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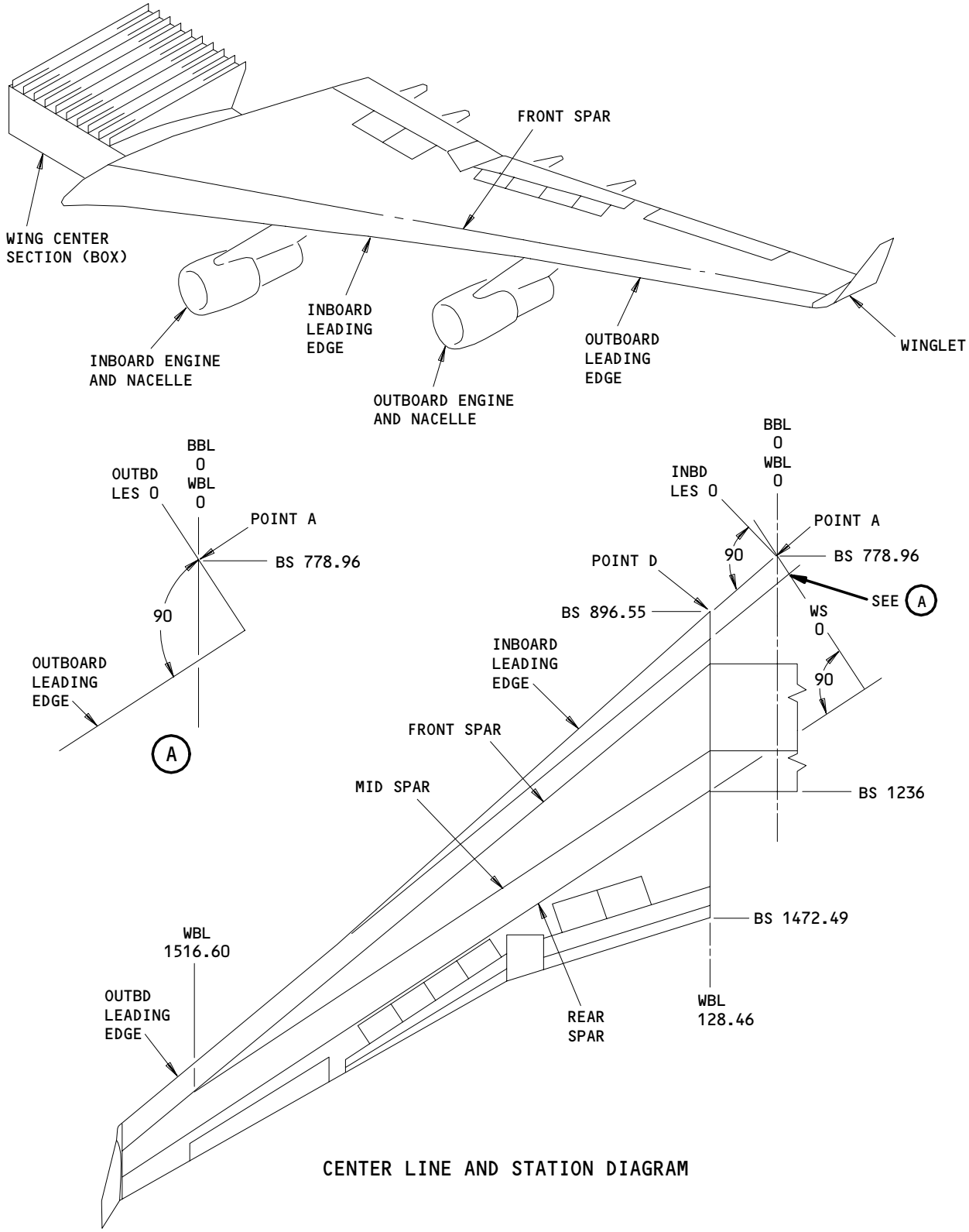
WINGS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The wing surfaces develop aerodynamic forces for supporting the airplane in flight. The wing also stores fuel for flight, houses fuel system equipment, provides support for the engines, and contains the flaps, spoilers, and ailerons. A lightning strike diverter and static dischargers are attached to the wing tip. The wings are swept back at 37.5 degrees and are of semi-monocoque construction. The right and left wings are joined by the wing center section which passes through the lower lobe section of the fuselage.
   B. Location references on the wing are usually indicated by a distance in inches from a base point along a specific reference line. The main reference lines for designating locations on the wing are the rear spar, inboard leading edge, and the outboard leading edge. Wing stations (WS) are measured along the rear spar while the leading edge references are indicated by inboard leading edge stations (INBD LES) and outboard leading edge stations (OUTBD LES). Another location reference used on the wing is the distance from the center line of the fuselage designated as wing buttock lines (WBL). See Fig. 1 for diagram of basic reference points and location of station 0. Refer to Chapter 6, Wing Station Diagram, for principal dimensions and additional design data.
   C. The structure of the wing consists basically of the left wing box, the center wing box, and the right wing box. This structure comprises the main frame of the wing. 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. The wings are permanently attached to the fuselage.
   D. 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 ribs at BBL 127.75 to the removable winglets. 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. A chordwise rib at BBL 127.75 constitutes the inboard end of the left wing box. This same rib is the left outboard end of the center wing box. 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-to-body rib and two spars, which are connected by means of flanged fittings.



CENTER LINE AND STATION DIAGRAM

Wing
Figure 1

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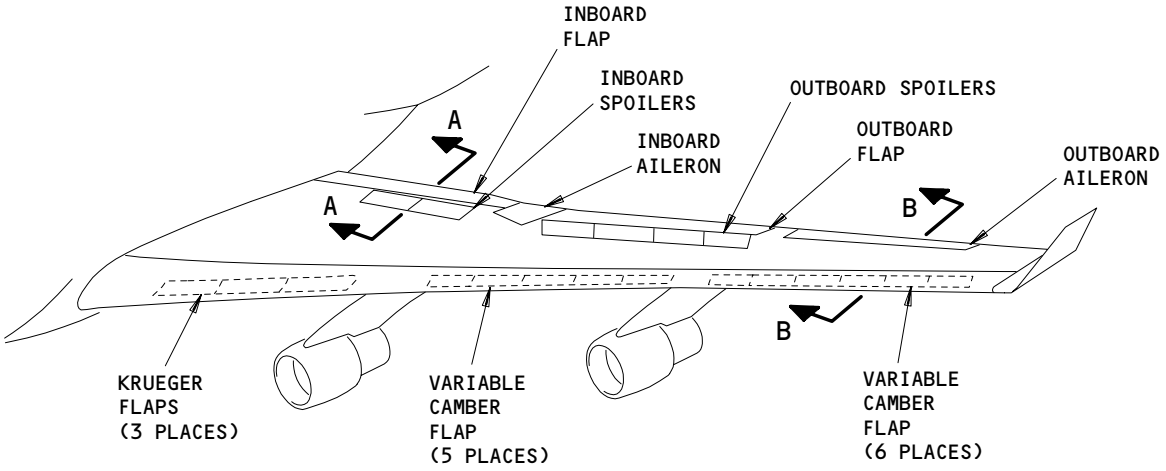
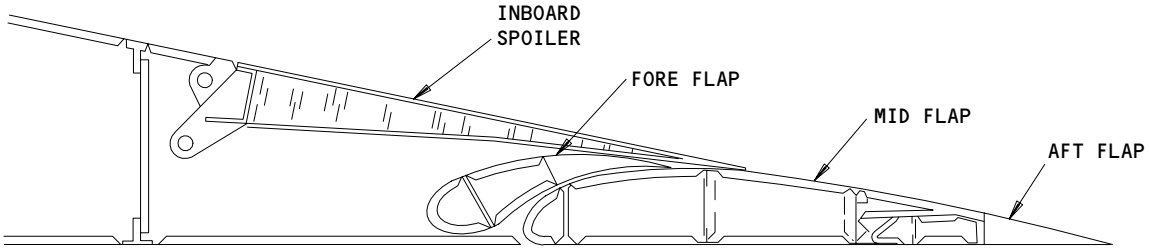
E. The wing is attached to the fuselage in such a manner that the wing spars form an integral part of bulkheads at body stations 1000.0, 1140.0, and 1241.0. Another wing-to-fuselage attachment is by the flanged upper rib chords at right and left BBL 127.75. Other points of attachment are the main landing gear support beams, the keel beam, and the longitudinal floor beams above the center wing.

F. The auxiliary structure of the wing includes the wing leading edge, trailing edge, wing tip, winglet, and flight control surfaces. 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 landing gear support beam. The landing gear support beam is attached at the inboard end to the fuselage frame at the center of the main wheel well and at the outboard end to the rear face of the wing rear spar. The winglet is cantilevered outboard from the wing closure rib at WBL 1247.

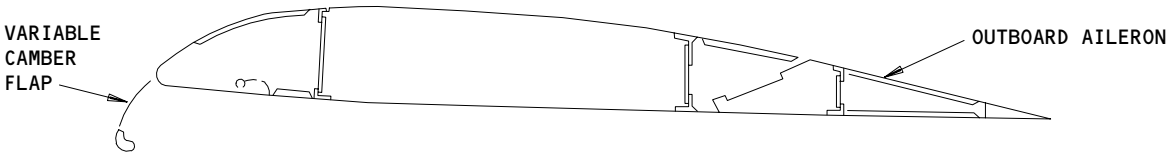
G. Fourteen control surfaces (Fig. 2) are supported by the leading edge structure of each wing; three Krueger flaps are hinged from the inboard one-third of the wing span, and along the outboard two-thirds, eleven variable camber flaps are installed. The control surfaces along the trailing edge of each wing consist of inboard and outboard flaps, an inboard and outboard aileron, and a total of six spoilers.

H. Access doors and openings are provided in the lower wing skin to permit entry to the interior of the wing boxes. Access to the interior of the center wing box dry bay area is provided in the center wing front spar web. Refer to AMM 57-31-00/001 for description and location of wing access doors and openings.





INBOARD FLAP AND INBOARD SPOILER
A-A

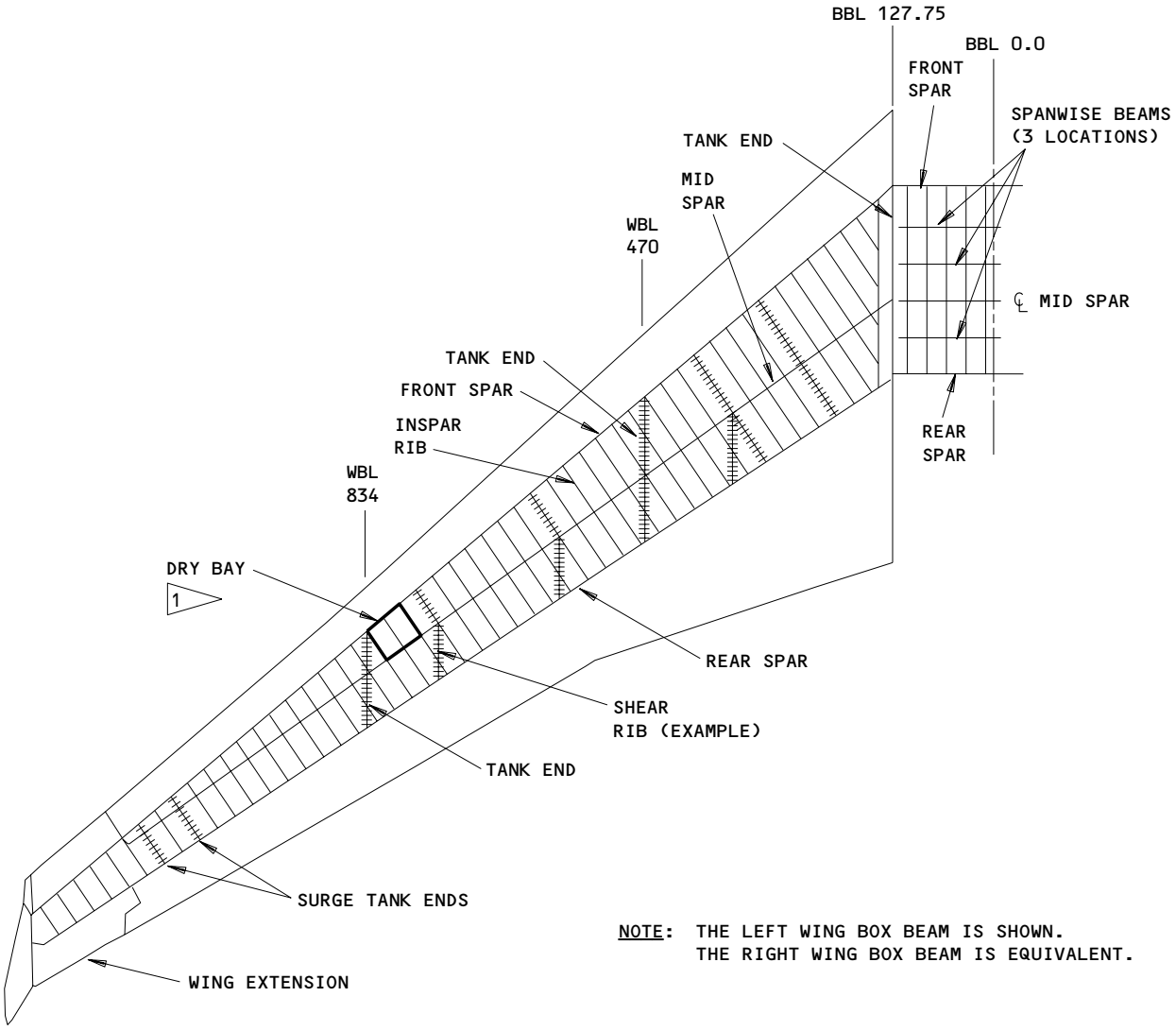


VARIABLE CAMBER FLAP
AND OUTBOARD AILERON
B-B

Wing Flight Control Surface
Figure 2

MAIN FRAME - DESCRIPTION AND OPERATION

1. General
   A. The main frame, a box beam, consists of the left and right wing boxes and the center wing box permanently joined together. Each section is formed by upper and lower skin panels and front and rear spars. The wingtip closure rib and a chordwise rib at BBL 127.75 define the ends of the left and right boxes. The ends of the center section are defined by the BBL 127.75 ribs. Flanged chords and fittings are used to join the left and right boxes to the center box.
2. Left and Right Box Beams (Fig. 1)
   A. The areas of the left and right box beams between the wing-to-body rib at BBL 127.75 outboard to wing station 1485 are sealed to provide a fluid-tight compartment for storage of fuel. This area is divided into three separate fuel tanks by tank end ribs at WBL 470 and WBL 834. The area outboard of wing station 1485 contains a vent surge tank.
   B. AIRPLANES WITH GE ENGINES;
   a dry bay is found from the midspar to the front spar between the ribs at WS 1084 and 1140.
   C. Major components of the wing box beams are front spar, mid spar, rear spar, inspar ribs, shear tie ribs, tank end ribs, upper and lower stringers, and upper and lower skin panels.
3. Center Wing Box Beam (Fig. 1)
   A. The structure of the center wing box beam consists of front spar, mid spar, rear spar, spanwise beams No. 1, 2, and 3, intercostals, stabilizing angles, fairing beam chords, keel beam chords, buttock line 0 rib between the mid spar and rear spar, and upper and lower skin panels. The center wing box beam is sealed to provide a fluid- tight compartment for fuel storage.

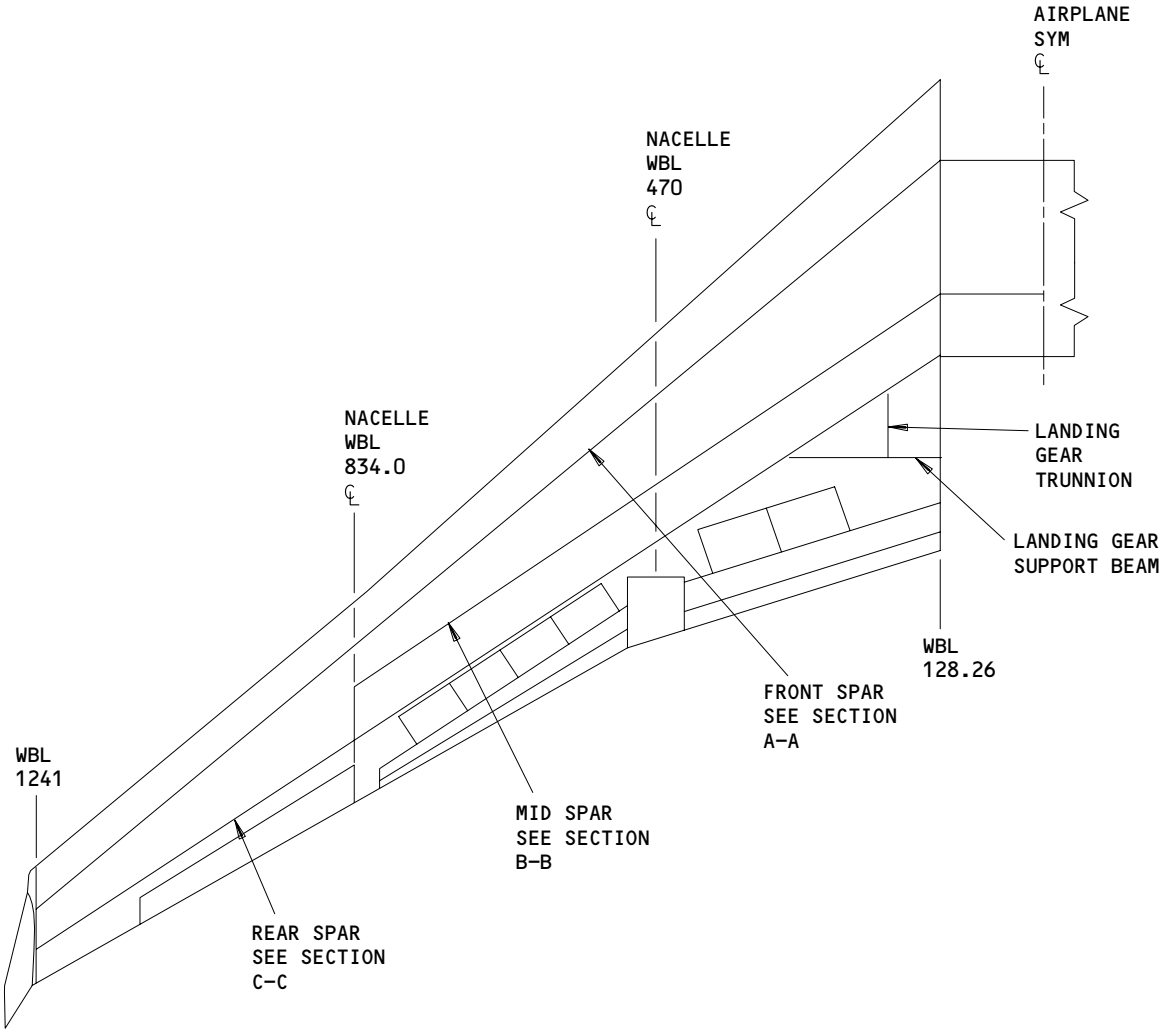


1 AIRPLANES WITH GE ENGINES HAVE A DRY BAY BETWEEN THE MID SPAR AND THE FRONT SPAR

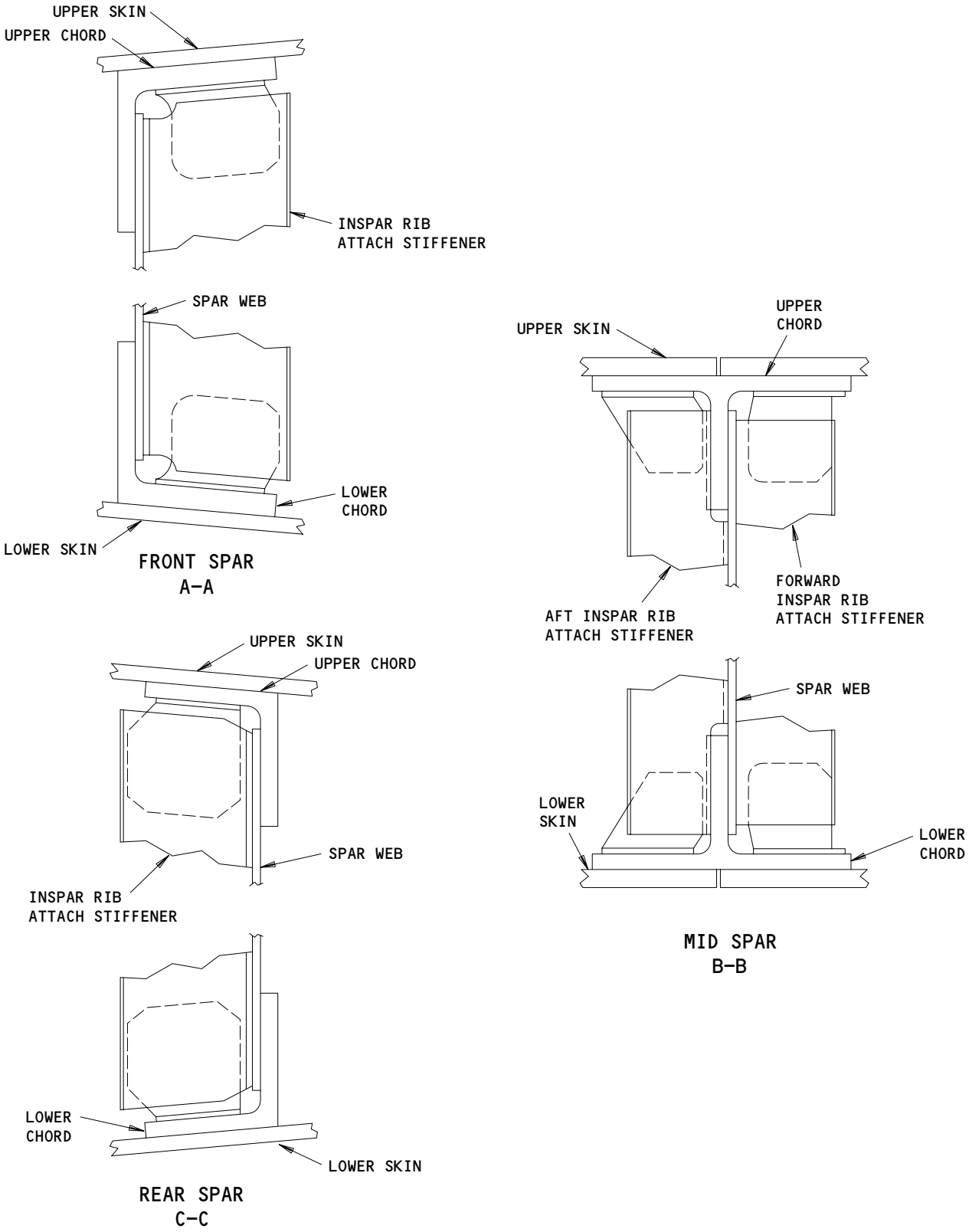
Wing Main Frame
Figure 1

WING SPARS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The front, mid, and rear wing spars are primary spanwise structural components of the main frame. The outboard wing spars are joined to the respective center wing spars by flanged fittings at the BBL 127.75 rib (Ref 57-41-00, Description and Operation). The front and rear spars are sealed in the areas that are to serve as sides of the integral fuel tanks.
   B. The spars provide load carrying attachment for wing-mounted components consisting of engine support fittings, landing gear beams, and the trailing edge beams. In addition, hinge supports, transmission assemblies, actuators, and gear box mounts associated with the flight controls are attached to the spars.
2. Front Spars (Fig. 1)
   A. The front spar consists of two wing extension sections, two outboard wing sections, and a center wing section joined at wing extension join rib and the wing-to-body rib respectively.
   B. The outboard wing front spars are beams which consist of an upper chord angle, web, and lower chord angle. The spars taper down in depth toward the wingtip and are spliced at front spar station 1446. vertical stiffeners, attached to both faces of the spar web, provide means of attaching the wing inspar and leading edge ribs. The center wing front spar consists of constant depth vertical web and angle chords which also serve as a structural part of the bulkhead at body station 1000. Vertical stiffeners attached to the web and chords provide additional rigidity.
3. Mid Spars (Fig. 1)
   A. The mid spar consists of two outboard sections and a center section joined at the wing-to-body rib by flanged fittings. The mid spar extends outboard to WBL 834.
   B. Each mid spar consists of a one-piece web, plus upper and lower tee-chords and web stiffeners. Fifteen access openings are provided in each outboard mid spar web and two access openings covered by removable doors are provided in the center wing mid spar web.
4. Rear Spars (Fig. 1)
   A. The rear spar consists of two wing extension sections, two outboard wing sections, and a center wing section joined at the wing extension join rib and wing-to-body rib respectively.



Wing Spar
Figure 1 (Sheet 1)

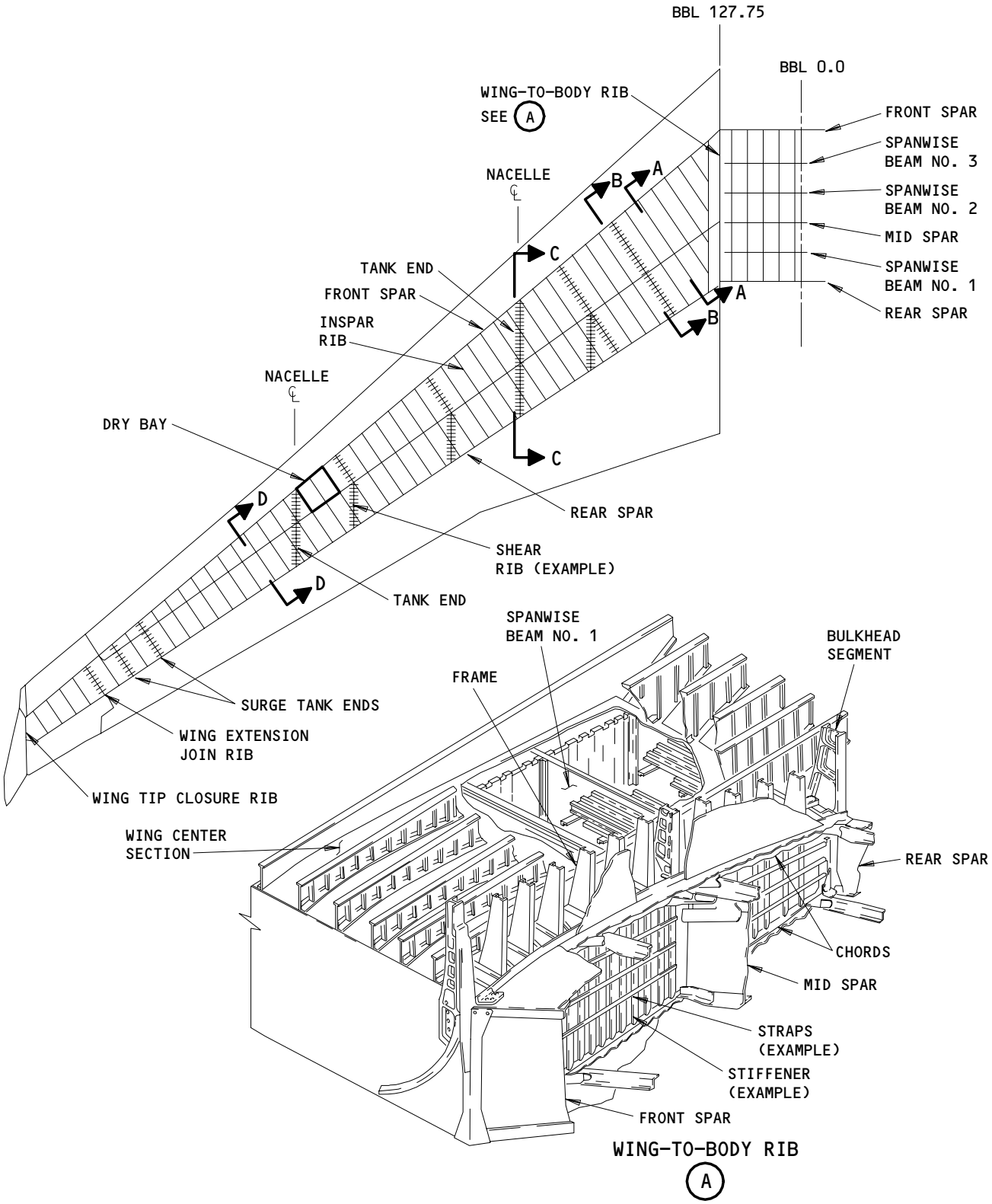


Wing Spars
Figure 1 (Sheet 2)

B. The center wing rear spar consists of a constant depth vertical web and angle chords which also serve as a structural part of the fuselage bulkhead at body station 1241. Vertical stiffeners attached to the web and chords provide additional rigidity. The outboard rear spars are beams which consist of a web and upper and lower angle chords. The spar tapers down in depth toward the wingtip. Vertical stiffeners, attached to both faces of the web, provide a means of attaching the wing inspar and trailing edge ribs.

WING RIBS - DESCRIPTION AND OPERATION

1. General
   A. The wing ribs consist of three basic types: join ribs, standard ribs, and special ribs. Join ribs are provided where the wing joins the body, forming the inboard end of the wing box, and where the wing extensions join the wing box, forming the outboard end of the wing box. Outboard of the wing-to-body ribs, the standard wing ribs, which extend from the front spar to the rear spar, are located normal to the rear spar. The special ribs are located as required to carry various wing loads.
   B. The wing ribs in the integral fuel tanks act as baffles to prevent excessive fuel surges resulting from airplane attitude changes. Full baffle ribs are provided with check valves to contain fuel around the fuel boost pumps and still permit free flow of fuel when the airplane is in level flight.
2. Join Ribs (Fig. 1)
   A. Join ribs are used where the wing joins the body and where the wing extensions join the wing box.
      (1) The two wing-to-body ribs, one each on the left and right side of fuselage, basically consist of chords, stiffened webs, and straps. The rib is attached to the front, mid, and rear spars, and No. 1, 2, and 3 spanwise beams. The rib is sealed to form the closure rib for the wing integral fuel tank.
      (2) The two wing-extension-to-wing-box ribs, one each at the outboard end of the left and right wing boxes, are constructed differently than any other rib. The upper chord, web, and stiffeners are made of a single aluminum casting. The lower chord, which is made by forming and machining an aluminum extrusion, is attached to the casting. The stringers, spars and skin of the wing box and wing extension are attached to the rib assembly.
3. Standard Ribs (Fig. 1)
   A. Standard ribs are of two basic types: those used inboard of wing station 1224 and those used outboard of wing station 1224.
      (1) Inboard of wing station 1224, the rib consists of a forward section, located between the front and mid spars, and aft section, located between the mid and rear spars. Each rib section is formed by an upper angle chord, stiffened web, and lower angle chord. Along the upper and lower edges of the web, an angle chord attaches the rib to the wing stringers; and at the forward and aft ends, the rib web is attached to spars.
      (2) Outboard of wing station 1224, the structure of a typical rib consists of an upper angle chord, stiffened web, and lower angle chord. Along the upper and lower edges of the web, an angle chord attaches the rib to the wing stringers, and at the forward and aft ends, the rib web is attached the front and rear spars.



Wing Ribs
Figure 1 (Sheet 1)

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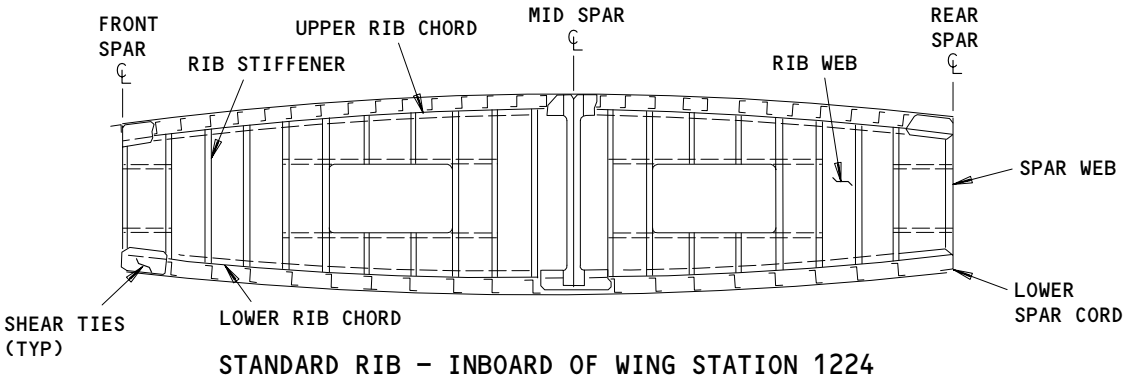
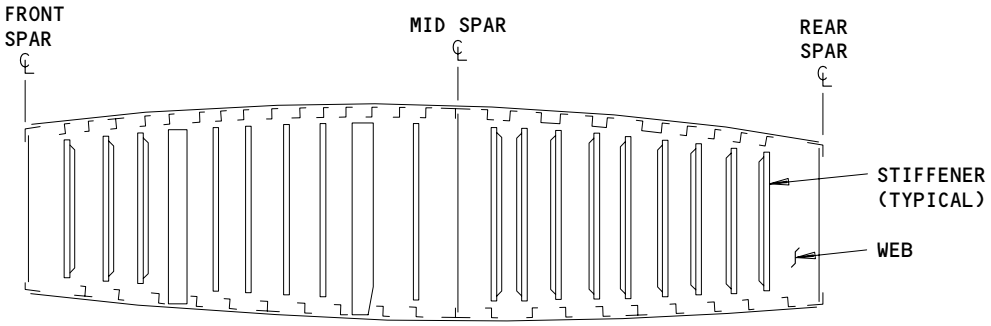
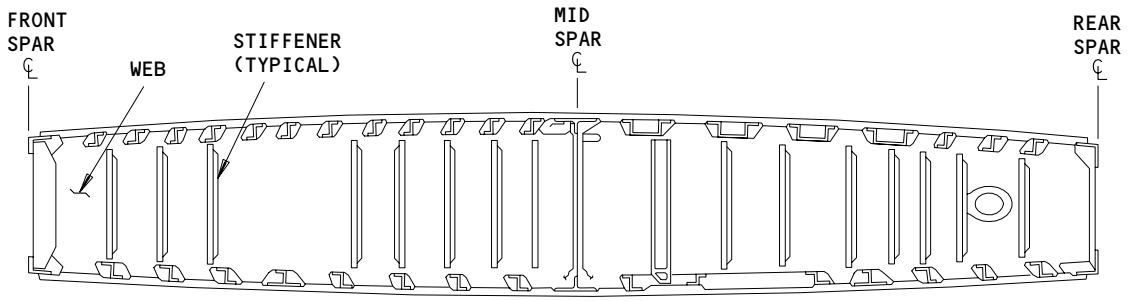


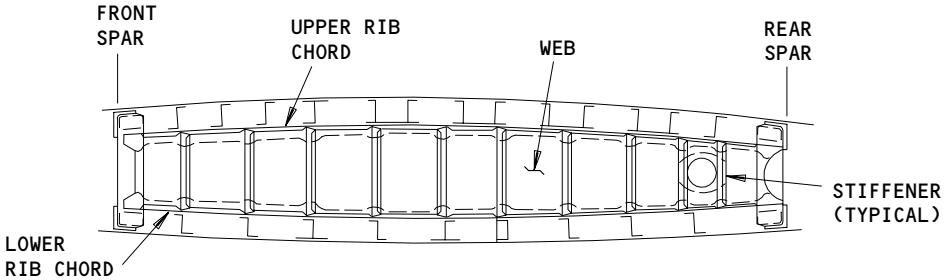
STANDARD RIB - INBOARD OF WING STATION 1224
A-A



TYPICAL SHEAR TIE RIB
B-B



SUPPORT RIB
C-C



STANDARD RIB - OUTBOARD OF WING STATION 1224.0
D-D

Wing Ribs
Figure 1 (Sheet 2)

B. Direct access to some of the structure and equipment located inside the fuel tanks is not possible through the fuel tank access doors. To obtain access to this structure or equipment, personnel must enter the tank through the nearest fuel tank access door and go through rib access openings into the areas where no external access door is provided. Four of the inboard standard ribs have removable sections for access to the area behind the rib (See Inspar - Removable Ribs, below).

4. Special Ribs (Fig. 1)
   A. There are three basic types of special ribs: shear tie ribs, tank end ribs, and a wingtip closure rib.
      (1) Shear-tie ribs are used to distribute specific loads to the wing frame. Shear tie ribs are joined to both the stringers and skin panels. Shear tie ribs include the nacelle ribs, outboard surge tank end rib, three flap track support ribs, and landing gear support ribs.
      (2) Tank end ribs are like standard ribs but have seal pans installed between the stringers and between rib chord and wing skins. These tank end ribs are sealed to provide an absolute fuel seal.
      (3) The wingtip closure rib extends between the wing leading edge and trailing edge and provides attach structure for the winglet.
5. Inspar - Removable Ribs (Fig. 1)
   A. The ribs at wing stations 1056, 1084, 1168, and 1196 have a removable section that provides access to the area between the removable section and the adjacent rib. Access to the removable section is through a fuel tank access door in the lower surface of the wing.

INSPAR REMOVABLE RIBS - REMOVAL/INSTALLATION

1. General
   A. This procedure supplies two tasks. The first task is the removal of an inspar rib. The second task is the installation of the inspar rib.
      (1) The removal of a rib includes these tasks:
         (a) Remove the access door to the fuel tank
         (b) Disconnect the pipes and brackets from the rib
         (c) Remove the bolts from the rib and move the rib one side to get clearance.
      (2) The installation is the opposite of these steps.
   B. Remove the inspar ribs at WS 1056, 1084, 1168, and 1196 to get access to the area behind the rib. Disconnect all of the rib and these components:
      (1) The upper chords
      (2) The lower chords
      (3) The web
      (4) The stiffeners from the spars
      (5) The stringers.

TASK 57-12-01-004-001

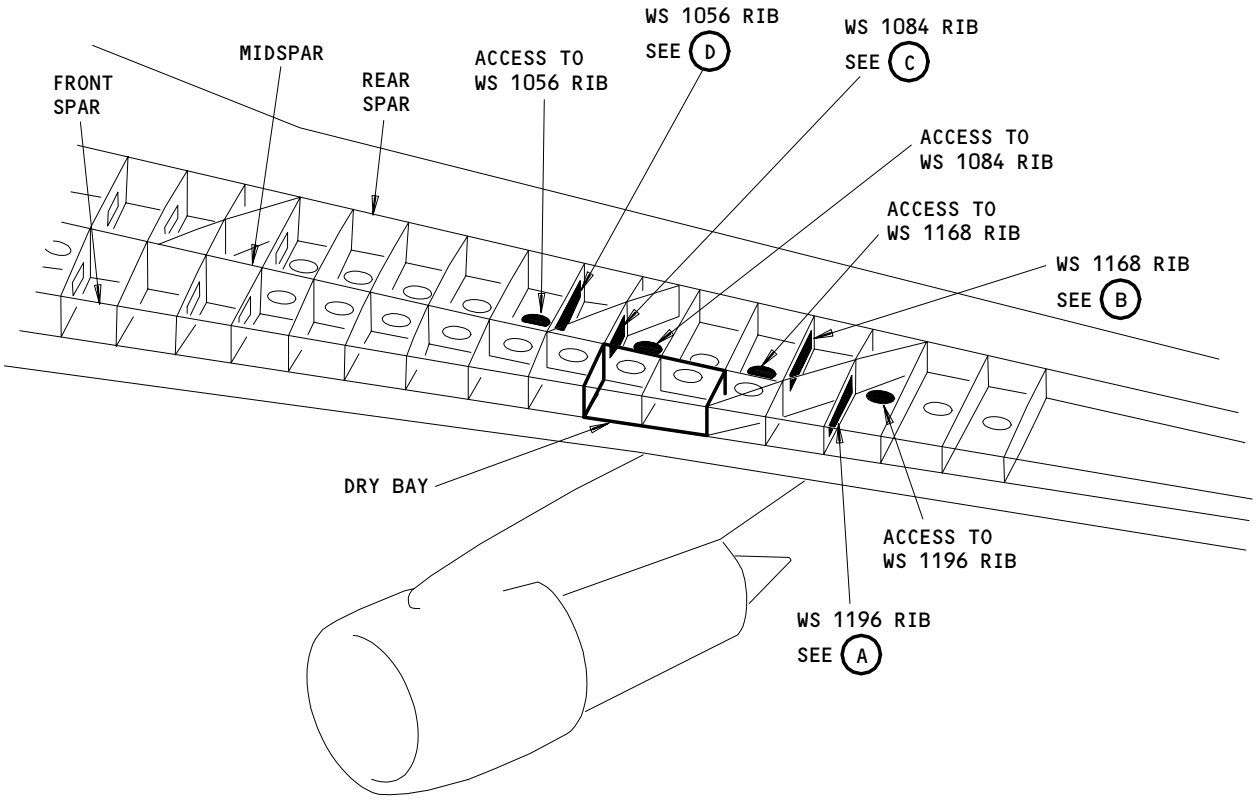
2. Rib Removal (Fig. 401)
   A. Standard Tools and Equipment
      (1) Sack - small cloth (used as a container for removed fasteners from the rib, many are necessary)
   B. Consumable Materials
      (1) G00298 Tape - Masking
   C. References
      (1) 28-11-02/401, Reserve and Main Tank Access Doors
      (2) 28-41-01/401, Tank Unit
      (3) SRM 51-50-01, Support of Fuselage in Jigged Position
      (4) IPC 57-12-13 Fig. 1 (WS 1084)
      (5) IPC 57-12-18 Fig. 1 (WS 1168)
   D. Access
      (1) Location Zone

553	Reserve Tank Front Spar to Rear Spar, Left
653	Reserve Tank Front Spar to Rear Spar, Right

      (2) Access Panel

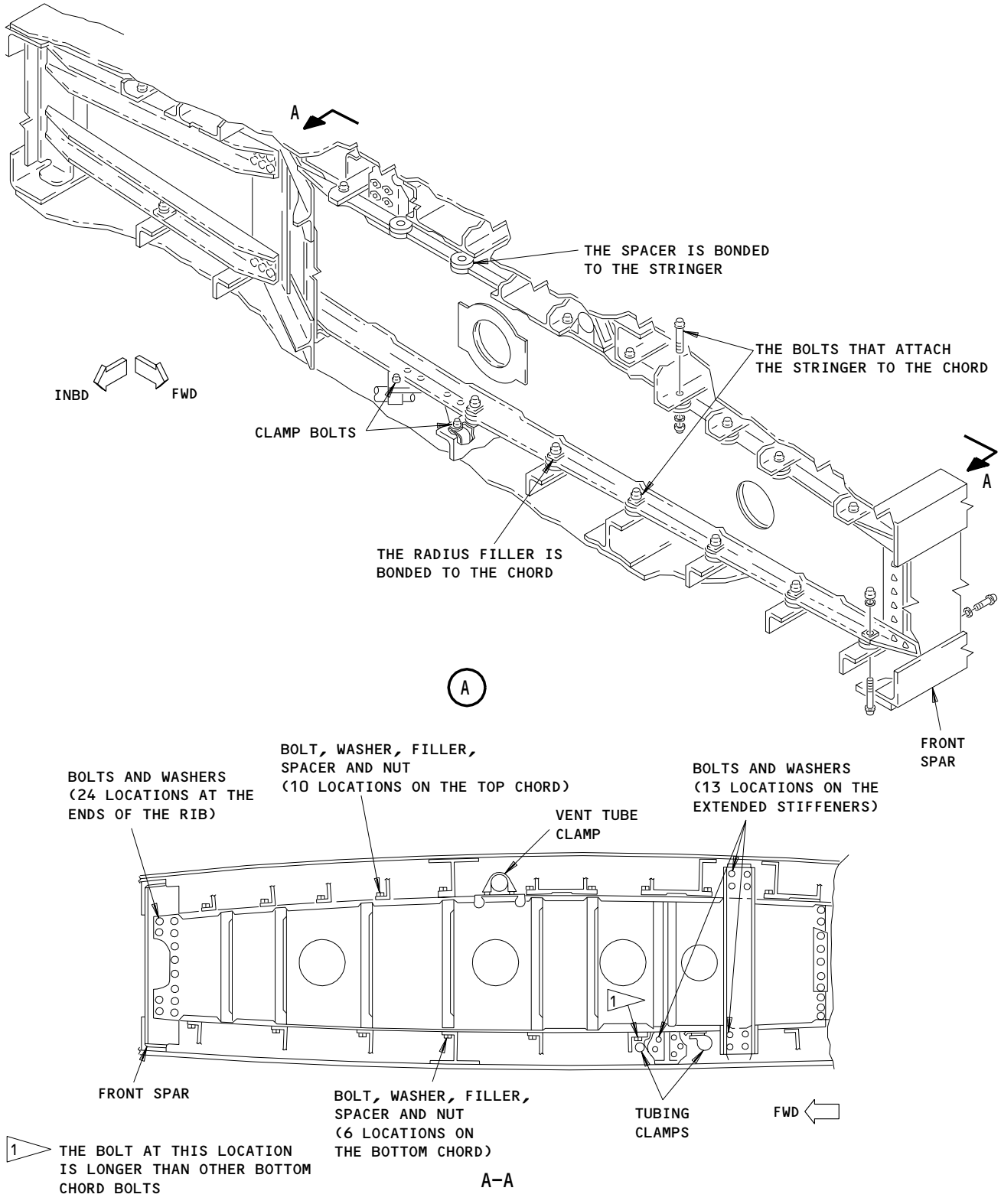
552DB	Access Door - Fuel Tank
552EB	Access Door - Fuel Tank
552GB	Access Door - Fuel Tank
553AB	Access Door - Fuel Tank
652DB	Access Door - Fuel Tank
652EB	Access Door - Fuel Tank
652GB	Access Door - Fuel Tank
653AB	Access Door - Fuel Tank

   E. Procedure

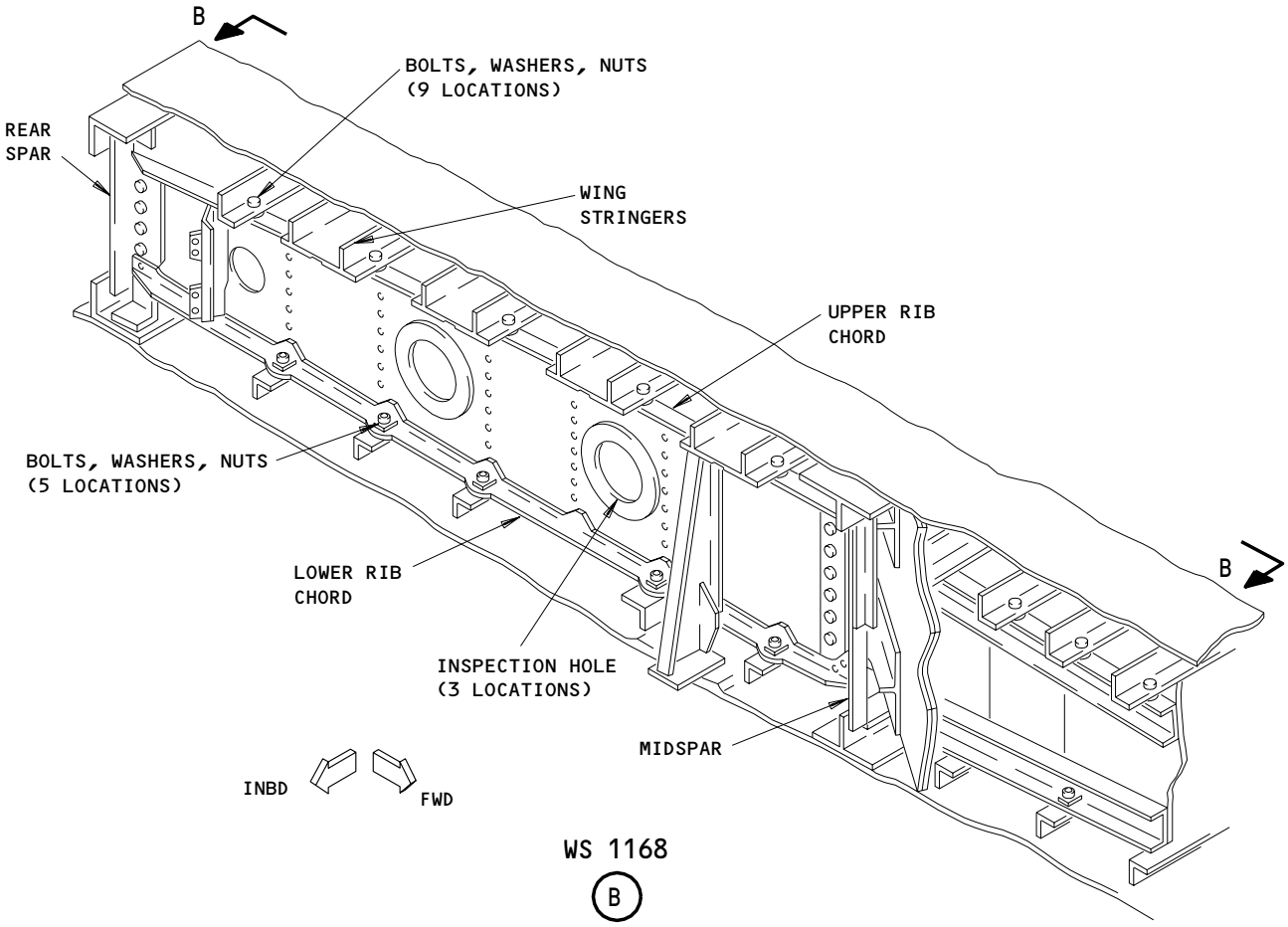


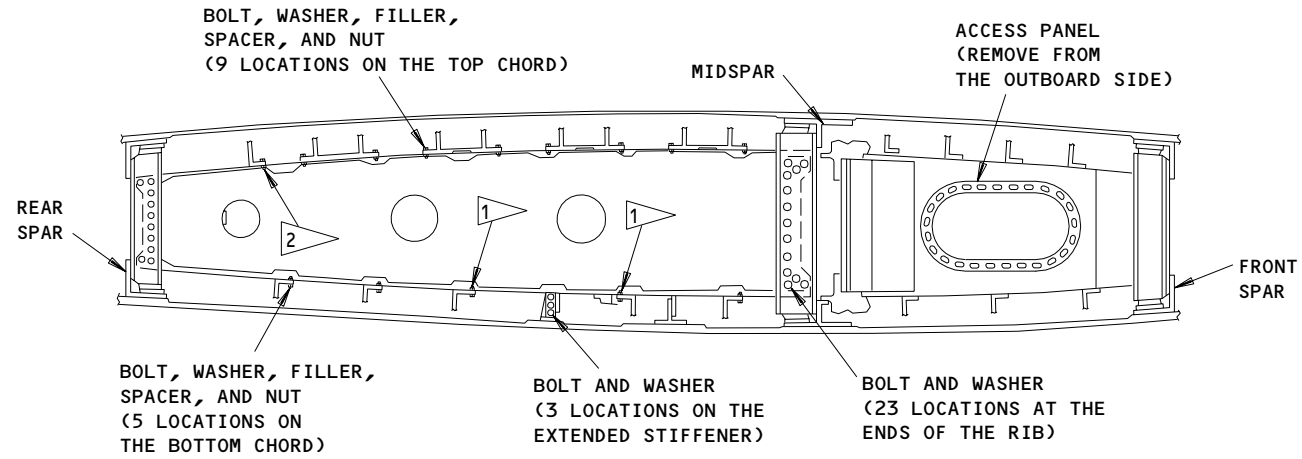
Inspar Removable Rib Installation
Figure 401 (Sheet 1)

760693

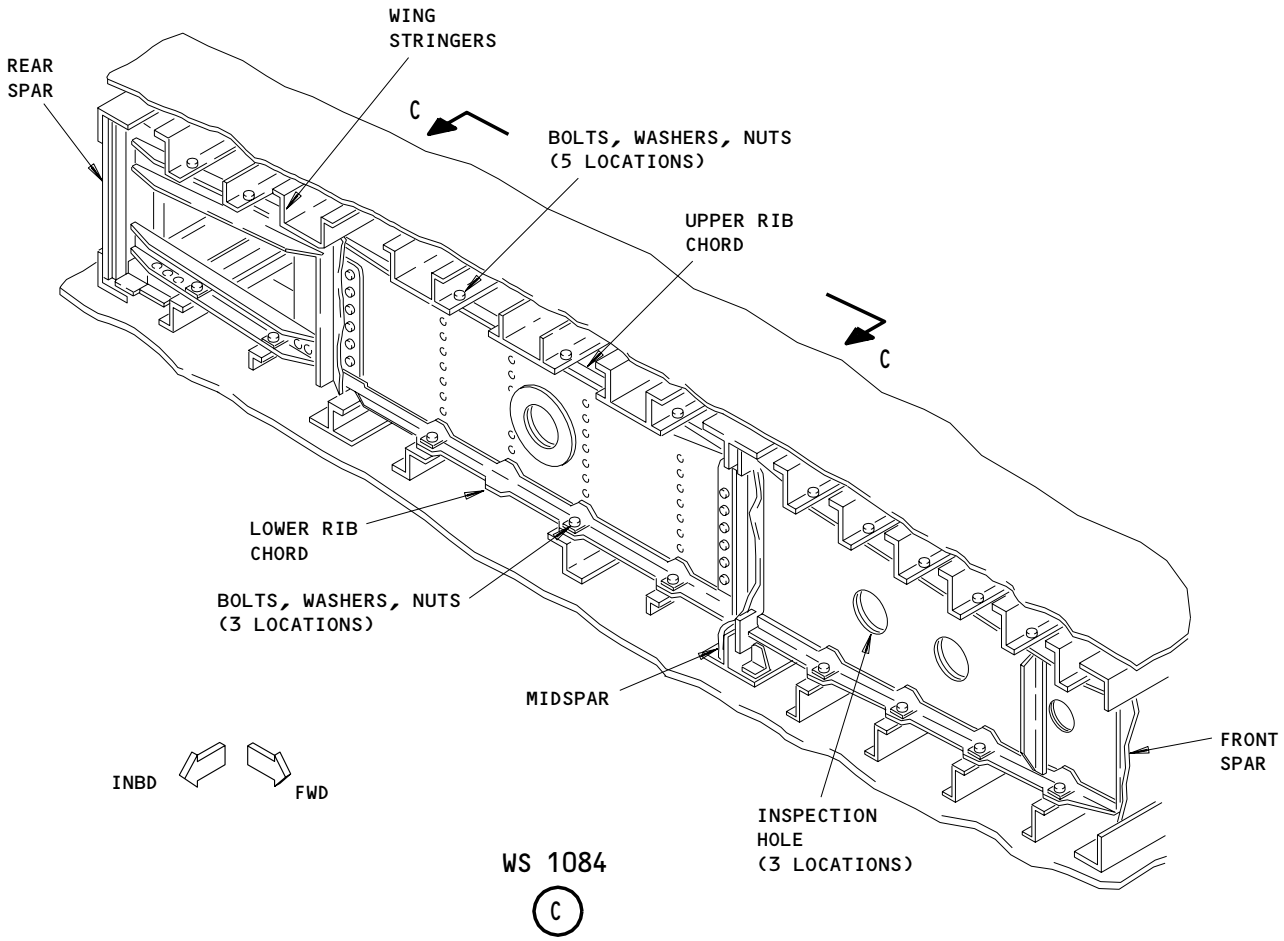


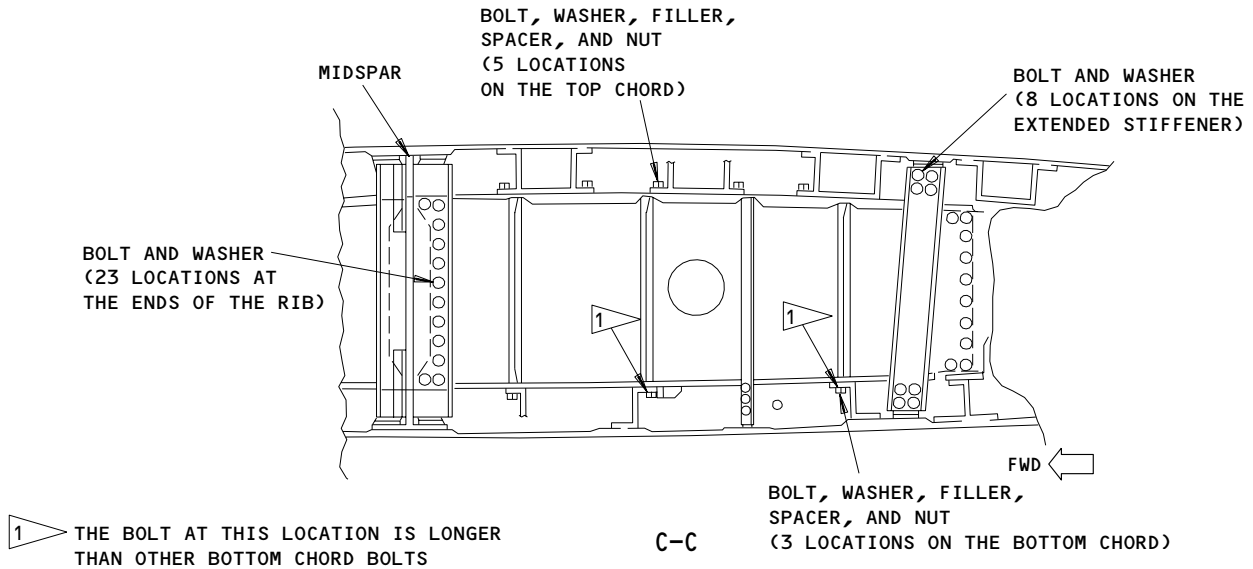
Inspar Removable Rib Installation
Figure 401 (Sheet 2)



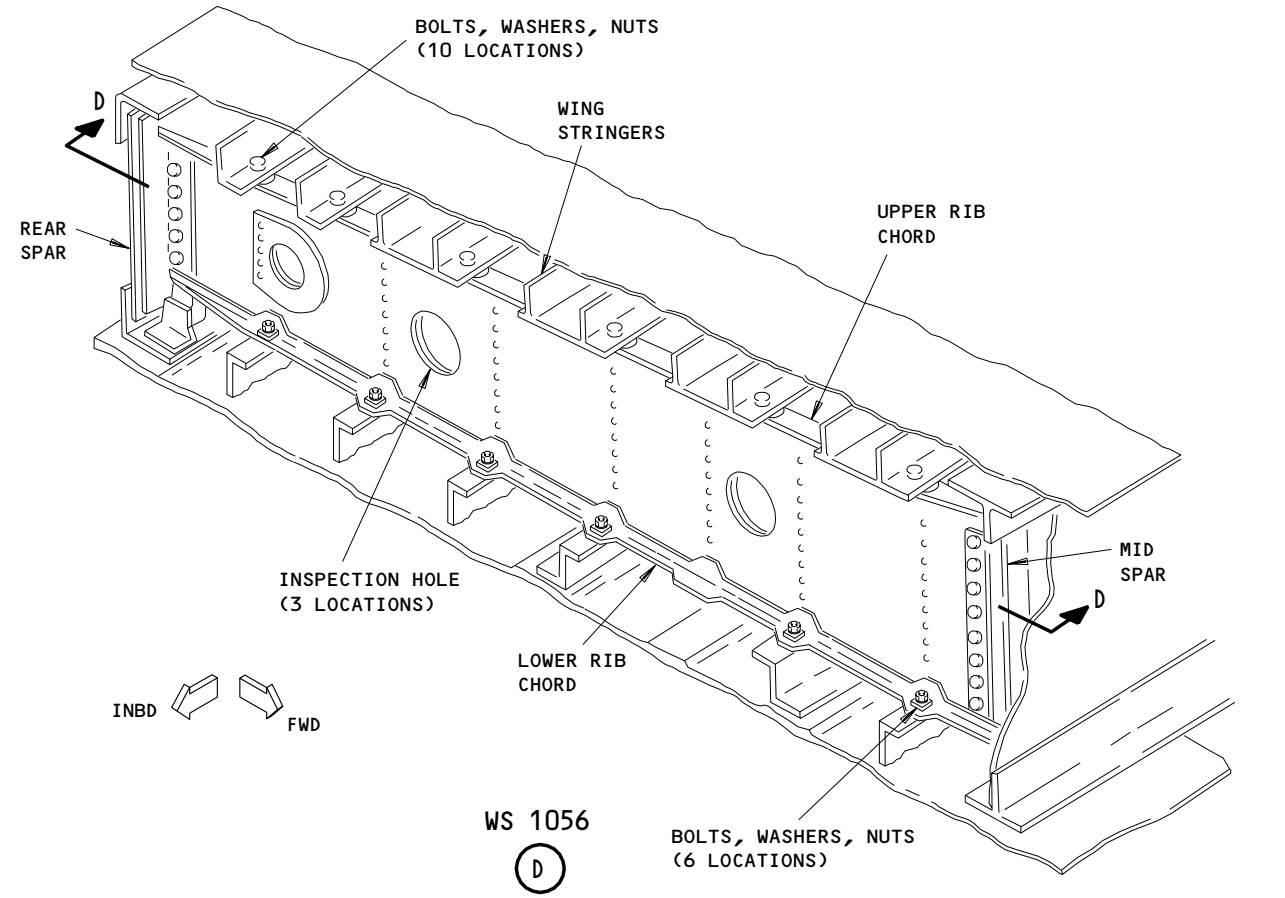


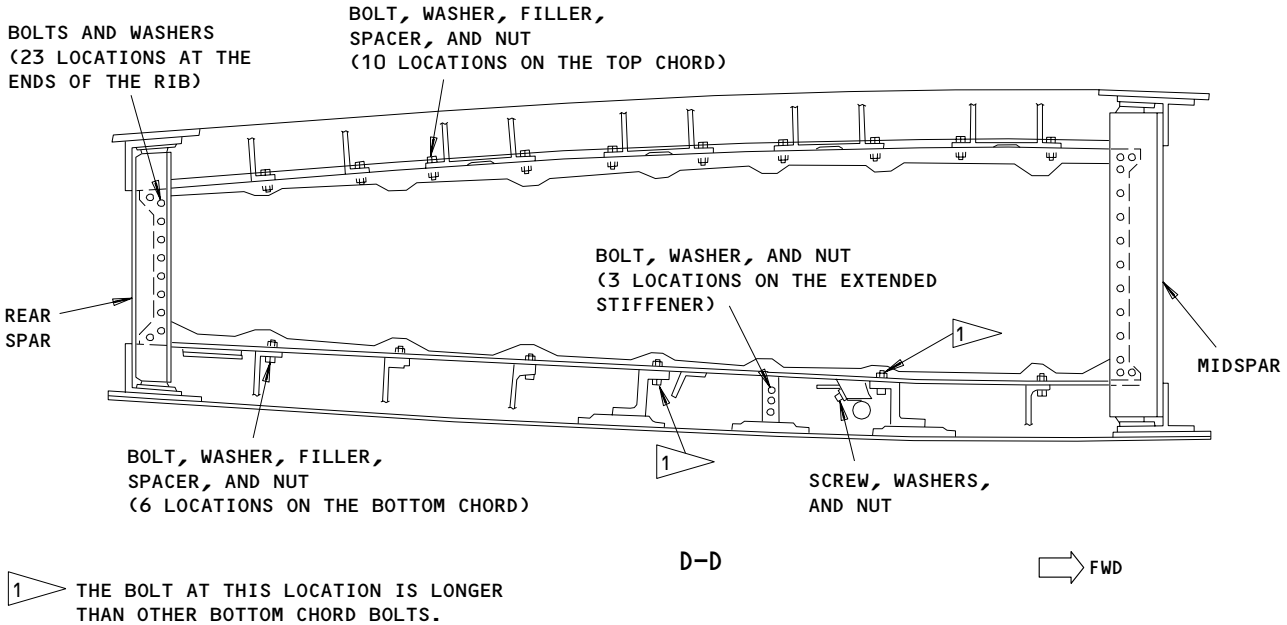
Inspar Removable Rib Installation
Figure 401 (Sheet 3)





Inspar Removable Rib Installation
Figure 401 (Sheet 4)





Inspar Removable Rib Installation
Figure 401 (Sheet 5)

S 014-002

CAUTION: BEFORE THE RIB REMOVAL, MAKE SURE YOU HAVE PADS AND MATS IN THE WORK AREA. WHEN YOU REMOVE THE RIBS, DO NOT LET THEM TOUCH THE TUBING, HOSE OR WING STRUCTURE BECAUSE IT WILL DAMAGE THE FUEL TANK SEALANT OR THE RIB SURFACE.

(1) Remove the access door to the fuel tank to get access to the rib (Ref 28-11-02/401).

S 034-003

(2) Disconnect the plumbing brackets from the bottom side of the rib chords.

S 034-004

(3) If you are at WS 1056 or 1168, remove the fuel quantity indicating system tank units (Ref 28-41-01/401).

S 034-016

(4) Disconnect the tubing clamp from the rib web at WS 1056 and 1168.

S 034-005

(5) If you are at WS 1196, disconnect the tubing clamp at the top of the rib.

S 034-006

(6) Loosen all the bolts that attach the rib to the wing structure.

NOTE: If you find a hole that is not in line with the bolt during the bolt removal, it is recommended that you put the wing in the jig position (Ref SRM 51-50-01).

S 034-007

CAUTION: IDENTIFY THE UPPER AND THE LOWER CHORD PARTS. IF YOU DO NOT INSTALL THE COMPONENTS IN THEIR INITIAL LOCATIONS, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(7) First remove the upper chord bolts and then remove the lower chord bolts last.

NOTE: When you remove each fastener, put the bolt, the micarta spacer(s), the radius filler, the washers, and the nut in a cloth sack. Attach the sack to the rib with tape where it was removed.

S 024-008

(8) Move the rib to the opposite side of the bay so you can get to the area behind the rib.

TASK 57-12-01-404-009

3. Rib Installation (Fig. 401)

A. References

(1) 28-41-01/401, Tank Unit

(2) 28-11-02/401, Reserve and Main Tank AccessDoors

(3) IPC 57-12-13 Fig. 1 (WS 1084)

(4) IPC 57-12-18 Fig. 1 (WS 1168)

B. Access

(1) Location Zone

553	Reserve Tank Front Spar to Rear Spar, Left
653	Reserve Tank Front Spar to Rear Spar, Right

(2) Access Panel

552DB	Access Door - Fuel Tank
552EB	Access Door - Fuel Tank
552FB	Access Door - Fuel Tank
553AB	Access Door - Fuel Tank
652DB	Access Door - Fuel Tank
652EB	Access Door - Fuel Tank
652FB	Access Door - Fuel Tank
653AB	Access Door - Fuel Tank

C. Procedure

S 424-010

(1) Put the rib against the wing structure.

S 434-011

(2) First install the lower chord bolts and then the upper chord bolts last.

NOTE: First install all the bolts loosely. Install the bolt with the head and the washer against the stringer. Install the nut and the washer against the radius filler of the rib chord. Make sure all the bolts, the micarta spacers, the radius fillers, the washers, and the nuts are in their initial locations.

S 434-015
(3) Tighten the bolts.

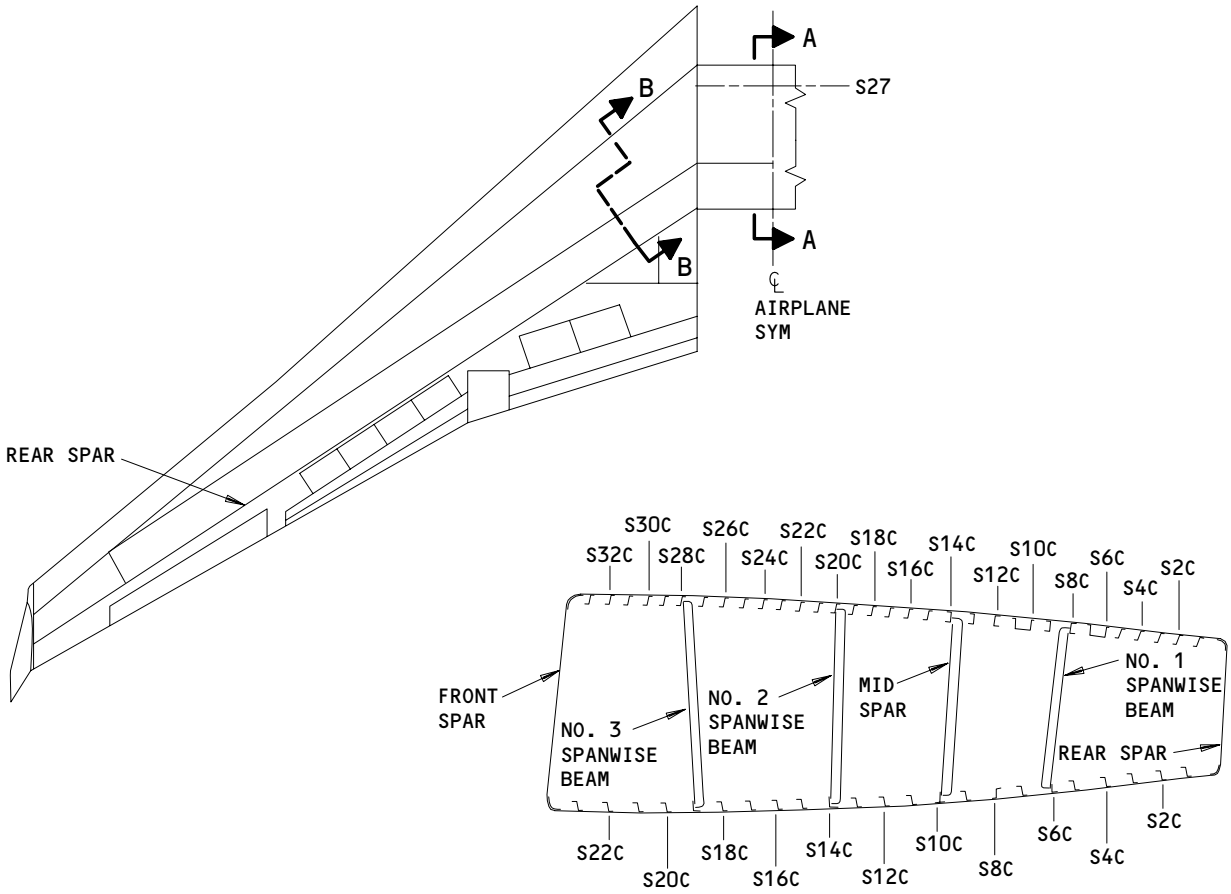
S 434-012
(4) Connect all the plumbing brackets that were disconnected.

S 434-013
(5) If you are at WS 1056 or 1168, install the fuel quantity indicating system tank units (Ref 28-41-01/401).

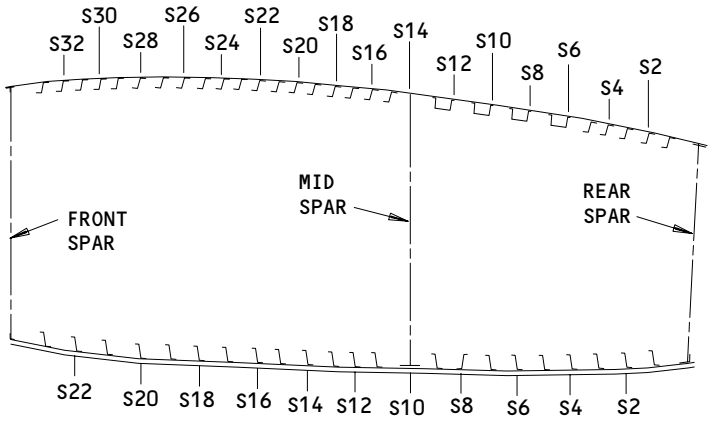
S 414-014
(6) Install the access door for the fuel tank (Ref 28-11-02/401).

WING STRINGERS - DESCRIPTION AND OPERATION

1. General
   A. The upper and lower center and outboard wing skin panels are reinforced internally by a series of Z, T, J, channel, and hat section stringers. Thirty-three stringers are attached to the upper skin inner surface, twenty-three are attached to the lower skin inner surface. Since there are no production breaks in the outboard wing structure, the stringers extend continuously from the wing-to-body rib to the wing tip, as far as the tapering wing planform allows.
2. Wing Stringers (Fig. 1)
   A. The upper and lower center and outboard wing stringers are identified by their position relative to the rear spar and are numbered in sequence beginning with the first stringer forward of the rear spar. The center wing upper stringers S8C, S14C, S20C, and S28C, and lower stringers S6C, S10C, S14C, and S19C serve as chords for the No. 1 spanwise beam, mid spar, and No. 2 and 3 spanwise beams respectively. Upper stringers S6C, S7C, S10C, and S11C are utilized in the wing tank vent system. Spanwise skin splices are accomplished at upper stringers S14C and S27C, and at lower stringers S5C, S10C, S15C, and S20C, Correspondingly numbered outboard wing and center wing stringers have common junctions at WBL 127.75, providing continuous load paths across the wing-to-body rib. The outboard wing upper stringers S6 through S13 are utilized as a portion of the fuel tank vent system. The skin flange of upper stringers S14 and S27 and lower stringers S5, S10, S15, and S20 serves as a skin joint splice. Lower stringer S7 outboard is nonexistent where access doors are found in lower panel No. 2.



WING CENTER SECTION STRINGERS
A-A

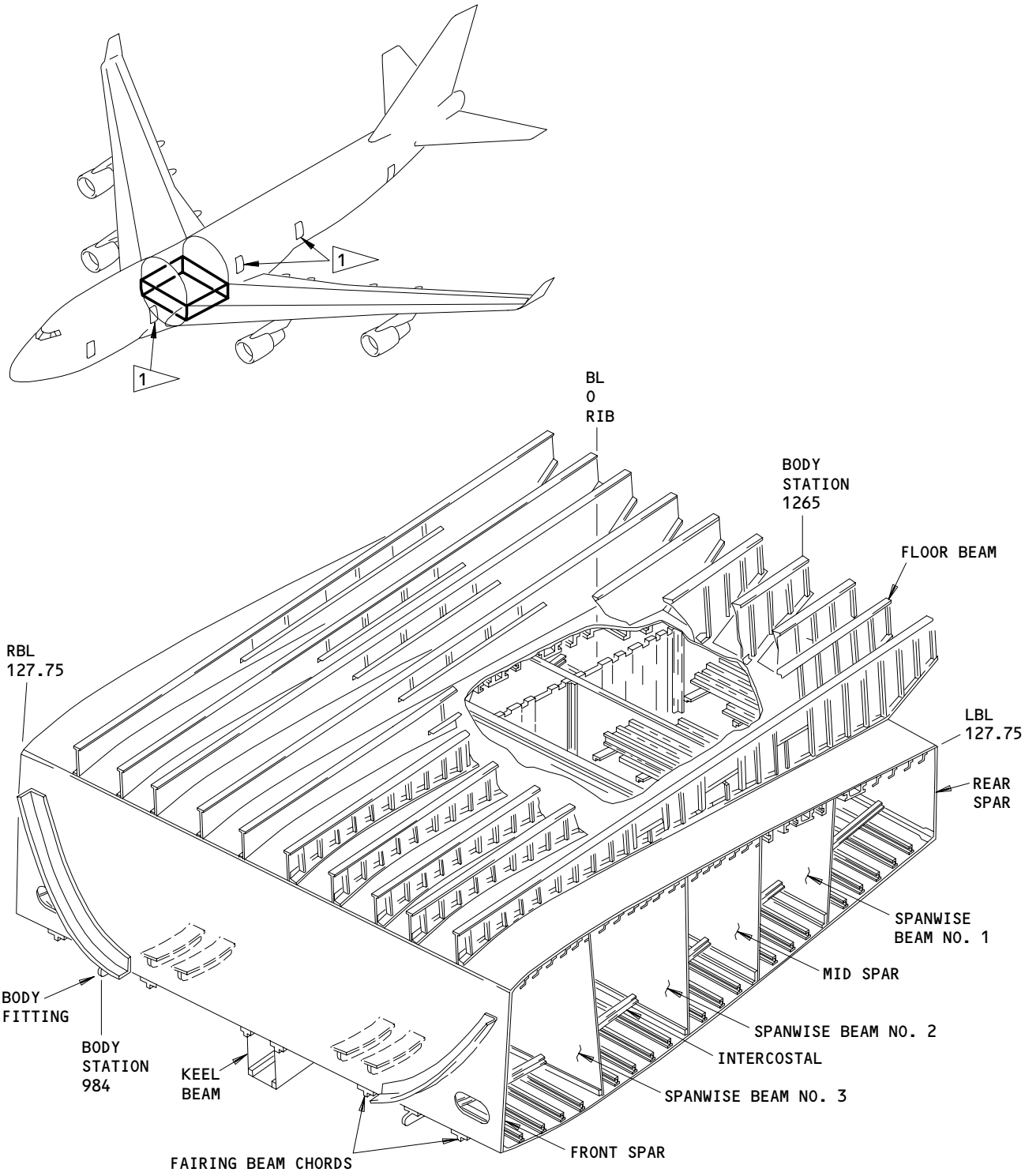


OUTBOARD WING STRINGERS
B-B

Wing Stringers
Figure 1

CENTER WING BOX BEAM - DESCRIPTION AND OPERATION

1. General
   A. The center wing box beam, part of the wing main frame, functions to support the fuselage, to serve as an integral fuel tank, and to support the cantilevered outboard wing box beams.
2. Center Wing Box Beam Structure (Fig. 1)
   A. The forward, aft, upper, and lower surfaces of the center wing box beam are formed by the front and rear spars and upper and lower skin panels. The outboard sides of the center wing box beam are formed by the wing-to-body rib (Ref 57-12-00, Description and Operation). The skin panels are reinforced with spanwise stringers, and are spliced to the outboard wing skins, forming an integral beam. In contrast to the outboard wing boxes, the center wing box does not utilize chordwise ribs, except for a partial rib at BL0. Instead, the box is reinforced by a mid spar and three spanwise beams with stiffened webs which attach to the upper and lower skins. Other structural components and attachments consist of the vertical keel beam, intercostals, stabilizing angles, fairing beams, and fuselage floor beams.
3. Center Wing to Fuselage Attachments (Fig. 1)
   A. The center wing box beam fits into a cutout section of the fuselage where the front, mid, and rear spars form an integral part of body bulkheads at stations 1000.0, 1140.0, and 1241.0 respectively. Another wing-to-fuselage attachment is by the flanged upper and lower chords and frame fittings at left and right WBL 127.75. Other points of attachment include the keel beam and the longitudinal floor beams.

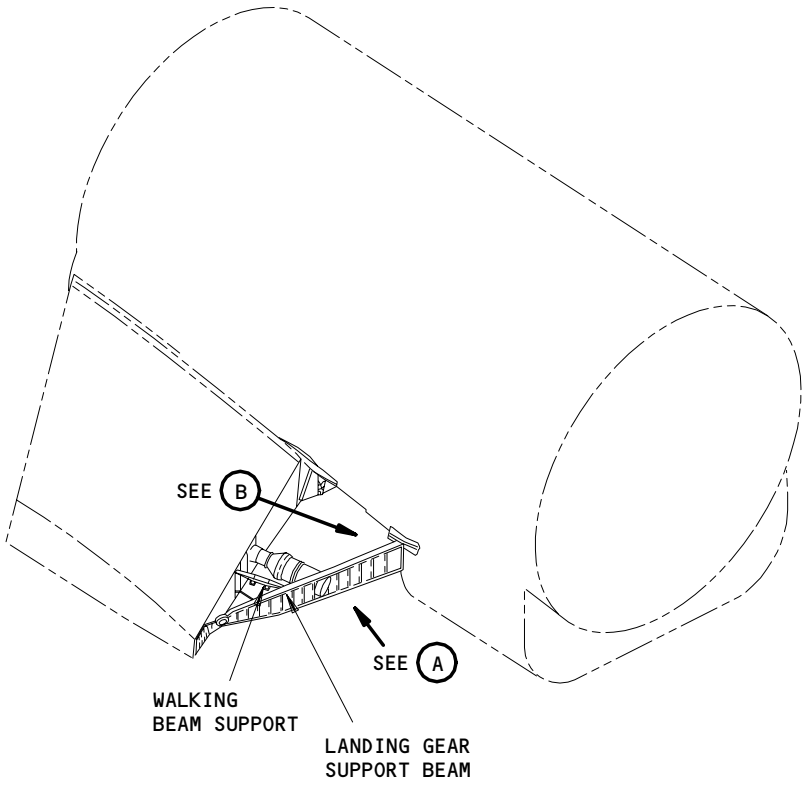


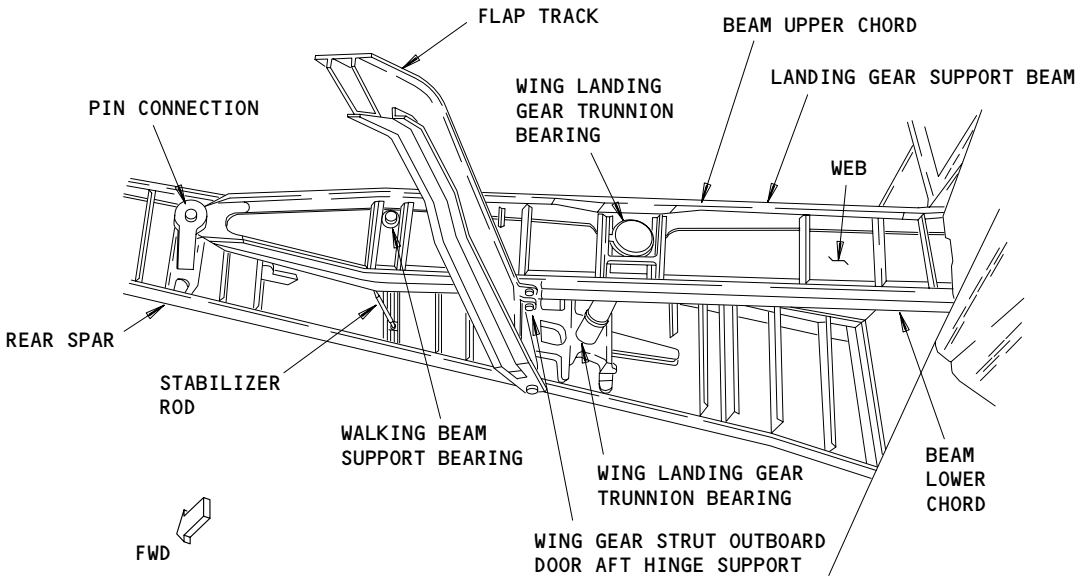
1 ON PASSENGER AIRPLANES ONLY

Wing Center Section
Figure 1

LANDING GEAR SUPPORT BEAMS - DESCRIPTION AND OPERATION

1. General
   A. The support beam for the landing gear is made of two titanium I-beams connected together. The outboard end makes a rigid connection to the wing rear spar at wing station 586 by a one pin connection. The inboard end also makes a rigid connection to the fuselage at body station 1350. A trunnion fitting is in the middle and transmits aft main landing gear loads. The loads go through the beam to the wing spar and to the fuselage structure.
2. Landing Gear Support Beam Structure (Fig. 1)
   A. The support beam is made of a strong web with angle chords at the top and bottom and an outboard terminal fitting. There are six components attached to the support beam of the landing gear:
      (1) The inboard track of the inboard flap.
      (2) The wing trunions.
      (3) The support fitting of the walking beam.
      (4) The aft support hinge to the outboard door for the wing gear strut.
      (5) The support fitting to the flap track.
      (6) The stabilizer rod.

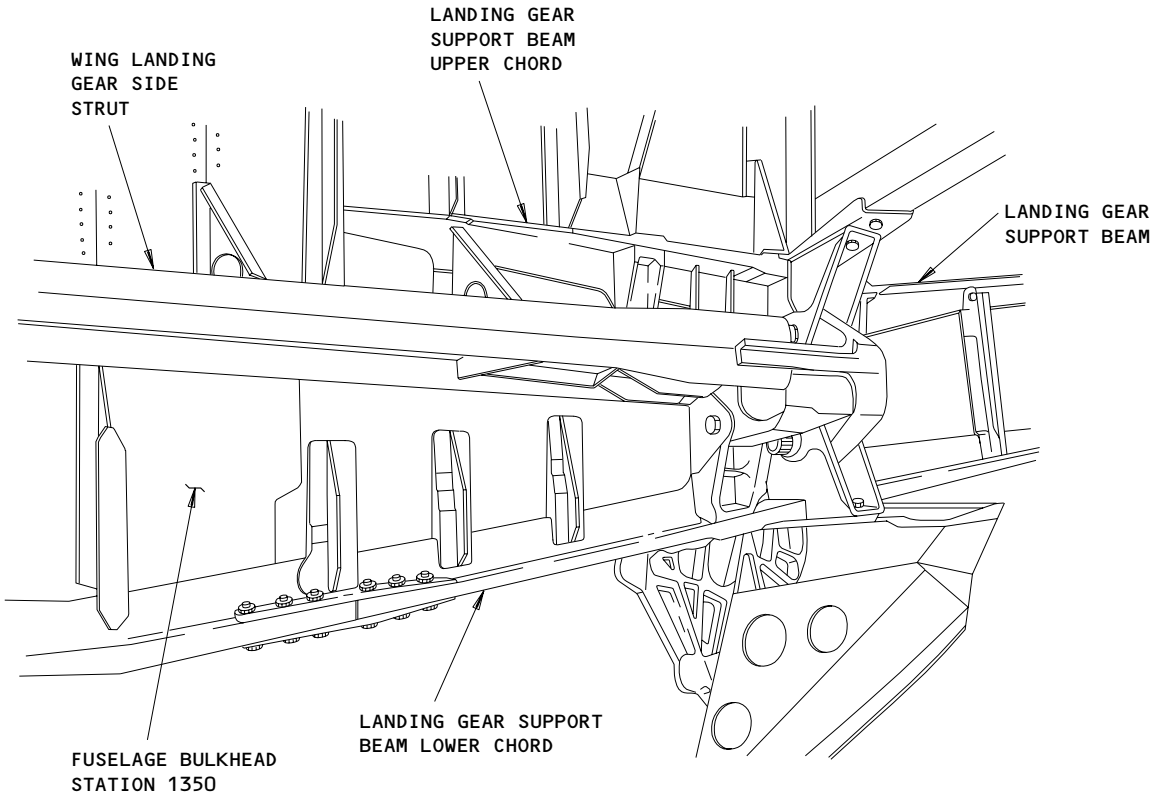




LANDING GEAR SUPPORT BEAM

(A)

Landing Gear Support Beam
Figure 1 (Sheet 1)



LANDING GEAR SUPPORT BEAM ATTACHMENT

B

Landing Gear Support Beam
Figure 1 (Sheet 2)

LANDING GEAR SUPPORT BEAM - MAINTENANCE PRACTICES

1. General
   A. This section contains a task to replace a bolt in the support beam for the landing gear that is unserviceable.
   B. To replace the bolt, you must do these steps:
      (1) Install the door locks on the landing gear doors.
      (2) Remove the unserviceable bolt.
      (3) Apply the sealant to the new bolt if it is necessary.
      (4) Install a new bolt.
      (5) Remove the door locks from the landing gear doors.

TASK 57-15-00-962-001

2. Landing Gear Support Beam Bolt Replacement
   A. Consumable Materials
      (1) A00247 Sealant - BMS 5-95, Class B
   B. References
      (1) 09-11-00/201, Towing
      (2) 32-00-30/201, Landing Gear Door Locks
      (3) IPC 57-15-04 Fig. 1
   C. Access
      (1) Location Zone
          572 Landing Gear Support Beam and Rear Spar to Trailing Edge, Left
          672 Landing Gear Support Beam and Rear Spar to Trailing Edge, Right
   D. Procedure

S 492-011

WARNING: YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Install the ground locks in all landing gear (Ref 09-11-00/201).

S 492-003

WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO INSTALL THE DOOR LOCKS ON THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT INSTALL THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Install the door locks on the wing landing gear (Ref 32-00-30/201).

S 492-012
(3) Install the door locks on the body landing gear (Ref 32-00-30/201).

S 022-013
(4) Remove the bolt that is unserviceable.

S 612-014
(5) When you replace a bolt that attaches brackets and fittings, do one of the two steps that follows:
(a) Apply the sealant in the hole where you will install the bolt.
(b) Apply the sealant on the bolt shank.

S 422-007
(6) Install the new bolt.

S 092-006

WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO REMOVE THE DOOR LOCKS FROM THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT REMOVE THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Remove the door locks from the wing landing gear (Ref 32-00-30/201).

S 092-010
(8) Remove the door locks from the body landing gear (Ref 32-00-30/201).

WING LANDING GEAR SUPPORT BEAM GATE FITTING - REMOVAL/INSTALLATION

1. General
   A. This section contains two tasks. The first is the removal of the gate fitting on the support beam for the wing landing gear. The second is the installation of the gate fitting on the support beam for the wing landing gear.

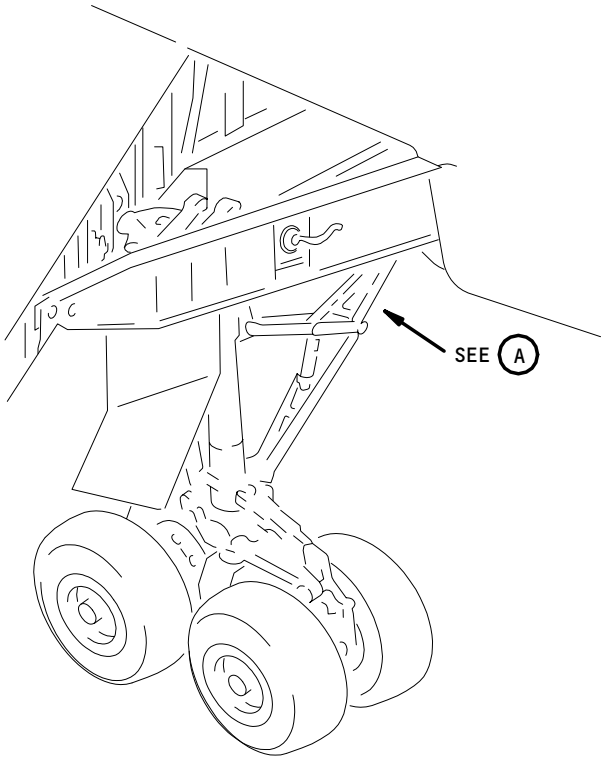
   TASK 57-15-01-004-001

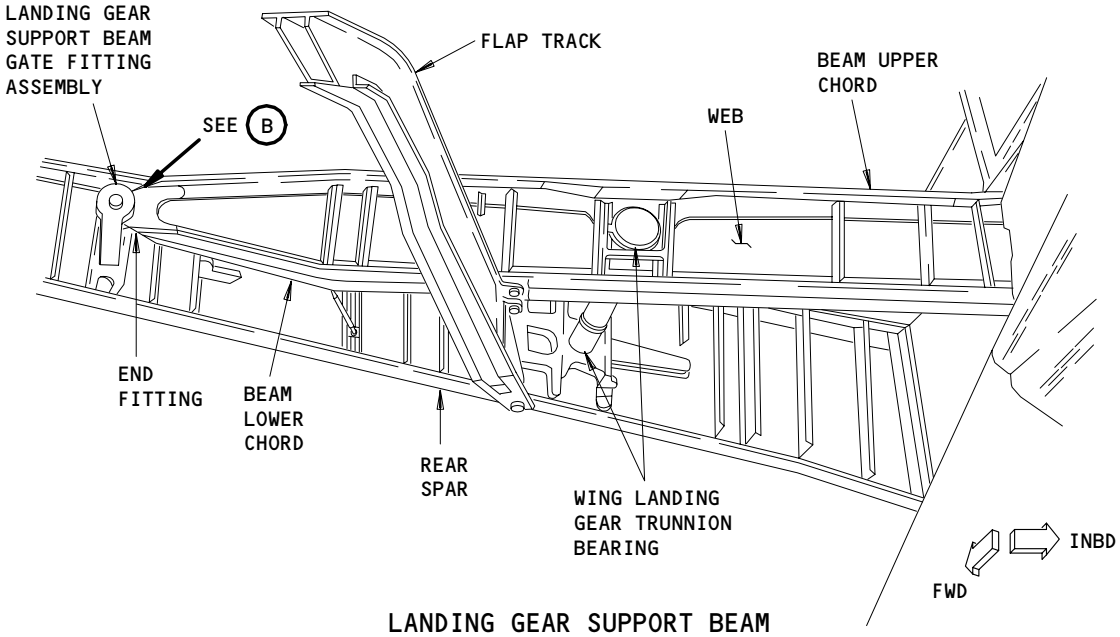
2. Gate Fitting Removal
   A. Special Tools and Equipment
      (1) MIT65B01185 Landing Gear Beam Bearing Installation Tool

   B. Standard Tools and Equipment
      (1) Hoist - Chain, with dynamometer, or other suitable tool for application of up or down 10,000-pound (maximum) load on support beam.
      (2) Protective cloth cover
   C. References
      (1) 7-11-01/201, Jacking Airplane
      (2) 06-09-08/201, Wing Access Doors and Panels
      (3) 32-00-30/201, Landing Gear Door Locks
      (4) IPC 57-41-07 Fig. 1
   D. Access
      (1) Location Zone
          572 Landing Gear Support Beam and Rear Spar to Trailing Edge, Left
          672 Landing Gear Support Beam and Rear Spar to Trailing Edge, Right

      (2) Access Panel
          On the left wing:
          571AT Access Panel - Trailing Edge Up
          571BT Access Panel - Trailing Edge Up
          571CT Access Panel - Trailing Edge Up
          571DT Access Panel - Trailing Edge Up
          571AB Access Panel - Trailing Edge Lower
          572AB Access Panel - Trailing Edge Lower
          572BB Access Panel - Trailing Edge Lower
          572CB Access Panel - Trailing Edge Lower
          572DB Access Panel - Trailing Edge Lower
          572EB Access Panel - Trailing Edge Lower

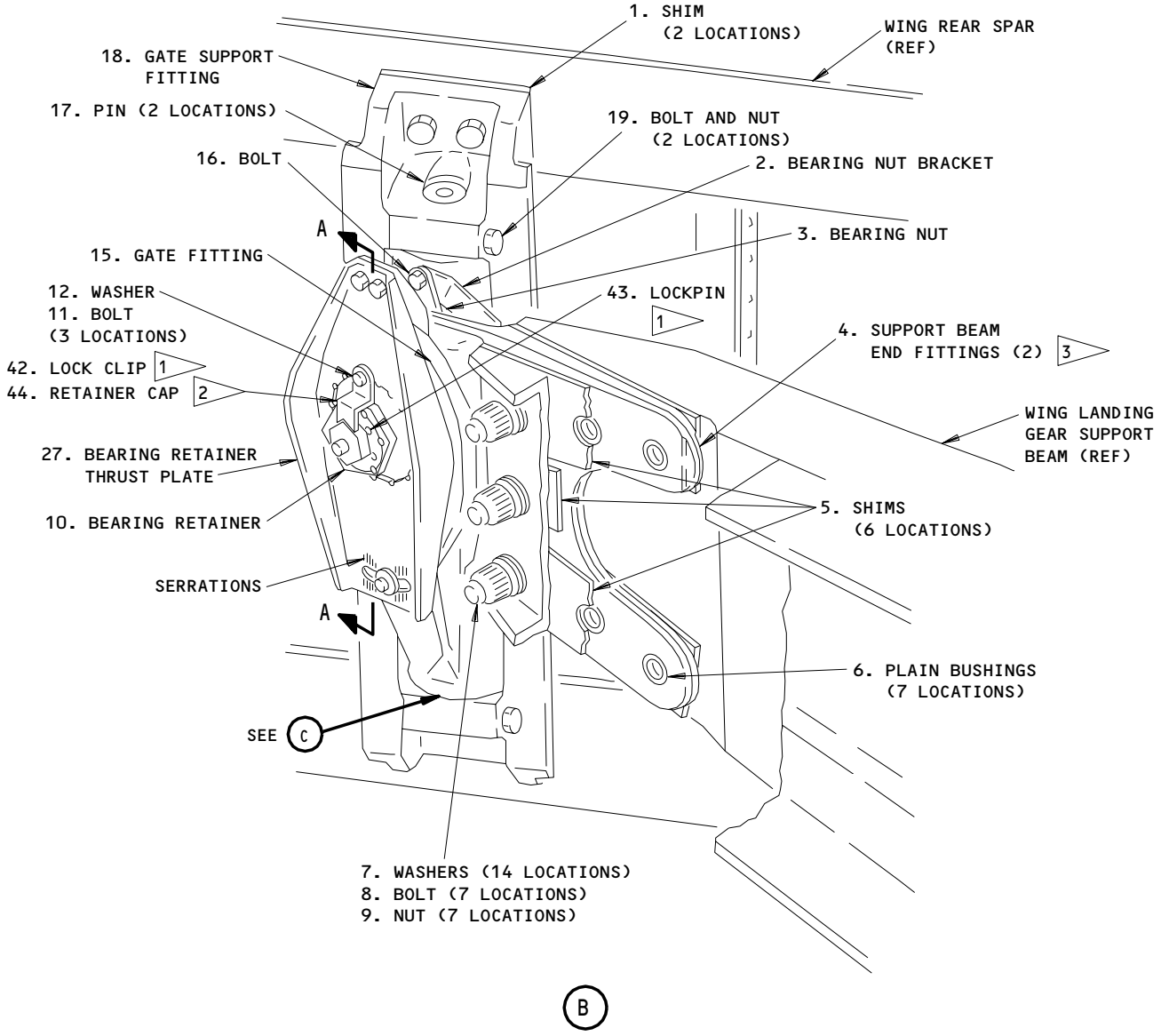
          On the right wing:
          The same number panels as the left wing, but in the 600 number series





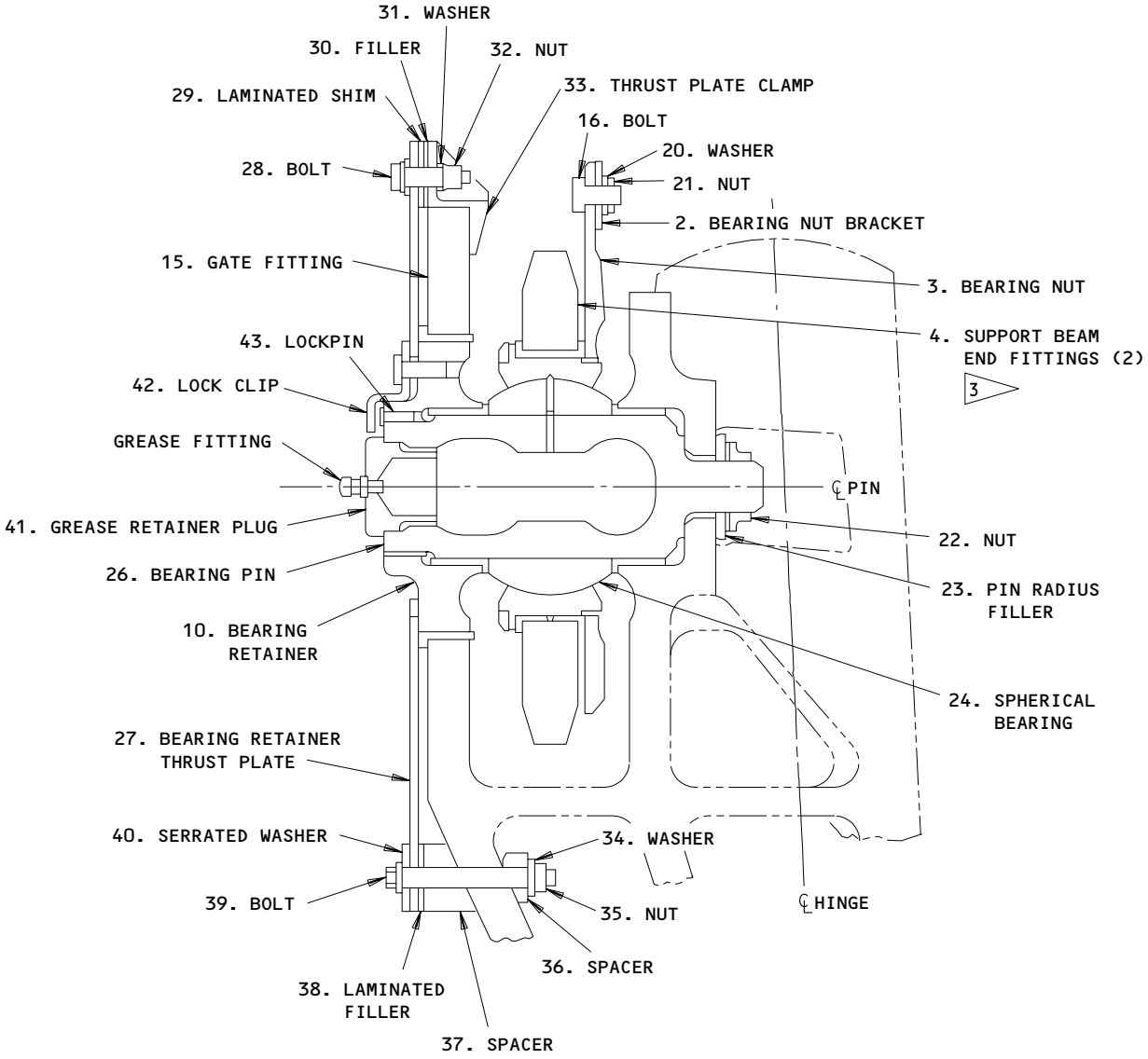
LANDING GEAR SUPPORT BEAM
A

Wing Landing Gear Support Beam Gate Fitting
Figure 401 (Sheet 1)

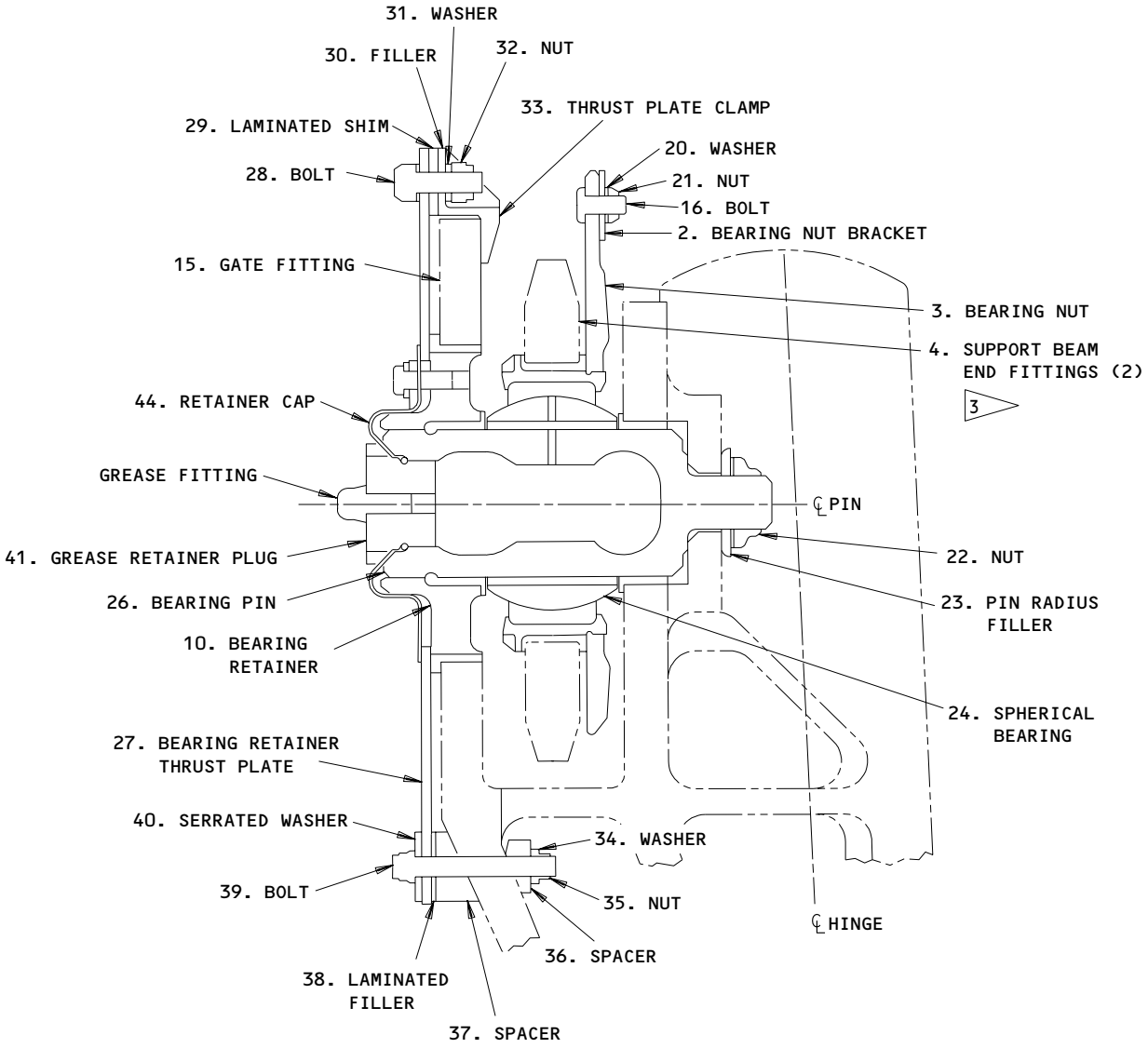


1 AIRPLANES WITH LOCK CLIP
2 AIRPLANES WITH RETAINER CAP
3 ONE FITTING ON SOME AIRPLANES

Wing Landing Gear Support Beam Gate Fitting
Figure 401 (Sheet 2)



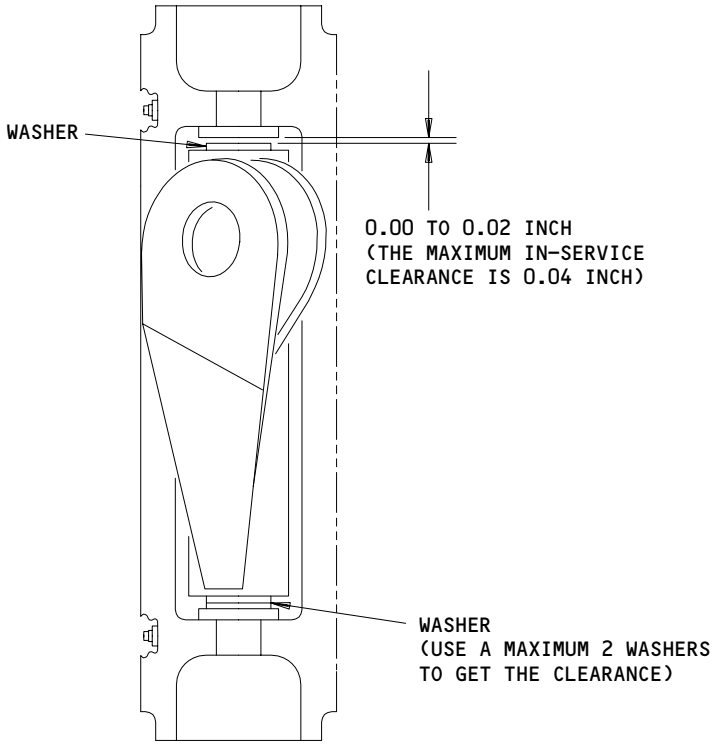
Wing Landing Gear Support Beam Gate Fitting
Figure 401 (Sheet 3)



Wing Landing Gear Support Beam Gate Fitting
Figure 401 (Sheet 4)

EFFECTIVITY
AIRPLANES WITH RETAINER CAP

A44817



C

Wing Landing Gear Support Beam Gate Fitting
Figure 401 (Sheet 5)

E. Prepare for Removal

S 494-027

WARNING: YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Install the ground locks in all landing gear (Ref 09-11-00/201).

S 494-028

WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO INSTALL THE DOOR LOCKS ON THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT INSTALL THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Install the door locks in the doors of the wing and body landing gear (Ref 32-00-30/201).

S 014-029

(3) Remove these access panels if you will do maintenance on the left side (Ref 06-09-02/201):
   (a) Access panels 571AT, 571BT, 571CT, 571DT
   (b) Access panels 571AB, 572AB, 572BB, 572CB, 572DB, and 572EB

S 014-030

(4) Remove these access panels if you will do maintenance on the right side (Ref 06-09-02/201):
   (a) Access panels 671AT, 671BT, 671CT, 671DT
   (b) Access panels 671AB, 672AB, 672BB, 672CB, 672DB, and 672EB

S 954-031

(5) Install the protective covers on the cables and the tubes near the gate fitting.

S 494-032

(6) Install a chain hoist with a dynamometer on the support beam immediately inboard of the walking beam support.

S 864-033

(7) Lift the airplane off the ground with a jack until the wheels or landing gear are off the ground (Ref 07-11-01/201).

F. Remove the Gate Fitting (Fig. 401)

S 034-034

(1) Remove the bolts (11), the washers (12), and the pin retainer assembly (14) from the gate fitting (15).

S 034-035

(2) Remove the bearing retainer thrust plate (27).
  (a) Remove the bolt (28), nut (32), washer (31), filler (30), laminated shim (29), and the thrust plate clamp (33).
  (b) Remove the bolt (39), nut (35), washer (34), spacer (36), spacer (37), laminated filler (38), and serrated washer (40).
  (c) Remove the lock clip (42) and the lockpin (43) if it is installed.
  (d) Remove the retainer cap (44) if it is installed.

S 034-036

(3) Remove the thrust plate (27) from the gate fitting (15).

S 034-037

(4) Remove the nut (22) and the pin radius filler (23) from the bearing pin (26).

S 864-038

CAUTION: DO NOT PERMIT MORE THAN A 10,000 POUND LOAD IN THE UP OR THE DOWN DIRECTION.

(5) Slowly apply a load on the support beam until there is no load on the gate fitting (15) and the bearing pin (26).

NOTE: Use the chain hoist and dynamometer to apply the load. Adjust the load on the beam or adjust the wing jack until you can turn the bearing pin to show the unloaded condition.

S 034-039

(6) Remove the bearing retainer (10) and the bearing pin (26) as an assembly from the gate fitting (15).

S 034-040

(7) Remove the nut (21), washer (20), and the bolt (16) that attaches the bearing nut bracket (2) to the bearing nut (3).

S 034-041

(8) Use the bearing installation tool to remove the bearing nut (3) and the spherical bearing (24).

S 034-042

(9) Remove the bearing pin (26), the spherical bearing (24), and the bearing nut (3) from the gate fitting (15).

S 034-043

(10) Remove the nuts (9), washers (7), and bolts (8) from the end fitting (4) on the support beam.

S 034-044

(11) Remove the end fitting (4) and shims (5) as it is necessary.

NOTE: You cannot interchange the shims and you must install them in the same location they were removed from. Put a tag or a mark on the shims for identification during installation.

S 024-045

(12) Remove the nuts and bolts (19) and the top and lower pins (17) that attach the gate fitting (15) to the support fitting (18).

NOTE: To remove the top and lower pins, push the top pin down and the lower pin up.

TASK 57-15-01-404-019

3. Gate Fitting Installation (Fig. 401)

A. Special Tools and Equipment

(1) MIT65B01185 Landing Gear Beam Bearing Installation Tool

(2) 8ME65B01202-3 Wing Gear Oleo Lock Assembly
(3) 9ME65B00161-1 Wing Gear Oleo Lock Assembly (optional)
(4) MIT65B11261 Torque Holder
(5) ST2580-337 Torque Wrench Adapter

B. Standard Tools and Equipment

(1) Hoist - Chain, with dynamometer, or other suitable tool for application of up or down 10,000-pound (maximum) load on support beam.

C. Consumable Materials

(1) D00013 Grease - MIL-C-23827
(2) A00247 Sealant - Chromate, BMS 5-95, Class B

D. References

(1) 06-09-08/201, Wing Access Doors and Panels
(2) 7-11-01/201, Jacking Airplane
(3) 12-15-03/301, Wing Landing Gear Shock Strut
(4) 12-21-07/301, Landing Gear Support Beam Gate Fitting
(5) 32-00-30/201, Landing Gear Door Locks
(6) 32-32-00/501, Wing Gear and Door Extension ad Retraction
(7) IPC 57-41-07 Fig. 1

E. Access

(1) Location Zone

572 Landing Gear Support Beam and Rear Spar to Trailing Edge, Left
672 Landing Gear Support Beam and Rear Spar to Trailing Edge, Right

(2) Access Panel

On the left wing:

571AT	Access Panel - Trailing Edge Up
571BT	Access Panel - Trailing Edge Up
571CT	Access Panel - Trailing Edge Up
571DT	Access Panel - Trailing Edge Up
571AB	Access Panel - Trailing Edge Lower
572AB	Access Panel - Trailing Edge Lower
572BB	Access Panel - Trailing Edge Lower
572CB	Access Panel - Trailing Edge Lower
572DB	Access Panel - Trailing Edge Lower
572EB	Access Panel - Trailing Edge Lower

On the right wing:
The same number panels as the left wing, but in the 600 number series

F. Procedure

S 424-046

(1) Install the gate fitting.

(a) Put the gate fitting (15) in the support fitting (18) with a minimum of one washer on top and one washer on bottom.

(b) Make sure the clearance is (total both ends) 0.00 to 0.02 inches

NOTE: Install a maximum of three washers to get the clearance. The maximum in-service clearance is 0.04 inch.

(c) Lubricate all the parts with the grease.

(d) Install the top and the lower pins (17) and the bolt and nut (19).

(e) Put the end fitting (4) in the gate fitting (15).

(f) Put the end fitting (4) on the support beam.

(g) Attach the end fitting (4), shims (5), and the bearing nut bracket (2) to the support beam with the bolts and nuts.

NOTE: Tighten the nuts hand-tight.

(h) Apply a thin layer of grease to the mating surfaces of the threads before the installation.

NOTE: You cannot interchange the shims and you must install them in the same location they were removed from.

(i) Install the spherical bearing (24) and the bearing nut (3) on the support beam end fitting (4) hand-tight.

(j) Install the bolt (16) through the bearing nut (3) and the bearing nut bracket (2).

(k) Install the washer (20) and the nut (21).

(l) Use the bearing installation tool to tighten the outer race of the spherical bearing (24), 1000 to 1500 pounds-inches.

(m) Tighten the nuts (9), washer (7), and the bolts (8) that attach the end fitting (4):

1) For bolt part number BACB30NH14SUXX, tighten to 2600 to 3000 pound-inches.
2) For bolt part number BACB30US14KXX, tighten to 5100 to 6700 pound-inches.

G. Align the Spherical Bearing and Gate Fitting.

S 844-047

WARNING: YOU MUST NOT REMOVE THE VALVE BODY WHEN THERE IS PRESSURE ON IT. THE VALVE CAN BLOW OUT AND CAUSE INJURY TO PERSONS.

(1) Remove the charging valve cap on the shock strut of the wing landing gear.

S 874-073

WARNING: BEFORE YOU DEFLATE THE STRUT, MAKE SURE THAT THE AREA BELOW THE WING IS CLEAR. WHEN YOU DEFLATE THE STRUT, THE WING CAN LOWER MANY FEET, WHICH CAN CAUSE DAMAGE TO THE EQUIPMENT.

(2) Loosen the outer nut no more than two turns to remove the pressure from the shock strut.

S 864-049

(3) When the air flow stops, replace the cap.

S 494-050

(4) Install the lock assembly for the wing gear oleo.

S 584-051

(5) Lift the airplane on jacks until the wheels do not touch the ground (Ref 7-11-01/201).

NOTE: Apply a 20,000-pound load on inboard auxiliary wing jacks and a 10,000-pound load on outboard auxiliary wing jacks. For an airplane that has a fuel load that is not symmetrical, apply the jack loads in proportion to the unbalanced condition or move fuel to symmetrically load the airplane.

S 864-052
(6) Apply a 20,000-pound load on the inboard auxiliary wing jacks and a 10,000-pound load on the outboard auxiliary wing jacks.

NOTE: For an airplane that does not have a symmetrical fuel load, apply the jack loads in proporation to the unbalanced condition or transfer fuel to symmetrically load the airplane.

H. Continue the Installation.

S 434-053
(1) Install the bearing pin (26) through the spherical bearing (24) and into the gate fitting (15).

S 034-054
(2) Remove the grease retainer plug (41) from the bearing pin (26).

S 434-055
(3) Install the pin radius filler (23) and the nut (22) on the bearing pin (26).
(a) Hold the bearing pin (26) stationary with a torque holder.
(b) Tighten the nut (22) to 1300 to 1500 pound-inches with a torque wrench adapter.
(c) Make sure the thread protrusion through the nut (22) is at a minimum of 0.15 inch.
(d) Tighten the nut (22) if it is necessary to get the 0.15-inch minimum thread protrusion.

S 434-056
(4) Install the bearing retainer.
(a) Partially install the bearing retainer (10) on the bearing pin (26).
(b) Make sure the retainer will turn with a torque of less than 500 pound-inches.
(c) Adjust the load on the jacks if it is necessary to get the correct freedom of rotation of the bearing retainer (10).

NOTE: Do not permit more than 30,000 pounds on the inboard auxiliary wing jacks. Do not permit more than 25,000 pounds on the outboard auxiliary wing jacks.

(d) Install the bearing retainer (10) on the bearing pin (26) and into the gate fitting (15).

NOTE: Apply a layer of grease to the mating surfaces before the installation. Adjust the load on the beam or adjust the load on wing jack if it is necessary until you can turn the bearing retainer (10) into the gate fitting (15).

(e) Tighten the bearing retainer (10) tightly against the spherical bearing (24) between 40 to 70 pound-inches more than the run-on torque.

(f) Loosen the bearing retainer (10) 60 ±30 degrees counterclockwise as it is necessary to align one of the half-round key slots with corresponding slot on the bearing pin (26).

(g) Make sure the total dimension between the flanged bushings of the gate fitting (15) and the spherical bearing (24) is 0.020 (+0.005/-0.013) inch.

NOTE: Tighten or loosen the bearing retainer (10) to get the necessary dimension.

(h) Fully fill the empty space of the bearing pin (26) with the grease and install the grease retainer plug (41) fully hand-tight.

(i) Loosen the plug (41) if it is necessary (up to 60 degrees) to permit the installation of the lock clip or retainer cap.

(j) Make sure the slots of these items align correctly:

NOTE: After you align the parts, they will be in the last aligned position. Do not turn the bearing parts during the remaining steps.

1) The bearing retainer (10)
2) The pin slots of the bearing pin (26)
3) The pin slots of the grease retainer plug (41).

S 434-057

(5) Install the thrust plate (27) for the bearing retainer.

(a) Put the thrust plate in its position.

(b) Turn the plate to align the slot in the plate with the 0.25-inch hole in the gate fitting (15).

(c) Put the serrated washer (40) in its position to align the serrations on the thrust plate (27).

(d) Temporarily install the laminated filler (38), the spacer (37), and the bolt (39).

(e) Remove the 0.003-inch laminations from the laminated filler (38) if it is necessary, to get a solid-stack fit.

NOTE: A maximum clearance of 0.005 inch is permitted after the installation of the shims and before the fastener installation.

(f) Apply the sealant in the hole through the gate fitting at the lower attachment of the retainer thrust plate (27) immediately before the installation.
(g) Apply the sealant on the shank of the bolt (39) immediately before the installation.
(h) Install the spacer (36), the washer (34), and the nut (35).
(i) Tighten the nut (35) between 30 to 40 pound-inches.
(j) Temporarily install the laminated shim (29), the filler (30), and the thrust plate clamp (33).
(k) Remove the 0.003-inch laminations from the laminated shim (29) if it is necessary, to get a solid-stack fit.

NOTE: A maximum clearance of 0.005 inch is permitted after the installation of the shims and before the fastener installation.

(l) Install the washer (31) and the nut (32).
(m) Tighten the nut (32) between 30 to 40 pound-inches.

S 434-058
(6) On Airplanes with lock clip, install the lock clip.
(a) Install the lockpin (43).
(b) Install the lock clip (42) with the attach bolt to trap the lockpin in the pin slot with the lock clip.
(c) Install the two other attach bolts in the aligned holes with the two countersink washers.

S 434-059
(7) On airplanes with retainer cap, install the retainer cap.
(a) Install the retainer cap (44) with the three bolts and countersink washers.

S 434-060
(8) Install the lockwire on the attach bolts.

I. Put the Airplane to Its Usual Condition.

S 094-061
(1) Slowly release the load on the support beam until there is no load on the beam.

S 094-062
(2) Remove the lock assembly from the wing gear oleo if it is installed.

S 614-063
(3) Service the shock strut if you removed the pressure from it (Ref 12-15-03/301).

S 644-064
(4) Lubricate the gate fitting (Ref 12-21-07/301).

S 094-065
(5) Remove the chain hoist and the dynamometer from the support beam.

S 094-066
(6) Remove the protective covers from the cables and the tubes near the gate fitting.

S 414-067
(7) Install these access panels if you did maintenance on the left side (Ref 06-09-02/201):
(a) Access panels 571AT, 571BT, 571CT, 571DT
(b) Access panels 571AB, 572AB, 572BB, 572CB, 572DB, and 572EB

S 414-068
(8) Install these access panels if you did maintenance on the right side (Ref 06-09-02/201):
(a) Access panels 671AT, 671BT, 671CT, 671DT
(b) Access panels 671AB, 672AB, 672BB, 672CB, 672DB, and 672EB

S 094-069

WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO REMOVE THE DOOR LOCKS FROM THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT REMOVE THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Remove the door locks from the doors of the wing and body landing gear (Ref 32-00-30/201).

S 714-070
(10) Do the operational test of the wing landing gear (Ref 32-32-00/501).

S 864-071
(11) Lower the airplane to the ground (Ref 7-11-01/201).

WING LANDING GEAR SUPPORT BEAM GATE FITTING - INSPECTION/CHECK

1. General
   A. This section contains a task to examine the gate fitting for the support beam of the wing landing gear.
   B. To do the inspection, you must accurately measure the inner and the outer diameters of these components in the gate fitting:
      (1) The bushings
      (2) The bearings
      (3) The pins.
   C. You must first disassemble the gate fitting to do the inspection.

TASK 57-15-01-206-001

2. Examine the Gate Fitting (Fig. 601)
   A. Standard Tools and Equipment
      (1) Micrometer - 2 to 3 inch, inner and outer measuring
      (2) Micrometer - 3 to 4 inch, inner and outer measuring
      (3) Vernier Caliper - alternative to micrometers
   B. References
      (1) 57-15-01/401, Wing Landing Gear Support Beam Gate Fitting
      (2) IPC 57-41-07 Fig. 1
   C. Access
      (1) Location Zone

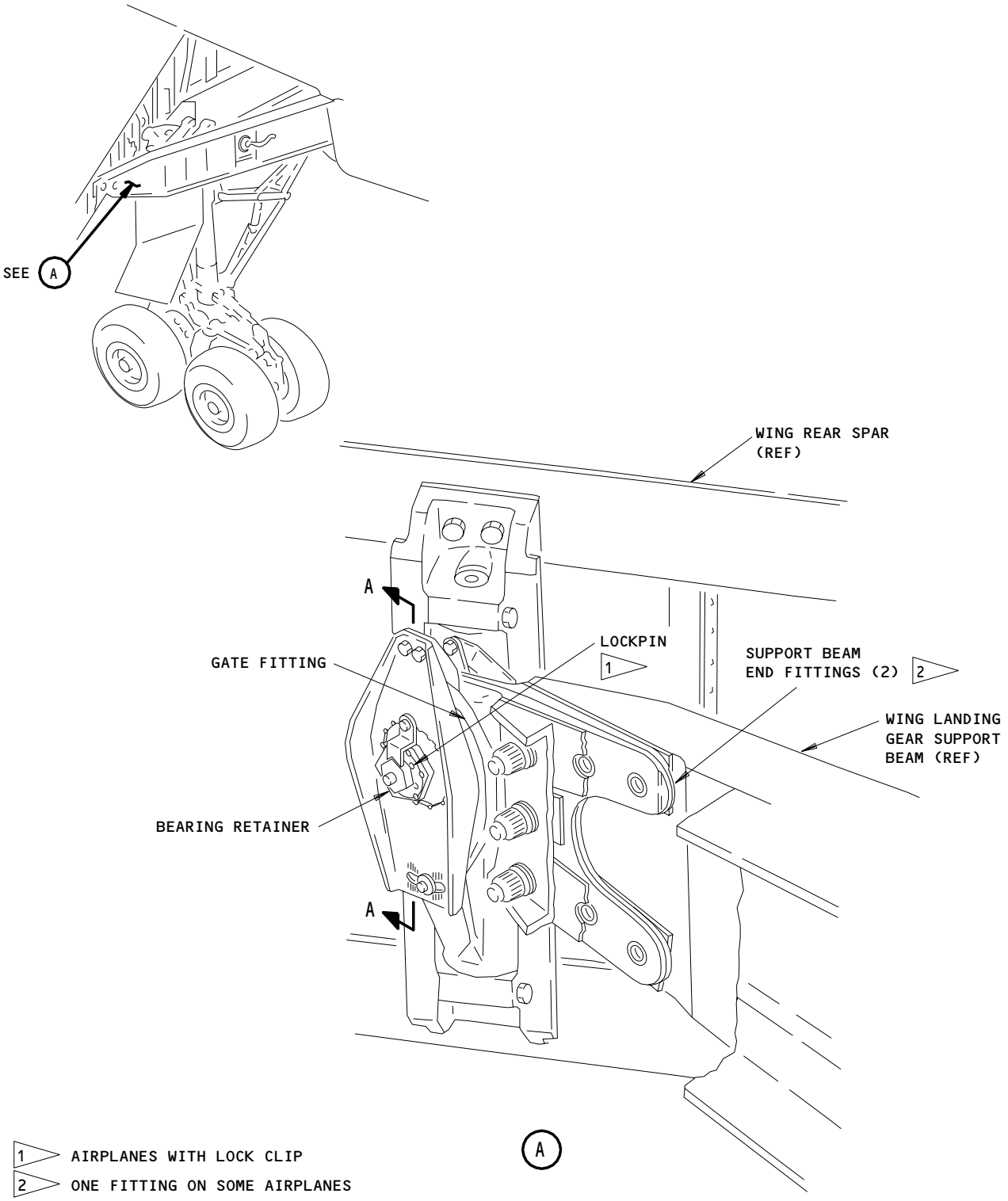
572	Landing Gear Support Beam And Rear Spar To Trailing Edge, Left
672	Landing Gear Support Beam and Rear Spar to Trailing Edge, Right

   D. Procedure

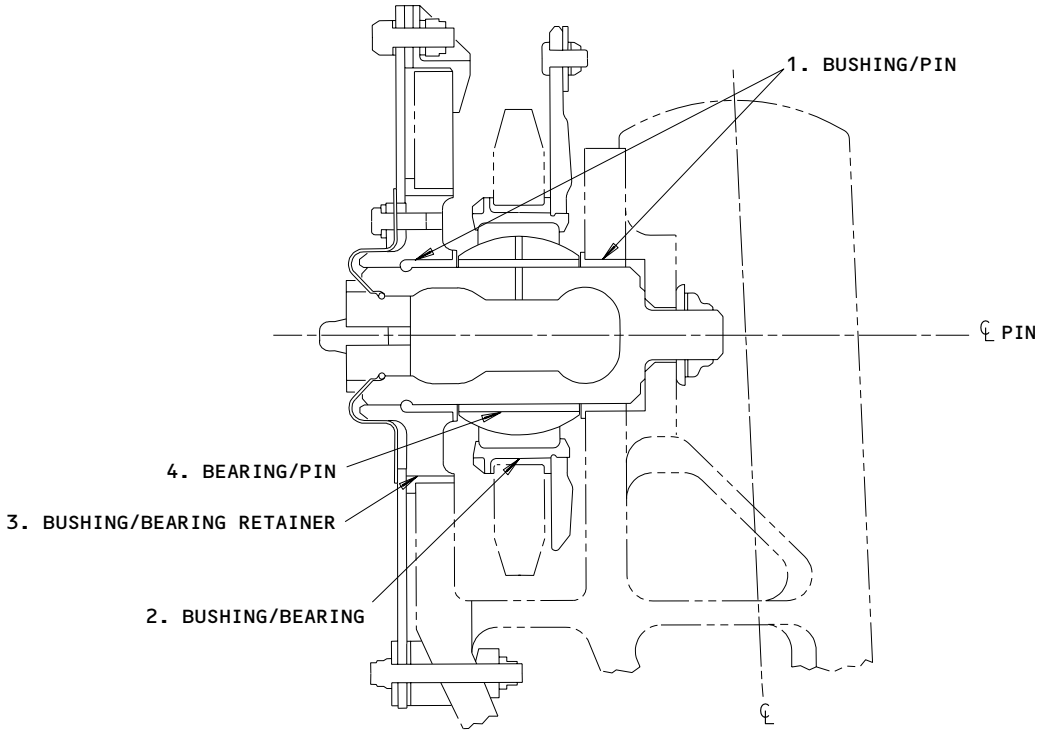
S 036-002
(1) Remove the gate fitting (Ref 57-15-01/401).

S 226-003
(2) Examine the condition of the gate fitting and its related parts for the wear limits.
   (a) Remove the parts you will examine.
   (b) Measure the parts as necessary and compare your measured dimensions to the dimensions in Table 601.
   (c) If the part dimensions do not agree with the tolerances from Table 601, repair or replace the part (Refer to Table 601).
   (d) Install the parts that you removed.

S 436-004
(3) Install the gate fitting (Ref 57-15-01/401)



Wing Landing Gear Support Beam Gate Fitting Wear Limits
Figure 601 (Sheet 1)



INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PER-MITTED WEAR DIM.	MAX DIA CLEAR-ANCE			
			MIN	MAX					
1	BUSHING	ID	2.0495	2.0500	2.0540	0.006	X		3
	PIN	OD	2.0480	2.0490	2.0440		X	5	
2	BUSHING	ID	3.7015	3.7026	3.7052	0.0052	X		3
	BEARING	OD	3.7000	3.7010	3.6974		X		
3	BUSHING	ID	4.2006	4.2020	4.2055	0.006	X		3
	BEARING RETAINER	OD	4.1995	4.2001	4.1960		X		
4	BEARING 4	ID	2.0495	2.0500	2.0540	0.006	X		
	PIN	OD	2.0480	2.0490	2.0440		X	5	

NOTE: THE WEAR LIMITS FOR THE AREAS SHOWN ARE SAME FOR ALL THE INSTALLATIONS.

3 YOU MUST REPLACE THE BUSHING. REFER TO THE OVERHAUL MANUAL FOR THE REPAIR INFORMATION.

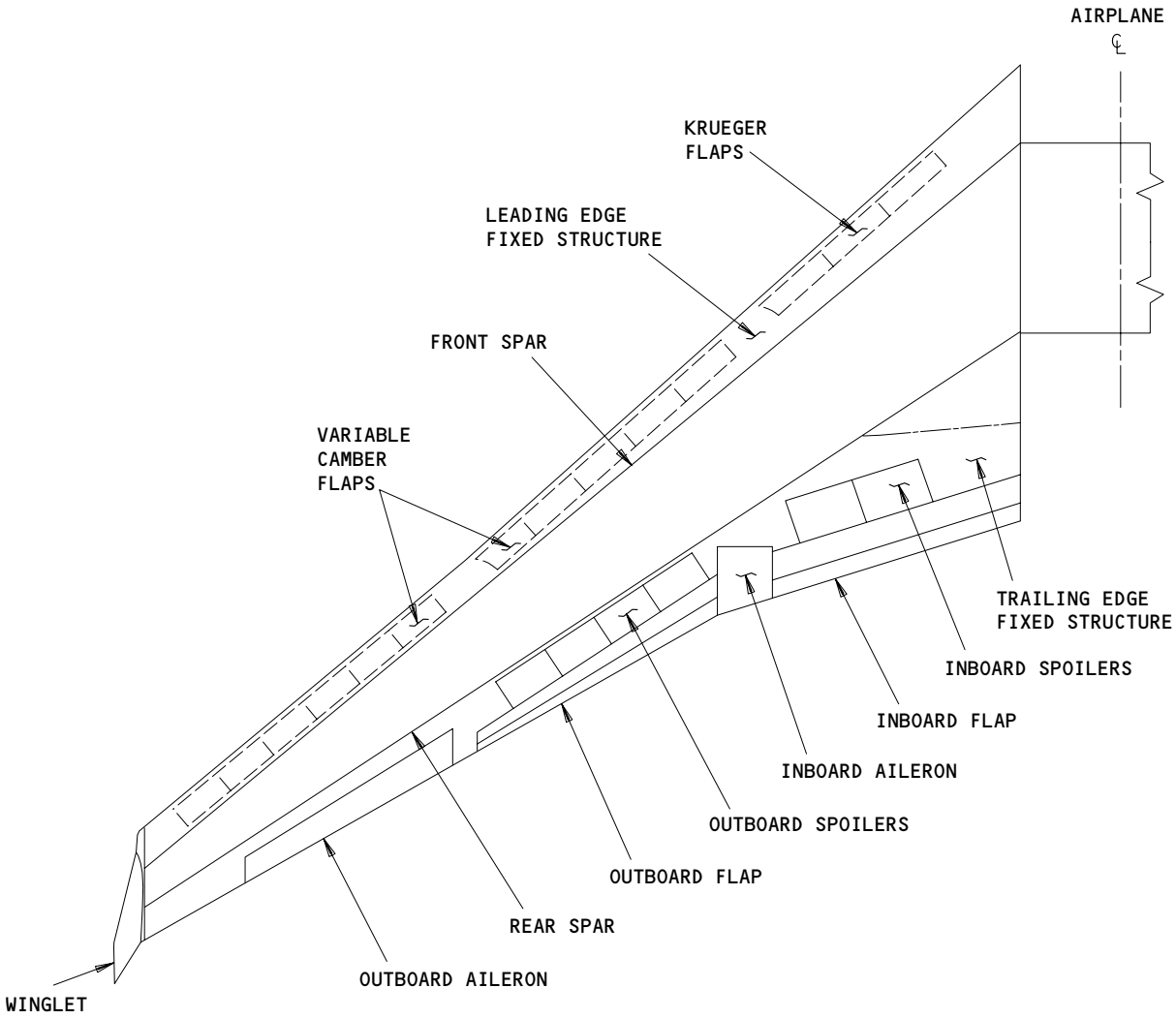
4 THE MAXIMUM AXIAL CLEARANCE PERMITTED BEARING BALL TO THE BEARING RACE - 0.018

5 CAUTION: DO NOT REPAIR DAMAGED OR WORN PIN. YOU MUST REPLACE A PIN THAT HAS DAMAGE. STRUCTURAL FUSE ITEM

Wing Landing Gear Support Beam Gate Fitting Wear Limits
Figure 601 (Sheet 2)

AUXILIARY STRUCTURE - DESCRIPTION AND OPERATION

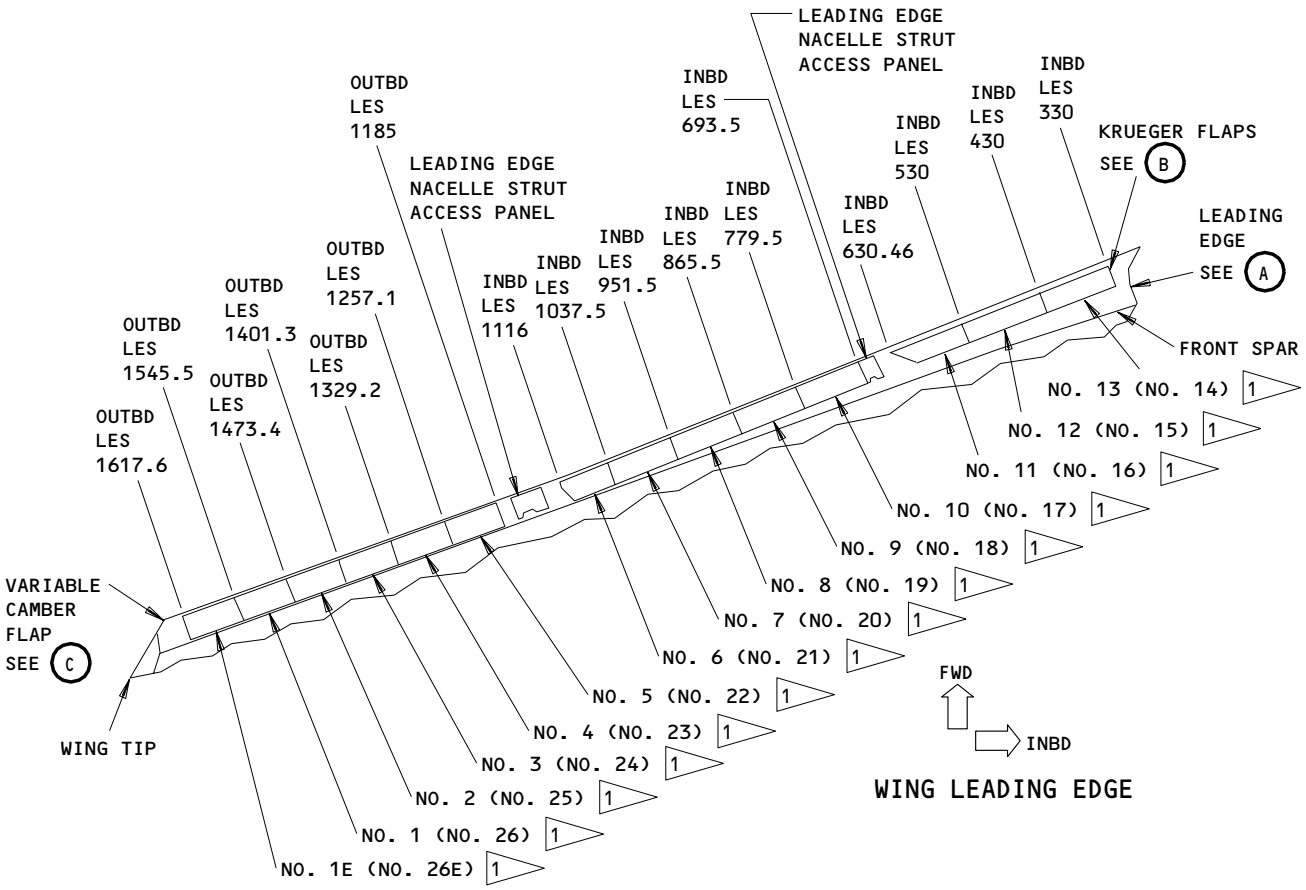
1. General
   A. The wing auxiliary structure basically comprises structure which does not carry primary loads and thus includes the components outside the wing main frame. This structure serves as supporting framework for aerodynamic fairings or skins, flight control surfaces and associated mechanisms, and for systems wiring, tubing, and cables.
2. Auxiliary Structure (Fig. 1)
   A. The wing auxiliary structure consists of three basic sections: the leading edge fixed structure, trailing edge fixed structure, and winglet. The wing leading edge fixed structure comprises ribs, braces, struts, beams, intercostals, and skins, and is cantilevered from the wing front spar to support and house the leading edge flaps and operating mechanisms. To increase fatigue resistance, a considerable portion of the exterior surface is of fiberglass honeycomb sandwich construction. The trailing edge fixed structure, cantilevered from the wing rear spar, is comprised of ribs, beams, intercostals, and skin. The trailing edge flaps, ailerons, spoilers, and respective equipment are supported by the trailing edge fixed structure. These flight control surfaces form a large portion of the exterior surface of the trailing edge. The trailing edge external surface utilizes fiberglass and aluminum honeycomb panels to a large extent because of the excellent resistance to fatigue failures. The removable winglet is cantilevered from the wing closure rib structure at wing buttock line 1247.0 and consists of skin panels, spars and ribs all made primarily of graphite composite materials. The leading edge and tip are aluminum. Included with the winglet are three fairing sections which are removable.



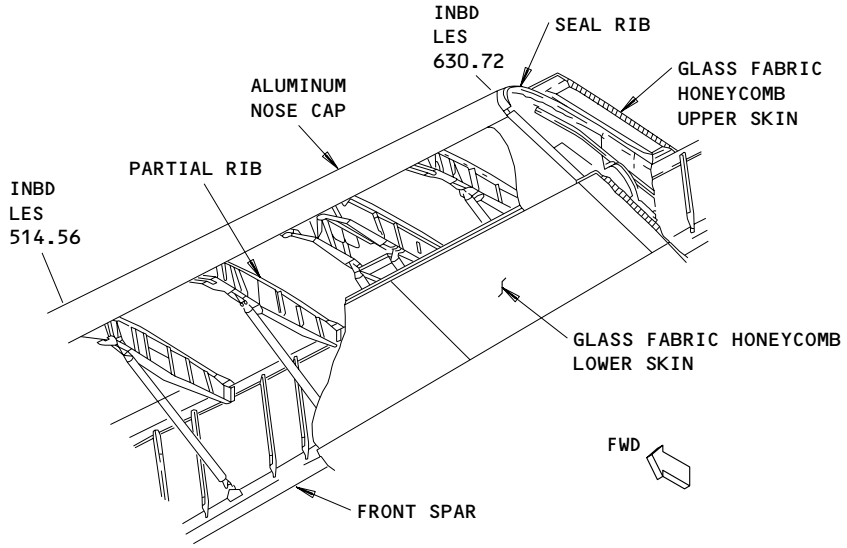
Wing Auxiliary Structure
Figure 1

WING LEADING EDGE - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The leading edge structure is cantilevered forward from the front spar and consists of a series of flanged, stiffened ribs installed normal to the leading edge. The upper and lower leading edge skin panels are constructed of glass fabric honeycomb materials and finished with a static conditioner and conductive coating. The nose cap is aluminum. In the area where the Krueger and variable camber (leading edge) flaps are installed, the ribs are only partial ribs, and form the upper and forward portion of the leading edge structure. Tubular braces between the forward portion of the ribs and the front spar lower chord provide additional structural support. The leading edge flaps are supported by the leading edge structure and, when retracted, form a large portion of the lower forward exterior surface. Spanwise beams are located immediately aft of the flap trailing edges and serve to support the lower aft leading edge skin panels. Struts connecting the beam to the ribs provide additional rigidity. An aerodynamic seal is provided to seal the gap between the flap trailing edges and the beam when the flaps are in the retracted position (Ref 27-81-00).
2. Krueger Flap Area (Fig. 1)
   A. Three Krueger type flaps are supported by each wing leading edge structure and retract into the flap well in the lower forward portion of the leading edge inboard of the inboard nacelle. Four hinge fittings support each flap segment; each hinge fitting is attached to a flap support leading edge rib. The center two support ribs for each segment also serve as a flap actuator attachment point. Air loads generated during operation of the flaps are transferred through the leading edge ribs into the wing main frame. Flap mechanism components such as the drive unit and torque tube transmissions, are housed in the wing leading edge and are supported by the ribs and associated structure. The Krueger flaps are numbered, left to right, 11 through 16.
3. Variable Camber Flap Area (Fig. 1)
   A. The 14 segments of the variable camber flaps, in each wing, are installed in the lower forward portion of the leading edge and retract into flap wells. Two sets of mechanical actuation linkages supporting each flap segment are attached to the forward portion of ribs installed on each side of the flap linkages. Other ribs are installed near the midpoint of each flap segment. During flap operation, air loads are transferred through the flap linkages and support ribs into the wing main frame. Flap mechanism components, including the drive units, rotary actuators, and torque tube drives, are supported by the leading edge structure. The variable camber flaps are numbered, left to right, 1E through 13 and 14 through 26E.



WING LEADING EDGE

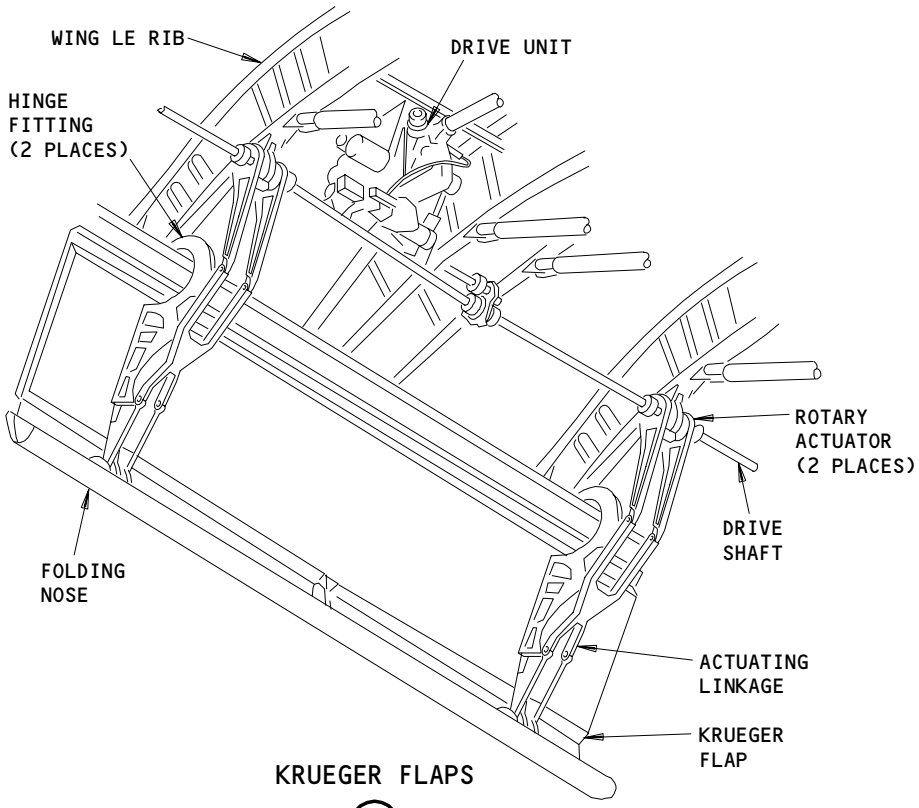


LEADING EDGE STRUCTURE (TYPICAL)

A

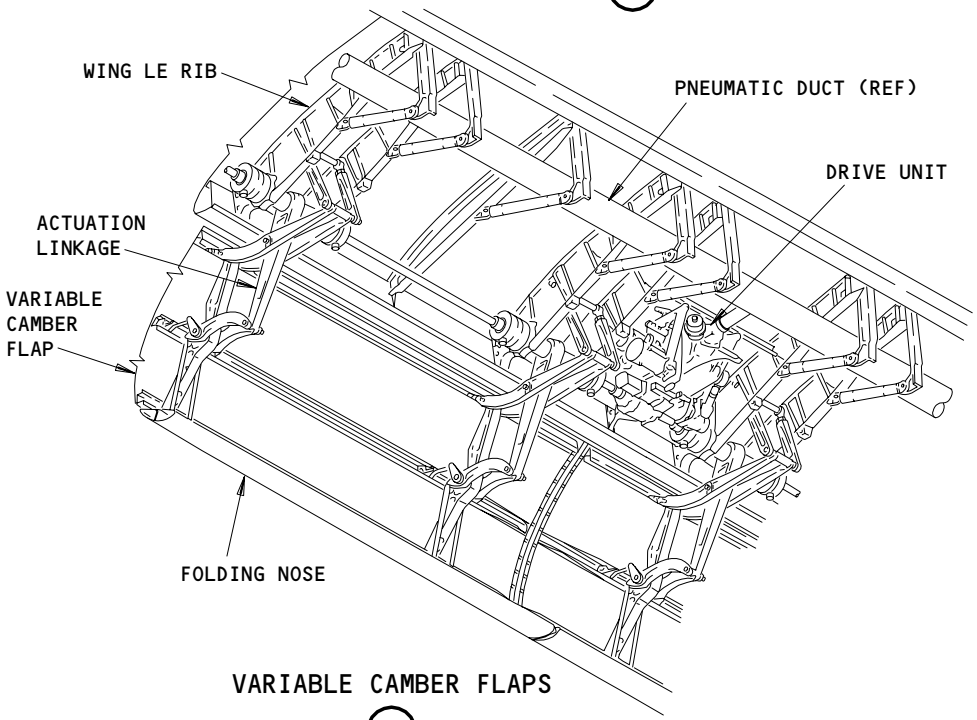
1 PARENTHESIS INDICATES RIGHT WING LEADING EDGE FLAP NUMBER.

Wing Leading Edge
Figure 1 (Sheet 1)



KRUEGER FLAPS

B



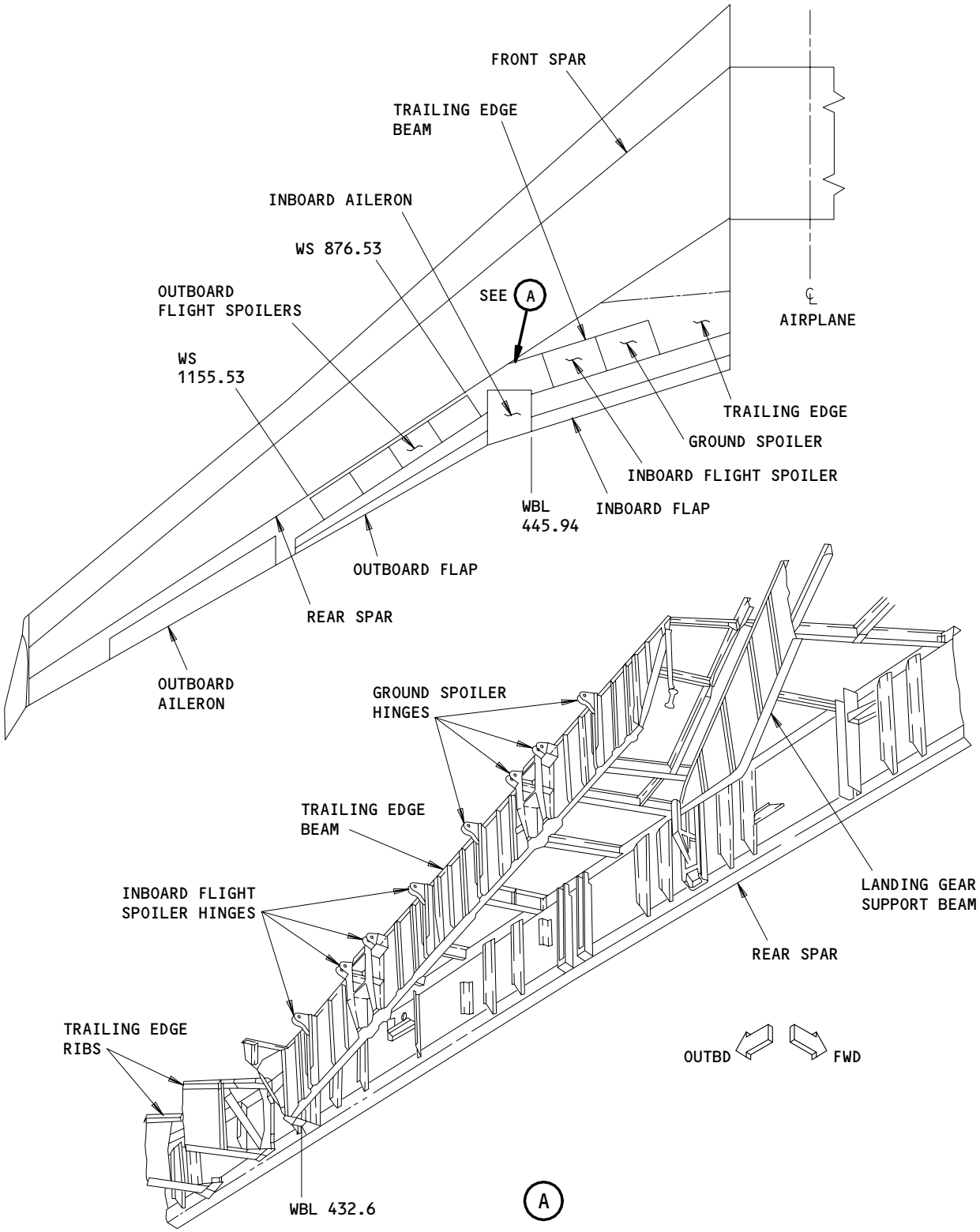
VARIABLE CAMBER FLAPS

C

Wing Leading Edge
Figure 1 (Sheet 2)

WING TRAILING EDGE - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The wing trailing edge structure is cantilevered from the wing rear spar and comprises stiffened ribs, spanwise beams and intercostals, auxiliary spars, braces, and skin panels. Additional support of the inboard portion is provided by the landing gear support beam. The structure is generally divided into two sections: fixed structure and movable structure. Flight control surfaces are movable structure and consist of two ailerons, two flaps, and six spoiler segments on each wing. These surfaces form a large portion of the trailing edge structure and are supported by hinge support ribs, beams, and/or track ribs. The inboard portion of the trailing edge structure between the fuselage and WBL 515.0 extends aft of the basic wing trailing edge.
2. Trailing Edge Structure
   A. The trailing edge structure consists of the cantilevered portion aft of the wing rear spar. This structure supports the flight control surfaces, operating mechanisms, and other airplane systems equipment, tubing, cables, and wiring. Wells and/or operating clearance areas for the spoilers, aileron, flaps, and wing main landing gear are provided in the ribs, beams, and other supporting members.
   B. The inboard portion, between WBL 128.46 and 445.94, is constructed of chordwise and spanwise ribs, a trailing edge beam, auxiliary spars, intercostals, strut-type braces, and skin panels. Flap track ribs at WBL 235.20 and 353.00 support the inboard flap. These ribs are mounted beneath the trailing edge proper and are supported by the wing rear spar, inspar ribs, and the landing gear support beam. The trailing edge support beam, which is located immediately forward of the leading edge of the spoilers between WBL 235.20 and 445.94, provides hinge support and actuator attachments for the inboard spoilers. Upper and lower auxiliary spars are attached to either side of the landing gear support beam. These spars provide support for the trailing edge skin panels and internal structure without transferring landing gear loads into the auxiliary spars and panels. Truss-type braces attached to the aft side of the auxiliary spar and the trailing edge support beam reinforce the lower skin panels. The skin panels are primarily of fiberglass honeycomb materials (Ref 57-30-00 D&O).



Wing Trailing Edge Structure
Figure 1

C. Outboard of WBL 445.94, the trailing edge ribs are either located on buttock lines or are normal to the wing rear spar. Two primary hinge support ribs at WBL 461.5 and 505.0, and two fail-safe hinge support ribs at WBL 446.16 and 514.63 support and provide a hinge line for the inboard aileron. The outboard flap is attached to the wing by means of flap track ribs at WBL 584.98 and 743.83. These ribs, external to the trailing edge, are attached to the wing rear spar and to wing inspar ribs. Fittings attached to the wing rear spar at 16 places between wing stations 876.53 and 1155.53 serve as hinge supports for the four outboard flight spoilers. The outboard aileron is supported by five hinge fittings attached to the wing rear spar between wing stations 1252.00 and 1548.20. A series of truss-type members cantilevered aft of the rear spar reinforce the lower skin panels. The trailing edge panels are primarily of fiberglass honeycomb construction (Ref 57-30-00 D&0).

D. With the exception of fixed structure at the outboard nacelle and the outboard wing areas, the flight control surfaces form the entire trailing edge of the wing. These surfaces are the inboard and outboard flaps, flight and ground spoilers, and inboard and outboard ailerons (Ref 57-42-00 D&0).

FIXED TRAILING EDGE UPPER PANEL - REMOVAL/INSTALLATION

1. General
   A. The fixed trailing edge flap is located over the inboard flaps between the inboard spoiler and the side of the body. This procedure has these tasks for the trailing edge panel:
      (1) Removal of the trailing edge panel.
      (2) Installation of the trailing edge panel.
   B. These panels are in this procedure:
      (1) Fixed trailing edge upper panels.

TASK 57-22-01-014-001

2. Trailing Edge Panel Removal
   A. References
      (1) AMM 57-22-01/501, Fixed Trailing Edge Upper Panel
   B. Equipment
      (1) 24MIT65B00002 - Safety Lanyard
      (2) G57003-1 Rib Installation Turnbuckle (Supersedes MIT65B13962-1).
      (3) G27001-1 - Spoiler Lock-Out Tool
   C. Prepare for Panel Removal

      S 214-018

      (1) Inspect the panel to see if it must be repaired or replaced (AMM 57-22-01/501).
   D. Procedure

      S 864-049

      WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR BEFORE YOU MOVE THE CONTROL LEVERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

      (1) Extend the inboard spoilers and install the lockout tools.

      S 484-053

      WARNING: USE A MAN LIFT TO ATTACH THE SAFETY HARNESS FITTINGS TO THE RECEPTACLES. MAINTENANCE PERSONS CAN FALL WHICH MAY CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

      WARNING: DO NOT WALK ON THE WING UPPER SURFACE WITHOUT A SAFETY HARNESS. MAINTENANCEE PERSONS CAN FALL WHICH MAY CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Attach the Flight Control Safety Lanyard to the wing upper surface. (AMM 20-11-33/201).

S 864-020

(3) Extend inboard trailing edge flaps.

WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE TRAILING EDGE FLAPS BEFORE YOU MOVE THE LEVER. WITH THE HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRIC POWER WHEN YOU MOVE THE FLAP CONTROL LEVER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Attach DO NOT TOUCH flaps to spoiler lever, flap lever, hydraulic pump switches, wing isolation valves and APU air switch.

S 014-051

CAUTION: YOU SHOULD USE THE RIB INSTALLATION TOOL TO REMOVE ANY PRE-LOAD IN THE PANEL. THE PARTS CAN SUDDENLY MOVE WHEN THE FASTENERS ARE REMOVED CAUSING DAMAGE TO EQUIPMENT.

(4) Disconnect the upper end of the vertical tie rod of the No. 2 rib near the top of the landing gear beam.
(a) Apply upward pressure to the lower surface of the panel to overcome the weight of the panel and any pre-load caused by deflection of the landing gear beam.

NOTE: Do not adjust the length of the rod because it must stay the same length for the installation.

S 494-022

(5) Install the rib installation tool as shown in Fig. 401.
(a) Attach the eye-hook of the tool to the upper panel fitting.
(b) Attach the opposite end of the tool to the unused hole in the torque fitting.

S 494-023

(6) Turn the hand-wheel of the installation tool to permit easy removal of the bolt from the tie link.

S 014-024

(7) Disconnect one end of the tie link and turn the hand-wheel of the installation tool to expand the tool until the pre-load is completely removed from the torque fitting.

S 014-025

(8) Disconnect the diagonal tie rods from ribs No. 1 and 2.

S 164-026
(9) Remove all sealant from the upper surface of the panel to expose the fasteners attaching the ribs to the panel.

S 024-030
(10) Remove all fasteners from ribs No. 1 and 2.

S 024-028
(11) Remove all fasteners that attach the panel to the rib and wing-to-body fillet fairing adjacent to the body.

S 024-029
(12) Remove all fasteners that attach the panel to the rib at approximately BL 255, BL 235 and spoiler support beam.

S 024-031
(13) Remove all fasteners that attach the panel leading edge to the rib aft of the wing landing gear support beam.

S 024-032
(14) Remove the panel from the airplane.

S 024-033
(15) Remove hardware from the panel for installation to the new panel.

TASK 57-22-01-414-017

3. Trailing Edge Panel Installation

A. References
(1) AMM 57-22-01/501, Fixed Trailing Edge Upper Panel
(2) SRM 51-40-09
(3) SRM 51-70-06
(4) SOPM 20-10-06

B. Equipment
(1) G57003-1 Rib Installation Turnbuckle (Supersedes MIT65B13962-1).
(2) G27001-1 - Spoiler Lock-Out Tool

C. Consumable Materials
(1) Sealant, BMS 5-95 (AMM 20-30-05/201)
(2) Enamel Paint, BMS 10-11, Type II, Color 707 Gray (AMM 20-30-02/201)
(3) Glass Fabric, BMS 9-3, Type H2 (AMM 20-30-04/201)
(4) Alodine or Iridite (AMM 20-30-02/201)
(5) Sandpaper, 150 grit, Aluminum Oxide (AMM 20-30-04/201)
(6) Sandpaper, 240 grit, Aluminum Oxide (AMM 20-30-04/201)

D. Procedure

S 214-056
(1) First, inspect the ribs and Trailing Edge Beam for a machined step or joggle under the trailing edge panel as shown in Fig. 402.
(a) If no step or joggle is present, shims will be required in those areas.

S 424-057
(2) Install the removed hardware from the old panel to the new panel in accordance with Service Bulletin 747-57-2289.

S 424-058
(3) Make shims, if necessary, as shown in Fig. 402.
  (a) Measure the space between the bottomn surface of the trailing edge panel and the top surface of the trailing edge beam.

    NOTE: The area of the trailing edge panel with the internal plate is .080 inch thicker than the adjacent areas of the trailing edge panel.

  (b) Measure the space between the bottom surface of the trailing edge panel and the top surface of the rib.
  (c) Make a shim of 2024-T3 aluminum, 1.5 inches wide.

    NOTE: You can make a shim from laminated shim stock.

    1) If you make the shim in more than one piece, make the shim long enough that a minimum of four fasteners will go through it.
    2) Make the minimum thickness of the shim 0.005 inch and maintain 0.003 inch clearance between the shim and structure.
    3) Make the shim the length necessary to get the correct fit.
  (d) Apply a chemical conversion coating (Alodine or Iridite) to the shim.
  (e) Apply one layer of BMS 5-95, color 707 Gray to the shim.
    1) Let the enamel dry.

S 624-059
(4) Apply the sealant BMS 5-95 to the shims.
  (a) Put the shims in their positions on the trailing edge beam and on the rib.

S 424-060
(5) Install the fasteners as shown in Fig. 402.

S 424-061

(6) Attach the panel to the airplane:
  (a) Install the fasteners that attach the panel leading edge to the rib aft of the wing landing gear beam.
  (b) Install the fasteners that attach the panel to the rib at approximately BL 255, BL 235 and the support beam.
  (c) Install the fasteners that attach the panel to rib and the wing-to-body fillet fairing adjacent to the body.

S 764-065

(7) Do a check of the resistance between the fasteners and adjacent structure.

NOTE: The maximum permitted resistance is 0.001 Ohm (SWPM 20-20-00).

S 624-063

(8) Seal the Fasteners and Paint the Panel:
  (a) Seal the exposed fasteners that attach the panel to the ribs as shown in Fig. 403.

CAUTION: DO NOT WALK OR KNEEL DIRECTLY ON THE UPPER PANEL, THIS CAN CAUSE DELAMINATION.

  (b) Put protective mats on the upper panel.

NOTE: Where it is possible do work from a stand.

WARNING: USE BREATHING FILTERS SO AS TO NOT INHALE SANDING DUST WHICH MAY CAUSE INJURY TO PERSONS.

  (c) Remove all paint and primer from the upper panel in the area to be sealed.

CAUTION: DO NOT EXPOSE OR DAMAGE THE FIBERS OF THE FIBERGLASS.

    1) Use 150 grit, or finer, aluminum oxide sandpaper to remove the finish coat and primer in the area to be sealed.
    2) Use 240 grit, or finer, aluminum oxide sandpaper to feather the edges of the finish coat and primer around the area to be sealed.
    3) Apply BMS-5-95 Class F sprayable sealant over the fastener heads on the panel.
    4) ALTERNATE METHOD: Apply one ply of BMS-9-3, Type H-2 glass fiber to the area to be sealed (wet lay-up) (SRM 52-40-09).
    5) Apply conductive coating (SOPM 20-10-06).
    6) Apply primer (SOPM 20-10-06).

7) Apply top coat to match existing finish on airplane (SOPM 20-10-06).

S 424-064

(9) Connect and adjust the No. 1 and 2 ribs, diagonal tie rods and tie link (AMM 57-22-01/501).

S 424-066

(10) Connect the upper end of the vertical tie rod of the No. 2 rib near the top of the landing gear beam.

NOTE: If you have a problem with the installation of the pin, apply upward pressure on the lower surface of the panel to overcome the weight of the panel and any pre-load caused by deflection of the landing gear beam.

S 634-068

(11) Apply fillet sealant BMS-5-95 around the torsion link ribs and bolt head on the lower surface.

E. Put the Airplane Back to its Usual Condition.

S 944-052

WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE TRAILING EDGE FLAPS BEFORE YOU MOVE THE LEVER. WITH THE HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRIC POWER WHEN YOU MOVE THE FLAP CONTROL LEVER. THIS CAN CAUSE INJURY TO PERSONS AND DAMGE TO EQUIPMENT.

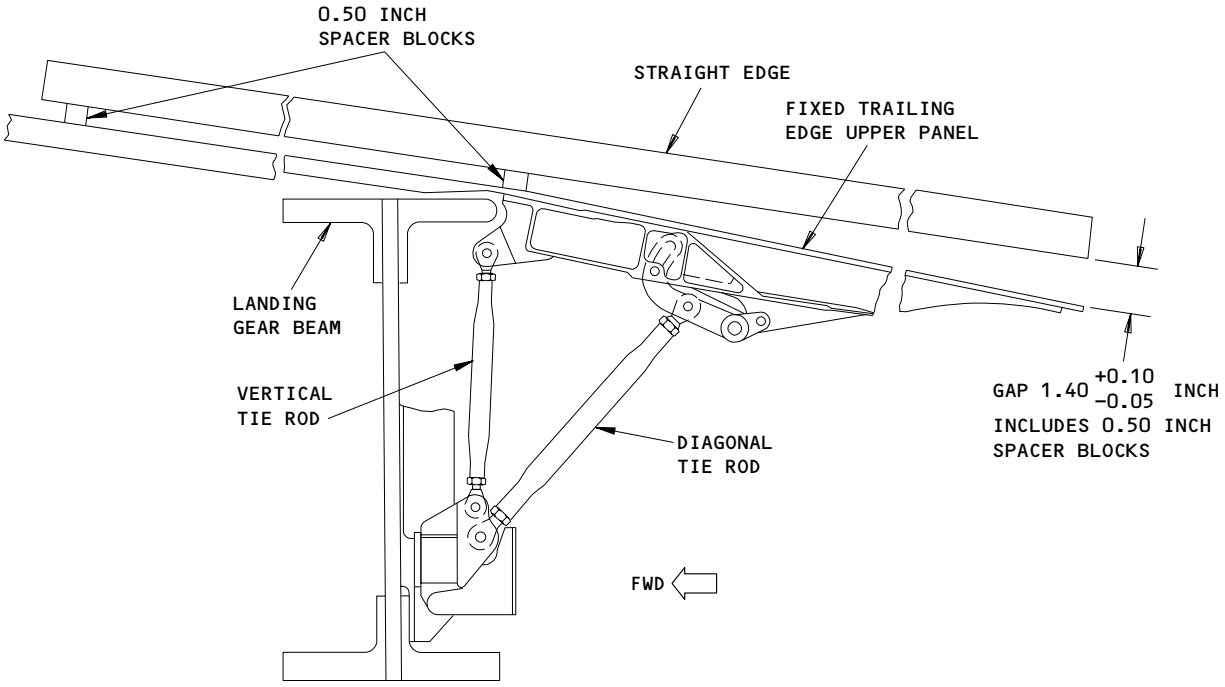
WARNING: MAKE SURE ALL PERSON AND EQUIPMENT ARE CLEAR BEFORE YOU MOVE THE CONTROL LEVERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Remove the DO NOT TOUCH tags from the spoiler lever, flap lever, hydralic pump switch and APU air switch.

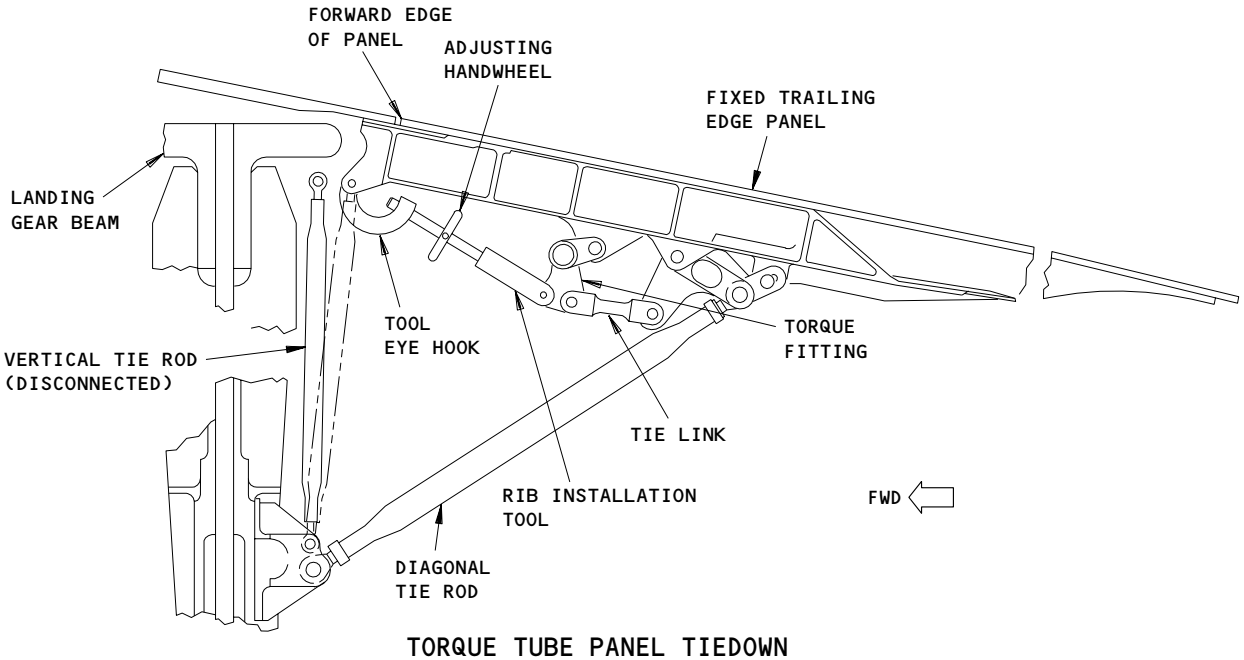
S 864-046
(2) Retract the inboard trailing edge flaps.

S 094-047
(3) Remove the spoiler lockout tools.

S 864-048
(4) Retract the inboard spoilers.

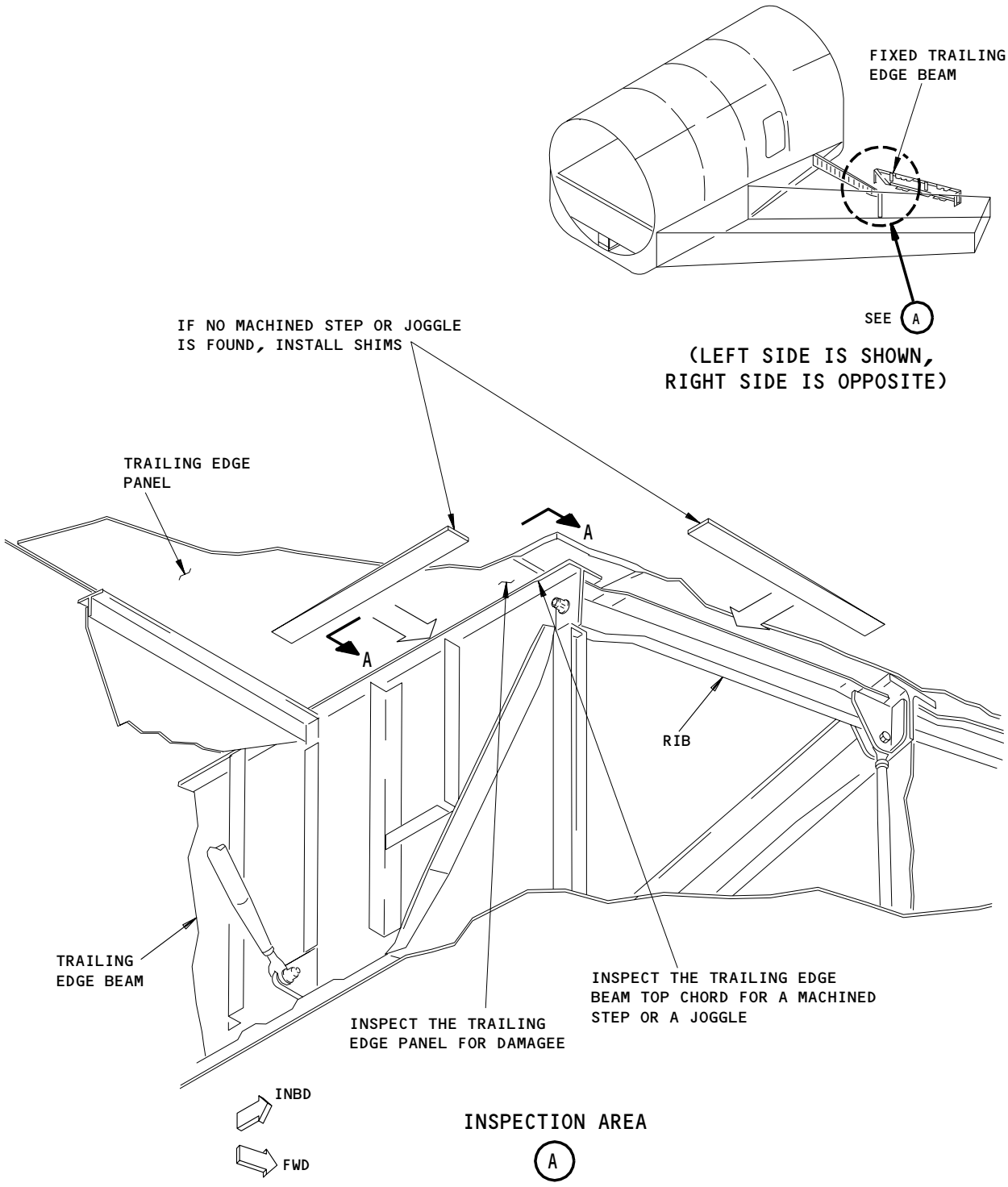


TORQUE TUBE PANEL TIEDOWN
(RIB NO. 1)



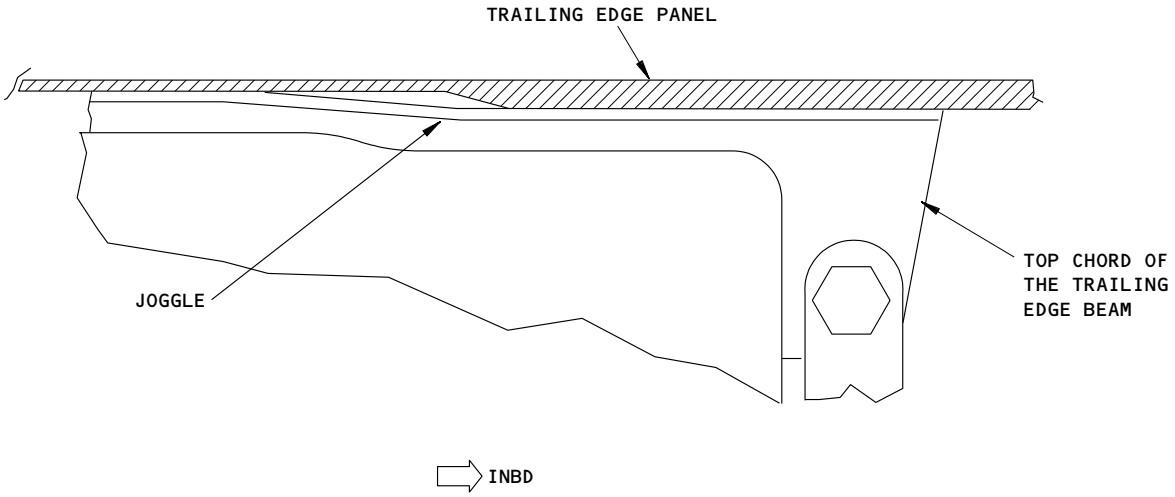
TORQUE TUBE PANEL TIEDOWN
(RIB NO. 2)

Fixed Trailing Edge Upper Panel, Tie Down Details
Figure 401

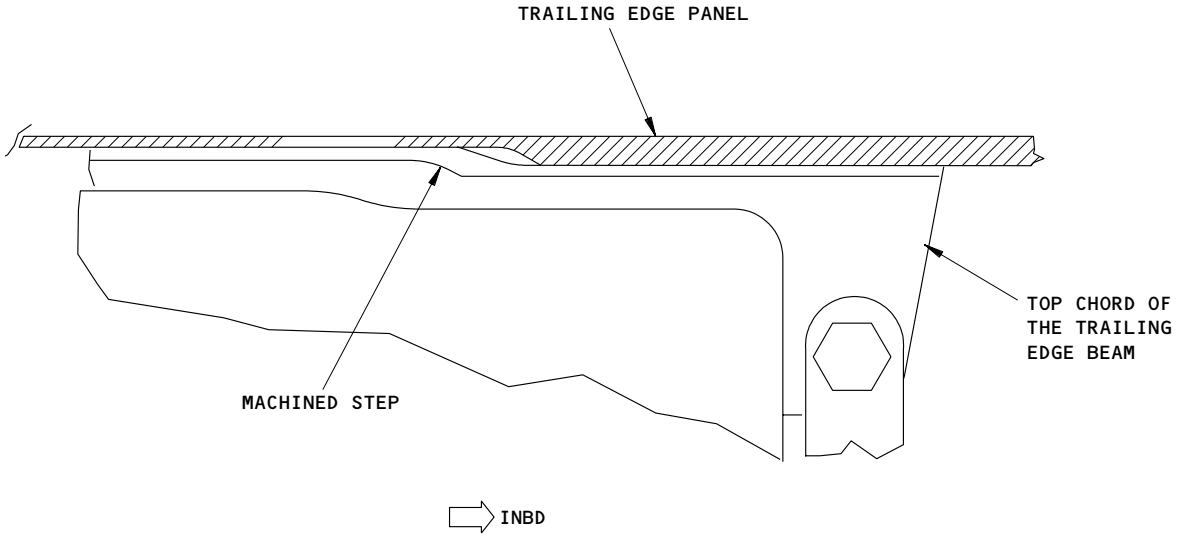


Fixed Trailing Edge Upper Panel Installation
Figure 402 (Sheet 1)

H48994

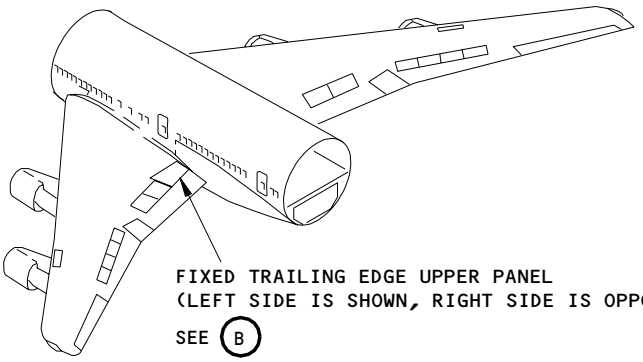


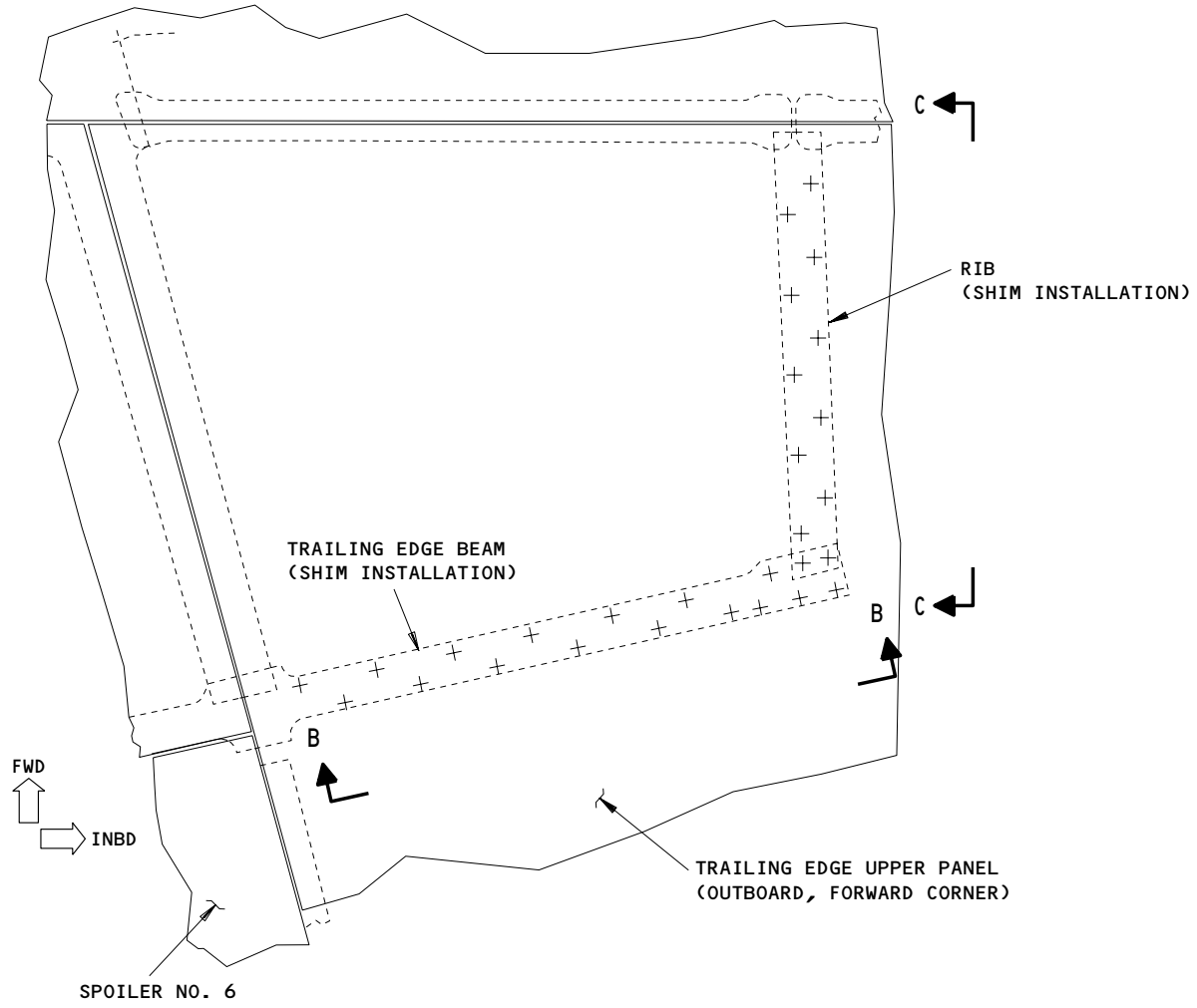
(WITH A JOGGLE)
A-A



(WITH A MACHINED STEP)
A-A

Fixed Trailing Edge Upper Panel Installation
Figure 402 (Sheet 2)



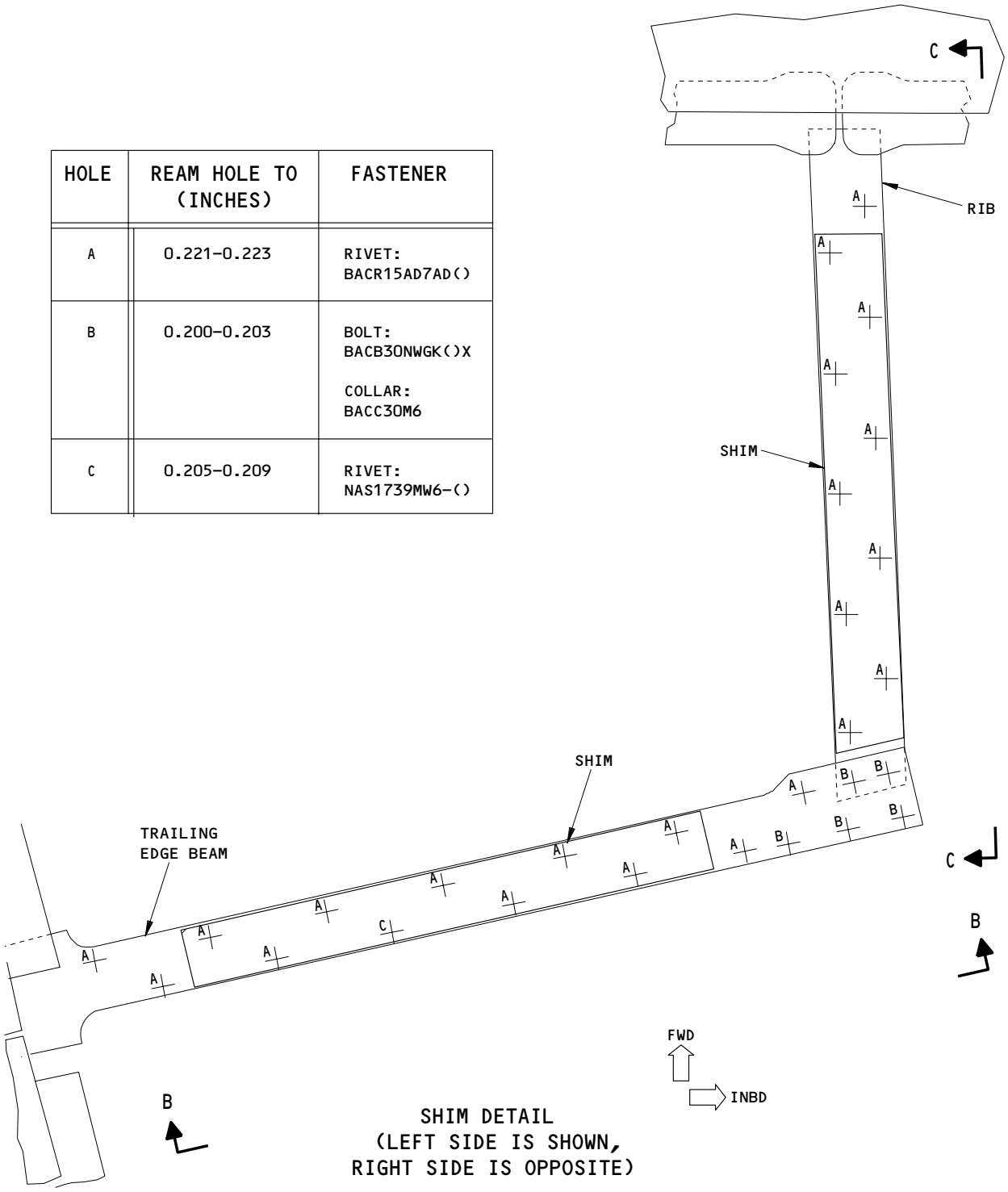


FIXED TRAILING EDGE UPPER PANEL

B

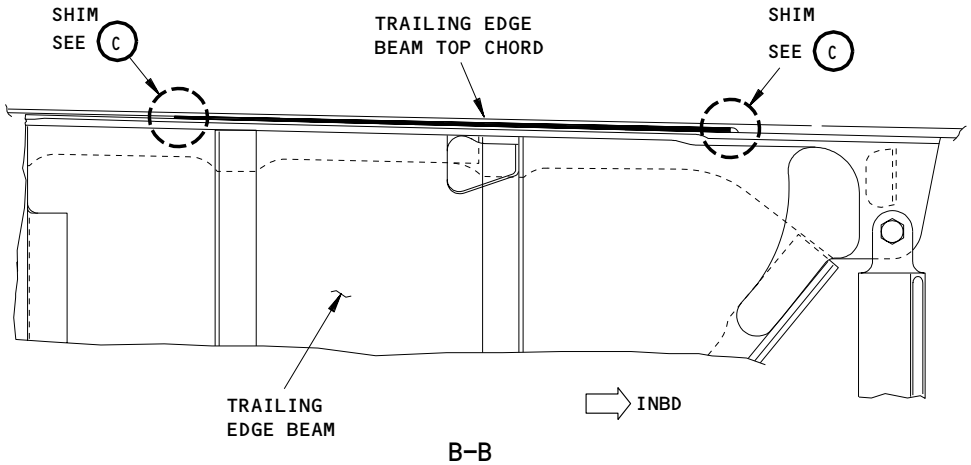
Fixed Trailing Edge Upper Panel Installation
Figure 402 (Sheet 3)

HOLE	REAM HOLE TO (INCHES)	FASTENER
A	0.221-0.223	RIVET: BACR15AD7AD()
B	0.200-0.203	BOLT: BACB30NWGK()X COLLAR: BACC30M6
C	0.205-0.209	RIVET: NAS1739MW6-()

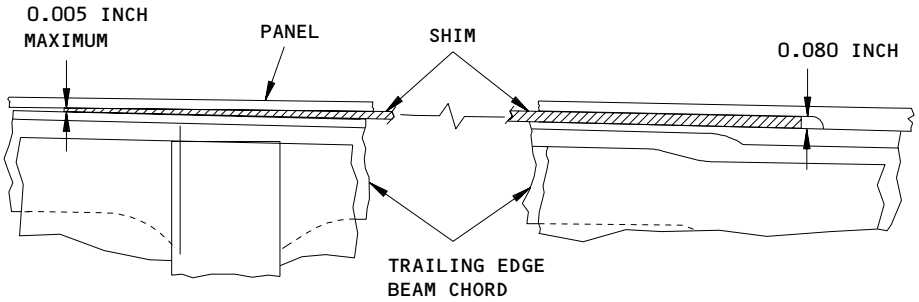


SHIM DETAIL
(LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE)

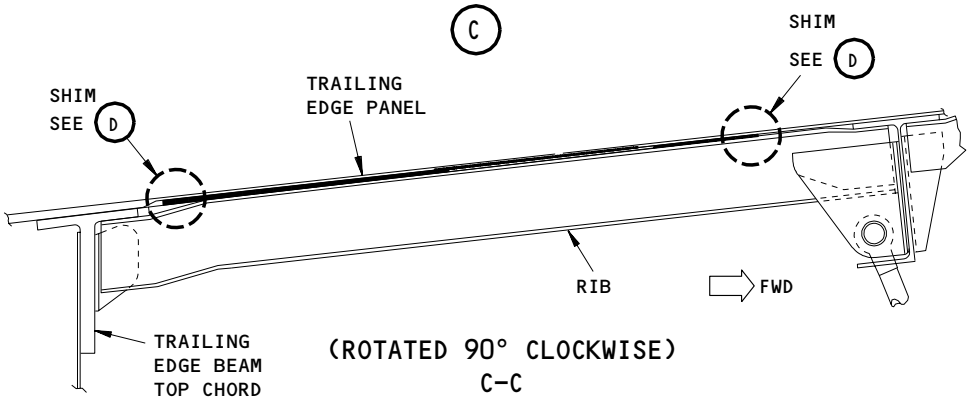
Fixed Trailing Edge Upper Panel Installation
Figure 402 (Sheet 4)



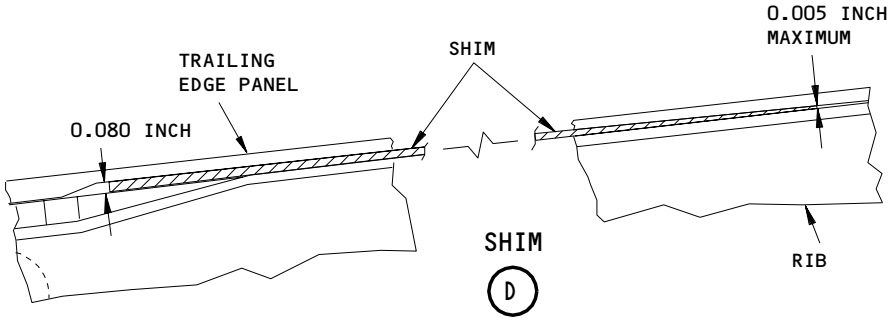
B-B



SHIM
C



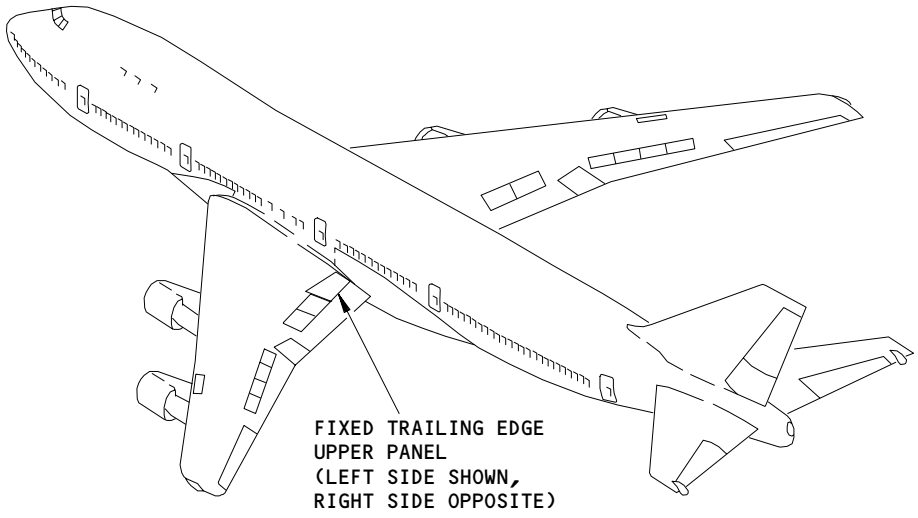
(ROTATED 90° CLOCKWISE)
C-C

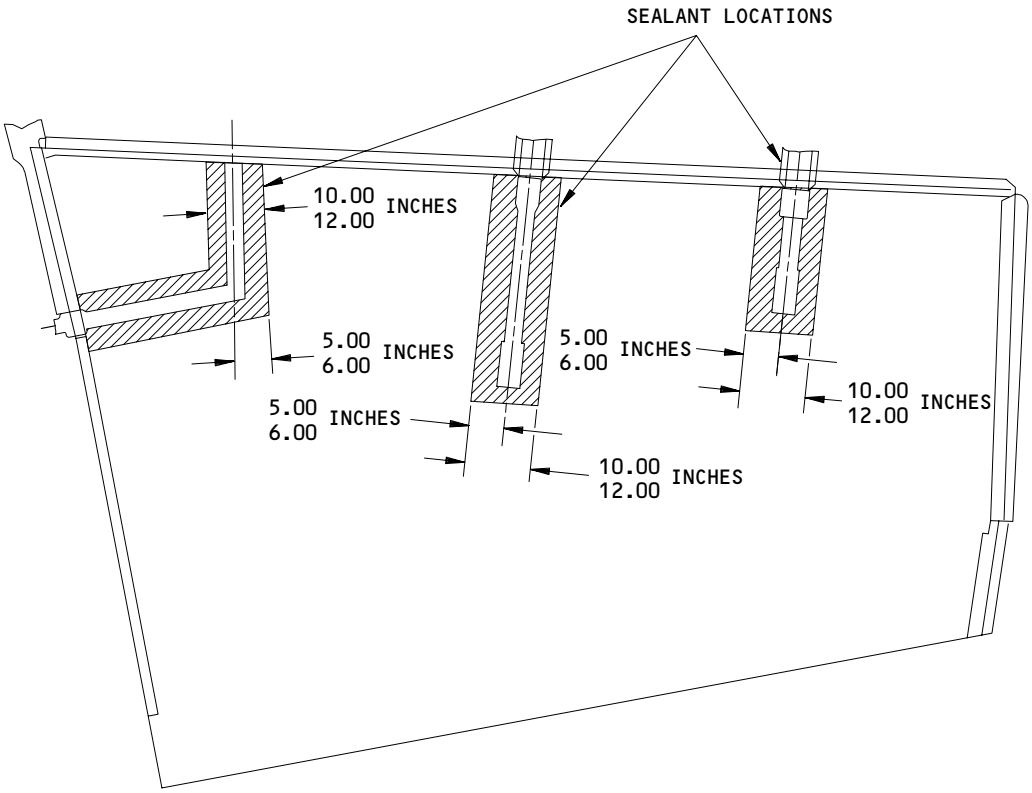


SHIM
D

Fixed Trailing Edge Upper Panel Installation
Figure 402 (Sheet 5)

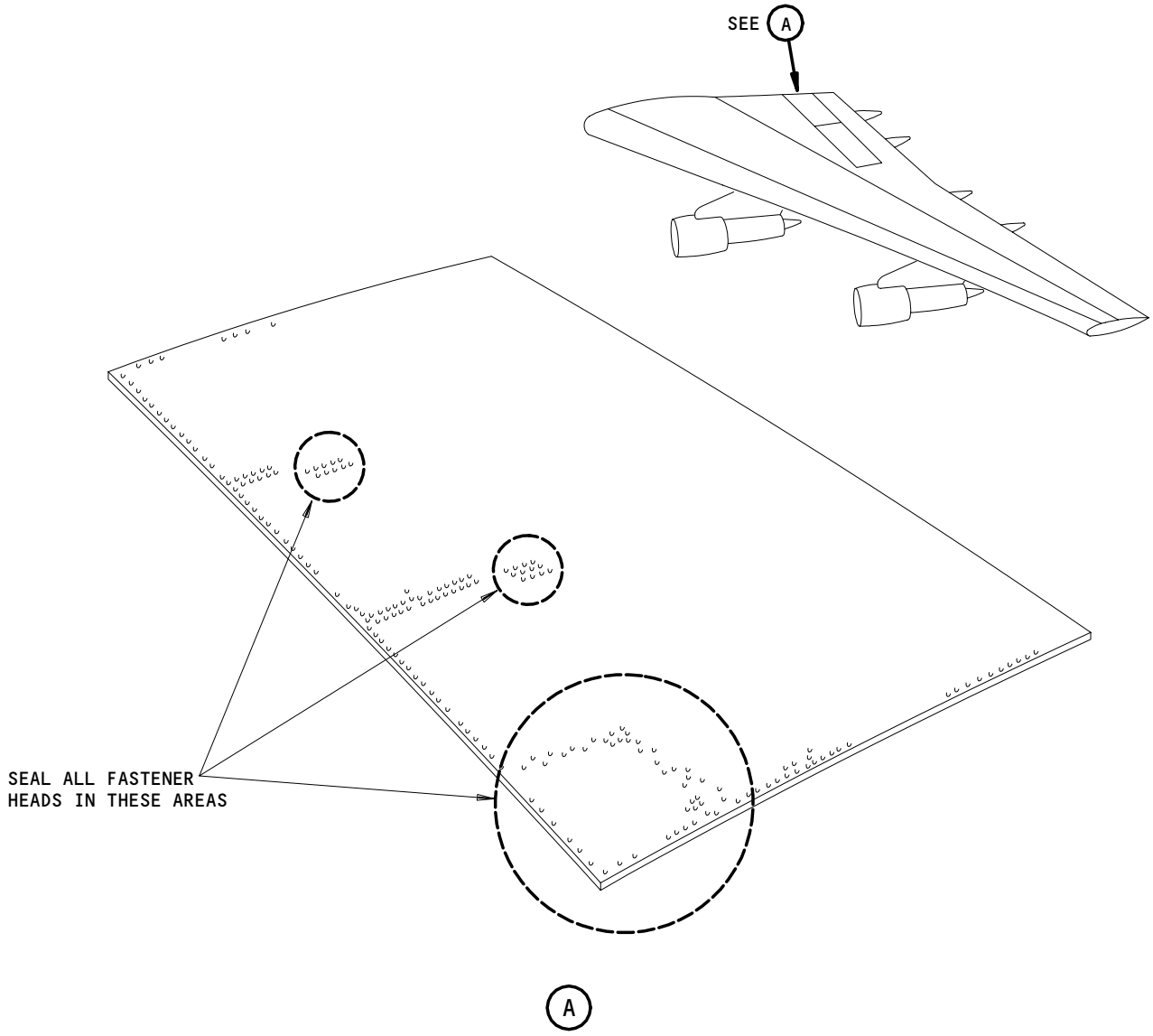
E55342





Fixed Trailing Edge Upper Panel - Fastener Sealant Locations
Figure 403

QF



Fixed Trailing Edge Upper Panel Sealing
Figure 404

E55336

FIXED TRAILING EDGE UPPER PANEL - ADJUSTMENT/TEST

1. General
   A. This section contains one task: the upper panel adjustment of the Fixed Trailing Edge (FTE).
      (1) Adjustment of a panel is as follows:
          - Examine the necessary clearances
          - Adjust the tie rods to get the necessary clearances
          - Install and adjust the rib installation tool, if it is necessary.
      (2) Before aligning the panel, visually inspect it for signs of cracking, disbonding, de-laminating, surface cracks, or fasteners pulling through the material.
          (a) If any of the above conditions exist, replace the panel and any shims required, as indicated in AMM 57-22-01/401.
   B. You will find the upper panel of the FTE above the inboard flaps and between the inboard spoiler and the fuselage.
   C. When the flaps are fully retracted, you must move the upper panel of the FTE to get the conditions that follow:
      (1) The midflap upper surface at the inboard end controls this level.
      (2) The outboard end of the upper panel of the FTE must not touch or hit the midflap when it operates.
      (3) To adjust the FTE upper panel, you will adjust the lengths of the diagonal rods. These rods are installed at the three adjustable ribs.
   D. You will make adjustments with the landing gear extended. This procedure applies to the left and the right fixed panels.

TASK 57-22-01-825-001

2. Adjust the Panel (Fig. 501)
   A. Special Tools and Equipment
      (1) G57003-1 Rib Installation Turnbuckle (Supersedes MIT65B13962-1).
      (2) Rigging Beam tool, 12 feet long, KLM p/n 93085002 (Boeing tool: G57006-1)
      (3) Spoiler No. 5 and 8 Locking Tool - 3MIT65B02300
   B. Standard Tools and Equipment
      (1) Straightedge - 8 feet long, commercially available.

(2) Suggested source for straightedge (equivalent tools acceptable): p/n 380-96 (8 feet)

The L.S. Starrett Co.
121 Crescent Street
Athol MA 01331 USA

C. References
(1) IPC 57-22-30 Fig. 1 (Rib No. 3)
(2) IPC 57-22-34 Fig. 2 (Rib No. 1 and 2)
(3) AMM 29-11-00/201 Main Hydraulic Supply System

D. Access
(1) Location Zone
572 Landing Gear Support Beam and Rear Spar to Trailing Edge, Left
672 Landing Gear Support Beam and Rear Spar to Trailing Edge, Right

E. Prepare to Adjust the Panel

S 845-029

WARNING: OPEN THE CIRCUIT BREAKERS TO PREVENT RETRACTION OF THE SPOILERS. THE SPOILERS WILL RETRACT AUTOMATICALLY IF YOU USE THE SPEED BRAKE LEVER TO LIFT THE SPOILERS AND IF HYDRAULIC SYSTEM NO. 1 AND 4 ARE NOT PRESSURIZED. INJURY TO PERSONS CAN OCCUR IF THE SPOILERS RETRACT.

(1) Open the 7G6 SPEED BRAKE AUTO CONT circuit breaker on the P7 Overhead Circuit Breaker Panel.

S 845-025
(2) Pressurize the hydraulic systems No. 1 and 4 (AMM 29-11-00/201).

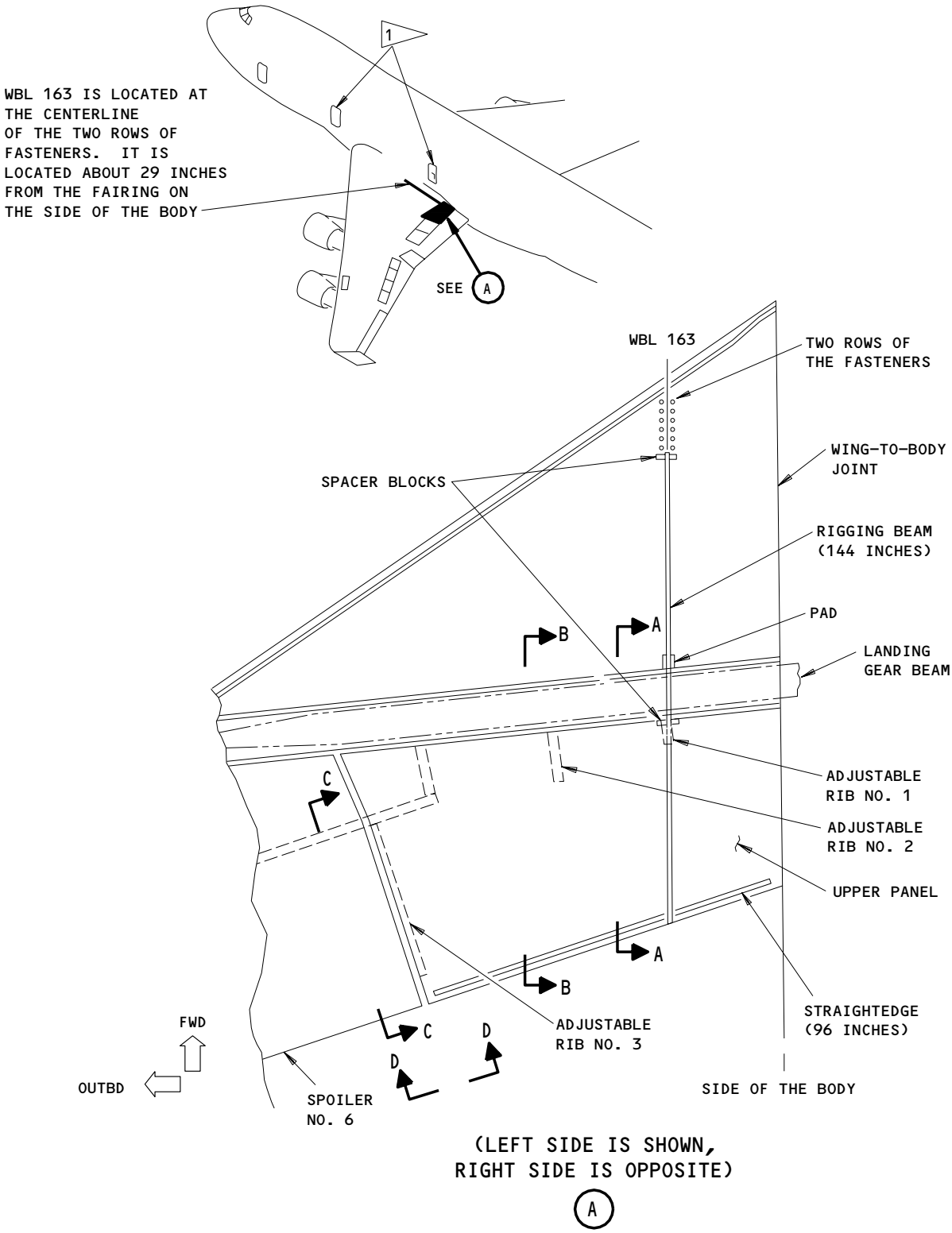
S 845-026
(3) Put the speed brake control lever in the UP detent to lift the spoilers No. 5 through 8 above the inboard flap.

S 845-027
(4) Install the spoiler actuator locking tools or move the FLT CONTROL HYD POWER switches to SHUTOFF to prevent retraction of the spoilers.

S 845-028
(5) Release the pressure in the hydraulic systems No. 1 and 4 (AMM 29-11-00/201).

F. Adjust Rib No. 3

S 865-016
(1) The airplane must be on its landing gear and have the flaps fully retracted.



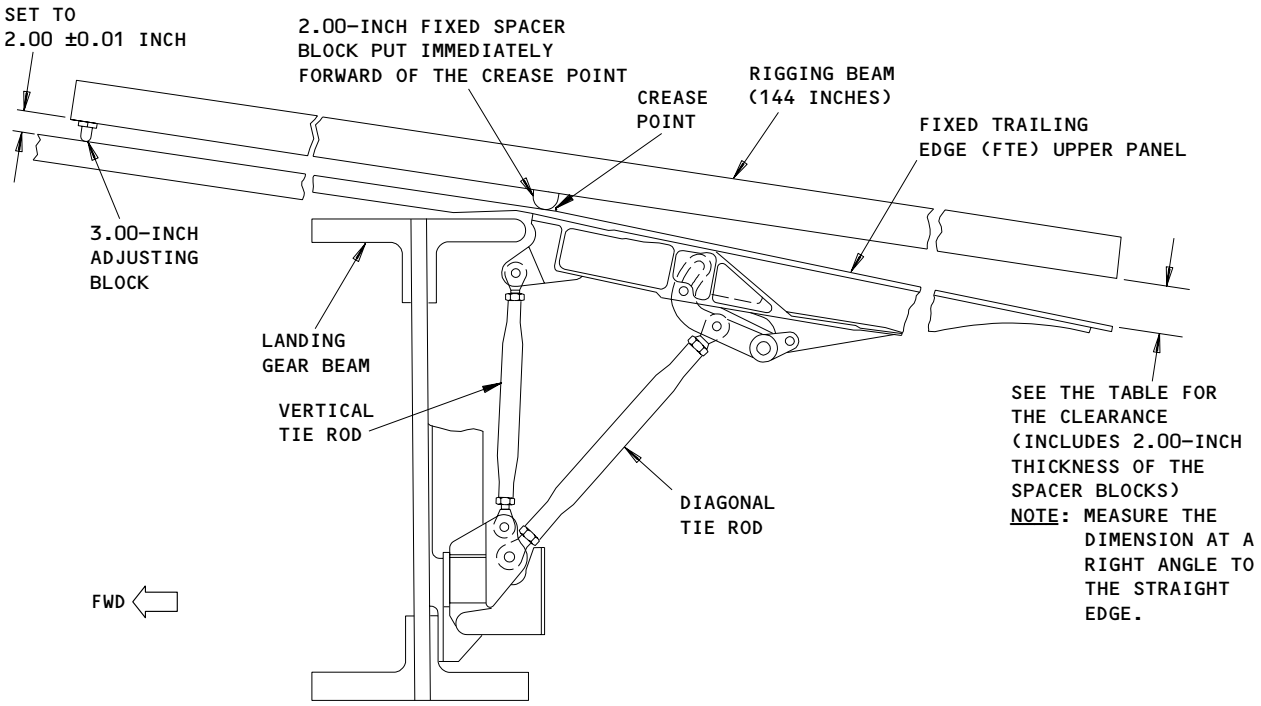
(LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE)

A

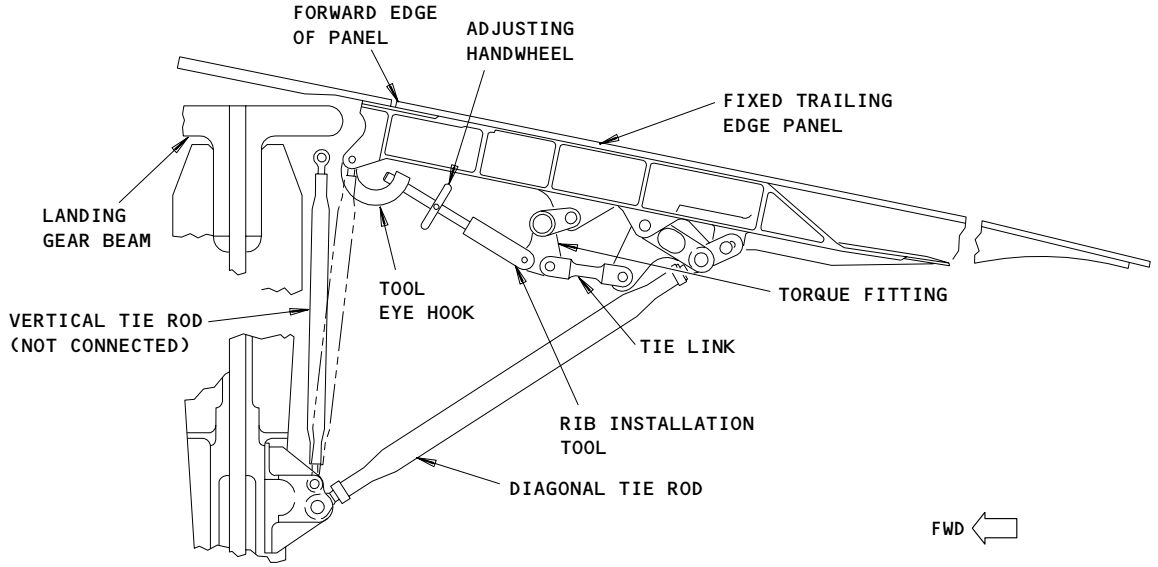
1 ON PASSENGER AIRPLANES ONLY

Fixed Trailing Edge Upper Panel Adjustment
Figure 501 (Sheet 1)

K03966



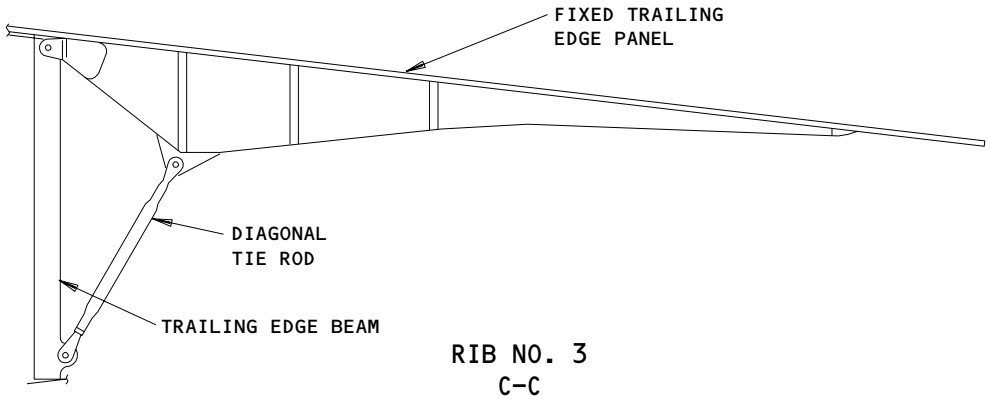
TORQUE TUBE PANEL TIEDOWN, USING RIGGING BEAM
(RIB NO. 1)
A-A



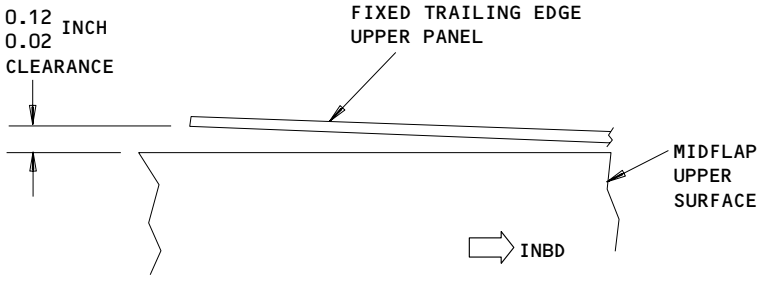
TORQUE TUBE PANEL TIEDOWN
(RIB NO. 2)
B-B

Fixed Trailing Edge Upper Panel Adjustment
Figure 501 (Sheet 2)

KD3971

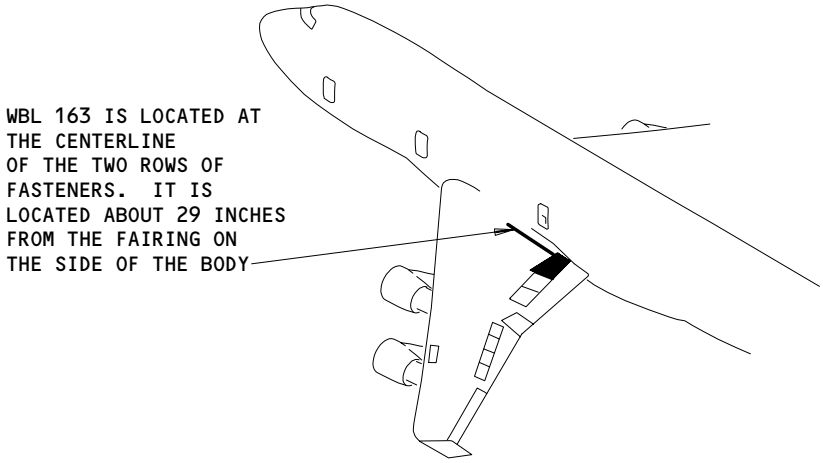


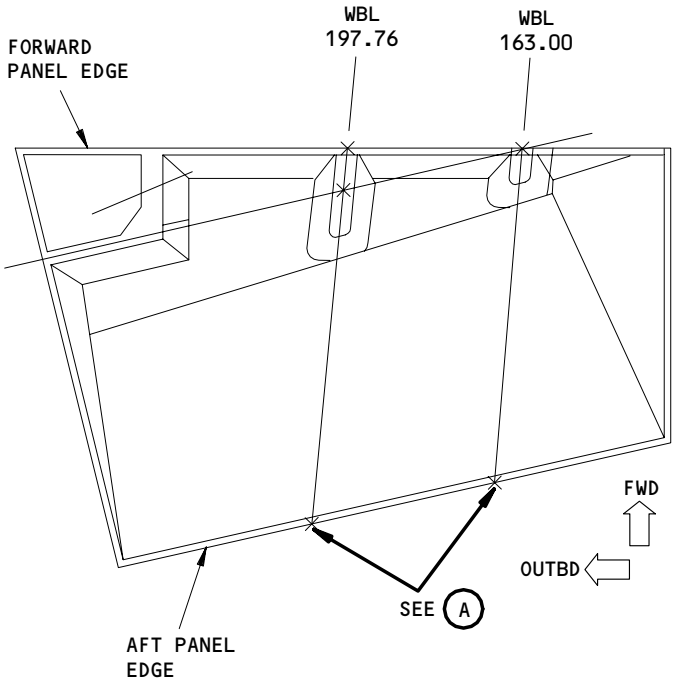
RIB NO. 3
C-C

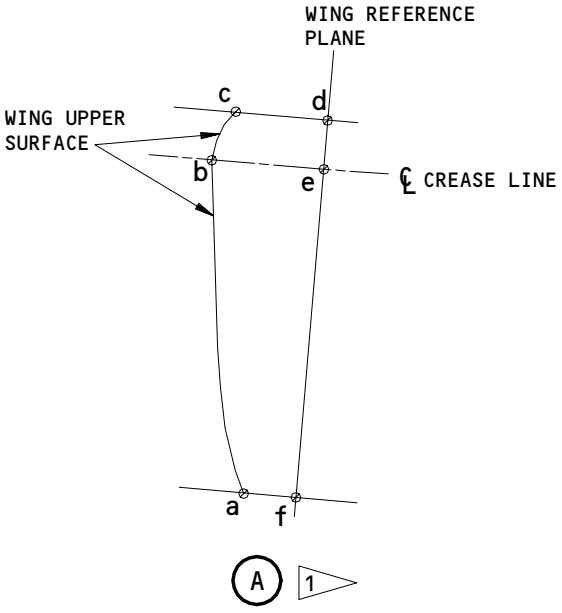


D-D

Fixed Trailing Edge Upper Panel Adjustment
Figure 501 (Sheet 3)







1

WBL	ARC bc	ARC ab	LINE de	LINE ef
163.00	0.6560	63.7365	0.6519	63.3160
197.97	8.7437	63.7365	8.6946	63.3160

Fixed Trailing Edge Upper Panel Crease Line Location
Figure 502

S 225-002
(2) Examine the clearance between the outboard aft corner of the panel and the upper surface of the midflap.

S 825-003
(3) If the clearance is not in the range of the limits shown in view D-D, adjust the rib as follows:
(a) Extend the inboard trailing edge flaps.
(b) Disconnect the lower end of the diagonal tie rod on the Number 3 adjustable rib.
(c) Adjust the tie rod (view C-C) to get the necessary clearance (view D-D).

NOTE: To adjust some tie rods, rotate the tie rod's tube. To adjust other tie rods, turn the end fitting of the tie rod.

S 825-011
(4) Until you get the necessary clearance, continue to adjust the tie rod:
(a) Retract the flaps to measure the clearance.
(b) Extend the flaps to adjust the diagonal tie rod.

G. Adjust Ribs No. 1 and 2

S 865-004
(1) Make sure when you extend the inboard flap, the upper panel at the inboard end and the upper surface of the flap do not touch.

S 485-012
(2) Put the rigging beam tool (KLM p/n 93085002) on top of the upper panel as shown in Fig. 501.
(a) The tool must be parallel to the fuselage and on top of rib number 1.

S 825-030
(3) Measure the clearance dimension between the lower edge of the tool's straightedge and the aft end of the panel's upper surface (Fig. 501):

NOTE: There are four possible conditions for fuel loading. Make sure that you know which condition is applicable during this measurement. Refer to the applicable table below.

(a) Use the rigging beam tool with the following guidelines:
1) The "MIN" and "MAX" lines on the tool scale are applicable only to conditions 1 and 2 in the table below.
2) You can measure the clearance dimension for conditions 3 and 4 with a caliper gage.

S 225-018

(4) Make sure the dimension in view A-A is as follows:

NOTE: Empty fuel tanks can contain fuel that can not be used. Airplane fuel loading must be symmetrical on left and right sides.

FUEL LOAD TABLE FOR CLEARANCE DIMENSIONS AT SECTION A-A
(RIGGING BEAM TOOL)
LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE

CONDITION NUMBER	RESERVE TANKS	NO. 1 TANKS	NO. 2 TANKS	CENTER TANK	CLEARANCE DIMENSION /INCHES/ *[2]
1	EMPTY	EMPTY	EMPTY	EMPTY	2.65 + 0.10/-0.05
2	EMPTY	EMPTY	*[1]	*[1]	2.65 + 0.10/-0.05
3	EMPTY	FULL	*[1]	*[1]	2.85 + 0.10/-0.05
4	FULL	FULL	*[1]	*[1]	2.90 + 0.10/-0.05

*[1] THESE TANKS CAN BE EMPTY, OR CAN CONTAIN SOME FUEL OR A FULL LOAD OF FUEL.
*[2] THIS DIMENSION INCLUDES THE 2.0 INCH HEIGHT OF THE TOOL.

S 825-007

(5) If the measured clearance is not in the range as shown in view A-A, continue as follows:
(a) Loosen the locknuts on each end of the diagonal tie rods and on the number 1 and 2 adjustable ribs.
(b) To get the necessary clearance at the trailing edge, make the adjustment as follows:
1) Turn the tube of the tie rod at rib number 1 to adjust the height of the trailing edge panel.

WARNING: THE LINKS THAT CONNECT THE TORQUE TUBE AND THE DIAGONAL TIE RODS AT RIBS NUMBER 1 AND 2 ARE PRELOADED. TO REMOVE ALL POSSIBLE PRELOAD, YOU MUST MAKE SURE YOU INSTALL THE RIB INSTALLATION TOOL CORRECTLY. THIS WILL PREVENT POSSIBLE PERSONNEL INJURY WHEN YOU DISCONNECT THE LINKS OF THE TORQUE TUBE OR THE TIE RODS.

(c) If you cannot turn the tie rods, remove the preload from the tie rods and ribs number 1 and 2 linkages as follows:
1) Disconnect the upper end of the vertical tie rod of Rib 2 near the top of the landing gear beam.
2) Make a record of the length of the rod because you must not change the length of the rod.

3) If it is not easy to remove the pin, push up on the panel lower surface.

NOTE: This will release the weight from the panel and any preload caused by the deflection of the landing gear beam.

4) Install the rib installation tool as shown in view B-B.
   a) Pin the eyehook of the tool to the upper panel fitting.
   b) Pin the opposite end of the tool to the hole not used in the torque fitting.
5) Adjust the tool.
   a) Turn the handwheel of the installation tool make the tool smaller.

NOTE: This will permit you to easily remove the bolt from the tie link.

   b) Disconnect one end of the tie link and turn the handwheel of the installation tool.

NOTE: This will open the tool until the preload is fully removed from the torque tube.

(d) Put the straightedge (8 ft) on top of the panel at the trailing edge to examine the flat condition along the span.
(e) If the panel at the trailing edge is not flat to 0.06 inch, continue as follows:
   1) To get the trailing edge to the necessary flat condition, you must turn the diagonal tie rod on Rib number 2.
   2) If you cannot turn the tie rods, remove the preload from the tie rods as shown above.
(f) Before you use the tool, make the necessary adjustments and then preload the torque tube as follows:
   1) Turn the handwheel of the tool to make the tool smaller.
   2) Continue this step until you can install the bolt in the tie link after you install all the other bolts.
   3) Turn the handwheel of the tool to loosen it until you can remove the tool.
   4) Attach the upper end of the vertical tie rod.
   5) Tighten the nut from 30 to 60 pound-inches.
(g) Tighten the locknuts on each end of the diagonal tie rods at Rib numbers 1 and 2 from 480 to 600 pound-inches.
(h) Install the lockwire.

S 865-008

(6) Retract the inboard flaps.

H. Put the Airplane Back to its Usual Condition

S 845-033

(1) Pressurize hydraulic system No. 4 (AMM 29-11-00/201).

S 845-034
(2) Remove the spoiler actuator locking tools or open the flight control shutoff valves for hydraulic system No. 4.

S 845-035
(3) Put the speed brake lever in the DOWN detent to lower spoilers No. 5 through 8 above the inboard flaps.

S 845-036
(4) Release the pressure from the hydraulic system (AMM 29-11-00/201).

S 845-037
(5) Close the 7G6 SPEED BRAKE AUTO CONT circuit breaker on the P7 Overhead Circuit Breaker Panel.

FIXED TRAILING EDGE RIB BUSHING - INSPECTION/CHECK

1. General
   A. This procedure contains one task. The task is the inspection of the rib bushing for the fixed trailing edge.
   B. To do the inspection, you must measure the inner and/or the outer diameters of the bushings and the pins. These components are used in the connections of the rods and the panel and the landing gear beam.
   C. You must remove the rib's rods from the airplane. You must not fully disassemble the rib rods after the removal.

TASK 57-22-02-206-001

2. Rib Bushings Inspection (Fig. 601)
   A. Standard Tools and Equipment
      (1) Micrometer - 0 to 1 inch
      (2) Vernier caliper
   B. References
      (1) IPC 57-22-30, Fig. 1 (Rib No. 3)
      (2) IPC 57-22-34, Fig. 2 (Rib No. 1 and 2)
   C. Access
      (1) Location Zones
          572 Landing gear support beam and rear spar to trailing edge, Left
          672 Landing gear support beam and rear spar to trailing edge, Right
   D. Procedure

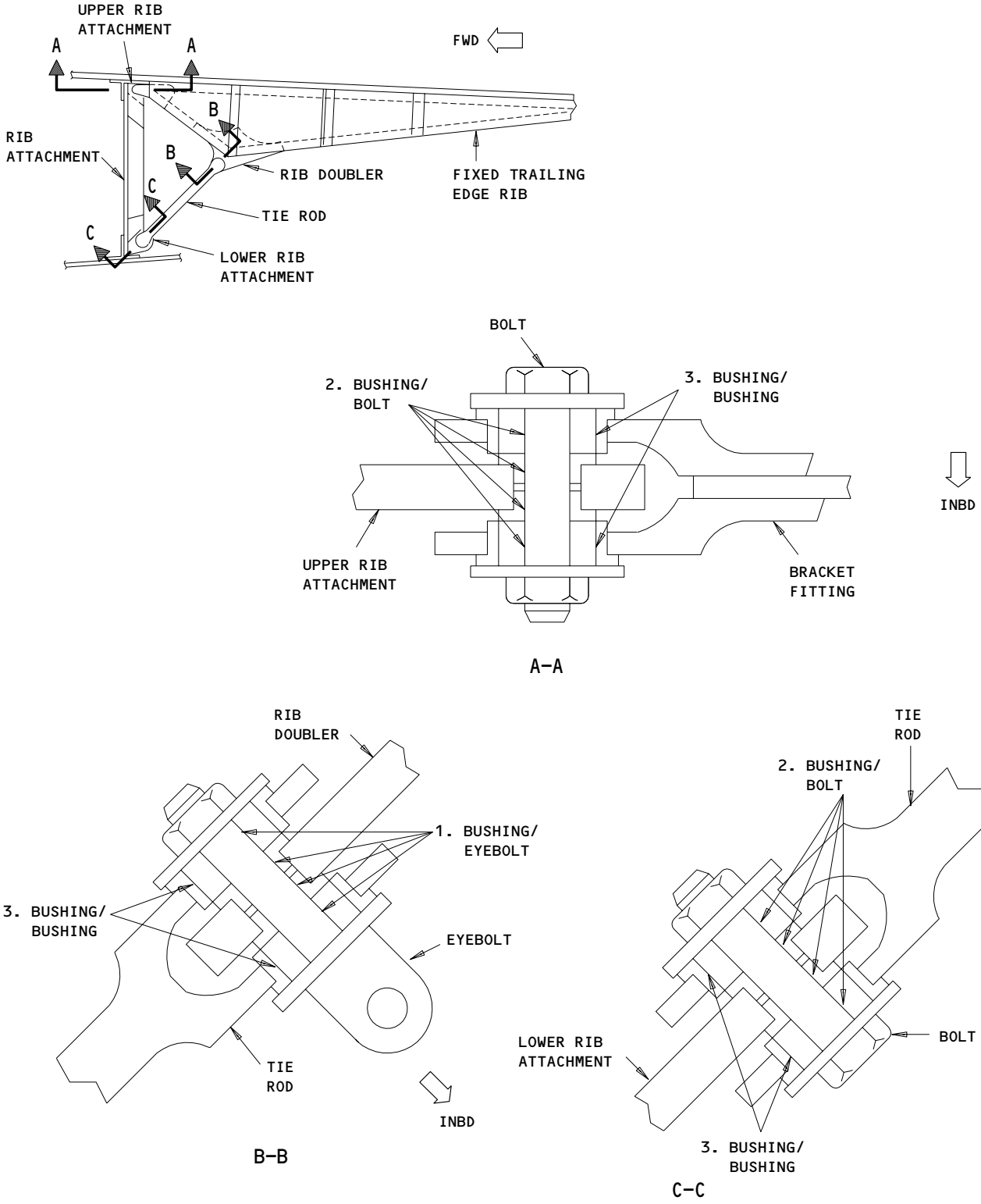
      S 036-002
      (1) Remove the tie rods.

      S 226-003
      (2) Examine the rib bushings of the fixed trailing edge and the related parts for worn areas (Fig. 601, 602, 603).
          (a) Remove the parts that you must examine.
          (b) Measure the parts as it is necessary.

              NOTE: Use the micrometer or the vernier caliper to measure the dimensions.

          (c) Compare the dimensions that you measured to the permitted dimensions as shown.
          (d) If a part is not to the correct tolerance, repair it or replace it as it is necessary.
          (e) Install the parts that you removed.

      S 436-004
      (3) Install the tie rods.



Fixed Trailing Edge Rib WBL 255.692 Bushing Wear Limits
Figure 601 (Sheet 1)

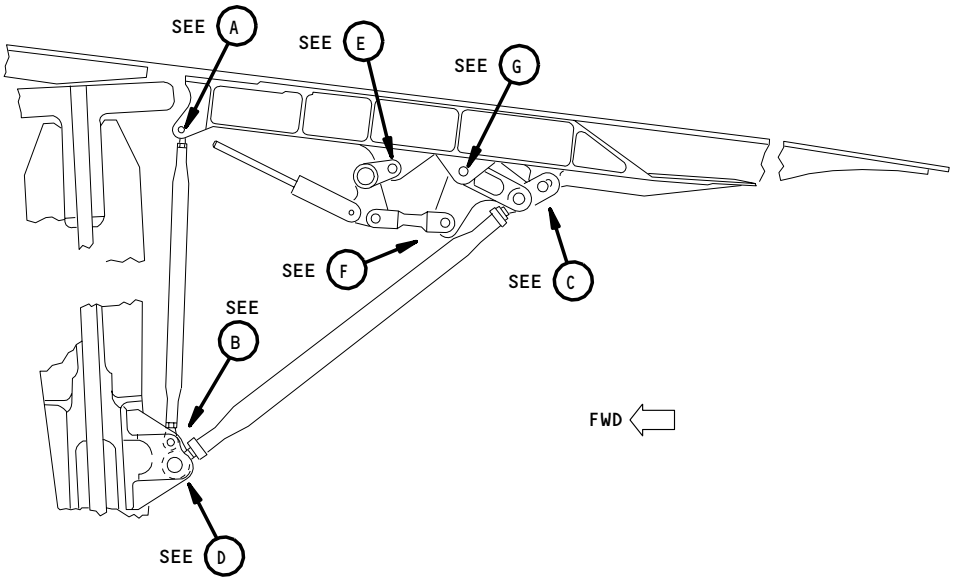
INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MIN	DESIGN LIMITS DIAMETER MAX	WEAR LIMITS PERMITTED WEAR DIM.	WEAR LIMITS MAX DIA CLEARANCE	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
1	BUSHING	ID	0.2500	0.2515	0.254	0.005		X	2
	EYEBOLT	OD	0.246	0.249	0.245		X		
2	BUSHING	ID	0.2500	0.2515	0.2545	0.005		X	2
	BOLT	OD	0.2485	0.2495	0.245			X	1
3	BUSHING	ID	0.5000	0.5015	0.5045	0.005		X	3
	BUSHING	OD	0.4985	0.4995	0.4950			X	1

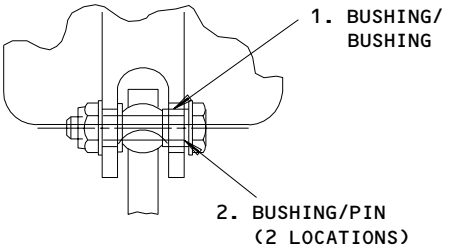
1 HARD CHROME PLATE REFER TO QQ-C-320 AND GRIND TO THE DESIGN LIMITS. THE PLATING THICKNESS IS 0.005 INCH MAXIMUM.

2 REPLACEMENT BUSHING CAN HAVE THE OVERSIZE EXTERNAL DIAMETER TO 0.03 INCH. BUSHING INTERFERENCE IS 0.0002 TO 0.0011 INCH.

3 REPLACEMENT BUSHING CAN HAVE THE OVERSIZE EXTERNAL DIAMETER TO 0.03 INCH. BUSHING INTERFERENCE IS 0.0003 TO 0.001 INCH.

Fixed Trailing Edge Rib WBL 255.692 Bushing Wear Limits
Figure 601 (Sheet 2)





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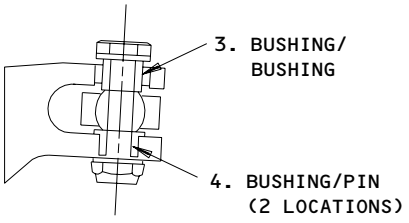

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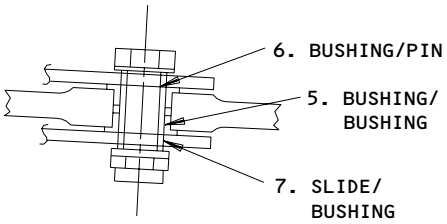
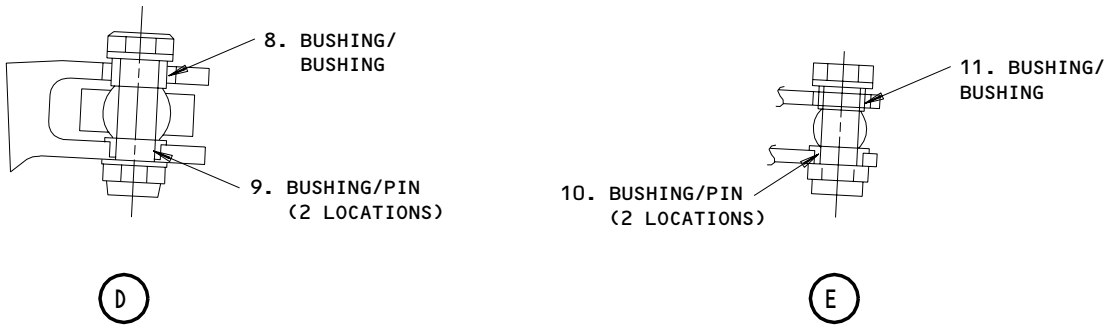


C

Fixed Trailing Edge Rib WBL 197.76 Bushing Wear Limits
Figure 602 (Sheet 1)



Fixed Trailing Edge Rib WBL 197.76 Bushing Wear Limits
Figure 602 (Sheet 2)

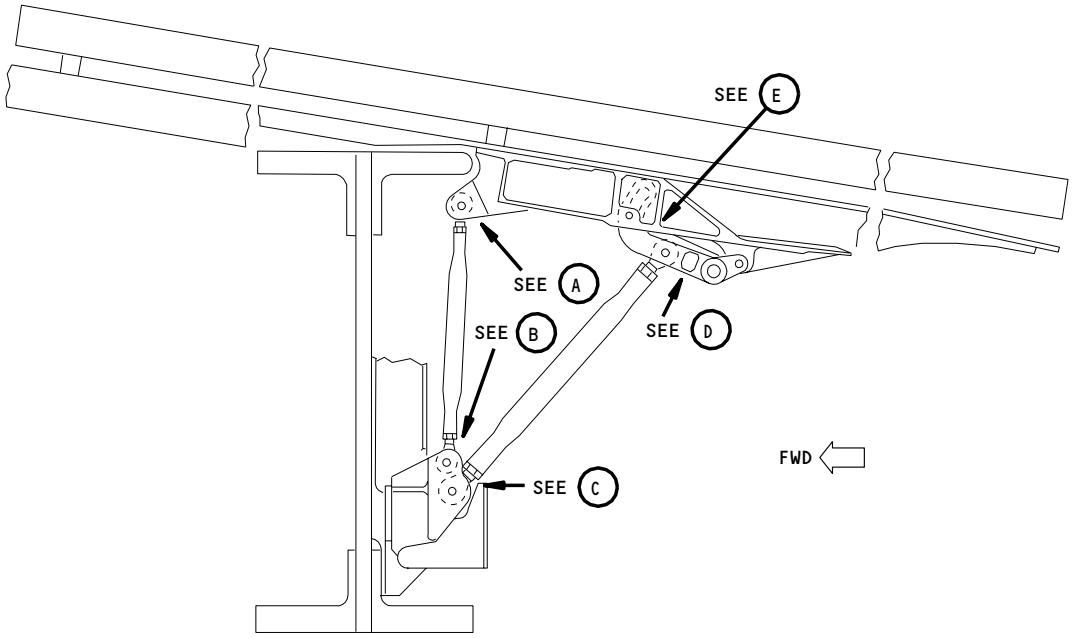
INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MIN	DESIGN LIMITS DIAMETER MAX	WEAR LIMITS PERMITTED WEAR DIM.	WEAR LIMITS MAX DIA CLEARANCE	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
1	BUSHING	ID	0.3750	0.3765	0.379	0.005	X		
	BUSHING	OD	0.3730	0.3740	0.370		X		
2	BUSHING	ID	0.2500	0.2510	0.2545	0.005	X		
	PIN	OD	0.2485	0.2495	0.245		X		
3	BUSHING	ID	0.3750	0.3765	0.379	0.005	X		
	BUSHING	OD	0.3730	0.3740	0.370		X		
4	BUSHING	ID	0.2500	0.2515	0.2545	0.005	X		
	PIN	OD	0.2485	0.2495	0.245		X		
5	BUSHING	ID	0.5000	0.5015	0.5045	0.005	X		
	BUSHING	OD	0.4985	0.4995	0.495		X		
6	BUSHING	ID	0.375	0.376	0.3795	0.005	X		
	PIN	OD	0.3735	0.3745	0.370		X		
7	SLIDE	ID	0.5018	0.5031	0.5045	0.005	X		
	BUSHING	OD	0.4985	0.4995	0.4968		X		
8	BUSHING	ID	0.625	0.6265	0.6313	0.0073	X		
	BUSHING	OD	0.623	0.624	0.6177		X		
9	BUSHING	ID	0.4375	0.4390	0.4426	0.0056	X		
	PIN	OD	0.436	0.437	0.4319		X		
10	BUSHING	ID	0.3750	0.3765	0.3800	0.0055	X		
	PIN	OD	0.3735	0.3745	0.3695		X		

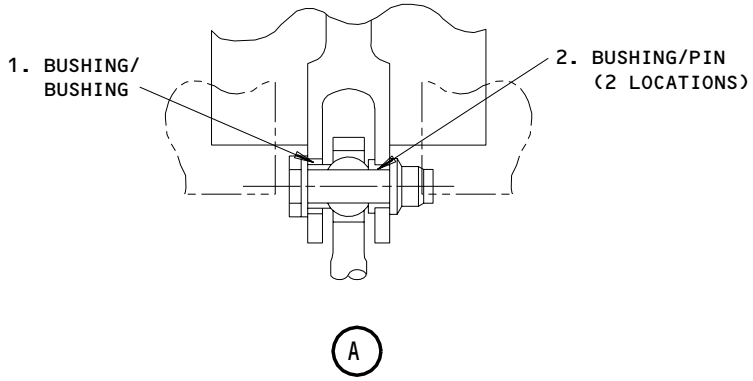
Fixed Trailing Edge Rib WBL 197.76 Bushing Wear Limits
Figure 602 (Sheet 3)

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MIN	DESIGN LIMITS DIAMETER MAX	WEAR LIMITS PERMITTED WEAR DIM.	WEAR LIMITS MAX DIA CLEARANCE	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
11	BUSHING	ID	0.5000	0.5018	0.5052	0.0062	X		
	BUSHING	OD	0.4980	0.4990	0.4938		X		
12	BUSHING	ID	0.3750	0.3765	0.3800	0.0055	X		
	BUSHING	OD	0.3735	0.3745	0.3695		X		
13	BUSHING	ID	0.500	0.5015	0.5052	0.0062	X		
	PIN	OD	0.4980	0.4990	0.4938		X		
14	BUSHING	ID	0.625	0.627	NA	0.005	X		
	BUSHING	OD	0.622	0.623	0.620		X		
15	BUSHING	ID	0.4375	0.4390	0.4426	0.0056	X		
	PIN	OD	0.4360	0.4370	0.4319		X		
16	BUSHING	ID	0.6250	0.6270	0.630	0.007	X		
	PIN	OD	0.627	0.623	0.618		X		

NA - NOT APPLICABLE

Fixed Trailing Edge Rib WBL 197.76 Bushing Wear Limits
Figure 602 (Sheet 4)





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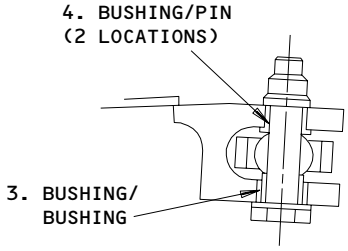

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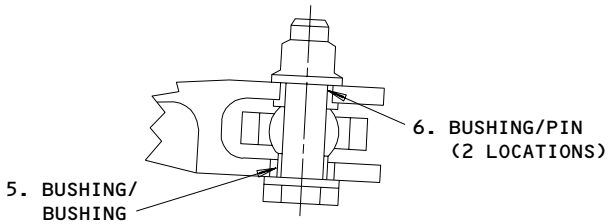
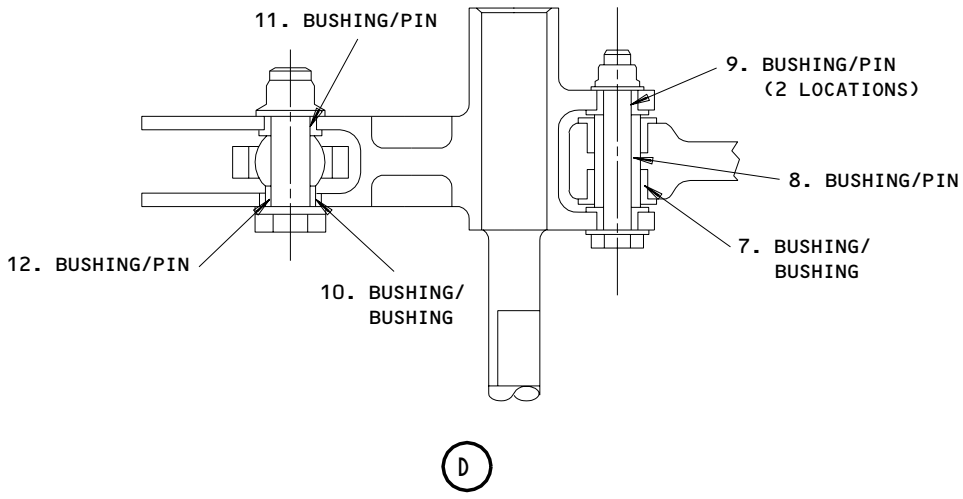
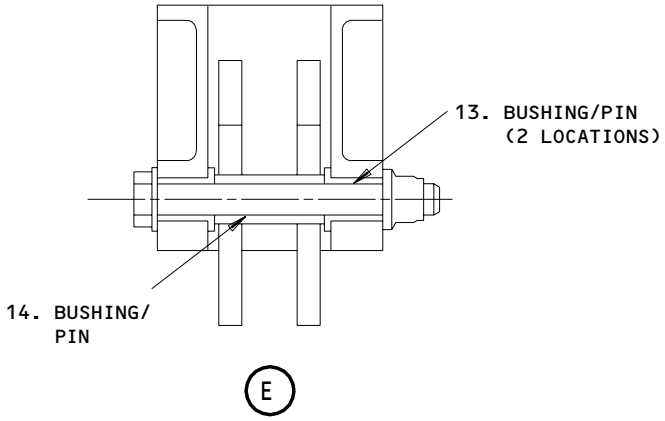


C

Fixed Trailing Edge Rib WBL 163.0 Bushing Wear Limits
Figure 603 (Sheet 1)





Fixed Trailing Edge Rib WBL 163.0 Bushing Wear Limits
Figure 603 (Sheet 2)

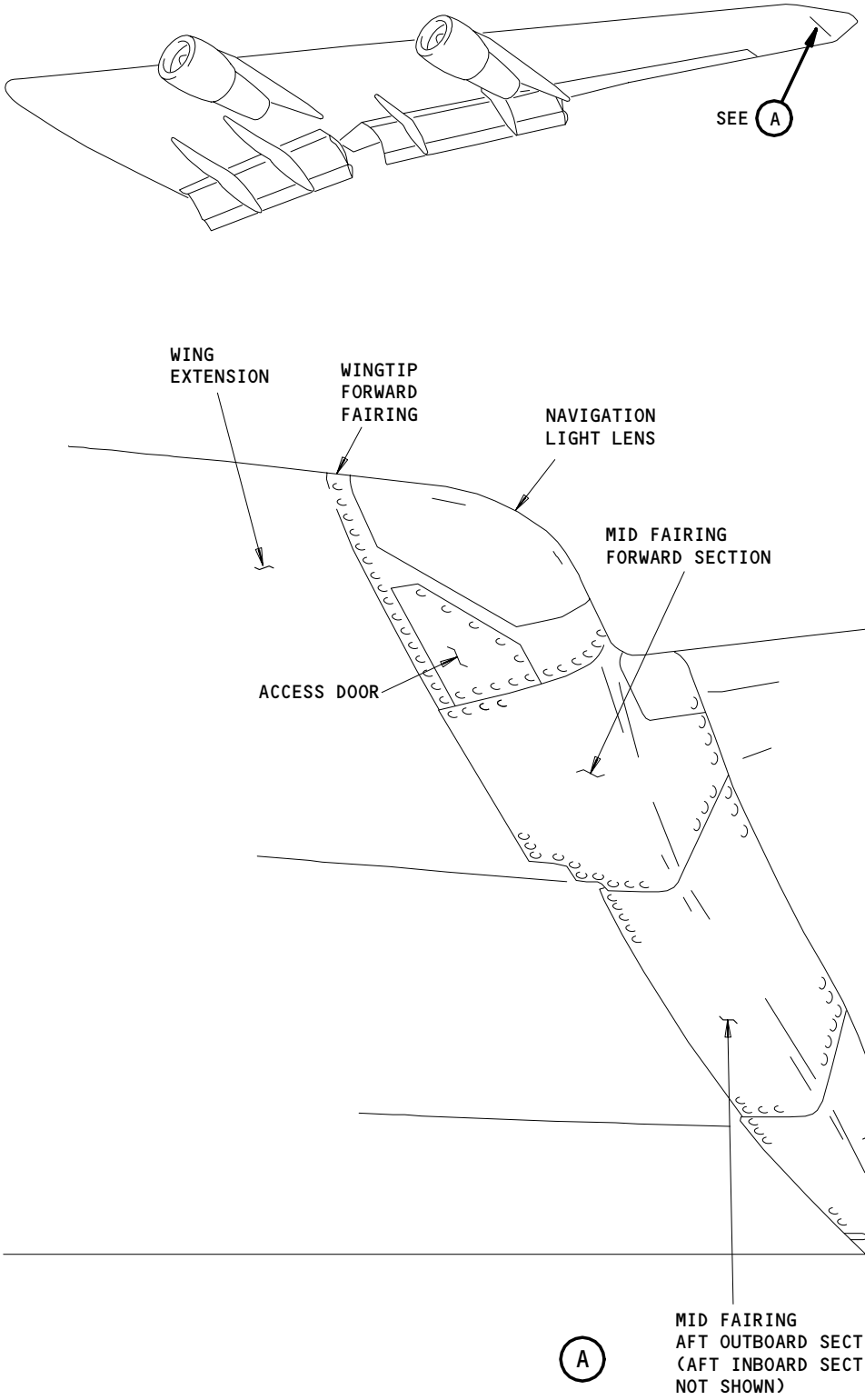
INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MIN	DESIGN LIMITS DIAMETER MAX	WEAR LIMITS PERMITTED WEAR DIM.	WEAR LIMITS MAX DIA CLEARANCE	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
1	BUSHING	ID	0.4375	0.439	0.4421	0.0056	X		
	BUSHING	OD	0.4355	0.4365	0.4319		X		
2	BUSHING	ID	0.3125	0.3135	0.3172	0.0052	X		
	PIN	OD	0.311	0.312	0.3073		X		
3	BUSHING	ID	0.4375	0.4390	0.4021	0.0056	X		
	BUSHING	OD	0.4355	0.4365	0.4319		X		
4	BUSHING	ID	0.3125	0.3135	0.3172	0.0052	X		
	PIN	OD	0.311	0.312	0.3073		X		
5	BUSHING	ID	0.5625	0.564	0.5681	0.0066	X		
	BUSHING	OD	0.5605	0.5615	0.5559		X		
6	BUSHING	ID	0.4375	0.4390	0.4426	0.0056	X		
	PIN	OD	0.436	0.437	0.4319		X		
7	BUSHING	ID	0.5015	0.5025	NA	0.005	X		
	BUSHING	OD	0.4985	0.4995	0.4965		X		
8	BUSHING	ID	0.3125	0.3135	0.3170	0.005	X		
	PIN	OD	0.3110	0.3120	0.3075		X		
9	BUSHING	ID	0.3135	0.3140	0.3170	0.005	X		
	PIN	OD	0.3110	0.3120	0.3085		X		
10	BUSHING	ID	0.5625	0.5640	0.5681	0.0066	X		
	PIN	OD	0.5605	0.5615	0.5559		X		
11	BUSHING	ID	0.4375	0.4390	0.4426	0.0056	X		
	PIN	OD	0.436	0.437	0.4319		X		
12	BUSHING	ID	0.4375	0.4385	0.4426	0.0056	X		
	PIN	OD	0.436	0.437	0.4319		X		
13	BUSHING	ID	0.3125	0.314	0.317	0.005	X		
	PIN	OD	0.311	0.312	0.3075		X		
14	BUSHING	ID	0.3125	0.3135	0.317	0.005	X		
	PIN	OD	0.311	0.312	0.3075		X		

NA - NOT APPLICABLE

Fixed Trailing Edge Rib WBL 163.0 Bushing Wear Limits
Figure 603 (Sheet 3)

WINGTIP FAIRING - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The left and right wingtip fairings are structurally similar and consist of panels attached to the wing closure ribs and winglet root rib (on airplanes with winglet). The wingtip fairings are divided into three sections, all of which are removable. These three sections are identified as the forward fairing, mid fairing, and aft fairing. To facilitate maintenance of the strobe and navigational lights, access doors are provided.
   B. The forward fairing is formed from aluminum sheet. Bolts and nutplates attach the forward fairing to the wing leading edge closure rib and to the mid fairing. Strobe and navigational lights are installed in the forward fairing. An access door is provided for the lights.
   C. The mid fairing is made of three individually removable sections: forward, aft lower, and aft upper. The forward section is made of an aluminum fairing attached to a fiberglass honeycomb fairing. The two aft sections are made of fiberglass honeycomb panels. On airplanes with winglets, the mid fairing transitions between the wing and the winglet. Bolts and nutplates attach the forward section to the wing closure ribs, the winglet and the aft sections. The aft sections are attached by bolts and nutplates to the wing closure rib, winglet, forward section, and aft fairing.
   D. The aft fairing is assembled from fiberglass honeycomb panels attached to aluminum ribs and splice chords. The assembly is attached by bolts and nutplates to the wing trailing edge closure rib and the mid fairing.



Wingtip Fairing
Figure 1

WINGTIP FORWARD FAIRING - REMOVAL/INSTALLATION

1. General
   A. This procedure contains two tasks:
      (1) The first task is the removal of the forward fairing wingtip.
      (2) The second task is the installation of the forward fairing wingtip.
      (3) Remove the fairing as follows:
          - Open the circuit breakers
          - Open the access door
          - Disconnect the electrical connectors
          - Remove the fasteners
      (4) Install the fairing as follows:
          - Install the fasteners
          - Connect the electrical connectors
          - Do a Test of the lights
          - Do a Test of the bonding resistance
          - Apply sealant to the space between the skin(s)
   B. The navigation lights are installed in the forward fairing wingtip. To repair the lights, you must remove the fairing.

TASK 57-23-01-004-001

2. Wingtip Forward Fairing Removal (Fig. 401)
   A. References
      (1) IPC 57-23-01 Fig. 1
   B. Access
      (1) Location Zone
          538 Wingtip, Left
          638 Wingtip, Right

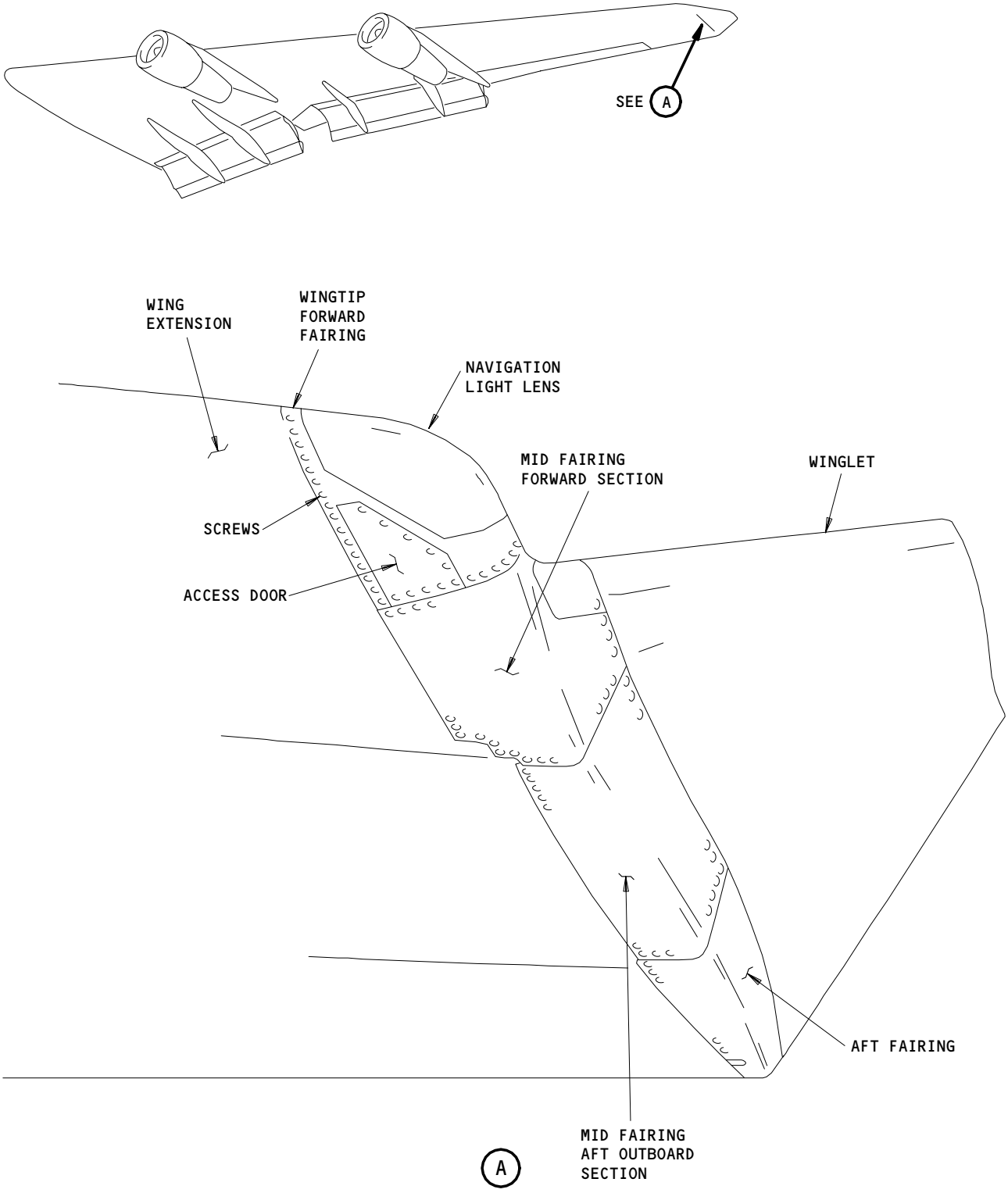
      (2) Access Panel
          538B Access Door - Navigation Light Fairing, Left
          638B Access Door - Navigation Light Fairing, Right

   C. Procedure

      S 864-002
      (1) For the left wing, open the 6L28 EXTERIOR LIGHT L WING CONT circuit breaker on panel P6.

      S 864-003
      (2) For the right wing, the open 6L29 EXTERIOR LIGHT R WING circuit breaker on P6.

      S 864-004
      (3) Open the 6L32 EXTERIOR LIGHT BEACON STROBE circuit breaker on panel P6.



Wingtip Forward Fairing Installation
Figure 401

S 014-005
(4) Open the access panel 538B or 638B.

S 034-006
(5) Disconnect the electrical connectors from the strobe and navigation lights.

S 024-007
(6) Remove the external fasteners around the fairing perimeter and then remove the fairing.

S 034-008
(7) Put a cover on the open area of the structure and the equipment.

TASK 57-23-01-404-009

3. Wingtip Forward Fairing Installation (Fig. 401)
   A. Consumable Materials
      (1) A00247 Sealant - BMS 5-95
   B. References
      (1) 20-22-01/601, Electric Bonding
      (2) 24-22-00/201, Manual Control
      (3) IPC 57-23-01 Fig. 1
   C. Access
      (1) Location Zone
          538 Wingtip, Left
          638 Wingtip, Right

      (2) Access Panel
          538B Access Door - Navigation Light Fairing, Left
          638B Access Door - Navigation Light Fairing, Right

   D. Procedure

S 144-010
(1) Clean the drain/vent hole, if it is necessary.

S 434-011
(2) If the hole has a cover, remove it.

S 424-012
(3) Install the fairing.
    (a) Put the fairing on the wing.
    (b) Install the fasteners at all locations.

S 434-013
(4) Connect the electrical connectors to the strobe and the navigation lights.

S 414-014
(5) Close and lock the access panel 538B or 638B.

S 864-015
(6) Close the 6L32 EXTERIOR LIGHT BEACON STROBE circuit breaker on panel P6.

S 864-016
(7) For the left wing, close the 6L28 EXTERIOR LIGHT L WING CONT circuit breaker on the main power circuit breaker of panel P6.

S 864-017
(8) For the right wing, close the 6L29 EXTERIOR LIGHT R WING circuit breaker on panel P6.

S 864-018
(9) Supply the electrical power (Ref 24-22-00/201).

S 714-019

WARNING: BEFORE YOU OPERATE THE STROBE LIGHTS, TELL PERSONNEL NEAR THEM NOT TO LOOK DIRECTLY AT THEM WHEN THEY FLASH. IF YOU LOOK AT THE STROBE LIGHT WHEN YOU ARE NEAR IT, IT CAN CAUSE TEMPORARY VISION PROBLEMS.

(10) Do a test of the strobe lights.
  (a) Set the BEACON STROBE LTS switch on the pilots' overhead panel P5 to ON and make sure that the strobe light operates.
  (b) Set the BEACON STROBE LTS switch to OFF.

S 714-020
(11) Do a test of the navigation lights.
  (a) Set the NAV lights switch on the pilots' overhead panel P5 to ON.
  (b) Look to see that the wingtip navigation light comes on.
  (c) Set the NAV lights switch to OFF.

S 864-021
(12) Remove electrical power if it is not necessary (Ref 24-22-00/201).

S 764-022
(13) Use a bonding meter to measure the electrical resistance between the forward fairing and the leading edge of the wing extension.
  (a) The maximum permitted resistance is 0.0025 ohm.

S 344-023
(14) Apply sealant to the skin joints.

S 344-010

(15) Remove the unwanted sealant to align the sealant with the panels.

WINGTIP FORWARD FAIRING - REPAIRS

1. General
   A. This procedure contains two tasks. One task is to repair the navigation light lens in the forward fairing of the wingtip. The other task provides instructions for a temporary repair for the lens cover for limited flight.
      (1) Repair the lens as follows:
      - Remove the wingtip forward fairing
      - Remove the plastic lens
      - Stop drill the crack
      - Put a plug in the drilled hole
      - Install the plastic lens
      - Install the wingtip forward fairing
      - Polish the lens.
      (2) If you find any cracks in the acrylic plastic of the navigation light lens, you must repair them.
      (3) For a temporary repair, use a stop drill, RTV-174, and Clear Mylar Tape.

      NOTE: This repair is only a temporary repair to prevent a flight delay or cancellation and will allow the airplane to fly until replacement parts can be obtained and installed.

      (4) Inspection of repaired lenses will be required prior to each flight.

   TASK 57-23-01-308-016
2. Repair the Lens
   A. Standard Tools and Equipment
      (1) Drill Motor
      (2) Bits - Drill, 1/4 inch or 3/8 inch
      (3) Soap and Water
   B. Consumable Materials
      (1) A00000 Cement - PS-30
      (2) A00000 Cement - PS-18 (optional to PS-30)
      (3) A00966 Cement - EC-2216 B/A (Optional to PS-30)
      (4) G00000 Paper - Abrasive, Wet or Dry, 240, 280, 320, 400, 600 Grit
      (5) G00000 Sheet - Acrylic Plastic, per MIL-P-8184 or MIL-P-5425, 0.10 Inch Thick
      (6) B00083 Solvent - TT-N-95, Aliphatic Naphtha
      (7) G00000 Tape - Masking
      (8) G00000 Cellophane
      (9) G00000 Chamois
      (10) G00000 Cloth - Cotton Flannel
      (11) G00000 Block - Rubber, Durometer Reading of 35 ±5, Shore A Scale, or Wood
      (12) G00000 Wheel - Buffing, Stitched Muslin, 4 to 10 Inch Diameter
      (13) G00000 Wheel - Buffing, Unstitched Muslin, 4 to 10 Inch Diameter

(14) GOOOOO Compound - Buffing, Learock No. S-30
(15) GOOOOO Compound - Buffing, Learock No. 888
(16) GOOOOO Compound - Buffing, OOOO Rouge
(17) GOOOOO Compound - Buffing, Dupont 7
(18) GOOOOO Compound - Buffing, Polysand
(19) GOOOOO Wax - Simonize

C. Access

(1) Location Zone

538	Wingtip, Left
638	Wingtip, Right

D. Repair Cracks in the Lens

S 018-001
(1) Remove the forward fairing of the wingtip (AMM 57-23-01/401).

S 018-002
(2) Remove the lens.

S 348-003
(3) Drill a 1/4 inch or 3/8 inch diameter hole at the end of the crack to stop drill the crack.

NOTE: Be careful when you drill into the acrylic lens because you can damage it easily. It is recommended that you drill holes in MIL-P-8184 or MIL-P-5425 acrylic plastic sheet before you drill the lens. The material must be 0.10 inch thick.

S 348-004
(4) Rub the abrasive paper around the hole to remove all cracks or chips in the acrylic.

S 348-005
(5) Cut and remove a 0.10 inch thick plug from the MIL-P-8184 or MIL-P-5425 acrylic plastic sheet.

NOTE: The plug dimension must be accurate before you install it into the drilled hole of the acrylic.

S 348-006

(6) Bond the plug in the fairing with one of the recommended cements as follows:
(a) Make the mating surfaces rough with 240 grit wet or dry paper.
(b) Clean the mating surfaces with aliphatic naphtha or soap and water followed by aliphatic naphtha.
(c) Let the mating surfaces dry.
(d) Apply tape to the area around the plastic.

NOTE: The tape must not be more than 1/32 inch from the inch from the bonded area. The location of the tape must extend a minimum of 1 inch. The tape must be parallel to the joint.

(e) Prepare the adhesive
1) Prepare the cement PS-30 (Component A - base, Component B - catalyst).
a) Add one part by weight of Component B to 19 parts by weight of Component A and mix fully.

NOTE: The pot life of this bond is 20 minutes at 75° F.

WARNING: WHEN YOU USE PS-18, YOU MUST OBEY THE PRECAUTIONS THAT FOLLOW:

- DO NOT MIX COMPONENT B DIRECTLY WITH COMPONENT C BECAUSE A DANGEROUS CHEMICAL EFFECT WILL OCCUR.
- DO NOT LET COMPONENT C TOUCH YOUR SKIN.
- IF COMPONENT C TOUCHES YOUR SKIN, CLEAN THOSE SKIN AREAS IMMEDIATELY WITH SOAP AND WATER.

2) Prepare the 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 (118 cc) of component A and mix together.

NOTE: You can keep this mixture for no more than 24 hours at 35-40°F.

b) Before you use it, add 5 cc of component C to the mixture and mix the components fully.

NOTE: The pot life of this adhesive is 10 minutes at 75° F.

3) Prepare the Cement EC-2216B/A
   a) Mix equal parts by weight of EC-2216B (base) and EC-2216A (accelerator).

      NOTE: The pot life of the mixed adhesive is about 90 ±10 minutes at 70-80°F.

(f) Apply a light layer of adhesive to the two mating surfaces.
(g) Put the two surfaces together immediately after you apply the adhesive.
(h) Remove the unwanted adhesive and apply to the surface with tape if it is possible.
(i) Put a cover on top of the adhesive not used to keep it wet.

S 348-007
(7) If the adhesive decreases the intensity of light in the lens repaired area, make the lens surface smooth again as follows:

NOTE: Parts bonded with PS-30 or PS-18 can be made smooth again after 5 hours at ambient temperature.

Parts bonded with EC-2216 B/A must be dried for 24 hours at ambient temperature, or 130 ±10 minutes at 160 ±10°F before you touch or use them.

(a) Remove the tape and flush all areas without tape with clean water to remove the dirt and the grit.
(b) Clean with soap and water.

NOTE: To clean the area, you can use a soft cloth or a chamois Only use the cloth or the chamois to move the water to the plastic. Do not rub the plastic with the cloth or the chamois. Rub the plastic with your hand to quickly find and remove all abrasive material.

(c) You must use a clean, moist chamois to dry the area.

NOTE: Use the approved cloth if you are careful not to rub the acrylic after it is dry.

(d) Lightly rub the acrylic with a cloth soaked with aliphatic naptha to remove the oil and grease.

(e) Dry the area with the approved cloth.

NOTE: Do not rub acrylic plastics with a dry cloth. To remove a light dust film or electrostatic charges, rub the surface with a clean, moist chamois or a clean, moist approved cloth.

(f) Rub sandpaper along the plastic surface that has scratches.

NOTE: Start with 280 grit wet or dry abrasive paper and continue with smoother grit paper (320, 400, 600) until you get the necessary finish. You must wind abrasive paper around a rubber block with a durometer indication of 35 ±5, Shore A scale, or a wood block wound with the approved cloth. Keep the surface soaked with water while you use the sandpaper. The plastic surface will become too hot if you are not careful. Stay in the repaired area when you sand to get a smooth repair that is continuous with the adjacent area.

(g) If you make deeper scratches from the sandpaper, you must remove them.

NOTE: Clean with water each time you change the grit. After you get a smooth, continuous surface, clean with water until you remove the grit.

(h) Polish the lens.

S 418-008

(8) Install the lens.

S 428-009

(9) Install the forward fairing of the wingtip (AMM 57-23-01/401).

E. Polish the Lens

S 348-010

(1) Machine polish the lens.
   (a) It is recommended you polish with a machine when the equipment and an approved person are available.
   (b) You must balance the items as follows on the machine to prevent the acrylic to become too hot.
      1) Contact pressure
      2) Feed rate
      3) Wheel speed

(c) Use a stitched muslin wheel and Learock S-30 buffing compound.

NOTE: Change the direction of "feed" frequently and use only light pressure. To make it shiny, polish with a loose, open, unstitched wheel with spacers and Learock 888 buffing compound. (To make spacers, remove all the muslin disks, and with scissors, cut half of them to 1/2 the initial diameter. Assemble the wheel, again and replace the large disks with the small ones). Continue this procedure to replace the large disks with the small ones. If you use this wheel it will decrease the surface heat a large quantity caused by friction.

S 348-011

(2) Polish the lens with your hand.

(a) When the machines that polish and the approved persons are not available, you can polish with your hand as follows:

1) Polish the area to the necessary finish with 0000 wet rouge that you apply to a wet approved cloth.

NOTE: Apply the polish to a clean, wet, approved cloth and polish until you get the necessary finish. Rub with the approved cloth.

S 348-012

(3) Apply a thin, continuous layer of wax with an approved cloth.

S 348-013

(4) Rub lightly through circular motions to make it shiny.

TASK 57-23-01-308-017

3. Wingtip Lens Temporary Repair

A. Standard Tools and Equipment

(1) Drill Motor

(2) Bits - Drill, 3/16, 1/4 inch or 3/8 inch

B. Consumable Materials

(1) G00000 Paper - Abrasive, Wet or Dry, 240, 280, 320, 400, 600 Grit

(2) RTV-174 Silicone Sealant
General Electric Corporation
Waterford, NY 12188

(3) Clear Mylar Tape

(4) Location Zone

538	Wingtip, Left
638	Wingtip, Right

C. Temporarily Repair Crack(s) in the Lens

S 038-018

(1) Remove the forward fairing of the wingtip (AMM 57-23-01/401).

S 218-019

(2) Examine the condition of the lens.

NOTE: If the lens has multiple repairs or cracks, or if any of the cracks are continous from one edge of the lens or attachment hole to another, you must replace the lens. Do not repair the lens. You must satisfactorily see light come out of the lens for the lens to have an effect. Continued use of lens that has multiple repairs or cracks is a safety of flight concern.

S 038-020

(3) Remove the lens.

S 348-021

(4) Drill a 3/16, 1/4 inch or 3/8 inch diameter hole at the end of the crack to stop drill the crack.

NOTE: Be careful when you drill into the acrylic lens because you can damage it easily. It is recommended that you drill holes in MIL-P-8184 or MIL-P-5425 acrylic plastic sheet before you drill the lens. The material must be 0.10 inch thick.

S 348-022

(5) Rub the abrasive paper around the hole to remove all cracks or chips in the acrylic.

S 348-023

(6) For cracks in any direction, stop drill and seal with RTV-174 Silicone Sealant, apply clear mylar tape to the crack in the lens for a temporary repair.

NOTE: This repair is only a temporary repair to prevent a flight delay or cancellation and will allow the airplane to fly until replacement parts can be obtained and installed.

S 438-024

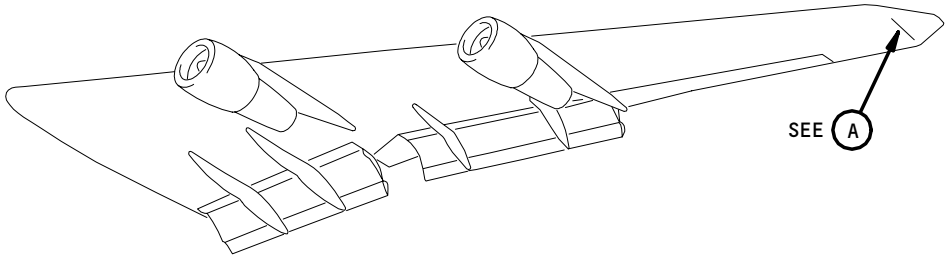
(7) Install the lens.
   (a) For lenses with fixed grommets, torque fasteners to 25-35 inch pounds (2.8-4.0 Newton meters).
   (b) For lenses with rubber and aluminum washer assemblies, tighten fastener until the large outer dimpled washer is snug against the lens.

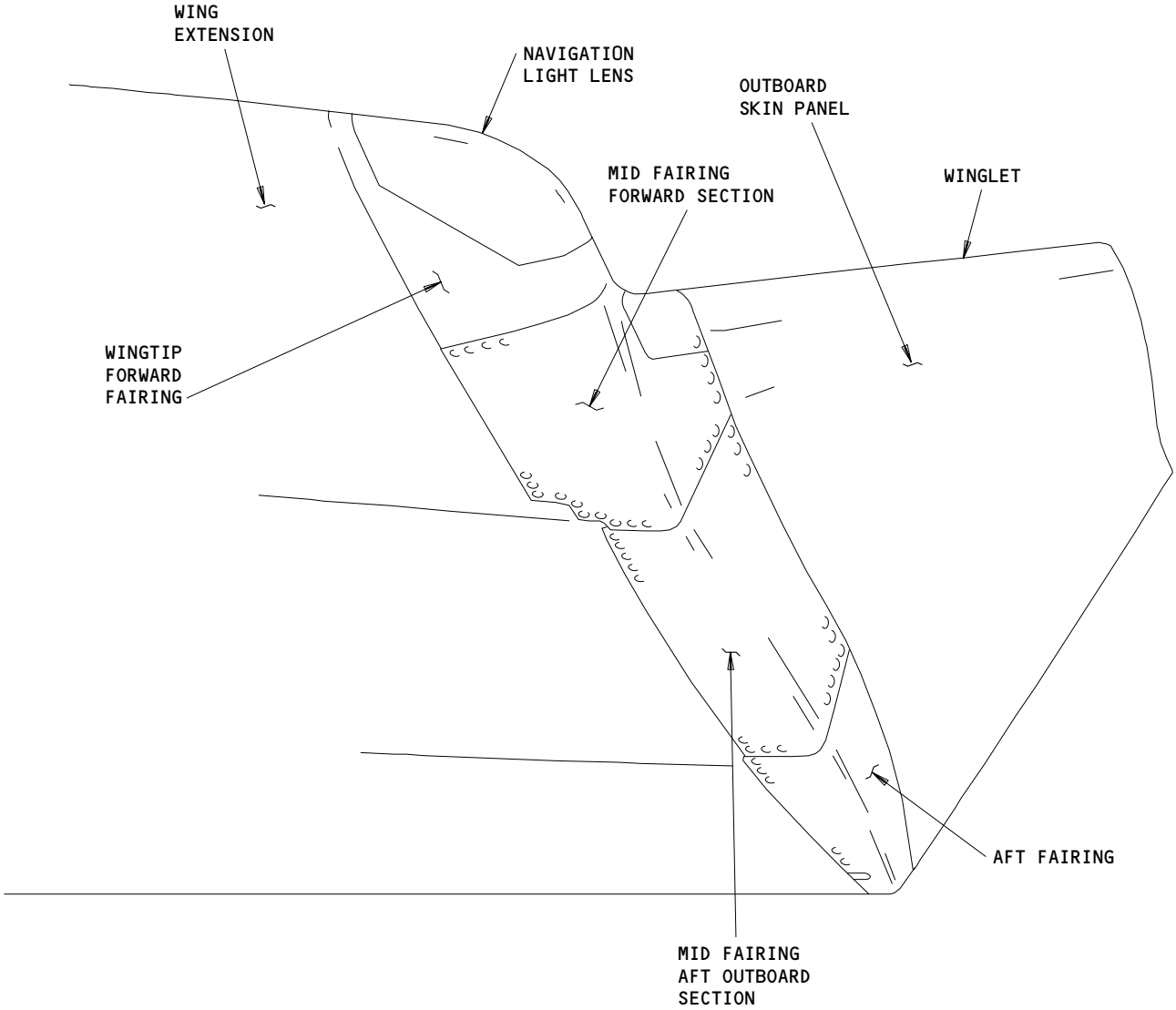
S 438-025

(8) Install the forward fairing of the wingtip (AMM 57-23-01/401).

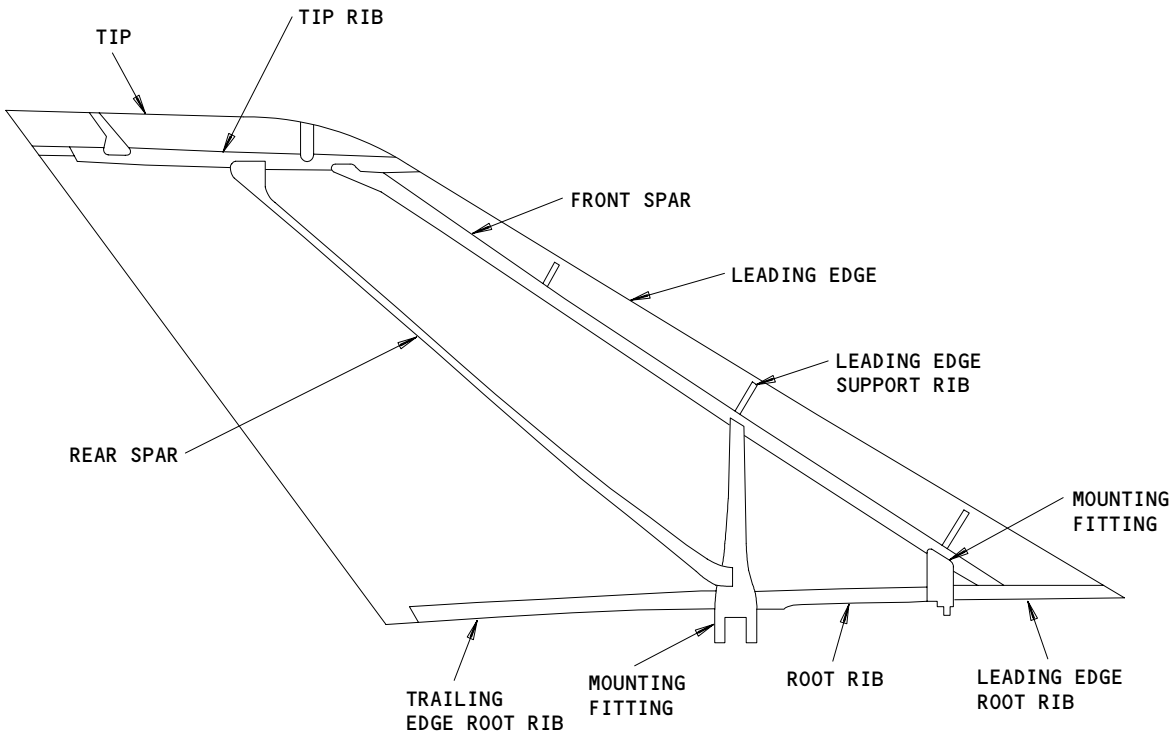
WINGLET - DESCRIPTION AND OPERATION

1. General
   A. The winglet is an aerodynamic device designed to improve the performance of the wing by reducing drag. It is attached to the outboard end of the wing on special fittings incorporated into the wing end rib.
   B. The construction of the winglet follows standard airfoil practice, using a structure of spars and ribs enclosed by a skin which provides the shape of the winglet.
   C. The winglet is faired into the wing by rigid fairings which are attached to the winglet and wing.
2. Structure
   A. The two spars, front and rear, are composite structures built up from a Nomex honeycomb core and epoxy impregnated graphite fabric plies. The front spar is the mount for the leading edge.
   B. The winglet has two rib locations, one root rib and one tip rib. The root ribs have nutplates to allow mounting of fairings. The root rib is made in three parts, the leading edge root rib, the root rib and the trailing edge rib.
      (1) The leading edge root rib is made of a sheet of aluminum with aluminum channel stiffeners.
      (2) The root rib and trailing edge rib are composite structures built up of Nomex honeycomb cores and epoxy impregnated graphite fabric plies.
      (3) The tip rib is built up of epoxy impregnated graphite fabric plies.
   C. The two mounting fittings extend from the root rib to the front spar. These fittings are made of forged aluminum.
3. Skin
   A. The major skin panels extend from the front spar to the trailing edge. The panels are composite construction built up of Nomex honeycomb cores and epoxy impregnated graphite fabric plies. The inboard panel is attached to the spars and ribs by hilocks. The outboard panel is attached to the spars and ribs by bolts into nutplates.
   B. The leading edge is attached to the front spar by rivets. The construction of the leading edge is sheet aluminum over formed aluminum ribs.
   C. The tip is attached to the tip rib by rivets. The tip has three parts, the forward and mid parts are made of sheet aluminum joined by splice plates. The aft part is an aluminum casting.
   D. The winglet is faired into the wing by forward, mid, and aft wing extension fairings.
      (1) The mid fairing is made in three parts all of which are attached by bolts into nutplates to the winglet's root rib and wing extension closure rib. The mid fairing parts are primarily composite construction with an aluminum leading edge portion.





Winglet
Figure 1



Winglet Structure
Figure 2

(2) The aft fairing is composite construction and is attached by bolts into nutplates on the wing extension trailing edge closure rib. The aft fairing is not attached to the winglet. Instead of attaching the winglet to the fairing, the winglet rests against the fairing on a bulb seal.

WINGLET - REMOVAL/INSTALLATION

1. General
   A. This procedure contains two tasks. The first task is the removal of the winglet. The second task is the installation of the winglet.
   B. To remove and install the winglet you must use the winglet sling. The mid fairings between the wingtip and the winglet are attached to the winglet and to the wingtip. You must remove the mid fairings first before you remove the winglet. The procedure to remove the mid fairings is included in this section. The forward and aft fairings can stay attached to the wingtip during the removal or installation of the winglet.
   C. The winglet is attached to the wingtip with two fittings attached with bolts, one smaller forward fitting and one larger aft fitting. You can get access to the bolts after you remove the outboard section of the mid fairing. You must remove the two ground straps attached to the winglet before you remove the winglet. You must measure the bonding resistance between the winglet and the wingtip during the installation of the winglet.

TASK 57-28-01-004-001

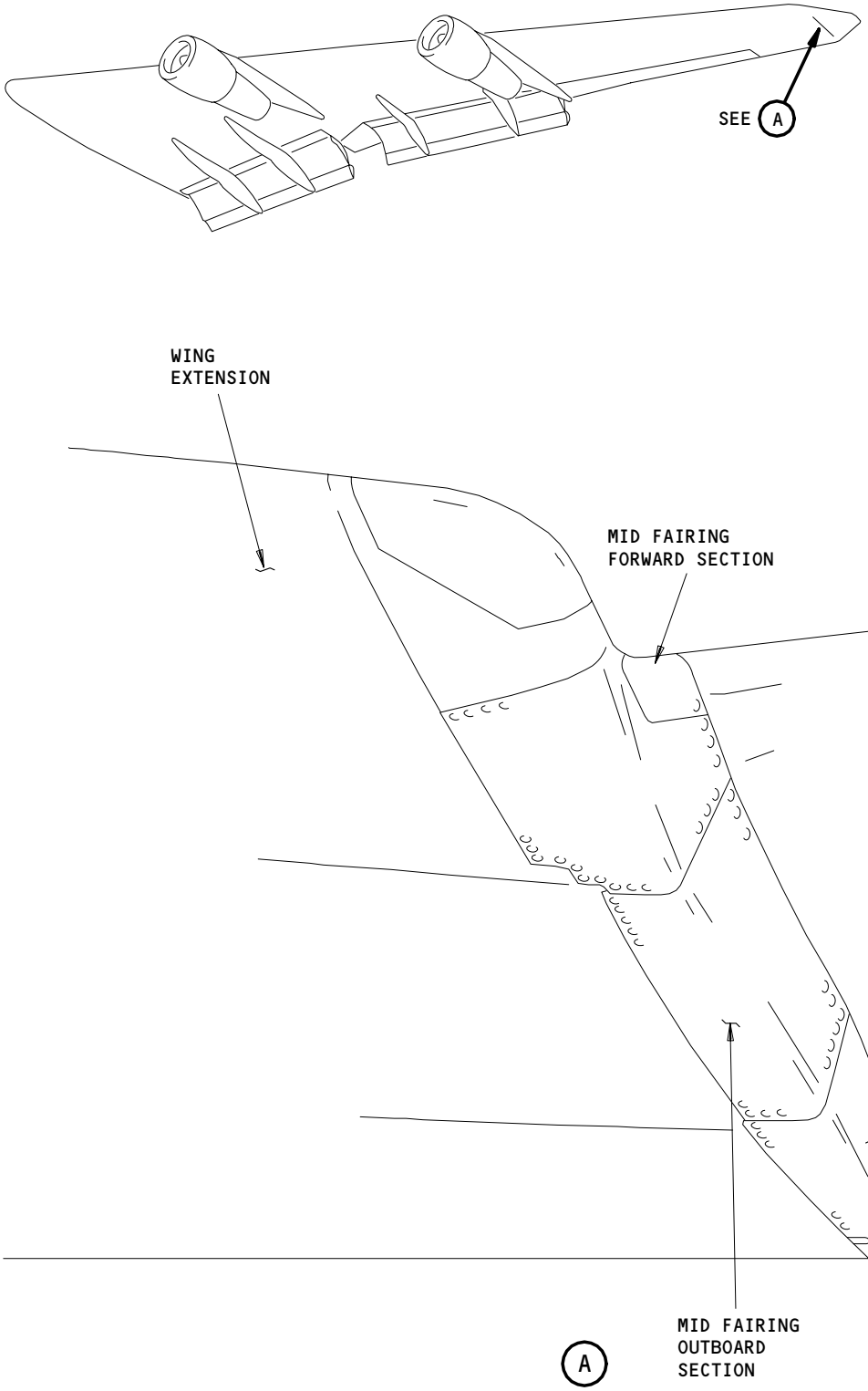
2. Winglet Removal (Fig. 401)
   A. Special Tools and Equipment
      (1) G57002-24 - Winglet Sling
      (2) G57004-7 - Installation/Removal Tool - Winglet Aft Mount Bolts
   B. Standard Tools and Equipment
      (1) Positioner - Load (For 140 Pounds), LL-5-3, Permadur Industries, INC. 47 old camplain road, Somerville New Jersey, 08876 USA. (alternative)
      (2) Hoist - Suitable for reaching above the winglet with provisions for attaching the winglet sling
   C. References
      (1) IPC 57-28-01 Fig. 1
   D. Access
      (1) Location Zone
          539 Winglet, Left
          639 Winglet, Right

   E. Procedure

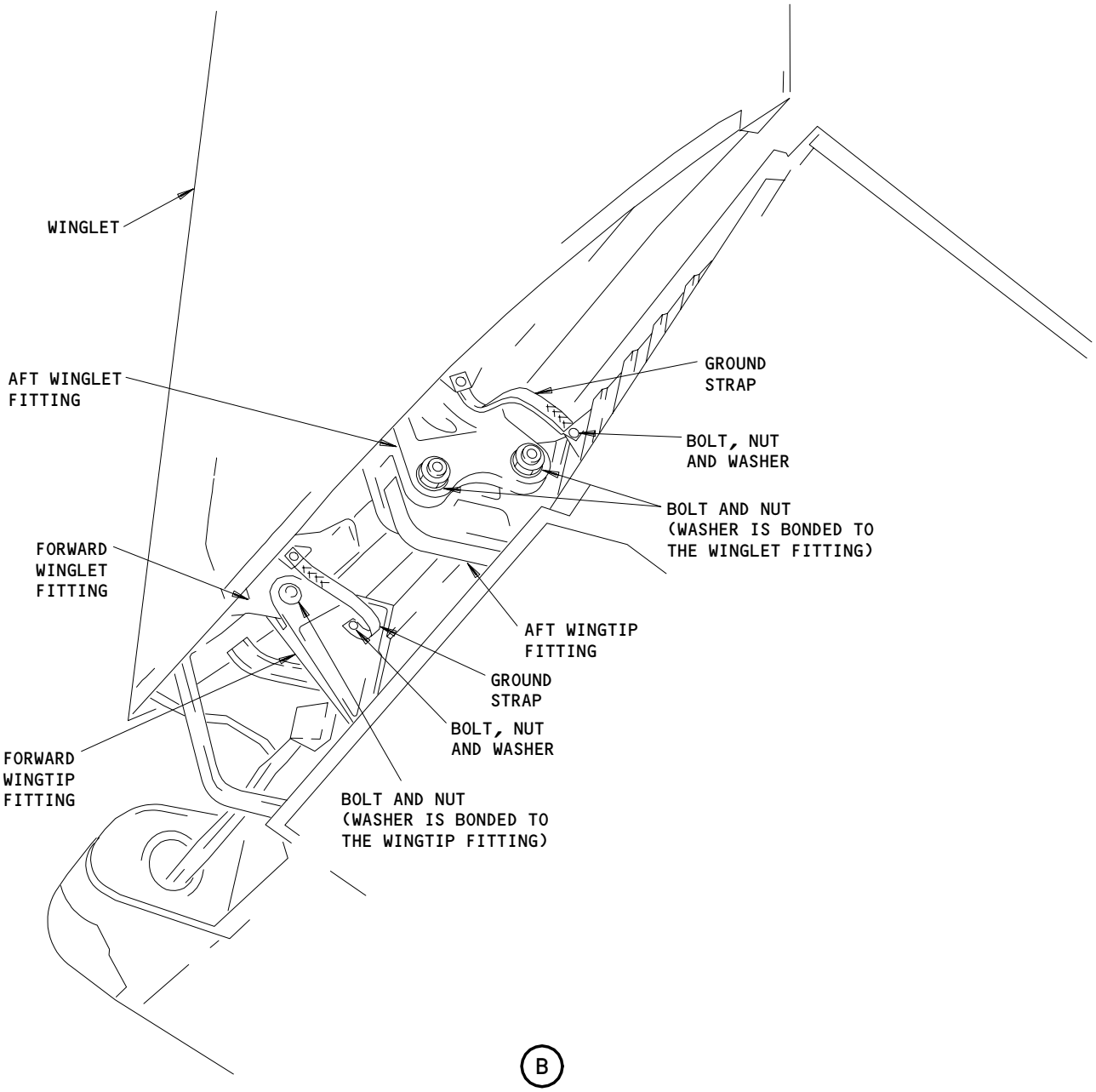
      S 014-002
      (1) Remove the mid fairing.

          NOTE: There are three divided sections to the mid fairing. A forward, or leading edge section, an aft inboard section and an aft outboard section. You must remove all three of these sections before you remove the winglet.

          (a) Remove the screws from the perimeter of the forward section of the mid fairing.



Winglet Installation
Figure 401 (Sheet 1)



Winglet Installation
Figure 401 (Sheet 2)

(b) Remove the forward section.
(c) Remove the screws from the forward edge at the aft inboard section and the aft outboard section.
(d) Remove the splice channels from the fairing.
(e) Remove the screws from the edges of the aft inboard section of the mid fairing.
(f) Remove the aft inboard section.
(g) Hold the aft outboard section of the mid fairing while you remove the screws from the edges of the section.
(h) Remove the aft outboard section.

S 494-003
(2) Attach the sling to the winglet.
(a) Use the recommended hoist and load positioner to lift the winglet.

NOTE: The load positioner tool is not needed if the hoist has precise vertical positioning controls.

(b) Continue to lift the winglet until the sling cables are not loose.

S 024-004
(3) Remove the winglet.
(a) To disconnect the ground straps from the winglet, remove the bolts, washers and nuts.
(b) Remove the bolt, the nut and the washer at the forward fitting.

NOTE: You will find one washer bonded to each side of the wingtip fitting. Do not remove these washers.

CAUTION: AFTER YOU REMOVE THE LAST BOLT, THE WINGLET IS FREE TO MOVE. BE CAREFUL AND MOVE THE WINGLET AWAY FROM THE WINGTIP. YOU CAN CAUSE DAMAGE THE WINGLET OR THE AIRPLANE IF YOU ARE NOT CAREFUL.

(c) Use the recommended tool on the forward side of the aft fitting to hold the bolts while you loosen the nuts.

NOTE: The use of this tool will allow one single mechanic to remove the nuts from the aft fitting.

(d) Remove the bolts, nuts and washers at the aft fitting.

NOTE: You will find one washer bonded to each side of the winglet fitting. Do not remove these washers.

(e) Remove the winglet.

S 434-006

(4) If the airplane flies without the winglet, use safety wire to keep the bonded washers to the forward fittings on the wingtip.

S 034-007

(5) If the airplane flies without the winglet, remove the ground straps from the wingtip.

S 414-018

(6) If the airplane will fly without the winglet, apply speed tape to the open end of the trailing edge of the wingtip.

S 434-008

(7) Put a cover along the open structure to prevent possible damage.

TASK 57-28-01-404-009

3. Winglet Installation

A. Special Tools and Equipment

(1) G57002-24 - Winglet Sling

(2) G57004-7 - Installation/Removal Tool - Winglet Aft Mount Bolts

B. Standard Tools and Equipment

(1) Positioner - Load (For 140 Pounds), LL-5-3, Permadur Industries, INC. 47 old camplain road, Somerville New Jersey, 08876 USA. (alternative)

(2) Meter - Bonding (Ref 20-22-01/601)

(3) Hoist - Suitable for reaching above the winglet with provisions for attaching the winglet sling

(4) Brush - Bonding, stainless steel, rotary, No. P-33-SS, C.W. Morris Company, Detroit, Michigan, or Equivalent

C. Consumable Materials

(1) A00247 Sealant - BMS 5-95, Class B

(2) C00064 Coating - Surface Treatment, MIL-C-5541, Alodine

(3) C00259 Enamel - Primer, Green, BMS 10-11

(4) D00013 Grease - MIL-G-23827

(5) Y436 "Scotch" Vibration Damping Tape (Speed Tape) - 3M Industrial Tape and Specialties Division, 3M Center, Bldg. 220-7E-01 St. Paul, Minnesota 55144-1000

D. References

(1) IPC 57-28-01 Fig. 1

E. Access

(1) Location Zone

539 Winglet, Left

639 Winglet, Right

F. Procedure

S 014-010

(1) Remove the cover along the open structure.

S 034-011
(2) If the airplane flew without the winglet, remove the safety wire from the forward wingtip fitting.

S 214-012
(3) If the airplane flew without the winglet, remove the unwanted material.

NOTE: If the airplane will fly without the winglet, make sure that you install the wingtip fairings at the leading and trailing edges of the wingtip.

S 024-017
(4) If the airplane flew without the winglet and you will install the winglet now, remove the speed tape. This speed tape is applied over the open end of the trailing edge of the wingtip fairing.

S 214-011
(5) Examine the components as follows for damage:
(a) The wingtip.
(b) The wing closure rib.
(c) The fitting bushings.
(d) The skin.

S 104-012
(6) Clean and repair the areas if it is necessary.

S 424-013
(7) Install the winglet.
(a) Make sure that the washers bonded to the aft fitting on the winglet and to the forward fittings on the wingtip are in their position.

S 434-013
(8) If you cannot find the washer, continue as follows:
(a) Remove the remaining sealant from the fitting.
(b) Bond a new washer to the fitting with BMS 5-95.

S 424-014
(9) Continue to install the winglet.
(a) Make sure that the drain holes in the root rib of the winglet have no blockage.
(b) With the recommended hoist, load positioner and sling, lift the winglet into its position on the wingtip.
(c) Apply grease to the bolts before you install them.
(d) Install the aft bolts, washers and self-locking nuts.
(e) Use the recommended tool on the forward side of the aft fitting to hold the two aft bolts while you torque the nuts.

(f) Make sure the run-on torque is a minimum of 285 pound-inches.
1) If the run-on torque is less than 285 pound-inches, discard the nut and install a new nut.
(g) Torque the nut from 3000 to 4000 pound-inches.
(h) Install the forward bolt, washer and self-locking nut.
(i) Make sure that the run-on torque is a minimum of 90 pound-inches.
1) If the run-on torque is less than 90 pound-inches, discard the nut and install a new nut.
(j) Torque the nut from 800 to 1100 pound-inches.

S 094-014
(10) Remove the sling.

S 434-015
(11) With wet sealant, install the winglet screws at each sling attach point.

S 434-019
(12) Attach the ground straps.
(a) Use a bonding brush to clean the fitting surfaces and the ground strap where the strap attaches to the fitting.

NOTE: The surface must be smooth and shiny.

(b) Apply Alodine to the cleaned surfaces.
(c) Attach the ground straps with the bolts, washers, and self-locking nuts.
(d) Measure the bonding resistance between the ground plates on the winglet and the wingtip.

NOTE: The maximum permitted resistance is 0.0025 ohms.

(e) Paint the attach points of the ground straps with primer.
(f) After you apply the primer, apply a fillet seal between the ground strap and the ground plate.

S 414-016
(13) Install the mid fairing.
(a) Examine all the nutplates for loose fasteners and make sure they are all there.
(b) Repair if it is necessary.
(c) Put the aft outboard section in its position.
(d) Install the screws.
(e) Put the aft inboard section in its position.
(f) Install the screws.
(g) Put the splice channels in their positions on the aft inboard and the aft outboard sections.
(h) Install the screws at the forward edges of the fairing section.
(i) Put the forward section in its position.
(j) Install the screws.

S 394-017

(14) Apply sealant in the space between:
  (a) the mid fairing parts.
  (b) the mid fairing and the winglet
  (c) the mid fairing and the wing.

WINGLET CONDUCTING STRIP - REPAIRS

1. General
   A. This procedure contains instructions for the repair of inboard or outboard winglet conductor strips.
      (1) The conducting strip should be replaced or repaired if damage extends across more than half the width of the strip.
         (a) Exposed areas less than half the width of the conductive strip may have touchup conductive coating applied using approved coatings per BMS 10-21.
      (2) This repair option is intended to be used to repair damage to the inboard (upper) or outboard (lower surface) conductive strip.
         (a) Remove any damaged portions of the conductive strip.
         (b) Scrape or peel the strip from the winglet where possible. Use care to prevent damage to the carbon fiber.
         (c) Remove the remaining residue by sanding with aluminum oxide sandpaper.
      (3) Install 0.020 6061-T4 bare sheet splice strips.
         (a) Apply chemical conversion coating to the strips prior to installation (SRM 51-20-01).
         (b) Small amounts of BMS5-92 type 1 resin may be used to hold the splice in place.
      (4) Overlay the repair area with one ply of BMS 9-3, type 120 fiberglass and cure using BMS 8-301, class 2 resin (SRM 51-70-06).
      (5) Do a continuity of the splices. Maximum 0.010 OHM maximum resistance allowed.

TASK 57-28-01-308-001

2. Repair the Inboard Conducting Strip (Fig. 801)
   A. Standard Tools and Equipment
      (1) Meter - Bonding (Ref 20-22-01/601 Electrical Bonding)
      (2) Scraper - Plastic or Hardwood
   B. Consumable Materials
      (1) B00000 Cleaner - Alkaline, Ridolene No. 53
      (2) A00966 Compound - EC-2216 Part A and Part B
      (3) G00000 Paper - Aluminum Oxide, 240-grit or finer

(4) B00148 Solvent - Methyl Ethyl Ketone (MEK), TT-M-261
(5) G00033 Cheesecloth
(6) A00247 Sealant - BMS 5-95
(7) C00064 Coating - Surface treatment, MIL-C-5541 (Alodine 1200 or 1200S)
(8) G00000 Aluminum Sheet - 1100-0 or 5052, 0.020 inch thick

C. References
(1) AMM 23-61-00/201, Static Dischargers

D. Access
(1) Location Zone
539 Winglet, Left
639 Winglet, Right

E. Remove the conducting strip.

S 038-002
(1) Trim the conducting strip near the base of each static discharger found at the ends of the damaged area.

S 018-003
(2) Remove the static dischargers if it is necessary (Ref 23-61-00/201).

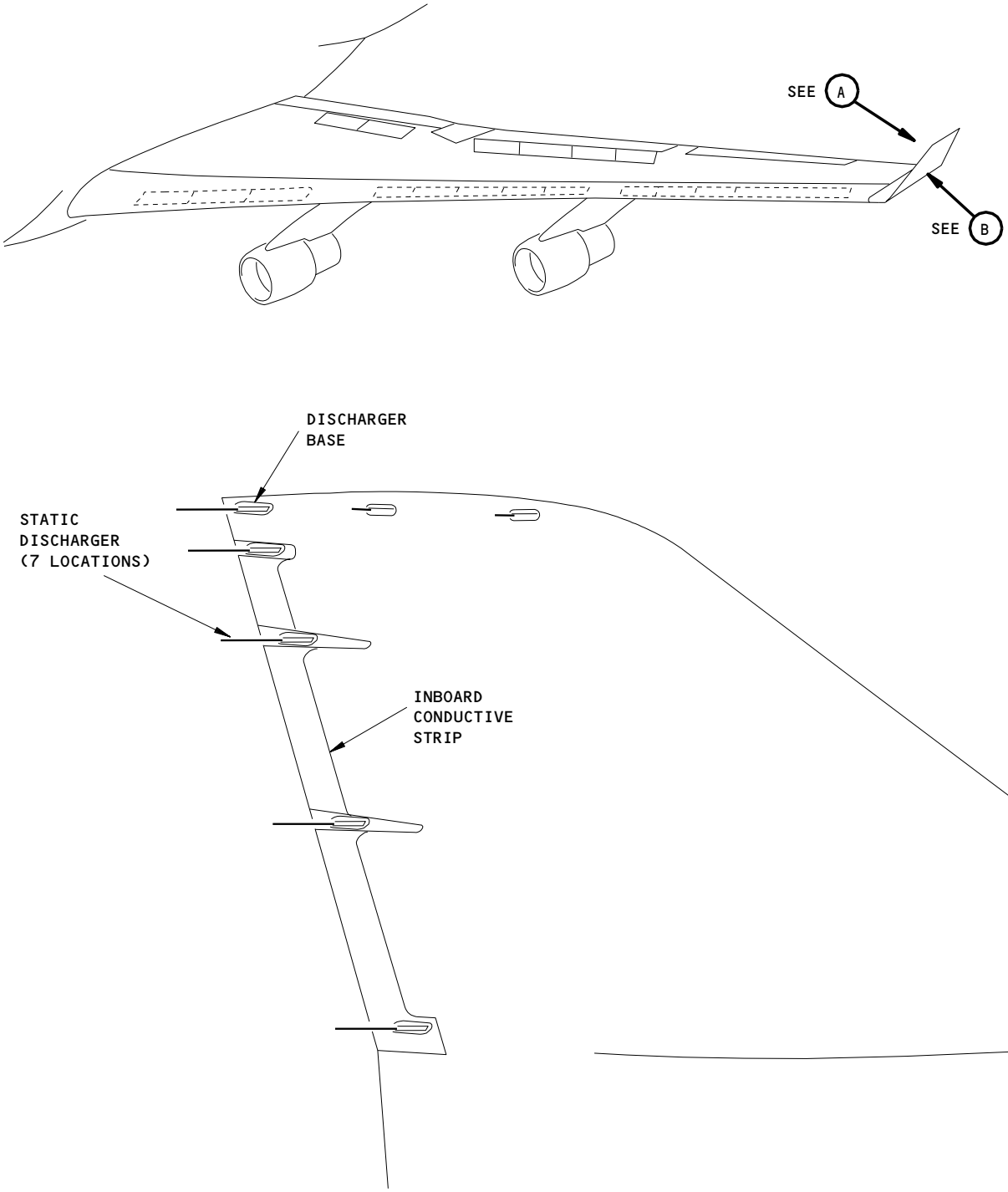
S 358-004
(3) Remove the damaged parts of the conducting strip.
(a) Scrape or peel strip from winglet where possible. Use care to prevent damage to the carbon fiber.
(b) Complete the removal of residue by sanding with aluminum oxide paper.
(c) Remove the strip from the winglet where it is possible.

CAUTION: DO NOT ABRADE THE SURFACE OF THE WINGLET TO THE EXTENT THAT THE CARBON FIBER FILAMENTS ARE EXPOSED OR DAMAGED.

(d) Complete the removal of residue by sanding with aluminum oxide sandpaper.

F. Install the conducting strip.

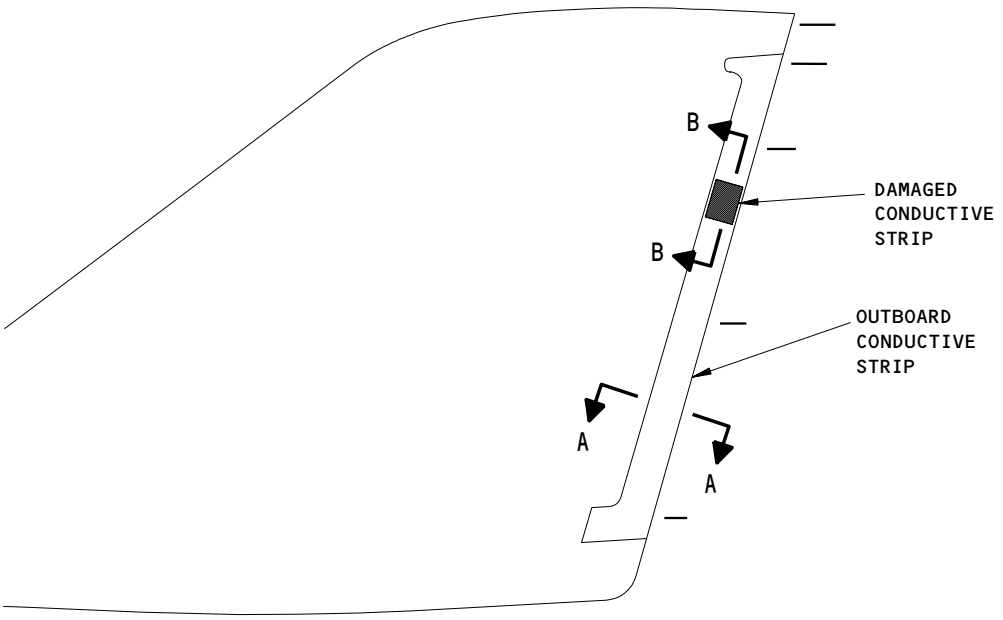
S 358-005
(1) Make the conducting strip.
(a) Use the remaining conducting strip found above the static discharger locations as a template.
(b) Trim to size to overlap the existing conducting strip under the static discharger locations.
(c) Drill holes in the new strip to align with the attach holes in the remaining strips.



INBOARD WINGLET CONDUCTING STRIP
AND STATIC DISCHARGERS (EXAMPLE)

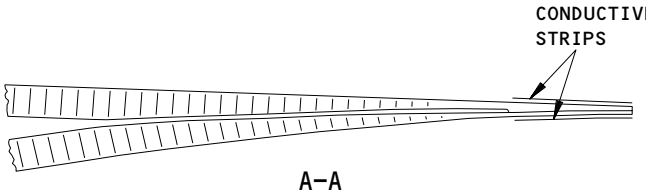
A

Winglet Conducting Strip Repair
Figure 801 (Sheet 1)

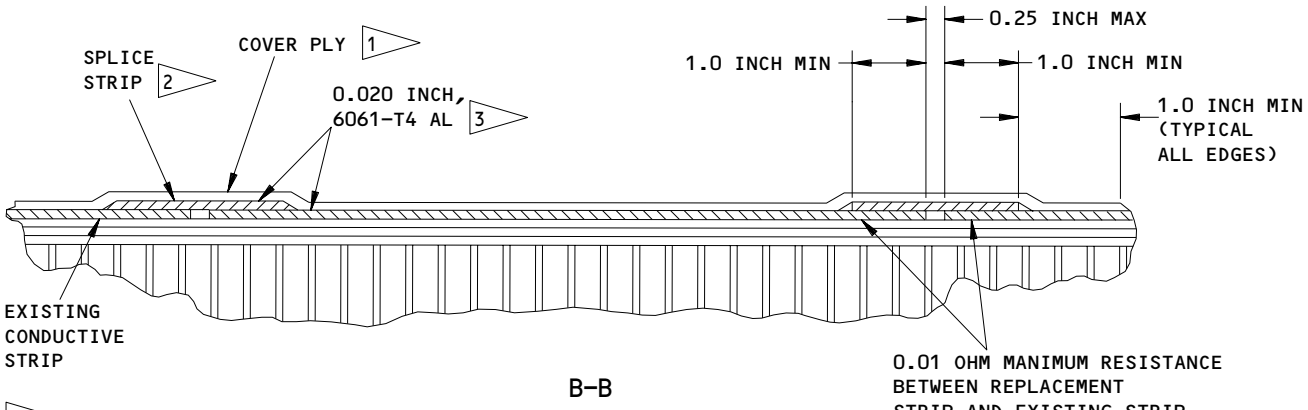


OUTBOARD WINGLET CONDUCTING STRIP

B



A-A



B-B

1 BMS 9-3, STYLE 120 FIBERGLASS OVERLAY PLY.

2 TREAT CONTACTING SURFACES WITH CONVERSION COATING.

3 SPLICE STRIP AND REPLACEMENT STRIP
ARE THE SAME WIDTH AS THE EXISTING STRIP.

Winglet Conducting Strip Repair
Figure 801 (Sheet 2)

S 118-006

(2) Before installation, clean the new conducting strip.
  (a) Remove the grease and apply the recommended alkaline cleaner.
  (b) Soak the conducting strip in the alkaline cleaner for a minimum of 10 minutes.

    NOTE: The temperature of the cleaner must be 160bF to 180bF (71 - 82 degrees C).

    1) Flush the conducting strip with clean water at a temperature of 110 degrees farenheight until the strip is free of water breaks.
  (c) Dry the strip with a lint-free cloth.

    NOTE: The temperature of the water must be a minimum of 110bF.

  (d) For the side that you bond, rub smooth grit sandpaper on that side.
  (e) Wash and rub that side clean.

S 428-007

(3) Bond the conducting strip.
  (a) Prepare the adhesive.

    WARNING: THESE CHEMICALS CONTAIN TOXIC INGREDIENTS. PROVIDE ADEQUATE VENTILATION AND PROTECT THE SKIN AND EYES FROM CONTACT WITH UNCURED RESINS OR THE AGENT. WEAR RUBBER GLOVES OVER COTTON GLOVES FOR PROTECTION OF YOUR HANDS. IF THE SKIN IS EXPOSED TO DIRECT CONTACT WITH UNCURED RESINS OR CURING AGENT, WASH WITH WARM WATER AND SOAP. AVOID USE OF SOLVENTS FOR CLEANING SKIN.

    1) Fully mix 140 parts by weight of EC-2216 Part A with 100 parts by weight of EC-2216 Part B.

      NOTE: The pot life of the mixture is approximately two (2) hours.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

(b) Apply solvent, Series 89 (AMM 20-30-89) to the area where you removed the conducting strip.

CAUTION: THE SOLVENT USED IN THIS PROCESS IS FLAMMABLE AND SHOULD NOT BE USED NEAR FLAME OR SPARKS.

(c) Also clean the areas of the remaining conducting strip above the static discharger.
(d) Use a clean gauze or cheesecloth to absorb the solvent before it dries.

NOTE: To prevent contamination on the surfaces, permit no more than 1 hour span from the time you clean to the time you you bond.

(e) Apply a thin layer of adhesive to the trailing edge of the winglet and to the conducting strip.
(f) Do not apply adhesive to the ends of the strip where it makes an overlap with the remaining strip.

NOTE: New and remaining strips must have full electrical contact at areas that make an overlap.

(g) Remove the unwanted adhesive with a clean gauze or cheesecloth lightly moist with solvent, Series 89 (AMM 20-30-89).

NOTE: Do not permit the solvent to get in the area that you bond.

(h) Apply pressure and dry the bond (SRM 51-70-03).

S 418-008
(4) To complete the static discharger installation, you must obey 23-61-00/201 and the instructions that follow:
(a) Apply sealant if it is necessary to fill the space where the new conducting strip makes an overlap with the remaining strip.

(b) Use the bonding meter to measure the resistance between the discharger base and the conducting strip (AMM 20-22-01/601).
(c) To make sure that there is electrical contact between the strips, measure to the remaining conducting strip and to the new conducting strip.

NOTE: The resistance must be no more than 0.010 ohms.

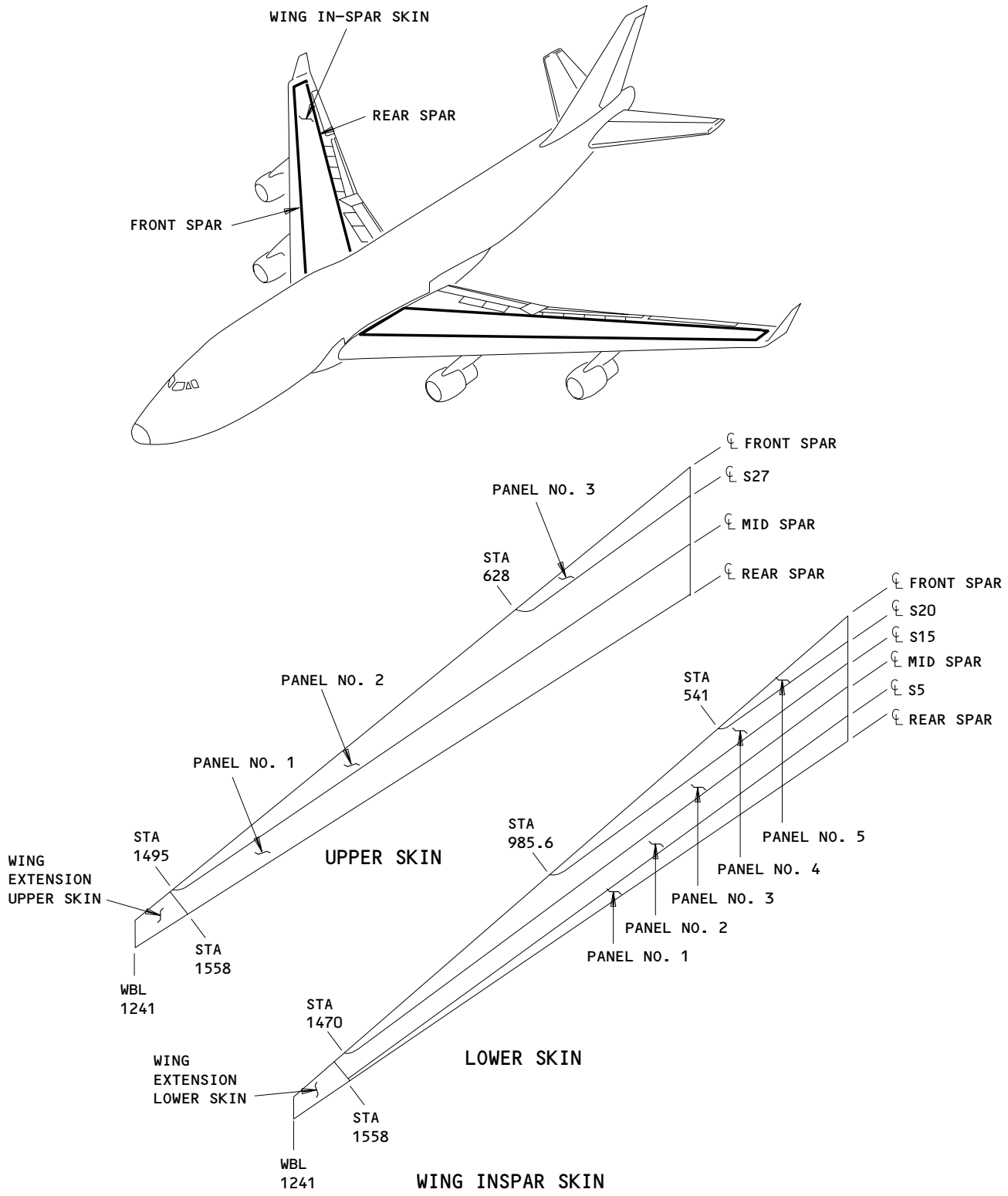
(d) Measure the resistance between the rod and the base of the static dischargers that you installed during this repair (AMM 23-61-00/201).

S 378-020
(5) Apply the conductive strip finish.
(a) Use smooth grit sandpaper to make the open surface of the conducting strip shiny.
(b) Wash and rub the area clean.
(c) Use a brush to apply Alodine 1200S or 1200 to the open surface of the strip.

NOTE: You will apply this last finish if it is necessary.

PLATES/SKIN - DESCRIPTION AND OPERATION

1. General
   A. The exterior surface of the wing is formed by the wing skin, which can be divided into skin of primary and secondary structural importance. The primary wing skin forms the upper and lower external surface of the main frame. The secondary wing skins are those which do not carry primary loads and comprise wing leading and trailing edges, winglet, fairings, and the inspar skins outboard of the rib at wing station 1548.2.
2. Wing Primary Skin (Fig. 1)
   A. The outboard wing main frame beams do not incorporate production breaks between the wing root and the tip, and thus are adapted to the use of continous spanwise skin panels. The panels are preformed to fit the wing contour and are machine sculptured to provide the desired tapered basic thickness with thicker pads around access openings and at panel attachment areas. The skin panels extend chordwise beyond the front and rear spar chords and have machined recesses for leading and trailing edge skin attachments as required. The three upper skin panels are tapered so that the basic thickness increases from the root to the area of inboard nacelle, then reduces from the inboard nacelle to the wingtip. The outboard wing lower primary skin consists of five panels. As with the upper panels, no chordwise splices are used. Spanwise skin panel splices are made at stringers S5, S10 (mid spar), S15, and S20. Inspar structure access doors are provided in the No. 2 panel. The panels taper so that the basic skin thickness increases from the wing root to the area of the outboard track of the inboard trailing edge flaps, and then decreases on the remaining wing span to the wingtip. Spanwise stringers are attached to the inner surface of the skin panels. In the integral fuel tank areas, the skin panels are sealed to contain the fuel.
   B. The wing center section skin consists of three upper and five lower panels which extend spanwise between left and right WBL 128.4, The upper and lower panels are separately identified in numerical sequence from the rear spar forward. The upper panels have spanwise splices at the mid spar and stringers S27C; the lower panels are spliced at stringers S5C, S10C (mid spar), S15C, and S20C. Basic upper and lower skin thickness increases from the front spar to the rear spar.
   C. The panels are preformed to match the rib contours and are machined sculptured to eliminate excess weight while maintaining the required strength. Upper and lower stringers are attached to the inner panel surfaces. The skins are sealed in the wing center section integral fuel tank. Chordwise splice fittings attach the skin panel ends to the wing to body ribs.

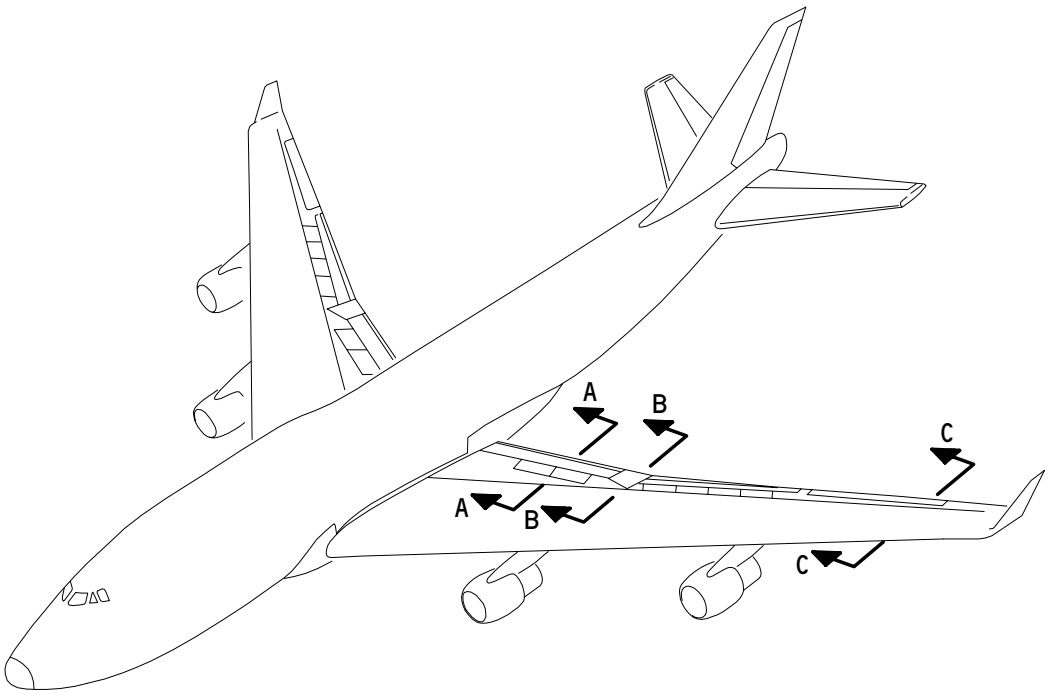


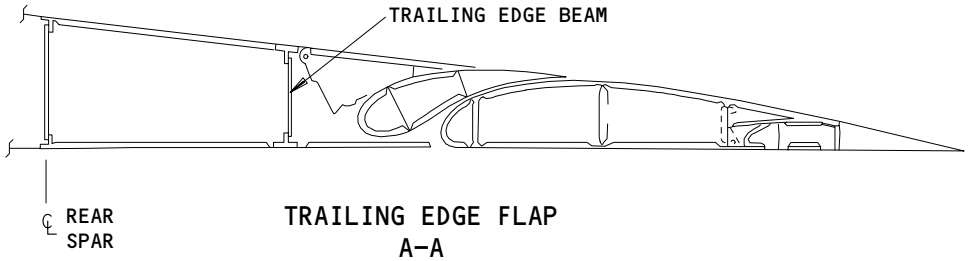
Wing Plates and Skins
Figure 1

3. Wing Secondary Skin (Fig. 2)

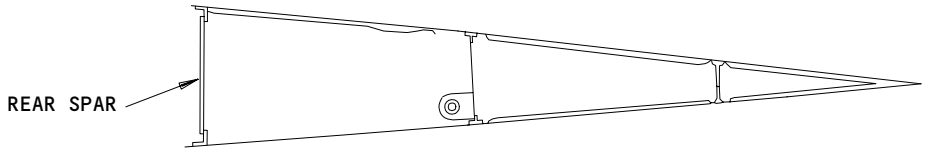
A. The wing leading edge skins consist of a series of fiberglass panels and aluminum skins, spliced both chordwise and spanwise. The forward portion is formed from aluminum alloy sheet to eliminate erosion by moisture particles and high velocity air impingement. Fiberglass honeycomb panels are attached to the nose sections and, except for cutouts for the leading edge flaps, form the major portion of the leading edge skin. The honeycomb panels are attached at the aft edge to the front spar chords. On the upper surface, laminated plastic glass panels or strips are used to effect the attachment. The Krueger flap skins are fabricated from 7075 clad aluminum sheet, except that the nose section skins are of 2024 clad aluminum sheet. The skins are attached to spanwise beams and chordwise ribs. To provide the flexibility required for the variable camber flaps, the skin is made of plastic glass honeycomb and fabric materials. The skins are attached to spanwise structural members and nose ribs. Maintenance access is accomplished through removable doors and fairings and through the flap wells.

B. The fixed trailing edge upper and lower skins inboard of wing station 1548.2 consist almost entirely of fiberglass honeycomb sandwich panels attached to spanwise and chordwise structural members. One exception is the lower surface aft of the outboard nacelle, which is of laminated fiberglass construction. The aft 10 inches on the under side of the inboard upper trailing edge fixed structure between the inboard spoiler and the fuselage is coated with an abrasion resistant teflon finish. This area is susceptible to chafing during operation of the inboard flaps (Ref 51-24-00). The inboard and outboard flap segment skins consist of fiberglass honeycomb panels forming the leading and trailing edge areas of each segment with aluminum honeycomb sandwich panels forming the upper and lower skins. With the exception of an upper forward aluminum sheet panel, the exterior of both ailerons consists of fiberglass honeycomb panels fastened to internal ribs and spars. The wing landing gear doors, located on the lower surface of the inboard wing, are aluminum bonded honeycomb material, and form a part of the trailing edge skin when closed. The flight and ground spoilers have aluminum honeycomb cores with bonded clad aluminum skins. Between wing sta. 1548.2 and WBL 1169, the inspar skin consists of upper and lower aluminum honeycomb panels supported by the wing spars and rib chords. Winglet fairings are made up of a leading edge fairing of formed aluminum, and three sandwich fairings attached to the wing and winglet skins. Access doors and flight control surface wells permit access to internal trailing edge structure and airplane systems components.

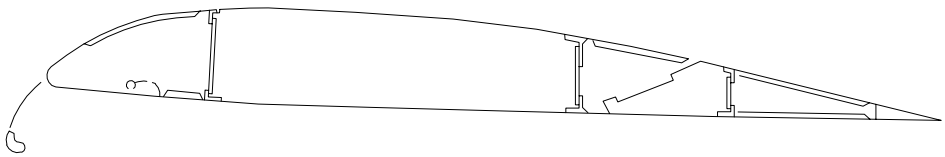




TRAILING EDGE FLAP
A-A



INBOARD AILERON
B-B

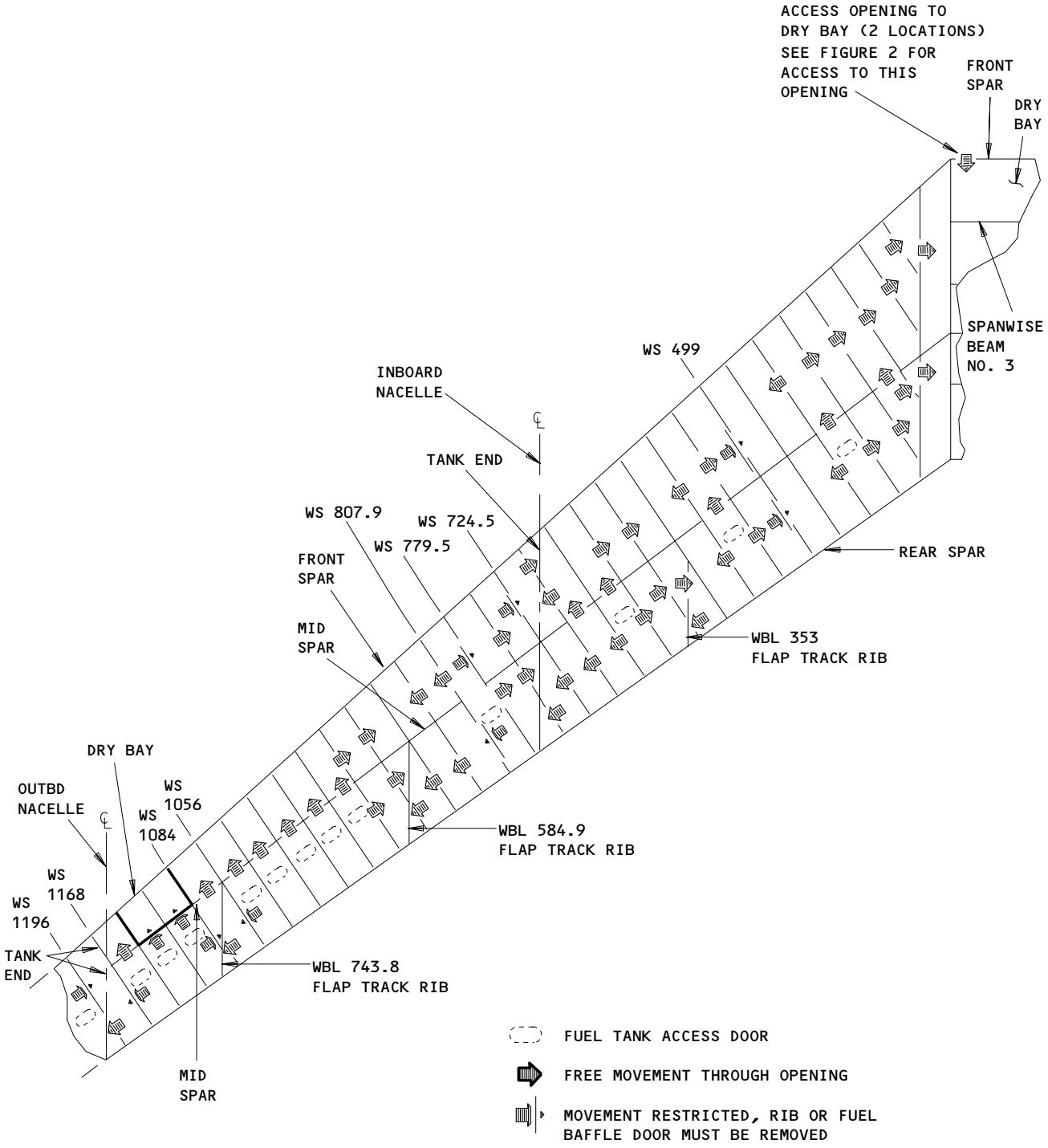


VARIABLE CAMBER FLAP AND OUTBOARD AILERON
C-C

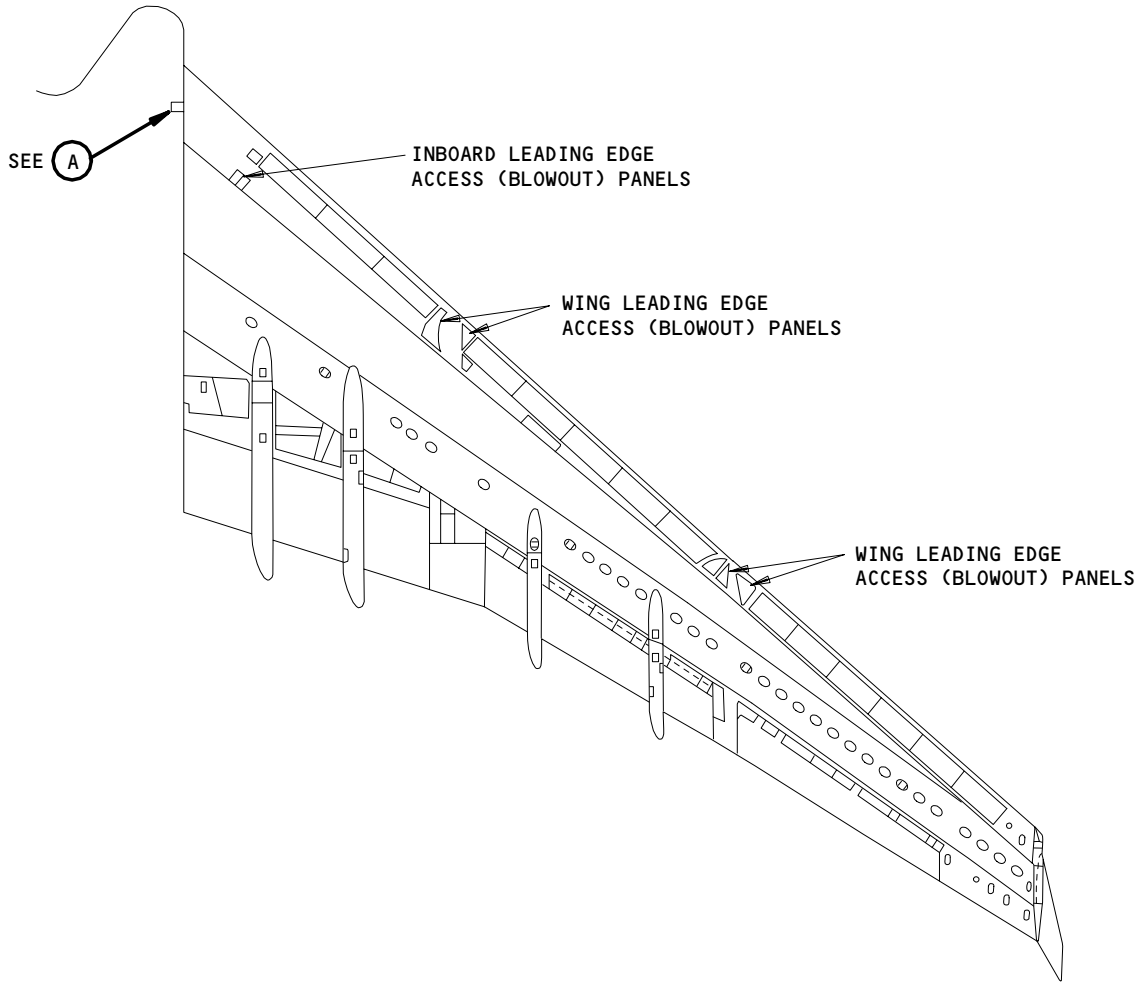
Wing Secondary Skin
Figure 2

ACCESS DOORS (OPENINGS) - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. Access doors and panels are provided in the wing interior and exterior structure to facilitate inspection, maintenance, and repair of airplane systems equipment components, wing internal structure, and integral fuel tank areas (Ref AMM 12-21-04/301 for numerical listings and locations of external doors and openings).
2. Fuel Tank Access Doors (Fig. 1)
   A. Access to the main wing fuel tanks, reserve fuel tanks, and the vent surge tank is accomplished through removable sealed nonstructural access doors located in the wing lower inspar skin (Ref 28-11-00).
   B. The wing center section fuel tank access doors are located in the lower outboard corners of the center section front spar (Ref 28-11-00).
3. Internal Access Openings (Fig. 2)
   A. Access to the wing inspar areas without a fuel tank access door is possible through openings provided in the web of the mid spar and many of the webs of the ribs. Movement to certain areas is restricted by fuel baffle doors and inspar removable ribs which must be removed to gain entrance to areas beyond. There are openings in the web of the mid spar of each wing which permit movement into all the bays between the mid spar and the front spar. Except in the wing extension, there are openings in the web of the ribs permitting movement between ribs and partial depth rib openings permitting maintenance and inspection of the confined areas created by the diagonal ribs. Reinforcement of the structure surrounding each opening provides load carrying capabilities around the cutouts. At WS 1056, 1084, 1168, and 1196, the inspar removable ribs must be removed to gain entrance to the area behind (Ref 57-12-00). At WS 499.0, WS 724.5, WS 779.5 and WS 807.9, fuel baffle doors must be removed to permit further movement (Ref 2 -11-00).
4. External Access Doors and Panels (Fig. 2)
   A. Hinged access doors are installed in the lower side of the wing leading edge just outboard of the inboard nacelle to permit access to the fueling receptacles. On the left wing immediately outboard of the fuel station door is a hinged door for access to the fueling station control panel (Ref 28-11-00).
   B. Additional access to the leading and trailing edge area is obtained by extending the flaps and raising the spoilers.
   C. The wing-to-fuselage fillet fairing is removed per 53-51-01 to gain access to the wing center section front spar access openings.
   D. Wing leading edge lower skin access (blowout) panels are located on the lower surface of the wing near each nacelle strut side fairing. The eight triangular shaped panels, when removed, permit access to the wing leading edge and nacelle strut areas. A panel within each access panel is designed to blow out if there should be a pressure buildup within the wing cavity.

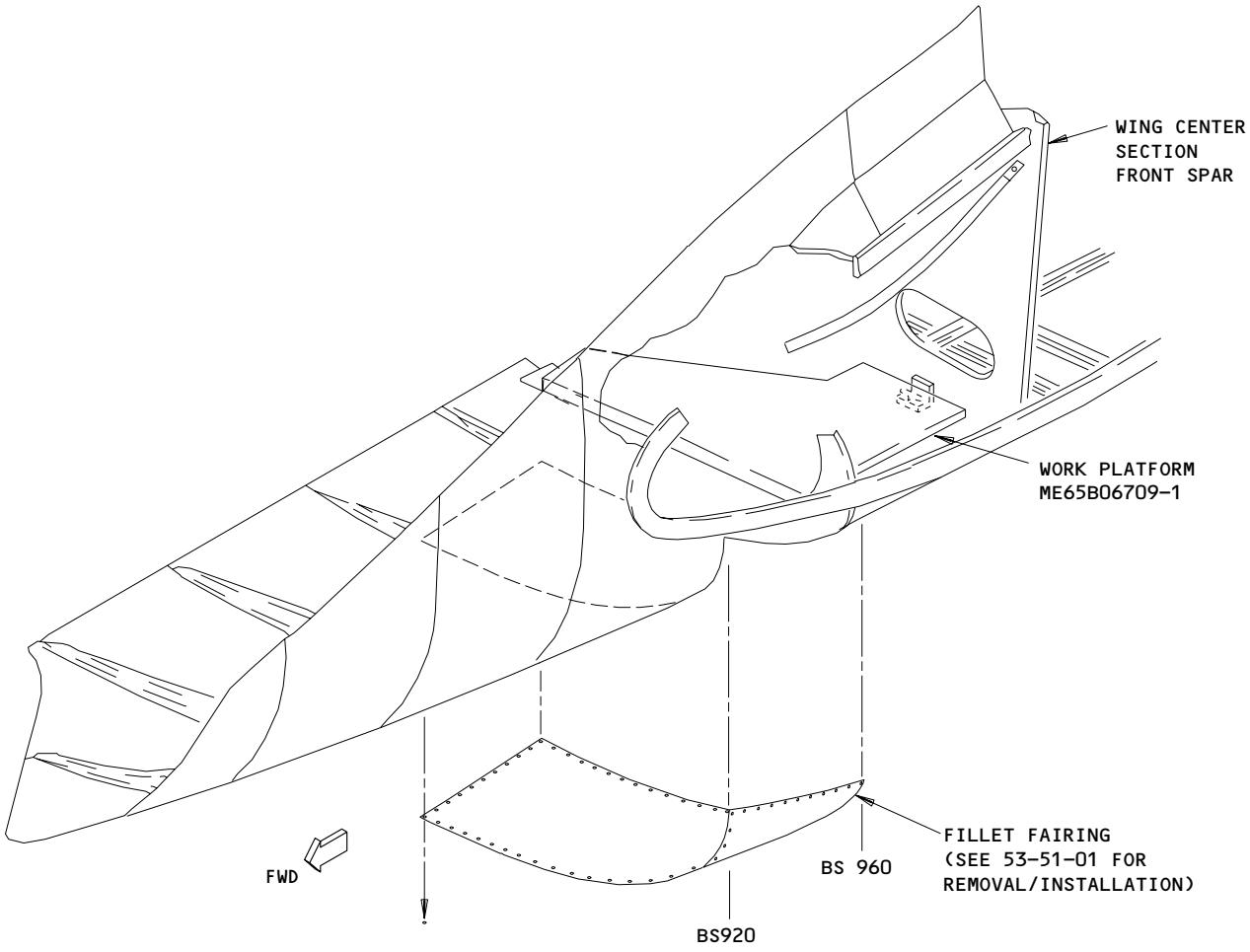


Internal Access Openings
Figure 1



BOTTOM VIEW OF LEFT WING

External Access Doors and Panels
Figure 2 (Sheet 1)



ACCESS TO WING CENTER SECTION FRONT SPAR

(A)

External Access Doors and Panels
Figure 2 (Sheet 2)

E. A pressure relief panel is located on the inboard leading edge of the wing lower surface. If there should be a pressure buildup within the wing cavity, a replaceable panel within the panel is designed to blow out and thus relieve the pressure. Access to flap mechanism is provided by removing the pressure relief panel.

WING LEADING EDGE ACCESS (BLOWOUT) PANEL - REMOVAL/INSTALLATION

1. General
   A. This procedure contains two tasks:
      (1) The first task is the removal of the blowout panel from the wing leading edge.
      (2) The second task is the installation of the blowout panel into the wing leading edge.
      (3) Remove the blowout panel as follows:
      - Loosen the screws on the outboard side of the panel
      - Remove the screws on the inboard side of the panel
      - Remove the panel out of the wing.
      (4) Install the blowout panel as follows:
      - Clean and remove the remaining sealant
      - Install the panel
      - Tighten the bolts
      - Seal the space between the skin panels
   B. The blowout panels are part of the panel assemblies of the wing leading edge. You will find these panels in the wing leading edge. Directly adjacent to each side of nacelle strut, you will find one panel (total 4). The aft edge of each blowout panel is held together directly between the adjacent honeycomb panel and panel stiffener. At the forward edge of each blowout panel there are bolts installed through the blowout panel and the panel edge plate.

TASK 57-31-02-004-001

2. Panel Removal (Fig. 401)
   A. Access
      (1) Location Zone
      511 Leading Edge to Front Spar, Left
      611 Leading Edge to Front Spar, Right

   B. Procedure

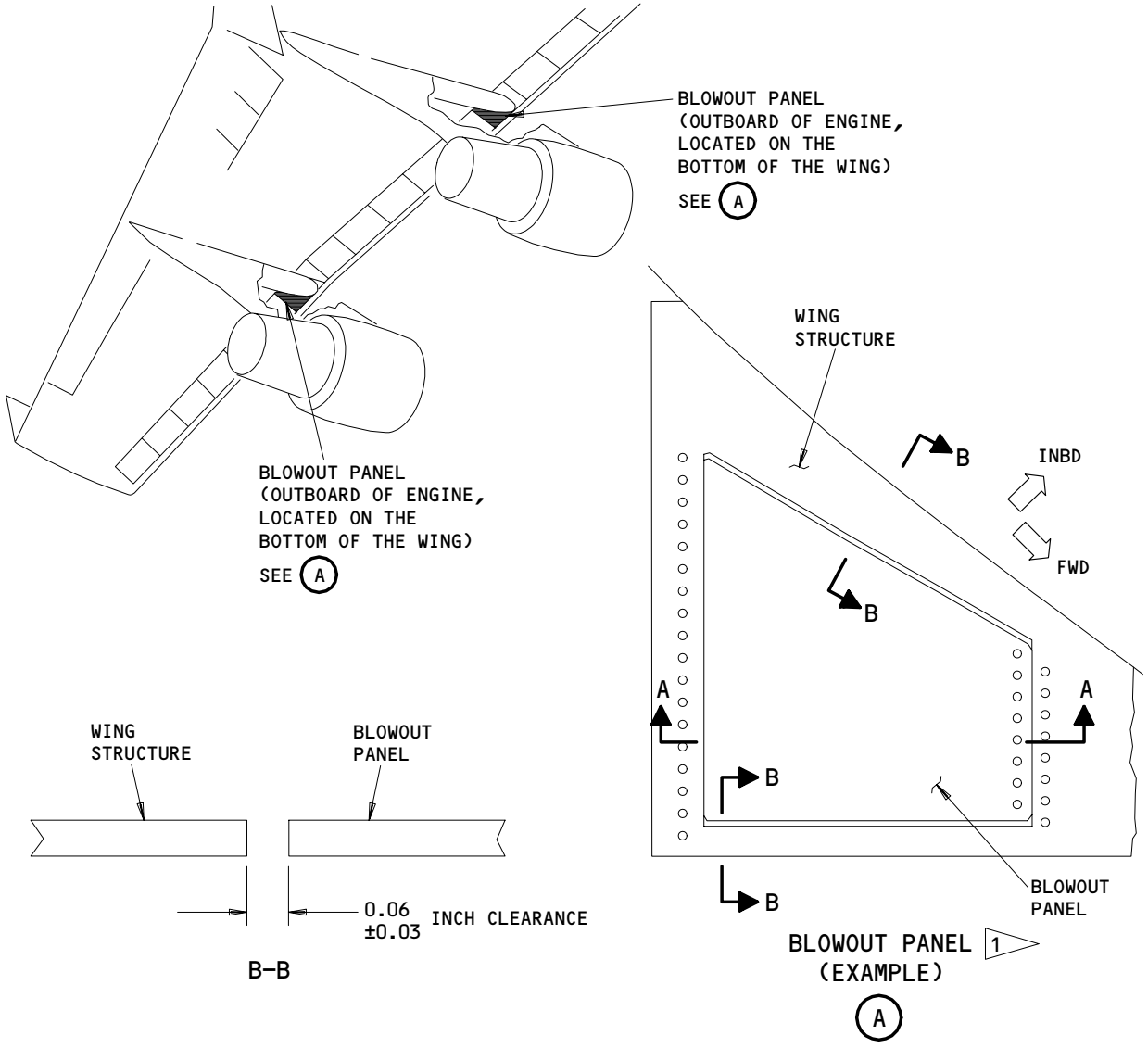
      S 024-002
      (1) Remove the panel.
      (a) Turn the screws many times to loosen the bolts directly outboard of the blowout panel along the longer edge.

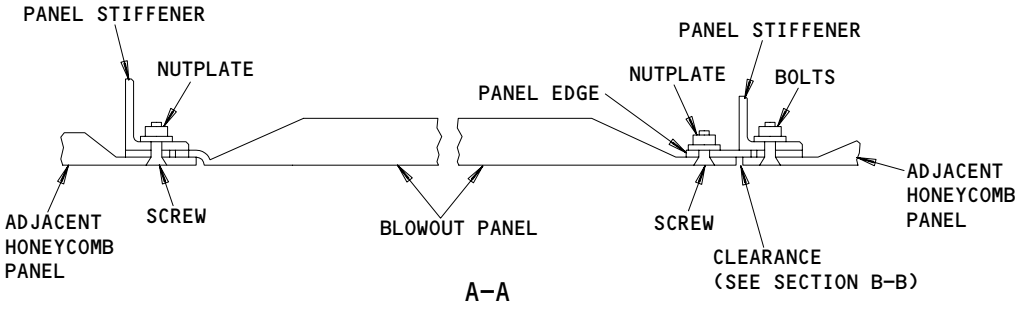
      NOTE: Do not remove these screws.

      (b) To remove the blowout panel, remove the bolts directly inboard of the blowout panel along the shorter edge.

TASK 57-31-02-404-003

3. Panel Installation (Fig. 401)
   A. Consumable Materials
      (1) B00184 Solvent - Presealing Cleaning, BMS 11-7
      (2) A00099 Sealant - Silicone, RTV 154





1 LEFT WING SHOWN, RIGHT WING OPPOSITE

Wing Leading Edge Access (Blowout) Panel Installation
Figure 401

(3) BOO624 Compound - Lubricant BMS 3-28

B. References

(1) AMM 20-51-01/201, Standard Torque Values

C. Access

(1) Location Zone

511 Leading Edge to Front Spar, Left
611 Leading Edge to Front Spar, Right

D. Procedure

S 424-004

(1) Install the panel.

(a) If you use the same blowout panel, remove the silicone sealant from the lower surface of the panel edge.

(b) To install a new panel edge, you must loosen and remove the screws directly forward and aft of the blowout panel on the shorter side of the panel.

(c) Put the aft and forward panel edge panel into their positions between the adjacent honeycomb panel and the panel stiffener.

(d) Make sure that you put the blowout panel in the center of the opening before you install the screws.

(e) Apply BMS3-28 lubricant to the fasteners prior to installation (AMM 20-51-01/201).

NOTE: The BMS 3-28 will prevent corrosion on the threads of the fasteners and make them easier to remove.

(f) Install the screws through the blowout panel along the forward edge of the blowout panel.

(g) Make sure that the space between the inboard and outboard edges of the blowout panel and the adjacent honeycomb panels is 0.06 +/-0.03 inch.

(h) Tighten the bolts directly forward and aft of the blowout panel.

S 344-005

(2) Seal the panel joints.

(a) Clean the space at the forward edge of the blowout panel. Use a clean bristle brush applied with the approved solvent.

(b) Remove the unwanted solvent with filtered air that has no oil or water in it from an air hose.

(c) For the last step to clean, lightly apply solvent with a cloth.

(d) Rub to make the area dry.

(e) Apply sealant to the area between the blowout panel and the honeycomb panel.

WING LEADING EDGE INBOARD PRESSURE RELIEF PANEL - REMOVAL/INSTALLATION

1. General
   A. This section contains two tasks:
      (1) The first task is the removal of the pressure relief panel from the wing leading edge.
      (2) The second task is the installation of the pressure relief panel to the wing leading edge.
   B. The removal of the panel is as follows:
      - Loosen the screws aft of the panel.
      - Remove the screws forward of the panel.
      - Remove the panel out of the wing.
   C. Installation of the panel is as follows:
      - Clean off the remaining sealant.
      - Install the panel.
      - Tighten the screws.
      - Apply the sealant to the spaces between the skin and the panel.
   D. The inboard access (pressure relief) panels are assemblies of the wing leading edge. The panels are installed inboard of the Krueger flaps, on the bottom of the wing.
   E. The forward and aft edges of the retaining plate hold the pressure relief panel in its position.

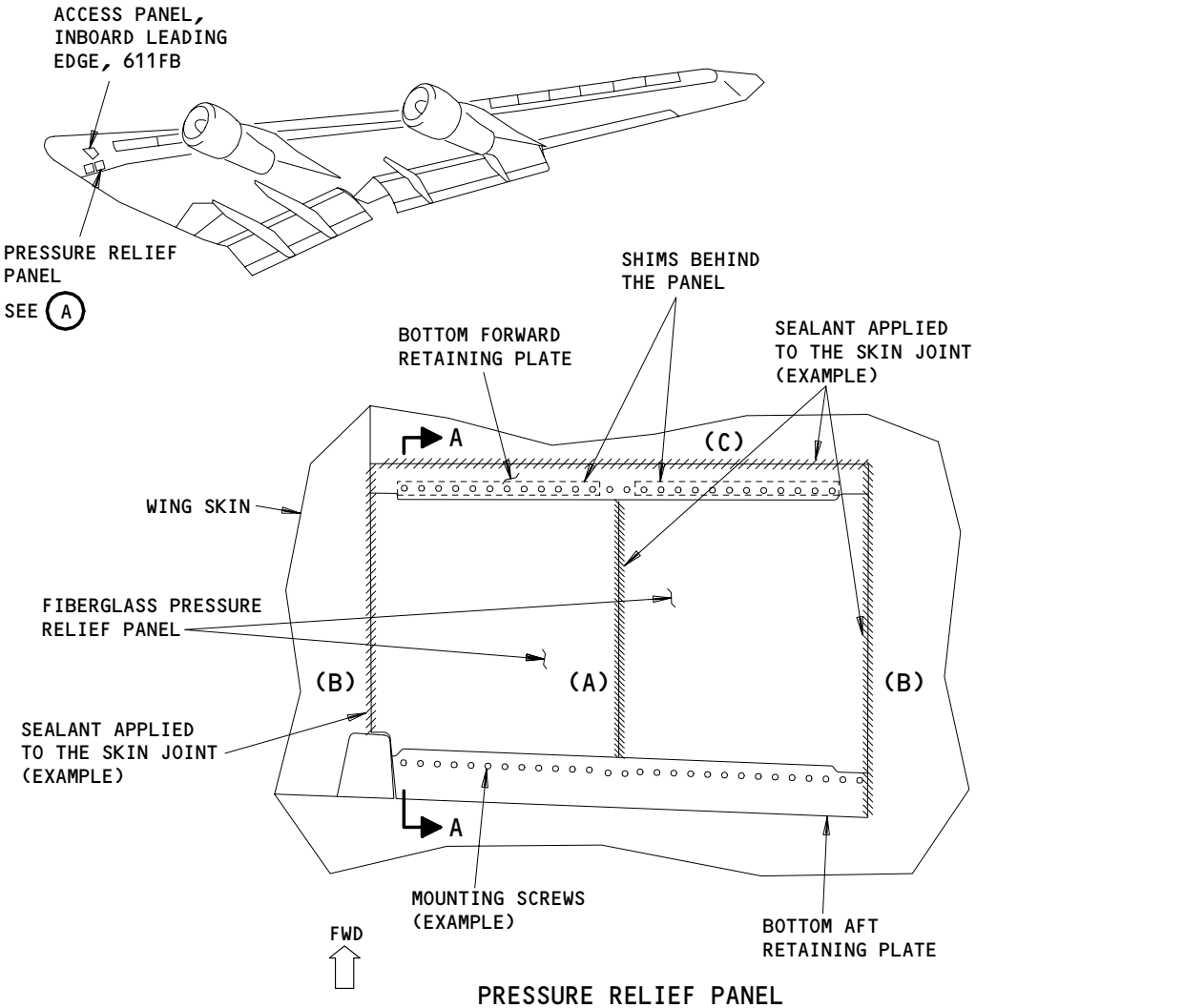
TASK 57-31-03-004-001

2. Panel Removal (Fig. 401)
   A. Access
      (1) Location Zone
          511 Leading Edge to Front Spar, Left
          611 Leading Edge to Front Spar, Right

   B. Procedure

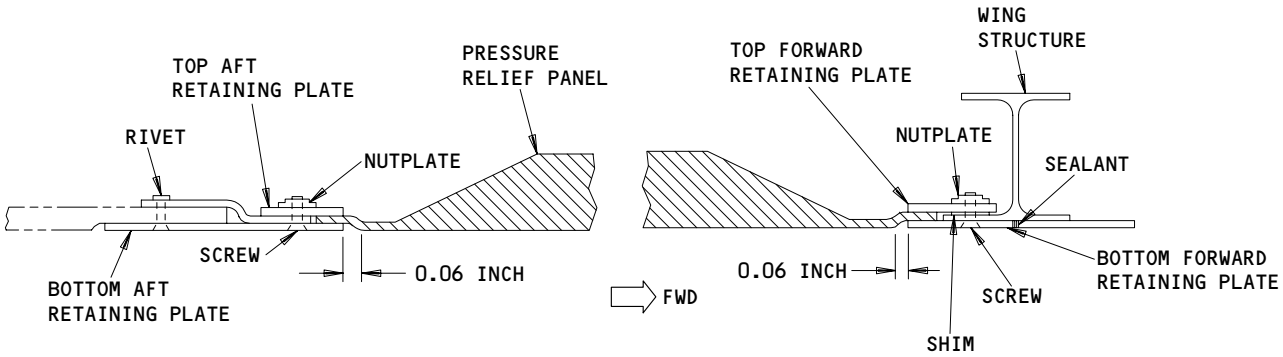
      S 024-002
      (1) Remove the panel
          (a) Loosen the screws that hold the two aft retaining plates and the pressure relief panel together, but do not remove the screws.
          (b) Remove the screws that hold the pressure relief panel and the two forward retaining plates together.

              NOTE: The screw removal from the forward retaining plates will cause the top retaining plate and the 2 shims to move down into the wing. Be careful when you remove the panel because the shims and the top retaining plate may fall down.



PRESSURE RELIEF PANEL

A



(ROTATED 90° CW)
A-A

Wing Leading Edge Pressure Relief Panel Installation
Figure 401

283092

(c) Remove the forward retaining plate at the bottom.
(d) Pull the forward edge of the panel down and away from the wing skin.
(e) Move the panel forward to release the aft edge of the panel from the aft retaining plates.
(f) Remove and keep the forward retaining plate at the top and the shims you removed from the inner part of the wing.

TASK 57-31-03-404-003

3. Panel Installation

A. Consumable Materials
(1) B00184 Solvent - Presealing Cleaning, BMS 11-7
(2) B00624 Compound - Lubricant BMS 3-28
(3) A00099 Sealant - Silicone, RTV154

B. References
(1) AMM 06-09-08/201, Wing Access Doors and Panels
(2) AMM 20-51-01/201, Standard Torque Values

C. Access
(1) Location Zone
511 Leading Edge to Front Spar, Left
611 Leading Edge to Front Spar, Right

D. Procedure

S 424-004
(1) Install the Panel

NOTE: To install the two shims and the top retaining plate, you will have to get access through access panel 611 FB. This installation will require 2 people. One person will install the screws, and the other person will hold the shims and top retaining plate in position.

(a) Before you install the panel, remove the remaining sealant from the wing structure and the panel.
(b) Make sure that you loosen the screws from the aft retaining plate.
(c) Put the aft end of the panel into the space between the aft retaining plates at the top and bottom.

(d) Open access panel 611 FB.

CAUTION: DO NOT USE TAPE OR ADHESIVES TO KEEP THE PRESSURE RELIEF PANEL OR RETAINING PLATES IN ITS POSITION. TAPE OR ADHESIVES CAN CAUSE THE PANEL NOT TO OPERATE AND CAUSE DAMAGE TO THE AIRPLANE.

(e) Hold the panel and the forward retaining plate at the bottom in their position.
(f) From the inner part of the wing, align the 2 shims and the top retaining plate with the bottom retaining plate.
(g) Apply BMS3-28 lubricant to the fasteners prior to installation (AMM 20-51-01/201).

NOTE: The BMS 3-28 will prevent corrosion on the threads of the fasteners and make them easier to remove.

(h) First put in only two screws at the ends of the retaining plate to align the shims together with the retaining plates.

NOTE: This will prevent movement of the shims and the retaining plates.

(i) Make sure that you install the panel in the center of the cutout in the wing.
(j) Adjust the position of the panel to permit an equal space around the forward and aft edges of the panel (Fig 401, View A-A).
(k) Install the remaining screws.
(l) Keep the screws sufficiently loose to permit panel adjustment.
(m) Tighten all of the screws.
(n) Close access panel 611 FB.

S 394-005
(2) Seal the panel.
(a) Use the recommended solvent to clean the areas that follow (See Fig 401):
1) The space between the 2 panels (See side (A)).
2) The space between the panel and the skin (See sides (B)).
3) The space between the skin and the forward retaining plate at the bottom (See side (C)).
(b) Dry the areas that you cleaned with compressed air.

NOTE: The air must be clean and dry.

(c) For the last step, rub the area with a clean cloth, moist with solvent.
(d) Use a clean cloth to dry the area.

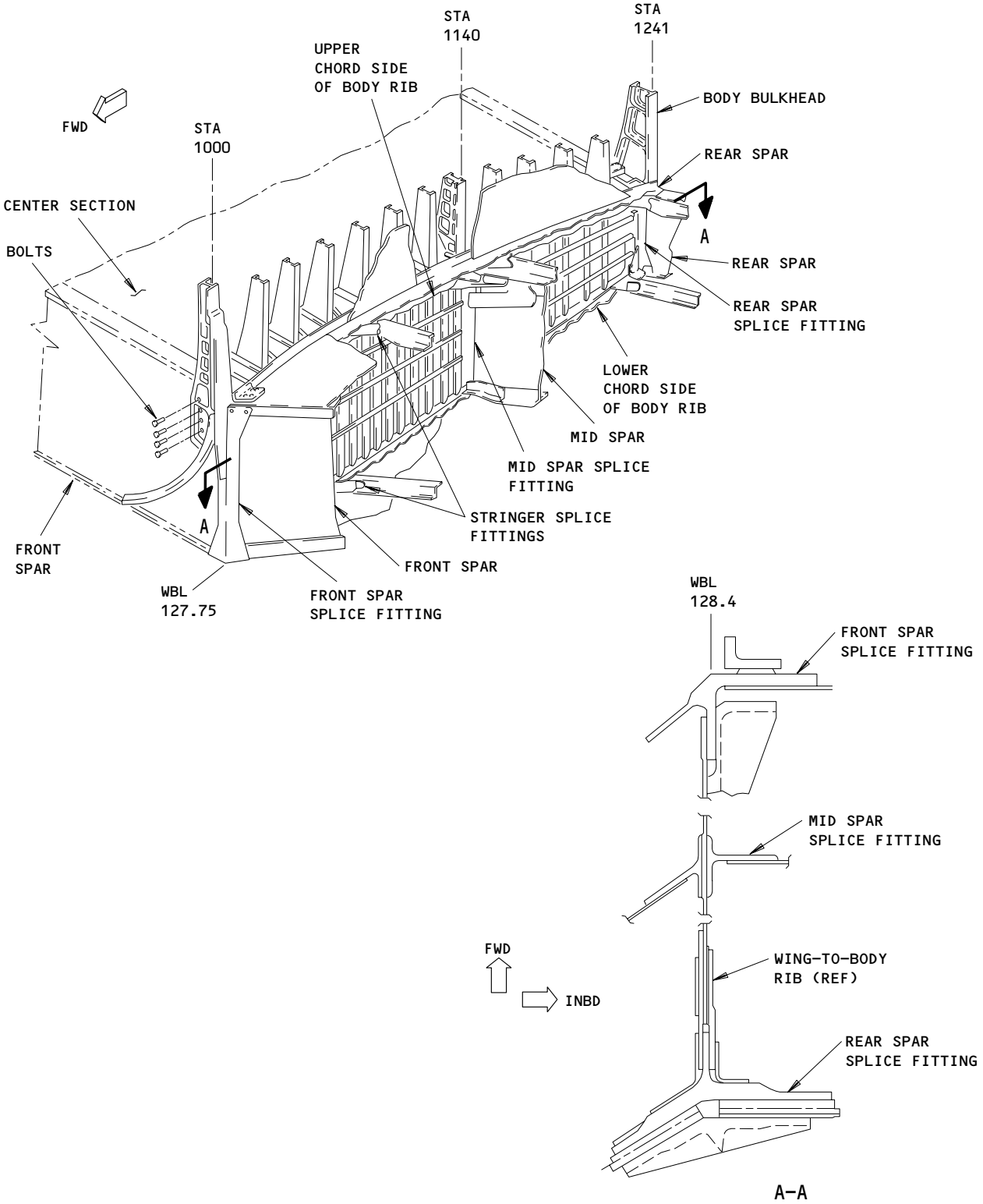
(e) Apply sealant between the spaces in the skin (Sides (A), (B) (C) and the aft edge of the retaining plate.)

ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. Attach fittings fasten major components to main wing structure, splice main wing structural components to each other, and attach the wing to the fuselage.
2. Wing Attach/Splice Fittings
   A. Wing splice fittings are made from aluminum forgings and are used to join the outboard wing spars to the center wing spar and wing-to-body ribs and wing extension join rib (Ref 57-41-00).
3. Flight Control Attach Fittings
   A. Flight control attach fittings are used to attach flaps, ailerons, spoilers, and actuation mechanisms to the wing (Ref 57-42-00).
4. Landing Gear Attach Fittings
   A. Landing gear attach fittings anchor the wing landing gear to the wing. The fittings which attach the wing landing gear doors to the wing are part of the landing gear attach fittings (Ref 57-43-00).
5. Nacelle Strut Attach Fittings
   A. Inboard and outboard nacelle strut attach fittings support the engine and transmit the thrust developed by the engine into the wing.

WING ATTACH/SPLICE FITTINGS - DESCRIPTION AND OPERATION

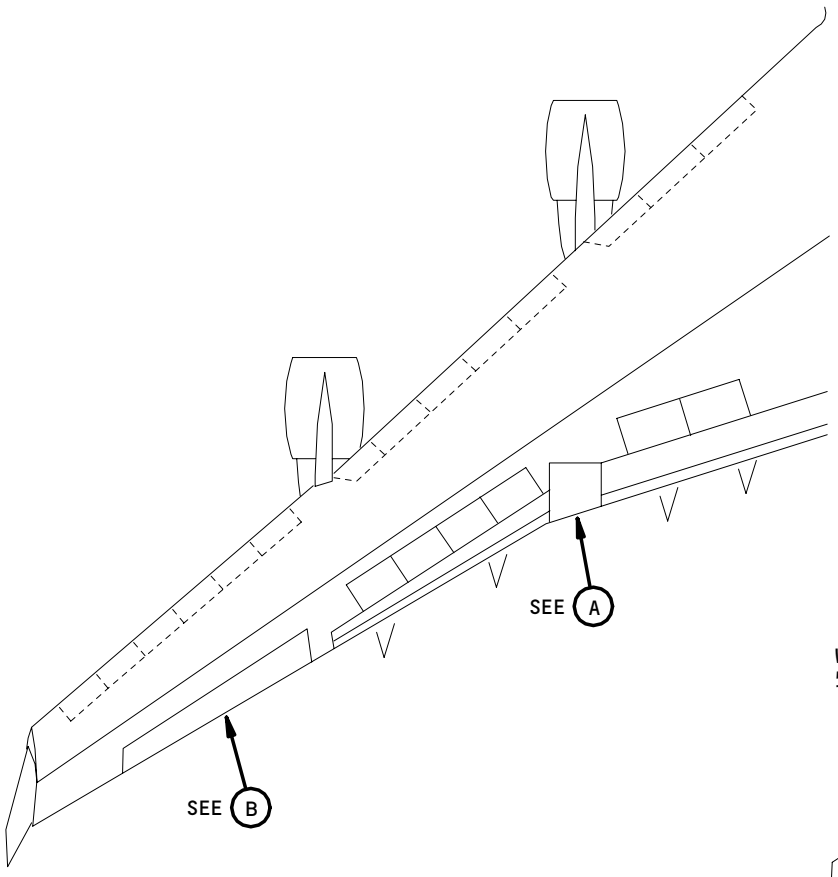
1. General (Fig. 1)
   A. The wing splice fittings are fabricated from aluminum alloy and serve to join the outboard wing main frame to the center wing frame thus forming an integral, continuous wing box section. The primary splice fittings attach the respective front and rear spars of the outboard wing to those in the wing center section at the wing-to-body ribs. Splice fittings join the mid spars of the outboard and wing center section at the wing-to-body ribs. Additional splice fittings join the stringers of wing center section to the outboard wing.
2. Front Spar Splice Fittings
   A. The front spar splice fittings are vertically mounted, modified tee section fittings machined from forged aluminum alloy material. The fittings join the outboard front spar chords and webs with the wing center section front spar chords and webs and to the left and right wing-to-body ribs at WBL 127.75 to provide a continuous load path design. Machined pads or bosses provide additional strength at fastener hole locations and facilitate fit of mating structure. The fittings are shot peened after machining to reduce the possibility of stress corrosion. The front spar fittings form a part of the wing-to-fuselage attachment at the body station 1000 bulkhead.
3. Rear Spar Splice Fittings
   A. The rear spar splice fittings have similar structural applications as the front spar fittings in that they are flanged type, vertically mounted members joining the rear spar chords and webs of the outboard wing and center sections to the wing-to-body ribs. Machined from aluminum alloy forgings, the fittings are of a modified tee section, and of a different configuration than the front spar fittings. The fittings are shot peened and form a portion of the wing-to-fuselage bulkhead attachment at body station 1241.0.
4. Mid Spar Splice Fittings
   A. The outboard wing mid spar chords and webs are joined to like parts of the wing center section at the wing-to-body ribs, WBL 127.75. The fittings, fabricated from 7075 aluminum alloy, are tee shaped extrusions installed in the vertical position. The splice fittings are an integral part of the mid spar-fuselage bulkhead, station 1140, attachment.
5. Stringer Splice Fittings
   A. Upper and lower stringers in the wing center section is spliced through the wing-to-body rib to stringers in the outboard wing at WBL 127.75. Splicing is accomplished with fittings from machined forgings or extrusions. All fittings are of aluminum alloy.

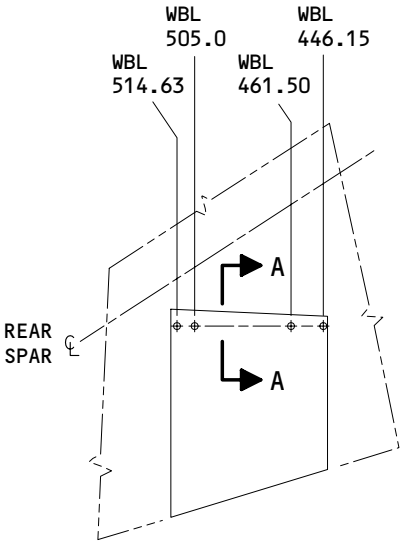


Wing Attach/Splice Fittings
Figure 1

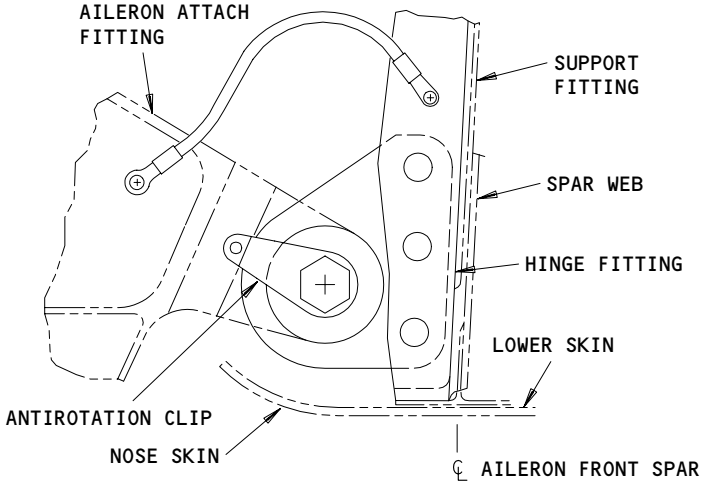
FLIGHT CONTROL ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. Attach fittings are provided to anchor flight control surfaces to the wing structure. Fittings attach the aileron to special hinge ribs, the trailing edge flaps to the lower wing skin and associated structure, the Krueger and variable camber flaps to leading edge ribs, the inboard spoilers to the trailing edge support beam, and the outboard spoilers to the wing rear spar.
2. Aileron Attach Fittings (Fig. 1)
   A. The inboard ailerons are primarily supported by two wing trailing edge hinge ribs at WBL 461.5 and 505.0. Hinge support clevis fittings attach to the ribs and mate with aileron hinge fittings. The support fittings are fabricated from aluminum alloy forged material. Two fail-safe hinge fittings, installed on trailing edge ribs at WBL 446.16 and 514.63, also attach to aileron hinge fittings to provide additional support. Actuation mechanism and reaction linkages attach to wing rear spar fittings and to aileron front spar fittings.
   B. Each outboard aileron is supported by six hinge support fittings attached to wing trailing edge rib structure at wing stations 1252.0, 1308.0, 1364.0, 1423.0, 1485.0, and 1548.2. These fittings are similar, with waffle type design, and are machined from aluminum forgings. Hinge fittings on the aileron front spar are bolted to the wing support fittings. The aileron actuator and reaction linkages attach to wing rear spar fittings and to aileron front spar fittings.
3. Flap Attachment Fittings (Fig. 2)
   A. The inboard trailing edge flaps are mounted on flap tracks at WBL 235.2 and 353.0 by means of carriage assemblies which attach to the midflap primary structure. The flap tracks are double-web I-section beams machined from 4340 steel forgings. The tracks are installed beneath the lower surface of the wing skin and are cantilevered aft from the wing inspar structure. The inboard track is also supported by the landing gear support beam. The carriages are fabricated from steel forgings which structurally support the flaps. Through attach rollers, the carriages provide flap transition and transmit flap loads into the flap tracks. The flaps are extended and retracted by means of actuating mechanisms mounted on the wing trailing edge beam and attached to the midflap structure at WBL 246.3 and 340.7.
   B. Support and attach fittings for the outboard trailing edge flaps are similar to the inboard flaps. Forged steel flap tracks are attached to the lower exterior surface of the wing at WBL 584.98 and 743.83. Actuating mechanisms are supported by the wing rear spar and attached to the midflap structure.





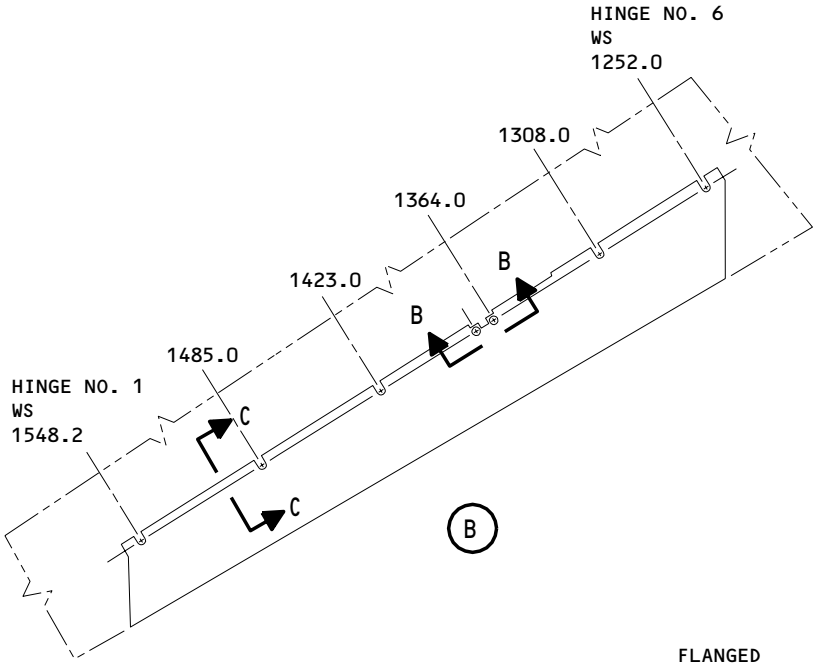
INBOARD AILERON
A

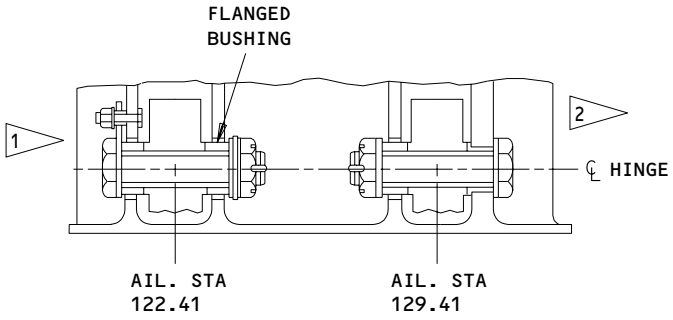


HINGE WBL 461.50
A-A

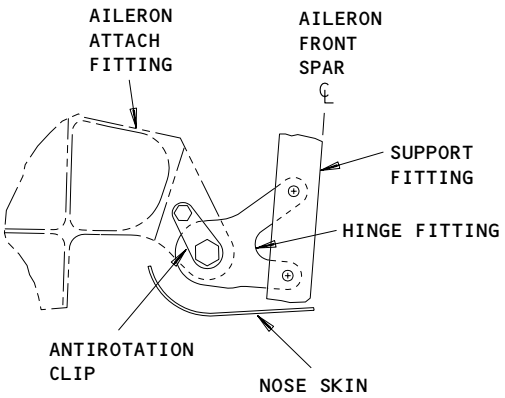
Aileron Attach Points
Figure 1 (Sheet 1)

278401

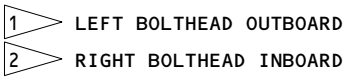




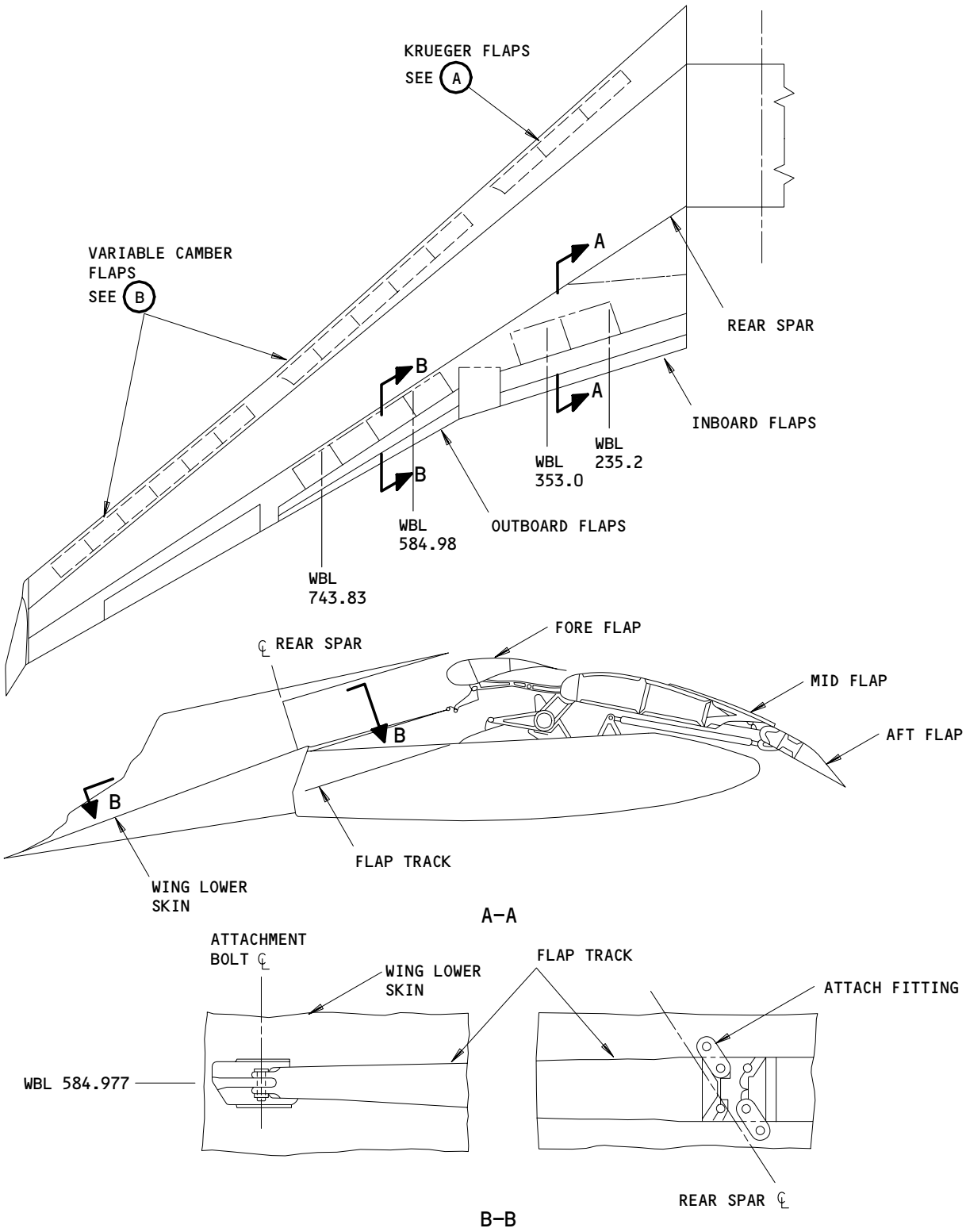
HINGE NO. 4 LEFT AILERON SHOWN
B-B



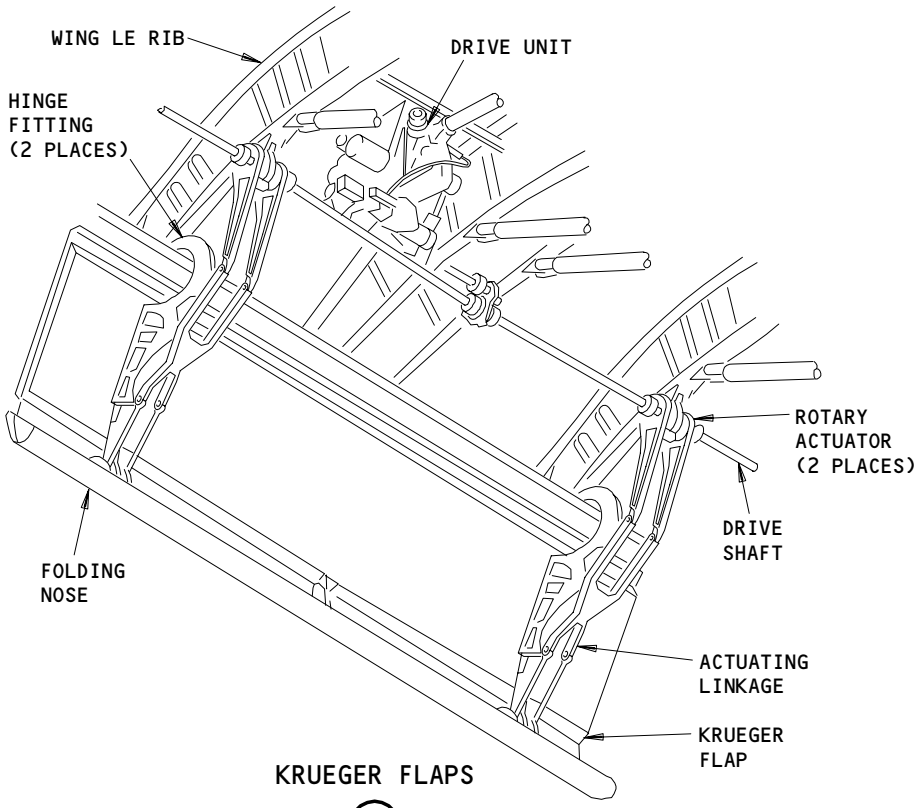
HINGE - TYPICAL NO. 1,2,3,5 AND 6
C-C



Aileron Attach Points
Figure 1 (Sheet 2)

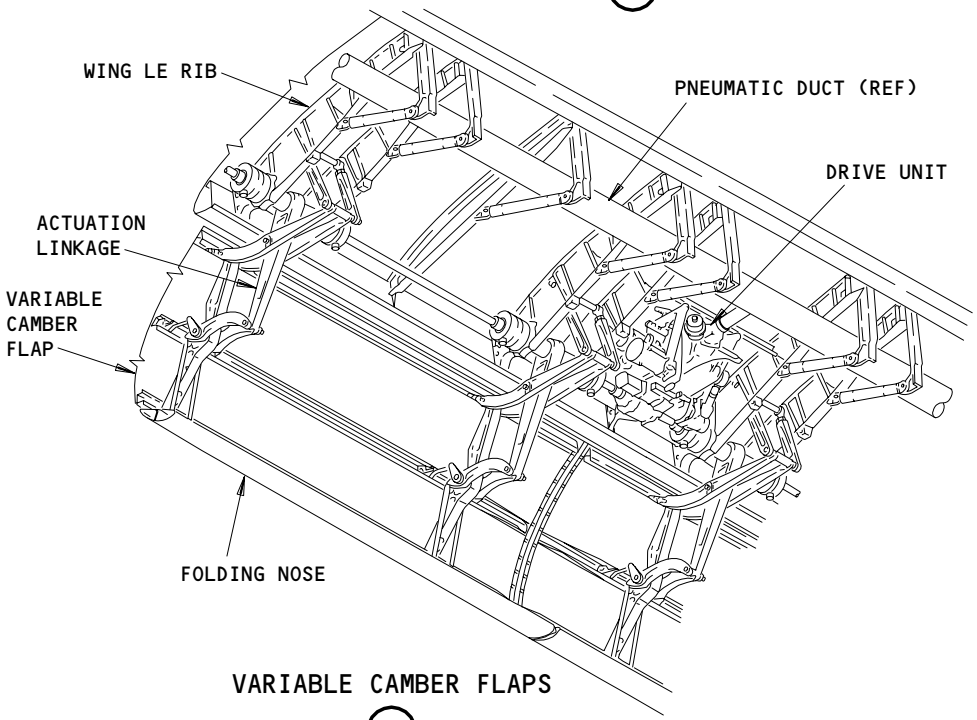


Flap Attachment
Figure 2 (Sheet 1)



KRUEGER FLAPS

(A)



VARIABLE CAMBER FLAPS

(B)

Flap Attachment
Figure 2 (Sheet 2)

C. Each segment of the leading edge Krueger flaps is attached to wing leading edge rib structure by two hinge fittings. The hinges are also attached to the actuating linkage which positions the flaps. The hinge fittings are machined aluminum alloy forgings.

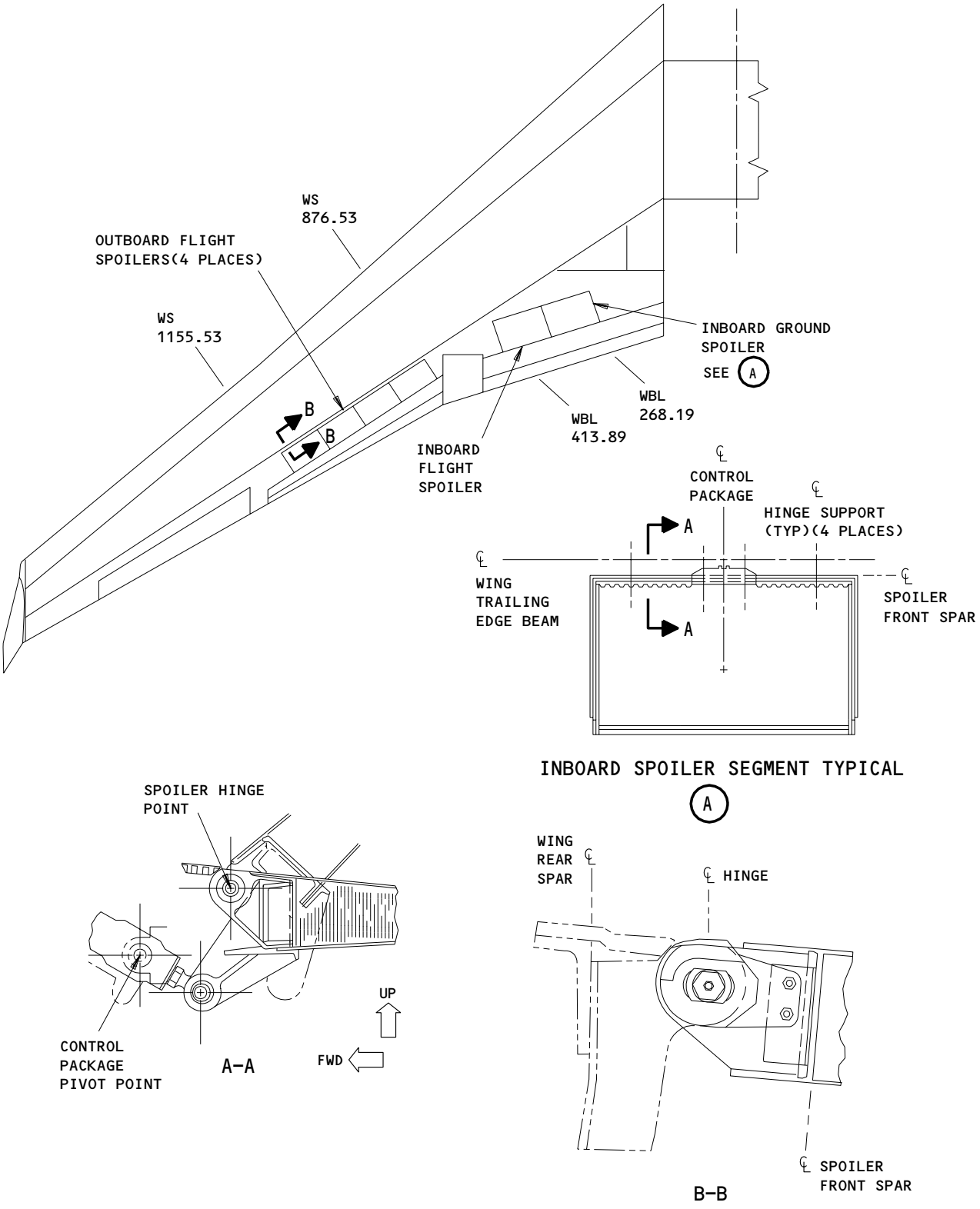
D. Each of the 10 variable camber flaps in each wing is supported from wing leading edge ribs by two flap linkages which extend and contour the flap. Each linkage attaches to the flap at the three spanwise beams and to the folding nose. The actuator arm fittings are attached to the flap torque tube which is supported by adjacent wing leading edge ribs on either side. The actuator arm fittings are fabricated from steel plate or forgings; the other attach fittings are made from aluminum forgings or plate.

4. Spoiler Attach Fittings (Fig. 3)

A. Each inboard flight spoiler (one each side) is attached by means of four hinge support fittings installed on the spoiler front spar. The fittings are bolted to mating fittings installed on the aft side of the wing trailing edge support beam between WBL 354.85 and 413.89. The fittings are machined from aluminum alloy forgings. The center fitting on the spoiler incorporates two hinge supports, as well as a spoiler actuator attach point. The spoiler actuators are attached to the trailing edge support beam.

B. Attach fittings for the four outboard flight spoilers on each wing are similar to the inboard flight spoiler fittings, except that the hinge and actuator support fittings are attached to the aft side of the wing rear spar between wing stations 876.53 and 1155.53.

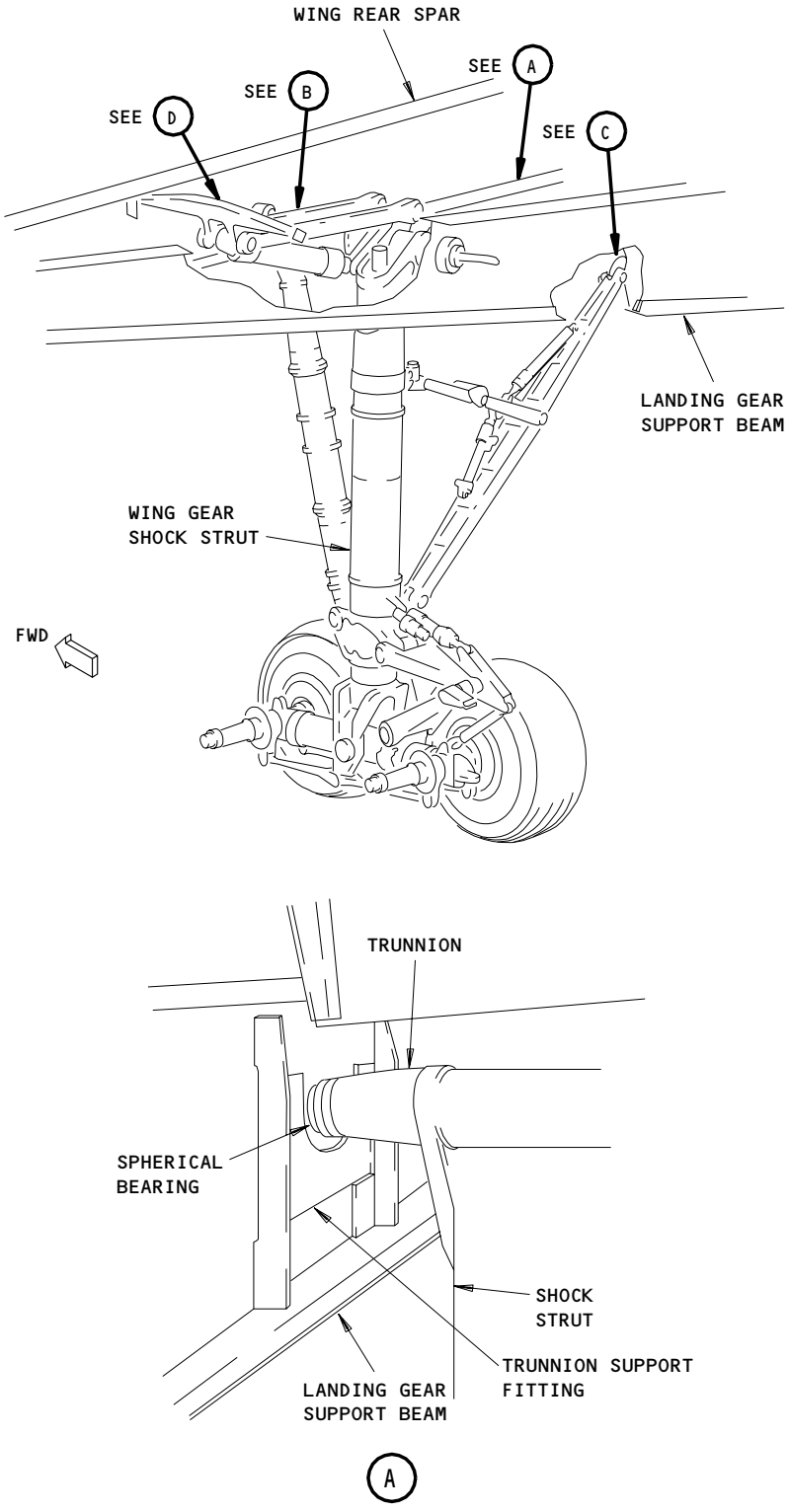
C. Attachments for the ground spoilers is identical to that of the inboard flight spoilers. The hinge fittings are installed between WBL 268.19 and 327.22 on the wing trailing edge support beam.



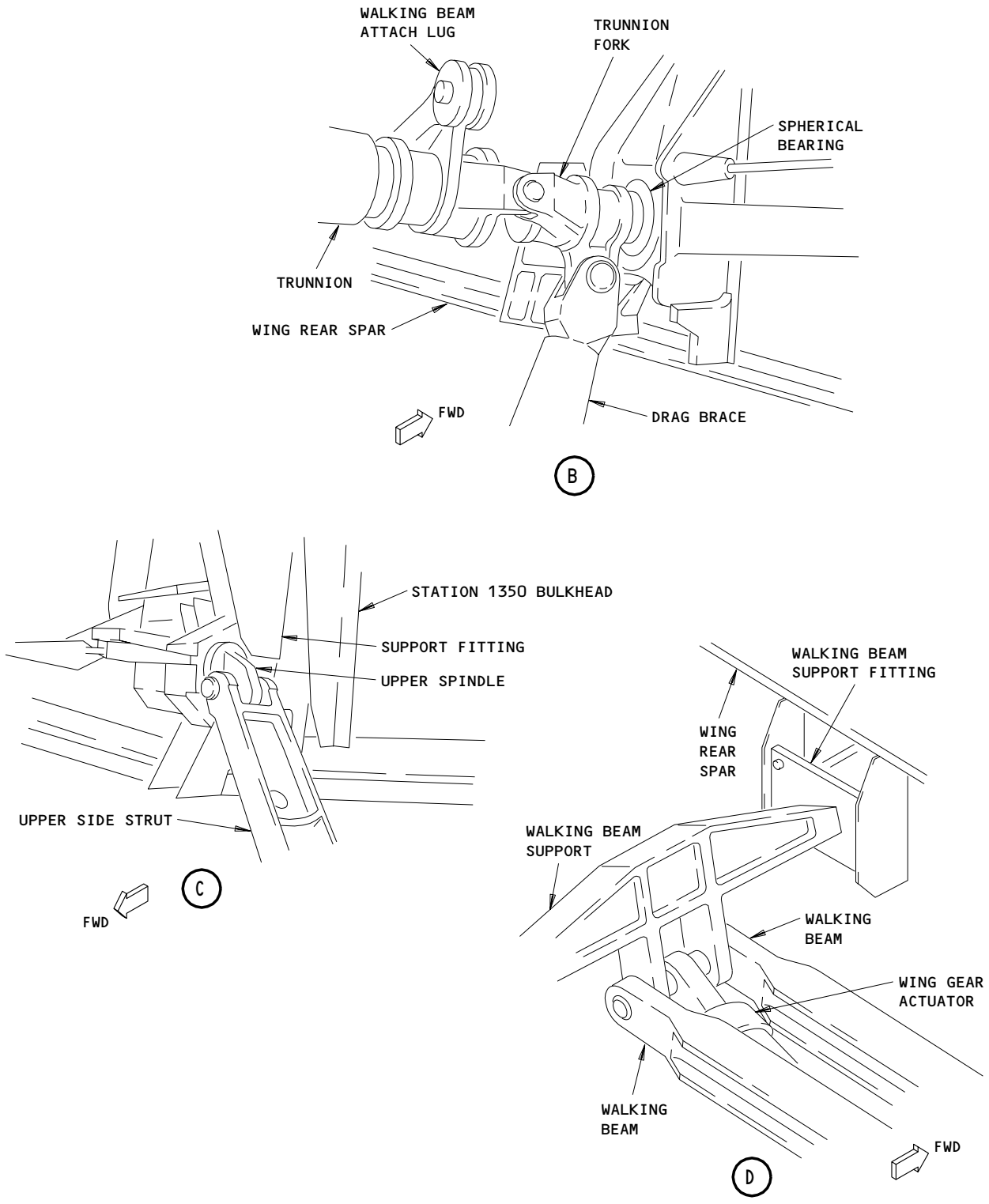
Spoiler Attachment
Figure 3

LANDING GEAR ATTACH FITTINGS - DESCRIPTION AND OPERATION

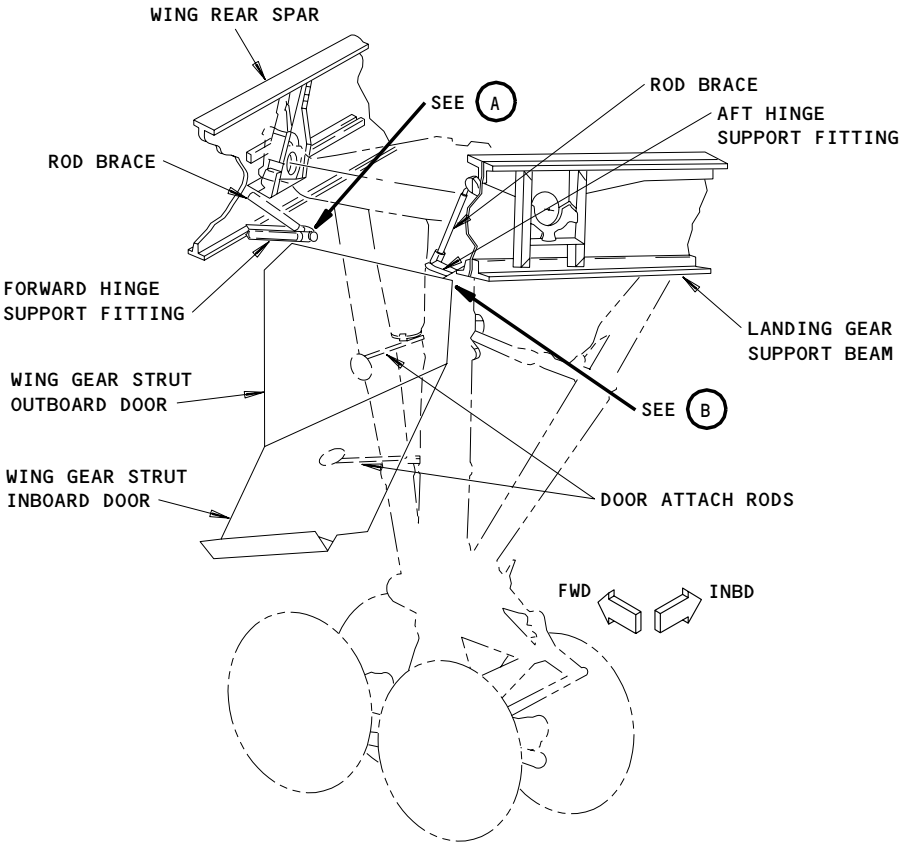
1. General
   A. The wing landing gear attach fittings consist of the forward and aft trunnion bearing support fittings, the walking beam support fittings, the side strut fittings, and the strut door hinges.
2. Trunnion Bearing Support Fittings (Fig. 1)
   A. Trunnion fittings installed on the rear spar and the landing gear support beam support the wing main landing gear strut. The trunnion centerline forms an angle of approximately 73 degrees with the rear spar. The forward trunnion bearing is supported by fittings installed vertically on the aft side of the wing rear spar. The fittings are machined from aluminum alloy forgings. The aft trunnion bearing is supported by two titanium fittings attached, one on each face, to the landing gear support beam. The fittings incorporate both longitudinal and transverse stiffener flanges normal to the fitting web.
3. Walking Beam Support Fittings (Fig. 1)
   A. The outboard ends of the landing gear walking beams and the actuator are attached by pin joints to the walking beam support. The support is a machined titanium forging and has trunnion type ends. Two lugs are provided for actuator and walking beam attachment. The trunnion ends are supported by fittings installed on the wing rear spar and landing gear support beam. The spar attachment consists of three fittings installed on the aft side of the rear spar. A modified J-section fitting is mounted vertically and closed-end I-section fittings are installed on each side near the spar upper chord to react side loads. The fittings are machined aluminum alloy forgings. The walking beam support aft trunnion fitting is also a machined aluminum forging and is attached to the forward side of the landing gear support beam upper chord.
4. Side Strut Fittings (Fig. 1)
   A. The landing gear side strut is attached to the fuselage structure by means of a spindle fitting. The spindle fitting is inserted through a side strut attach fitting which is fastened to the body station 1350 bulkhead. The attach fitting is fabricated from an aluminum alloy forged block, and is designed to carry landing gear side loads.
5. Strut Door Hinges (Fig. 2)

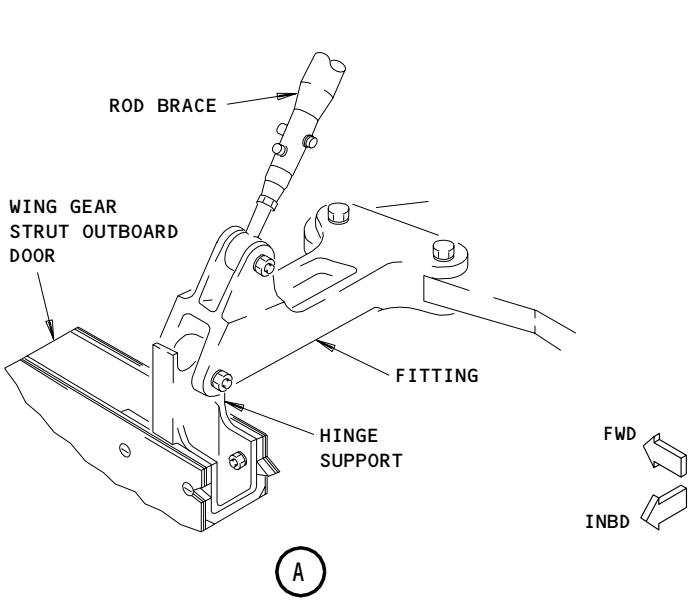


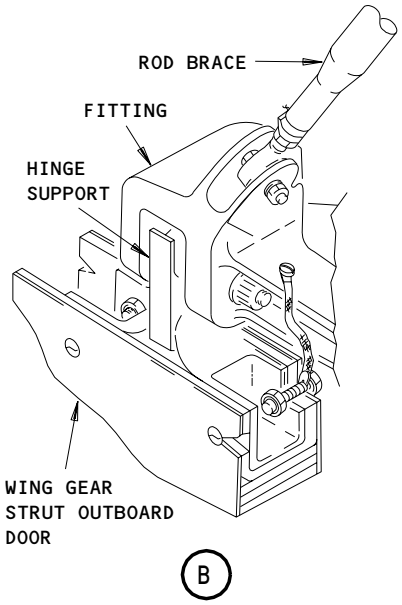
Wing Gear Attachment Fittings
Figure 1 (Sheet 1)



Wing Gear Attachment Fittings
Figure 1 (Sheet 2)







Wing Gear Door Attach Fittings
Figure 2

A. The wing landing gear strut doors are attached to wing structure by two hinge fittings installed on the outboard end of the outboard door. The door hinge fittings and the mating support hinge fittings are fabricated from forged aluminum alloy. The forward hinge support fitting is attached to the wing lower skin panel and inboard flap rear spar support fitting. The aft hinge support fitting is attached to the landing gear support beam lower chord and the flap track support fitting. Rod braces provide additional reinforcement to the hinge support fittings. The inboard door is attached to the outboard door by two aluminum hinge fittings and one titanium aft hinge fitting. Both doors are actuated by a rod-type actuator attached from the door to the drag brace actuator attach fitting and oleo actuator attach fittings.

WING GEAR FORWARD TRUNNION BEARING HOUSING - REMOVAL/INSTALLATION

1. General
   A. This procedure contains two tasks. The first task is the removal of the housing for the forward trunnion bearing of the wing gear. The second task is the installation of the housing for the forward trunnion bearing of the wing gear.
      (1) To remove the housing, do these steps:
          - Remove the trunnion fork to the wing gear
          - Remove the housing
      (2) To install the housing, do these steps:
          - Get the shims
          - Install the housing
          - Examine the space between the housing and the bearing plate

TASK 57-43-01-004-001

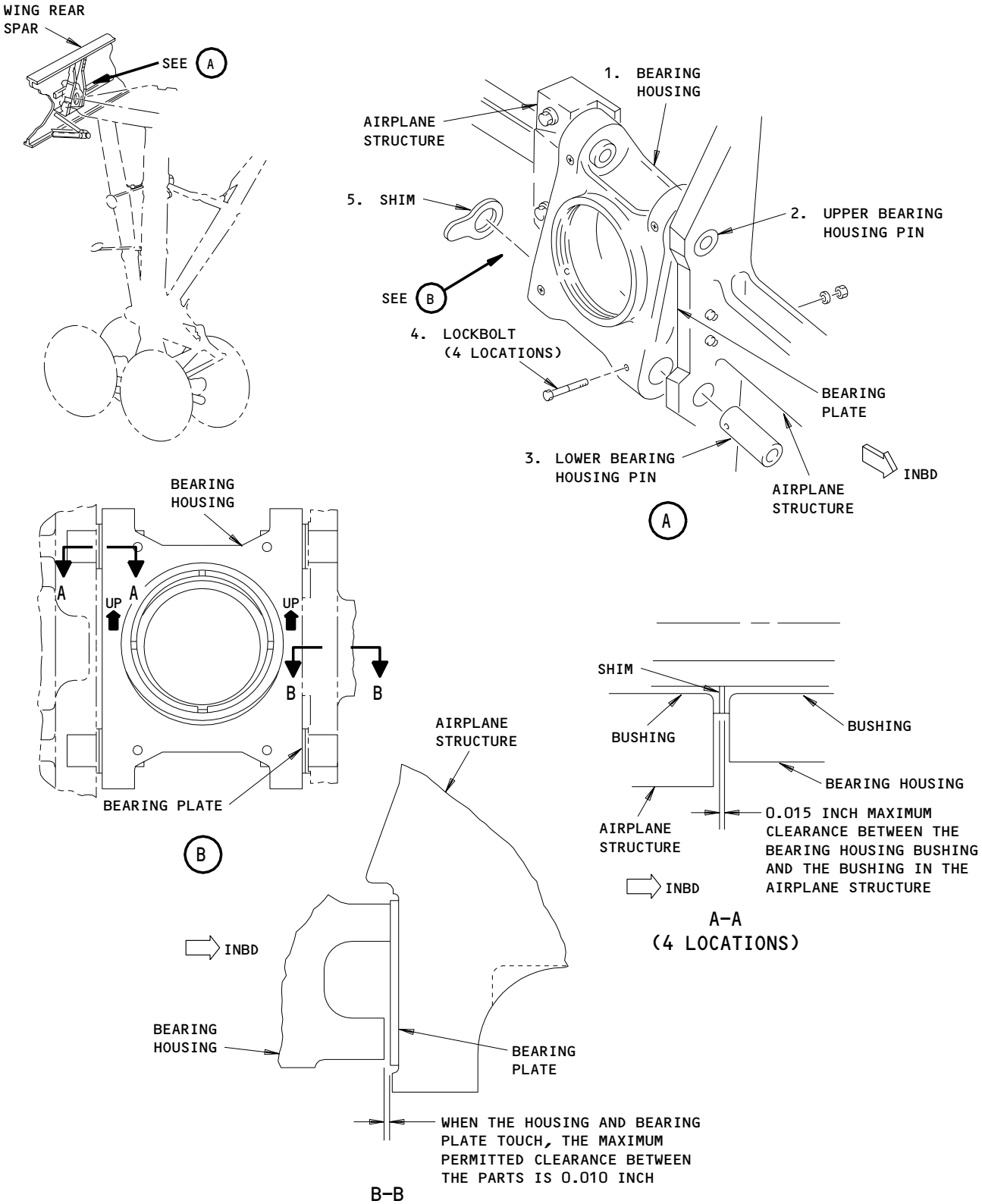
2. Bearing Housing Removal
   A. Special Tools and Equipment
      (1) ST921E - Wing Landing Gear Bearing Housing Shear Pin Puller
   B. References
      (1) 32-11-19/401, Trunnion Fork
      (2) IPC 57-11-53 Fig. 1
   C. Access
      (1) Location Zone
          571 Rear Spar To Landing Gear Support Beam, Left
          671 Rear Spar to Landing Gear Support Beam, Right
   D. Procedure

      S 034-002
      (1) Remove the trunnion fork of the wing gear (Ref 32-11-19/401).

      S 024-003
      (2) Remove the housing
          (a) Remove the lockbolts (4) (Fig. 401) from the bearing housing pins (2) and (3) at the top and bottom.
          (b) Remove the inboard pins.
          (c) Use the puller to remove the outboard pins that you cannot easily get to.
          (d) When you remove the outboard pins, remove the shims (5).
          (e) Remove the bearing housing (1) from the airplane structure.

TASK 57-43-01-404-004

3. Bearing Housing Installation (Fig. 401)
   A. Consumable Materials
      (1) D00013 Grease - MIL-G-23827



Wing Gear Forward Trunnion Bearing Housing Installation
Figure 401

B. References
(1) 32-11-19/401, Trunnion Fork
(2) IPC 57-11-06 Fig. 1

C. Access
(1) Location Zone
571 Rear Spar To Landing Gear Support Beam, Left
671 Rear Spar to Landing Gear Support Beam, Right

D. Procedure

S 224-005
(1) Get the Shims
(a) Install the housing (1) in the structure.

NOTE: The inboard surface of the housing must touch the structure.

(b) Get the shims and remove laminations if it is necessary.

NOTE: The thickness of these shims is important. The space between the aft bushing and the bushing in the structure must be as small as possible.

(c) Maximum permitted clearance is 0.015 inch.

S 424-006
(2) Install the housing.
(a) Apply grease to the pins, the shims, the inboard side of the housing and the bearing plate.
(b) Install the housing in the airplane structure.
(c) Put the pins through the housing.
(d) Put the shims into the airplane structure.
(e) Install the lockbolts.

S 224-007
(3) You must get the inboard clearance dimension as shown in View B-B.
(a) Make sure that the housing touches the bearing plate.

(b) Look for any spaces between housing and bearing plate.

NOTE: The maximum permitted tolerance is 0.010 inch.

(c) If the tolerance is more than the maximum permitted, the housing is not serviceable.

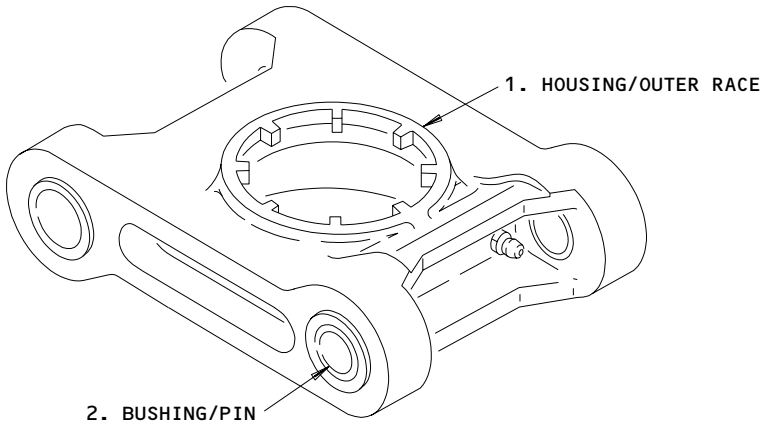
WING GEAR FORWARD TRUNNION BEARING HOUSING - INSPECTION/CHECK

TASK 57-43-01-206-007

1. Wing Gear Forward Trunnion Bearing Housing - Inspection

A. General

(1) This data consists of illustations and wear limits charts. No procedure is given in this section for access to permit inspection. For this information, refer to Removal/Installation.



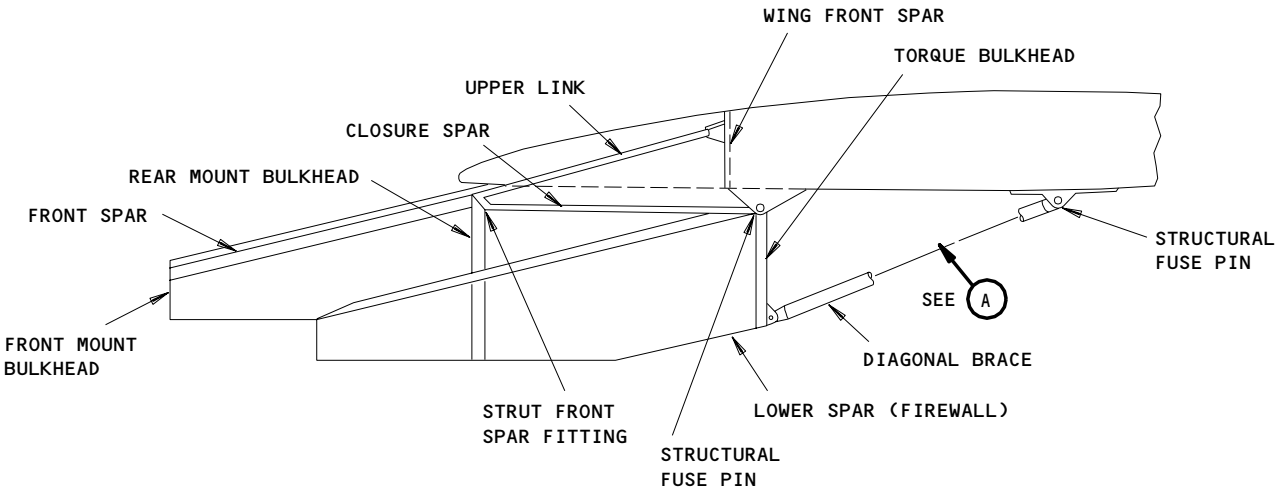
INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MIN	DESIGN LIMITS DIAMETER MAX	WEAR LIMITS ALLOWED WEAR DIM.	WEAR LIMITS MAX DIAM CLEARANCE	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR.
1	HOUSING	ID	6.9998	7.0016	7.0043	0.0083		X	3
1 [1]	OUTER RACE	OD	6.9960	6.9980	6.9933		X		
1	HOUSING	ID	6.9998	7.0016	7.0050	0.0083		X	3
1 [2]	OUTER RACE	OD	6.9956	6.9972	6.9933		X		
2	BUSHING	ID	1.7500	1.7515	1.7540	0.0066	X		
	PIN	OD	1.7475	1.7480	1.7450			X	3

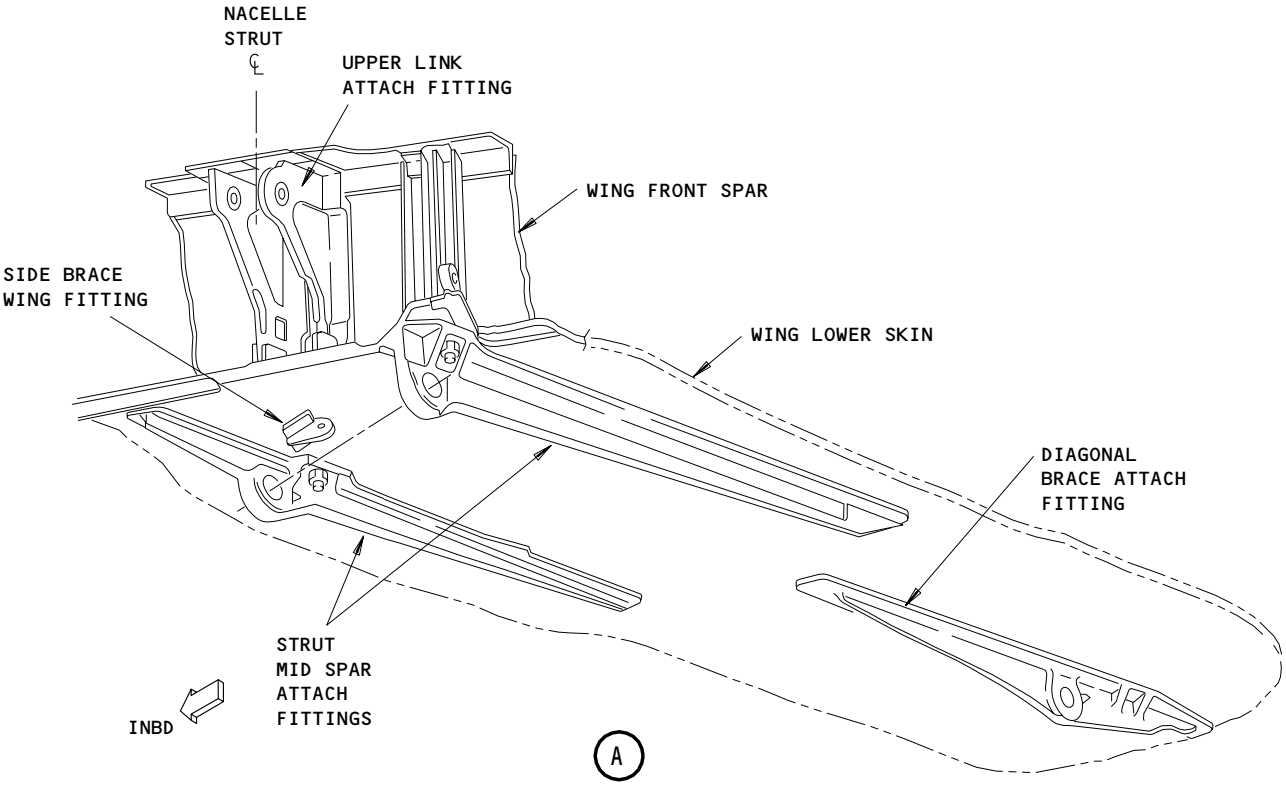
[1] OUTER RACE WITHOUT LUBRICATION GROOVES
[2] OUTER RACE WITH LUBRICATION GROOVES
[3] REPAIR PER OVERHAUL MANUAL

Wing Gear Forward Trunnion Bearing Housing
Figure 601

NACELLE STRUT ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General
   A. The nacelle strut attach fittings transmit engine loads to the wing main frame, where each attach fitting load is distributed by internal backup structure. Fittings are provided for the inboard and outboard nacelles on each outboard wing.
2. Inboard Nacelle Strut Attach Fittings (Fig. 1)
   A. The inboard nacelle strut is attached to the wing main frame at approximate WBL 470.0 by five pin joint fittings attached to the strut front, mid, and lower spars. An upper link, the nacelle mid spar, torque bulkhead, a side brace, and a diagonal brace engage the fittings. Engine thrust and side loads are transmitted through the nacelle strut attachment fittings into the main frame. The use of fuse pins permits clean separation of the engine and strut from the wing to prevent damage to the wing primary structure.
   B. The upper link, fabricated from aluminum alloy tubing, connects the strut front spar fitting to the wing front spar upper fitting. The forward connection utilizes a steel fuse pin retained by a bolt and cap; the aft connection uses a steel hollow shoulder bolt.
   C. The strut mid spar and torque bulkhead to inspar wing attachment consists of two pin-joint fittings. The strut fittings are double lug steel forgings. The wing fittings, installed on the lower exterior surface of the skin, comprise two forged titanium parts fastened together to form a T-section, single lug fitting. A tubular aluminum alloy side brace connects the strut outboard fitting to a wing lower surface fitting to transmit side loads.
   D. An aft diagonal brace, fabricated from aluminum tubing, connects the strut lower spar and torque bulkhead to an attachment fitting on the wing lower surface in the wing mid spar area. The strut fitting is a single lug, machined aluminum alloy forging attached to the strut lower spar. Attachment to the diagonal brace is by a hollow pin retained by a bolt. The wing fitting is a T-section, single lug fitting formed by fastening two forged titanium parts together.





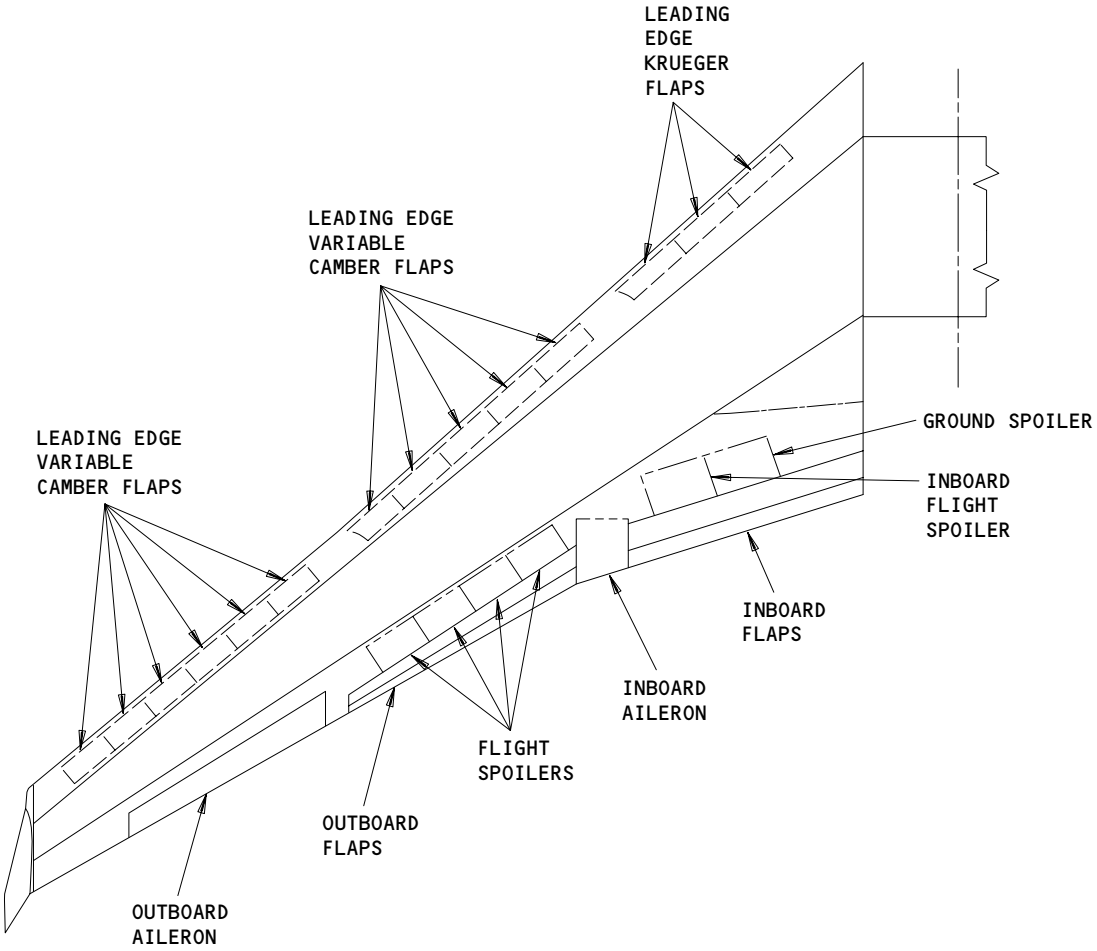
Nacelle Strut Attach Fittings
Figure 1

3. Outboard Nacelle Strut Attach Fittings (Fig. 1)

A. The outboard nacelle strut is attached to the main wing frame at approximately WBL 834.00 by five pin joint fittings attached to the strut front, mid, and lower spars. The attachment fittings and pins are of a similar design to the inboard nacelle fittings and are fabricated from the same material. The aft end of the upper link attaches to the wing front spar upper chord fitting. The strut mid spar and torque bulkhead fittings are attached to the wing forward attachment fittings. The aft diagonal brace connects the strut lower spar fitting to the wing aft attachment fitting. As in the case of the inboard strut installation, fail-safe fuse pins protect the wing primary structure from damage in the event of engine separation.

FLIGHT CONTROL SURFACES - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The wing flight control surfaces consist of ailerons, trailing edge flaps, leading edge Krueger flaps, leading edge variable camber flaps, and spoilers.
   B. The ailerons are primary flight control surfaces, and, in conjunction with the spoilers, provide lateral control of the airplane. Each wing has an inboard and an outboard aileron, which are hinged from support ribs attached to the wing rear spar or trailing edge beam (Ref 57-51-00 D&0).
   C. The trailing edge flaps are auxiliary flight control surfaces. Each wing has triple-slotted, inboard and outboard trailing edge flaps consisting of three separate sections; the fore flap, the midflap, and the aftflap (Ref 57-52-00 D&0).
   D. The Krueger flaps are auxiliary flight control surfaces. The leading edge of each wing has three Krueger flaps located inboard of the inboard nacelle (Ref 57-54-00 D&0).
   E. The 11 leading edge variable camber flaps are auxiliary flight control surfaces. Five flaps are located between the inboard and outboard nacelles and six outboard of the outboard nacelle (Ref 57-55-00 D&0).
   F. Five flight spoilers and one ground spoiler are installed in the upper surface of the trailing edge structure of each wing. Four of the flight spoilers are installed in a group between the engine nacelles and one flight spoiler is installed adjacent to the ground spoiler inboard of the inboard nacelle. The flight spoilers serve as auxiliary flight control surfaces in conjunction with the ailerons to provide airplane lateral control and serve as speed brakes both in flight and after touchdown. The ground spoilers provide additional speed braking after touchdown (Ref 57-57-00 D&0).



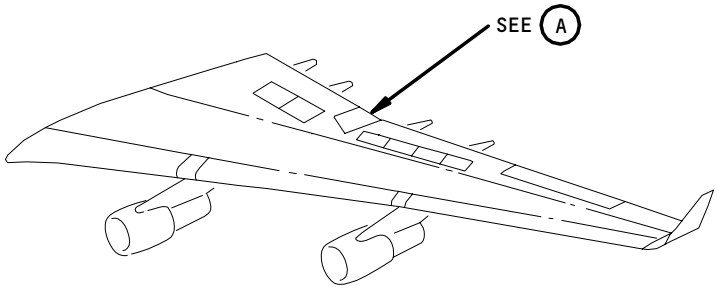
Flight Control Surfaces
Figure 1

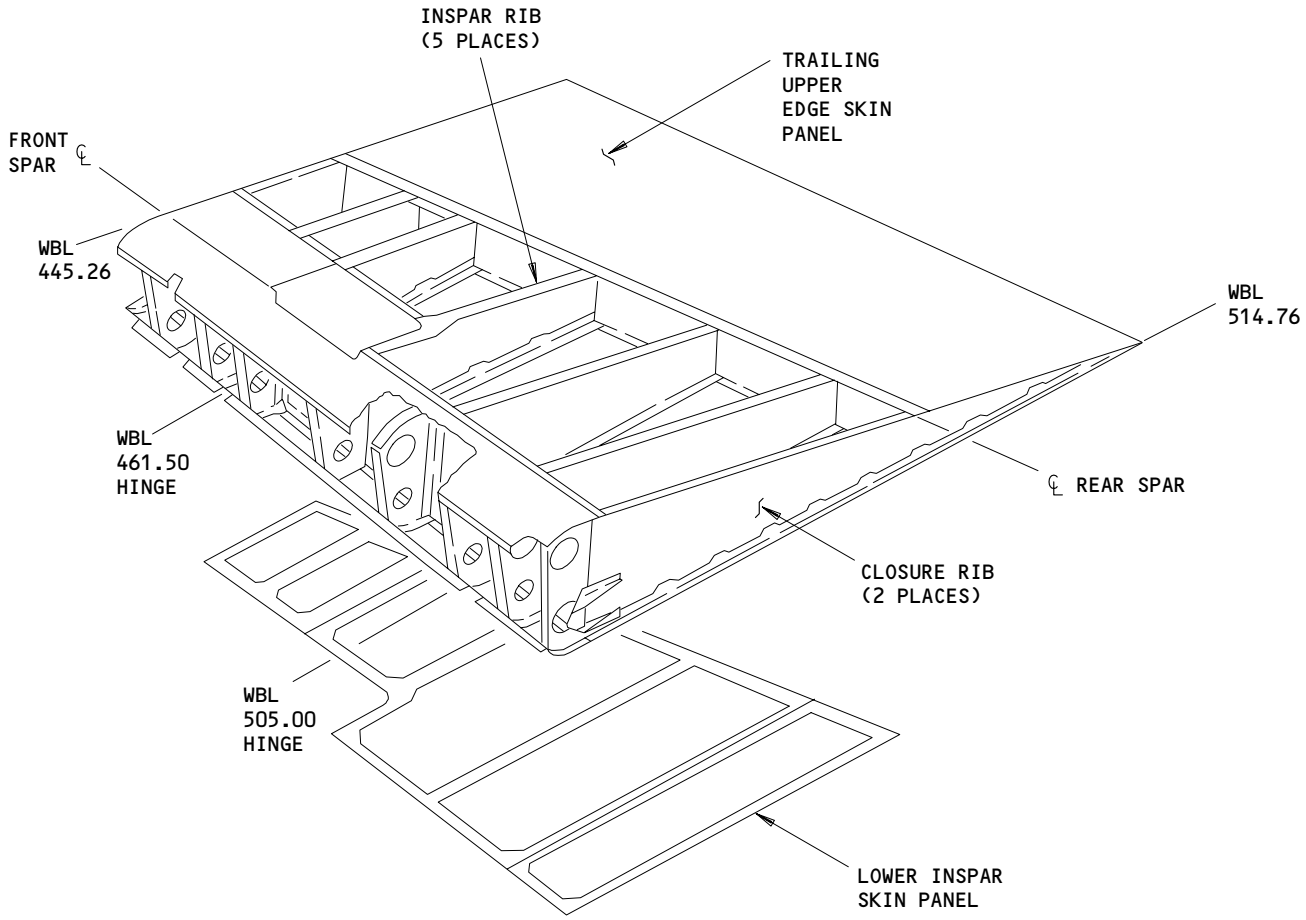
AILERONS - DESCRIPTION AND OPERATION

1. General
   A. The two aileron control surfaces on each side of the wing provide the primary lateral control of the airplane during flight. Both surfaces are positioned by individual hydraulic power packages attached to fittings on the aileron front spars. Attachment of the ailerons is to the wing trailing edge hinge support ribs.
2. Inboard Aileron
   A. The inboard ailerons are located in the wing trailing edge directly aft of the inboard engine nacelle. Width is 69.5 inches; length of the inboard side is slightly less than that and the outboard side is approximately 92.0 inches including the leading edge.
   B. The trailing edge and the inspar skins are of fiberglass fabric reinforced honeycomb sandwich panels. The remaining structure consists of aluminum ribs and spars and aluminum nose skins.
3. Outboard Aileron
   A. The outboard aileron is located outboard of the outboard engine nacelle. Overall length of the aileron is 331.4 inches.
   B. The trailing edge is of fiberglass reinforced honeycomb sandwich and the structure forward is of aluminum ribs and spar with inspar panels also of the foregoing sandwich material.

INBOARD AILERONS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The inboard ailerons, located in the wing trailing edge area aft of the inboard engine nacelle struts, function as primary lateral control surfaces during all phases of flight. Each aileron is supported by two primary and two fail-safe hinge fittings installed on the aileron front spar. These fittings are attached to wing trailing edge hinge support rib fittings by pin joints.
   B. The aileron chord length at the outboard end is approximately 40% greater than at the inboard end.
2. Inboard Aileron Structure
   A. The structural frame consists of front and rear spanwise spars, conventional chordwise ribs, hinge and actuator supports, and skins.
   B. The spars consist of extruded T-section aluminum alloy chords and two-sheet, laminate webs of the same alloy.
   C. The inspar ribs have aluminum alloy extruded T-chords with webs of the same alloy. The closure ribs, which are continuous from the front spar to the trailing edge, have aluminum webs and formed chords. Stiffeners are installed on the spars and ribs to provide additional web rigidity.
   D. Lug-type hinge fittings, machined from aluminum plate, are attached to the lower, forward side of the front spar at four locations. Forged aluminum reinforcing support fittings are also installed at the locations of the primary hinge fittings, WBL 461.5 and 505.0. A double-lug forged aluminum fitting attached to the front spar between the inboard primary and fail-safe hinges provides attachments for the aileron power control package and reaction link (Ref 57-42-00 D&O).
   E. The inspar and trailing edge skin panels are of plastic glass fabric reinforced honeycomb sandwich construction. Screws and nutplates attach the lower center inspar panel; the rest are fastened by rivets. The upper and lower trailing edge panels are bonded to each other at the aft end. Upper and lower nose skins are of clad aluminum sheet.
   F. Three hoist attachment points on the upper chords of the spars facilitate lifting the surface during removal or installation. When hoist attachment points are not in use, the holes are plugged with a countersunk screw.



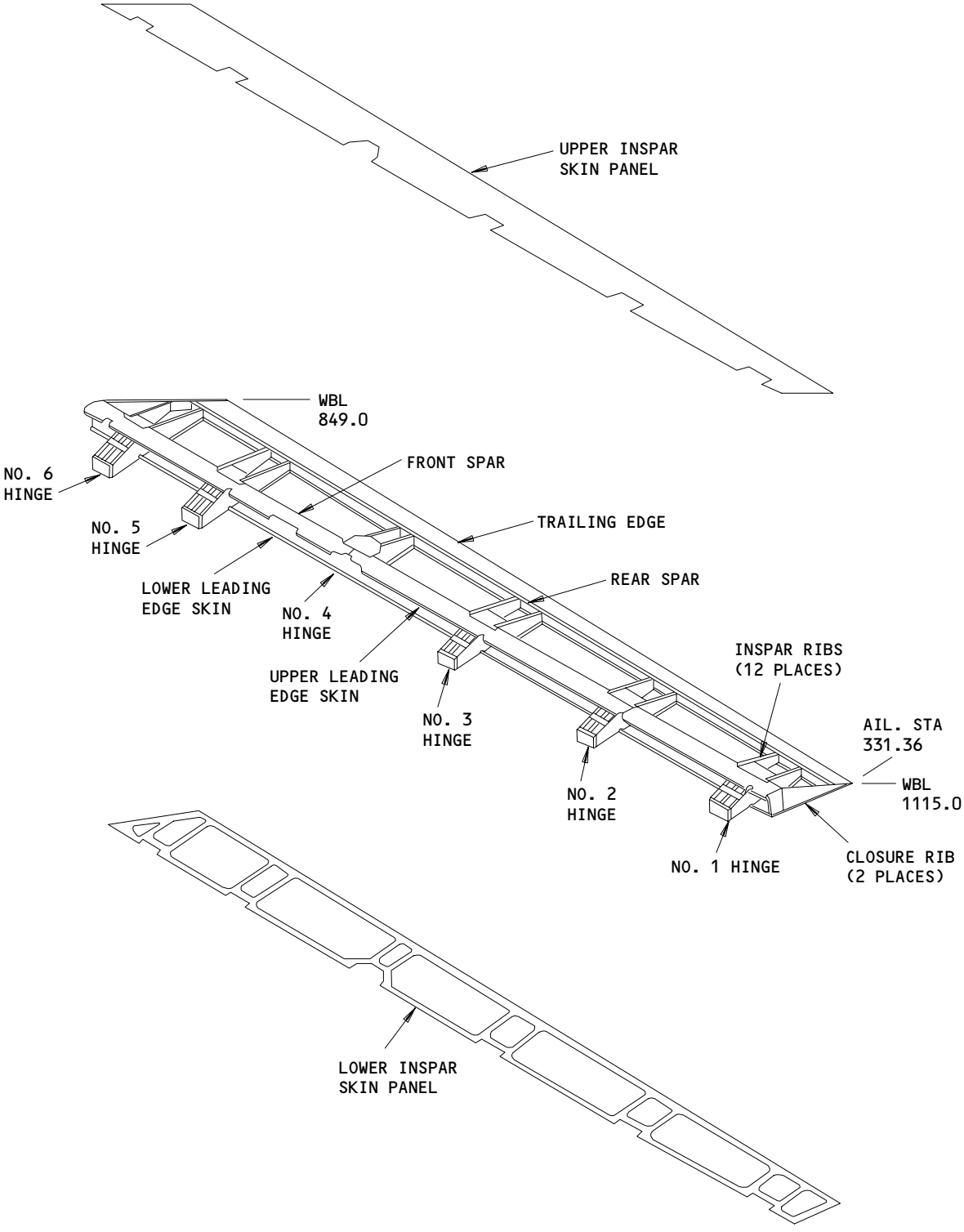


A

Inboard Aileron
Figure 1

OUTBOARD AILERONS - DESCRIPTION AND OPERATION

1. General
   A. The outboard ailerons are located in the wing trailing edge outboard of the outboard engine nacelle. In conjunction with the inboard ailerons, they serve as primary lateral control surfaces during low airspeed operation. They are supported by six hinge support fittings attached to the aileron front spar. These fittings are attached to wing trailing edge hinge support rib fittings by pin joints.
   B. Static balance weights of a tungsten base high density metal are attached to ribs cantilevered forward of the aileron front spars.
2. Outboard Aileron Structure (Fig. 1)
   A. The aileron structure consists of spanwise spars, chordwise ribs, skin panels, hinge supports, an actuator attachment fitting, and the trailing edge.
   B. The front spar consists of extruded T-section aluminum alloy chords and a laminated web of two sheets of the same alloy. The rear spar is a channel section of glass fabric reinforced plastic laminate.
   C. The inspar ribs are located in pairs, aft of the six aileron hinges. These ribs have extruded aluminum alloy chords and laminated webs of two sheets of the same alloy. Closure ribs of aluminum alloy chords and laminated webs are continuous from the nose ribs to the rear spar. Static balance weight support ribs are cantilevered forward from the front spar at hinges No. 1, 2, 3, 5, and 6 and are installed in groups of three at these hinge locations. Formed nose ribs and formers of aluminum alloy provide support for the upper and lower forward skins.
   D. Upper and lower inspar skin panels are of plastic glass fabric reinforced honeycomb sandwich construction. Screws and nutplates attach the lower inspar skin to the ribs and spars; the upper inspar skin is riveted. The upper and lower skins forward of the front spar are contoured from aluminum sheet.
   E. Six forged aluminum alloy hinge fittings are attached to the front spar to provide the aileron-to-wing structure attachment. All hinge fittings are single lug except hinge No. 4. The fitting located at hinge No. 4 has two double lugs for hinging and one double lug for the attachment of the hydraulic power control package (Ref 57-42-00, Description and Operation).
   F. The wedge-shaped trailing edge is fabricated of plastic glass fabric reinforced honeycomb sandwich and attaches to the aileron rear spar. Static dischargers are located nine places at the aft edge. An aluminum bus bar along three-fourths of the lower aft edge connects all discharger
   G. Hoist attachment points on the upper chord of the forward spar at hinges No. 3 and 5 facilitate lifting the surface during removal or installation When hoist attachment points are not in use, the holes are plugged with a normal countersunk screw.



Outboard Aileron
Figure 1

AILERON CONDUCTING STRIP - REPAIRS

1. General
   A. This section contains one task:
      (1) The repair of a static discharger conducting strip at the outboard aileron.
   B. The repair of the conducting strip is as follows:
      - Remove the static dischargers
      - Remove the damaged conducting strip
      - Clean the new conducting strip
      - Bond the new conducting strip to the aileron
      - Install the static dischargers
      - Apply a smooth finish to the conducting strip.
   C. This procedure gives instructions to repair the items as follows:
      (1) The aluminum conducting strip found between the outboard aileron trailing edge and the two outboard static dischargers.
         (a) You must replace the conducting strip if more than half the width of the strip is damaged.
         (b) You can apply the approved conductive paint to the surface with BMS 10-21.
         (c) Do this step if less than half the width of the conducting strip is damaged.
      (2) The static discharger attaches to the outboard aileron.
         (a) Static dischargers also attach to the ground strap. The ground strap is bonded with adhesive to the non-conductive aileron surface of the trailing edge. Then the strap is electrically bonded to the aileron outboard rib.
         (b) If the electrical bond of the ground strap at the outboard rib becomes weak, these conditions will follow:
            1) The static dischargers to the aileron can become electrically isolated.
            2) The static dischargers will not operate.
         (c) If you find these conditions, you must repair the electrical bond of the ground strap.

TASK 57-51-03-308-014

2. Repair the Conducting Strip (Fig. 801)
   A. Standard Tools and Equipment
      (1) Meter - Bonding (Ref 20-22-01/601 Electrical Bonding)
      (2) Scraper - Plastic or Hardwood
   B. Consumable Materials
      (1) G00000 Paper - Aluminum Oxide, 240-grit or finer
      (2) B00000 Cleaner - Alkaline, Ridolene No. 53
      (3) A00966 Compound - EC-2216 Part A and Part B

(4) B00148 Solvent - Methyl Ethyl Ketone (MEK), TT-M-261
(5) G00033 Cheesecloth
(6) A00247 Sealant - BMS 5-95
(7) C00064 Coating - Surface treatment, MIL-C-5541 (Alodine 1200 or 1200S)
(8) G00000 Aluminum Sheet - 1100-0 or 505250, 0.010 inch thick

C. References
(1) 23-61-00/201, Static Dischargers
(2) SRM 51-70-03
(3) SRM 51-70-09

D. Access
(1) Location Zone
592 Outboard Aileron, Left
692 Outboard Aileron, Right

E. Remove the conducting strip.

S 038-001
(1) Cut the conducting strip near the base of each static discharger found at the ends of the damaged area.

S 018-002
(2) Remove the static dischargers if it is necessary (Ref 23-61-00/201).

S 358-003
(3) Remove the damaged parts of the conducting strip.
(a) Remove the strip from the aileron where it is possible.

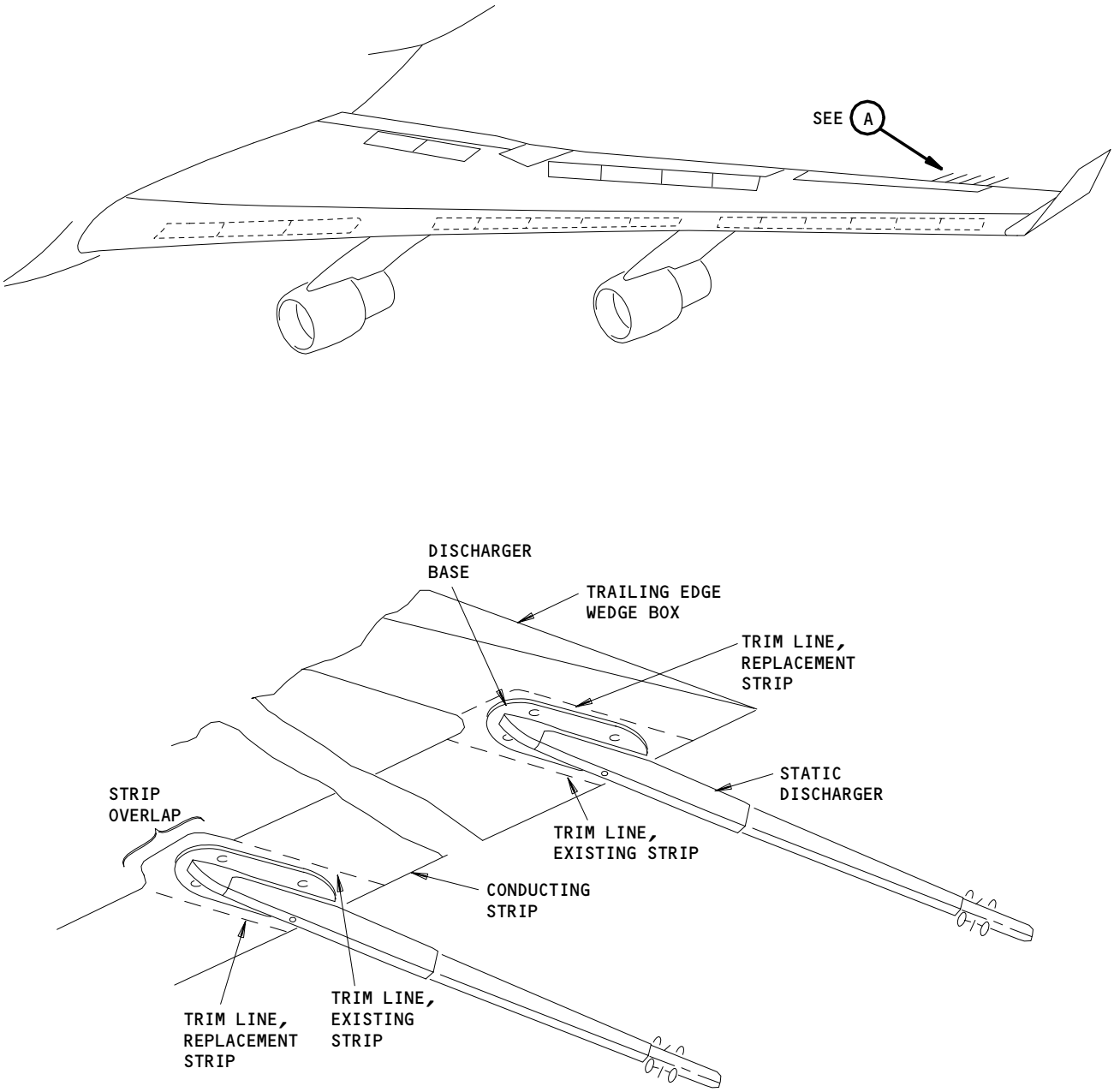
NOTE: Be careful to prevent damage to the fiberglass.

CAUTION: DO NOT APPLY PRESSURE TO THE SURFACE OF THE OF AILERON TO WHERE YOU CAUSE DAMAGE TO THE FIBERGLASS. DO NOT APPLY PRESSURE TO CAUSE THE FIBERGLASS FILAMENTS TO COME OUT.

(b) As a last step, remove the remaining strip with aluminum oxide sandpaper.

F. Install the conducting strip.

S 358-004
(1) Make the conducting strip.
(a) Use the remaining conducting strip found above the static discharger locations as a template.



TRAILING EDGE CONDUCTING STRIP
AND STATIC DISCHARGERS (EXAMPLE)

A

Aileron Conducting Strip Repair
Figure 801

(b) Use this template to cut the new strip to make the correct fit.
(c) Drill holes in the new strip to align with the attach holes in the remaining strips.

S 118-005
(2) Before installation, clean the new conducting strip.
(a) Remove the grease and apply the recommended alkaline cleaner.
(b) Soak the conducting strip in the alkaline cleaner for a minimum of 10 minutes.

NOTE: The temperature of the cleaner must be 160 deg F to 180 deg F.

1) Flush the conducting strip with clean water until the strip has no more alkaline cleaner on it.

(c) Dry the strip with a lint-free cloth.

NOTE: The temperature of the water must be a minimum of 110bF.

(d) For the side that you bond, rub smooth grit sandpaper on that side.
(e) Wash and rub that side clean.

S 428-006
(3) Install the conducting strip.
(a) Prepare the adhesive.

WARNING: THESE CHEMICALS AGENTS ARE POISONOUS. USE IN OPEN AREAS ONLY. WITHOUT PROTECTION, DO NOT TOUCH THE RESIN OR THE CURING AGENT. DO NOT GET THEM IN YOUR EYES. ALWAYS WEAR RUBBER GLOVES ON TOP OF THE COTTON GLOVES FOR PROTECTION OF YOUR HANDS. IF YOUR SKIN TOUCHES THE RESINS OR THE CURING AGENT, CLEAN THOSE AREAS WITH WARM WATER AND SOAP. DO NOT USE SOLVENTS TO CLEAN YOUR SKIN.

1) Fully mix 140 parts by weight of EC-2216 Part A with 100 parts by weight of EC-2216 Part B.

NOTE: The pot life of the mixture is approximately 2 hours.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

(b) Apply solvent, Series 89 (AMM 20-30-89) to the area where you removed the conducting strip.

(c) Also clean the areas of the remaining conducting strip above the static discharger.
(d) Use a clean gauze or cheesecloth to absorb the solvent before it dries.

NOTE: To prevent contamination on the surfaces, permit no more than 1 hour span from the time you clean to the time you you bond.

(e) Use the Phosphoric Acid Non-Tank Anodize (PANTA) method to prepare the conductive strip and the repair area for bonding (Ref SRM 51-70-09).
(f) Apply a thin layer of adhesive to the trailing edge of the aileron and to the conducting strip.
(g) Do not apply adhesive to the ends of the strip where it makes an overlap with the remaining strip.

NOTE: New and remaining strips must have full electrical contact at areas that make an overlap

(h) Remove the unwanted adhesive with a clean gauze or cheesecloth lightly moist with solvent, Series 89 (AMM 20-30-89).

NOTE: Do not permit the solvent to get in the area that you bond.

(i) Apply pressure and dry the bond (refer to SRM 51-70-03).

S 418-007
(4) To complete the static discharger installation, you must obey 23-61-00/201 and the instructions that follow:
(a) Apply sealant if it is necessary to fill the space where the new conducting strip makes an overlap with the remaining strip.
(b) Use the bonding meter to measure the resistance between the discharger base and the conducting strip (Ref 20-22-01/601).
(c) To make sure that there is electrical contact between the strips, measure to the remaining conducting strip and to the new conducting strip.

NOTE: The resistance must be no more than 0.010 ohms.

S 228-008
(5) Measure the resistance between the rod and the base of the static dischargers that you installed during this repair (Ref 23-61-00/201).

G. Conducting Strip Finish.

S 358-009
(1) Use smooth grit sandpaper to make the open surface of the conducting strip shiny.

S 168-013
(2) Wash and rub the area clean.

S 378-010
(3) Use a brush to apply Alodine 1200S or 1200 to the open surface of the strip.

NOTE: You will apply this last finish if it is necessary.

H. Repair the Aileron Static Discharger Conducting Strip

S 358-016
(1) If you only want to repair the electrical bonding of the aileron static discharger conducting strip, do the following:
(a) Remove the static dischargers.
(b) Remove the damaged portion of the conducting strip.
(c) Clean the faying surfaces between the conducting strip and the aileron surface with aluminum oxide paper.
(d) Wash and wipe the cleaned surfaces to remove residue.
(e) Treat the cleaned surfaces with Alodine.
(f) Bond the new conducting strip to the aileron.
(g) Install the static dischargers.
(h) Check the bonding resistance between the existing conducting strip and the new conducting strip.

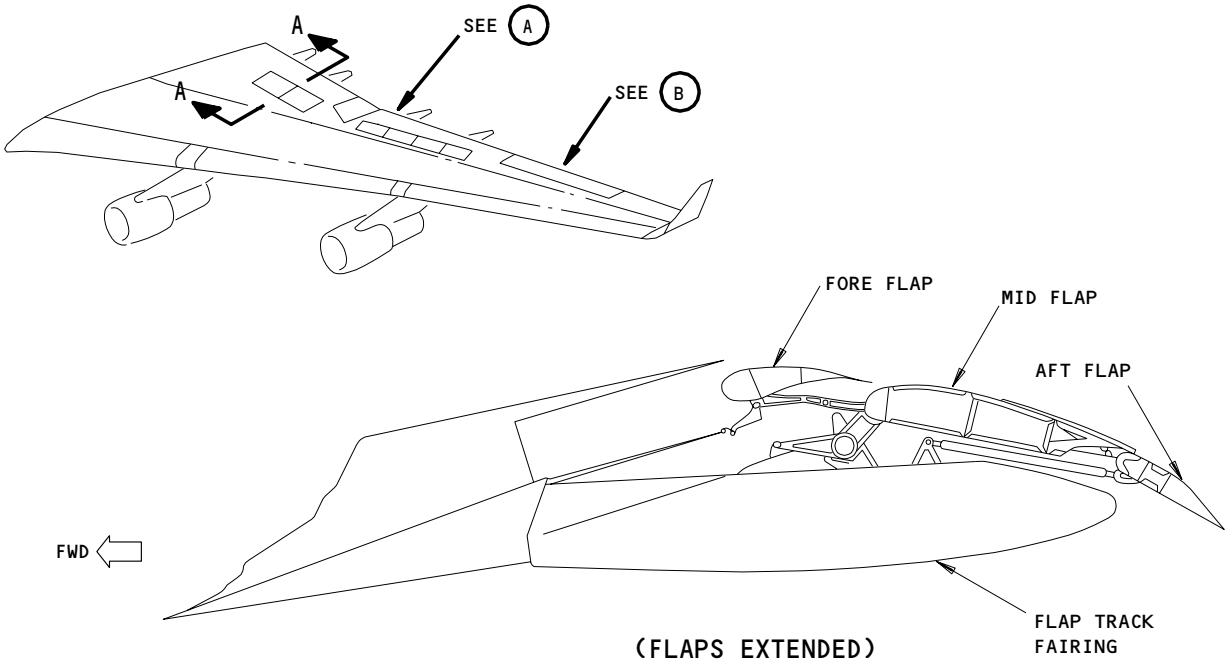
NOTE: The resistance must be no more than 0.010 ohms.

(i) Check the bonding resistance between the existing conducting strip and the static dischargers.

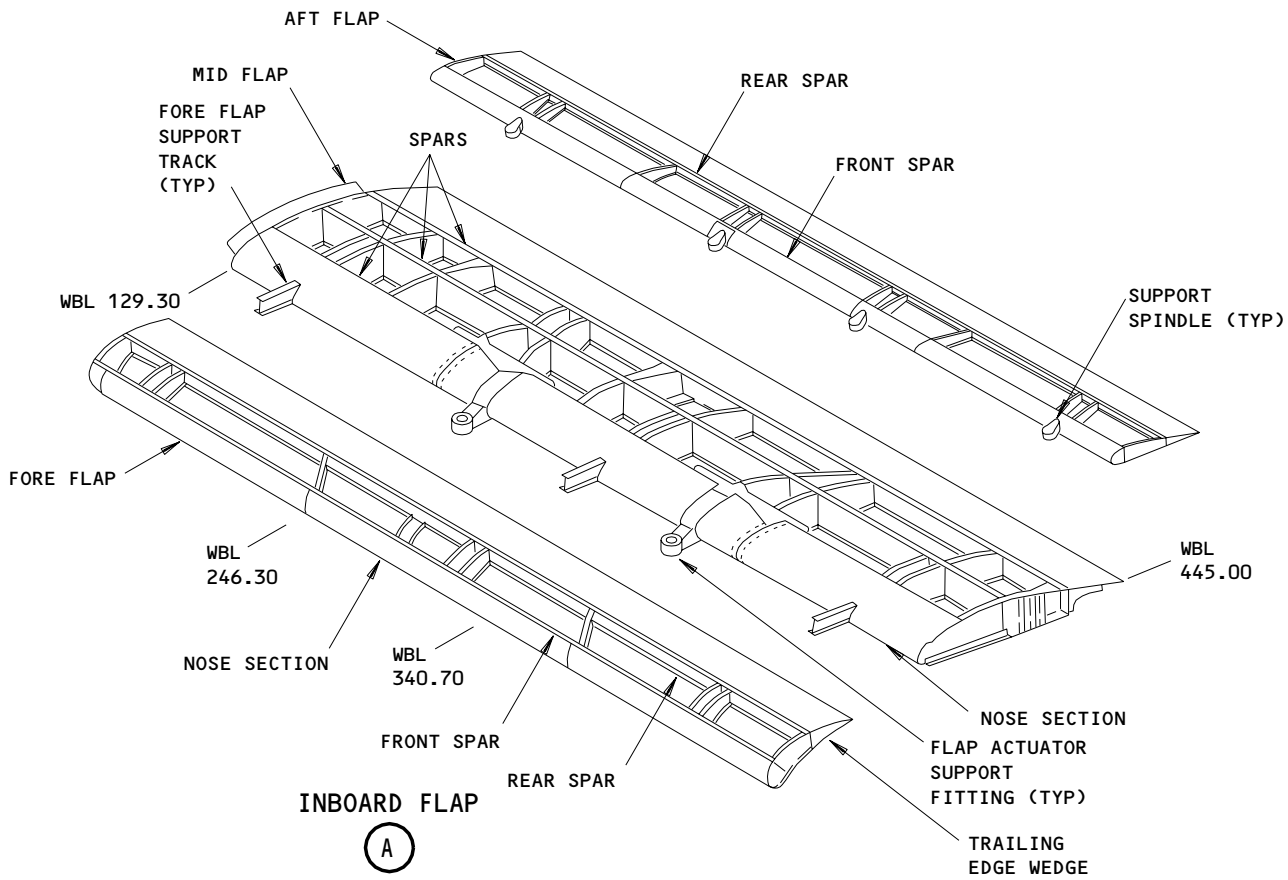
NOTE: The resistance must be no more than 0.010 ohms.

TRAILING EDGE FLAPS - DESCRIPTION AND OPERATION

1. General
   A. Each outboard wing has two trailing edge flaps to provide additional lift during takeoff and landing. Each trailing edge flap consists of a foreflap, a midflap, and an aftflap.
2. Inboard Flaps (Fig. 1)
   A. The inboard flaps occupy the portion of the wing trailing edge between WBL 129.30 and 445.00.
   B. The fore flap structure consists of spanwise front and rear spars, inspar ribs, a leading edge section, and a trailing edge section. The front spar upper chords are extruded aluminum angles and the lower chords are aluminum angles. The web consists of two layers of aluminum sheet. The rear spar is a formed channel of aluminum sheet material. The inspar ribs have extruded aluminum angle upper chords, extruded aluminum angle lower chords, and aluminum sheet webs. The nose ribs consist of formed chords and webs fabricated from aluminum sheet.
   C. The foreflap inspar skin panels are of aluminum honeycomb construction and the nose and trailing edge skins are fabricated from laminated fiberglass honeycomb material. Abrasion-resistant finish is applied to the upper surface of the foreflap and lower surface of the trailing edge panel to provide chafing protection. A phenolic rub strip is installed on the lower trailing edge surface of the fore flap skin to provide chafing protection from the mid flap.
   D. The midflap structure consists of three spanwise spars (forward, mid, and aft), chordwise inspar ribs, a nose section, and a trailing edge section. The spars have extruded T-chords and utilize aluminum alloy for the upper chords and aluminum material for the lower chords. The spar webs are fabricated from two layers of aluminum sheet. The inspar rib chords and webs are fabricated from aluminum. The nose ribs have extruded aluminum upper and lower chords and aluminum sheet webs. Support tracks are attached to the midflap inspar structure and extend forward of the nose section to support the foreflap. The tracks are machined from steel forgings. At wing buttock lines 246.30 and 340.70, flap actuator support fittings are installed. These fittings, machined aluminum forgings, are attached to the mid spar and front spar and are cantilevered forward of the leading edge to accommodate the flap actuator attachment.
   E. The mid flap skins are of fiberglass honeycomb construction with the exception of trailing edge lower skin which is fabricated from aluminum sheet. An abrasion-resistant finish is applied to the upper surface of the mid flap to provide protection from chafing with the fore flap. The lower aft portion of the upper midflap skin contains a phenolic rub strip bonded to the surface to provide chafing protection from the aftflap.

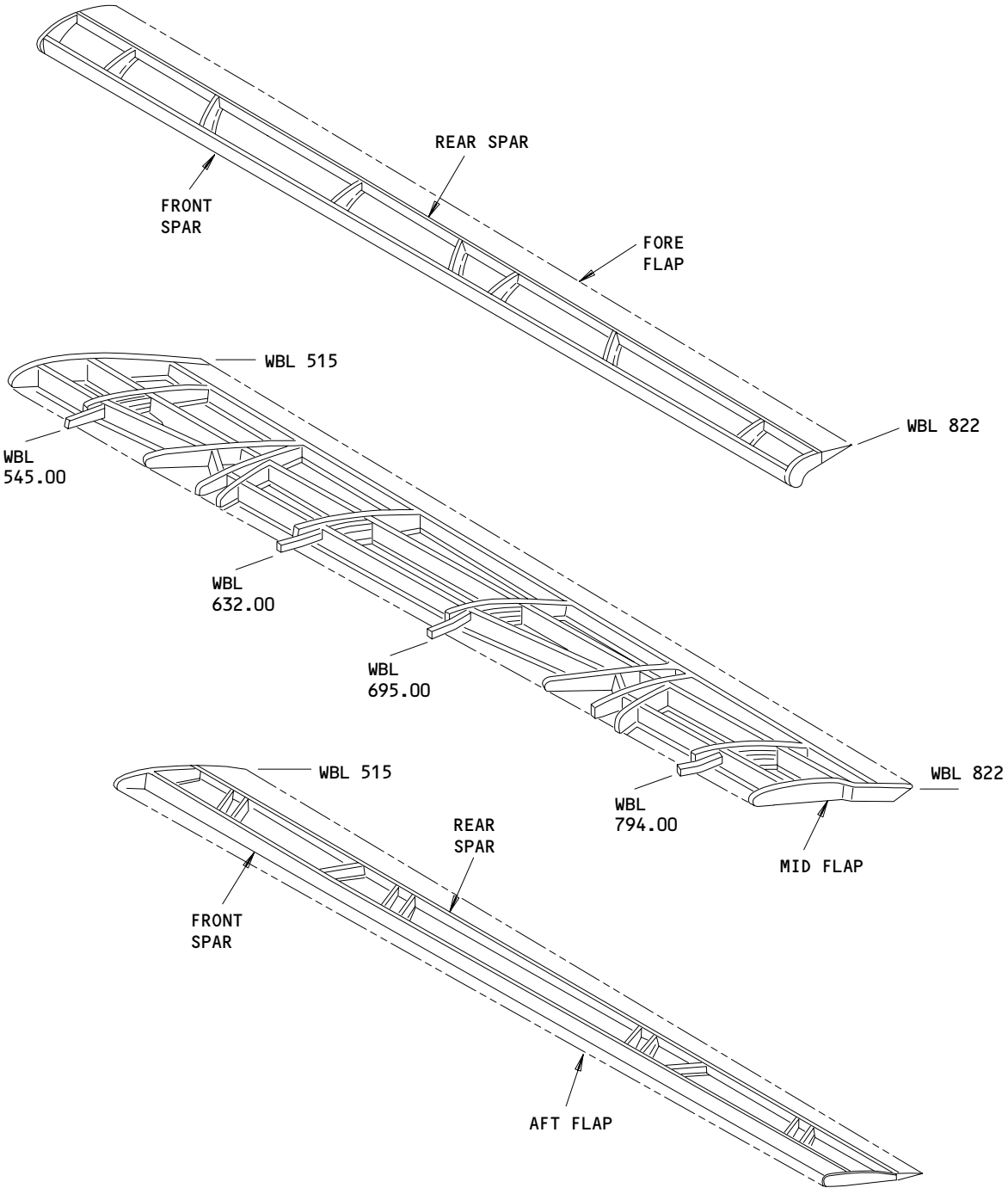


(FLAPS EXTENDED)
A-A



INBOARD FLAP
A

Trailing Edge Flaps
Figure 1 (Sheet 1)



OUTBOARD FLAP

(B)

Trailing Edge Flaps
Figure 1 (Sheet 2)

F. The aftflap structural frame utilizes two spanwise spars, inspar ribs, nose ribs, and a trailing edge wedge section. The front spar is a formed channel section and the rear spar is an extruded channel section. Both spars are made of aluminum alloy material. The nose ribs are formed from aluminum sheet. The trailing edge wedge is of fiberglass honeycomb construction. The inspar ribs have extruded aluminum upper chords, aluminum sheet webs, and extruded aluminum lower chords.

G. The inspar skin panels are constructed of aluminum honeycomb containing fiberglass cores.

3. Outboard Flaps (Fig. 1)

A. The outboard flaps are similar in design to the inboard flaps; however, the chord length for the outboard flaps tapers downward from inboard (approximately WBL 515.00) to outboard (WBL 822.00). Flap carriages are attached to the midflap segment at WBL 584.98 and 743.83. Flap actuator support fittings are installed on the midflap at WBL 594.98 and 753.83. The foreflap and aftflap have constant sections and are supported by fittings cantilevered from the midflap. Four foreflap support tracks are cantilevered forward from the leading edge of the midflap at WBL 545.00, 632.00, 695.00, and 794.00. Hoist attach points are provided on the upper surface of the midflap in the spar chord areas to lift the three flap sections as a unit. In general, the types of materials used to fabricate the structural components of the outboard flaps are the same as those of the inboard flap.

TRAILING EDGE FLAPS TO FUSELAGE SEALS - REMOVAL/INSTALLATION

1. General
   A. This section contains two tasks:
      (1) The removal of the flap seals for the trailing edge.
      (2) The installation of the flap seals for the trailing edge.

   TASK 57-52-01-004-001

2. Trailing Edge Flap Seals Removal
   A. References
      (1) AMM 27-51-00/201, Trailing Edge Flap System
      (2) AMM 27-51-02/401, Inboard Foreflap
   B. Access
      (1) Location Zone

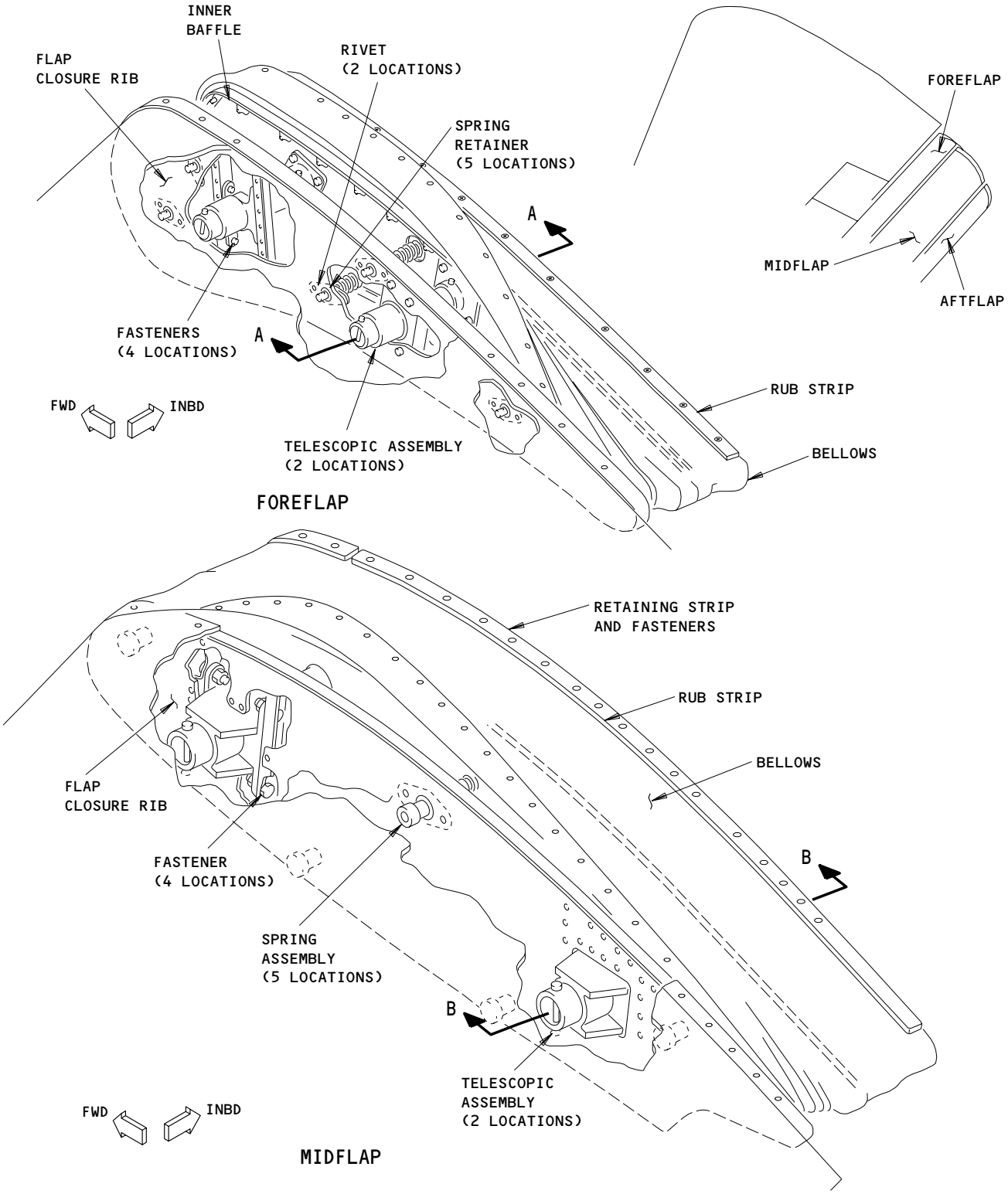
576	Inboard Flap Foreflap, Left
577	Inboard Flap Midflap, Left
578	Inboard Flap Aftflap, Left
676	Inboard Flap Foreflap, Right
677	Inboard Flap Midflap, Right
678	Inboard Flap Aftflap, Right

   C. Prepare for the removal of the seals.

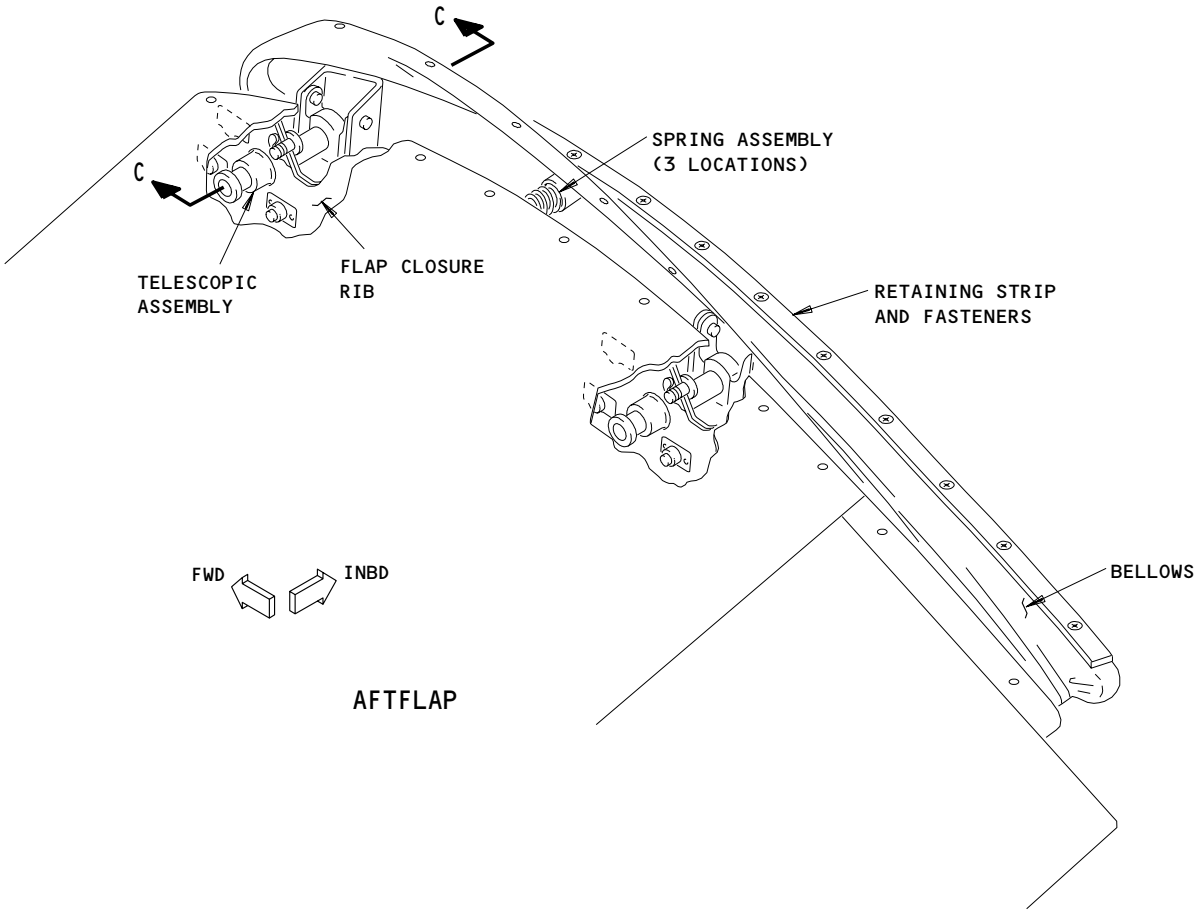
      S 864-004
      (1) Extend the flaps fully (AMM 27-51-00/201).

      S 014-005
      (2) If the foreflap seal will be removed, remove the foreflap (AMM 27-51-02/401).
   D. Remove the seals.

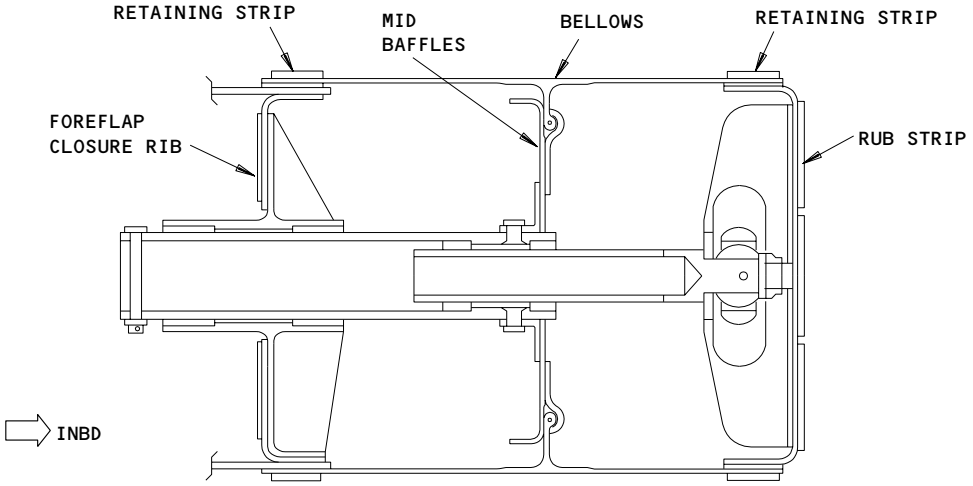
      S 024-006
      (1) Remove the aft flap seal.
         (a) Remove the fasteners from around the aft flap closure rib.



Inboard Trailing Edge Flap Seals Installation

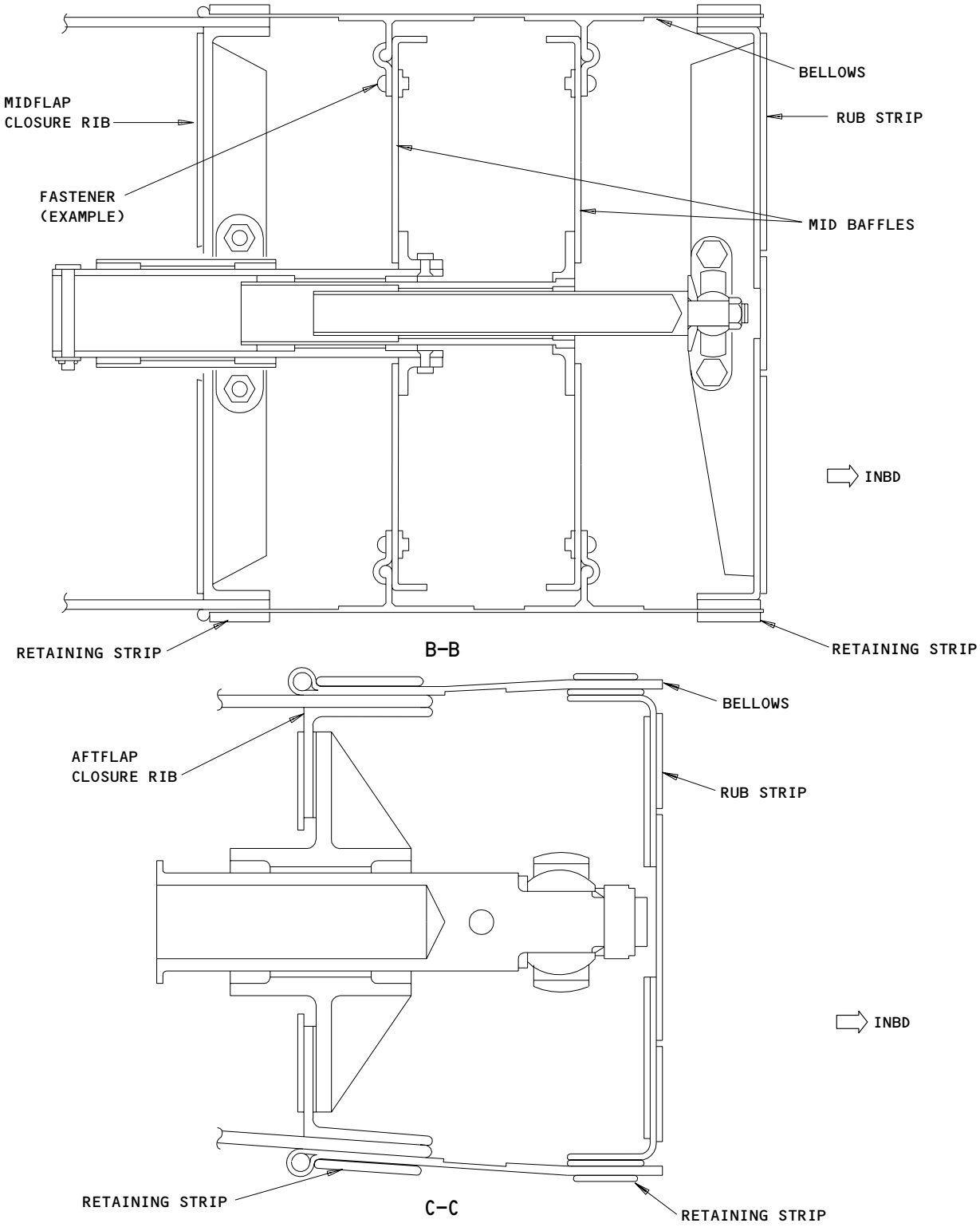


AFTFLAP



TELESCOPIC ASSEMBLY
A-A

Inboard Trailing Edge Flap Seals Installation
Figure 401 (Sheet 2)



Inboard Trailing Edge Flap Seals Installation
Figure 401 (Sheet 3)

(b) Remove the fasteners that hold the two telescopic assemblies to the closure rib of the aft flap.
(c) Remove the aft seal springs and the telescopic assemblies.
(d) Put a cover on the closure rib to prevent it from damage and the weather.

S 024-007

(2) Remove the midflap seal.
(a) Remove the fasteners from around the midflap closure rib that hold the seal retainer strips.
(b) Remove the retainer strips to get into the seal assembly.
(c) Drill the rivets that hold each spring retainer.
(d) Remove the fasteners that keep the two telescopic assemblies on the midflap.
(e) Remove the midflap seal assembly.
(f) Put a cover on the closure rib to prevent it from damage and the weather.

S 024-008

(3) Remove the foreflap seal.
(a) Remove the fasteners from around the foreflap closure rib that hold the seal retainer strip.
(b) Remove the retainer strips.
(c) Divide the velcro tapes that hold the seal in its position.
(d) Drill the rivets that hold each spring retainer.
(e) Remove the fasteners that keep the two telescopic assemblies on the foreflap.
(f) Remove the foreflap seal assembly.
(g) Put a cover on the closure rib to prevent it from damage and the weather.

TASK 57-52-01-404-009

3. Trailing Edge Flap Seals Installation

A. References

(1) AMM 27-51-00/201, Trailing Edge Flap System

(2) AMM 27-51-02/401, Inboard Foreflap

(3) IPC 57-52-51 Fig. 2 Aft Flap

B. Access

(1) Location Zone

576	Inboard Flap Foreflap, Left
577	Inboard Flap Midflap, Left
578	Inboard Flap Aftflap, Left
676	Inboard Flap Foreflap, Right
677	Inboard Flap Midflap, Right
678	Inboard Flap Aftflap, Right

C. Procedure

S 424-010

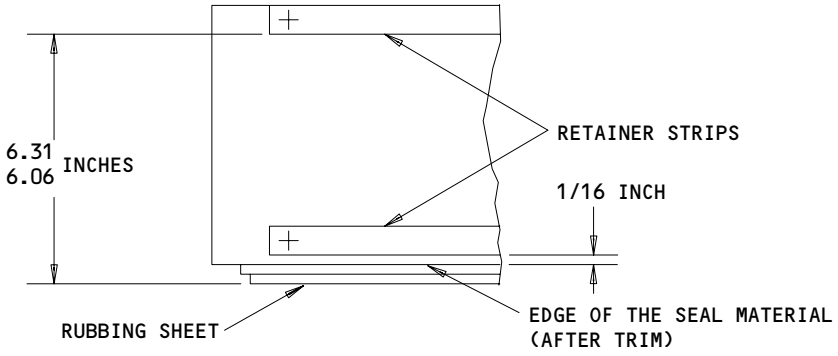
(1) Install the aft flap seal.
   (a) Remove the cover from the aft flap closure rib (if installed).
   (b) Install the springs in the spring tubes.
   (c) Put the aft flap seal assembly in its position.
   (d) Install the fasteners that hold each telescopic assembly.
   (e) Install the retaining strips with fasteners around the outer side of the aft flap closure rib to hold the bellow seal in its position.
   (f) Cut the seal (Fig. 402).

S 424-011

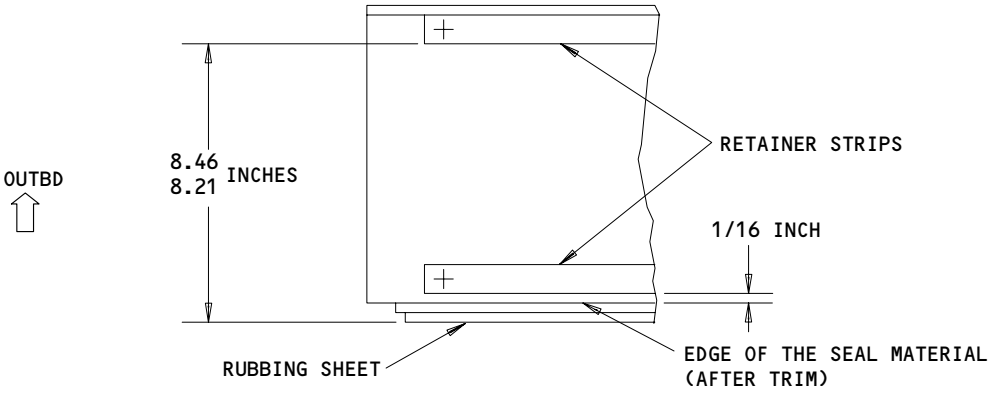
(2) Install the midflap seal.
   (a) Remove the cover from the midflap closure rib (if installed).
   (b) Put the midflap seal assembly in its position.
   (c) Install the fasteners that hold each telescopic assembly.
   (d) Install the spring retainers with rivets.
   (e) Install the retaining strips with fasteners around the outer side of the midflap closure rib.
   (f) Cut the seal (Fig. 402).

S 424-012

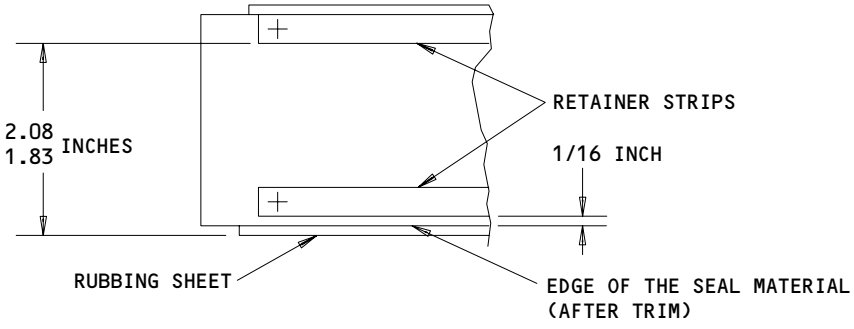
(3) Install the foreflap seal.
   (a) Remove the cover from the aft flap closure rib (if installed).



FOREFLAP SEAL



MIDFLAP SEAL



AFTFLAP SEAL

Inboard Trailing Edge Flap Seals Trim Dimensions
Figure 402

(b) Put the foreflap seal assembly in its position.
(c) Install the fasteners that hold each telescopic assembly.
(d) Install the spring retainers with rivets.
(e) Connect the Velcro tapes to put the foreflap seal in its position.
(f) Install the retaining strips with fasteners around the outer side of the foreflap closure rib.
(g) Cut the seal (Fig. 402).

D. Put the airplane to its usual condition.

S 414-013

(1) Install the foreflap, if removed (AMM 27-51-02/401).

S 864-014

(2) Retract the flaps (AMM 27-51-00/201).

TRAILING EDGE FLAPS TO FUSELAGE SEALS - APPROVED REPAIRS

1. General
   A. This section contains these four tasks:
      (1) The permanent repair of the bellows on a trailing edge flap to the fuselage seal.
      (2) The replacement of the fabric bellows on a seal.
      (3) The replacement of a rubstrip on a seal.
      (4) The replacement of the velcro tape strip on a seal.

TASK 57-52-01-848-044

2. Prepare for the Repair of the Seals
   A. Procedure

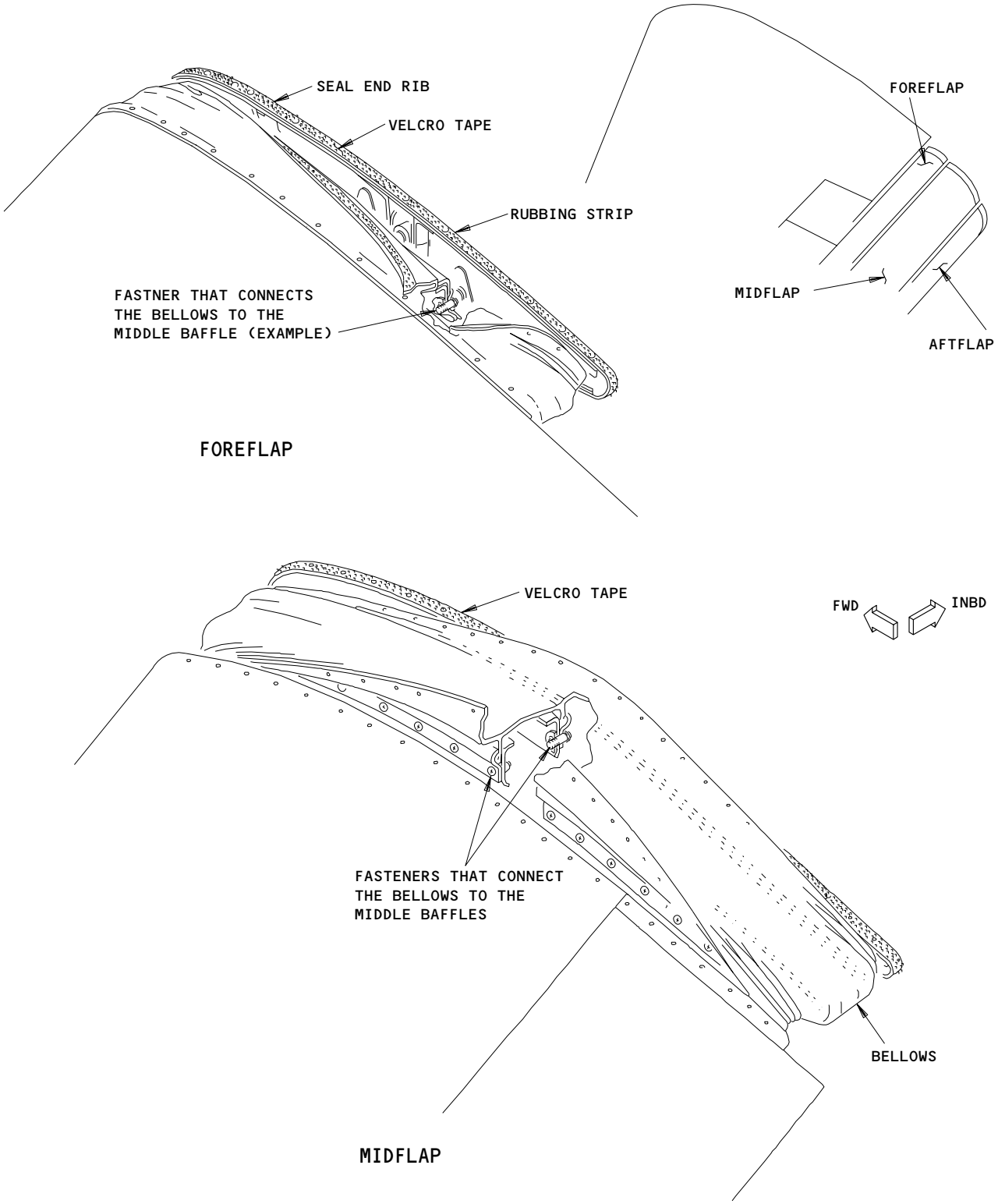
      S 868-050
      (1) Extend the flaps fully (AMM 27-51-00/201).

      S 028-051
      (2) If the foreflap seal will be repaired, remove the foreflap (AMM 27-51-02/401).

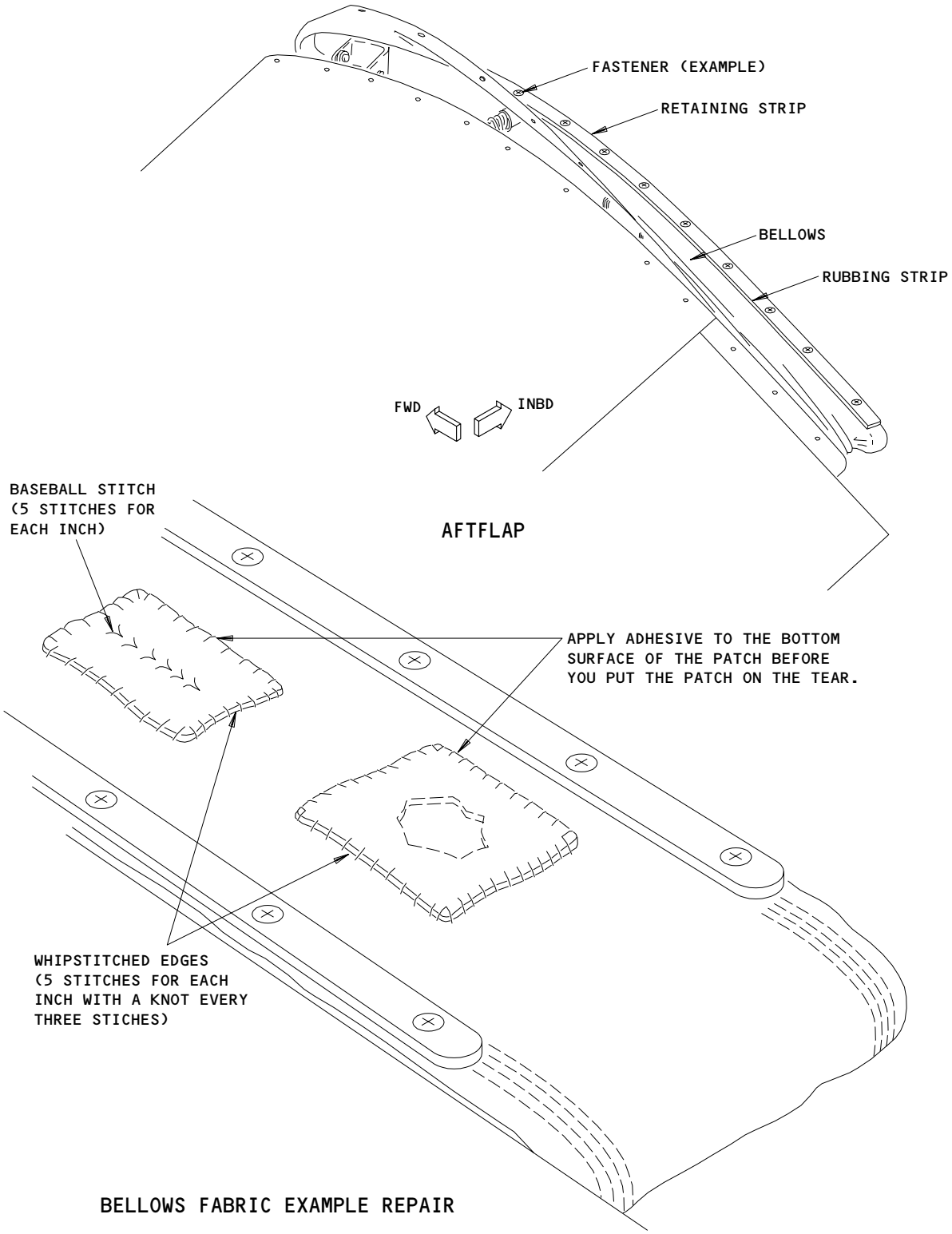
TASK 57-52-01-308-001

3. Repair Small Cuts or Tears in Bellows Fabric (Fig. 801)
   A. Consumable Materials
      (1) G00030 Fabric - Carolon style 1032, 11.5 oz, Dacron
          Warwick Mills 301 Turnpike Rd Ipswich, NH 03071
          (603) 878-1565 Ext 291
      (2) Dacron Fabric - Carolon 1209, 11.5 oz, Dacron (Alternative)
          Warwick Mills 9141 (above)
      (3) Dacron Fabric - Carolon 1234, 11.5 oz (Alternative)
          Warwick Mills 9141 (Above)
      (4) G00159 Thread - dacron type 1 class 1, size F, white, V-T-285
      (5) B00062 Solvent - O-A-51, Acetone
      (6) A00027 Adhesive - BAC5010, type 60
   B. Access
      (1) Location Zones
          576 Inboard Flap Foreflap, Left
          577 Inboard Flap Midflap, Left
          578 Inboard Flap Aftflap, Left
          676 Inboard Flap Foreflap, Right
          677 Inboard Flap Midflap, Right
          678 Inboard Flap Aftflap, Right

   C. Procedure



Inboard Trailing Edge Flap Seals Installation
Figure 801 (Sheet 1)



Inboard Trailing Edge Flap Seals Installation
Figure 801 (Sheet 2)

S 918-052
(1) Cut a patch of the same material that is used on the bellows.

S 118-006
(2) Clean the surface around the tear with solvent.

S 168-053
(3) Rub the surface around the tear until it is dry.

S 348-007

CAUTION: DO NOT CATCH AIR IN THE MATERIAL. IF AIR IS CAUGHT IN THE MATERIAL, THEN THE SEAL MAY BE UNSATISFACTORY.

(4) Apply the adhesive to the full patch surface over the tear.

NOTE: Use the vendor's instructions to prepare the adhesive. Do not catch air in the material.

S 358-008
(5) Whip-stitch the edges with thread.

NOTE: Put a knot after every three stitches.

S 888-054

WARNING: DO NOT USE TOO MUCH HEAT TO CURE THE PATCH. TOO MUCH HEAT CAN CAUSE A FIRE.

CAUTION: MAKE SURE THE HEAT IS APPLIED SMOOTHLY AND THE TEMPERATURE DOES NOT EXCEED 120°F. IF THE HEAT IS NOT APPLIED SMOOTHLY AND IS ABOVE 120°F, THEN THE BOND CAN BECOME WEAK.

(6) If the ambient temperature is low, then increase the temperature of the repaired area to help curing.

NOTE: A cure time of one hour is necessary at 70°F.

TASK 57-52-01-808-012

4. Replace Bellows

A. Access

(1) Location Zones

576 Inboard Flap Foreflap, Left
577 Inboard Flap Midflap, Left
578 Inboard Flap Aftflap, Left
676 Inboard Flap Foreflap, Right
677 Inboard Flap Midflap, Right
678 Inboard Flap Aftflap, Right

B. Procedure

S 038-055

(1) Do the Prepare for the Repair of the Seals procedure.

S 028-016

(2) Remove the aft flap seal bellows.
(a) Remove the fasteners from the edge of the aftflap closure rib and the seal end rib.
(b) Remove the retainer strips.
(c) Divide the velcro tape that holds the seal in position.

S 428-017

(3) Install aftflap seal bellows
(a) Put the bellows seal into its position.
(b) Attach the velcro tapes to keep the bellows seal in its position.
(c) Install the retaining strips with fasteners around the edge of the seal.

S 028-018

(4) Remove midflap seal bellows.
(a) Remove the fasteners from around the edge of the midflap closure rib and the seal end rib.
(b) Remove the retainer strips.
(c) Divide the Velcro tape that holds the bellows seal in its position.
(d) Loosen the fasteners from around the edge of the two inner baffles to release the bellows.

S 428-019

(5) Install midflap seal bellows
(a) Put the bellows seal into its position.
(b) Attach the bellows seal to the inner baffles.
(c) Attach the Velcro tape to keep the bellows seal in its position.
(d) Install the retaining strips with fasteners around the edge of the seal.

S 028-020

(6) Remove foreflap seal bellows.
  (a) Remove the fasteners from around the edge of the foreflap closure rib and the seal end rib.
  (b) Remove the retainer strips.
  (c) Divide the Velcro tape that holds the bellows seal in its position.
  (d) Loosen the fasteners from around the edge of the inner baffle to release the bellows.

S 428-021

(7) Install aftflap seal bellows
  (a) Put the bellows seal into its position.
  (b) Attach the bellows seal to the inner baffle.
  (c) Attach the Velcro tapes to keep the bellows seal in its position.
  (d) Install the retaining strips with fasteners around the outer edge of the seal.

S 868-056

(8) Do the Put the Airplane Back to its Usual Condition procedure.

TASK 57-52-01-688-025

5. Replace Seal Rubstrips

NOTE: The replacement of the aft flap and the midflap rubstrips can be done on the airplane. The foreflap must be removed to replace the foreflap rubstrip.

A. References
  (1) AMM 51-51-00/801, Bonded Rub Pads

  (2) IPC 57-52-51 Fig. 2 Aft Flap

B. Access
  (1) Location Zones
    576 Inboard Flap Foreflap, Left
    577 Inboard Flap Midflap, Left
    578 Inboard Flap Aftflap, Left
    676 Inboard Flap Foreflap, Right
    677 Inboard Flap Midflap, Right
    678 Inboard Flap Aftflap, Right

C. Procedure

S 848-045
(1) Do the Prepare for the Repair of the Seals procedure.

S 038-030
(2) Remove the rubstrip from the seal end rib.

S 118-031
(3) Clean the mating surfaces of the seal end rib (AMM 51-51-00/801).

S 348-032

WARNING: DO NOT USE TOO MUCH HEAT TO CURE THE PATCH. TOO MUCH HEAT CAN CAUSE A FIRE.

CAUTION: MAKE SURE THE HEAT IS APPLIED SMOOTHLY AND THE TEMPERATURE DOES NOT EXCEED 120°F. IF THE HEAT IS NOT APPLIED SMOOTHLY AND IS ABOVE 120°F, THEN THE BOND CAN BECOME WEAK.

(4) Bond a new rubbing sheet to the rib surface of the seal end (AMM 51-51-00/801).

TASK 57-52-01-808-034

6. Replace Velcro Tape (Sealing Strip)
A. References
(1) AMM 51-51-00/801, Bonded Rub Pads
(2) IPC 57-52-51 Fig. 2
B. Access
(1) Location Zone
576 Inboard Flap Foreflap, Left
577 Inboard Flap Midflap, Left
578 Inboard Flap Aftflap, Left
676 Inboard Flap Foreflap, Right
677 Inboard Flap Midflap, Right
678 Inboard Flap Aftflap, Right

C. Procedure

S 848-046
(1) Do the Prepare for the Repair of the Seals procedure.

S 028-038
(2) Remove the damaged part of the velcro strip retainer.

S 118-039
(3) Clean the mating surface (AMM 51-51-00/801).

S 348-040
(4) Bond the new velcro tape (AMM 51-51-00/801).

TASK 57-52-01-848-047

7. Put the Airplane Back to its Usual Condition

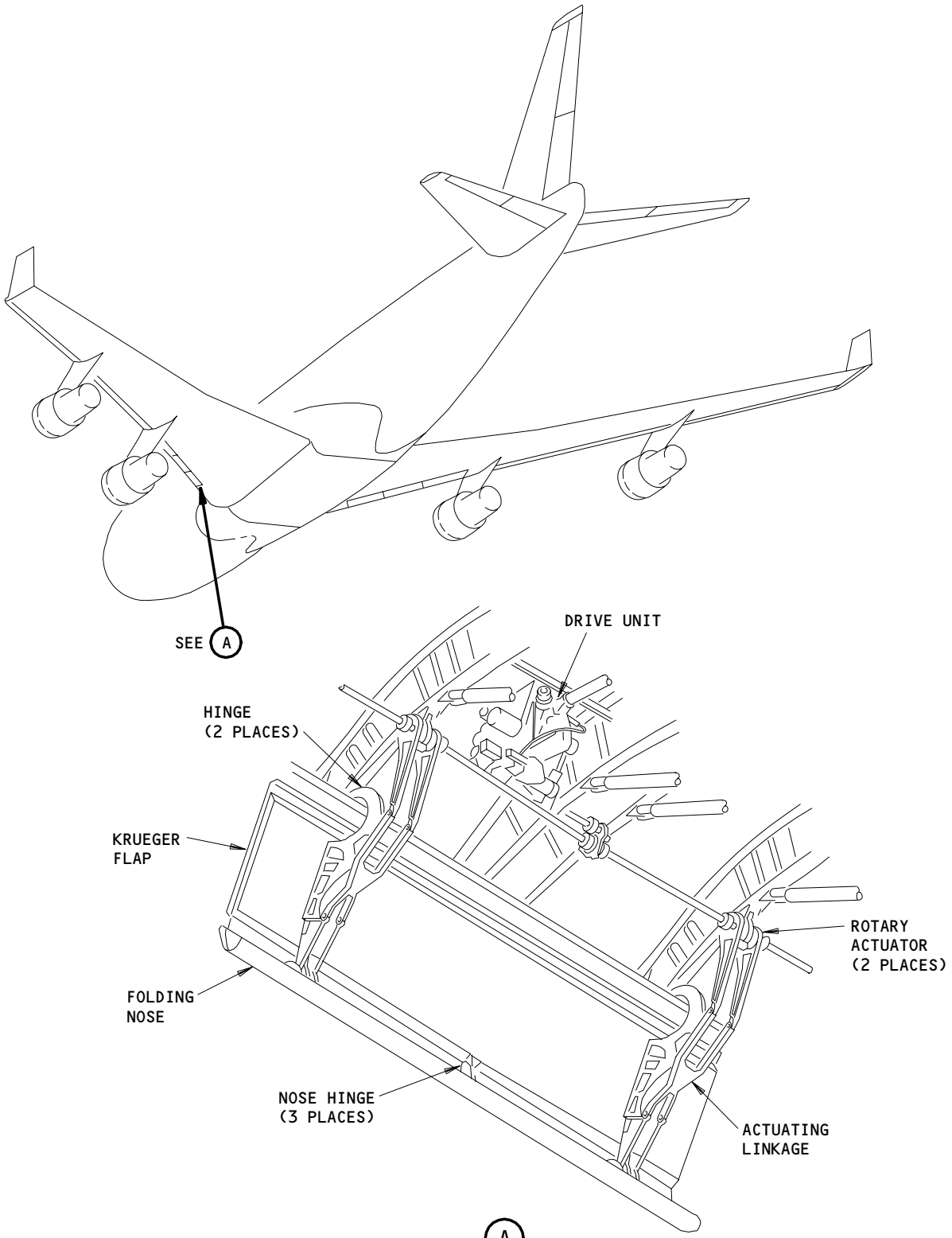
A. Procedure

S 428-049
(1) If the foreflap was removed, install the foreflap (AMM 27-51-02/401).

S 868-048
(2) Retract the flaps (AMM 27-51-00/201).

LEADING EDGE KRUEGER FLAPS - DESCRIPTION AND OPERATION

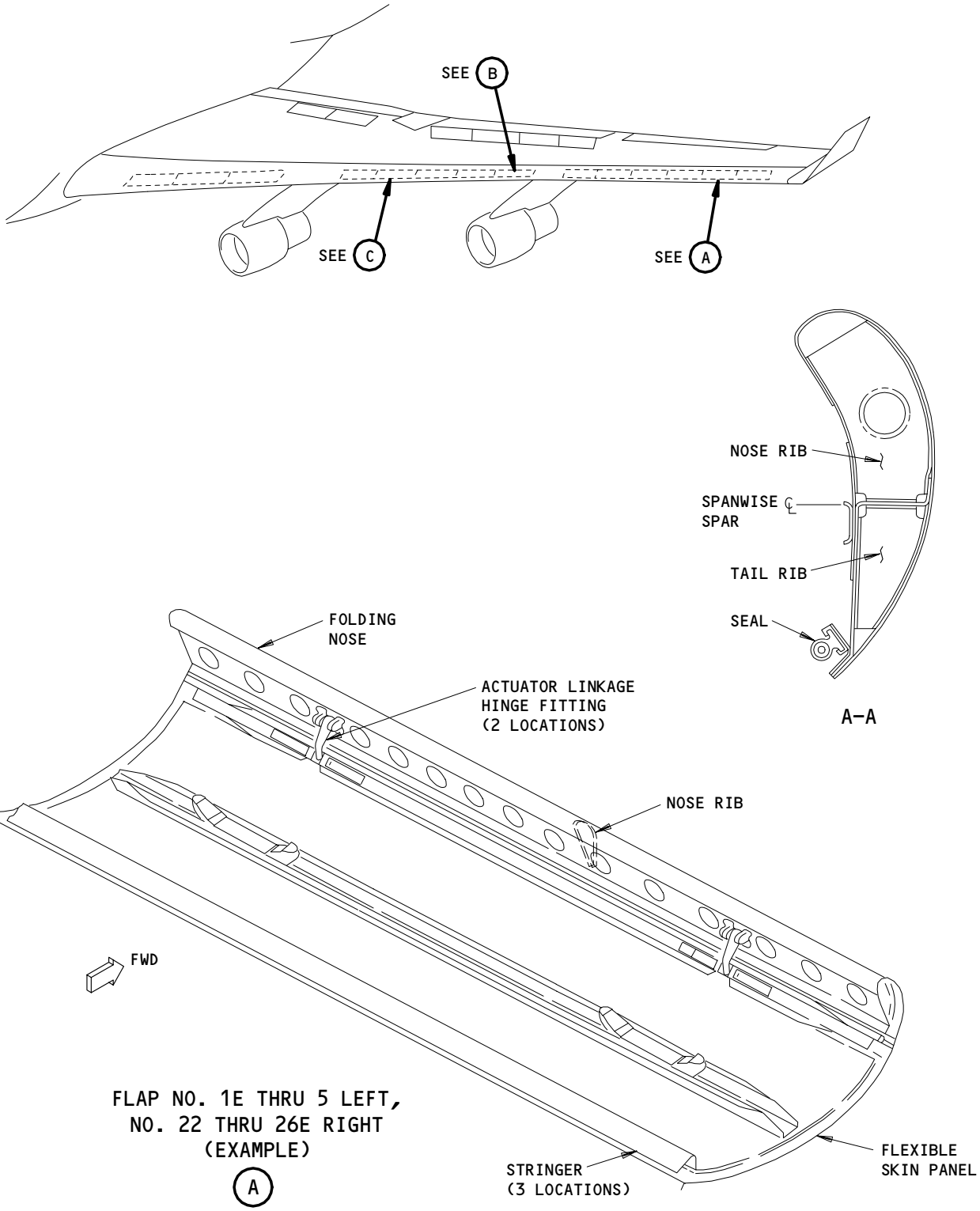
1. General (Fig. 1)
   A. The leading edge Krueger flaps are auxiliary control surfaces which, in conjunction with the other leading and trailing edge flaps, provide additional lift during takeoff and landing by changing the wing camber and area. The flaps are housed in the lower inboard portion of the wing leading edge, and consist of three sections or segments which operate as a group. The three segments are of similar configuration except that the outboard segment has a cutout to clear the inboard nacelle structure. They are located between inboard leading edge stations 330.00 and 630.46.
   B. Pneumatically driven units operate the flaps through a torque tube drive and transmission system. The flaps are controlled by position switches installed on the trailing edge flaps. The flaps are hinged at the forward end and incorporate a folding nose section which extends to increase effective area.
2. Krueger Flap Structure
   A. The structure of the Krueger flaps consists of a front spar, rear spar, inspar ribs and a folding fairing or nose assembly.
      (1) The front spar and ribs are made of sheet aluminum formed into C-section members.
      (2) The rear spar is machined from extruded aluminum.
      (3) The folding nose assembly is made up of sheet aluminum ribs with sheet aluminum skin.
   B. The skin of the Krueger flaps is made of fiberglass and attached to the spars with hi-locks.
   C. The hinge fittings are made of machined aluminum forgings and are bolted to the skin panel and spars.
   D. For a description of the operation of the Krueger flaps, refer to 27-81-00/001.
   E. Aerodynamic seals on the flap segments eliminate gaps when the flaps are in the retracted position.



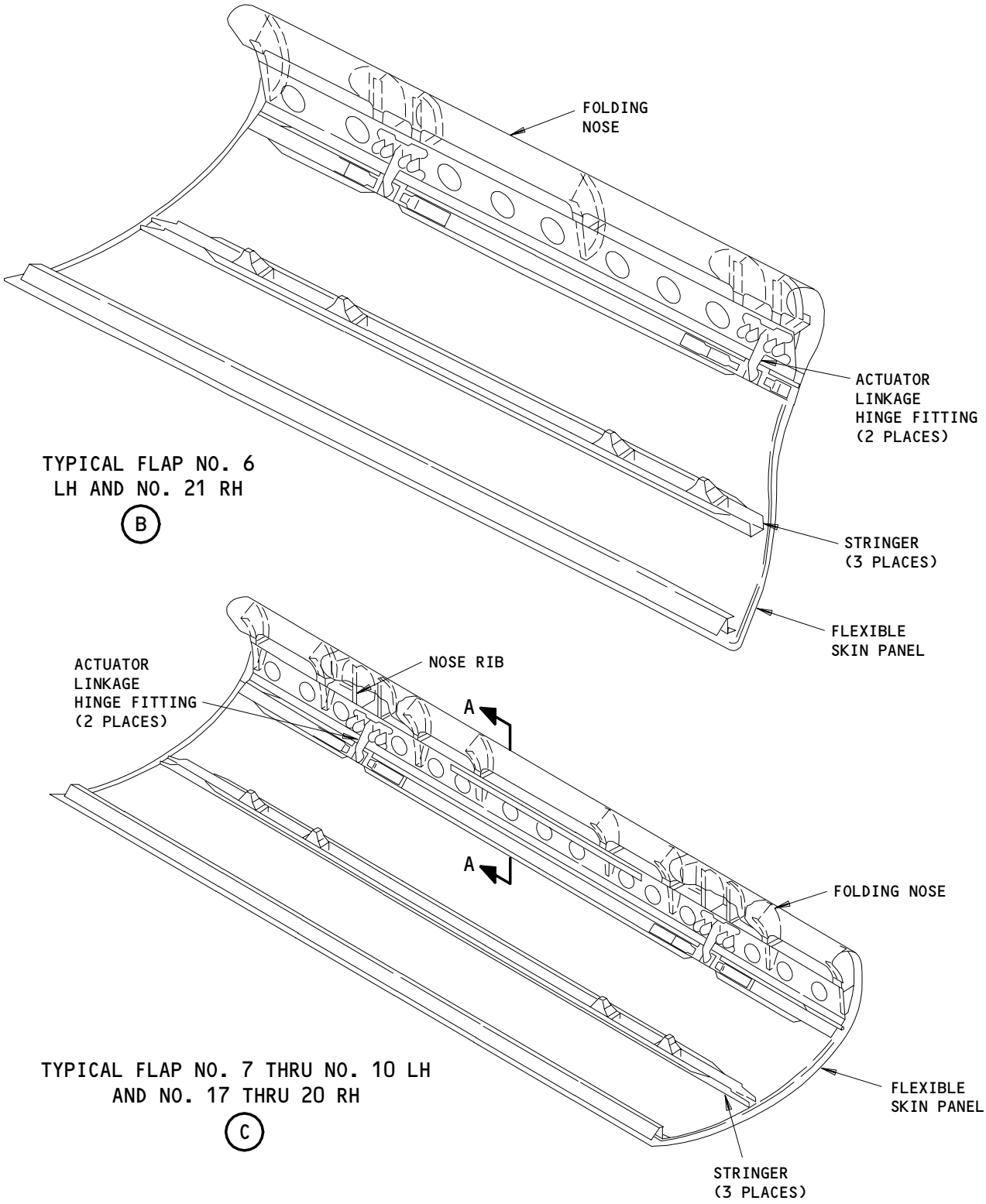
Krueger Flap
Figure 1

LEADING EDGE VARIABLE CAMBER FLAPS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The variable camber flaps are auxiliary control surfaces installed in the lower portion of the wing leading edge to increase the aerodynamic lift of the wing by changing the wing camber. Incorporation of a flexible surface for the flaps provides a contour which improves the wing lift efficiency.
   B. The flaps consist of one group of five segments and one group of six segments for each outboard wing. The segments are identified in numerical sequence beginning with the outboard segment of the left outboard wing and progressing to the right outboard wing outboard segment. Segments No. 1E thru 5 and No. 22 thru 26E are located outboard of the outboard nacelles on the left and right outboard wings respectively. Segments No. 6 thru 10 and No. 17 thru 21 are located between the engine nacelles of the left and right outboard wings respectively. Each segment is supported by two linkages which extend and contour the flap and extend the folding nose section.
   C. The structural framework of the variable camber flaps consists of spanwise stringers supporting a flexible skin panel, linkage support fittings, and a folding nose assembly.
   D. The stringers are installed spanwise on the skin panels along the fore and aft edges and in the center. The forward stringer (flaps retracted) is a modified J-section member machined from an aluminum extrusion for flap segments No. 6 thru 10 (and opposites), and an aluminum sheet formed member for segments No. 1A thru 5 (and opposites). The center stringers are extruded hat-section members of aluminum alloy. The aft stringers are basically tubular-type members fabricated from extruded rectangular tubes or mated channel sections of aluminum alloy.
   E. The flexible skin panels are of laminated fiberglass construction. Actuator linkage hinge fittings are installed at two places on each stringer near the ends of each segment. Up-stop fittings are installed adjacent to the hinge fittings on the center stringers. The hinge and up-stop fittings are machined from aluminum alloy.
   F. The folding nose section structure utilizes a spanwise spar and chordwise nose and tail ribs. The spar is a Z-section member formed from aluminum alloy sheet. Flanged lightening holes are incorporated in the nose rib web. The ribs are formed from aluminum alloy sheet and are attached to the spar. The folding nose section skin is a contoured aluminum alloy sheet. The folding nose assembly is attached to the main section of each flap by means of hinge fittings fastened to the Z-spar near the ends of the nose section. Two additional lugs on each hinge fitting provide attachments for the folding nose actuation linkages. The hinge fittings are machined from aluminum forgings. Seals are provided to improve the aerodynamic efficiency of the leading edge variable camber flaps in the faired position by eliminating gaps between flaps and adjacent structure.



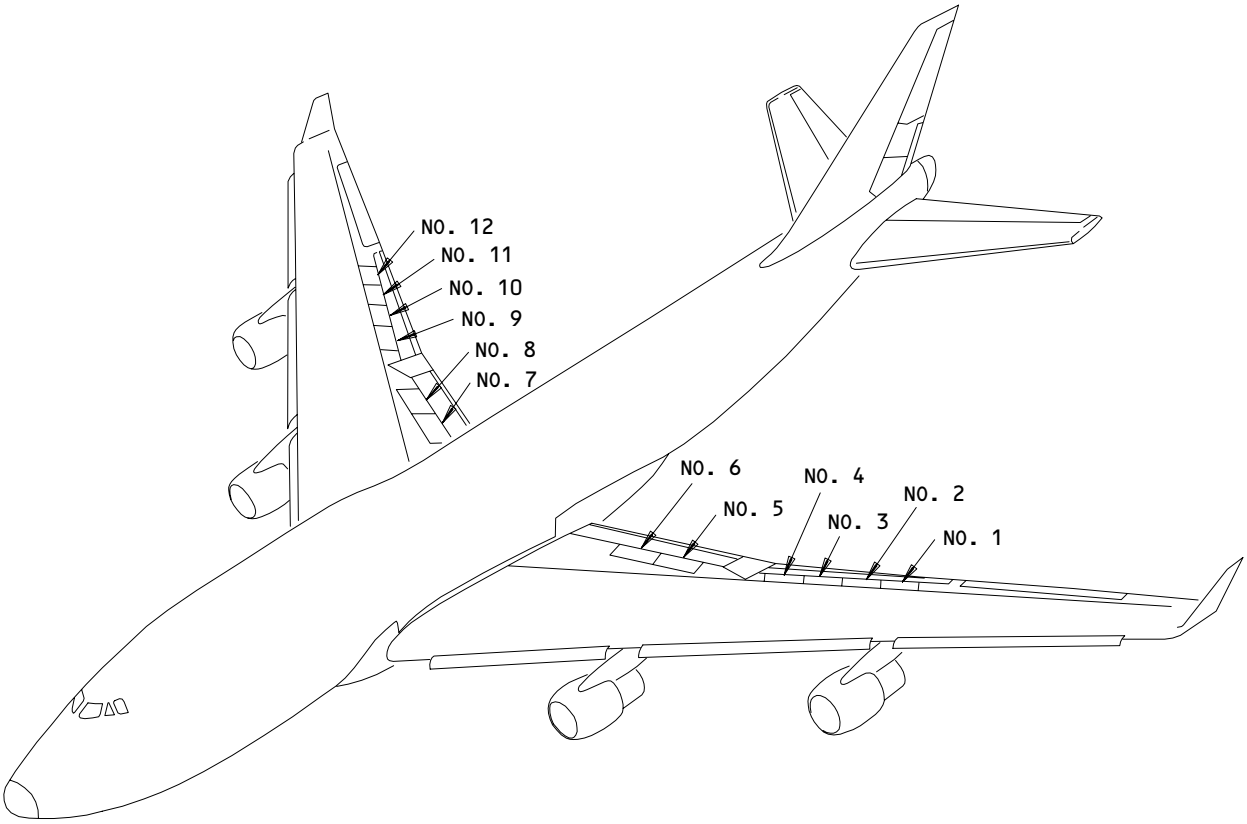
Variable Camber Leading Edge Flaps Structure
Figure 1 (Sheet 1)



Variable Camber Leading Edge Flaps Structure
Figure 1 (Sheet 2)

SPOILERS - DESCRIPTION AND OPERATION

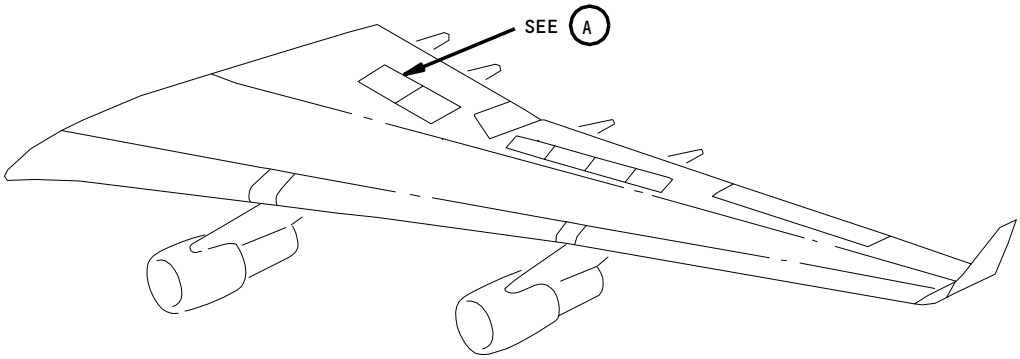
1. General (Fig. 1)
   A. The spoilers are hydraulically actuated control surfaces hinged to the upper surface on both sides of the wing. A group of four spoilers is located between the engine nacelles on each outboard wing and is supported by fittings attached to the wing rear spar. Another group of two spoilers is installed just inboard of the inboard engine nacelle on each wing and is supported by fittings attached to the trailing edge beam. The spoilers are identified in numerical sequence beginning with the outboard spoiler on the left outboard wing and progressing to the outboard spoiler on the right outboard wing.
   B. In the retracted position, the spoilers fit into spoiler wells and fair with the wing trailing edge upper surface. Each spoiler has a hydraulic power control package which can pivot the spoiler through a range of 45 degrees.
2. Ground Spoilers
   A. Spoilers No. 6 and 7 are ground spoilers and are used only to assist the flight spoilers in braking after touchdown.
   B. The ground spoilers are of monocoque design and consist basically of aluminum alloy bonded honeycomb structure attached to the spar. Each spoiler has four hinge points.
   C. Refer to 27-62-00 for additional information.
3. Flight Spoilers
   A. Spoilers No. 1 thru 4 and No. 9 thru 12 are the outboard flight spoilers of the left and right wings respectively; spoilers No. 5 and 8 are the inboard flight spoilers on the left and right outboard wings respectively. The flight spoilers are auxiliary flight control surfaces, since they supplement the ailerons in providing lateral control of the airplane. They also serve as speed brakes to reduce airspeed in flight and to aid in braking after touchdown.
   B. Construction and attachment is similar to that of the ground spoilers.
   C. Refer to 27-61-00 for additional information.

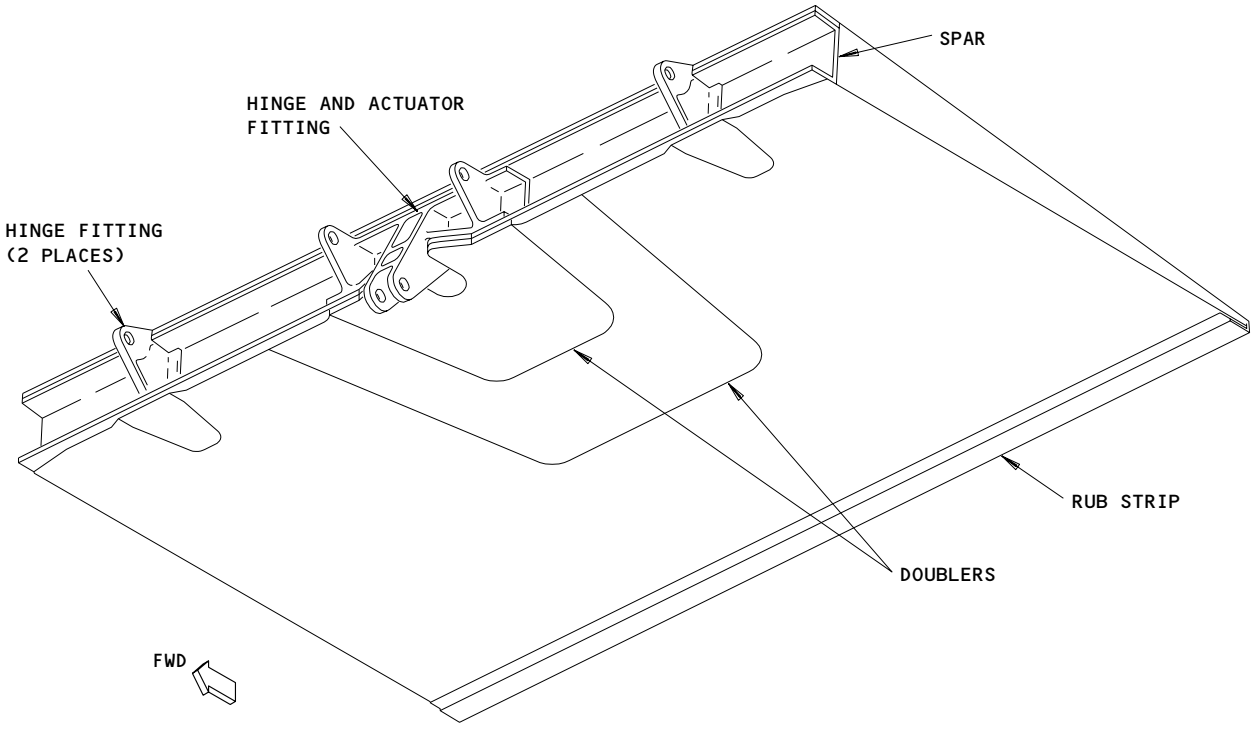


Spoiler Location
Figure 1

GROUND SPOILERS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. There are two ground spoilers, one on each wing. They are the spoilers closest to the fuselage and are attached by hinge fittings to the upper portion of the wing trailing edge beam. Spoiler No. 6 is located on the left outboard wing and No. 7 is on the right outboard wing. They are interchangeable (Ref 57-42-00).
   B. The function of the ground spoilers is to assist the flight spoilers as speed brakes by increasing aerodynamic drag and reducing lift after airplane touchdown. Each spoiler is positioned by a hydraulic control package through a travel range of 45 degrees from the faired position. Spoiler wells in the wing trailing edge upper surface structure house the spoilers in the retracted position so that the spoilers fair with the upper skin.
2. Ground Spoiler Structure
   A. Each spoiler is of bonded construction, consisting primarily of a spanwise leading edge spar, a wedge-shaped trailing edge section, and three hinge support fittings.
   B. The three-piece spar consists of an aluminum alloy extruded channel at each end, spliced into the center (hinge and control package) fitting.
   C. The trailing edge section is of honeycomb sandwich construction utilizing an aluminum alloy core and face sheets also of aluminum alloy. Doublers of aluminum alloy are bonded to the face sheets in the vicinity of the hinge fittings to provide reinforcement. A teflon-coated phenolic rub strip is bonded to the lower skin at the trailing edge to minimize chafing between the spoiler and spoiler well in the faired position. The closure ribs consist of an aluminum alloy web and upper chord and a lower chord of fiberglass laminate.
   D. The four aluminum alloy hinge fittings with self-aligning bearings are attached to the spar. The center (hinge and control package) fitting provides an attaching point for the hydraulic control package as well as two hinge points. The outer hinge fittings have slotted bearing holes to allow for structural deflection without overloading the bearings.
   E. Aerodynamic seals are installed on the inboard and outboard edges and the leading edge to eliminate air gaps.





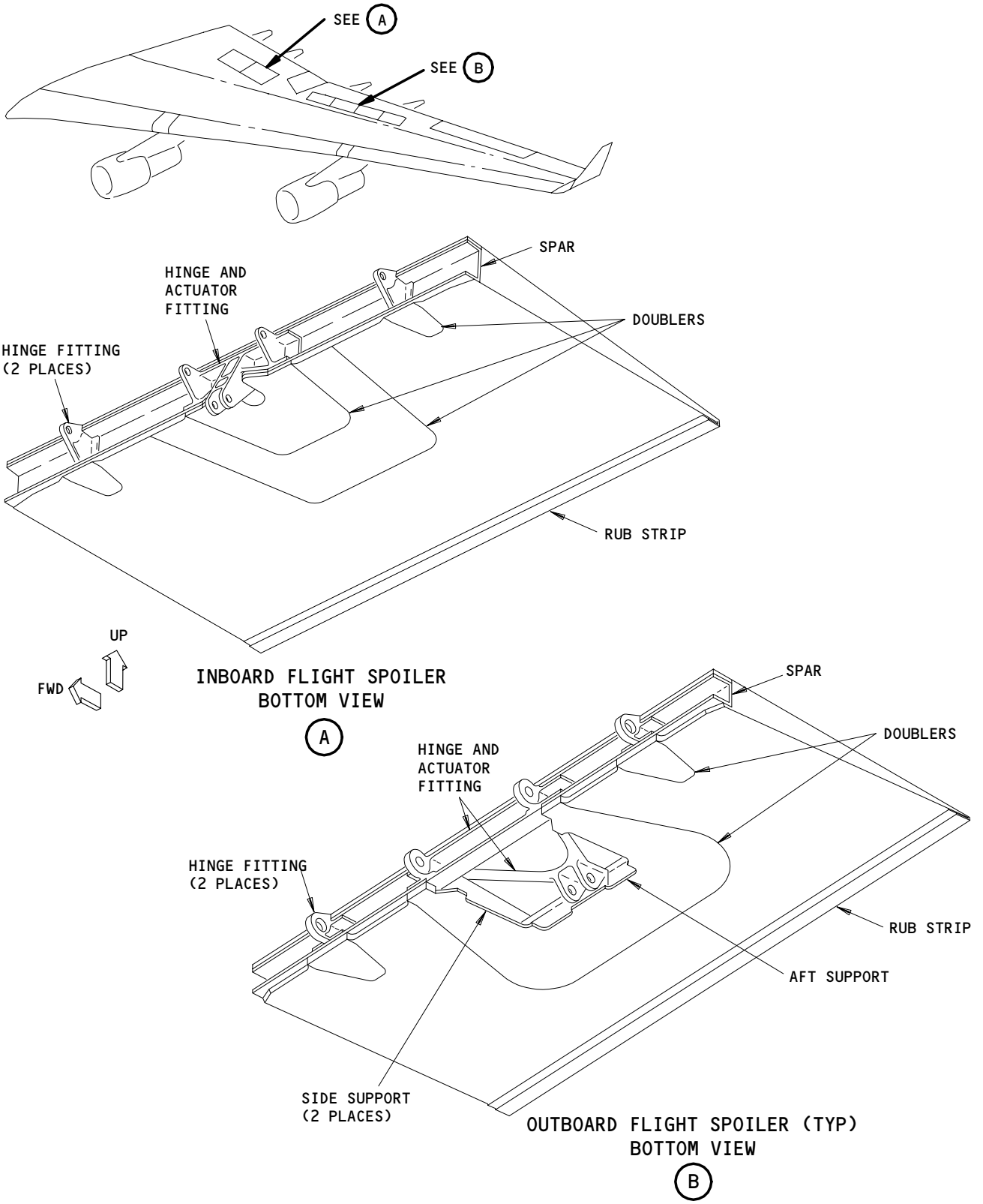
GROUND SPOILERS (TYP)
BOTTOM VIEW

A

Ground Spoilers
Figure 1

FLIGHT SPOILERS - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. There are 10 flight spoilers, 5 on each outboard wing. Four are in a group on each side of the airplane between the engine nacelles, the fifth is located inboard of the inboard nacelle. Spoilers No. 1 through 5 are located on the left side, and spoilers No. 8 through 12 are located on the right side. The outboard four spoilers are attached to the wing rear spar by hinge fittings. The inboard flight spoiler attaches to hinge support fittings on the trailing edge support beam. Spoilers No. 1 through 4 and No. 9 through 12 are interchangeable; and spoilers No. 5 and 8 are interchangeable (Ref 57-42-00, Description and Operation).
   B. The flight spoilers serve as auxiliary flight control surfaces to assist the ailerons in lateral control of the airplane, and as speed brakes in flight and after touchdown. Each spoiler is pivoted by a hydraulic control package through a travel range of 45 degrees. Wells are provided in the wing trailing edge upper surface structure so that the spoilers fair in the retracted position.
2. Inboard Flight Spoiler Structure (Fig. 1)
   A. Each inboard flight spoiler (No. 5 and 8) is of bonded construction, consisting primarily of a spanwise leading edge spar, a wedge-shaped trailing edge section, and three hinge support fittings.
   B. The three-piece spar consists of an aluminum alloy extruded channel at each end spliced into the center (hinge and control package) fitting.
   C. The trailing edge section is of honeycomb sandwich construction utilizing an aluminum alloy core and face sheets also of aluminum alloy. Doublers of aluminum alloy are bonded to the face sheets in the vicinity of the hinge fittings to provide reinforcement. A teflon-coated phenolic rub strip is bonded to the lower skin at the trailing edge to minimize chafing between the spoiler and spoiler well in the faired position. The closure ribs consist of an aluminum alloy web and upper chord and a lower chord of fiberglass laminate.
   D. The four aluminum alloy hinge fittings with self-aligning bearings are attached to the spar. The center fitting provides an attaching point for the control package as well as two hinge points. The outer hinge fittings have slotted bearing holes to allow for structural deflection without overloading the bearings.
   E. Aerodynamic seals are installed on the inboard and outboard edges and the leading edge to eliminate air gaps.



Flight Spoilers
Figure 1

3. Outboard Flight Spoiler Structure (Fig. 1)
   A. The outboard flight spoilers, No. 1 thru 4 and No. 9 thru 12, are of similar construction to that of the inboard flight spoilers except for the center (hinge and control package) fitting. The point of attachment for the control package is aft of the hinge centerline and in a cavity in the honeycomb. A rectangular box structure strengthens the spoiler in this area and is composed of the front spar portion of the center fitting, two side supports (spliced angles), and the aft support (channel). All are part of the bonded assembly.