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CHAPTER 53

FUSELAGE

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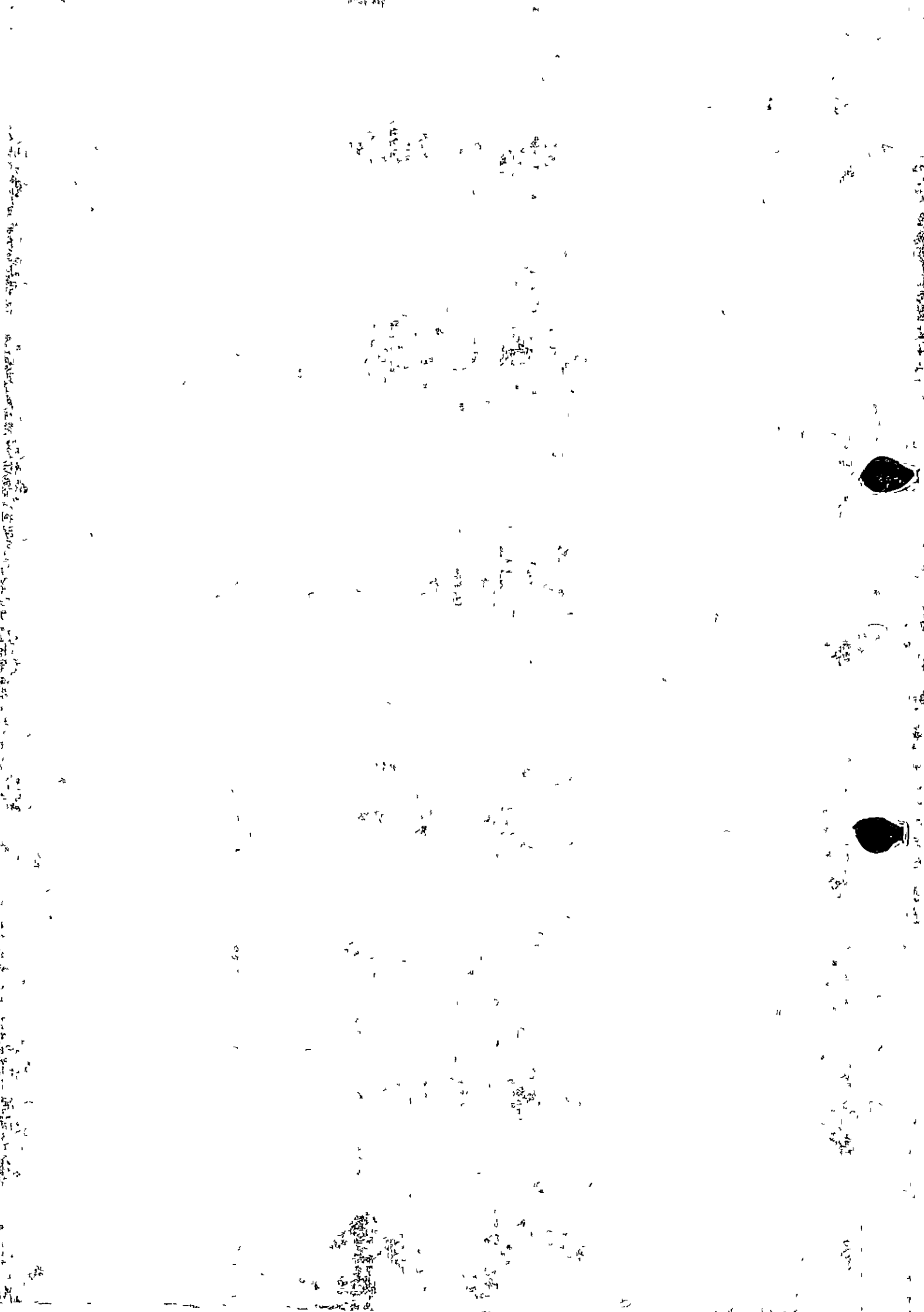
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FUSELAGE - DESCRIPTION AND OPERATION

1. General

- A. In the fuselage structure, attention has been paid to both fail-safe abilities and the need for a long fatigue life. The structural design provides alternate load paths so that should one member fail, the load can be safely taken by adjoining members. Where loads have to be taken by a single member, such as the pilots' window frame center post, that member is of at least two pieces so that a crack will initially be confined to half of the member. The control of crack growth in the fuselage structure is accomplished in two ways: first, by using materials with a slow crack propagation rate; and second, by providing tear stoppers in the critical structural areas. The use of 2024 material for fuselage skins, and internal skin doublers at frame locations, are examples of these crack growth controls.
- B. The fuselage may be considered to be divided into three major sections; the control cabin, the main cabin, and the tail compartment. The fuselage is of a semi-monocoque construction utilizing clad skin and longitudinal hat section stringer (figures 1 and 2). The shell is stiffened circumferentially by bulkheads, and Z or web and extruded section frames. Production breaks occur at fuselage stations 360 and 1440. The monocoque structure is considered a complete torque box throughout its length, all cutouts for doors, service access openings and windows being adequately reinforced locally. The skins carrying hoop tension in addition to body bending loads are generally clad aluminum and magnesium. The fuselage skin is installed with circumferential butt joints and longitudinal lap joints and is flush riveted. In some areas on the Cargo airplanes, particularly around the cargo door and around the escape hatches, additional reinforcement has been installed in the form of heavier skin, doublers and straps. The fuselage bending that is carried in a triangular torque box that runs under the wing, is transferred by shear to the wing lower surface. Wing to fuselage attachment structure consists of terminal fittings at body bulkhead 600K and 820. The upper surface of the wing is attached to the fuselage through a shear joint between upper rib chord WBL-6 and fuselage skin. The sides of the fuselage are cut away from stringers S18a to S29 between bulkhead station 820 to 960 to allow the main gear to be retracted inside the lower lobe of the fuselage. Vertical shear in this area is carried through a keel beam which connects the pressure deck at WL 202 to stringer S29 at the bottom of the fuselage. Main gear side loads in the side struts are carried to the monocoque structure through forged floor beams at fuselage stations 880 and 890. Bulkheads at fuselage stations 259.5, 312 and 360, support the nose wheel structure and the nose gear and carry these loads into the monocoque structure. The floor structure, consisting of beams, intercostals and panels, is supported through fuselage frames and side attachments. All floor and pressure loads are distributed into the monocoque structure. The main fuselage pressure bulkheads are at stations 178 and 1440 with intermediate bulkheads at stations 259.5, 360, 600K, 820 and 960. The entire shell is pressurized from station 178 to 1440 except within the nose gear wheel well, center wing, and main landing gear bays. The nose radome extends forward of station 178.

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FUSELAGE
Description and Operation

2 Control Cabin

- A. The control cabin extends from body station 178 to 312. In the upper portion of the cabin are the pilot's and copilot's windshields, which are supported by a space truss structure which extends from bulkhead 178 to bulkhead 259.50. Between the two bulkheads is a series of horseshoe-shaped frames at eight inch spacing which extend from the lower windshield sills around the bottom of the body. These frames are tied together by the floor at approximately WL 208. The fail safe loading, which applies to the control cabin, is pressure at 1.15 factors based on the maximum operating pressure of 8.6 psi. Each of the members which make up the windshield support structure is composed of at least two elements, and the structure designed for an ultimate cabin pressure of 3.0 times the maximum operating pressure. This insures that, with failure of one element of any member, the remaining element will be ample to withstand the required 1.15 factor fail safe pressure. Another fail-safe feature of the structure is the ability of the windows themselves to carry axial loads in the event of failure of one of the truss elements. In the event of failure or damage to any one of the frames, fail safe loads could readily be assumed by the adjacent frames. The floor structure acts as a tension tie between the sides of the frames. Tension loads will normally be carried by the channel type beams which support the floor, but in the event of failure of one of these members, fail safe loads can be carried either by the floor web or by the beams at adjacent frames.

3 Station 178 Bulkhead

- A. This bulkhead is the forward end of the pressure cabin, and is composed of three element vertical beams, and a flat pressure web which the beams divide into small panels. The beam chords are effective in stopping cracks in the web. The bulkhead is subject to loads from the cabin window posts, from the windshield carried by the three center vertical beams, and from the frames between the windshield and the bulkhead. Loads from the sill support at BL 5.7 and pressure loads on the web are also transmitted into the bulkhead. All these loads result from cabin pressure.

4. Station 259.5 Bulkhead

- A. The bulkhead consists basically of a three element frame and deep cross beam, the principle function being the distribution of pressure loads. The bulkhead receives pressure loads from both the control cabin structure on the upper forward side, and from the nose wheel well structure on the lower aft side. Since the lower portion of the bulkhead forms the forward end of the nose wheel well, it is also subject to pressure loads normal to the plane of the bulkhead. The primary tension members are the T-section outside chord of the bulkhead and the cross floor beam. In the event of failure of the outside chord, fail safe loads can be carried by the skin or the skin and circumferential tear stopper strap located between the chord and the skin.

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Fuselage - Skin Diagram and Stringer Diagram

Boeing pages 3 through 25 have been deleted.

For SRM (Structural Repair Manual) references see Conversion Tables below.

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5. Station 312 Bulkhead

- A. The bulkhead is located approximately midway along the length of the nose wheel well and its design is dictated by nose gear loads and fuselage pressure loads. The structure above the floor consists mainly of a Z-type frame with a tear stopper strap riveted to the fuselage skin. The frame is cut away on the left hand side by the forward entry door and adequate reinforcing in the form of skin doublers is applied in the area. Below the floor, in addition to the floor beam, is a combination web-truss structure which surrounds the wheel well, and all members are of dual load path construction.

6. Station 360 Bulkhead

- A. The station 360 bulkhead is the major forward fuselage production break. The bulkhead is designed by nose gear and pressure loads in addition to jacking loads and of these, only pressure is a flight condition. The upper portion of the bulkhead, above WL 230, consists of a dual angle outer chord and lipped angle web. The lower portion forms the aft boundary of the nose wheel well and consists of the continuation of the dual angle outerchord, an increasing width web with stiffeners, and an angle inner chord. For the critical tension loads in the outer chord, fail safety is provided by the fact that the chords are dual members which are bolted together. The floor beam, which is subject to tension loads resulting from cabin pressure, is composed of three members, two chords and a web.

7. Station 600K Bulkhead

- A. The bulkhead is located next to the wing front spar and its primary purpose is to transmit body loads to the wing. The upper lobe, consisting of an H-section extrusion, is connected to large forged terminal fittings which house the front spar wing to body terminal pins. Below the terminal pins the fittings attach to the lower built-up portion of the bulkhead which widens from the attachment point to a depth of 33 inches at the aircraft center-line. The keel beam attaches on the aft side of the bulkhead. The floor beam is of multiple load path design in that the upper and lower T-section chords and webs are separate members. The beam is connected directly into the main terminal forgings. The lower portion of the bulkhead is connected to the floor beam by a heavy hat section member at the aircraft center line. In the event of any failure of a member of the lower bulkhead any loads can be carried up through the hat section and into the floor beam. The floor beam can then carry this load, in bending, over to the sides of the body and into the main terminal forgings. A pressure seal is installed between the station 600K bulkhead and the wing center section front spar to prevent cabin air leakage in this area. The seal lies laterally between the ribs at BL 70.5 on each side of the body.

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8. Station 820 Bulkhead

- A. This bulkhead is located at the wing rear spar and its primary function is to transmit body loads to the wing. The construction of the bulkhead is similar to that of station 600K bulkhead, the basic difference is in the lower lobe where the bulkhead has a solid web between the floor beam and the outside chord. A main feature of this bulkhead is the heavy reinforced back to back channel members which extends across the bulkhead from wing pin to wing pin. The primary function of these members is to carry vertical fin gust loads, but in the extreme event of the failure of the dual member lower chord this channel member will create an additional load path and carry the vertical loads (in bending) over to the sides of the body and into the terminal forgings. A pressure seal and a vapor barrier are installed between the station 820 bulkhead and the rear spar of the wing center section to prevent cabin air leakage in this area. The seal and the barrier lie laterally between the ribs at BL 70.5 on each side of the body.

9. Station 960 Bulkhead

- A. The station 960 bulkhead consists of an extruded I-section ring around the crown of the body, which is connected by forged side members to a solid web type structure in the lower lobe. The principal functions of this bulkhead are to redistribute flight loads from the two-cell body structure on the aft side of the bulkhead to the single cell and keel beam structure on the forward side. Secondly to form the forward end of the pressurized cargo compartment. Thirdly to redistribute loads from the keel beam due to pressure loading on the deck over the wheel well. The ring in the upper lobe shares the hoop tension load of the skin under pressure loading. In the event of a failure of the ring, the load would be carried by the skin and the circumferential strap which splices the skin at this station. If a crack developed in the inside flange, making it capable of carrying only compression loads and therefore only positive bending moments, the bulkhead could still perform its shear redistributing function by carrying upper lobe shear as axial load to the solid bulkhead structure below the floor for redistribution. Pressure loads on the lower section of this bulkhead put compression in the upper chord of the floor beam, tending to reduce the tension load due to body shear. The lower outside chord is composed of an angle and a heavy strap so that a substantial amount of strength remains even though one of the members fails. Pressure loads which act in a forward direction against the bulkhead web, are beamed to the floor and to the lower surface of the body by vertical stiffeners. A horizontal stiffener at approximately WL 170 and running from BL 10 to the outside chord acts as a tear stopper for any vertical cracks that might occur in the bulkhead web.

10. Station 1440 Bulkhead

- A. The bulkhead at station 1440 is located at a production break and part of the bulkhead is located on each side of the break. The forward side is composed of a vertical frame that carries the loads from the front spar of the vertical fin. The portion aft of the production break supports the pressure web that forms the end of the pressure cabin. The

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curved pressure web is reinforced with ring straps for positive pressure and Z-section stiffeners for negative pressure. It is designed for 2.50 factors positive pressure and the reinforcing will limit any crack growth in the web. At the intersection of each stiffener and the outer ring of the bulkhead a steel open angle member is fitted which will carry fail-safe pressure loads in the event of a failure of the outer T-ring member.

11. Station 1505.87 Bulkhead

- A. This bulkhead is of the outer chord, web, and horizontal beam conventional type structure and has two purposes. First the lower portion of the bulkhead supports the loads from the horizontal stabilizer center section actuator jackscrew. Secondly it is designed to carry the loads from the rear spar of the vertical fin. Two lugs at the top of the bulkhead receive this load from the vertical fin

12. Station 1592 Bulkhead

- A. This bulkhead consists of a solid web with T-section outer chords which are joined by forged stabilizer hinge fittings at the sides of the body. This bulkhead is designed to distribute the stabilizer hinge loads to the body monocoque structure through the outer chords.

13. Typical Frames Station 500 to 600

- A. The frames are of the conventional ring shape Z-section and carry pressure loads in hoop tension. The floor beam acting as a tension tie across the frame consists of an upper and lower chord and web. On the upper lobe of the frame above the window line, a tear stopper strap is fitted next to the skin providing an alternate load path. In the lower lobe and running up to the window area, shear ties from the frame to the skin are used between the stringers with an inner angle on the frame providing an alternate load path. In the window area the straps from above and the shear ties from below are fastened to the heavy skin of the window area. The frame is also attached in two places to the window reinforcing forgings which contribute to fail-safe structure in the window area.

14. Typical Frames Stations 1060 to 1280

- A. The typical body frame consists basically of a formed ring in both the upper and lower lobes, with a floor beam extending from side to side, all members being similar to those in frames stations 500 to 600. These frames are designed for 2.50 factors pressure load acting alone, or for 2.0 factors pressure acting with flight loads which include floor and cargo loads. The frames adjacent to the door cutouts are designed for 3.0 factors pressure and are also utilized to distribute body shears around the openings. One of the most critical frames in the area is at station 1240. The multiple load path principles are used in all members throughout these frame assemblies.

15 Typical Frames Stations 1300 to 1420

- A The frames in this area consist of the usual Z-section frame above the floor, while the structure below the floor is of a solid web type with access holes for inspection and installation of equipment. These frames are designed for pressure loads, floor loads, and dorsal fin support. The frames adjacent to the aft entry door are utilized to help distribute shear loads around the door opening. The multiple load path principles are used in all members throughout these frame assemblies.

16. Cabin Floor Structure

- A. The cabin floor structure consists of transverse floor beams spaced at 48 inches, with each beam supported by a fuselage frame through a shear connection. The floor beams attached to the upper skin of the wing center section, run in a longitudinal direction. The continuous longitudinal seat tracks are supported on the floor beams. The floor panels supported on the beams and tracks complete the floor structure. With the airplane pressurized, each floor beam carries a tension load of 5800 lbs between the sides of the fuselage. A cross section through the fuselage shows that the upper lobe is a portion of a circle, and the lower lobe approximates a circular section with a smaller radius. Extension of the two circular sections results in a theoretical crease at WL 201.28, which is the location of the line of action of the tension load in the floor beam. An actual crease in the skin exists at the level of the top of the floor beam. A beam which is known as the crease beam, and is the same depth as a frame, is located in this position and is continuous for the length of the cabin. This crease beam transfers pressure loads from the large radius portion of the fuselage skin to the frames and floor beams. The beam chords are continuous, the outboard chord being attached to the skin, and the inboard chord running immediately inboard of the body frame with webs between frames.
- B. The floor structure on the Cargo airplanes is similar to that on turbojet planes. The main difference is the heavier construction of the floor beams and their side attachments from station 420 through station 600J and from station 960 through station 1280. These heavy floor beams are extruded sections. Additional seat tracks are installed on the cargo planes.

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17 Structure Around Cargo Door (Cargo airplanes)

- A. The opening for the cargo door in the fuselage runs from station 480 to station 600D, and from S-3 LH to S-17 LH. Due to this opening, several reinforcing structural features have been added in this area. An upper auxiliary sill is installed at S-4 RH and a lower auxiliary sill is installed at S-24 LH. The upper main sill is installed in two parts at S-2 and S-3 LH. The lower main sill at S-17 LH is on a slope inboard from the main fuselage. The four sills are longitudinal members running from station 440 to 600G, and are built up from webs, angles and T-sections. At stations 480 and 600D, part of the sloping flange of the lower main sill has been cut away to allow the vertical main door frames to fit into the slots and follow the fuselage contour. The main door frames, which are machined channels, are placed at stations 480 and 600D, and are spliced to the standard frames between S-4 RH and S-5 RH and between S-24 LH and S-25 LH. The main door frames are also spliced at S-14 LH. At the level of the lower main sill, the web of the main door frames has extra depth to give more strength. Straps, called bear skins, have been added from S-4 RH to S-24 LH forward and aft of the cargo door, and from station 440 to station 600G above and below the cargo door. In addition, the standard frames at stations 440, 460, 600E, 600F and 600G have been made heavier.

18 Pressure Seals

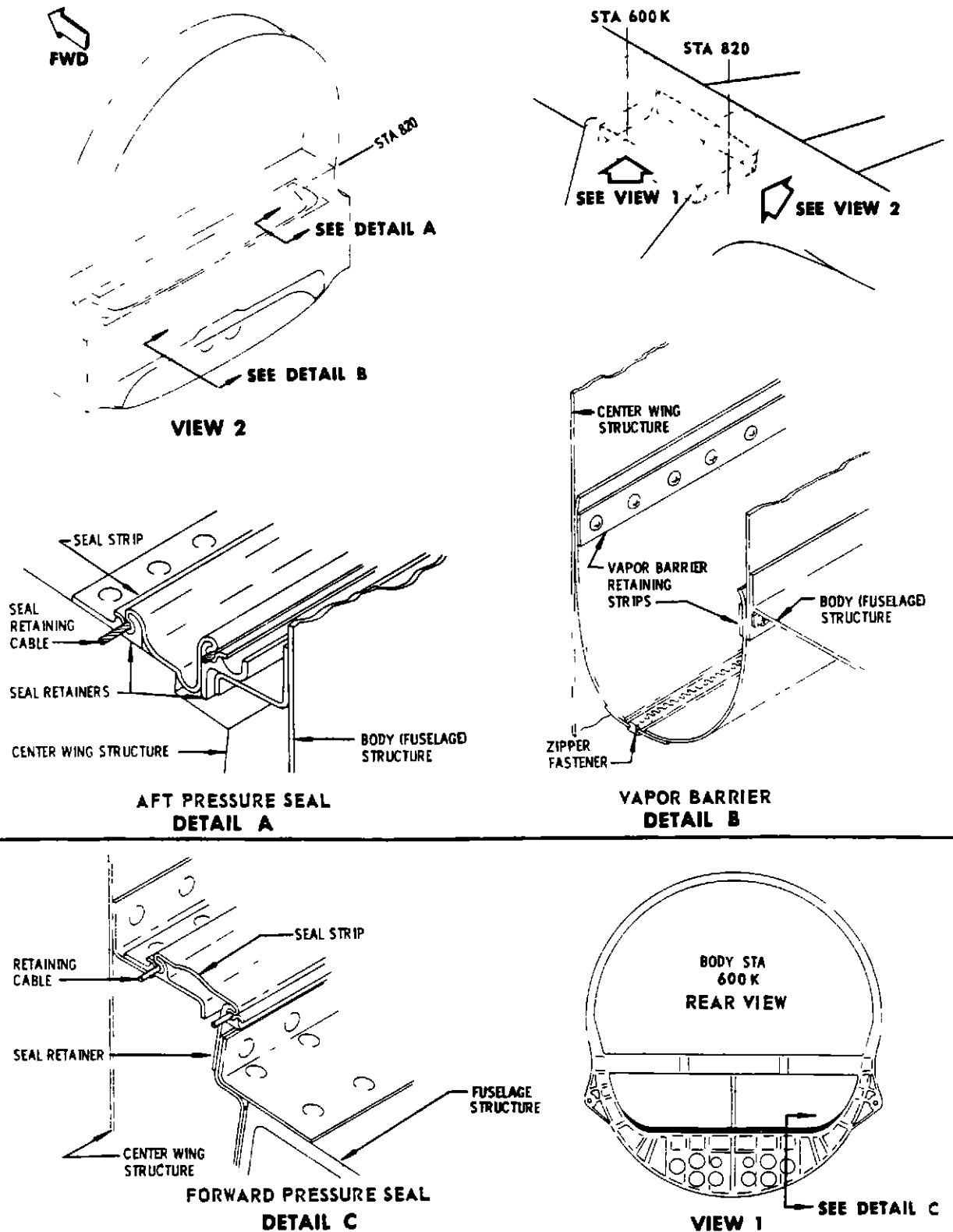
A General

- (1) The pressure seals (figure 3) prevent the cabin pressurizing air from escaping through the gaps between the center wing section and the adjacent fuselage bulkheads. Two pressure seals are installed the forward pressure seal and the aft pressure seal

B Forward Pressure Seal

- (1) The forward pressure seal is a flexible narrow strip, installed between the center wing forward spar and the aft bulkhead of the air conditioning distribution bay. The seal ends are curved upwards and are attached to the airplane sides. The seal is made of 1/16-inch thick fabric reinforced rubber sheet. The seal strip is folded at its ends and along the whole length of both sides into grooves in which it is retained by metallic cables.

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Pressure Seals and Vapor Barrier
Figure 3



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C Aft Pressure Seal

- (1) The aft pressure seal is a flexible narrow strip covering the gap between the center wing rear spar and the forward wall of the main wheel well. The seal ends are wider and curve a short distance forward. The seal is about 15 inches below the passenger cabin floor. It is made of 1/16-inch thick fabric reinforced rubber sheet. The seal strip is folded along the whole perimeter into the grooves in which it is retained by metallic cables.

19. Vapor Barrier

- A. The vapor barrier (figure 3) isolates the gap between the center wing rear spar and the forward bulkhead of the main wheel well from the main wheel well area and the air conditioning equipment bays. The barrier is installed at the lower end of the gap. It consists of two strips made of 1/16-inch thick sheet of fabric reinforced rubber, and joined at the lower edges by a zipper fastener. The ends of the strips are wider and curve downwards. The forward strip is fastened to the lower edge of the wing center section rear spar. Outboard edges of both ends of this strip are riveted to the structure. The aft strip is fastened to the main wheel well bulkhead.

20. Nose Radome

- A. The nose radome extends forward from body station 178. The two main functions of the radome are to serve as a fairing and to house the weather radar antenna.
- B. The radome is a cone-shaped structure of fiberglass and is hinged at three places to the top side of the bulkhead at body station 178. Further attachment of the radome is by fasteners which screw into clips on the bulkhead at body station 178. In the open position the radome is supported by rods.
- C. The weather radar antenna is cantilevered from the bulkhead at body station 178.
- D. The nose of the radome is equipped with erosion protection. The radome, which is an extremity of the airplane, is susceptible to lightning strikes and has therefore been provided with diverter strips on the exterior surface.

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FUSELAGE - MAINTENANCE PRACTICES

1. Inspection/Check Static Vent Ports

- A. Examine the skin around the static vent ports, on each side of the lower fuselage forward of the forward cargo door, for dents or scratches. Refer to the Structural Repair Manual, 53-2-1, for a definition of the critical area surrounding the ports, maximum damage allowable within this area and approved repairs of excessive damage.

NOTE The condition of the skin surrounding the static vent ports is critical because excessive irregularities can cause variations in pressure with consequent effect on instrument readings.



19/07/06

**INTERCONTINENTAL
STRUCTURAL REPAIR
ALLOWABLE DAMAGE - FUSELAGE****TEMPORARY REVISION 53-27****FILING INSTRUCTIONS**

For the printed manual, file this temporary revision adjacent to the page(s) affected.

For the microfilm supplement, file this temporary revision in sequence by ATA number. Mark the microfilm cartridge to indicate that it has been changed by temporary revision(s).

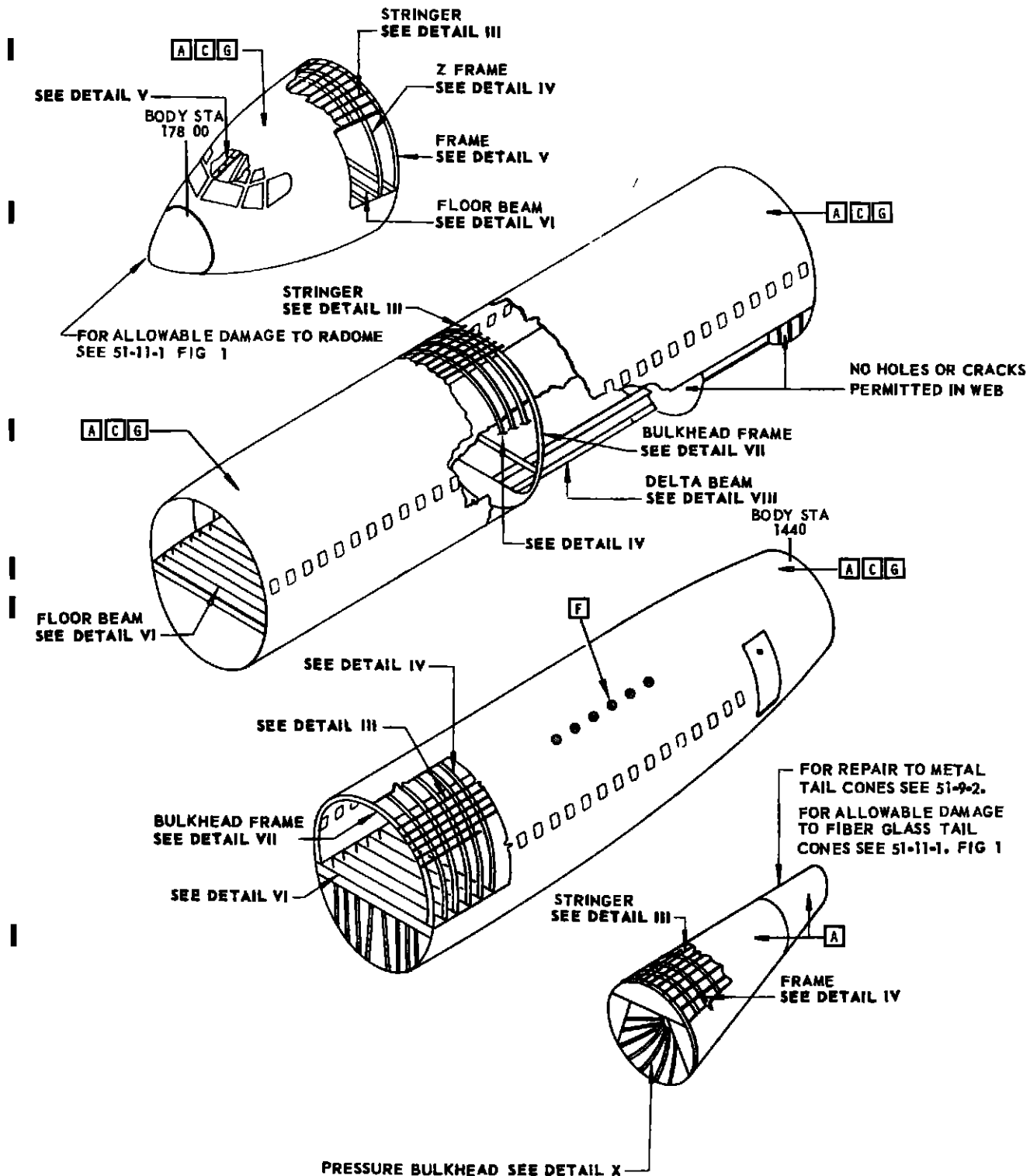
Revision reason Added new damage and rework limits to fuselage
 skin allowable damage.

This temporary revision furnishes an advance copy of the following page(s) which supersede any previously issued page(s). The information thereon is to be used until this temporary revision is either incorporated or rescinded.

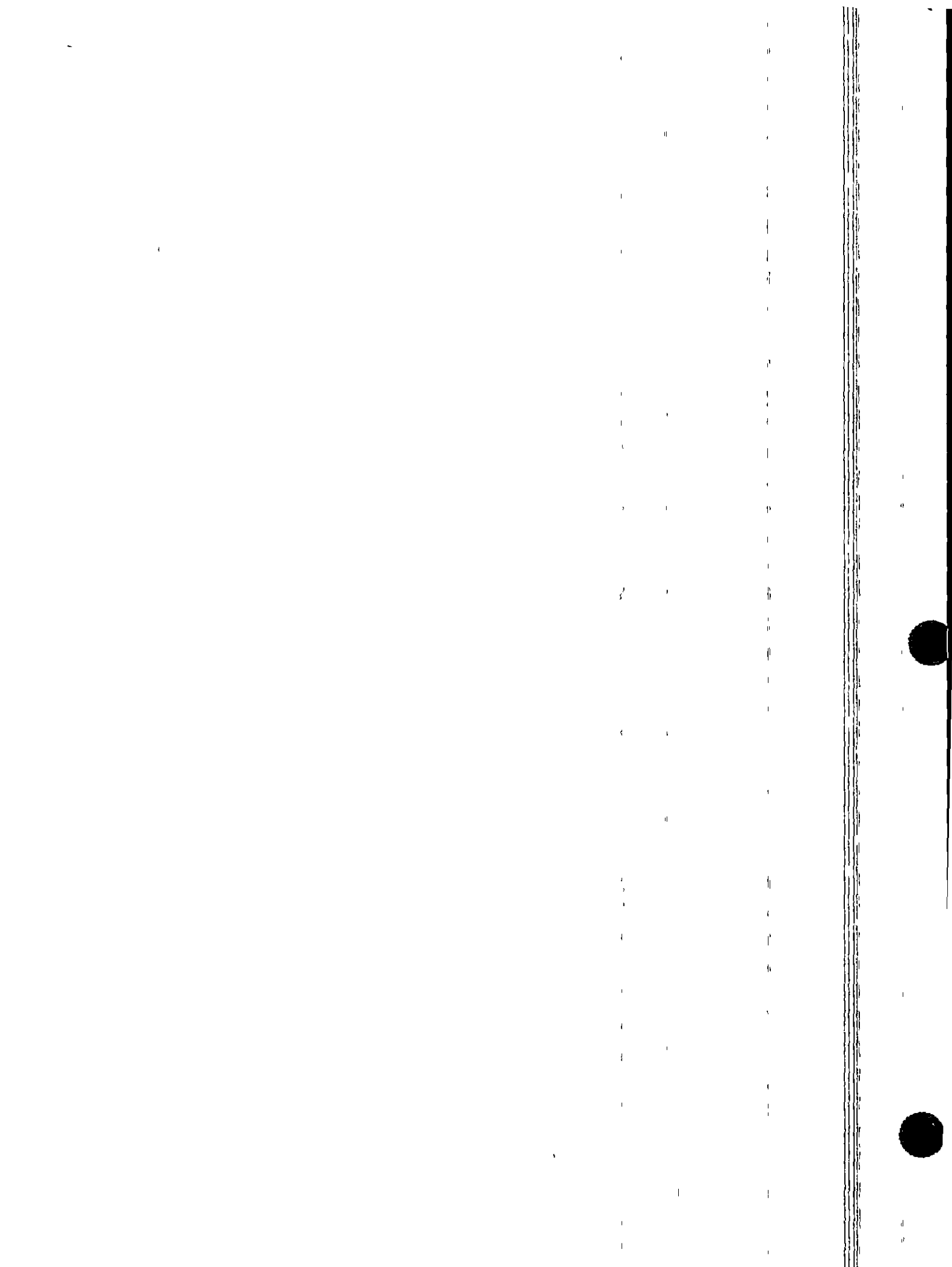
Chapter-Section-Subject	Page No.	Date
53-2-1	1	May 17/06
	2	May 17/06
	4A	May 17/06
	4B	BLANK
	5	May 17/06



INTERCONTINENTAL STRUCTURAL REPAIR



Allowable Damage - Fuselage
Figure 1 (Sheet 1)





INTERCONTINENTAL STRUCTURAL REPAIR

NOTES

FOR GENERAL REPAIR PROCEDURES
REFER TO 51-13-1, PAR. 2

CLEAN UP NICKS TO 1.00 MIN RADIUS

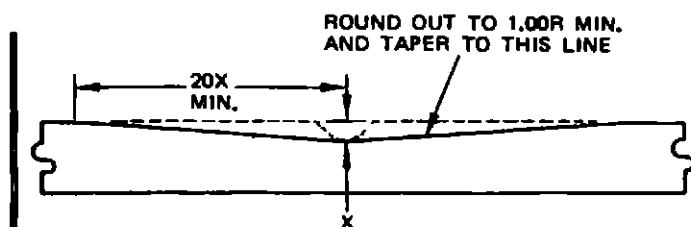
FOR AERODYNAMIC SMOOTHNESS REQUIREMENTS
REFER TO 51-4-1.

IN THE FUSELAGE CAVITY, MAXIMUM ALLOWABLE
CROSS SECTION AREA REMOVED INCLUDING ALL
EXISTING HOLES SHALL NOT EXCEED 15% OF THE
TOTAL CROSS SECTIONAL AREA (SKIN AND
CONTIGUOUS INTERNAL STRUCTURE) IN ANY
LOCAL REGION EXCEPT IN THE CROWN AREA
BETWEEN BS 600 AND BS 1160, S-6LH AND
S-6RH WHERE ONLY 10% OUT IS ALLOWED

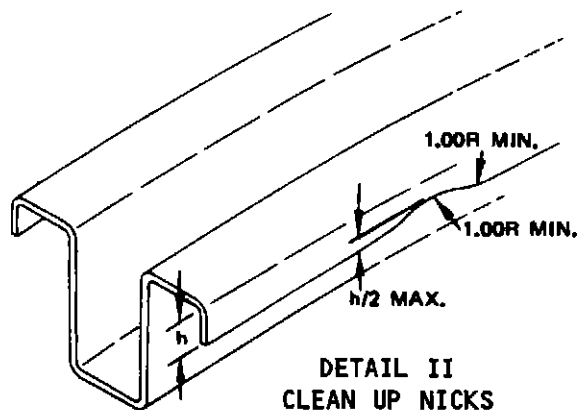
MAXIMUM DEPTH OF SCRATCH OR GOUGE NOT TO
EXCEED 1/4 MATERIAL THICKNESS PROVIDING
REQUIREMENTS IN ABOVE PARAGRAPH ARE
MAINTAINED. ROUND OUT AND TREAT ALL
SCRATCHES AND GOUGES PER DETAIL I

MAINTAIN EDGE MARGIN ON ALL FASTENERS.

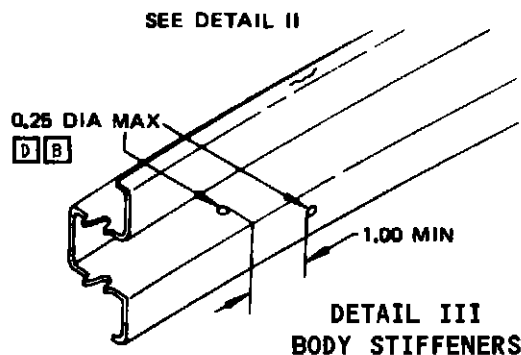
- [A] MAXIMUM OF DEPTH OF A SCRATCH OR
GOUGE IN THE SKIN AND PRESSURE WEBS, IS
NOT TO EXCEED THAT GIVEN IN FIG 2
ROUND OUT AND TREAT ALL SCRATCHES AND
GOUGES PER DETAIL I FOR ADDITIONAL
LIMITATIONS AND REPAIR INFORMATION SEE
FIG 2
- [B] AFTER CLEAN UP
- [C] SMOOTH DENTS IN THE FUSELAGE SKIN WHICH
DO NOT EXCEED THE LIMITS ESTABLISHED BY
FIG 4 AND WHICH HAVE NO PULLED OR LOOSE
RIVETS, CREASES, GOUGES OR CRACKS ARE
CONSIDERED ALLOWABLE REPAIR DENTS
WHICH EXHIBIT PULLED OR LOOSE RIVETS,
CREASES, GOUGES OR CRACKS PER FIG 2
- [D] PLUG HOLES WITH RIVETS.
- [E] PLUG ONLY IF OUTSIDE THE CENTER HALF OF
WEB WIDTH. PLUG WITH RIVETS TO MAX.
DIA OF 0.25. BEYOND THIS DIA PLUG WITH
5056 SLUGS INSTALLED WET WITH PRIMER.
IF MATERIAL IS 2024 DO NOT INSTALL 5056
SLUGS
- [F] FOR REPAIR OF LIGHTNING STRIKE DAMAGE
SEE 53-3-2, FIG. 22
- [G] SEE DETAIL XI THRU XIII FOR LAP SPLICE,
BUTT JOINT AND REPAIR PERIPHERY DAMAGE
AND REWORK LIMITS. IF YOU CAN NOT
REMOVE THE DAMAGE WITHIN THE LIMITS AS
GIVEN IN APPLICABLE DETAILS, CONTACT THE
BOEING COMPANY WITH DESCRIPTION OF
DAMAGE FOR REWORK AND/OR REPAIR
INFORMATION.



DETAIL I
SECTION THROUGH GOUGE

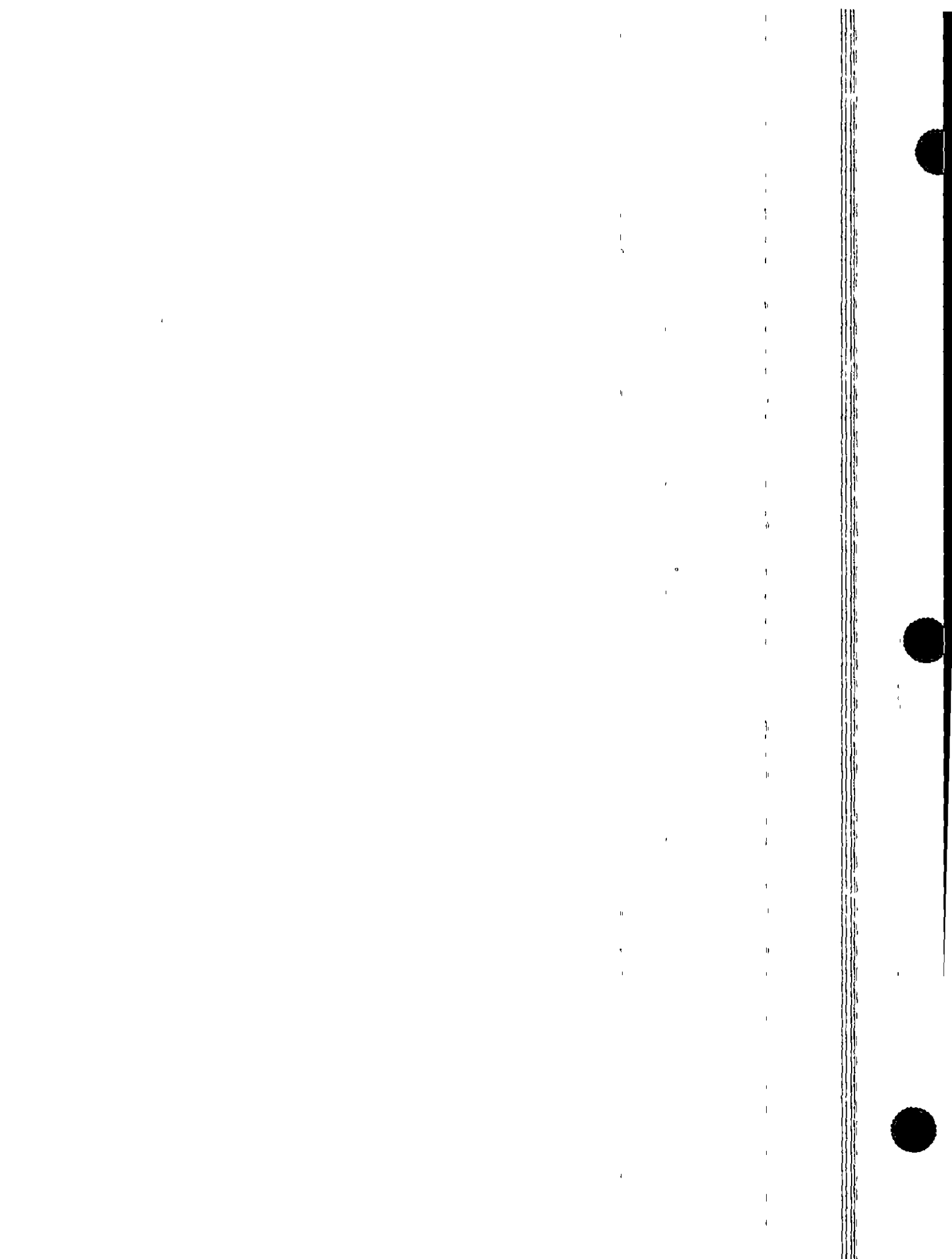


DETAIL II
CLEAN UP NICKS



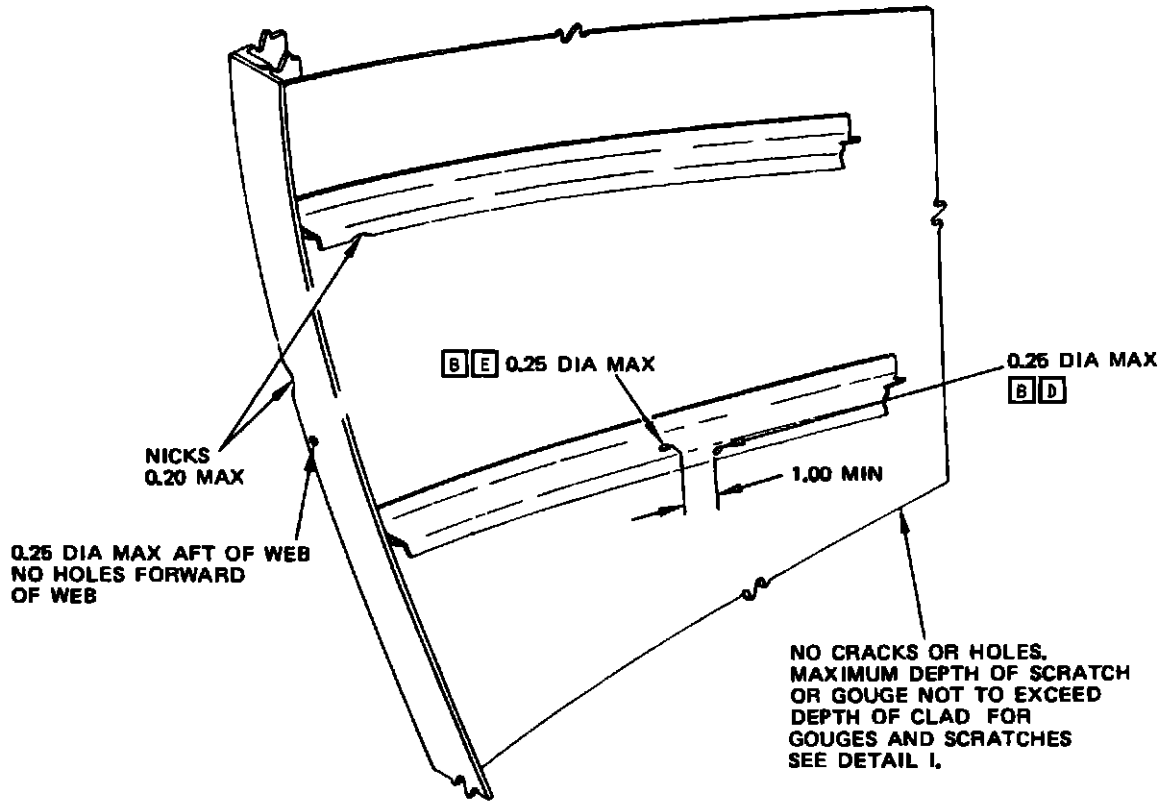
DETAIL III
BODY STIFFENERS

Allowable Damage - Fuselage
Figure 1 (Sheet 2)





INTERCONTINENTAL
STRUCTURAL REPAIR

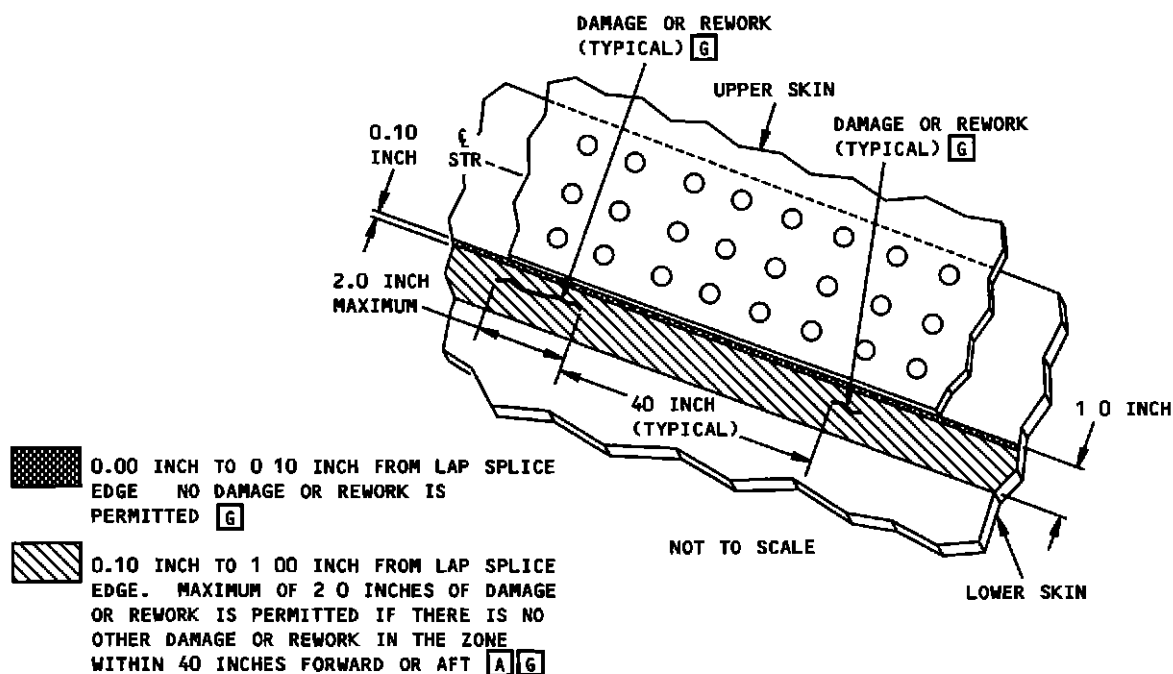


DETAIL X
PRESSURE BULKHEAD

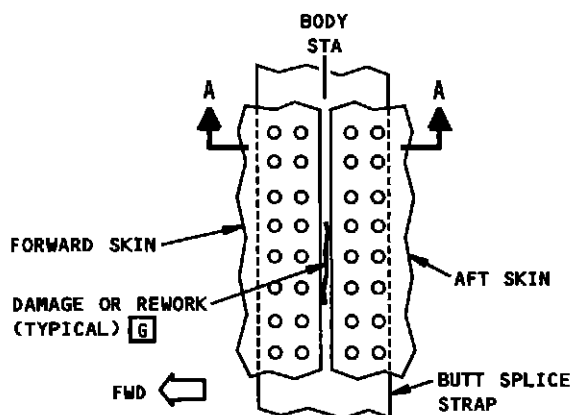
Allowable Damage - Fuselage
Figure 1 (Sheet 5)



INTERCONTINENTAL STRUCTURAL REPAIR



SKIN LONGITUDINAL LAP SPLICE LIMITS DETAIL XI



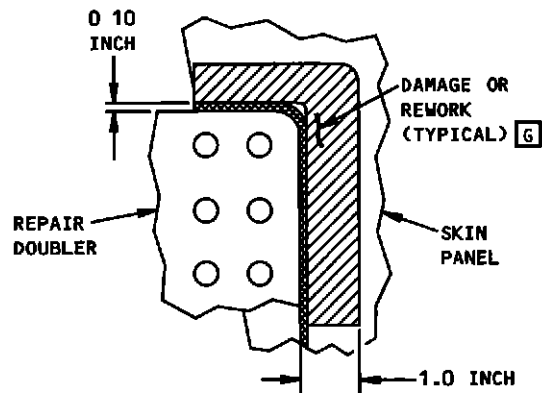
TYPICAL SKIN BUTT JOINT

NO DAMAGE OR REWORK IS PERMITTED IN BUTT SPLICE STRAP [G]



SECTION A-A

CIRCUMFERENTIAL BUTT SPLICE LIMITS DETAIL XII



TYPICAL SKIN EXTERNAL REPAIR
DOUBLER PARTIAL VIEW

0.00 INCH TO 0.10 INCH FROM EDGE OF REPAIR DOUBLER. NO DAMAGE OR REWORK IS PERMITTED. [G]

0.10 INCH TO 1.00 INCH FROM EDGE OF REPAIR DOUBLER. MAXIMUM OF 2.0 INCHES REWORK OF DAMAGE IS PERMITTED, IF THERE IS NO OTHER DAMAGE OR REWORK IN THE ZONE AROUND THE REPAIR WITHIN 40 INCHES. [A][G]

REPAIR PERIPHERY LIMITS DETAIL XIII

Allowable Damage - Fuselage
Figure 1 (Sheet 6)

LOWER NOSE COMPARTMENT - MAINTENANCE PRACTICES

1. Inspection/Check Lower Nose Compartment

A. Access to lower nose compartment structure is obtained as follows

- (1) Open lower nose compartment access door. Refer to Interior Doors, Chapter 52.
- (2) Remove any equipment and furnishings as necessary. Refer to applicable chapters.
- (3) Remove lining and insulation as necessary. Refer to Equipment and Furnishings, Chapter 25.

B. Examine for the following.

- (1) All circumferential and longitudinal skin joints for misalignment, cracks in skin, and loose or missing rivets.
- (2) Corners of access door openings for cracks in skin, doublers and framing. Refer to Access Doors and Panels, Chapter 12.
- (3) Electrical compartment door opening, skin and skin doublers, frame, and sill termination points for cracks and distortion.
- (4) Frames for cracks or distortion, particularly at splices.
- (5) All floor beams and floors for cracks, distortion, or corrosion, particularly at frame connections.
- (6) Stringers for cracks, distortion, loose or missing fasteners, especially at splices. Also check end spotwelds where doublers are spotwelded to skin under stringer splices.
- (7) Forward pressure bulkhead station 178 flat pressure panel for cracks especially at rivet location, beams and stiffeners for cracks or distortion.
- (8) Nose gear wheel well side and top panels for cracks, especially in vicinity of stiffeners and riveting, loose or missing rivets, stiffeners for cracks or distortion.
- (9) Bulkhead station 360 pressure panel below floor for cracks, especially at rivet locations.

END

NOSE WHEEL WELL - MAINTENANCE PRACTICES

1 Inspection/Check Nose Wheel Well

A Access to nose wheel well is obtained as follows

- (1) Nose landing gear extended and locks in position. Refer to Landing Gear, Chapter 32.
- (2) Open nose wheel well doors. Refer to Landing Gear, Chapter 32.

B Examine for the following:

- (1) Nose gear wheel well side and top panels for cracks, especially in vicinity of riveting, loose or missing rivets especially in top panel, panel stiffeners for cracks or distortion.
- (2) Trunnion fittings for distortion, cracks, flaking paint and pulled or missing bolts and rivets.
- (3) Door actuator support fittings for cracks and loose fasteners.
- (4) Nose gear actuator support fitting for cracks and loose fasteners.

END

CONTROL CABIN - MAINTENANCE PRACTICES

1 Inspection/Check Control Cabin

A Access to control cabin is obtained as follows

- (1) Forward passenger, and crew compartment entry doors. Refer to Entry Doors, and Interior Doors, Chapter 52.
- (2) Remove interior lining and insulation as necessary. Refer to Control Cabin Equipment, Chapter 25.
- (3) Remove any equipment and furnishings as necessary. Refer to applicable chapters.

B. Examine for the following:

- (1) All circumferential and longitudinal skin joints for misalignment, cracks, and loose or missing rivets, especially skin splice at station 259.5 - stringers 14 to 20.
- (2) All frames for cracks, distortion, and loose fasteners, especially at station 259.5 and frame splices.
- (3) Stringers, particularly S14 and above, for cracks, distortions, loose or missing fasteners, especially at splices; check end spotwelds where doublers are spotwelded to skin under stringer splices.
- (4) Forward pressure bulkhead station 178 flat pressure panel for cracks in vicinity of stiffeners and riveting.
- (5) Framing around pilots' windows for cracks and loose fasteners.
- (6) Skin doublers adjacent to window frames for cracks or corrosion.
- (7) Splice plate at top of windshield centerpost for cracks.

END



CONTROL CABIN FLOOR - MAINTENANCE PRACTICES

1 Inspection/Check Control Cabin Floor

A. Access to control cabin floor is obtained as follows.

- (1) Remove floor covering. Refer to Control Cabin Equipment, Chapter 25.

B. Examine for the following

- (1) Floor skin for cracks, corrosion, and loose or missing fasteners.
- (2) Structure for attachment of crew seats, for cracks, distortion, and loose and missing fasteners.

END



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NOSE RADOME - REMOVAL/INSTALLATION

1. Equipment and Materials

- A. Ohmmeter
- B. Corrosion preventive Compound - MIL-C-16173C, Grade 2
(Aeroshell Compound n°2)

2. Remove Nose Radome (See figure 401.)

- A. Open weather radar circuit breakers on radio and T-R circuit breaker panel (P5).
- B. Remove screws attaching aft edge of radome to clips on fuselage bulkhead.
- C. Open radome and support in open position.
- D. Disconnect either end of bonding jumper at radome hinge.
- E. Remove bolts attaching hinge arms to hinge fittings on radome and remove radome from fuselage.

NOTE When removing bolts, be prepared to catch shims installed between hinge arms and hinge fittings. Observe installed positions of shims to facilitate installation of same radome.

3. Install Nose Radome (See figure 401.)

- A. Prepare radome for installation (new radome).
 - (1) Install erosion protection as required.
 - (2) Install hinge brackets, serrated plates, and fillers on radome with attachment screws, and position brackets so that they bear against flange of reinforcement angle. Tighten bolts.
- B. Open weather radar circuit breakers on radio and T-R circuit breaker panel (P5).

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- C. Support radome adjacent to fuselage bulkhead so that hinge brackets may be engaged with the hinge arms on the bulkhead. Install shims, as necessary, between hinge brackets and hinge arms, and install hinge attachment bolts.
- D. Lower radome carefully to closed position, and check to insure that top aft edge does not interfere with fuselage skin. If an interference exists, raise and support radome in open position, slacken hinge bracket attachment screws, slide brackets forward relative to radome, and tighten screws. Repeat this procedure as many times as is necessary to eliminate interference between top, aft edge of radome and fuselage skin.

CAUTION: EXTREME CARE SHOULD BE EXERCISED WHEN LOWERING RADOME TO CLOSED POSITION AFTER INSTALLATION OF HINGES BECAUSE THE TOP AFT EDGE OF RADOME MAY INTERFERE WITH AND DAMAGE FUSELAGE SKIN.

- E. Check attachment clips on fuselage bulkhead, especially those adjacent to hinges, for binding on radome when radome is moved to closed position. If adjustment is necessary, slacken attachment bolts on appropriate clips and move clips inboard. Lower radome to closed position and install screws. Tighten screws sufficiently to bring clips into contact with inside face of radome, and then remove screws.
- F. Open radome carefully to avoid disturbing position of adjusted clips. Tighten clip attachment bolts to torque range of 100 to 125 pound-inches.

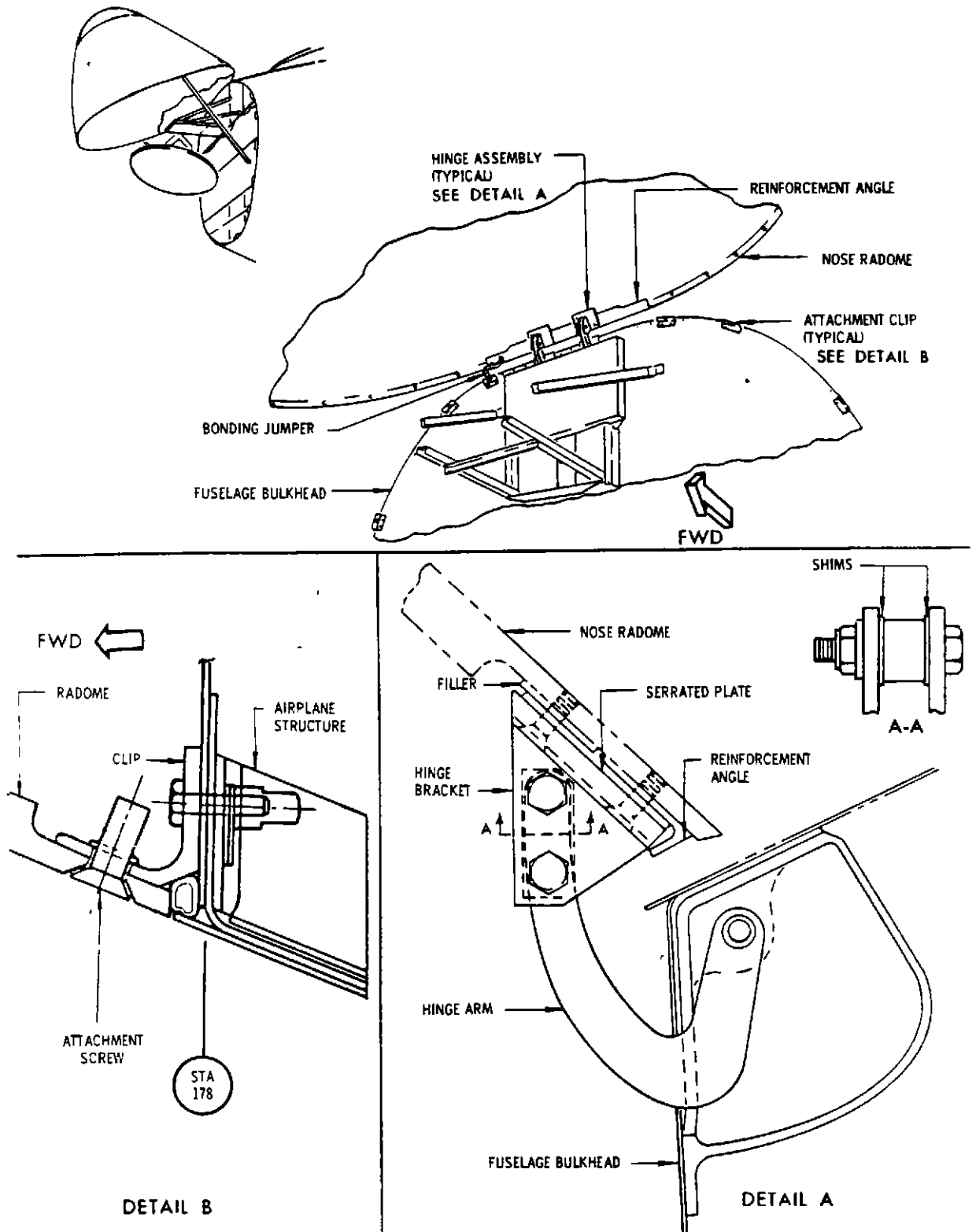
NOTE If pressure sealant is disturbed on clip attachment bolts it must be reapplied to insure an adequate seal. Refer to Chapter 51, "Seals and Sealing."

- G. Check that bonding resistance between each clip and the airplane structure is not more than 0.001 ohm.

NOTE. Any clip failing this test should be removed and reinstalled after cleaning the faying surface between it and the structure to remove whatever sealant or foreign matter was causing the high resistance.

- H. Connect bonding jumper to proper attachment at either side of radome hinge.

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Nose Radome Installation
 Figure 403

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- I. With radome in closed position check alignment of radome attachment screw holes with holes in attachment clips. If adjustment is necessary insert a mandrel or similar tool of suitable diameter in appropriate screw holes in radome and clip and apply leverage to ease holes into alignment, taking care not to damage radome or clip by use of excessive force.
- J. Install screws with antiseize compound in aft edge of radome.
- K. Close weather radar circuit breakers.



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NOSE RADOME - CLEANING/PAINTING

1. General

A. Protective finish system used on the nose radome:

Prestec Enamel (black)

B. Erosion protection used on tip of nose radome:

Erosion coating (rubber paint)

C. Decorative finish system used behind tip of nose radome:

BMS 10-11, type 2.

2.

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4. Prestec Enamel (black)

A. General

- (1) The Prestec enamel is a black polyester paint.
- (2) The Prestec paint system is to be applied to bare fiberglass.
- (3) Bare (uncoated) fiberglass surfaces should not be exposed to outdoor weathering and moisture. Radomes in this condition, however, may be kept on the airplane during transportation providing total time of outdoor exposure does not exceed 7 days.
- (4) Store methyl ethyl ketone peroxide in a cool, ventilated, and isolated facility (e.g., approved refrigerated unit or underground storage) away from buildings, combustible materials, reducing agents catalysts, and sources of ignition and as approved by the fire unit.
- (5) Return small (less than 2 ounces) quantities of unused solution to approved storage area or dispose of it by diluting with large amount of water. Do not pour leftover solution back into original container.
- (6) Large quantities of methyl ethyl ketone peroxide resulting from breakage of spillage should be absorbed in Pearlite or Vermiculite.

B. Equipment and Materials

- (1) Prestec enamel, black, semi gloss.
- (2) Siphon spray gun, DeVilbiss JGA-502, No. 30 cap, No. AV-15-EX tip, or equivalent.
- (3) Mixing cup, No. 2 Zahn.
- (4) Pinhole filling compound, Magna 28-C-1.
- (5) Methyl ethyl ketone peroxide.
- (6) Pearlite, or Vermiculite.
- (7) Methylene chloride.

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- (8) Acetone.
- (9) Naphtha.
- (10) Abrasive paper.
- (11) Cheese cloth.

C. Mixing of Prestec Enamel

- (1) The Prestec enamel consists of base component only with the catalyst and thinner to be supplied separately.
- (2) Agitate the Prestec base thoroughly just before mixing.
- (3) Measure the required amount of Prestec base into the cup of a siphon spray gun, DeVilbiss JGA-502 gun or equivalent.
- (4) Thin the base for 25-35 seconds in a No. 2 Zahn cup with methylene chloride.
- (5) When ready to begin spraying, slowly add 2.0 ± 0.5 percent by volume methyl ethyl ketone (MEK) peroxide to the thinned base while stirring the base. Do not add base to catalyst. Stir the catalyzed material for 1-2 minutes to ensure a homogeneous mixture.

WARNING MEK PEROXIDE IS AN OXIDIZER AVOID BREATHING VAPOR. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAMES. DO NOT ALLOW CONTACT WITH COMBUSTIBLES.

- (6) Record the time of adding the catalyst to the Prestec base and the temperature of the paint facility. The material should be used and the spray gun emptied and flushed prior to expiration of the pot life. Pot life at various temperatures is listed below

<u>Temperature</u>	<u>Pot Life (Minutes)</u>
62°	57
67°	40
72°	30
77°	20
82°	15
87°	11



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D. Application of Prestec Enamel

- (1) For application use a DeVilbiss JGA-502 siphon spray gun, No. 30 cap and No. AV-15-EX tip or equivalent.
- (2) Use 35 to 40 pounds per square inch air pressure at the gun.
- (3) Apply one light cross-coat of Prestec to the radome surface. After 10 minutes or one-half of the pot life has expired (whichever is less) apply a second wet cross-coat of Prestec to obtain a total dry film thickness of 2.5 ± 0.5 mils.
- (4) In areas where one enamel color overlaps another, the total dry enamel thickness shall not exceed 5 mils.

E. Cure of Prestec Enamel

- (1) Allow the coating to dry 24 hours or more at 70°F or higher before exposing the coating to rain or outdoor temperatures below 70°F.
- (2) The dry-to-tape time is 6 hours at 70°F. This drying time is dependent on temperature and humidity and is given here as a guide only. This time may be varied providing the tape after removal has had no visible effects on the enamel film. The exact time can best be determined on practice panels under shop conditions identical to those under which the radome is painted.

F. Cleanup of Equipment

- (1) Prior to expiration of the pot life, thoroughly clean the spray gun with acetone or methylene chloride.

G. Rework and Repair

- (1) All loose and damaged paint shall be removed by sanding with 280 grit or finer abrasive paper or Scotch-Brite pads. Do not expose fiber reinforcement.
- (2) All areas of bare fiberglass shall be sanded with 280 grit or finer abrasive paper or Scotch-Brite pads to remove gloss. Feather all paint edges using 280 grit or finer abrasive paper. Do not abrade the glass fiber reinforcement.



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- (3) Remove sanding dust by cleaning using naphtha followed immediately by wiping with a dry, clean cheesecloth. Repeat until all sanding residue has been removed.
- (4) If any pinholes exist, fill per Chapter 51, "Chemical and Solvent Resistant Finish." Do not allow solvents to contact the applied static conditioner as they will remove it from pinholes.
- (5) As soon as possible apply Prestec enamel so as to blend in with the surrounding surfaces. If further blending is required allow the enamel to cure approximately 3 hours then blend in using 280 grit or finer abrasive paper with aliphatic naphtha or water.

NOTE If balling up on the paper occurs, the paint film is not sufficiently cured and additional curing time must be allowed.

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5. Erosion Coating (Rubber paint)

A. Equipement and Materials

(1) Erosion Coating System

Goodyear Tire and Rubber Co., Ohio:

3 Component System

- a) 1801C Topcoat Cement
- b) 983C Accelerator
- c) 1803C Diluting Solvent.

(2) Primer

Bostik 1007 Primer

(3) Solvent or Thinner

- (a) Toluene (TT-T-548)

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- (b) Xylene (TT-X-916)
 - (c) Methyl Ethyl Ketone (TT-M-261)
 - (d) Acetone (O-A-51)
 - (e) Aliphatic Naphtha (TT-N-95)
 - (f) BMS 3-2 Solvent
- (4) Miscellaneous
- (a) TUF-ON 24A Putty
 - (b) Abrasive Paper
 - (c) Cheesecloth
 - (d) Masking Tape
 - (e) Talcum Powder

B. Repair Nose Radome Erosion Coating

(1) Miscellaneous Information

- (a) Work shall be conducted in a well ventilated area due to the toxic effects of solvents used in the coatings. This work area shall be free of dust and severe temperature changes which will affect the application and drying time of the coatings.
- (b) Avoid open flames around the coating materials.
- (c) All components of the coating shall be uniform, homogeneous, and free of gelled particles. There shall be no separation or gelation of ingredients which cannot be dispersed readily.
- (d) The pot life of coatings is approximately 8 hours. The accelerated coating cement shall be discarded after gelation.
- (e) The laminate surface to be coated must be a smooth surface free of voids.



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- (f) The thickness requirements listed for the coatings shall be strictly maintained. The thickness may be checked at the edge of the part or on separate pieces of sheet metal or plastic laminate which have been given the same treatment as the part.
- (g) Fresh films are subject to shrinkage because of loss of solvents. When measurements of film thickness are made on fresh films, coating thickness must be maintained in the upper portion of the thickness range to allow for shrinkage and still remain above the specification minimum requirement. Shrinkage after 72 hours cure has been found to be less than 5%.
- (h) The number of coats listed as the recommended application is intended as a guide only. The actual number of coats required to meet the specified thickness depends on many spraying condition variables.

(2) Repair Erosion Coating

- (a) When the coating is blistered, or a localized failure of the coating occurs, rework of the coating shall be made as follows
 - 1) Trim away any loose coating and sand the coating irregularities down to the laminate using 180 grit or finer abrasive paper. Avoid unnecessary sanding of the laminate.
 - 2) Clean surface and apply coatings as required.
 - 3) Avoid applying new coatings much beyond the edge of area to be reworked as adhesion to the existing coating is only fair.
 - 4) Cure new coatings.

(3) Rework of Eroded Laminate Surface

- (a) Rework of eroded laminate surfaces and subsequent application coatings shall be as follows:
 - 1) Sand to a smooth surface using 180 grit or finer abrasive paper.
 - 2) Clean the sanded surface with solvent, such as Toluene to remove oil or grease and wipe dry.



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- 3) Apply Tuf-On-P-24A Putty to the depressions of the eroded area using a spatula or knife to spread smoothly and allow to dry for one hour. If sink marks show in the filled-in area, this operation shall be repeated. Xylene may be used for thinning if necessary.
 - 4) After the final application of the Tuf-On Putty has dried for at least one hour, sand the filled surfaces smooth to the original contour of the surface laminate, using 180 grit or finer abrasive paper.
 - 5) Clean surface with naphtha or BMS 3-2 and apply coatings as required. Do not use other solvents as these damage the putty.
- (4) Complete Removal of Erosion Coating
- (a) Apply rags saturated with Toluene to the coated surface. Leave rags in contact with the surface for several minutes.
 - (b) After removal of the rags, agitate the coating using a fiber bristle brush.
 - (c) Repeat above steps as many times as necessary to remove coatings.
 - (d) Avoid contact of the Toluene with the underlying laminate as much as possible.
- (5) Preparation of Laminate Surface
- (a) Prior to sanding, remove residual parting agent from surface to be coated with a clean cheesecloth saturated with Toluene or Xylene. Wipe the surface dry with a clean cheesecloth.
 - (b) Vapor blast the laminate surface using an air pressure of 40-50 psi and 100 grit abrasive material to remove any coating or glossy finish of the laminate.
 - (c) Hand sand the surface to be coated with 180 grit or finer abrasive paper to remove any coatings or glossy finish of the laminate. (Optional method)
 - (d) Remove sanding dust by wiping the laminate with a clean cheesecloth.



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- (e) Clean surfaces to be coated with a clean cheesecloth dipped in Toluene or Xylene and squeezed to remove excess. Wipe the surface dry with a dry cheesecloth.
 - (f) Mask off portions adjacent to those areas to be coated with masking tape.
- (6) Application of Primer
- (a) The primers shall be applied and allowed to dry according to the following requirements.

Bostik 1007

Thickness	0.001 to 0.002 inch
Number of Coats - Brush	2 to 3
Number of Coats - Spray	2 to 5
Drying Time between Coats	5 minutes
Drying Time before Application of Rain Resistant Coating	20 to 30 Minutes
Thinner (3 Volumes Maximum)	MEK

(7) Preparation of Erosion Coating

(a) Mixing Ratios

- 1) Goodyear 1801C Topcoat Cement shall be accelerated with 983C Accelerator in the following ratios

	Volume		Weight	
	Fluid Ounces	cc	Gms	
Cement	16 (1 Pint)	473	471	
Accelerator	1.34	39.6	34.7	

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- 3) Stir accelerator thoroughly before mixing with topcoat cement.
 - 4) Mix accelerator and cement thoroughly to insure uniform distribution.
- (b) For Brush Application
- 1) Normally, thinning of the accelerated cement will not be required. However, if necessary to facilitate brushing, thin Goodyear coating with 1803C thinner.
- (c) For Spray Application
- 1) One part of the accelerated Goodyear 1801C cement shall be thinned with three parts by volume of 1803C thinner. Up to four parts of 1803C thinner (per one part of 1801C cement) may be used on warm days.
- (8) Application of Erosion Coating
- (a) The total cured coating thickness shall be 0.008 to 0.012 inch including the primer. The required thickness shall be applied as follows
 - 1) Brush Application
 - a) Application of four brush coats of cement may be adequate.
 - b) The coating should be brushed similarly to a fast drying enamel. Use a brush well wet with coating material. Use short, even strokes, brushing from wet to dry surface to prevent pinholing and blistering due to trapped air bubbles. Do not disturb the surface after a smooth coating has been applied. Avoid brushing over an area that has partially dried as this will result in drag.

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2) Spray Application

- a) Application of 8 to 24 spray coats may be adequate.
- b) The following recommendations may be used as a guide to determine a satisfactory technique. A DeVilbiss pressure feed gun type MBC with a number 54 nozzle and size E needle and tip or equivalent may be used. 30 psi atomizing air pressure and 15 to 20 psi fluid pressure may be used.
- (b) Trapped air bubbles can be dispersed by spraying the surface with an equal-part mixture of Toluene and Methyl Ethyl Ketone immediately after the application of each coat of cement. Do not allow the Toluene mixture to drop on the coated surface.
- (c) Allow 10 to 15 minutes drying time between coats. Do not allow more than 1-1/2 hours drying time between coats, because the successive coats will not adhere satisfactorily.

NOTE The coating should be agitated prior to the application of each coat.



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(9) Cure of Erosion Coating

- (a) The coatings will be sufficiently cured for use in 72 hours at room temperature.
- (b) Force curing of the coatings may be accomplished by heating for two or three hours at 150°F ($\pm 10^\circ\text{F}$) in an air circulating (underwriter's approved Class A) oven or by use of heat lamps. Care should be exercised in using this accelerated method of cure to insure that the coatings do not blister. Where blisters occur, the coating shall be removed and the area reworked.
- (c) In an emergency, the coated article may be used as soon as the final coating is past the tacky stage if care in handling is exercised. Ordinary talcum powder may be used to reduce tackiness.
- (d) The rain erosion coating plus primer should be tack free within 6 hours, including the time between coats.

(10) Storage

- (a) Storage of the coating materials shall be in a cool place not exceeding 80°F, whenever possible. Normal shelf life at this temperature is 8 months. Higher temperatures will reduce the shelf life of the materials.

6. Decorative Finish System.

- (a) The surface of the radome not covered by the erosion coating system shall be painted in accordance with the general decoration scheme of the airplane.
- (b) Paint to be used:

BMS 10-11, type 2.

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NOSE RADOME - APPROVED REPAIRS

1. Repair Nose Radome

A. Temporary Repair

(1) Equipment and Materials

(a) Scotchcal tape #850, or equivalent.

(2) Repair Nose Radome

(a) One square inch damage allowed for one flight only, provided the damage is sealed from moisture by use of tape.

(b) Holes larger than one square inch must be repaired permanently before flight per paragraph B.

B. Permanent Repair

(1) Permanent repair of the nose radome must be made per Structural Repair Manual, Chapter 51, "Fiber Glass Cloth Reinforced Plastics Repair."

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CONDUCTIVE STRIPS - MAINTENANCE PRACTICES

1. General

A. This section is limited to airplanes with bonded-on nose radome conductive strips.

2. Removal/Installation Conductive Strips

A. General

(1) The possibility of lightning strike damage to the nose radome area is reduced by metallic conductive strips attached to the exterior surface of the nose radome. In the event of a lightning strike, several or all of the conductive strips may be burned off and these should be replaced at the earliest opportunity. The conductive or protective coating on the radome in the vicinity of the conductive strips may burn off at the same time and should also be replaced.

(2) Two methods of installing the aft end of some conductor strips are shown as types "A" and "B" in figure 201, and the explanation of the difference is as follows:

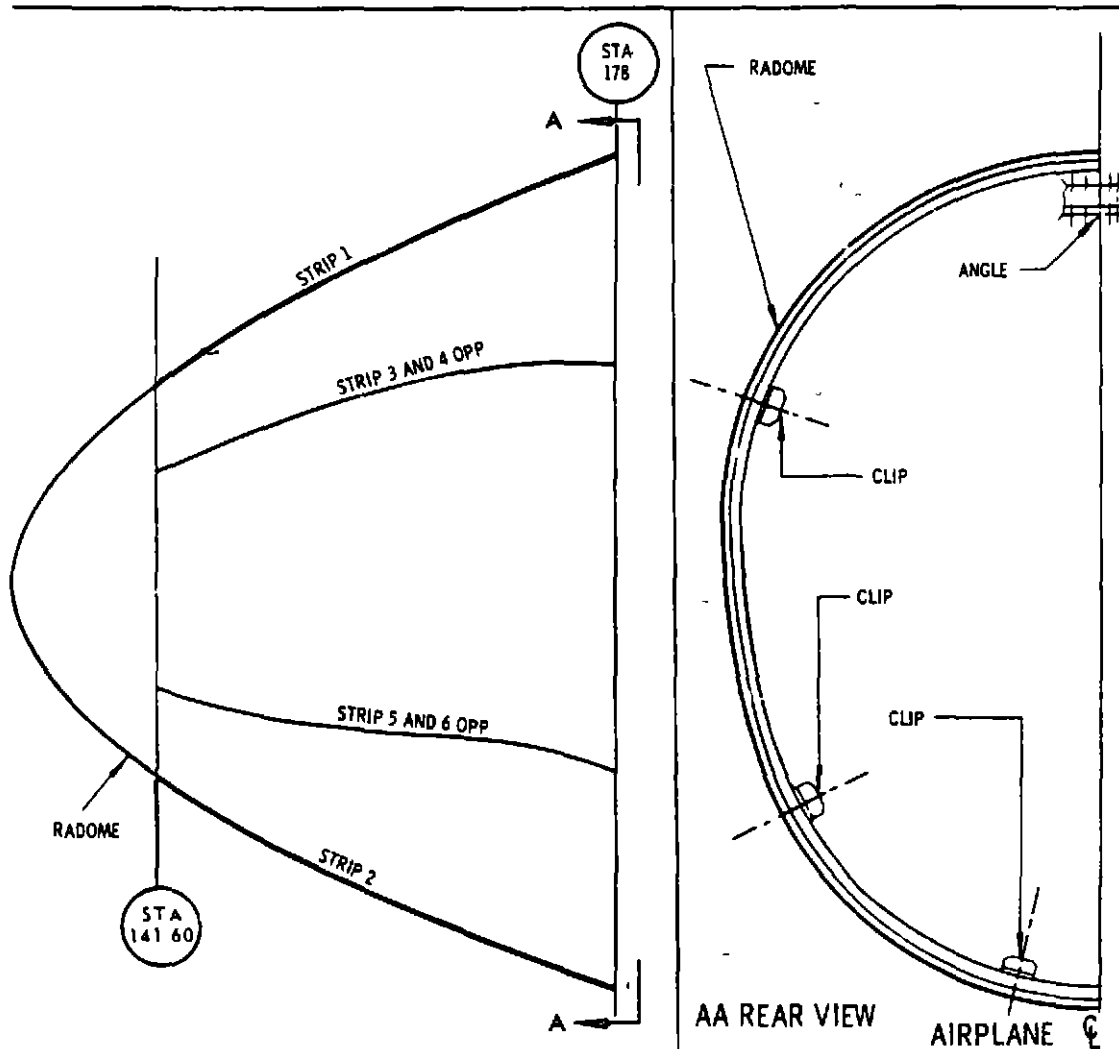
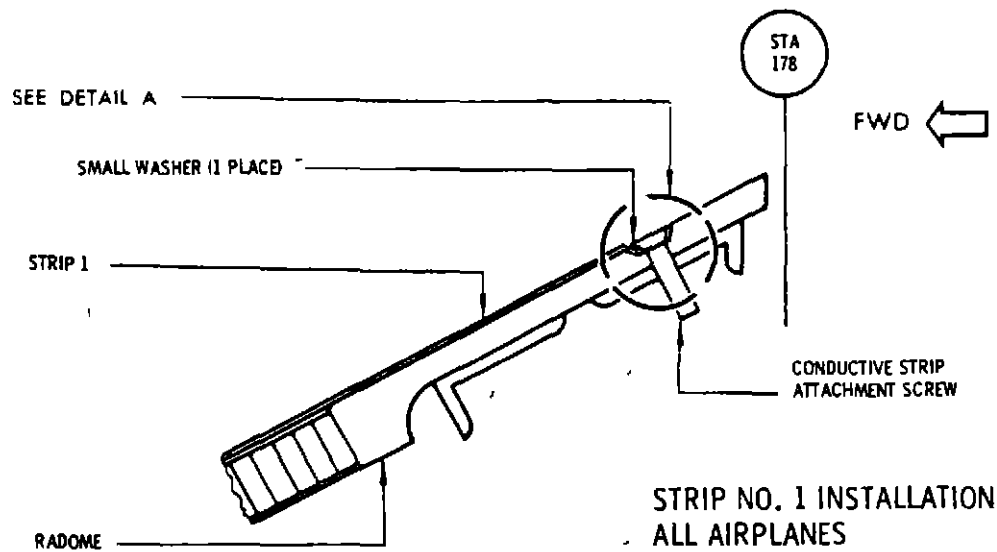
(a) Type "A" was applied in production, or in some early airplanes was covered by Boeing Service Bulletin 291, on the following airplanes

PAA	N707PA thru N712PA, N714PA thru N728PA and N701PA thru N703PA
TWA	N731TW thru N745TW and N761TW thru N767TW
SABENA	OO-SJA thru OO-SJC
AF	F-BHSA thru F-BHSF
BOAC	G-APFB thru G-APFD
AA	N7501A thru N7525A
QUANTAS	VH-EBA thru VH-EBG
UAL	N7201U thru N7203U
AIJ	VT-DJI thru VT-DJK
DLH	D-ABOB and D-ABOC
CAL	N-70773 thru N74612
BNF	N7071 thru N7075

(b) In order to increase the service life of the strips, the change in design to type "B" was put into effect on all airplanes manufactured later than those listed above. No Boeing Service Bulletin was issued to bring the type "A" installations into conformity with this change.

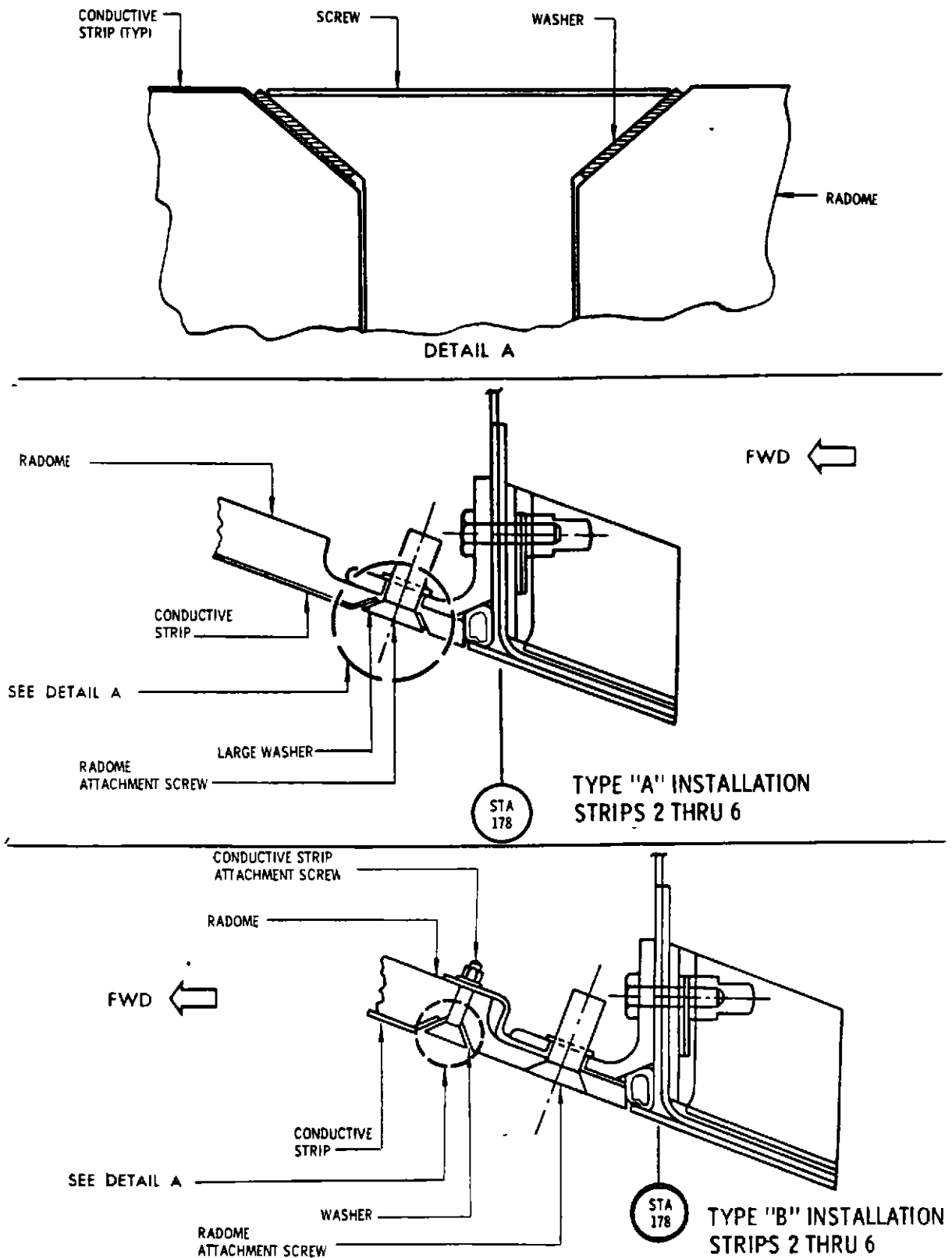
(c) Conductive strips have in all cases been of aluminum tape, but service experience has now brought about a conversion to the use of beryllium copper material, the method of aft end installation still being in accordance with type "B". Boeing Service Bulletin 1279 covers this conversion. The following procedures assume that an individual replacement copper strip is to be applied to a radome of either type "A" or "B" design.

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Nose Radome Conductive Strips Installation
Figure 201 (Sheet 1 of 2)

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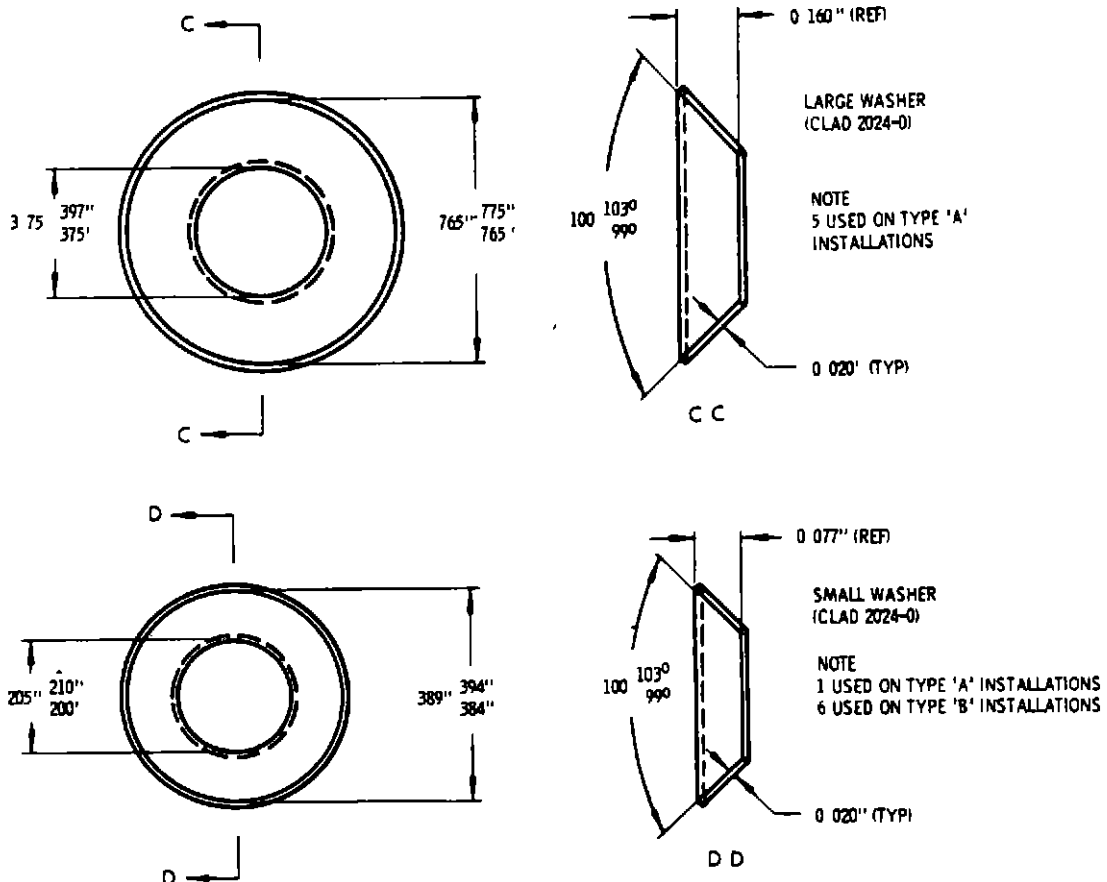
Conductive Strip and Washer Installation
Figure 201 (Sheet 2 of 2)

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B. Equipment and Materials

- (1) Adhesive BMS 5-19, Type B
- (2) Beryllium Copper Strip QQ-C-533 A temper, 0.005 inch thick, 1/4 inch wide
- (3) Masking Tape
- (4) Scraper, plastic or hard wood
- (5) Washers, 100° countersunk (See figure 202.)
- (6) Aliphatic Naphtha
- (7) Xylene
- (8) Sandpaper, 150 grit or finer
- (9) Boiled cheesecloth





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C. Remove Conductive Strips

- (1) Open radome and support in open position, or remove radome completely.
- (2) Remove screws from holes in which strips terminate, and pry out washers from countersunk holes.
- (3) Remove damaged or loose conductive strips by peeling away from radome surface.

D. Prepare Surfaces for Installation of Conductive Strips

- (1) Clean surfaces including surrounding area where conductive strips are located with clean cheesecloth dipped in xylene or aliphatic naphtha and squeezed to remove excess.
- (2) Wipe surfaces dry with clean cheesecloth before solvent evaporates.
- (3) Replace, if damaged, applicable finish on radome surfaces. Refer to 53-2-51, "Nose Radome - Cleaning/Painting."

NOTE. It is not mandatory that conductive coating be maintained.

- (4) After any replaced finish has cured, clean surfaces per steps (1) and (2).

E. Install Conductive Strips

- (1) Apply to the radome surface two parallel strips of masking tape about 1/2 inch apart along the path to the followed by the conductive strip. (See figure 201.)

NOTE The path of each strip should be similar to that of the strip removed, the prime consideration being that the strip should follow the straightest possible path. This is particularly true in the case of the extreme bottom position, at which no attempt should be made to follow the sharply angled path used on earlier installations.

- (2) Mix BMS 5-19, Type B adhesive.
- (3) Brighten one side of conductive strip by rubbing with fine sandpaper.

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- (4) Apply thin uniform coat of adhesive to brightened side of conductive strip and to surface of radome between strips of masking tape, taking care to include countersunk hole at aft end of strip's path.

CAUTION ADHESIVE MUST BE APPLIED TO STRIP WITHIN FIFTEEN MINUTES OF BRIGHTENING, IN ORDER TO AVOID OXIDATION AND CONSEQUENT POOR ADHESION. INSTALLATION OF STRIP TO RADOME SHOULD PROCEED IMMEDIATELY AFTER ADHESIVE IS APPLIED.

- (5) Install conductive strip to radome by placing forward end of strip centrally between two bands of masking tape and, pressing with fingers, work towards aft end of dome.

NOTE As the countersunk hole at the aft end is approached, the conductive strip should be trimmed carefully so that it will extend far enough into the hole to be trapped by the countersunk washer and screw which will be installed in the hole. Type "A" and type "B" installations require the use of different holes and washers. (See figure 201.)

- (6) Smooth strip down into perfect contact with radome by using a plastic or wood scraper.
- (7) Before adhesive cures, use clean, dry cheesecloth to remove surplus adhesive on either side of strip between masking tapes.
- (8) Remove masking tapes and, using clean cheesecloth lightly moistened with aliphatic naphtha, wipe conductive strip and radome surface each side of it to remove last traces of surplus adhesive

CAUTION EXCESSIVE QUANTITIES OF ALIPHATIC NAPHTHA WILL DESTROY THE ADHESION BETWEEN THE STRIP AND THE RADOME, USE AS LITTLE OF THIS SOLVENT AS POSSIBLE.

- (9) Apply thin, even coat of mixed adhesive to surface of countersunk hole in radome, taking care not to coat conductive strip. Also coat surface of washer in area that does not contact conductive strip of installation.



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- (10) Press washer firmly into hole in radome and apply uniform pressure until adhesive cures.

NOTE Surplus uncured adhesive can be removed by wiping with clean dry cheesecloth and finishing off with cheesecloth lightly moistened with aliphatic naphtha. Care should be taken not to disturb the washer and not to apply excessive quantities of aliphatic naphtha.

Adhesive cures completely in about 24 hours at 75°F, but this time can be reduced by applying heat at 150°F curing time will be about 4 hours. Heat applied should never exceed 160°F.

- (11) Check bonding resistance between all radome attachment clips and their adjacent structure as described in 53-2-51, "Nose Radome - Removal/Installation."
- (12) If radome has been removed, install it in open position.
- (13) Check security of bonding jumper across radome hinge.
- (14) On airplanes with type "A" installations, close radome and install all radome attachment screws.
- (15) On airplanes with type "B" installations, install conductive strip attachment screws and then close radome, installing all radome attachment screws.
- (16) On all airplanes test newly installed conductive strip, or strips, in accordance with paragraph 3 C.
- (17) Brighten head of countersunk screw and about 1/4 unit of the conductive strip with fine sandpaper. Blow dust from screw head with clean, dry air.
- (18) Within fifteen minutes of brightening, apply a circular patch of conductive coating about 1-1/2 to 2 inches in diameter, centered on the screw head.

NOTE It is not mandatory that conductive coating be maintained. If conductive coating is maintained, refer to 53-2-51, "Nose Radome - Cleaning/Painting."



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- (19) Apply primer (BMS 10-11, chemical and solvent resistant finish) to surface of conductive strip and about one inch of radome surface on either side of strip, over whole length of radome. Refer to Chapter 51, "Interior and Exterior Finishes."

NOTE Not more than fifteen minutes prior to application of this primer, the conductive strip should be brightened with fine sandpaper, except where already treated with conductive coating at its aft end.

- (20) Apply appropriate finish to affected area(s) of radome. Refer to 53-2-51, "Nose Radome - Cleaning/Painting."

3. Adjustment/Test Conductive Strips

A General

- (1) Sharp corners anywhere along a conductive strip will tend to cause radio noise interference. A conductive strip should be tested for dc continuity if any physical deterioration is evident.

B. Equipment and Materials

- (1) Ohmmeter

C Test Conductive Strip

- (1) Make good contact between one lead of ohmmeter and aft end of strip, and between other lead of ohmmeter and airplane body skin immediately aft of radome hinge line at Body Sta 178. Resistance should not exceed 0.01 ohms.
- (2) Make a similar resistance test between the aft extremity and the forward extremity of the conductive strip. Resistance should not exceed 0.15 ohm.



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4. Inspection/Check Conductive Strips

- A. The conductive strips should be examined at frequent intervals for any sharp corners resulting from tearing, lifting, looseness or general deterioration. If such a condition is evident a continuity test should be performed in accordance with paragraph 3.

5. Approved Repairs Conductive Strips

- A. If any strip is found deteriorated to the point where radio noise interference is caused, or where it fails to meet the continuity requirements of paragraph 3, it should be repaired.
- B. If the damage can be made good by partial repairs, work in accordance with the relevant portions of paragraph 2. If entire removal and replacement is necessary, proceed according to the whole of paragraph 2.

GLIDE SCOPE ANTENNA DIRECTOR BAR - REMOVAL/INSTALLATION1. General

- A The glide slope antenna director bar is a passive element of the glide slope antenna used to alter the glide slope radiation antenna patterns such that the navigation units have maximum glide slope sensitivity. The bar consists of a strip of pressure-sensitive aluminum foil tape installed horizontally inside the nose radome.

2. Equipment and Materials

- A. Aliphatic Naphtha (Ref 13-1-3)
B 1/2 inch wide aluminum foil pressure sensitive tape - No. 425, BAC5801 (Ref 13-1-5)
C. Primer BMS 10-11, Type I (Ref 31-1-4)
D Solvent BMS 3-2, Type I (Ref 13-1-3)

3. Remove Director Bar (Fig. 401)

- A. Open nose radome (Ref 53-2-51 R/I)
B. Remove director bar by peeling off tape.

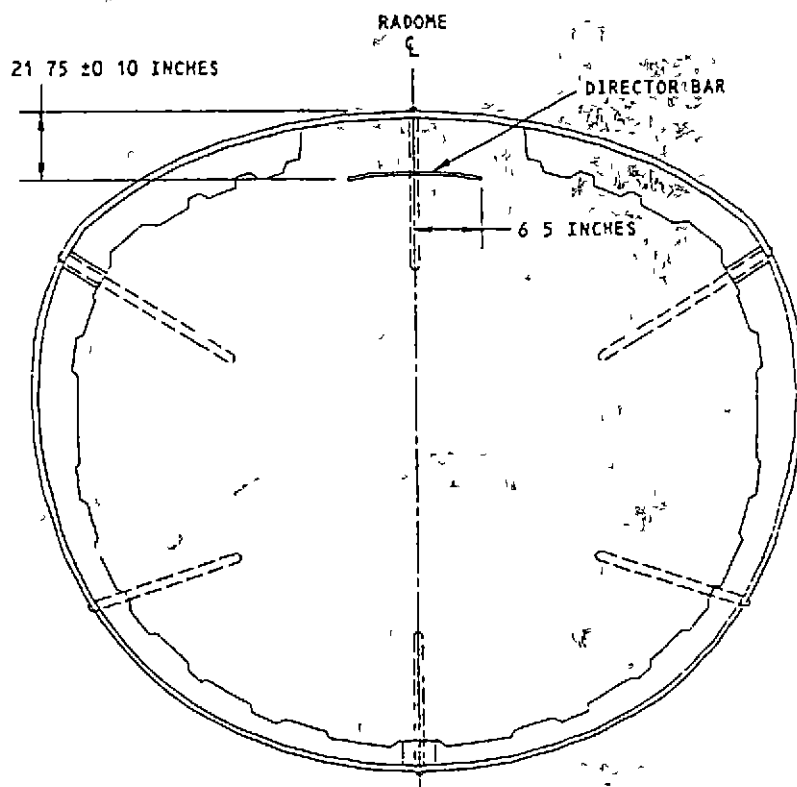
4. Install Director Bar (Fig. 401)

- A. Using aliphatic naphtha, clean surface where director bar will be installed.
B. Apply one coat of primer to areas where director bar will be installed.
C. Clean primed and cured surface with solvent.
D. Cut strip of aluminum foil tape 13.00 inches long.
E. Apply tape per Fig. 401 and press firmly in place
F Close nose radome (Ref 53-2-51 R/I)

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SEE DETAIL A



NOSE RADOME INNER SURFACE
DETAIL A

Glide Slope Antenna Director Bar Installation
Figure 401

MAIN WHEEL WELL - MAINTENANCE PRACTICES

1. Inspection/Check Main Wheel Well

A Access to main wheel well is obtained as follows.

- (1) Main landing gear in extended position Refer to Landing Gear, Chapter 32.
- (2) Main landing gear doors open. Refer to Landing Gear, Chapter 32.

B. Examine for the following

- (1) Station 820 bulkhead web and stiffeners for cracks and loose fasteners. Also main forgings for cracks, particularly in vicinity of wing terminal pins.
- (2) Station 960 bulkhead web and stiffeners for cracks and loose fasteners. Also examine for cracks at attachment of upper ends of vertical pressure beams to deck structure.
- (3) Cracks in floor beam upper chords at stations 880 and 890.30.
- (4) Door hinges for cracks and loose fasteners.
- (5) Door actuator support fittings for cracks and loose fasteners.
- (6) Pressure web at top of wheel wells for cracks and looseness at attaching rivets
- (7) Keel beam chords, webs, and stiffeners for cracks, distortion, loose or missing fasteners.
- (8) Water injection tank, interior for evidence of corrosion Refer to Water Injection, Chapter 82.

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FORWARD CARGO COMPARTMENT - MAINTENANCE PRACTICES

1 Inspection/Check Forward Cargo Compartment

A. Access to forward cargo compartment is obtained as follows.

- (1) Forward cargo compartment door. Refer to Cargo Compartment Doors, Chapter 52.
- (2) Forward cargo compartment interior access door. Refer to Interior Doors, Chapter 52.
- (3) Remove any equipment and furnishings as required. Refer to applicable chapters.
- (4) Remove lining and insulation as required. Refer to Forward Cargo Compartment Equipment, Chapter 25.

B. Examine for the following:

- (1) All circumferential and longitudinal skin joints for misalignment, cracks in skin and loose or missing rivets.
- (2) Skin side, where contour flattens, for cracks adjacent to rivets.
- (3) Stringers for cracks, distortion, loose or missing fasteners, especially at splices; also check end spotwelds where doublers are spotwelded to skin under stringer splices.
- (4) All frames for cracks or distortion, particularly at splices.
- (5) Bulkhead station 360 pressure panel below floor for cracks, especially at rivet location.
- (6) Corners of access door openings for cracks in skin, doublers and framing. Refer to Access Doors and Panels, Chapter 12.
- (7) Reinforcing skin around cargo door and galley door cutouts, frames, and sill termination points for cracks.
- (8) Cargo door opening upper main sill web, station 600 for cracks in area of flange relief.
- (9) Upper main sill web cargo door cutout for cracks in area of frame flange relief at termination of frames, stations 540 and 560.
- (10) Floor beams and floor for cracks, distortion, corrosion, loose or missing fasteners, particularly at frame connections.



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- (11) Check the production break tension bolts at stations 360 and 1440, and the stiffener tie bolts at stations 360, 600K, 820, 960 and 1440 for specified torque values. Refer to Chapter 91, "Standard Torque Values" for all bolts except bolts listed in the note below.

NOTE Higher nonstandard torque values are called for to insure preload in the bolt will be higher than actual load normally encountered. Listed below are the nonstandard torque values.

MS20005	5/16 inch dia	205-255 pound-inches
MS20006	3/8 inch dia	330-420 pound-inches
MS20007	7/16 inch dia	600-730 pound-inches
MS20008	1/2 inch dia	925-1150 pound-inches

- (12) Remove a representative number of production break, station 360, tension bolts. Examine bolts, bolt holes and fuselage frames for condition.
- (13) Station 600K bulkhead, especially in area adjacent to wing terminal pins and pressure web at bottom of bulkhead, for distortion, flaking paint and pulled or missing fasteners.



AFT CARGO COMPARTMENT - MAINTENANCE PRACTICES

1. Inspection/Check Aft Cargo Compartment

A. Access to aft cargo compartment is obtained as follows:

- (1) Aft cargo compartment doors. Refer to Cargo Compartment Doors, Chapter 52.
- (2) Remove any equipment and furnishings as required. Refer to applicable chapters.
- (3) Remove lining and insulation as necessary. Refer to Aft Cargo Compartment Equipment, Chapter 25.

B. Examine for the following:

- (1) All circumferential and longitudinal skin joints for misalignment, cracks in skin, and loose or missing fasteners.
- (2) Skin at sides, where contour flattens, for cracks adjacent to riveting.
- (3) Frames and stringers for cracks, distortion, loose or missing fasteners, particularly at splices.
- (4) Floor beams and floor for cracks, distortion, corrosion, loose or missing fasteners, particularly at frame connections
- (5) Termination joints of stringers S19 and S20 and adjacent skin areas for cracks.
- (6) Bulkhead web and stiffeners, station 960 for cracks, also end attachments of vertical pressure beams for cracks and distortion.
- (7) Skin and skin doublers in area of cargo and galley door cutouts for cracks.
- (8) Cargo and galley door frames and sill termination joints for cracks, distortion, or corrosion.

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AIR CONDITIONING COMPARTMENT - MAINTENANCE PRACTICES

1. Inspection/Check Air Conditioning Compartment

A Access to air conditioning compartment is obtained as follows

- (1) Air conditioning pack access doors, 1124L and R. Refer to Access Doors and Panels, Chapter 12
- (2) Access panels along base of torque box

B Examine for the following:

- (1) Torque box main chords, webs, and stiffeners, for cracks, distortion and loose fasteners
- (2) Loose torque box attachment bolts at ends of main chords; also external indication of bolt corrosion.
- (3) Beams connecting wing lower surface to breather web, BL 12 78, for cracks, distortion, loose rivets, and particularly for cracks in bend radius of lower flange.
- (4) Wing center section lower skin surface for cracks and loose fasteners.
- (5) Air conditioning pack access door hinges and latches for cracks and loose bolts

END



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PASSENGER CABIN - MAINTENANCE PRACTICES

1. Inspection/Check Passenger Cabin

A. Access to passenger cabin is obtained as follows:

- (1) Remove any equipment and furnishings as necessary. Refer to applicable chapters.
- (2) Remove internal lining and insulation blankets as required. Refer to Passenger Cabin Equipment, Chapter 25.

B. Examine for the following.

- (1) All circumferential and longitudinal skin joints for misalignment, cracks in skin, and loose or missing rivets.
- (2) Frames for cracks or distortion, particularly at splices.
- (3) All stringers, particularly S14 and above, for cracks, distortion, loose or missing fasteners, especially at splices, also check end spotwelds where doublers are spotwelded to skin under stringer splices.
- (4) Tabs on outer chords of bulkheads station 600K, 820, 960 and 1240 which act as stringer splices. (S14 and above.)
- (5) Crease beam for cracks and distortion, also all attachment points for loose fasteners.
- (6) Crease beam for crack and distortion at station 600K, 640, 800 and 820, also steel straps attaching outer chords to bulkheads at stations 600K and 820 for cracks.
- (7) Upper wing to fuselage shear attachment joint station 600K to 820 for cracks and loose or missing rivets.
- (8) Station 360 and 1440 remove and examine representative number of production break tension bolts. Check bolts, bolt holes and fittings for elongation, wear and corrosion.
- (9) Check the production break tension bolts at stations 360 and 1440, and the stiffener tie bolts at stations 360, 600K, 820, 960 and 1440 for specified torque values. Refer to Chapter 91, "Standard Torque Values" for all bolts except bolts listed in the note below.

NOTE: Higher nonstandard torque values are called for to insure preload in the bolt will be higher than actual load normally encountered. Listed below are the nonstandard torque values.

MS20005	5/16 inch dia	205-255 pound-inches
MS20006	3/8 inch dia	330-420 pound-inches
MS20007	7/16 inch dia	600-730 pound-inches
MS20008	1/2 inch dia	925-1150 pound-inches

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- (10) Station 1440 pressure bulkhead web and radial stiffeners for cracks, distortion, flaking paint and pulled or missing rivets.
- (11) Forward upper bulkhead at station 1440 for cracks distortion, pulled or missing rivets, in web fin attachment fittings, horizontal and vertical support channels, and web stiffeners.
- (12) Window frame forgings and reinforcing skin for cracks especially at corner locations.
- (13) Galley and passenger door cutouts for cracks in skin and skin doublers, particularly at corners, hinge cutouts and frame and sill termination points, also check frames and sills bordering cutouts for cracks and distortion.
- (14) Emergency exit door frames and adjacent skin, particularly at corners, also frames and sills bordering cutouts for cracks, and distortions.



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PASSENGER CABIN FLOOR - MAINTENANCE PRACTICES

1 General

- A. The top surface of all floor beams in contact with the underside of the corrugated metal floor panels is covered with a cushioning tape.
- B. When cargo is to be carried in the cabin on Standard Passenger Airplanes and Passenger/Cargo Convertible Airplanes in passenger configuration, the flooring should be protected by padding, such as plywood. On Standard Passenger Airplanes, the load should be evenly distributed and limited to an overall maximum of 90 pounds per square foot, and to a maximum concentration of 34 3 pounds per inch lengthwise of the cabin.
- C. Access to passenger cabin floor is obtained as follows.
 - (1) Remove passengers seating as required. Refer to Chapter 25, Passenger Seats.
 - (2) Remove floor covering as required. Refer to Chapter 25, Passenger Cabin Equipment.

2. Removal/Installation Passenger Cabin Floor Panels

A. Equipment and Materials

- (1) Grease - BMS 3-24 (Ref 13-1-2)

B. Remove Floor Panels

- (1) Remove tape, sealant and fasteners as required to remove panel. On airplanes with integrally heated panels (marked with metal-cals), open main cabin heaters circuit breakers on P4 and disconnect panel wiring before removing panel.

C. Install Floor Panels

- (1) Treat holes in floor beams with brush alodine and primer (Ref 51-2-31 C/P).
- (2) Coat floor panel fasteners with grease. Position panel and install fasteners. Refer to Chapter 51, Sealing - D&O, and MP, for taping and sealing requirements. On airplanes with integrally heated panels, connect panel wiring and close main cabin heaters circuit breakers. Refer to Chapter 21, Air Conditioning for other maintenance practices concerning integrally heated panels.



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3. Inspection/Check Passenger Cabin Floor

A. Examine for the following.

- (1) Floor skins for cracks, corrosion and loose fasteners, especially in toilet and galley compartments.
- (2) Floor panels for cracks.
- (3) Seat tracks for distortion, cracks and loose fasteners.
- (4) Check for radius cracks in longitudinal floor beam chords attached to upper center wing skin, especially at fasteners located near skin stiffeners
- (5) Check floor beams at station 678.95, 701.95, 758.95 and 781.95 for radius cracks in beam chords attached to upper center wing skin.



WATER BARRIER - MAINTENANCE PRACTICES

1 General

- A The water barrier consists of mylar sheets (transparent), vinyl sheets (nontransparent) or 18 inch wide strips of vinyl tape bonded to floor panels. This section describes how to cut the water barrier in order to remove a floor panel and how to repair the water barrier after the floor panel is installed.
- B Vinyl tape applied at right angles to the seat tracks is the preferred replacement of water barrier.
- C Cutting the water barrier is accomplished by locating the edges of the floor panel and cutting through the water barrier around the edges of the floor panel to allow removal of the floor panel. Floor panel fasteners covered by vinyl may be exposed by peeling back the vinyl. Floor panel fasteners covered by mylar may be exposed by cutting away circular patches for each fastener. Remove floor panels per Passenger Cabin Floor - Removal/Installation.

2 Vinyl Water Barrier Approved Repairs (Sheet or Tape)

A Equipment and Materials

(1) Solvents

- (a) Methyl ethyl ketone (MEK)
- (b) Aliphatic naphtha
- (c) BMS 11-7

(2) Thinner - methyl ethyl ketone

(3) Adhesive

- (a) BMS 5-30B EC 1458 Anchor-weld 0308

(4) Vinyl Sheet

(5) Vinyl tape - Permacel 306 at least 18 inches wide

B Prepare for Repair

- (1) Install floor panel (Ref Passenger Cabin Floor - Removal/Installation)
- (2) Cut out strips of vinyl to splice edges of floor panel. The splice must overlap 3/4 inch on both sides of edges of floor panel.

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(3) Mix adhesives

- (a) BMS 5-30 Mix adhesive thoroughly before using Adhesive Which has thickened excessively or gelled shall not be used When thinning is necessary, use MEK Unless stored in airtight containers and kept under continuous agitation, thinned adhesive shall be used within 4 hours

(4) Clean faying surfaces

- (a) Clean faying surfaces between vinyl water barrier and floor panel with MEK
- (b) Clean faying surfaces between vinyl splice and vinyl water barrier with aliphatic naphta

C Repair Vinyl Water Barrier

(1) Repair of Vinyl Sheet Water Barrier

- (a) Brush apply adhesive to each faying surface between vinyl water barrier and floor panel
- (b) Allow adhesive to dry until it is tacky but no longer transfers to the knuckle when touchet lightly The optimum drying time will depend on temperature and humidity
- (c) Progressively, from center of floor panel, bond vinyl water barrier to floor panel
- (d) Wipe away any squeezed-out adhesive with a clean rag dampened with MEK

(2) Repair of Vinyl Splice

- (a) Clean again faying surfaces between vinyl splice and vinyl water barrier with aliphatic naphtha
- (b) Apply a thin, uniform brush coat of adhesive to both faying surfaces between vinyl splice and vinyl water barrier
- (c) Allow the adhesive to dry tack-free and reactivate it by lightly wiping one surface with a clean cheesecloth saturated with MEK
- (d) Join the faying surfaces, applying sufficient pressure to ensure intimate contact Care must be taken to avoid entrapping air pockets

D Restore Airplane to Normal

- (1) Excess adhesive may be removed with MEK



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3 Mylar Water Barrier Approved Repairs

A Equipment and Materials

- (1) Solvent - aliphatic naphtha
- (2) Adhesive - BM5 5-31B Pro-Seal 501 with Pro-Seal 501-A Accelerator
- (3) Mylar Sheet - Type A, 0.010 inch thick

B Prepare for Repair

- (1) Install floor panel (Ref Passenger Cabin Floor - Removal/Installation)
- (2) Cut out strips of mylar to splice edges of floor panel. The splice must overlap fastener line and adjoining floor panel 3/4 inch.
- (3) Clean faying surfaces with aliphatic naphtha.
- (4) Combine 100 parts by weight of Pro-Seal 501 with 30 parts by weight of Pro-Seal 501-A accelerator. Mix thoroughly by hand for approximately 5 minutes using a spatula or similar tool. If adhesive is mixed in the original can, it is recommended that the rim be cut out of the can to make mixing easier.

NOTE : Adhesive should be applied and spread as soon as possible after mixing. The heat of reaction of the mixed material in a container will shorten the work life. Work life is 20 minutes at 77°F.

The amount of adhesive to be used should be calculated on the basis of 50 +/- 5 grams per square foot of surface to be covered. Too little adhesive will make removal of air bubbles difficult.

C Repair Mylar Water Barrier

- (1) Apply adhesive to faying surface of splice.
- (2) Bond splice to water barrier.
- (3) Remove squeezed-out adhesive by wiping with naphtha dampened cloth. If any edge shows signs of delaminating, weight or tape it down until adhesive has cured.

D Restore Airplane to Normal

- (1) Allow adhesive to cure undisturbed for 2 hours minimum. Complete cure takes 12 hours or more.

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PRESSURE SEALS - MAINTENANCE PRACTICES

1. General

- A. Defective seals will be indicated by a loss of the passenger cabin pressure and excessive air currents around any access opening in the passenger cabin floor, or in the air-conditioning distribution bay. In such cases the seal may be ruptured, or more likely dislodged from the seal retainer groove.
- B. Small punctures, and deeper cuts and bruises on a seal can be repaired without removing the seal. More extensive damage or dislodged seals require removal of a part of or the whole seal.

2. Removal/Installation Pressure Seal

A. General

- (1) Removal and installation procedures of the two seals are identical except for the removal and installation of the adjacent equipment. Special tools are used for gaging retainer groove and for inserting retaining cables.

B. Equipment and Materials

- (1) Gage for retainer groove (See figure 201.)
- (2) Tool for inserting cables (See figure 201.)
- (3) Tape, thin and strong, 1/2-inch wide, "Flightex," Air Associates, Los Angeles, Calif., or equivalent
- (4) Hole filling compound, BMS 5-16A.

C. Remove Aft Pressure Seal (See figure 202.)

- (1) Remove four rows of passenger seats in the area of emergency exits. See Chapter 25, "Equipment and Furnishings."
- (2) Remove part of passenger cabin floor carpet strips and seat track covers Refer to Chapter 25, "Equipment and Furnishings "

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- (3) Remove five passenger cabin floor panels between Stations 800 and 820 by removing attachment bolts and lifting panels out

NOTE Removal of the section of each seat track adjacent to the removed panels affords further improved access, if desired, and is effected by lifting the lining strips from the track flanges and removing the bolts securing the track sections to the structure and to their hinged mountings below

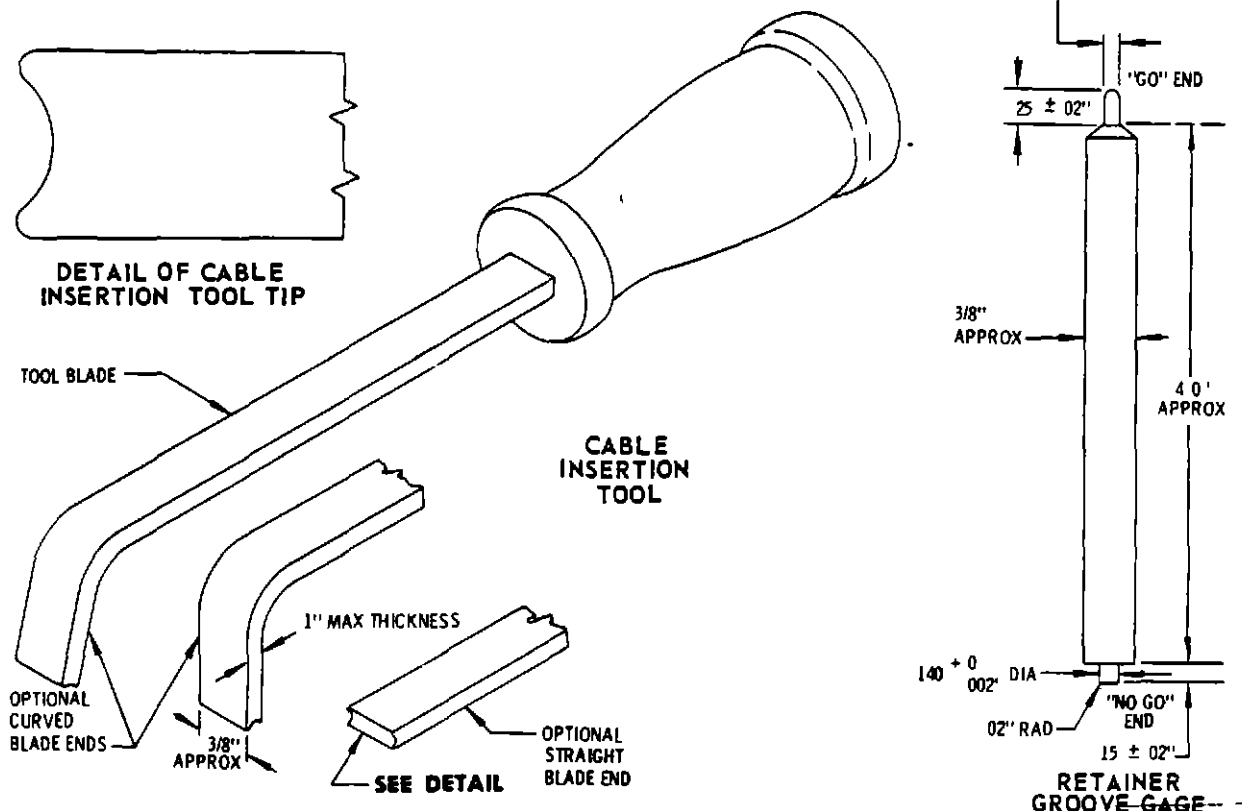
- (4) Examine pressure seal to locate the defect.

NOTE Only a part of strip from defect to end of strip may need removal.

- (5) Remove sealing cable

NOTE. Work with sufficient care to prevent formation of kinks on cable. Free cable may be coiled to facilitate handling.

- (a) Pull up steadily both ends of tags at the end of defective seal until cable comes out of seal retainer groove
- (b) Continue pulling cable away from groove in steps as permitted by adjacent equipment.
- (c) Stop pulling when cable is freed to about 8 inches beyond defect in seal, or when about one-half of cable length is free.
- (d) Repeat steps (a) through (c) with other cable on same end of strip.



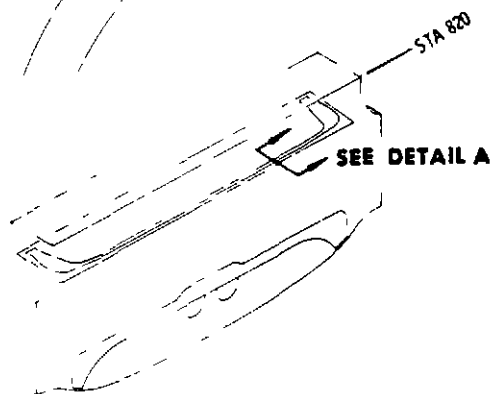
Pressure Seal Installation Tools
Figure 201

- (e) Remove short cable at the end of strip by pulling its tabs.
 - (f) When removing whole seal, mark approximate center of each cable length and corresponding point on retainer grooves.
 - (6) When replacing part of seal strip only cut off free part of strip at 45-degree angle just behind defect. See "Approved Repairs."
 - (7) Examine folded seams of free strip. Cut strip off at 45-degree angle if seam is damaged or so deformed that good sealing is doubtful.
- D. Remove Forward Pressure Seal (at the aft bulkhead of air-conditioning distribution bay)
- (1) Remove aft bulkhead panels of forward cargo compartment.
 - (2) Remove main cabin temperature control valve assembly and any air-conditioning system ducts as necessary for access to pressure seal. See Chapter 21, "Air Conditioning."
 - (3) Continue with steps 2.C.(4) through 2.C.(7) above.
- E. Prepare for Pressure Seal Installation
- (1) Apply hole filling compound BMS 5-16A to structure on which ends of seal will rest, on both sides of airplane between BBL 65 and BBL 70 and Body Stations 800 and 820.

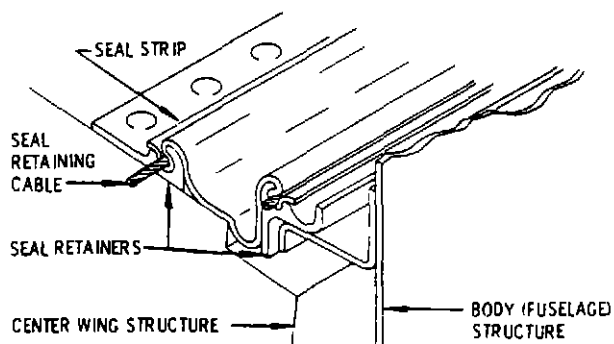
NOTE. The compound should be so applied that bolt heads cannot chafe the underside of the seal. Curing time at 77°F is about 20 hours, but this can be reduced by applying heat at 115°F the curing time is about 5 hours. Heat applied should not exceed 120°F.
 - (2) Prepare a new seal strip or repair defective seal strip by cementing a new strip See "Approved Repairs."
 - (3) Wipe clean the free length of seal strip, apply talcum powder or soap on both sides of strip along the whole seam area, wind the strip into a roll and secure roll against unwinding by using masking tape
 - (4) Prepare retainer grooves.
 - (a) Examine grooves for clean and smooth edges.
 - (b) Remove any nicks and dents by careful filing, sanding or light hammering. Wipe filings away.
 - (c) Check grooves for correct opening by feeling along the whole length with groove gage. (See figure 201)
 - (d) Close or open groove carefully where necessary

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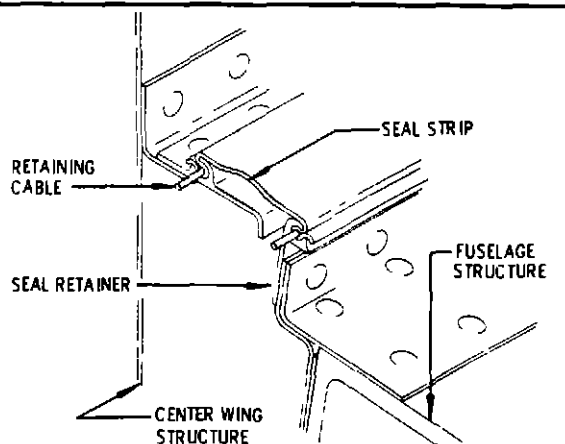
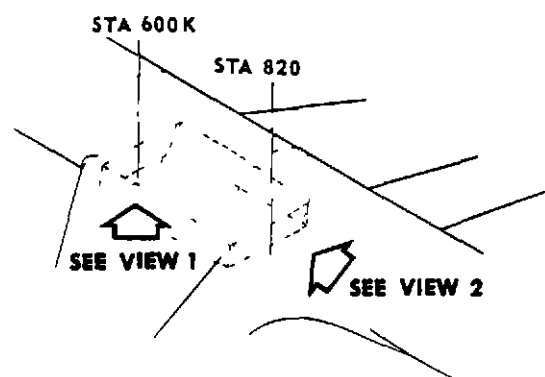
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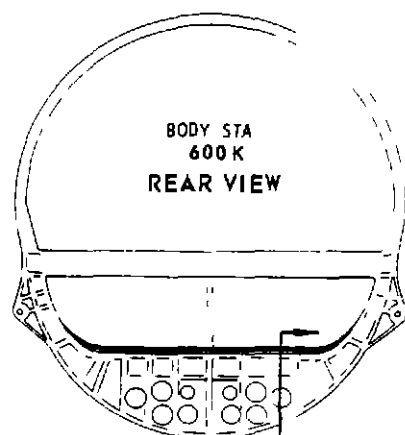
VIEW 2



**AFT PRESSURE SEAL
 DETAIL A**



**FORWARD PRESSURE SEAL
 DETAIL B**



VIEW 1

Pressure Seals Installation
 Figure 202

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- (e) Blow retainer grooves clean with compressed air and vacuum clean surrounding area.
- (5) Wipe cables clean, using rag moistened with methyl ethyl ketone. Carefully straighten any light kinks on cables.
- (6) Apply light coat of talcum powder or soap to all free sealing cables. Coil the cables and secure coils against unwinding by using masking tape or string

F. Install Aft Pressure Seal

- (1) Uncoil the strip, place it in position and spread it flat and even. Secure strip against shifting where necessary by using masking tape. Check that seal strip is wide enough to provide slack between retainers after installation (See figure 202.)

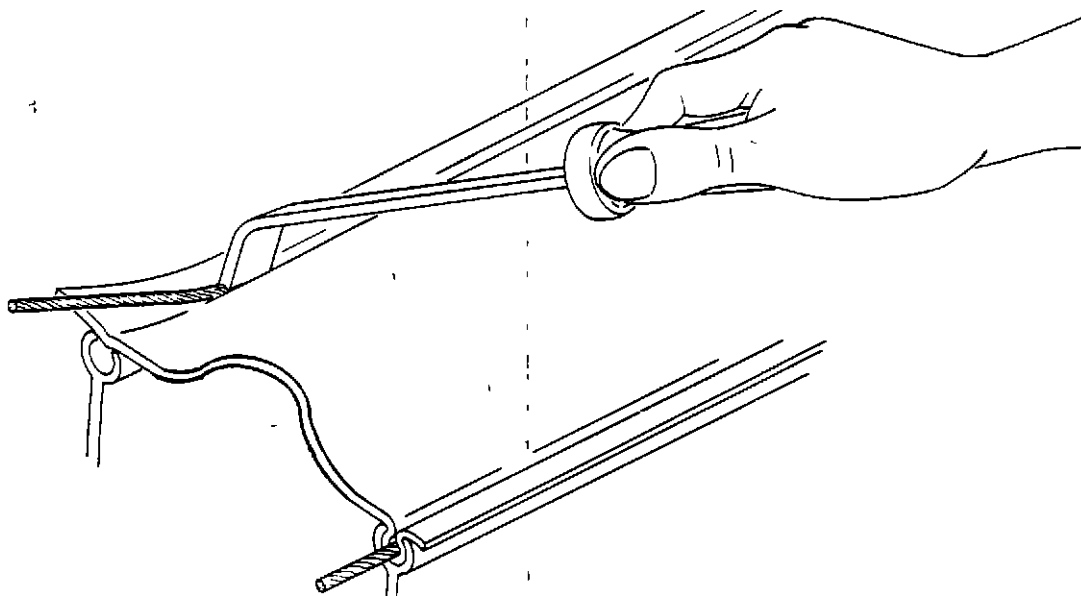
CAUTION UNLESS AMPLE SLACK IS PROVIDED ACROSS THE INSTALLED SEAL, AIRPLANE FLEXING WILL WEAR SEAL EXCESSIVELY AND MAY PULL SEAL FROM ITS RETAINERS.

- (2) Uncoil and spread aft sealing cable over the aft groove. In case the whole cable was removed, make sure that the marked center of cable length and correspondingly marked center of retainer groove coincide

NOTE: Omit steps (3) and (4) when installing part of strip only.

- (3) Using the cable inserting tool, press cable into groove just in the middle of cable length. (See figure 203)

CAUTION USE PROPER CABLE INSERTING TOOL, FIGURE 201. DO NOT USE SCREWDRIVER OR SIMILAR SHARP EDGED TOOL WHICH WOULD DAMAGE SEAL OR RETAINER.



Seal Retaining Cable Installation
Figure 203

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- (4) Working alternately on both sides of seal center, press about 18 inches of cable into groove
- (5) Using the cable inserting tool, press cable into groove in short steps in the direction of free end of cable. Check that sealing cable is well embedded in groove. Continue until about 4 inches from cable end
- (6) Place one piece of strong thin tape (e g "Flightex") on each end of cable, to form tabs for future cable removal, and press remaining free cable into groove.

NOTE Do not fail to place tabs on cable, to facilitate possible future removal.

- (7) Repeat steps (2) through (6) with forward cable.
- (8) Install short cable across the end of strip, after placing removal tags on one end of each cable
- (9) Check that all cables are properly installed.
- (10) Trim free edges of seal strip to leave about 3/4 of an inch along all edges

CAUTION DO NOT TRIM CLOSER THAN 3/4 OF AN INCH. TRIM CAREFULLY NOT TO DAMAGE SEAL. CHECK THAT ALL CABLES ARE FULLY IN GROOVES. IMPROPER CABLE INSTALLATION, IMPROPER TRIM AND DAMAGED SEAL WOULD RESULT IN LOSS OF CABIN PRESSURE.

- (11) Pressure check passenger cabin (optional). See 53-5-1
- (12) Install four sections of seat tracks, if removed for access, and install five floor panels removed in paragraph 2.C.(3).
- (13) Install floor carpet strips removed in paragraph 2.C (2). See Chapter 25, "Equipment and Furnishings."
- (14) Install passenger seats removed in paragraph 2.C.(1). See Chapter 25, "Equipment and Furnishings."

G Install Forward Pressure Seal

- (1) Perform steps 2.F.(1) through 2 F.(11) for the forward pressure seal strip.
- (2) Install main cabin temperature control valve and any air-conditioning system ducts which were removed in paragraph 2 D (2) for access to pressure seal. See Chapter 21, "Air Conditioning."
- (3) Install aft bulkhead panels of forward cargo compartment.

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3 Approved Repairs

A General

- (1) Repair work on pressure seal includes cementing of patches over deep cuts and bruises or small punctures, cement joining of two or more pieces of seal strip, and trimming the ends of seal retaining cables.

NOTE Correctly prepared and clean surfaces, for cemented joints and patches, and for trimmed cable ends, are essential for successful repair work.

B. Equipment and Materials

- (1) Repair material, BMS 1-25A.
- (2) Repair cement, BMS 5-14, grade I, adhesive
- (3) Cleaning solvent, methyl ethyl ketone.
- (4) Solder and soldering paste for stainless steel cable.
- (5) Corrosion resistant steel cable 3/32 Dia 7x7 flex preformed, MIL-C-5424.
- (6) Sharp knife and scissors.
- (7) Abrasive cloth number 120 grit, Aluminum Oxide, Three-M-ITE.
- (8) Soldering iron or torch for solder bath.

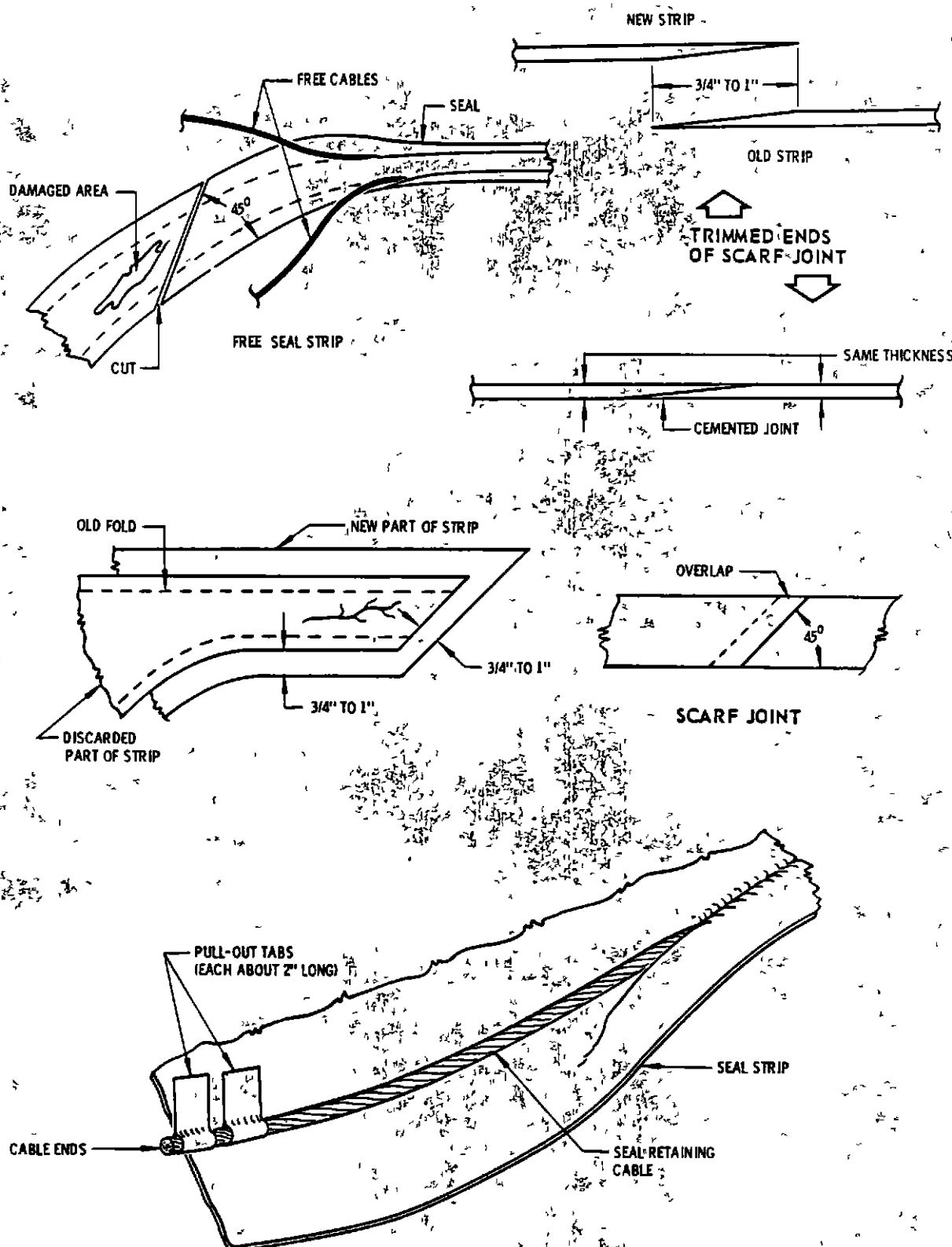
C. Repair Seal Strip Surface Damage

- (1) Cut a patch from repair material, adding about 1/2 an inch to 3/4 of an inch on all sides of the damage. (See figure 204.)
- (2) Roughen damaged seal surface over an area 1/4-inch bigger than patch.

NOTE Remove seal when surface of installed seal cannot be properly roughened.

- (3) Roughen or buff the side of patch to be cemented
- (4) Wash the roughened areas of seal and patch until all rubber dust and grit is removed. Use clean cloth soaked with solvent.

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Pressure Seal Approved Repair
Figure 204

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- (5) Apply a brush coat of adhesive to the seal and to the patch, and allow coats to dry until quite tacky.

NOTE. Check tackiness by touching coated surface with knuckle.

- (6) Carefully locate patch over coated seal area. Press patch to seal making sure that no air is trapped under patch.

D. Repair Body Pressure Seals

NOTE This procedure can be applied only on airplanes using RMS-1-25 seal material.

- (1) Clean the pressure seals upper surface thoroughly, using brushes or clean cloth dampened in MEK.
- (2) Apply a thin coat of PR-380 sealant to the cleaned surfaces.
- (3) Cut a strip of neoprene impregnated nylon fabric 1.5 ft. by 12 ft. and trim to fit over seal, lapping over all edges. Wipe off repair strip with MEK.
- (4) Lay fabric over seal, pressing firmly onto the sealant.
- (5) Seal all edges of repair fabric with PR-380 sealant.

E Splice Seal Strip

- (1) Cut pieces of seal material to a correct size.

NOTE. Use discarded part of seal as a template. Add about 3/4 up to 1 inch along the whole perimeter of part spread fully flat. (See figure 204.)

- (2) Cut corresponding joint ends to 45-degree angle.
- (3) Trim and buff contact sides of overlapping strip ends to form a scarf joint running at 45-degree angle.

NOTE. Total thickness of overlapped ends of scarf joint should be the same as full thickness of seal material (at least in the area of folds).

- (4) Wash trimmed and buffed areas until all rubber dust and grit is removed. Use clean rags soaked with solvent.
- (5) Apply a brush coat of adhesive to both matching surfaces and allow coats to dry until quite tacky.

NOTE. Check tackiness by pressing a knuckle against coated surfaces.

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- (6) Carefully join surfaces while still tacky. Press joint sufficiently to insure good contact.

NOTE: Make sure the parts are correctly aligned before contacting coated surfaces.

- (7) Check that joint thickness is about the same as thickness of seal material. Remove excess material if necessary by buffing on the top surface of seal.

F. Repair Seal Retaining Cable

(1) General

- (a) Seal retaining cables normally do not require repair or replacement. Small kinks can be straightened by hand or with pliers. Cables with sharp kinks, or badly deformed must be replaced. Cables with frayed ends or with broken wires should be cut off, soldered and a new section of cable added to replace the damaged end. The new section need not be soldered to the usable cable but can be used as a separate replacement of the damaged section.

(2) Prepare new cable

- (a) Cut 3/32-inch diameter corrosion resistant steel cable to the same length as the cable to be replaced.
- (b) Wipe cable clean from grease with paper and with solvent moistened cloth
- (c) Check that cable ends are clean, neatly cut and with wire ends close together. Trim ends if necessary
- (d) Degrease cable ends by rinsing them up to about 3 inches in solvent. Leave ends to dry.
- (e) Dip ends in solder, or solder the ends to a length of about 3/4 of an inch. Wipe off excess solder.
- (f) File ends to make smooth, round tips.
- (g) Immerse ends for a few seconds in boiling water

(3) Repair a cable with frayed ends or broken wires.

- (a) Cut off damaged section of cable.
- (b) Degrease ends of usable cable, as described above, and dip ends in solder.
- (c) Add new sections of cable as required. Make sure each end of cable is solder dipped and fitted with tape tab for future removal.



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VAPOR BARRIER - MAINTENANCE PRACTICES

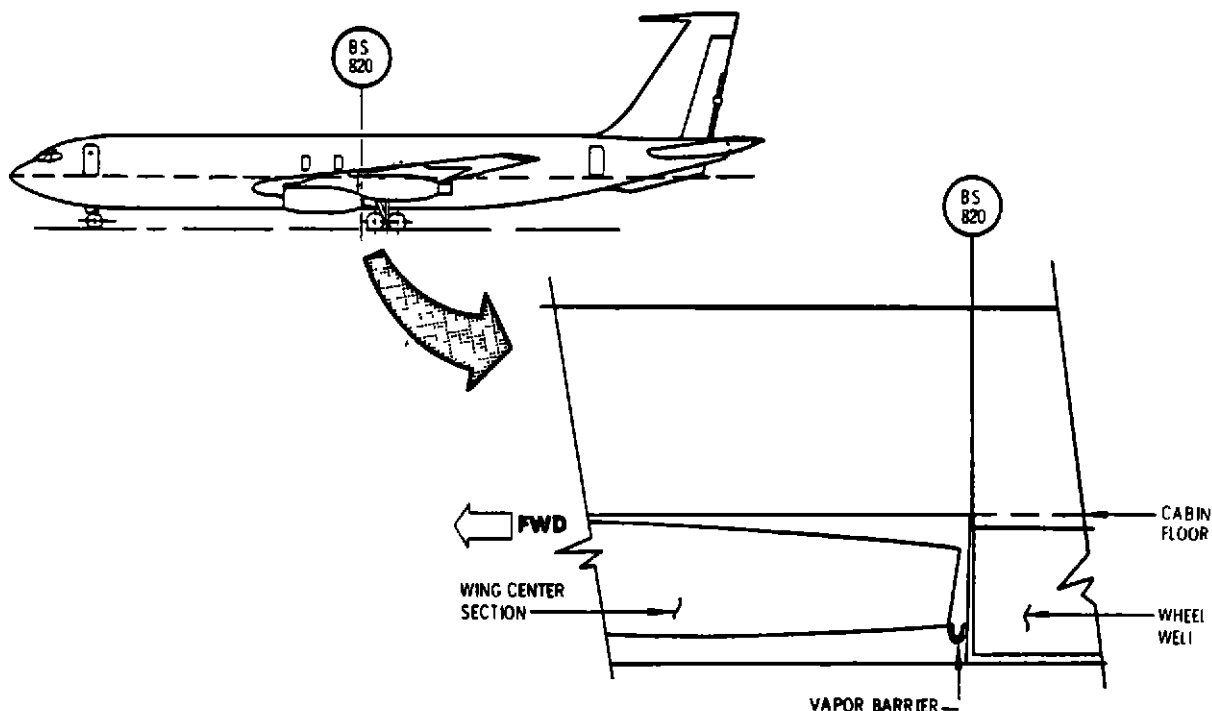
1 Removal/Installation Vapor Barrier

A. General

- (1) The forward edge of the vapor barrier is secured by a retaining strip bolted to the lower aft edge of the wing center section. The bolts are installed from the aft direction, and are screwed into nuts or nut plates on the retaining strip. (See figure 201.)
- (2) The aft edge of the vapor barrier is secured by a retaining strip bolted, screwed and, in some cases, riveted to the forward face of the fuselage bulkhead at Body Sta 820. (See figures 201 and 202.) The bolts and screws are installed from the forward direction and screw into nuts or nut plates on the aft face of the bulkhead. On early airplanes bolts were used to secure the retaining strip in the area of the airplane centerline; on either side of this series of bolts the retaining strip is attached to the bulkhead by a series of rivets extending to each end of the vapor barrier, except that bolts were again used where the retaining strip crossed the line of a stiffener on the aft face of the bulkhead.

B. Equipment and Materials

- (1) Leather punches
- (2) Hole filling compound BMS 5-16





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B. Remove Vapor Barrier

- (1) Open both air conditioning equipment bay doors.
- (2) Remove air conditioning equipment at aft end of each bay. See Chapter 21, "AIR CONDITIONING."

NOTE: On air cycle systems it will be necessary to remove the turbofan and the ram air exit damper. On vapor cycle systems it will be necessary to remove the primary heat exchanger.

- (3) Unscrew and remove fairing immediately outboard of each air conditioning equipment bay, and from Body Sta 820 forward.
- (4) Reach up to left extremity of vapor barrier, grasp zipper-fastener handle and draw it across whole width of airplane until two halves of vapor barrier are completely disconnected from each other. (See figure 202.)
- (5) Using tools suitable for restricted clearance, remove bolts and screws from retaining strips along both halves of vapor barrier and remove retaining strips.

NOTE: On airplanes with riveted aft edge retaining strips, the rivets should be drilled out. Access for this operation is obtained from both wheel wells.

- (6) Remove both halves of vapor barrier by peeling it away from those portions of structure at which sealant was applied. Remove old sealant from surfaces of structure with a plastic scraper and finally clean surfaces with clean cloth moistened with methyl-ethyl-ketone, or equivalent solvent.

C. Install Vapor Barrier

- (1) Lay aft half of new vapor barrier on bench, with its faying surface flat and shrouded face of zipper uppermost, and make chalk mark across center of vapor barrier to represent airplane centerline.

NOTE: When the faying surface of the barrier is flat, the opposite edge (with the zipper) will be slightly fuller and will tend to distort upward.

- (2) Make equivalent mark across forward face of the central straight section of the aft retaining strip.
- (3) Carefully place marked section of retaining strip face upward on vapor barrier so that retaining strip is parallel to vapor barrier and the same distance from its edge as it was from the edge of the old seal, and so that centerlines marked on each item coincide.

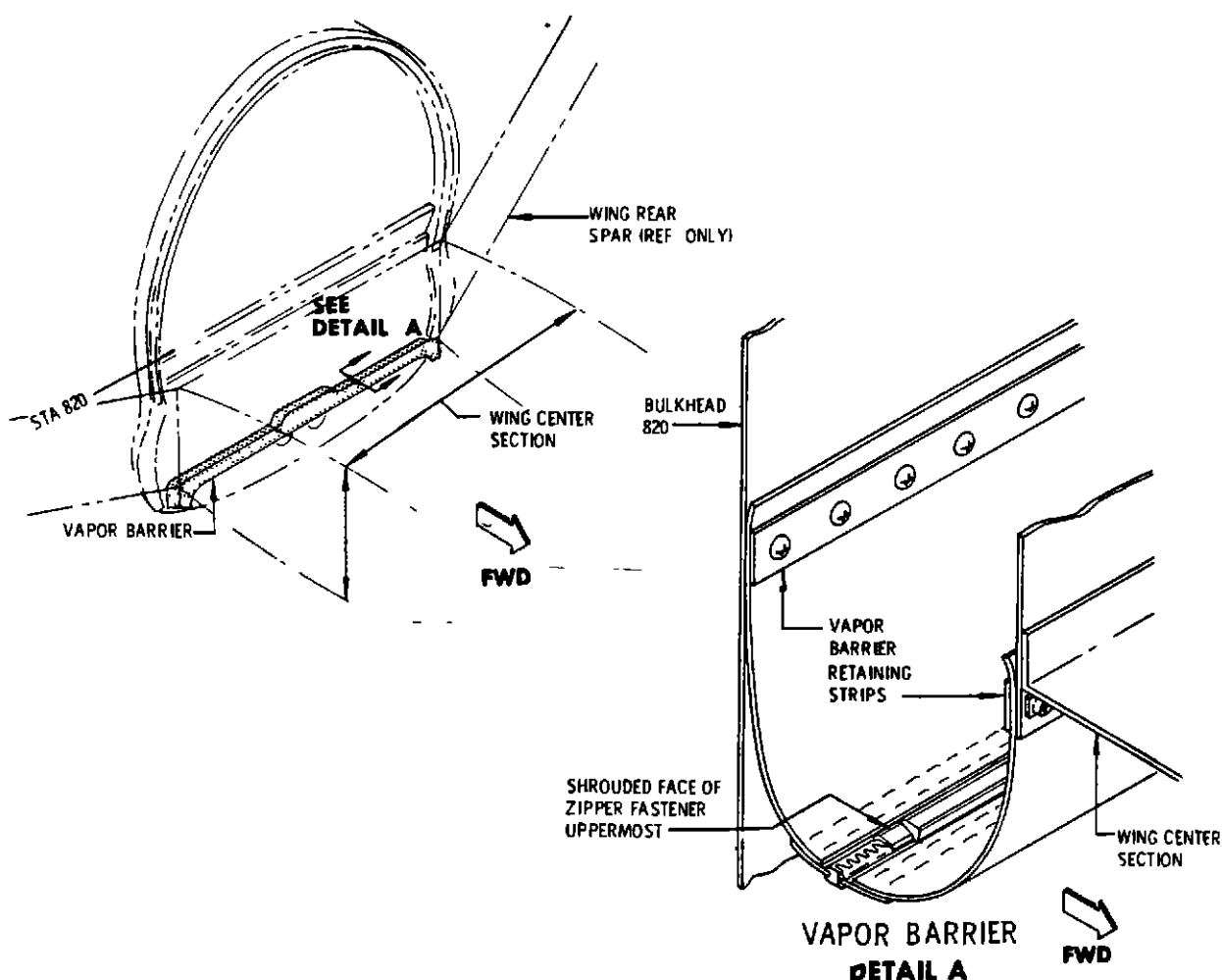
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- (4) Carefully place remaining sections of aft retaining strip on each end of vapor barrier, so that they are properly located.
- (5) Using existing holes in retaining strips, mark location for holes in vapor barrier.

CAUTION. IT IS ESSENTIAL THAT DURING THIS OPERATION THE VAPOR BARRIER IS KEPT FLAT AND THE RETAINING STRIPS ARE KEPT PROPERLY LOCATED. IF THE VAPOR BARRIER HOLES ARE MARKED INCORRECTLY, A TWISTED AND DIFFICULT INSTALLATION MAY RESULT.

- (6) Using leather punches of suitable diameters for bolts or screws to be installed, pierce holes in marked positions along vapor barrier.
- (7) Apply hole filling compound EMS 5-16 to those parts of structure where vapor barrier is to be installed across a joggle between different metal thicknesses.



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- (8) Before expiry of hole filling compound work life, locate vapor barrier, together with its central retaining strips, correctly against the structure, observing centerline markings previously applied.

CAUTION: CARE SHOULD BE TAKEN THAT VAPOR BARRIER IS THE RIGHT WAY AROUND: THE SHROUDED EDGE OF THE ZIPPER SHOULD FACE FORWARD, WHICH WILL BE UPPERMOST WHEN BOTH HALVES OF BARRIER ARE ZIPPED TOGETHER.

- (9) Install about three widely spaced bolts attaching the straight retaining strip, locate remaining retaining strips and install similarly spaced bolts and screws.
- (10) Check that vapor barrier is properly positioned and free of excessive distortions, and install remaining bolts and screws.
- (11) Repeat steps (1) through (10) for forward half of vapor barrier, taking care to apply these instructions in the opposite sense so that when forward half is installed the two halves may be joined by the zipper.
- NOTE:** On those airplanes on which the aft half of the barrier was originally attached to the bulkhead by rivets, it is recommended that bolts and/or screws be employed when installing a replacement barrier. These may be installed from either direction and with any suitable nut, the choice depending on simplicity of installation.
- (12) Engage zipper at extreme right hand end of vapor barrier and connect separate halves of vapor barrier by drawing zipper handle across airplane until handle is at extreme left hand end.
- (13) Replace fairings immediately forward of Body Sta 820 and immediately outboard of both air conditioning equipment bays.
- (14) Replace air conditioning equipment removed for access. See Chapter 25, "AIR CONDITIONING."
- (15) Close both air conditioning equipment bay doors.

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FENCE RECESS PANEL - MAINTENANCE PRACTICES

EFFECTIVITY

TURBOFAN

1. Removal/Installation Fence Recess Panel

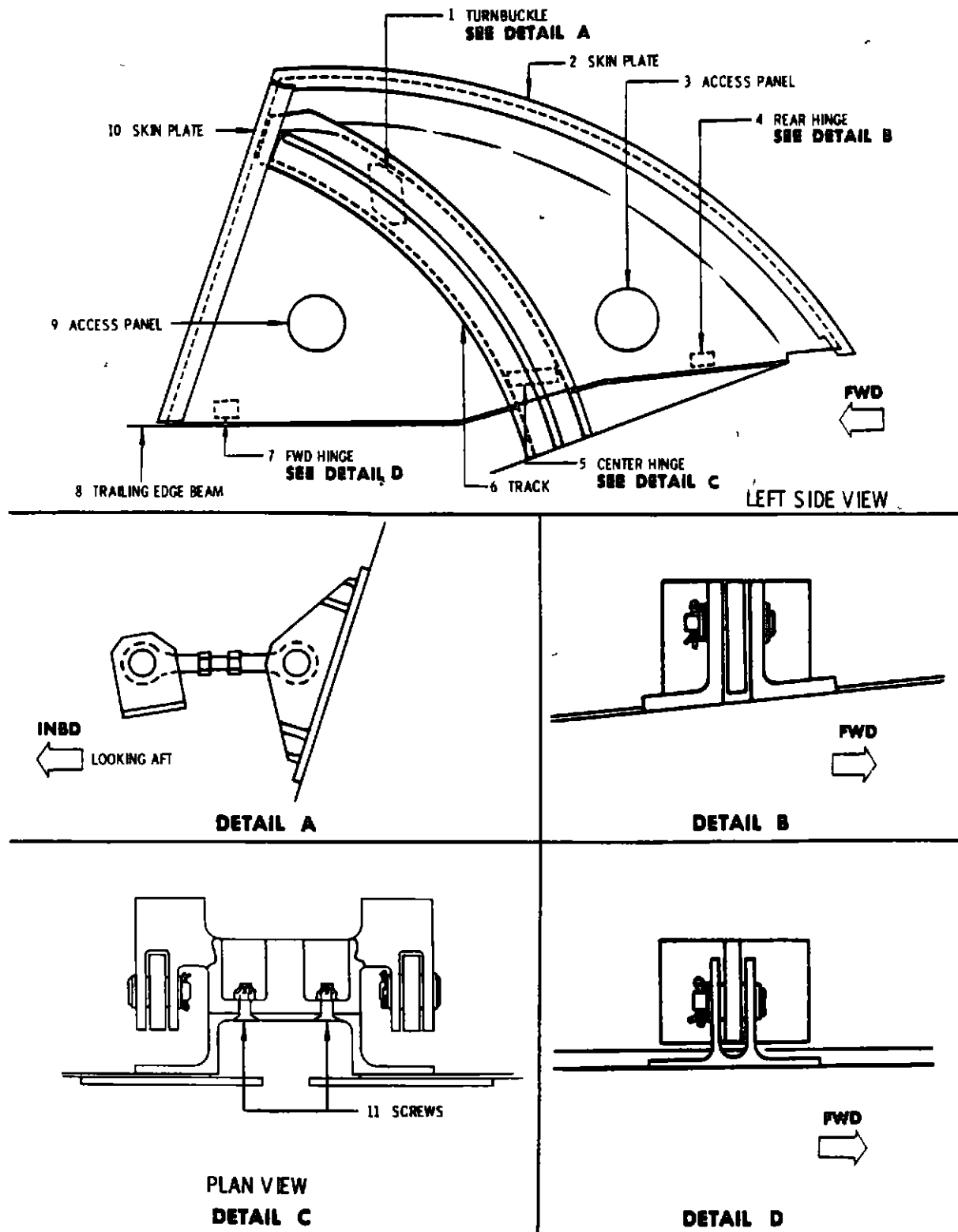
A. Remove Fence Recess Panel

- (1) Remove fence. See "Fillet Flap Fence Assembly," Chapter 27.
- (2) Trim flaps to down position.
- (3) Remove skin plates (2) and (10). See figure 201.
- (4) Working from inside main wheel well, release panel from turnbuckle (1) and hold panel in vertical position.
- (5) Remove access panel (3).
- (6) Using an offset screwdriver and working from the outboard side, remove two screws (11) attaching panel to center hinge.
- (7) Reach through access panel (3) and remove cotter pin from rear hinge pin.
- (8) Support panel and remove rear hinge pin.
- (9) Working from inside main wheel well, remove cotter pin from forward hinge pin.
- (10) Remove forward hinge pin.
- (11) Remove panel.

B. Install Fence Recess Panel

- (1) Trim flaps to down position.
- (2) Place and support panel on trailing edge beam (8) in such a manner that hinge fittings on the beam and the panel match.
- (3) Working from inside main wheel well, install forward hinge pin.
- (4) Install cotter pin in forward hinge pin.
- (5) Reach through access panel (3) and install rear hinge pin.

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- (6) Install cotter pin in rear hinge pin.
- (7) Using an offset screwdriver and working from the outboard side, fasten two screws (11) attaching panel to center hinge.
- (8) Install access panel (3).
- (9) Working from inside main wheel well, attach turnbuckle (1) to panel.
- (10) Install skin plates (2) and (10).
- (11) Install fence. See "Fillet Flap Fence Assembly," Chapter 27.



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KEEL BEAM - CLEANING/PAINTING

1 General

- A. The interior of the keel beam is coated with a corrosion resistant compound. Cleaning refers to removal of this coating and painting refers to its application.
- B. Upon completion of the cleaning operation the affected area must be brush alodized. Refer to Interior and Exterior Finishes, Chapter 51. Application of the corrosion resistant coating (painting) is done after cleaning and alodizing.

2 Equipment and Materials

- A. Cneesecloth or new rags, less than 0.75% oil
- B. Cleaning brush, wire
- C Aluminum wool
- D. Special solvent cleaners
 - (1) Shell Solvent TS-1; Shell Oil Company, or equivalent
 - (2) Skellysolve-S; Skelly Oil Company; or equivalent
 - (3) Standard Thinner #325; Standard Oil Company; or equivalent
 - (4) Stanisol Solvent; Standard Oil Company; or equivalent
 - (5) Union No. 5 Thinner, Union Oil Company; or equivalent
- E. Toluene Thinner, TT-T-548, or equivalent
- F Deleted

3. Clean Interior of Keel Beam

- A. Thoroughly dry interior of keel beam.
- B. Clean affected area to bare metal.
 - (1) Clean aluminum parts with aluminum wool.
 - (2) Clean steel parts with wire brush.
- C. Brush alodize bare metal area. Refer to Chapter 51, Interior and Exterior Finishes.



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D. Wipe up entire area with clean cloths moistened with solvent cleaner and proceed with painting.

4. Paint Interior of Keel Beam

A. After cleaning and repairs are complete apply one coating of Alodine, followed by two coatings of BMS 10-11, Type 1, primer, per Chapter 51, Interior and Exterior Finishes.



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ANTENNA BAY DOORS - APPROVED REPAIRS

1. General

- A. The antenna bay doors are located in the lower section of the wing-to-fuselage fairing, along the airplane centerline and below the wing center section. See Chapter 12, Access Doors and Panels.

2. Approved Repairs Antenna Bay Door Hinges

- A. The maximum clearance allowed between the pin and the inside of the hinge half attached to the door is 0.05 inch. The maximum clearance allowed between the pin and the inside of the hinge half attached to the fuselage is 0.03 inch. The minimum allowable wall thickness of the door hinge half is 0.018 inch and of the fuselage hinge half is 0.042 inch.
- B. When pin-to-hinge clearances are exceeded, a larger pin must be installed.

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AFT FUSELAGE SECTION - MAINTENANCE PRACTICES

1 Inspection/Check Aft Fuselage Section

A Access to aft fuselage section is obtained as follows.

- (1) Access door, 1185L stations 1462 to 1484. Refer to Access Doors and Panels, Chapter 12
- (2) Access door, 1188 station 1608. Refer to Access Doors and Panels, Chapter 12.

B. Examine for the following

- (1) All circumferential and longitudinal skin joints for misalignment, cracks in skin, corrosion in magnesium skins, and loose or missing rivets.
- (2) Stringers, particularly S14 and above for cracks, distortion, and loose or missing fasteners, especially at splices. Check end spotwelds where doublers are spotwelded to skin under stringer splices
- (3) Frames for cracks or distortion particularly at splices.
- (4) Intercostals for cracks or distortion particularly at splices.
- (5) Corners of access openings for cracks in frames and adjacent skin.
- (6) Upper and lower beams at WL 273.70 and WL 231.85 to WL 246.10 between stations 1505.87 and 1592 for cracks, distortion, loose or missing fasteners
- (7) Bulkheads at stations 1505.87 and 1592, webs and web stiffeners for cracks and loose fasteners, fin terminal fittings and horizontal stabilizer torque box hinge fittings for cracks, and loose attaching bolts, bolts and bolt holes for corrosion and wear.
- (8) Horizontal stabilizer jackscrew actuator support fittings station 1507 for cracks and loose attaching bolts.

END

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TAIL CONE - MAINTENANCE PRACTICES

1. Removal/Installation Tail Cone

A. Remove Tail Cone

- (1) Depressurize auxiliary hydraulic system.

WARNING. AUXILIARY HYDRAULIC SYSTEM MUST BE DEPRESSURIZED BEFORE WORKING IN AREA OF RUDDER. HYDRAULIC OPERATION OF RUDDER MAY CAUSE PERSONNEL INJURY.

- (a) Position systems interconnect valve switch to "CLOSED "
- (b) Position auxiliary pump switches to "OFF."
- (c) Open systems interconnect valve circuit breaker.
- (d) Open auxiliary hydraulic motor circuit breakers on panels P1 and P3
- (e) Position rudder switch on pilots' overhead panel to "ON."
- (f) Unscrew utility reservoir filler cap three turns to vent pressurization air
- (g) Cycle rudder pedals until rudder stops operating hydraulically.
- (h) On airplanes fitted with rudder hydraulic manual shutoff valve, position this valve to "OFF."

CAUTION. WHEN THE AUXILIARY HYDRAULIC SYSTEM IS RETURNED TO NORMAL, THIS VALVE SHOULD BE LOCKWIRED IN THE "ON" POSITION.

- (2) Remove tail cone access panels 1076 (left) and 1076 (right), or tail cone access panel 1188, whichever is applicable. Refer to Chapter 12, "Access Doors and Panels."
- (3) Disconnect leads to tail light at splice location.
- (4) Remove flare tube assembly if applicable. Refer to Chapter 25, "Pyrotechnic Equipment."
- (5) Provide support for tail cone.
- (6) Remove the upper and lower beam attachment bolts, and skin attachment angle bolts.
- (7) Remove rudder fairing splice plate along upper surface of tail cone

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- (8) From outside the airplane, remove the screws attaching skin to frame

NOTE: Rudder may be pushed from side to side to give access to skin attaching screws.

- (9) Remove tail cone from airplane, moving it aft and down.

B. Install Tail Cone

- (1) Depressurize auxiliary hydraulic system per step 1.A.(1).

- (2) Place tail cone in position.

NOTE Exercise caution to prevent damage to elevators, and support tail cone until all attaching screws and bolts are installed

- (3) From within the tail compartment, install the upper and lower beam attachment bolts, and the skin attachment angle bolts.

- (4) From outside the airplane, install the screws attaching skin to frame.

- (5) Install the rudder fairing splice plate along upper surface of tail cone.

NOTE: Rudder may be pushed from side to side to give access to attachment screw holes.

- (6) Install the flare tube assembly if applicable. Refer to Chapter 25, "Pyrotechnic Equipment."

- (7) Resplice lead to tail light.

- (8) Check for correct functioning of tail light.

- (9) Replace tail cone access panels.

- (10) Restore auxiliary hydraulic system to normal configuration

(a) Tighten utility reservoir filler cap.

(b) Close auxiliary hydraulic motor circuit breakers on panels P1 and P3.

(c) Close systems interconnect valve circuit breaker.

(d) On airplanes fitted with rudder hydraulic manual shutoff valve, position this valve to "ON" and lockwire it in this position.

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CABIN PRESSURE LEAKAGE - ADJUSTMENT/TEST

1. Cabin Pressure Leakage Test

A. General

- (1) Deleted.
- (2) Pressure leakage testing may be performed to determine the tightness of the pressurized areas of the fuselage and the rate of leakage from the structure.
- (3) For the simplified cabin leakage test described herein, the airplane is to be on the ground in a standard production configuration. No covering or blocking or normal vents is required.
- (4) Precautions to Protect Personnel and Equipment:
 - (a) Care must be taken not to subject personnel within the airplane to excessive rates of pressure change. Do not increase pressure at a higher rate than that which can be borne comfortably and safely by the personnel inside the airplane. Customer airlines which adopt this method of leakage test should apply the codes for compression and decompression and the standards of safety for compressed air work applicable to the states in which they are located. Operators should be cleared for flight by their respective medical departments.

WARNING: DO NOT INCREASE PRESSURE AT A HIGHER RATE THAN THAT WHICH CAN BE BORNE COMFORTABLY AND SAFELY BY THE PERSONNEL INSIDE THE AIRPLANE. EVEN REGARDLESS OF HUMAN FACTORS, THE SAFETY OF AIRPLANE INSTRUMENTS REQUIRES THAT THE RATE OF CLIMB IS HELD BELOW -2000 FPM. DO NOT INCREASE DIFFERENTIAL PRESSURE TO MORE THAN 8.6 PSIG.

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B Equipment and Materials

(1) Pressure Source for Airplanes with Air Cycle Cooling Packs

- (a) The airplane turbocompressors
- (b) A BAC502 gas turbine, or equivalent

NOTE. If either B (1)(a) or B (1)(b) is used as a pressure source, the pressurized air must be routed through either or both of the air conditioning packs to maintain a maximum cabin inlet duct temperature of 140°F. Cabin temperatures may be controlled as desired by the cabin temperature control system.

- (c) A compressed air supply. The system must be capable of providing a continuous flow in excess of 2000 cfm at a pressure of 10 psig or more.

(2) Pressure Source for Airplanes with Vapor Cycle Cooling Packs

- (a) The airplane turbocompressors.
- (b) A compressed air supply. The system must be capable of providing a continuous flow in excess of 2000 cfm at a pressure of 10 psig or more.

NOTE. If the turbocompressors are used as a pressure source, the pressurized air must be routed through either or both of the air conditioning packs to maintain a maximum cabin inlet duct temperature of 140°F. Cabin temperatures may be controlled as desired by the cabin temperature control system.

C Prepare for Cabin Pressure Leakage Test

(1) Wing valve switches.

- (a) Check that wing valve switches are open if pressure sources B.(1)(a) or B (2)(a) are used.
- (b) Close wing valve switches if pressure sources B (1)(b), B.(1)(c) or B (2)(b) are used.

(2) Check that ram air valve switch is closed (if installed).

(3) Set cabin air thrust recovery valve switch to OFF (if installed).



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- (4) Operate equipment cooling system outflow valves as follows:
- (a) On airplanes equipped with electrically operated cooling valve, set equipment cooling switch to BLOWER OFF, VALVE CLOSED.
 - (b) On airplanes equipped with an overboard dump valve (recirculation duct airplanes) check that dump valve switch is OPEN and manually set override handle to CLOSE position.
 - (c) On direct duct discharge airplanes, the flow control valve will close automatically when cabin pressure differential reaches 1.8 to 2.8 psi, however, the override handle may be manually set to CLOSE.
- NOTE. Use of electronic equipment must be kept to a minimum with electronic fan off.
- (5) In control cabin, remove diluter demand regulators and cap lines with clean metal caps.
- (6) On airplanes with personnel accommodations oxygen system, remove pneumatic continuous flow control unit and electropneumatic continuous flow control unit in forward cargo compartment oxygen installation and cap lines with clean metal caps.
- (7) Remove both continuous flow regulators and automatic (trigger) valve in aft cargo compartment oxygen installation and cap lines with clean metal caps.
- (8) Check pitot static systems for integrity and test pitot static systems per Chapter 34, Pitot Static Systems - Maintenance Practices. All spare data units and air data units with disconnected pitot static lines must be removed from the airplane and the pitot static lines must be capped. No pressure leakage test should be conducted on an airplane which has not been tested for pitot static systems leaks or blocks unless all air data equipment is removed.

D. Cabin Pressure Leakage Test

- (1) Using manual cabin pressure controller, pressurize airplane by supplying air to the cabin from the pressure source.

NOTE The selected pressure differential need not be the 8.6 psig maximum.

- (2) Close off the pressure source.
- (a) If using the turbocompressors as the pressure source, place the air conditioning switches in the OFF position and both wing valve switches in the OFF position with the turbocompressors still working.



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- (3) After delaying approximately 10 to 15 seconds to assure that the pressure source is closed, record cabin pressure differential, and record the time required for the cabin to bleed down from the initially observed pressure to 3 psi.
- (4) Check results of test to determine acceptability of the leakage rate.
 - (a) If the test was conducted at field altitudes significantly higher than sea level, obtain correction factor from figure 502 to correct time readings.
 - (b) Plot readings, initial pressure differential on the vertical and time on the horizontal axis, per figure 501.
 - (c) Draw a straight line through the points plotted in step (b).
 - (d) If the slope of the line does not exceed the one shown on figure 501, the pressure leakage rate is acceptable.

E. Restore Airplane to Normal Configuration

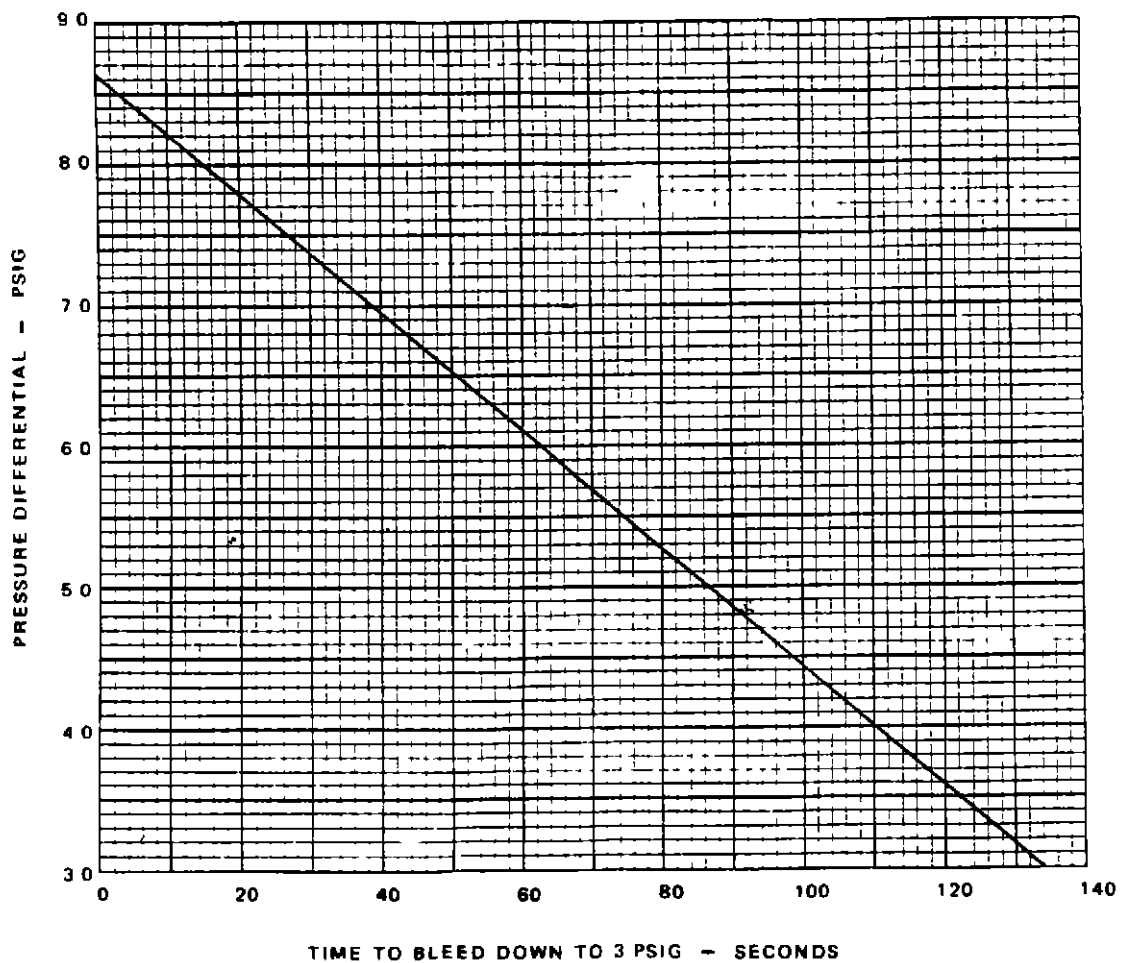
- (1) Open wing valve switches if B.(1)(b), B.(1)(c) or B.(2)(b) pressure source is used.
- (2) Position cabin air recovery thrust valve switch to ON.
- (3) Operate equipment cooling system outflow valves as follows
 - (a) On airplanes equipped with electrically operated cooling valve, set equipment cooling switch to BLOWER ON, VALVE OPEN.
 - (b) On airplanes equipped with an overboard dump valve (recirculation duct airplanes), manually set override handle to midposition.
 - (c) On direct duct discharge airplanes, set override handle manually to midposition.
- (4) In control cabin, remove caps from diluter demand regulator lines and install diluter demand regulators:
- (5) On airplanes with personnel accommodations oxygen system, remove caps from pneumatic and electropneumatic continuous flow control unit lines in forward cargo compartment oxygen installation and install pneumatic and electropneumatic continuous flow control units.
- (6) In aft cargo compartment oxygen installation, remove caps from continuous flow regulator and automatic (trigger) valve lines and install continuous flow regulators and automatic (trigger) valve.
- (7) Upon completion of testing, systems and components subject to damage during pressure testing require reactivation or reinstallation and functional testing in compliance with applicable maintenance manual sections.



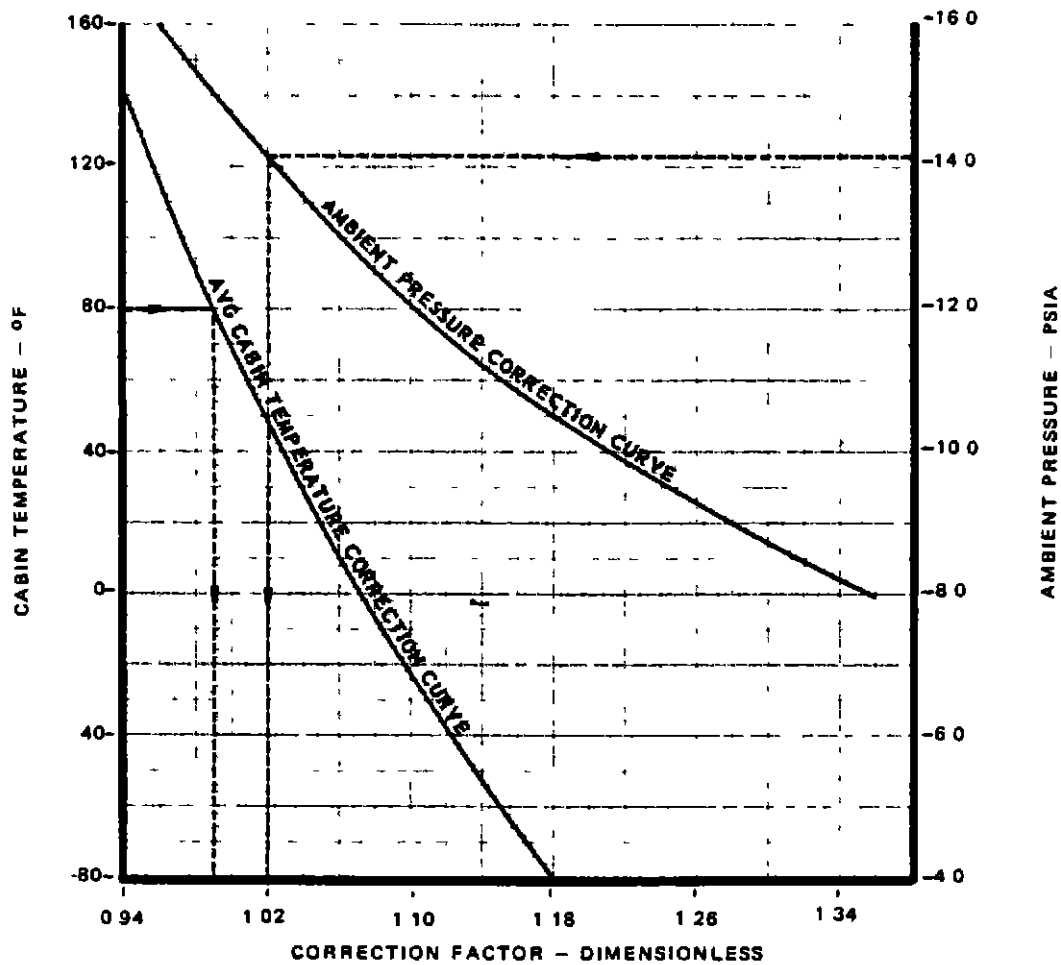
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BASED ON

CABIN TEMPERATURE = 70°F
AMBIENT PRESSURE = 14.7 PSIA
FACTORY FUNCTIONAL LIMIT = 450 CFM
GROWTH FACTOR = 1.6
GROUND TEST
ELECTRONIC FAN OFF AND VALVE CLOSED
THRUST RECOVERY VALVES OFF
VENTILATION VENTURIS NOT PLUGGED



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CORRECTION FACTOR TO BE APPLIED TO BLEED DOWN TIME WHEN AMBIENT PRESSURE DOES NOT EQUAL 14.7 PSIA AND/OR CABIN TEMPERATURE DOES NOT EQUAL 70°F

Bleed Down Time Correction Factor
 Figure 502

CHAPTER

54

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F = FOLDOUT PAGE

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CHAPTER 54

NACELLES

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Nacelle Strut Diagonal Brace	54-1-41
Engine Front Mount Support	54-1-51
Nacelle Strut Leakage	54-1-61

COWL PANELS (See 71-2 Subjects)

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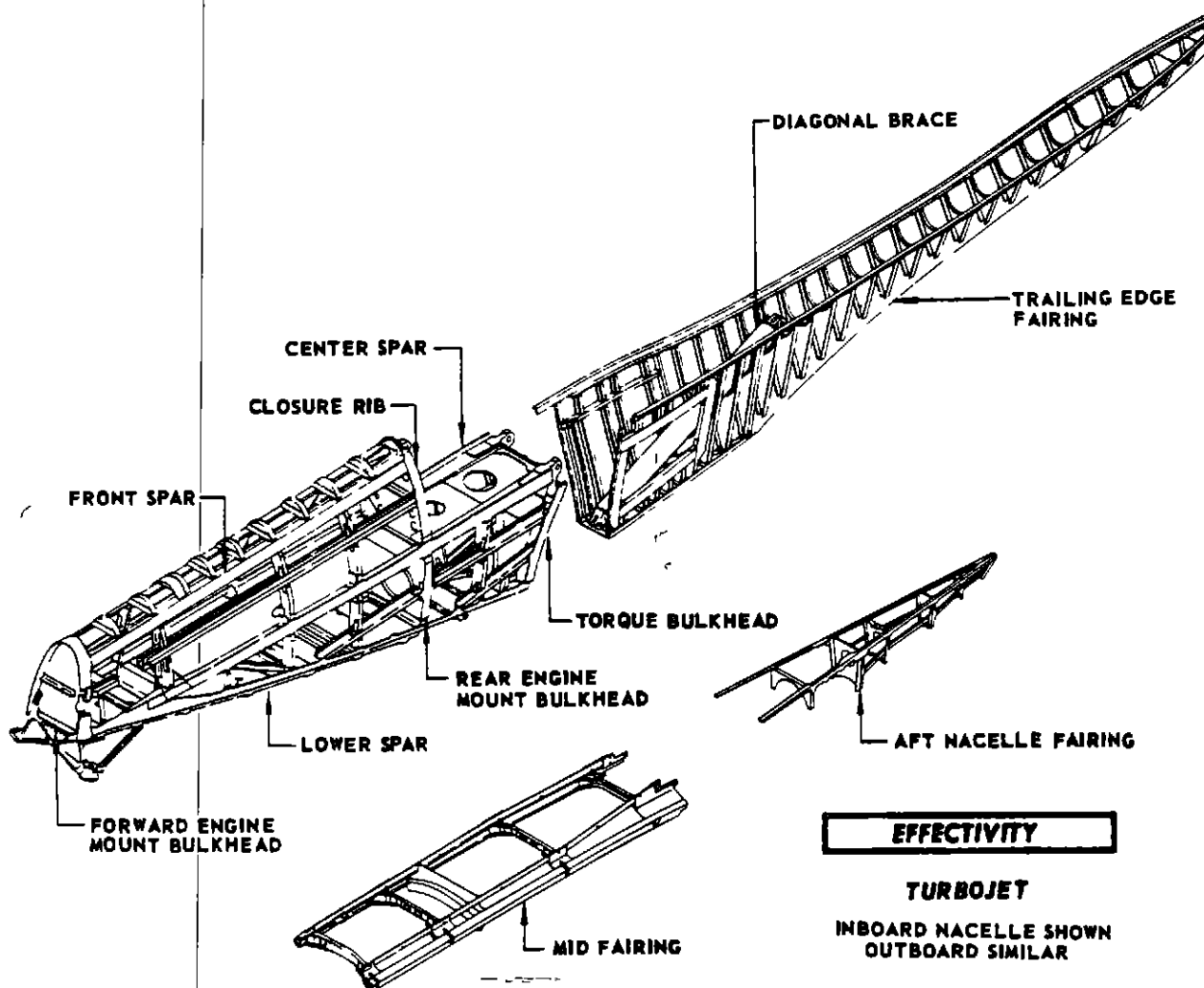
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NACELLE STRUTS - DESCRIPTION AND OPERATION

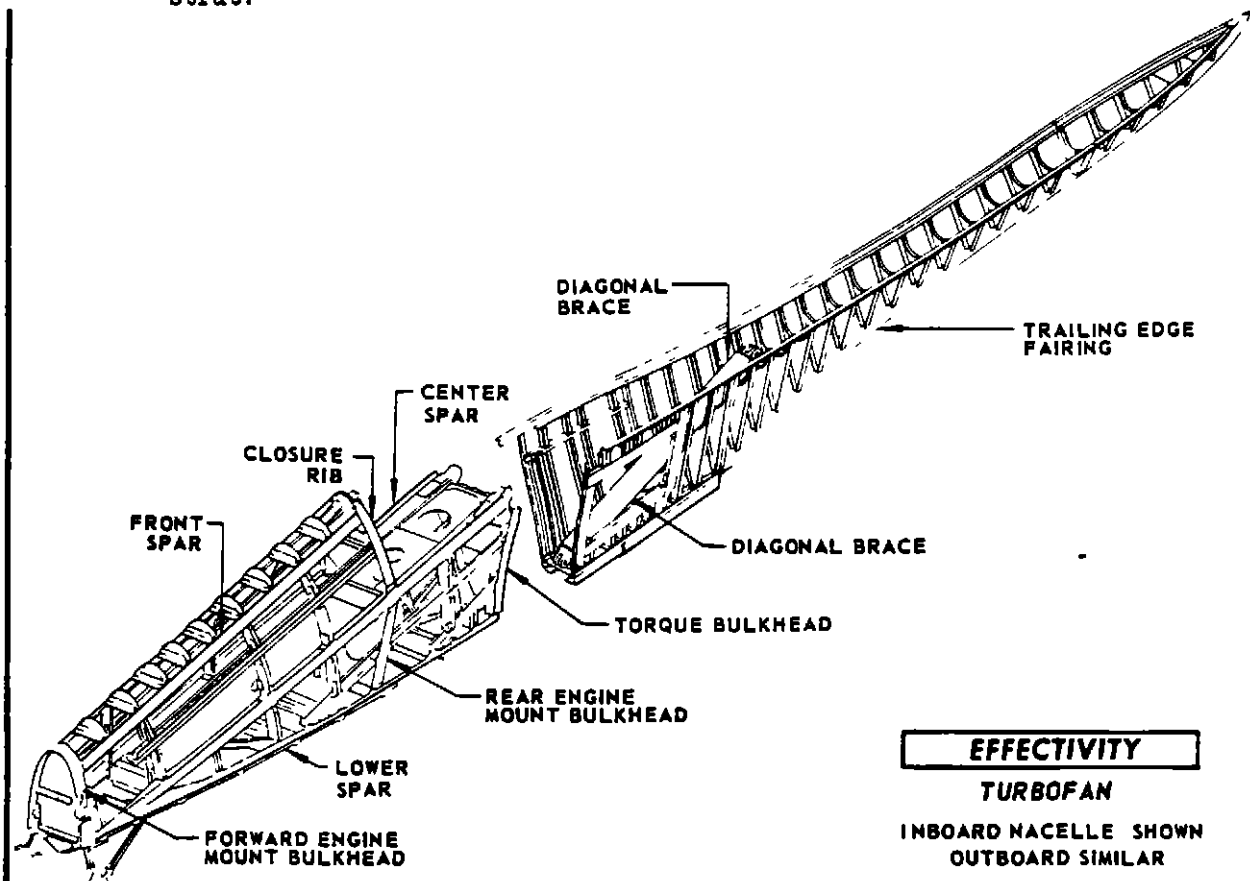
1. General

- A. The nacelle struts (figure 1) are the means by which the engines and nacelles are mounted forward of, and below, the wing. Their primary function is to transmit engine loads to the wing. The differences between the inboard strut and the outboard strut are limited.
- B. Primary structure in the struts comprises four longitudinal members, four vertical members and the skin panels (figures 2 and 3). The longitudinal members are the front, or upper, spar, the center spar, the lower spar and the tubular diagonal brace at the rear. The vertical



members are the torque bulkhead, at the aft end of the center and lower spars, the forward and aft engine mount bulkheads, and the closure rib at the aft end of the front, or upper spar. On turbojet airplanes a mid-fairing, which houses the hinges for the engine side cowl panels, is attached to the underside of the lower spar. On turbofan airplanes the cowl panel hinges are bolted directly to the underside of the lower spar. On all airplanes strut to wing attachment is made with four bolts, one at the aft end of the strut front spar, two at the aft end of the strut center spar, and one at the aft end of the tubular diagonal brace.

- C. Secondary structure includes the fairing around the wing leading edge and back over the wing upper surface, and the trailing edge fairing (figure 1) which fairs in the diagonal brace on the wing under surface. On turbojet airplanes an aft nacelle fairing is attached to the underside of the lower spar and the trailing edge fairing, above the engine thrust reverser. On turbofan airplanes this fairing is not a part of the nacelle as it is integral with the engine aft thrust reverser outer sleeve. On all airplanes the skin has several access panels which are easily detachable by means of quick disconnect fasteners and afford admittance to engine accessory systems located within the struts. Two of these panels in the center spar area are made of light gauge material and are designed to blow out in the event of a pressure build up within the strut.



Nacelle Strut Structure
Figure 1 (Sheet 2)

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Inboard and Outboard Strut Skin Diagram.

Boeing pages 3 through 6 have been deleted.
 For SRM (Structural Repair Manual) references see Conversion Table below.

PAGE No.	DATE	FIGURE No. / TITLE	REFERENCE S.R.M.
3	15/11/61	Figure 2 Inboard Strut Skin Diagram	54-4-1 figure 1 (sheet 2 of 4) page 2
4	15/11/61	Figure 3 Outboard Strut Skin Diagram	54-4-1 figure 1 (sheet 1 of 4) page 1
5	15/8/66	Figure 4 Inboard Strut Skin Diagram	54-4-1 figure 2 (sheet 2 of 2) page 6
6	15/8/66	Figure 5 Outboard Strut Skin Diagram	54-4-1 figure 2 (sheet 1 of 2) page 5

Conversion Table

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LX-N20199

NACELLE STRUTS - MAINTENANCE PRACTICES

1 Inspection/CHECK Nacelle Struts

A Access

- (1) Refer to Access Doors and Panels, Chapter 12

B Examine struts for the following

- (1) Cracks in the thrust link at forward engine mount on left side, wear and corrosion in thrust link terminal bolts and holes (5, figure 201), remove one bolt, cracks and loose or missing fasteners in aft end fitting on thrust link and strut lower spar in same area, cracks in forward engine mount bulkhead
- (a) Install bolt and tighten to 1300 to 1500 pound-inches torque
- (2) Cracks in rear engine mount support fitting between mount bulkhead on strut and mount on engine, cracks, corrosion, and wear in bolts and holes (6)
- (a) Remove bolt on either side of the male fitting, and install bolt per 54-1-11, Engine Rear Mount Support, on Turbojet airplanes, and per 54-1-12, Engine Rear Mount Support, on Turbofan airplanes
- NOTE Establishment of correct clearances and torque is necessary
- (3) Cracks and loose or missing fasteners in skin and doublers around access openings
- (4) Cracks and loose or missing fasteners in access opening and gap covers
- (5) Cracks and loose or missing fasteners at ribs, bulkheads, and stiffeners on strut lower spar

(Pages 202 through 203 are DELETED)

INBOARD NACELLE STRUT

Sub Rev. July 27, 1965

Nacelle Struts - Allowable Wear and Rework.

Figure 201 (Sheet 2 of 7)

54-1-0
Page 202A

INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIAM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
1	WING FRONT SPAR 64-1027-87 -88	69-2860-37	65-23413-19	.9064	.9090	.9110	.0050	See Drawing 1-5120		
	STRUT 65-2531-5 or 65-42128-2 (SB 2027)	65-27303-3								
				.9058	.9064	.9012		See Drawing 1-45527		
2	WING INB. FWD. DRAG 50-6884-3 -4	INBD. LUG 69-2860-31 OUTBD. LUG 69-2860-57	65-23413-2	1.1869	1.1897	1.1925	.0060	See Drawing 1-5120		
	WING OUTBD. FWD. DRAG 50-6887-1 -2	69-2860-32								
	STRUT 65-2536	NEANT						1.3497	A	.0005-.0025
				1.1853	1.1859	1.1809		See Drawing 1-45458		
3	WING AFT DRAG 5-72319-3013 -3014	69-2860-35	65-23413-18	1.0619	1.0647	1.0675	.0060	See Drawing 1-5120		
	DIAG. BRACE UPPER FITTING 65-2526-4	65-27303-8								
				1.0617	1.0623	1.0569		See Drawing 1-45525		

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See Continuation

INBOARD NACELLE STRUT

INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIM.	MAX. DIAM. CLEAR.	STRUC. ϕ BEFORE BUSHING OR PLATING	MAT.	BUSHING INTER- FERENCE
4	DIAG. BRACE LOWER FITTING 65-2527-3	65-27303-21		.8735	.8763	.8787		.0045	See Drawing 1-5120	
	STRUT LOWER SPAR FITTING 65-2525-12	65-27303-11 -12								
			NAS-1114-68W	.8730	.8740	.8718				
5	FITTING NAC. (AFT) 65-2539-1 or -4			.7486	.7506	.7530	.0045	.8706	A	SHRUNK FIT .0005-.0025
	THRUST LINK 65-2498 or -2									
	FWD. ENGINE MOUNT FITTING 65-2530 or 65-2530-3 or 65-2530-6									
			NAS-1112-210W	.7480	.7490	.7468				
6	ENGINE AFT MOUNT FITTING 65-2540-1 L.H. NAC. -2 R.H.			.4995	.5005	.5027	.0045	See Drawing 1-5649		
	REAR ENGINE MOUNT SUPPORT BRACKET 65-2505 or 65-2505-2 or 65-2505-3									
			66-1928	.4982	.4991	.4976				

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Nacelle Struts - Allowable Wear and Rework
Figure 201 (Sheet 3 of 7)

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INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MIN. WEAR. DIM.	MAX. DIAM. CLEAR.	STRUC.Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
1	WING FRONT SPAR 50-8731-9 -10	69-2860-38 -39		.8440	.8465	.8485	.0050	See Drawing 1-5120		
	STRUT 65-13347-5	65-27303-1								
			65-23413-9	.8434	.8440	.8388		See Drawing 1-45452		
2	WING INBD. FWD. DRAG 50-8732-1 -2	69-2860-34		1.1244	1.1272	1.1300	.0060	See Drawing 1-5120		
	WING OUTBD. FWD. DRAG 50-8733-1 -2	69-2860-33								
	STRUT 65-2534	NEANT						1.2872	A	.0005-.0025
			65-23413-1	1.1228	1.1234	1.1184		See Drawing 1-45453		
3	WING AFT DRAG FITTING 5-72316-3017 -3018	69-2860-36		1.2498	1.2522	1.2550	.0070	See Drawing 1-5120		
	DIAG. BRACE UPPER FITTING 69-2018-2	65-27303-10								
			65-23413-16	1.2492	1.2498	1.2444		See Drawing 1-45451		

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Nacelle Struts - Allowable Wear and Rework
Figure 201 (Sheet 4 of 7)

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OUTBOARD NACELLE STRUT

INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE.
4	DIAG. BRACE LOWER FITTING 69-2019-2	65-27303-25	NAS464P14- A89	.8737	.8763	.8787	.0050	See Drawing 1-5120		
	STRUT LOWER SPAR FITTING 65-2541-2	65-27303-19 -20								
				.8725	.8737	.8718				
5	FITTING NAC. (AFT) 65-2539-2 or -5			.7486	.7506	.7530	.0045	.8706	A	SHRUNK FIT .0005-.0025
	THRUST LINK 65-2498 or -2									
	FWD. ENGINE MOUNT FITTING 65-2530 or 65-2530-3 or 65-2530-6									
				.7480	.7490	.7468				
6	ENGINE AFT MOUNT FIT. NAC. 65-2540-3 L.H. -4 R.H.			.4995	.5005	.5027	.0045	See Drawing 1-5649		
	REAR ENGINE MOUNT SUP- PORT BRACKET 65-2505 or 65-2505-2 or 65-2505-3									
				.4982	.4991	.4976				

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7-1117
Maintenance
Manual

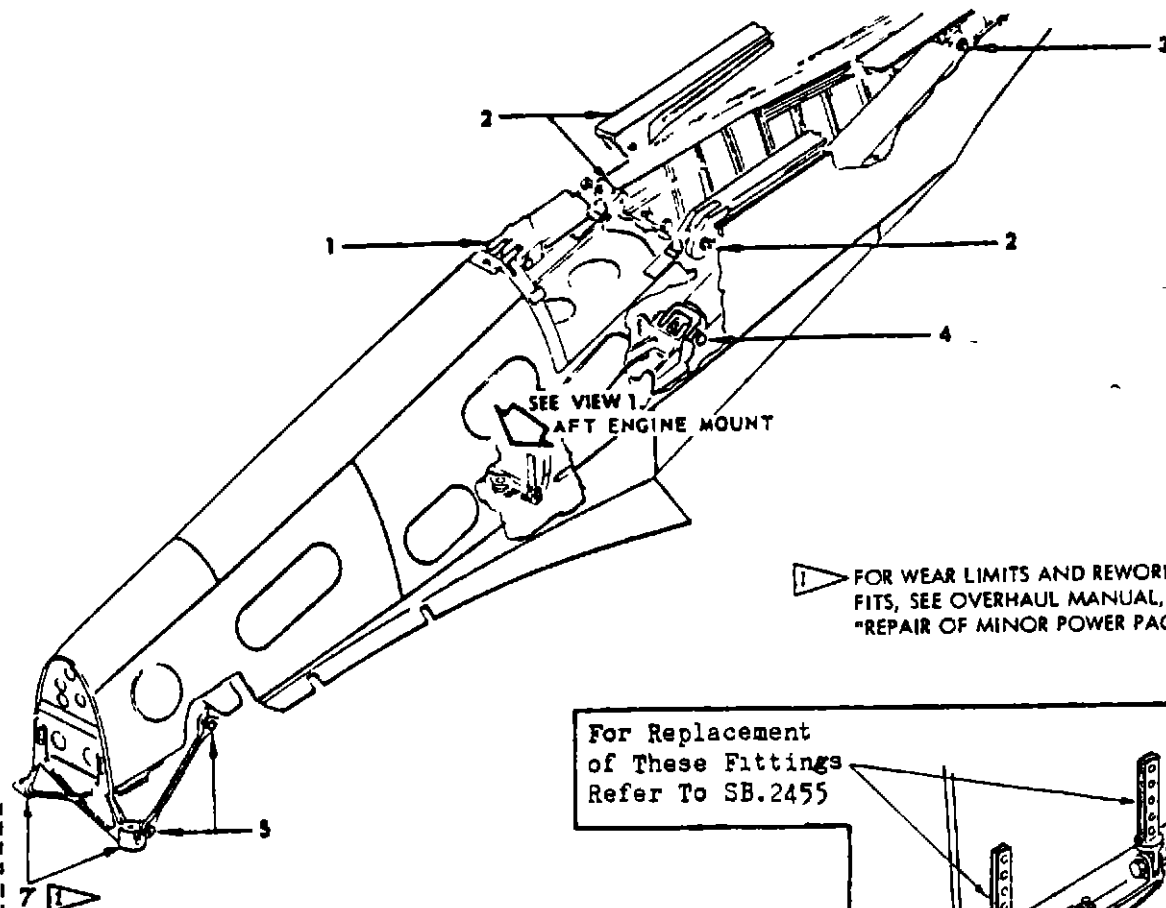
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EFFECTIVITY

TURBOFAN



FOR WEAR LIMITS AND REWORK OF THESE FITS, SEE OVERHAUL MANUAL, CHAPTER 71, "REPAIR OF MINOR POWER PACK COMPONENTS"

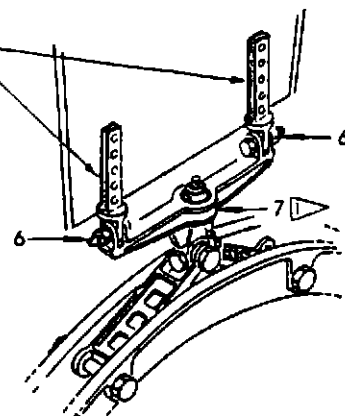
For Replacement
of These Fittings
Refer To SB.2455

LEGEND (SEE TABLE ON SHEETS 7, 8, 9 AND 10)

A 17-4PH STAINLESS STEEL BUSHING CAD PLATE O.D.
REAM ID TO SIZE AFTER INSTALLATION.

R REF : DOCUMENT D6-1498.

NOTE . Coat all attachment pins, bolts and
reamed holes (item 1 to 5) prior to
each installation or reinstallation,
with corrosion preventive Aeroshell
Compound n°2 per MIL-C-16173 type II.



AFT ENGINE MOUNT

VIEW 1

WARNING: For fittings where material has already been removed any place
for corrosion clean up, T.Eg.CEL should be advised whenever
oversizing of a bolt hole following tables hereafter has to
be accomplished, even if within allowable limits specified in
those tables

T.Eg CEL SB 2455

Nacelle Struts - Allowable Wear and Rework
Figure 201 (Sheet 6 of 10)

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T.Eg CEL.

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INBOARD WACELLE STRUT.

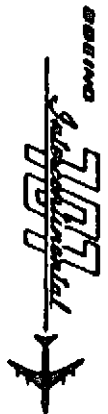
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Macelle Struts - Allowable Wear and Rework
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INDEX No	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIAM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
1	WING FRONT SPAR 64-1027-89 or-90 -101 or-102	69-2860-49 69-2860-60		.9382	.9410	.9430		.0055		See Drawing 1-5120 Sht2
	STRUT 65-42128-1	65-27303-5							1.0610	[A] .001-.0025
			65-23413-10 -23	.9364	.9378	.9324				
2	WING INBD. FWD. DRAG 50-6884-33or-34 -45or-46	69-2860-59 -51 69-42475-10						.0060		See Drawing 1-5120 Sht2
	WING OUTB. FWD. DRAG 50-6887-9or-10 -1or-2	69-2860-50 69-42475-9 -15		1.2189	1.2217	1.2245				
	STRUTS 65-2536-4or-5 -9or-10	NEANT 65-27303-27							1.3217 [B]	[A] .001-.0025
			65-23413-3 or-4 -29 or-30	1.2171	1.2185	1.2151				
3	WING AFT DRAG 5-72319-3013 -3014	65-2860-35						.0060		See Drawing 1-5120 Sht1
	DIAG. BRACE UPPER FITT 65-2526-1	65-27303-8		1.0619	1.0647	1.0675				
			65-23413-12	1.0601	1.0615	1.0597				

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INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIAM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
4	DIAG. BRACE LOWER FITT. 65-2527-1	65-27303-21	NAS 1114-68W	.8735	.8763	.8787	.0045	See Drawing 1-5120 Sht 1 and Sht 2		
	STRUT LOWER SPAR FITT. 65-13348-3	65-27303-11 -12								
				.8730	.8740	.8718				
5	FITT. NAC (AFT) 65-11760-3		NAS 1112-21W				.0045	.8706	A	.001 .0025
	THRUST LINK 65-2498-2			.7486	.7506	.7530		See Drawing 1-6407		
	FWD. ENG. MOUNT FITT. 65-10693-2							See Drawing 1-6405		
				.7480	.7490	.7468				
6	ENGINE AFT MOUNT FITT. 65-11602 65-11602-7 after appli. SB2455		66-1928-1	.4995	.5005	.5025	.0040	.6205	A	.001 .0025
	REAR ENG. MOUNT SUPPORT BRACKET 65-11633-4							See Drawing 1-6404		
				.4982	.4991	.4962				

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INDEX No.	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIAM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
1	WING FRONT SPAR 50-8731-1 or -2 50-8731-21 or -22	69-2860-38or-39 69-2860-63or-39								
	STRUT 65-13347-3	65-27303-1		.8438	.8465	.8485	.0055	See Drawing 1-5120 Sht 1 and 2		
			65-23413-11 -24	.8419	.8434	.8388				
2	WING INBD. FWD. DRAG 50-8732-7 or -8 -13 or -14	69-2860-53 69-42475-6								
	WING OUTB. FWD. DRAG 50-8733-9 or -10 -17 or -18	69-2860-52 69-42475-5 69-42475-18		1.1564	1.1592	1.1620	.0060	See Drawing 1-5120 Sht 2		
	STRUTS 65-2534-4 or -5 -7 or -8	NEANT 65-27303-26						1.2592 [B]	[A]	.001-.0025
			65-23413-5or-6 65-23413-31or-32	1.1546	1.1560	1.1510				
3	WING AFT DRAG 5-72316-3005 or -3006	69-2860-36								
	DIAG. BRACE UPPER FITT. 69-2018-1	65-27303-10		1.2494	1.2522	1.2560	.0062	See Drawing 1-5120 Sht 1		
			65-23413-20	1.2476	1.2490	1.2436				

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INDEX N°	FITTING P/N	BUSHING P/N	BOLT P/N	DESIGN LIMITS		WEAR LIMITS		REWORK INSTRUCTIONS		
				MIN. DIAM.	MAX. DIAM.	MAX. WEAR DIAM.	MAX. DIAM. CLEAR.	STRUC. Ø BEFORE BUSHING PLATING	MAT.	BUSHING INTER- FERENCE
4	DIAG. BRACE LOWER FITT. 65-13761-1	65-27303-22		.9990	1.0018	1.0042	.0045	See Drawing 1-5120 Sht 2		
	STRUT LOWER SPAR FITT. 65-13349-1	65-27303-13 -14								
			NAS1116-90W	.9980	.9990	.9968				
5	FITTING NACELLE (AFT) 65-11760-4			.7486	.7506	.7530	.0045	.8706	A	.001 .0025
	THRUST LINK 65-2498-2							See Drawing 1-6407		
	FWD ENGINE MOUNT FITT. 65-10693-2							See Drawing 1-6405		
			NAS1112-21W	.7480	.7490	.7468				
6	ENGINE AFT MOUNT FITT. 65-11602-8			.1995	.5005	.5018	.0040	.6205	A	.001 .0025
	REAR ENG. MOUNT SUPPORT BRACKET 65-11633-4							See Drawing 1-6404		
			66-1928-1	.4982	.4991	.4976				

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- (6) Cracks and loose or missing fasteners in center spar fitting at attachment to wing; cracks in center spar and torque bulkhead in same area; cracks and loose or missing fasteners in center spar at ribs, bulkheads, and stiffeners; cracks, corrosion and wear of bolts and holes at center spar joint with forward drag support on wing (2, figure 201); cracks and loose or missing fasteners in forward drag support fitting and wing skin in same area.

- (a) Remove bolts, noting carefully the shimming, if any, at outside (bolt head side) of male fitting.
- (b) Install bolts, keeping shimming same as prior to bolt removal, and tighten nuts to 400 to 500 pound-inches torque.

NOTE: Prior to installation, clean bolts and holes with solvent and coat with Aeroshell Compound No. 2 per MIL-C-16173 Type II.

- (7) Cracks and loose or missing fasteners in front spar fitting at attachment to wing; cracks in front spar and closure bulkhead in same area; cracks and loose or missing fasteners in front spar at ribs, bulkheads, and stiffeners; cracks, corrosion and wear of bolts and holes at front spar joint with upper surface support on wing (1); cracks and loose or missing fasteners in upper surface support and wing skin in same area.

NOTE: On later airplanes, an inspection hole with a plug is provided in the strut skin to allow examination of the upper surface of the front spar fitting.

- (a) Install bolt with a thin enough washer that clamp-up loads will not be applied to clevis arms when nut is torqued 400 to 500 pound-inches (nut should bottom against bolt shoulder and not on washer).

NOTE: Prior to installation, clean bolts and holes with solvent and coat with Aeroshell Compound No. 2 per MIL-C-16173 Type II.

- (8) Cracks, loose or missing fasteners, and corrosion in diagonal brace, and terminal fittings, and lower spar attachment fitting; cracks and loose or missing fasteners in lower spar and torque bulkhead in area of diagonal brace; cracks, corrosion and wear of terminal bolts and holes for diagonal brace (3 and 4); cracks and loose or missing fasteners in aft drag support fitting and wing skin in same area.

- (a) Install bolts at forward end of diagonal brace and tighten nut to 600 to 700 pound-inches torque.
- (b) Install bolt at aft end of diagonal brace and tighten nut to 800 to 1000 pound-inches torque.

NOTE: Prior to installation, clean bolts and holes with solvent and coat with Aeroshell Compound No. 2 per MIL-C-16173 Type II.

- (9) Cracks, loose or missing fasteners and corrosion in fairings at hinge fittings, hinge spacers and guide pins; cracks and loose or missing fasteners in trailing edge and aft nacelle fairings.