Aerolineas Argentinas

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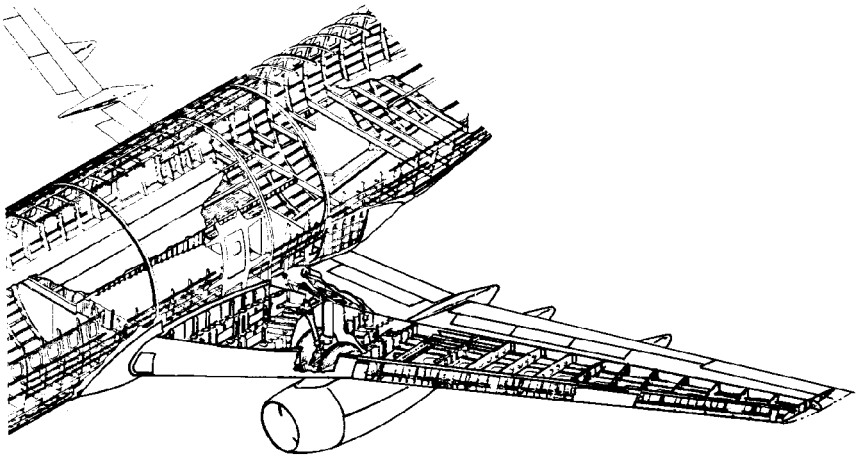
WINGS - DESCRIPTION AND OPERATION

1. General
   A. The structure of the wing between left and right tips consists basically of the left wing box, the center wing box and the right wing box (Fig. 1). The left and right wing boxes are similar in structure. The left and right wing boxes are cantilevered from the center wing box which carries, and is enclosed within, the fuselage. The thickness and chord of each wing tapers down toward the tip and, in plan view, both wings sweep back from the center wing box See Fig. 2 for wing cross sections, See Chapter 6, "Dimensions and Areas", for reference concerning station numbers.
   B. The surfaces of the wing boxes and the center wing box consist of upper and lower skin panels and front and rear spars. The left and right wing boxes extend from the wing root ribs at WBL 70.85 to the removable wing tips. Throughout the left, center and right wing boxes, the skin panels are reinforced by spanwise stringers, and the spars are reinforced by vertical stiffeners. The left and right wing boxes are reinforced by a series of chordwise ribs, and the greater part of their enclosed volume is sealed to serve as fuel tanks. The center wing box is reinforced by spanwise beams, and contains bladder-type fuel cells. On some airplanes, the center wing box contains an integral center fuel tank. A chordwise rib (the wing root rib) at BBL 70.85 constitutes the inboard end of the left wing box. This same rib is the left outboard end of the center wing box.
   C. An identical arrangement exists on the right side of the airplane. At each of the four corners of the center wing box, three members meet. These are the wing root rib and two spars, which are connected by means of a three-flanged terminal fitting. Longitudinal floor beams are attached to the upper skin of the center wing box.
   D. A connection exists between the wing and the fuselage by means of six-flanged chords running between the bukheads at body stations 540 and 664 and at buttock line 70.85 along the upper edges of the wing. A wing-to-fuselage connection exists between the lower surface of the center wing box and the fuselage keel beam which passes beneath it.
   E. The bulkhead at body station 540 combines with the center wing box front spar, and the bulkhead at body station 664 combines with the center wing box rear spar. the upper front and rear and the lower front and rear spanwise wing-to-fuselage connections are rigid.



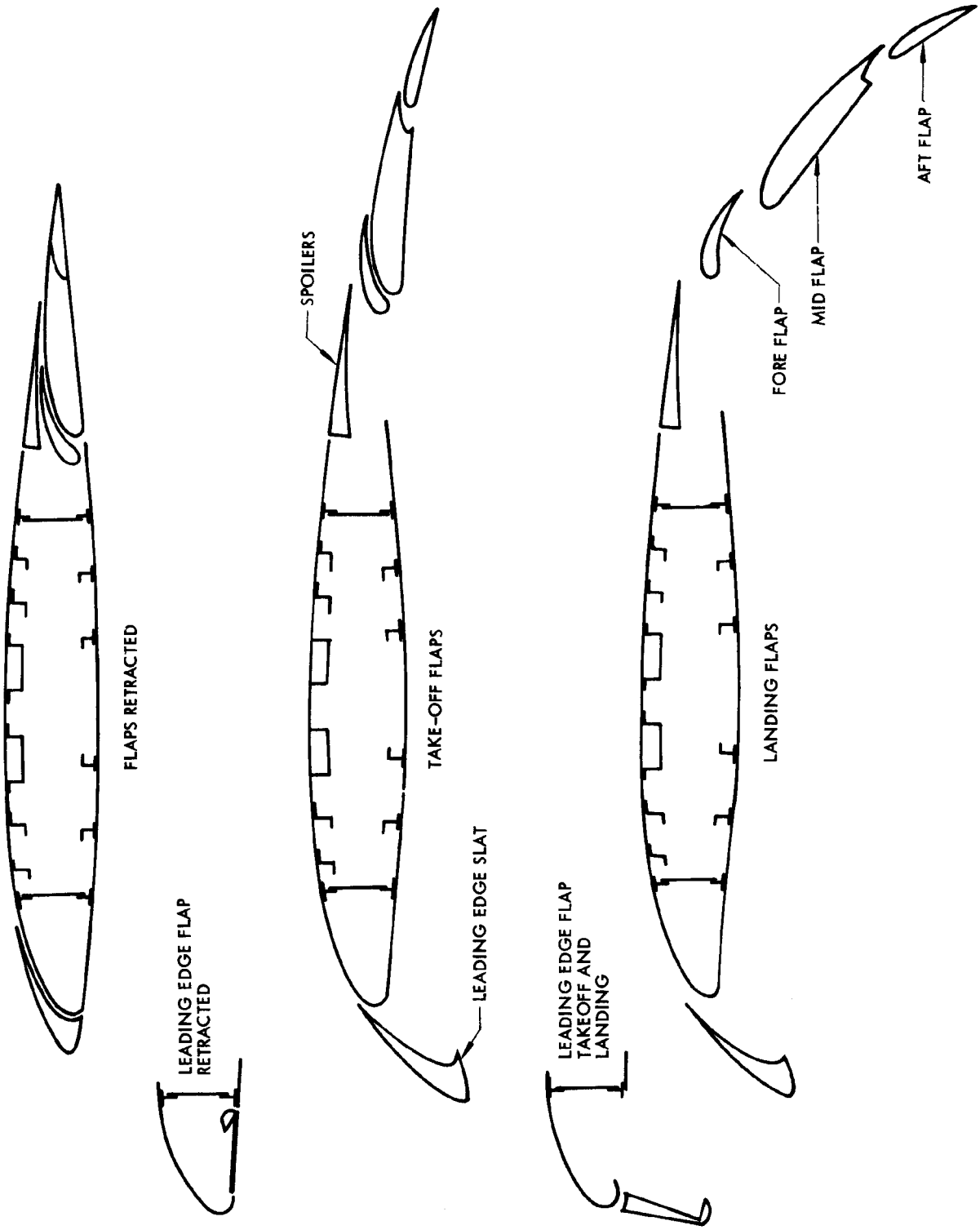
Wing Structure
Figure 1

F. On each wing, the leading edge structure is cantilevered forward of the wing front spar. the trailing edge structure and control surfaces are cantilevered aft of the wing rear spar and supported additionally at the inboard end of the wing by the spoiler support beam and the landing gear support beam. The landing gear support beam is attached at its inboard end to the rear face of the wing rear spar. A bearing approximately midway along the landing gear support beam, together with one forward of it on the wing rear spar, form the axis of main landing gear rotation and are points at which landing loads are transmitted to the wing structure. The wing-to-body fairing is attached to the upper and lower surfaces of the wing.

G. Five control surfaces are supported by the leading edge structure of each wing: two flaps are hinged from the inboard one-third of the wing span, and along the outboard two-thirds three extendable slats are installed. The control surfaces along the trailing edge of each wing consist of inboard and outboard flaps, an aileron and a total of four spoilers.

H. A pressure relief panel is installed in the fixed leading edge skin inboard of the engine-to-wing fairing. The pressure relief panel, secured by a compression spring-loaded lock plate, is designed to open at a pressure of one psi. The function of the pressure relief panel is to alleviate pressures due to leaks or ruptures in ducts associated with the engine.

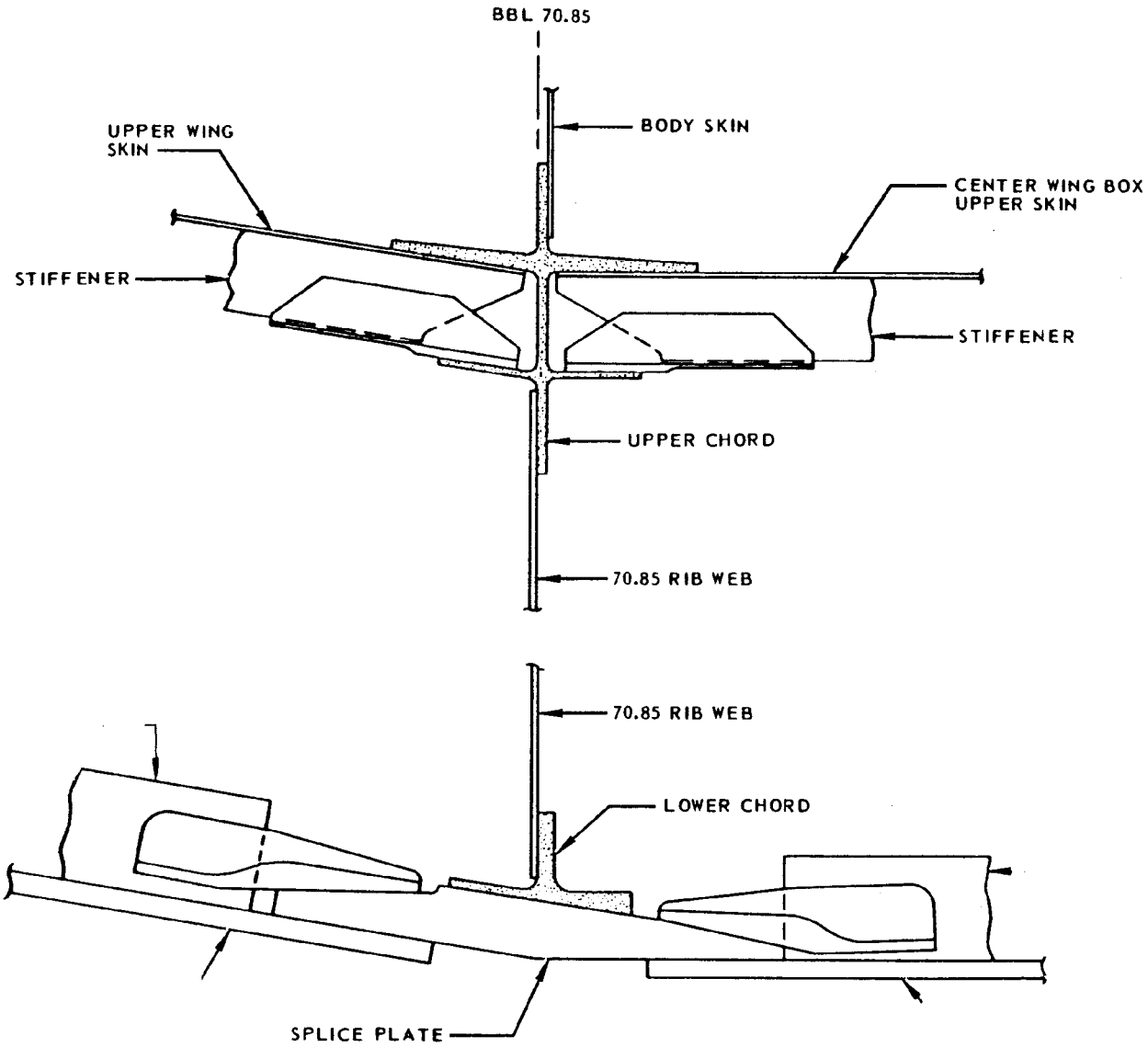
I. Vortex generators are installed on the upper wing surface.



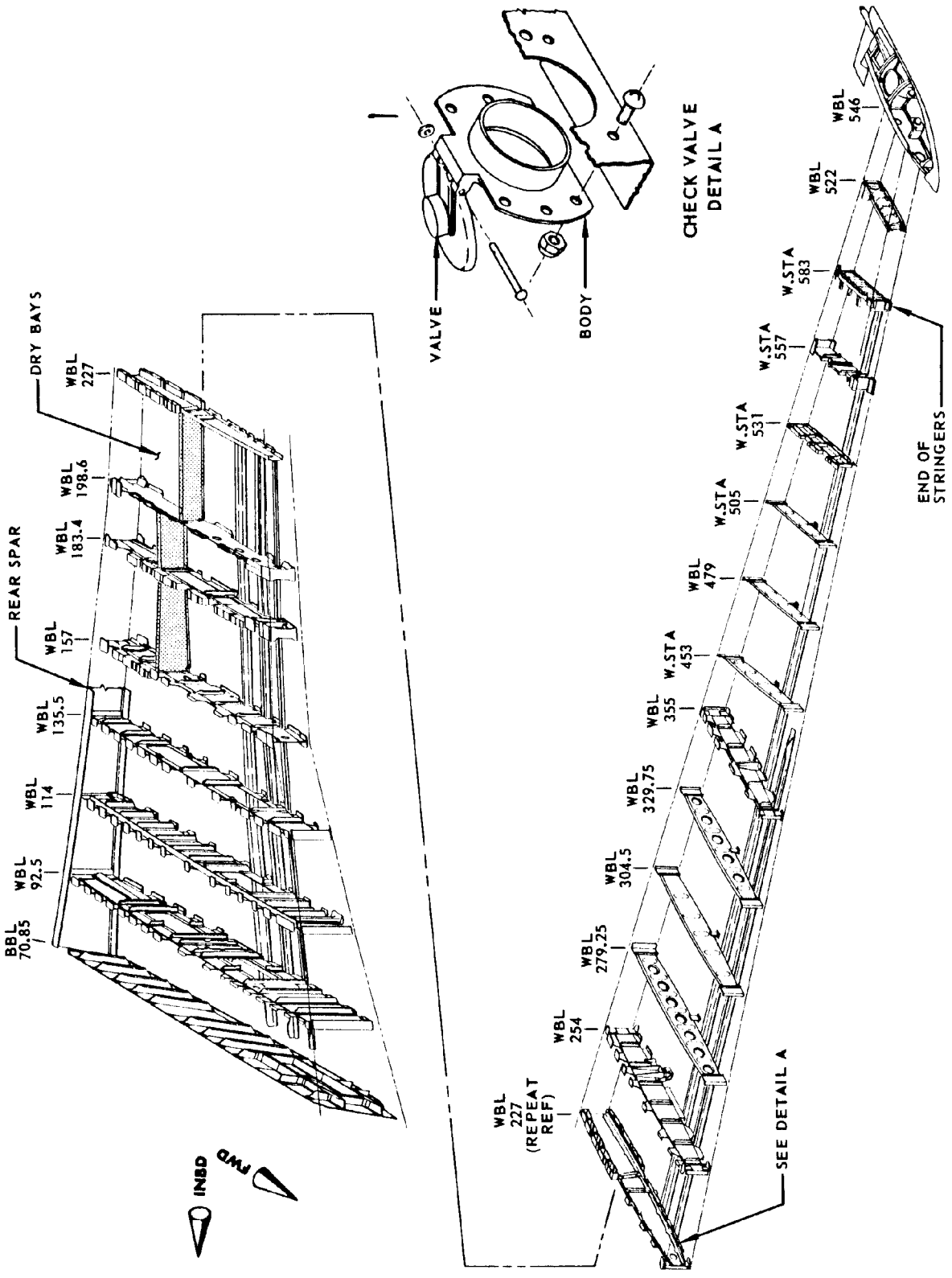
Wing Cross Sections
Figure 2

MAIN FRAME - DESCRIPTION AND OPERATION

1. General
   A. The main frame consists of the left and right wing boxes, and the center wing box. The left and right wing boxes are attached to the center wing box at the four corners where the spars and the wing root ribs meet by means of three-flanged terminal fittings and longitudinal upper and lower flanged chords at left and right buttock lines 70.85. At any one corner the center wing box spar, the wing box spar and the wing root rib are attached to the flanges of the terminal fitting.
   B. The wing, as a single unit consisting of the left and right wing boxes and the center wing box is attached to the fuselage frames at body stations 540 and 664 in such a manner that the center wing box front and rear spars combine with the bulkheads at body stations 540 and 664. Another wing-to-fuselage connection is by means of the longitudinal upper flanged chords at left and right buttock lines 70.85. The center wing box skin, the wing box skin, the wing root rib and the fuselage skin attach to these flanged chords on both sides of the airplane. (See figure 1.) Other points of attachment are the main landing gear support beams, the keel beam and the longitudinal floor beams above the center wing box.
   C. The primary structure of the wing is the structural components of the main frame. All other wing structures, such as leading edge, trailing edge, control surfaces and wing tips are auxiliary.
2. Wing Boxes
   A. Important components of the structure of each wing box are the front and rear spars, the ribs, the upper and lower skins, and their reinforcing stringers. (See figure 2.)
3. Center Wing Box
   A. The structure of the center wing box consists of front and rear spars, two spanwise beams, upper and lower skin panels, and reinforcing stringers.



Wing to Fuselage Attachment
Figure 1



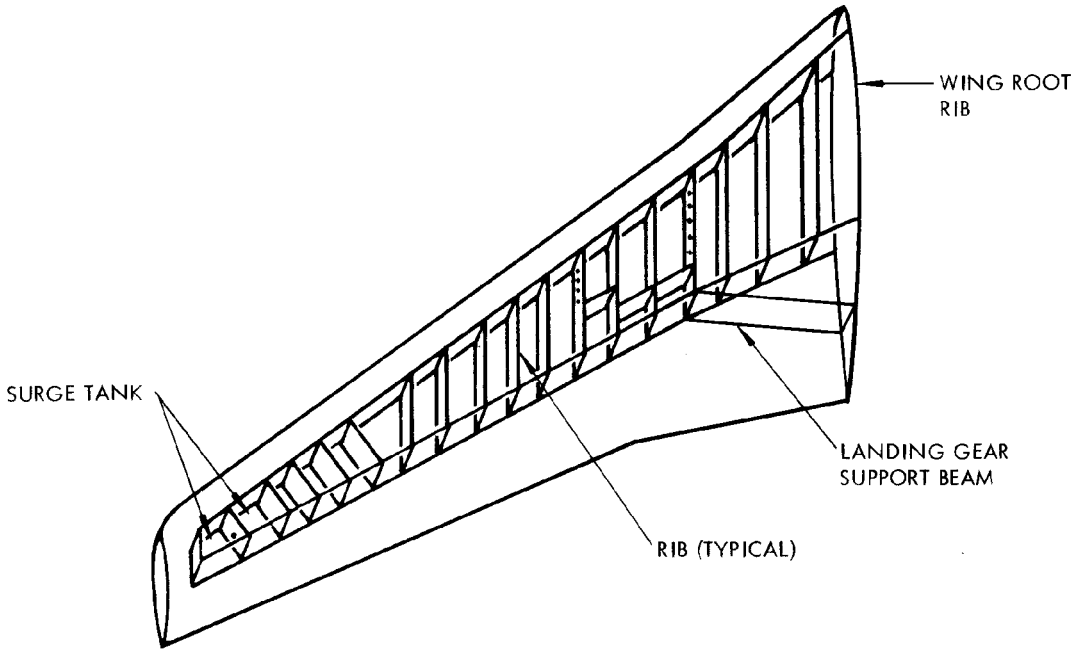
Wing Inspar Structure
Figure 2

WING SPARS - DESCRIPTION AND OPERATION

1. General
   A. The front and rear wing spars on the left and right wing boxes are primary structural components of the main frame. They extend from the wing root rib to the wing tip. Engine support fittings, hinge supports, transmission assemblies, actuators and gearbox mounts associated with the flight controls are attached to the spars. See Flight Controls, Chapter 27, and Power Plant, Chapter 71.
   B. The inboard ends of the wing spars are points of attachment of the wing boxes to the center wing box. The three-flanged fitting described in 57-41-0 is the means of attachment.
   C. A main feature of the rear spar is the forged fitting to which the main gear landing beam attaches. The integral fuel tanks providing the major portion of the fuel supply storage capacity are located between the wing front and rear spars.
2. Wing Front Spars
   A. The left and right front spars consist of vertical webs tapering down in depth towards the wing tips, and provided with tee-section chords along their upper and lower edges. Vertical stiffeners are attached to the forward face of each spar web. The inboard ends of the left and right front spars are attached to the front spar of the center wing box and the wing root ribs by means of a three-flanged terminal fitting.
   B. Along the outboard section of the aft face of the front spars, a series of housings are provided to allow the leading edge slat guide rails and actuators to protrude through holes in the spar web. The forward outboard engine support fitting is attached to the front spar.
3. Wing Rear Spars
   A. The left and right rear spar upper and lower edge chord members are angle-sections, the flange projecting forward only, and the vertical stiffeners are attached to the aft face of the web. The inboard ends of the left and right rear spars are attached to the rear spar of the center wing box and the wing root ribs by means of a three-flanged terminal fitting.

WING RIBS - DESCRIPTION AND OPERATION

1. General
   A. The two wing root ribs form the inboard ends of the left and right wing boxes and the outboard ends of the center wing box. Each wing root rib consists of a solid stiffened web. At its forward and aft ends, each wing root rib is attached to the wing front and rear spars by means of the three-flanged terminal fittings. The wing root ribs form the inboard ends of the integral sections of fuel tank No. 2, and ports in their webs provide the connections into the central bladder cell sections of that tank. (See figure 1.)
   B. Outboard of the wing root rib, on each wing, the ribs until wing buttock line 355.0 are parallel to the airplane centerline. The ribs at wing buttock lines 254.0 and 355.0 support the forward ends of the outboard flap tracks.
   C. Outboard of wing buttock line 355.0 the ribs lie at an angle normal to the wing rear spar. The two spaces between the ribs at wing stations 531 and 583 constitute a surge tank.
2. Standard Ribs
   A. The structure of a typical rib consists of a web, reinforced by stiffeners and, in some instances, provided with a reinforced opening. Along the upper and lower edges of the web, an angle chord member attaches the rib to the edges of the continuous wing stringers, and at its forward and aft ends the rib web is attached to the webs of the front and rear spars.
3. Special Ribs
   A. The ribs forming the ends of fuel tanks differ from other ribs in that their webs extend to join the inside surfaces of the wing skin panels between the stringers.
   B. The wing ribs in the integral tanks act as baffle plates to prevent excessive fuel surges. Some of the wing ribs contain a series of baffle check valves to prevent fuel flow away from the fuel boost pumps.
4. Rib Access Openings
   A. Access to some of the equipment located inside the fuel tanks is not directly possible through the fuel tank access panels. To obtain access to this equipment, personnel must enter the tank through the nearest access panel and go through rib access openings into the areas between ribs where no access panel is provided. See Fuel, Chapter 28.



Wing Ribs
Figure 1

WING STRINGERS - DESCRIPTION AND OPERATION

1. General
   A. The upper and lower left and right wing skin panels are reinforced by a series of spanwise stringers. These are zee-section extrusions attached to the inside of the skin panels. As the wing structure has no production joints, many of the stringers extend continuously from the wing root rib to the wing tip, and others extend as far outboard as the tapering shape of the wing will allow. The lower edges of the upper stringers and the upper edges of the lower stringers are attached to the edges of the wing ribs. Some stringers are part of the vent system.
   B. The upper and lower center wing box skin panels are reinforced by a similar series of spanwise stringers.

CENTER WING BOX - DESCRIPTION AND OPERATION

1. General
   A. The center wing box is part of the wing main frame. Its main functions are to support the fuselage, to act as the structural part from which the wing boxes are cantilevered and to accommodate the removable fuel cells.
2. Center Wing Box Structure
   A. The surfaces of the center wing box consist of the front and rear spars, the two wing root ribs at BL 70.85, and the upper and lower skins. The front and rear spars combine with the bulkheads at body stations 540 and 664. The skins are attached to a series of Z-section stringers. The center wing box skins are spliced with the left and right wing box skins. In contrast to the wing boxes, the center wing box has no reinforcing chordwise ribs. Instead, the reinforcement consists of a pair of spanwise beams which are stiffened webs attached to the lower and upper skins. The center wing box fits into a cutout section of the fuselage between body stations 540 and 664. A chordwise vertical keel beam is attached to the lower skin.
3. Removable Fuel Cells
   A. The center wing box is divided by the two spanwise reinforcing beams into three individual cavities to accommodate up to three bladder fuel cells. The cavities are numbered one through three starting with the forward cavity and going aft. The spanwise beams have cutouts that act as access openings, allowing personnel to move from one cavity to another. Cavity No. 1 has a cutout in the bottom which serves as an access opening to the center wing box and the bladder cells. The center wing box cavities are isolated from each other by sealing the structure in the bottoms and a portion of the walls.
4. Backing Boards
   A. Backing boards are fastened to the center wing box structure by means of screws. A backing board consists of nylon resin impregnated material. The purpose of the backing board is to prevent fuel cells from chafing against bare metal structure.

CENTER WING CAVITY BACKING BOARDS - REMOVAL/INSTALLATION

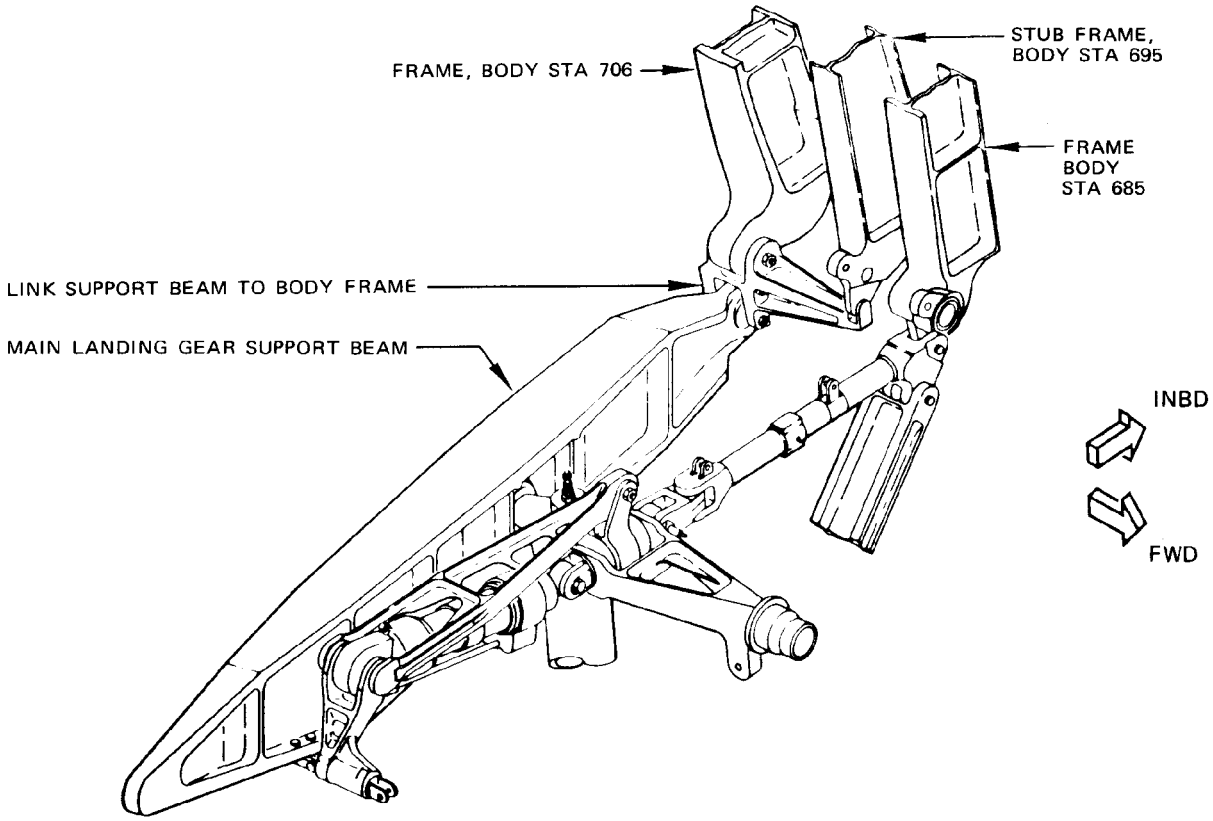
1. General
   A. Purpose of backing board is to prevent fuel cell from chafing against bare stiffeners, or sagging, causing a fuel pocket. The backing board consists of nylon resin impregnated material which softens and expands when soaked in water at room temperature. Board contracts and hardens after drying.
   B. The center wing cavity backing boards must be soaked in water at room temperature to facilitate installation. The boards will soften and stretch after soaking in water permitting installation of backing board fasteners. Installation must take place soon after removal of board from water because of backing board shrinkage when drying.
2. Equipment and Materials
   A. Suitable rust resistant container
   B. Osnaberg Cloth, Federal Specification CCC-C-429, any class
3. Remove Backing Board
   A. Defuel center wing tank (Ref Chapter 28, Defueling).
   B. Remove fuel cell (Ref Chapter 28, Removable Fuel Cell).
   C. Remove fasteners attaching backing board to cavity stiffeners.
   D. Remove backing board.
4. Install Backing Board
   A. Soak backing board in water at room temperature in a rust resistant container until board is soft and pliable.

      NOTE: Soaking time will be shortened if board (new or existing) is soaked in water at approximately 55°C (130°F). Do not use warmer temperature.
      Drying time may be extended by covering board with up to three layers of Osnaberg cloth thoroughly soaked in water. Wet cloth should remain in surface contact with board on one side during handling and installation.

   B. Attach backing board to cavity structure using proper fasteners.

LANDING GEAR SUPPORT BEAMS - DESCRIPTION AND OPERATION

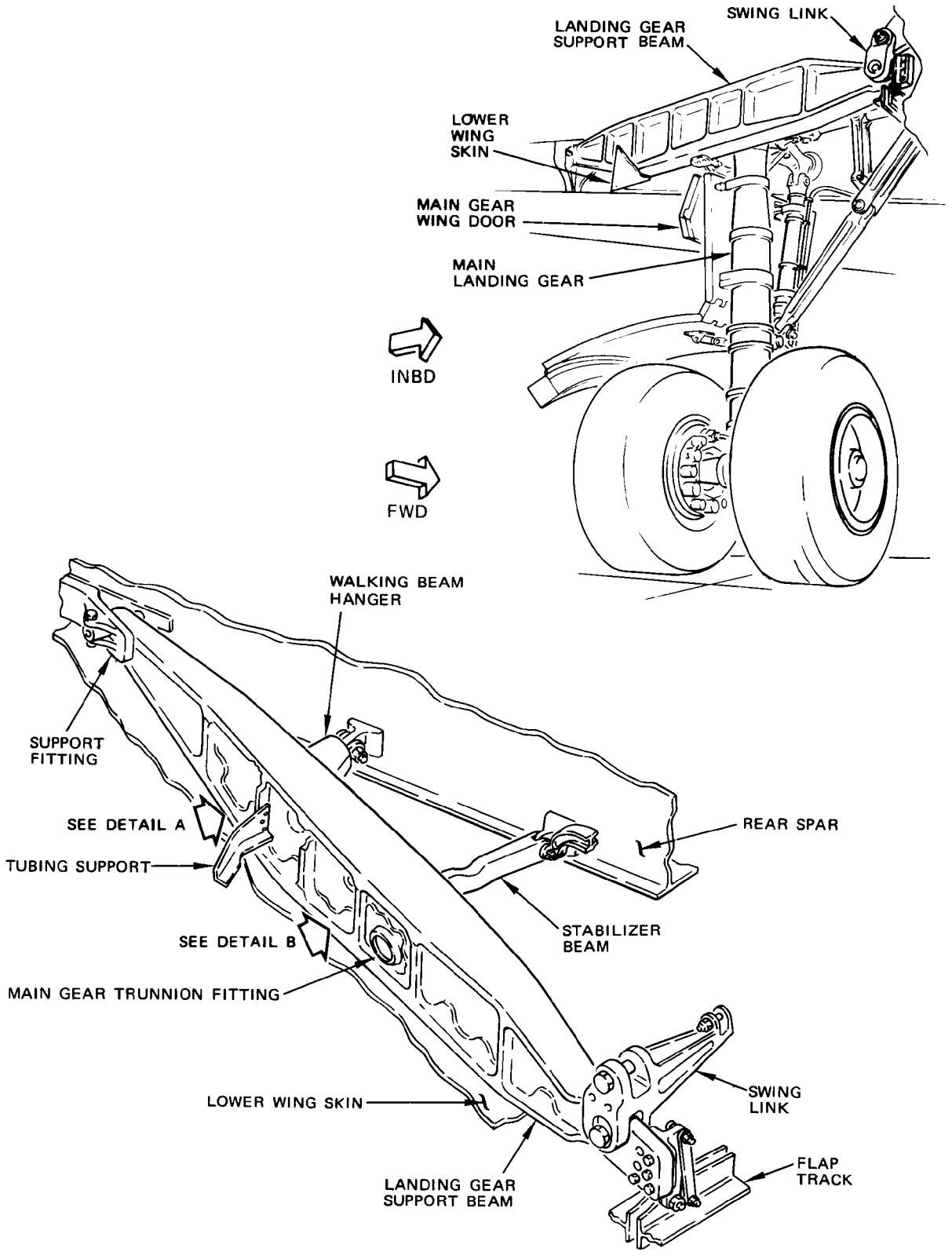
1. General
   A. The landing gear support beams are two-piece I-section forgings bonded and bolted together, and connected at their outboard ends to the left and right wing rear spars and at their inboard ends to the left and right sides of the fuselage. (See figure 1.)
2. Landing Gear Support Beam Structure
   A. Each beam is connected to the side of the fuselage by a short swinging link whose upper end is hinged from fuselage fittings at body stations 695 and 706, and whose lower end is hinged to the beam slightly outboard of its inboard end. Each landing gear support beam is connected at its outboard end to the aft face of the wing rear spar, by a single pin in a heavy forged fitting. These connections at each end of the beams allow them to transmit landing loads into the wing and fuselage. The forward end of the inboard flap inboard track is attached to a fitting on the inboard end of the beam. Several ribs supporting the inboard spoiler are attached to the aft face of the beam. Slightly inboard of its midpoint the beam incorporates a bearing for the aft end of the main landing gear trunnion.



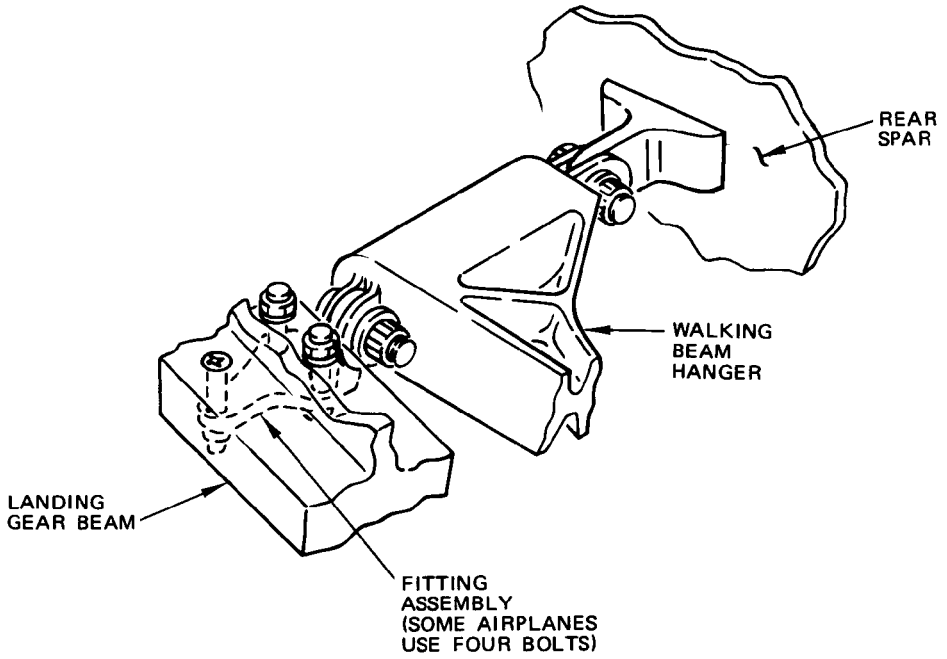
Landing Gear Support Beams
Figure 1

LANDING GEAR SUPPORT BEAMS - REMOVAL/INSTALLATION

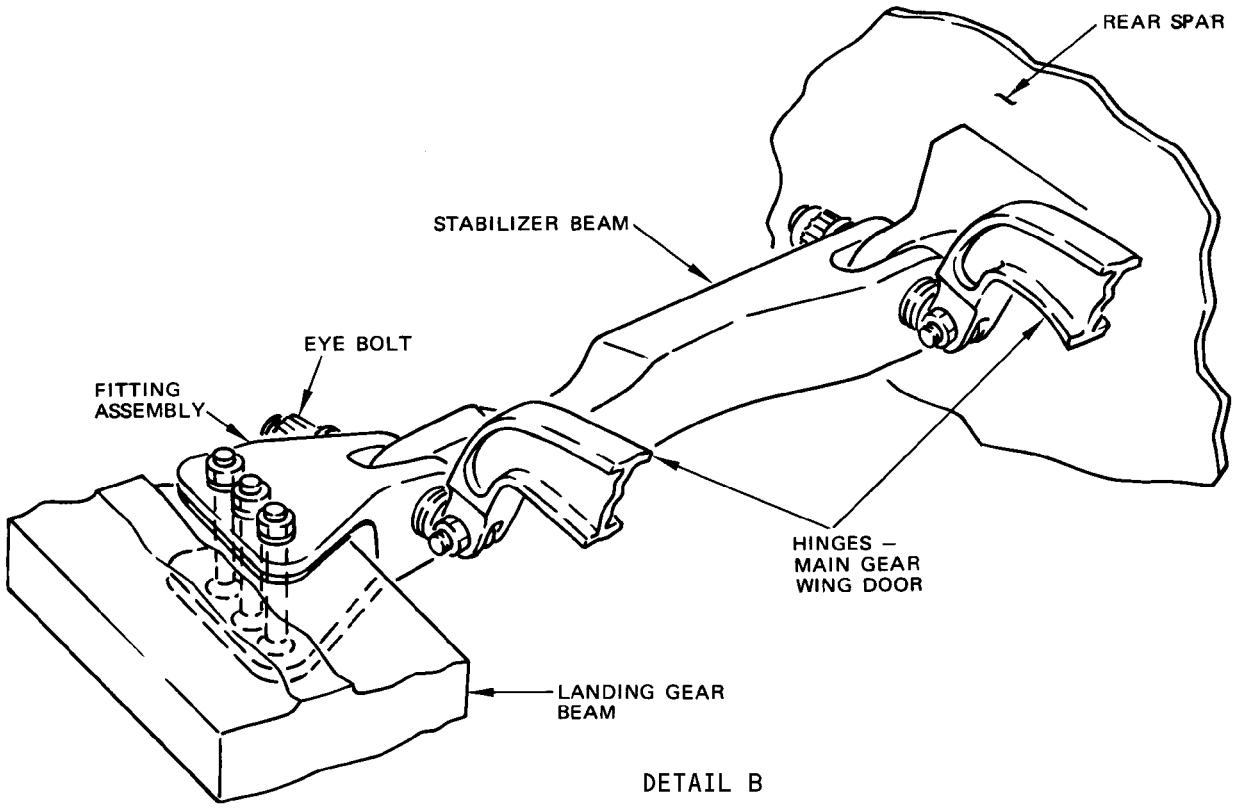
1. General
   A. The landing gear support beams are connected to the wing rear spars at the outboard ends and to the fuselage by means of swing links at the inboard ends. To remove the support beam, the complete landing gear, the swing link, the flap transmission, spoiler actuator and supports, flap drive and miscellaneous electrical and hydraulic clamps must be removed.
2. Equipment and Materials
   A. Primer, BMS 10-11, Type 1 (AMM 20-30-41/201)
   B. Grease - BMS 3-33 (Preferred)
   C. Grease - MIL-PRF-23827 (Supercedes MIL-G-23827) (Alternate)
   D. Corrosion Preventive Compound, Petrolatum, Hot Application, MIL-C-11796, Class B (AMM 20-30-21/201)
3. Prepare for Landing Gear Support Beam Removal
   A. Defuel the airplane wing tanks (AMM 28-23-0/201).
   B. Extend flaps to gain access to aft side of landing gear support beam.
   C. Remove main landing gear on the side where beam removal is to be accomplished (AMM 32-11-21/401).
   D. Remove main gear wing door (AMM 32-13-21/401).
   E. Remove inboard flap track fairing (AMM 27-51-141/401).
   F. Open ground spoilers for further access.
4. Remove Landing Gear Support Beam
   A. Remove the eyebolt connecting the stabilizer beam to the stabilizer beam attach fitting on the support beam. Move the stabilizer beam down and out of way (Detail A, Fig. 401).
   B. Remove the stabilizer beam attach fitting from the support beam by unbolting. Make a note of the position of the shims for reinstallation.
   C. Remove the bolts that secure the walking beam hanger fitting assembly to the support beam and remove the fitting. Make a note of the location and the thickness of tthe shims for reinstallation on the beam (Fig. 401).
   D. Disconnect the spoiler braces and remove the lower wing skin section which is attached to the beam aft of the landing gear wheel well.
   E. Disconnect and remove the hydraulic tubing, as necessary, for access to the swing link.
   F. Disconnect both of the ground spoiler actuators and bracing, one from the aft side of the support beam and other from the rear spar, for clearance (AMM 27-62-72/401).
   G. Disconnect the hydraulic tubing and electrical wiring that are attached to the support beam, as necessary. Make a note of the location for reassembly.
   H. Disconnect the flap transmission (AMM 27-51-281/401).
   I. Disconnect the flap angle gearbox from the aft side of the support beam, and remove the inboard section of the flap torque tube (AMM 27-51-251/401).
   J. Support the landing gear support beam.



Landing Gear Support Beam Installation
Figure 401 (Sheet 1)



DETAIL A



DETAIL B

Landing Gear Support Beam Installation
Figure 401 (Sheet 2)

K. Unbolt and remove the swing link sections between the fuselage structure and the inboard end of the support beam. Record the location and definition of the shims and washers used on the assembly of the swing link. Save all shims and washers (Fig. 402 and 403).

L. On configuration 1 airplanes, remove the inboard flap and the inboard flap track strap, between the support fitting and the flap track (Fig. 402, Sheet 1, Detail A).

M. Remove the wing inboard flap and the inboard flap track forward support fitting, between the forward end of the inboard flap track and the beam (Fig. 402 and 403, Sheet 1, Detail A).

N. ON AIRPLANES PRE SB 57A1260;
Remove the self-locking nut, washer, lockbolt and rubber grommet from the outboard attach pin. Pull the outboard attach pin at the outboard end of the support beam, between the beam and the rear spar (Fig. 402 and 403, Sheet 2, Section AA).

O. ON AIRPLANES POST SB 57A1260;
Remove the cotter pin, castellated nut, lockbolt and rubber grommet from the outboard attach pin. Pull the outboard attach pin at the outboard end of the support beam, between the beam and the rear spar (Fig. 402 and 403, Sheet 2, Section AA).

P. Ease the beam inboard, from its installed position, until the outboard end is free of the spar fitting and hydraulic tubing. Lower the outboard beam end and move the beam outboard through landing gear wheel well, until free.

5. Install Landing Gear Support Beam

A. Lift the landing gear support beam into position through the wheel well by raising the beam, inboard end up, and inboard over the flap track, until the beam is raised clear of the hydraulic tubing. Raise the outboard end of the beam, and move the beam outboard, until the outboard end is seated in the rear spar fitting. Support the beam until fasteners are installed (Fig. 402 and 403).

B. Install the outboard end of the support beam to the rear spar.

(1) Apply a light film of grease to the the outboard attach pin and install the pin through the beam aft support fitting and the outboard end of the beam. Use 69-63589-9 CRES washer to adjust the gap between the bushing face and the support fitting.

(2) Check the gap between the bushing faces in the beam and in the support fitting. The maximum combined gap shall not exceed 0.020 inch (0.508 mm).

(3) ON AIRPLANES PRE SB 57A1260;
Install the outboard attach pin lockbolt, rubber grommet, washer and self-locking nut.

(4) ON AIRPLANES POST SB 57A1260;
Install the outboard attach pin lockbolt, rubber grommet, washer and castellated nut.

(5) ON AIRPLANES PRE SB 57A1260;
Tighten the self-locking nut until the rubber grommet is compressed no smaller than 0.06 inch (1.524 mm) thick, in dimension.

NOTE: The free state of the rubber grommet is 0.07 inch (1.78 mm) thick, in dimension.

(6) ON AIRPLANES POST SB 57A1260;
Tighten the castellated nut until the rubber grommet is compressed no smaller than 0.06 inch (1.524 mm) thick.

NOTE: The free state of the rubber grommet is 0.07 inch (1.78 mm) thick.

(7) ON AIRPLANES POST SB 57A1260;
Install a new cotter pin.

(8) Apply corrosion preventive compound to the hole in the pin and the cavity behind the pin to exclude all moisture.

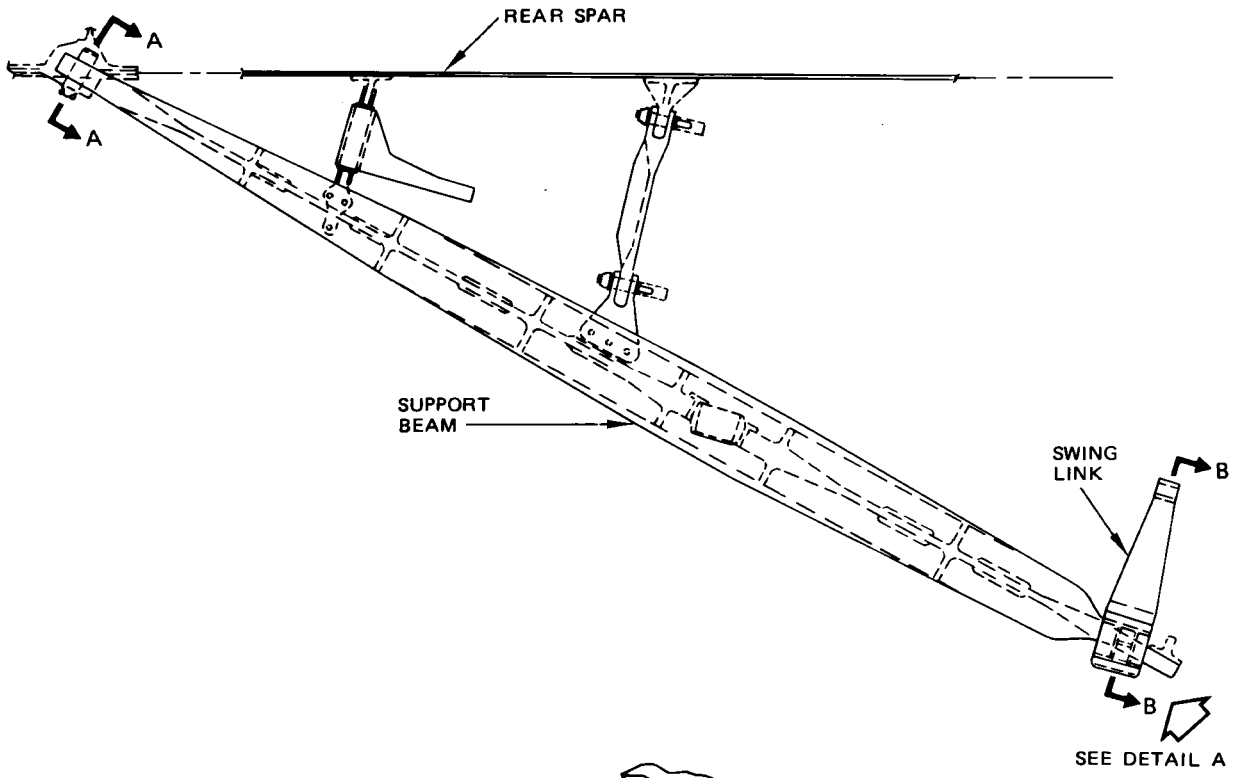
C. On airplanes with configuration 1 (Fig. 402), proceed as follows:

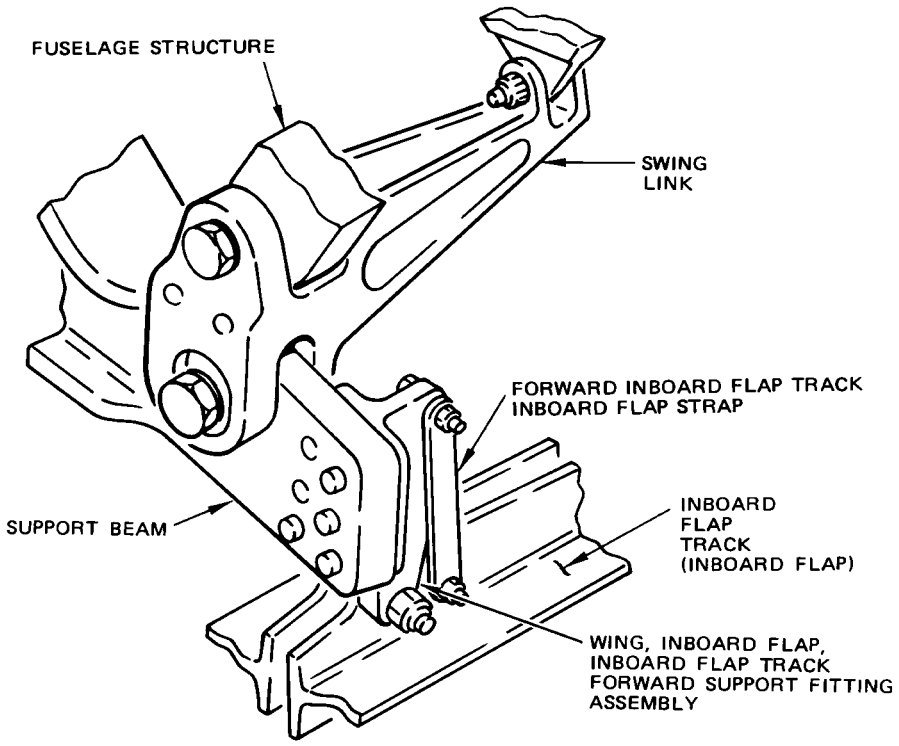
(1) Install the wing inboard flap and inboard flap track forward support fitting, by bolting to the beam and forward end of the inboard flap track (Fig. 402).

(2) Position the inboard flap and inboard flap track strap between the support fitting and the flap track, and bolt into place (Fig. 402).

(3) Install the swing link between the inboard end of the support beam and the fuselage. Use the shims and washers as recorded during the removal procedure. Torque the bolts securing the swing link to the fuselage structure and support beam as specified in Section B-B, Figure 402.

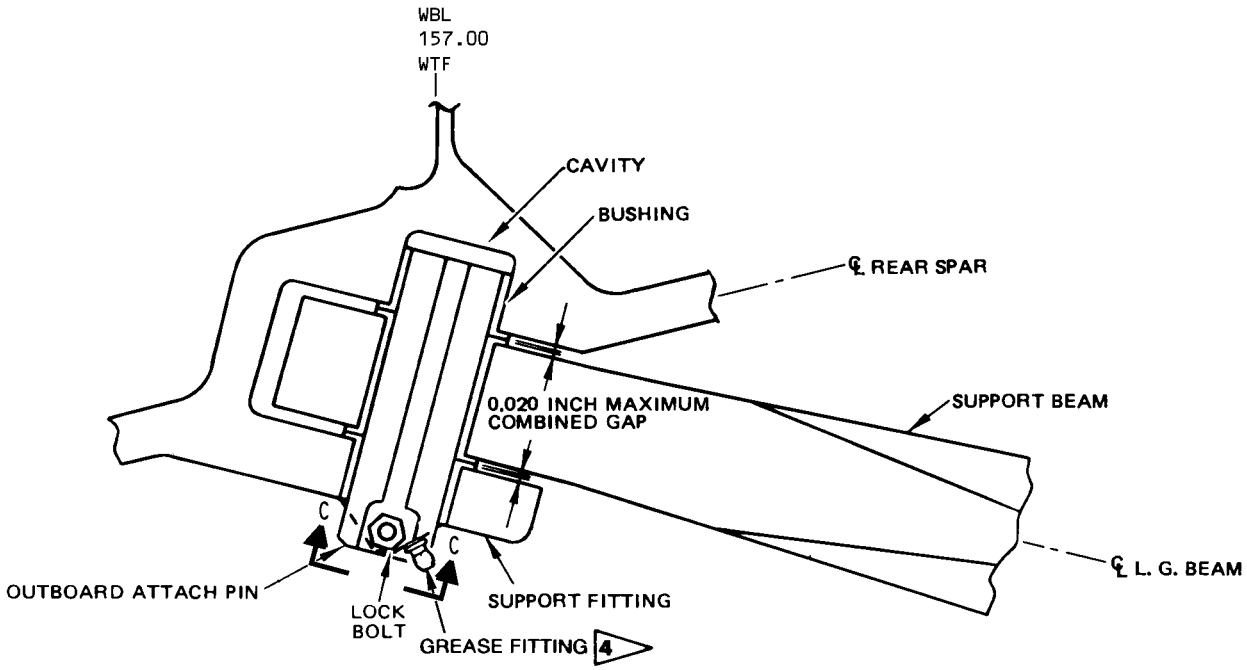
D. On airplanes with configuration 2 (Fig. 403), proceed as follows:
   (1) Install the wing inboard flap and inboard flap track forward support fitting by bolting to the beam, and forward end of the inboard flap track (Fig. 403).
   (2) Install the swing link between the inboard end of the support beam and the fuselage. Use the shims and washers as recorded during the removal procedure. Torque the bolts securing the swing link to the fuselage structure and support beam, as specified in section B-B, Figure 403.
E. Install the flap transmission (AMM 27-51-281/401).
F. Install the flap angle gearbox on the aft side of the support beam and install the inboard section of flap torque tube (AMM 27-51-251/401).
G. Install the flap transmission (AMM 27-51-281/401).
H. Remove the supports from under the support beam.
I. Install the ground spoiler actuators and bracing to the aft side of the support beam and to the rear spar (AMM 27-62-72/401).
J. Install the hydraulic tubing and electric wiring to the aft side of the support beam.
K. Reinstall the hydraulic tubing over the bolts securing the swing link.
L. Secure the lower wing skin section to the beam aft of the wheel well with screws and attach the spoiler braces.
M. Install the walking beam hanger fitting to the support beam (Fig. 401).
   (1) If the beam is drilled, install the fitting using the shims noted during removal.
   (2) If the beam is undrilled, use a drill jig. When installing a new beam, compensate for beam mismatch by tightening the nuts on the beam half which has the positive mismatch and add shims, as required, so that the untorqued gap does not exceed 0.010 inch (0.254 mm). The maximum allowable shimming is not to exceed 0.060 inch (1.524 mm). Complete the tightening of the fitting bolts.
N. Bolt the stabilizer beam attach fitting to the support beam flange. Shim as noted during removal (Fig. 401, Detail B).
O. Connect the stabilizer beam to the attach fitting on the support beam using an eyebolt with the eye inboard. Apply primer to the eyebolt but not to the bolt threads (Fig. 401, Detail B).



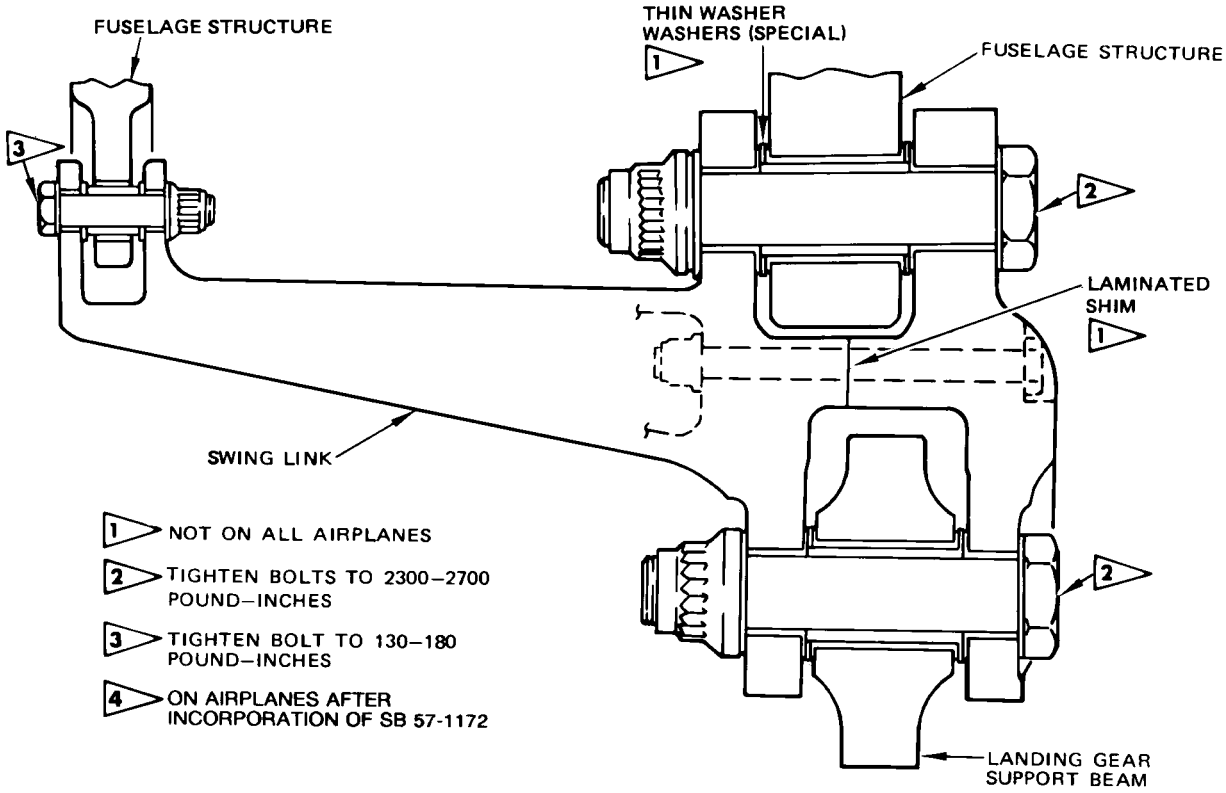


DETAIL A

Landing Gear Support Beam Attachments (Configuration 1)
Figure 402 (Sheet 1)



A–A



1 NOT ON ALL AIRPLANES

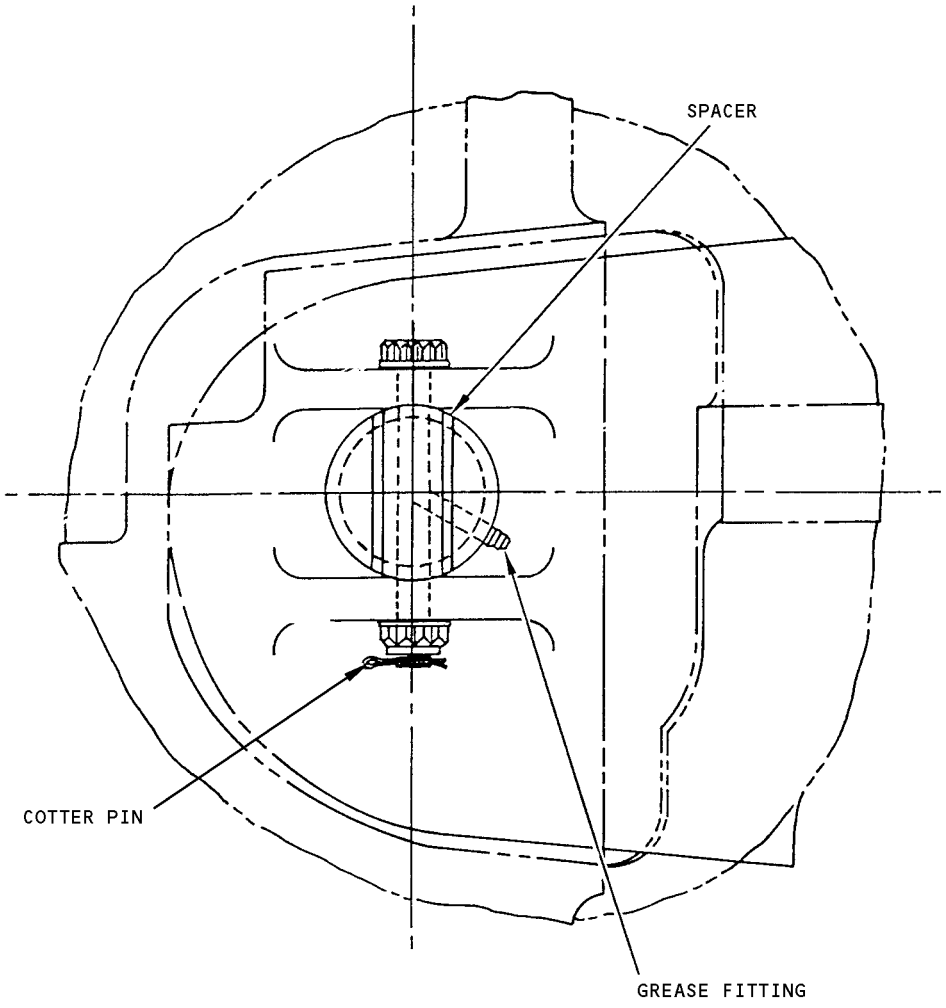
2 TIGHTEN BOLTS TO 2300–2700 POUND–INCHES

3 TIGHTEN BOLT TO 130–180 POUND–INCHES

4 ON AIRPLANES AFTER INCORPORATION OF SB 57-1172

B–B

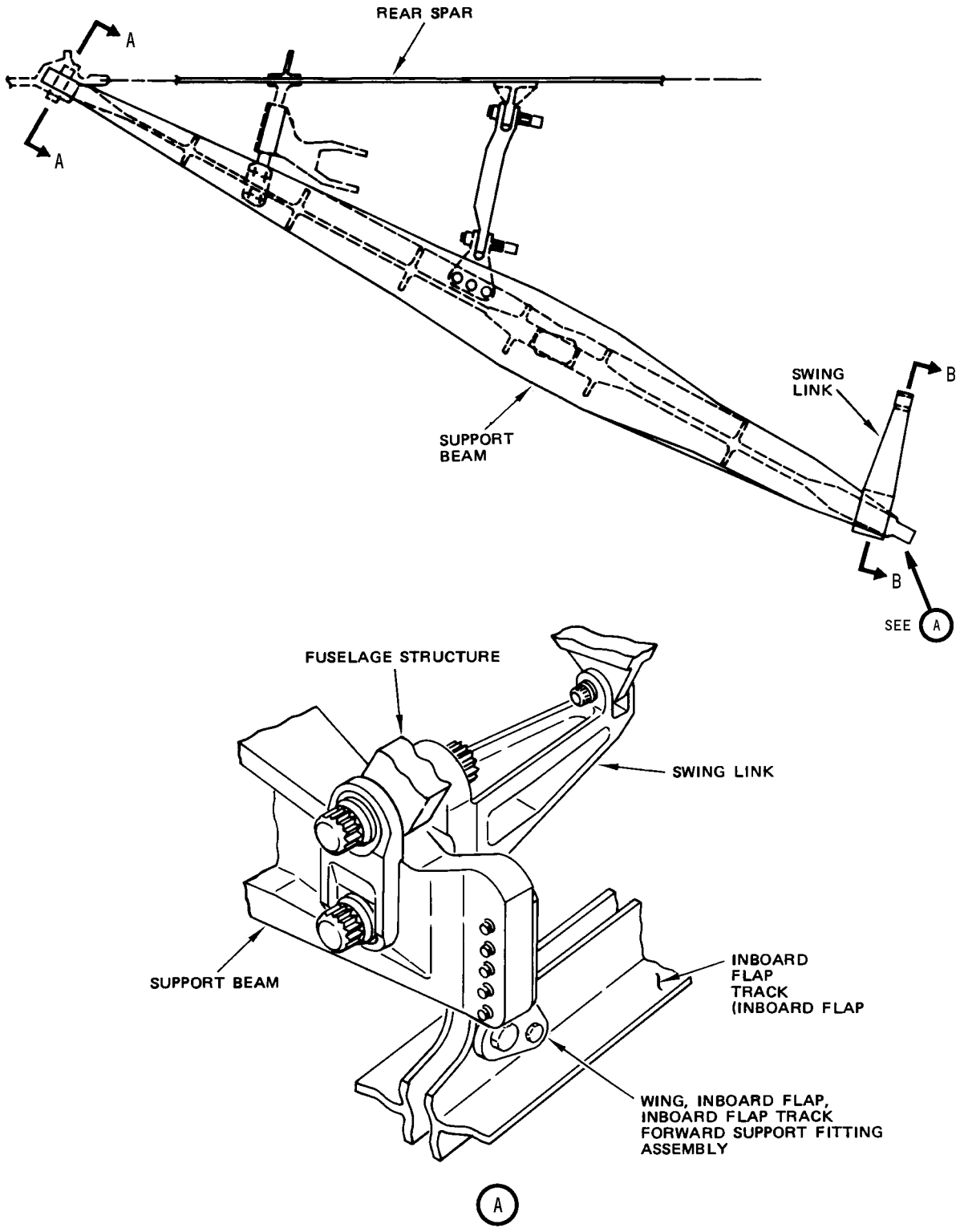
Landing Gear Support Beam Attachments (Configuration 1)
Figure 402 (Sheet 2)



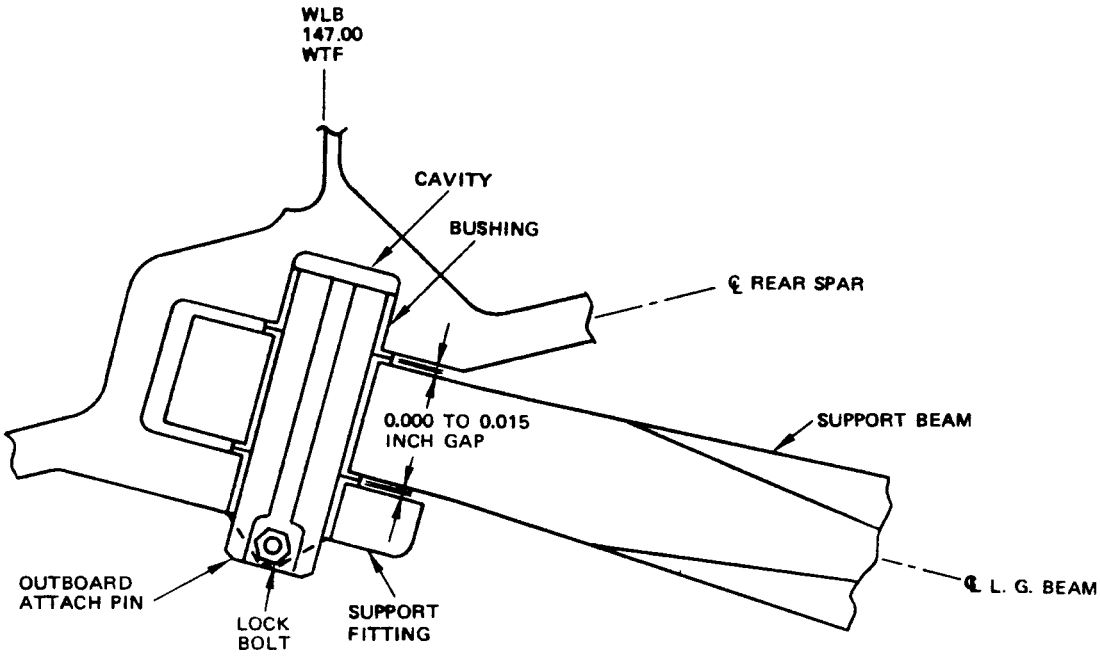
C-C

NOTE: AIRPLANES POST-SB 57A1260

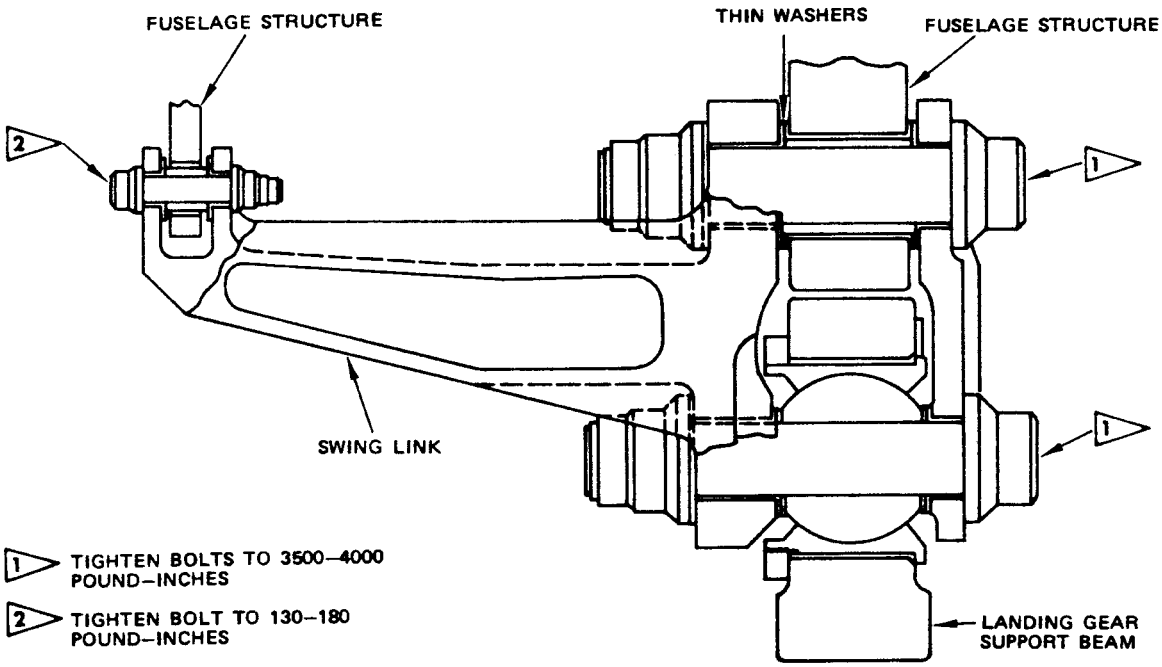
Landing Gear Support Beam Attachments
Figure 402 (Sheet 3)



Landing Gear Support Beam Attachments (Configuration 2)
Figure 403 (Sheet 1)



A-A



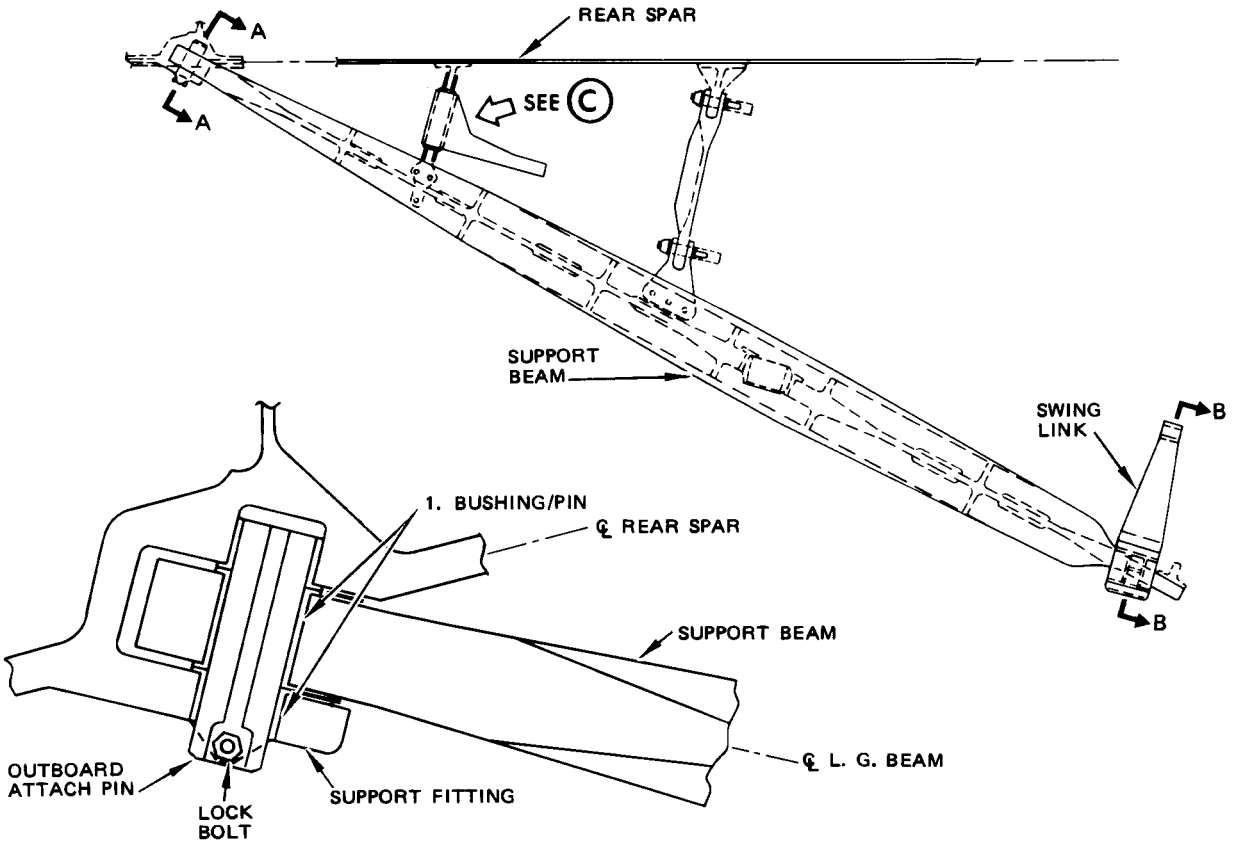
B-B

Landing Gear Support Beam Attachments (Configuration 2)
Figure 403 (Sheet 2)

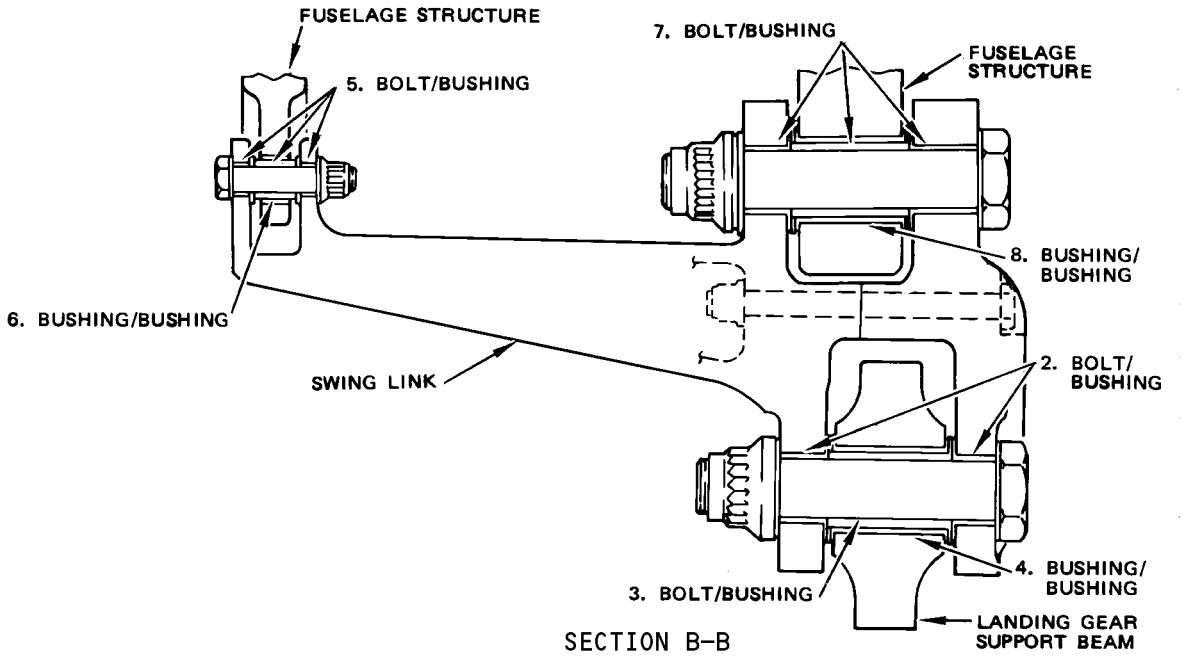
6. Return Airplane to Normal
   A. Install the main landing gear (AMM 32-11-21/401).
   B. Install main landing gear wing door (AMM 32-13-21/401).
   C. Install the inboard flap track fairing (AMM 27-51-141/401).
   D. Test the operation of the spoilers and flaps (AMM 27-51-01/501 and AMM 27-62-12/501).
   E. Refuel the airplane (AMM 12-11-0/201).

LANDING GEAR SUPPORT BEAM – INSPECTION/CHECK

1. General
   A. These data consists of illustrations and wear limit charts. No procedure is given in this section for access to permit inspection. Refer to Landing Gear Support Beam – Removal/Installation for removal procedure.
2. Landing Gear Support Beam Wear Limits

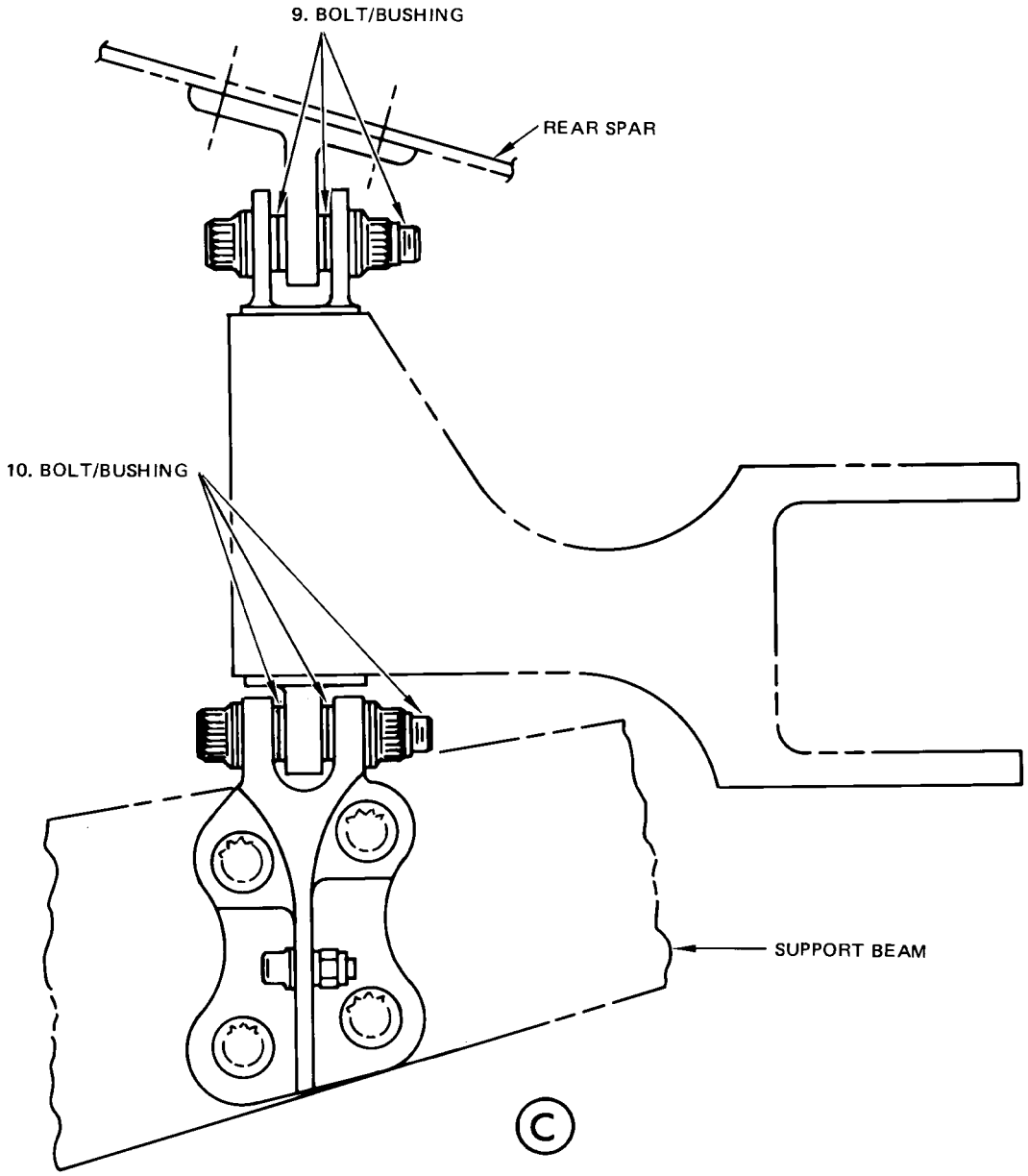


SECTION A-A



SECTION B-B

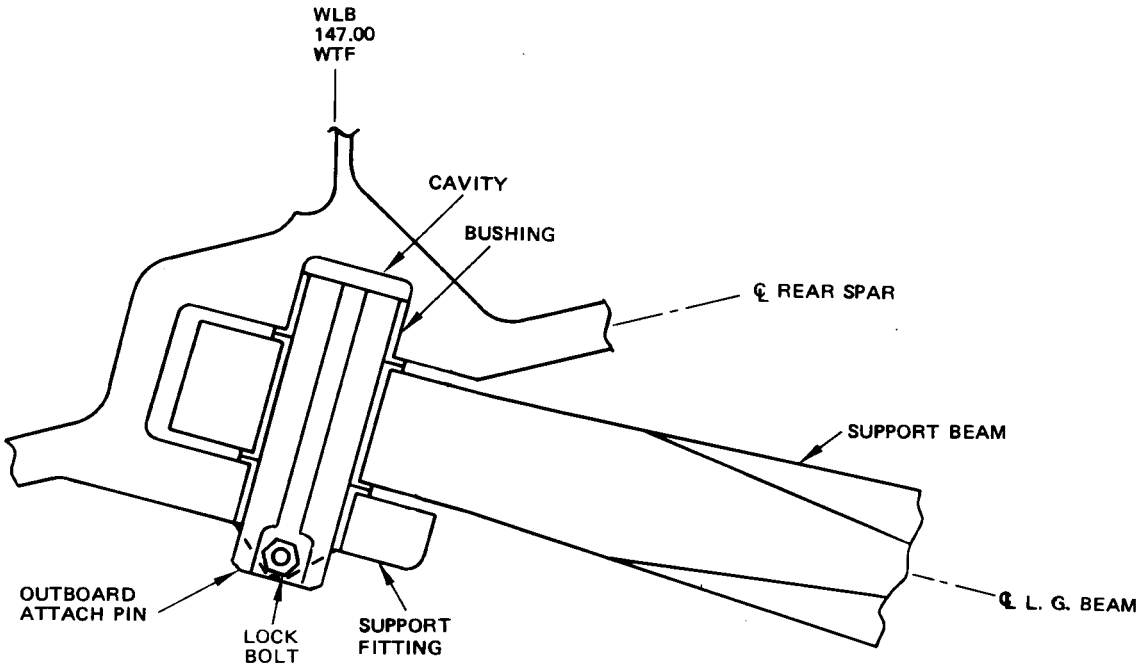
Landing Gear Support Beam Wear Limits (Config. 1)
Figure 601 (Sheet 1)



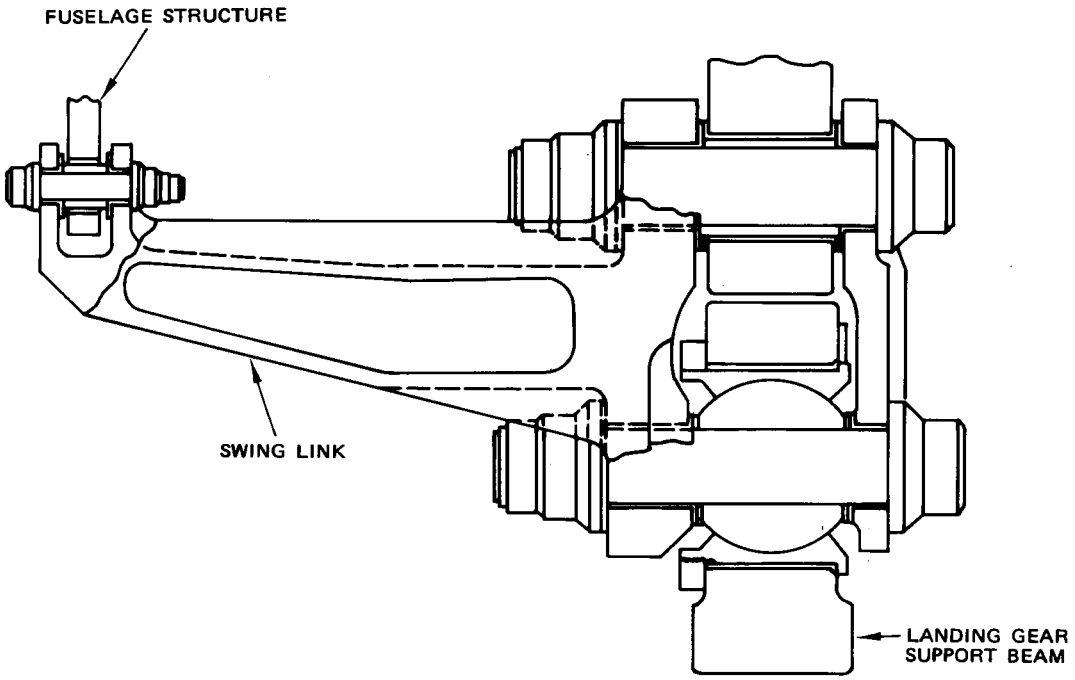
Landing Gear Support Beam Wear Limits (Config. 1)
Figure 601 (Sheet 2)

Landing Gear Support Beam Wear Limits (Config 1)
Table 601

INDEX NO.	PART NAME	DIM	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		ALLOWED WEAR DIM.	MAX DIAM CLEAR.			
			MIN	MAX					
1	BUSHING	ID	1.1250	1.1265	1.1320	0.008	X		
	PIN	OD	1.1225	1.1240	1.1170		X		
2	BUSHING	ID	1.1245	1.1260	1.1300	0.006	X		
	BOLT	OD	1.1225	1.1240	1.1185		X		
3	BUSHING	ID	1.1305	1.1320	1.1390	0.015	X		
	BOLT	OD	1.1225	1.1240	1.1155		X		
4	BUSHING	ID	1.4375	1.4390	1.4445	0.008	X		
	BUSHING	OD	1.4350	1.4365	1.4255		X		
5	BUSHING	ID	0.4995	0.5005	0.504	0.006	X		
	BOLT	OD	0.4990	0.4995	0.498		X		
6	BUSHING	ID	0.7500	0.7515	0.7566	0.010	X		
	BUSHING	OD	0.7456	0.7466	0.7400		X		
7	BUSHING	ID	1.1245	1.1260	1.1300	0.006	X		
	BOLT	OD	1.1225	1.1240	1.1185		X		
8	BUSHING	ID	1.4375	1.4390	1.4445	0.008	X		
	BUSHING	OD	1.4350	1.4365	1.4255		X		
9	BUSHING	ID	0.4995	0.5005	0.5025	0.003	X		
	BOLT	OD	0.4990	0.4995	0.4965		X		
10	BUSHING	ID	0.4995	0.5005	0.5025	0.003	X		
	BOLT	OD	0.4990	0.4995	0.4965		X		

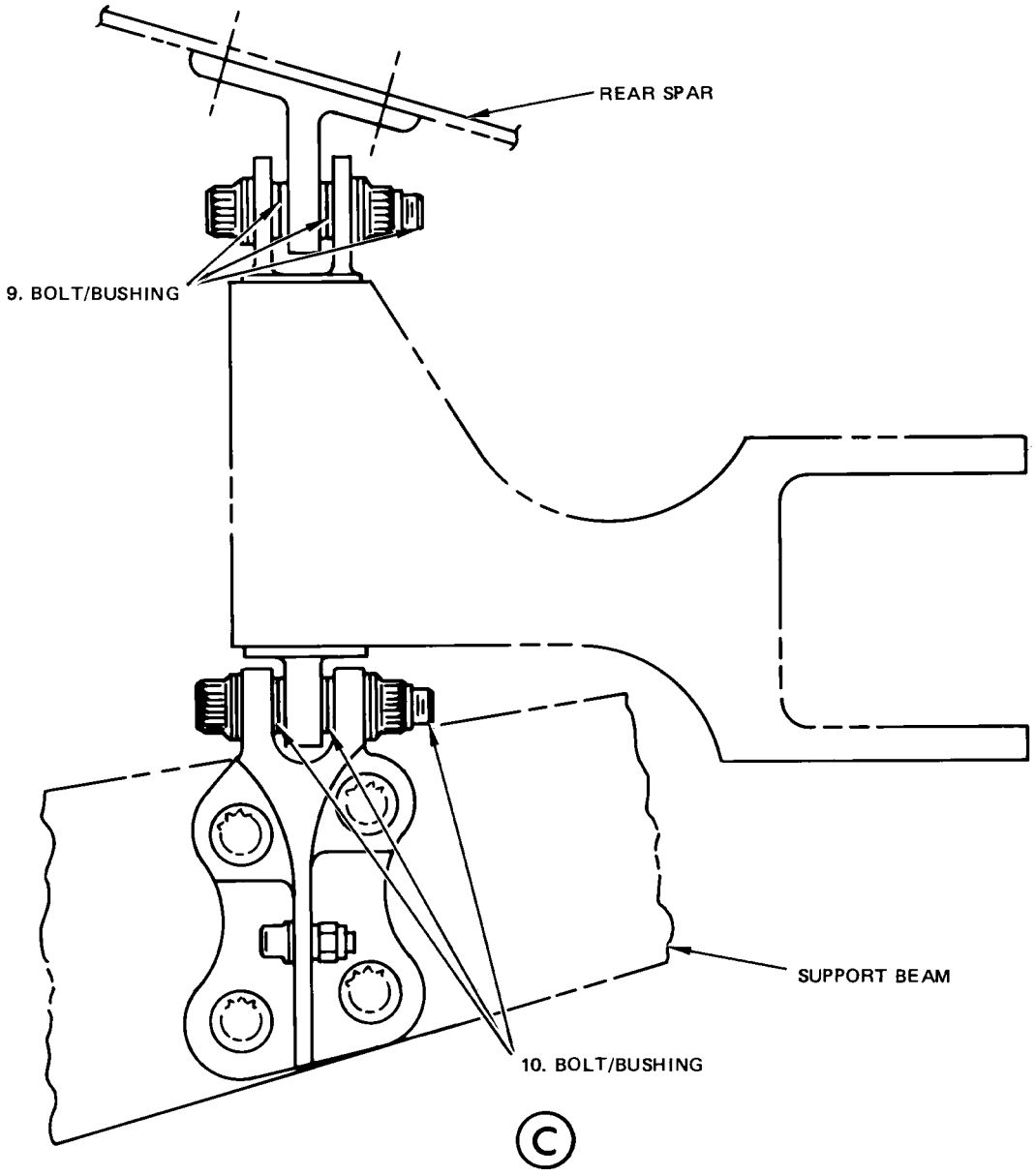


SECTION A-A



SECTION B-B

Landing Gear Support Beam Wear Limits (Config. 2)
Figure 602 (Sheet 1)



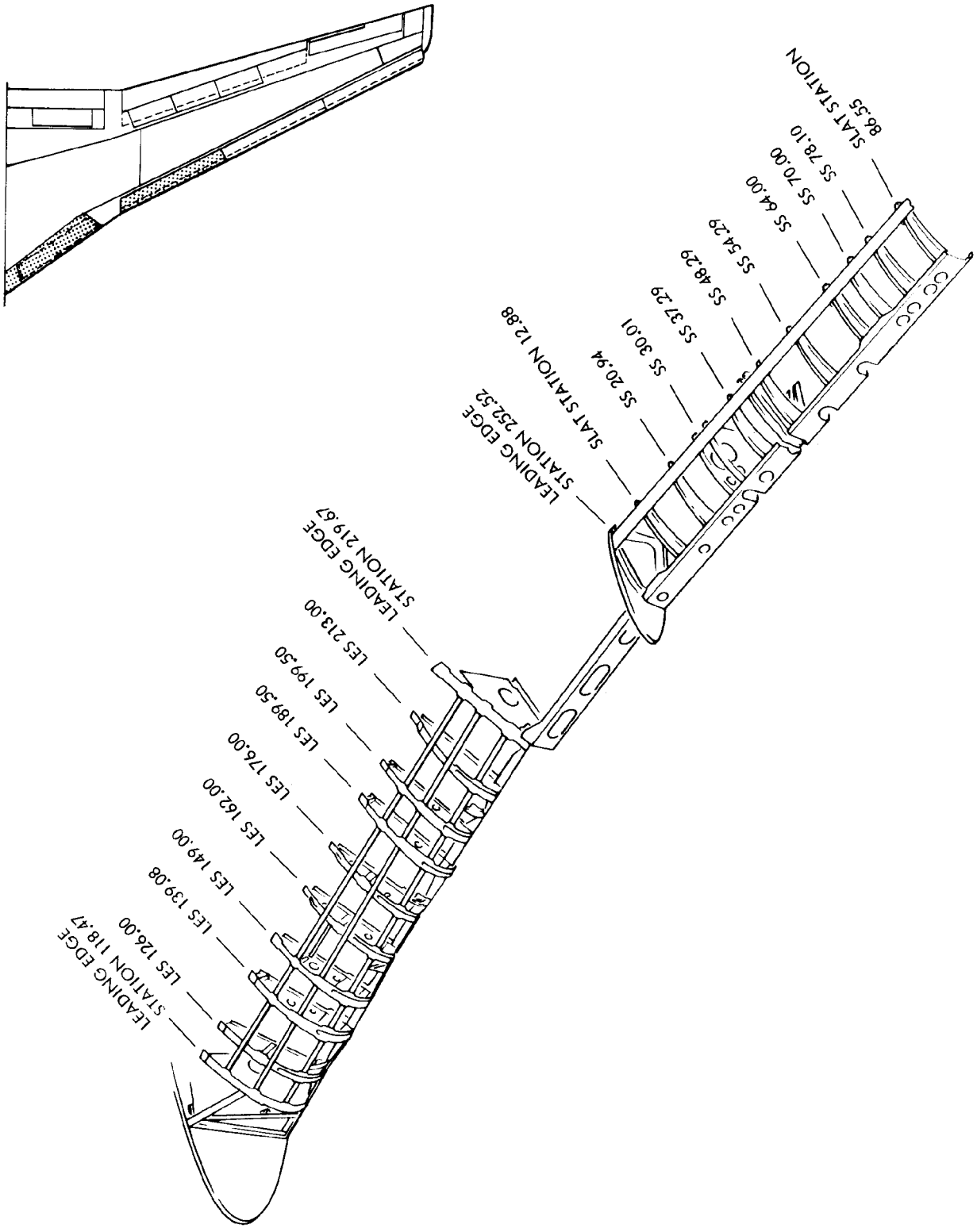
Landing Gear Support Beam Wear Limits (Config. 2)
Figure 602 (Sheet 2)

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
			DIAMETER		ALLOWED WEAR DIM.	MAX DIAM CLEAR-ANCE			
			MIN	MAX					
1	BUSHING	ID	1.3140	1.3150	1.3215	0.008	X		
	PIN	OD	1.3100	1.3115	1.3040		X		
2	BUSHING	ID	1.3750	1.3760	1.378	0.006	X		
	BOLT	OD	1.3735	1.3745	1.372		X		
3	BEARING	ID	1.3750	1.3760	1.378	0.006	X		
	BOLT	OD	1.3735	1.3745	1.372		X		
4	BEARING RACE	ID	3.000	3.002	3.0045	0.0105	X		
	BEARING	OD	2.999	3.000	2.9940		X		
5	BUSHING	ID	0.4995	0.5005	0.504	0.006	X		
	BOLT	OD	0.4990	0.4995	0.498		X		
6	BUSHING	ID	0.7500	0.7515	0.7566	0.010	X		
	BUSHING	OD	0.7456	0.7466	0.7400		X		
7	BUSHING	ID	1.3750	1.3760	1.378	0.006	X		
	BOLT	OD	1.3735	1.3745	1.372		X		
8	BUSHING	ID	1.7500	1.7515	1.7530	0.007	X		
	BUSHING	OD	1.7475	1.7490	1.7460		X		
9	BUSHING	ID	0.4995	0.5005	0.5025	0.003	X		
	BOLT	OD	0.4990	0.4995	0.4965		X		
10	BUSHING	ID	0.4995	0.5005	0.5025	0.003	X		
	BOLT	OD	0.4990	0.4995	0.4965		X		

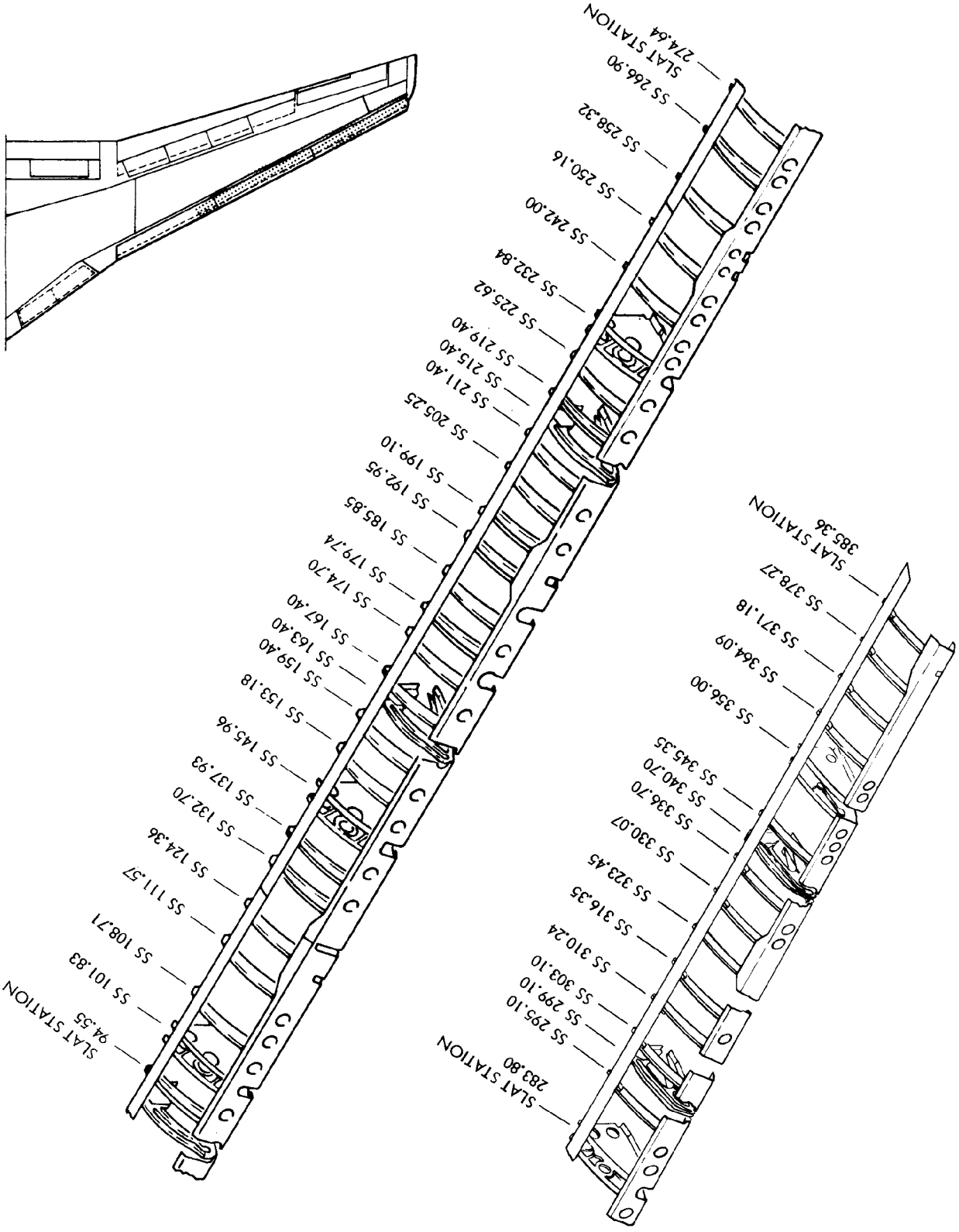
Landing Gear Support Beam Wear Limits (Config 2)
Figure 603

AUXILIARY STRUCTURE - DESCRIPTION AND OPERATION

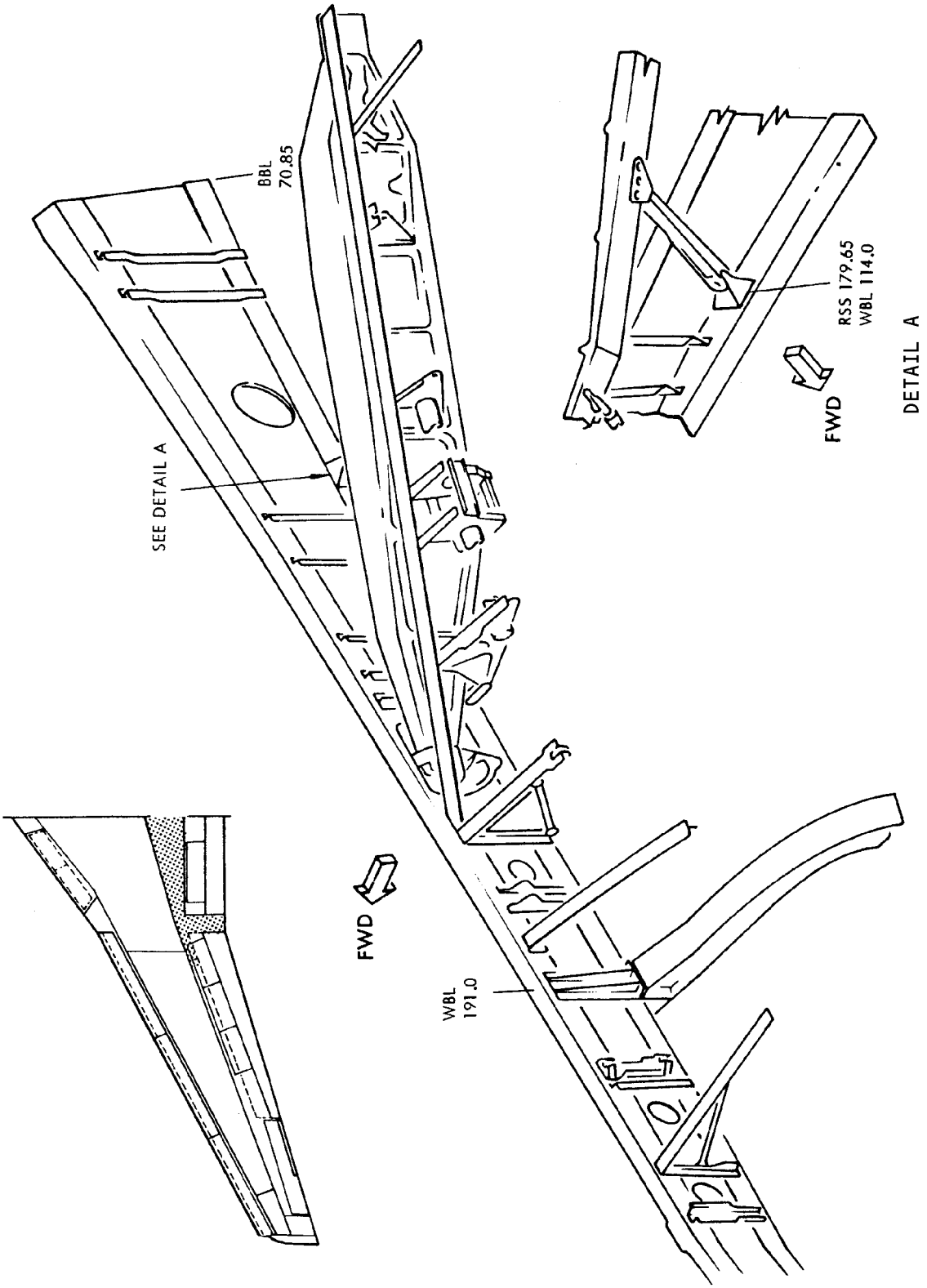
1. General
   A. The auxiliary structure consists of those structural wing components which are outside the main frame. Therefore the auxiliary structures are the leading edge, the trailing edge, the wing tip and the flight controls. The structural composition of the flight controls is described in 57-50-0.
2. Leading Edge Structure
   A. The leading edge structure (figure 1) in the area of the flaps consists generally of a series of flanged ribs attached to the upper forward face of the wing front spar, each rib being additionally supported by a short tubular brace between the lower side of its forward end and the lower forward face of the wing front spar. The upper edges of the ribs carry the leading edge skin. The flap hinges are attached to the forward ends of the ribs.
   B. The leading edge structure (figure 2) in the area of the slats consists of slat guides and actuators supported between pairs of flanged ribs mounted on the forward face of the wing front spar web.
3. Trailing Edge Structure
   A. The trailing edge structure consists of brackets and stiffeners cantilevered aft of the wing rear spar. Certain of the brackets within this structure serve to support the hinge fittings for the ailerons.
   B. The tracks carrying the inboard and outboard trailing edge flaps are described in 57-42-0.
   C. The spoilers are supported by brackets extending aft from the aft faces of the rear spar and the landing gear support beam.
4. Wing Tip Structure
   A. The left and right wing tips are similar in structure. The wing tip consists of the structure outboard from the tank end rib and outboard from the leading edge and the aileron. (See figure 3.)



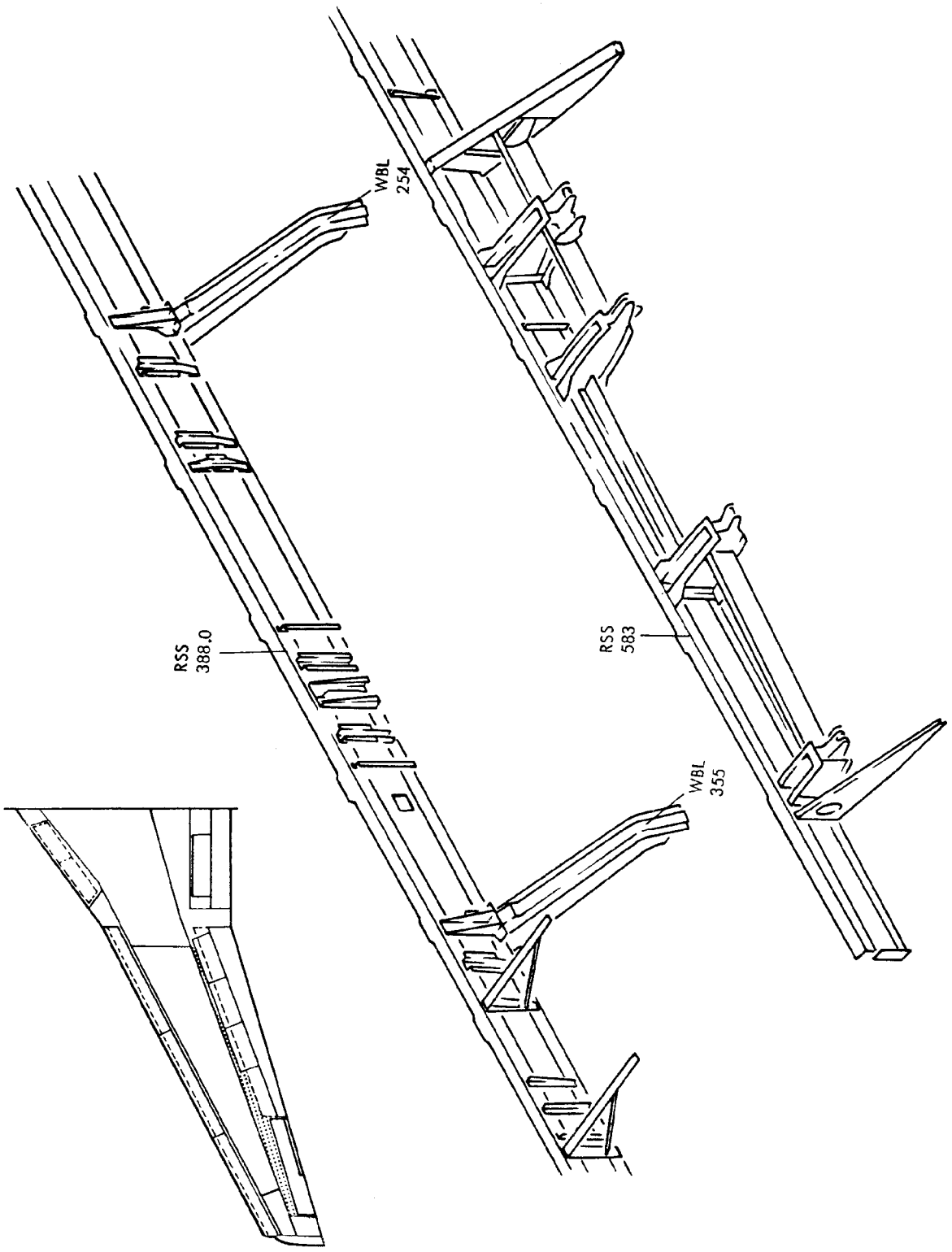
Wing Leading Edge Structure
Figure 1 (Sheet 1)



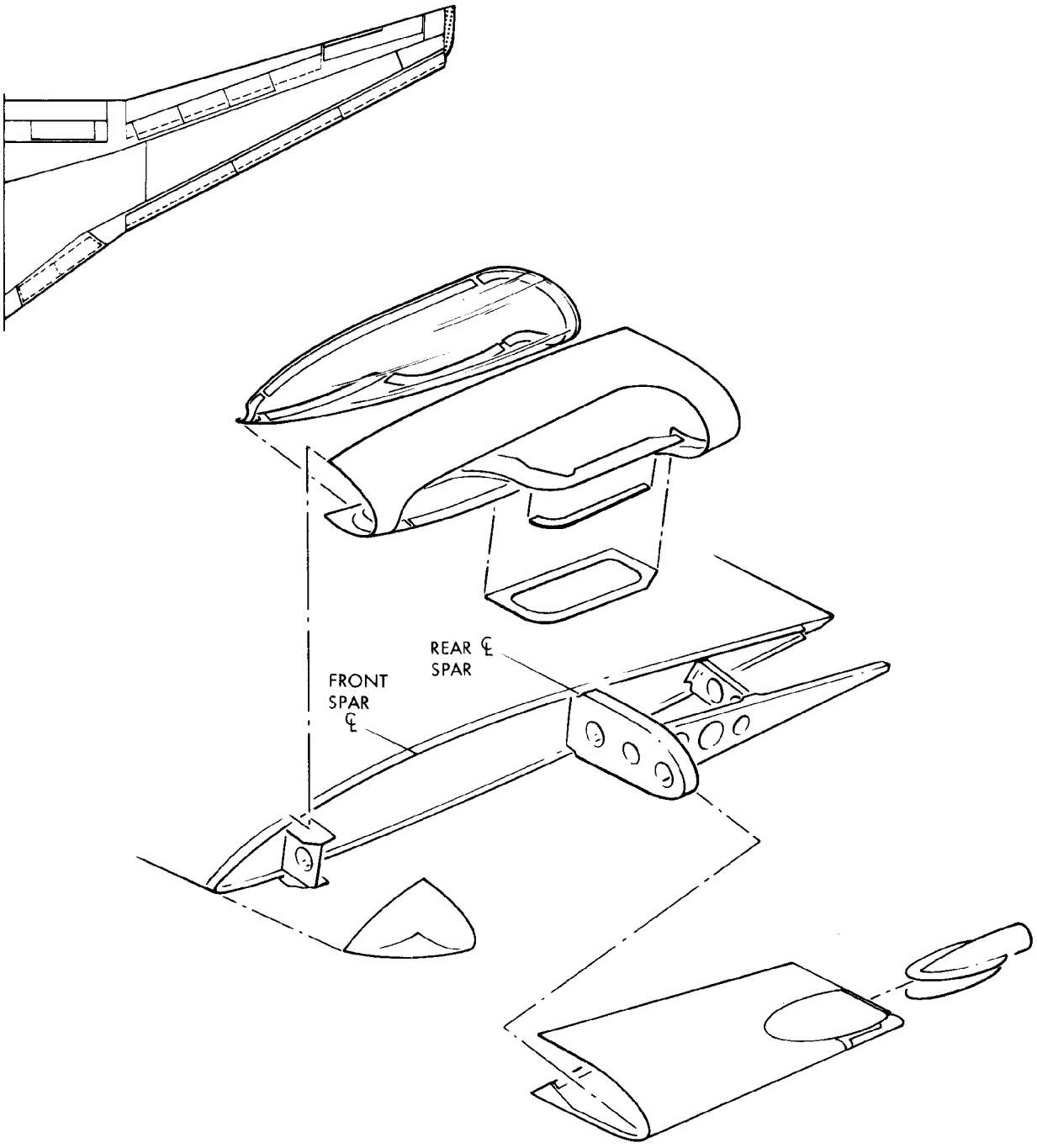
Wing Leading Edge Structure
Figure 1 (Sheet 2)



Wing Trailing Edge Structure
Figure 2 (Sheet 1)



Wing Trailing Edge Structure
Figure 2 (Sheet 2)



Wing Tip Structure
Figure 3

REMOVABLE WINGTIP - REMOVAL/INSTALLATION

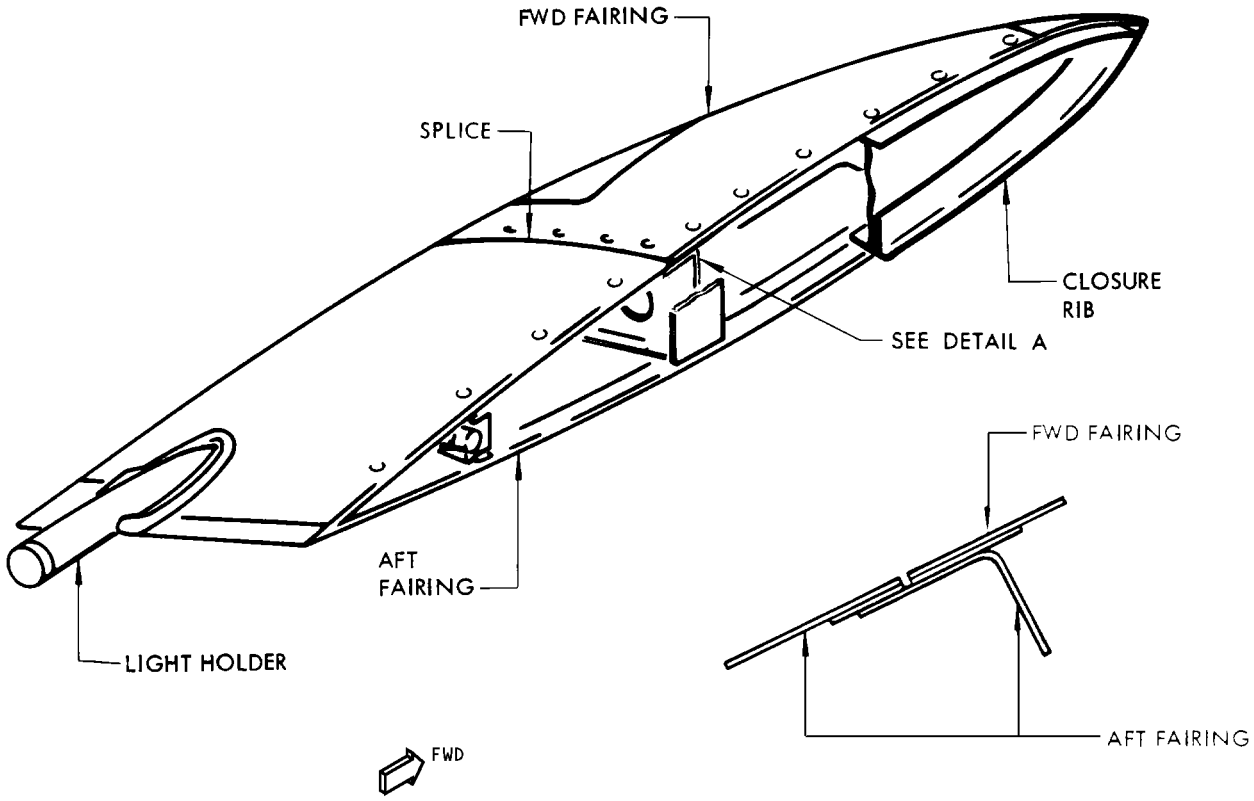
1. General
   A. The removable wingtip consists of the forward fairing, or navigation light window, and the aft fairing. The forward fairing is removable separately, but in order to remove the aft fairing, the forward fairing must be removed first (Fig. 401).
2. Removal/Installation Forward Fairing
   A. Equipment and Materials
      (1) Faying surface sealant - BMS 5-79, class B or BMS 5-95, class B (Ref 20-30-11)
   B. Remove Forward Fairing
      (1) Remove fasteners from wing tip closure rib and from wing tip splice (Fig. 401).
      (2) Remove fairing carefully to avoid breakage.

          NOTE: Faying surface seal may cause fairing to stick to structure in some areas. In such areas, fairing must be pried away from structure carefully to avoid breakage.

   C. Install Forward Fairing
      (1) Prepare faying surfaces for sealing per Chapter 51, Seals and Sealing.
      (2) Apply removable faying surface seal per Chapter 51, Seals and Sealing.
      (3) Place fairing in position on wing tip closure rib and wing tip splice.
      (4) Install fasteners.

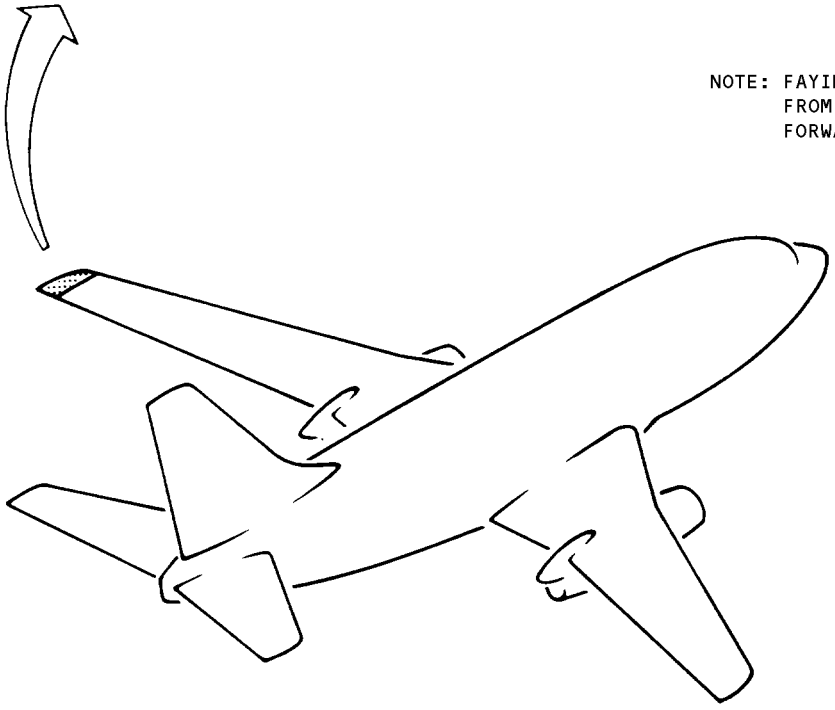
          NOTE: For replacement wing tip navigation light windows that require drilling and chamfering of fastener holes, refer to (57-21-11/401) Drilling and Chamfering of Fastener Holes, as needed.

3. Removal/Installation Aft Fairing
   A. Equipment and Materials
      (1) Faying surface sealant - BMS 5-79, class B or BMS 5-95, class B (Ref 20-30-11)
   B. Remove Aft Fairing
      (1) Remove forward fairing per paragraph 2.B.
      (2) Remove all fasteners along wing tip closure rib. (See figure 401).



DETAIL A

NOTE: FAYING SURFACE SEAL REQUIRED FROM CLOSURE RIB AND SPLICE TO FORWARD AND AFT FAIRING



Removable Wing Tip Installation
Figure 401

(3) Remove aft fairing.

NOTE: The faying surface seal may cause the fairing to stick to structure in some places. In such areas, the fairing must be pried away carefully.

(4) If wing tip is going to remain removed for any length of time, protect closure rib to avoid damage to sealing.

C. Install Aft Fairing

(1) Prepare faying surfaces for sealing per Chapter 51, Seals and Sealing.
(2) Apply removable faying surface seal per Chapter 51, Seals and Sealing.
(3) Place aft fairing in position on wing tip closure rib.
(4) Install all fasteners along wing tip closure rib.

NOTE: For replacement wing tip navigation light windows that require drilling and chamfering of fastener holes, refer to (57-21-11/401) Drilling and Chamfering of Fastener Holes, as needed.

(5) Install forward fairing per paragraph 2.C.

4. Drilling and Chamfering of Fastener Holes, as needed (Fig. 402).

A. Equipment and Materials.

(1) Drill Bit - Boeing Standard Tool ST10-1257-B, .281 Dia., or equivalent.
(2) Rotary File - Nicholson 50173, or equivalent.

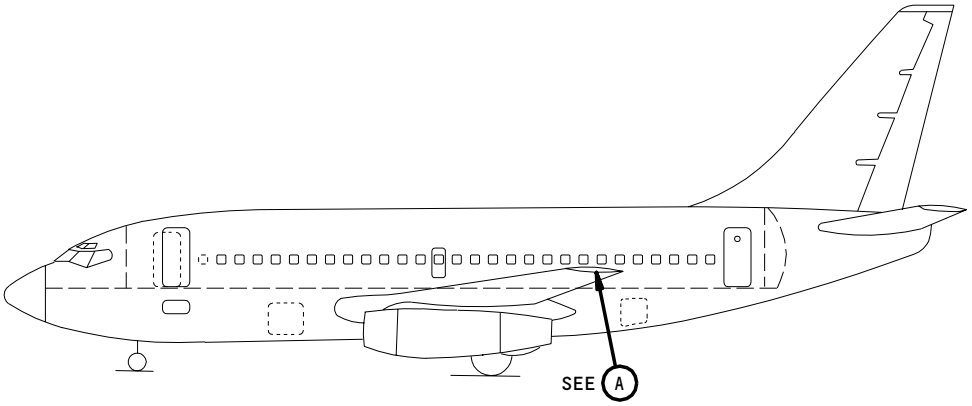
B. Procedure

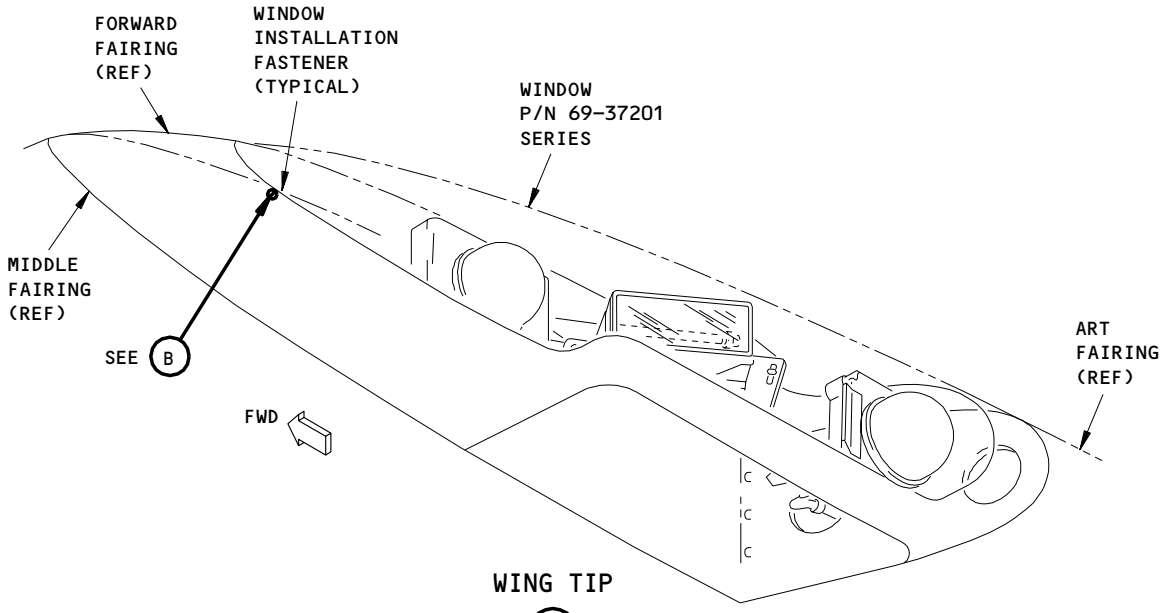
(1) Drill a hole in the wing tip navigation light window at all fastener locations (Fig. 402).

CAUTION: INCORRECT DRILLING CAN MAKE MICROSCOPIC SIZE AND LARGER FLAWS THAT CAN CAUSE IN-SERVICE CRACKING IN THE WINDOW. ADDITIONALLY, INCORRECT DRILLING MAY OVERHEAT THE SURROUNDING MATERIAL AROUND THE HOLE WHICH MAY MAKE RESIDUAL STRESSES THAT MAY ALSO LEAD TO IN-SERVICE CRACKING OF THE WINDOW.

NOTE: Use a drill speed of 1200 to 1500 RPM. Cutters should be kept at a near room temperature when drilling successive holes.

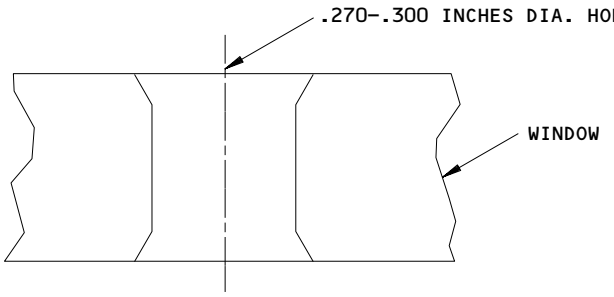
(2) Use the file to make a chamfer at each fastener location (Fig. 402).





WING TIP

A



45-55 DEGREES BY .02 TO .04 INCHES DEEP
(TYPICAL)

B

Drilling and Chamfering of Fastener Holes
Figure 402

REMOVABLE WING TIP - APPROVED REPAIRS

1. Forward Fairing Approved Repairs
   A. General
      (1) The forward fairing, or navigation light window, is made of acrylic plastic. Repairs of plastic window must not create noticable optical distortion over more than 10% of the window area.
   B. Equipment and Materials
      (1) Drill - 1/4 inch or 3/8 inch
      (2) Cement - PS-18 or EC-2216B/A clear (Ref 20-30-11)
      (3) Abrasive paper - Wet-or-dry 240, 280, 320, 400, 600 grit
      (4) Acrylic plastic sheet - Plexiglass 55, 0.10 inch thick
      (5) Cleaning solvent - Aliphatic Naptha (Ref 20-30-31)
      (6) Soap and water
      (7) Masking tape
      (8) Cellophane
      (9) Clean cloth - chamois and cotton flannel
      (10) Rubber block (durometer reading of 35 ± 5, Shore A scale) or wood block
      (11) Buffing wheels
         (a) Stitched muslin wheels - 4 inches to 10 inches diameter
         (b) Unstitched muslin wheels - 4 inches to 10 inches diameter
      (12) Buffing compounds
         (a) Learock No. S-30 (Ref 20-30-51)
         (b) Learock No. 888 (Ref 20-30-51)
         (c) 0000 rouge
         (d) Dupont 7 (Ref 20-30-51)
         (e) Polysand (Ref 20-30-51)
      (13) Wax - Simonize (Ref 20-30-51)
   C. Examine the lens for cracks to determine if the lens is repairable.

      NOTE: Do these repairs before the defects are more than the crack limits.

      (1) Cracks in acrylic plastic not longer than five inches are repairable.
      (2) Continuous cracks in the acrylic plastic, which extend across the lens from one fastener hole to another in multiple locations, are acceptable provided a minimum of two fasteners are on each side of the crack.
      (3) If a continuous crack is found, inspect the lens during each subsequent A check and replace the lens at the next C check.

D. Prepare for Repair
   (1) Prepare cement PS-18 (Component A - base, Component B - catalyst, Component C - promoter).
      (a) Add one capsule (2.4 grams) of component B to 4 fluid ounces (118cc) of component A and dissolve by stirring. This mixture can be stored up to 24 hours at 35-40°F.
      (b) Just before using, add 5 cc of component C to the above mixture and stir thoroughly. The pot life of this cement at 75°F is 10 minutes.

         WARNING: THE FOLLOWING PRECAUTIONS MUST BE OBSERVED IN USING THIS CEMENT: DO NOT MIX COMPONENT B DIRECTLY WITH COMPONENT C AS A VIOLENT REACTION WILL OCCUR. AVOID CONTACTING THE SKIN WITH COMPONENT C. WASH CONTACTED SKIN AREAS IMMEDIATELY WITH SOAP AND WATER.

   (2) Prepare Cement EC-2216B/A
      (a) Blend equal parts by weight of EC-2216B (base) and EC-2216A (accelerator). Pot life of the blended adhesive is about 90 ± 10 minutes at 70-80°F.

E. Repair Cracks in Forward Fairing
   (1) Stop drill the crack by drilling a 1/4 inch or 3/8 inch diameter hole at the end of the crack.

      NOTE: CARE MUST BE TAKEN IN DRILLING AS THE ACRYLIC IS EASILY CRACKED. IT IS SUGGESTED THAT PRACTICE HOLES BE DRILLED IN 0.10 INCH THICK PLEXIGLASS 55 SHEET MATERIAL.

   (2) Smooth hole by sanding to eliminate all cracks or chips in the acrylic.
   (3) Cut out a 0.10 inch thick Plexiglass 55 plug to fit hole drilled in acrylic. The fit must be accurate.
   (4) Bond the plug in the fairing with either cement using the following method:
      (a) Roughen faying surface with 240 grit wet-or-dry paper.
      (b) Clean faying surface with aliphatic naptha or soap and water followed by aliphatic naptha.
      (c) Let faying surfaces dry.
      (d) Mask surrounding plastic covering the surface to within 1/32 inch of the bonding area with tape.

         NOTE: Masking shall extend a minimum of one inch parallel to the joint.

      (e) Apply a light coat of adhesive to both faying surfaces.
      (f) Join the surfaces immediately after coating.

(g) Wipe excess cement onto the masking material if possible. Cover exposed cement with cellophane to prevent inhibition of cure by the air.

F. Restore Airplane to Normal

(1) Parts cemented with PS-18 may be machined after five hours at room temperature.

(2) Parts cemented with EC-2216B/A must be cured 24 hours at room temperature, or 130 ± 10 minutes at 160 ± 10°F before handling or use.

(3) If the cement greatly reduces the transmission in the repaired area, it should be sanded and polished per the following to restore original surface smoothness:

(a) Remove masking and flush all unmasked areas with clean water to remove dirt and grit.

(b) Wash with soap and water. A soft cloth, or chamois may be used in washing, but only as a means of carrying the soapy water to the plastic. Go over the surface with a bare hand so that any adhesive can be quickly detected and removed.

(c) A clean, damp chamois should be used for drying. A clean cotton-flannel cloth may be used if care is taken to avoid rubbing after the acrylic is dry.

(d) Remove oil and grease by wiping lightly with a cloth saturated with aliphatic naptha. Dry with a clean cotton-flannel cloth.

NOTE: Acrylic plastics shall never be rubbed with a dry cloth. To remove a light dust film or electrostatic charges, wipe the surface with a clean, damp chamois or a clean, damp cotton-flannel cloth.

(e) Sand the married plastic surface with progressively finer grits of wet-or-dry abrasive papers (280, 320, 400, 600) to the desired finish. Abrasive papers shall be wrapped around a rubber block having a durometer reading of 35 ± 5, Shore A scale, or a wood block covered with cotton- flannel. Keep the surface covered with water while sanding. Use extreme care to avoid overheating. Hold sanded area to a minimum needed to achieve a satisfactory repair. A smooth repair blended with the surrounding area is desirable. However, this blending shall not enter a critical vision area.

(f) During each step, the deeper scratches left by the preceeding grade of adhesive should be removed. Wash with water each time the grit is changed. After smooth, even surface is obtained, wash with water until grit has been removed.

(g) Polish per the following to produce an optical finish:
   1) Machine polishing is preferred when the equipment and a qualified operator are available. Contact pressure, feed rate and wheel speed must be balanced to prevent overheating. For preliminary buffing use a stitched muslin wheel and Learock S-30 buffing compound. Change direction of feed frequently and use only light pressure. For a high luster, finish with a loose, open, unstitched wheel with spacers and Learock 888 buffing compound. (To make spacers, remove all the muslin discs, and with scissors, reduce half of them to 1/2 the original diameter. Re-assemble the wheel, alternating the large discs with the small ones.) This wheel will substantially reduce surface heating due to friction.
   2) When polishing machines and qualified operators are not available, hand polishing may be used as follows: Polish the area to the desired finish with 0000 wet rouge applied to a wet cotton-flannel pad. Apply a polish to a clean, wet cotton-flannel pad and polish to desired finish. Wipe with a clean cotton-flannel cloth.

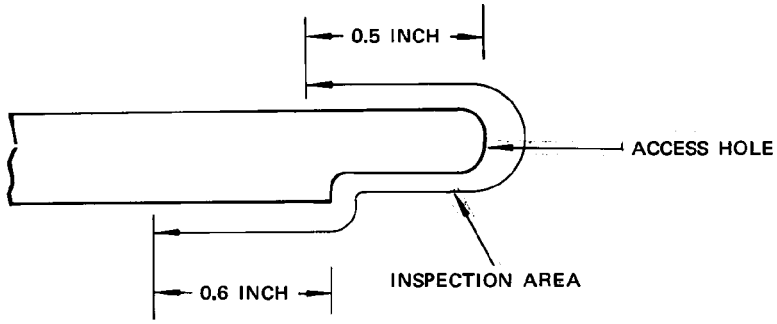
(h) Apply a thin, even film of wax with a clean cotton-flannel pad and bring to a high luster by rubbing lightly with a circular motion.

PLATES/SKIN - DESCRIPTION AND OPERATION

1. General
   A. The exterior surface of the wing comprises the wing skin and the flight control surfaces attached to the wing. This section describes the wing skin, which can be divided into skin of primary and secondary structural importance.
   B. The majority of the wing skin is a component of the wing boxes and the center wing box, of which it forms the upper and lower surfaces.
   C. The remainder of the wing skin forms the surfaces of the leading and trailing edge fairings and of the wingtip, and is of secondary structural importance.
2. Primary Wing Skin
   A. The left and right wing box structures are continuous and have no production joints. This feature allows the upper and lower wing skin panels to be continuous on each wing from tip to root. The wing inspar upper skin is in two sections, spliced in the spanwise direction. The entire upper inspar skin is made from 7178 aluminum alloy. The wing inspar lower skin is made in three sections spliced in the spanwise direction and pierced by the openings for fuel tank access holes and fuel pump access holes. Refer to AMM Chapters 52 and 57 of the Structural Repair Manual for wear limits on tank doors and tank door openings respectively. All the lower inspar skin is made from 2024 aluminum alloy, the most suitable material for withstanding the heavy tensile loads on the lower surface, and is shotpeened to give additional fatigue life besides forming the curvature of the wing. The inside surface of both upper and lower wing skins is attached directly to the edges of the zee-section wing stringers. The upper and lower skin panels of the center wing box are also attached directly to similar internal stringers. At the outboard ends of the center wing box, the upper and lower skins are connected to the upper and lower skins of the left and right wings by heavy chordwise splice extrusions which follow the lines of the upper and lower edges of the wing root ribs.
3. Secondary Wing Skin
   A. Many of the larger areas of fairing skin are laminated honeycomb panels. Several sections of the lower surface are removable for access purposes.
   B. The lower wing leading edge skin associated with each slat incorporates one pressure relief door. The door is spring-loaded and will open when cavity pressure reaches 1.5 psig.

PLATES/SKIN - INSPECTION/CHECK

1. Plates/Skins Inspection
   A. Fuel Tank and Boost Pump Access Panel Openings Inspection
      (1) General
         (a) Examine fuel tank and boost pump openings when a fuel tank access panel is removed or a boost pump access door is opened.
      (2) Examine Fuel Tank and Boost Pump Access Panel Openings
         (a) Examine skin around perimeter of fuel tank and boost pump access panel openings in the area shown in figure 601.
         (b) Rework nicks, scratches, corrosion, fretting, wear, or abrasion found in the edge of an access opening per Chapter 57 of the Structural Repair Manual

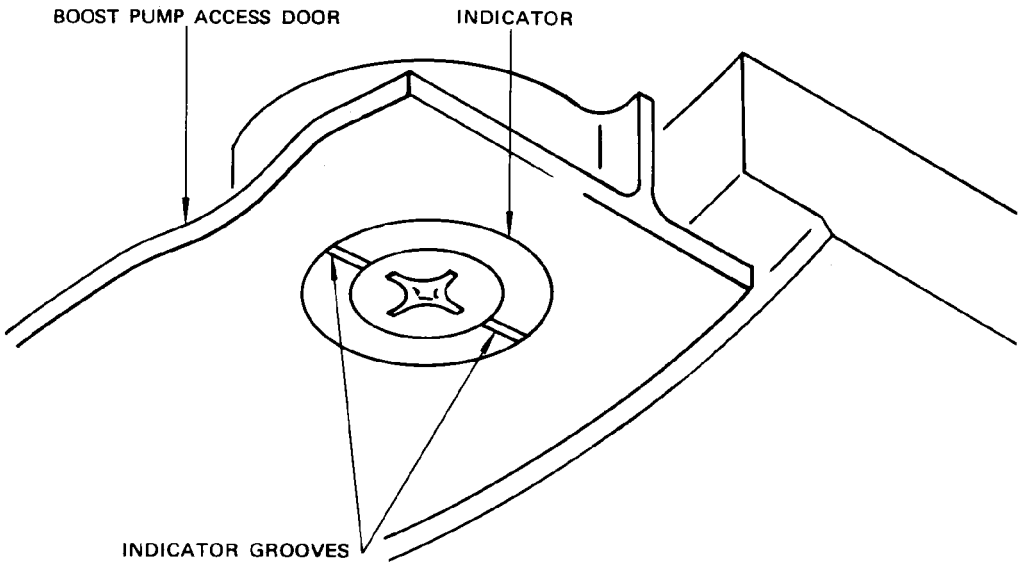


Fuel Tank and Boost Pump Access Openings Inspection
Figure 601

BOOST PUMP ACCESS DOOR - REMOVAL/INSTALLATION

1. General
   A. The boost pump access doors are secured in locked position by clamp latches. The latches incorporate indicators with a groove to supply visible indication that the latch is in the locked position.
2. Remove Boost Pump Access Door
   A. Unscrew fasteners with hand screwdriver until grooves in indicator are parallel with edge of skin cutout. (See figure 401.)
   B. Disengage bonding jumper.
   C. Remove panel.
3. Install Boost Pump Access Door
   A. Install bonding jumper.
   B. Check that long end of latch will provide clamping action to secure door.
   C. Place panel in position and tighten fasteners. (See figure 401.)

      NOTE: Indicator will turn with latch when screw is tightened. When grooves in indicator are perpendicular to edge of skin cutout, latch is in closed position. When the screws are tight, the panel is secure.



Boost Pump Access Door
Figure 401

WING VORTEX GENERATORS - DESCRIPTION AND OPERATION

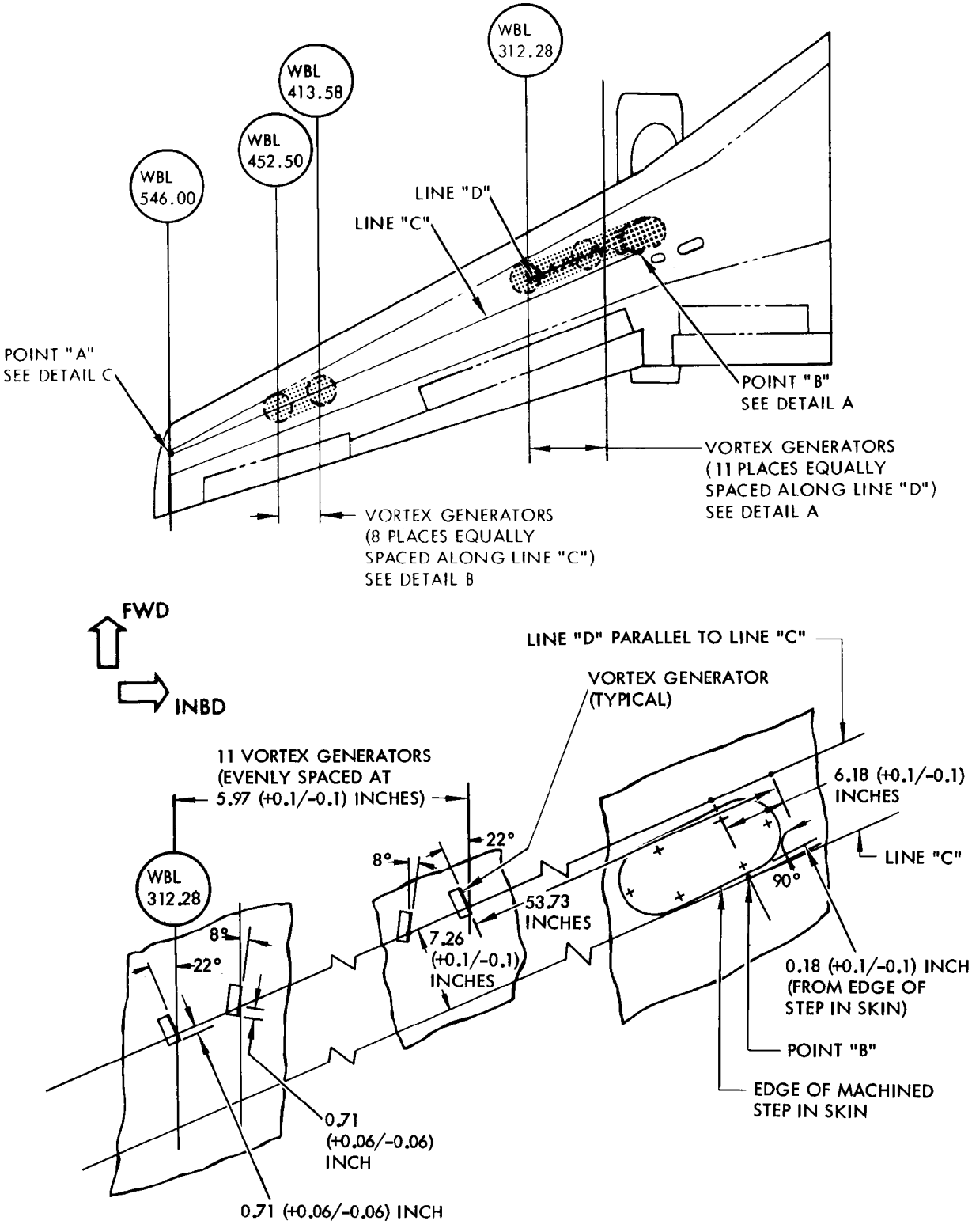
1. General
   A. Inboard and outboard rows of vortex generators are installed on both upper wing surfaces. The function of the vortex generators is to improve airflow across the wing surfaces.

WING VORTEX GENERATORS - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Hardwood Stick
   B. Solvent - Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (Ref AMM 20-30-88)
   C. Paint Stripper - Del Chem EZ (Ref 20-30-31)
   D. Adhesive - BMS 5-44 or BMS 5-95 Class B (Ref 20-30-11)
2. Remove Wing Vortex Generator
   A. Pry off loose vortex generator with hardwood stick.
3. Install Wing Vortex Generator
   A. Remove residual bonding agent (AMM 51-31-0/201).

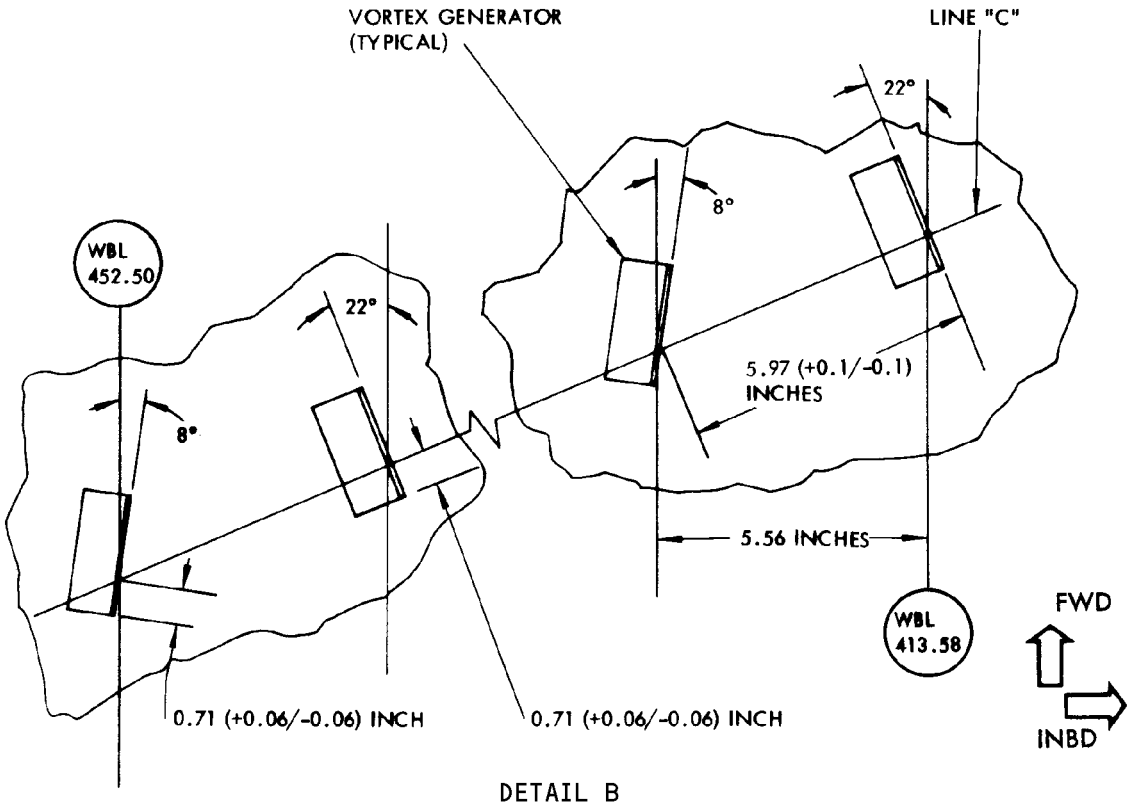
      CAUTION: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO REMOVE THE BONDING. IF YOU DO NOT OBEY THE INSTRUCTIONS, DAMAGE TO THE AIRPLANE SURFACE CAN OCCUR.

   B. Remove minimum amount of paint necessary to install vortex generator.
   C. Orient vortex generator per Fig. 401, with sloping edge pointing forward.
   D. Bond vortex generator to wing surface using 100% coverage. Form 0.06 inch by 0.06 inch fillet around edge of generator with excess adhesive.
      (1) Thoroughly blend base compound with activator in accordance with manufacturer's instructions. Adhesive shall not be thinned.
      (2) Apply a thin, uniform coat of blended adhesive to each faying surface.
      (3) Assemble immediately, applying sufficient pressure to ensure complete contact of the faying surfaces. A continuous bead of extruded adhesive usually indicates proper contact.
   E. After cure, apply paint to wing surface as required.

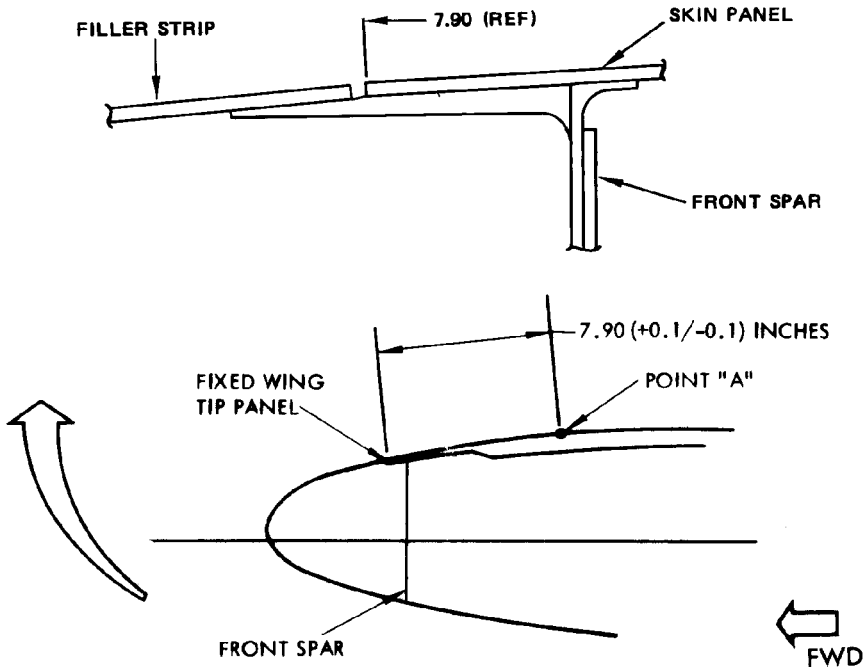


DETAIL A

Wing Vortex Generator Installation
Figure 401 (Sheet 1)



DETAIL B



DETAIL C

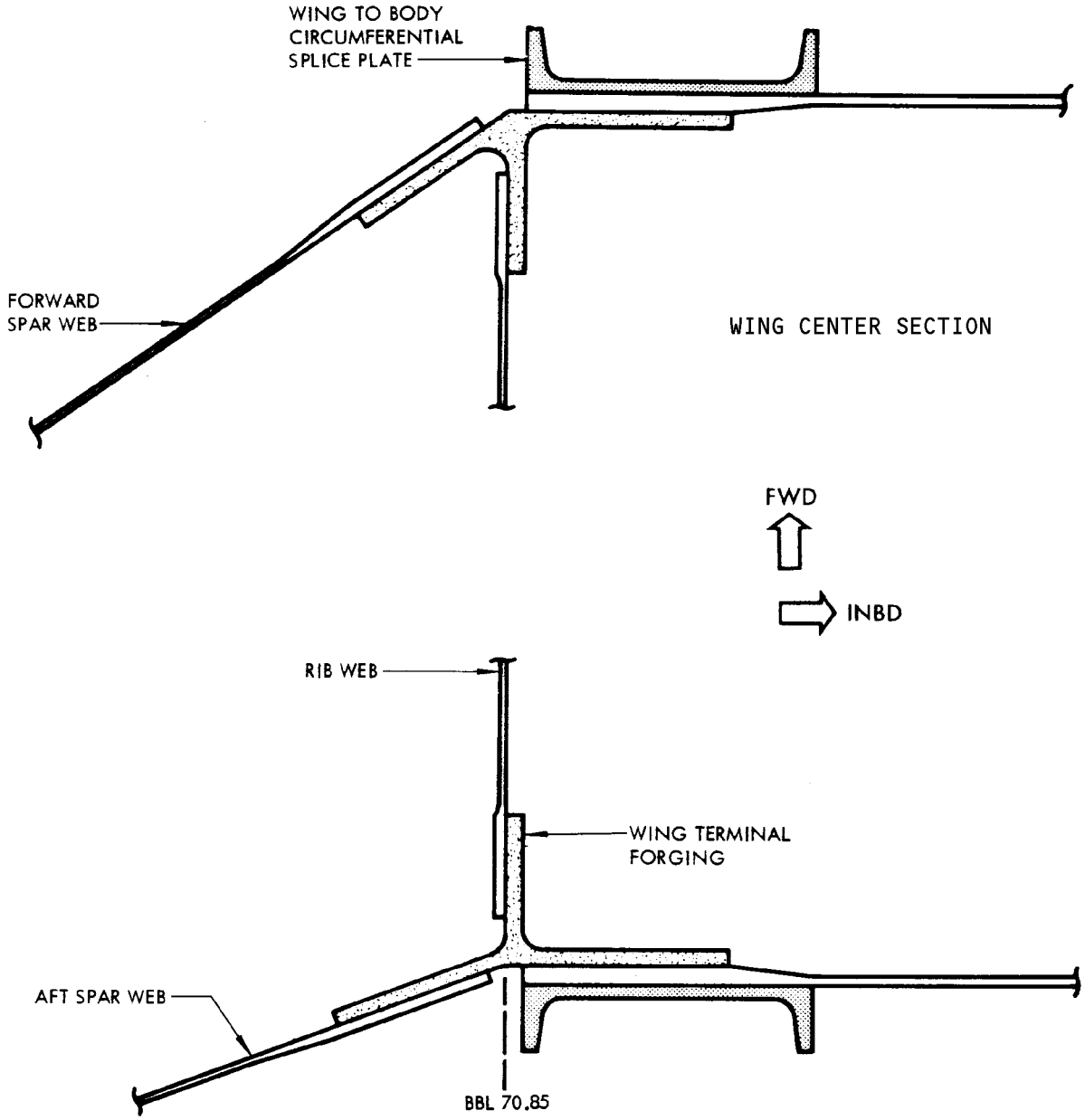
Wing Vortex Generator Installation
Figure 401 (Sheet 2)

ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. Fittings used as a means of connection between main structural parts are listed here.
      (1) Wing terminal fittings.
         (a) These are heavy three-flanged forged fittings (Ref to 57-41-0).
      (2) Flight control attach fittings.
         (a) These are fittings used to attach the flight control surfaces and their actuation mechanisms to the wing (Ref 57-42-0).
      (3) Landing gear attach fittings.
         (a) These are the fittings by means of which the main landing gear is attached to the wing and the fuselage. The fittings connecting the main landing gear doors and the wing are considered part of the landing gear attach fittings (Ref 57-43-0).
      (4) Engine hoist attach fittings.
         (a) Six fittings located on the bottom of the wing and attached to the front and rear spar permit the attachment of ground support equipment for removal and installation of engines. (Ref 57-44-0).

WING TERMINAL FITTINGS - DESCRIPTION AND OPERATION

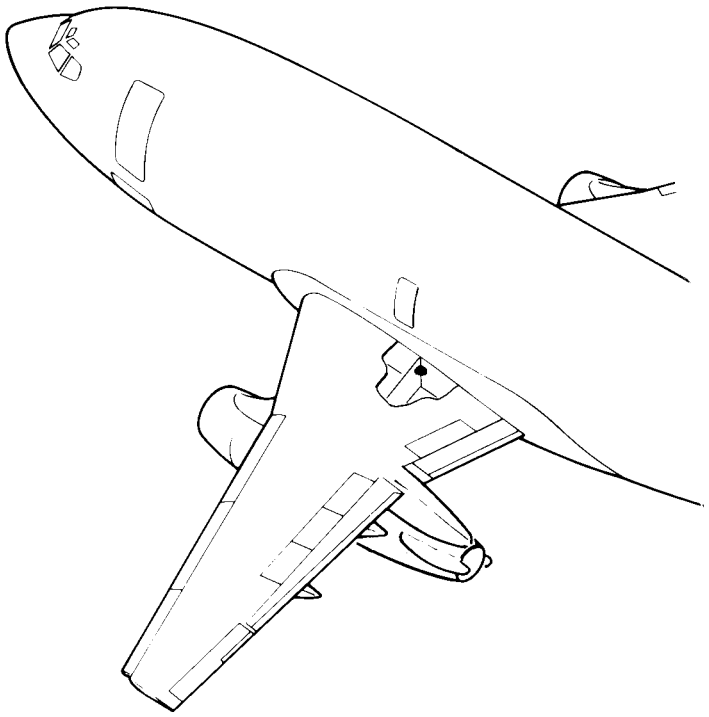
1. General
   A. The wing terminal fitting is a heavy three-flanged forging. (See figure 1.) There are four of these fittings, the two forward ones and the two aft ones. Though the concept of use is the same for the four fittings, the structure differs between the forward and the aft fittings. The flanges of the fitting act as a means of connection between the wing boxes and the center wing box.
2. Wing Box to Center Wing Box Connection
   A. The wing box to center wing box connection is accomplished by the use of the three flanges of the wing terminal fitting. The places of connection is at the four corners of the center wing box where three main members join: a wing box spar, a center wing box spar and a wing root rib. At any one corner of the center wing box, the two spars and the wing root rib are attached to the three flanges of the fitting.

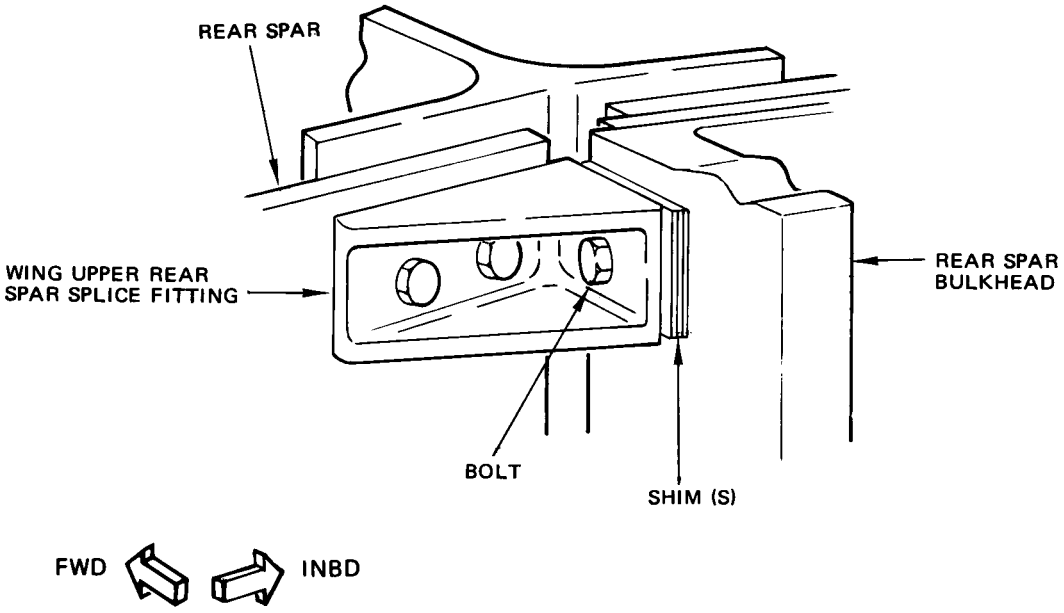


Wing Terminal Fittings
Figure 1

UPPER AFT WING-TO-FUSELAGE SHIM - REMOVAL/INSTALLATION

1. General
   A. The upper aft wing-to -fuselage shim is composed of combinations of one to three solid shims of varying thickness and one laminated shim. Part or all of the shim may be replaced as necessary. If all of the shim is to be replaced, it may be necessary to support the airplane to relieve the load from the wing (Ref Chapter 51, Structural Repair Manual).
2. Remove Upper Aft Wing-to-Fuselage Shim
   A. Remove bolt, nut, and washer securing shim to rear spar bulkhead and wing upper rear spar splice fitting (Fig. 401).
   B. Remove part of shim desired to be replaced or support airplane as necessary to remove all of shim.
3. Install Upper Aft Wing-to-Fuselage Shim
   A. Measure gap between rear spar bulkhead and wing upper rear spar splice fitting (Fig. 401).
   B. Select proper thickness of one tapered filler and flat fillers as necessary to fill gap. Maximum gap after insertion of fillers and prior to tightening bolt should not be more than 0.007 inch.
   C. Place fillers in position and drill a 0.4370 +0.0010/-0.0000-inch diameter hole through fillers to align with existing holes in rear spar bulkhead and splice fitting.
   D. Install bolt, wsher, and nut. Tighten nut 270 to 300 pound-inches.





Upper Aft Wing-to-Fuselage Shim Installation
Figure 401

FLIGHT CONTROL ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. The aileron attachment fittings consist of hinge and actuation mechanism fittings and these are mounted on the aft side of the rear spar, and to structure mounted on that spar.
   B. The trailing edge flap attachment fittings on each wing consist primarily of two pairs of flap tracks, one pair for each flap assembly. Each flap track is an H-section forging bolted to the lower edges of the wing rear spar and wing ribs, except the inboard track of the inboard flap which is attached to the inboard end of the landing gear support beam and the aft outboard side of the main landing gear wheel well.
   C. The leading edge flap attachment fittings consist of hinge fittings mounted along the forward edge of the leading edge structure, and actuator mountings on the forward face of the wing front spar.
   D. The leading edge slat attachment fittings consist of brackets which support the guide rollers and the actuators, all of which are attached to the forward face of the wing front spar.
   E. The spoiler attachment fittings consist of hinge fittings and the fittings which support the actuation mechanisms. The fittings associated with the outboard set of spoilers are mounted on the aft face of the wing rear spar, and those for the inboard spoilers are on the aft face of the wing rear spar and landing gear support beam.

LANDING GEAR ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. The landing gear attachments consist of fittings to which the gear side strut and reaction link connect, the forward and aft trunnion bearings, the landing gear door hinges and the actuator support beam fitting.
   B. The side strut and the reaction link are attached to fuselage fittings at body stations 685 and 695. the aft trunnion bearing is incorporated in the landing gear support beam. The forward trunnion bearing is mounted in a heavy forged fitting on the wing rear spar. The landing gear door is hinged from a short beam between the forward face of the landing gear support beam and the aft face of the wing rear spar. The outboard end of the actuator support beam is supported by a fitting attached between the landing gear support beam and the wing rear spar.

ENGINE HOIST ATTACH FITTING - DESCRIPTION AND OPERATION

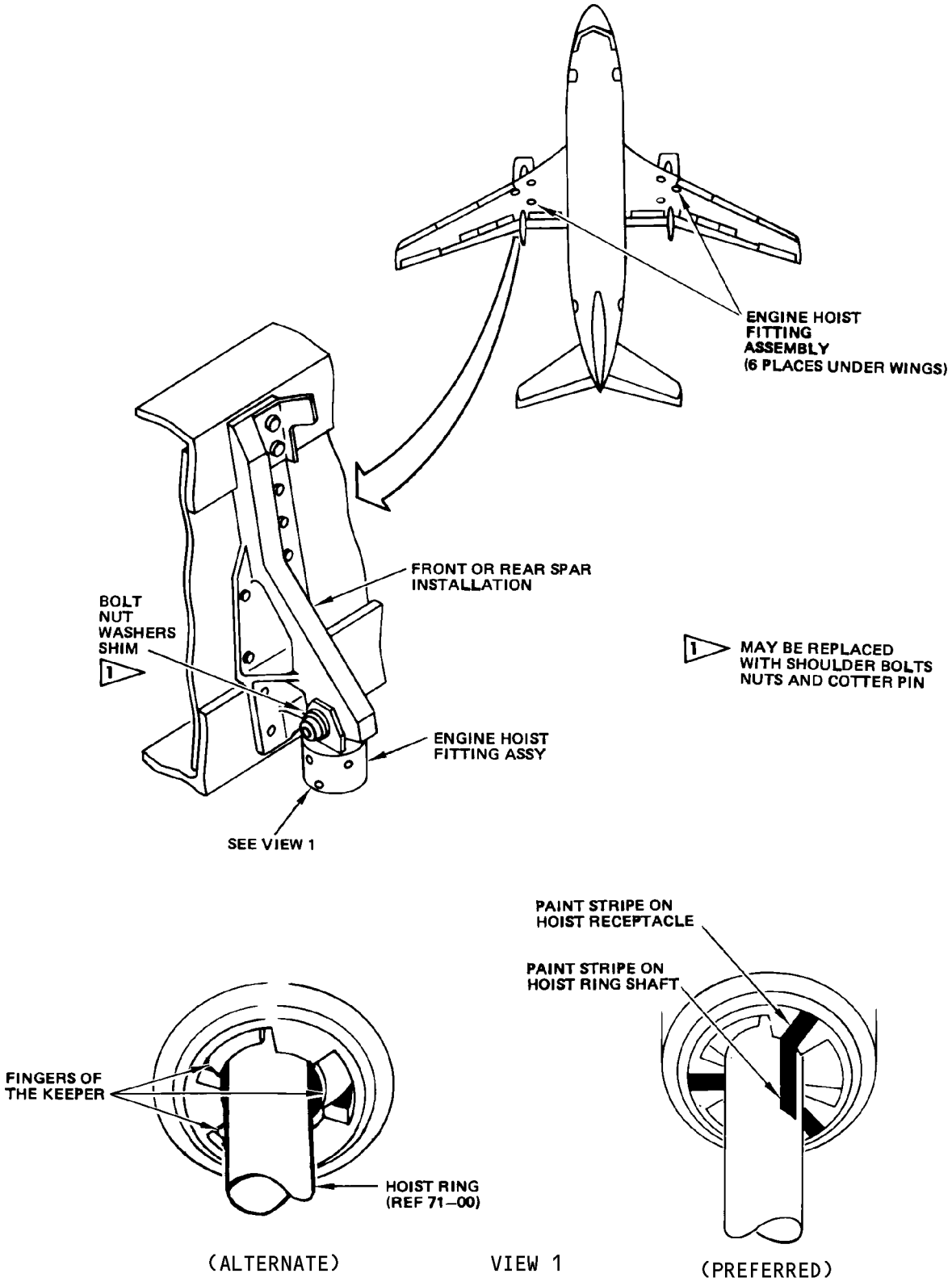
1. General
   A. Six engine hoist attach fittings are installed on the front and rear spars and are located behind access panels on the bottom surface of the wing. Four fittings are located on the forward spar, two on each wing. Two fittings are located on the aft spar, one on each wing.
   B. These fittings form a receptacle for the attachment of ground support equipment to the wing for removal and installation of engines (Ref 71-00, R/I).

ENGINE HOIST ATTACH FITTING - REMOVAL AND INSTALLATION

1. General
   A. The engine hoist attach fitting is located behind access doors 6275, 6376, 8475 on left wing lower surface and 6579, 6476, 8575 on right wing lower surface. One procedure is provided for all six fittings with differences in installation noted.
2. Remove Engine Hoist Attach Fitting (Fig. 401)
   A. Open applicable access panel on wing lower surface.
   B. On airplanes with alternate fitting installation, remove nut, bolt, washers and shim securing fitting to spar fitting.

      NOTE: It will be necessary to cut the bolt head from the bolt on fittings attached to the rear spar.

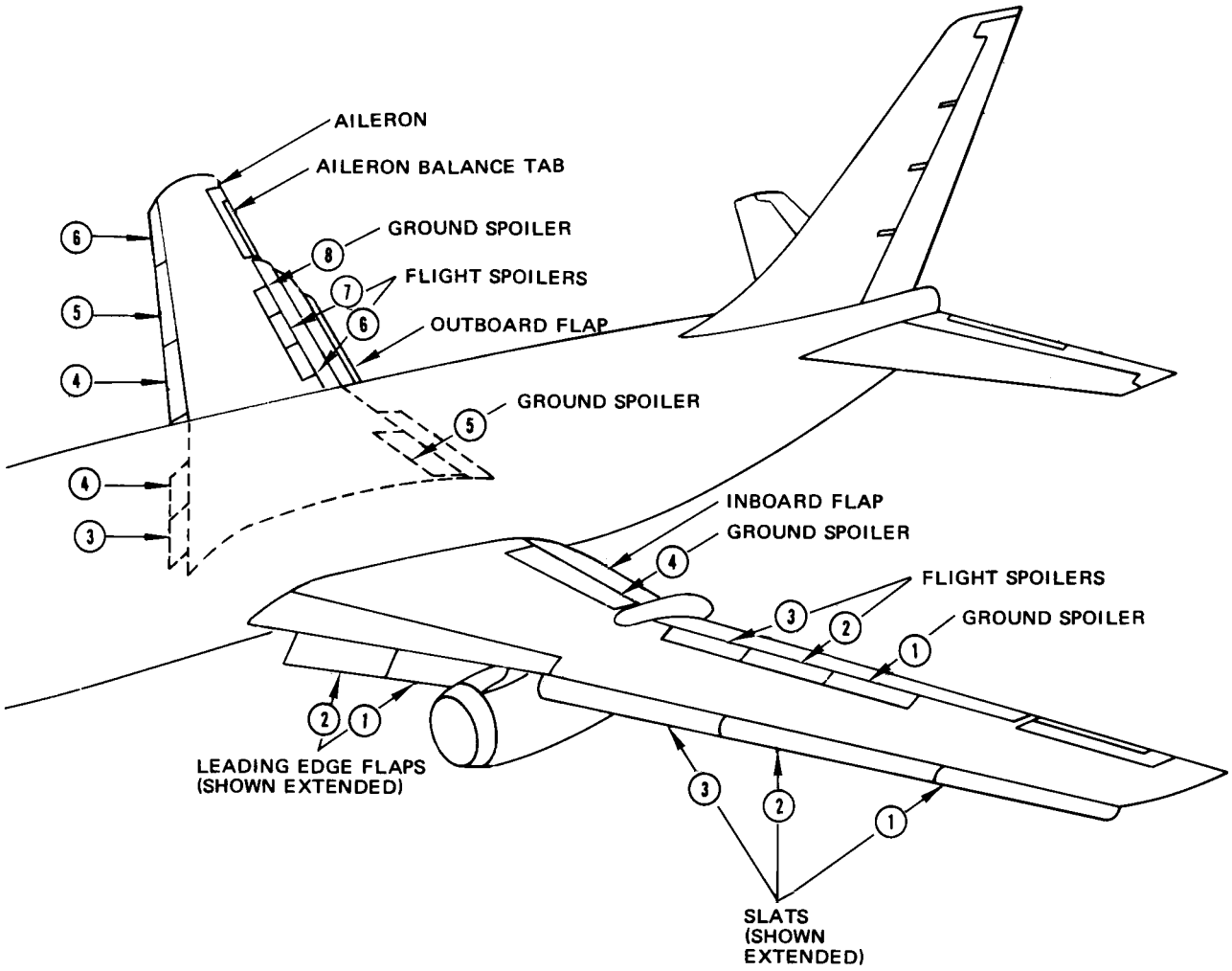
   C. On airplanes with the preferred fitting installation, remove cotterpin, nut and bolt.
   D. Remove fitting from spar fitting.
3. Install Engine Hoist Attach Fitting (Fig 401)
   A. Install fitting to spar fitting with shoulder bolt nut and cotterpin. Bolt head direction optional for forward spar installation. Bolt head outboard on aft spar installations.
   B. Install appropriate access panel on wing lower surface.



Engine Hoist Attach Fitting
Figure 401

FLIGHT SURFACES - DESCRIPTION AND OPERATION

1. General
   A. The wing flight surfaces consist of ailerons, trailing edge flaps, leading edge flaps, leading edge slats, and spoilers (Fig. 1).
2. Ailerons
   A. The ailerons are the major wing flight control surfaces. Each wing has an aileron. Each aileron is hinged from ribs attached to the rear spar, and is provided with a tab along its trailing edge.
3. Trailing Edge Flaps
   A. The trailing edge flaps are auxiliary surfaces. Each wing has an inboard and an outboard trailing edge flap assembly. Each of these assemblies are triple slotted, consisting of three component sections: the foreflap, the midflap and the aftflap. Each complete trailing edge flap assembly is supported on the wing by two flap tracks, and is moved along these tracks to assume its various extended positions.
4. Leading Edge Flaps
   A. The leading edge flaps are auxiliary surfaces. The inboard section of the leading edge of each wing is provided with two leading edge flaps. These flaps hinge downwards from the forward side of the wing front spar, and are equipped with nose sections which hinge inward when the flaps retract flush with the wing lower surface.
5. Leading Edge Slats
   A. The outboard section of the leading edge of each wing, from the change in leading edge taper to the wing tip, is provided with three leading edge slats. These slats are auxiliary flight surfaces. The slats are supported on tracks attached to the wing front spar.
6. Spoilers
   A. The remaining auxiliary flight surfaces are four spoilers along the upper surface of the trailing edge of each wing. Each spoiler hinges upwards from its leading edge. The inboard spoiler is hinged from the aft side of the wing rear spar and the landing gear support beam, and the three outboard spoilers are hinged from the aft side of the wing rear spar. The ground spoilers are located furthest outboard on the wings and inboard of the engines. The flight spoilers are located immediately outboard of the engines. All spoilers lie flush with the wing when faired and can be raised to various angles when in use.



Wing Flight Control Surfaces
Figure 1

AILERONS - DESCRIPTION AND OPERATION

1. General
   A. The ailerons are hinged from the wing rear spars and include balance tabs.
2. Ailerons
   A. Each aileron is a frame structure consisting of leading and trailing edge spars and ribs, all fabricated from aluminum alloy. A clad aluminum or graphite/epoxy skin is flush-riveted to this structure. An aileron balance tab is attached to the rear spar of the aileron by four hinge bearings. Outboard of the balance tab, the aileron trailing edge is of honeycomb construction. The aileron is provided with four hinge bearings attached to the front spar. Access panels are provided for each hinge bearing. The aluminum nose of the aileron extends forward between the hinge bearings and is connected to one balance panel.
3. Aileron Balance Tabs
   A. The aileron balance tab is a thin tapered light weight control surface with an aluminum spar, fiberglass honeycomb core, fiberglass or graphite/epoxy skin, and an aluminum alloy nose. It is attached to the aileron rear spar by four hinge bearings.

TRAILING EDGE FLAPS - DESCRIPTION AND OPERATION

1. General
   A. Each trailing edge flap consists of a midflap, a foreflap and an aftflap. The three flap segments are mechanically separated during flap extension. Each trailing edge flap is supported by two flap carriages which travel on tracks mounted under the wing.
2. Midflap
   A. The inboard midflap consists of ribs, three spars, a honeycomb trailing edge and clad aluminum skins. A hinged flap segment is attached to the outboard trailing edge of the midflap. Four tracks mounted on the rear spar of the midflap support the aftflap.
   B. The outboard midflap consists of ribs, two spars, a trailing edge beam, two honeycomb trailing edge panels and clad aluminum skins. Four tracks mounted on the rear spar protrude through the trailing edge beam to support the aftflap.
3. Foreflap
   A. The foreflap is a monospar structure with a honeycomb trailing edge panel and clad aluminum skins. Three curved support beams extend through the lower surface and connect to three foreflap tracks.
4. Aftflap
   A. The aftflap is also a monospar structure with a honeycomb trailing edge panel and clad aluminum skins. Four carriages are installed on the leading edge of the aftflap.

LEADING EDGE FLAPS - DESCRIPTION AND OPERATION

1. General

   A. Two Krueger-type leading edge flaps are installed on each wing. The flaps are numbered 1 through 4 from left to right. Each flap is a machined aluminum casting containing integral ribs and stiffeners. Each flap has four gooseneck hinges which attach to fittings in the leading edge of the wing. A centrally located fitting is also provided on each flap for connecting the flap to a hydraulic actuator. A hinged fairing is installed on the trailing edge of each flap. The fairing extends the full length of the flap on leading edge flaps 2 and 3 and approximately the inboard 70 percent on flaps 1 and 4.

LEADING EDGE SLATS - DESCRIPTION AND OPERATION

1. General

   A. Three leading edge slats are installed on each wing outboard of the engine. The slats are numbered 1 through 6 from left to right. The slats consist of ribs attached to a beam, inner and outer clad aluminum skins, and a honeycomb trailing edge. A void between the inner and outer skins provides a path for thermal anti-icing. Anti-icing ducts installed in the slat leading edge connects with hot air supply lines through a telescoping tube. A three-position hydraulic actuator is attached at the center of the slat. Each slat has two main tracks and two auxiliary tracks which ride on rollers in the wing leading edge.

SPOILERS - DESCRIPTION AND OPERATION

1. General
   A. The spoilers consist of four ground spoilers and four flight spoilers.
2. Ground Spoilers
   A. A ground spoiler panel is located inboard of the engine and furthest outboard on each wing. The ground spoiler panels are of bonded honeycomb construction. They are constructed with upper and lower skins of clad aluminum alloy and with a nonperforated aluminum alloy honeycomb core. A continuous phenolic rub strip is bonded to the lower surface at the trailing edge. Dacron covered silicone rubber seals are installed at each end and at the forward edge. The seals at each end are adjustable.
   B. The ground spoilers are attached to wing structure by four hinge fittings equipped with self-aligning bearings. The ground spoilers are attached to wing structure aft of the rear spar. A ground spoiler actuator linkage is attached between wing structure and two arms on the leading edge of the inboard ground spoiler. Bonding jumpers provide an electrical bond between the ground spoiler panels and wing structure.
3. Flight Spoilers
   A. Spoiler panels raise to provide spoiler action. The panels are of bonded honeycomb construction with upper and lower skins of clad aluminum alloy and a nonperforated aluminum honeycomb core. A continuous phenolic rub strip is bonded to the lower surface at the trailing edge. Dacron covered silicone rubber seals are installed at each end and at the forward edge. The seals at each end are adjustable.
   B. Spoilers are attached to the wing structure by four hinge fittings equipped with self-aligning bearings. The flight spoilers are located forward of the outboard flaps and are attached to wing structure aft of the rear spar. The four flight spoiler actuators are attached between the spoiler panels and wing structure at the spanwise center of each spoiler panel. Bonding jumpers provide an electrical bond between spoiler panels and wing structure.

      NOTE: Some airplanes have graphite/epoxy skinned spoilers in place of clad aluminum alloy spoilers.