	5153035-9 R.H.						1
20	5153035-6 L.H.	Rib	6x14	.040	24SO	24ST	1
	5153035-7 R.H.						1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

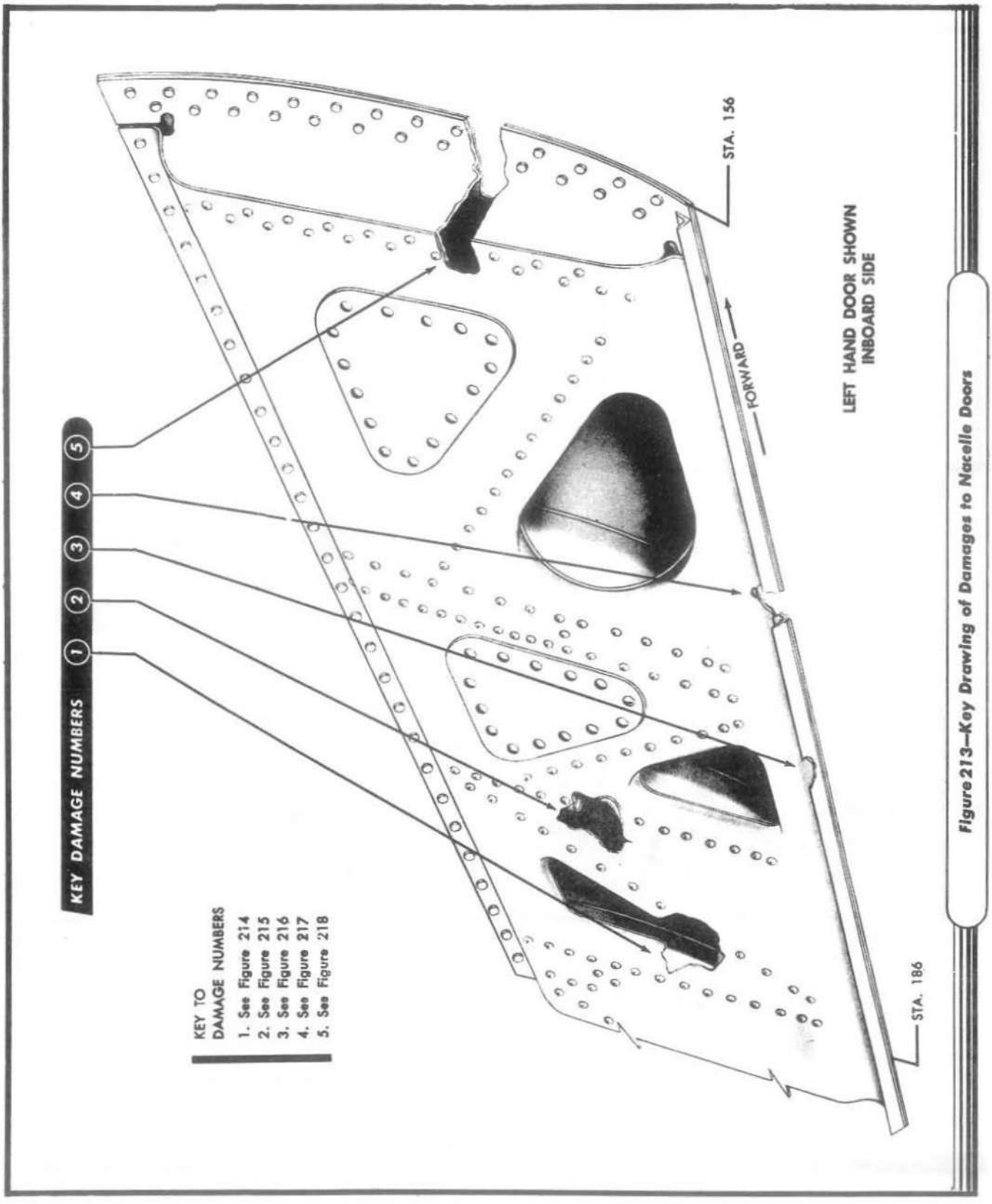
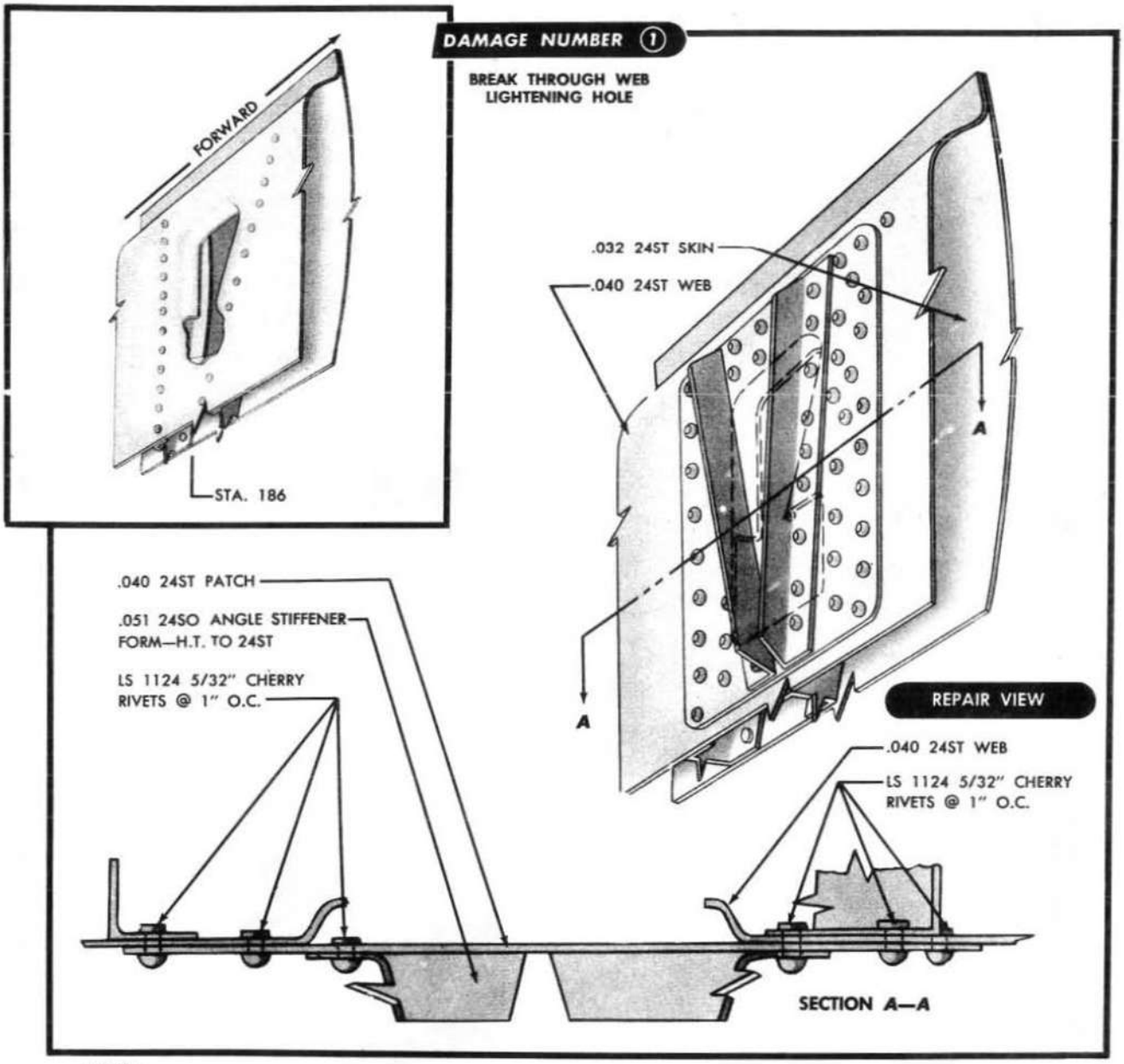


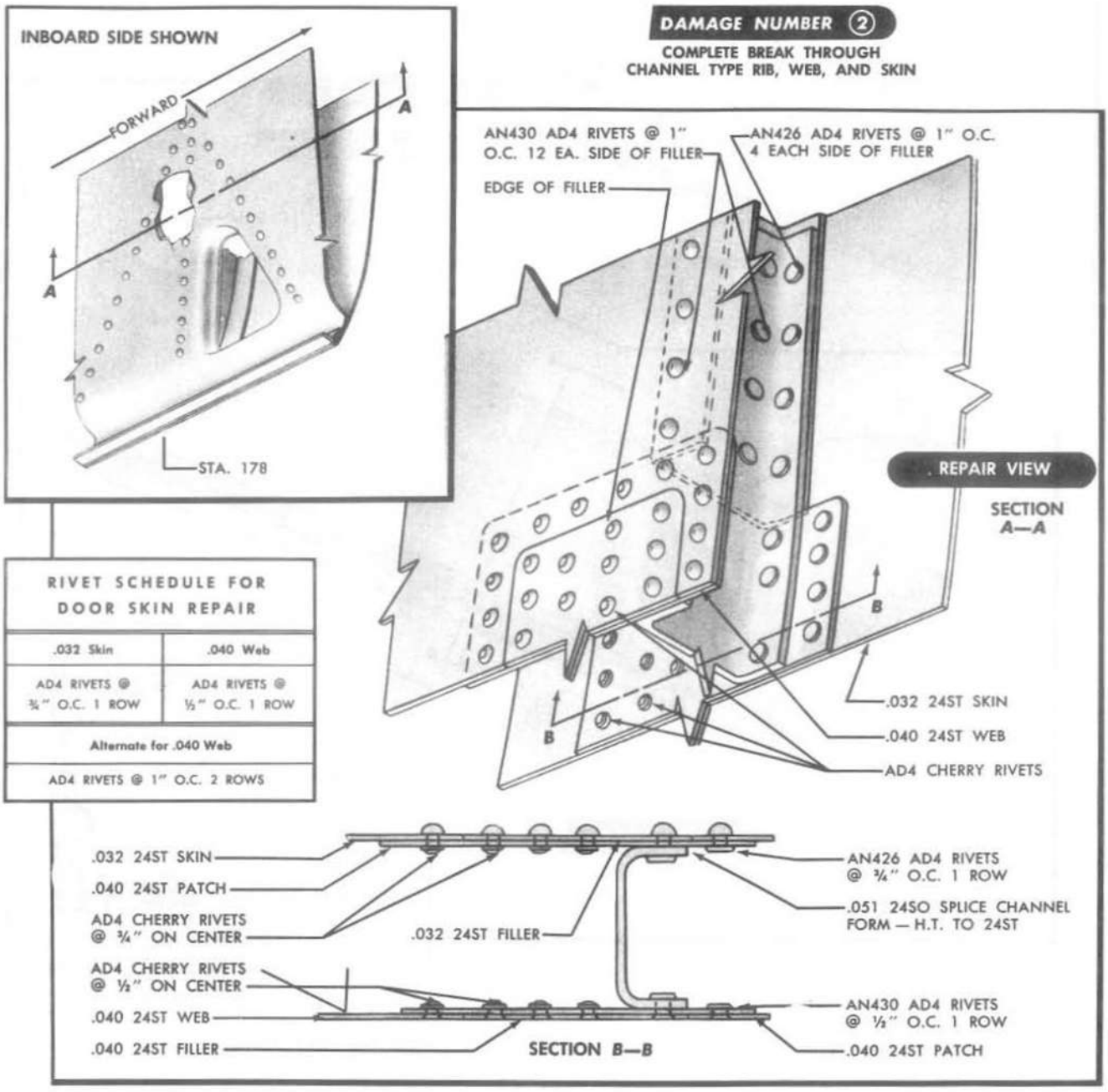
Figure 213—Key Drawing of Damages to Nacelle Doors



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct patch from .040 24ST material.
4. Use angle stiffeners as shown above to restore original strength lost by damaged lightening hole flange.
5. Use cherry rivets where bucking is impossible.
6. For repair of ribs and skin, refer to typical rib and skin repairs in Nacelle Door Repair series.
7. For rivet edge and row distance see Figure 7, Section I.

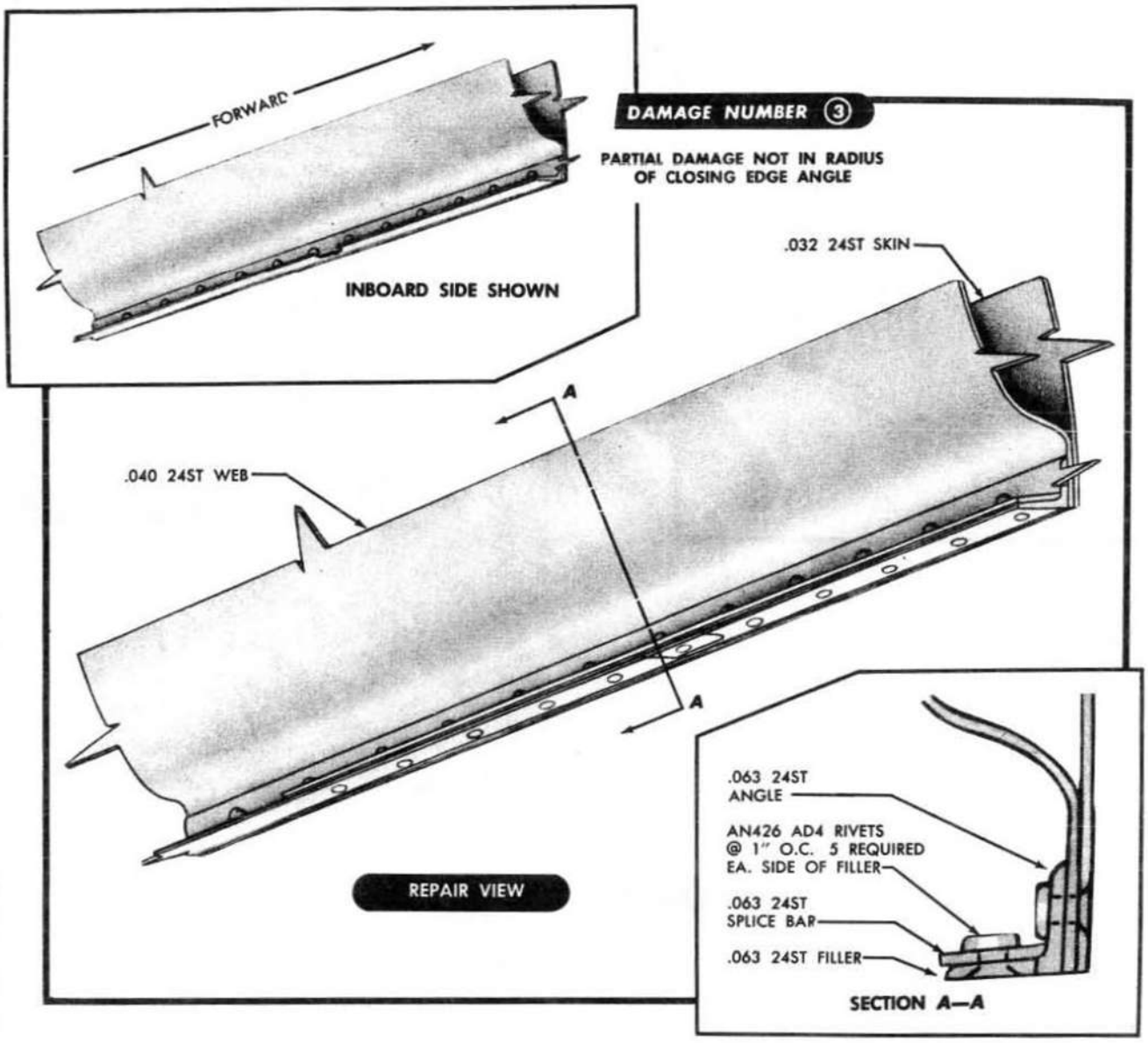
Figure 214—Patch Repair of Nacelle Door Lightening Hole



RIVET SCHEDULE FOR DOOR SKIN REPAIR	
.032 Skin	.040 Web
AD4 RIVETS @ ¾" O.C. 1 ROW	AD4 RIVETS @ ½" O.C. 1 ROW
Alternate for .040 Web	
AD4 RIVETS @ 1" O.C. 2 ROWS	

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct channel splice from .051 24SO material. Form and heat treat to 24ST.
4. Construct skin patches from .040 24ST material.
5. Construct all fillers from the same gage and material as original.
6. Use cherry rivets where bucking is impossible.
7. For minimum bend radii of sheet material see Figure 5, Section I.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

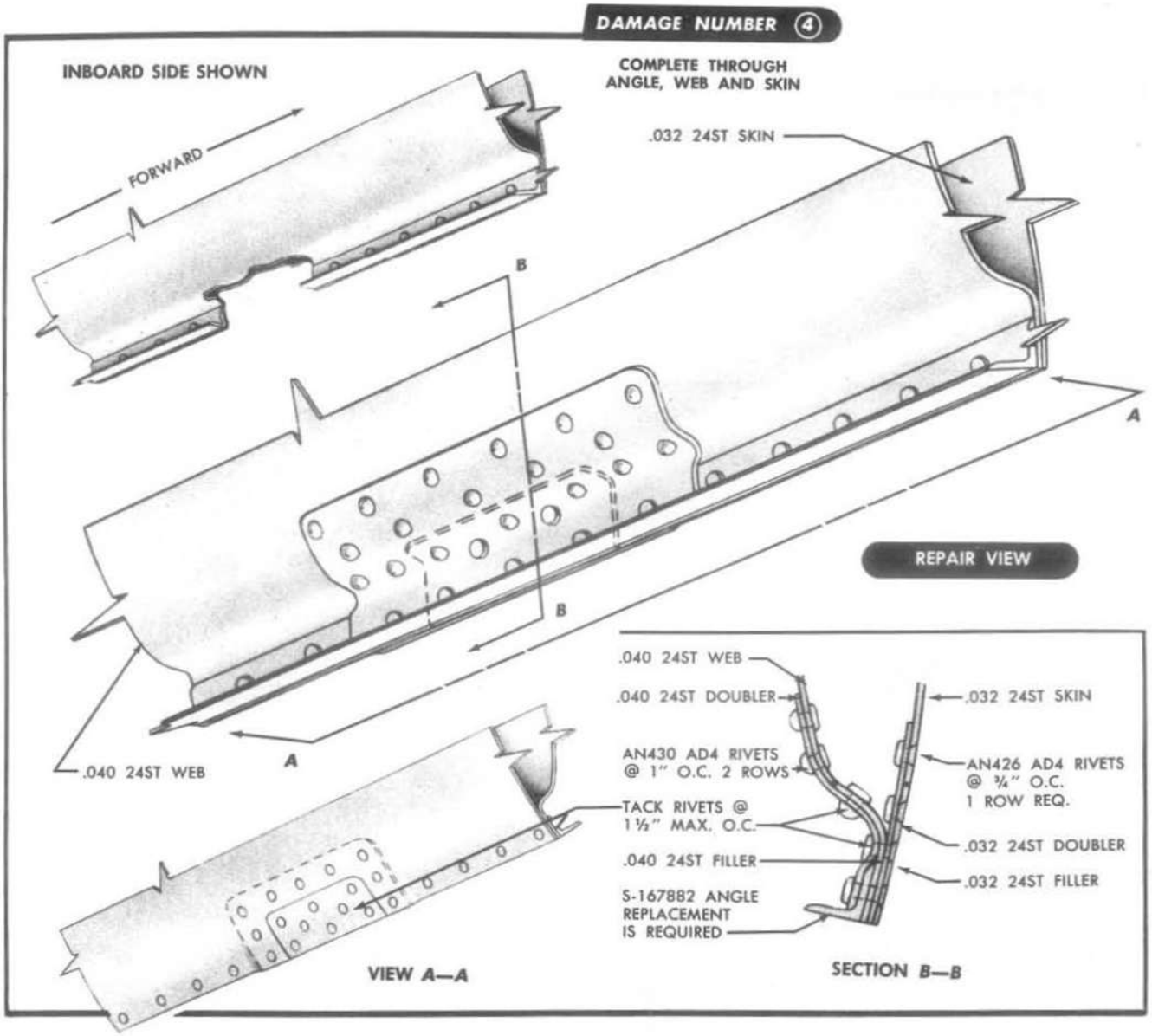
Figure 215—Splice Repair of Nacelle Door Rib (Channel Type)



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice bar from .062 24ST material.
4. Construct filler from .062 24ST material.
5. For flush riveting, see Figure 6, Section I.
6. For rivet edge and row distance see Figure 7, Section I.

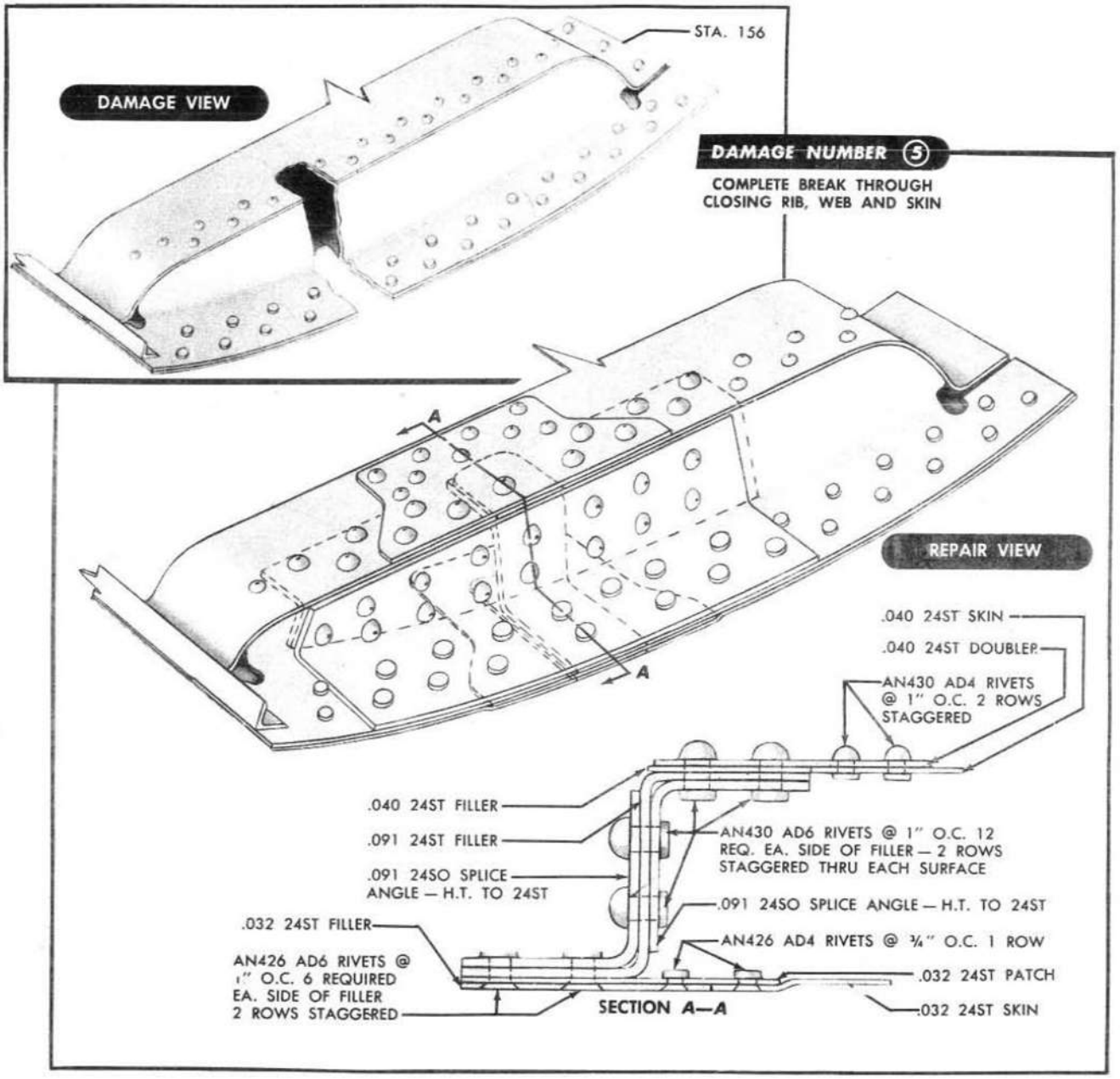
Figure 216—Patch Repair of Nacelle Door Closing Edge Angle



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct patch doublers from 24ST material of gages noted on Section B-B.
4. Construct fillers from the same gage and material as original.
5. Use existing rivet holes where possible.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance, see Figure 7, Section I.

Figure 217—Splice Repair of Nacelle Door Closing Edge Angle



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice angles from .091 24SO material. Form and heat treat to 24ST.
4. Construct rib filler from .091 24SO material. Form and heat treat to 24ST.
5. Construct skin patches and fillers from 24ST material of gages indicated on Section A-A.
6. For minimum bend radii of sheet material see Figure 5, Section I.
7. For flush riveting see Figure 6, Section I.
8. For rivet edge and row distance see Figure 7, Section I.

Figure 218–Splice Repair of Nacelle Door Closing Rib (Zee Type)

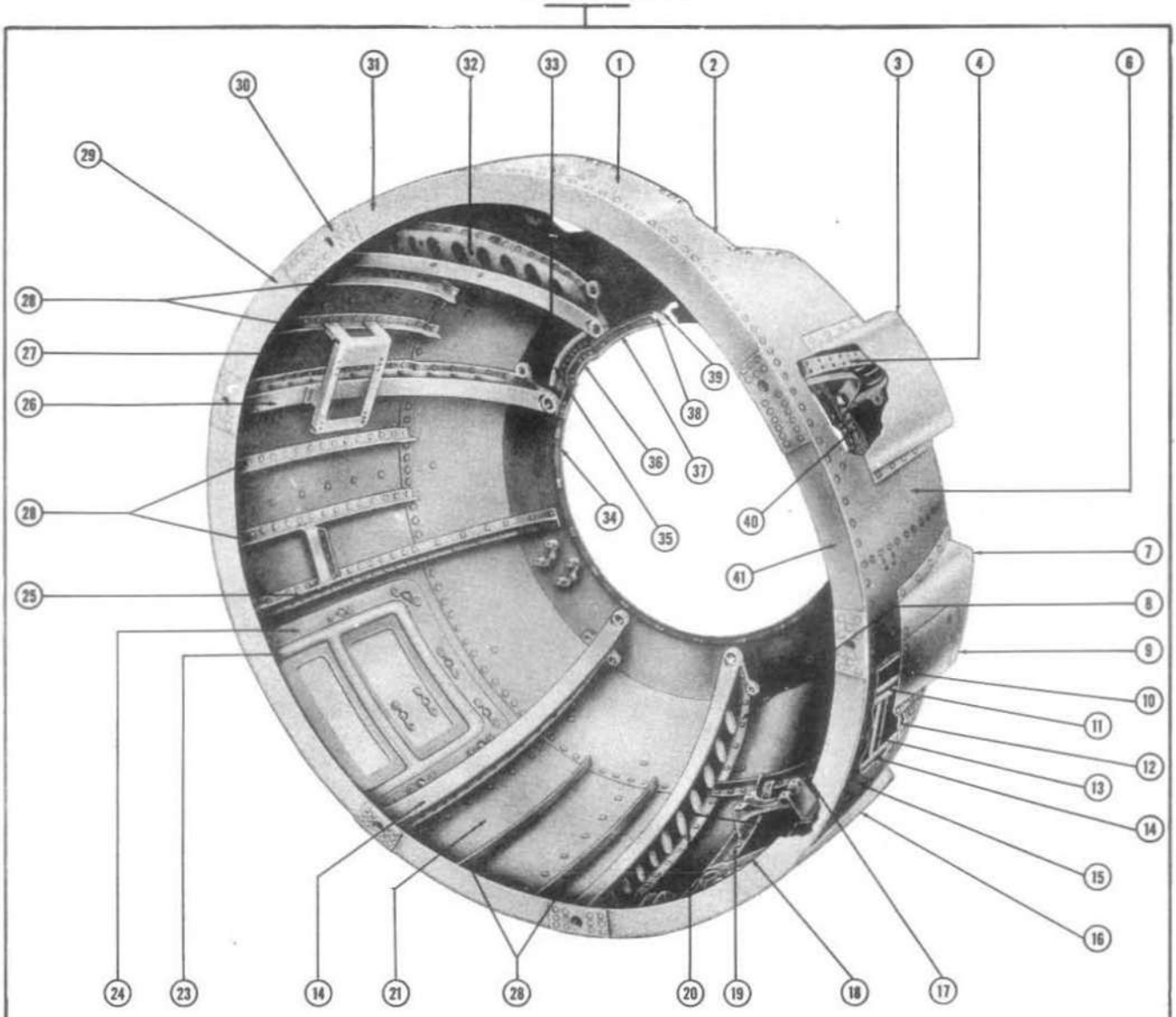


Figure 219—Engine Mount Assembly

KEY TO FIGURE 219

Engine mounts are interchangeable.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5123042-2	Skin	19½x43	.035	Corr. Resist. Steel		1
2	5123042-4	Channel	14¼x30½	.035	Corr. Resist. Steel		1
3	5191301-4	Baffle	15⅛x22	.040	24SO	24ST	1
4	5123011-2	Rib	Make from 5123086 Blank Forg.		14ST		1
5	(This item has been deleted.)						

KEY TO FIGURE 219 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
6	5123043-2	Skin	23-15/16x45	.035	Corr. Resist. Steel		1
7	5191016-2	Baffle	15-9/32x22	.040	24SO	24ST	2
8	5123011-4	Rib	Make from 5123086 Blank Forg.		14ST		1
9	5191016-8	Baffle Door	5-3/32x9-1/16	.040	24SO	24ST	2
10	5123043-4	Stiffener	20x20	.035	Corr. Resist. Steel		1
11	5191089-5	Stiffener	3-9/16x13¾	.025	Corr. Resist. Steel		1
12	5191089-8	Stiffener	4x8½	.025	Corr. Resist. Steel		1
13	5191089-6	Stiffener	2¼x5½	.025	Corr. Resist. Steel		1
14	5123011-4	Rib	Made from 5123086 Blank Forg.		14ST		1
15	5191089-2	Skin	21x21	.035	Corr. Resist. Steel		1
16	5191301-2	Baffle	15⅝x22	.040	24SO	24ST	3
	5191301-6	Baffle					1
17	5202442-12	Stiffener S-167890	Length 18		24ST		1
18	5202442-14	Stiffener S-1093708	Length 7⅝		24ST		1
19	4143773	Stiffener S-1007015	Length 20		24ST		1
20	4143773-1	Stiffener S-1007015	Length 20		24ST		1
21	5123044-2	Skin	23-15/16x60	.035	Corr. Resist. Steel		1
22	(This item has been deleted.)						
23	5191088-4	Doubler	21x21	.032	Corr. Resist. Steel		1
24	5191088-2	Sheet	18x20	.020	Corr. Resist. Steel		1
25	4121993	Rib S-167884	Length 34		24ST		2
26	5123011-4	Rib (Inbd. & Outbd.)	Made from 5213086 Blank Forg.		14ST		2
27	5123556	Skin	23-15/16x60	.035	Corr. Resist. Steel		1
28	4152415	Rib S-133193	Length 20		24SO	24ST	8
29	5123072-6	Stiffener	3x5	.125	24SO	24ST	2
30	5123072-10	Spacer	2x8⅛	3/16	24ST		2
31	5123072-4	Ring S-167892	Length 49		24SO	24ST	1
32	5123011-8	Rib	Made from 5123086 Blank Forg.		14ST		1
33	5202450	Ring	60x60	.125	24SO	24ST	1
34	2123200	Retainer	¾x22	.025	24SO	24ST	1
35	5202442-4	Retainer	5x7½	.125	24SO	24ST	2
36	5202442-8	Retainer	1x6	.032	24SO	24ST	2
37	2150809-2	Retainer	1¼x25	.025	24SO	24ST	2
38	2150822	Ring	1⅜x44	3/32	Neoprene Sheet		1
39	5202442-2	Stiffener S-1076089	Length 24		24ST		1
40	5202442-6	Stiffener	3x5¾	.032	24SO	24ST	2
41	5123072-2	Ring S-167892	Length 137		24SO	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURAL.

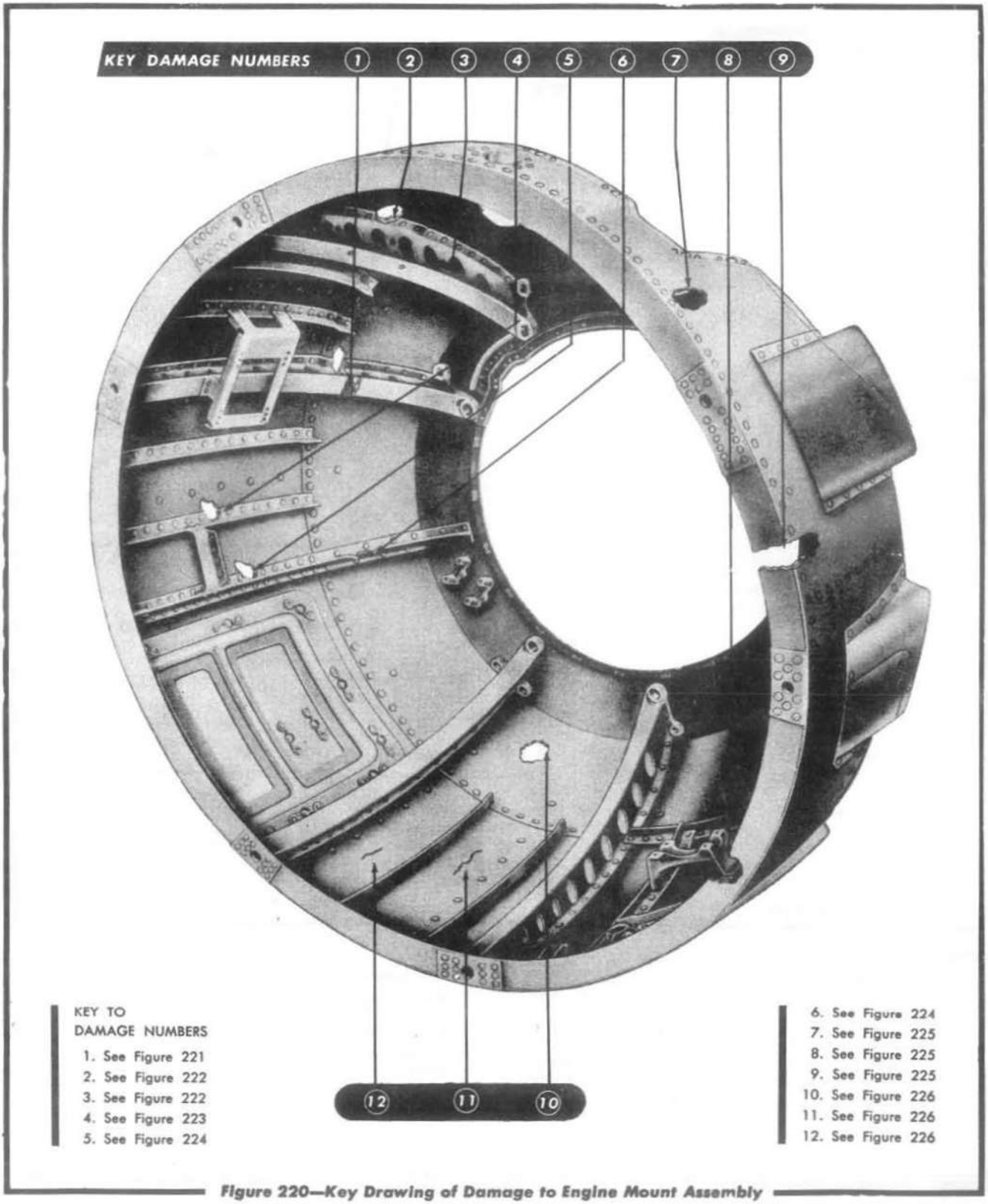
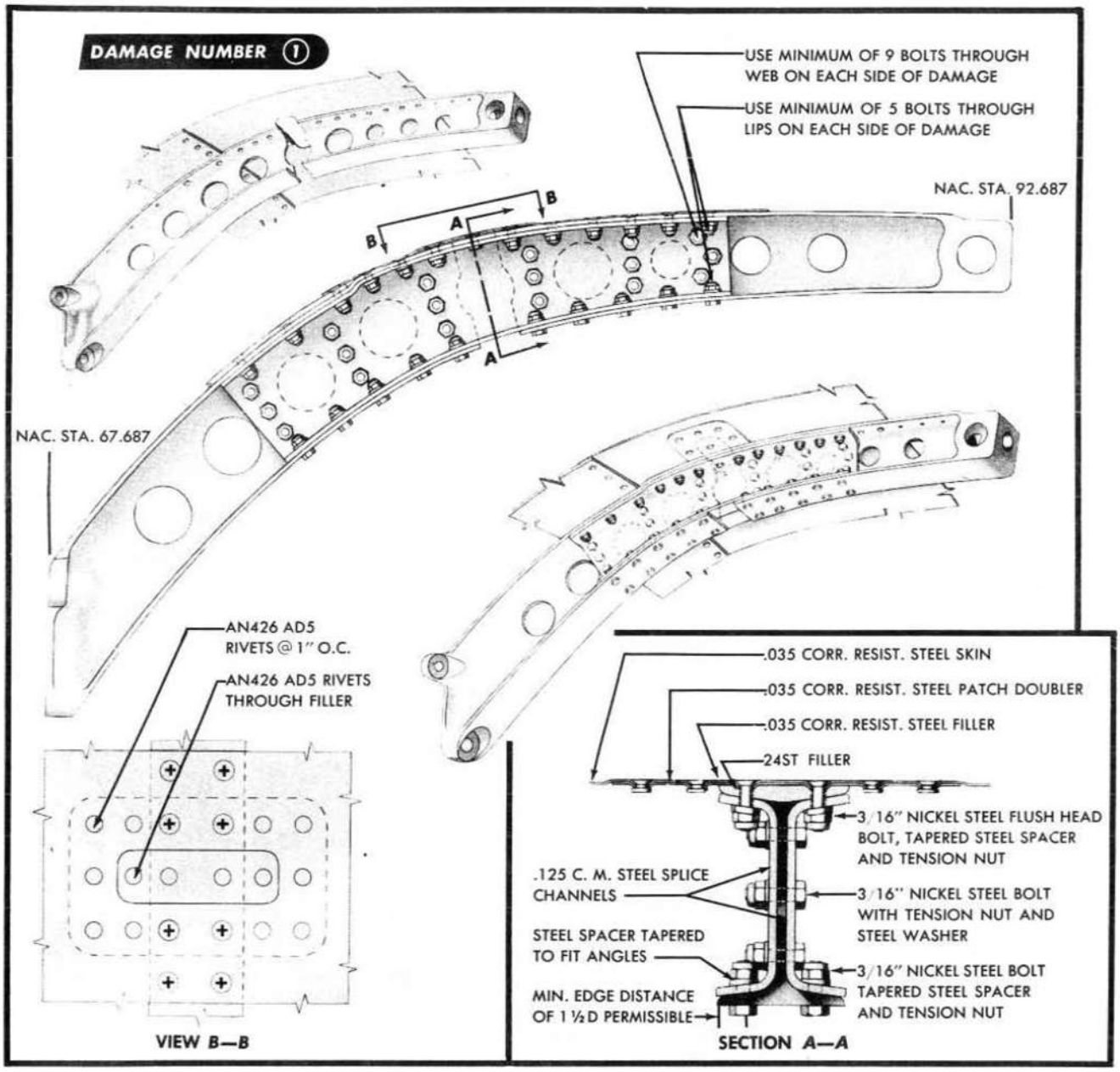


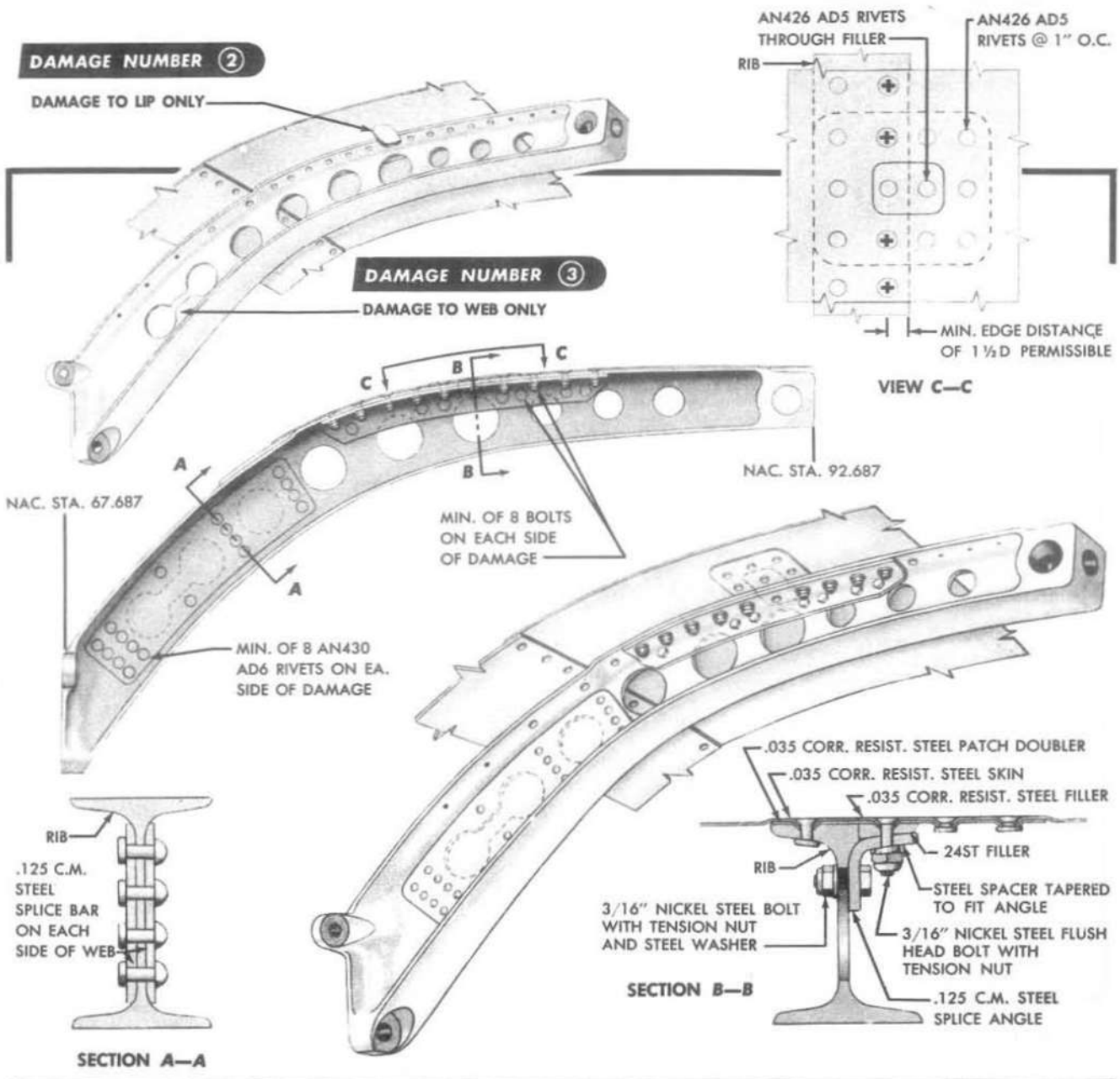
Figure 220—Key Drawing of Damage to Engine Mount Assembly



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-sixteenths inch.
3. Construct splice channels from .125 CM steel. Anneal for forming and heat treat to 125,000 P.S.I.
4. Construct filler in rib from 24ST of the same thickness as rib lip. A filler in the rib is necessary only where the skin attaches.
5. Use existing rivet holes in skin and rib lip for bolts.
6. Holes for bolts must be reamed for a light drive fit.
7. When damage in rib extends into engine mount fitting, rib must be replaced.
8. For skin repair see Figure 226 Section VI.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

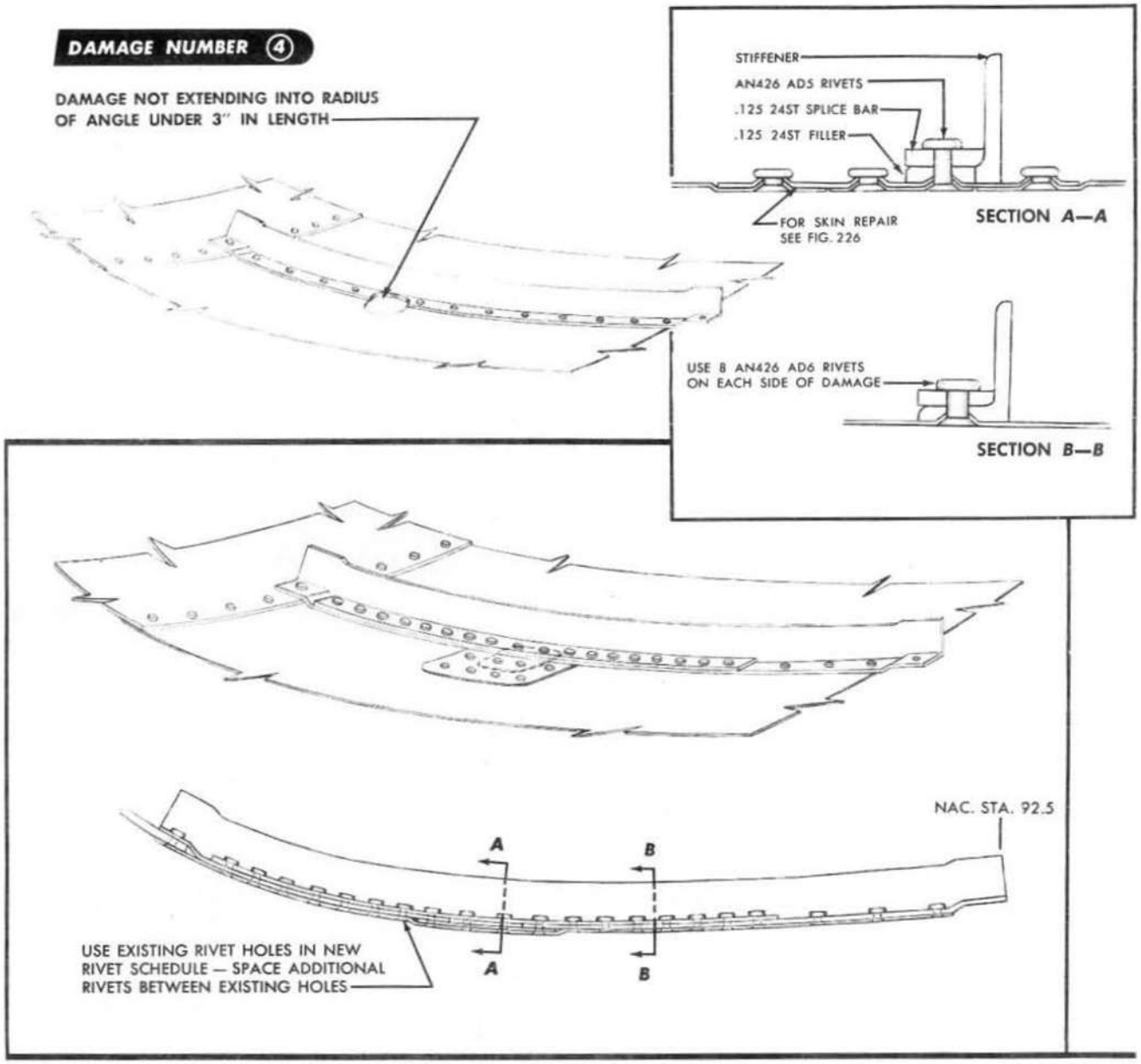
Figure 221 — Splice Repair of Engine Mount Rib



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bars or splice angles from .125 CM steel. Anneal for forming and heat treat to 125,000 P.S.I.
4. Construct filler in rib from 24ST of same thickness as rib lip. A filler is necessary only when the repair is being made to a part of the rib to which the skin is attached.
5. Use existing rivet holes in skin and rib lip for bolts.
6. Holes for bolts must be reamed for a light drive fit.
7. When damage in rib extends into engine mount fitting, rib must be replaced.
8. For skin repair see Figure 226 Section VI.
9. For minimum bend radii of sheet material see Figure 5, Section I.
10. For flush riveting see Figure 6, Section I.
11. For rivet edge and row distance see Figure 7, Section I.

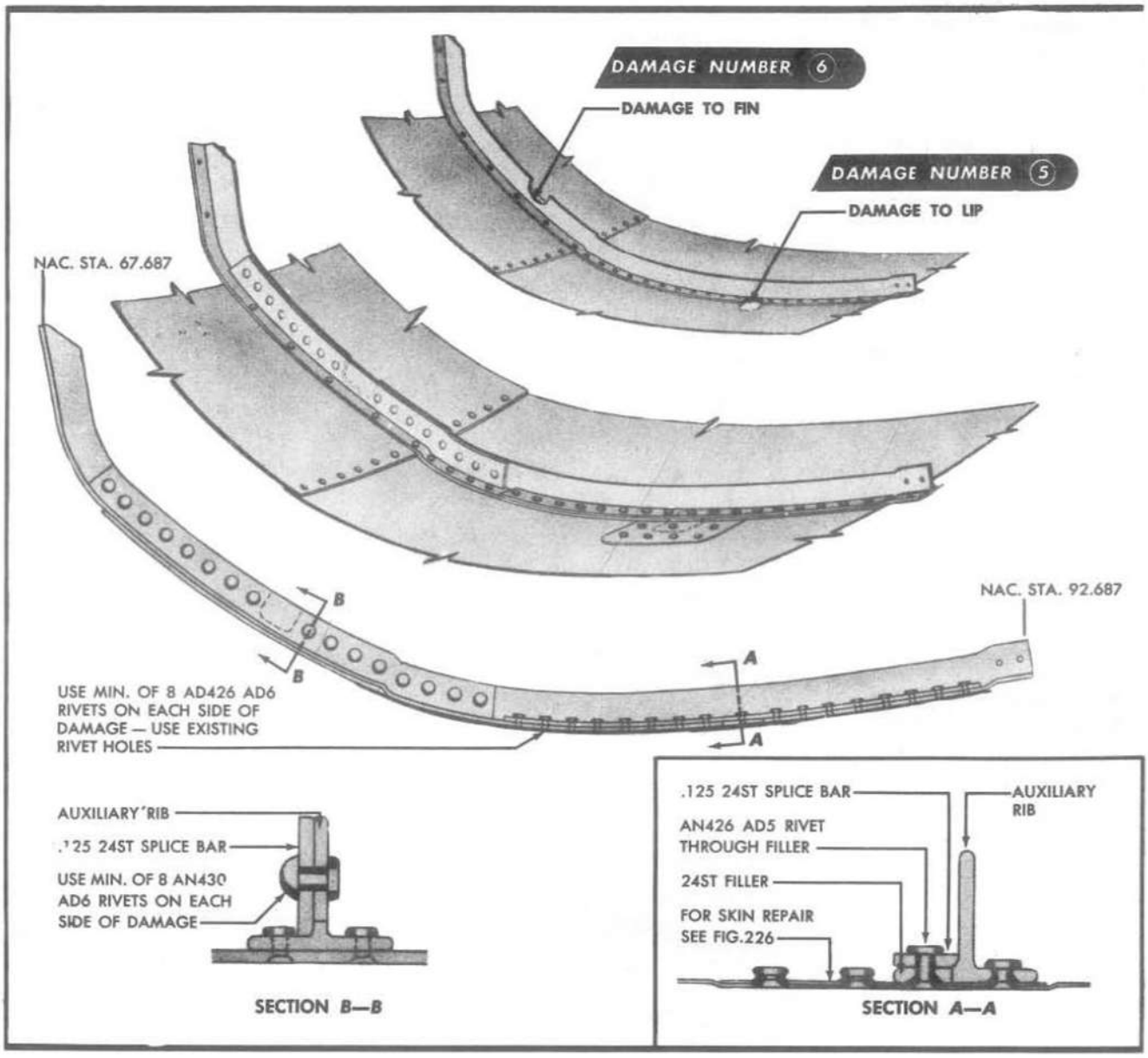
Figure 222 — Patch Repair of Engine Mount Rib



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar from .125 24ST material of sufficient length to accommodate required number of rivets on each side of damage.
4. Construct filler from 24ST of same thickness as stiffener lip, and trim to fit radius.
5. Repair shown is for lip on skin side of angle. For lip perpendicular to skin use same repair with AN430 AD6 rivets, and omit filler.
6. When damage extends into the radius of angle, the stiffener must be replaced.
7. When damage exceeds three inches in length, the stiffener must be replaced.
8. When location of damage does not permit the use of required number of rivets on each side of damage, the stiffener must be replaced.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

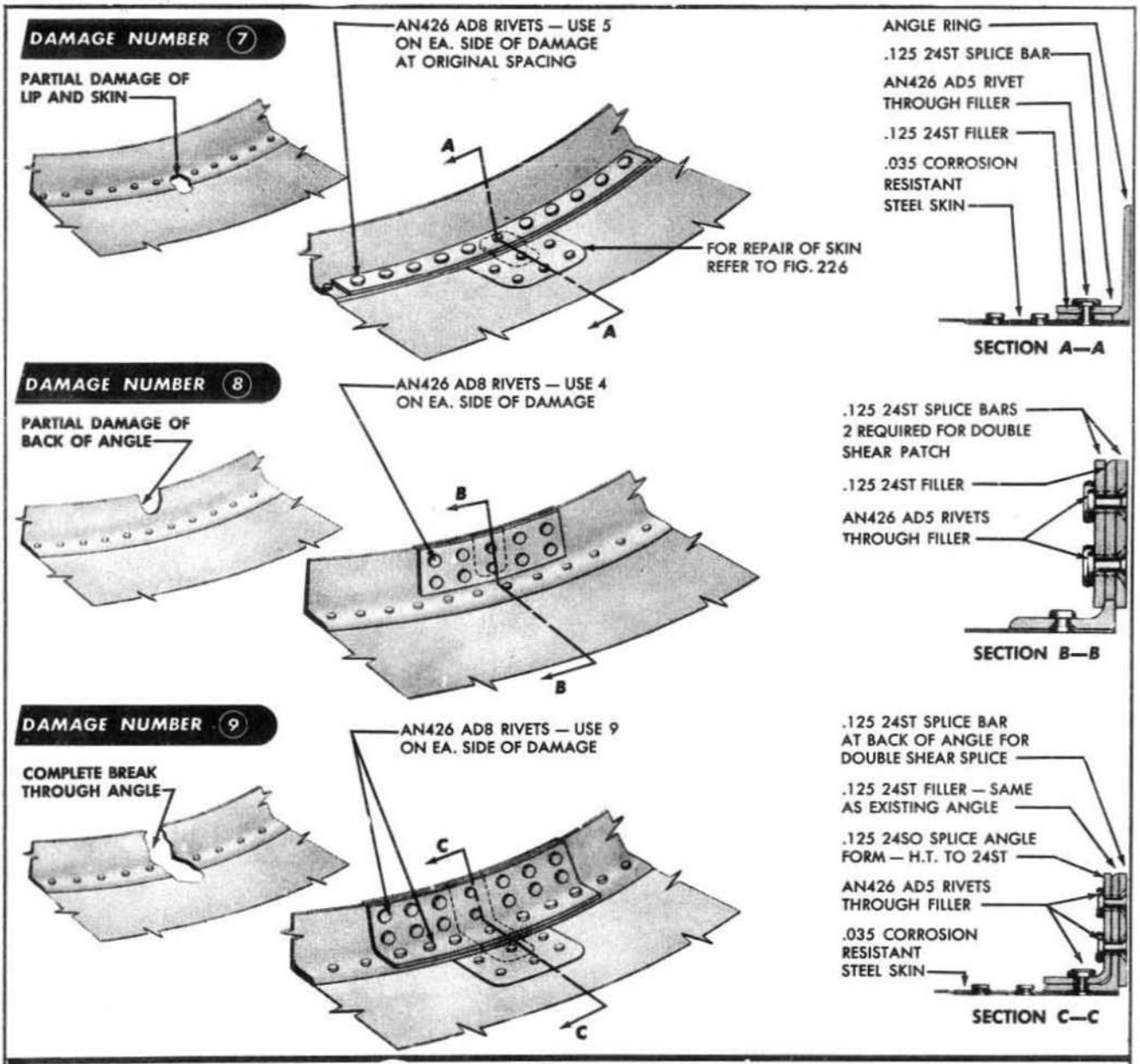
Figure 223— Patch Repair of Engine Mount Angle Stiffener



NOTES

1. Remove all intertering rivets.
2. Trim damage smooth leaving no radius less than three-eighths inch.
3. Construct splice bar from .125 24ST material of sufficient length to accommodate the required number of rivets on each side of damage.
4. Construct filler from 24ST of same thickness as rib lip.
5. When damage extends into the radius of the lip or fin, the rib must be replaced.
6. When damage exceeds three inches in length, the rib must be replaced.
7. When location of damage does not permit the use of required number of rivets on each side of damage, the rib must be replaced.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

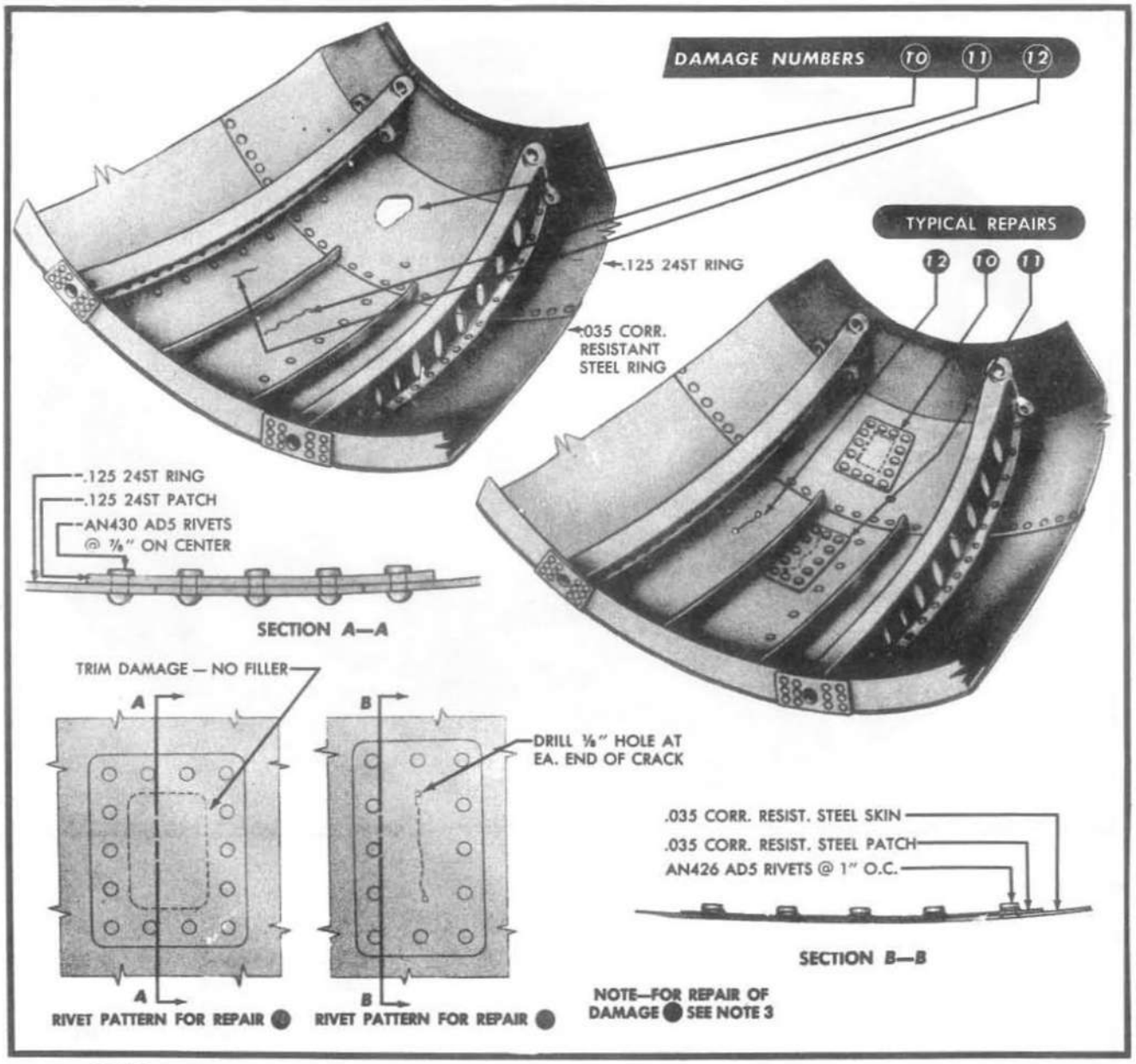
Figure 224 — Patch Repair of Engine Mount Auxiliary Rib



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-half inch.
3. When the damage is a crack, drill one-eighth inch hole at each end of crack and patch as shown. Omit damage trim and filler.
4. Construct splice bars from .125 24ST material.
5. Construct splice angle from .125 24SO. Form and heat treat to 24ST.
6. Construct fillers from 24ST material the same gage as the angle ring.
7. For minimum bend radii of sheet material, see Figure 4, Section I.
8. For flush riveting, see Figure 5, Section I.
9. For rivet edge and row distance, see Figure 6, Section I.

Figure 225 — Patch and Splice Repair of Engine Mount Angle Ring



NOTES

1. Trim damage smooth leaving no radius less than three-eighths inch.
2. Drill one-eighth inch stop holes at each end of cracks.
3. Cracks under one inch in length may be neglected after having had one-eighth inch stop holes drilled at each end.
4. Construct patches and fillers from the same gage and material as the original.
5. When skin is damaged close to or over a rib or stiffener, insert patch between skin and rib or stiffener. Refer to repair of damages 1, 2, 4, and 5.
6. For flush riveting see Figure 6, Section I.
7. For rivet edge and row distance see Figure 7, Section I.

Figure 226 — Patch Repair of Engine Mount Skin

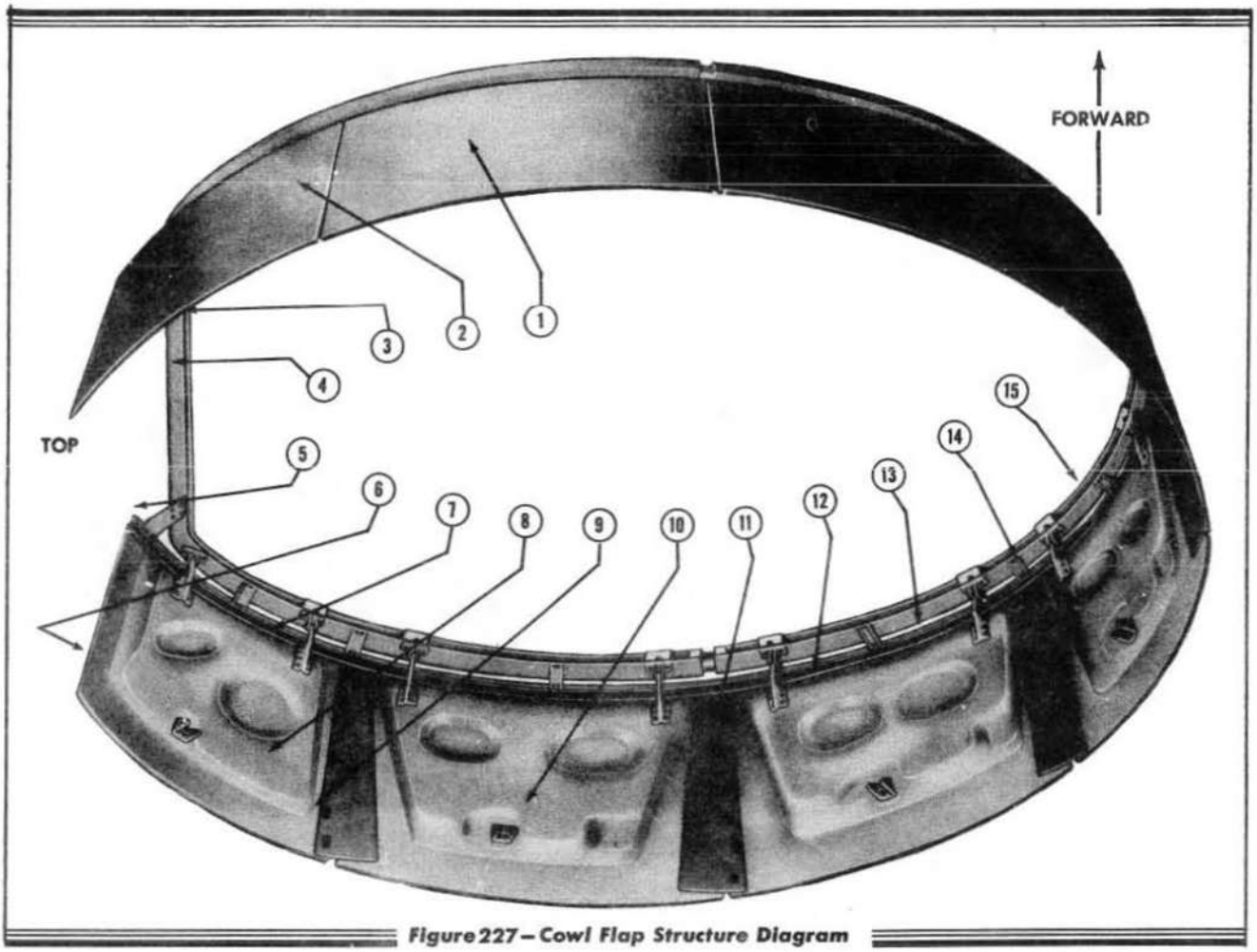


Figure 227—Cowl Flap Structure Diagram

KEY TO FIGURE 227

Cowl flap assemblies are interchangeable.

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
1	5125613-2	Cover	13½x20	.032	24ST		6
2	5125718-3	Cover	13x23	.032	24ST		1
3	5123962-8	Channel (Upper)	2½x96	.064	24SO	24ST	1
4	5123962-2	Channel (Upper)	4x99	.064	24SO	24ST	1
5	4195252-2	Retainer (Upper) S-1002772	Length 20¼		24ST		1
	4195252-3						1
6	5125718-2	Cover	13x23	.032	24ST		1
7	5123962-22	Seal (Upper)	1⅜x20½	3/32	Neoprene		2
8	5125718-4	Stiffener	17x25	.040	24SO	24ST	1
	5125718-5						1
9	5125718-10	Splice Plate	4-13/16x12⅜	.032	24ST		1
	5125718-11						1
10	5125613-4	Stiffener	15x22	.040	24SO	24ST	6
11	5128459-2	Splice Plate	4-3/16x12⅜	.032	24ST		5
12	5123962-24	Seal (Lower)	1⅜x79	3/32	Neoprene		1
13	4195252-4	Retainer (Lower) S-1002772-4024	Length 40¼		24ST		1
							1
14	5123962-4	Channel (Lower)	4x79	.064	24SO	24ST	1
15	5123962-6	Channel (Lower)	2½x76	.064	24SO	24ST	1

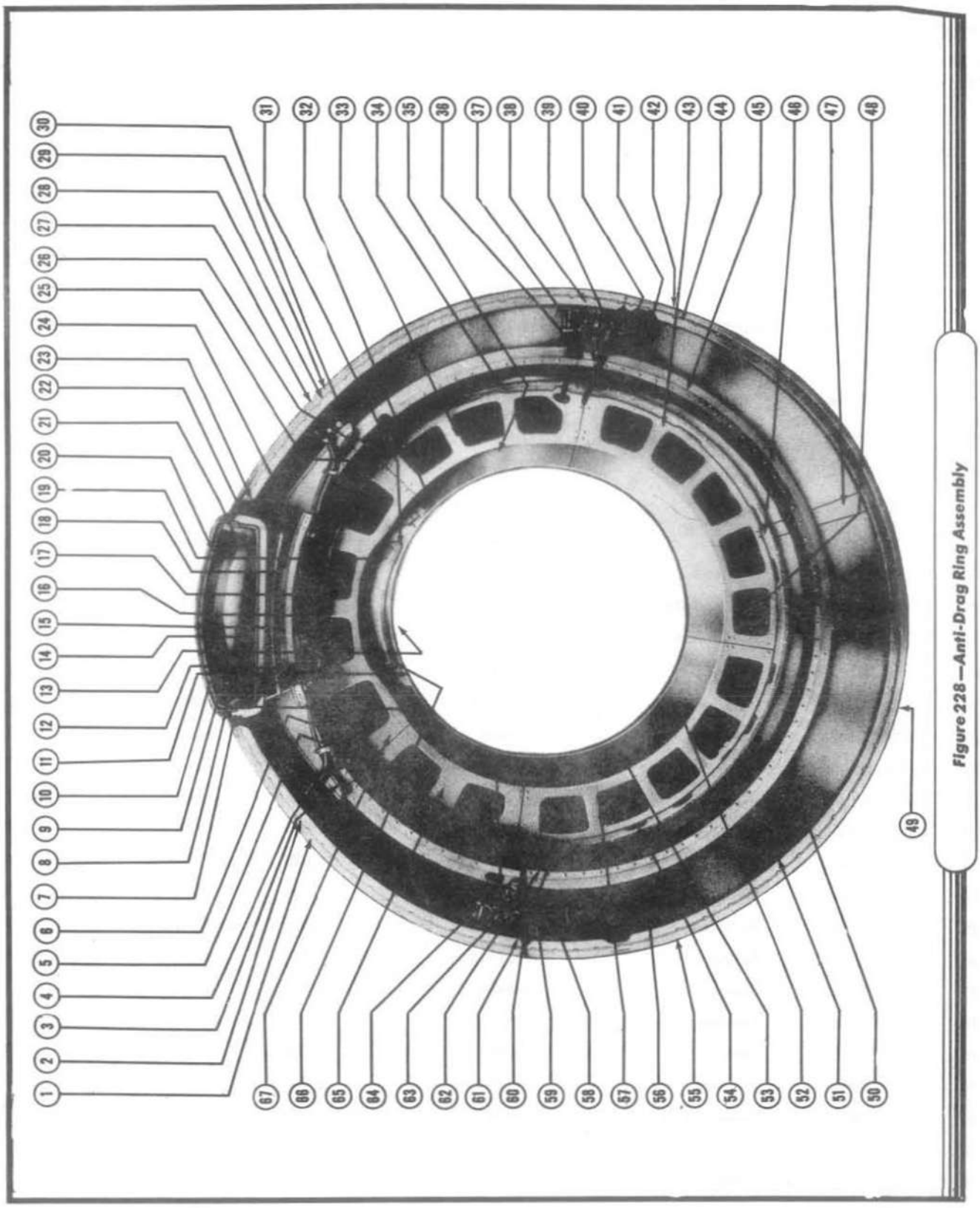


Figure 228—Anti-Drag Ring Assembly

KEY TO FIGURE 228

Anti-drag Rings are interchangeable.

Ref. No.	*Part No.*	*Description*	*Size*	*Gage*	*Material*	*H.T.*	*No. Req.*
1	5129739-8	Skin	30x52	.040	24SO	24ST	1
2	5129739-40	Doubler	5x31½	.032	24ST		1
3	5129739-110	Rib	5¼x13	.040	24SO	24ST	2
4	5129739-100	Support	4x13¼	.032	24SO	24ST	1
5	5129739-84	Stop S-1125596	Length 29		24ST		1
6	5129739-28	Rub Strip	2x19⅜	.020	Corr. Resist. Stl.	¼H	2
7	5129739-32	Rub Strip	1-9/16x26	.020	Corr. Resist. Stl.	¼H	1
8	5129739-14	Doubler	1½x23	.032	24ST		2
9	5129739-118	Retainer	½x17	.032	24ST		1
10	5129739-108	Angle S-167883	Length 19¼		24ST		1
11	5129739-120	Splice	4x20	.040	24ST		1
12	5129739-102	Support	1-7/16x15-7/16	.032	24SO	24ST	1
13	5129739-60	Former	18x30	.051	24SO	24ST	1
14	5129739-64	Top Duct	21x38	.051	24SO	24ST	1
15	5129739-114	Angle S-167883	Length 14½		24ST		1
16	5129739-66	Lower Duct	23x38	.051	24SO	24ST	1
17	5129739-74	Angle	1½x22	.040	24SO	24ST	1
18	5129739-52	Doubler	2½x24	.051	24SO	24ST	1
19	5129739-70	Diffuser	18x36	.032	24SO	24ST	1
20	5194627	Sleeve Assem.					1
21	5129739-116	Retainer	½x17¼	.032	24ST		1
22	5129739-50	Doubler	6½x22	.064	24ST		1
23	5129739-30	Rub Strip	1-9/16x32	.020	Corr. Resist. Stl.	¼H	1
24	5129739-111	Rib	5¼x13	.040	24SO	24ST	2
25	5129739-16	Rub Strip	2x25⅜	.020	Corr. Resist. Stl.	¼H	1
26	5129739-101	Support	4x13¼	.032	24SO	24ST	1
27	5129739-68	Skin	48x48	.040	24SO	24ST	1
28	5129739-38	Doubler	5x37½	.032	24ST		1
29	5129739-6	Skin	40x52	.040	24SO	24ST	1
30	5129739-48	Doubler	1½x44	.064	24ST		2
31	5129739-59	Doubler R.H.	6x38	.040	24ST		1
32	5129739-122	Splice	4x20	.040	24ST		1
33	5129739-34	Former	13x28	.032	24SO	24ST	1
34	5129739-86	Stop S-1125596	Length 29		24ST		1

KEY TO FIGURE 228 (Continued)

Ref. No.	Part No.	Description	Size	Gage	Material	H.T.	No. Req.
35	5129739-10	Diffuser	26x37-3/16	.032	24SO	24ST	1
36	5129739-89	Doubler	5⅛x42	.032	24SO	24ST	1
37	5129739-20	Support	2-9/16x27	.040	24SO	24ST	1
38	5129739-24	Stop S-1093785	Length 38		24ST		1
39	3191129-1	Angle S-1007015	Length 42		24ST		1
40	3191128-1	Angle S-1007015	Length 42		24ST		1
41	5129738-19	Doubler	4½x44	.032	24SO	24ST	1
42	5129738-36	Skin	40x52	.040	24SO	24ST	1
43	5129738-40	Former	16x42	.032	24SO	24ST	1
44	5129738-24	Stop S-1093785	Length 90		24ST		1
45	5129738-20	Support	2¾x90	.040	24SO	24ST	1
46	5129738-42	Stop S-1125596	Length 90		24ST		1
47	5129738-14	Strip	1½x44	.064	24ST		1
48	5129738-44	Doubler	5x7½	.051	24SO	24ST	2
49	5129738-8	Skin	40x52	.040	24SO	24ST	1
50	5129738-14	Strip	1½x44	.064	24ST		1
51	5129738-22	Doubler	5x90	.032	24ST		1
52	5129738-12	Strip	1½x22	.032	24ST		1
53	5129738-10	Diffuser	26x46-3/16	.032	24SO	24ST	2
54	5129738-28	Rub Strip	1-11/16x74	.020	Corr. Resist. Stl.	¼H	1
55	5129738-6	Skin	40x52	.040	24SO	24ST	1
56	5129738-30	Rub Strip	1-9/16x89	.020	Corr. Resist. Stl.	¼H	1
57	5129738-38	Former	16x42	.032	24SO	24ST	1
58	5129738-18	Doubler	4½x44	.032	24SO	24ST	1
59	3191128	Angle S-1007015	Length 42		24ST		1
60	3191129	Angle S-1007015	Length 42		24ST		1
61	5129739-46	Stop S-1093785	Length 32		24ST		1
62	5129739-22	Support	2-9/16x21	.040	24SO	24ST	1
63	5129739-12	Diffuser	26x27-3/16	.032	24SO	24ST	1
64	5129739-88	Doubler	5⅛x42	.032	24SO	24ST	1
65	5129739-36	Former	32x52	.032	24SO	24ST	1
66	5129739-58	Doubler	6x38	.040	24ST		1
67	5129739-72	Former	16x36	.032	24SO	24ST	1

Material designation SO or ST for all sheet stock indicates ALCLAD; for extrusions it indicates DURA[T]

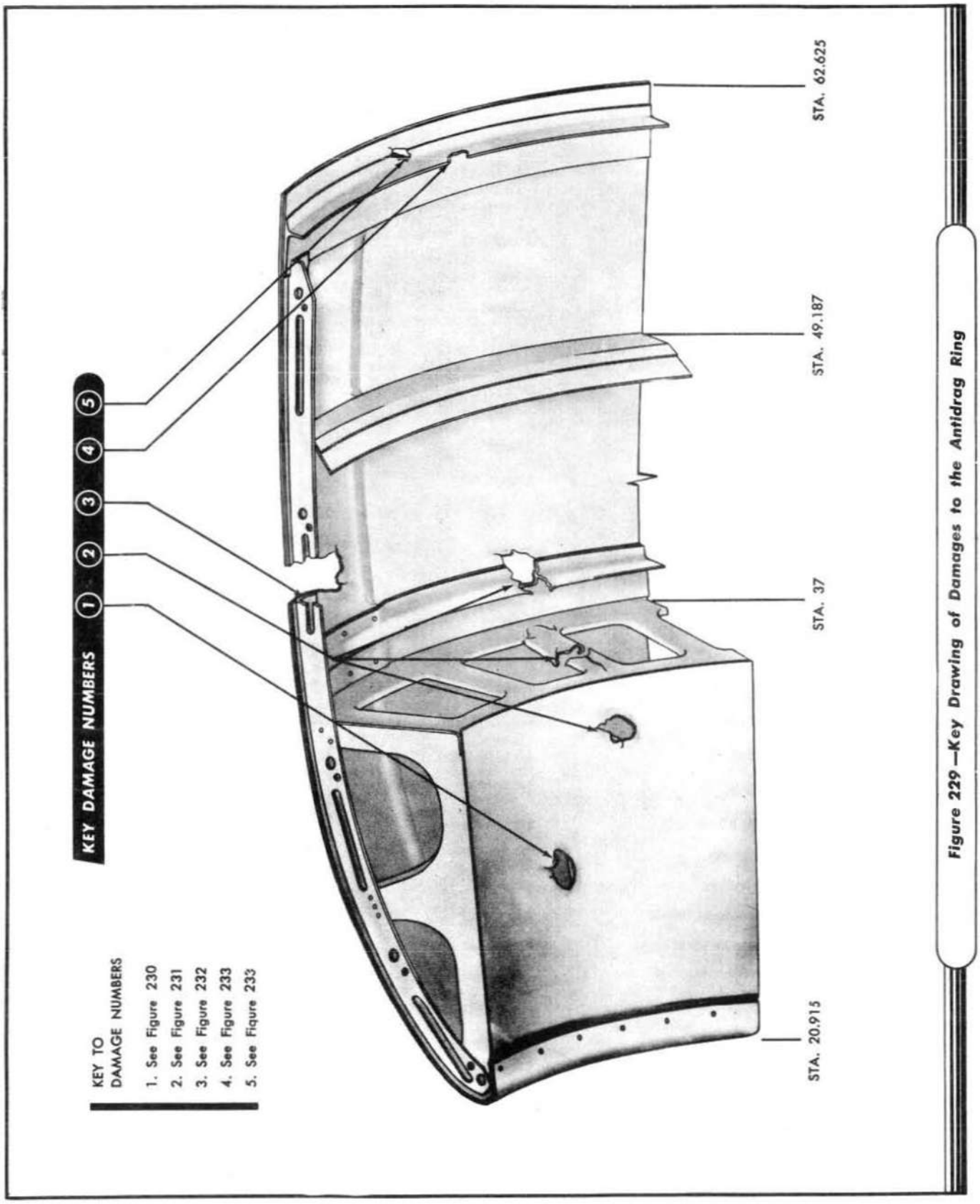
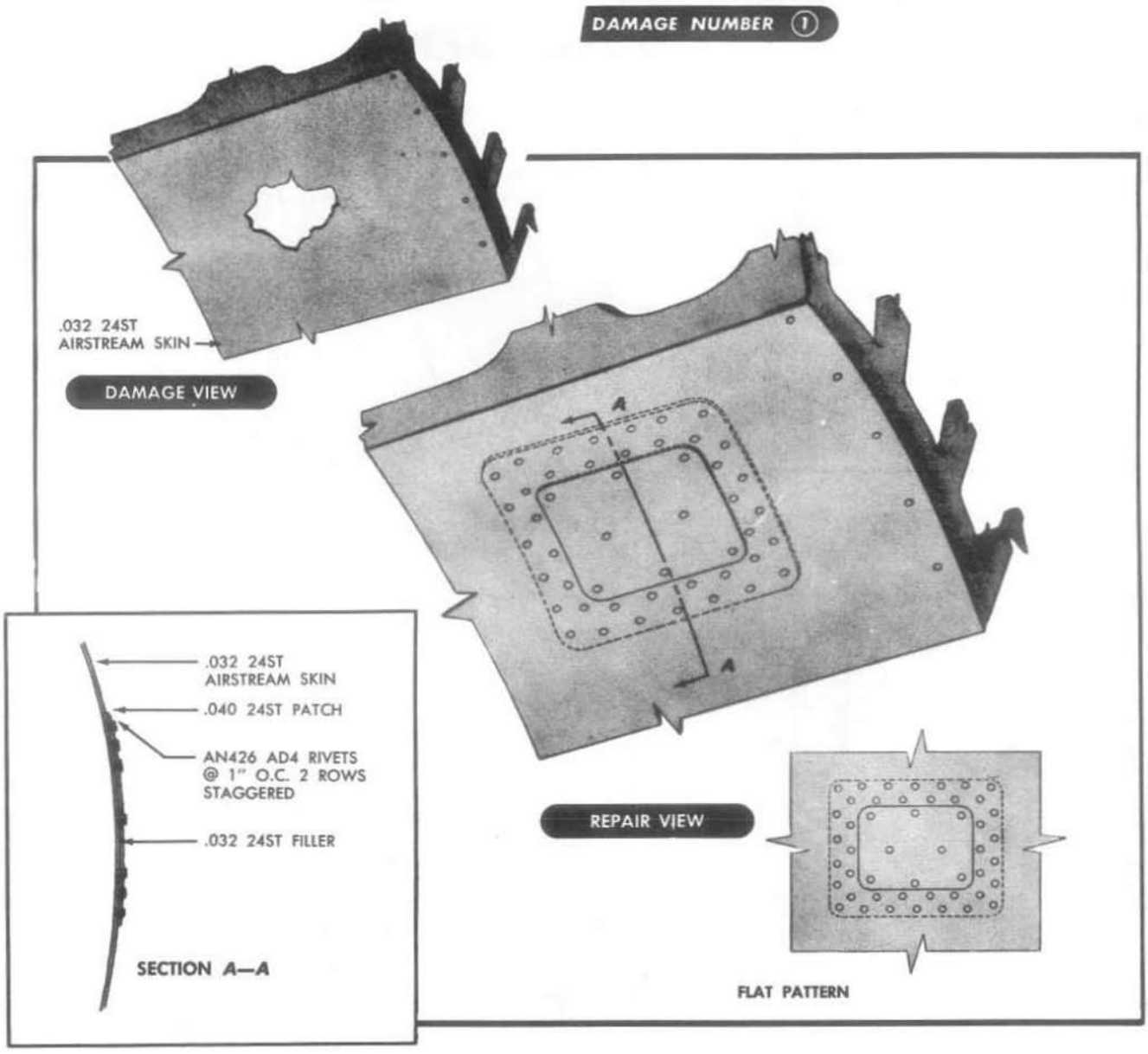


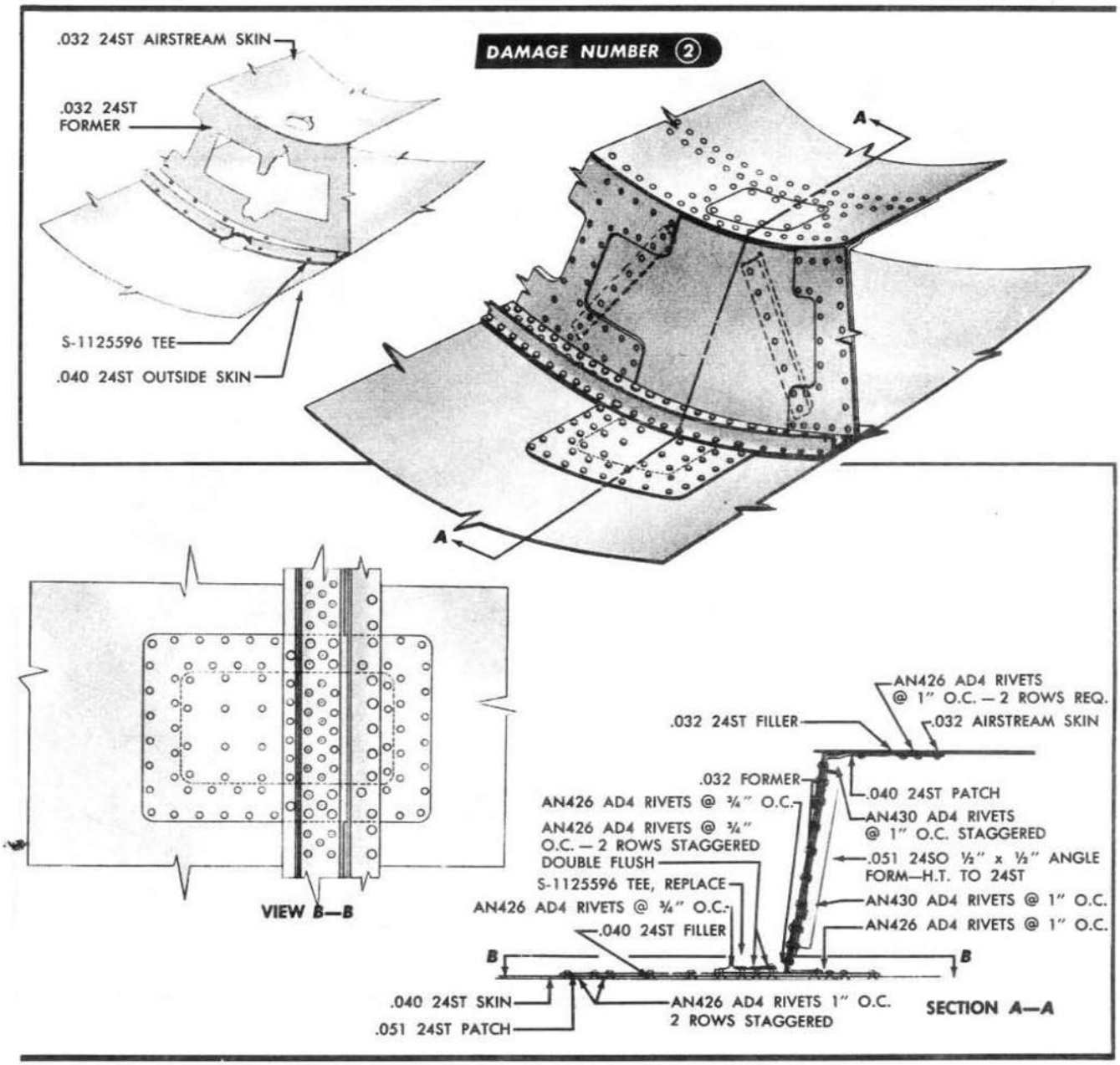
Figure 229—Key Drawing of Damages to the Antidrag Ring



NOTES

1. Trim damage smooth leaving a minimum radius of one-fourth inch at corners.
2. Construct patch from .040 24ST.
3. Rivet size and spacing for attachment of patch to skin is noted on Section A-A.
4. Construct filler from .032 24ST and attach with AN426 AD4 rivets at one and one-half inch on center maximum.
5. For flush riveting see Figure 6, Section I.
6. For rivet edge and row distance see Figure 7, Section I.

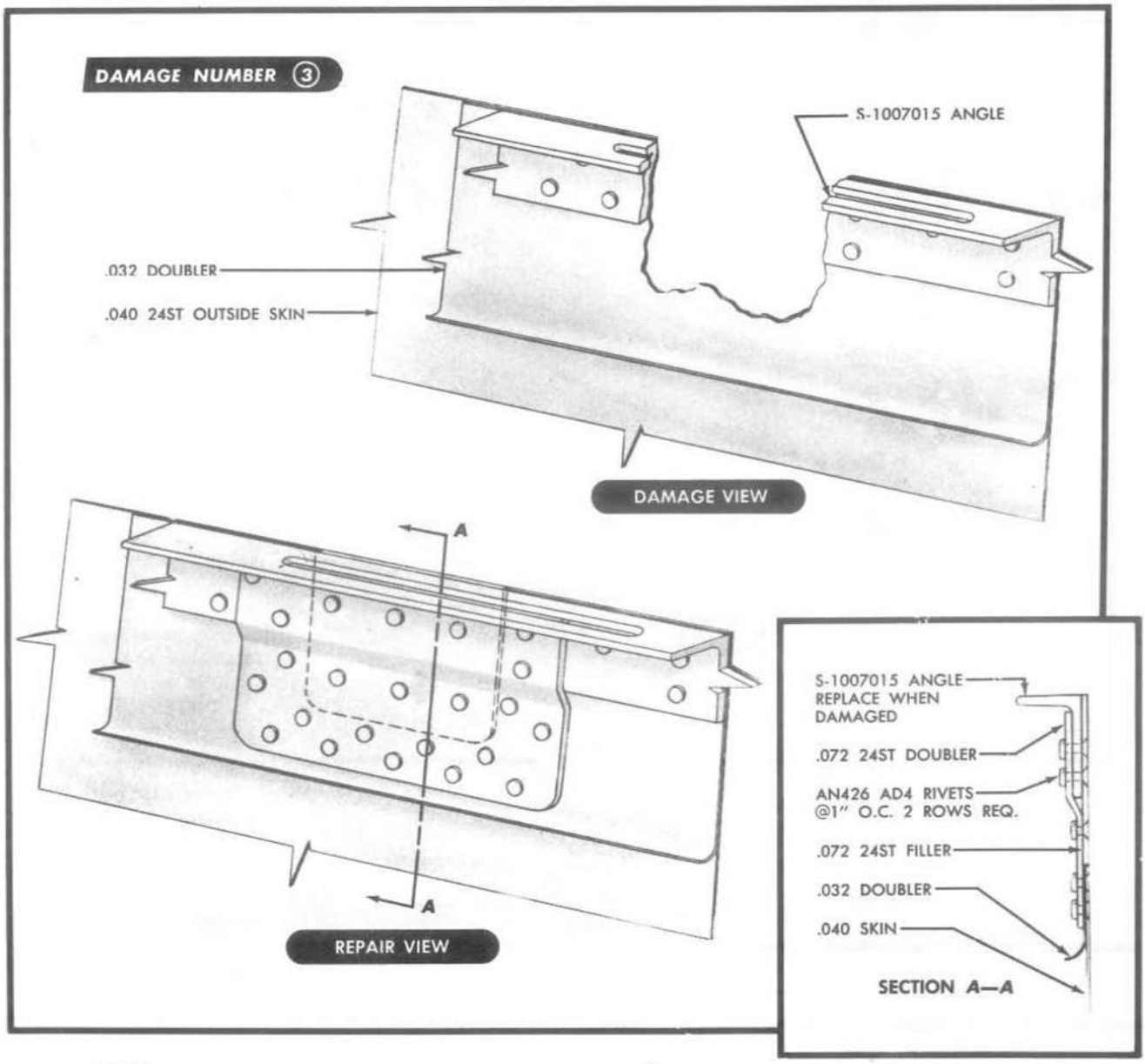
Figure 230 —Patch Repair of Airstream Skin—Antidrag Ring



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-quarter inch.
3. The extruded tee must be replaced when damage extends into the radius.
4. Construct patches from 24ST of gages noted on Section A-A.
5. Restore web strength with ½" x ½" .051 24SO angle. Form and heat treat to 24ST.
6. A filler must be used for flush type patch where patch is in airstream.
7. Construct fillers from same gage and material as original.
8. Attach fillers with AN426 AD4 rivets at one and one-half inch on center maximum.
9. Use existing rivet holes where possible.
10. For minimum bend radii of sheet material see Figure 5, Section I.
11. For flush riveting see Figure 6, Section I.
12. For rivet edge and row distance, see Figure 7, Section I.

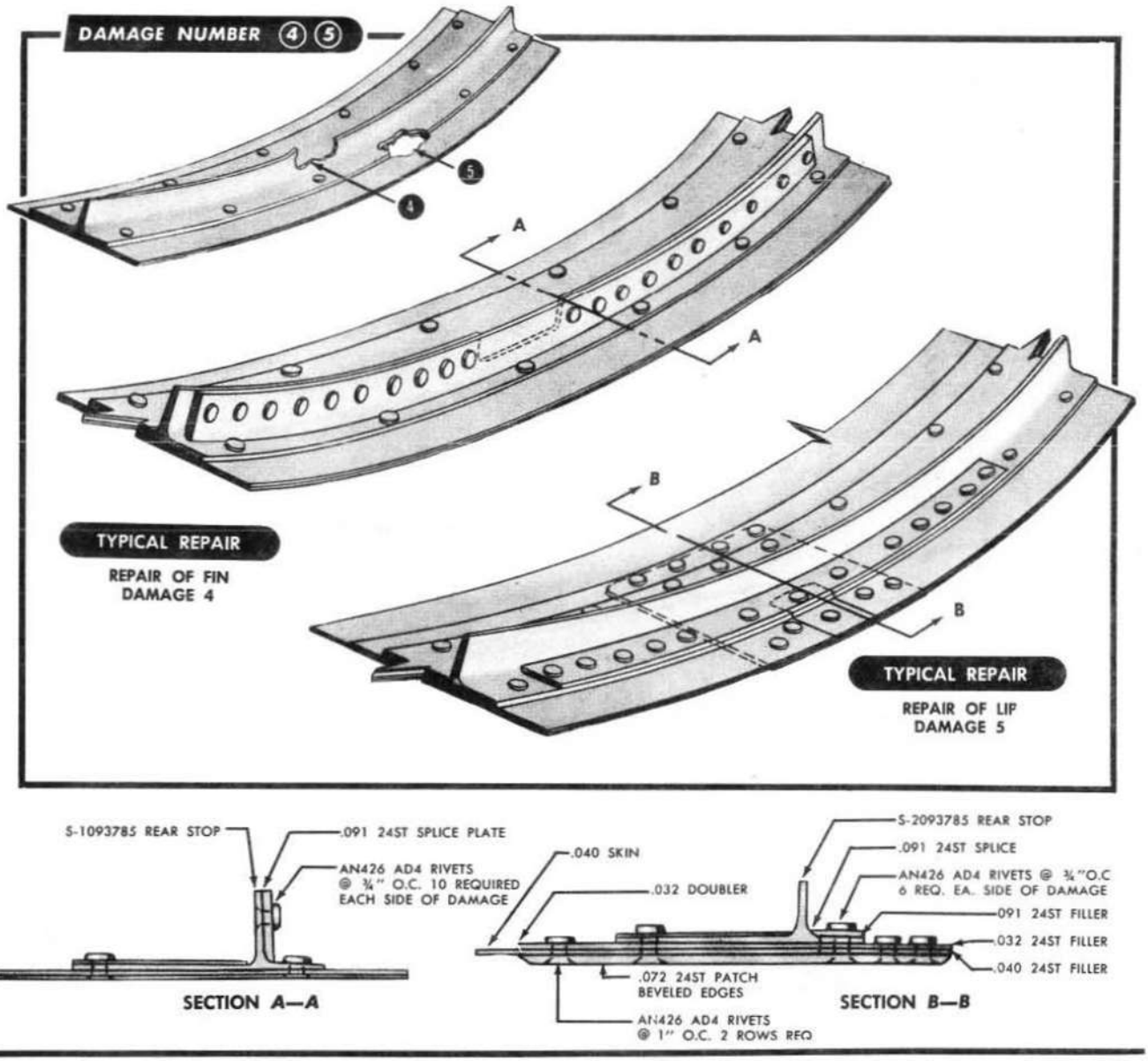
Figure 231—Patch and Splice of Skin and Former—Antidrag Ring



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Extruded angle must be replaced when damaged. Follow existing rivet schedule for replacement.
4. Construct patch from .072 24ST material.
5. Construct filler from .072 24ST material.
6. Follow existing rivet schedule in attaching patch and filler to angle.
7. Attach patch to skin with two rows AN426 AD4 rivets at one inch on center.
8. Attach filler to patch with AN426 AD4 rivets at one and one-half inch on center maximum.
9. For flush riveting see Figure 6, Section I.
10. For rivet edge and row distance see Figure 7, Section I.

Figure 232 —Splice of Complete Break through Angle—Antidrag Ring



NOTES

1. Remove all interfering rivets.
2. Trim damage smooth leaving no radius less than one-fourth inch.
3. Construct splice plates from .091 24ST material.
4. Construct patch from .072 24ST material.
5. Construct fillers from 24ST material of gages noted on Section B-B.
6. Use existing rivet holes where possible.
7. For skin repair refer to skin repair drawing, Figure 231 in this section.
8. For flush riveting see Figure 6, Section I.
9. For rivet edge and row distance see Figure 7, Section I.

Figure 233 —Patch of Partial Damages to Rear Stop—Antidrag Ring

SECTION VII Fabric Repair and Attachment

1. REPAIR.

When holes or tears are to be repaired, the area around the damage must be washed clean with dope thinner to provide for the attachment of a patch. The torn edges should be cleaned and sewed together using the overcast stitch. All patches must be cut from pre-doped airplane cloth and provided with pinked edges. At least 45 minutes drying time should be allowed between dope coats. The self tapping screws when removed should be replaced by oversize screws of the same type as shown on figure 235.

a. PLAIN PATCH. – The plain patch shown on figure 236 may be used for the repair of small holes or tears that are no larger than three-quarters of an inch in diameter. It should be cut to a circular shape that is large enough to extend a minimum of one and one-half inches in all directions beyond the damage. The procedure for its application is as follows:

(1) The area about the damage that is intended to accommodate the patch should be washed with dope thinner.

(2) Apply a wet brush coat of clear dope to the cleaned area.

(3) Apply a wet brush coat of clear dope to the patch and center it over the damage with the warp in line with the airflow. Rub with the fingers starting at the center and work out to the edge to eliminate all bubbles.

(4) Apply four coats of nitrate dope allowing sufficient drying time after each coat and finish the repair with two coats of protective paint to match the existing surface color.

b. PANCAKE PATCH.—The pancake patch shown on figure 236 may be used for the repair of damage up to six inches in diameter. Two patches are used in this repair; the first is used to provide a reinforced edge around the damage and the second is used to cover the damage. The procedure to be used in this repair is as follows:

(1) Cut the patches from pre-doped airplane cloth to a circular shape. The first patch should be large enough to extend a minimum of one and one-half inches in all directions beyond the damage, and the second patch should be large enough to overlap the first by approximately one-half inch.

(2) The area about the damage that is intended to accommodate the patches, should be washed with dope thinner.

(3) The edges of the damage are drawn tightly together by the use of the overcast stitch

(4) Apply a wet brush coat of clear dope to the damaged area and the first patch. The first patch is then centered over the damage and all bubbles are eliminated by rubbing the patch outwardly with the fingers.

(5) When dry, the damaged area and that portion of the first patch covering it, is removed, leaving a circular hole with a reinforced ring one and one-half inches in width. The cut should be made with a sharp knife using an outward stroke.

(6) Apply a wet brush coat of clear dope to the second patch and the area about the hole. The second patch is then placed over the hole and in the position to extend one-half inch in all directions beyond the outside edge of the first patch.

(7) Apply four coats of nitrate dope allowing sufficient drying time after each coat and finish the repair with two coats of protective paint to match the existing surface color.

c. BLANKET PATCH.—The blanket patch shown on figure 237 is used for the repair of damage exceeding six inches in diameter. The procedure to be used in this repair is given in the following paragraphs:

(1) After loosening with dope thinner, peel all tapes back to the second rib on either side of the damage.

(2) Cut the fabric along a line approximately one inch from the center of the ribs bordering the damaged area. Continue the cutting around the leading edge and back to the trailing edge. Remove the fabric completely from this section between the two incisions.

(3) Apply dope thinner to soften and remove the old finish from the fabric approximately three inches wide along each side of the opening on the upper and lower surfaces.

(4) Using the overcast stitch, sew the upper and lower loose ends of the fabric together along the bordering ribs to hold the surface taut.

(5) Remove the self tapping screws and reinforcing tape from the ribs bordering the damaged area and from all other ribs included in the repair.

(6) Cut a blanket patch from airplane cloth of sufficient length to wrap around the leading edge and extend approximately three inches past the trailing edge. It should be placed with the warp of the fabric in line with the air flow and be of sufficient width to extend to the second rib on each side of the damage.

(7) Wrap the blanket around the frame and pin the ends together along the trailing edge.

(8) Pin the fabric patch to the original fabric along the ribs and at the trailing edge. Start at the leading edge and insert pins working aft. The pins should be inserted alternately along the left and right-hand sides with the point of the pin in the direction of the patch. An even tautness of the blanket should be secured by the pinning operation. Each pin should be inserted through both the patch and reinforcing tape on the ribs, leaving each end of the pin exposed, thus holding the fabric firmly. Re-pin the trailing edge as required to compensate for any transverse stretching.

(9) Using a baseball stitch along the trailing edge between the cutout area, sew the blanket ends together. Remove pins and fold the material in, as the sewing progresses.

(10) Apply one coat of clear dope to the overlapping fabric along both sides of the blanket and allow it to dry. This will serve to hold the blanket in place.

(11) Replace the reinforcing tape and oversize rib screws on all ribs covered by the blanket.

(12) Remove the pins and trim the blanket on both sides so that it will just reach the reinforcing tape along the ribs.

(13) Trim the blanket at the trailing edge where it is not stitched.

(14) Apply a wet brush coat of clear dope to the entire blanket and make sure that the edges along the sides and trailing edge are doped down smoothly and allow the dope to dry.

(15) Apply new tape to ribs and leading and trailing edges.

(16) Apply four coats of nitrate dope allowing sufficient drying time after each coat. Finish the repair with two coats of protective paint to match the existing surface color.

2. COMPLETE RECOVERING.

The complete recovering of an entire control surface is necessary when damage is so great that patching cannot be accomplished efficiently. No more than two blanket patches may be applied to any control surface. Therefore, when more than two blanket patches would be required to repair a surface, the entire structure should be stripped and covered with new fabric. In preparing the frame work for recovering *(figure 238)* all sharp edges must be covered with tape to prevent them from chafing and cutting the fabric. The following steps should be used for the covering procedure.

a. ELEVATORS AND RUDDER.

(1) Cut the covering from airplane cloth large enough to wrap around the leading edge and extend

approximately three inches past the trailing edge. The warp must be in line with the airflow. Enough material should be left on one side to provide a flap to cover the inboard end of the structure. *(See figure 239.)*

(2) Prepare the hinge pockets for sewing by placing fabric patches along both sides of the pockets. They should be placed in such a way that they cover the forward half of the sides and fold over the edges with approximately a one-half inch lap. The lap is taped in place by adhesive tape.

(3) Draw the covering fabric taut and pin the loose ends together along the trailing edge.

(4) Cut the flap at the inboard end to fit around the torque tube; turn all edges under and pin to the opposite side.

(5) Begin sewing at the outboard end of the trailing edge using the baseball stitch and work inboard removing the pins as the work progresses.

(6) Begin sewing the flap at the inboard end, starting at the leading edge and work aft using the baseball stitch. The edges are tucked under and the pins removed as the work progresses.

(7) Cut the fabric at the hinge pockets and use the overcast stitch to attach the patches along the sides to the fabric covering. *(See figure 239.)*

(8) Place reinforcing tape along the ribs and install self-tapping screws. Use one size larger than the original screws, if necessary. When screws are not available, rib stitching may be used providing the proper precautions have been taken to cover the sharp corners of the screw holes.

(9) Apply a wet brush coat of nitrate dope to the entire surface and apply finish tape and reinforcing patches as shown on figures 241 and 240.

(10) Apply four coats of nitrate dope allowing sufficient drying time after each coat. Finish the covering with two coats of protecting paint.

b. AILERONS.—The recovering of the aileron may be accomplished by following the procedure given for the recovering of the elevators and rudder with the exception of the following:

(1) The fabric is wrapped around the trailing edge of the aileron and attached along the upper and lower edges of the leading edge by metal stripping and flush head screws. Rivets are used to attach the fabric retaining strips in the trim tab cut-out area. *(See figure 242.)*

(2) The finished taping should be attached as shown on figure 241.

3. AILERON AIR SEAL ATTACHMENT.

a. REPLACEMENT OF AIR SEAL TRAILING EDGE STRIPS.—When replacing the aileron air seal trailing edge strips, use 100° flat head steel machine screws, size No. 4-40 or 6-32. The size of the screws used shall be determined by the size of the existing rivet hole. Length used will afford at least one thread and not more than three threads to protrude through the fiber lock nut. One flat washer of corresponding screw size will be used under the fiber locknut to prevent damage to the surface of the backing strip.

b. ENLARGED SCREW HOLES.—If the existing holes are found to be enlarged to the degree that a No. 6 screw cannot be utilized, it will be permissible to use a countersunk steel washer, Part No. A3236, to be installed on the outer surface of the skin.

c. ATTACHING AIR SEAL TO AILERON UNIT.—When replacing the fabric air seal, Part No. 5154656 and 5154655, on the aileron unit, rivets shall be used. Type "A" or annealed "D" rivets may be used in case of enlarged holes only, in lieu of "AD" rivets.

d. METAL BACKING STRIPS.—The original metal backing strips shall be used if in serviceable condition.

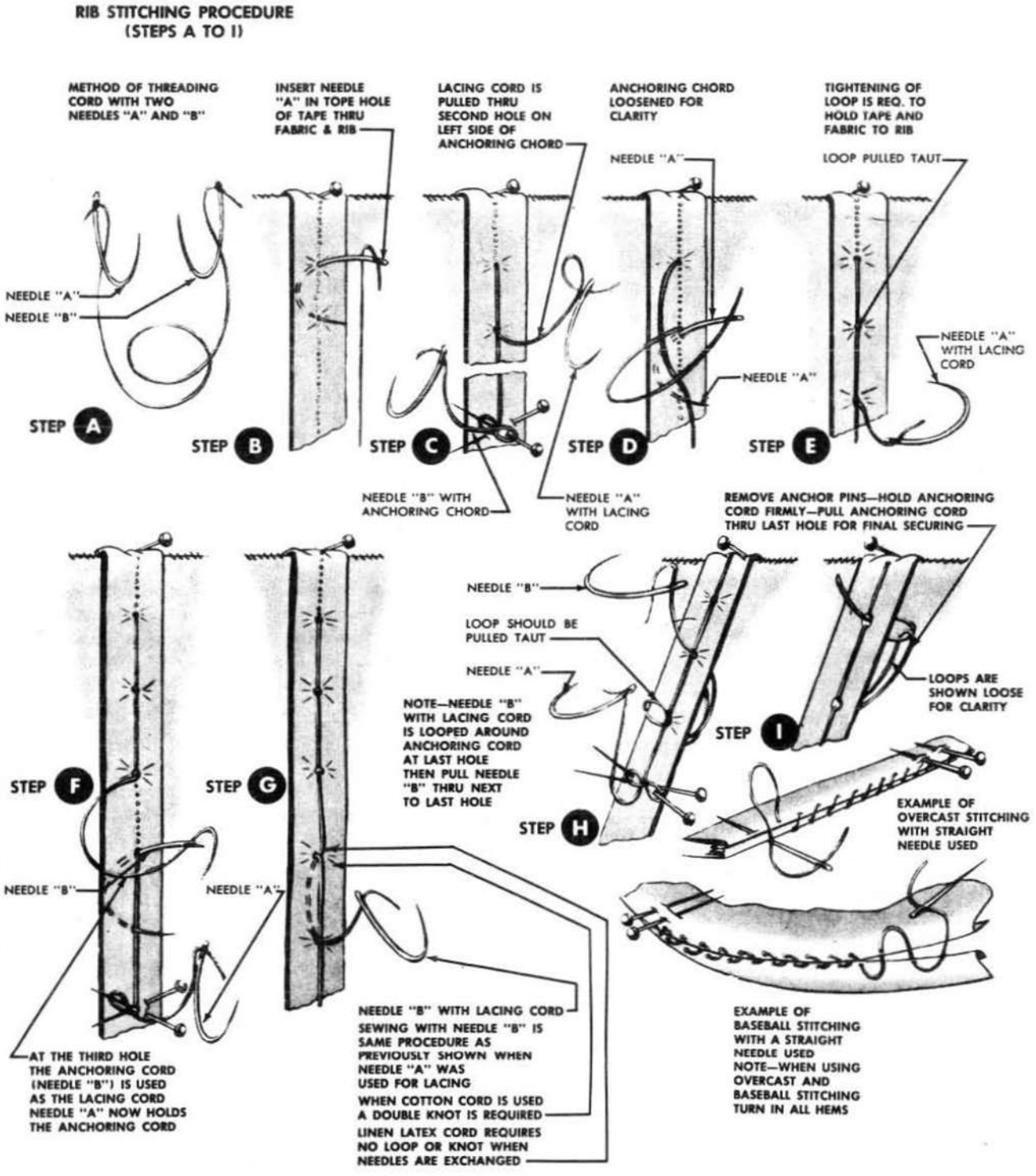


Figure 234—Fabric Stitching Procedure

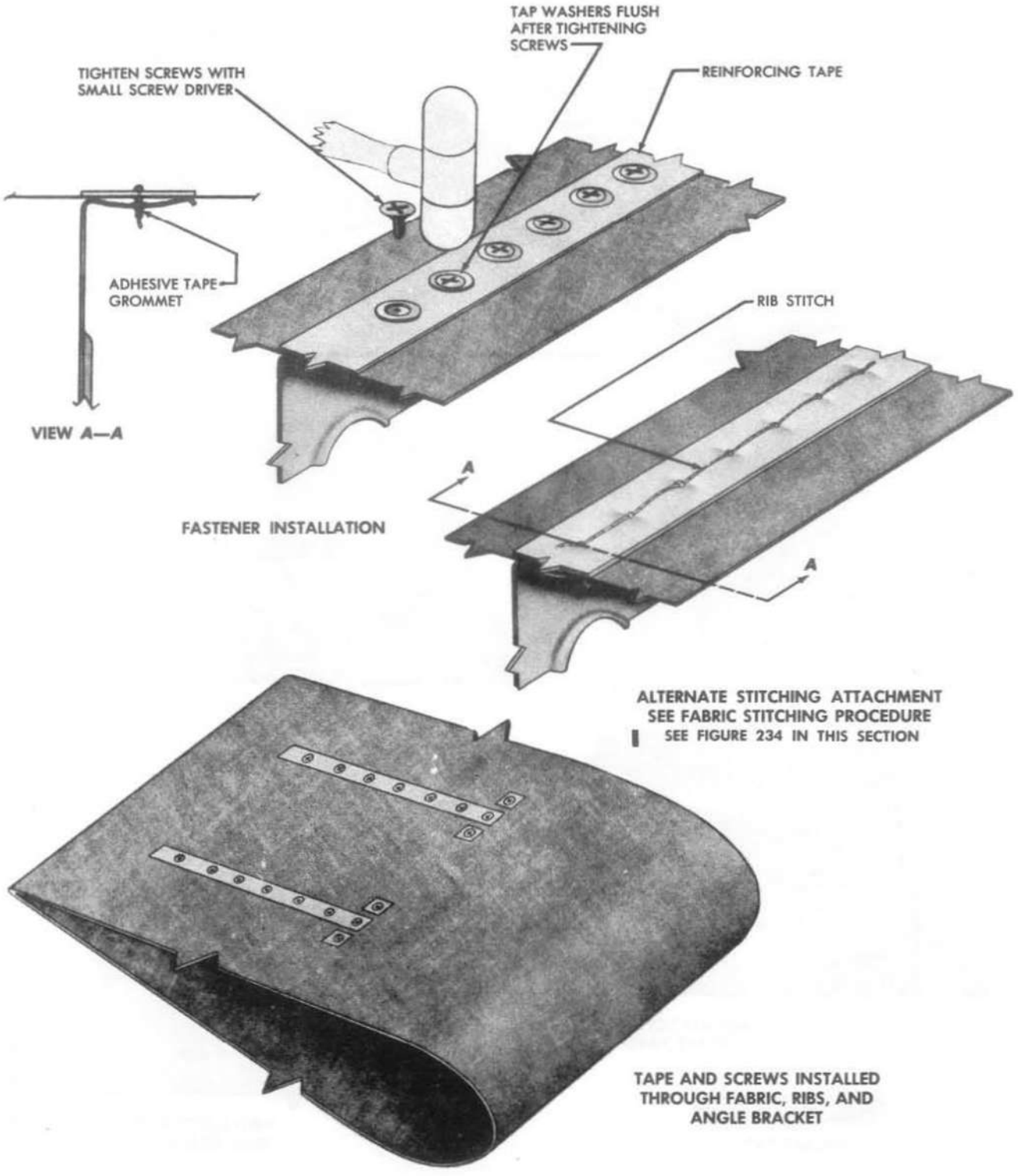


Figure 235—Procedure for Attachment of Fabric to Rib

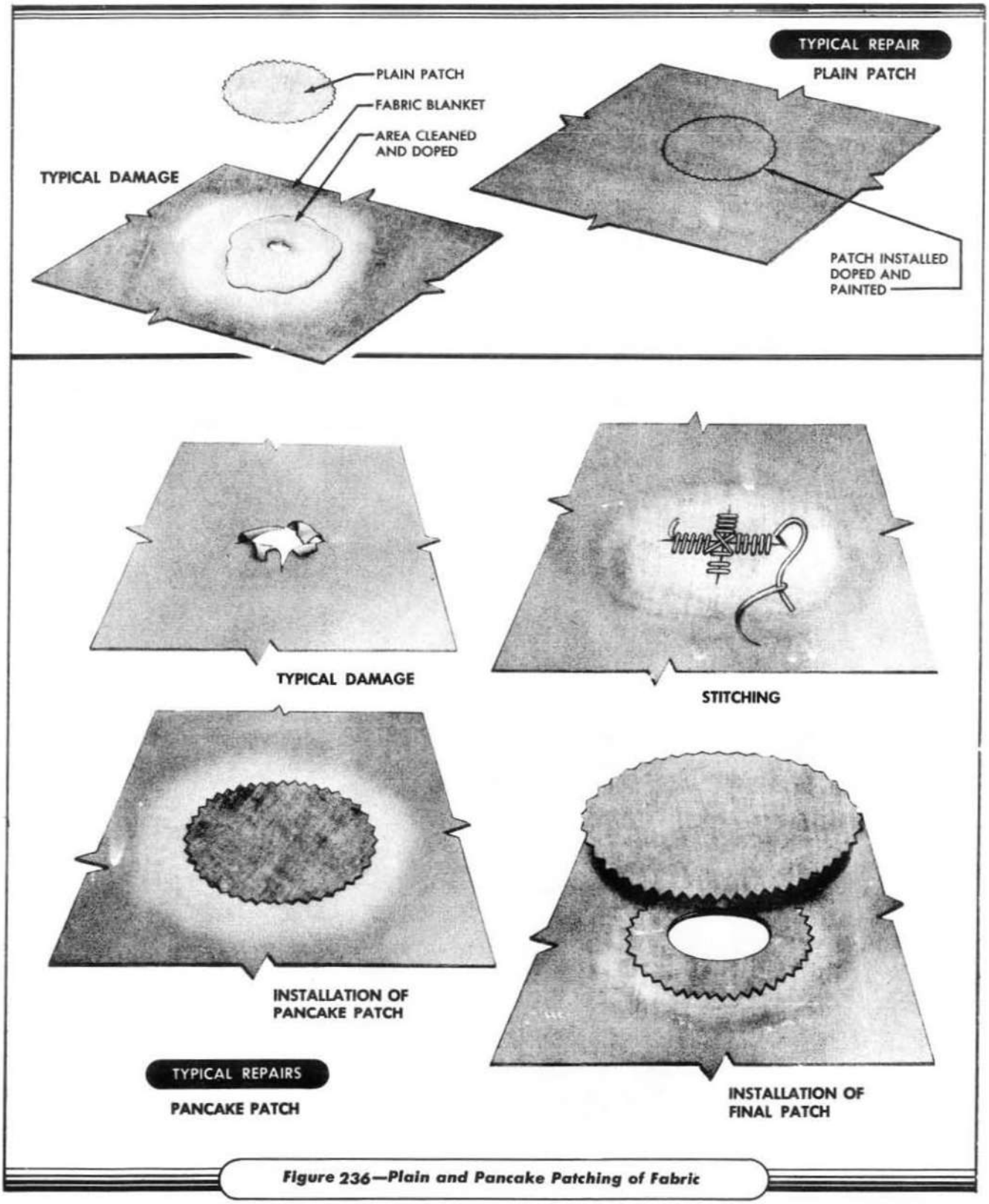


Figure 236—Plain and Pancake Patching of Fabric

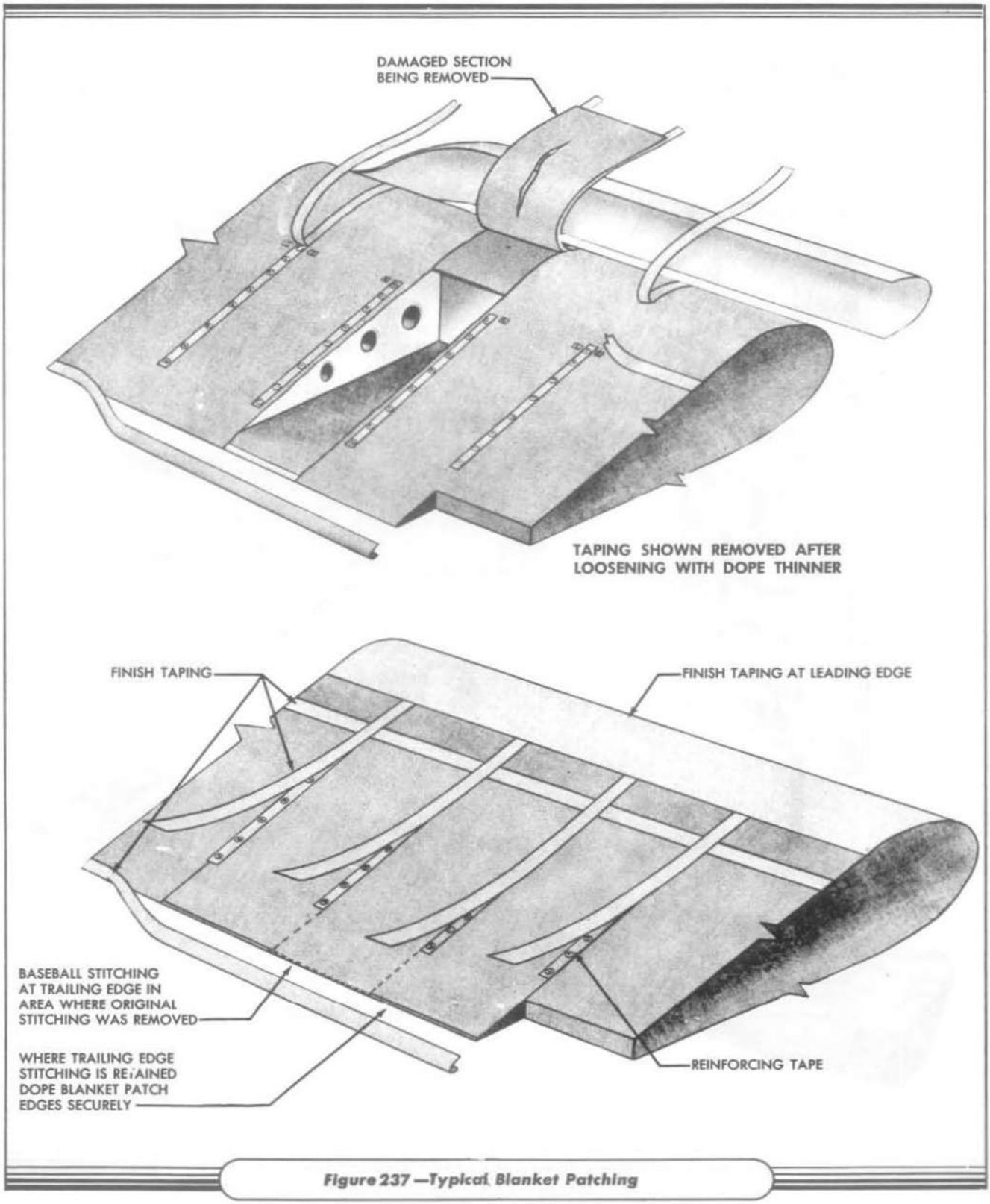


Figure 237 —Typical Blanket Patching

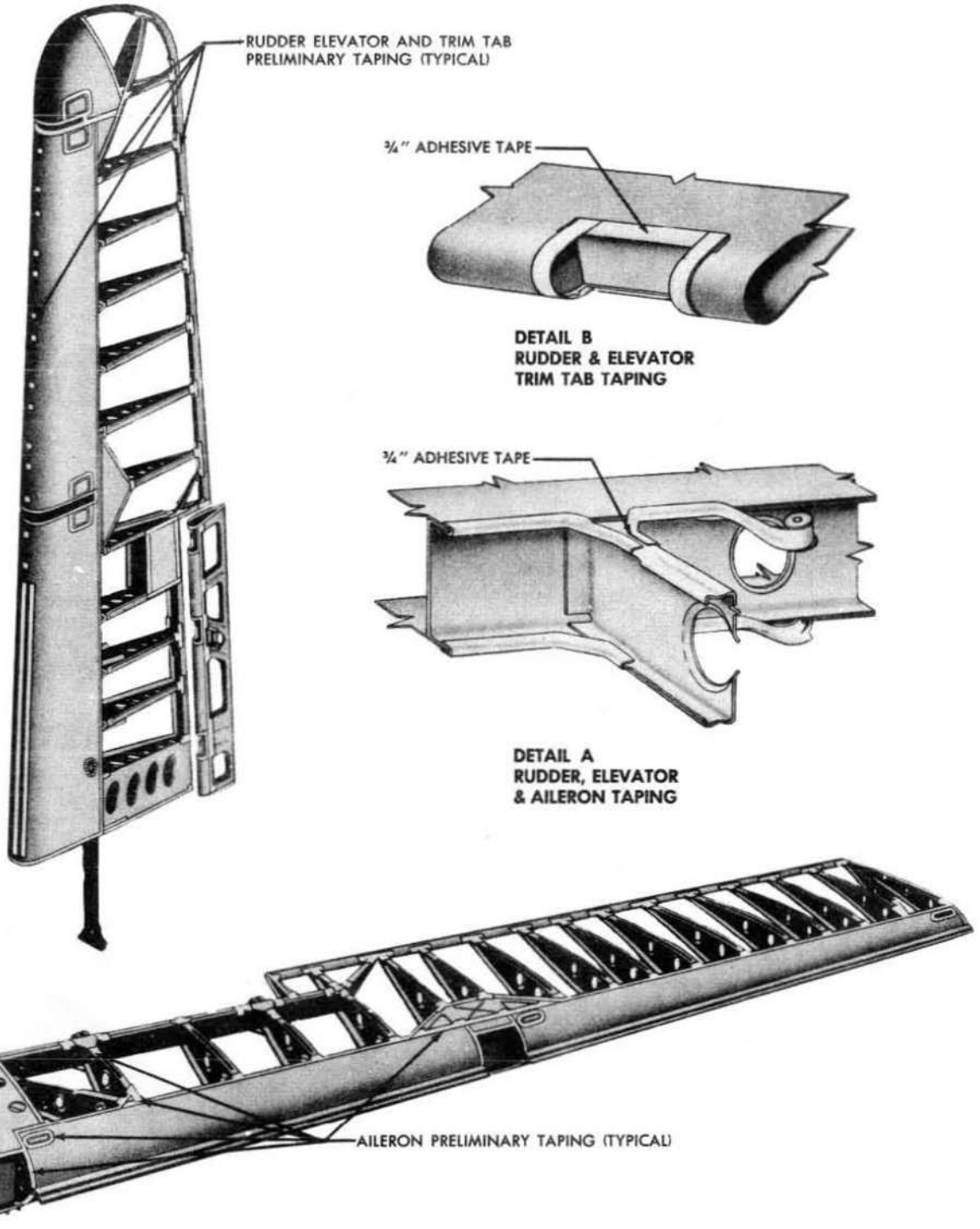


Figure 238—Preliminary Taping of Rudder, Elevator, Aileron and Tab

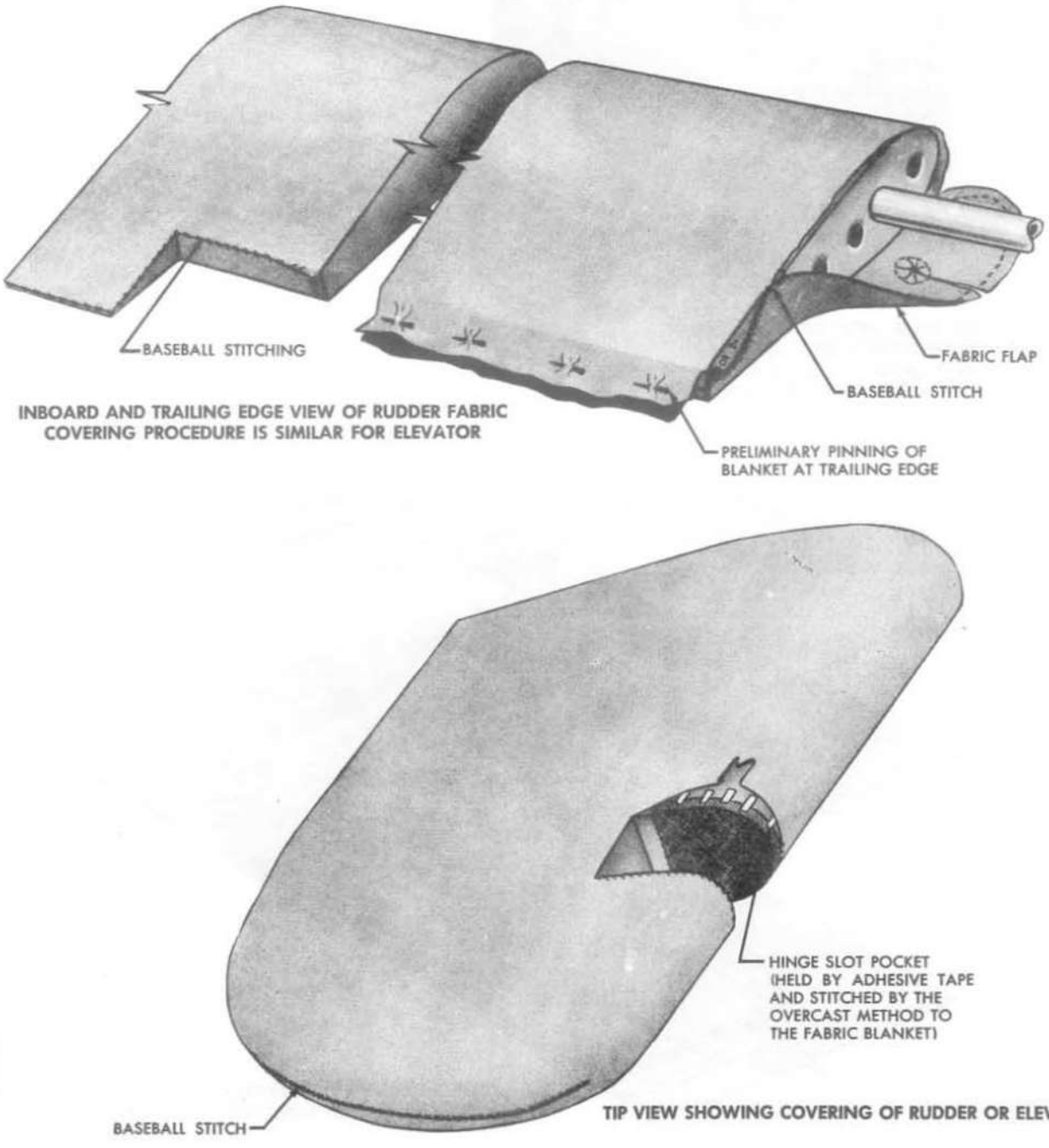
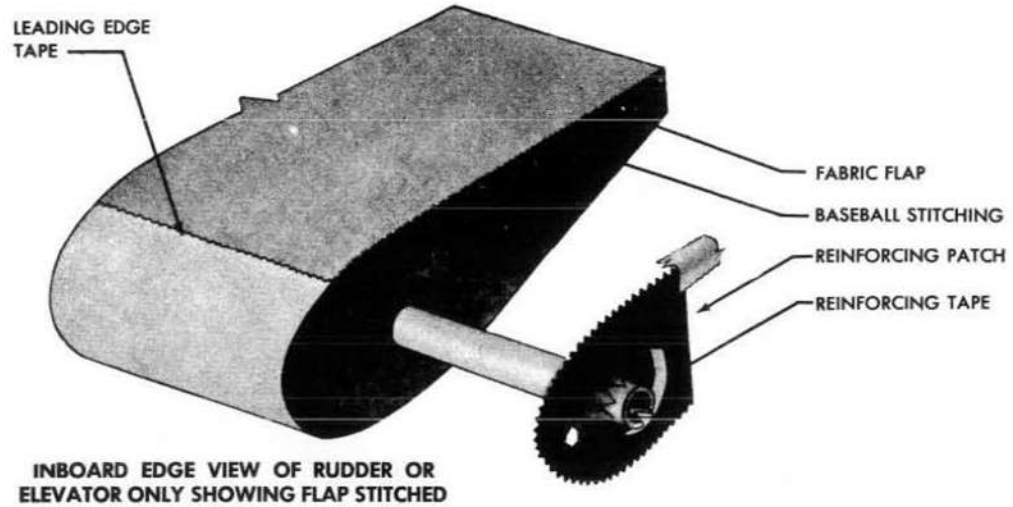
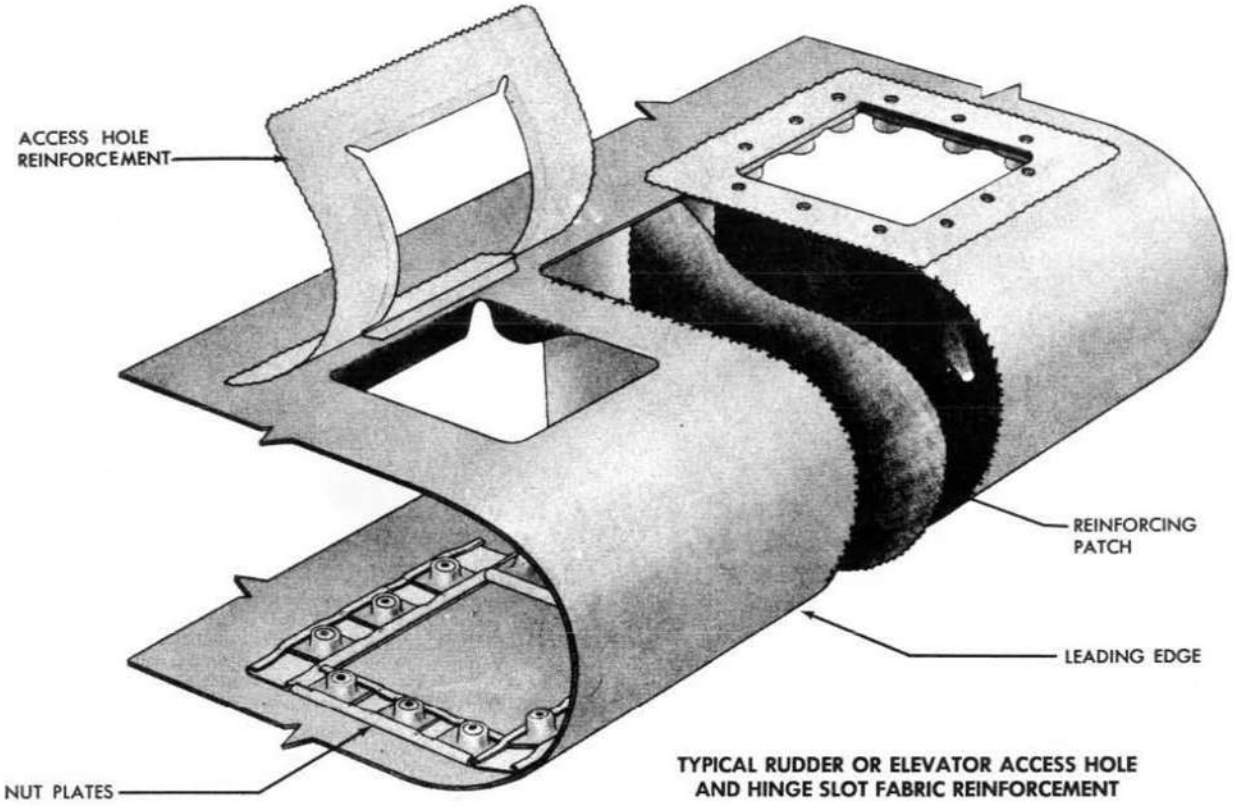


Figure 239—Fabric Covering, Pinning, and Stitching of Rudder and Elevator

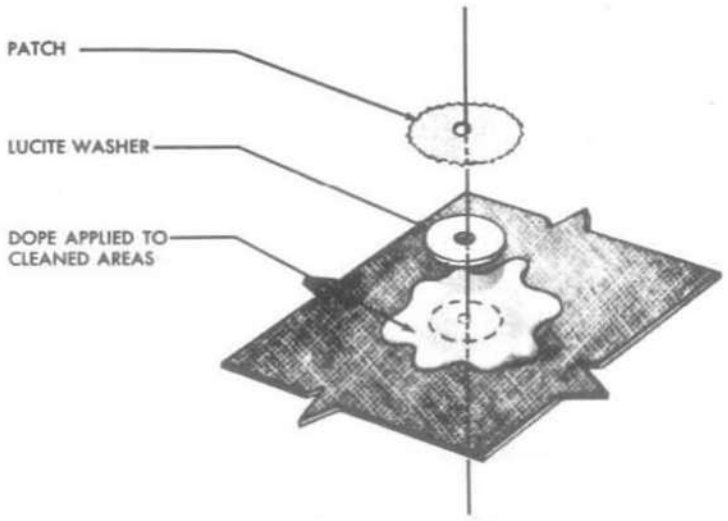


INBOARD EDGE VIEW OF RUDDER OR ELEVATOR ONLY SHOWING FLAP STITCHED AND INSTALLATION OF LEADING EDGE TAPE AND REINFORCING PATCH

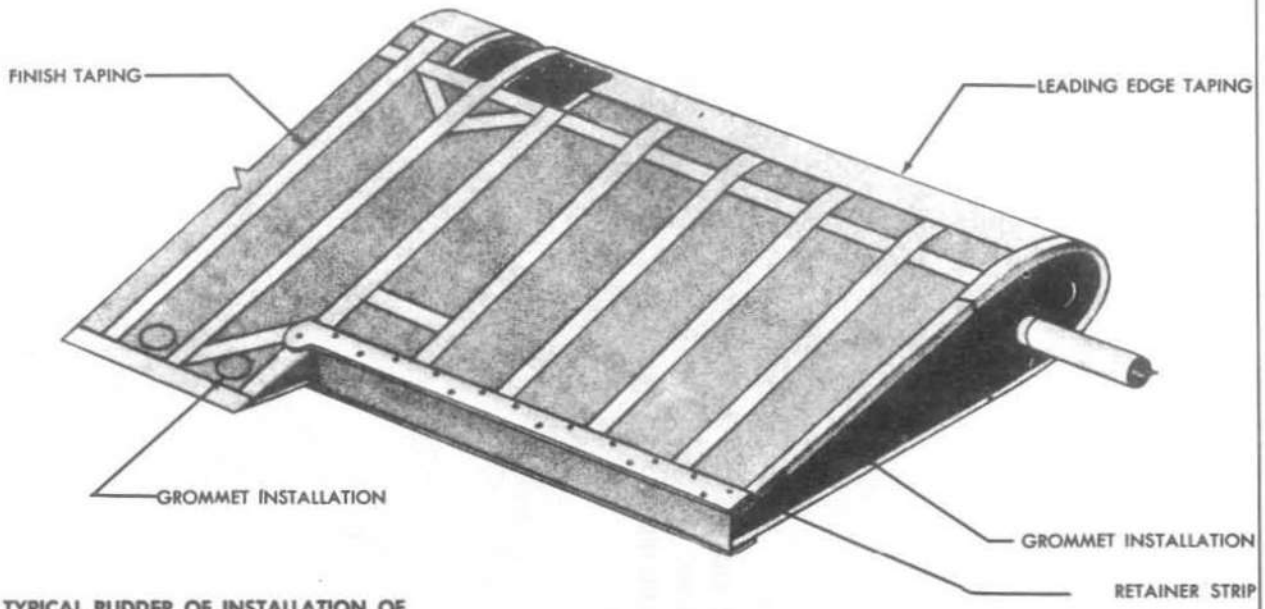


TYPICAL RUDDER OR ELEVATOR ACCESS HOLE AND HINGE SLOT FABRIC REINFORCEMENT

Figure 240—Fabric Reinforcement Around Torque Tube, Access Hole, and Hinge Slot



TYPICAL DRAIN GROMMET INSTALLATION FOR RUDDER, ELEVATOR, AND AILERON



TYPICAL RUDDER OF INSTALLATION OF FINISH TAPING AND RETAINER STRIPS

Figure 241—Installation of Drain Grommets, Finish Taping, and Retainer Strips

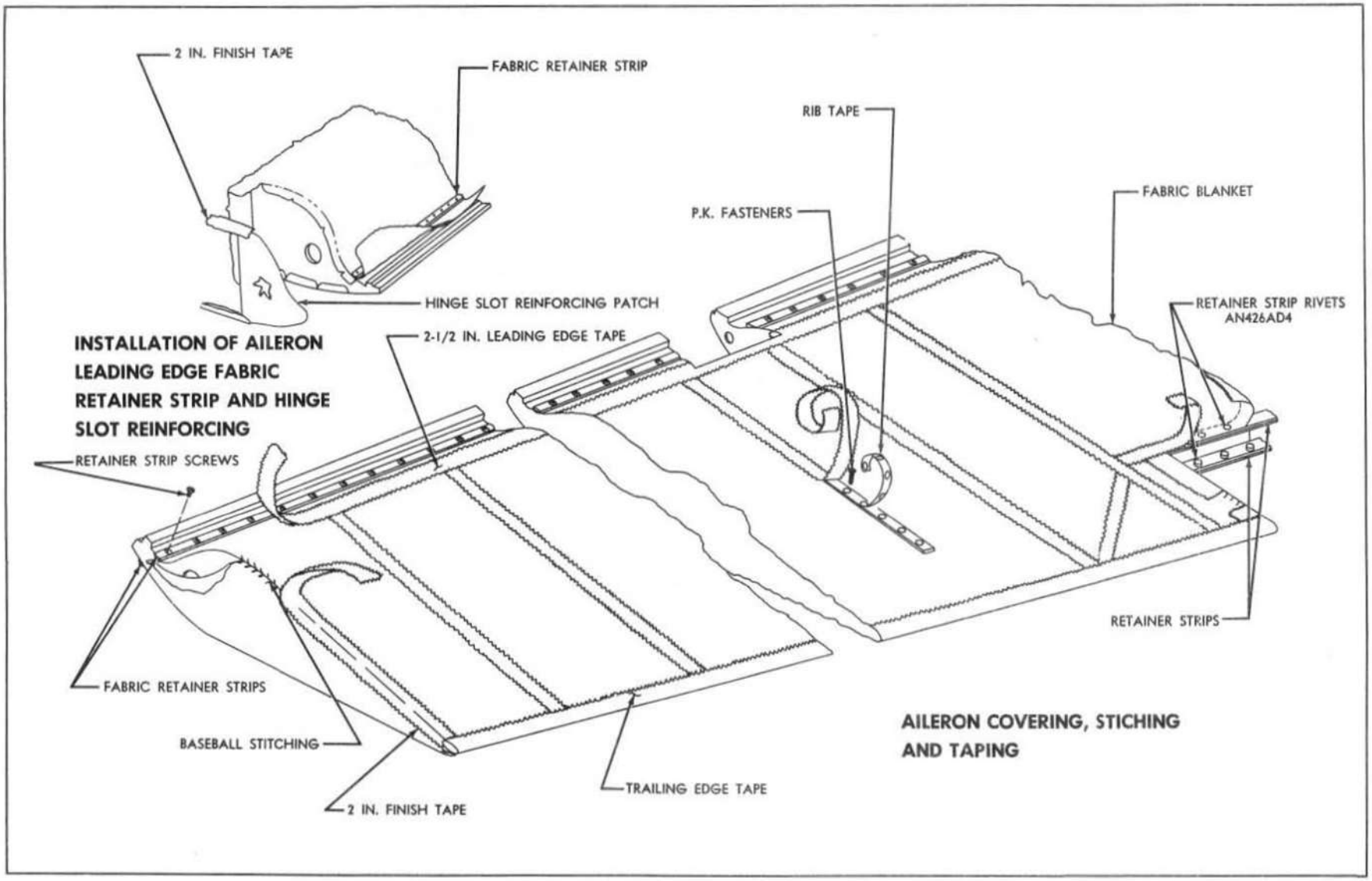


Figure 242 – Aileron Covering, Stitching and Taping

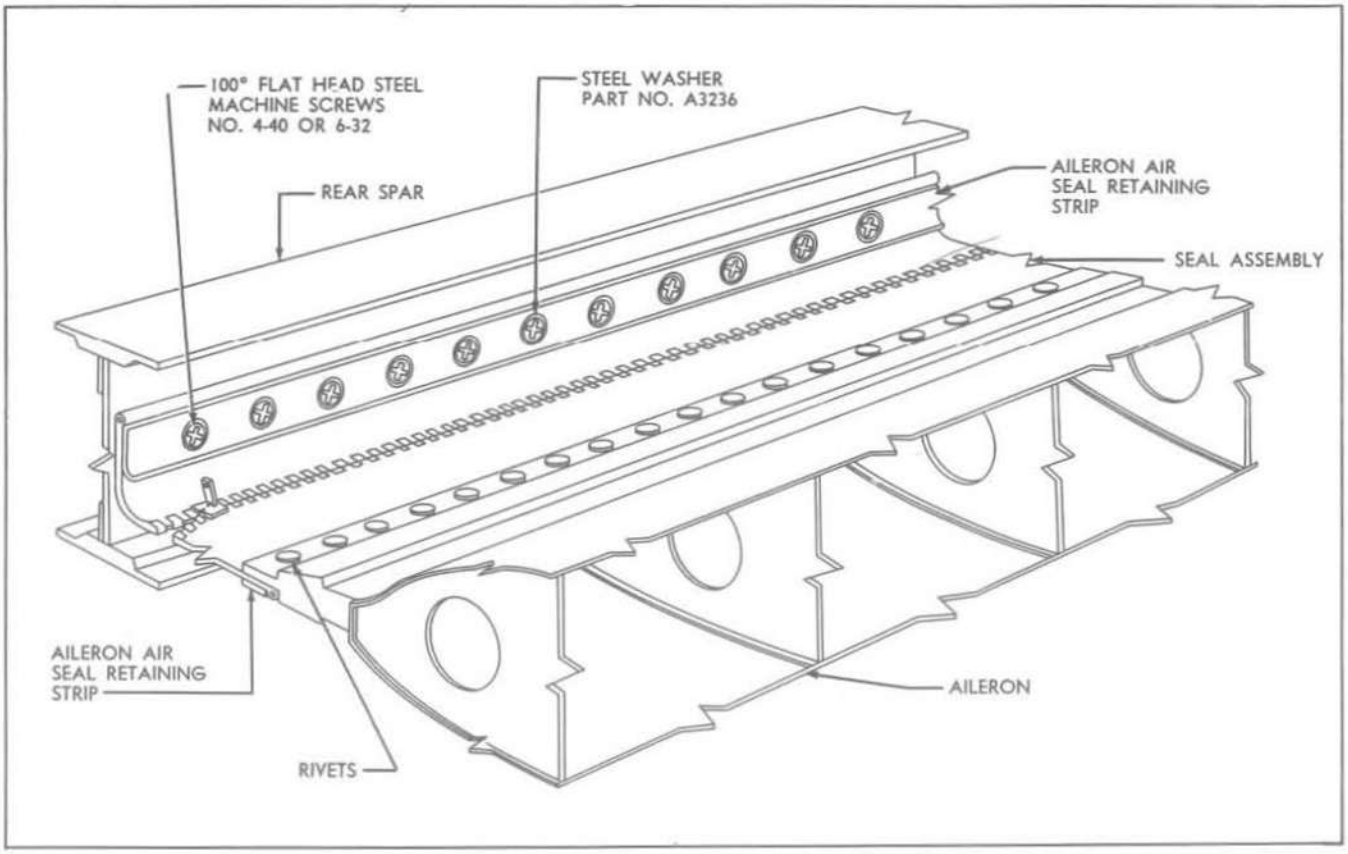


Figure 242A – Aileron Air Seal Attachment

SECTION VIII Extrusion Charts

This section consists of a cross-reference list and charts of all extrusions used in the construction of this airplane. They are listed numerically by the Douglas standard part number, and where possible, are provided with alternates. These alternates are constructed of 24SO sheet which is heat treated to 24ST after being formed. They are designed primarily to equal the strength of the extrusion, and since the minimum bend radius of the sheet must be larger than the corner radius of the extrusion, it may be necessary in some cases to add extra material to provide space for their attachment.

S-130892	ALCOA DIE NUMBER K-10265	S-167881	ALCOA DIE NUMBER 78-J
S-130893	ALCOA DIE NUMBER K-10266	S-167882	ALCOA DIE NUMBER 78-P
S-130906	ALCOA DIE NUMBER K-1516	S-167883	ALCOA DIE NUMBER 472
S-130907	ALCOA DIE NUMBER K-77-U	S-167887	ALCOA DIE NUMBER 3094
S-130909	ALCOA DIE NUMBER D-919	S-167889	ALCOA DIE NUMBER 78-C
S-130911	ALCOA DIE NUMBER K-77-G	S-167890	ALCOA DIE NUMBER 78-F
S-130913	ALCOA DIE NUMBER K-6029	S-167892	ALCOA DIE NUMBER 734-P
S-130985	ALCOA DIE NUMBER D-7868	S-168854	ALCOA DIE NUMBER K-14618
S-132965	ALCOA DIE NUMBER K-1312	S-169096	ALCOA DIE NUMBER K-5456
S-133009	ALCOA DIE NUMBER K-1725	S-169097	ALCOA DIE NUMBER K-78-K
S-133193	ALCOA DIE NUMBER K-734-JJ	S-172658	ALCOA DIE NUMBER K-5290
S-134904	ALCOA DIE NUMBER K-8477	S-176035	ALCOA DIE NUMBER 79-L
S-135311	ALCOA DIE NUMBER K-8478	S-177099	ALCOA DIE NUMBER 11495
S-135635	ALCOA DIE NUMBER 8640	S-179064	ALCOA DIE NUMBER 12673
S-136555	ALCOA DIE NUMBER K-8848	S-179364	ALCOA DIE NUMBER 12883
S-136967	ALCOA DIE NUMBER 8855	S-182216	ALCOA DIE NUMBER K-13857
S-137058	ALCOA DIE NUMBER 2499	S-287055	ALCOA DIE NUMBER K-14602
S-137449	ALCOA DIE NUMBER 6400	S-1000142	ALCOA DIE NUMBER K-10660
S-142266	ALCOA DIE NUMBER K-77-B	S1002772	ALCOA DIE NUMBER K-11069
S-150464	ALCOA DIE NUMBER K-6404	S-1007015	ALCOA DIE NUMBER K-985
S-151776	ALCOA DIE NUMBER K-7621	S-1007018	ALCOA DIE NUMBER 1730
S-164577	ALCOA DIE NUMBER 10282	S-1011464	ALCOA DIE NUMBER 3660
S-165186	ALCOA DIE NUMBER 10480	S-1016616	ALCOA DIE NUMBER K-12696
S-165536	ALCOA DIE NUMBER 10650	S-1017090	ALCOA DIE NUMBER K-13005

S-1018327	ALCOA DIE NUMBER K-12862
S-1018514	ALCOA DIE NUMBER K-12835
S-1019047	ALCOA DIE NUMBER K-12845
S-1020195	ALCOA DIE NUMBER K-14662
S-1020679	ALCOA DIE NUMBER 734-U
S-1021574	ALCOA DIE NUMBER K-13068
S-1022235	ALCOA DIE NUMBER K-13412
S-1022265	ALCOA DIE NUMBER K-13077
S-1023421	ALCOA DIE NUMBER K-13211
S-1025503	ALCOA DIE NUMBER K-734-HH
S-1027673	ALCOA DIE NUMBER K-13608
S-1028375	ALCOA DIE NUMBER K-13612
S-1028381	ALCOA DIE NUMBER K-13666
S-1028382	ALCOA DIE NUMBER K-13613
S-1028476	ALCOA DIE NUMBER K-13648
S-1029111	ALCOA DIE NUMBER K-13647
S-1030509	ALCOA DIE NUMBER K-13821
S-1039966	ALCOA DIE NUMBER K-14661
S-1045540	ALCOA DIE NUMBER K-15418
S-1045544	ALCOA DIE NUMBER K-15607
S-1046481	ALCOA DIE NUMBER K-77-W
S-1046482	ALCOA DIE NUMBER K-77-R
S-1046485	ALCOA DIE NUMBER K-77-L
S-1047298	ALCOA DIE NUMBER K-15643
S-1047299	ALCOA DIE NUMBER K-15644
S-1047872	ALCOA DIE NUMBER K-77-E
S-1047972	ALCOA DIE NUMBER 77-P
S-1048038	ALCOA DIE NUMBER 78-A
S-1049031	ALCOA DIE NUMBER K-77-F
S-1049075	ALCOA DIE NUMBER K-16867
S-1049401	DOW CHEMICAL DIE NUMBER 93
S-1049402	DOW CHEMICAL DIE NUMBER 322
S-1049790	DOW CHEMICAL DIE NUMBER 173
S-1054109	ALCOA DIE NUMBER 5137
S-1054805	ALCOA DIE NUMBER K-22291
S-1054820	ALCOA DIE NUMBER K-22345
S-1055272	ALCOA DIE NUMBER L-23574
S-1057232	ALCOA DIE NUMBER L-23637
S-1059604	ALCOA DIE NUMBER L-23761
S-1059614	ALCOA DIE NUMBER L-23792
S-1059651	ALCOA DIE NUMBER L-24121
S-1059653	ALCOA DIE NUMBER L-24182
S-1059654	ALCOA DIE NUMBER L-24181
S-1059657	ALCOA DIE NUMBER L-24180
S-1059659	ALCOA DIE NUMBER L-24183
S-1059660	ALCOA DIE NUMBER L-24126
S-1059682	ALCOA DIE NUMBER L-24577
S-1067527	ALCOA DIE NUMBER L-24316
S-1070278	ALCOA DIE NUMBER L-24044
S-1072124	ALCOA DIE NUMBER L-24327
S-1072629	ALCOA DIE NUMBER L-24375
S-1073342	ALCOA DIE NUMBER 78-Y
S-1073343	ALCOA DIE NUMBER L-24990
S-1075769	ALCOA DIE NUMBER K-16692
S-1076074	ALCOA DIE NUMBER 726
S-1076089	ALCOA DIE NUMBER K-22001
S-1076879	ALCOA DIE NUMBER 734-3
S-1081111	ALCOA DIE NUMBER K-22385
S-1081131	ALCOA DIE NUMBER K-22434
S-1081470	ALCOA DIE NUMBER K-22438
S-1093703	ALCOA DIE NUMBER 22882
S-1093706	ALCOA DIE NUMBER 27888
S-1093707	ALCOA DIE NUMBER 22897
S-1093708	ALCOA DIE NUMBER 22993
S-1093718	ALCOA DIE NUMBER K-13269
S-1093720	ALCOA DIE NUMBER 30897
S-1093726	ALCOA DIE NUMBER 29122
S-1093754	ALCOA DIE NUMBER 30238
S-1093755	ALCOA DIE NUMBER 30239
S-1093756	ALCOA DIE NUMBER 29496
S-1093759	ALCOA DIE NUMBER 30253
S-1093760	ALCOA DIE NUMBER 30281
S-1093761	ALCOA DIE NUMBER 30282
S-1093762	ALCOA DIE NUMBER K-22008
S-1093763	ALCOA DIE NUMBER 30105
S-1093764	ALCOA DIE NUMBER 30114
S-1093766	ALCOA DIE NUMBER 30106
S-1093767	ALCOA DIE NUMBER 30092
S-1093768	ALCOA DIE NUMBER 30093
S-1093769	ALCOA DIE NUMBER 30094
S-1093771	ALCOA DIE NUMBER 30115
S-1093774	ALCOA DIE NUMBER 30254
S-1093775	ALCOA DIE NUMBER 30266
S-1093776	ALCOA DIE NUMBER 30283
S-1093781	ALCOA DIE NUMBER 30088
S-1093782	ALCOA DIE NUMBER 30240
S-1093791	ALCOA DIE NUMBER 30267
S-1093788	ALCOA DIE NUMBER 30247
S-1093790	ALCOA DIE NUMBER 30248
S-1093791	ALCOA DIE NUMBER 30267

S-1093794	ALCOA DIE NUMBER 30107
S-1103518	ALCOA DIE NUMBER L-24920
S-1104495	ALCOA DIE NUMBER L-28554
S-1104751	ALCOA DIE NUMBER L-28557
S-1105429	ALCOA DIE NUMBER L-28631
S-1105658	ALCOA DIE NUMBER L-28623
S-1105662	ALCOA DIE NUMBER L-28567
S-1105663	ALCOA DIE NUMBER L-28568
S-1105759	ALCOA DIE NUMBER D-20720
S-1106624	ALCOA DIE NUMBER 734-B
S-1109270	ALCOA DIE NUMBER L-28739
S-1109685	ALCOA DIE NUMBER K-13689
S-1110787	ALCOA DIE NUMBER L-28829
S-1111225	ALCOA DIE NUMBER L-28827
S-1111710	ALCOA DIE NUMBER L-28877
S-1114110	ALCOA DIE NUMBER 30674
S-1114111	ALCOA DIE NUMBER 22891
S-1114163	ALCOA DIE NUMBER 30924
S-1125503	ALCOA DIE NUMBER L-28620
S-1125505	ALCOA DIE NUMBER 30329
S-1125506	ALCOA DIE NUMBER 30326
S-1125508	ALCOA DIE NUMBER 30268
S-1125511	ALCOA DIE NUMBER 30098
S-1125512	ALCOA DIE NUMBER 30099
S-1125513	ALCOA DIE NUMBER 30124
S-1125514	ALCOA DIE NUMBER 30123
S-1125515	ALCOA DIE NUMBER 30284
S-1125516	ALCOA DIE NUMBER 30242
S-1125517	ALCOA DIE NUMBER 30100
S-1125518	ALCOA DIE NUMBER 30101
S-1125520	ALCOA DIE NUMBER 29017
S-1125521	ALCOA DIE NUMBER 30313
S-1125524	ALCOA DIE NUMBER 30255
S-1125525	ALCOA DIE NUMBER 30249
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S-1125527	ALCOA DIE NUMBER 30730
S-1125528	ALCOA DIE NUMBER 30241
S-1125529	ALCOA DIE NUMBER 30319
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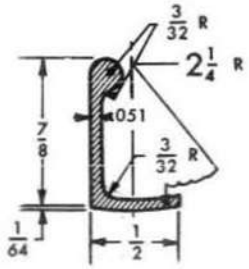
S-1125533	ALCOA DIE NUMBER K-22559
S-1125534	ALCOA DIE NUMBER 30236
S-1125537	ALCOA DIE NUMBER 30323
S-1125542	ALCOA DIE NUMBER 30299
S-1125549	ALCOA DIE NUMBER 30243
S-1125566	ALCOA DIE NUMBER K-15201
S-1125567	ALCOA DIE NUMBER 30232
S-1125570	ALCOA DIE NUMBER L-29021
S-1125575	ALCOA DIE NUMBER 30315
S-1125580	ALCOA DIE NUMBER 30316
S-1125581	ALCOA DIE NUMBER 30229
S-1125582	ALCOA DIE NUMBER 30228
S-1125585	ALCOA DIE NUMBER 30227
S-1125586	ALCOA DIE NUMBER 30322
S-1125595	ALCOA DIE NUMBER T-855
S-1125596	ALCOA DIE NUMBER 30500
S-1125599	ALCOA DIE NUMBER 30501
S-1130803	ALCOA DIE NUMBER 734 F F
S-1152320	ALCOA DIE NUMBER 30682
S-1152325	ALCOA DIE NUMBER K-15060
S-1152356	ALCOA DIE NUMBER 30698
S-1152358	ALCOA DIE NUMBER 30699
S-1152368	ALCOA DIE NUMBER 30727
S-1152380	ALCOA DIE NUMBER 30700
S-1152382	ALCOA DIE NUMBER K-16439
S-1152383	ALCOA DIE NUMBER L-23981
S-1152392	ALCOA DIE NUMBER 30750
S-1152393	ALCOA DIE NUMBER 30751
S-1152394	ALCOA DIE NUMBER 30752
S-1152395	ALCOA DIE NUMBER 30728
S-1152396	ALCOA DIE NUMBER 30753
S-1152397	ALCOA DIE NUMBER 30754
S-1152398	ALCOA DIE NUMBER 30755
S-1152399	ALCOA DIE NUMBER 30756
S-1159900	ALCOA DIE NUMBER 30757
S-1159905	ALCOA DIE NUMBER 30758
S-1159947	ALCOA DIE NUMBER 30867
S-1159953	ALCOA DIE NUMBER L-24769
S-1159955	ALCOA DIE NUMBER 31022
S-1159956	ALCOA DIE NUMBER 30898
S-1159957	ALCOA DIE NUMBER 30939
S-1159959	ALCOA DIE NUMBER 30942
S-1159968	ALCOA DIE NUMBER 30954
S-1179724	ALCOA DIE NUMBER K-985
S-2062618	ALCOA DIE NUMBER 30116
S-2062619	ALCOA DIE NUMBER 30117
S-2062621	ALCOA DIE NUMBER 30321
S-2062622	ALCOA DIE NUMBER 28074
S-2062623	ALCOA DIE NUMBER 28075
S-2062627	ALCOA DIE NUMBER 30301
S-2062665	ALCOA DIE NUMBER 34751

AN 01-40AJ-3

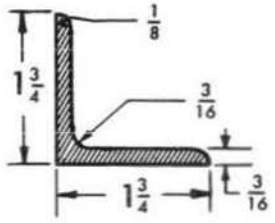


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .1096 Sq. In.

S-130892 ALCOA DIE NUMBER K-10265

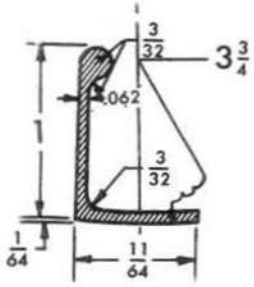
AREA .091 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-130907 ALCOA DIE NUMBER K-77-U

AREA .630 SQ. IN. MATERIAL 24ST

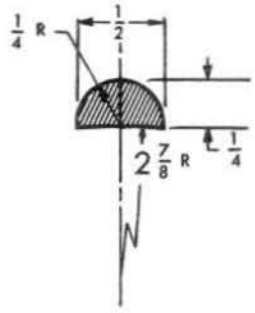


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1475 Sq. In.

S-130893 ALCOA DIE NUMBER K-10266

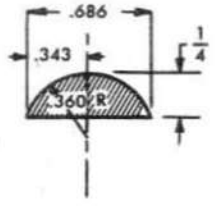
AREA .122 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-130909 ALCOA DIE NUMBER D-919

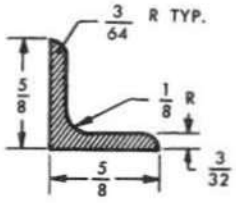
AREA .098 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-130906 ALCOA DIE NUMBER K-1516

AREA .128 SQ. IN. MATERIAL 24ST



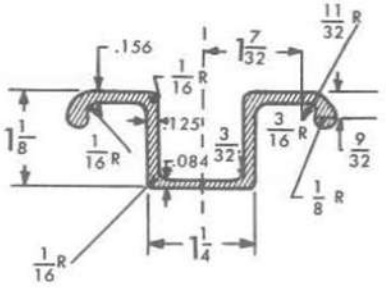
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .1256 Sq. In.

S-130911 ALCOA DIE NUMBER K-77-G

AREA .107 SQ. IN. MATERIAL 24ST

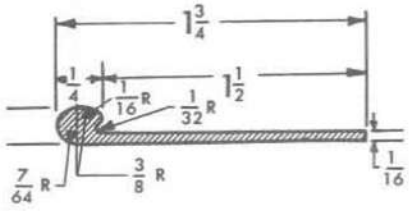
Figure 243—Extrusion Chart (Sheet 1 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-130913 ALCOA DIE NUMBER K-6029

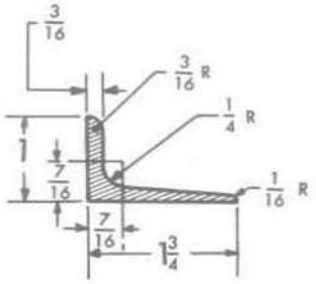
AREA .775 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-133009 ALCOA DIE NUMBER K-1725

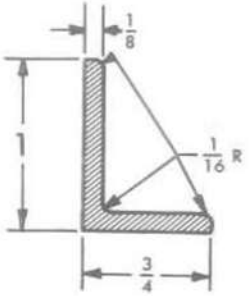
AREA .150 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

S-130985 ALCOA DIE NUMBER D-7868

AREA .410 SQ. IN. MATERIAL 24ST

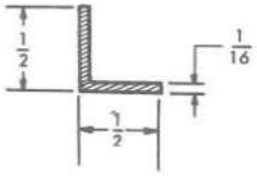


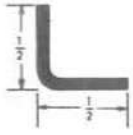
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .2241 Sq. In.

S-133193 ALCOA DIE NUMBER K-734-JJ

AREA .200 SQ. IN. MATERIAL 24S



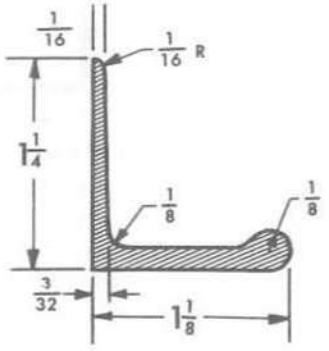


ALTERNATE

Material 24SO
H.T. to 24ST
Area .072 Sq. In.
Min. Radii 1/8
Area .0618 Sq. In.

S-132965 ALCOA DIE NUMBER K-1312

AREA .059 SQ. IN. MATERIAL 24ST



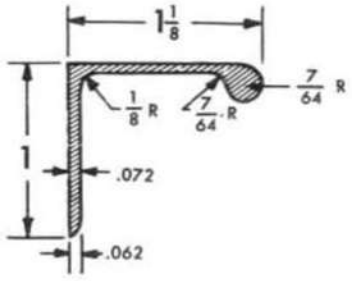
NO ALTERNATE FOR THIS EXTRUSION

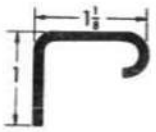
S-134904 ALCOA DIE NUMBER K-8477

AREA .256 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 2 of 38)

AN 01-40AJ-3



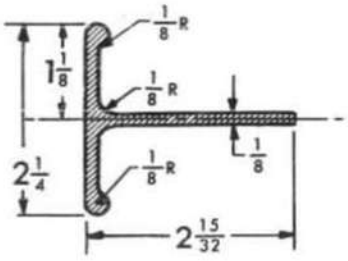


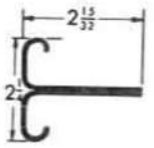
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .091
Min. Radii 5/32
Area .212 Sq. In.

S-135311 ALCOA DIE NUMBER K-8478

AREA .168 SQ. IN. MATERIAL 24S



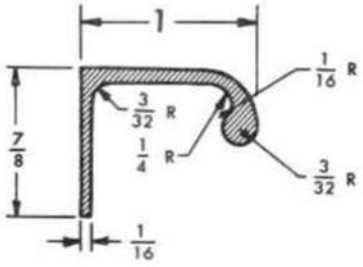


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .972 Sq. In.

S-136967 ALCOA DIE NUMBER 8855

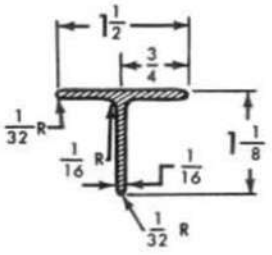
AREA .625 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-135635 ALCOA DIE NUMBER 8640

AREA .177 SQ. IN. MATERIAL 24ST

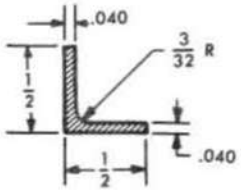


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .2047 Sq. In.

S-137058 ALCOA DIE NUMBER 2499

AREA .164 SQ. IN. MATERIAL 24ST

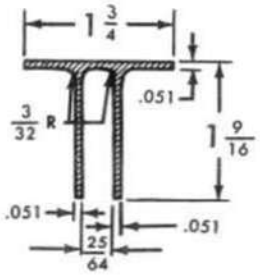


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .0464 Sq. In.

S-136555 ALCOA DIE NUMBER K-8848

AREA .03925 SQ. IN. MATERIAL 24ST

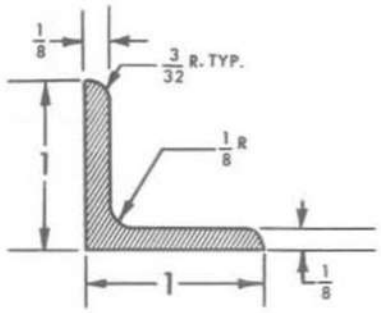


NO ALTERNATE FOR THIS EXTRUSION

S-137449 ALCOA DIE NUMBER 6400

AREA .251 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 3 of 38)

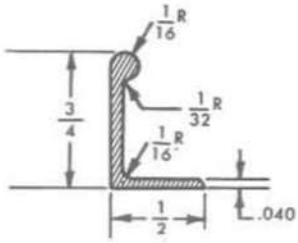


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .2634 Sq. In.

S-142266 ALCOA DIE NUMBER K-77B

AREA .235 SQ. IN. MATERIAL 24S

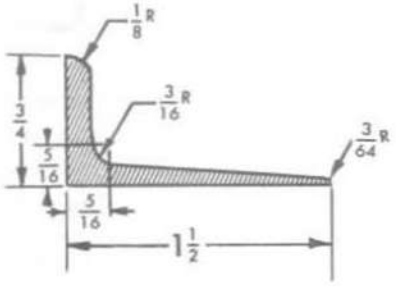


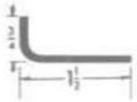
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .0689 Sq. In.

S-164577 ALCOA DIE NUMBER 10282

AREA .057 SQ. IN. MATERIAL 24ST



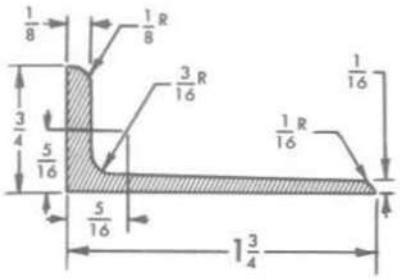


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .3499 Sq. In.

S-150464 ALCOA DIE NUMBER K-6404

AREA .221 SQ. IN. MATERIAL 24ST

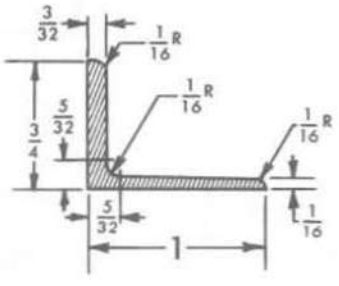


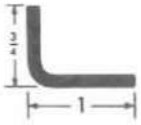
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .3965 Sq. In.

S-165186 ALCOA DIE NUMBER 10480

AREA .250 SQ. IN. MATERIAL 24ST



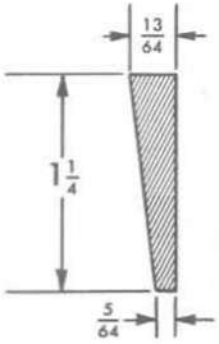


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .2242 Sq. In.

S-151776 ALCOA DIE NUMBER K-7621

AREA .140 SQ. IN. MATERIAL 24ST



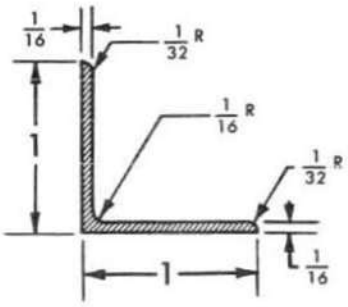
NO ALTERNATE FOR THIS EXTRUSION

S-165536 ALCOA DIE NUMBER 10650

AREA .176 SQ. IN. MATERIAL 24ST

Figure 243 —Extrusion Chart (Sheet 4 of 38)

AN 01-40AJ-3

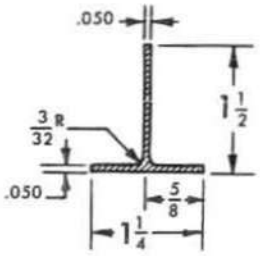


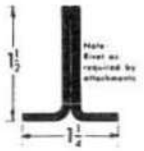
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .134 Sq. In.

S-167881 ALCOA DIE NUMBER 78-J

AREA .121 SQ. IN. MATERIAL 24ST



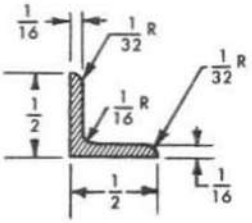


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .2076 Sq. In.

S-167887 ALCOA DIE NUMBER 3094

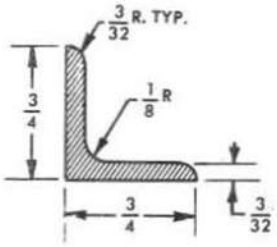
AREA .141 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-167882 ALCOA DIE NUMBER 78-P

AREA .059 SQ. IN. MATERIAL 24ST

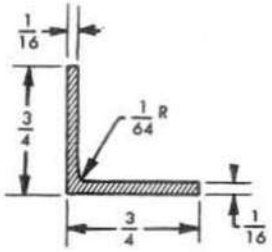


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .132 Sq. In.

S-167889 ALCOA DIE NUMBER 78-C

AREA .130 SQ. IN. MATERIAL 24ST

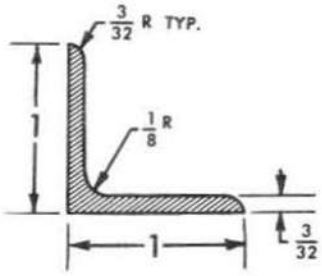


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .0978 Sq. In.

S-167883 ALCOA DIE NUMBER 472

AREA .090 SQ. IN. MATERIAL 24S



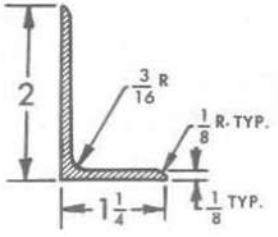
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .183 Sq. In.

S-167890 ALCOA DIE NUMBER 78-F

AREA .180 SQ. IN. MATERIAL 24S

Figure 243—Extrusion Chart (Sheet 5 of 38)

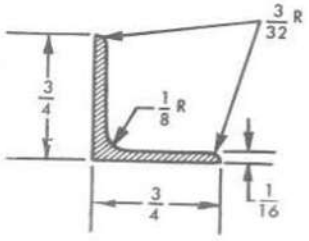


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .458 Sq. In.

S-167892 ALCOA DIE NUMBER 734-P

AREA .391 SQ. IN. MATERIAL 24ST

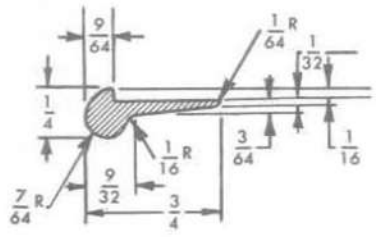


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .0978 Sq. In.

S-169097 ALCOA DIE NUMBER K-78-K

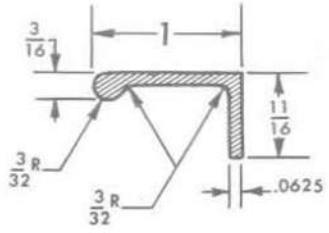
AREA .090 SQ. IN. MATERIAL 24S

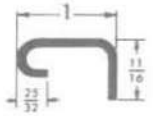


NO ALTERNATE FOR THIS EXTRUSION

S-168854 ALCOA DIE NUMBER K-14618

AREA .060 SQ. IN. MATERIAL 24ST



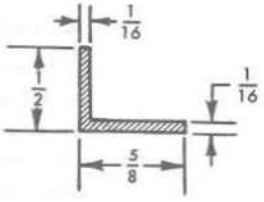


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1475 Sq. In.

S-172658 ALCOA DIE NUMBER K-5290

AREA .122 SQ. IN. MATERIAL 24ST

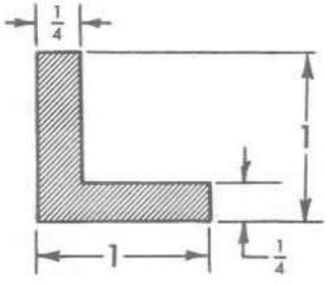


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .0708 Sq. In.

S-169096 ALCOA DIE NUMBER K-5456

AREA .066 SQ. IN. MATERIAL 24ST

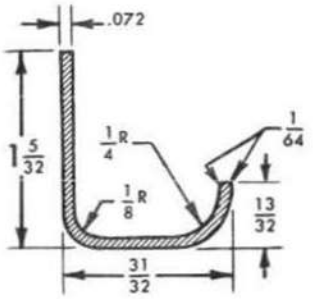


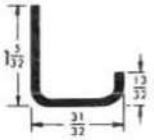
NO ALTERNATE FOR THIS EXTRUSION

S-176035 ALCOA DIE NUMBER 79-L

AREA .438 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 6 of 38)



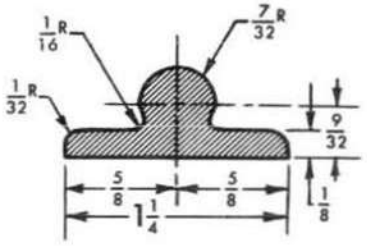


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .159 Sq. In.

S-177099 ALCOA DIE NUMBER 11495

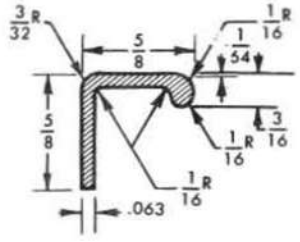
AREA .158 SQ. IN. MATERIAL 24S

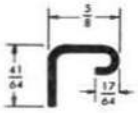


NO ALTERNATE FOR THIS EXTRUSION

S-182216 ALCOA DIE NUMBER K-13857

AREA .301 SQ. IN. MATERIAL 24ST



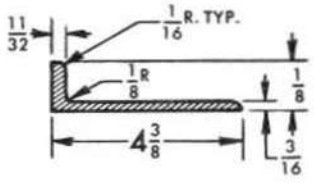


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1082 Sq. In.

S-179064 ALCOA DIE NUMBER 12673

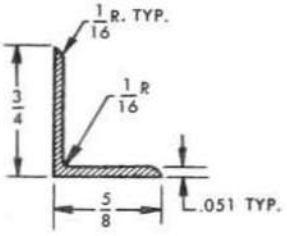
AREA .090 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

S-287055 ALCOA DIE NUMBER K-14602

AREA 1.144 SQ. IN. MATERIAL 24ST

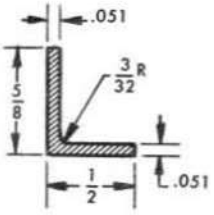


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .0805 Sq. In.

S-179364 ALCOA DIE NUMBER 12883

AREA .067 SQ. IN. MATERIAL 24S



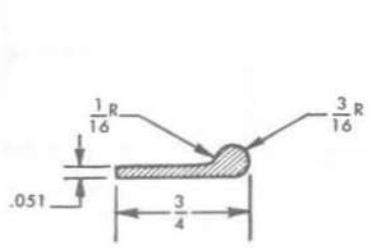
ALTERNATE

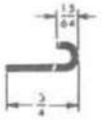
Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .0644 Sq. In.

S-1000142 ALCOA DIE NUMBER K-10660

AREA .056 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 7 of 38)



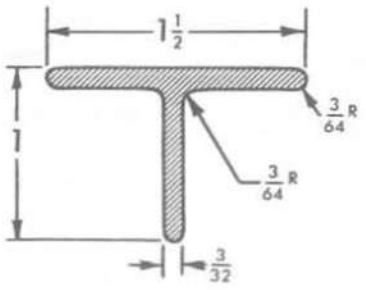


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .0681 Sq. In.

S-1002772 ALCOA DIE NUMBER K-11069

AREA .056 SQ. IN. MATERIAL 24S

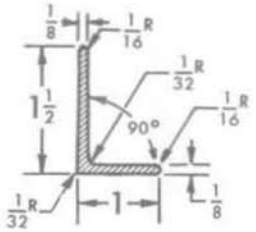


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .315 Sq. In.

S-1011464 ALCOA DIE NUMBER 3660

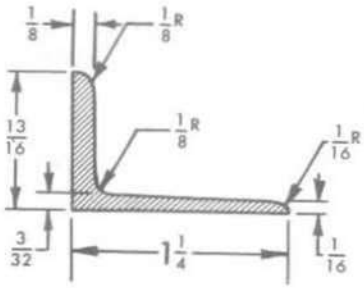
AREA .218 SQ. IN. MATERIAL 24ST

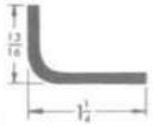


NO ALTERNATE FOR THIS EXTRUSION

S-1007015 ALCOA DIE NUMBER K-985

AREA .296 SQ. IN. MATERIAL 24S



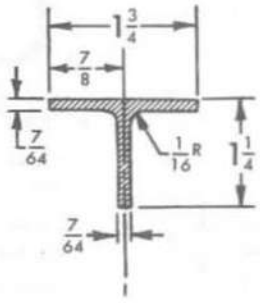


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .3142 Sq. In.

S-1016616 ALCOA DIE NUMBER K-12696

AREA .189 SQ. IN. MATERIAL 24ST

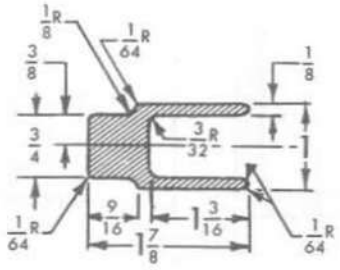


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .470 Sq. In.

S-1007018 ALCOA DIE NUMBER 1730

AREA .317 SQ. IN. MATERIAL 24S

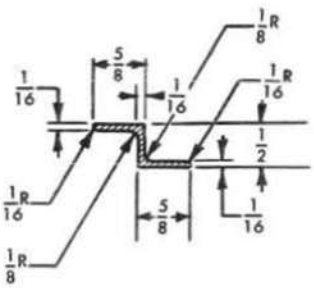


NO ALTERNATE FOR THIS EXTRUSION

S-1017090 ALCOA DIE NUMBER K-13005

AREA .854 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 8 of 38)

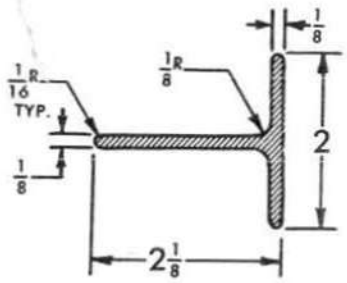


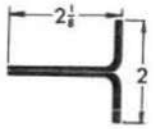
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .081
Min. Radii 1/8
Area .117 Sq. In.

S-1018327 ALCOA DIE NUMBER K-12862

AREA .107 SQ. IN. MATERIAL 24ST



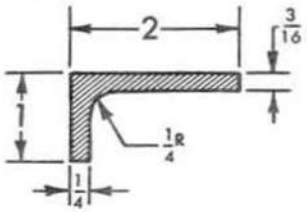


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .679 Sq. In.

S-1020195 ALCOA DIE NUMBER K-14662

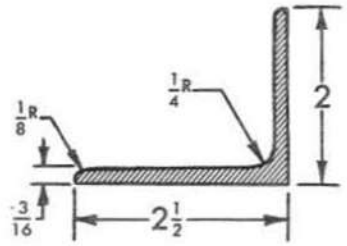
AREA .502 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1018514 ALCOA DIE NUMBER K-12835

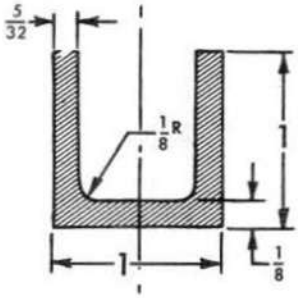
AREA .592 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1020679 ALCOA DIE NUMBER 734-U

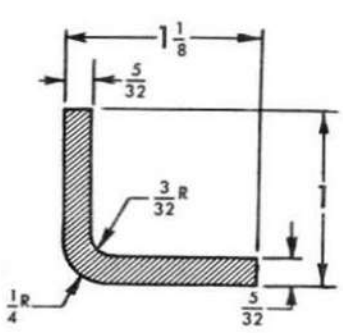
AREA .82 SQ. IN. MATERIAL 24ST

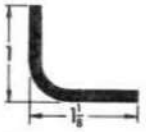


NO ALTERNATE FOR THIS EXTRUSION

S-1019047 ALCOA DIE NUMBER K-12845

AREA .405 SQ. IN. MATERIAL 24ST





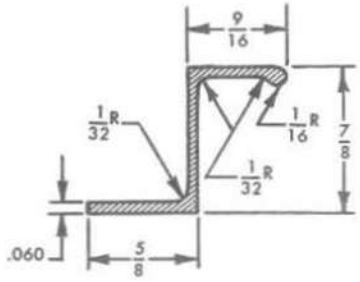
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .326 Sq. In.

S-1021574 ALCOA DIE NUMBER K-13068

AREA .296 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 9 of 38)

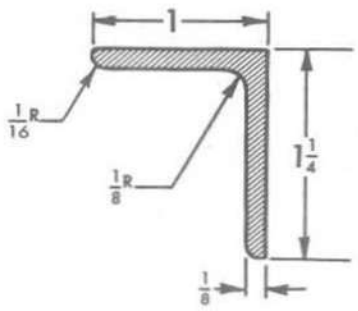


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1505 Sq. In.

S-1022235 ALCOA DIE NUMBER K-13412

AREA .118 SQ. IN. MATERIAL 24ST

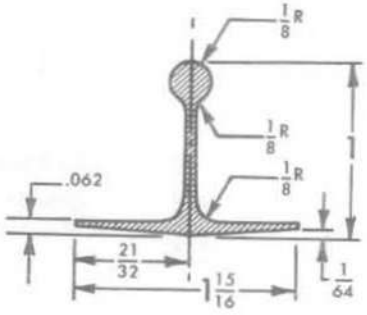


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .3025 Sq. In.

S-1025503 ALCOA DIE NUMBER K-734-HH

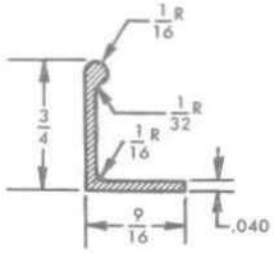
AREA .267 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

S-1022265 ALCOA DIE NUMBER K-13077

AREA .175 SQ. IN. MATERIAL 24ST

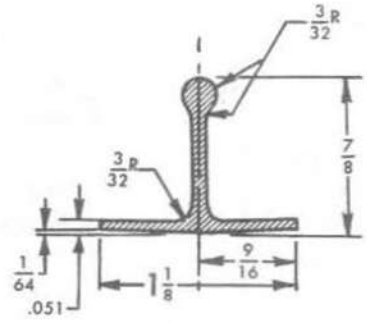


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .0721 Sq. In.

S-1027673 ALCOA DIE NUMBER K-13608

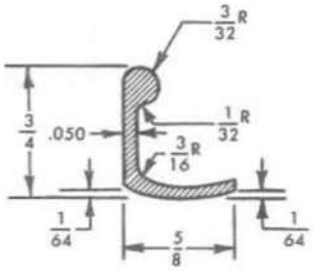
AREA .060 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

S-1023421 ALCOA DIE NUMBER K-13211

AREA .121 SQ. IN. MATERIAL 24ST



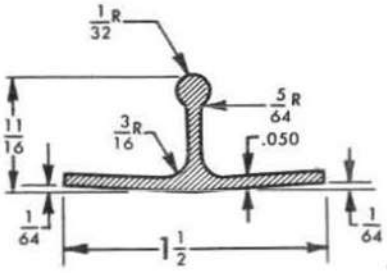
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .1136 Sq. In.

S-1028375 ALCOA DIE NUMBER K-13612

AREA .094 SQ. IN. MATERIAL 24ST

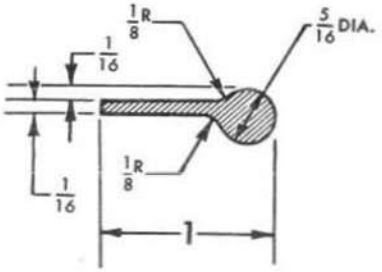
Figure 243—Extrusion Chart (Sheet 10 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1028381 ALCOA DIE NUMBER K-13666

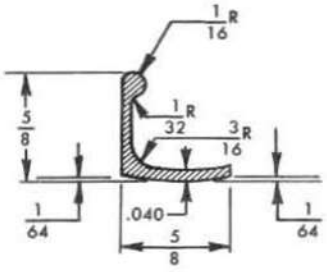
AREA .134 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1029111 ALCOA DIE NUMBER K-13647

AREA .128 SQ. IN. MATERIAL 24ST

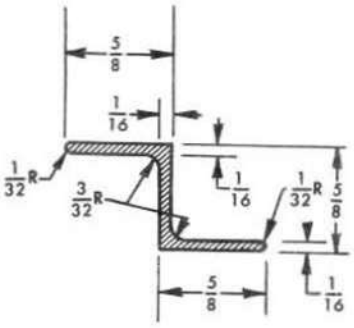


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .0769 Sq. In.

S-1028382 ALCOA DIE NUMBER K-13613

AREA .064 SQ. IN. MATERIAL 24S

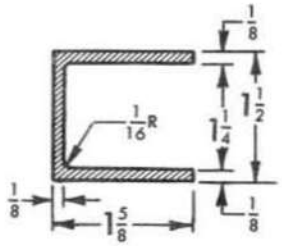


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1147 Sq. In.

S-1030509 ALCOA DIE NUMBER K-13821

AREA .113 SQ. IN. MATERIAL 24ST

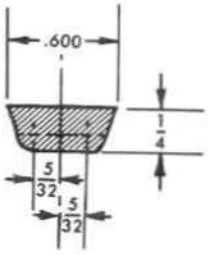


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .644 Sq. In.

S-1028476 ALCOA DIE NUMBER K-13648

AREA .564 SQ. IN. MATERIAL 24ST

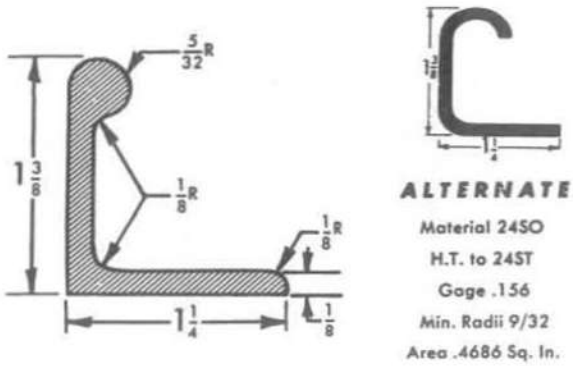


NO ALTERNATE FOR THIS EXTRUSION

S-1039966 ALCOA DIE NUMBER K-14661

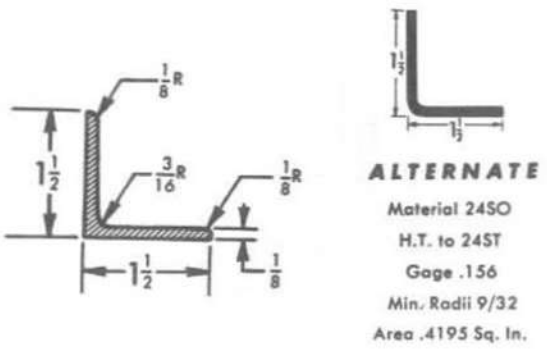
AREA .130 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 11 of 38)



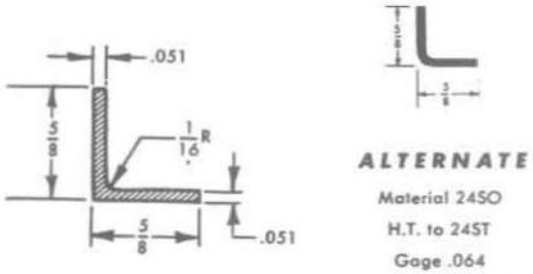
S-1045540 ALCOA DIE NUMBER K-15418

AREA .358 SQ. IN. MATERIAL 24ST



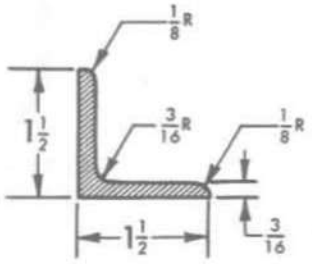
S-1046482 ALCOA DIE NUMBER K-77-R

AREA .36 SQ. IN. MATERIAL 24ST



S-1045544 ALCOA DIE NUMBER K-15607

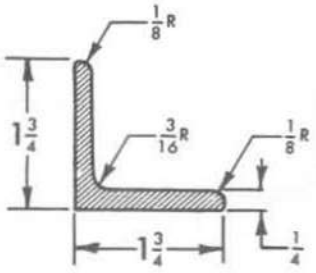
AREA .062 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1046485 ALCOA DIE NUMBER K-77-L

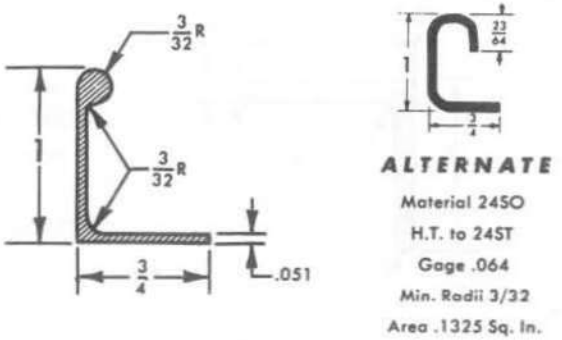
AREA .53 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1046481 ALCOA DIE NUMBER K-77-W

AREA .81 SQ. IN. MATERIAL 24ST

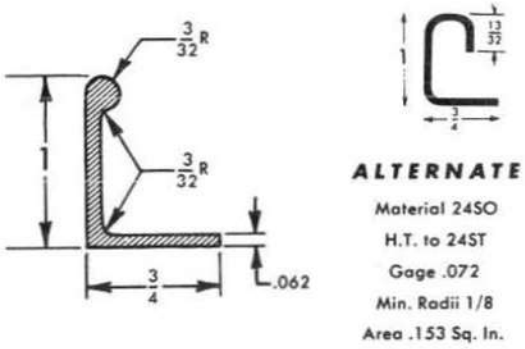


S-1047298 ALCOA DIE NUMBER K-15643

AREA .110 SQ. IN. MATERIAL 24ST

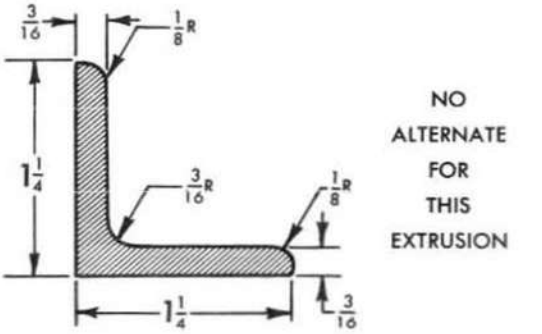
Figure 243—Extrusion Chart (Sheet 12 of 38)

AN 01-40AJ-3



S-1047299 ALCOA DIE NUMBER K-15644

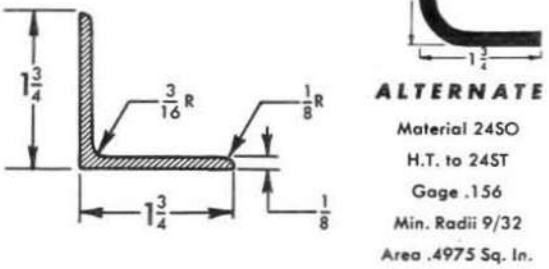
AREA .127 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

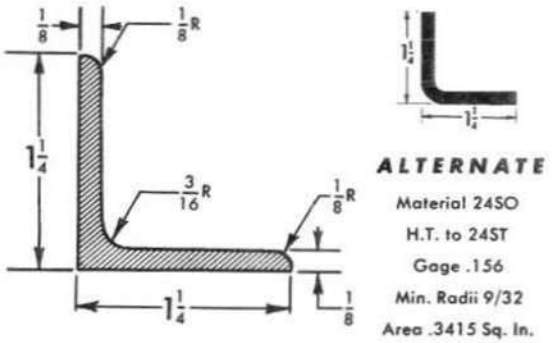
S-1048038 ALCOA DIE NUMBER 78-A

AREA .430 SQ. IN. MATERIAL 24S



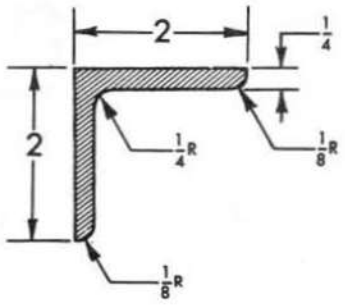
S-1047872 ALCOA DIE NUMBER K-77-E

AREA .42 SQ. IN. MATERIAL 24ST



S-1049031 ALCOA DIE NUMBER K-77-F

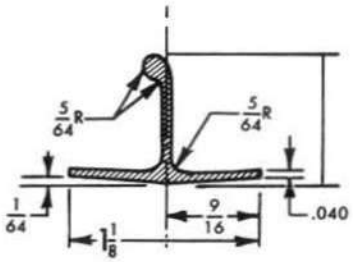
AREA .30 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1047972 ALCOA DIE NUMBER 77-P

AREA .940 SQ. IN. MATERIAL 24ST

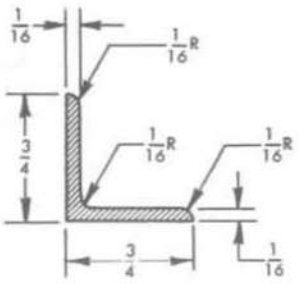


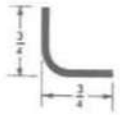
NO ALTERNATE FOR THIS EXTRUSION

S-1049075 ALCOA DIE NUMBER K-16867

AREA .092 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 13 of 38)



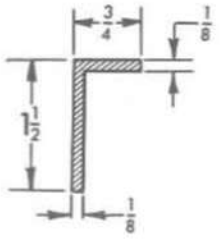


ALTERNATE

Material
AM 35O MA
H.T. to AM35H MH
Gage .072
Min. Radii 9/32
Area .093 Sq. In.

S-1049401 D.C. DIE NUMBER 93

AREA .0917 SQ. IN. MATERIAL MAG.

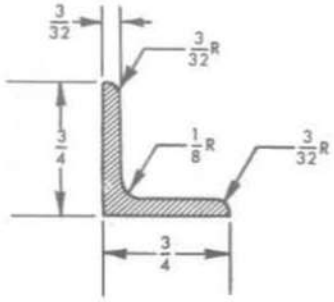


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .3025 Sq. In.

S-1054109 ALCOA DIE NUMBER 5137

AREA .266 SQ. IN. MATERIAL 24ST

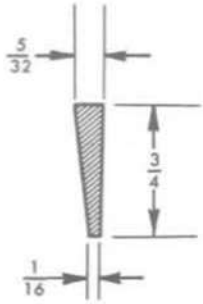


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .132 Sq. In.

S-1049402 D.C. DIE NUMBER 322

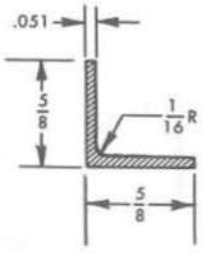
AREA .131 SQ. IN. MATERIAL MAG.



NO ALTERNATE FOR THIS EXTRUSION

S-1054805 ALCOA DIE NUMBER K-22291

AREA .082 SQ. IN. MATERIAL 24ST

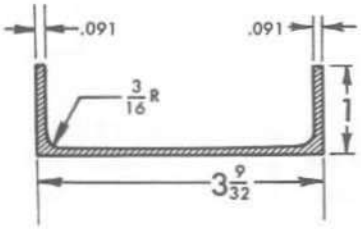


ALTERNATE

Material
AM 35O MA
H.T. to AM35H MH
Gage .064
Min. Radii 1/4
Area .0681 Sq. In.

S-1049790 D.C. DIE NUMBER 173

AREA .062 SQ. IN. MATERIAL MAG.



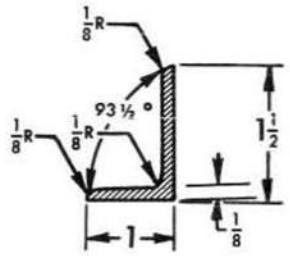
ALTERNATE

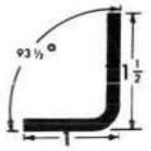
Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .497 Sq. In.

S-1054820 ALCOA DIE NUMBER K-22345

AREA .479 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 14 of 38)



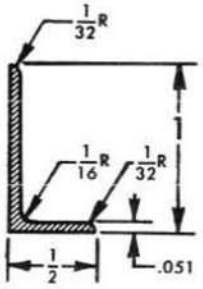


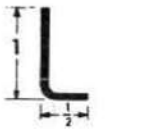
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .3365 Sq. In.

S-1055272 ALCOA DIE NUMBER L-23574

AREA .289 SQ. IN. MATERIAL 24ST



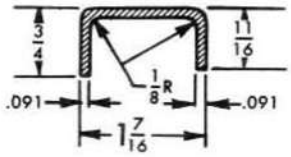


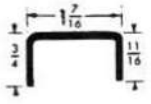
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .0881 Sq. In.

S-1059614 ALCOA DIE NUMBER L-23792

AREA .074 SQ. IN. MATERIAL 24ST



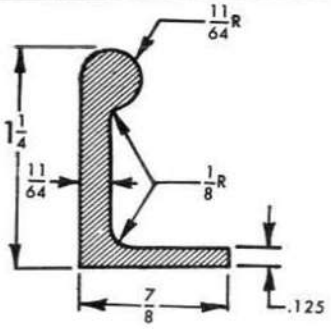


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .2515 Sq. In.

S-1057232 ALCOA DIE NUMBER L-23637

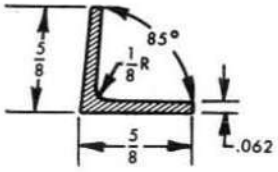
AREA .245 SQ. IN. MATERIAL 24ST

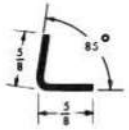


NO ALTERNATE FOR THIS EXTRUSION

S-1059651 ALCOA DIE NUMBER L-24121

AREA .348 SQ. IN. MATERIAL 24S



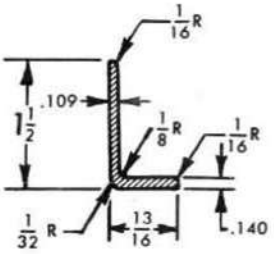


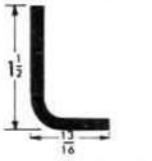
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .0804 Sq. In.

S-1059604 ALCOA DIE NUMBER L-23761

AREA .077 SQ. IN. MATERIAL 24ST





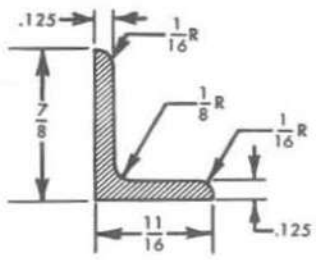
ALTERNATE

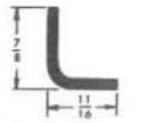
Gage .156
Material 24SO
H.T. to 24ST
Min. Radii 9/32
Area .3105 Sq. In.

S-1059653 ALCOA DIE NUMBER L-24182

AREA .262 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 15 of 38)



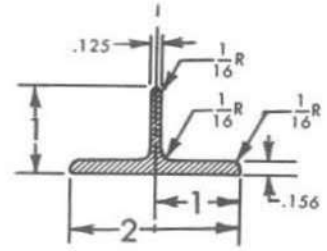


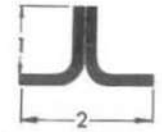
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .193 Sq. In.

S-1059654 ALCOA DIE NUMBER L-24181

AREA .180 SQ. IN. MATERIAL 24S



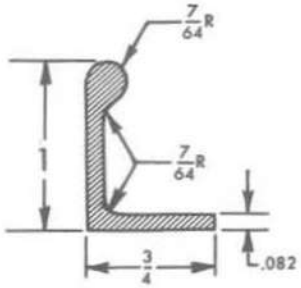


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .523 Sq. In.

S-1059660 ALCOA DIE NUMBER L-24126

AREA .4158 SQ. IN. MATERIAL 24ST



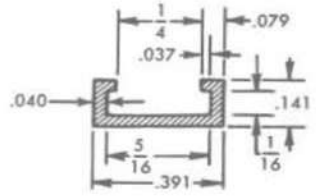
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .091
Min. Radii 5/32
Area .195 Sq. In.

S-1059657 ALCOA DIE NUMBER L-24180

AREA .162 SQ. IN. MATERIAL 24ST

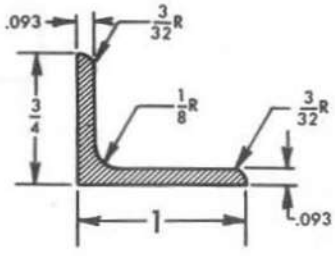
DOUBLE SIZE

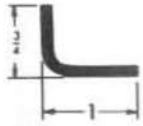


NO ALTERNATE FOR THIS EXTRUSION

S-1059682 ALCOA DIE NUMBER

AREA .027 SQ. IN. MATERIAL 53ST



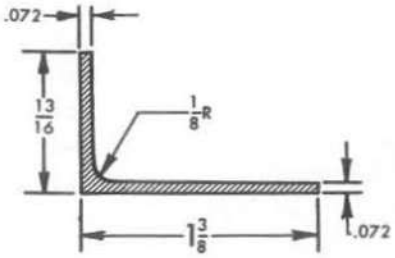


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .1567 Sq. In.

S-1059659 ALCOA DIE NUMBER L-24183

AREA .154 SQ. IN. MATERIAL 24ST



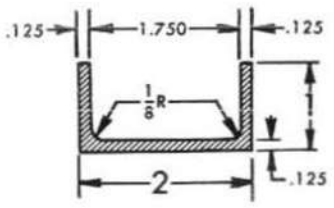
ALTERNATE

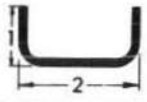
Material 24SO
H.T. to 24ST
Gage .081
Min. Radii 1/8
Area .1642 Sq. In.

S-1067527 ALCOA DIE NUMBER L-24316

AREA .156 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 16 of 38)



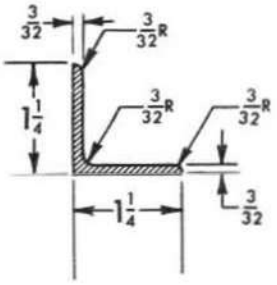


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .523 Sq. In.

S-1070278 ALCOA DIE NUMBER L-24044

AREA .475 SQ. IN. MATERIAL 24ST

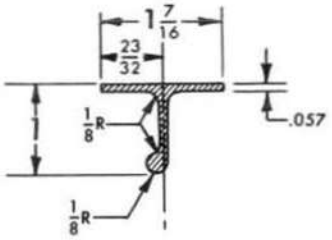


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .2334 Sq. In.

S-1073342 ALCOA DIE NUMBER 78-Y

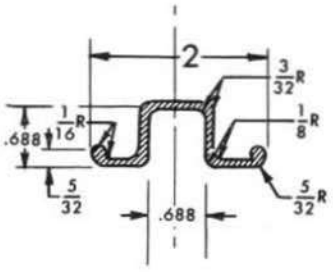
AREA .230 SQ. IN. MATERIAL 24ST

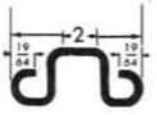


NO ALTERNATE FOR THIS EXTRUSION

S-1072124 ALCOA DIE NUMBER L-24327

AREA .184 SQ. IN. MATERIAL 24ST



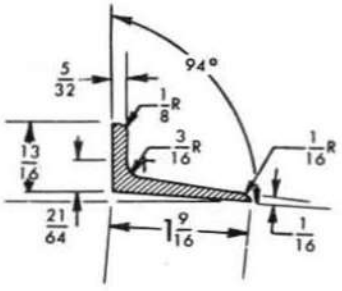


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .2785 Sq. In.

S-1073343 ALCOA DIE NUMBER L-24990

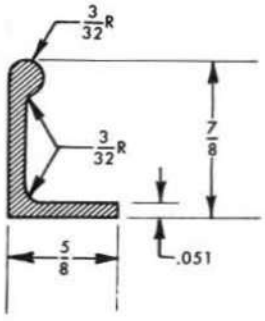
AREA .238 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1072629 ALCO DIE NUMBER L-24375

AREA .343 SQ. IN. MATERIAL 24ST



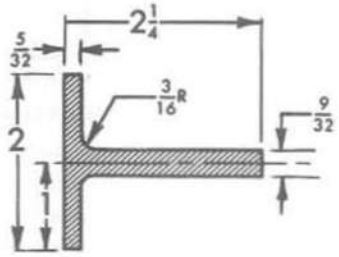
ALTERNATE

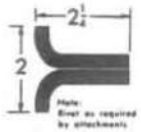
Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .1164 Sq. In.

S-1075769 ALCOA DIE NUMBER K-16692

AREA .097 SQ. IN. MATERIAL 24S

Figure 243—Extrusion Chart (Sheet 17 of 38)



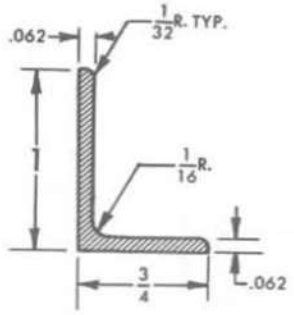


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area 1.07 Sq. In.

S-1076074 ALCOA DIE NUMBER 726

AREA .916 SQ. IN. MATERIAL 24ST

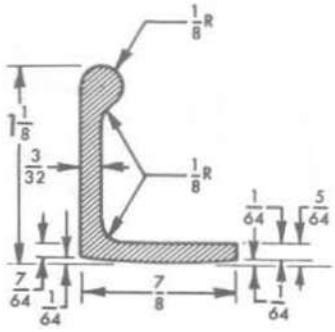


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .1154 Sq. In.

S-1081111 ALCOA DIE NUMBER K-22385

AREA .1047 SQ. IN. MATERIAL 24S

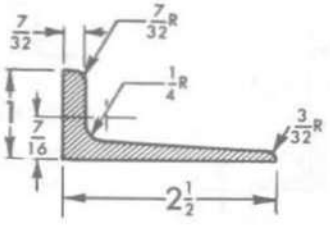


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .2825 Sq. In.

S-1076089 ALCOA DIE NUMBER K-22001

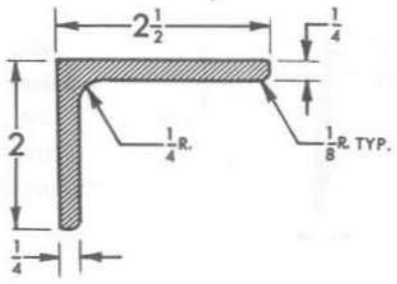
AREA .206 SQ. IN. MATERIAL 24ST



*NO ALTERNATE FOR THIS EXTRUSION

S-1081131 ALCOA DIE NUMBER K-22434

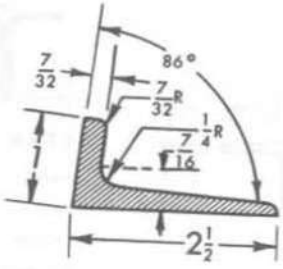
AREA .548 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1076879 ALCOA DIE NUMBER 734-3

AREA 1.07 SQ. IN. MATERIAL 24ST

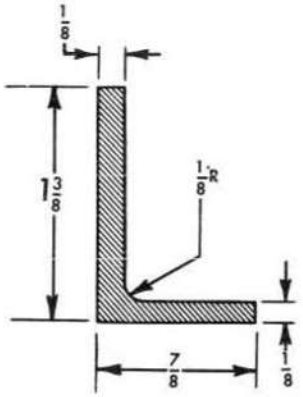


NO ALTERNATE FOR THIS EXTRUSION

S-1081470 ALCOA DIE NUMBER K-22438

AREA .548 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 18 of 38)

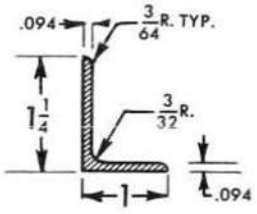


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .3005 Sq. In.

S-1093703 ALCOA DIE NUMBER 22882

AREA .269 SQ. IN. MATERIAL 24ST

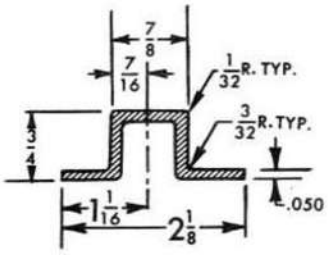


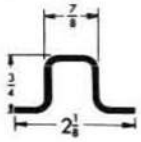
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .2075 Sq. In.

S-1093708 ALCOA DIE NUMBER 22993

AREA .203 SQ. IN. MATERIAL 24ST



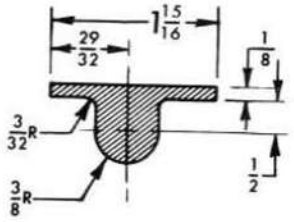


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .229 Sq. In.

S-1093706 ALCOA DIE NUMBER 27888

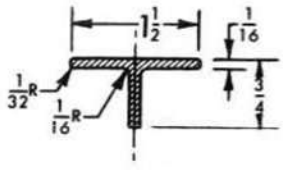
AREA .220 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093718 ALCOA DIE NUMBER K-13269

AREA .764 SQ. IN. MATERIAL 24ST

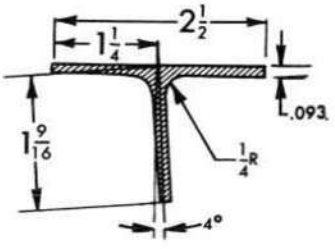


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .176 Sq. In.

S-1093707 ALCOA DIE NUMBER 22897

AREA .138 SQ. IN. MATERIAL 24S

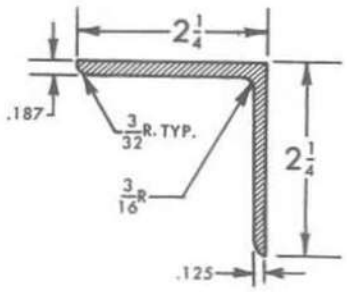


NO ALTERNATE FOR THIS EXTRUSION

S-1093720 ALCOA DIE NUMBER 30897

AREA .396 SQ. IN. MATERIAL 24S

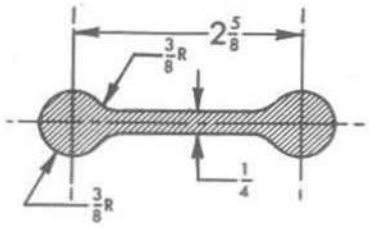
Figure 243—Extrusion Chart (Sheet 19 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1093726 ALCOA DIE NUMBER 29122

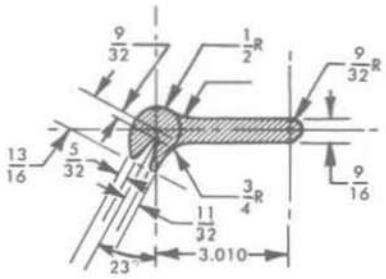
AREA .67 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093756 ALCOA DIE NUMBER 29496

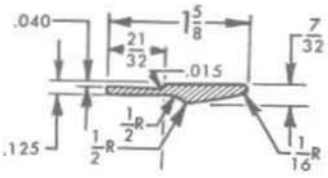
AREA 1.135 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093754 ALCOA DIE NUMBER 30238

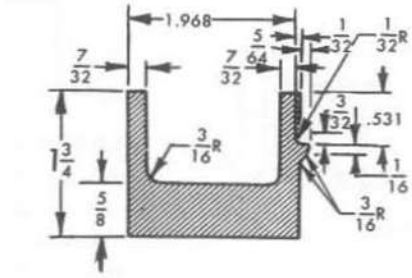
AREA 2.387 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093759 ALCOA DIE NUMBER 30253

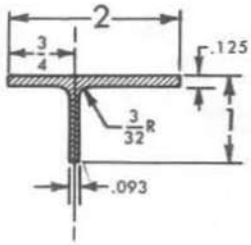
AREA .238 SQ. IN. MATERIAL 24ST

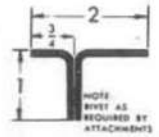


NO ALTERNATE FOR THIS EXTRUSION

S-1093755 ALCOA DIE NUMBER 30239

AREA 1.759 SQ. IN. MATERIAL 24ST





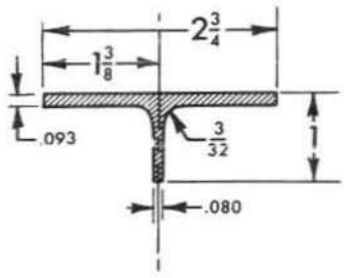
ALTERNATE

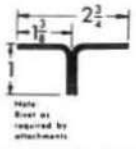
Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .436 Sq. In.

S-1093760 ALCOA DIE NUMBER 30281

AREA .335 SQ. IN. MATERIAL 24SO

Figure 243—Extrusion Chart (Sheet 20 of 38)



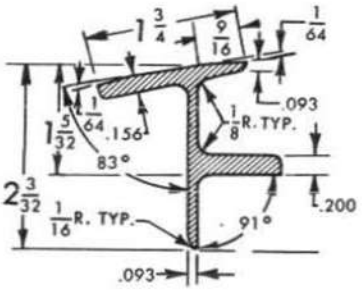


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .441 Sq. In.

S-1093761 ALCOA DIE NUMBER 30282

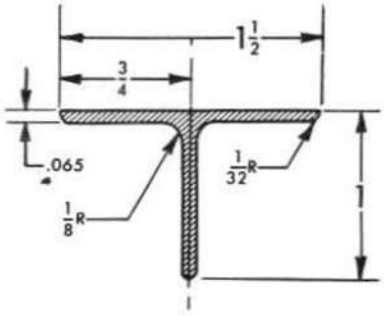
AREA .332 SQ. IN. MATERIAL 24SO

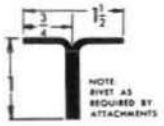


NO ALTERNATE FOR THIS EXTRUSION

S-1093764 ALCOA DIE NUMBER 30114

AREA .628 SQ. IN. MATERIAL 24ST



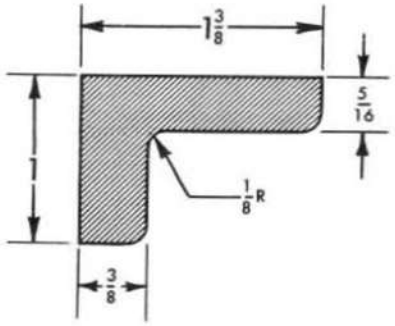


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .230 Sq. In.

S-1093762 ALCOA DIE NUMBER K-22008

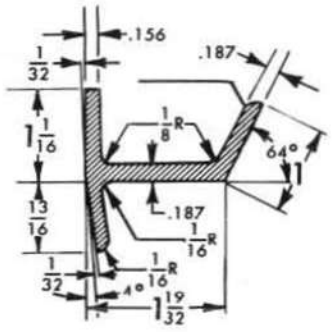
AREA .165 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-1093766 ALCOA DIE NUMBER 30106

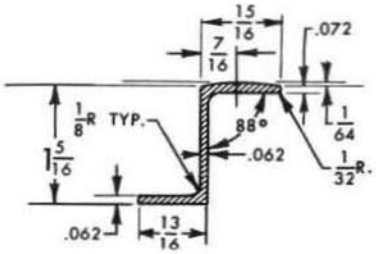
AREA .684 SQ. IN. MATERIAL 24ST

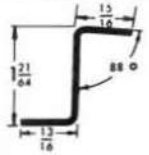


NO ALTERNATE FOR THIS EXTRUSION

S-1093763 ALCOA DIE NUMBER 30105

AREA .725 SQ. IN. MATERIAL 24ST





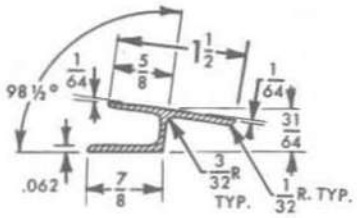
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .091
Min. Radii 5/32
Area .246 Sq. In.

S-1093767 ALCOA DIE NUMBER 30092

AREA .206 SQ. IN. MATERIAL 24ST

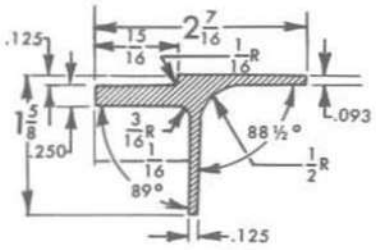
Figure 243—Extrusion Chart (Sheet 21 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1093768 ALCOA DIE NUMBER 30093

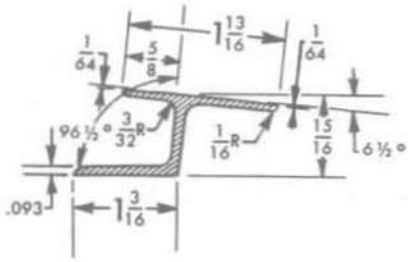
AREA .176 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093774 ALCOA DIE NUMBER 30254

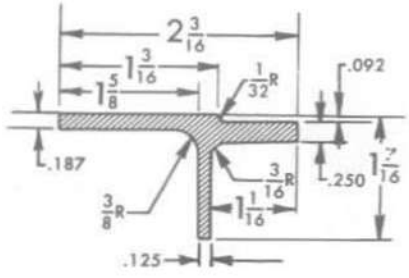
AREA .673 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093769 ALCOA DIE NUMBER 30094

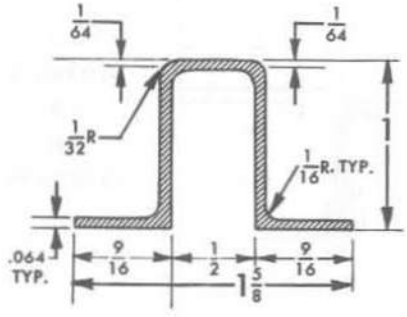
AREA .353 SQ. IN. MATERIAL 24ST

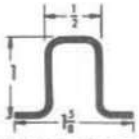


NO ALTERNATE FOR THIS EXTRUSION

S-1093775 ALCOA DIE NUMBER 30266

AREA .793 SQ. IN. MATERIAL 24SO



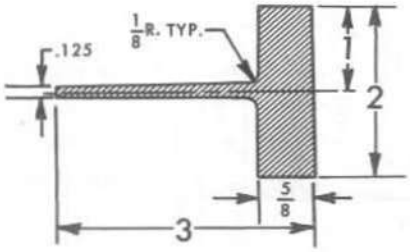


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .229 Sq. In.

S-1093771 ALCOA DIE NUMBER 30115

AREA .227 SQ. IN. MATERIAL 24ST

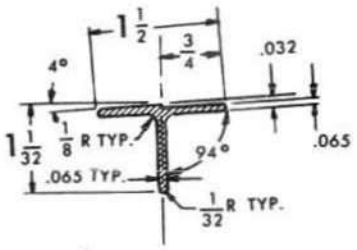


NO ALTERNATE FOR THIS EXTRUSION

S-1093776 ALCOA DIE NUMBER 30283

AREA 1.55 SQ. IN. MATERIAL 24SO

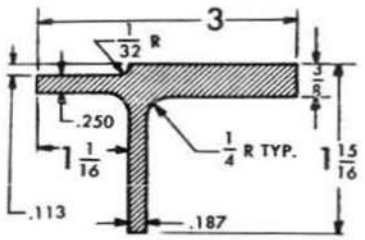
Figure 243—Extrusion Chart (Sheet 22 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1093781 ALCOA DIE NUMBER 30088

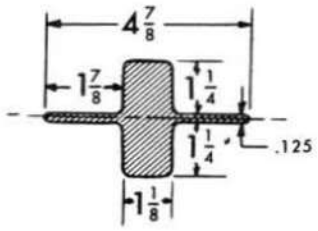
AREA .165 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-1093788 ALCOA DIE NUMBER 30247

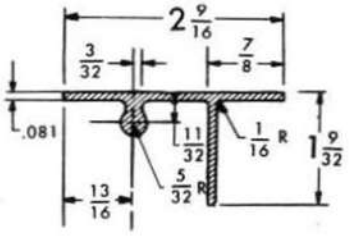
AREA 1.311 SQ. IN. MATERIAL 24SO



NO ALTERNATE THIS THIS EXTRUSION

S-1093782 ALCOA DIE NUMBER 30240

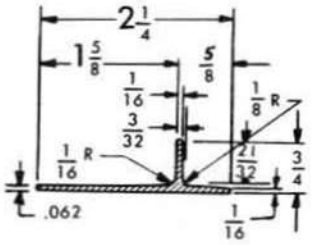
AREA 3.295 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-1093790 ALCOA DIE NUMBER 30248

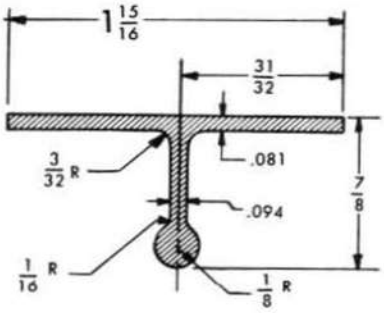
AREA .406 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1093785 ALCOA DIE NUMBER 30095

AREA .2348 SQ. IN. MATERIAL 24ST

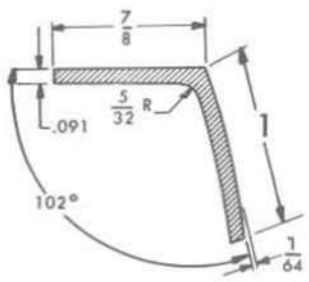


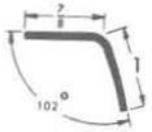
NO ALTERNATE FOR THIS EXTRUSION

S-1093791 ALCOA DIE NUMBER 30267

AREA .261 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 23 of 38)



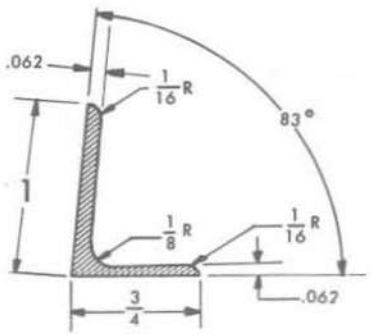


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .1755 Sq. In.

S-1093794 ALCOA DIE NUMBER 30107

AREA .169 SQ. IN. MATERIAL 24ST

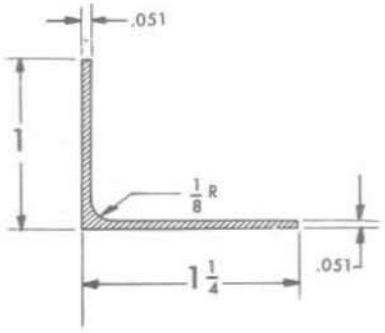


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .113 Sq. In.

S-1104751 ALCOA DIE NUMBER L-28557

AREA .107 SQ. IN. MATERIAL 24ST

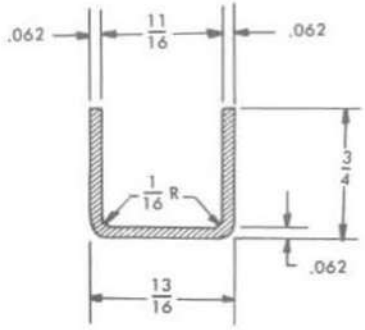


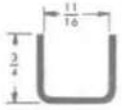
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .136 Sq. In.

S-1103518 ALCOA DIE NUMBER L-24920

AREA .116 SQ. IN. MATERIAL 24ST



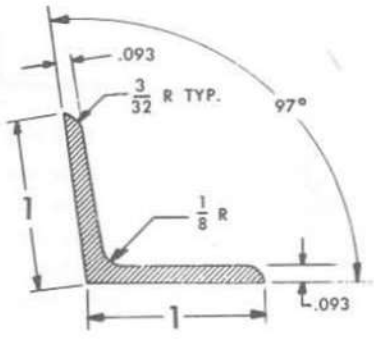


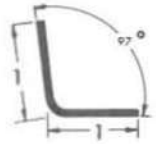
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .132 Sq. In.

S-1105429 ALCOA DIE NUMBER L-28631

AREA .123 SQ. IN. MATERIAL 24ST



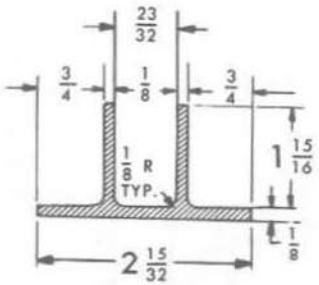


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .186 Sq. In.

S-1104495 ALCOA DIE NUMBER L-28554

AREA .177 SQ. IN. MATERIAL 24ST



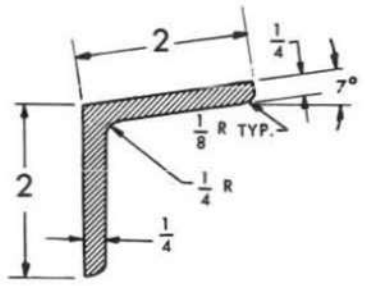
NO
ALTERNATE
FOR
THIS
EXTRUSION

S-1105658 ALCOA DIE NUMBER L-28623

AREA .619 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 24 of 38)

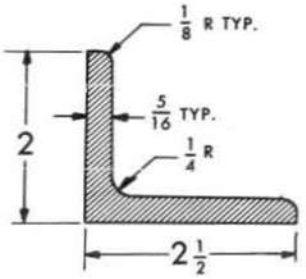
AN 01-40AJ-3



NO ALTERNATE FOR THIS EXTRUSION

S-1105662 ALCOA DIE NUMBER L-28567

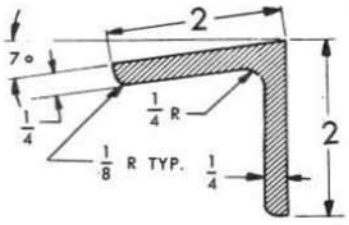
AREA .948 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1106624 ALCOA DIE NUMBER 734-B

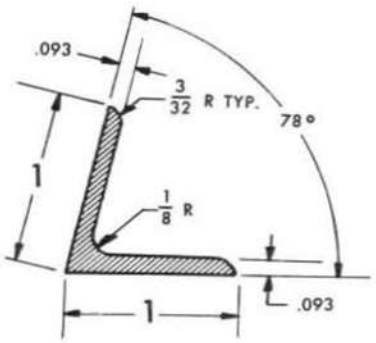
AREA 1.32 SQ. IN. MATERIAL 24SO



NO ALTERNATE THIS THIS EXTRUSION

S-1105663 ALCOA DIE NUMBER L-28568

AREA .940 SQ. IN. MATERIAL 24ST

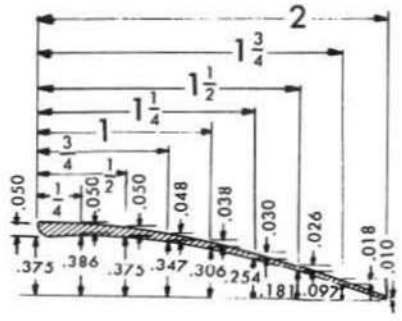


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .205 Sq. In.

S-1109270 ALCOA DIE NUMBER L-28739

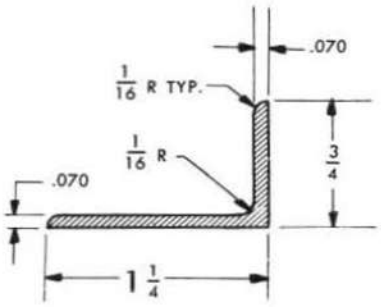
AREA .177 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1105759 ALCOA DIE NUMBER D-20720

MATERIAL 53ST



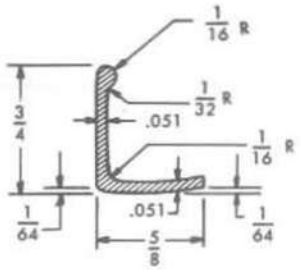
ALTERNATE

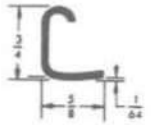
Material 24SO
H.T. to 24ST
Gage .081
Min. Radii 1/8
Area .149 Sq. In.

S-1109685 ALCOA DIE NUMBER K-13689

AREA .134 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 25 of 38)



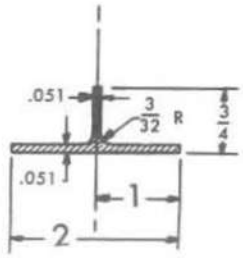


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .0946 Sq. In.

S-1110787 ALCOA DIE NUMBER L-28829

AREA .075 SQ. IN. MATERIAL 24ST

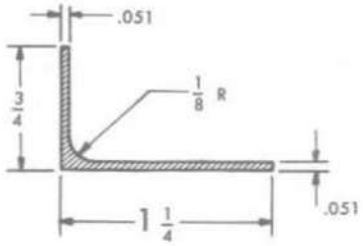


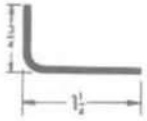
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .051
Min. Radii 1/16
Area .169 Sq. In.

S-1114110 ALCOA DIE NUMBER 30674

AREA .141 SQ. IN. MATERIAL 24ST



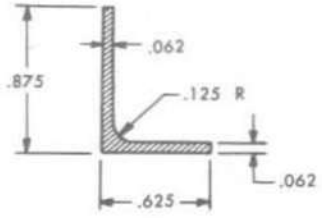


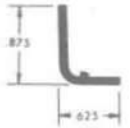
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .121 Sq. In.

S-1111225 ALCOA DIE NUMBER L-28827

AREA .099 SQ. IN. MATERIAL 24ST



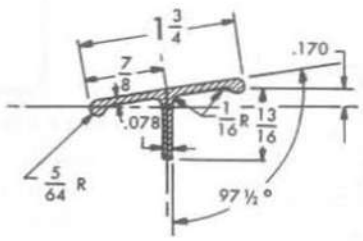


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .0974 Sq. In.

S-1114111 ALCOA DIE NUMBER 22891

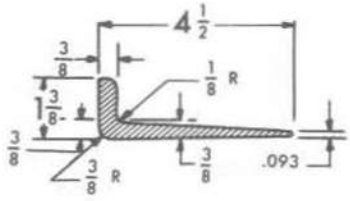
AREA .089 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1111710 ALCOA DIE NUMBER L-28877

AREA .213 SQ. IN. MATERIAL 24ST



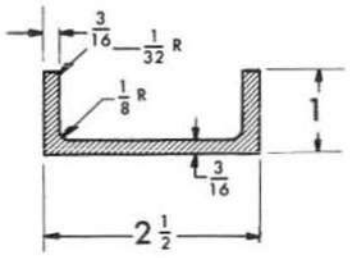
NO ALTERNATE FOR THIS EXTRUSION

S-1114163 ALCOA DIE NUMBER 30924

AREA 1.445 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 26 of 38)

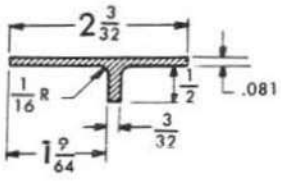
AN 01-40AJ-3



NO ALTERNATE FOR THIS EXTRUSION

S-1125503 ALCOA DIE NUMBER L-28620

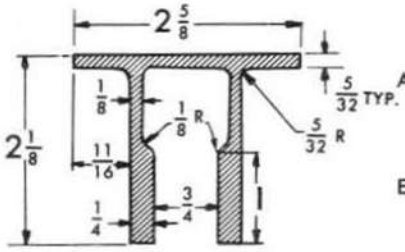
AREA .780 SQ. IN. MATERIAL 24S



NO ALTERNATE FOR THIS EXTRUSION

S-1125508 ALCOA DIE NUMBER 30268

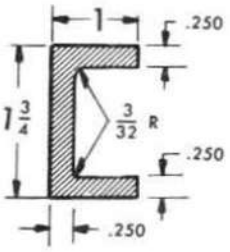
AREA .211 SQ. IN. MATERIAL 24ST



NO ALTERNATE THIS THIS EXTRUSION

S-1125505 ALCOA DIE NUMBER 30329

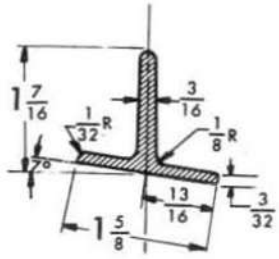
AREA 1.126 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125511 ALCOA DIE NUMBER 30098

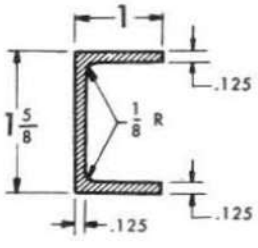
AREA .8144 SQ. IN.

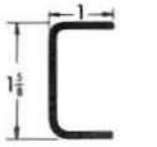


NO ALTERNATE FOR THIS EXTRUSION

S-1125506 ALCOA DIE NUMBER 30326

AREA .407 SQ. IN. MATERIAL 24S





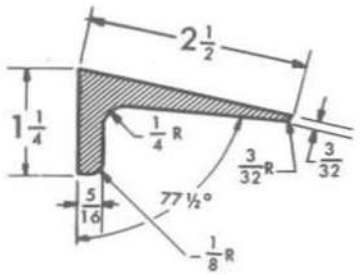
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .465 Sq. In.

S-1125512 ALCOA DIE NUMBER 30099

AREA .425 SQ. IN. MATERIAL 24ST

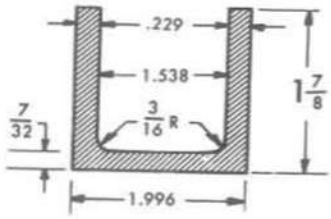
Figure 243—Extrusion Chart (Sheet 27 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1125513 ALCOA DIE NUMBER 30124

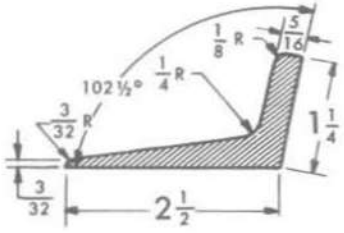
AREA .869 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125516 ALCOA DIE NUMBER 30242

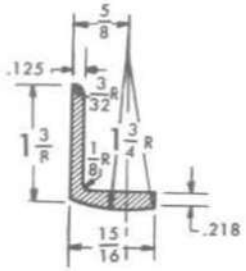
AREA 1.21 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125514 ALCOA DIE NUMBER 30123

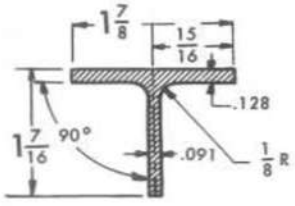
AREA .863 SQ. IN. MATERIAL 24ST

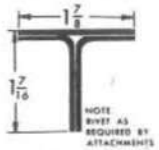


NO ALTERNATE FOR THIS EXTRUSION

S-1125517 ALCOA DIE NUMBER 30100

AREA .359 SQ. IN. MATERIAL 24SO



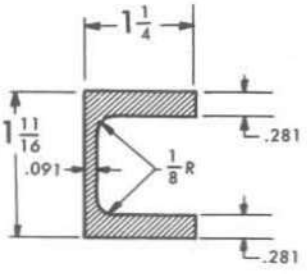


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .081
Gage .051
Min. Radii 1/16
Area .3763 Sq. In.

S-1125515 ALCOA DIE NUMBER 30284

AREA .366 SQ. IN. MATERIAL 24SO



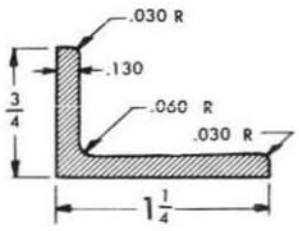
NO ALTERNATE FOR THIS EXTRUSION

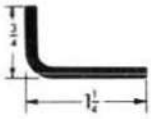
S-1125518 ALCOA DIE NUMBER 30101

AREA .809 SQ. IN. MATERIAL 24ST

Figure 243 —Extrusion Chart (Sheet 28 of 38)

AN 01-40AJ-3



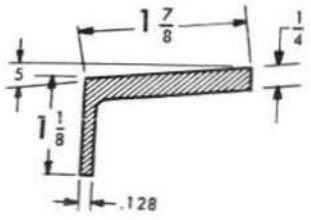


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .2615 Sq. In.

S-1125520 ALCOA DIE NUMBER 29017

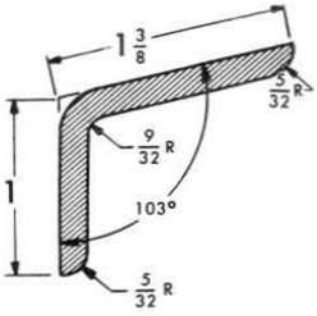
AREA .244 SQ. IN. MATERIAL 24ST

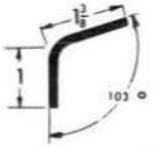


NO ALTERNATE FOR THIS EXTRUSION

S-1125525 ALCOA DIE NUMBER 30249

AREA .587 SQ. IN. MATERIAL 24ST



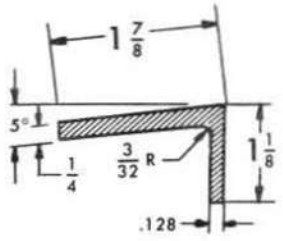


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .3355 Sq. In.

S-1125521 ALCOA DIE NUMBER 30313

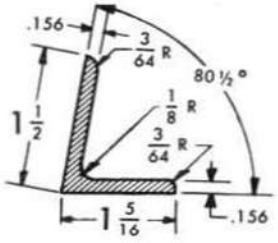
AREA .328 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125526 ALCOA DIE NUMBER 30250

AREA .578 SQ. IN. MATERIAL 24ST

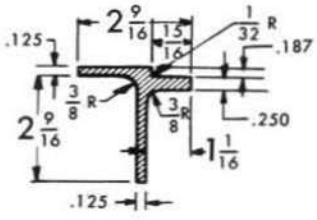


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .431 Sq. In.

S-1125524 ALCOA DIE NUMBER 30255

AREA .413 SQ. IN. MATERIAL 24ST

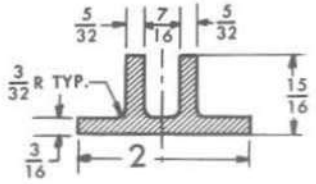


NO ALTERNATE FOR THIS EXTRUSION

S-1125527 ALCOA DIE NUMBER 30730

AREA .841 SQ. IN. MATERIAL 24ST

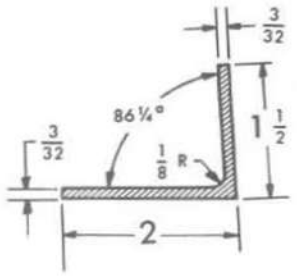
Figure 243—Extrusion Chart (Sheet 29 of 38)

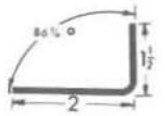


NO ALTERNATE FOR THIS EXTRUSION

S-1125528 ALCOA DIE NUMBER 30241

AREA .617 SQ. IN. MATERIAL 24ST



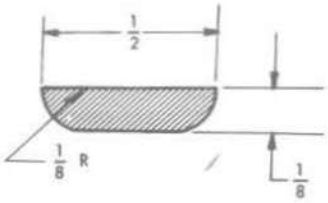


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .332 Sq. In.

S-1125533 ALCOA DIE NUMBER K-22559

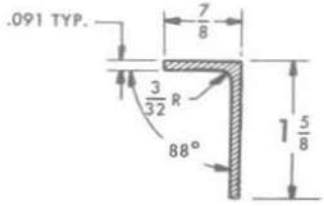
AREA .323 SQ. IN. MATERIAL 24ST

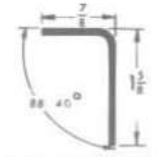


NO ALTERNATE FOR THIS EXTRUSION

S-1125529 ALCOA DIE NUMBER 30319

AREA .056 SQ. IN. MATERIAL 24ST



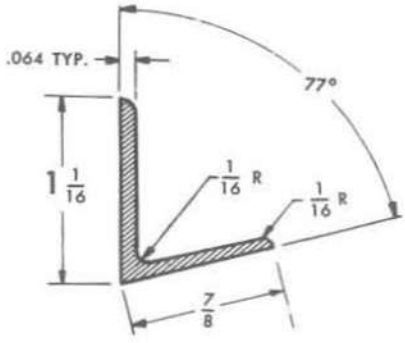


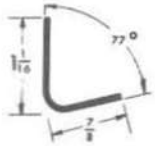
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .125
Min. Radii 7/32
Area .278 Sq. In.

S-1125534 ALCOA DIE NUMBER 30236

AREA .244 SQ. IN. MATERIAL 24SO



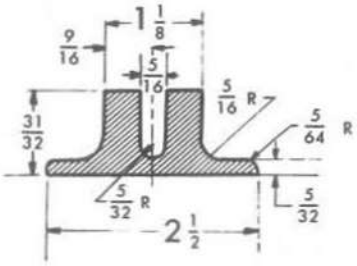


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .072
Min. Radii 1/8
Area .124 Sq. In.

S-1125531 ALCOA DIE NUMBER 30317

AREA .119 SQ. IN. MATERIAL 24ST

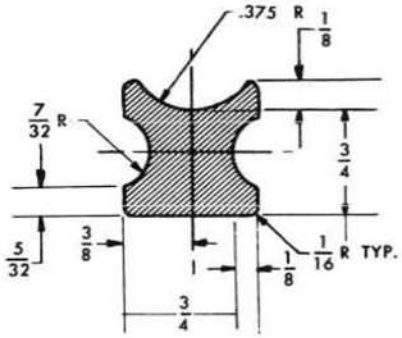


NO ALTERNATE FOR THIS EXTRUSION

S-1125537 ALCOA DIE NUMBER 30323

AREA 1.098 SQ. IN. MATERIAL 24ST

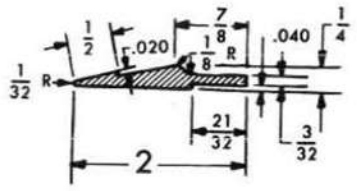
Figure 243—Extrusion Chart (Sheet 30 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1125542 ALCOA DIE NUMBER 30299

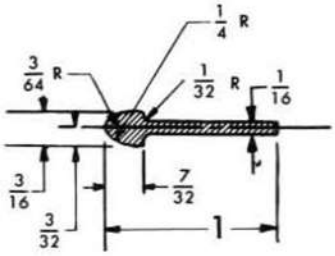
AREA .440 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125567 ALCOA DIE NUMBER 30232

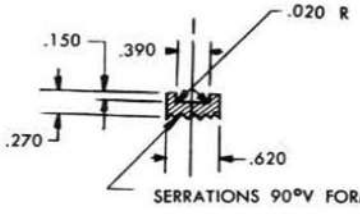
AREA .2281 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125549 ALCOA DIE NUMBER 30243

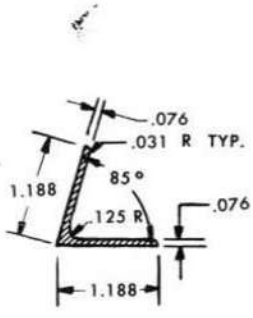
AREA .081 SQ. IN. MATERIAL 24ST

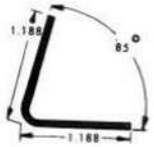


NO ALTERNATE FOR THIS EXTRUSION

S-1125570 ALCOA DIE NUMBER L-29021

AREA .115 SQ. IN. MATERIAL 24ST



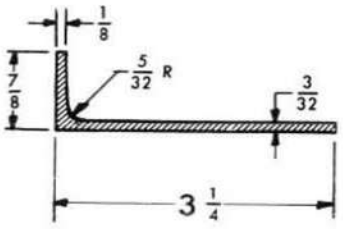


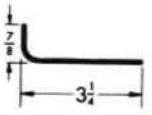
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .091
Min. Radii 5/32
Area .197 Sq. In.

S-1125566 ALCOA DIE NUMBER K-15201

AREA .178 SQ. IN. MATERIAL 24ST





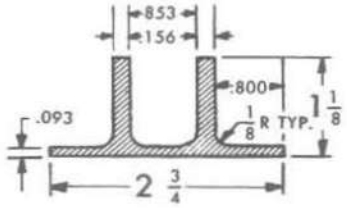
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .594 Sq. In.

S-1125575 ALCOA DIE NUMBER 30315

AREA .407 SQ. IN. MATERIAL 24SO

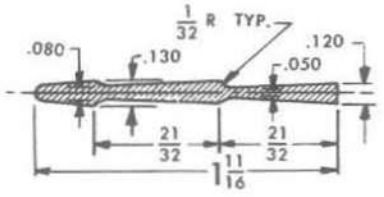
Figure 243—Extrusion Chart (Sheet 31 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1125580 ALCOA DIE NUMBER 30316

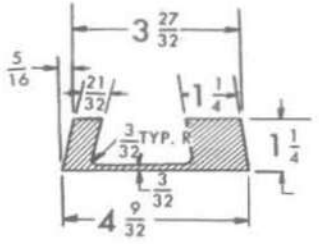
AREA .591 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125585 ALCOA DIE NUMBER 30227

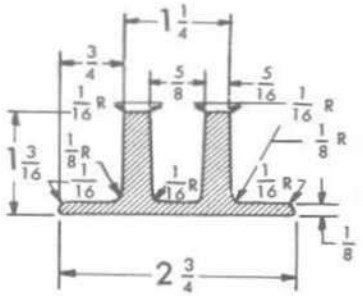
AREA .165 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125581 ALCOA DIE NUMBER 30229

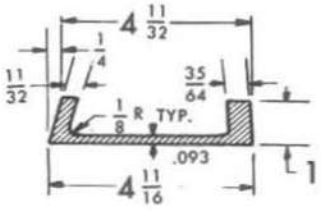
AREA 2.664 SQ. IN. MATERIAL 24ST



NO ALTERNATE THIS THIS EXTRUSION

S-1125586 ALCOA DIE NUMBER 30322

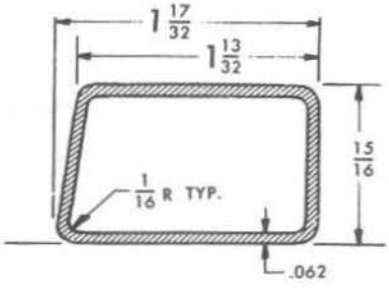
AREA 1.011 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125582 ALCOA DIE NUMBER 30228

AREA 1.257 SQ. IN. MATERIAL 24ST



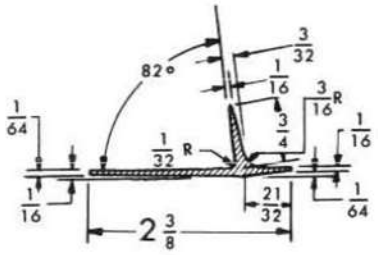
NO ALTERNATE FOR THIS EXTRUSION

S-1125595 ALCOA DIE NUMBER T-855

AREA .276 SQ. IN. MATERIAL 24SO

Figure 243—Extrusion Chart (Sheet 32 of 38)

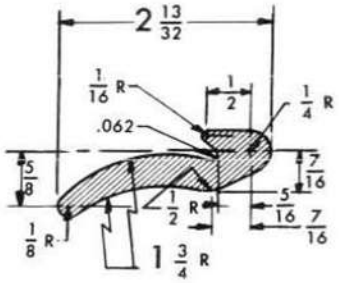
AN 01-40AJ-3



NO ALTERNATE FOR THIS EXTRUSION

S-1125596 ALCOA DIE NUMBER 30500

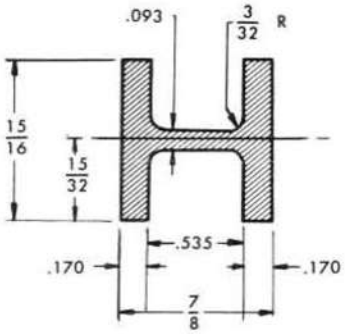
AREA .241 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152320 ALCOA DIE NUMBER 30682

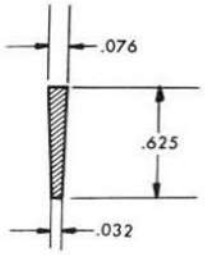
AREA .970 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1125599 ALCOA DIE NUMBER 30501

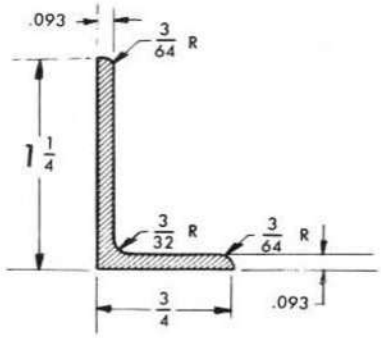
AREA .376 SQ. IN. MATERIAL 24ST

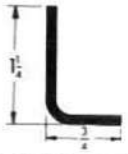


NO ALTERNATE FOR THIS EXTRUSION

S-1152325 ALCOA DIE NUMBER K-15060

AREA .034 SQ. IN. MATERIAL 24ST



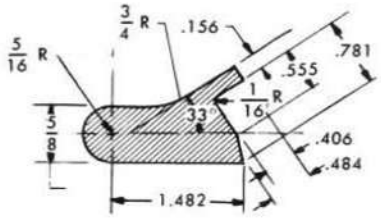


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .102
Min. Radii 3/16
Area .182 Sq. In.

S-1130803 ALCOA DIE NUMBER 734FF

AREA .180 SQ. IN. MATERIAL 24ST

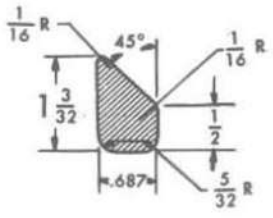


NO ALTERNATE FOR THIS EXTRUSION

S-1152356 ALCOA DIE NUMBER 30698

AREA 1.139 SQ. IN. MATERIAL 24ST

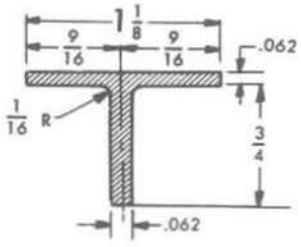
Figure 243—Extrusion Chart (Sheet 33 of 38)

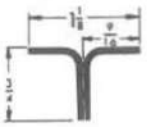


NO ALTERNATE FOR THIS EXTRUSION

S-1152358 ALCOA DIE NUMBER 30699

AREA .551 SQ. IN. MATERIAL 24ST



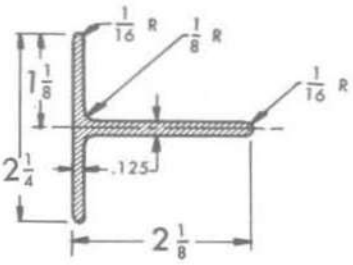


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Min. Radii 3/32
Area .152 Sq. In.

S-1152382 ALCOA DIE NUMBER K-16439

AREA .114 SQ. IN. MATERIAL 24SO

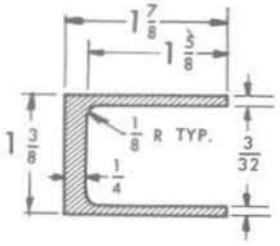


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .064
Gage .072
Min. Radii 1/8
Area .581 Sq. In.

S-1152368 ALCOA DIE NUMBER 30727

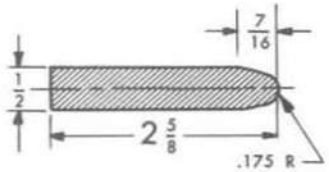
AREA .533 SQ. IN. MATERIAL 24SO



NO ALTERNATE FOR THIS EXTRUSION

S-1152383 ALCOA DIE NUMBER L-23981

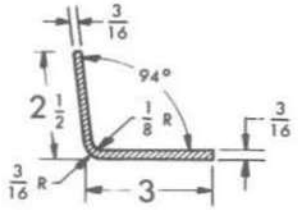
AREA .655 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152380 ALCOA DIE NUMBER 30700

AREA 1.255 SQ. IN. MATERIAL 24ST



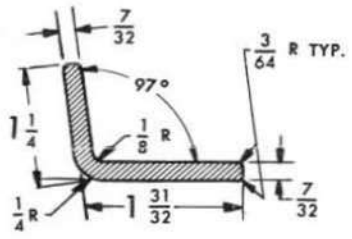
NO ALTERNATE FOR THIS EXTRUSION

S-1152392 ALCOA DIE NUMBER 30750

AREA .994 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 34 of 38)

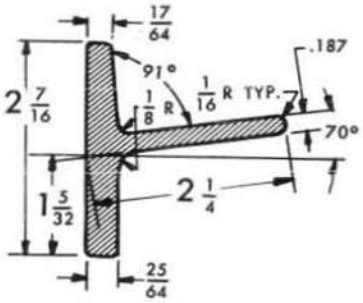
AN 01-40AJ-3



NO ALTERNATE FOR THIS EXTRUSION

S-1152393 ALCOA DIE NUMBER 30751

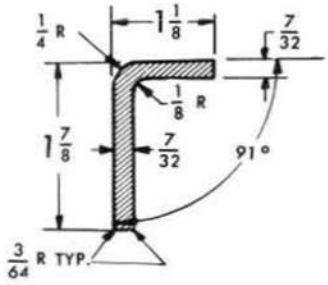
AREA .650 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152396 ALCOA DIE NUMBER 30753

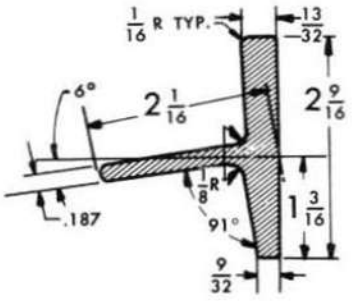
AREA 1.190 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152394 ALCOA DIE NUMBER 30752

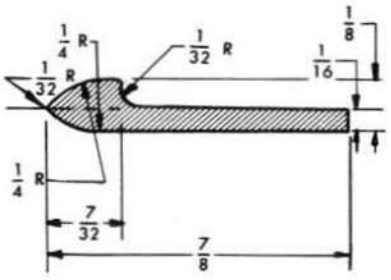
AREA .612 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152397 ALCOA DIE NUMBER 30754

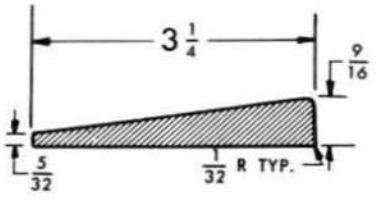
AREA 1.299 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1152395 ALCOA DIE NUMBER 30728

AREA .063 SQ. IN. MATERIAL 24ST

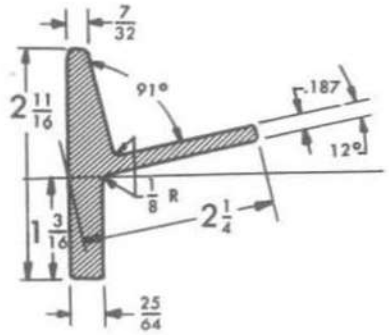


NO ALTERNATE FOR THIS EXTRUSION

S-1152398 ALCOA DIE NUMBER 30755

AREA 1.167 SQ. IN. MATERIAL 24ST

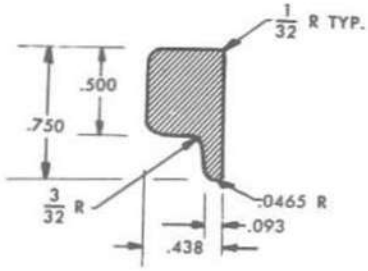
Figure 243—Extrusion Chart (Sheet 35 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1152399 ALCOA DIE NUMBER 30756

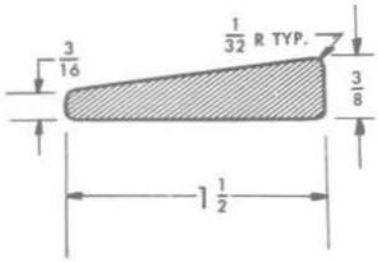
AREA 1.332 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1159947 ALCOA DIE NUMBER 30867

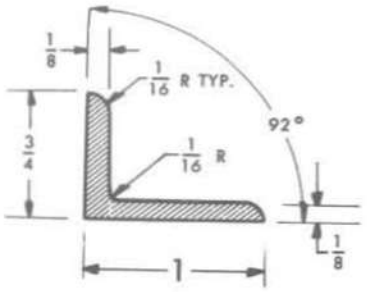
AREA .243 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1159900 ALCOA DIE NUMBER 30757

AREA .421 SQ. IN. MATERIAL 24ST

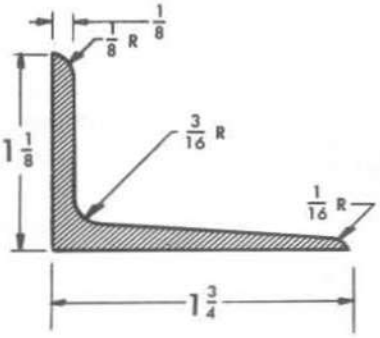


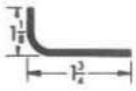
ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .225 Sq. In.

S-1159953 ALCOA DIE NUMBER L-24769

AREA .202 SQ. IN. MATERIAL 24ST



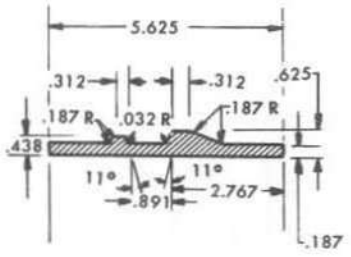


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .188
Min. Radii 3/8
Area .464 Sq. In.

S-1159905 ALCOA DIE NUMBER 30758

AREA .327 SQ. IN. MATERIAL 24ST

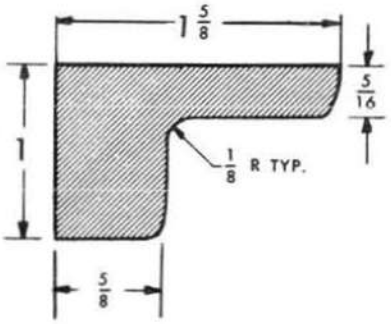


NO ALTERNATE THIS THIS EXTRUSION

S-1159955 ALCOA DIE NUMBER 31022

AREA 1.556 SQ. IN. MATERIAL 24ST

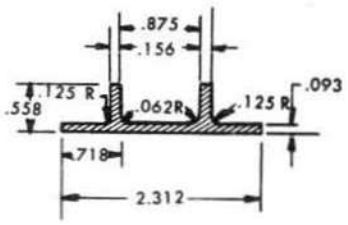
Figure 243—Extrusion Chart (Sheet 36 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-1159956 ALCOA DIE NUMBER 30898

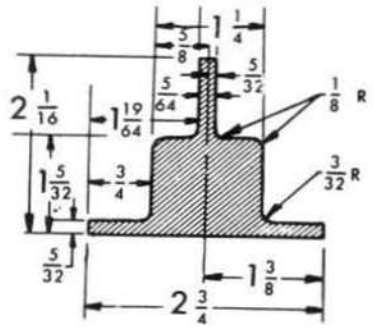
AREA .934 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1159968 ALCOA DIE NUMBER 30954

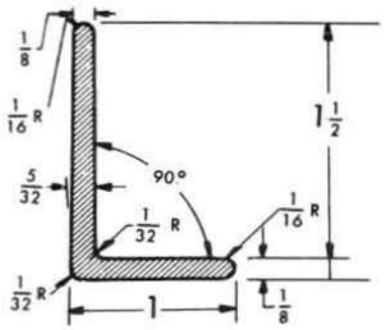
AREA .369 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1159957 ALCOA DIE NUMBER 30939

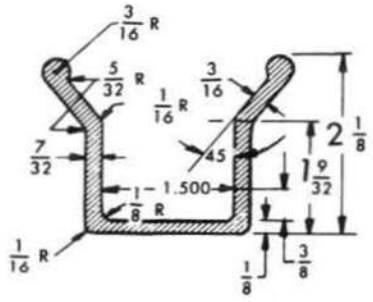
AREA 1.825 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1179724 ALCOA DIE NUMBER K-985

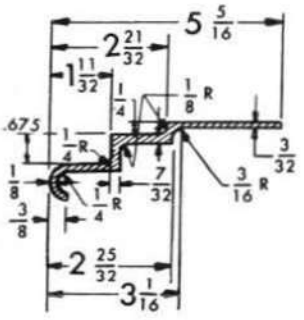
AREA .296 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-1159959 ALCOA DIE NUMBER 30942

AREA 1.233 SQ. IN. MATERIAL 24S

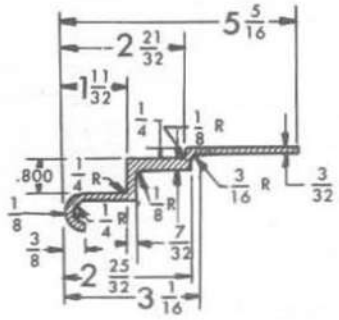


NO ALTERNATE FOR THIS EXTRUSION

S-2062618 ALCOA DIE NUMBER 30116

AREA 1.008 SQ. IN. MATERIAL 24ST

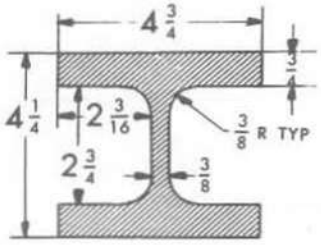
Figure 243—Extrusion Chart (Sheet 37 of 38)



NO ALTERNATE FOR THIS EXTRUSION

S-2062619 ALCOA DIE NUMBER 30117

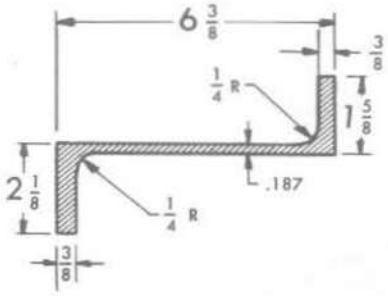
AREA 1.035 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-2062623 ALCOA DIE NUMBER 28075

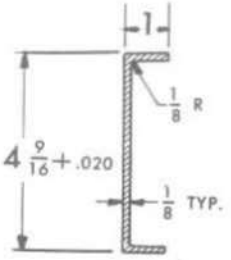
AREA 8.276 SQ. IN. MATERIAL 24ST

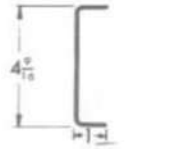


NO ALTERNATE FOR THIS EXTRUSION

S-2062621 ALCOA DIE NUMBER 30321

AREA 2.485 SQ. IN. MATERIAL 24ST



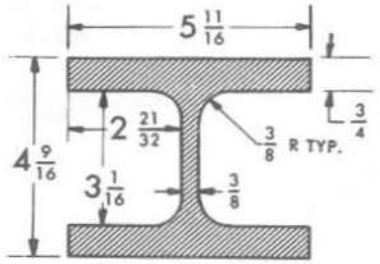


ALTERNATE

Material 24SO
H.T. to 24ST
Gage .156
Min. Radii 9/32
Area .923 Sq. In.

S-2062627 ALCOA DIE NUMBER 30301

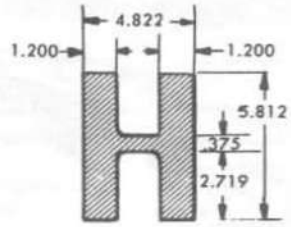
AREA .796 SQ. IN. MATERIAL 24ST



NO ALTERNATE FOR THIS EXTRUSION

S-2062622 ALCOA DIE NUMBER 28074

AREA 9.80 SQ. IN. MATERIAL 24ST



NO ALTERNATE THIS THIS EXTRUSION

S-2062665 ALCOA DIE NUMBER 34751

AREA 15.338 SQ. IN. MATERIAL 24ST

Figure 243—Extrusion Chart (Sheet 38 of 38)

APPENDIX I

GLOSSARY OF UNITED STATES — BRITISH AVIATION TERMS

United States	*British*
air controls.	flying controls.
aircraft (used as singular and as collective plural).	aircraft (used only as collective plural).
air filter.	air cleaner.
airfoil.	aerofoil.
airplane.	aeroplane.
alighting gear (used only as collective plural).	alighting gear (used as singular and as collective plural).
antenna.	aerial.
armor.	armour.
axis, lateral; wing axis; "Y" axis.	lateral axis; pitching axis.
axis, longitudinal; fuselage axis; "X" axis.	longitudinal axis; pitching axis.
axis, vertical; "Z" axis.	vertical axis; normal axis; yawing axis.
battery.	battery; accumulator.
cable controls. *See* controls, air-cable.	
carburetor.	carburettor.
center of inboard panel. *See* section, center.	
center wing panel. *See* section, center.	
center section panel. *See* section, center.	
chassis; structure.	chassis.
chord.	chord line.
clevis.	clevis; fork joint; knuckle joint; knuckle joint end.
conduit; electrical tubing.	conduit.
controls; air; cable controls; flight controls.	flying controls.
cooler, oil; oil radiator, cylinder, hydraulic. *See* hydraulic cylinder.	oil cooler.
drag; drag force; drag component.	drag; longitudinal force; head resistance.
electrical tubing. *See* conduit.	
elevator; flipper.	elevator.
empennage; airplane tail assembly; tail surfaces; tail group.	empennage; tail unit.
empty weight.	tare weight.
engine; power plant.	aero-engine.
engine section.	power plant; power egg.
exit.	egress.
fender; mudguard.	mud-wing.
firewall.	fire-proof bulkhead.
fixed tail surface. *See* stabilizer, horizontal.	
flight controls. *See* controls, air.	
flipper. *See* elevator.	
force, drag. *See* drag force.	
force, vertical. *See* vertical force.	
fork. *See* clevis.	
friction, skin. *See* skin friction.	
fuel; gasoline; gas.	fuel; petrol; motor spirit.
gear, alighting. *See* alighting gear.	
gross weight.	all-up weight.
horizontal stabilizer. *See* stabilizer, horizontal.	
hydraulic cylinder.	jack.
inboard panel, center of. *See* section, center.	
landing gear. *See* alighting gear.	

United States	*British*
lateral axis. *See* axis, lateral.	
leading edge airfoil.	slat.
left.	port.
line, mean.	centre line.
longeron. *See* stringer.	
longitudinal axis. *See* axis, longitudinal.	
main plane, outer. *See* panel, outboard.	
mast, radio.	rod aerial.
mean line. *See* line, mean.	
panel, center-section. *See* section, center.	
panel, center of inboard. *See* section, center.	
panel, center-wing. *See* section, center.	
panel, outboard; outer wing panel.	outer plane; outer main plane.
plant, power. *See* section, engine.	
radiator, oil. *See* cooler, oil.	
radio mast. *See* mast, radio.	
right.	starboard.
section, center; center wing panel;center-section panel.	centre section; centre-section plane; centre-plane.
section (complete), engine. *See* engine section.	
side force; side component.	lateral force.
skin friction.	surface friction.
spacer.	distance piece.
stabilizer, horizontal; fixed tail surface.	tail plane.
stabilizer, vertical; tail fin; vertical tail surface.	fin.
streamline flow.	streamline motion.
stringer; longeron.	stringer.
structure. *See* chassis.	
surface, balanced; aerodynamically balanced surface.	balanced surface.
surface, fixed tail. *See* stabilizer, horizontal.	
tab, trim. *See* trim tab.	
tail fin. *See* stabilizer, vertical.	
tail surface, fixed. *See* stabilizer, horizontal.	
tail surface, vertical. *See* stabilizer, vertical trim tab.	trimming tab.
under carriage. *See* alighting gear.	
vertical axis. *See* axis, vertical.	
vertical force.	vertical force; normal force.
vertical stabilizer. *See* stabilizer, vertical.	
vertical tail surface. *See* stabilizer, vertical.	
weight, empty. *See* empty weight.	
weight, gross. *See* gross weight.	
windshield.	windscreen.
wing.	main plane.
wing panel, center. *See* section, center.	
wing panel, outer. *See* panel, outboard.	
"X" axis. *See* axis, longitudinal.	
"Y" axis. *See* axis, lateral.	
"Z" axis. *See* axis, vertical.	

APPENDIX II

EMERGENCY REPAIRS

The manufacturer of this airplane cannot guarantee or recommend repairs using adhesive tape, wire, tin or other materials not generally used in the construction of aircraft.

Any repairs which do not follow the instructions and illustrations in the Handbook cannot be warranted by the manufacturer; these repairs should not be used then, for reasons of safety, unless it is known that the strength factors involved are equal to or better than the original design strength.

It is considered that certain repairs shown in this Handbook will not be used because of their complexity if replacement parts are available. These repairs, then, can be considered as emergency measures.
