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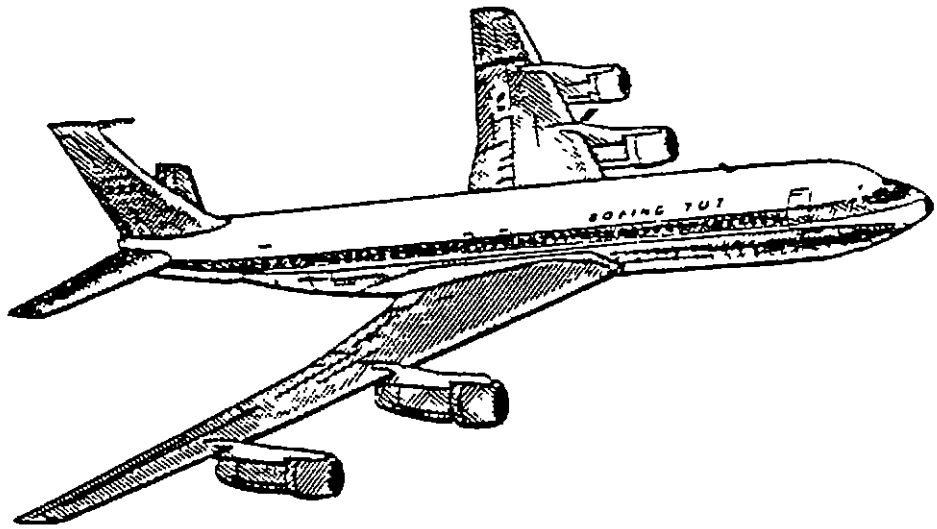

MAINTENANCE MANUAL

FOR NATO TRAINER CARGO AIRCRAFT

NATO DOC.. TCA D6-6003

SABENA REGISTRATION NO. 180 SABENA

CHAPTER

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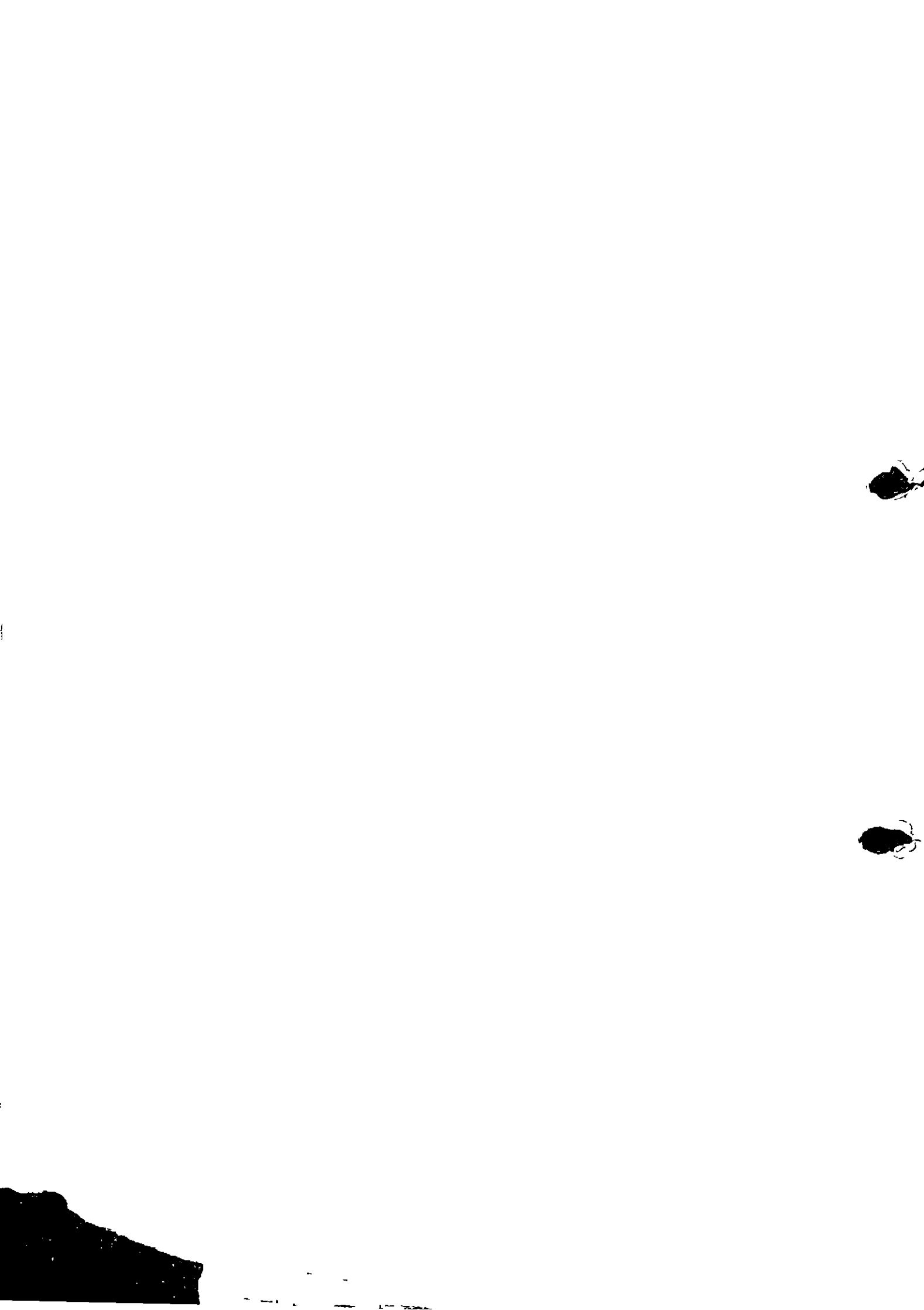

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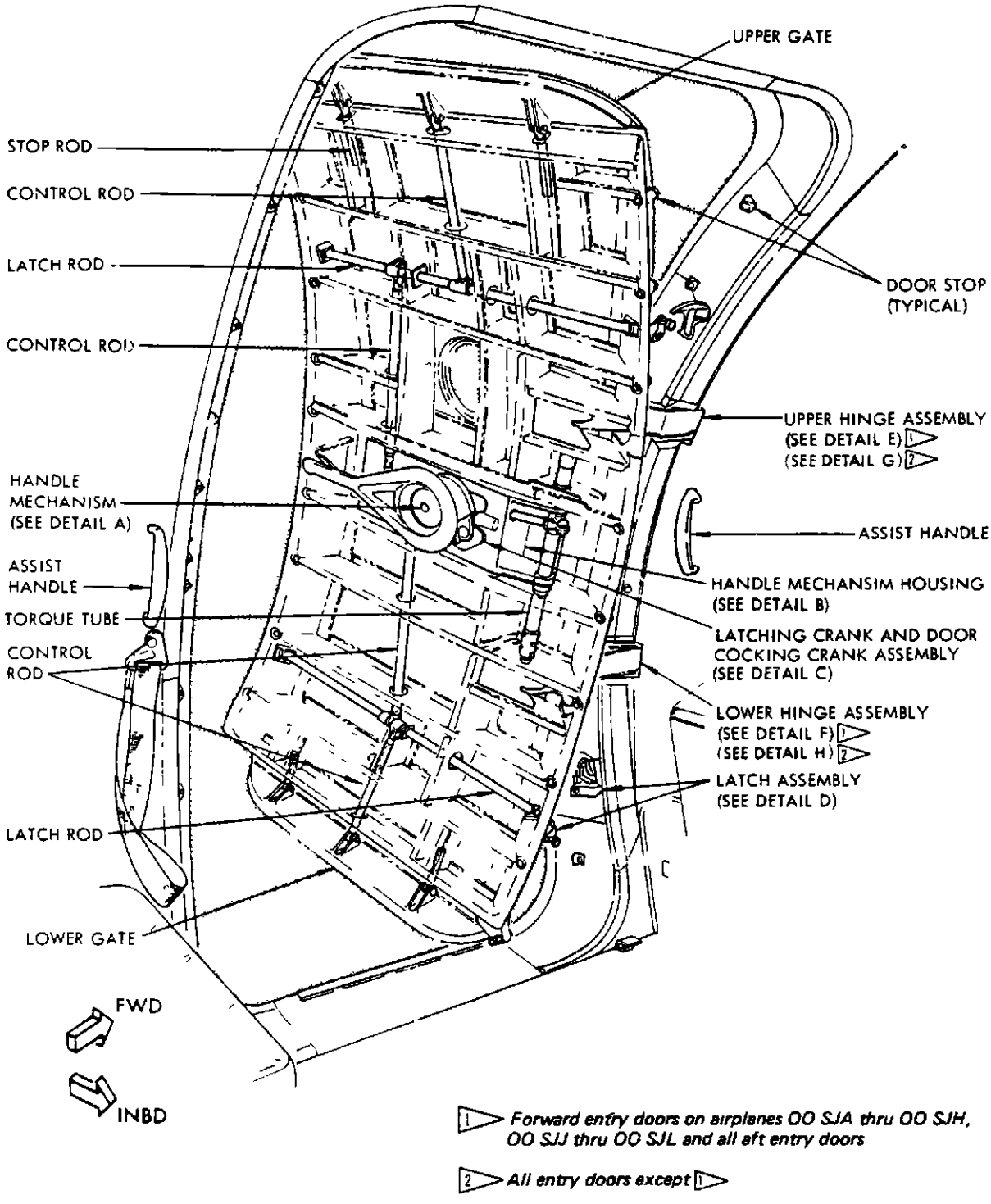
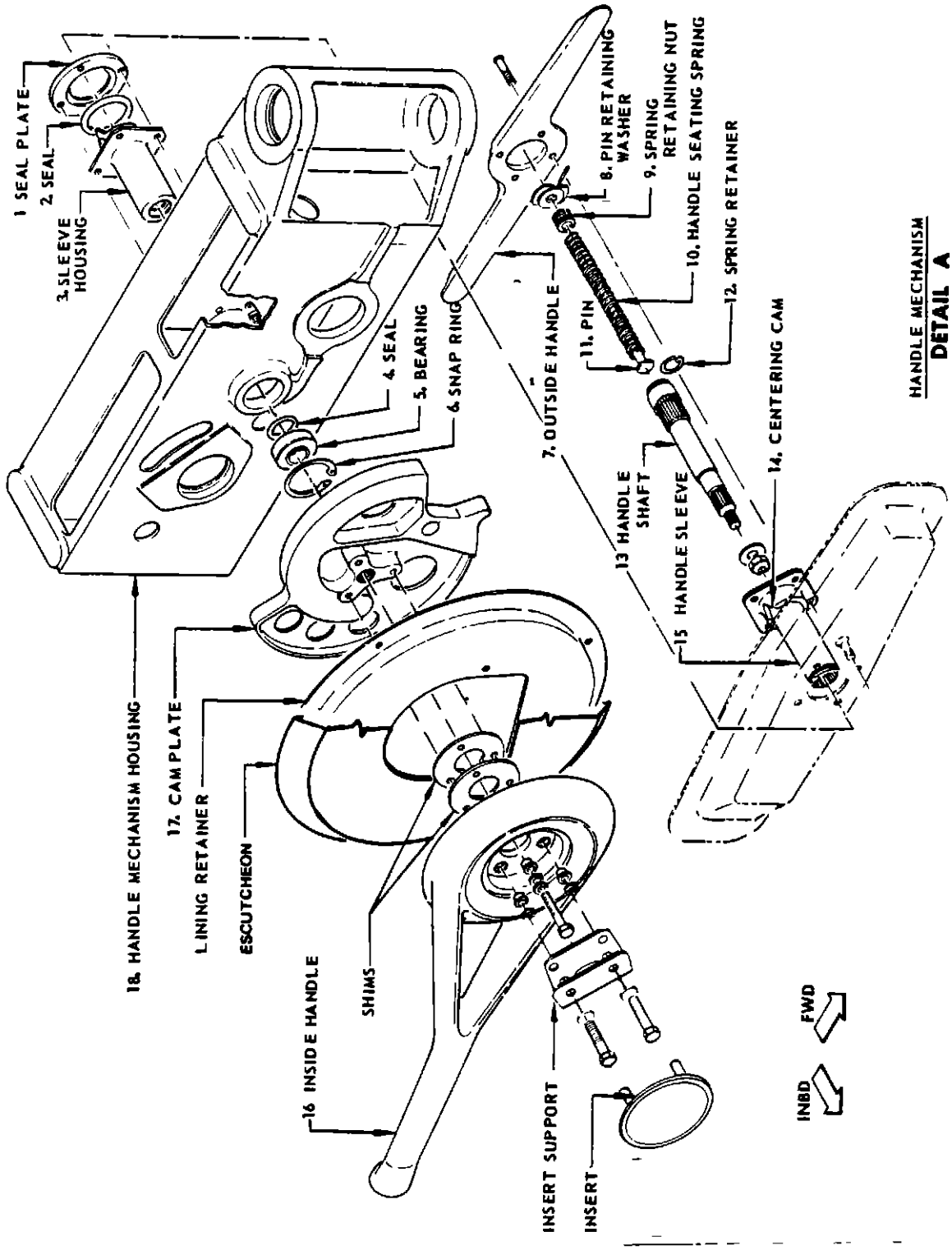
CHAPTER 52

DOORS

TABLE OF CONTENTS


UPPER GATE
STOP ROD
CONTROL ROD
LATCH ROD
CONTROL ROD
DOOR STOP (TYPICAL)
UPPER HINGE ASSEMBLY (SEE DETAIL E) 1 (SEE DETAIL G) 2
HANDLE MECHANISM (SEE DETAIL A)
ASSIST HANDLE
ASSIST HANDLE
HANDLE MECHANSIM HOUSING (SEE DETAIL B)
TORQUE TUBE
LATCHING CRANK AND DOOR COCKING CRANK ASSEMBLY (SEE DETAIL C)
CONTROL ROD
LOWER HINGE ASSEMBLY (SEE DETAIL F) 1 (SEE DETAIL H) 2
LATCH ASSEMBLY (SEE DETAIL D)
LATCH ROD
LOWER GATE
FWD
INBD
1 Forward entry doors on airplanes OO SJA thru OO SJH, OO SJJ thru OO SJL and all aft entry doors
2 All entry doors except 1



Entry Door Mechanism
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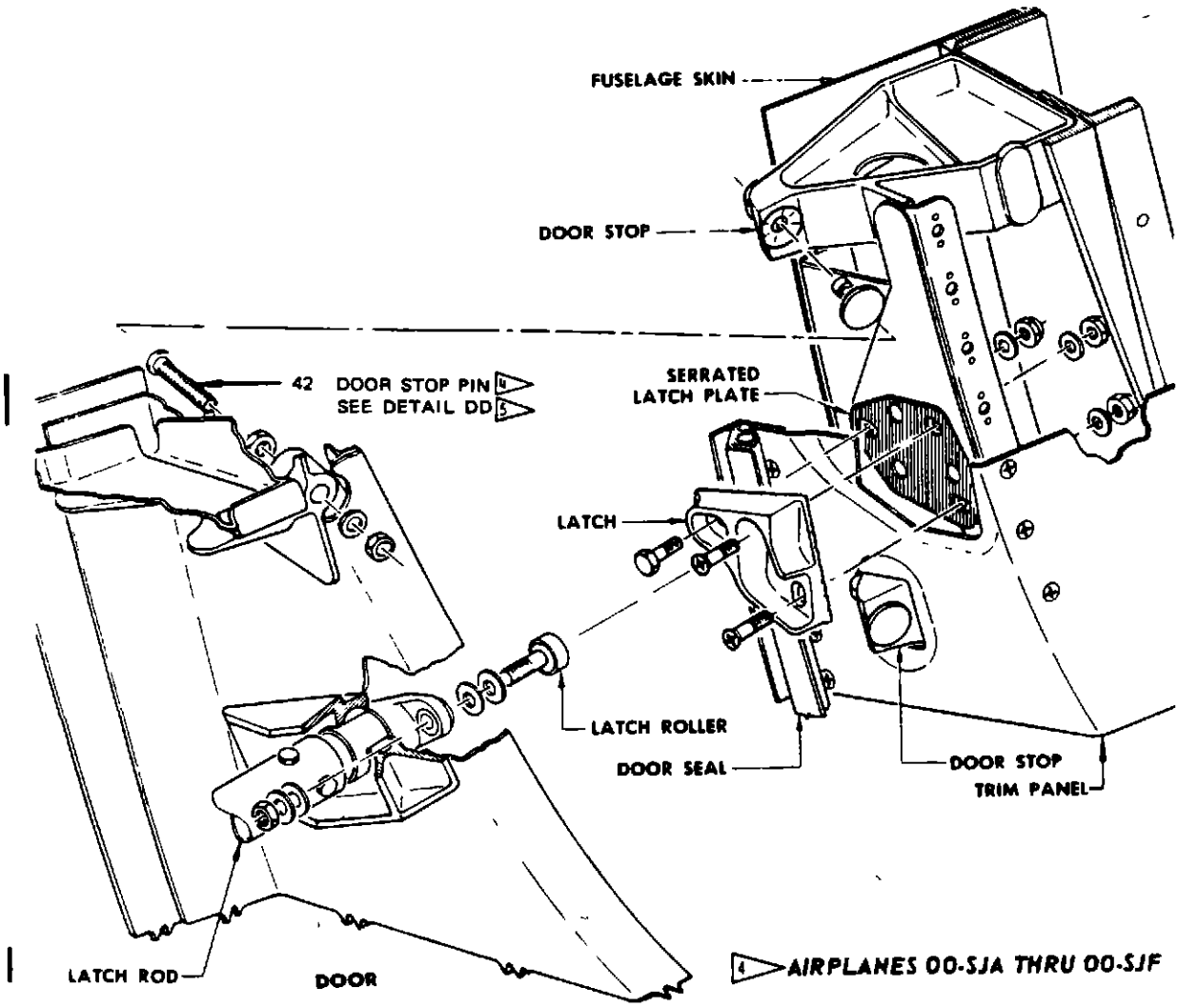
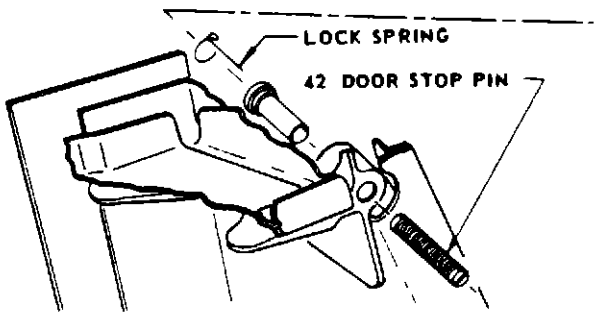


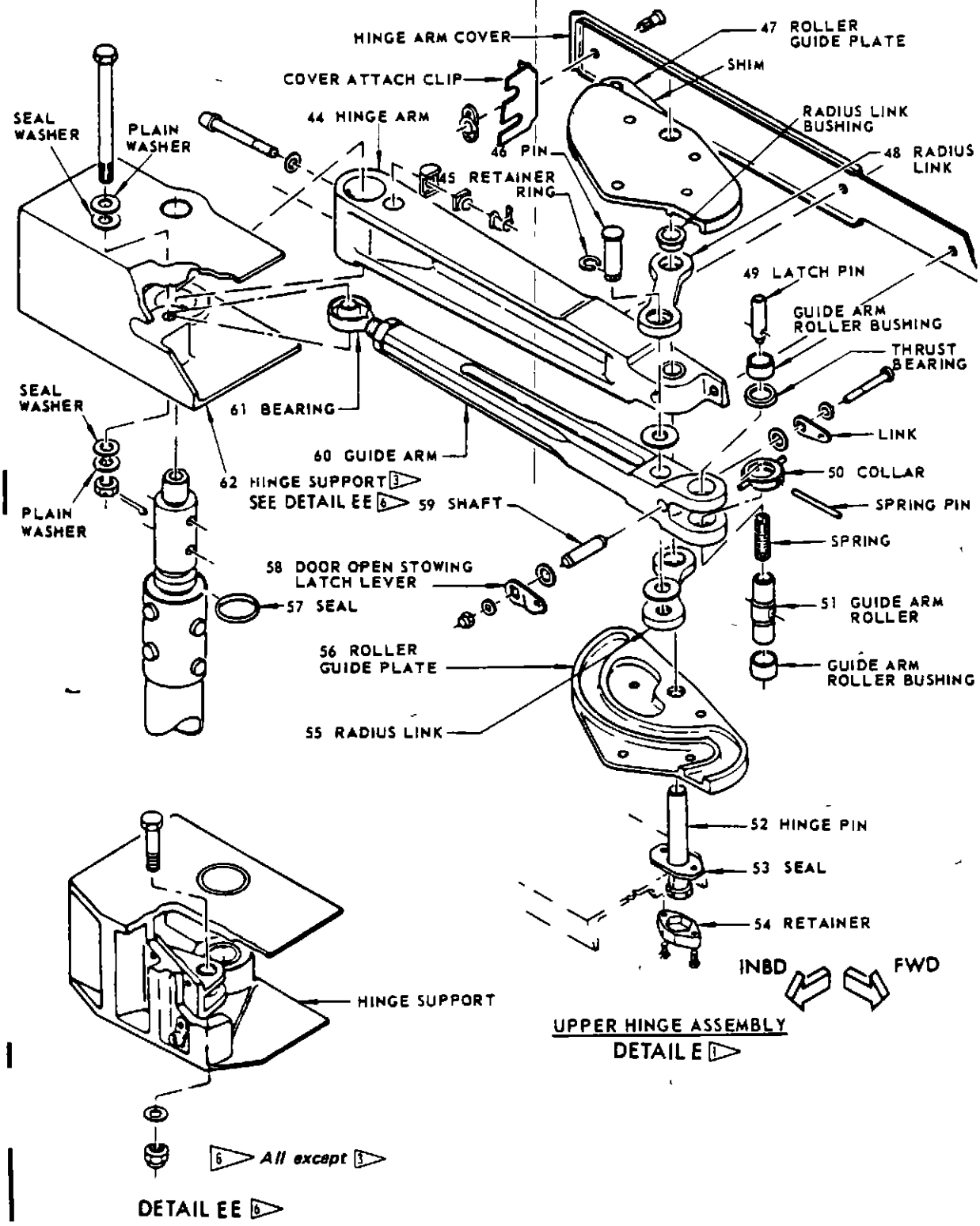
DETAIL D

DOOR FRAME
STOP AND LATCH DETAILS



5 All except 4

DETAIL DD 5



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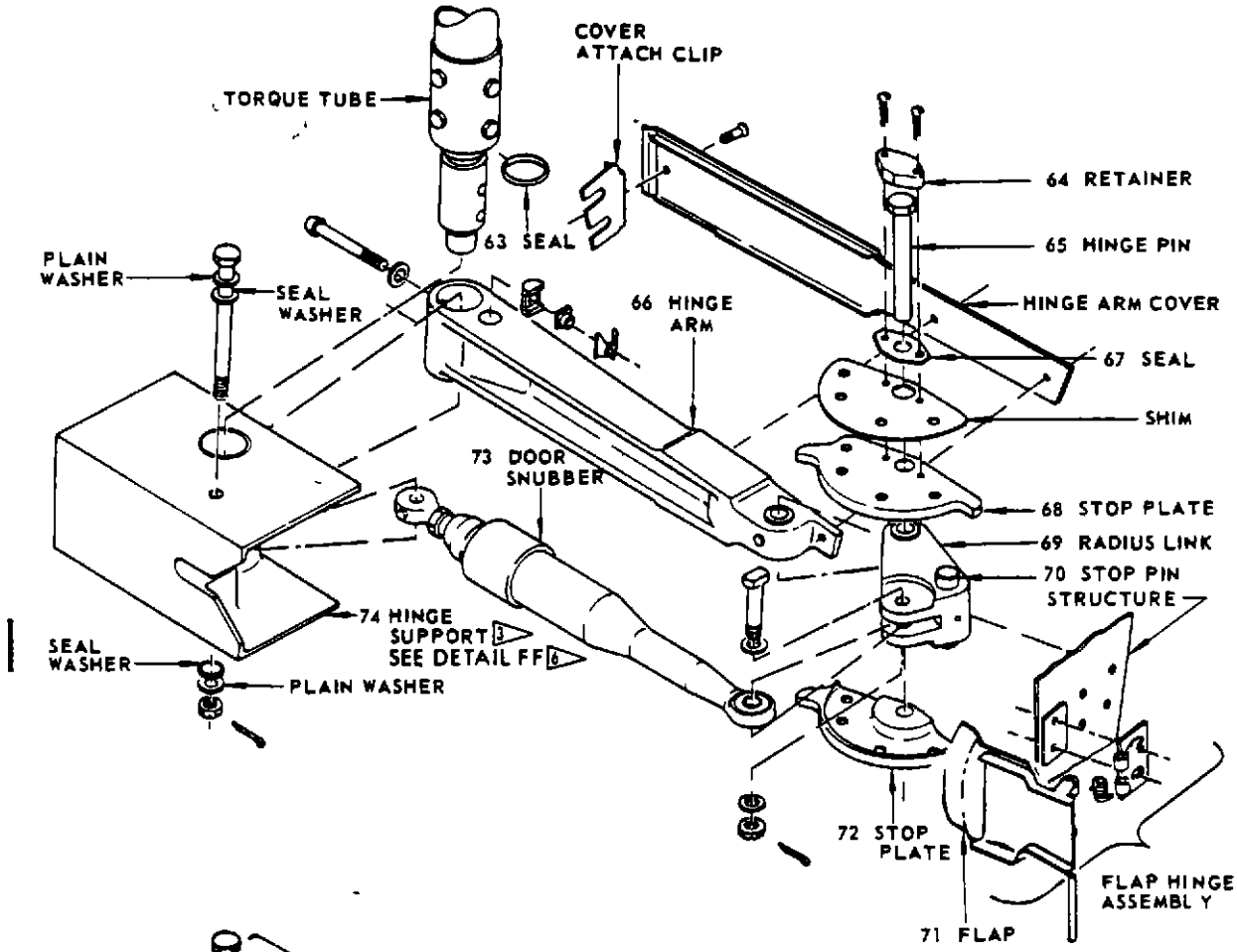
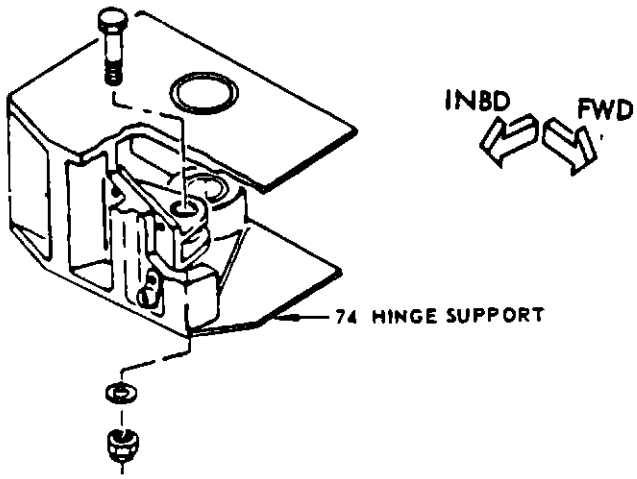
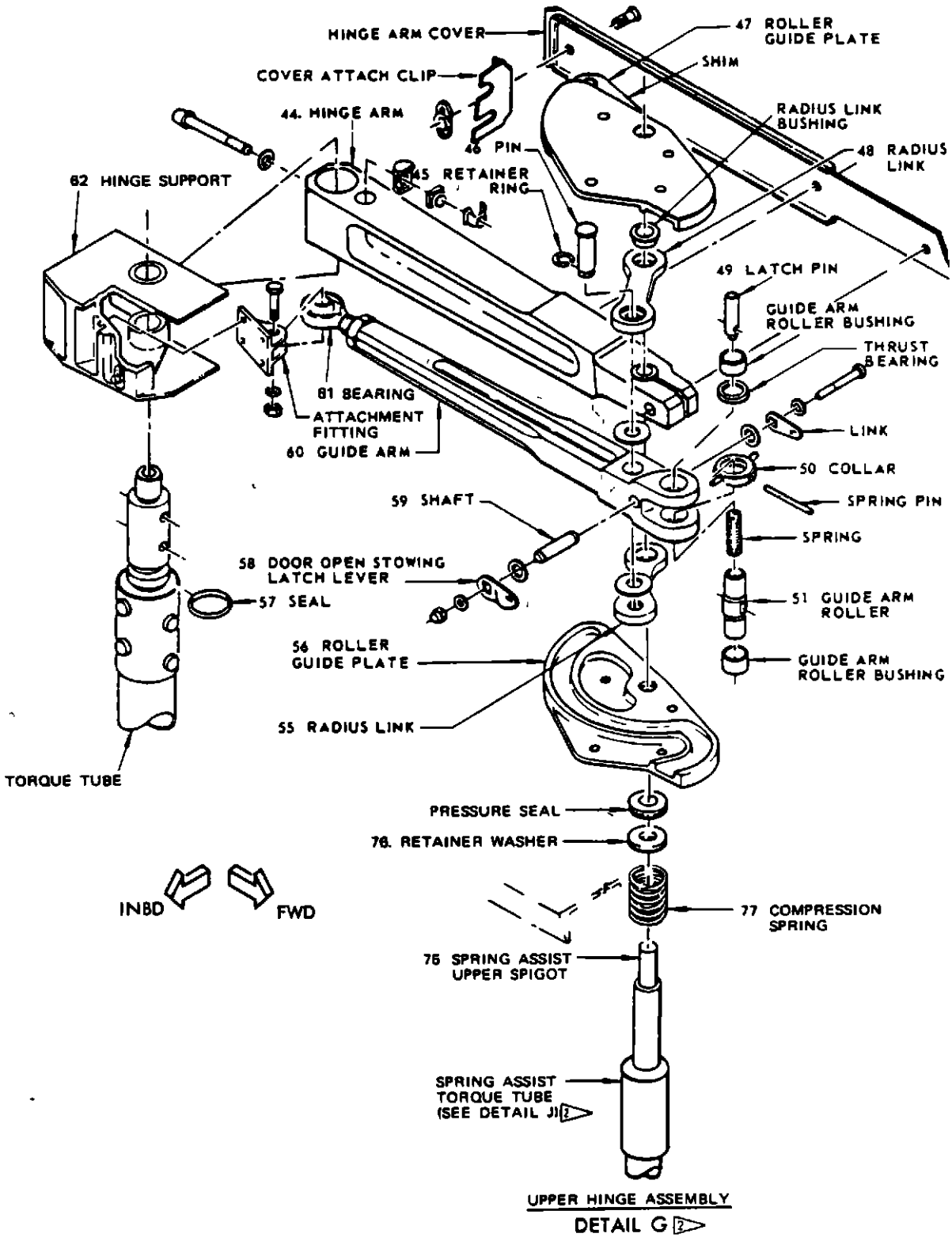


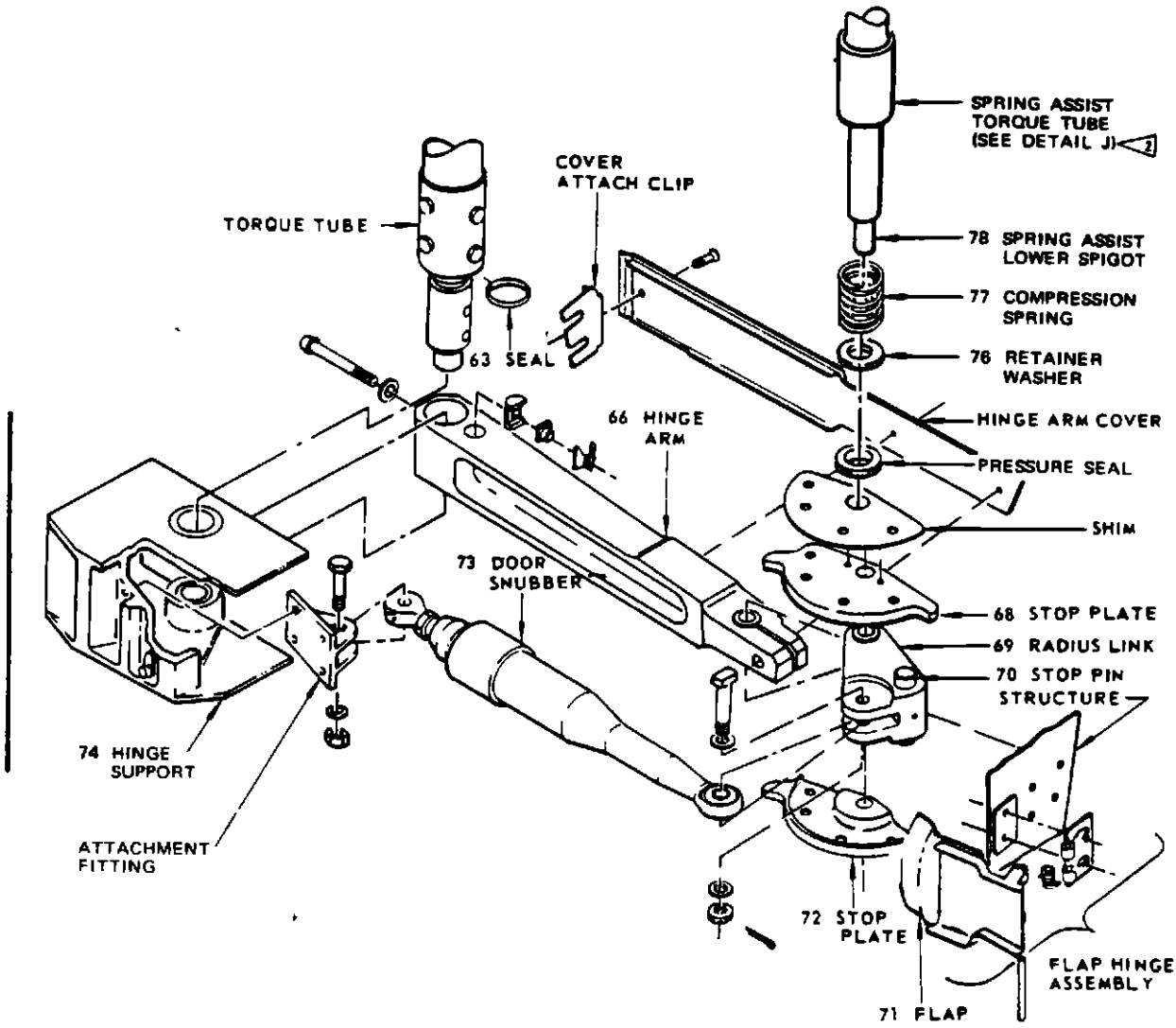


LOWER HINGE ASSEMBLY
DETAIL F

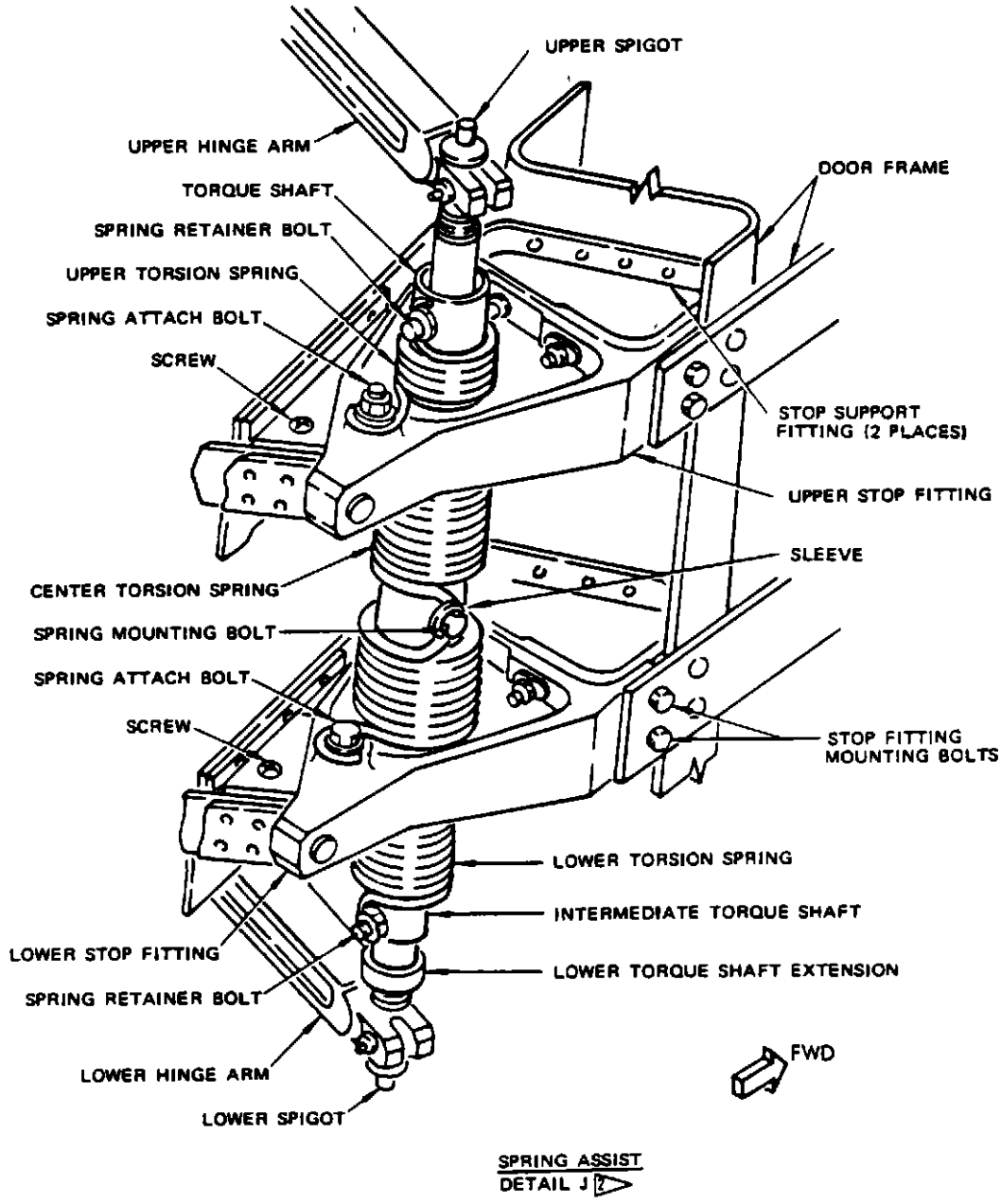
DETAIL FF



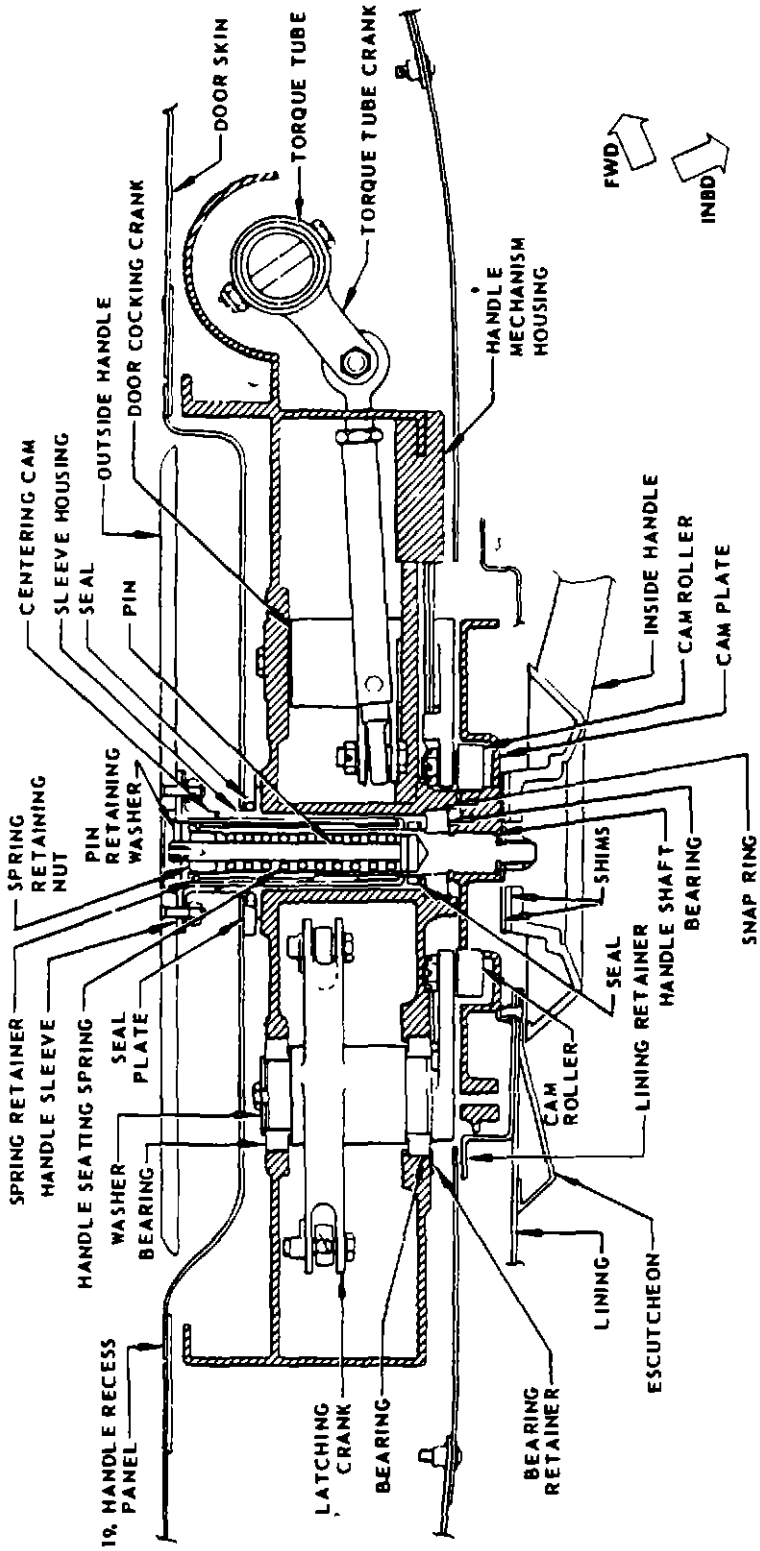
Entry Door Mechanism
Figure 1 (Sheet 8)



LOWER HINGE ASSEMBLY
DETAIL H



Entry Door Mechanism
Figure 1 (Sheet 10)



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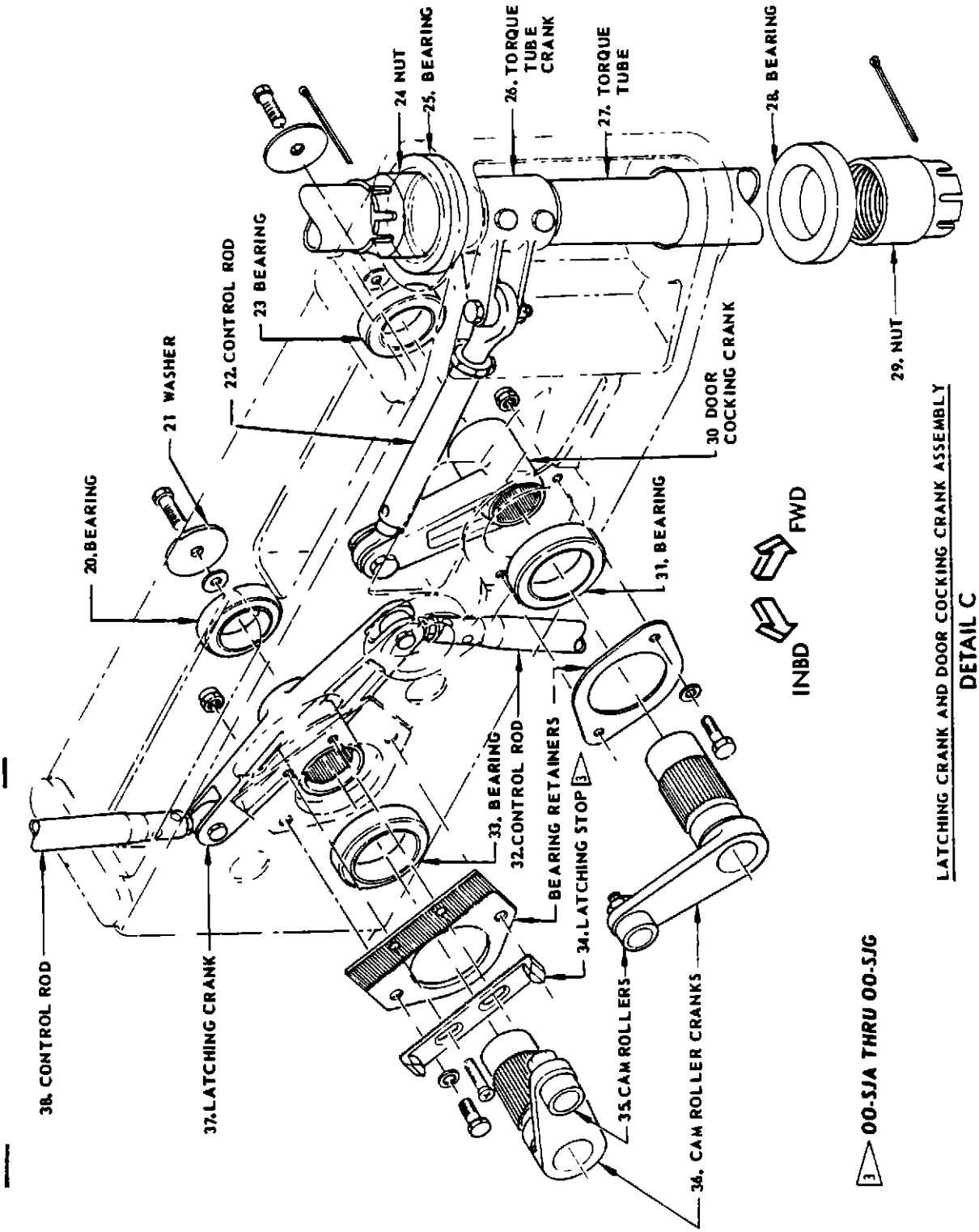

24 NUT
25. BEARING
26. TORQUE TUBE CRANK
27. TORQUE TUBE
28. BEARING
29. NUT
22. CONTROL ROD
23 BEARING
21 WASHER
20. BEARING
30 DOOR COCKING CRANK
31. BEARING
33. BEARING
32. CONTROL ROD
BEARING RETAINERS
34. LATCHING STOP
38. CONTROL ROD
37. LATCHING CRANK
35. CAM ROLLERS
36. CAM ROLLER CRANKS
INBD
FWD
LATCHING CRANK AND DOOR COCKING CRANK ASSEMBLY
DETAIL C
1 00-SJA THRU 00-SJG

ENTRY DOORS - DESCRIPTION AND OPERATION

1. General

A. A forward and an aft entry door for entering and leaving the passenger cabin are on the left hand side of the airplane.

B. The doors are inward-outward opening plug type. The forward entry door is not interchangeable with the aft entry door, but is similar, in structure and principle of door operation. On later airplanes, a spring assist is installed on the forward entry door. (See figure 1 for effectivity.)

C. Each door (figure 1) may be closed or opened from inside or outside of the airplane by a centrally located, manually operated handle. Hinged gates are located at the top and bottom of the door. An upper and a lower hinge assembly support the door on its forward edge in the door opening. A double pane window is located above the door operating mechanism handle. Refer to Passenger Cabin Windows, Chapter 56.

D. Each door may be opened by operating the handle, which causes an internal mechanism within the door to release roller latches on the door from latch fittings on the door jambs, folds the gates inward, and moves the door to its most inward position. The door is then manually swung through the door opening and stowed in the open position by the engagement of a latch pin in a hole in the upper hinge assembly

2. Entry Doors

A. Handle Mechanism

(1) The handle shaft (13, detail A, figure 1) rotates in a ball bearing (5) contained in the handle mechanism housing (18) by a snap ring (6). The inside handle (16) is bolted to a cam plate (17) which is splined to receive the handle shaft. The outside handle (7) in a recess panel (19, detail B) flush with the door outer skin, is attached to a handle sleeve (15, detail A). The handle sleeve is splined to receive the outer end of the handle shaft. A seal (4), for pressurization, is located inside the handle mechanism housing at the inner end of the handle shaft. Another seal (2) is positioned between the sleeve housing (3) and the seal plate (1) behind the recess panel. A handle seating spring (10) is retained within the handle shaft by a nut (9) and a spring retainer (12). A pin (11) within the handle seating spring is attached to a pin retaining washer (8) which is clamped between the outside handle and the handle sleeve. A centering cam (14) on the handle sleeve engages a cam on the sleeve housing which is attached to the handle mechanism housing.

B. Latching Crank and Door Cocking Crank Assembly

(1) Two cam rollers (35, detail C) attached to two roller cam cranks (36) bear against the camplate. Viewing the door on the inside surface, the left cam roller crank is splined to a latching crank (37). The complete crank assembly rotates in ball bearings (20 and 33) inside the handle mechanism housing. An adjustable latching stop (34) mounted on the outside of the handle mechanism housing restricts the travel of the cam roller crank. Two separate control rods (32 and 38) attached to each end of the latching crank connect with latch rods located at the top and bottom of the door.

C. Latch Assembly

(1) Latch rollers (41, detail D) at the ends of the latch rods engage with latches (40) mounted on the door jambs. The upper and lower latch rods each have a control rod (figure 1) connected to the upper and lower gates respectively. The gates are mounted on piano-type hinges. Stop rods at both ends of each gate prevent distortion of the gates when the cabin is pressurized. The right cam roller crank (36, detail C) is applied to the door cocking crank (30). The complete crank assembly rotates in ball bearings (23 and 31) inside the handle mechanism housing. A push rod (22) connects the cocking crank to the torque tube crank (26). The tube (27) is supported on two ball bearings (25 and 28) retained in the handle mechanism housing. Two nuts (24 and 29) allow vertical adjustment of the door in the door opening.

D. Upper Hinge Assembly

(1) At all aft entry doors and at forward entry doors without spring assist, the upper hinge arm (44, detail E) is bolted to the upper end of the torque tube which is located in two plain bushings in the upper hinge support (62). A pressure seal (57) is located between the torque tube and the hinge support. A guide arm (60) containing a plain bearing (61) at one end is bolted to the upper hinge support. The other end of the guide arm contains the guide arm roller (51). A spring loaded latch pin (49) is incorporated in the guide arm roller. Two roller guide plates (47 and 56) mounted on the forward frame of the door opening have tracks in which the guide arm roller is located. A hole in the top roller guide plate allows engagement of the latch pin, which is manually released by a door open stowing latch lever (58). Two radius links (48 and 55) connect the hinge arm to the guide arm. Connection of the radius links to the guide arm is made by a pin (46) and retainer ring (45). The upper hinge pin (52) connects the radius links and upper hinge arm to the roller guide plates. The hinge pin is held in position by a retainer (54) and two screws. A pressure seal (53) is located under the retainer.

(2) At forward entry doors with spring assist, the upper hinge arm (44, detail G) is bolted to the upper end of the torque tube which is located in two plain bushings in the upper hinge support (62). A pressure seal (57) is located between the torque tube and the hinge support. A guide arm (60) containing a plain bearing (61) at one end is bolted to the attachment fitting, which in turn, is bolted to the upper hinge support. The other end of the guide arm contains the guide arm roller (51). A spring-loaded latch pin (49) is incorporated in the guide arm roller. Two roller guide plates (47 and 56) mounted on the forward frame of the door opening have tracks in which the guide arm roller is located. A hole in the top roller guide plate allows engagement of the latch pin, which is manually released by a door open stowing latch lever (58). Two radius links (48 and 55) connect the hinge arm to the guide arm. Connection of the radius links to the guide arm is made by a pin (46) and retainer ring (45). The guide plates and guide arm are positioned in the hinge fitting by the spring assist upper spigot (75). The upper spigot is splined to mate with the splined hole in the upper guide arm. A pressure seal, located on the lower surface of the hinge fitting, is held in place by the retainer washer (76) and compression spring (77).

E. Lower Hinge Assembly

(1) At all aft entry doors and at forward entry doors without spring assist, the lower hinge arm (66, detail F) is bolted to the lower end of the torque tube which is located in two plain bushings in the lower hinge support (74). A pressure seal (63) is located between the torque tube and the hinge support. Two stop plates (68 and 72) are mounted at the lower hinge position on the forward frame of the door opening. A radius link (69), including a stop pin (70), is located between the stop plates. The lower hinge arm is attached to the radius link and stop plates by the lower hinge pin (65). The lower hinge pin is held in position by a retainer (64) and two screws. A pressure seal (67) is located under the retainer. A door snubber (73) is connected between the radius link and hinge support.

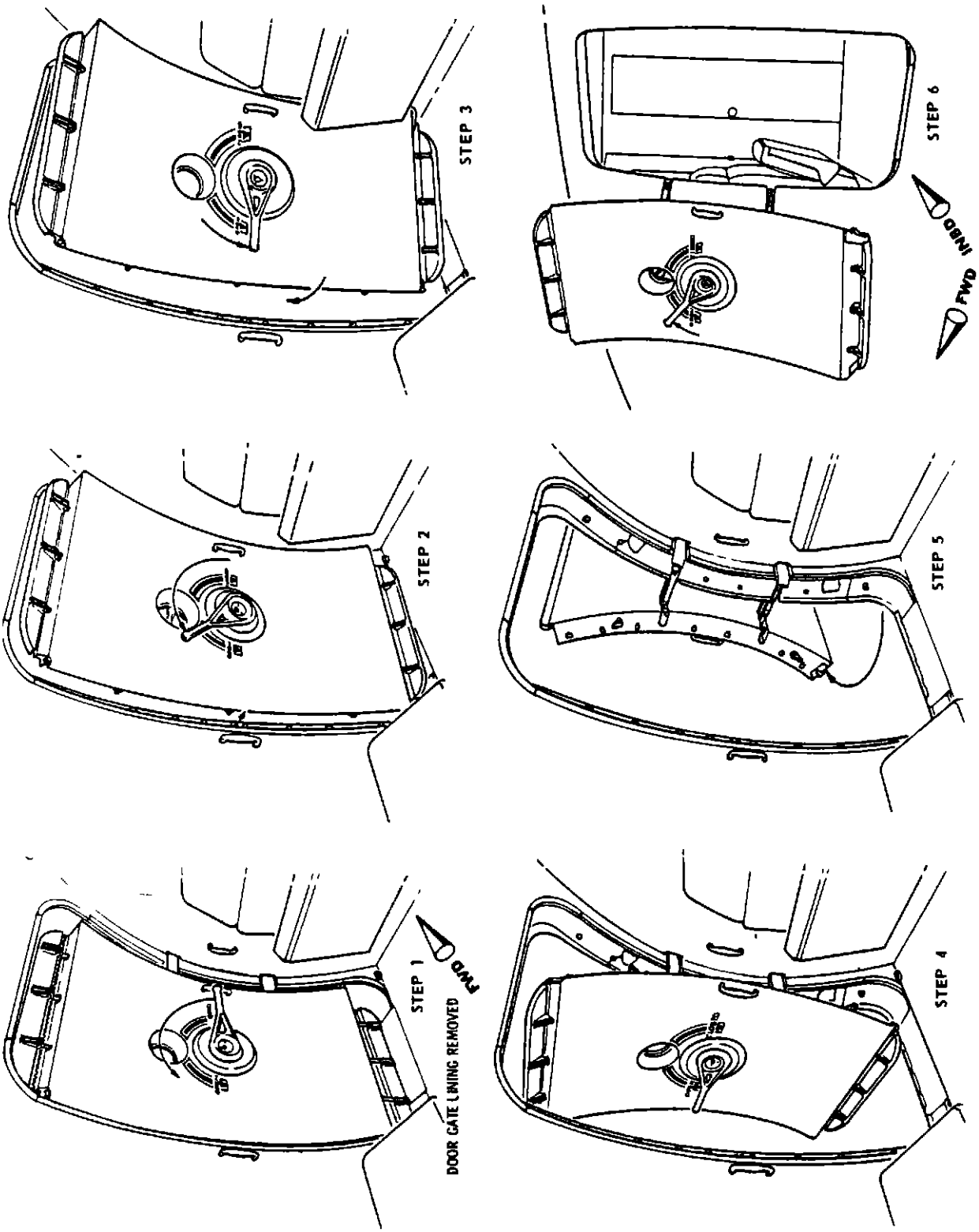
(2) At forward entry doors with spring assist, the lower hinge arm (66, detail H) is bolted to the lower end of the torque tube which is located in two plain bushings in the lower hinge support (74). A pressure seal (63) is located between the torque tube and the hinge support. Two stop plates (68 and 72) are mounted at the lower hinge position on the forward frame of the door opening. A radius link (69), including a stop pin (70), is located between the stop plates. A door snubber (73) is connected to the radius link and

hinge support. The hinge arm, radius link, and stop plates are positioned in the hinge fitting by the spring assist lower spigot (78). The lower spigot is splined to mate with the splined hole in the hinge arm. A pressure seal, located on the upper surface of the hinge fitting, is held in place by the retainer washer (76) and compression spring (77).

F. The door is guided during the final closing operation by a door centering roller attached to the center of the aft edge of the door engaging with a centering track located on the aft frame of the door opening. When the door is in the closed position and the passenger cabin is pressurized, door stops (39, detail D) mounted on the forward and aft frames of the door opening contact adjustable door stop pins (42) attached to the forward and aft edges of the door. The door stops transmit the pressurization loads on the door to the fuselage structure surrounding the door, and prevent excessive deflection of the continuous weather/pressurization seal (43) attached around the entire edge of the door. A flap (71, detail F) is located at both the upper and lower hinges between cut-outs in the door reveal and is attached by a hinge to the forward frame of the door opening. The flap provides continuity of contact surface for the weather/pressurization seal around the hinge cut-outs when the door is in the closed position. Water drains are provided at the upper and lower hinge locations and along the lower edge of the lower gate. A switch incorporated in one of the latches is in circuit with the door warning system. Refer to 52-7-0. Assist handles are provided to give personnel additional functional control during the door operating cycle.

G. Spring Assist (See figure 1 for effectivity.)

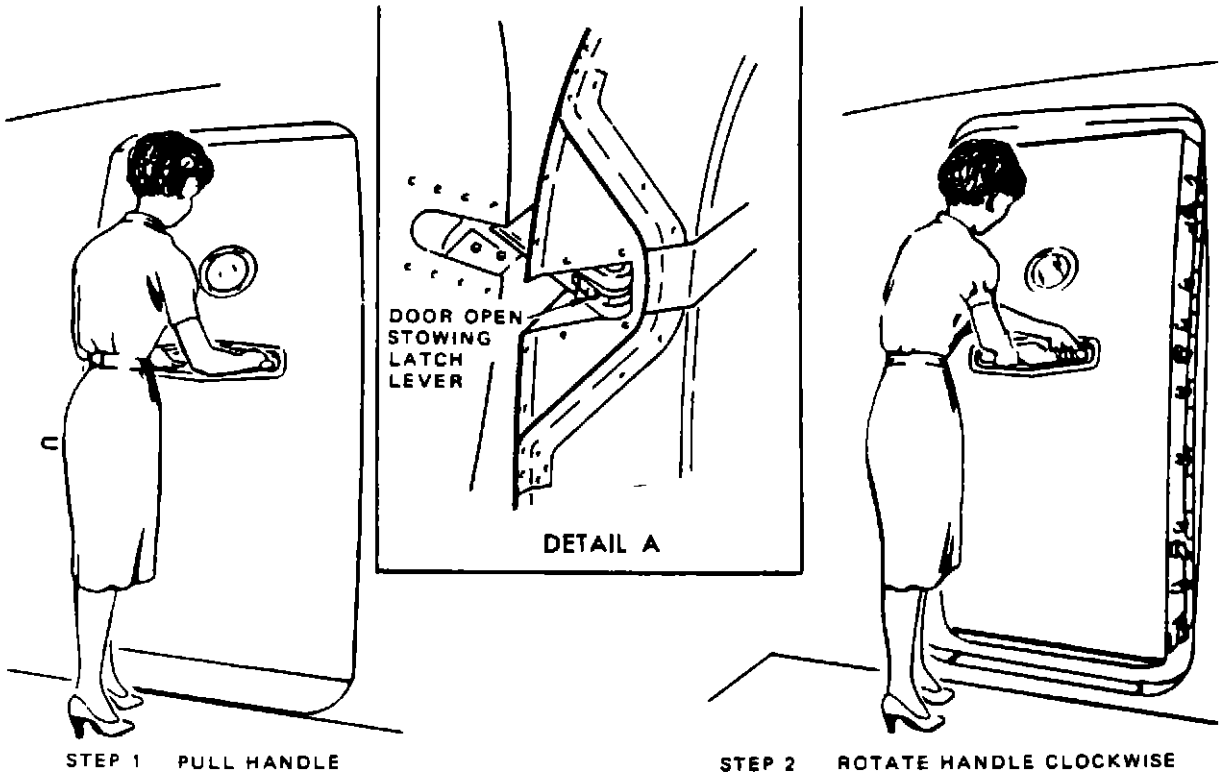
(1) A spring-loaded torque tube assembly (detail J, figure 1) is mounted in the right side of the door frame. The upper and lower hinge arms are splined and clamped to the upper and lower spigots at the ends of the torque tube. The upper spigot is connected to the torque tube by the upper spring attachment nut and bolt. The lower spigot is splined to the lower end of the torque tube. Three springs are mounted on the torque tube. The upper and lower springs are connected to the structure and torque tube to assist the initial 60 degrees of door closing from the door "stowed open" position. The center spring is connected to the torque tube and the structure to assist the door opening from the "door cocked" position to the balanced position, which is approximately 60 degrees from the door "stowed open" position. Spring-loaded retainers support seals at the upper and lower spigots to prevent pressurization losses.


STEP 3
STEP 6
INBD
FWD
STEP 2
STEP 5
STEP 1
FWD
DOOR CATE LINING REMOVED
STEP 4

3. Operation

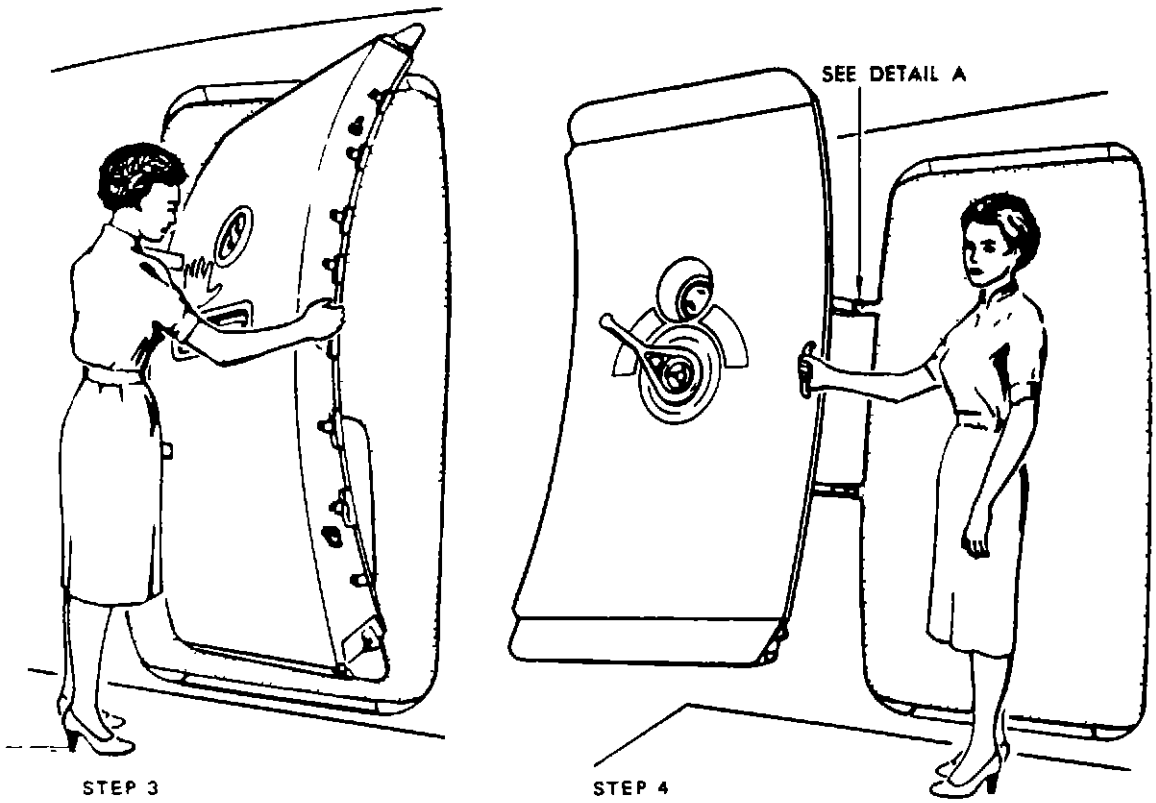
A. The door is opened from the airplane interior by rotating the inside handle counterclockwise (figure 2). Initial rotation of the cam plate transmits angular movement to the latching crank assembly. The control rods at each end of the latching crank, turn the latch rods and withdraw the latch rollers from the latches, allowing the door to move inward. Withdrawal of the latch rollers closes the door warning switch. Refer to 52-7-0. The latch rods also operate the control rods attached to the upper and lower gates, causing these to fold inward and push the stop rods away from their stops. Further rotation of the handle to its full travel of 180 degrees allows the cam plate to transmit angular movement to the cocking crank assembly. The cocking crank operates the push rod connected to the torque tube crank. Movement of the push rod is resisted by the torque tube, causing the door to rotate on the hinge arms and pivot about torque tube axis. This motion is due to the change in relative positions of the hinge arm and guide arm at the upper hinge, and the hinge arm and snubber at the lower hinge. Tracking of the door is controlled by the guide arm roller in the roller guide plates. As the door rotates to the cocked position, (figure 2, step 3), the guide arm and snubber deflect the upper and lower hinge flaps inward on their hinges. The door is swung through the opening by means of the assist handle. The outward lateral travel of the hinge arm transmits motion through the radius link to the guide arm which in turn causes the door to rotate, in an outward direction, about the pivot axis of the torque tube. The inside handle on the door automatically rotates approximately 45 degrees clockwise during final movement of the door to the latched position, (figure 2, step 6). This is due to the change in relative position of the hinge arms, guide arm and snubber, passing beyond 180 degrees from the door cocked position and causing the door to counter-rotate and operate the cocking crank and cam plate in reverse. When the door is approximately parallel with the airplane exterior, the stop pin contacts the stop plate and prevents further movement of the door. The door is latched in the open position by the latch pin engaging the latch pin hole.

B. The door is opened from the airplane exterior by grasping the outside handle with both hands and pulling outward to clear the handle recess panel (figure 3, step 1). This compresses the handle seating spring and engages the handle sleeve splines with the splines on the handle shaft. Rotating the handle 180 degrees clockwise operates the door mechanism as described in paragraph 3A, bringing the door into the cocked position. The handle is then returned into the recess. The centering cam on the handle sleeve ensures that the handle is centralized in the recess. The door is swung through the opening until the stop is contacted, and is latched in the open position by the latch pin engaging the latch pin hole (figure 3, step 4).



STEP 1 PULL HANDLE

STEP 2 ROTATE HANDLE CLOCKWISE



STEP 3

STEP 4

C. The door is closed from airplane interior by depressing door open stowing latch lever which releases the latch pin. The door is swung through the opening by means of the assist handle, and when the stop pin contacts the stop plate, the door is in the cocked position. As the door is swung around from the latched open position, the inside handle automatically moves counterclockwise to the fully open position, as described in paragraph 3A. Rotating the inside handle 180 degrees clockwise operates the door mechanism in the reverse direction to that described in paragraph 3A, and brings the door into the center of the door opening. The door centering roller engages with the centering track and guides the door into the center of the door opening, allowing the latch rollers to engage with the latches. Rotation of the latch rods operates the upper and lower gate control rods and unfolds the gates outward. The action of the latch rollers in the latches pulls the door into the door opening, compresses the weather/pressurization seal around the edge of the door and opens the door warning switch. Refer to 52-7-0.

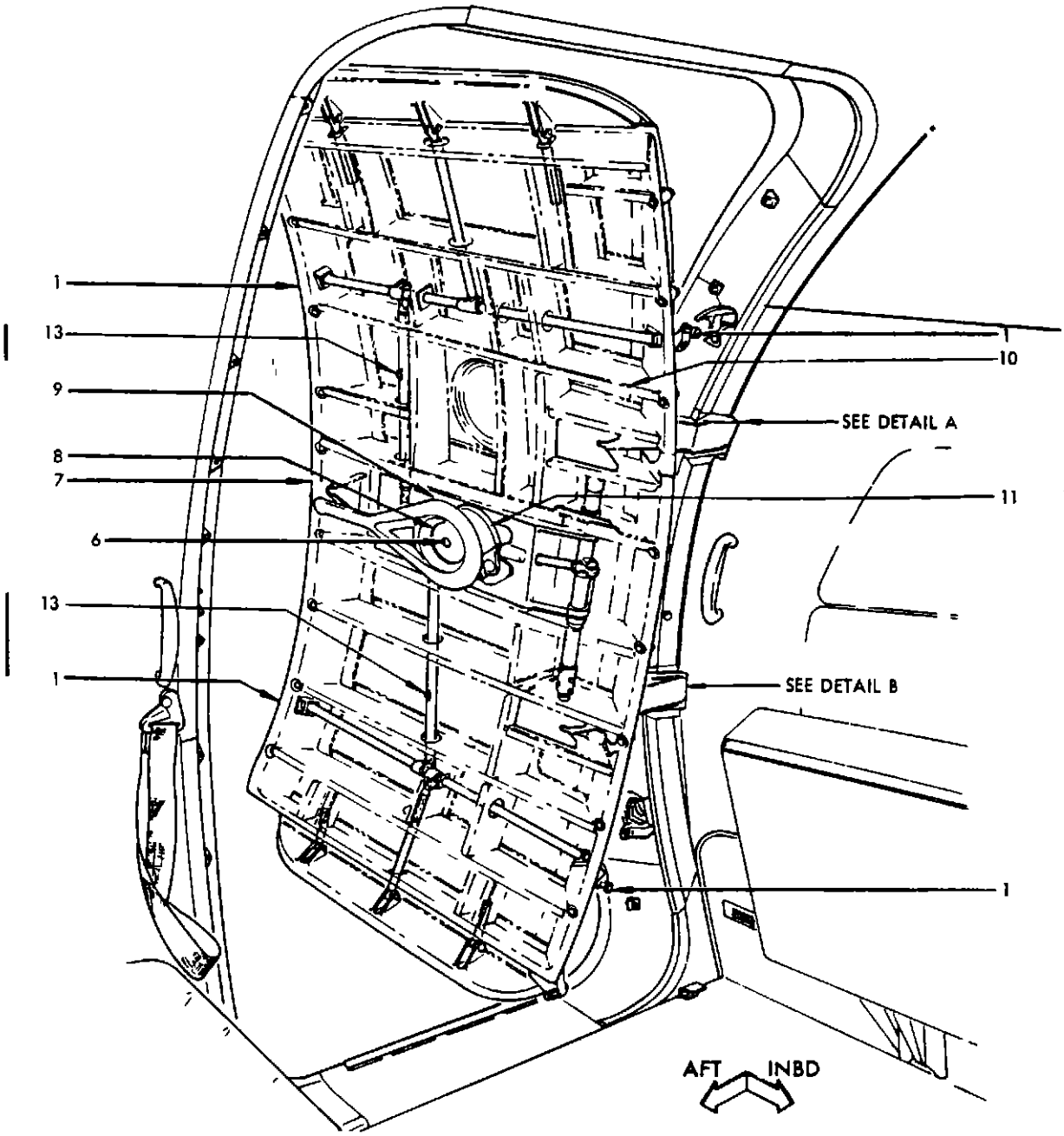
D. The door is closed from the airplane exterior by depressing the door open stowing latch lever and swinging the door through the opening by means of the assist handle. The outside handle is grasped with both hands, pulled outward to clear the handle recess panel, and rotated 180 degrees counterclockwise. This causes the door to function as described in paragraph 3C. The handle is then returned into the recess.

ENTRY DOORS - MAINTENANCE PRACTICES

1. Unit Servicing Entry Doors

A. Lubricate Entry Doors

(1) The items requiring lubrication are shown on figure 201.



Entry Doors Lubrication
Figure 201 (Sheet 1)

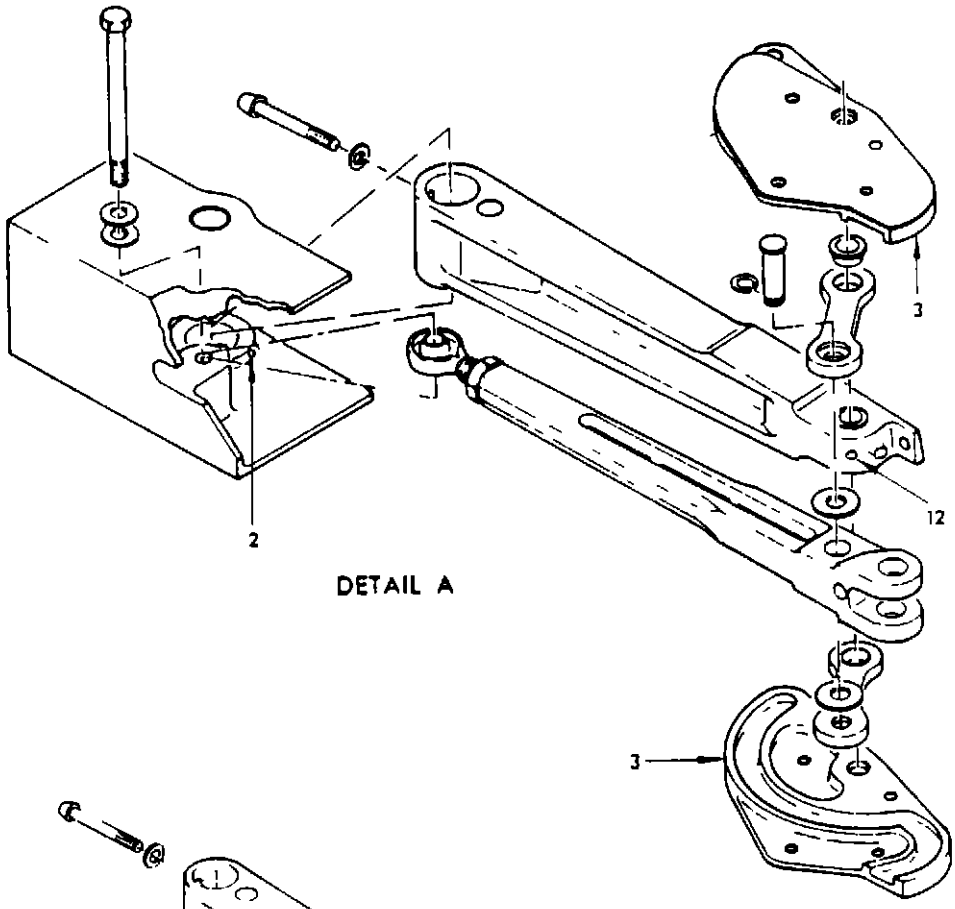
INDEX NO.	ITEM TO BE LUBRICATED	INSTRUCTIONS
1.	LATCH ROLLER	Apply Grease MIL-G-23827. Flush Fitting (4 places)
2.	UPPER HINGE BUSHING	Apply Grease MIL-G-23827. Flush Fitting (1 place)
3.	GUIDE PLATE TRACK	Apply Grease MIL-G-23827. Hand (4 places)
4.	LOWER HINGE BUSHING	Apply Grease MIL-G-23827. Flush Fitting (1 place)
5.	SNUBBER ENDS	Apply Grease MIL-G-23827. Flush Fitting (2 places)
6.	HANDLE SLEEVE	Apply Grease MIL-G-23827. Flush Fitting (1 place, adjacent to outside handle)
7.	CENTERING ROLLER [1]	Apply Grease MIL-G-23827. Flush Fitting (2 places)
8.	LATCHING CAM ROLLER [2]	Apply Grease MIL-G-23827. Flush Fitting (1 place)
9.	COCKING CAM ROLLER [2]	Apply Grease MIL-G-23827. Flush Fitting (1 place)
10.	HOLD-OPEN LOCK	Apply Grease MIL-G-23827. Hand (1 place, at door end of upper hinge arm, accessible from outboard side)
11.	CAM PLATE [2]	Apply Grease MIL-G-23827. Hand (2 places, around both track profiles)
12.	UPPER HINGE ARM	Apply Grease MIL-G-23827. Flush Fitting (1 place)
13.	DOOR CONTROL RODS [1]	Apply Grease MIL-G-23827. Flush fitting (2 places) accessible after door lining has been removed.

Early airplanes only. On later airplanes the door is centered by a spherical steel guide knob engaging a nylon-lined guide track, and these parts do not require lubrication.

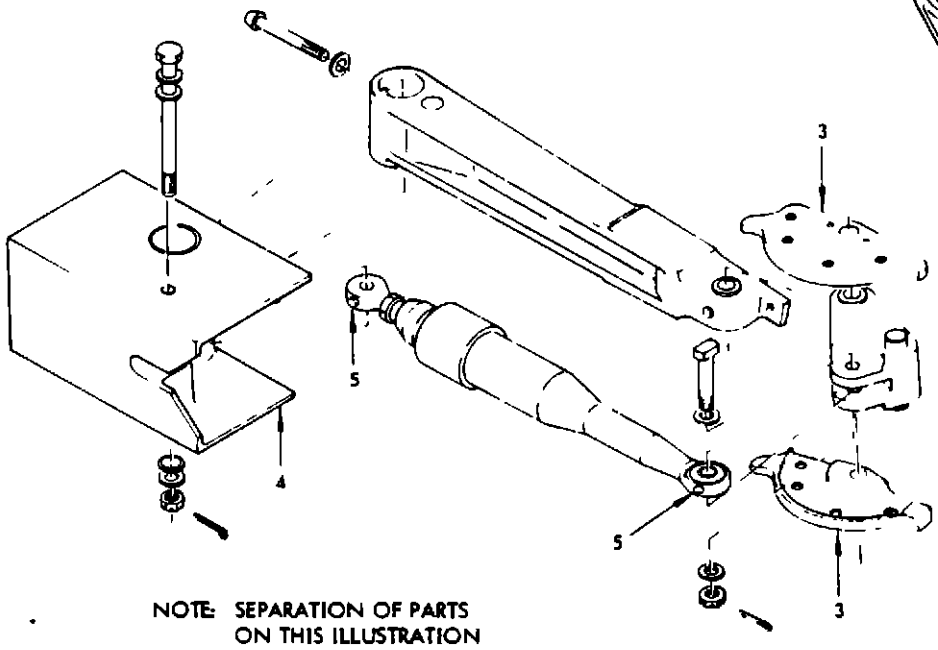
If entry door is equipped with an escutcheon plate, escutcheon plate must be removed for access to lubrication point.

Aft entry door only on all except the following airplanes:

AA	N7555 thru N7565
BNF	N7095 thru N7099
CAL	N17321 thru N17326
TWA	N760TW thru N776TW, N778TW thru N780TW, N786TW thru N793TW, N8705T, N8715T, N8725T, N18701 thru N18704 and N18706 thru N18709
QANTAS	VH-EBN thru VH-EBS
AF	F-BHSB thru F-BHSS, F-BHSU thru F-BHSZ and F-BLCA thru F-BLCD
SABENA	OO-SJA thru OO-SJH, OO-SJJ and OO-SJK
SAA	ZS-CKC thru ZS-CKE and ZS-DYL
TAP	CS-TBA and CS-TBB
AR	LV-ISA thru LV-ISD
DLH	D-ABOB thru D-ABOG, D-ABOV thru D-ABOT D-ABUA thru D-ABUH, D-ABUK and D-ABOX
NWA	N351US thru N370US
FTL	N322F thru N324F
PIA	AP-AUN thru AP-AUO
EL AL	4X-ATA thru 4X-ATC and- 4X-ATR
AII	VT-DJI thru VT-DJK VT-DNY, VT-DNZ, VT-DPM, VT-DSI and VT-DVA
BOAC	G-APFB thru G-APFP, G-ARRA thru G-ARRC G-ARWD, G-ARWE, G-ASZF and G-ASZG
VARIG	PP-VJA, PP-VJJ and PP-VJR
WAI	N372WA thru N376WA
IIA	EI-EMW, EI-ANO and EI-ANV
OA	SX-DBA thru SX-DBC



DETAIL A



NOTE: SEPARATION OF PARTS ON THIS ILLUSTRATION IS FOR CLARITY ONLY.

DETAIL B

FORWARD ENTRY DOOR - MAINTENANCE PRACTICES

1. Removal/Installation Forward Entry Door

A. Equipment and Materials

(1) Wrench - AN8514-4

(2) Hinge Pin Puller Kit - F70086

(3) Snubber Test Jig - TSJ90-10072

(4) Deleted

(5) Wrench - F70085

B. Remove Forward Entry Door

(1) Operate door handle fully, bringing door into cocked position.

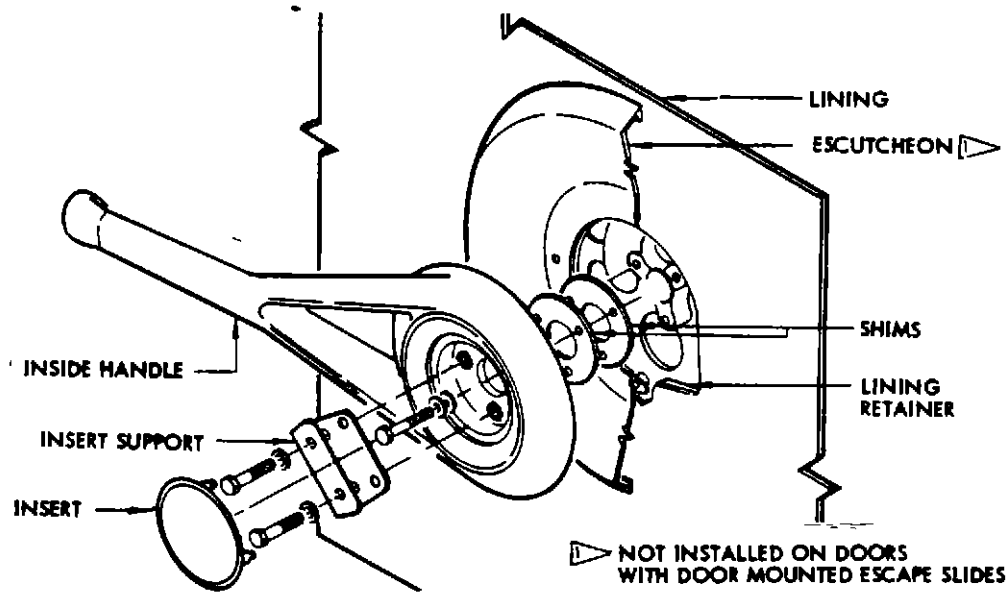
(2) Remove insert from spring fasteners, taking care not to mar polished surface of door inside handle. (See figure 201.)

(3) Remove three bolts with washers and remove handle with shims, taking care not to drop shims.

(4) Remove four escutcheon attachment screws and escutcheon.

(5) Rotate assist handle nuts, using AN8514-4 wrench, and remove handle. (See figure 202.)

(6) Remove bolt, washer, and collar within nuts and remove nuts and outer collars.



Forward Entry Door Handle and Escutcheon Installation
Figure 201

(7) Remove door interior trim panels. Refer to Chapter 25, Passenger Cabin Equipment.

(8) Remove interior trim panel and sidewall insulation at forward edge of door opening between door hinges. Refer to Chapter 25, Passenger Cabin Equipment.

(9) Remove door reveal screws and remove door reveal at forward edge of door opening between door hinges.

(10) Provide adequate support for door.

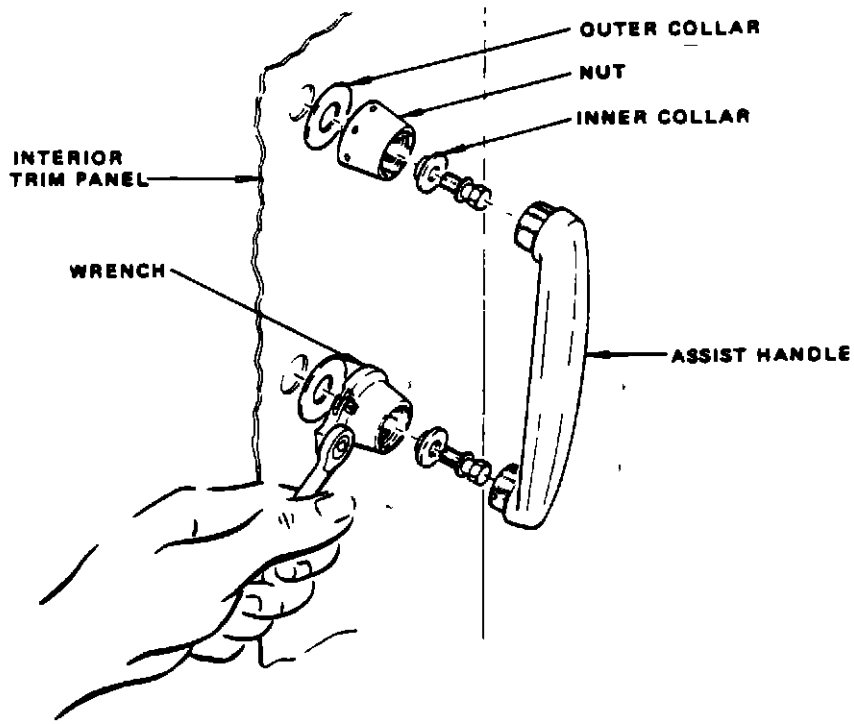
(11) Disconnect upper and lower hinge arms: (See figure 204 and 205 for effectivity.)

(a) On airplanes without spring assist·

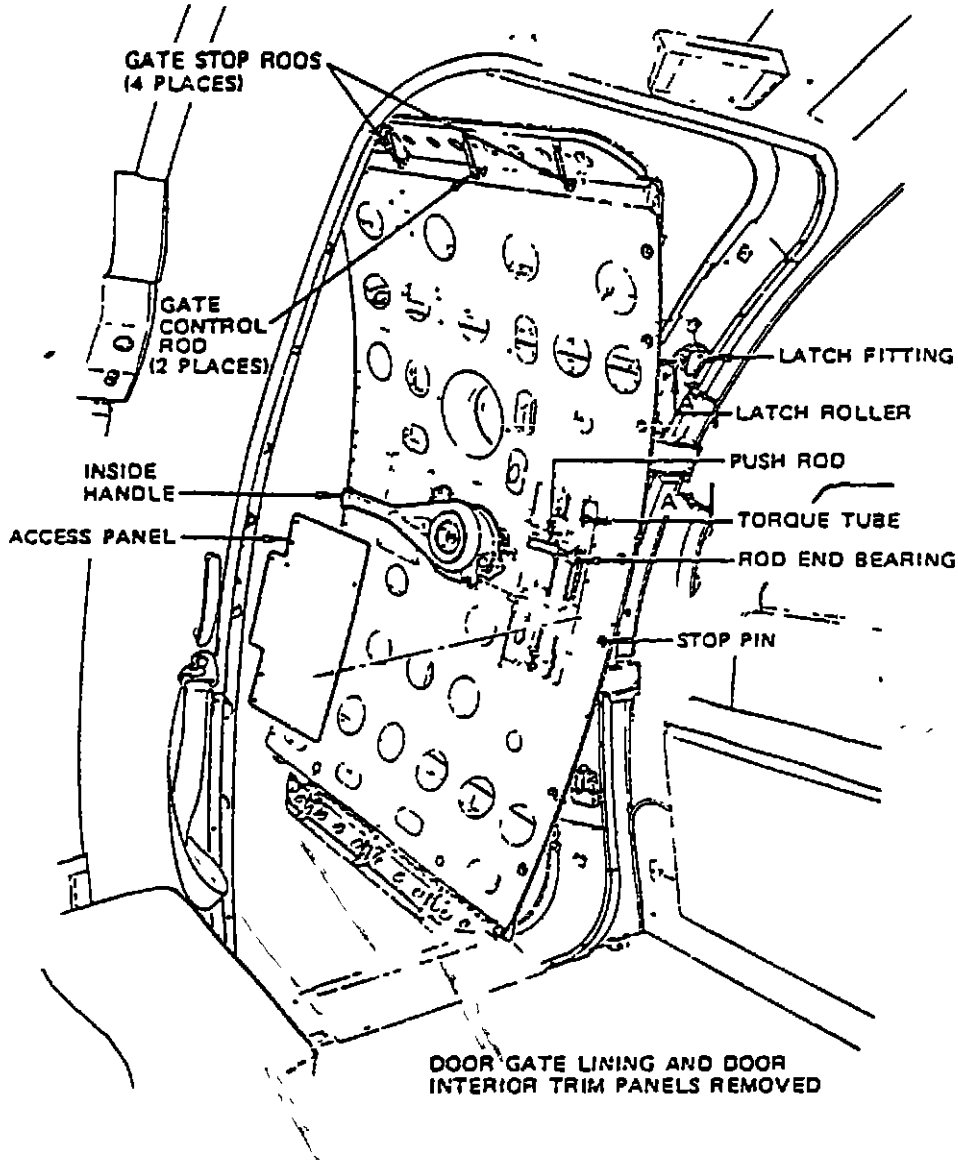
1) Remove lockwire on upper hinge pin retainer screws and remove screws, retainer (8, detail A, figure 204), and rubber seal (7).

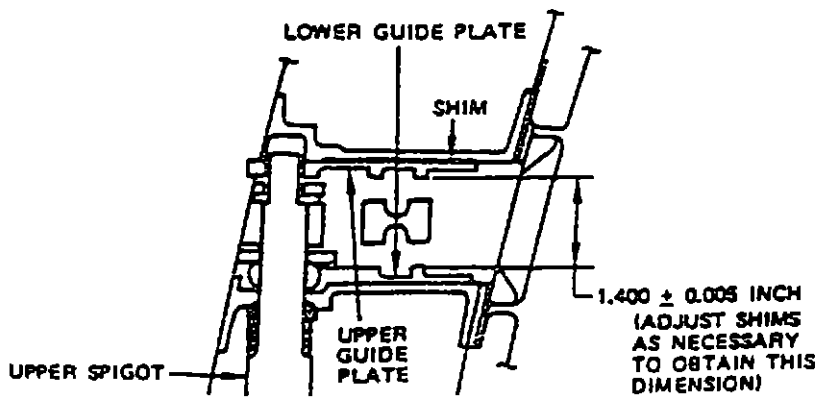
2) Remove hinge pin (6) using hinge pin puller kit F70086.

3) Remove lockwire on lower hinge pin retainer screws and remove screws, retainer (3, detail A, figure 205), and rubber seal (5).



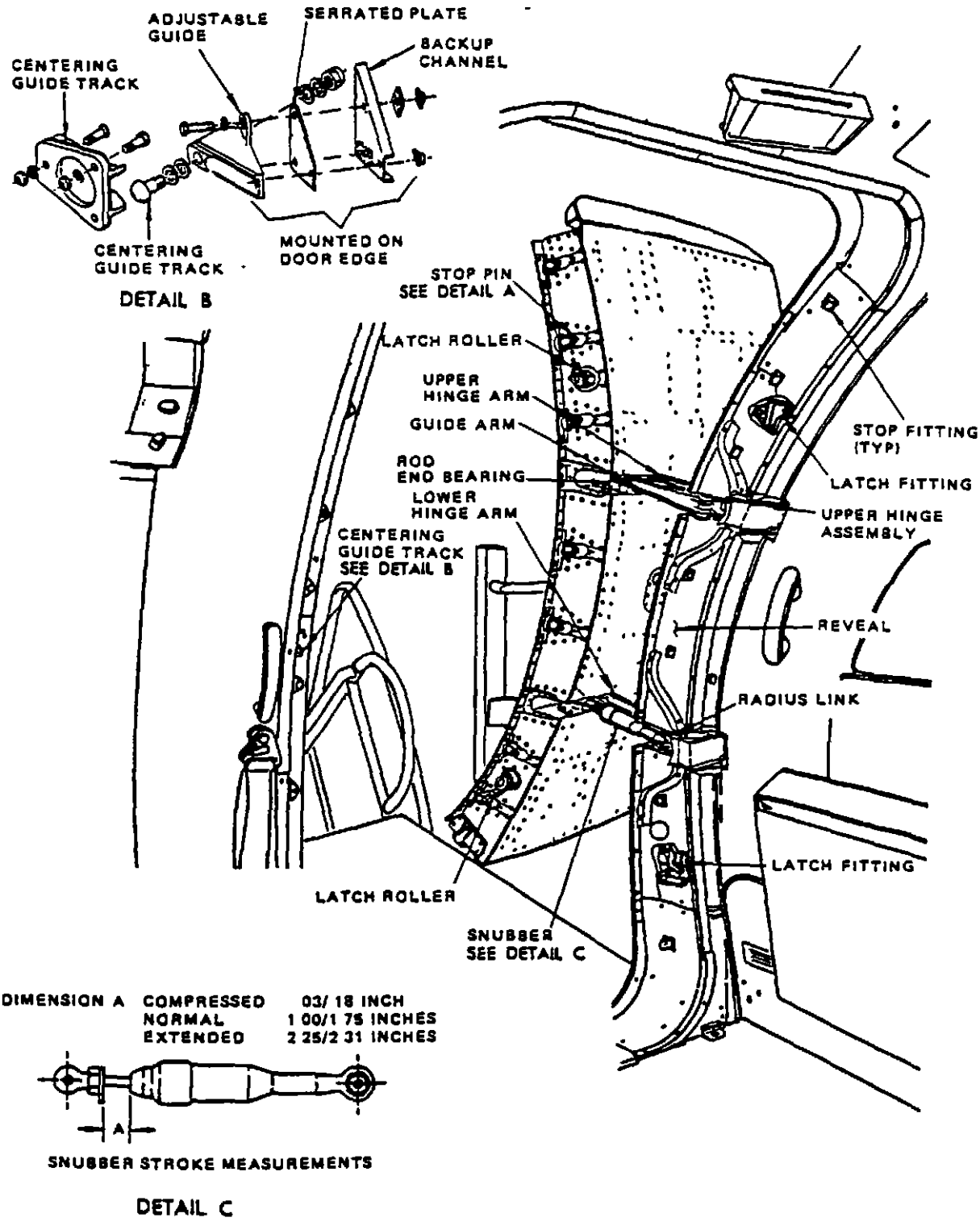
Forward Entry Door Assist Handle Installation
Figure 202



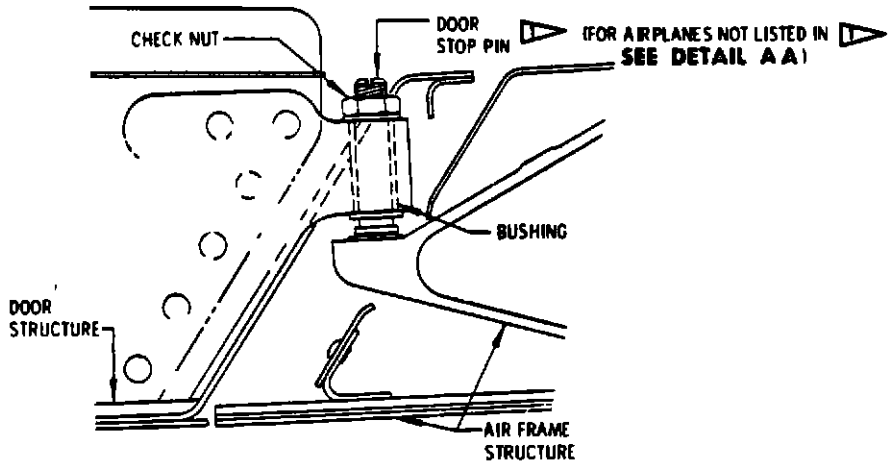


SECTION A–A

Forward Entry Door Installation
Figure 203 (Sheet 1)

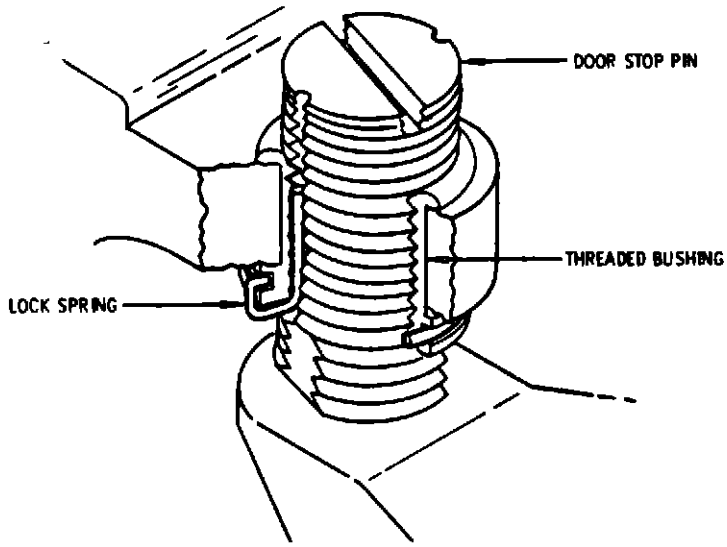


Forward Entry Door Installation
Figure 203 (Sheet 2)



▷ *AIRPLANES 00-SJA THRU 00-SJF*

DETAIL A



AIRPLANES 00-SJG AND ON

DETAIL A-A

4) Remove hinge pin (4) using hinge pin puller kit F70086.

(b) On airplanes with spring assist:

1) Remove spring assist assembly. Refer to 52-1-2, Forward Entry Door Spring Assist - Removal/Installation.

2) Remove clamp bolt from upper hinge arm (2, figure 204, detail C) and withdraw upper spigot (6) together with compression spring (7), retainer washer, and O-ring (8).

3) Remove clamp bolt from lower hinge arm (2, figure 205, detail C) and withdraw lower spigot (3) together with compression spring (4), retainer washer, and O-ring (5).

(12) Remove bolt connecting snubber (8) to radius link (7) at lower hinge.

(13) Carefully slide guide arm out from between roller guide plates, and remove entry door.

C. Install Forward Entry Door

(1) Prepare door for installation (New door)

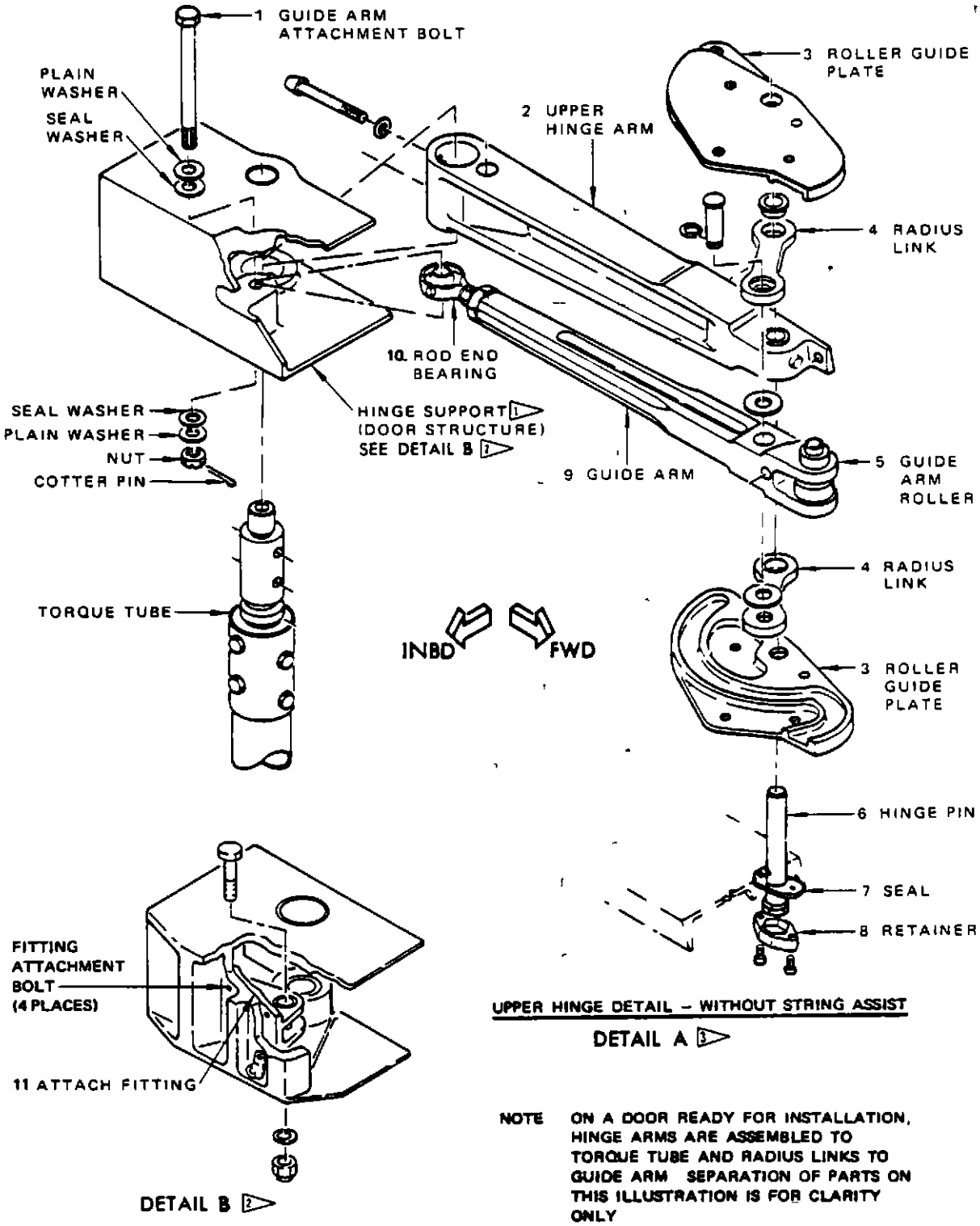
(a) Remove screws in forward mechanism access panel and remove panel. (See figure 203.)

(b) Remove guide arm (9, figure 204) from door by removing bolt (1) or by removing four bolts connecting attach fitting (11) (detail B) to hinge support. (See figure 204 for effectivity.)

(c) Remove snubber (8, figure 205) from door in same manner as guide arm, step (b). (See figure 205 for effectivity.)

(d) Remove attach fitting from snubber, if installed, and using snubber test jig TSJ90-11072, check snubber for correct compressed, central, and extended stroke measurements. (See detail C, figure 203.)

NOTE: Excessively soft operation may be caused by air in the snubber and the snubber should be overhauled or replaced with a new unit. However, no snubber should be rejected because it permits slow movement; the snubber is designed to resist accelerated movement only, and this can best be checked when the door and snubber are installed on the airplane.

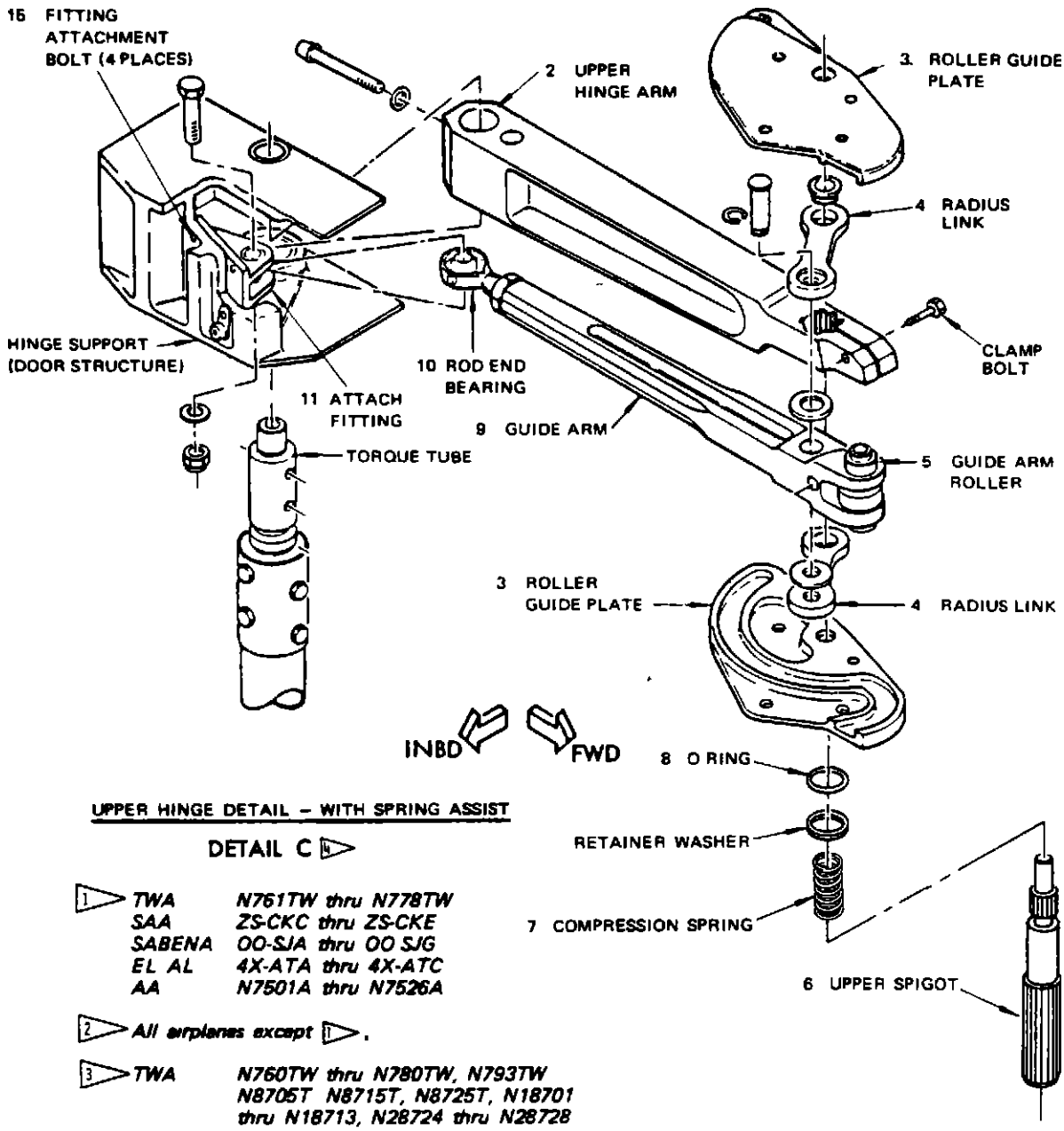


UPPER HINGE DETAIL – WITHOUT STRING ASSIST

DETAIL A 3

NOTE ON A DOOR READY FOR INSTALLATION, HINGE ARMS ARE ASSEMBLED TO TORQUE TUBE AND RADIUS LINKS TO GUIDE ARM. SEPARATION OF PARTS ON THIS ILLUSTRATION IS FOR CLARITY ONLY

Forward Entry Door Upper Hinge Details
Figure 204 (Sheet 1)



UPPER HINGE DETAIL – WITH SPRING ASSIST

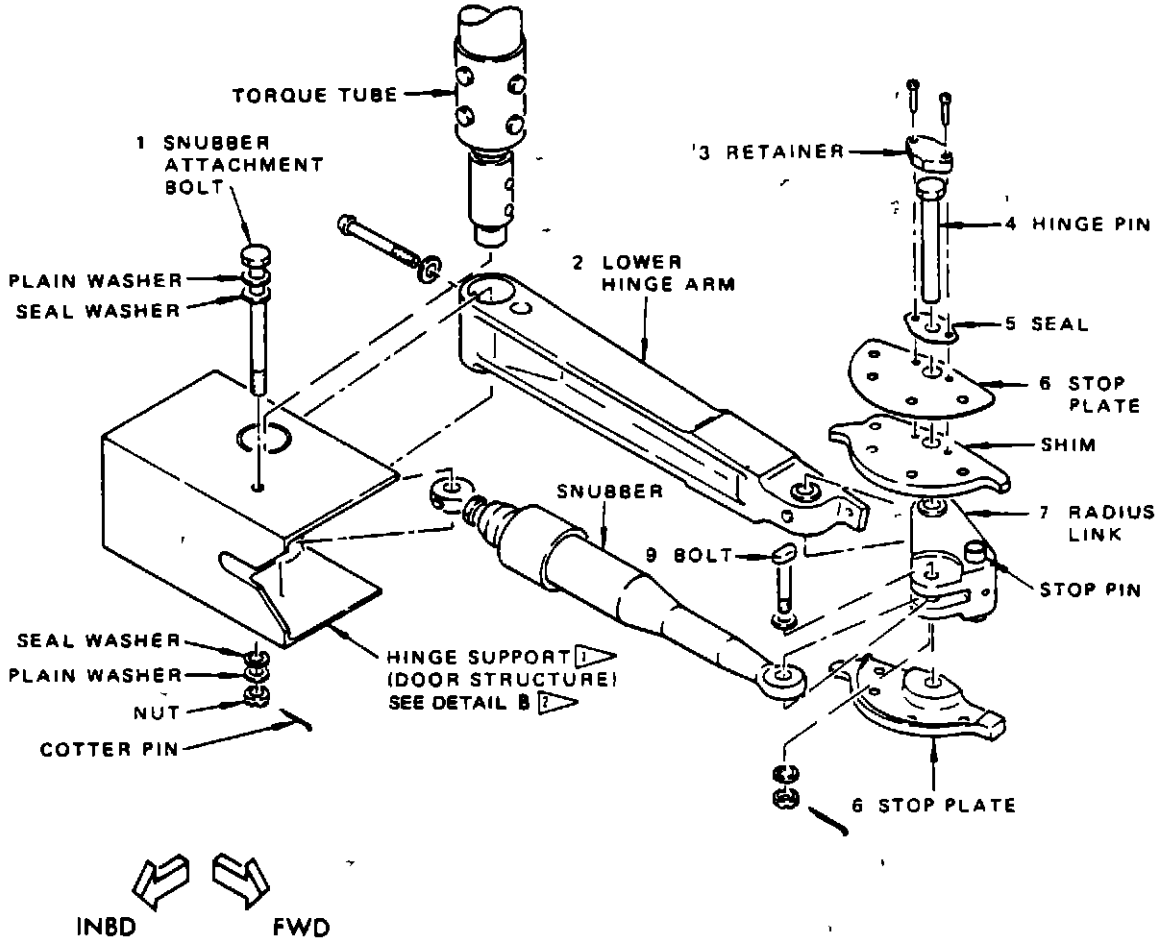
DETAIL C [4]

[1] *TWA* *N761TW thru N778TW*
SAA *ZS-CKC thru ZS-CKE*
SABENA *OO-SJA thru OO SJG*
EL AL *4X-ATA thru 4X-ATC*
AA *N7501A thru N7526A*

[2] *All airplanes except* [1].

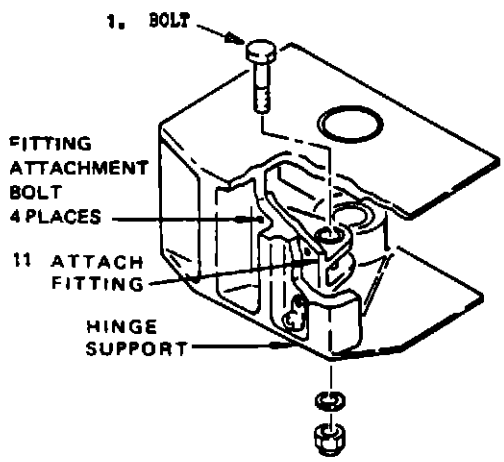
[3] *TWA* *N760TW thru N780TW, N793TW N8705T N8715T, N8725T, N18701 thru N18713, N28724 thru N28728 N8729 thru N8734*
SAA *ZS-CKC thru ZS-CKE, ZS DYL, ZS-EKV, ZS-EUW and ZS-EUX*
SABENA *OO-SJA thru OO-SJH and OO-SJJ thru OO SJL*
EL AL *4X-ATA thru 4X-ATC, 4X ATR thru 4X-ATT*
AA *N7501A thru N7526A, N7550A thru N7554A, N7570A thru N7592A*

[4] *All airplanes except* [3]



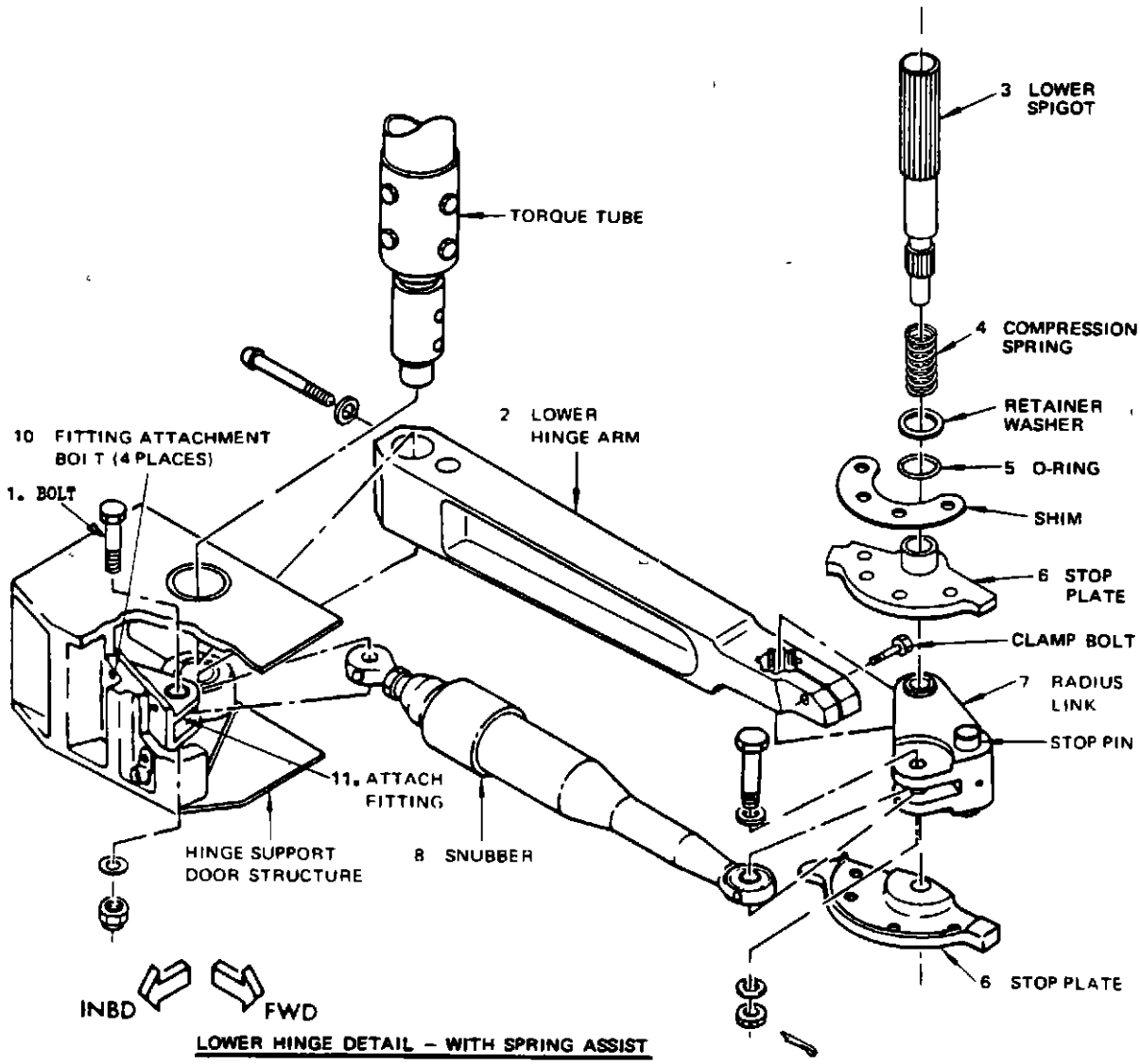
LOWER HINGE DETAILS – WITHOUT SPRING ASSIST

DETAIL A



DETAIL B

NOTE ON A DOOR READY FOR INSTALLATION HINGE ARMS ARE ASSEMBLED TO TORQUE TUBE AND RADIUS LINKS TO GUIDE ARM SEPARATION OF PARTS ON THIS ILLUSTRATION IS FOR CLARITY ONLY



LOWER HINGE DETAIL – WITH SPRING ASSIST

DETAIL C [4]

[1] *TWA N761TW thru N778TW*
SAA ZS-CKC thru ZS-CKE
SABENA OO-SJA thru OO-SJG
EL AL 4X-ATA thru 4X-ATC
AA N7501A thru N7526A

[2] *All airplanes except* [1]

[3] *TWA N760TW thru N780TW, N793TW, N8705T, N8715T, N8725T, N18701 thru N18713, N28724 thru N28728, N8729 thru N8734*
SAA ZS-CKC thru ZS-CKE, ZS-DYL, ZS-EKV, ZS-EUW, and ZS-EUX
SABENA OO-SJA thru OO-SJH and OO-SJJ thru OO SJL
EL AL 4X-ATA thru 4X-ATC, 4X-ATR thru 4X-ATT
AA N7501A thru N7526A, N7550A thru N7554A, N7570A thru N7592A

[4] *All airplanes except* [3]

(2) Slide roller end of guide arm assembly between guide plates (3, figure 204) at upper hinge assembly.

(3) Support door in position at door opening at approximately 90 degrees to airplane exterior.

NOTE: Until installation and adjustment of guide arm and snubber are complete, care should be taken not to allow excessive door movement which might strain hinge mechanism.

(4) Connect snubber (8, figure 205) to radius link (7).

(5) Connect upper and lower hinge arm (2). (See figures 204 and 205 for effectivity.)

(a) On airplanes without spring assist:

1) Engage lower hinge arm (2, figure 205, detail A) with radius link (7) on snubber (8). Align hinge pin holes in radius link and hinge arm with hinge pin holes in stop plates (6).

2) Fit seal (5) on hinge pin (4) and insert hinge pin through stop plate (6), radius link (7), and hinge arm (2).

3) Engage upper hinge arm (2, figure 204, detail A) with radius links (4) on guide arm (9). Align hinge pin holes in radius links and guide arm with hinge pin holes in roller guide plates (3).

4) Fit seal (7) on hinge pin (6) and insert hinge pin through roller guide plates (3), radius links (4), and hinge arm (2).

(b) On airplanes with spring assist.

1) Position lower hinge arm (2, figure 205, detail C) and radius link (7) between stop plates (6) and align hinge holes in hinge arm and radius link with hinge holes in upper and lower stop plates.

2) Insert lower spigot (3) through stop plates (6), radius link (7), and hinge arm (2). Secure lower spigot to hinge arm with clamp bolt.

NOTE: Install compression spring (4), retainer washer, and O-ring (5) on lower spigot (3) prior to insertion of spigot into stop plate (6).

3) Connect guide arm (9, figure 204, detail C) to radius links (4) and position guide arm between roller guide plates (3).

4) Position upper hinge arm (2) between radius links (4) and align hinge holes in hinge arm and radius links with hinge holes in roller guide plates (3).

5) Insert upper spigot (6) through roller guide plates (3), radius links (4) and hinge arm (2). Secure upper spigot to hinge arm with clamp bolt.

NOTE: Install compression spring (7), retainer washer, and O-ring (8) on upper spigot (6) prior to insertion of spigot into roller guide plate (3).

6) Install spring assist assembly Refer to 52-1-2, Forward Entry Door - Removal/Installation.

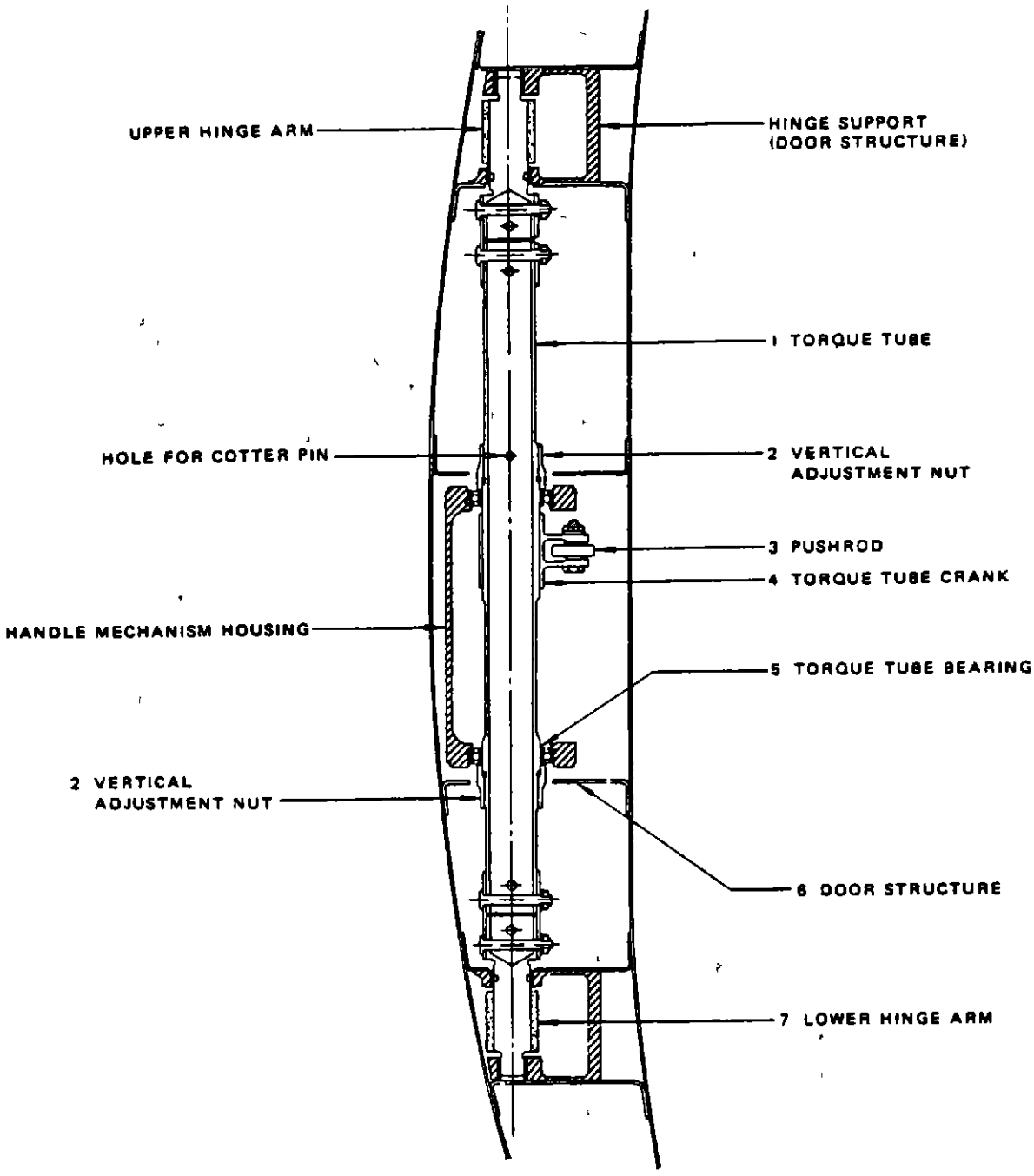
(6) Connect snubber (8, Fig. 205) to door either by installing bolt (1), seal washers, plain washers, nut, and cotter pin; or by connecting attach fitting (11) to snubber, using bolt (1) and installing attach fitting to hinge support using four bolts (Detail A). (See Fig. 205 for effectivity).

CAUTION: ATTACH FITTING (11) IS NOT SYMMETRICAL. BE SURE FITTING (11) IS ORIENTED AS SHOWN IN FIG. 205 OR DAMAGE TO SNUBBER CAN RESULT DURING DOOR OPERATION.

NOTE: If attach fitting was removed to permit testing of snubber, it must be reinstalled on snubber prior to connecting snubber to door.

(7) Connect guide arm (9, Fig. 204) to door either by installing bolt (1), seal washers, plain washers, nut, and cotter pin; or by connecting attach fitting (11) to guide arm, using bolt (1) and installing attach fitting to hinge support using four bolts (Detail A). (See Fig. 204 for effectivity).

CAUTION: ATTACH FITTING (11) IS NOT SYMMETRICAL. BE SURE FITTING (11) IS ORIENTED AS SHOWN IN FIG. 204 OR DAMAGE TO DOOR LINKAGE CAN RESULT DURING DOOR OPERATION.



Forward Entry Door - Torque Tube Details
Figure 206

(8) Attach 60 pound weight to inside door frame at approximately the mid-point of the lower half of the door.

NOTE: Upper and lower hinges and centering roller support gage are located to nominal position. Do not change these locations.

Adjust door when airplane is on its own wheels. Do not make door adjustments when airplane is jacked.

(9) Back off on all door stop pins until head of pin contacts end of stop pin bushing. (See figure 203.)

(10) Adjust vertical position of door by means of nuts (2, figure 206) on torque tube (1) to maintain a 0.12 (± 0.06) inch gap between upper and lower gates and fuselage. Check that all latch rollers enter latch fittings with equal clearance and lock adjustment nuts with cotter pins.

(11) Adjust length of pushrod (3) to move the four latch rollers into their respective latch fittings before the latch rollers start to rotate when handle is operated to the closed position.

(12) Adjust guide arm length at rod end bearing (10, figure 204), by removing four bolts holding attach fitting (11) to hinge support so that door is parallel to contour at the time latch rollers start to rotate when handle is operated to the closed position. Lubrication fitting on guide arm must be on inboard side. Tighten rod end checknut.

(13) Adjust latch fittings on serrated latch plates attached to door jambs, so that door is flush with fuselage.

NOTE: When closed and latched, outside surface of door along its forward and aft edges should not protrude beyond the fuselage exterior profile by more than 0.03 inch, nor be recessed by more than 0.09 inch. Measurements of flushness should only be made at points along the straight sections between the corners of the door.

(14) Adjust door upper and lower gates.

(a) Adjust upper and lower gate control rods so that the outside surface of the gates along the top and bottom edges of the door are recessed below the fuselage exterior profile by between 0.07 and 0.13 inch. Tighten checknuts and lockwire.

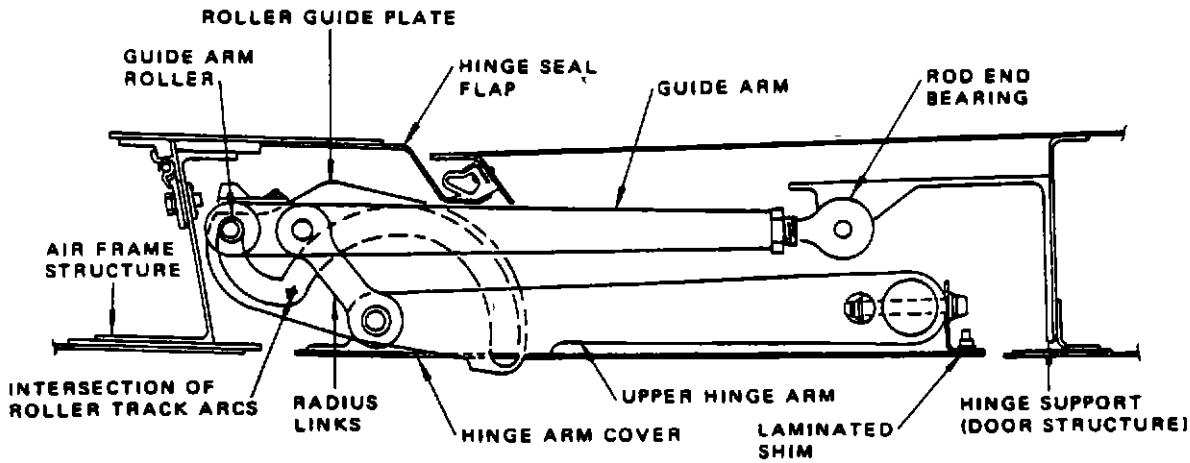
(b) Adjust the upper and lower gate stop rods by screwing the rod end in or out until the shoulder on the rod just contacts the bearing, then back off to nearest locking notch. Tighten checknut and lockwire. (See figure 203.)

(15) With door closed and latched, screw stop pins out until they just contact stop fittings on airframe structure. On stop pins with check nuts, back off stop pins half a turn and tighten check nuts to a torque of 75 to 125 pound-inches. On stop pins with lock springs, back off stop pins half a turn and lock them with lock springs.

(16) Deleted

(17) On early airplanes with stop fitting on handle mechanism (figure 207) cock door so that guide arm roller at upper hinge is at intersection of guide plate arcs (figure 208). Adjust stop fitting on serrated base so that it contacts roller crank arm (figure 207).

(18) Install hinge arm covers, using laminated shims to fair covers with fuselage external contour. (See figure 207.)



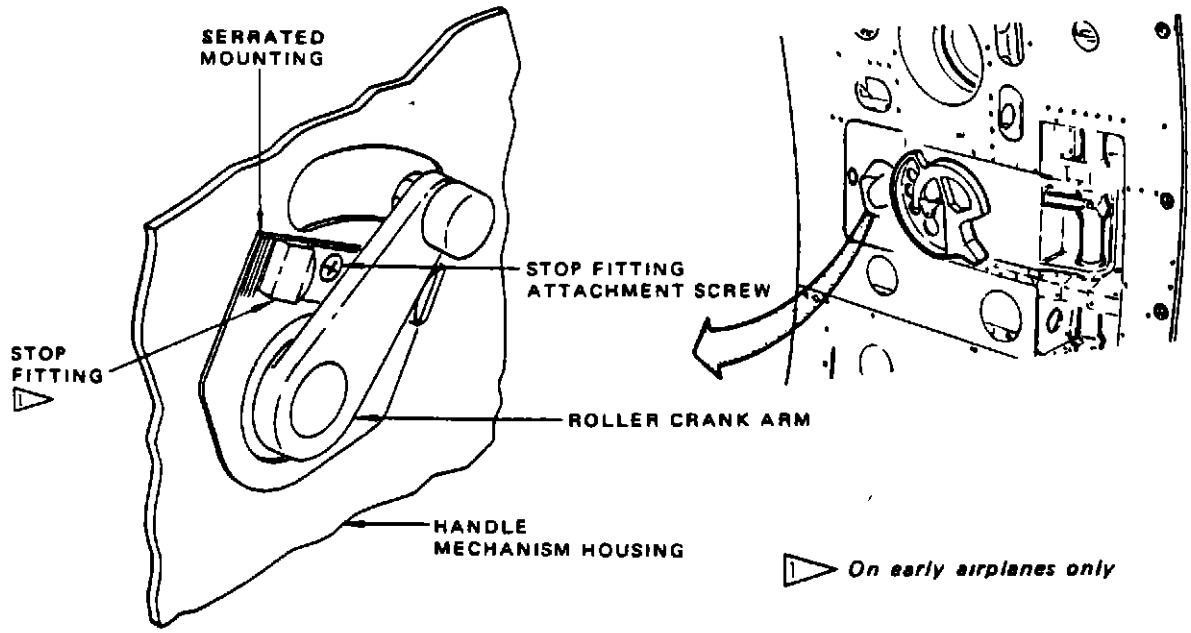
Forward Entry Door Upper Hinge Installation
Figure 207

(19) With door latched in the open position, check length of snubber to make sure it does not bottom before the latch pin engages hole in upper roller guide plate at upper hinge assembly.

(20) Check that door moves through full cycle of operation smoothly with no binding spots. Torque necessary to operate the handle must not exceed 450 pounds-inches without interior trim, or 600 pounds-inches with interior trim is installed.

(21) With door and mechanism installed and adjusted, check that snubber operates correctly. No snubbing action should be felt when door is moved slowly from cocked to stowed position or back to cocked position. The snubber is designed to function only under accelerated motion.

NOTE: An excessively soft operation may indicate the presence of air in the snubber. Any snubber suspected to be in this condition should be replaced with a new unit.



(22) Remove the 60 pound weight from door frame.

(23) Check that gap between door outside skin and fuselage outside skin is between 0.060 inch and 0.180 inch at any point when door is closed and latched. Where necessary, trim edge of door skin to achieve this condition.

(24) Check seal installation as described in 52-9-0, paragraph 1.D. (12).

(25) Install door reveal at forward edge of door opening between door hinges.

(26) Install sidewall insulation and interior trim panel at forward edge of door opening between door hinges. Refer to Chapter 25, Passenger Cabin Equipment.

(27) Install forward mechanism access panel in door.

(28) Remove insert from spring fasteners, taking care not to mar polished surface of door inside handle. (See figure 201.)

(29) Remove lock wire from three bolts and remove bolts with washers and handle with shims, taking care not to drop shims inside the door.

(30) Remove four escutcheon attachment screws and escutcheon.

(31) Install door interior trim panels. Refer to Chapter 25, Passenger Cabin Equipment.

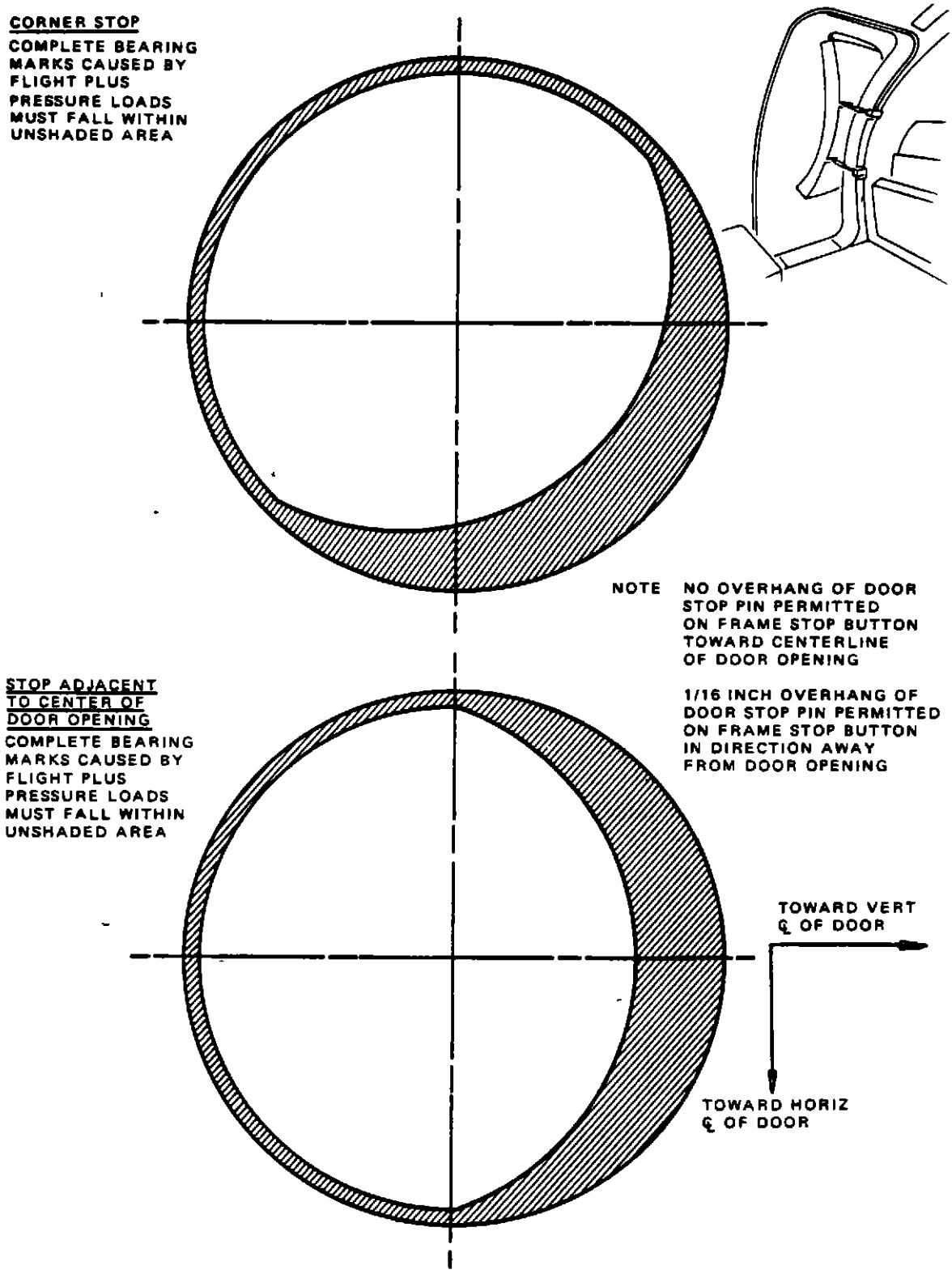
(32) Install door assist handle nuts with collars, washers and bolts. (See figure 202.)

(33) Engage threads on assist handle with threads in nuts and install assist handle by rotating nuts using AN8514-4 wrench.

(34) Install escutcheon. (See figure 201.)

(35) Install inside handle with shims, bolts and washers, and lockwire.

(36) Install insert in center of handle.



Typical Door Stop Misalignment Data
Figure 208

2. Inspection/Check Forward Entry Door

A. Examine for the following:

(1) Examine external and internal skins for cracks, and corrosion; hinge fairings for looseness and missing screws.

(2) Examine frames, internal brackets, handle mechanism housing, and hinges for cracks, corrosion, and loose bolts.

(3) Examine window and frame for cracks, and corrosion.

(4) Examine door operating mechanism for cracks, corrosion, excessive wear, and loose bolts.

(5) Examine latch rollers, latches, and door stops for cracks, corrosion and foreign particles lodged in latches or attached to stops.

(6) Examine drain holes for obstruction.

(7) Examine door seals for cracks, cuts and tears, and correct seating when door is in closed position.

(8) Examine roller cam plates and guide arm roller for excessive wear, which may cause door to malfunction. See 52-1-21, Guide Arm Roller - Removal/Installation.

(9) Examine door stops for misalignment, using the door stop pin bearing marks on frame stop buttons. (See figure 209.)

NOTE: Door stop bearing marks are a result of flight plus fuselage pressure loads.

(10) Check that snubber operates correctly to retard or snub rapid motion of the door towards stowed and cocked positions.

NOTE: If it proves necessary to remove and replace a snubber, access to the bolt connecting it to the airframe should be obtained by removing the door reveal and the interior trim panels forward of the door opening.

FORWARD ENTRY DOOR SPRING ASSIST - REMOVAL/INSTALLATION

EFFECTIVITY

All airplanes except.
OO-SJA thru OO-SJH and OO-SJJ thru OO-SJL

1. General

A. The following procedure is applicable to the removal/installation of the upper, center, and lower torsion springs without the removal/installation of the door. Replacement of either or both the upper and lower torsion springs, however, may be accomplished without the removal of the torque tube assembly and the lower stop fitting from the airplane. (Refer to step 3C)

2. Prepare for Removal (Refer to figure 401.)

A. Open forward entry door.

B Remove interior lining between upper and lower hinge arms of door. (See Forward Entry Door Sidewall Lining, Chapter 25.)

C. Remove reveal between upper and lower hinge arms.

D. Rotate the door to a balanced position where the upper and lower torsion springs (6, detail A) and the center torsion spring (15) are not loaded. This is approximately 60 degrees from the "door stowed" open position.

3. Remove Forward Entry Door Spring Assist (Refer to figure 401.)

A Remove upper and lower spring retainer bolts (10, detail A) and spring mounting bolt (14) from spring assist assembly.

NOTE: The torque tube assembly consists of the upper spigot (1), torque shaft (16), sleeve (4), intermediate torque shaft (7), lower torque shaft extension (8), and lower spigot (9). The upper spigot, torque shaft, intermediate torque shaft, and lower torque shaft extension are bolted to each other by the spring mounting bolts. The lower torque shaft extension is splined to receive the lower spigot.

B. Slide the torque tube assembly together to clear ends from upper spigot (1) and lower spigot (9).

CAUTION DO NOT REMOVE UPPER AND LOWER SPIGOTS FROM THEIR RESPECTIVE HINGE ARMS. IF UPPER AND LOWER SPIGOT REMOVAL IS NECESSARY, PROVIDE ADEQUATE SUPPORT FOR DOOR.

C. Remove two spring attach bolts (13, detail A) from upper stop fitting (3) and lower stop fitting (11). Slide upper and lower torsion springs (6) off ends of torque shaft.

D. Remove the torque shaft (16, section B-B), sleeve (4), intermediate torque shaft (7), lower torque shaft extension (8), center torsion spring (15), and lower stop fitting (11) as a unit from the airplane.

(1) Remove bolts (5, 17, and 18, section A-A) and screw (12) attaching lower stop fitting (11) to stop support fitting (2).

(2) Lower the unit until clear of the upper stop fitting (3, detail A).

E. Remove center torsion spring (15) from torque shaft (16).

4. Install Forward Entry Door Spring Assist (Refer to figure 401.)

A. Assemble the torque shaft (16, section B-B), sleeve (4), intermediate torque shaft (7), lower torque shaft extension (8), center torsion spring (15), and lower stop fitting (11) as a unit and install on the airplane.

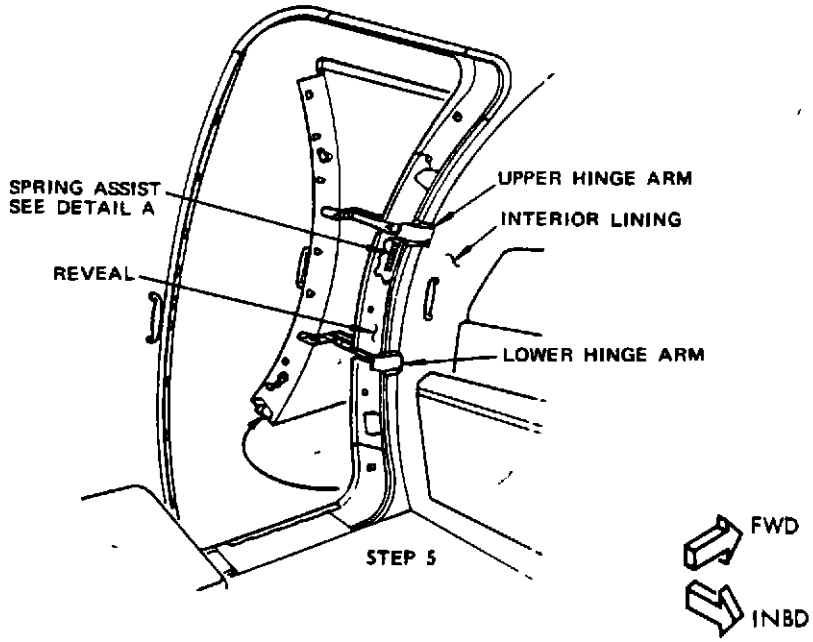
(1) Insert torque shaft (15) through upper stop fitting (3) as required to position lower stop fitting (11).

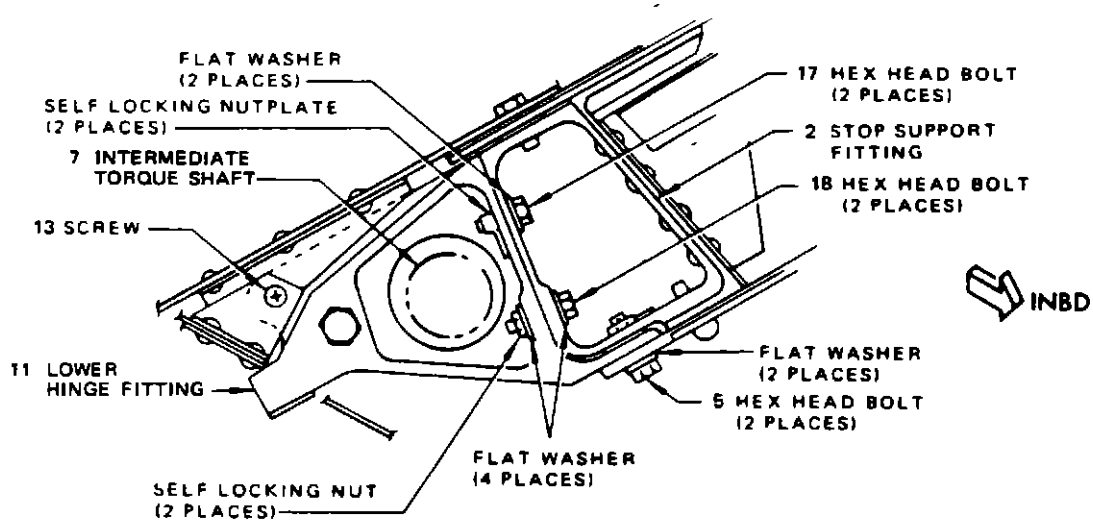
(2) Attach lower stop fitting (11, section A-A) to lower stop support fitting (2) with bolts (5, 17, and 18) and screw (12).

B. Position upper torsion spring (6, detail A) on torque shaft (16) and lower torsion spring (6) on intermediate torque shaft (7).

C. Attach upper and lower torsion springs (6) and center torsion spring (15) to their respective stop fittings with spring attach bolts (13).

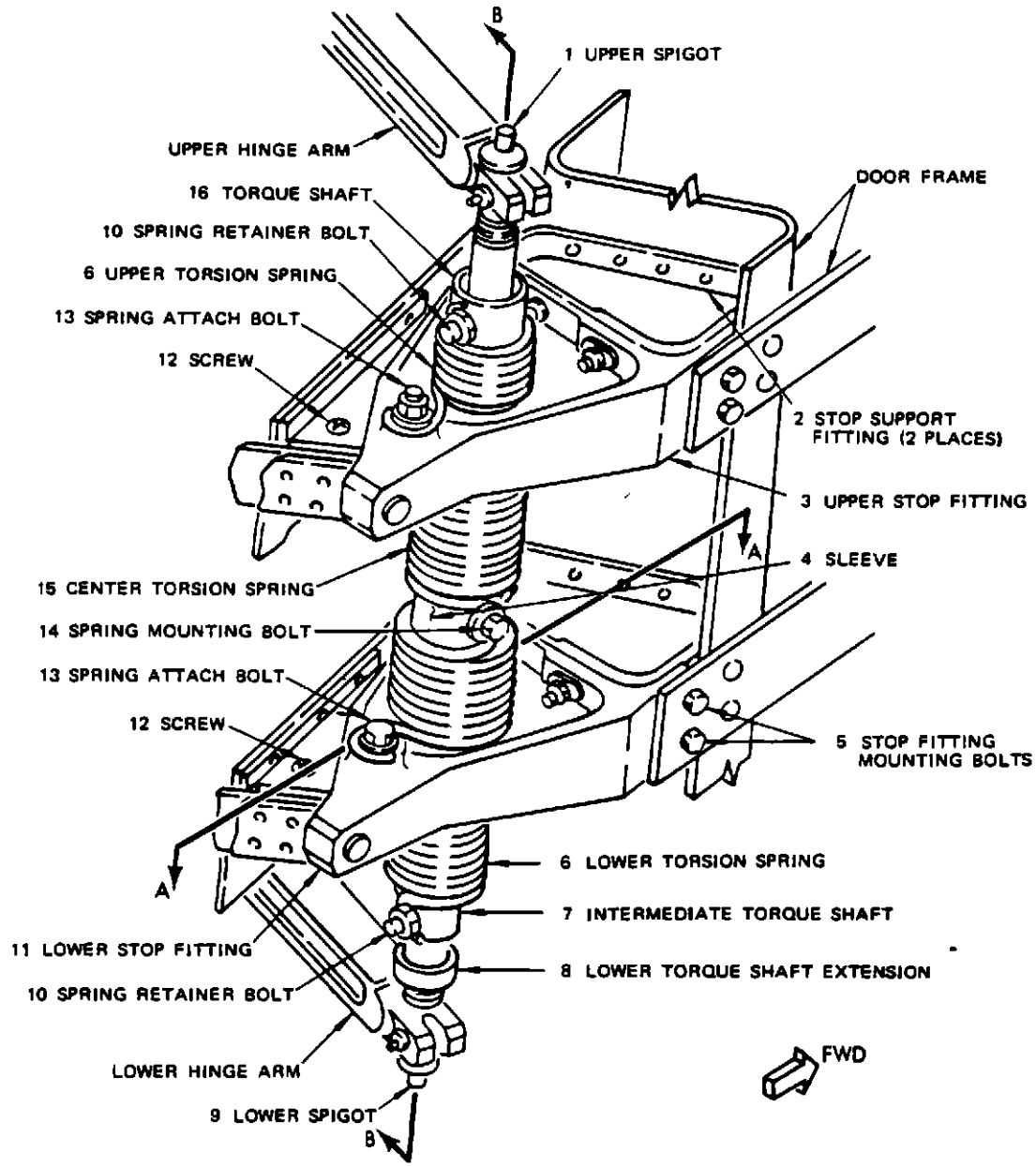
D. Align spline of torque shaft (16, section B-B) with spline of upper spigot (1) and slide torque shaft onto upper spigot.


SPRING ASSIST
SEE DETAIL A
REVEAL
UPPER HINGE ARM
INTERIOR LINING
LOWER HINGE ARM
STEP 5
FWD
INBD


FLAT WASHER
(2 PLACES)
SELF LOCKING NUTPLATE
(2 PLACES)
7 INTERMEDIATE
TORQUE SHAFT
13 SCREW
11 LOWER
HINGE FITTING
SELF LOCKING NUT
(2 PLACES)
FLAT WASHER
(4 PLACES)
17 HEX HEAD BOLT
(2 PLACES)
2 STOP SUPPORT
FITTING
18 HEX HEAD BOLT
(2 PLACES)
INBD
FLAT WASHER
(2 PLACES)
5 HEX HEAD BOLT
(2 PLACES)

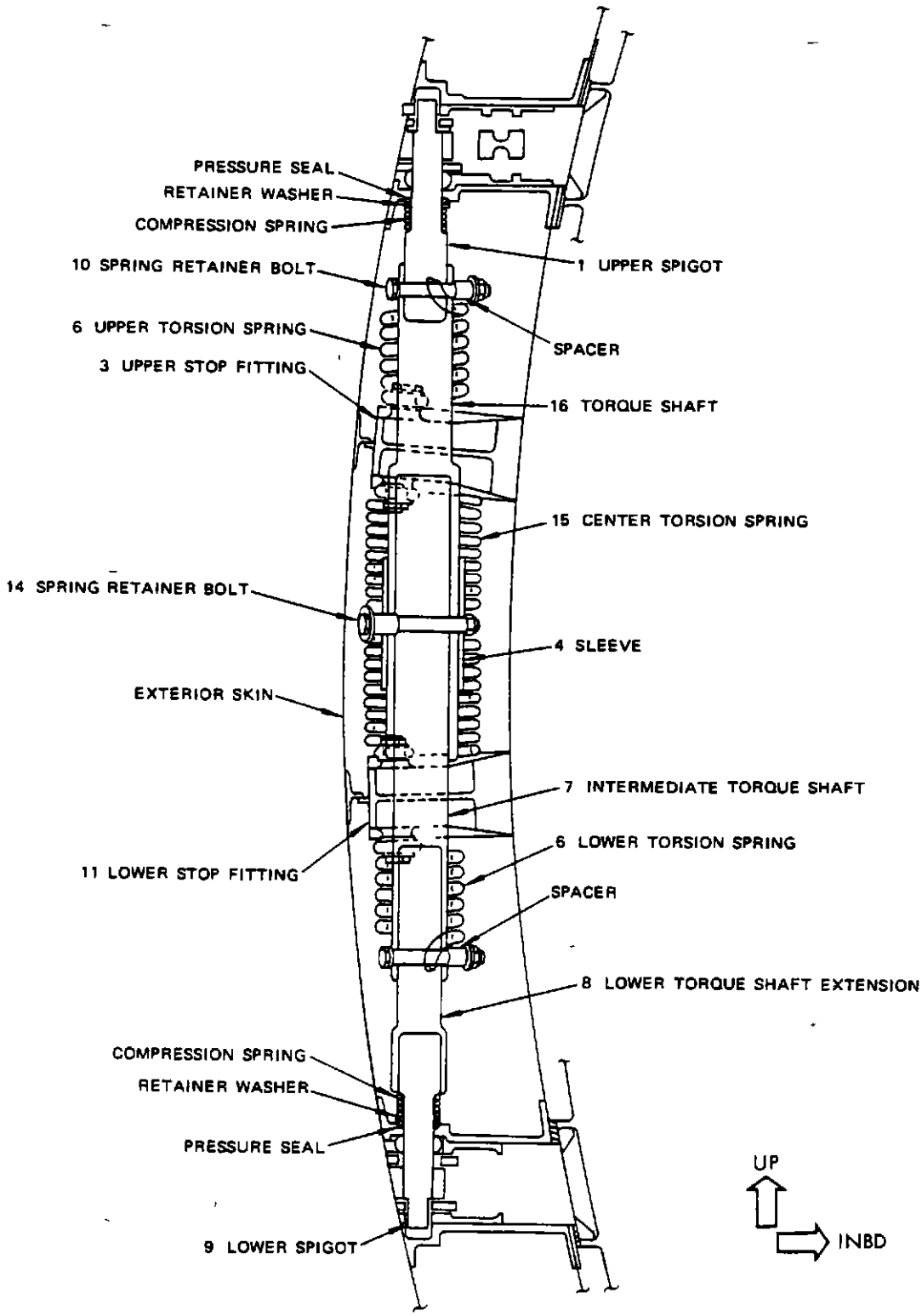
SECTION A-A

NOTE UPPER GUIDE PLATES AND LOWER STOP PLATES OMITTED FOR CLARITY



SPRING ASSIST ASSEMBLY
DETAIL A

Forward Entry Door Spring Assist Installation
Figure 401 (Sheet 2)



SECTION B B

Forward Entry Door Spring Assist Installation
Figure 401 (Sheet 3)

E. Align holes in torque shaft (16) and upper spigot (1) and install spring retainer bolt (10), washers, spacer, and nut.

NOTE Install bolt head on outboard side.

F. Align holes in torque shaft (16), intermediate torque shaft (7), and sleeve (4). Position center torsion spring (15) so that retainer slot aligns with bolt holes and install spring mounting bolt (14), washers, and nut.

NOTE: Install bolt head on outboard side.

G. Align spline of lower torque shaft extension (8) with spline of lower spigot (9) and slide lower torque shaft extension onto lower spigot. Install spring retainer bolt (10), washers, spacer, and nut.

NOTE: Install bolt head on outboard side.

H. Install reveal (figure 401) between upper and lower hinge arms.

I. Install interior lining between upper and lower hinge arms. (See Forward Entry Door Sidewall Lining, Chapter 25.)

AFT ENTRY DOOR - MAINTENANCE PRACTICES

1 General

A Maintenance Practices on the aft entry door are similar to those covered in Forward Entry Door - Maintenance Practices, 52-1-1, except as follows

2 Removal/Installation Aft Entry Door

A Remove Aft Entry Door

(1) Repeat steps (1) to (7) as described in paragraph 1.B., Remove Forward Entry Door, 52-1-1

(2) Rotate assist handle nuts on assist handle located at forward edge of door opening, using AN8514-4 wrench, and remove handle

(3) Remove bolt, washer, and collar within nuts and remove nuts and outer collars

(4) Repeat steps (8) to (14) as described in paragraph B , Remove Forward Entry Door, 52-1-1

(5) On airplanes not having access hole in hinge support; remove four attach bolts from snubber attach fitting.

(6) On airplanes having access hole with pressure sealed cap in hinge support, remove bolt connecting snubber to hinge support by removing nut and washer and push bolt into cap.

(7) Repeat step (16) as described in paragraph B , Remove Forward Entry Door, 52-1-1

B Install Aft Entry Door

(1) Repeat step (1) as described in paragraph 1.C , Install Forward Entry Door, 52-1-1, except remove the centering guide support at the center of aft edge of door

(2) Repeat steps (2) through (10) as described in paragraph 1 C , Install Forward Entry Door, 52-1-1.

(3) Attach 60 pound weight to inside door frame at approximately the mid-point of the lower half of the door.

NOTE Adjust door when airplane is on its own wheels Do not make door adjustments when airplane is jacked

(4) Back off on all door stop pins until head of pin contacts end of stop pin bushing

(5) Adjust vertical position of door by means of nuts (2, figure 206, 52-1-1) on torque tube so that gap between the bottom of the door gate and door sill is not more than 3/16 inch and door is vertically centered in the door frame Check that all latch rollers enter latch fittings with equal clearance when door is operated to closed position Install cotter pins Use care when tightening nuts to avoid binding of bearings

NOTE If vertical adjustment nuts are hard to turn, use wrench F70085 to rotate nuts.

(6) Install centering guide support on door and adjust position on serrated plate to allow engagement of roller with centering track on door jamb

(7) Repeat steps (13) through (36) as described in paragraph 1 C , Install Forward Entry Door, 52-1-1

3 Approved Repairs Aft Entry Door

A General

(1) A repair for certain door stops has been developed The repair is applicable only to those stops whose internal grain structure and external configuration are such that the need and the opportunity for the repair may both exist Repaired parts should be replaced at the next 2C check

(2) The stops which may currently be repaired by this method are

65-1779-3	65-5274-2
65-1779-4	65-5274-7
65-1779-5	
65-1779-8	
65-1779-11	
65-1779-12	

B Equipment and Materials

(1) Primer - BMS 10-11, type 1

C Repair Cargo Door Stop

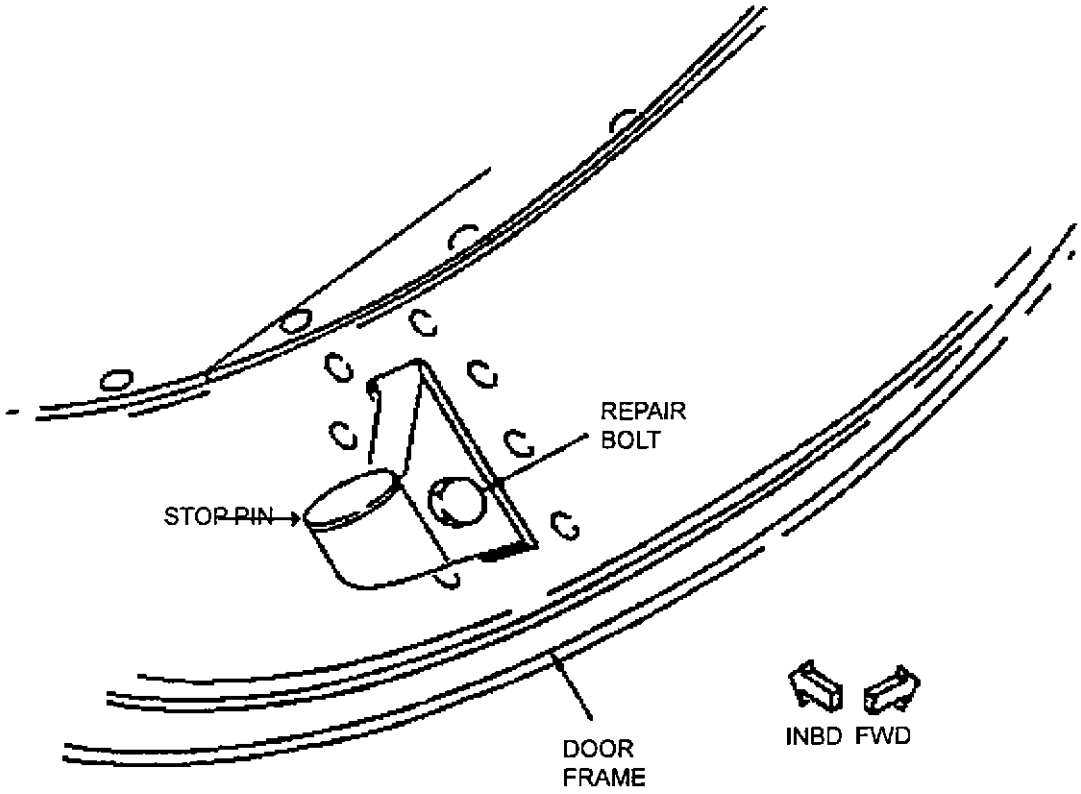
NOTE The procedure described below may be used on above mentioned stops which have cracked along the forging parting line but are otherwise serviceable

(1) Drill 0.190- to C 194-inch diameter hole in stop in direction transverse to hole for stop button and located between hole for button and major portion of stop (See figure 201)

(2) Spotface hole to permit installation of fasteners described below Minimum spotface radius is 0 06 inch

(3) Finish reworked area by chromic acid anodizing and application of one coat of primer Refer to Chapter 51, Interior and Exterior Finishes

(4) Install bolt NAS1103 of appropriate grip length, nut BACN10JC3, and on AN960D10 washer under bolthead and one under nut



Aft Entry Door Stop Repair
Figure 201

GUIDE ARM ROLLER - MAINTENANCE PRACTICES

1. Removal/Installation Guide Arm Roller

A. Remove Guide Arm Roller

(1) Open door to position where retainer ring (1, figure 201) is readily accessible, and remove retainer ring, pin (2) and washers. Swing radius links (4) and (12) away from guide arm.

CAUTION: WHEN THE GUIDE ARM IS DISCONNECTED FROM THE HINGE ARM OR REMOVED FROM THE DOOR, EXTREME CARE SHOULD BE EXERCISED IN HANDLING THE DOOR AS ITS MOTION WILL BE UNCONTROLLED. PARTICULAR CARE SHOULD BE OBSERVED WHEN MOVING THE DOOR TO OR FROM THE CLOSED POSITION IN ORDER TO PREVENT THE WEATHER/PRESSURIZATION SEAL FROM BEING PINCHED OR OTHERWISE DAMAGED.

(2) Remove latch lever retaining screw, nut, and washers, and remove door open stowing latch lever (14), link (7), and shaft (15).

(3) Move door to almost closed position. Swing the upper hinge flap inwards, and then slide the roller end of guide arm out of tracks on roller cam plates (3) and (13). Release hinge flap.

NOTE: To facilitate removal of guide arm it may be necessary to rock the door alternately inwards and outwards very slightly while sliding the guide arm out of roller cam plates.

(4) Remove guide arm (16) from hinge support.

(a) On airplanes 00-SJA thru 00-SJG open door to position where guide arm (16) is accessible and unscrew it from rod end bearing (17), counting the number of turns required to remove guide arm.

NOTE: It is important that the number of turns required to unscrew the guide arm from the rod end bearing should be counted, in order that the installed position of guide arm is not disturbed. This setting is critical and if upset will cause the door to malfunction.

(b) On airplanes 00-SJH and on, open door and keep it in cocked position, then remove four bolts holding guide arm attach fitting (19) to hinge support.

(5) Hold latch pin against spring pressure and drive out the long spring pin (9) through collar (8), guide arm roller (11), and latch pin (5). Remove latch pin and spring (10).

(6) Insert a punch in latch pin end of guide arm roller and drive out roller together with roller bushings. Remove collar and thrust bearing (6).

B. Install Guide Arm Roller

(1) Apply a light film of grease (MIL-G-23827) to latch pin (5), guide arm roller (11), thrust bearing (6), collar (8), roller bushings, and also tracks on roller cam plates (3) and (13).

(2) Place collar and thrust bearing between jaws of guide arm, and press guide arm roller and roller bushings into place.

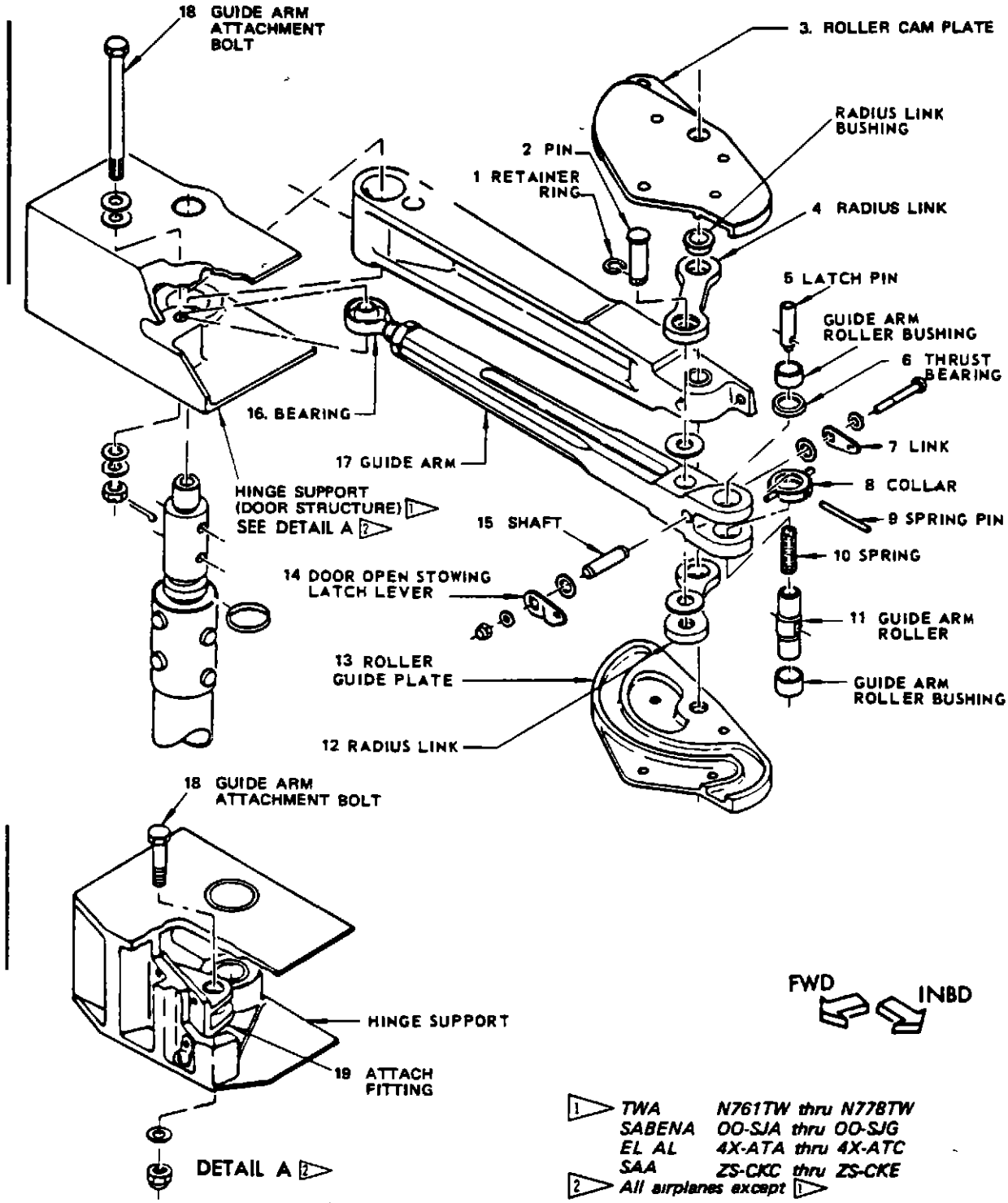
(3) Insert spring (10) and latch pin in top end of guide arm roller. Depress latch pin so that spring pin (9) may be driven into place through collar, guide arm roller, and latch pin.

CAUTION: WHEN THE GUIDE ARM IS DISCONNECTED FROM THE HINGE ARM OR REMOVED FROM THE DOOR, EXTREME CARE SHOULD BE EXERCISED IN HANDLING THE DOOR AS ITS MOTION WILL BE UNCONTROLLED. PARTICULAR CARE SHOULD BE OBSERVED WHEN MOVING THE DOOR TO OR FROM THE CLOSED POSITION IN ORDER TO PREVENT THE WEATHER/PRESSURIZATION SEAL FROM BEING PINCHED OR OTHERWISE DAMAGED.

(4) Install guide arm (16) to hinge support.

(a) On airplanes 00-SJA thru 00-SJG, screw guide arm (16) on to rod end bearing (17), counting same number of turns as required for removal.

(b) On airplanes 00-SJH and on, connect guide arm bearing (17) to attach fitting (19) using guide arm attachment bolt (18). Open door to cocked position and install attach fitting (19) to hinge support.



Upper Hinge Assembly Guide Arm Roller Installation
Figure 201

(5) Move door to almost closed position. Swing the upper hinge flap inwards and with the latch pin depressed, slide roller end of guide arm into the tracks on roller cam plates. Release hinge flap.

NOTE: To facilitate installation of guide arm it may be necessary to rock the door alternately inwards and outwards very slightly while sliding the guide arm between the roller cam plates.

(6) Open door to position where latch lever shaft (15), link (7), door open stowing latch lever (14), and retaining screw, nut and washers may be installed.

(7) Swing radius links (4) and (12) round on to guide arm, line up holes and install pin (2), washers, and retainer ring (1). Tighten guide arm rod end bearing check nut.

ENTRY DOOR GUIDE ARM AND ROLLER ASSEMBLY - REMOVAL/INSTALLATION

1 Remove Entry Door Guide Arm and Roller Assembly

A Open door to a positon where retainer ring (1, figure 401) is readily accessible, and remove retainer ring, pin (2) and washers Swing radius links (4) away from guide arm

CAUTION WHEN THE GUIDE ARM IS DISCONNECTED FROM THE HINGE ARM OR REMOVED FROM THE DOOR, EXTREME CARE SHOULD BE EXERCISED IN HANDLING THE DOOR AS ITS WILL BE UNCONTROLLED
PARTICULAR CARE SHOULD BE OBSERVED WHEN MOVING THE DOOR TO OR FROM THE CLOSED POSITION IN ORDER TO PREVENT THE WEATHER/PRESSURIZATION SEAL FROM BEING PINCHED OR OTHERWISE DAMAGED

B Move door to almost closed position Swing the upper hinge flap inwards, and then slide the roller end of guide arm (19) out of tracks on roller guide plates (3) Release hinge flap

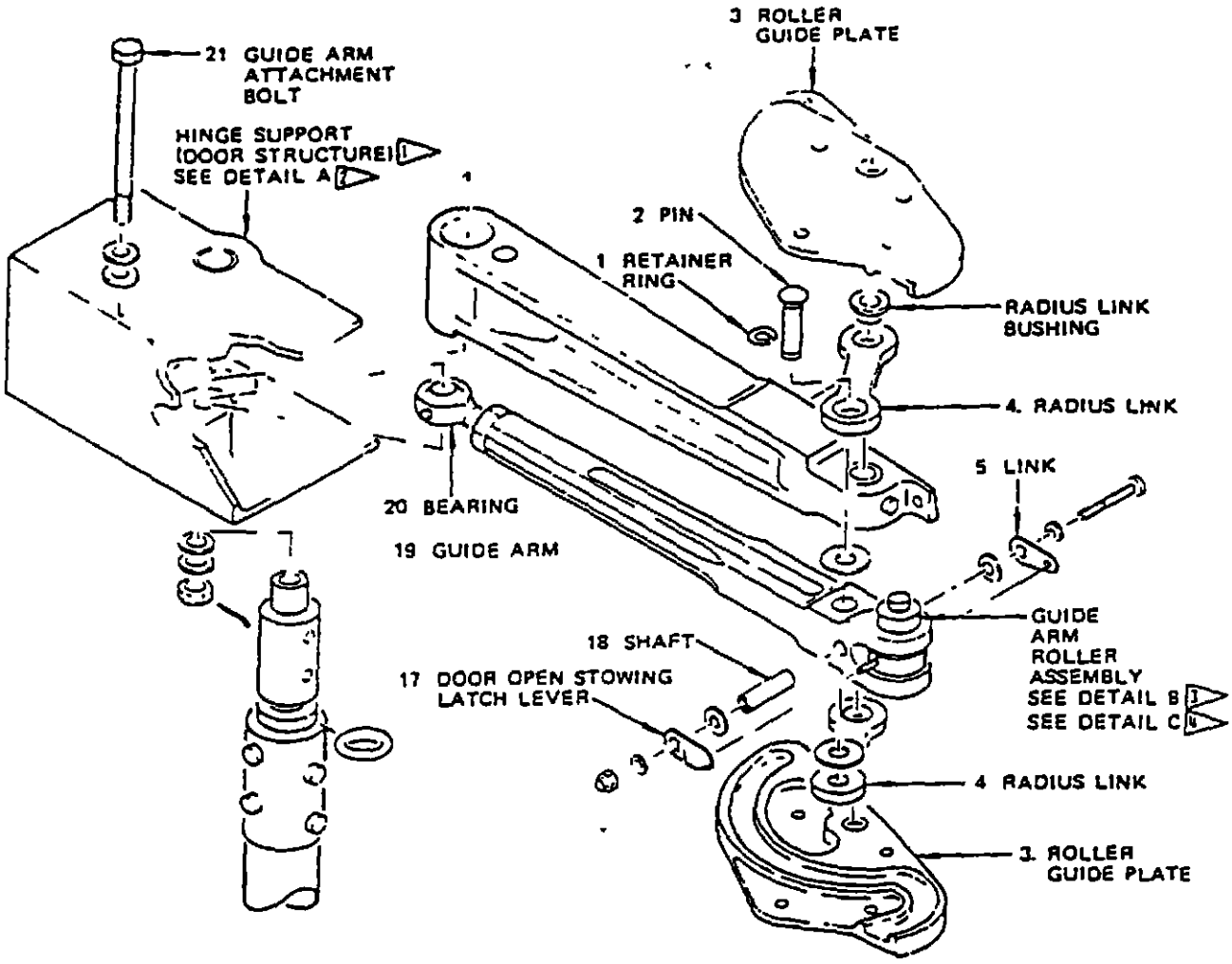
NOTE To facilitate removal of guide arm it may be necessary to rock the door alternately inwards and outwards very slightly while sliding the guide arm of roller cam plates

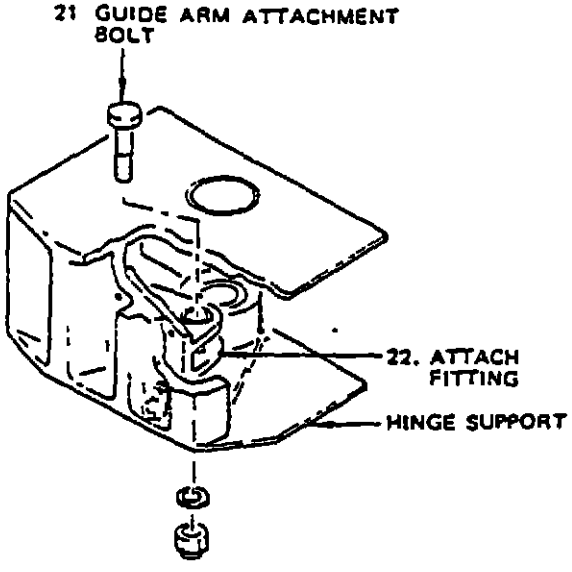
C At all aft entry doors and at all forward entry doors on early airplanes, remove roller assembly from guide arm (19) as follows

(1) Hold latch pin (6, detail B) against spring pressure and drive out the long spring pin (9) through collar (8), guide arm roller (11), and latch pin (6) Remove later pin and pring (10)

(2) Insert a punch in latch pin end of guide arm roller and drive out roller (11) together with roller bushings Remove thrust bearing (7)

D At all forward entry doors on later airplanes, press roller (13, detail C) out of guide arm (19) together with spring (14), thrust washer (15) and lower roller bushing (16)





DETAIL A 2

INBD FWD

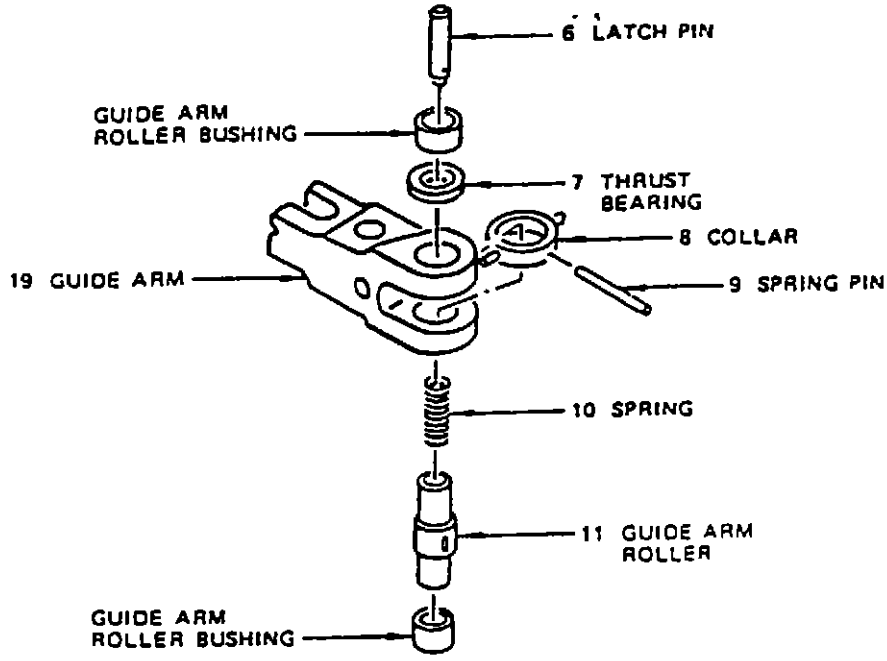
1 DLH D-ABOB thru D-ABOD, D-ABOF, D-ABOG, and D-ABOV
TWA N761TW thru N778TW and N789TW
WAI N373WA, N374WA

2 All airplanes except 1

3 Forward entry doors on early airplanes and all aft entry doors

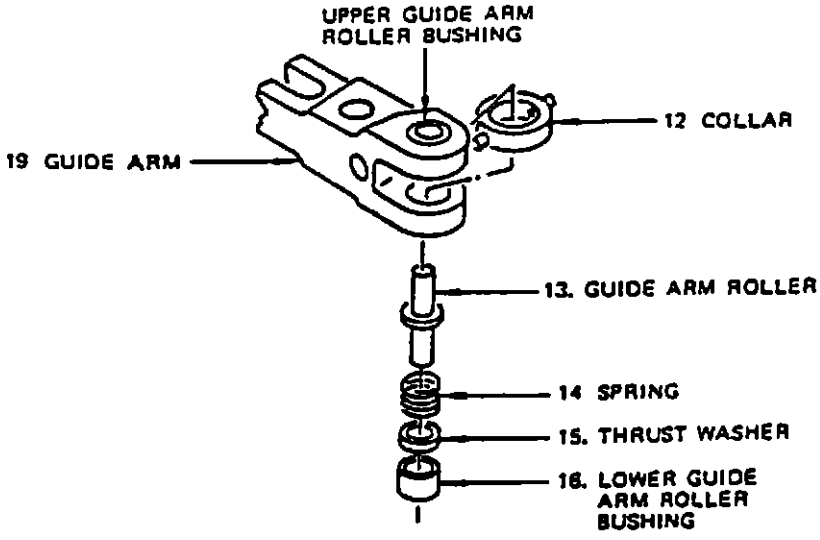
4 Forward entry doors on later airplanes

Upper Hinge Assembly Guide Arm Roller Installation
Figure 401 (Sheet 1)



GUIDE ARM ROLLER ASSEMBLY

DETAIL B



GUIDE ARM ROLLER ASSEMBLY

DETAIL C

Upper Hinge Assembly Guide Arm Roller Installation
Figure 401 (Sheet 2)

E Remove latch lever retaining screw, nut, and washers, and remove door open stowing latch lever (17), link (5), and shaft(18) Remove collar from guide arm

F Remove guide arm (19) from hinge support

(1) On early airplanes without attach fittings (see figure 401 for effectivity) open door to a position where guide arm (19) is accessible and unscrew it from rod end bearing (20), counting the number of turns required to remove guide arm

NOTE It is important that the number of turns required to unscrew the guide arm from the rod end bearing should be counted, in order that the installed position of guide arm is not disturbed This setting is critical and if upset will cause the door to malfunction

(2) On later airplanes with attach fittings open door and keep it in cocked position, then remove four bolts holding guide arm attach fitting (22, detail A) to hinge support

2 Install Entry Door Guide and Arm Roller Assembly

A Install guide arm (19, figure 401) to hinge support

CAUTION WHILE THE GUIDE ARM IS DISCONNECTED FROM THE HINGE ARM OR REMOVED FROM THE DOOR, EXTREME CARE SHOULD BE EXERCISED IN HANDLING THE DOOR AS ITS MOTION WILL BE UNCONTROLLED
PARTICULAR CARE SHOULD BE OBSERVED WHEN MOVING THE DOOR TO OR FROM THE CLOSED POSITION IN ORDER TO PREVENT THE WEATHER/PRESSURIZATION SEAL FROM BEING PINCHED OR OTHERWISE DAMAGED

(1) If guide arm was removed per step 1 F (1), reinstall guide arm (19) by screwing it on to rol end bearing (20), counting same number of turns as required for removal Tighten guide arm rol and bearing checknut

(2) If guide arm was removed per step 1 F (2), connect attach fitting (22, detail A), if removed, to guide arm rod and bearing (20) using guide arm attachment bolt (21) Open door to cocked position and install attach fitting (22) to hinge support

B Place collar between jaws of guide arm (1 and install latch lever shaft (18), washers, link (5) door open stowing latch lever (14), retaining screw, washers and nut Ensure that collar pins are engaged with hole in link (5) and latch lever (17)

C Apply a light film of grease (MIL-G-23827) to parts of guide arm roller assembly and tracks on roller guide plates (3)

D If roller assembly was removed from guide arm (17) per step 1 C , reinstall roller assembly as follows

(1) Place thrust bearing (7, detail B) between collar and upper jaw of guide arm, and press guide arm roller (11) and roller bushings into place

(2) Insert spring (10) and latch pin (6)in top end of guide arm roller Depress latch pin so that spring pin (9) may be driven into place through collar, guide arm roller, and latch pin

E If roller assembly was removed from guide arm (19) per step 1 D , reinstall roller assembly by inserting roller (13), spring (14) and thrust washer (15) between jaws of guide arm (19) and collar (12), then press lower roller bushing (16) into place

F Move door to almost closed position Swing the upper hinge flap inwards and with the latch lever (17) depressed, slide roller end of guide arm into the tracks on roller guide plates (3) Release hinge flap

NOTE To facilitate installation of guide arm it may be necessary to rock the door alternately inwards and outwards very slightly while sliding the guide arm between the roller on plates

G Swing radius links (4) round on to guide arm (19), line up holes and install pin (2), washers, and retainer ring (1)

DOOR HINGE ARMS - MAINTENANCE PRACTICES

1. Removal/Installation Door Hinge Arm

A. General

(1) Procedures described and illustrated in the following apply to the forward entry door, except where otherwise noted. Procedures for the aft entry door and both galley doors are similar, though sizes and proportions may differ slightly.

B. Equipment and Materials

(1) Assembly jig, torque shaft assembly, galley door - FJA 65-16720-953

(2) Assembly jig, torque shaft assembly, entry door - AJ50-7945-964

C. Remove Door Hinge Arms

(1) Remove door from airplane, as described in 52-1-1, 52-1-11 or 52-2-0, whichever is applicable.

(2) Remove self-locking nut (10, figure 201), washer (9), and cam plate (5) and allow handle shaft (7) and outside handle (8) to drop clear.

NOTE: On some airplanes a castellated nut and cotter pin are installed in place of the self-locking nut.

(3) Unscrew and remove fairing strip from outside surface of each hinge arm (16).

(4) Remove cover plates (6) in way of torque tube (2) and handle mechanism housing (3).

(5) Remove bolts from torque tube connecting sleeves (18) and hinge pins (17) Slide sleeves away from hinges far enough to expose joints between torque tube (2) and hinge pins.

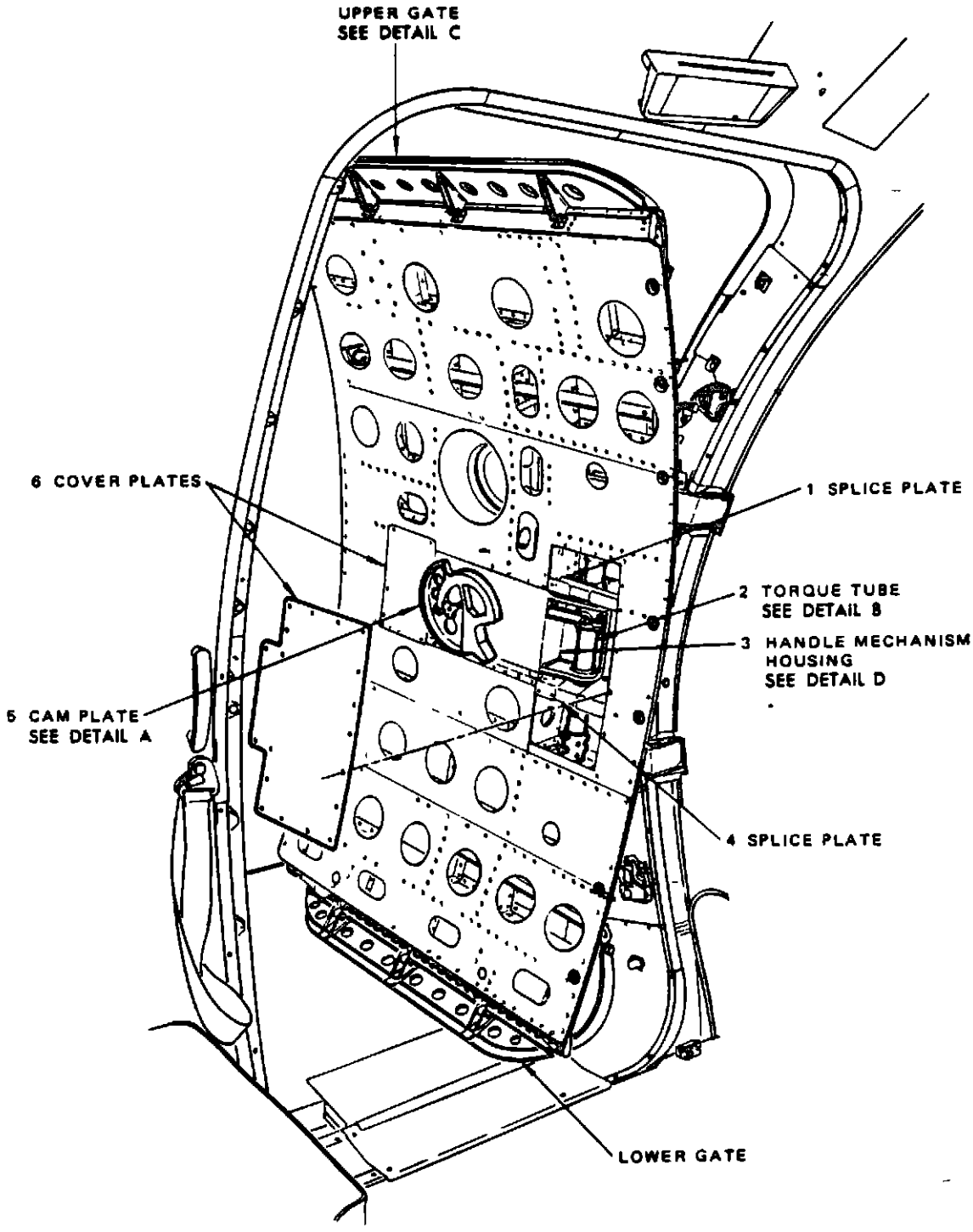
(6) Remove twelve bolts (23) securing handle mechanism housing (3) to door structure.

(7) Remove bolts securing splice plates (1 and 4) to door structure and remove splice plates.

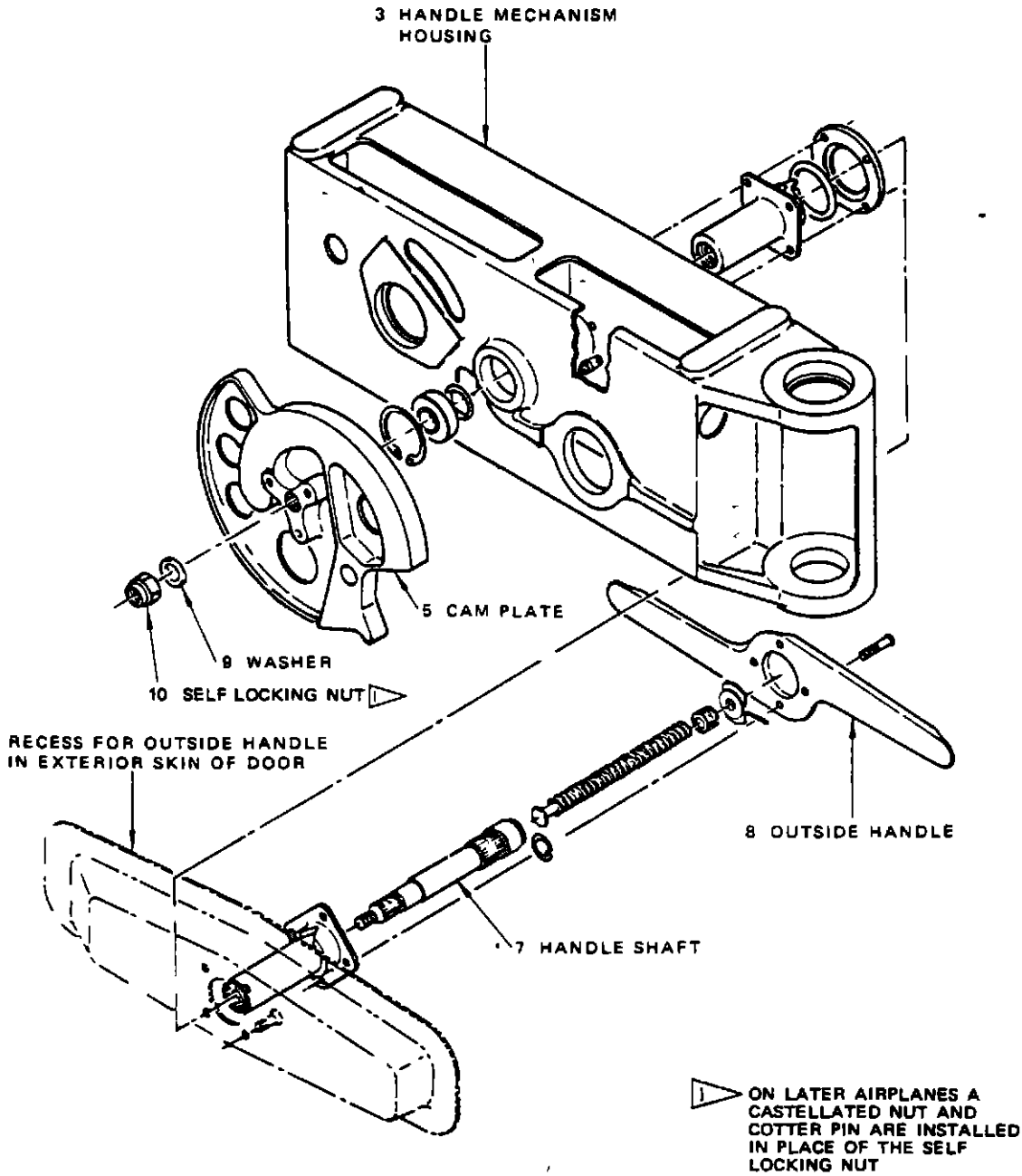
(8) Disconnect upper and lower gate control rods (20 and 29) at their connection to each gate.

NOTE On the aft entry door it will also be necessary to remove clamp blocks (21 and 22).

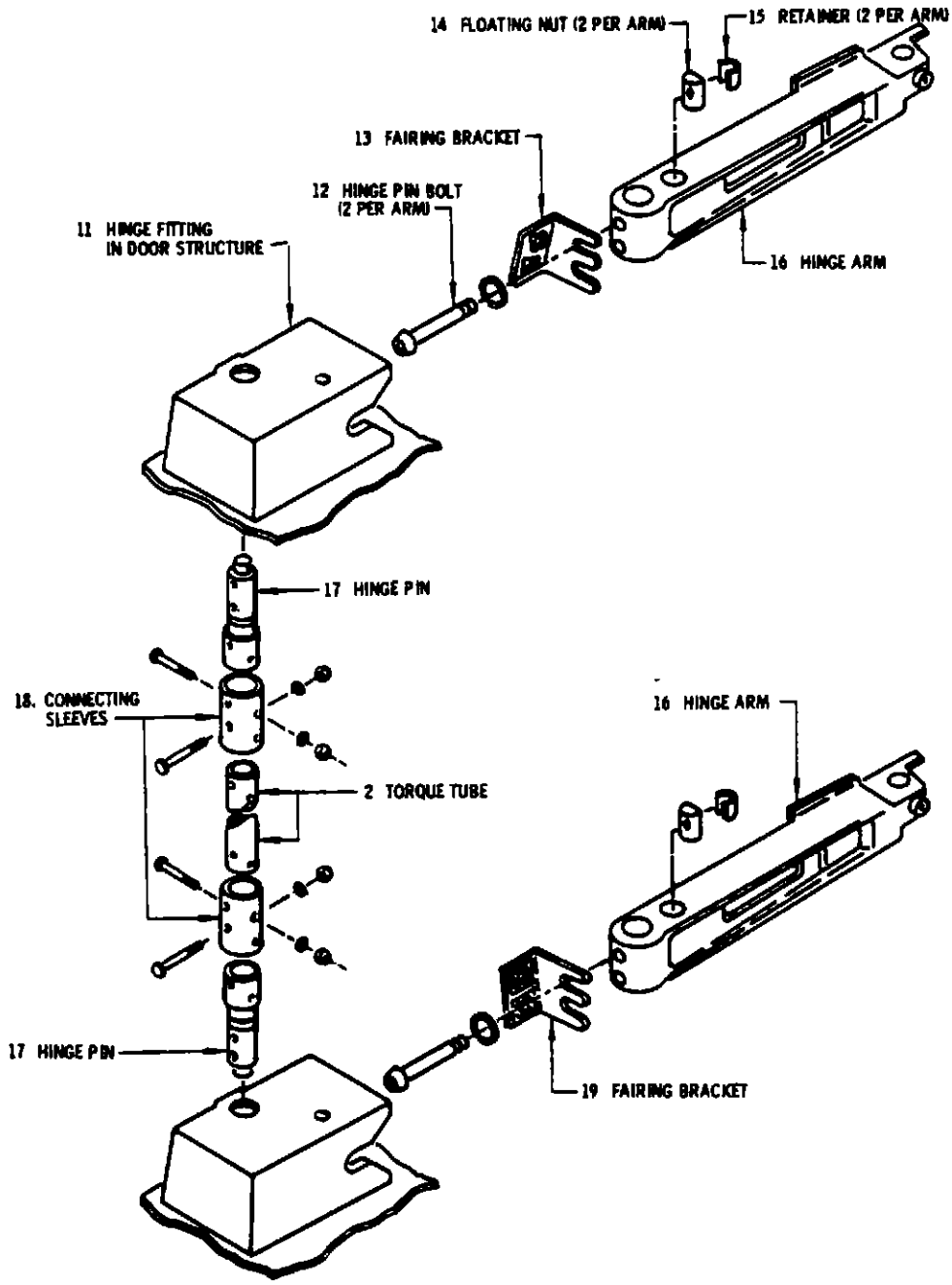
(9) Disconnect upper and lower gate control rods (20 and 29) through the access holes in the handle mechanism, from the latching crank. Move gate control rods clear of handle mechanism.



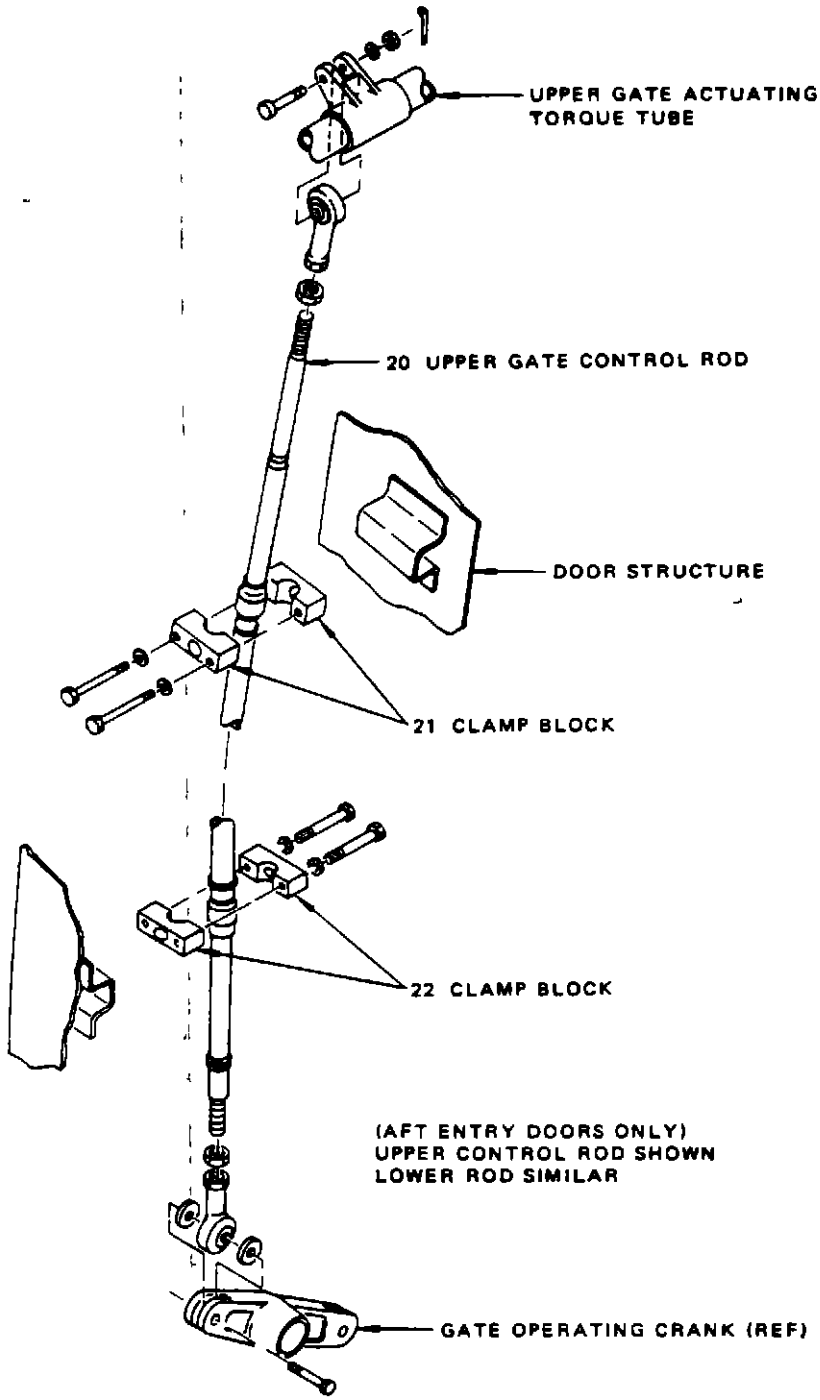
Door Hinge Arm Installation
Figure 201 (Sheet 1)


3 HANDLE MECHANISM HOUSING
5 CAM PLATE
9 WASHER
10 SELF LOCKING NUT 1
RECESS FOR OUTSIDE HANDLE IN EXTERIOR SKIN OF DOOR
8 OUTSIDE HANDLE
7 HANDLE SHAFT
1 ON LATER AIRPLANES A CASTELLATED NUT AND COTTER PIN ARE INSTALLED IN PLACE OF THE SELF LOCKING NUT

DETAIL A


14 FLOATING NUT (2 PER ARM)
15 RETAINER (2 PER ARM)
13 FAIRING BRACKET
12 HINGE PIN BOLT (2 PER ARM)
11 HINGE FITTING IN DOOR STRUCTURE
16 HINGE ARM
17 HINGE PIN
18. CONNECTING SLEEVES
2 TORQUE TUBE
16 HINGE ARM
17 HINGE PIN
19 FAIRING BRACKET

DETAIL B


UPPER GATE ACTUATING TORQUE TUBE
20 UPPER GATE CONTROL ROD
DOOR STRUCTURE
21 CLAMP BLOCK
22 CLAMP BLOCK
(AFT ENTRY DOORS ONLY)
UPPER CONTROL ROD SHOWN
LOWER ROD SIMILAR
GATE OPERATING CRANK (REF)

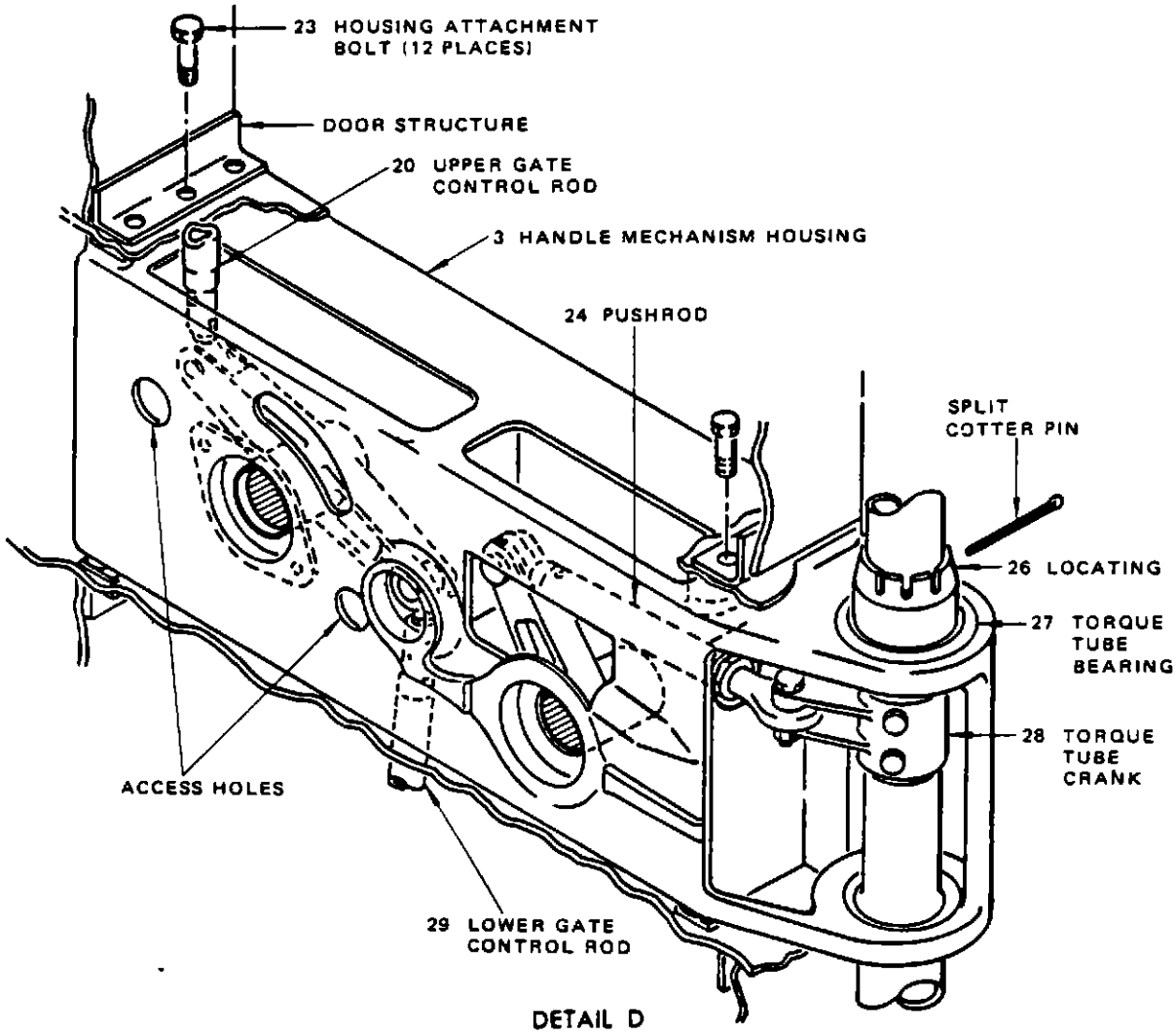
DETAIL C

(10) Remove handle mechanism housing (3) complete with torque tube crank (28) and torque tube (2) from the door.

(11) Remove hinge bolts (12) and fairing brackets (13 and 19) from hinge arms.

NOTE: The Allen-headed bolts (12) can be reached from the outside of the door, by bending the fairing brackets back slightly. The bolts can be turned by using a long 3/16 Allen wrench which has the short arm length reduced to 0.5 inch.

(12) Slide hinge pins (17) out of engagement with hinge arms (16) and remove hinge arms.



DETAIL D

Door Hinge Arm Installation
Figure 201 (Sheet 5)

D. Prepare Door Hinge Arm for Installation

(1) General

(a) It is essential for correct operation of the door that both hinge arms are perfectly aligned and that they bear the proper angular relationship to the torque tube crank. (See figure 202.)

(b) If only one arm is being replaced, a thorough check must be made that the distortion which necessitated its replacement has not been suffered to a less noticeable extent by the torque tube and the other hinge arm. Even a slight bend in the torque tube, or in one hinge arm, will put the several bearings of the mechanism out of alignment, thus necessitating heavy torque on the operating handle.

(c) During manufacture, predrilled hinge arms and hinge pins are assembled to the torque tube and torque tube crank in an assembly jig. Assembly jig AJ 65-16720-953 is used for galley door torque shaft assembly and assembly jig AJ 50-7945-964 is similarly used for entry doors. Individual hinge arms and hinge pins are supplied as spares with the attachment bolt holes undrilled. The holes must be drilled and reamed as described in paragraph (2)(c) below.

(d) The procedure for fitting an undrilled hinge arm necessitates removal of the torque tube and the handle mechanism housing.

(e) If a complete assembly of torque tube with both hinge arms is available as a replacement, no drilling will be necessary, but it will still be necessary to remove the existing torque tube and handle mechanism housing.

(2) Fit new hinge arm.

(a) Remove torque tube from handle mechanism housing.

1) Disconnect pushrod (24, figure 201) attached to torque tube crank (28).

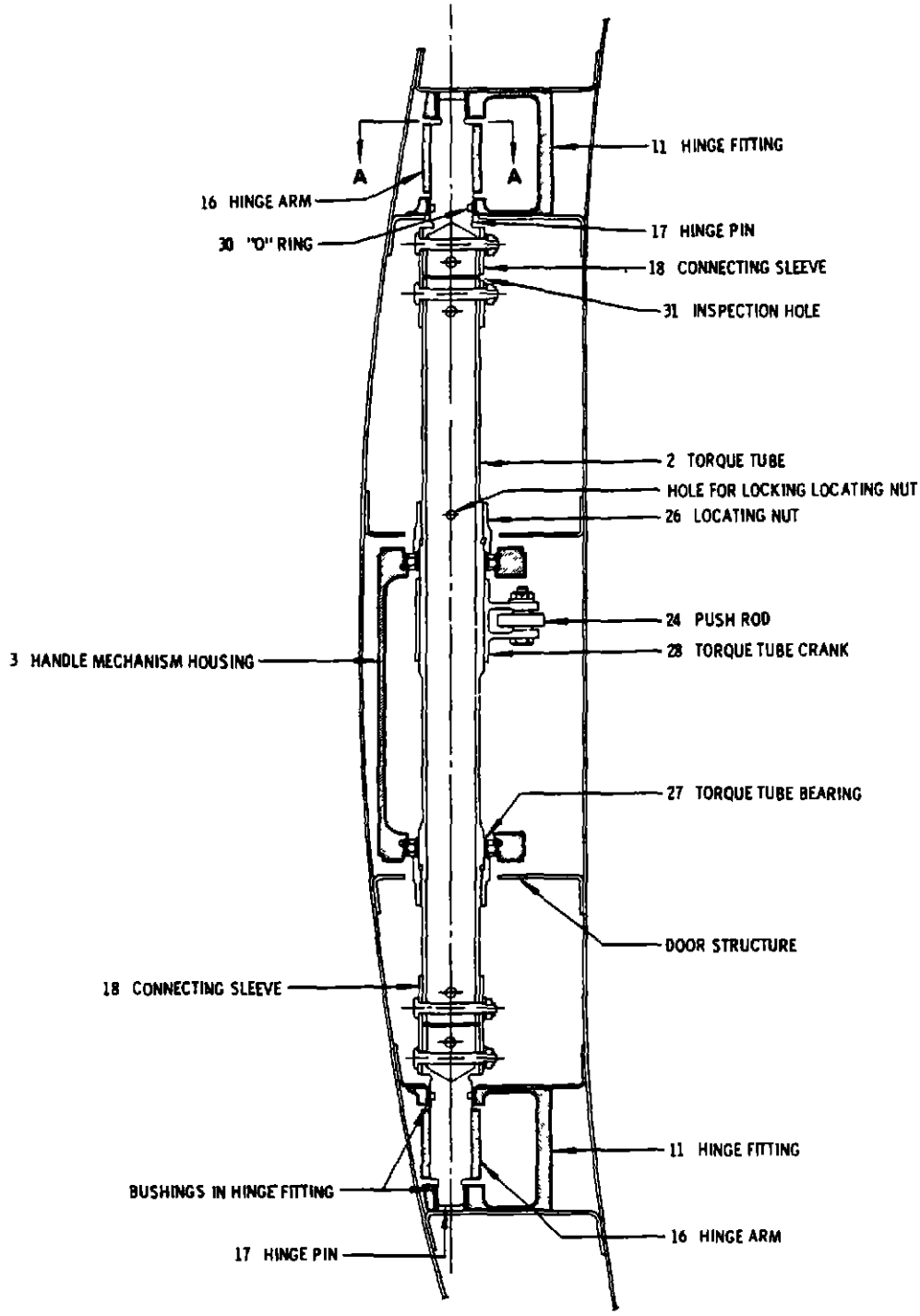
2) Remove bolts securing torque tube crank, and unlock and unscrew either one of the special slotted locating nuts (26) which position the tube endwise.

3) Withdraw torque tube from its bearings (27) and from crank.

(b) Reassemble torque tube on bench, preparatory to fitting new hinge arm.

1) Install bolts securing torque tube crank.

2) Install bolts securing connecting sleeves to ends of torque tube.



Door Hinge Arm and Torque Tube Assembly
Figure 202 (Sheet 1 of 2)

3) If one hinge arm is still usable, assemble its hinge pin to the proper connecting sleeve, and assemble the hinge arm to its pin

NOTE The hinge pin bolts are screwed into floating nuts (14) which are held in place within the hinge arm by retainers (15).

4) Assemble other hinge pin into other connecting sleeve

NOTE: This step should be omitted if hinge arm is to be fitted per paragraph (c)

(c) Drill new hinge arm

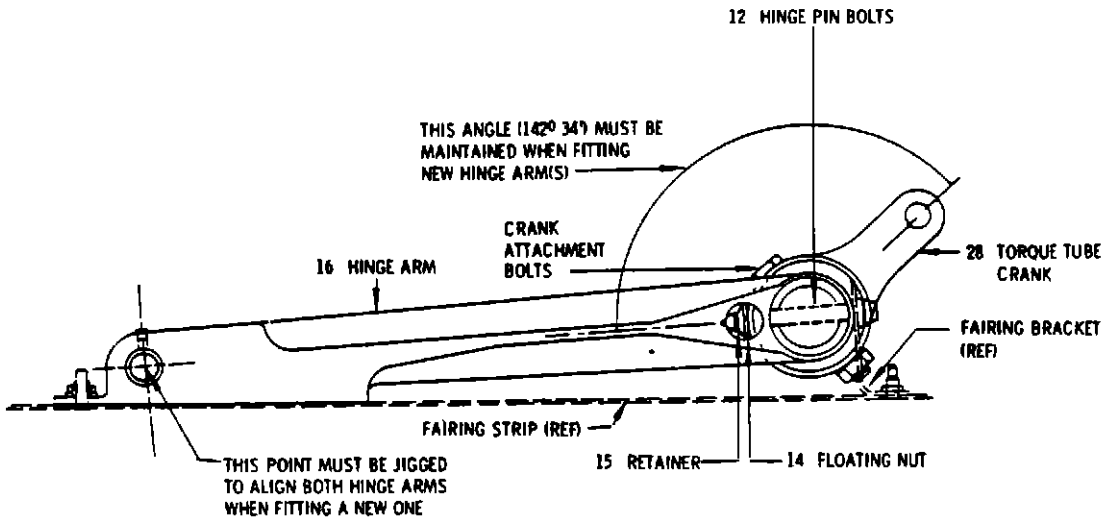
NOTE. This procedure should be used if one serviceable hinge arm is already assembled to the torque tube

1) Obtain, or machine, a hinge pin with no cross-drilling at all.

NOTE. The old, or a spare, pin may be used as a pattern if one is to be machined

2) Insert hinge pin into the hinge arm, and drill two 7/64 inch diameter holes through arm and pin, to a depth of 1.26 inches. Ream holes to a finished size of 1/4 inch Hinge arm and hinge pin must be kept together as a matched pair.

NOTE. Distance between hole centers may be measured from another arm Holes must pass through center of hinge pin and through center of the hole parallel to it which will contain the floating nuts



Door Hinge Arm and Torque Tube Assembly
Figure 202 (Sheet 2 of 2)

3) Insert floating nuts (14) and their retainers (15), and install hinge pin bolts (12).

4) Insert undrilled end of hinge pin into connecting sleeve (18), checking that end of pin is visible through inspection hole (31, figure 202) in sleeve.

5) Align new hinge arm with other one by inserting a long straight metal rod, of 7/16 inch diameter, through holes at small end of each hinge arm.

6) Drill bolt holes across new hinge pin through existing holes in connecting sleeve, and install bolts with nuts.

NOTE Misalignment in drilling these holes is permissible up to the point where ovality may be cleaned out by drilling oversize enough to accommodate the next larger bolt size. No such tolerance exists, however, on the bolt holes attaching the hinge arm to the hinge pin.

(d) Install door hinge arms, torque tube and handle mechanism housing in door as described in paragraph E below.

E. Install Door Hinge Arms

NOTE: The same hinge arms and pins should be installed in upper and lower positions as were assembled in those respective positions when the torque tube and hinge pins were drilled. Failure to ensure this may result in slight relative misalignment between the hinge arms.

(1) Check that O-rings (30, figure 202) are in good condition and are seated properly in the hinge pin grooves.

(2) Check that both floating nuts (14, figure 201) and their retainers (15) are positioned correctly in each hinge arm (16). Grease hinge pin bearing surfaces with grease MIL-G-23827.

(3) Position each hinge arm in its fitting in door structure (11), insert hinge pin through fitting bushing and hinge arm, and install hinge pin bolts (12) without fully tightening.

(4) Install handle mechanism housing (3) in door structure so that torque tube (2) lines up with hinge pins.

NOTE. If endwise interference exists, adjust torque tube along its axis by manipulating the slotted locating nuts (26). Do not lock these nuts.

(5) Slide connecting sleeves (18) over hinge pins and install all four bolts across each sleeve, making any necessary endwise adjustment of the torque tube by means of the slotted locating nuts.

NOTE: These locating nuts should be left finger tight and unlocked because they will be used to obtain vertical adjustment of the door when it is installed in the airplane.

(6) Install twelve bolts (23) securing housing to door structure.

(7) Connect control rods (20 and 29) to upper and lower gates. Connect control rods to latching crank through the access holes in the handle mechanism housing.

NOTE: On aft entry door, install clamp blocks (21 and 22).

(8) Install splice plates (1 and 4) across cutaways in door structure.

(9) Replace cover plates (6) over torque tube and handle mechanism.

(10) Fit fairing brackets (13 and 19) under heads of hinge pin bolts on each hinge arm, tightening bolts when bracket is positioned satisfactorily.

(11) Install fairing strip on each hinge arm.

(12) Install shaft (7) and handle (8) on door, with the camplate (5), washer (9), and nut (10) correctly positioned.

NOTE On later airplanes a castellated nut and cotter pin are installed in place of the self-locking nut.

(13) Install door on airplane, as described in 52-1-1, 52-1-11 or 52-2-0, whichever is applicable.

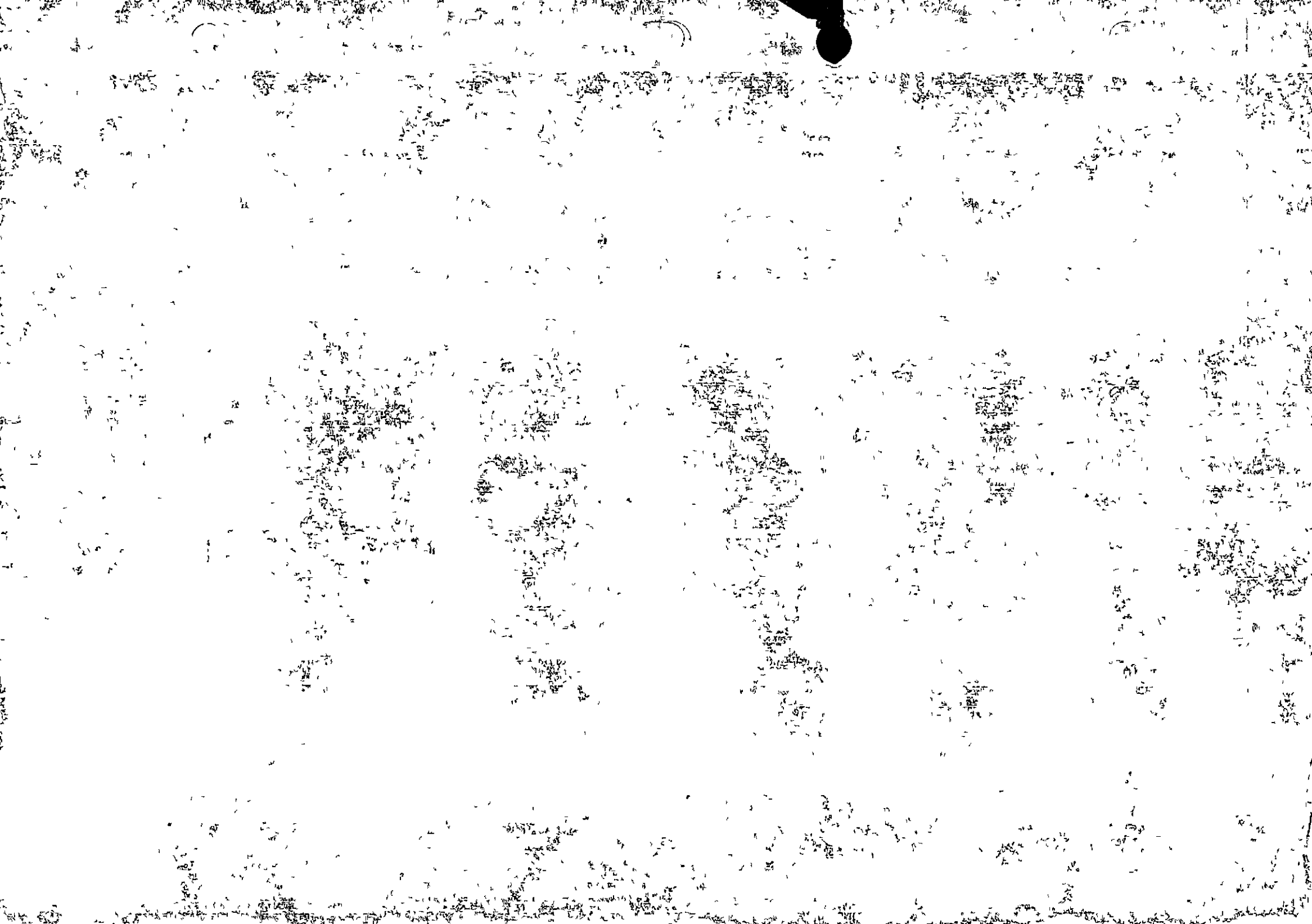
GALLEY DOORS - DESCRIPTION AND OPERATION

1. General

A. A forward and an aft galley door, permitting service access to the galleys, are on the right hand side of airplane. The doors are inward-outward-opening plug type and similar in structure, door operating mechanism, and principle of door operation. Both doors have structural, mechanical, and operational features similar to those embodied in the entry doors Refer to "Entry Doors - Description and Operation," 52-1-0.

NOTE: To open or close galley doors from inside or outside of airplane, the operating handle is moved, relative to the operator, in the opposite direction to that applicable on the entry doors.

END

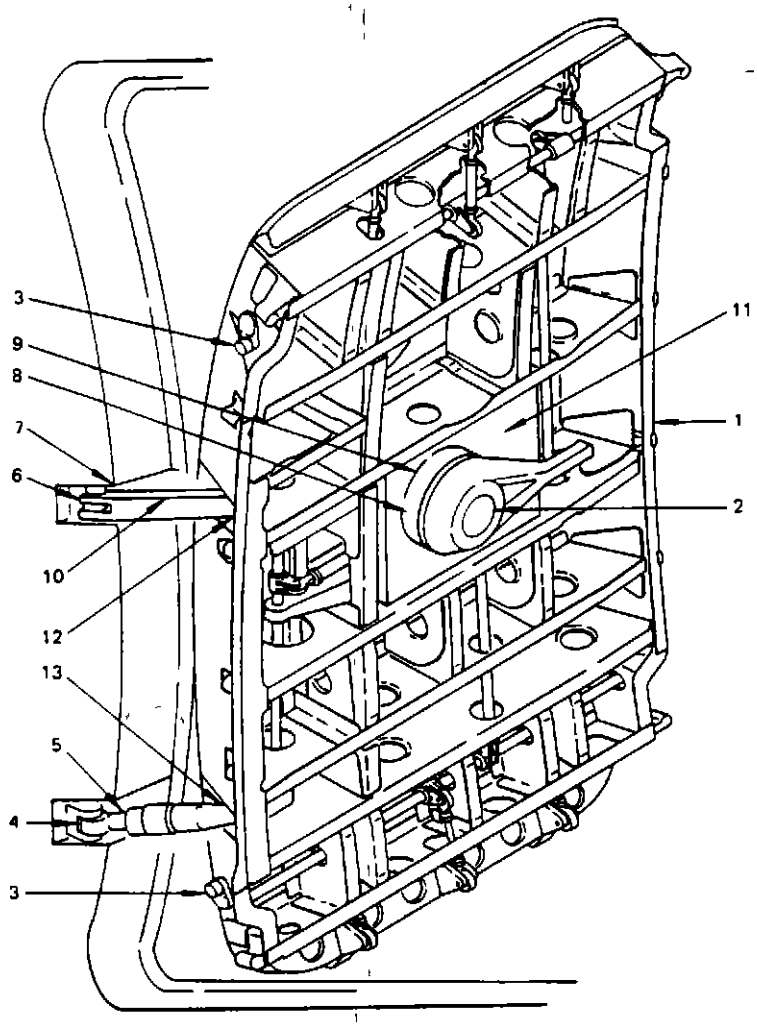


GALLEY DOORS - MAINTENANCE PRACTICES

1. Unit Servicing Galley Doors

A. Lubricate Galley Doors

(1) The items requiring lubrication are shown on figure 201.



INDEX NO.	ITEM TO BE LUBRICATED	INSTRUCTIONS	
1	CENTERING ROLLER [1]	Apply Grease, MIL-G-23827.	Flush Fitting (1 place)
2	HANDLE SLEEVE	Apply Grease, MIL-G-23827.	Flush Fitting (1 place, adjacent to outside handle)
3	LATCH ROLLER	Apply Grease, MIL-G-23827.	Flush Fitting (4 places)
4	SNUBBER ROD END	Apply Grease, MIL-G-23827.	Flush Fitting (2 places)
5	LOWER HINGE BUSHING	Apply Grease, MIL-G-23827.	Flush Fitting (1 place)
6	GUIDE PLATE TRACK	Apply Grease, MIL-G-23827.	Hand (2 places)
7	UPPER HINGE BUSHING	Apply Grease, MIL-G-23827.	Flush Fitting (1 place)
8	COCKING CAM ROLLER [2]	Apply Grease, MIL-G-23827.	Flush Fitting (1 place)
9	LATCHING CAM ROLLER [2]	Apply Grease, MIL-G-23827.	Flush Fitting (1 place)
10	HOLD-OPEN LOCK	Apply Grease, MIL-G-23827.	Hand (1 place, at door end of upper hinge arm, accessible from outboard side)
11	CAM PLATE [2]	Apply Grease, MIL-G-23827.	Hand (2 places, around both track profiles)
12	HINGE FITTING BUSHING - UPPER HINGE ARM [3]	Apply Grease, MIL-G-23827.	Flush Fitting (2 places at door end of upper hinge arm)
13	HINGE FITTING BUSHING - LOWER HINGE ARM [3]	Apply Grease, MIL-G-23827.	Flush Fitting (2 places at door end of lower hinge arm)

[1] Early airplanes only. On later airplanes the door is centered by a spherical steel guide knob engaging a nylon-lined guide track, and these parts do not require lubrication.

[2] Access to these points is obtained by removing the operating handle escutcheon plate.

[3] All except OO-SJA thru OO-SJH and OO-SJJ thru OO-SJL less airplanes incorporating Service Bulletin No. 2687

FORWARD GALLEY DOOR - MAINTENANCE PRACTICES

1. Removal/Installation Forward Galley Door

A. Equipment and Materials

(1) Wrench - AN8514-4

(2) Snubber Hinge Pin Puller Kit - F70086

(3) Snubber Test Jig - TSJ90-10072-1

(4) Wrench - F70085

B Remove Forward Galley Door

(1) Operate door handle fully bringing door into cocked position.

(2) Remove insert (figure 203) from spring fasteners, taking care not to mar polished surface of door inside handle.

(3) Remove three bolts with washers and remove handle with shims, taking care not to drop shims inside the door.

(4) Remove four escutcheon attachment screws and escutcheon.

(5) Rotate assist handle nuts (figure 204) using AN8514-4 wrench and remove handle

(6) Remove bolt, washer and collar within nuts and remove nuts and outer collars.

(7) Remove door interior trim panels Refer to Chapter 25, Door Lining and Insulation.

(8) Remove interior trim panel and sidewall insulation at forward edge of door opening between door hinges Refer to Chapter 25, Sidewall Lining and Insulation.

(9) Remove door reveal screws and remove door reveal at forward edge of door opening between door hinges.

(10) Provide adequate support for door.

(11) Remove lockwire on upper hinge pin retainer screws and remove screws, retainer and rubber seal

(12) Remove lockwire on lower hinge pin retainer screws and remove screws, retainer and rubber seal.

(13) On airplanes not having access hole in hinge support; remove four attach bolts from snubber attach fitting.

(14) On airplanes having access hole with pressure sealed cap in hinge support; remove bolt connecting snubber to hinge support by removing nut and washer and pushing bolt into cap.

(15) Remove lower hinge pin using hinge pin puller kit.

(16) Remove upper hinge pin using hinge pin puller kit F70086.

(17) Slide guide arm out from between roller guide plates, and remove galley door.

C Install Forward Galley Door

(1) Prepare door for installation (new door)

(a) Remove bolts attaching centering roller support to center of aft edge of door and remove centering roller support.

(b) Remove bolt, seal washers, plain washers, nut, and cotter pin connecting guide arm to hinge support on door and remove guide arm.

(c) Remove bolt, seal washers, plain washers, nut, and cotter pin connecting snubber to hinge support on door, and remove snubber.

(d) Slide roller end of guide arm between guide plates at upper hinge assembly. (See figure 201.)

(e) Using snubber test jig, check snubber for correct stroke measurements and operation.

NOTE: Distances between centers should be as follows:

Compressed:	9.18/9.36 inches
Neutral:	10 26/10 28 inches
Extended:	10 82/10 91 inches

An excessively soft operation may indicate the presence of air in the snubber and a snubber suspected to be in this condition should be overhauled before installation, or replaced with a new unit. No snubber should be rejected, however, merely because it permits slow movement throughout its whole travel: the snubber is designed to resist accelerated movement only, and this can best be checked when the door and snubber are installed on the airplane.

(2) Install radius link, with snubber attached, between stop plates and push hinge pin through upper bushing only in radius link.

(3) Support door in position at door opening and approxiamtely at 90° to airplane exterior.

(4) Engage lower hinge arm with radius link. Line up hinge pin holes and complete installation of hinge pin.

(5) Engage upper hinge arm with radius links on guide arm. Line up hinge pin holes in roller guide plates and install hinge pin.

(6) Install rubber seal, upper hinge pin retainer and screws, and lockwire.

(7) Install rubber seal, lower hinge pin retainer and screws, and lockwire.

(8) Install bolts, seal washers, plain washers, and nuts connecting snubber and guide arm to hinge support on door.

NOTE: Observe correct sequence when installing washers.

(9) Back off on all door stop pins until head of pin contacts stop fitting on door.

(10) Adjust vertical position of door by means of nuts on torque tube (figure 202) so that gap between the bottom of the door gate and door sill is not more than 3/16 inch and door is vertically centered in the door frame. Check that all latch rollers enter latch fittings with equal clearance when door is operated to closed position. Install cotter pins.

NOTE: If vertical adjustment nuts (2) are hard to turn, use wrench F70085 to rotate nuts. Avoid overtightening of nuts which would cause excessive end loads on bearings (5).

(11) Install centering roller support on door and adjust position on serrated plate to allow engagement of roller with centering track on door jamb.

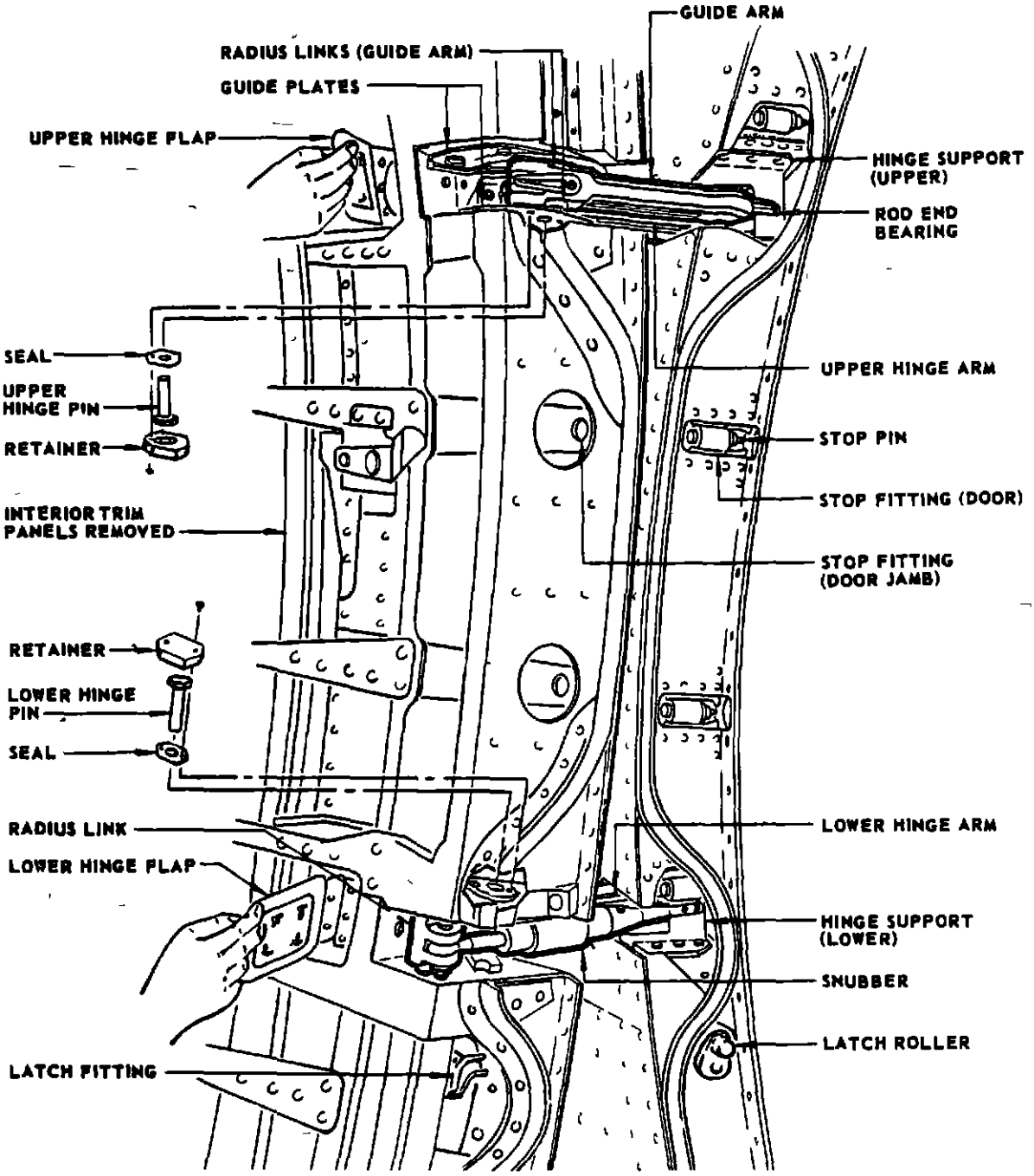
(12) Adjust guide arm assembly length at rod end bearing so that both fore and aft latch rollers enter their respective fittings at the same time, when door is operated to closed position. Aft rollers may lead forward rollers slightly to improve clearance on forward edge of door. Tighten rod end bearing check nut.

(13) Install bolt, seal washers, plain washers and nut connecting guide arm to hinge support on door.

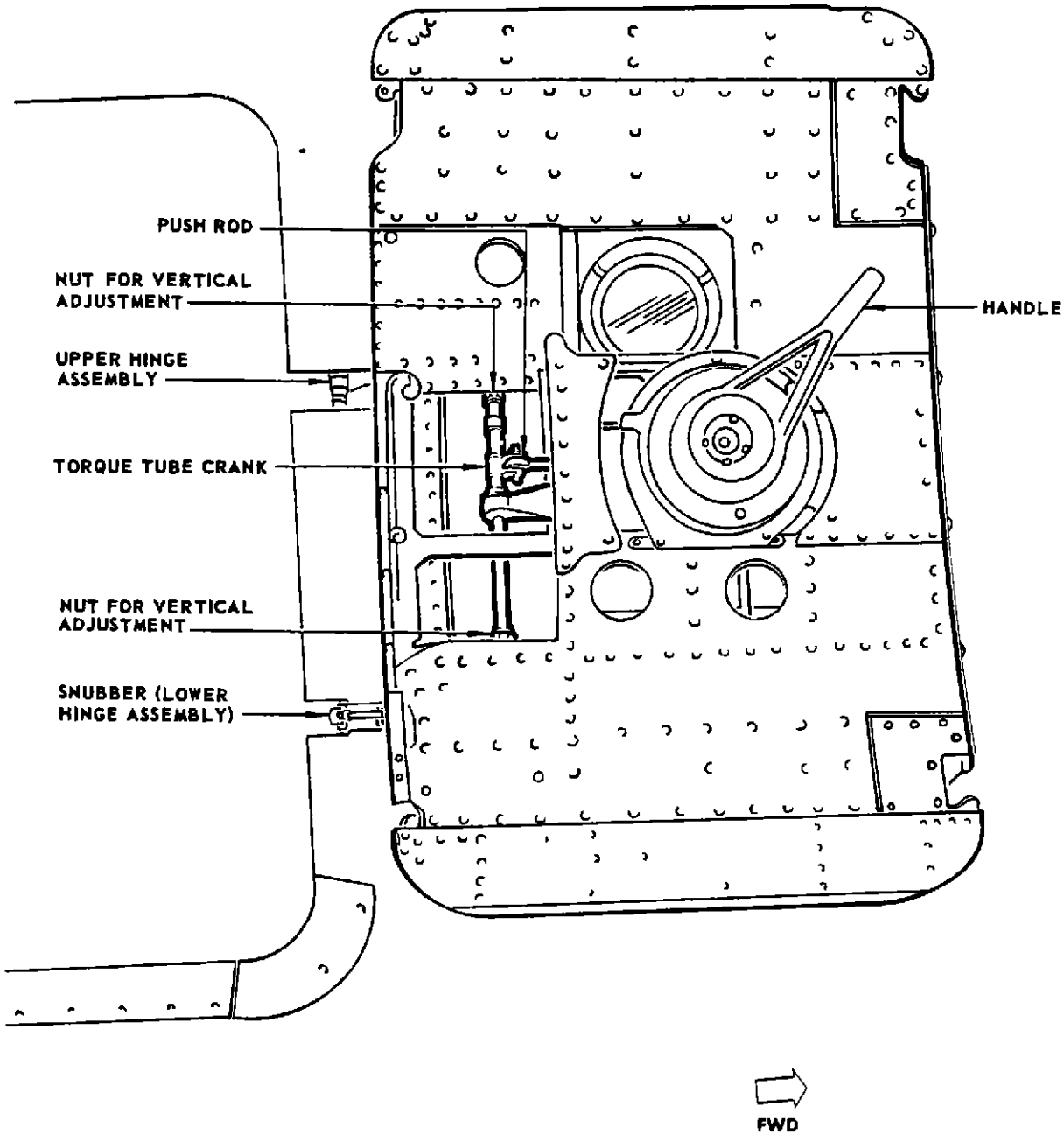
(14) Adjust latch fittings on serrated latch plates attached to door jambs, so that door is flush with fuselage.

NOTE: When closed and latched, outside surface of door along its forward and aft edges should not protrude beyond the fuselage exterior profile by more than 0.03 inch, nor be recessed by more than 0.09 inch. The outside surface of the gate along the top edge of the door should be recessed below the fuselage exterior profile by between 0.13 and 0.20 inch. The outside surface of the gate along the bottom edge of the door should be recessed below the fuselage exterior profile by between 0.17 and 0.30 inch. Measurements of flushness should be made at points along the straight sections between corners of the door.

(15) With the door closed and latched, screw stop pins out until they just contact stop fittings on door jambs. On stop pins with check nuts, back off stop pins half a turn and tighten check nuts. On stop pins with lock springs, back off stop pins half a turn and secure with lock springs.



Installation of Upper and Lower Hinge Assemblies, Forward Galley Door 6
Figure 201



VIEW ON INSIDE SURFACE OF DOOR - DOOR IN LATCHED OPEN POSITION

(16) With door closed and latched, adjust length of pushrod (figure 202) so that it just fits between the cocking crank and torque tube crank. Then unlatch door, shorten pushrod by one half turn of rod end bearing, tighten check nut and reinstall

(17) Install hinge arm covers, using laminated shims to fair covers with fuselage external contour.

(18) With the door stowed and latched in open position, check length of snubber to make sure it does not bottom before the latch pin engages hole in upper roller guide plate at upper hinge assembly

(19) The door must move through full cycle of operation smoothly with no binding spots, and torque applied to the handle must not exceed 360 pound-inches without lining, or 460 pound-inches with lining

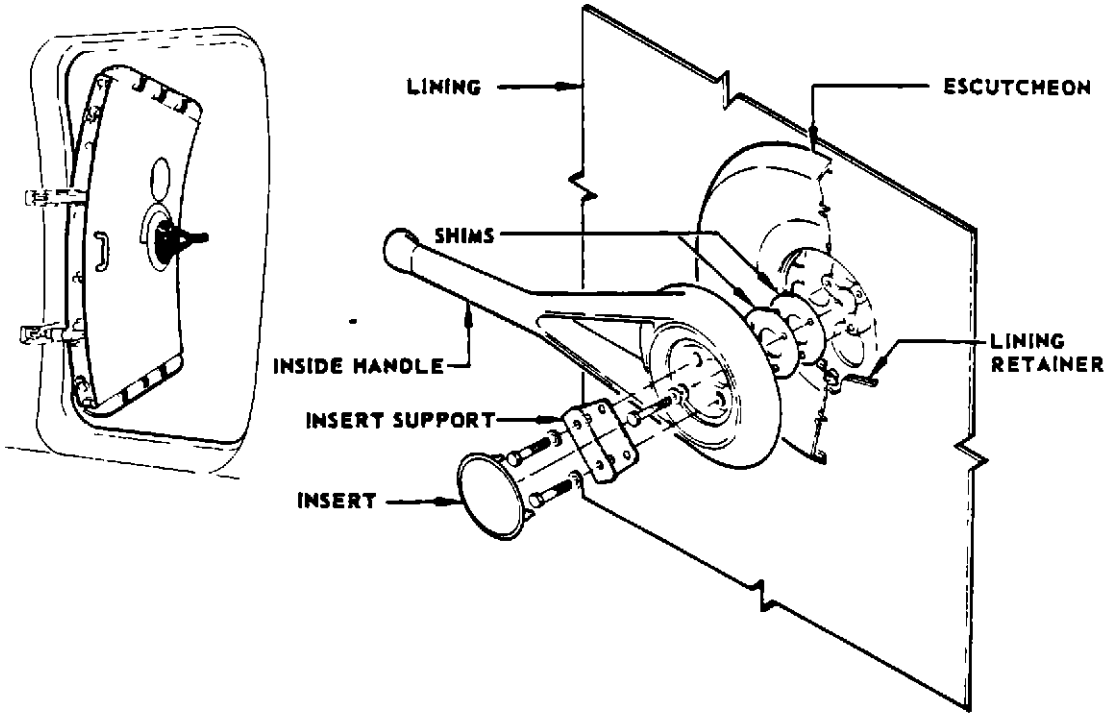
(20) Gap between door outside skin and fuselage outside skin should be from 0.06 inch to 0.18 inch at any point when door is closed and latched. Where necessary, file edge of door skin to achieve this condition.

(21) Check that snubber operates correctly to retard or snub rapid motion of the door toward stowed and cocked positions.

(22) Check seal installation as described in 52-9-0, paragraph 1.D.(12).

(23) and (24) Deleted.

(25) Install door reveal at forward edge of door opening between door hinges.



Installation of Inside Door Handle and Escutcheon
Figure 203

(26) Install sidewall insulation and interior trim panel at forward edge of door opening between door hinges. Refer to Passenger Cabin Equipment, Chapter 25.

(27) Remove insert (figure 203) from spring fasteners, taking care not to mar polished surface of door inside handle.

(28) Remove lock wire from three bolts, and remove bolts with washers and handle with shims, taking care not to drop shims inside the door.

(29) Remove four escutcheon attachment screws and escutcheon.

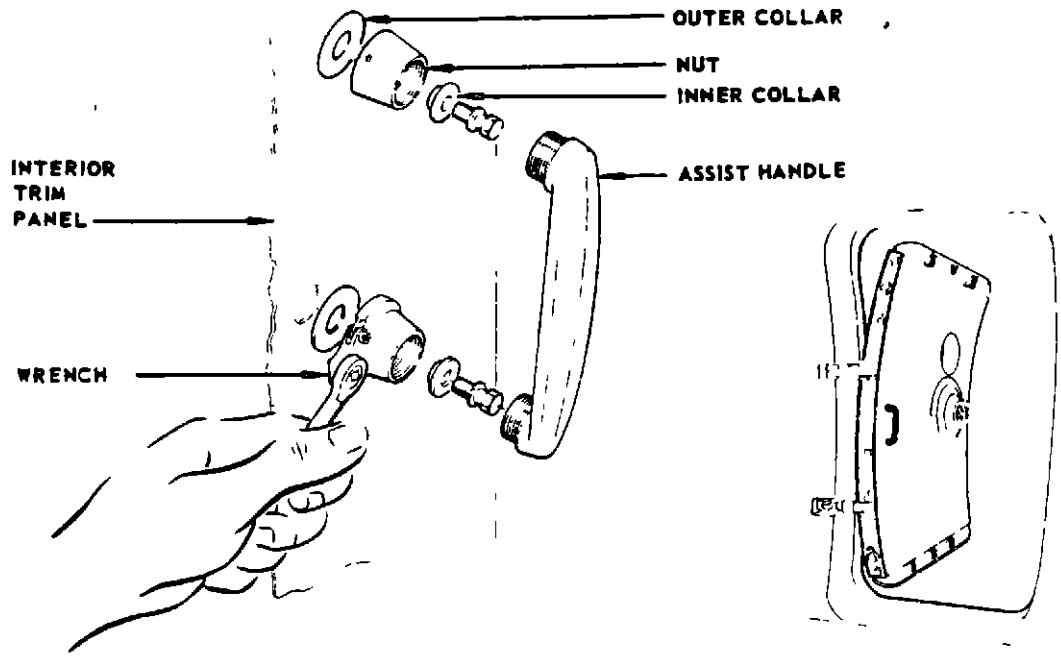
(30) Install door interior trim panels. Refer to Passenger Cabin Equipment, Chapter 25

(31) Install door assist handle nuts with collars, washers and bolts.

(32) Engage threads on assist handle (figure 204) with threads in nuts and install assist handle by rotating nuts using AN8514-4 wrench.

(33) Install escutcheon.

(34) Install door inside handle with shims, bolts and washers, and lockwire.



Installation of Assist Handle on Forward Galley Door
Figure 204

(35) Install insert in center of handle.

(36) Deleted.

2. Inspection/Check Forward Galley Door

A. Examine for the following:

(1) Examine external and internal skins, and framing around opening, for cracks and corrosion, hinge fairings for looseness and missing screws.

(2) Examine frames, internal brackets, handle mechanism housing and hinges for cracks, corrosion, and loose bolts.

(3) Examine window and frame for cracks and corrosion.

(4) Examine door operating mechanism for cracks, corrosion, excessive wear, and loose bolts.

(5) Examine latch rollers, latches, and door stops for cracks, corrosion, and foreign particles lodged in latches or attached to stops.

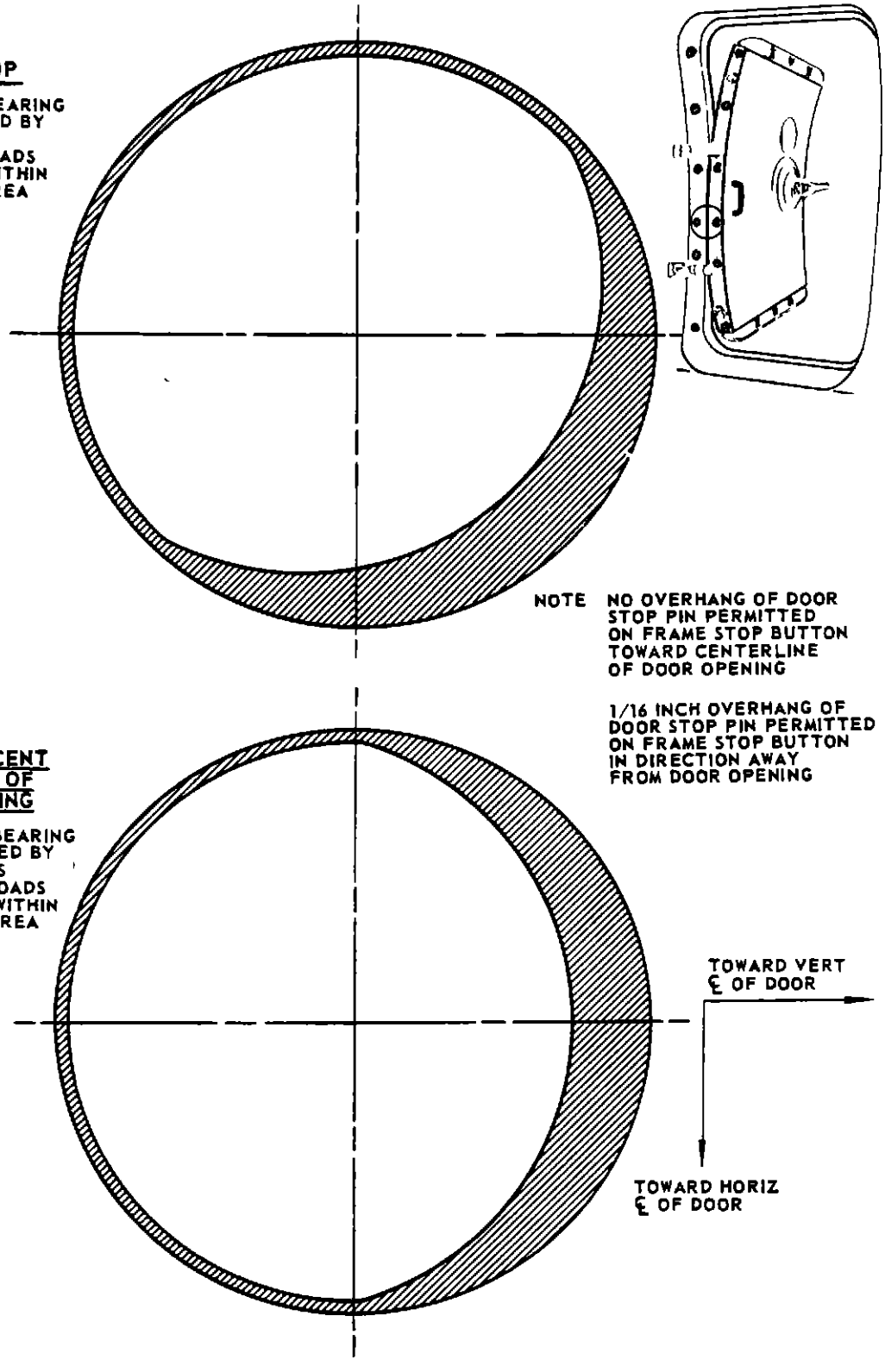
(6) Examine drain holes for obstruction.

(7) Examine door seal for cracks, cuts, tears, deterioration and correct seating when door is in closed position.

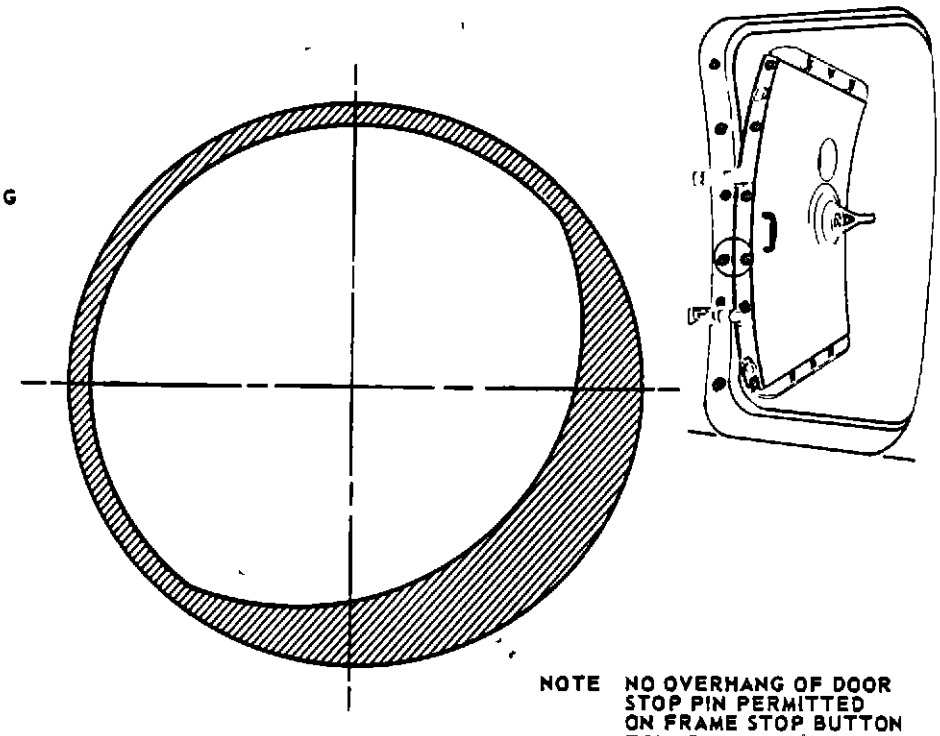
(8) Examine roller camplates and guide arm roller for excessive wear, which may cause door to malfunction. See "Guide Arm Roller - Removal/Installation."

(9) Examine door stops for misalignment, using the door stop pin bearing marks on frame stop buttons. (See figures 205 and 206)

NOTE: Door stop bearing marks are a result of flight plus fuselage pressure loads.



Door Stop Misalignment Data
(0.75 inch dia Frame Stop Button)
Figure 205



Door Stop Misalignment Data
(0 62 inch dia Frame Stop Button)
Figure 206

AFT GALLEY DOOR - MAINTENANCE PRACTICES

1 General

A. Maintenance Practices on the aft galley door are similar to those covered in Forward Galley Door - Maintenance Practices, 52-2-1, except as follows:

2. Removal/Installation Aft Galley Door

A Prepare Door for Installation (New Door)

(1) Remove screws in forward mechanism access panel and remove panel.

(2) Remove bolts attaching centering roller support to center of aft edge of door and remove centering roller support.

(3) Remove cotter pin, nut, seal washers, and bolt connecting guide arm to hinge support on door and remove guide arm.

(4) On airplanes not having access hole in hinge support; remove four attach bolts from snubber attach fitting.

(5) On airplanes having access hole with pressure sealed cap in hinge support; remove bolt connecting snubber to hinge support by removing nut and washer and pushing bolt into cap.

(6) Remove the two button plugs located in forward edge of door inner skin adjacent to hinge positions.

(7) Slide roller end of guide arm between guide plates at upper hinge assembly

B Install Aft Galley Door

(1) Repeat steps (2) to (7) as described in paragraph C , Install Forward Galley Door, 52-2-1.

(2) Install bolt, seal washers, nut and cotter pin connecting snubber to hinge support on door.

(3) Install bolt, seal washers, nut and cotter pin connecting guide arm to hinge support on door

(4) Repeat steps (9) to (26) as described in paragraph C., Install Forward Galley Door.

(5) Install forward mechanism access panel in door.

(6) Install the two button plugs in holes in forward edge of door inner skin adjacent to hinge positions

(7) Repeat steps (27) to (35) as described in paragraph C., Install Forward Galley Door.

CARGO COMPARTMENT DOORS - DESCRIPTION AND OPERATION

1. General

A A forward cargo door, providing access to the forward cargo compartment, and a center and an aft cargo door, providing access to the aft cargo compartment, are on the right hand side of the airplane.

(1) The doors are plug type and similar in structure, door operating mechanism, and principle of door operation.

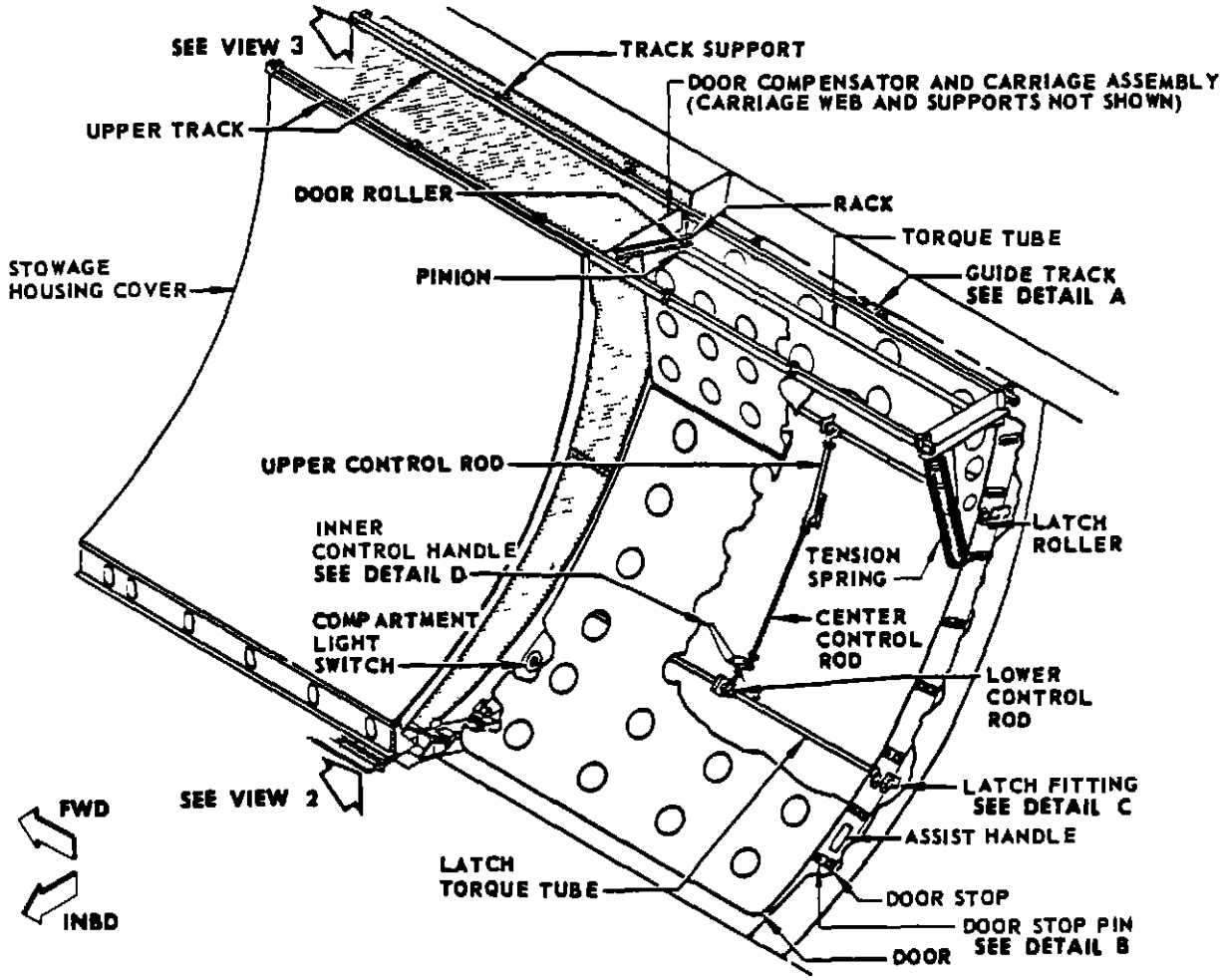
(2) Each door may be latched or unlatched from inside or outside of the airplane by a manually operated control handle Adjustable stop pins on the forward and aft edges of the door mate with the door stop fittings on the door opening frames A removable compensator assembly and carriage, bolted to the upper part of the door, assists in the operational control of the door.

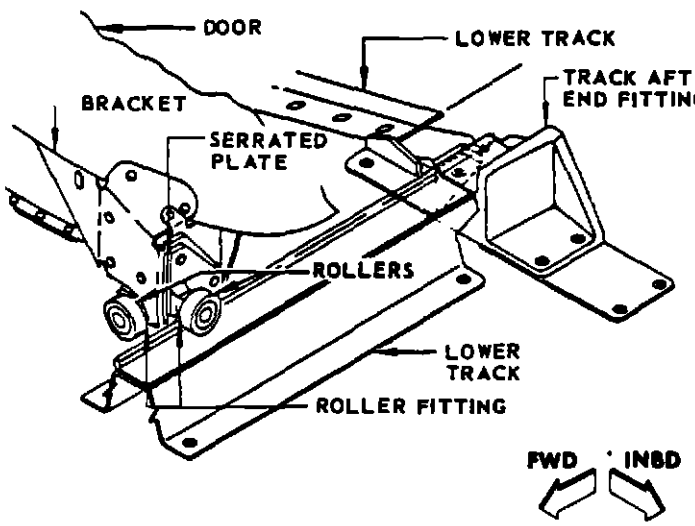
(3) Each door may be opened by operating the control handle which actuates a linkage within the door to release roller latches on the door from latch fittings on the door jambs The door may then be pushed inward, assisted by the compensator, on a rack and pinion and roller track attached to the carriage at the top of the door The carriage runs on rollers located in two tracks attached to fuselage structure and allows the door to be pushed forward into a stowage housing

2. Cargo Compartment Doors

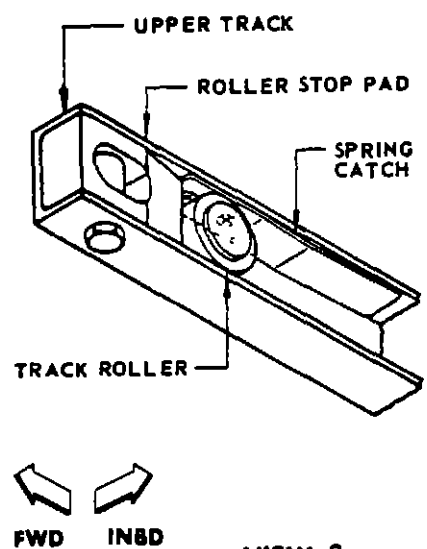
A Door Internal Mechanism

(1) The door lock assembly (detail D, figure 1) contains an inner and an outer control handle. The outer handle when stowed in closed position is in a handle housing and flush with the door outer skin. A handle release catch is incorporated in the outer handle. Both handles are attached to a handle shaft on which there are three lugs. A collar is located on the inner end of the shaft adjacent to the inner handle. The lock assembly is riveted to the outer and inner door skins through the handle housing, and collar respectively. A lock retaining spring linkage is at one end attached to the inner lug on handle shaft, and at the other end attached to the door inner skin by a spring support. The spring linkage has a spring centerer which slides inside a spring retainer. A compression spring is retained between the spring centerer and spring retainer. The forward, and the center cargo door each have a lower control rod connected between the inner and center lugs on the handle shaft and an arm bolted to the lower latch torque tube. All cargo doors have a center control rod connected between the center and outer lugs on the handle shaft and an idler arm supported by a bracket attached to the door inner skin An upper control rod connects the idler arm to an arm bolted to the upper latch torque tube. The latch torque tubes are supported centrally by a plain spherical bearing contained in a housing bolted to the



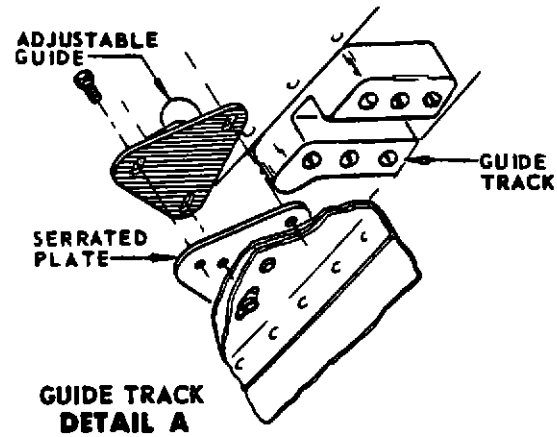


VIEW 2
LOWER TRACK AND ROLLER ASSEMBLY
(DOOR IN OPEN POSITION)

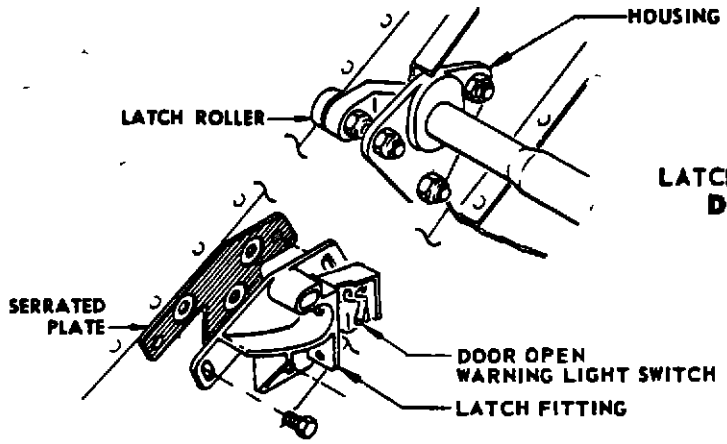


VIEW 3

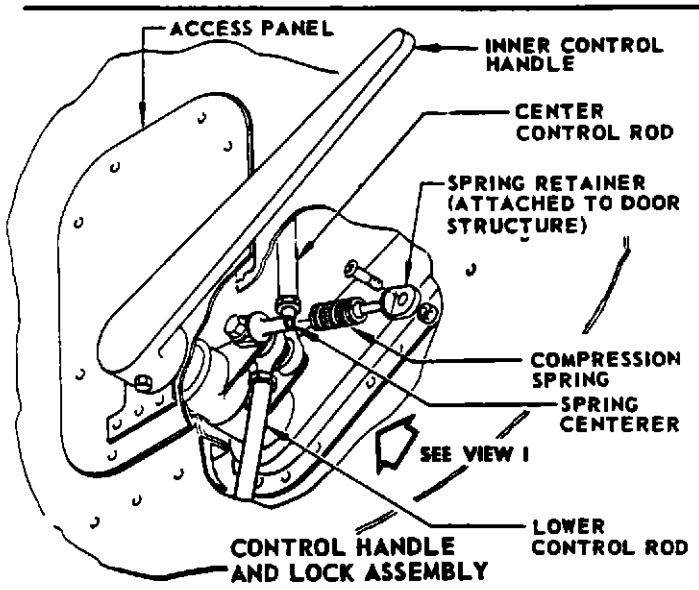
Forward Cargo Compartment Door
Figure 1 (Sheet 1 of 3)



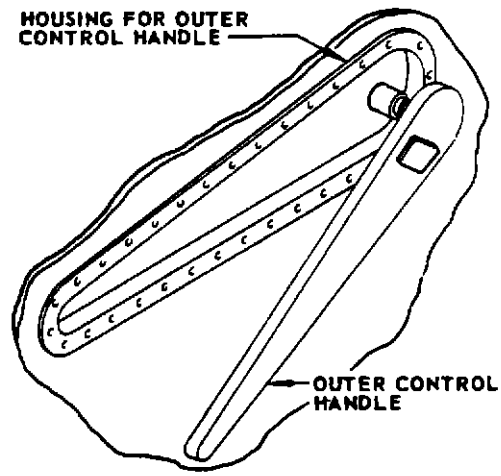
GUIDE TRACK
DETAIL A



LATCH ASSEMBLY
DETAIL C



DETAIL D

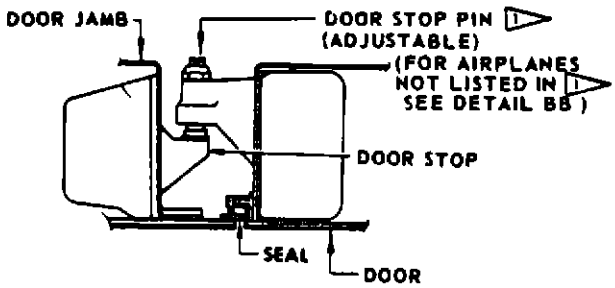


VIEW 1

door internal structure. The torque tubes at each end are located in a flanged bushing contained in a housing (detail C) bolted to the edge of the door. Latch rollers at the ends of the torque tubes engage with latch fittings bolted to serrated plates on the door jambs when door is in closed position.

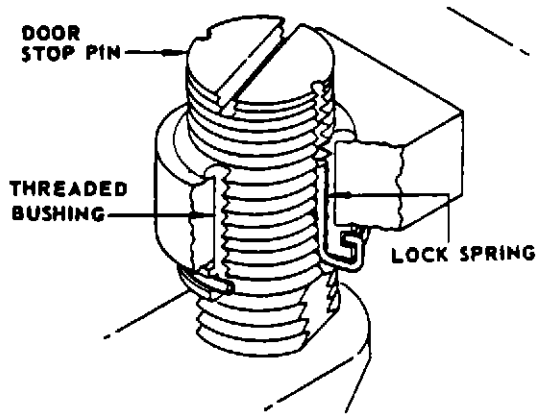
B. Door External Mechanism and Fittings

(1) When the door is in closed position and the airplane is pressurized, door stops, (detail B) attached to the forward and aft frames of the door opening, contact adjustable door stop pins, attached to the forward and aft edges of door. The stops transmit the pressurization loads on the door to the fuselage structure surrounding the door, and also prevent excessive deflection of the continuous weather/pressurization seal attached around entire edge of door. To guide the door during final closing operation an adjustable guide (detail A), attached to the center of the top edge of the door, engages with a guide track located at the top of the door opening. A door roller assembly is supported by a bracket on the forward lower edge of the door, and bears against a track on the floor. Access panels in the door outer skin provide access to the outer ends of the latch torque tubes which may be rotated manually in the event of a failure in the normal operating mechanism. An access panel located in the door inner skin around the inner control handle provides access to the lock



1 AIRPLANES 00-SJA THRU 00-SJF

DOOR STOP ASSEMBLY
DETAIL B



AIRPLANES 00-SJG AND ON

DETAIL BB

mechanism assembly An assist handle incorporated in the aft edge of the door provides personnel with additional functional control during door closing cycle An insulation blanket is attached to the door outside skin A switch incorporated in one of the latch fittings is in circuit with the door warning system Refer to 52-7-0

C Door Compensator and Carriage Assembly

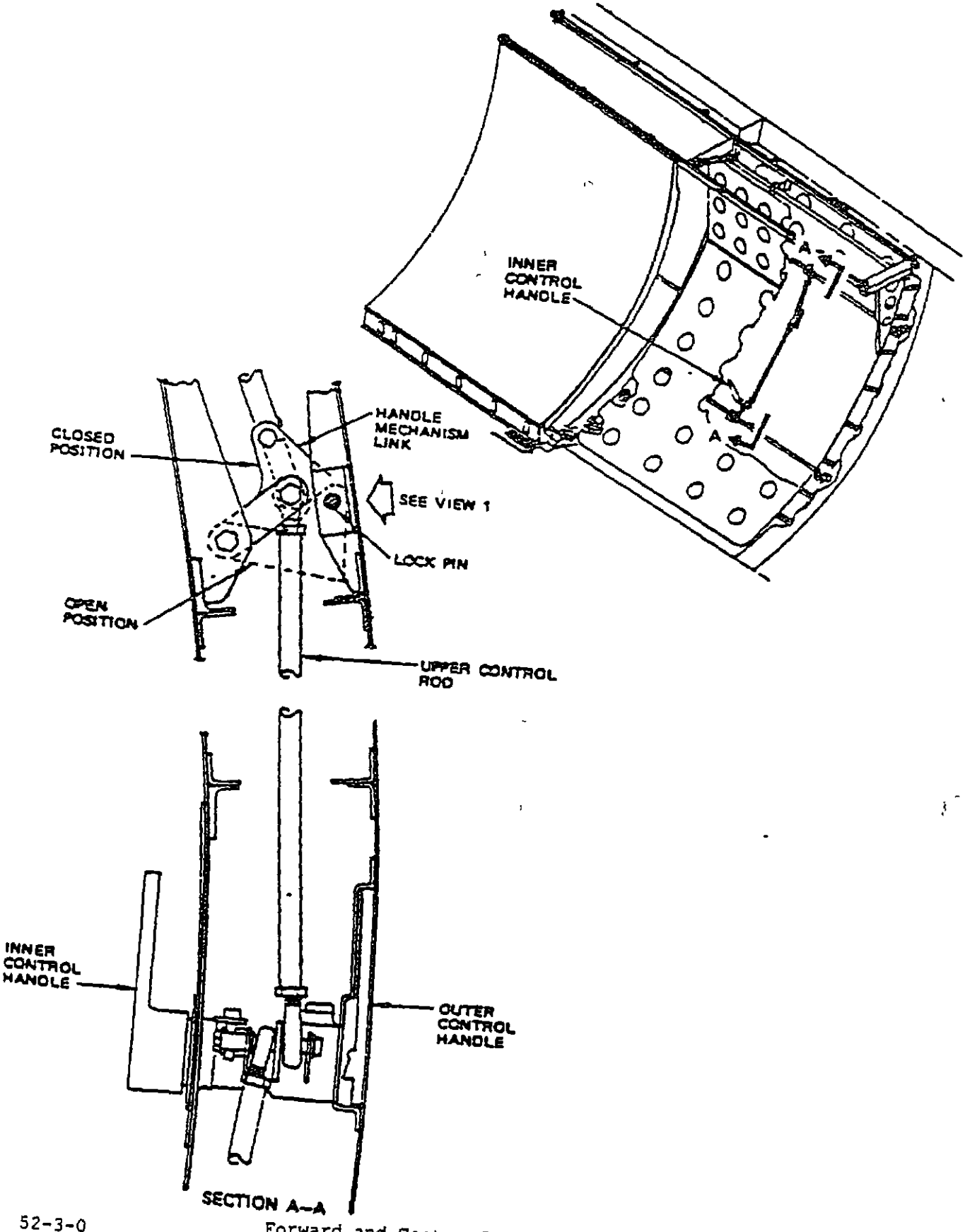
(1) The door compensator and carriage assembly (figure 1) is bolted to the upper part of door Two wedge shaped end brackets and a web provide support for a torque tube, to each end of which a pinion is attached Two door rollers are attached to the top of each end bracket The carriage has a web supported by angle and zee members Attached to each end of the carriage is a roller track, in the lower edge of which is incorporated a rack The door rollers support the door on the carriage roller tracks, and the pinions are engage with the two racks Each end of the door has a tension spring connected between the lower side of the carriage and the inside edge of the door A track roller is attached to each corner of the carriage The track rollers support the carriage in two tracks attached to floor support structure Roller stop pads are bolted to the ends of the tracks A flat spring catch attached to the forward end of each track holds the door in the fully open position

3 Cargo Door Locks (Airplanes incorporating SB 3334)

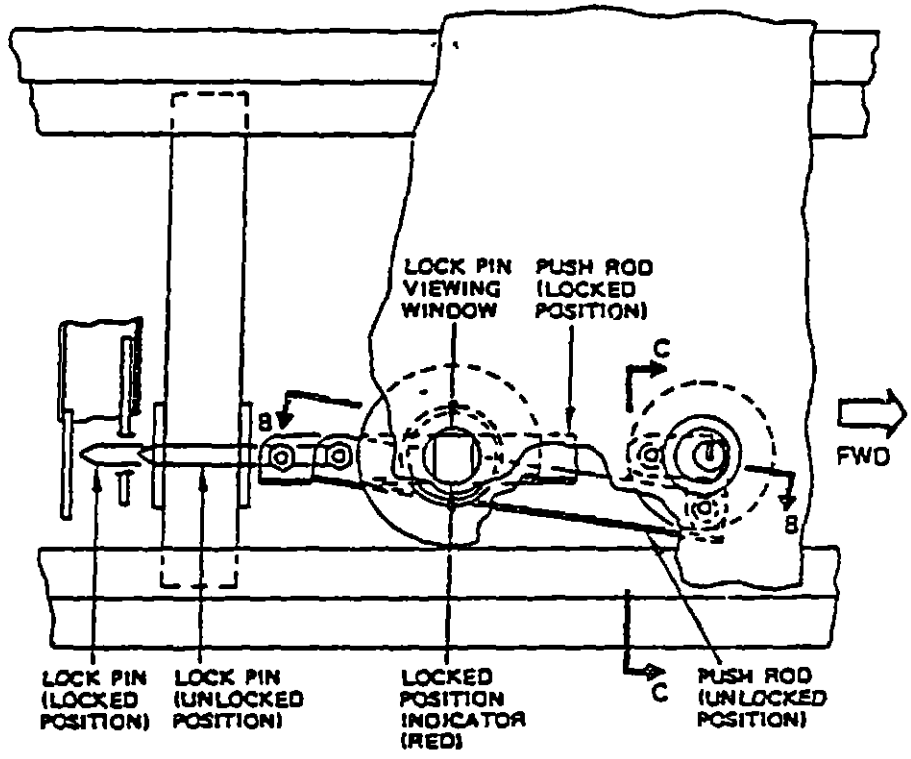
A The forward, center, and aft cargo doors have a key-operated single-bitted cam-type lock installed through the outside of the door to prevent unauthorized entry to the cargo compartments (Fig 2 and 3) When the lock is turned to the locked position using the key, am arm on the lock cylinder turns, operating a pushrod which causes a lockpin to extend across the face of a handle mechanism link, locking out the handle operating linkage so that the door cannot be operated by either the outside or inside handle A red band on the lock pushrod is visible through a viewing window on the outside of the cargo door when the door is in the locked position

4 Operation

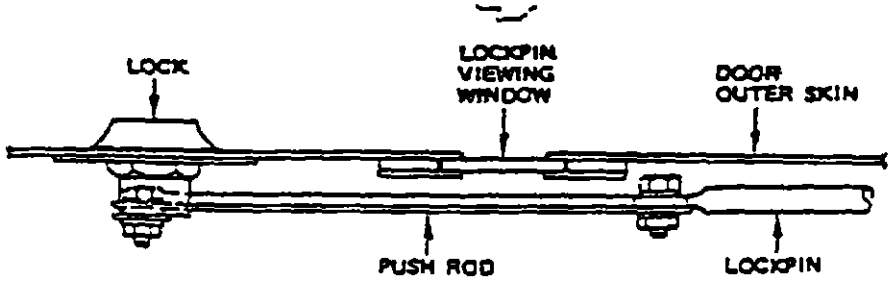
A The door is opened from the cargo compartment interior by rotating the inner control handle 45 degrees clockwise The control handle rotates the handle shaft, actuating the control rod linkage, to turn the upper and lower torque tubes (forward and center door), or upper torque tube (aft door) Rotation of torque tube withdraws the latch rollers from the latch fittings Withdrawal of the latch rollers closes the door warning switch (Ref 52-7-0). The door is then pulled inward This rotates the pinions on the racks and brings the door rollers to rest at the ends of the tracks on the carriage The tension springs at each end of the door assist effort required to move the door inward The door is then pushed forward into the stowage housing The door is carried forward by the carriage rolling on its tracks and comes to rest when the carriage rollers contact the roller stop pads and the spring catches are tripped to bold the door in the fully open position



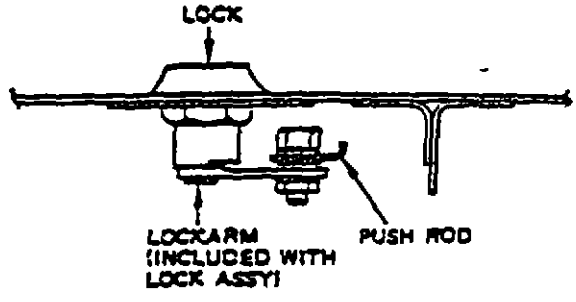
Forward and Center Cargo Door Locks
Figure 2 (Sheet 1)



VIEW 1

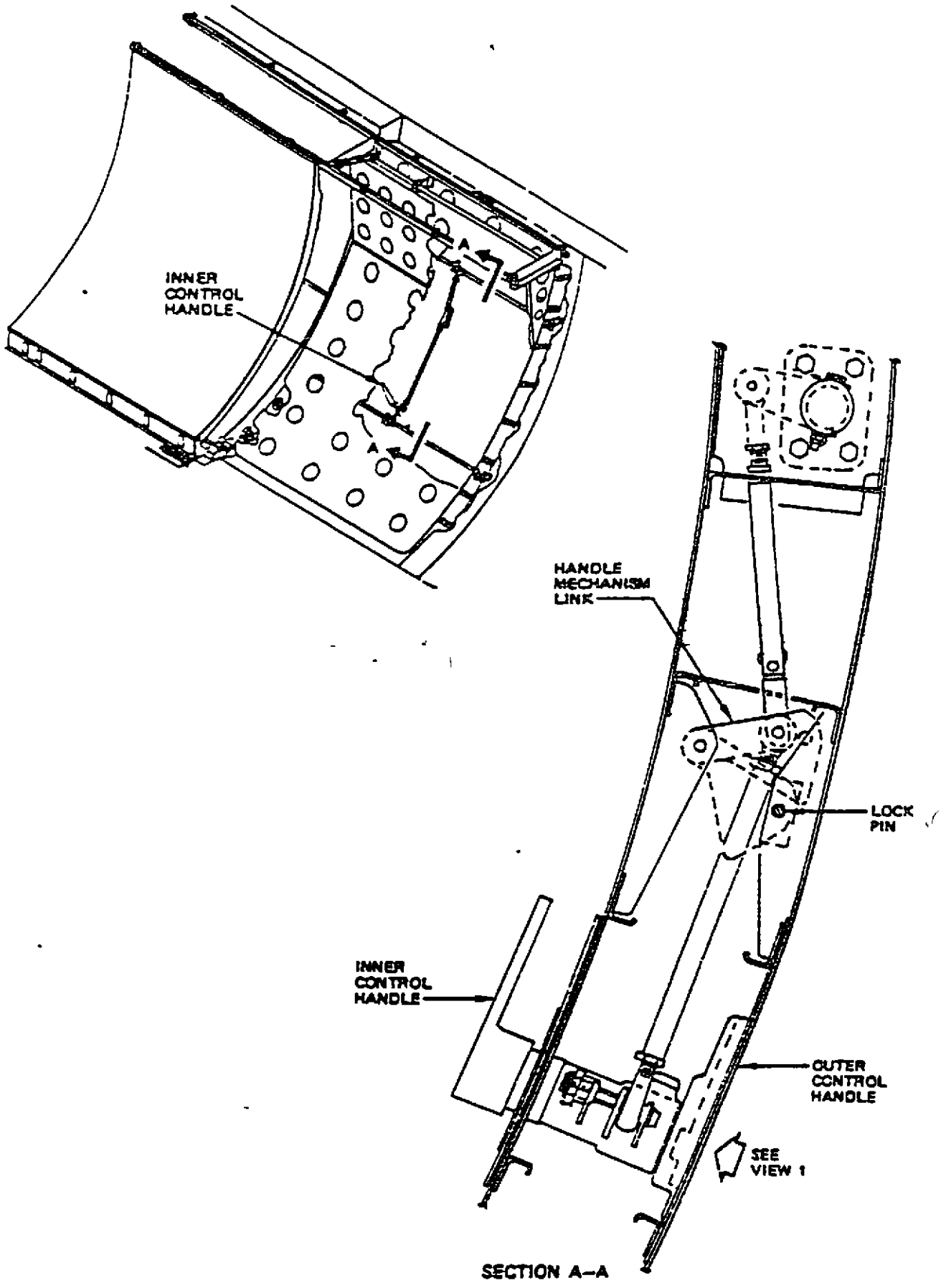


SECTION B–B

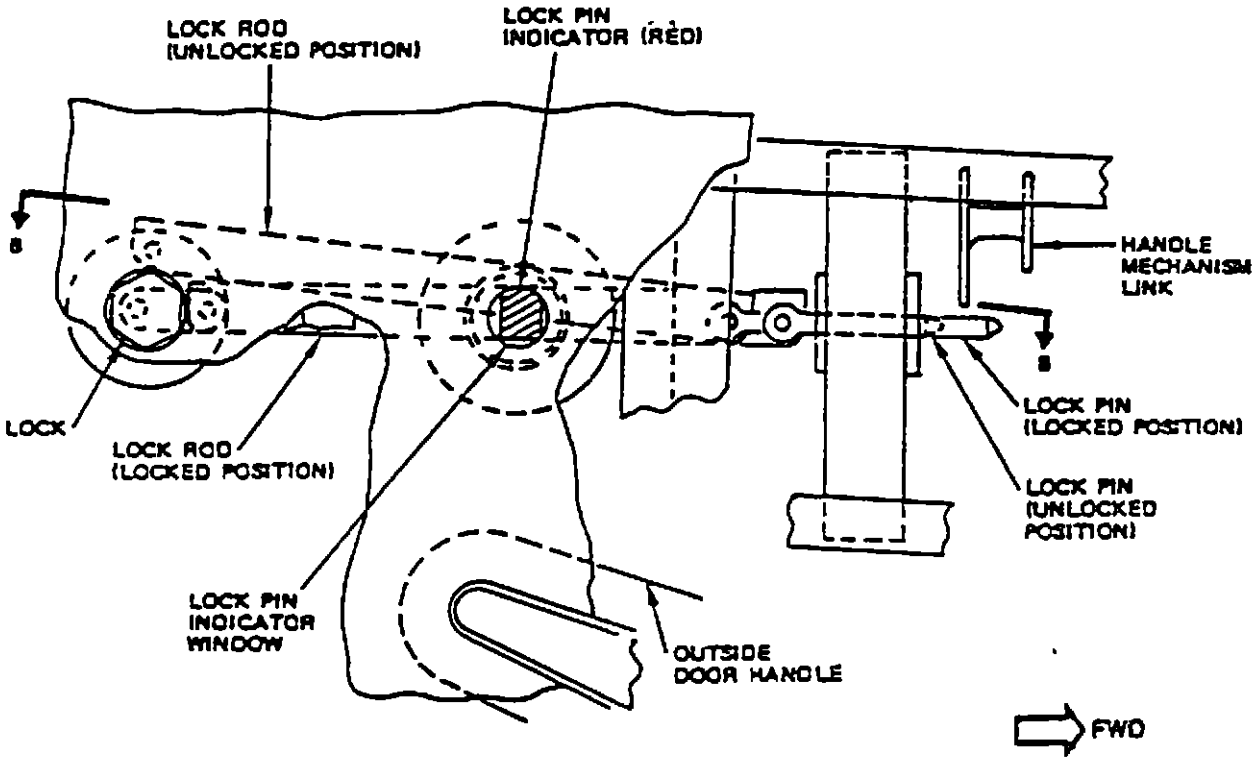


SECTION C–C

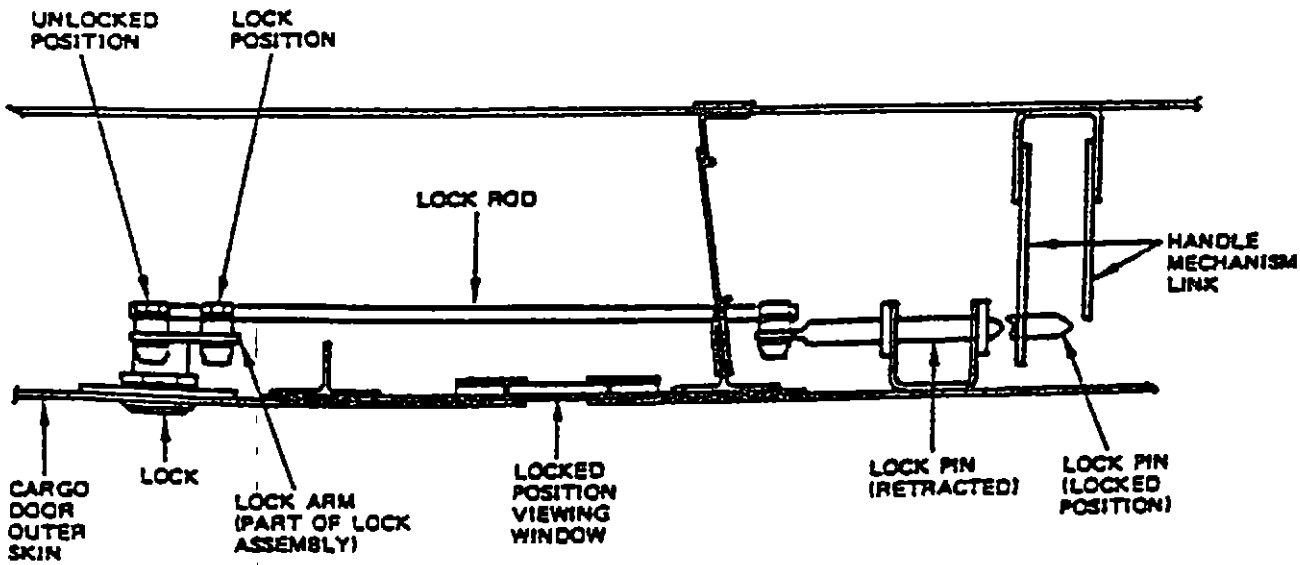
Forward and Center Cargo Door Locks
Figure 2 (Sheet 2)



Aft Cargo Door Lock
Figure 3 (Sheet 1)



VIEW T



SECTION B-B

Aft Cargo Door Lock
Figure 3 (Sheet 2)

B The door is opened from the airplane exterior by depressing the catch in the center of the outer control handle which releases the handle from the housing The handle is pulled outward and rotated 45 degrees counterclockwise This unlatches the door as described in par 3 A The door is pushed inward and then forward into the stowage housing until the spring catches are tripped to hold the door in the fully open position

C The door is closed from the cargo compartment interior by pulling the door aft with the assist handle The carriage rollers ride over the spring catches and allow the door to travel aft until the carriage comes to rest against the roller stop pads The door may then be pushed into the door opening and the inner control handle rotated 45° counterclockwise This operates the door control rod linkage in the reverse direction to that described in paragraph 3 A , and latches door in closed position. Engagement of the latch rollers in the latch fittings opens the door warning switch. Refer to 52-7-0

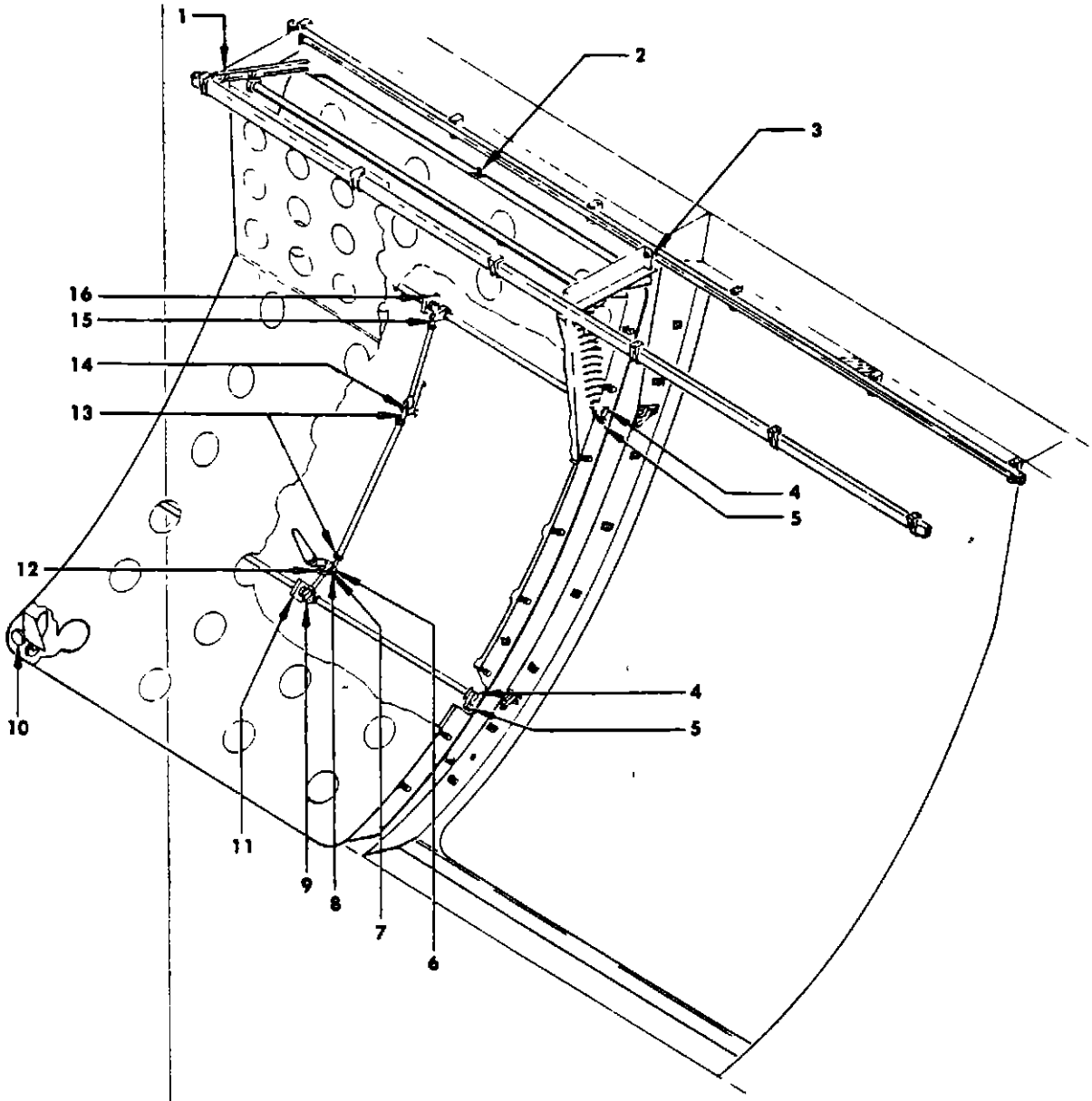
D The door may be closed from airplane exterior by pulling the door aft until the carriage comes to prest against the roller stop pads Holding outer control handle in the unlocked position, the door is pulled into opening and the handle is then rotated 45° clockwise This operates door control rod linkage in the reverse direction to that described in paragraph 3 A , and latches the door in a closed position Engagement of the latch rollers in the latch fittings opens the door warning switch Refer to 52-7-0 The outer control handle is returned to its housing and the stowing catch engaged

CARGO COMPARTMENT DOORS - MAINTENANCE PRACTICES

1. Unit Servicing Cargo Compartment Doors

A Lubricate Cargo Compartment Doors

(1) The items requiring lubrication are shown on figure 201



Cargo Compartment Doors Lubrication
Figure 201 (Sheet 1 of 2)

INDEX NO.	ITEM TO BE LUBRICATED	INSTRUCTIONS
1	DOOR ROLLER	Apply Grease, MIL-G-23827, Flush Fitting. (4 places)
2	GUIDE ROLLER	Apply Grease, MIL-G-23827, Flush Fitting. (1 place)
3	TRACK ROLLER	Apply Grease, MIL-G-23827, Flush Fitting. (4 places)
4	LATCH ROLLER CRANK SUPPORT	Apply Oil, MIL-L-7870. (Forward and Center Door. 4 places) (Aft Door. 2 places)
5	LATCH ROLLER	Apply Grease, MIL-G-23827, Flush Fitting. (Forward and Center Door. 4 places) (Aft Door. 2 places)
6	SPRING RETAINER END	Apply Oil, MIL-L-7870. (1 place)
7	SPRING CENTERER END	Apply Oil, MIL-L-7870. (1 place)
8	SPRING LINKAGE	Apply Oil, MIL-L-7870. (1 place)
9	LOWER CONTROL ROD END	Apply Grease, MIL-G-23827, Flush Fitting. (2 places) (Forward and Center Door only.)
10	LOWER ROLLER ASSEMBLY	Apply Grease, MIL-G-23827, Flush Fitting. (2 places)
11	LOWER LATCH TORQUE TUBE SUPPORT	Apply Grease, MIL-G-23827, Flush Fitting. (1 place) (Forward and Center Door only.)
12	LOCK ASSEMBLY SHAFT AND RETAINING LATCH SPRING	Apply Oil, MIL-L-7870. (2 places)
13	CENTER CONTROL ROD END	Apply Grease, MIL-G-23827, Flush Fitting. (2 places)
14	IDLER	Apply Oil, MIL-L-7870. (2 places)
15	UPPER CONTROL ROD END	Apply Grease, MIL-G-23827, Flush Fitting. (1 place)
16	UPPER LATCH TORQUE TUBE SUPPORT	Apply Grease, MIL-G-23827, Flush Fitting. (1 place)

2. Removal/Installation Forward Cargo Compartment Door

A. General

(1) On airplanes 00-SJA through 00-SJG, the forward cargo door, complete with compensator and carriage assemblies, may be removed from the airplane by removing the roller stop pads from the tracks and sliding the doors forward and clear of the tracks. On airplanes 00-SJH and on, the forward cargo door may be removed complete with compensator and carriage assemblies by removing two angles covering slots in lower flange of the upper roller tracks, allowing the rollers to pass through the slots.

(2) The forward cargo door weights approximately 92 pounds.

B. Remove Forward Cargo Compartment Doors

(1) On airplanes 00-SJA through 00-SJG, remove roller stop pads from forward ends of upper tracks. (See figure 202.) On airplanes 00-SJH and on, remove two angles covering slots in lower flange of upper roller tracks.

(2) Unlatch door and move inward.

(3) On airplanes 00-SJA through 00-SJG, provide adequate support for door and pull forward over the spring catches and clear of the tracks.

(4) On airplanes 00-SJH and on, provide adequate support for door and pull forward until rollers align with slots in tracks, tilt door so that rollers disengage from tracks.

(5) Rotate door in such a manner as to allow it to be passed through door opening to the outside of airplane.

C. Install Forward Cargo Compartment Door

(1) Provide adequate support for door and rotate in such a manner as to allow it to be passed through door opening into airplane interior.

(2) On airplanes 00-SJA through 00-SJG, engage carriage rollers with tracks and push complete assembly aft over spring catches. (See Figure 202.) Install roller stop pads at forward ends of tracks.

(3) On airplanes 00-SJH and on, tilt door so that rollers pass through slots in track and engage track. Push door backward. Install angles over slots in tracks.

(4) Operate door throughout opening and closing cycle, including stowage location on tracks, to check the system for operating ease and the maintenance tolerances required in its closed and latched position. The door must move through full cycle of operation smoothly with no binding spots, and torque applied to the inner handle must not exceed 450 pounds-inches, or 600 pounds-inches to the outer handle.

2A. Removal/Installation Center Cargo Compartment Door

A. General

(1) The center cargo door, complete with compensator and carriage assembly, may be removed from the airplane by removing two angles covering slots in the upper, outboard track, and tilting the door so that the outboard rollers on the carriage pass through the slots and allow the door to be brought clear of the tracks.

(2) The center cargo door weights approximately 86 pounds.

B. Remove Center Cargo Compartment Door

(1) Unlatch door, move inward, and push forward clear of door opening. Secure compensator assembly to carriage to prevent relative motion between these components, (figure 202).

(2) Remove the two angles covering slots in outboard track in way of door opening.

(3) Provide adequate support for door and pull aft until outboard rollers align with slots in outboard track.

(4) Tilt door so that rollers pass through slots and inboard rollers disengage from inboard track.

(5) Rotate door in such a manner as to allow it to be passed through door opening to the outside of airplane.

C. Install Center Cargo Compartment Door

(1) Provide adequate support for door and rotate in such a manner as to allow it to be passed through door opening into airplane interior.

(2) Position door adjacent to door opening and engage inboard rollers with inboard track, (figure 202). Tilt door so that outboard rollers pass through slots in, and engage with, outboard track. Push door forward clear of door opening and free compensator assembly from carriage.

(3) Install angles over slots in outboard track.

(4) Operate door throughout opening and closing cycle, including stowage location on tracks, to check the system for operating ease and the maintenance of tolerances required in its closed and latched position. The door must move through full cycle of operation smoothly with no binding spots, and torque applied to the inner handle must not exceed 450 pounds-inches, or 600 pounds-inches to the outer handle.

3. Removal/Installation Aft Cargo Compartment Door

A. General

(1) The aft cargo door, complete with compensator and carriage assemblies, may be removed from the airplane by removing the roller stop pads from the tracks and sliding the door forward and clear of the tracks.

(2) The complete cargo compartment door assembly, including compensator assembly and carriage, stowage housing covers and support structure, carriage tracks, and lower roller track may be removed from the airplane if necessary.

(3) The aft cargo door weighs approximately 47 pounds.

B. Remove Aft Cargo Compartment Door

(1) Remove roller stop pads from forward ends of upper tracks, (figure 202).

(2) Unlatch door and move inward.

(3) Provide adequate support for door and pull forward over the spring catches and clear of the tracks.

(4) Rotate door in such a manner as to allow it to be passed through door opening to the outside of airplane.

C. Install Aft Cargo Compartment Door

(1) Provide adequate support for door and rotate in such a manner as to allow it to be passed through door opening into airplane interior.

(2) Engage carriage rollers with tracks and push complete assembly aft over spring catches, (figure 202).

(3) Install roller stop pads at forward ends of tracks.

(4) Operate door throughout opening and closing cycles, including stowage location on tracks, to check the system for operating ease and the maintenance of tolerances required in its closed and latched position. The door must move through full cycle of operation smoothly with no binding spots, and torque applied to the inner handle must not exceed 450 pounds-inches, or 600 pounds-inches to the outer handle.

4. Removal/Installation Cargo Compartment Door Assembly

A. Remove Cargo Compartment Door Assembly

(1) Remove door.

(a) Close and latch door.

(b) Disconnect the two tension springs (figure 202) from inside edges of door and secure in a suitable position on compensator assembly.

(c) Remove compensator assembly to door attachment bolts, washers, radius fillers, and shims, (figure 203).

CAUTION: WHEN DETACHED FROM DOOR, COMPENSATOR IS FREE TO MOVE BOTH AFT AND OUTWARD UNDER LIGHT LOAD AND CARE SHOULD BE EXERCISED IN HANDLING TO PREVENT DAMAGE TO STRUCTURE AND COMPARTMENT LINING.

NOTE: To facilitate installation of same door, observe sequence of removal for radius fillers and, if used, shims between compensator assembly attachment angles and door inner skin.

(d) Pull compensator assembly inward and then push it forward on the carriage into the stowage housing.

(e) Provide adequate support for door.

(f) Unlatch door and remove inward from opening.

(g) Rotate door in such a manner as to allow it to be passed through door opening to the outside of airplane.

(2) Remove compensator assembly and carriage

(a) Remove screws attaching stowage housing covers and lower support structure, and remove covers and support structure.

(b) Remove roller stop pads at forward ends of tracks

(c) Provide adequate support for the compensator assembly and carriage, and pull forward over the spring catches to bring the complete assembly clear of carriage tracks.

(3) Remove carriage tracks

(a) Provide adequate support for the tracks.

(b) Remove screws, two at each track support, nuts, washers, and shims, and remove tracks from track supports, complete with stowage housing covers attachment supports

CAUTION: CARE SHOULD BE EXERCISED IN HANDLING AND STORING THE TRACKS TO ENSURE THAT THEY ARE IN NO WAY WARPED, BENT, OR CRUSHED.

NOTE: If the same tracks are to be installed, observe relationship between shims and installed location.

(4) Remove lower roller track.

(a) Remove screws attaching track, and track aft end fitting to floor, and remove track, aft end fitting, plate, and shims.

NOTE: If the same track and end fitting are to be installed, observe sequence of removal for shims and plate, and relationship between screws and installed location

B. Install Cargo Compartment Door Assembly (New door)

(1) Install lower roller track.

(a) Locate track, track aft end fitting and plate, on the floor and install attachment screws, using shims between track and floor at screw locations, and between end fitting and plate, so that mismatch between top surface of track and top edge of end fitting does not exceed -0.02 inch to +0 02 inch.

(2) Install carriage tracks.

(a) Locate the tracks in the track supports and install attachment screws, nuts, and washers.

(3) Install compensator assembly and carriage.

(a) Provide adequate support for the compensator assembly and carriage.

(b) Engage carriage rollers with tracks and push complete assembly aft over spring catches.

(c) Install roller stop pads at forward ends of tracks.

(d) Locate stowage housing covers lower support structure on floor, align attachment holes and install screws.

(e) Support stowage housing covers against support structure, align attachment holes and install screws.

(4) Install door.

(a) Provide adequate support for door and rotate in such a manner as to allow it to be passed through door opening into airplane interior.

(b) Install door in door opening, and latch in closed position.

(c) Back off on all door stop pins (figure 202) until head of pin contacts stop fitting on door.

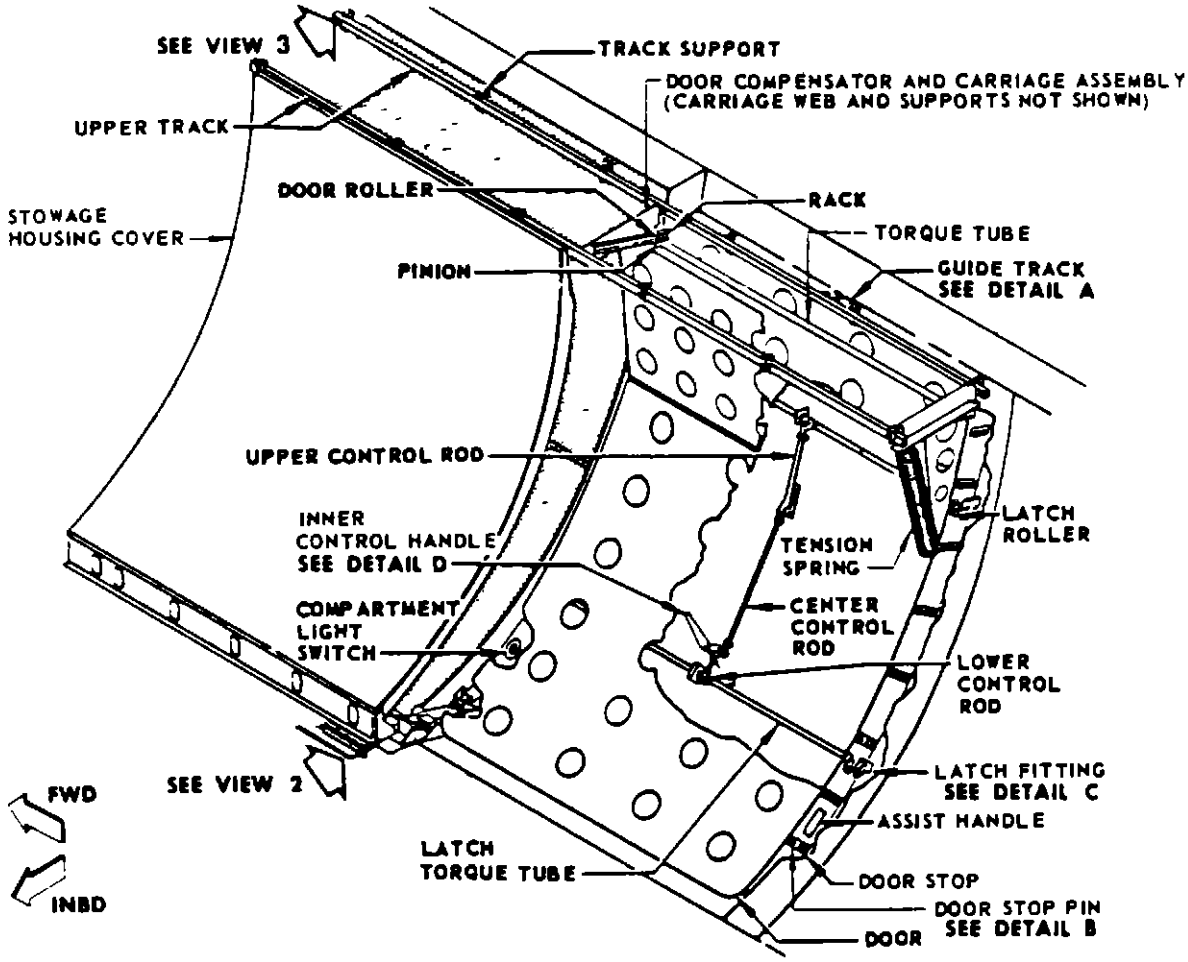
(d) Adjust, if and as required, adjustable guide, guide track, latch fitting, and control rod ends, so that door is from flush to 0.09 inch inside fuselage external contour at any point when closed and latched.

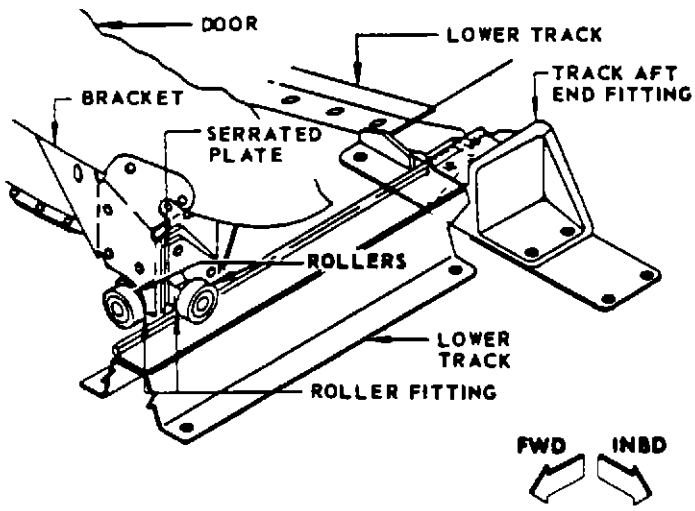
(e) With the door closed and latched, screw stop pins out until they just contact stop fittings on door jambs. On stop pins with checknuts, back off half a turn on stop pins and tighten checknuts. On stop pins with locksprings, back off half a turn on stop pins and secure stop pins with locksprings. In places where door is from 0.06 to 0.09 inch inside fuselage external contour, back off stop pins one and a half turns and lock stop pins in position.

(f) Gap between door outside skin and fuselage skin should be from 0.06 inch to 0.15 inch at any point along top and sides of door with door closed and latched. Gap at bottom of door varies with location and should be as follows: 0.35 inch to 0.50 inch for forward cargo door; 0.32 inch to 0.47 inch for center cargo door; and 0.43 inch to 0.58 inch for aft cargo door. Door skin may be filed to obtain gap.

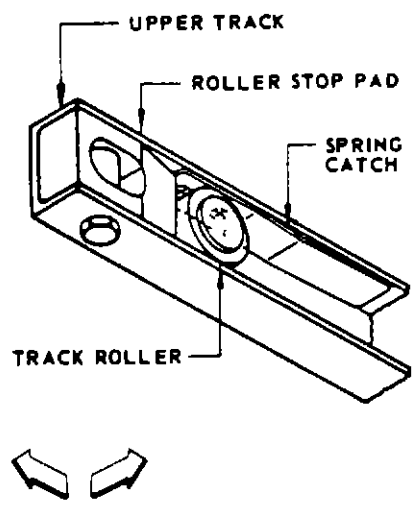
(g) With door installed in door opening and latched in closed position, free the compensator assembly and carriage and pull it aft to the roller stop pads, and then push outward to contact door inner skin.

CAUTION: WHEN DETACHED FROM DOOR, COMPENSATOR IS FREE TO MOVE BOTH AFT AND OUTWARD UNDER LIGHT LOAD AND CARE SHOULD BE EXERCISED IN HANDLING TO PREVENT DAMAGE TO STRUCTURE AND COMPARTMENT LINING.



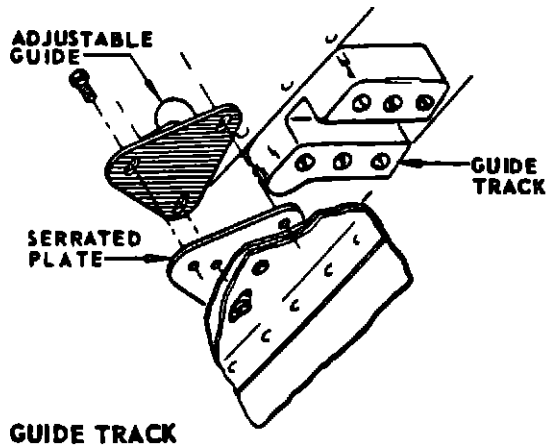


VIEW 2
LOWER TRACK AND ROLLER ASSEMBLY
(DOOR IN OPEN POSITION)

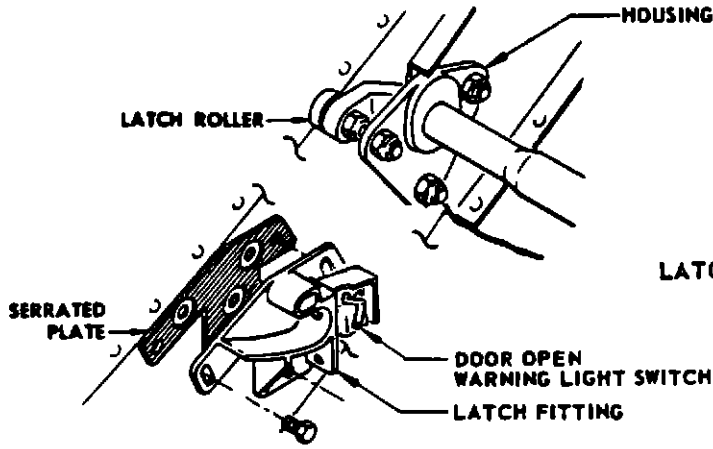


VIEW 3

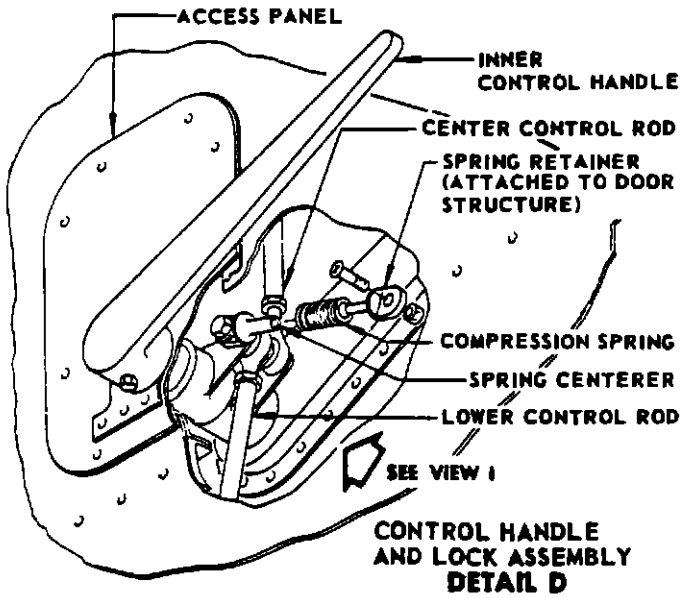
Cargo Compartment Door Installation (Typical)
Figure 202 (Sheet 1 of 3)



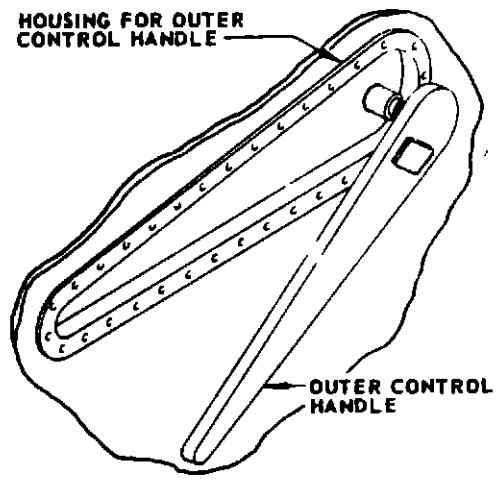
GUIDE TRACK
DETAIL A



LATCH ASSEMBLY
DETAIL C



CONTROL HANDLE AND LOCK ASSEMBLY
DETAIL D



VIEW 1

Cargo Compartment Door Installation (Typical)
Figure 202 (Sheet 2 of 3)

(h) Align compensator assembly to door attachment bolt holes and install bolts, washers and radius fillers, using shims where necessary between tracks and track supports and between door and compensator assembly, to permit unstrained assembly of complete unit. (See figure 203.)

(i) Connect tension springs between lower side of carriage and inside edge of door at both forward and aft locations.

(j) Open door all adjust the two rollers on their serrated plates located at lower, forward edge of door, so that with door in both open and closed and latched positions, the clearance between each roller and its respective part of track is between 0.00 inch and 0.036 inch

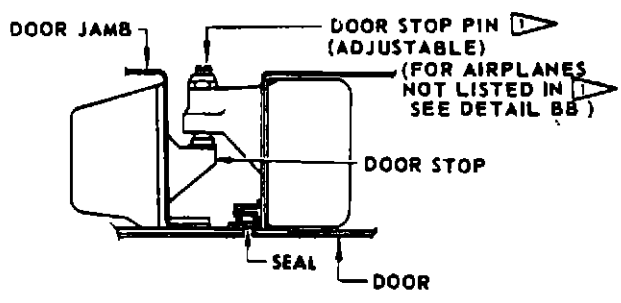
(k) Tape a 0.06 inch shim on stop fittings adjacent to latches

CAUTION DO NOT ATTEMPT TO FULLY LATCH DOOR WHEN SHIMS ARE ATTACHED TO STOP FITTINGS.

(l) Operate door to closed position until stop pins contact shims In this position.door seal must be contacting all around edge of door opening in order to ensure an adequate weather and pressure seal.

(m) Examine seal for correct seating from inside airplane while a source of light is moved around seal on outside

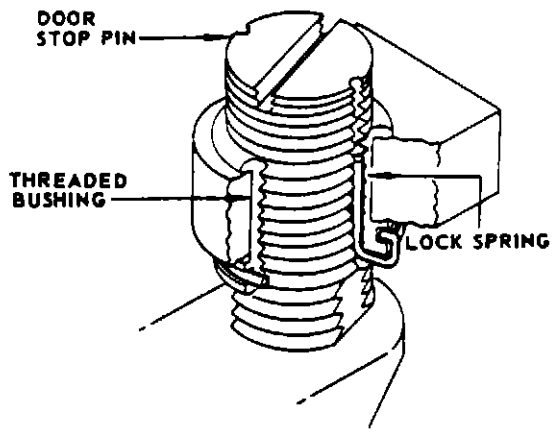
(n) Open door and remove 0.06 inch shims from stop fittings.



EFFECTIVITY

AIRPLANES OO-SJA THRU OO-SJF

DOOR STOP ASSEMBLY
DETAIL B



EFFECTIVITY

AIRPLANES OO-SJG AND ON

DETAIL BB

Cargo Compartment Door Installation (Typical)
Figure 202 (Sheet 3)

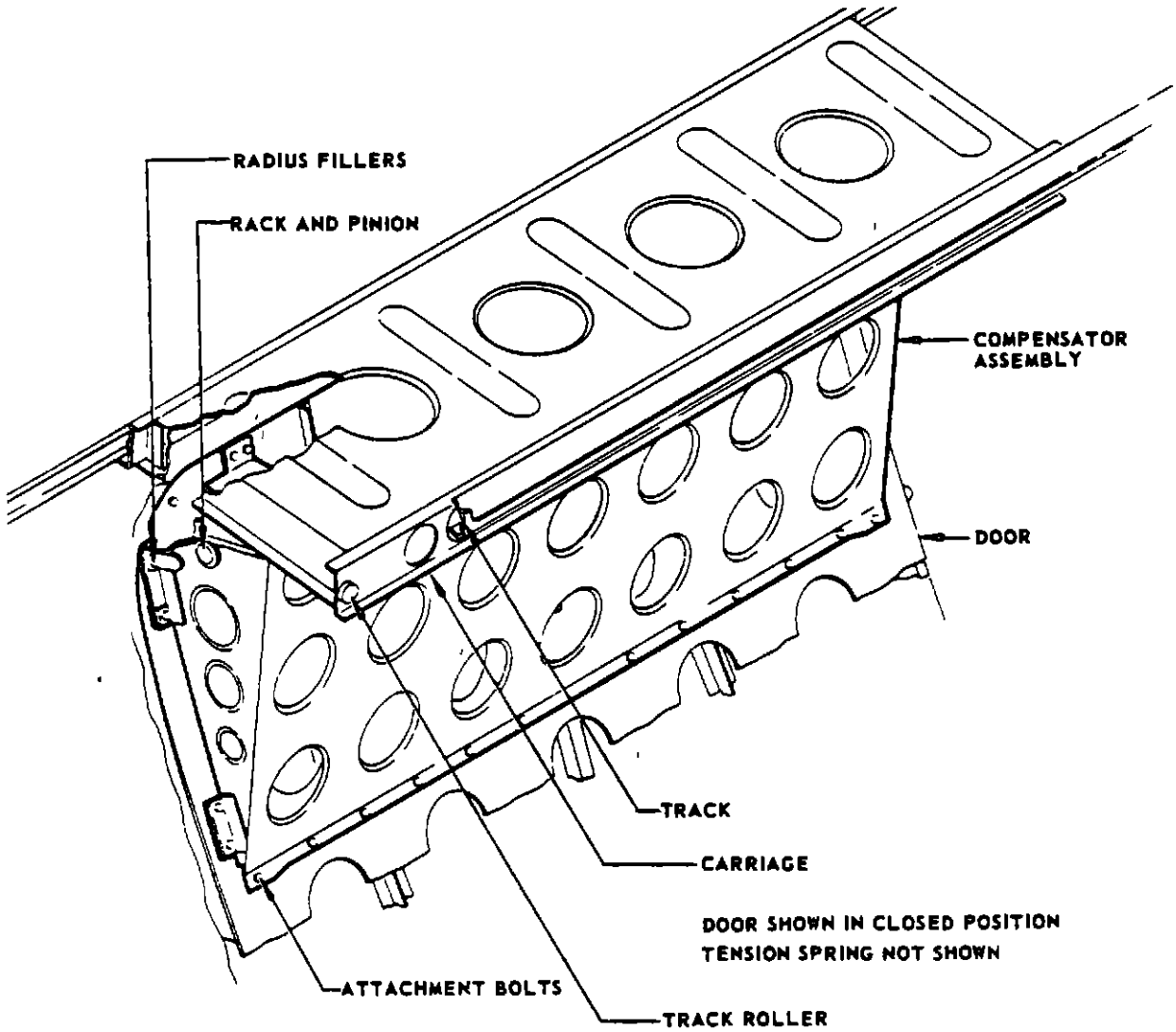
(o) Operate door throughout opening and closing cycle, including stowage location on tracks, to check the system for operating ease and the maintenance of tolerances required in its closed and latched position. The door must move through full cycle of operation smoothly with no binding spots, and torque applied to the innder handle must not exceed 450 pounds-inches, or 600 pounds-inches to the outer handle.

5. Inspection/Check Cargo Compartment Doors

A. Examine for the following:

(1) Examine external and internal skins for cracks, and corrosion.

(2) Examine frames, internal brackets, handle, and handle housing for cracks, corrosion, and loose bolts.



Installation of Cargo Compartment Doors
Compensator Assembly
Figure 203

(3) Examine door operating mechanism for cracks, corrosion, excessive wear and loose bolts.

(4) Examine latch rollers, latches, and door stops for cracks, corrosion and foreign particles lodged in latches or attached to stops.

(5) Examine drain holes at lower edge of door, inboard of seal, for obstruction.

(6) Examine door seal for cracks, cuts, tears, deterioration, and correct seating when door is in closed position.

(7) Examine guide and guide track at top of door, and door roller assembly and track at bottom of door, for cracks, corrosion, excessive wear, and foreign particles lodged in tracks or attached to guide, and rollers

(8) Examine compensator assembly and carriage webs, brackets, and support structure for cracks, and corrosion.

(9) Examine torque tube for cracks, and corrosion.

(10) Examine rack and pinion at each end of compensator for cracks, corrosion, excessive wear, and foreign particles lodged in gear teeth.

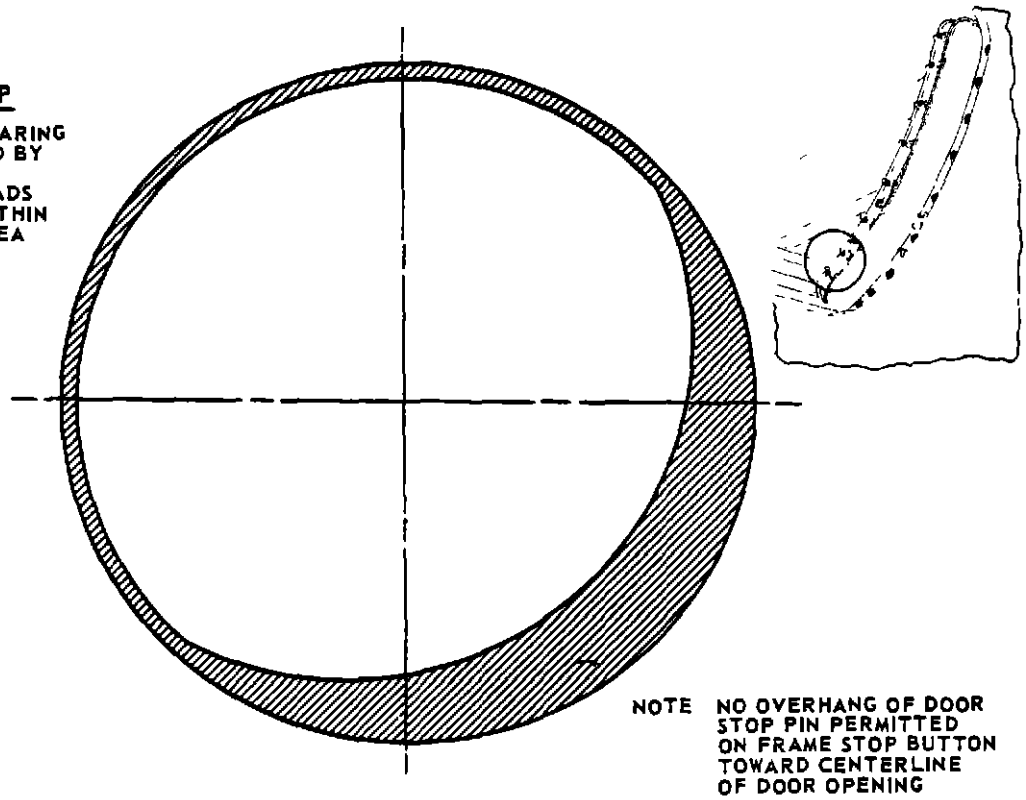
(11) Examine rollers, roller stop pads, tracks, track supports, and spring catches for cracks, corrosion, excessive wear, and foreign particles lodged in tracks or attached to rollers.

(12) Examine wear strips located in carriage tracks, and on forward edge of door sill, for cracks, corrosion, and loose or missing fasteners.

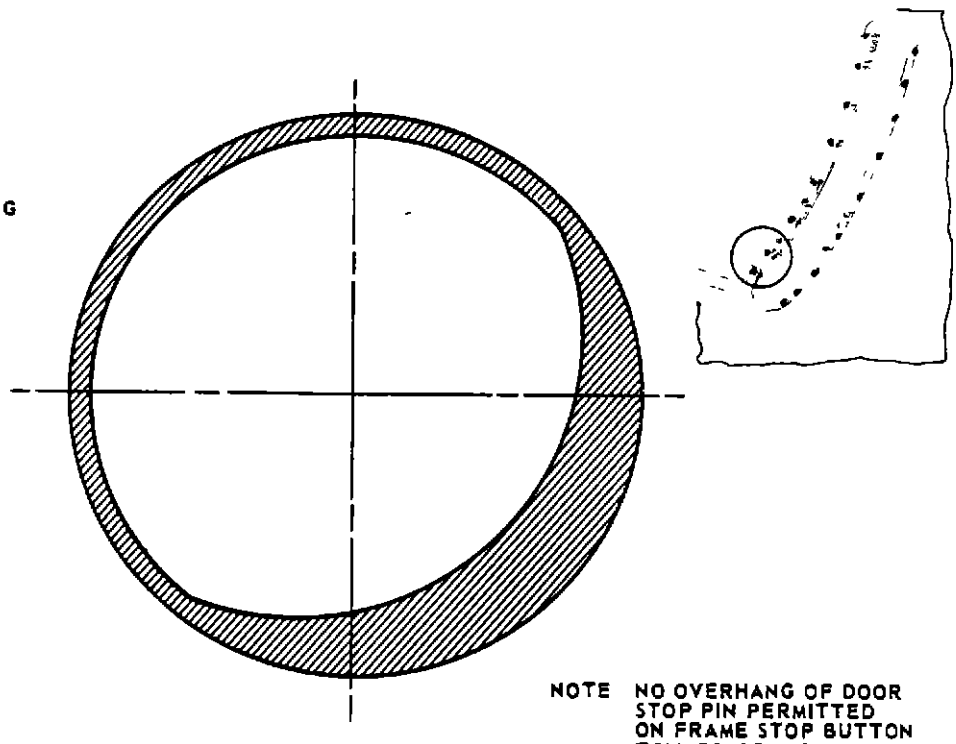
(13) Examine stowage housing covers for general condition and loose or missing fasteners.

(14) Examine door stops for misalignment, using the door stop pin bearing marks on frame stop buttons. (See figures 204 and 205.)

NOTE Door stop bearing marks are a result of flight plus fuselage pressure loads.



Door Stop Misalignment Data
(0.75 inch dia Frame Stop Button)
Figure 204



Door Stop Misalignment Data
(0.62 inch dia Frame Stop Button)
Figure 205

ELECTRONIC COMPARTMENT EXTERNAL DOOR - DESCRIPTION AND OPERATION

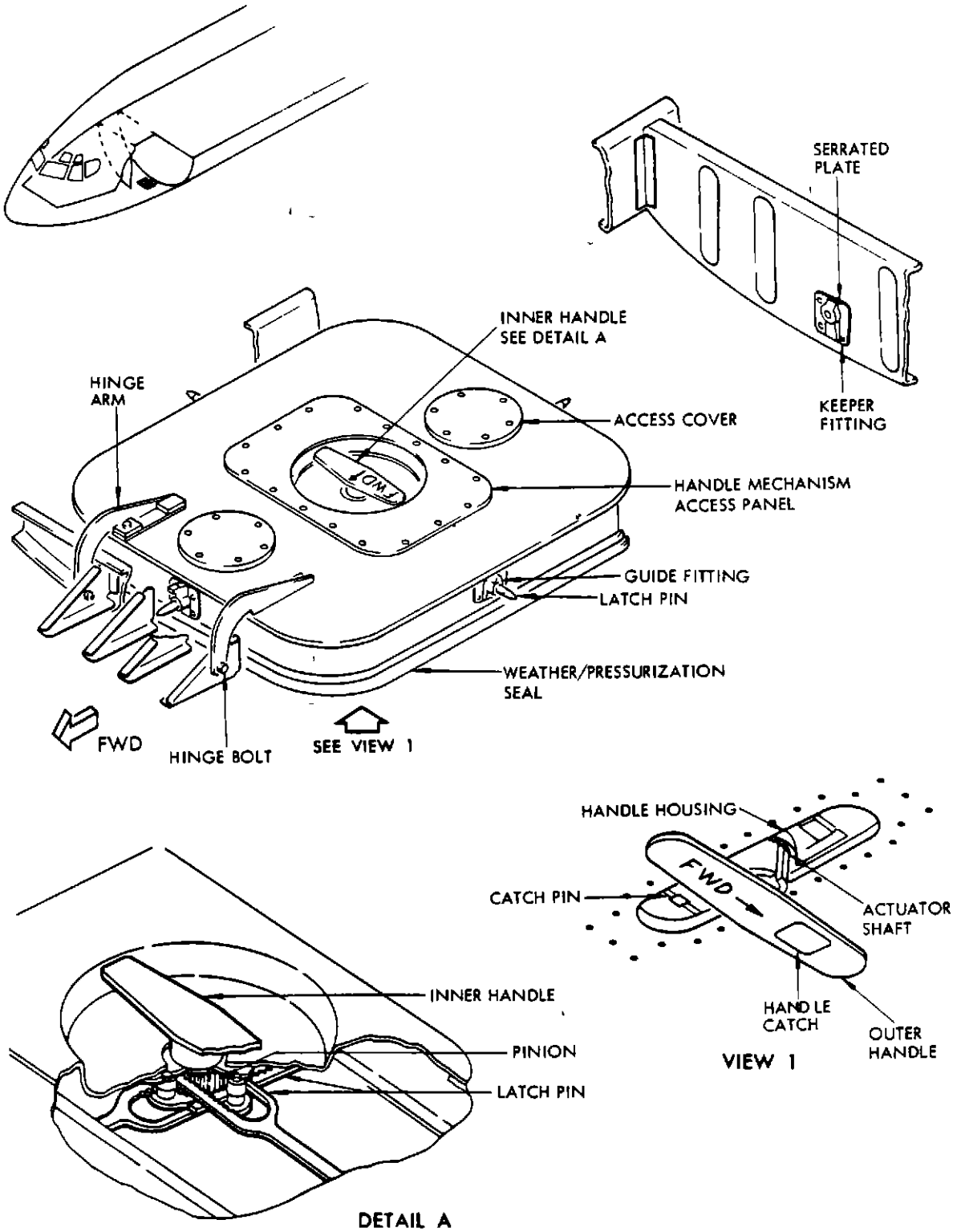
1. General

A. An external plug type door in the lower part of fuselage nose provides access to equipment in the electronic compartment.

B. The door (figure 1) is supported on two hinge arms located at forward edge of door. Two hinge bolts inside flanged bushings, connect the hinge arms to support structure on the forward frame of door opening. The hinges are designed to allow for door alignment in the door opening. The door may be opened or closed from inside or outside of airplane by means of a centrally-located, manually-operated handle, recessed flush in inner and outer surfaces of the door. An outer handle housing contains an actuator shaft on which there is a pressurization seal. Two dowel pins are located inside the actuator shaft. The outer handle is located inside the outer end of the actuator shaft and has a manually-operated release catch. Two grooves in the outer surface of handle shaft are aligned with the two pins inside the actuator shaft. The outer handle shaft contains a compression spring which seats inside the actuator shaft. The inner handle is screwed onto the inner end of actuator shaft and locked by a bolt and nut. Four latch pins, each having a rack at their inner ends, engage with a pinion on the outside of the actuator shaft. The outer ends of the latch pins pass through guide fittings bolted to the four sides of the door. The guide fittings are adjacent to adjustable keeper fittings on the door opening structure. The keeper fittings receive the latch pins when the door is closed and latched. Should the airplane interior be pressurized with the door in the closed position and accidentally unlatched, the guide fittings are designed to contact the keeper fittings and prevent further movement of the door. The recessed cover beneath the inner handle is removable. There are also two screw-down access covers on the inner surface of door, providing access to the guide fitting attachments. A continuous weather and pressurization seal is attached around entire edge of door. A switch incorporated in one of the keeper fittings is in circuit with the door warning system. Refer to 52-7-0.

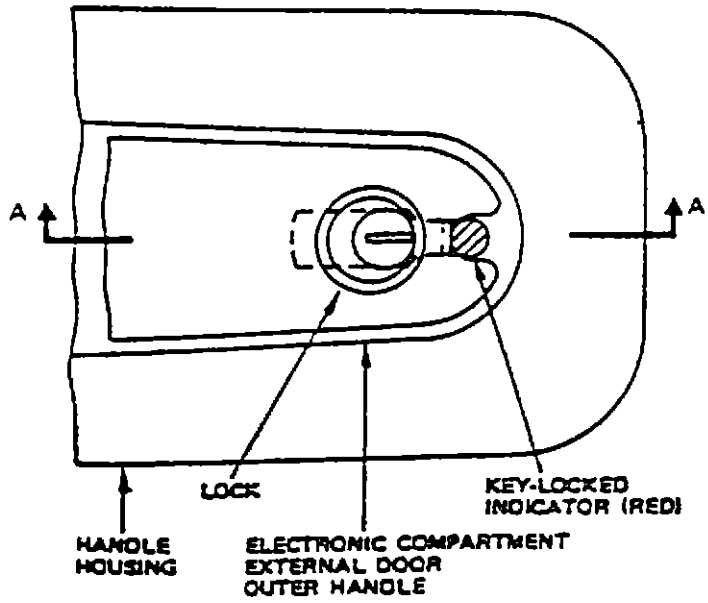
CAUTION: THE DOOR IS NOT PROPERLY CLOSED AND LATCHED UNLESS ARROWS ON BOTH INNER AND OUTER HANDLES POINT FORWARD AND OUTER HANDLE IS IN STOWED POSITION

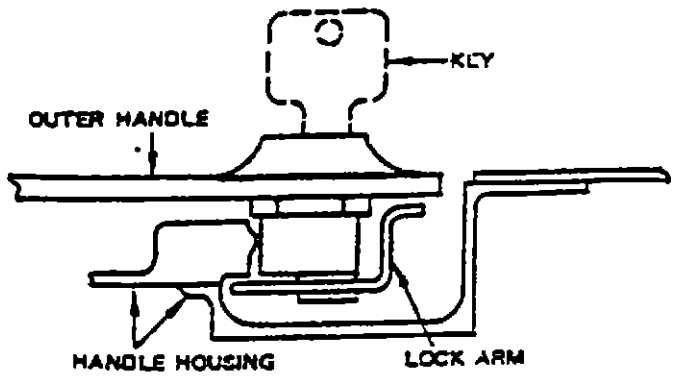
ON AIRPLANES WITH TWO CATCH PINS, ONE IN FORWARD END OF OUTER HANDLE RECESS AND ONE IN AFT END OF THE RECESS, THE HANDLE CATCH MUST BE AT FORWARD END OF OUTER HANDLE BEFORE THE DOOR CAN BE PROPERLY LATCHED.



Electronic Compartment External Door
Figure 1

C On airplanes incorporating SB 3334,
a key-operated lock (Fig 2) is installed on one end of the outer handle to prevent unauthorized entry to electronic compartment In the locked position, the key prevents operation of the outer handle A red indicator on the end of the lock arm is visible in the key-locked position





SECTION A–A

Electronic Compartment External Door Lock
Figure 2

ELECTRONIC COMPARTMENT EXTERNAL DOOR - MAINTENANCE PRACTICES

1. Removal/Installation Electronic Compartment External Door

A. Remove electronic compartment external door.

(1) Operate door handle and unlatch door.

(2) Remove hinge bolts and bushings from hinge arms

(3) Lift door from door opening and remove door.

B Install electronic compartment external door.

CAUTION. DOOR LATCH PINS MUST BE IN THE FULLY UNLATCHED POSITION PRIOR TO INSTALLATION.

(1) Lower door into door opening and engage hinge arms on the door with outer faces of hinge brackets.

(2) Install hinge bolts and bushings.

NOTE. Hinge arm hole size is oversize to allow for door alignment when closed.

2. Adjustment/Test Electronic Compartment External Door

A. Adjust electronic compartment external door (new door).

(1) Adjust vertical position of keeper fittings on serrated plates mounted on the four sides of door opening, so that with door closed and latched contour of door is from 0.030 to 0.060 inch inside fuselage contour.

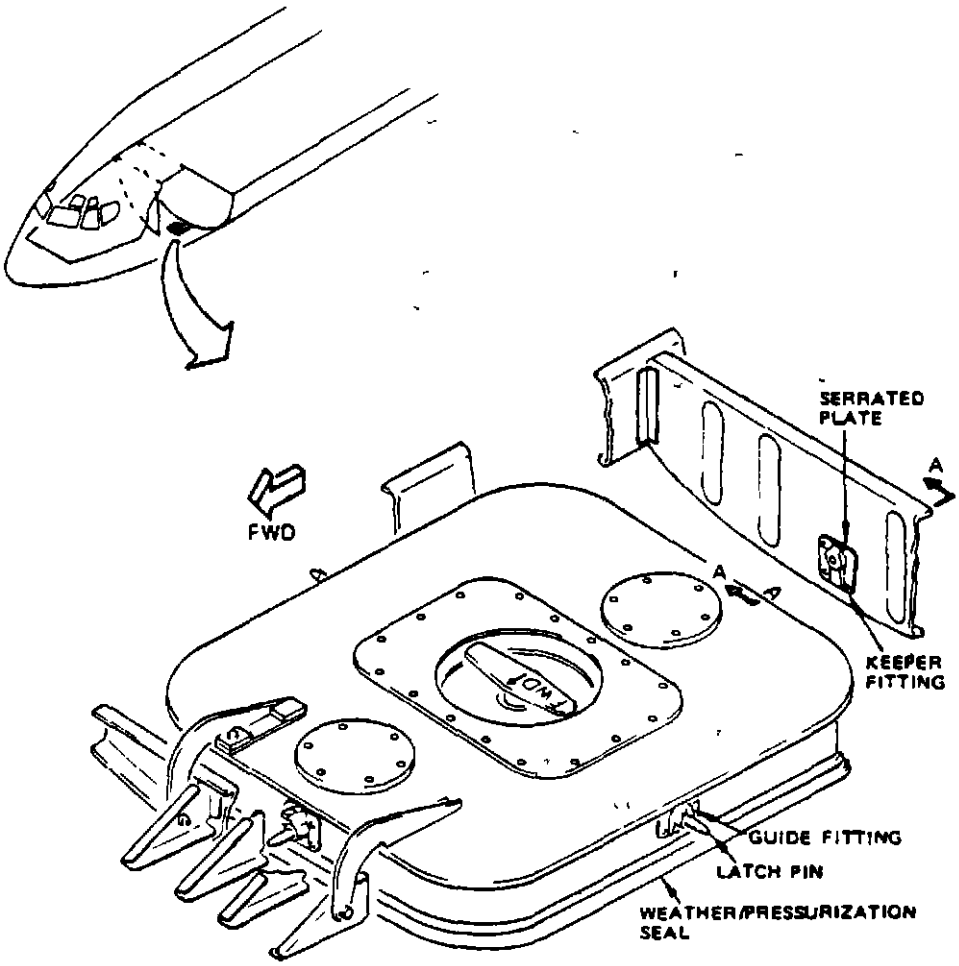
(2) Gap between door outside skin and fuselage outside skin should be from 0.030 to 0.120 inch at any point when door is closed and latched. Where necessary, trim edge of door skin to achieve this condition.

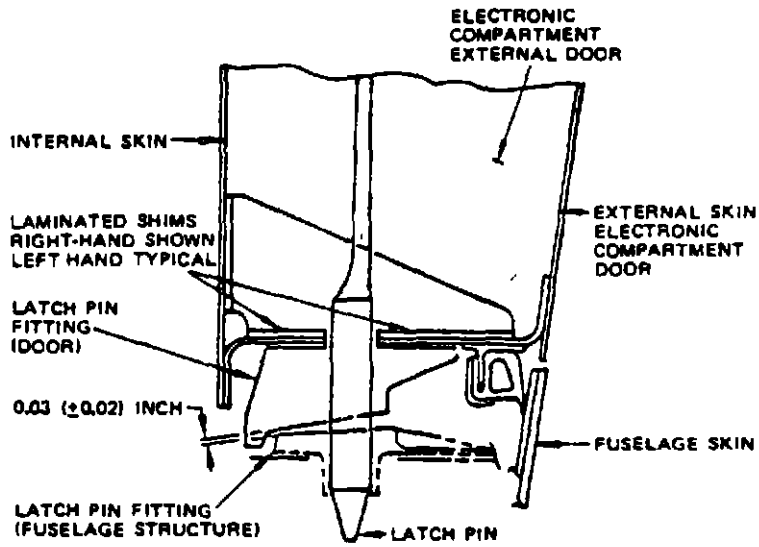
(3) Check gap between latch pin fittings on door and fuselage structure and adjust by removing laminations as required (See Section A-A, Fig. 201).

3. Inspection/Check Electronic Compartment External Door

A. Examine for the following.

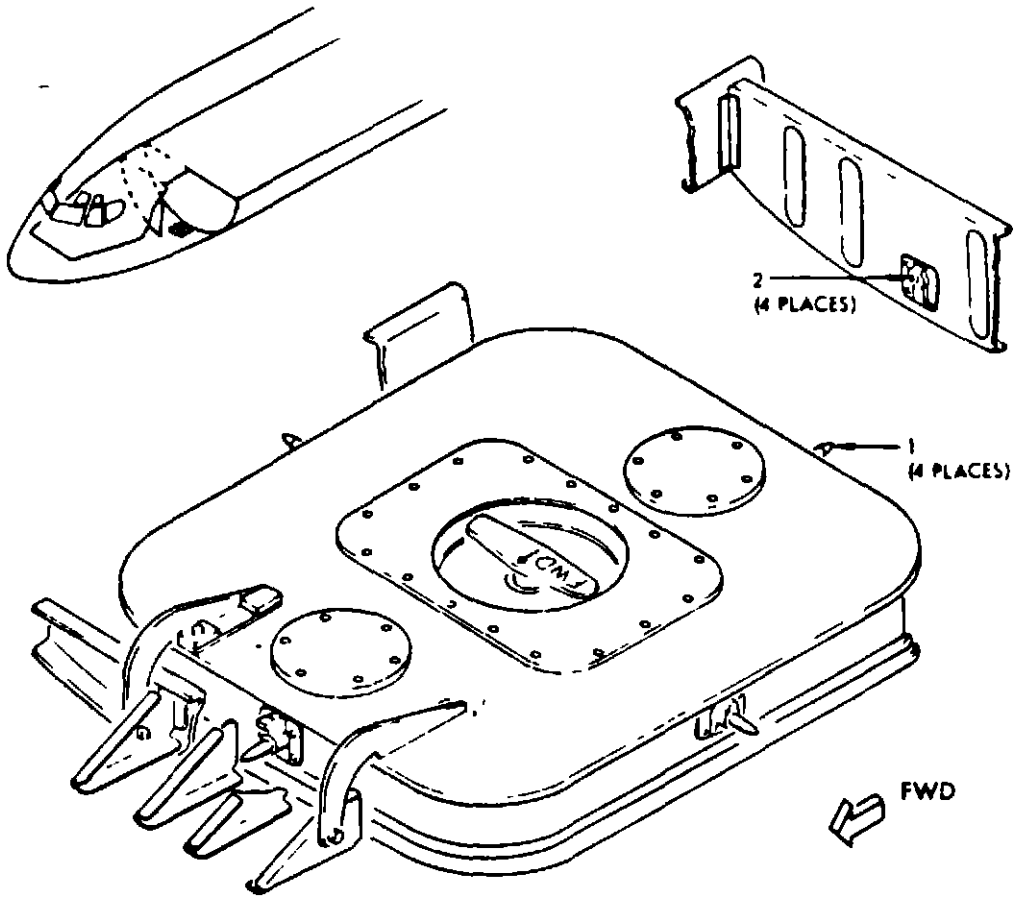
(1) Examine external and internal skin, and framing around opening, for cracks, corrosion, loose and missing fasteners.





SECTION A-A

Electronic Compartment External Door Latch Fitting Adjustment 6
Figure 201 Aug 20/76



		DESIGN LIMITS		WEAR LIMITS		REWORK LIMITS					
INDEX NO	DIM	DIAMETER		MAX WEAR DIM	MAX DIAM CLEARANCE	BUSHING OR PLATING PERMITTED			OVERSIZE HOLE OR PLATING BUILD-UP MAX	BUSHING INTERFERENCE	
		MIN	MAX			YES	NO	MTL.		MIN	MAX
1	ID	460	473	477	.045						
	OD	4325	4425	432		X		1	.005		
2	ID	460	.473	491	.060						
	OD	4325	.4425	431		X		1	005	-	

1 Cadmium QQ-P-416

(2) Examine internal beams, brackets, outer handle housing, and hinge arms for cracks, corrosion, and loose bolts.

(3) Examine door operating mechanism for cracks, corrosion, excessive wear and loose bolts.

(4) Examine latch pins, guide fittings (1, Fig. 202), and keeper fittings (2), for excessive wear, cracks, corrosion, loose bolts, and foreign particles lodged in or attached to guide fittings and keeper fittings.

(5) Examine door seal for cracks, cuts and tears or deterioration.

(6) Examine stowing hook assembly for cracks, corrosion, and loose bolts.

INTERIOR DOORS - DESCRIPTION AND OPERATION

1. Control Cabin Door

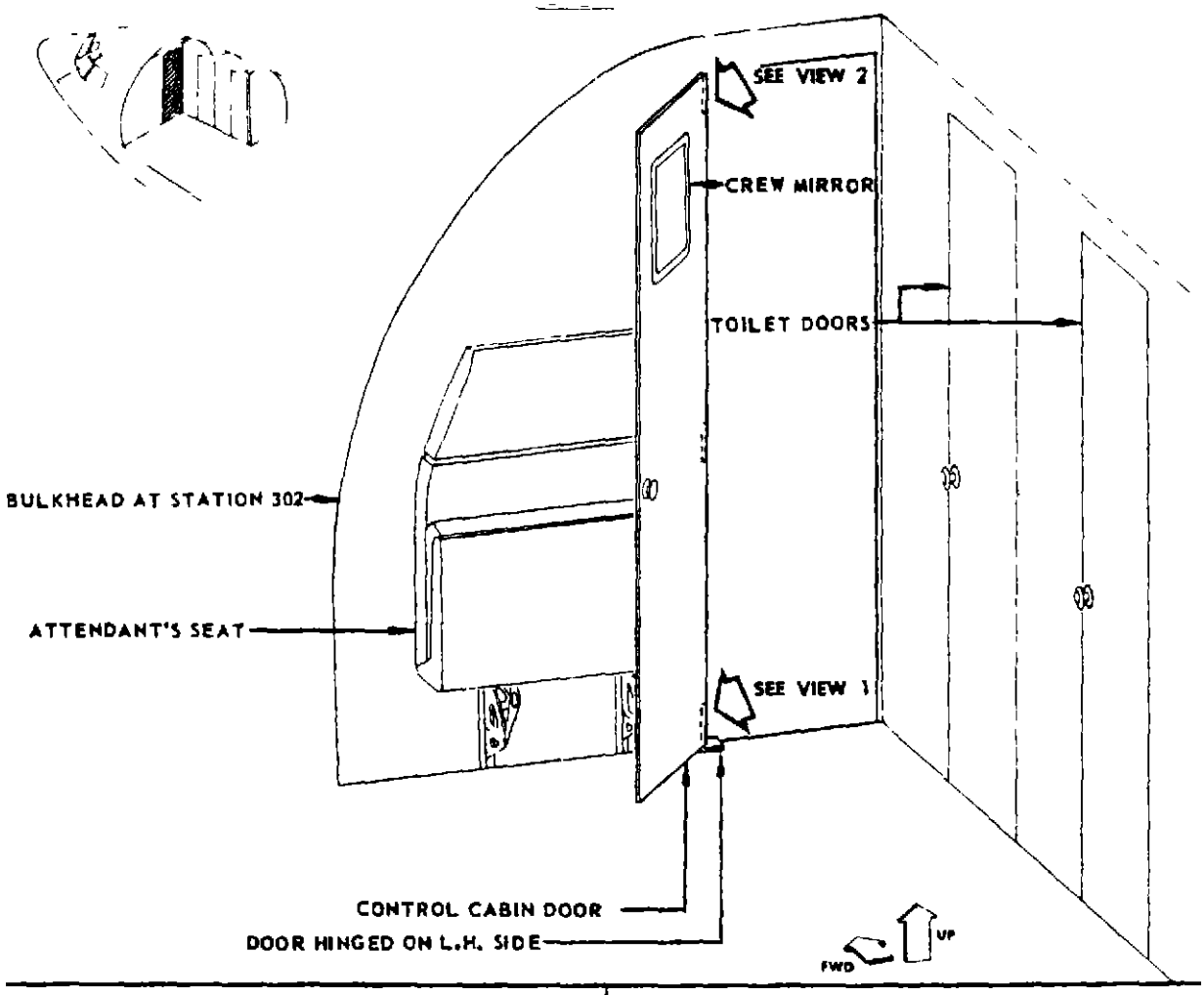
A. The control cabin door (Fig. 1) is of wood frame, paper honeycomb core sandwich panel construction. The door is supported on the left-hand side of the partition by three spring loaded hinge pins located at the top, center, and bottom of the door. A door handle and latch permits the door to be opened or closed, and locked, from either side. A mirror for use by the crew is attached to the top, forward side of the door. A screw down serrated plate at the lower hinge pickup on the floor provides vertical alignment of the hinges. The door latch bolt is designed to fail in the event of a rapid decompression inside the airplane.

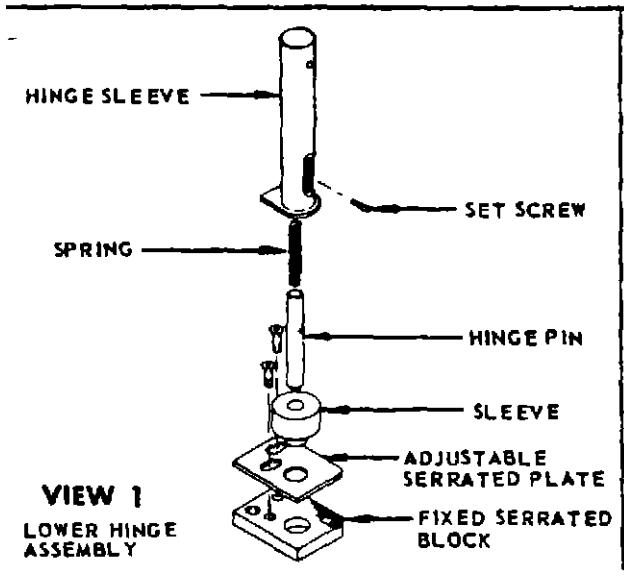
2. Lower Nose Compartment Access Door

A. The lower nose compartment access door (Fig. 2) is a cast magnesium grating bolted to a floor beam at its aft edge by means of a piano hinge. Two support fittings attached to the forward edge of the door opening, support the door flush with the top of the floor when the door is in the closed position.

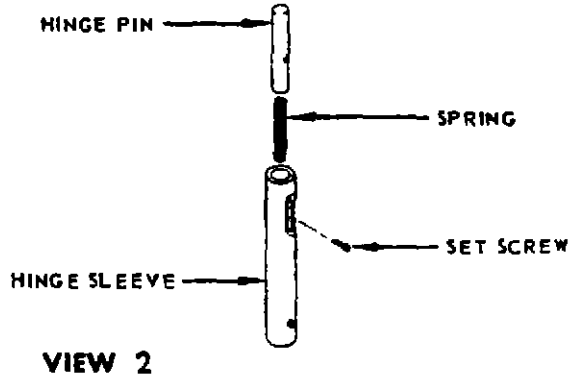
3. Toilet Doors

A. The forward toilet doors are similar in size, construction, and principle of door operation. Each toilet door (Fig. 3) is of wood frame, paper honeycomb core sandwich panel construction. Both sides are covered with a vinyl decorative panel. An upper and lower hinge screwed to the edge of the door, support the door in the door opening. A door handle permits the door to be opened or closed from either side. A slide type lockbolt allows the door to be closed and locked from inside of toilet compartment. The lockbolt is connected to an indicator above the door handle, to show whether or not the toilet is in use. At the bottom of the door is a depressurization louver and grille above which, on the outside of the door, is a door bumper. A coat hook is provided at the top of the door on the inside surface. On airplanes incorporating SAB 707/722, a self-contained ashtray is installed on aisle side of the door. A switch in the lockbolt receptacle on doorjamb is in circuit with the toilet compartment mirror lights. The door may be unlocked from outside the compartment in case of emergency by either of two methods, depending upon the design of latch installed. On early airplanes, a coin or other suitable object may be inserted in the slot of the sliding indicator panel, which can then be pushed downwards until the latch bolt is withdrawn. On later airplanes a small pin protrudes slightly through a lateral slot in the face of the fixed indicator panel. The latch bolt may be withdrawn by applying a fingernail, or any equivalent implement, to the pin and sliding it away from the door edge. Most replacement spares latches are of this latter design.



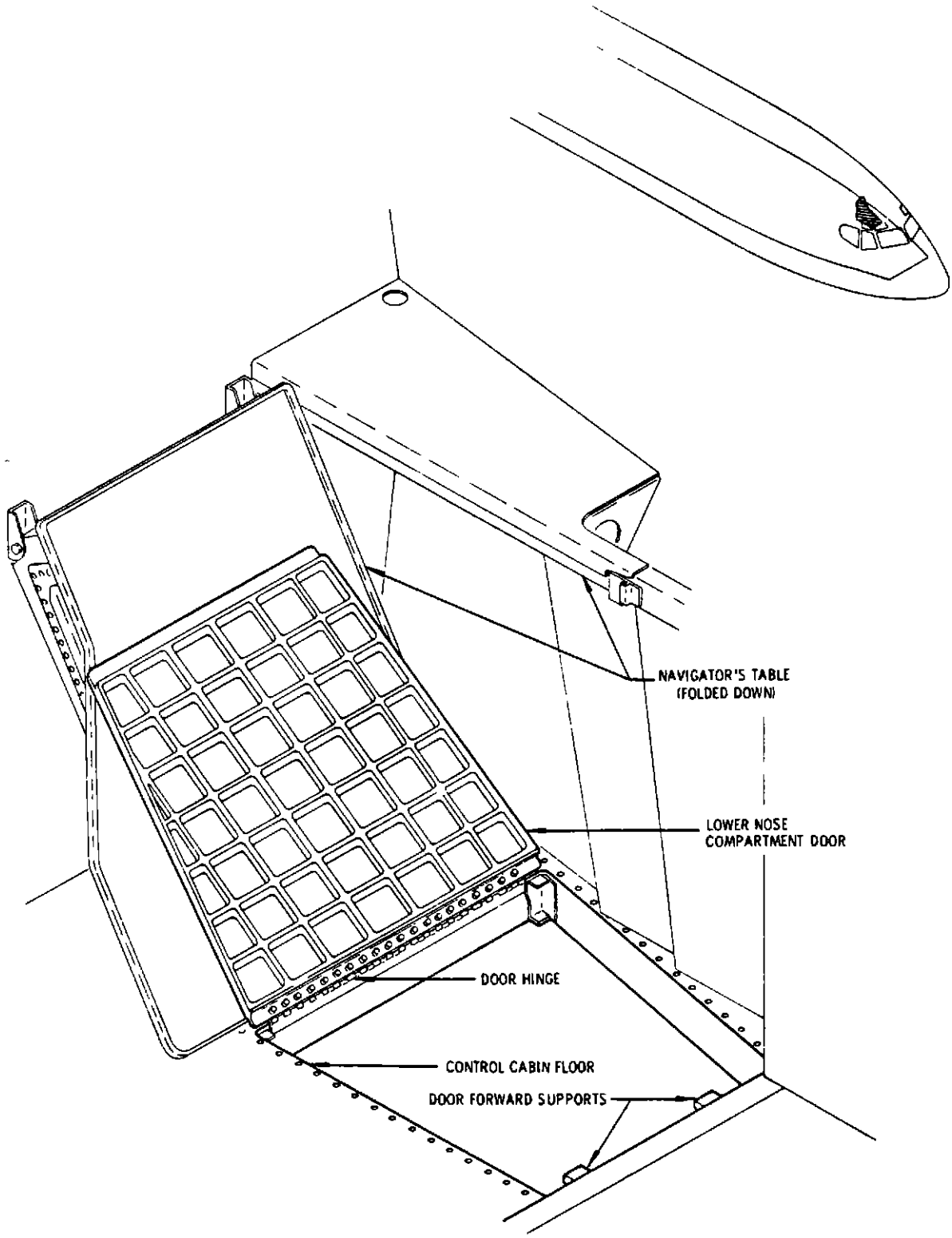


VIEW 1
LOWER HINGE ASSEMBLY

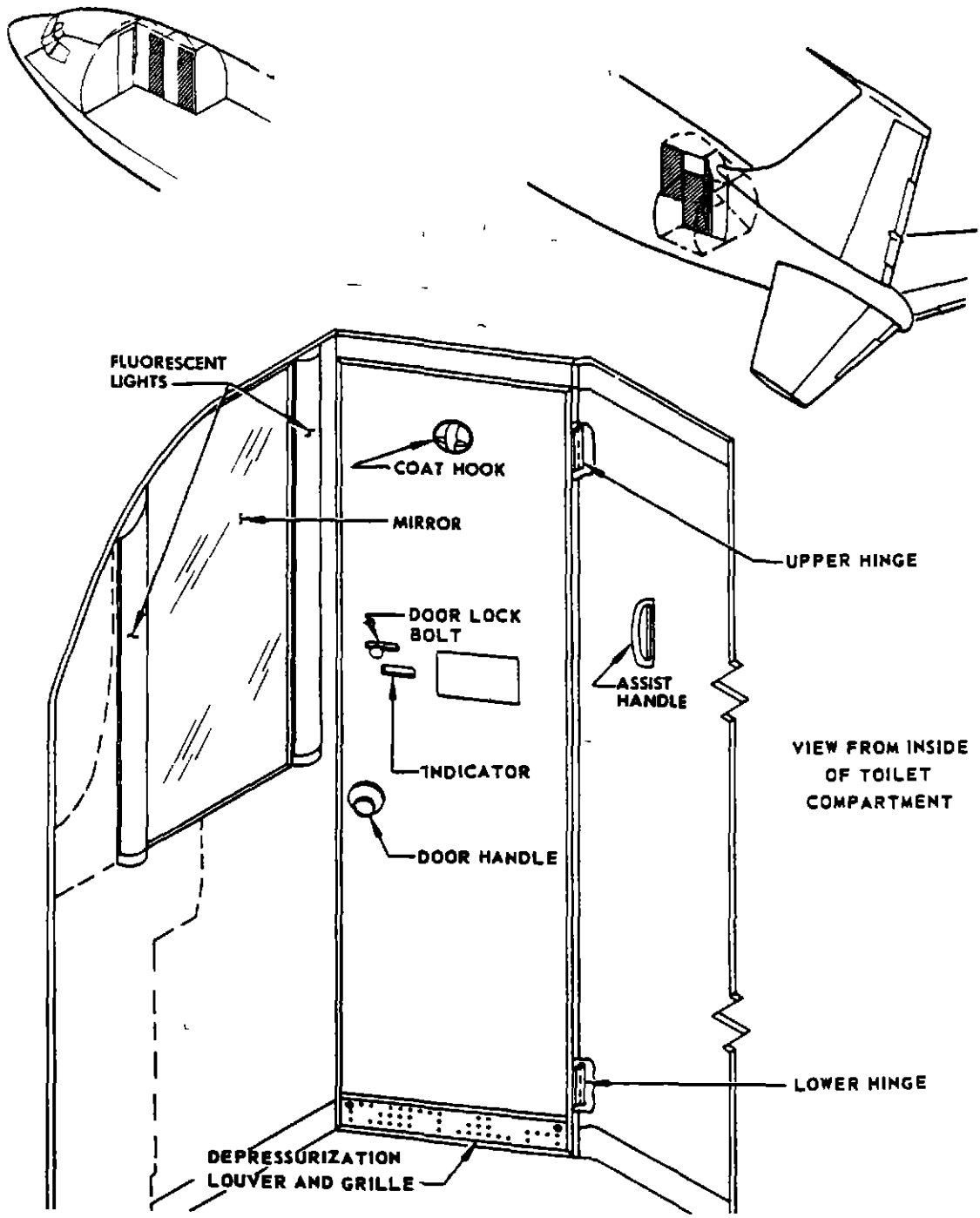


VIEW 2
UPPER HINGE ASSEMBLY
(CENTER HINGE ASSEMBLY SIMILAR)

Control Cabin Door
Figure 1



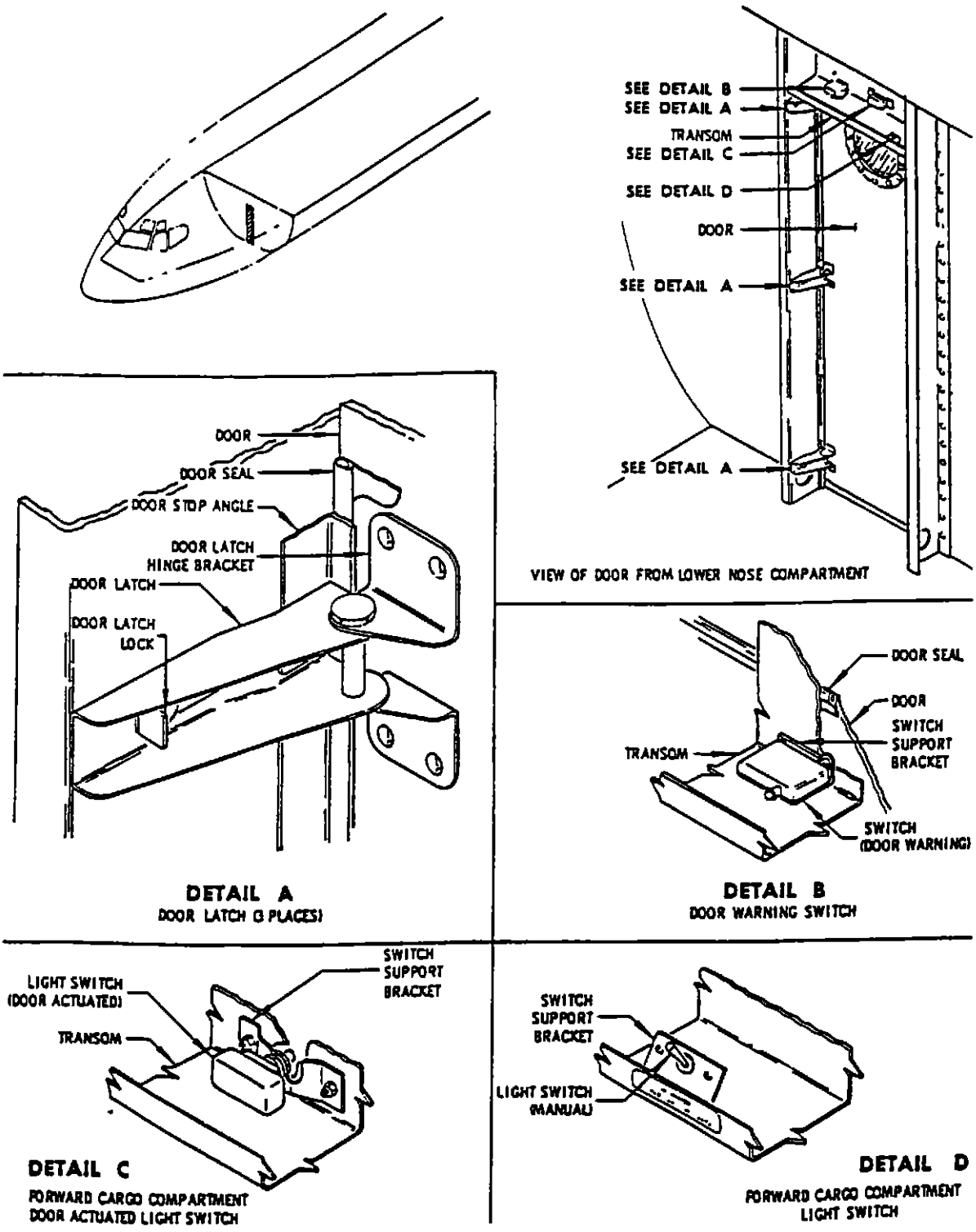
Lower Nose Compartment Access Door
Figure 2



Toilet Door (Typical)
Figure 3

4 Forward Cargo Compartment Interior Access Door

A The forward cargo compartment interior access door (figure 4) is of metal honeycomb core sandwich, metal skin panel construction The door is supported on the left hand side of the bulkhead by three piano hinges located at the top, center and bottom of the door Three hinged door latches with integral latch locks are attached to the right hand side of the door opposite the door hinges A door stop angle is attached to the edge of the door frame opening A continuous pressurization seal is cemented around entire forward edge of the door A small observation window is located near the top of the door A switch (detail B) attached to the left hand side (facing aft) of the door transom is in circuit with the door warning system Refer to 52-7-0 A second switch (detail C) attached to the center of the door transom is in circuit with the forward cargo compartment interior lights A toggle switch (detail D) attached to the right hand side (facing aft) of the door transom provides control of the forward cargo compartment lights independent of door operation
Refer to Cargo Compartment Lighting, Chapter 33 It is not possible to open or close and latch the door from inside the forward cargo compartment



Forward Cargo Compartment Interior Access Door
Figure 4

5 Cargo Compartment Partition Aft Door

A The cargo compartment partition aft door is constructed of a spruce frame with two layers of paper honeycomb sandwiched between fiberglas sheets Both exterior faces are covered with decorative sheet (See figure 5) The door is supported at station 600L by a continuous extruded section hinge Two sliding latches and one handle-operated latch enable the door to be opened and closed from either side of the door An assist handle is located at the top outboard side of the door The door is made tight against smoke or fumes by the following

(1) A length of neoprene rubber sponge at the hinge line

(2) An extruded silicone bulb-section seal at the bottom of the door

(3) Rubber facing at the door frame for the top and forward door edges

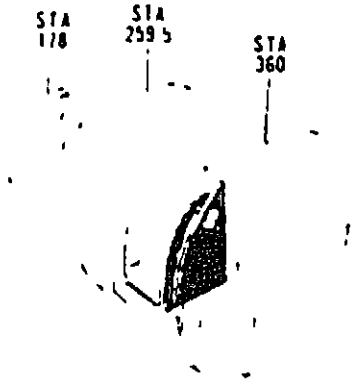
6 Cargo Compartment Partition Forward Door

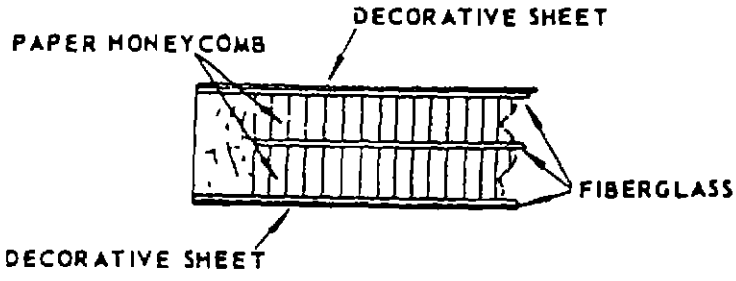
A The partition forward door consists of two panels, the inboard one hinged from the partition on an extruded hinge at body station 350 and the outer panel hinged from the inboard panel Each of the panels is made of a spruce frame and paper honeycomb sandwiched between fiberglass sheet, with decorative facing on each side of the panels The inboard panel when in the closed position is secured to the airplane structure by two sliding latches The outboard panel is secured, in the closed position, by a handle-operated latch, and is chamfered to permit opening of only the outboard panel The forward partition door is made smoke and fume proof in the closed position by the following

(1) Neoprene sponge rubber at the hinges

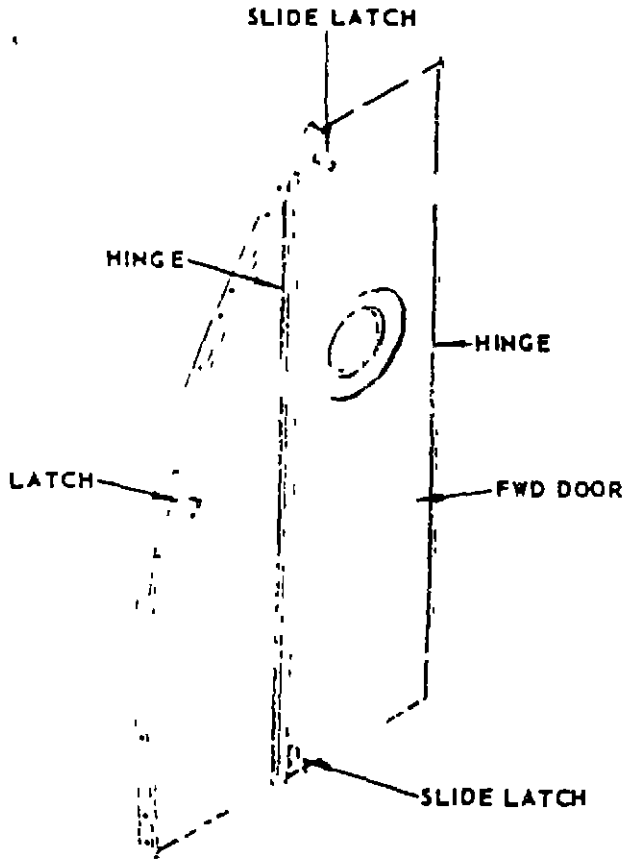
(2) Extruded bulb-section silicone rubber seals at the bottom of the panels

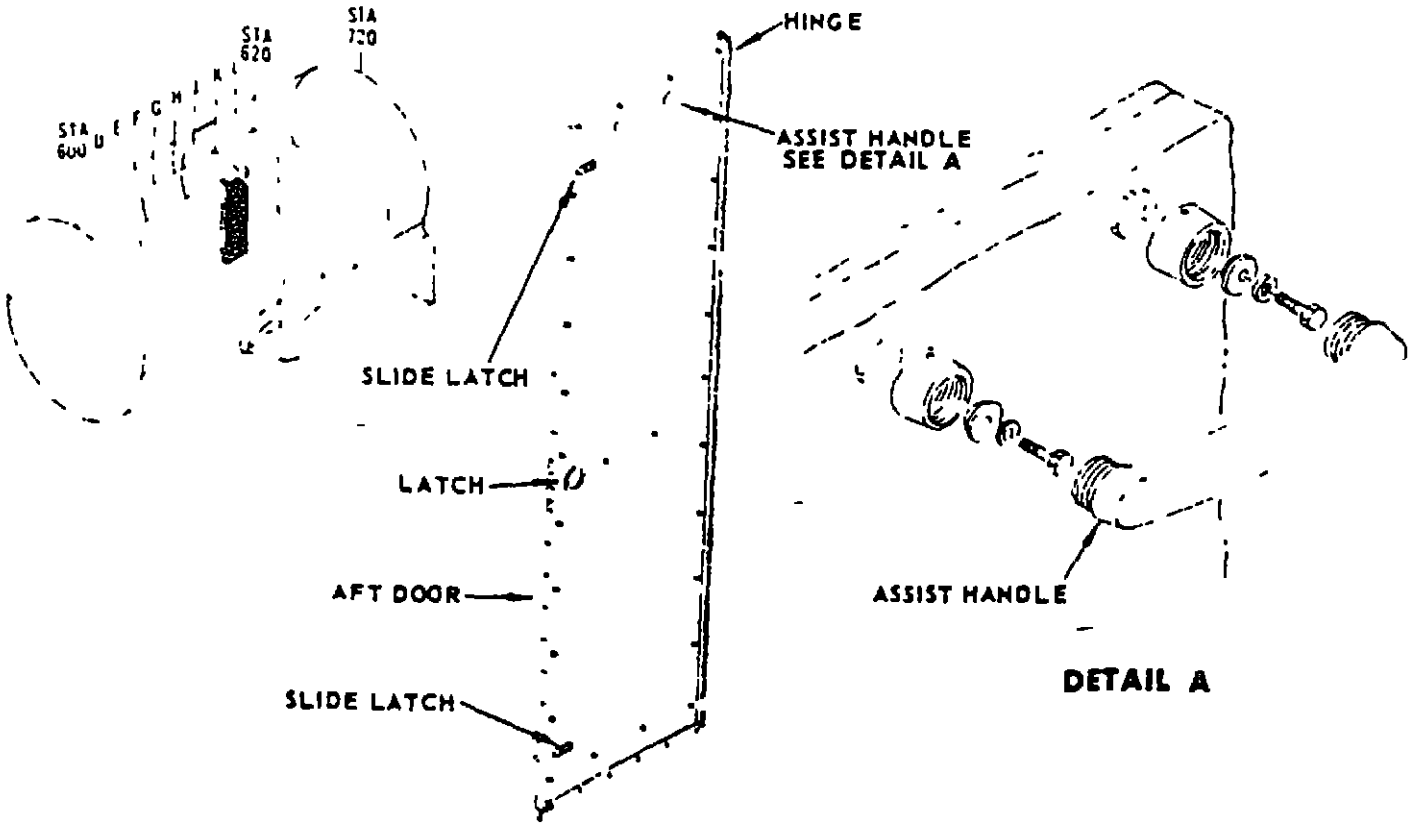
(3) Silicone rubber facing at the contoured portion of the door frame





TYPICAL DOOR SECTION





DETAIL A

CONTROL CABIN DOOR - MAINTENANCE PRACTICES

1. Removal/Installation Control Cabin Door

   A. Remove Control Cabin Door

      (1) Open door to position where slots in edge of door adjacent to hinge pins are readily accessible.

      (2) Provide adequate support for door.

      (3) Using an Allen wrench in head of upper hinge pin set screw, fully depress hinge pin and retain in this position.

      (4) Repeat step (3) for center and lower hinge pins.

      (5) Remove door from door opening.

   B. Install Control Cabin Door

      (1) Support door in door opening.

      (2) Using an Allen wrench in head of upper hinge pin set screw, fully depress hinge pin and retain in this position.

      (3) Repeat step (2) for center and lower hinge pins.

      (4) Position center hinge support in center of hinge slot on door and allow hinge pin to engage with hole in hinge support.

      (5) Allow upper and lower hinge pins to engage with their respective holes.

2. Adjustment/Test Control Cabin Door

   A. Adjust Control Cabin Door

      (1) Adjust vertical alignment of three hinges by means of screw down serrated plate at lower hinge position.

3 Control Cabin Doorstop - Approved Repairs

A General

(1) The control cabin doorstop mounted on the door is designed to fall in the case of sudden decompression in the control cabin In case of rapid decompression in the passenger cabin, pressure equalization occurs by air leaking around the door

(2) The following repair procedure assumes that the doorstop has failed and that the doorstop and backplate are not salvageable The doorstop and backplate are riveted together, if failed doorstop and backplate are salvageable they may be riveted together using MS20426A3 rivets

CAUTION NO SUBSTITUTE FOR THESE RIVETS IS ALLOWED

B Repair Doorstop Attached to Door (Fig 201)

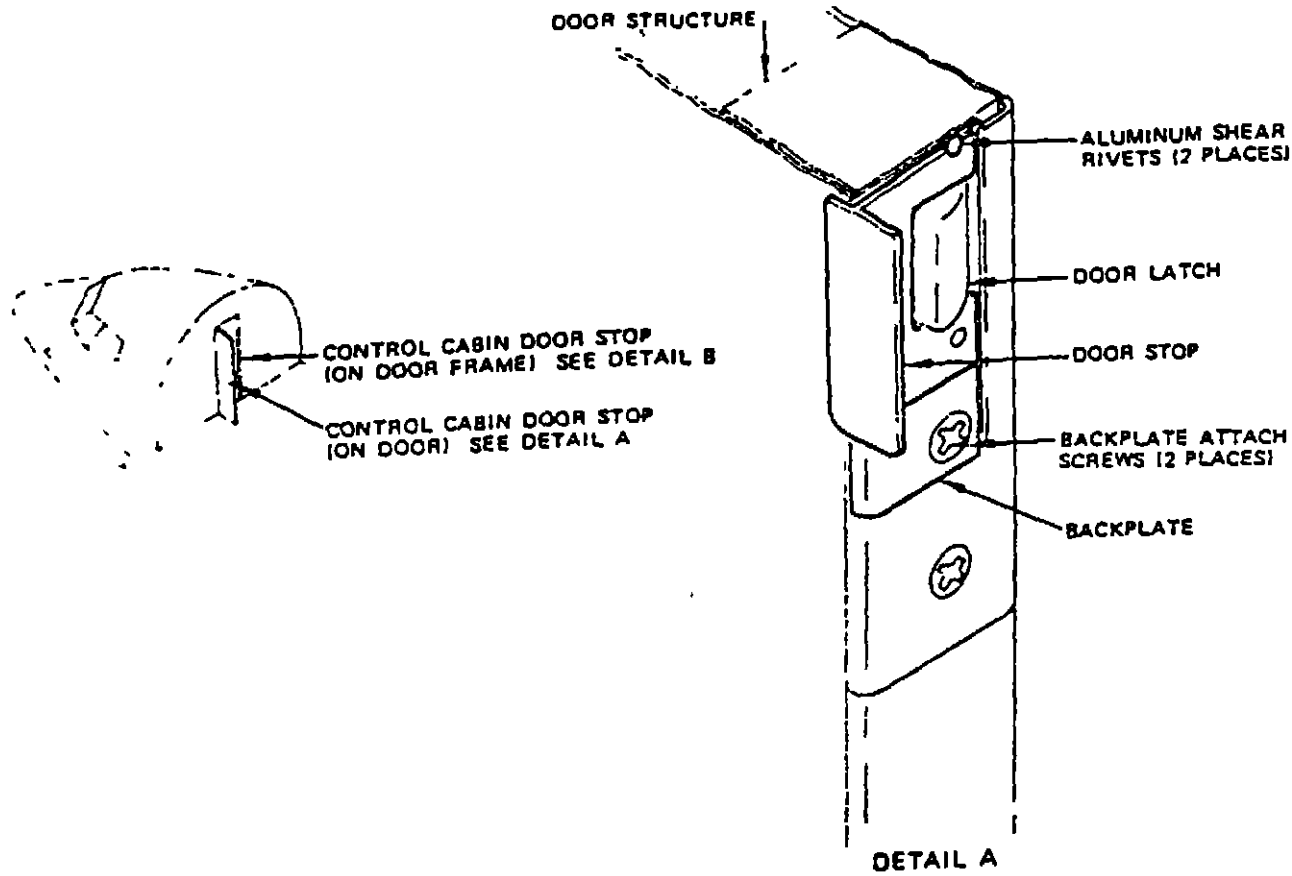
(1) Remove two screws attaching backplate to door structure and remove backplate

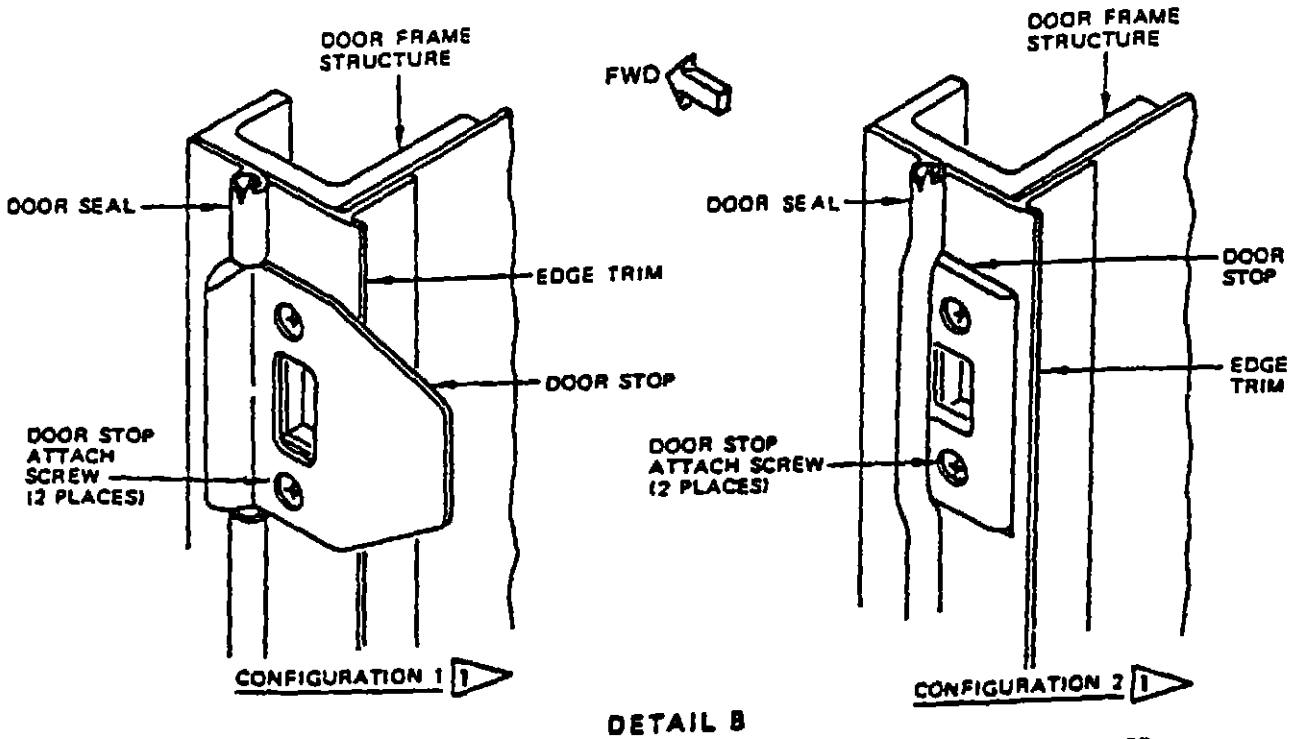
(2) Check door seal for damage, replace if necessary

(3) Install new doorstop and backplate assembly (doorstop is riveted to backplate) on door using two screws

(4) Check door and latch operation

C Deleted





1 EITHER CONFIGURATION 1 OR CONFIGURATION 2 DOOR STOP IS INSTALLED ON DOOR FRAME. SHEAR-OUT CAPABILITY IS NOT PROVIDED ON THESE STOPS.

Control Cabin Door Stop Installation
Figure 201

LAVATORY DOOR KNOB - REMOVAL/INSTALLATION

1. General

A. The lavatory door knob mechanism consists of two knobs, two knob inserts, two escutcheons, a shaft, and a bolt assembly. Both knobs are secured to the shaft by self-locking nuts which are covered by knob inserts. On one knob, the insert is bonded in place; and, on the other knob, the insert is held in place by a snapring retainer. Disassembly of the knob mechanism should only be accomplished by removing the knob insert which is held in place by the snapring.

2. Remove Lavatory Door Knob

A Remove snapring (1) and lift out knob insert (2). (See figure 401.)

NOTE: Do not attempt to remove the bonded knob insert.

B. Remove nut (3) from shaft.

C. Disassemble by removing knob (4), washer (5), escutcheon (6), and withdraw knob and shaft assembly (7) from the bolt assembly.

D. Remove washer (5) and escutcheon (6) from the opposite side of door.

E. Remove bolt assembly by withdrawing it from the door.

3. Install Lavatory Door Knob

A. Insert bolt assembly into door.

B. Insert washer (5) into escutcheon (6).

C. Install knob and shaft assembly (7) through assembled washer and escutcheon.

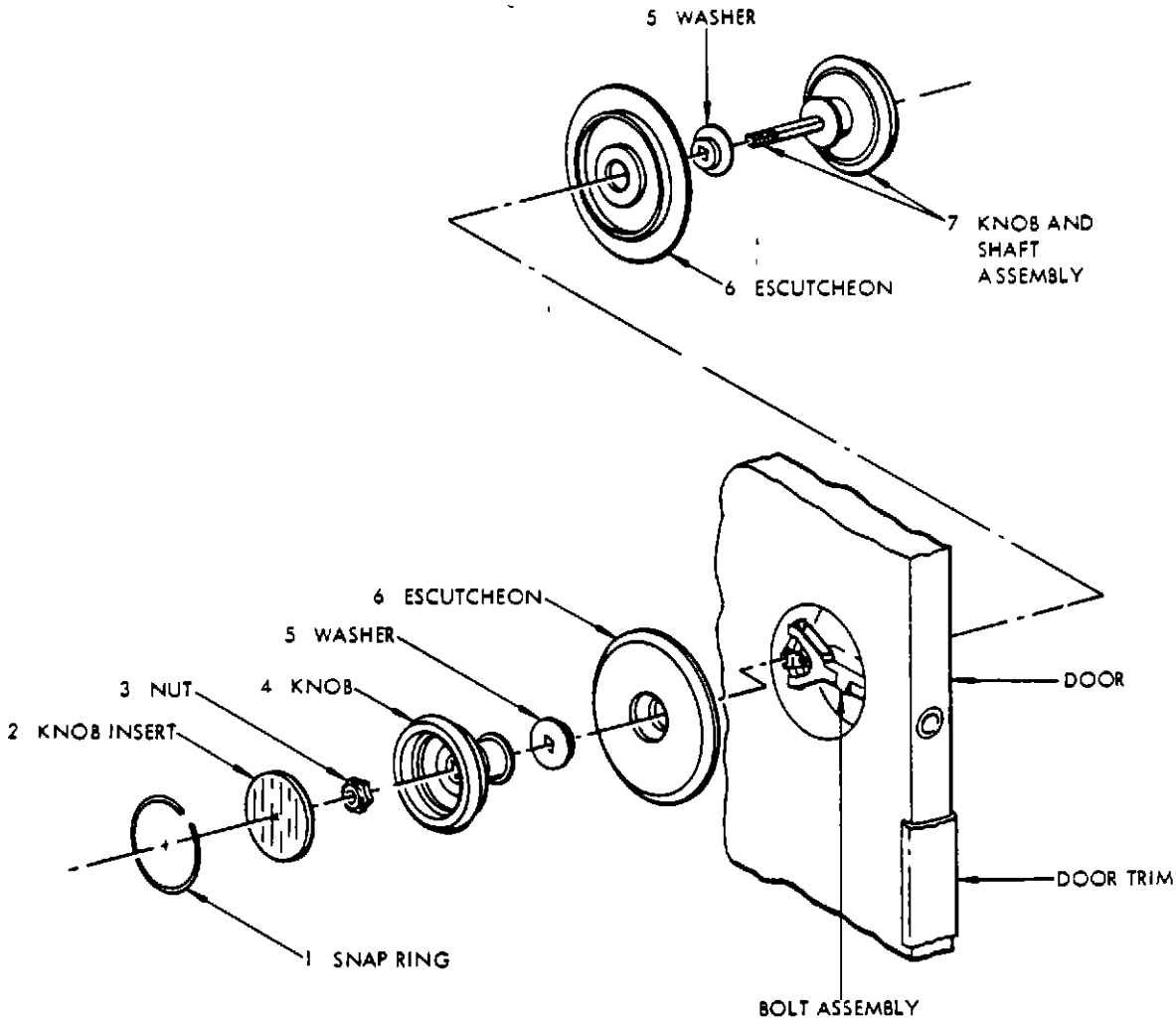
D. Insert shaft through driver of bolt assembly.

E. Repeat step B. and install escutcheon with washer on opposite side of door.

F. Install knob (4) on shaft.

G. Install nut (3) on shaft and tighten nut until latch operates smoothly.

H. Install knob insert (2) and snapring (1).



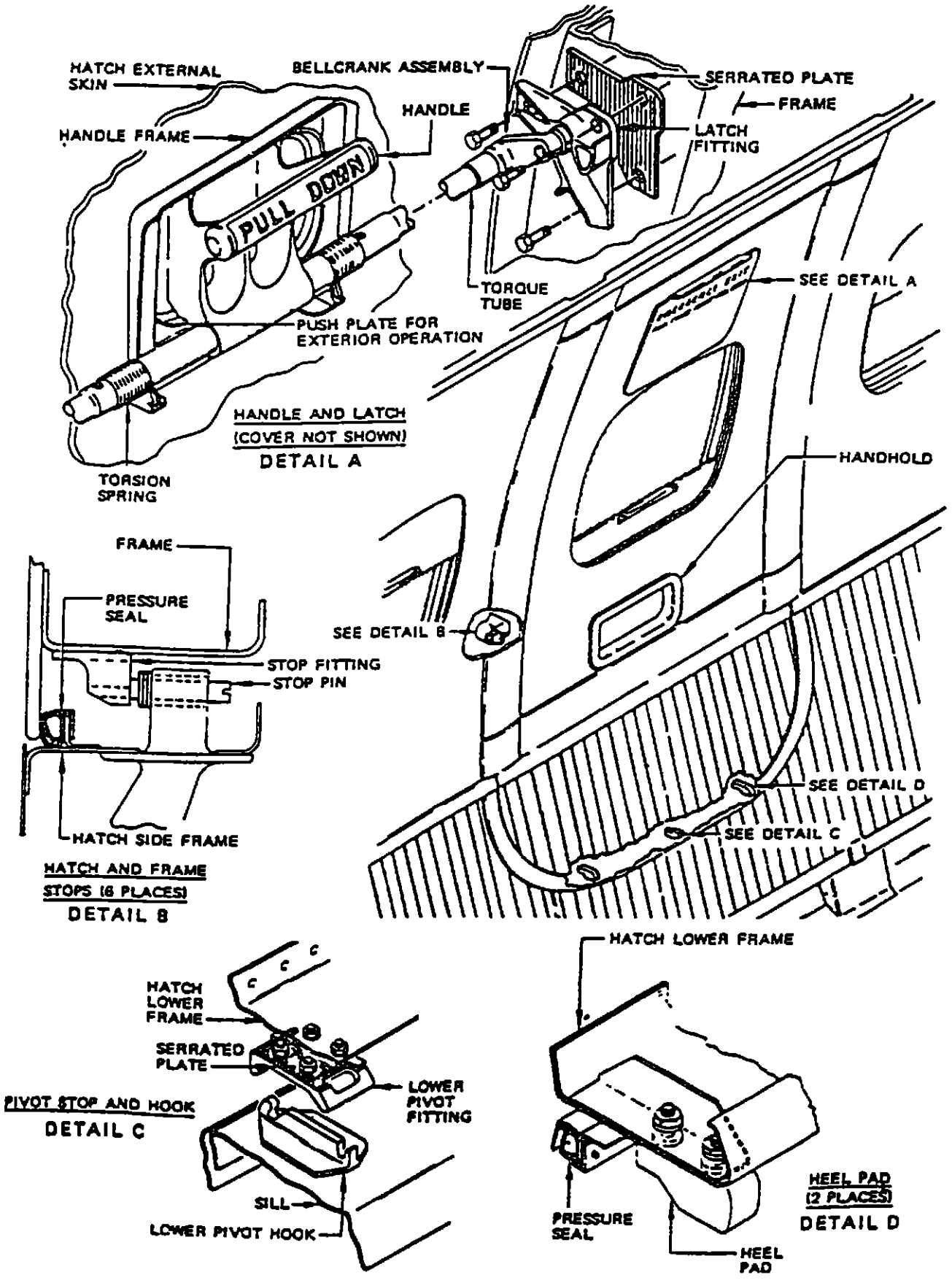
Door Knob Mechanism
Figure 401

EMERGENCY EXIT HATCH - DESCRIPTION AND OPERATION

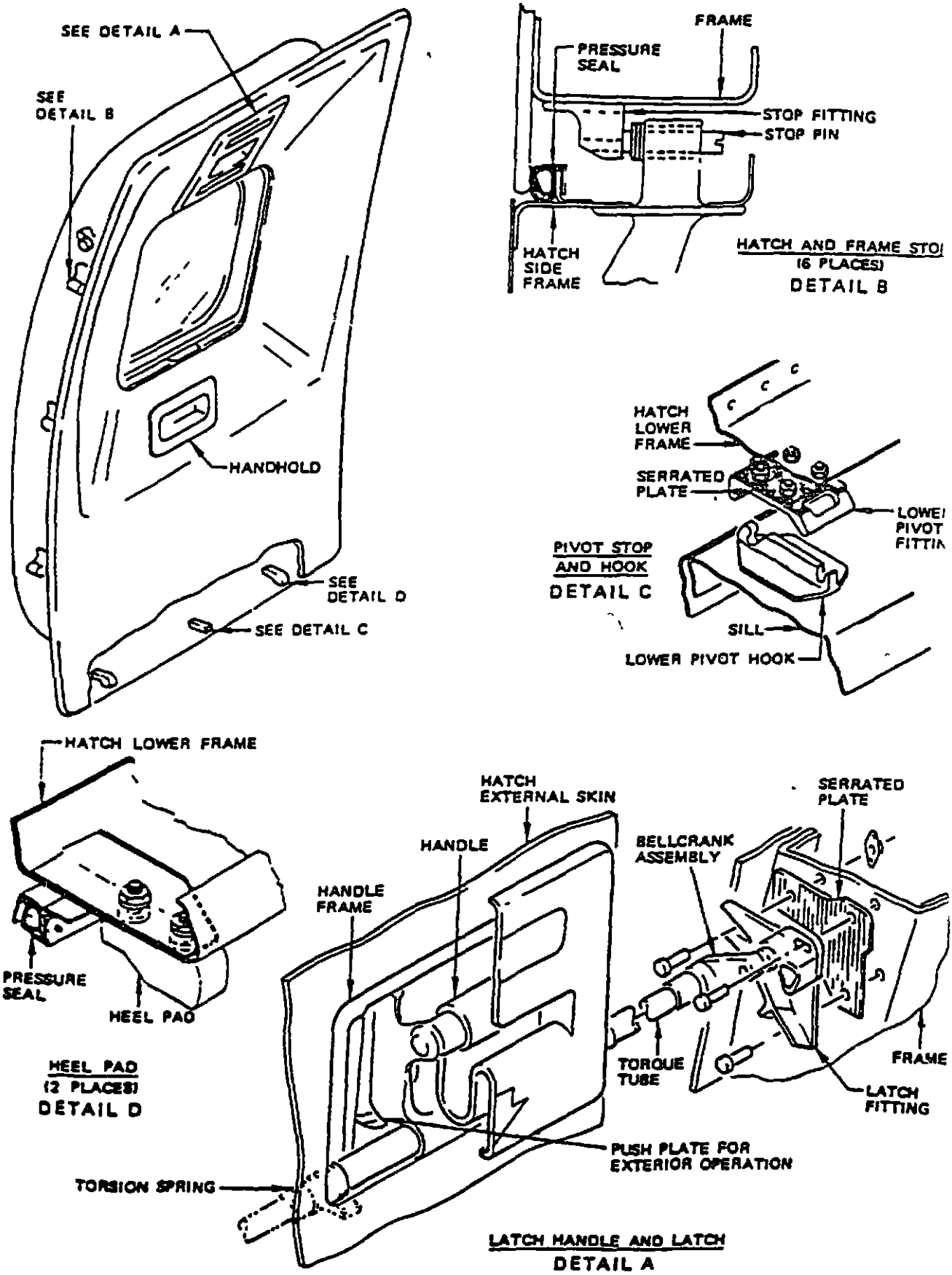
1 General

A Four emergency exit hatches are provided to facilitate emergency exit from the passenger cabin These identical hatches are plug type, and are located two on each side of the fuselage over the wing area On cargo airplanes an additional two emergency exit hatches are provided, one on each side of the fuselage at body station 990 Except for being 13 inches longer, the two additional exit hatches are similar in description and operation to the exit hatches near the wing

B Each hatch (figure 1) is supported in the hatch opening by a lower pivot fitting which is engaged with a lower pivot hook on the sill of the hatch opening (See detail B, figure 1) Two heel pads attached to the lower edge of the hatch on each side of the lower pivot fitting bear against the sill of the hatch opening (See detail C) The hatch may be opened from inside or outside of the airplane by means of a manually operated handle,located at the top of the hatch (See detail A) The handle is an integral casting formed with a pull-type lever on the inside surface, and a push-type panel flush with the outside contour of the hatch A continuous weather/pressurization seal is attached around the entire edge of the handle frame The lower end of the handle on the inside of the hatch is pinned to a torque tube
Two torsion springs, one on each side of the handle, are at one end attached to the outside of the torque tube, and at the other end bear against a wear plate on the handle frame Each end of the torque tube is attached to separate bellcrank assemblies Each bellcrank assembly rotates in a spherical bearing, which is suported in a bearing housing One bearing housing is attached to the forward frame of the hatch, and the other to the aft frame Two latch rollers, one on each bellcrank, engage with the latch fittings attached to the forward and aft frames of the hatch opening. When the passenger cabin is pressurized, adjustable stop pins attached to the forward and aft edges of the hatch, contact stop fittings attached to the forward and aft frames of the hatch opening (See detail B) The stops transmit the pressurization loads on the hatch to the fuselage structure surrounding the hatch, and prevent excessive deflection of the continuous weather/ pressurization seal attached around the entire edge of the hatch
Two spacers adjacent to the upper stop fittings, one on the forward frame and one on the aft frame of the hatch opening, assist in centralizing the stop fittings on the hatch and the hatch opening frames A double pane window is lacated below the hatch operating handle



Emergency Exit Hatch
Figure 1 (Sheet 1)



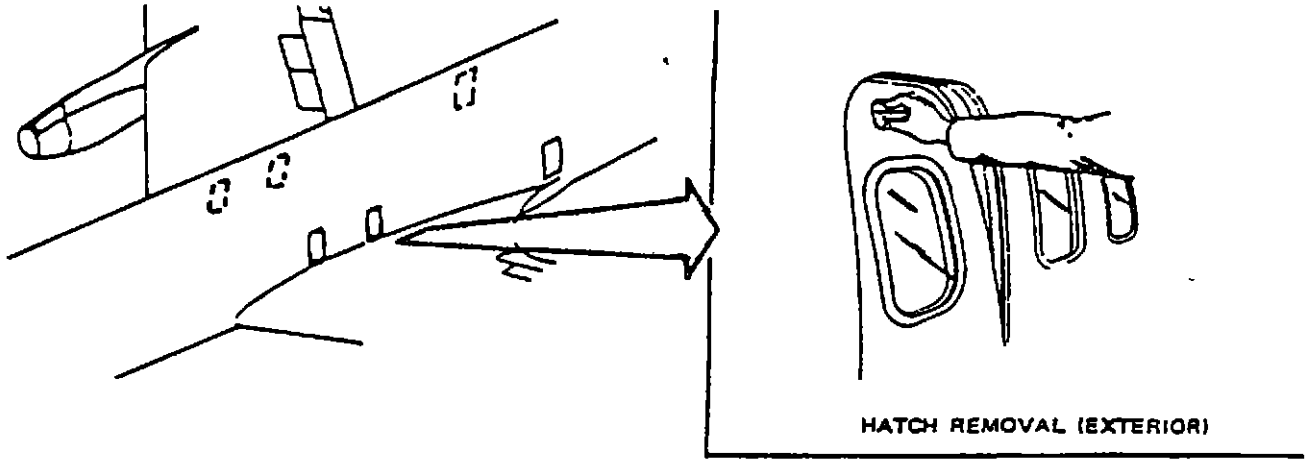
Emergency Exit Hatch
Figure 1 (Sheet 2)

C The trim panel attached to the inside surface of the hatch is provided with a recess-type handhold in the lower part of the panel to assit in removing hatch from hatch opening On airplanes without New Look Interior, a hinged flap-type cover concealing the hatch operating handle is incorporated in the top part of the trim panel On airplanes with New Look Interior, a molded cover with a formed handhold pocket is attached to the operating handle A roller-type window shade is also incorporated in the trim panel The emergency exit hatches are not included in the Door Open Warning System

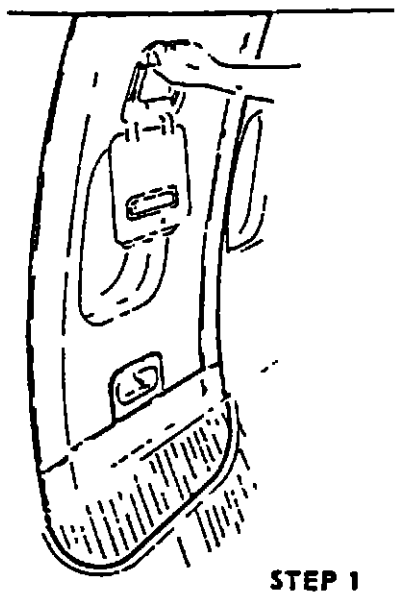
D On airplanes without New Look Interior, the hatch is opened from inside the airplane by pulling down the flap cover over the handle at the top of the hatch and then pulling down the handle (figure 2) On airplanes with New Look Interior, the hatch is opened from inside the airplane by pulling down on the handhold pocket (figure 2) The action of the handle rotates the torque tube against the torsion spring load, and causes the bellcranks to turn The latch rollers disengage from the latch fittings and allow the hatch to move inward at the top edge. Continuing to hold the upper handle, the lower handle is grasped with the free hand and the hatch is pulled inward at the top edge, disengaging the lower pivot fitting from the lower pivot hook With both hands, the hatch is lifted upwards and inwards away from the opening

E The hatch is opened from outside the airplane by pushing in the flush panel at the top of hatch and then pushing hatch inwards An assistant should be inside the airplane to receive the hatch to avoid damage

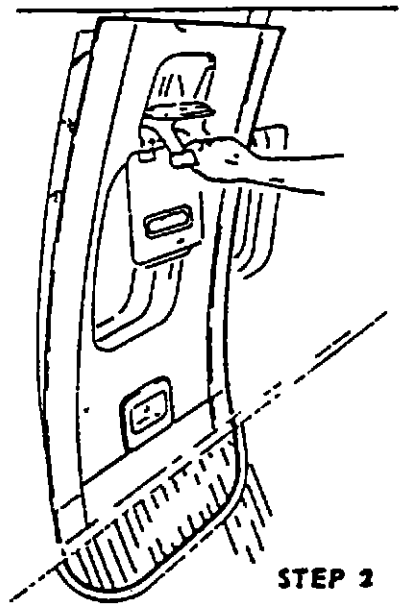
F On Cargo Airplanes, an external release mechanism at the right sliding window allows it to be operated from the outside as an emergency exit For additional information, refer to Chapter 56, Pilot's Sliding Windows



HATCH REMOVAL (EXTERIOR)



STEP 1



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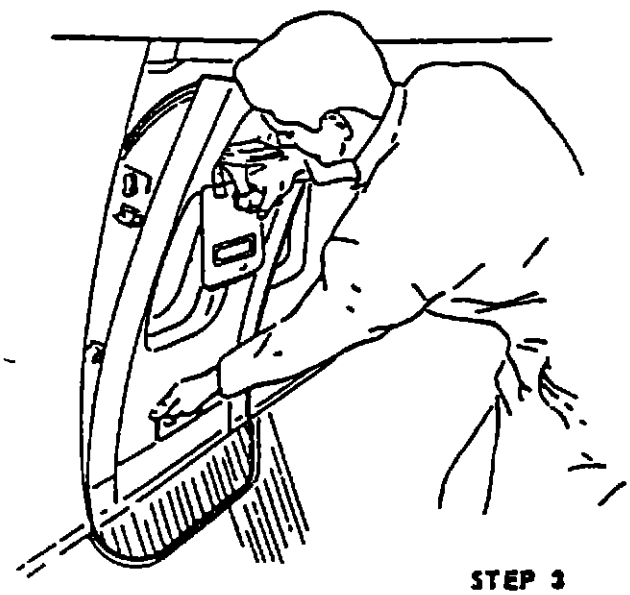
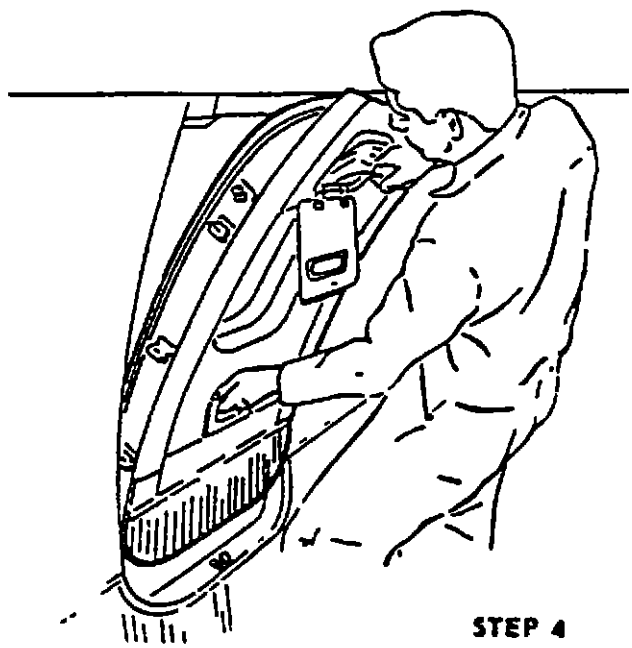


STEP 3



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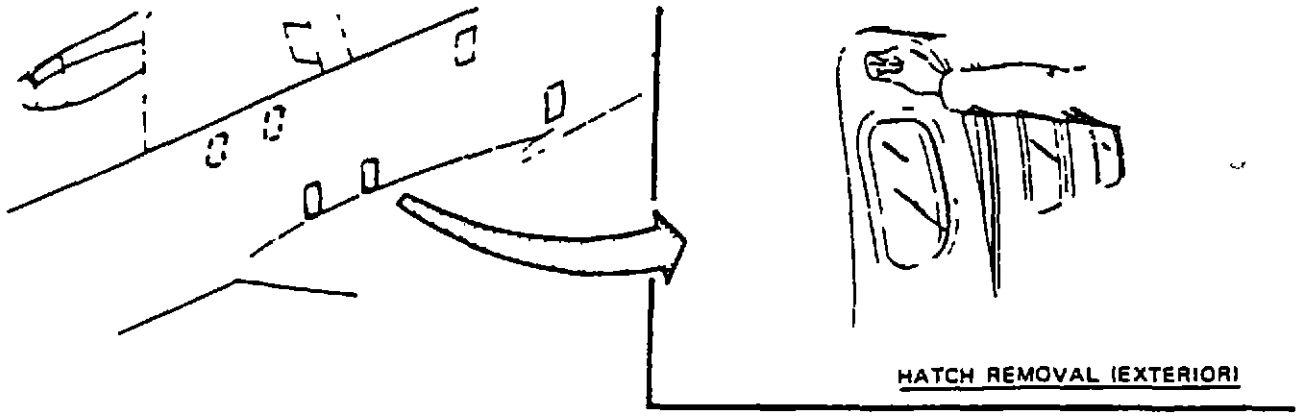
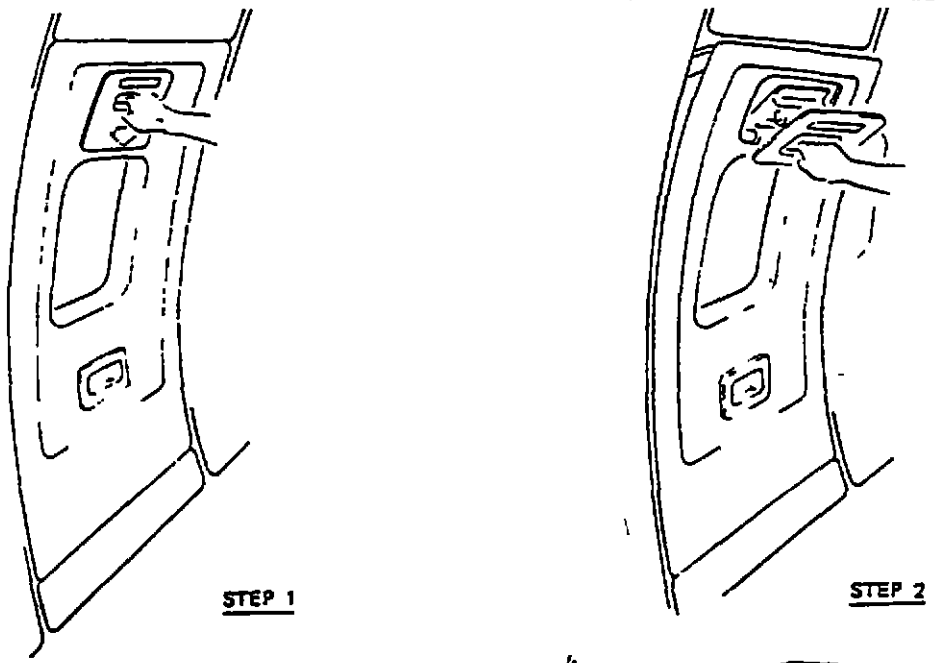
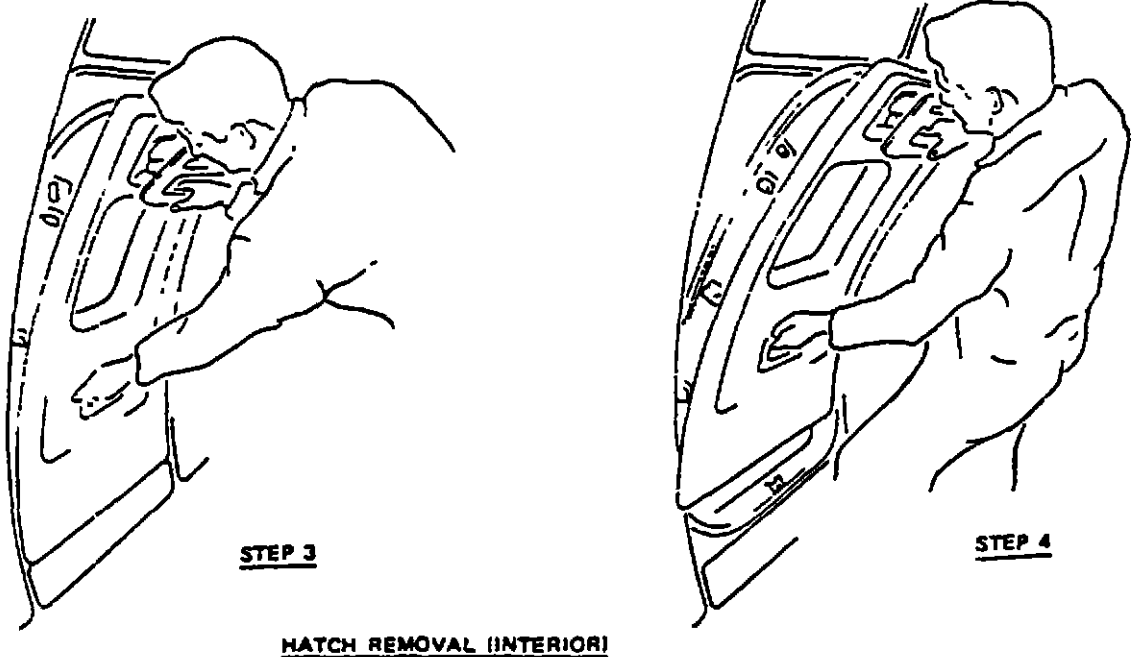


HATCH REMOVAL (EXTERIOR)





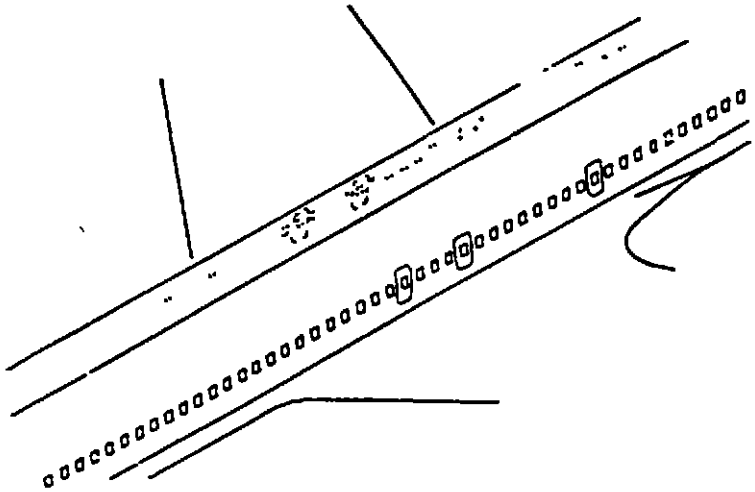
HATCH REMOVAL (INTERIOR)

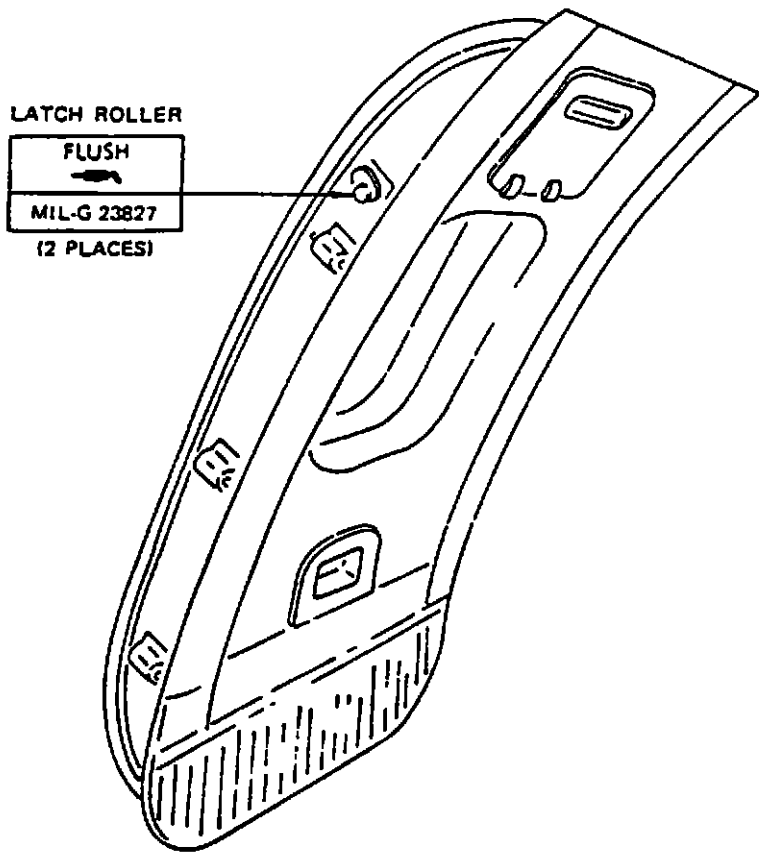
Operation of Emergency Exit Hatch
Figure 2 (Sheet 2)

EMERGENCY EXIT HATCH - MAINTENANCE PRACTICES

1 Emergency Exit Hatch Lubrication

A The items requiring lubrication are shown on Fig 201





Emergency Exit Hatch Lubrication
Figure 201

(2) Adjust Hatch Flushness

(a) Adjust hatch fittings (detail A, figure 501) on serrated latch plates attached to hatch opening frames, and also lower pivot fitting (detail C) on serrated plate attached to lower frame, so that hatch is flush with fuselage.

NOTE When closed and latched, outside surface of hatch should not protrude beyond fuselage exterior more than 0.03 inch, or be recessed more than 0.09 inch without lining installed. With lining installed, the hatch should not protrude beyond fuselage exterior more than 0.03 inch or recessed more than 0.15 inch. These tolerances apply only to any point along straight sections between hatch corners with airplane unpressurized.

(b) With the hatch closed and latched, screw stop pins out until they just contact stop fittings on latch opening frames.

(c) Back off a half turn on stop pins and secure with checknuts or lock springs except where hatch is between 0.06 inch and 0.09 inch inside fuselage external contour, back off stop pins one and a half turns and secure with checknuts or lock springs.

(3) Adjust Hatch Seal

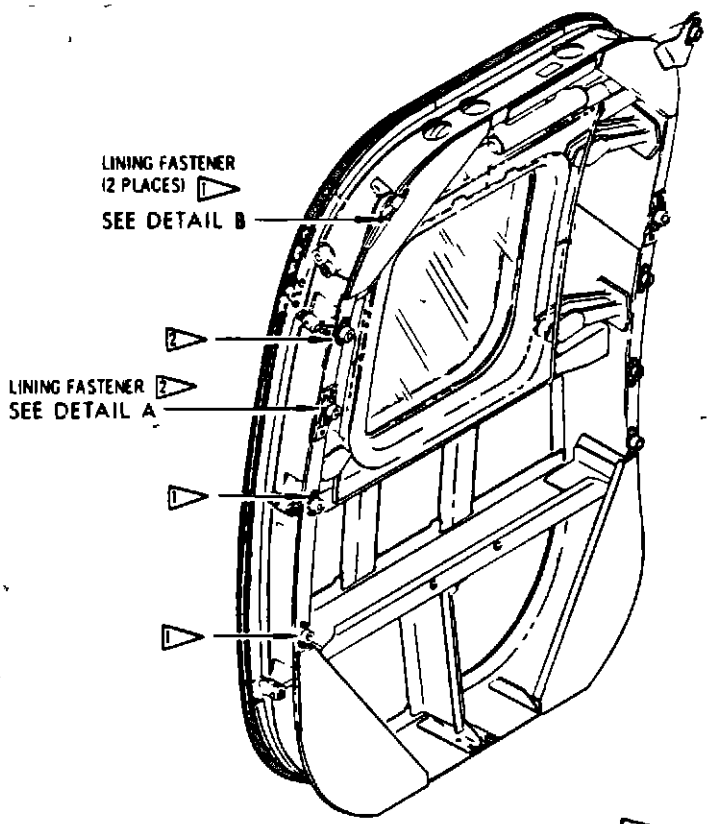
(a) Bend seal attach angles a maximum of 3 degrees from nominal to maintain dimension shown in detail B of figure 501.

NOTE: This bend is for initial installation only. When hatch is installed, this 3 degrees maximum bend may increase slightly due to pressure during hatch installation.

(4) Adjust the Force Required to Open and Close Hatch

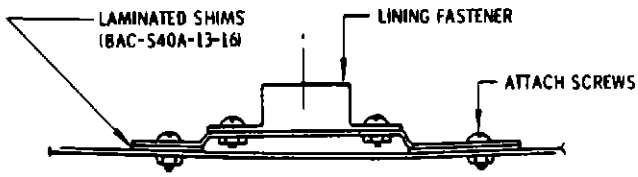
(a) Adjust force required to open and close hatch by removing or adding laminated shims (BAC-S40A-13-16 and 63-2541) under mounting flanges of lining fasteners. (See details A and B, figure 502.) Force required to open and close hatch without lining installed should be between 10 and 20 pounds and with the lining installed between 10 and 25 pounds. The handle load with the hatch not installed is between 6 and 10 pounds.

NOTE Adding shims decreases force, removing shims increases force.

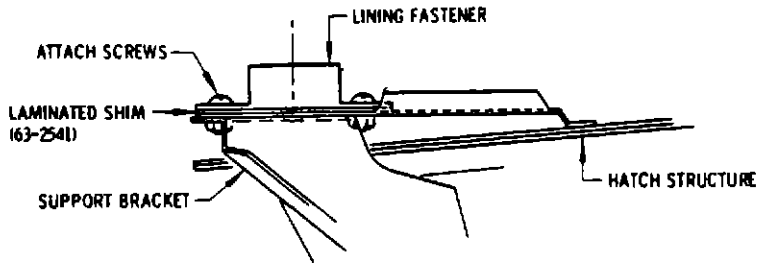


1 *Use shim 63-2541 as required*

2 *Use shim BACS40A13 16 as required to satisfy door handle load limits Remove 0 003 inch laminations as needed*



LINING FASTENER
DETAIL A



LINING FASTENER
DETAIL B

Emergency Exit Hatch Closing Force Adjustment
Figure 502

EMERGENCY EXIT HATCH - REMOVAL/INSTALLATION

1 General

A. If an emergency exit hatch is removed and reinstalled at the same location to the same airplane, without disturbance to its adjustments, it may be installed in accordance with paragraph 3.

B. If the emergency exit hatch to be installed is a new unit or one that is being installed at a different location, it must first be prepared as described in Emergency Exit Hatch - Adjustment/Test.

2. Remove Emergency Exit Hatch (See figure 401.)

A. If the hatch is provided with an electric heater, open escape hatch heater circuit breaker on 115 volt ac bus No. 4 circuit breaker panel (P4).

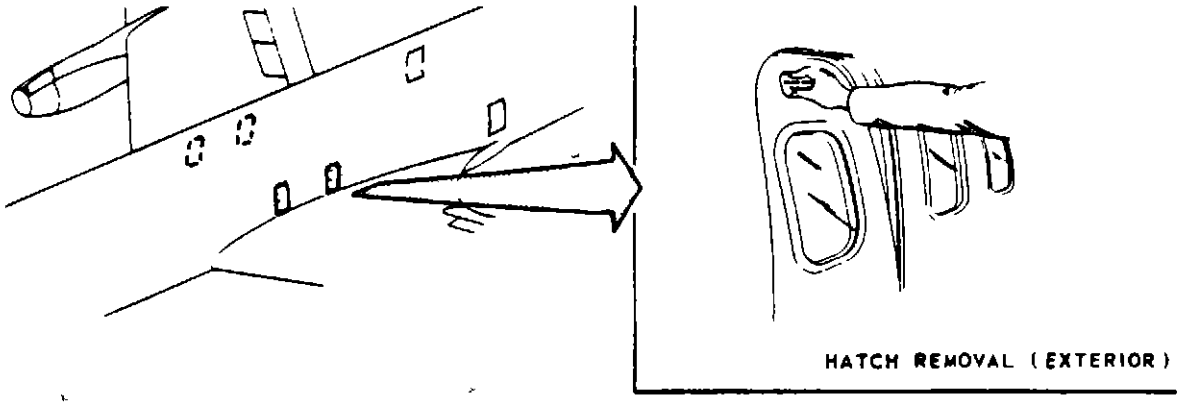
NOTE: On hatches located at station 990, open access panel in sidewall lining adjacent to hatch forward edge and disconnect the emergency hatch surface heater electrical terminals.

B. From inside airplane, pull down flap cover at top of hatch and pull down operating handle.

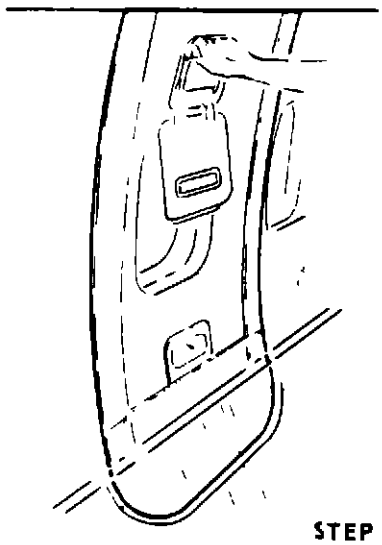
C. Grasp lower handhold with free hand, and pull hatch inward at top edge by means of upper handle until lower pivot fitting can be disengaged from lower pivot hook.

D. Lift hatch up and inboard with both hands, and remove from opening.

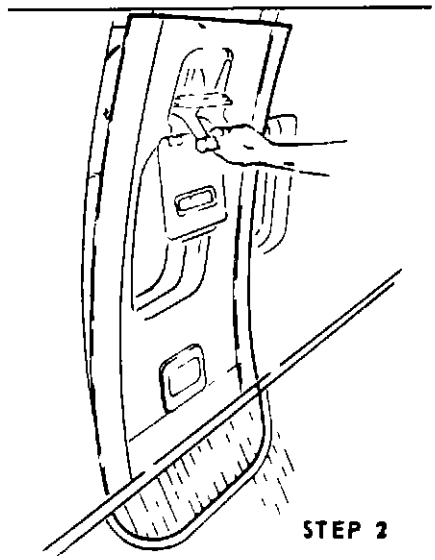
NOTE Whenever an emergency exit hatch is removed, check the metal-cal installed on the top edge of the hatch to ascertain that the hatch is properly marked for the opening. Each hatch should be marked for its location. Any exit hatch not marked as to location should be marked by blanking out appropriate metal-cal markings.



HATCH REMOVAL (EXTERIOR)



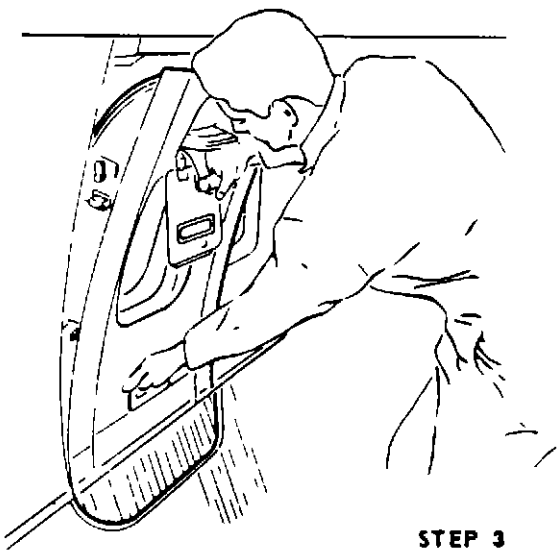
STEP 1



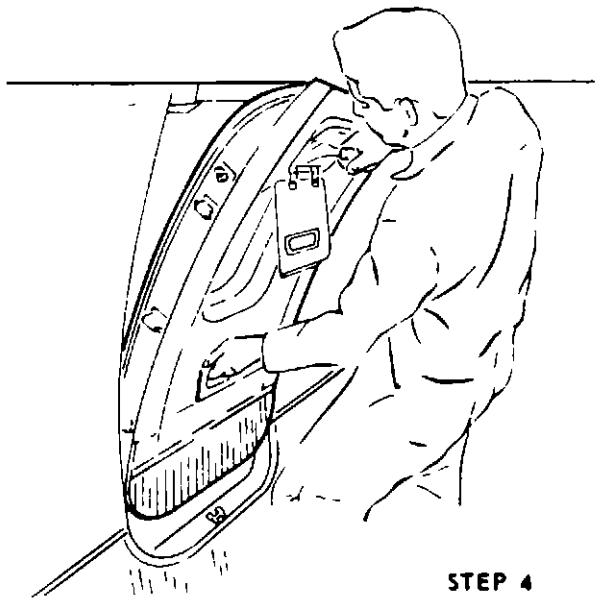
STEP 2

STANDARD HATCH SHOWN

LARGER HATCH SIMILAR



STEP 3



STEP 4

Emergency Exit Hatch Removal
Figure 401

3. Install Emergency Exit Hatch (See figure 402.)

NOTE: Before an emergency exit hatch is installed, check the metal-cal on the top edge of the hatch to ascertain that the proper hatch is being installed in the proper opening. Each hatch should be marked for its location. Any exit hatch not marked as to location should be marked by blanking out appropriate metal-cal markings.

A. From inside airplane, support hatch in hatch opening and engage lower pivot fitting with lower pivot hook on sill of hatch opening. (See section BB.)

CAUTION: TO AVOID SEAL DAMAGE, HATCH WILL HAVE TO BE IN AS NEAR VERTICAL POSITION AS POSSIBLE WHILE LOWER PIVOT FITTING ENGAGES LOWER PIVOT HOOK. ALSO THE LOWER EDGE OF HATCH MUST ALIGN WITH SILL EDGE BEFORE LATCHING.

B. Pull down operating handle and push upper edge of hatch outboard so that latch rollers engage latches.

C. Pull operating handle upward to engage latch rollers with latches.

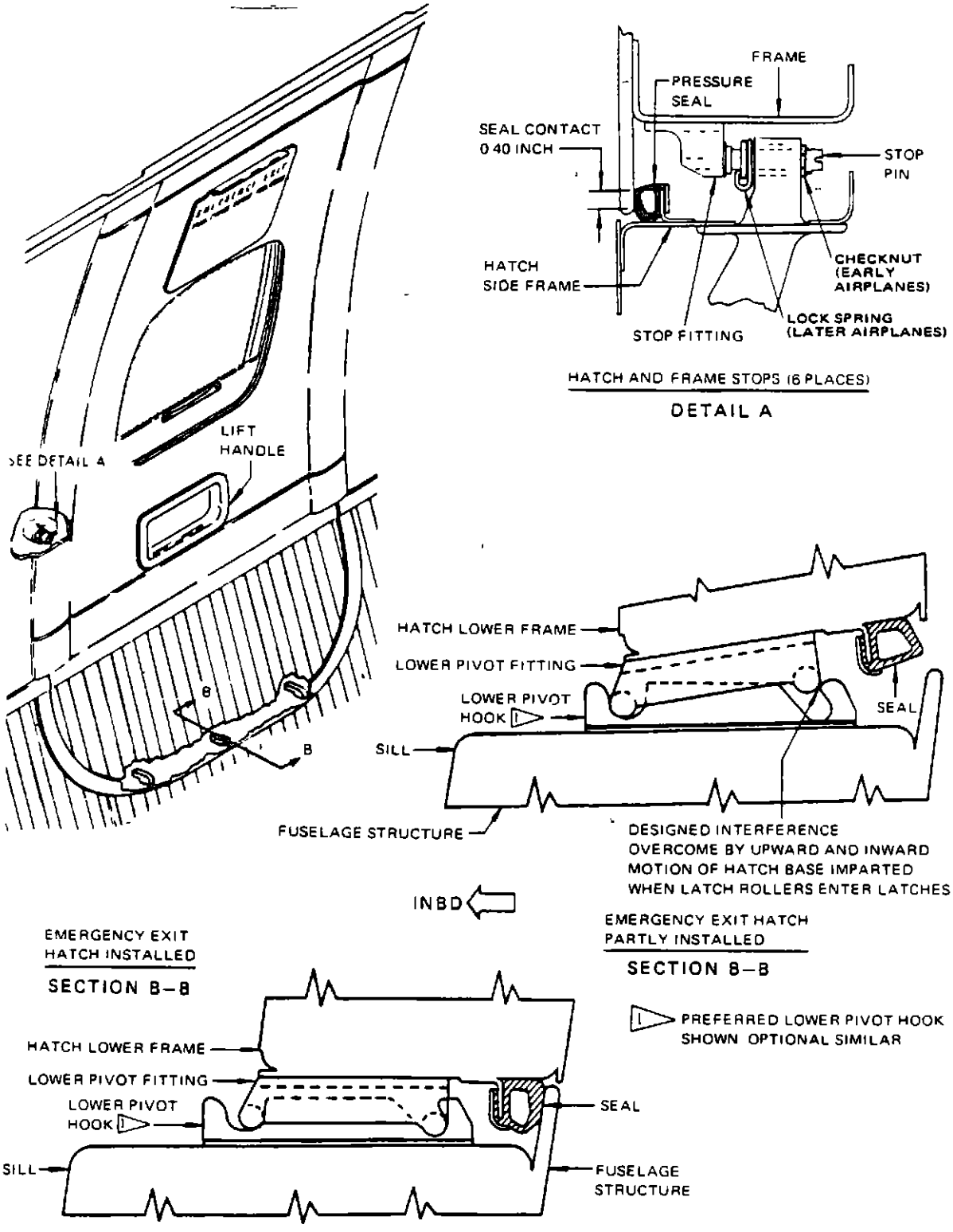
D. Close hatch and check that seal contact with fuselage skin is not less than 0.40 inch. (See detail A, figure 402.) This check must be made with airplane in a level position. If seal contact with fuselage skin is less than 0.40 inch, adjust seal as described in paragraph 1.B.(3), Emergency Exit Hatch - Adjustment/Test.)

E. Close cover over operating handle.

F. On hatches installed at station 990, connect hatch surface heater electrical terminals and close access panel.

G. On hatches provided with an electric heater, close the hatch heater circuit breaker on 115 volt ac bus No. 4 circuit breaker panel (P4).

H. If the hatch is provided with an electric heater, test heater to verify that the blankets are operational. Refer to Escape Hatch Heating Blankets, Chapter 21.



Emergency Exit Hatch Installation
Figure 402

EMERGENCY EXIT HATCH - ADJUSTMENT/TEST

1. Emergency Exit Hatch Adjustment

A. Equipment and Materials

(1) Laminated Shims, BACS40B24-34

(2) Washers, AN960-10L

(3) Laminated Shims, BACS40A9-21

(4) Shims, BACS40A13-16

(5) Shims, 63-2541

B. Adjust Emergency Exit Hatch

(1) Adjust Hatch Vertically and Horizontally

(a) Remove emergency exit hatch lining if installed. Refer to Passenger Cabin Equipment, Chapter 25.

(b) Back off all hatch stop pins until head of pin contacts stop fitting on hatch. (See detail B, figure 501.)

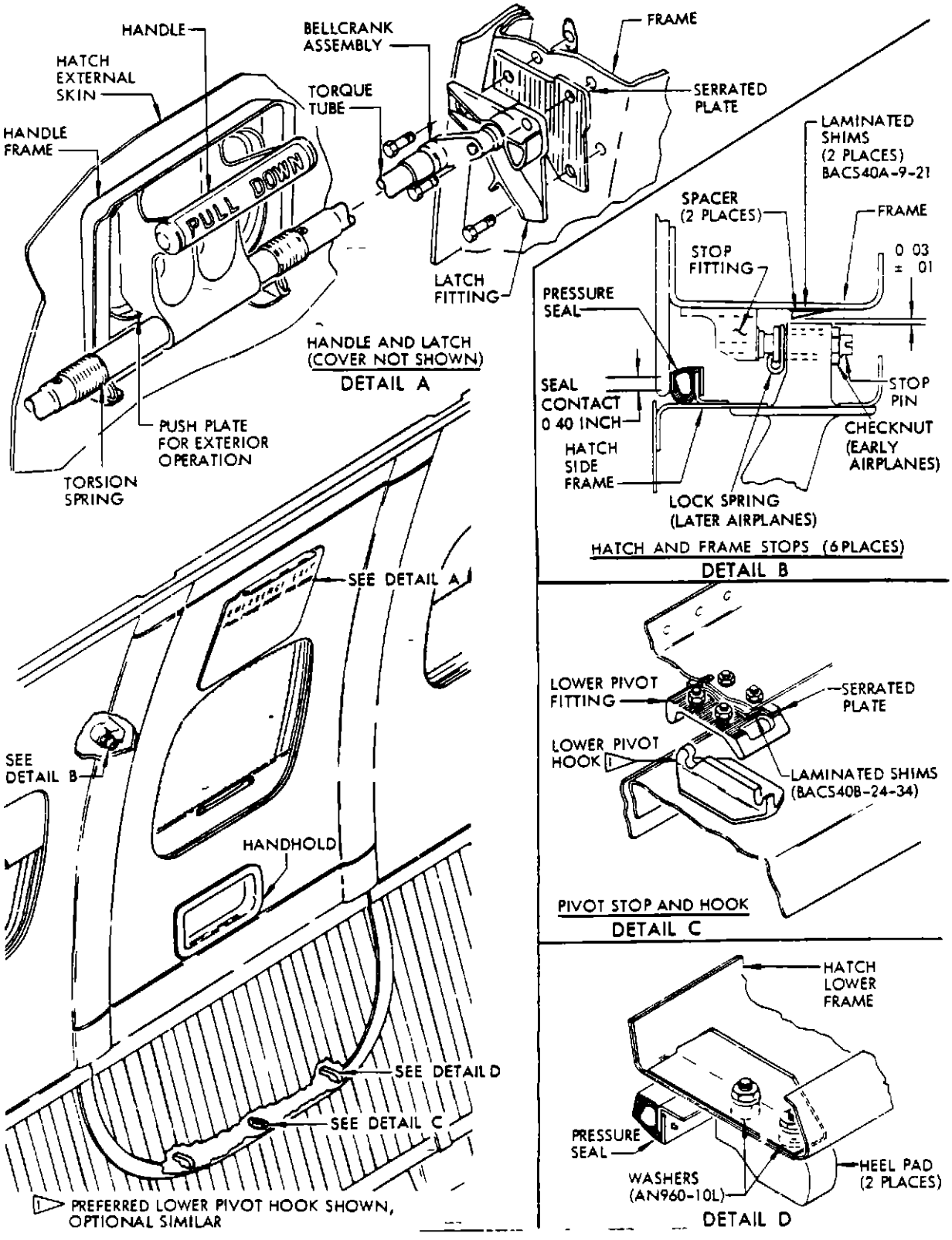
(c) Adjust stop pins vertical alignment with stop fittings by adding or removing laminated shims (BACS40B24-34) under the lower pivot fitting. (See detail C)

(d) Adjust the two heel pads (detail D) by adding washers (AN960-10L) at each screw location, so that weight of hatch is supported by heel pads.

(e) Adjust gap between each of the upper stop fittings and adjacent spacer (detail B) using laminated shims (BACS40A9-21) under spacers.

(f) Check that gap between hatch skin and fuselage skin is between 0.06 inch and 0.180 inch at any point when hatch is closed and latched. Where necessary, trim edge of hatch to achieve this condition.

CAUTION: UNDER NO CIRCUMSTANCES SHOULD MATERIAL BE TRIMMED FROM THE EDGE OF THE HATCH OPENING.



Emergency Exit Hatch Adjustment
Figure 501

(5) Install metal-cal at top edge of hatch to identify hatch location.

(6) Install emergency exit hatch lining and check force required to open and close hatch is within limits.

2. Emergency Exit Hatch Test

A. Test Emergency Exit Hatch Operation

(1) Check hatch opening and closing operations from inside and outside airplane.

CAUTION TO AVOID POSSIBLE DAMAGE TO HATCH WHEN CHECKING HATCH OPENING FROM OUTSIDE, AN ASSISTANT SHOULD BE INSIDE THE AIRPLANE TO RECEIVE HATCH.

(2) Check hatch for freedom from binding or obstructions throughout the open and closing cycle.

(3) Close hatch and check that force required to open and close hatch is between 10 and 25 pounds with lining installed.

B. Test Emergency Exit Hatch Seal

(1) Close hatch to within 0.06 inches of latch position. In this position seal must make contact entirely around hatch to ensure an adequate pressure and weather seal. Check may be accomplished by taping a 0.06 shim on the stop fittings adjacent to the latches and closing hatch until contact is made with the shims. Do not attempt to fully lock latch. Check seal from inside while a source of light is moved around seal on outside.

(2) Remove shims from stop fittings.

(3) Close hatch and check that seal contact with fuselage skin is not less than 0.40 inch. This check must be made with airplane in a level position.

(4) If seal contact with fuselage skin is less than 0.40 inch, adjust seal as described in paragraph 1.B.(3)(a).

EMERGENCY EXIT HATCH - INSPECTION/CHECK

1. Examine for the following:

   A. Examine external skin and framing around opening, for cracks, corrosion, loose and missing fasteners.

   B. Examine frames, and internal brackets for cracks, corrosion, and loose bolts.

   C. Examine window and frame for cracks and corrosion.

   D. Examine hatch operating mechanism for cracks, corrosion, excessive wear, and loose bolts.

   E. Examine latch rollers, latches, lower pivot fitting, and lower pivot hook for cracks, corrosion, and foreign particles lodged in latches or attached to stops.

   F. Examine operating handle seal for cracks, cuts, tears and signs of deterioration.

   G. Examine hatch peripheral seal for cracks, cuts and tears, signs of deterioration, and correct seating when hatch is in closed position.

      NOTE This check could be made from outside the airplane by viewing seal through gap between hatch and fuselage skin.

EMERGENCY EXIT HATCH WINDOW - MAINTENANCE PRACTICES

1. General

A Maintenance practices on the emergency exit hatch window are similar to those described in Passenger Windows, Chapter 56 Differences between the two types of window installation are confined to the method of retaining the outer and center panes and the reveal. The emergency exit hatch window center pane and reveal is fastened with screws to the window frame, and angles screwed to the inside of the window frame retain the outer pane spring assembly

END

DOOR WARNING SYSTEM - DESCRIPTION AND OPERATION

1. General

A. The door warning system provides visual indication of the latched or unlatched condition of the following doors:

Forward and Aft entry

Forward, center and aft cargo

Electronic compartment (Radio) access

Forward and aft galley

On cargo airplanes, in addition to the doors listed above, the main cargo door and the forward cargo compartment interior door are included in the door warning system.

B. On turbojet airplanes the door red warning lights are located on the right side of the copilot's instrument panel with an adjacent press-to-test switch. On cargo airplanes the door red warning lights are positioned on the copilot's sidewall panel with a press-to-test switch adjacent to the lights. (See figure 1.) The system is powered by 28 volts dc from the radio and T-R circuit breaker panel (P5). (See figure 2.)

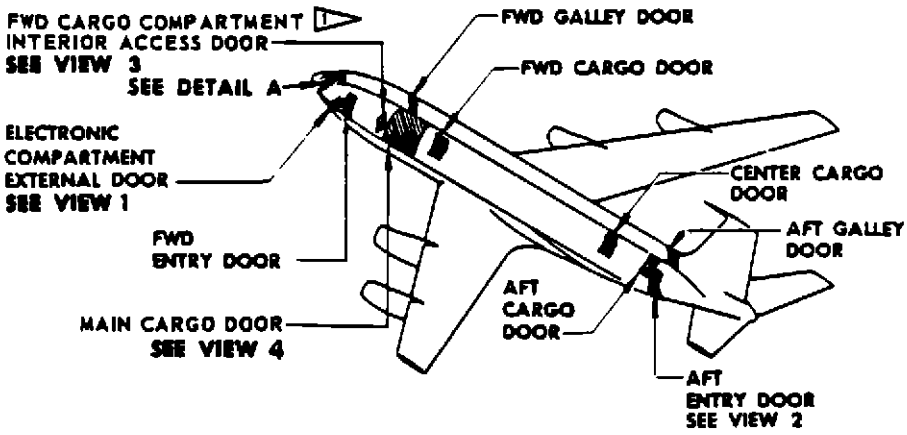
C. A plunger type switch is installed in a latch fitting at each of the entry, galley, or cargo compartment doors, and at the electronic compartment access door. (See figure 1.) All the switches are in circuit with individual red indicator lights.

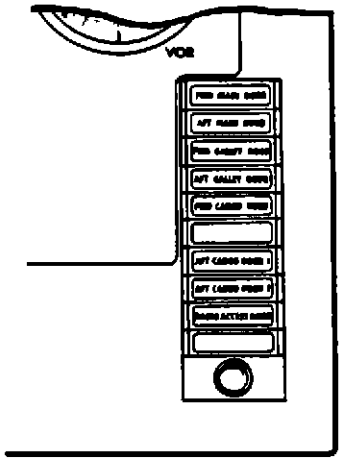
D. When the doors are closed, their warning switches are held open and the warning lights are de-energized. The entry, galley and cargo compartment door warning switches are depressed, when the doors are closed, by their latch rollers. The electronic compartment access door warning switch is depressed by the latch pin.

E. When any one of the doors is opened, the associated movement of the roller, pin or arm, which was holding the switch open, releases the switch plunger. This action closes the switch and energizes the appropriate red warning light.

F. On cargo airplanes two microswitches are mounted under the floor, at the main cargo door sill, to operate the main cargo door warning lights. Each pressure door has an arm which projects below the lower edge of the main cargo door structure and actuates a microswitch. When the main cargo door is closed and latched the arms on the pressure doors depress the microswitches to open the red warning lights circuit. (See figure 2.) The two microswitches are connected to three warning lights, one on the hydraulic panel, at Station 302 and one on the copilot's instrument panel.

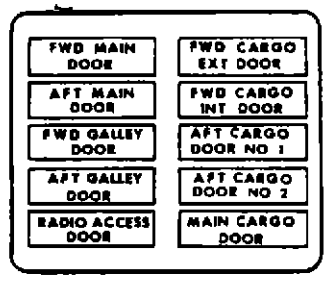
In addition to providing a door latched or unlatched indication, the copilot's main cargo door warning light also illuminates when the electrical plug in door control panel is connected to the ground service receptacle and the cargo door hydraulic pump circuit is operational. The warning light is de-energized when the electrical plug is connected to the stowage receptacle, thus indicating that the cargo door hydraulic pump circuit is inoperative. For additional information on the main cargo door circuits see 52-11-01.





COPILOT'S INSTRUMENT PANEL

TURBOJET

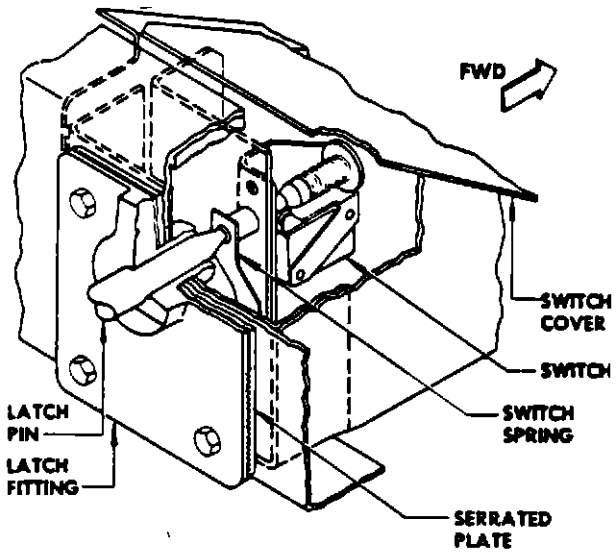


COPILOT'S SIDEWALL PANEL

CARGO AIRPLANES

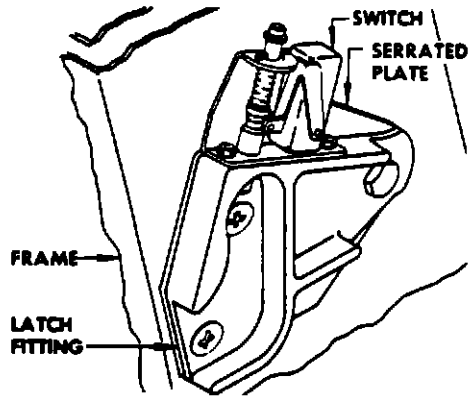
DETAIL A

Door Unlatched Warning System
Figure 1 (Sheet 1)



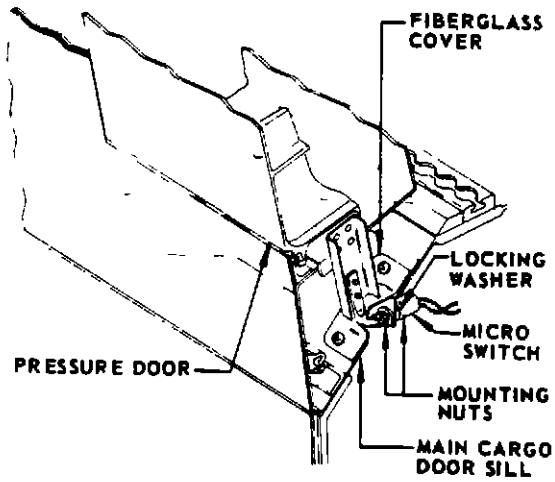
ELECTRONIC COMPARTMENT
EXTERNAL DOOR SWITCH
INSTALLATION

VIEW 1

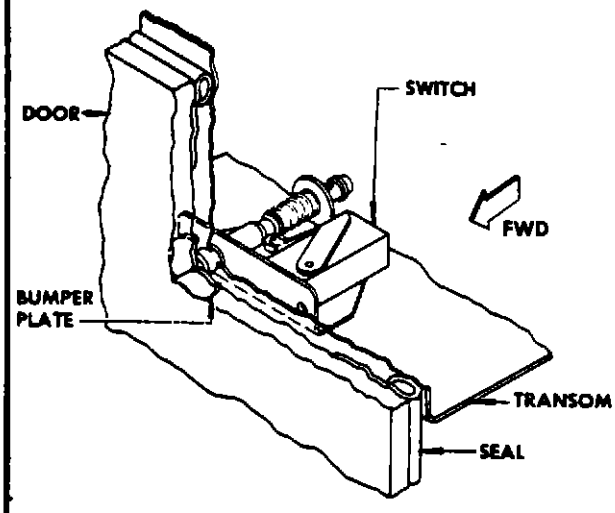


TYPICAL ENTRY, GALLEY
AND CARGO DOOR SWITCH

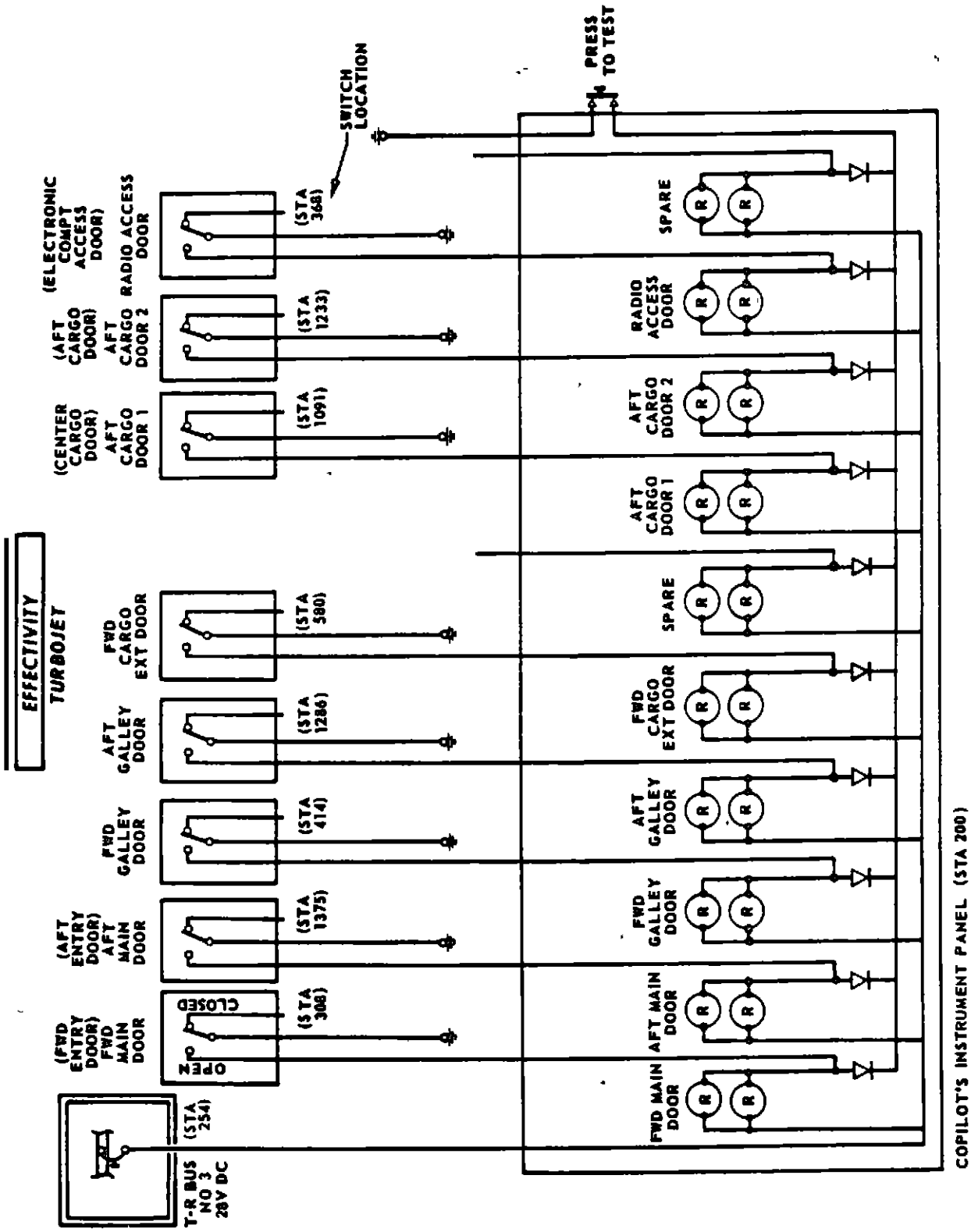
VIEW 2



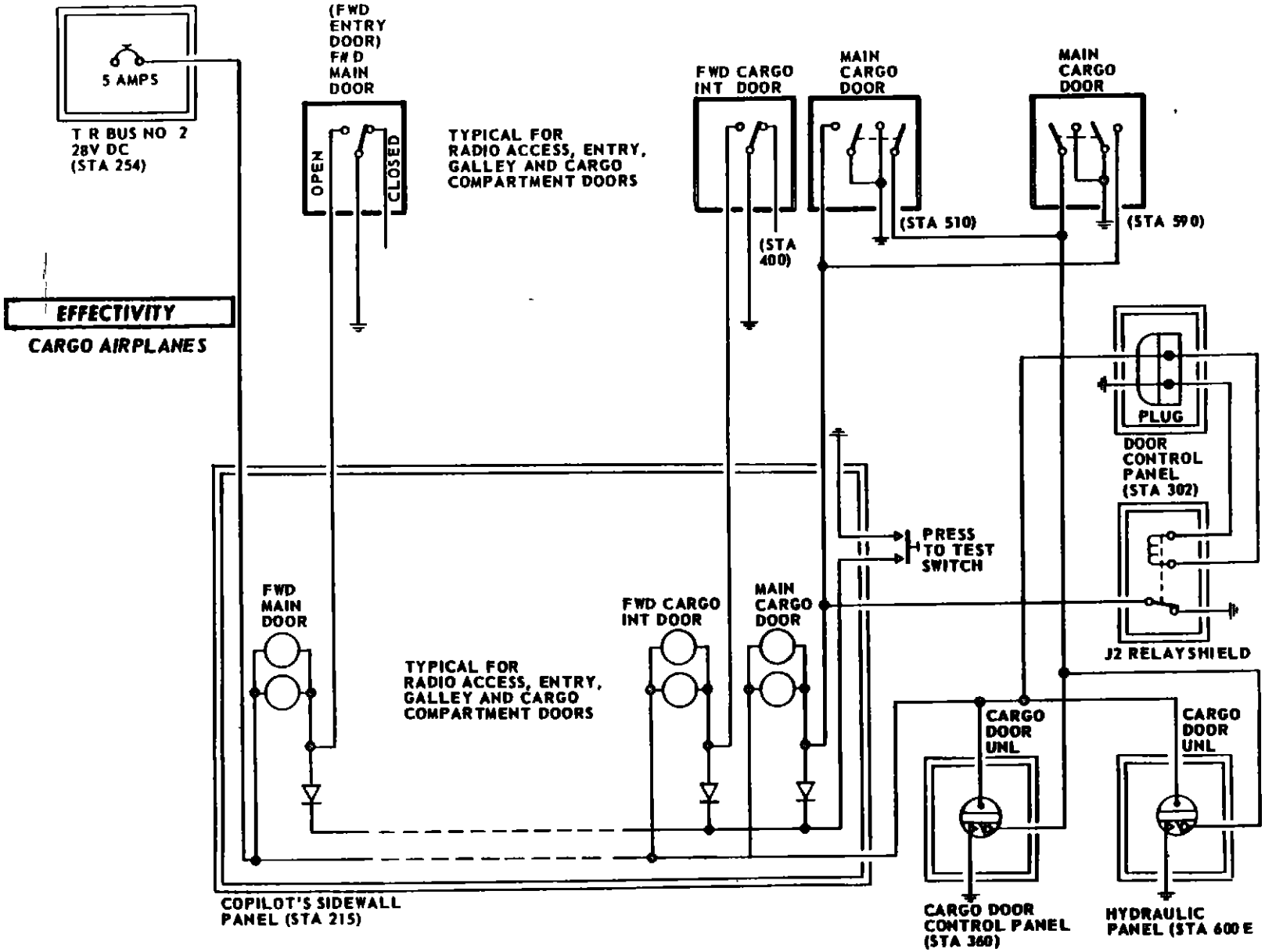
MAIN CARGO DOOR SWITCH
CARGO AIRPLANES
VIEW 4



FWD CARGO COMPARTMENT
INTERIOR ACCESS DOOR SWITCH
VIEW 3



Fuselage Door Warning Circuit
Figure 2 (Sheet 1)



Fuselage Door Warning Circuit
Figure 2 (Sheet 2)

DOOR WARNING SYSTEM - ADJUSTMENT/TEST

1 Door Warning System Adjustment

A General

(1) The entry, galley and cargo doors, and the electronic compartment access door warning switches are adjusted as described in paragraph B On Passenger/Cargo Convertible Airplanes, refer to paragraph C to adjust the main cargo door warning switches All switch adjustments are to be performed only after all other door adjustments are completed Perform system test or applicable portion of test after switch adjustment

B Entry, Galley, Cargo and Electronic Access Doors Warning Switch Adjustment (See figure 501, detail A)

(1) General

(a) On earlier airplanes the entry, galley and cargo doors, and electronic compartment access door warning switches (type C2-38) are adjusted by adding or removing laminated shims on the switch base and if necessary, by inserting a round head screw with spring washer into tapped hole on end face of switch plunger On later airplanes, and replacement door warning switches (type C2-1021-1) an improved method of adjusting the door warning switch is provided through the use of an adjustable switch plunger, thus eliminating use of the shims

(2) Equipment and Materials (Use if/as required for C2-38 type switch installation)

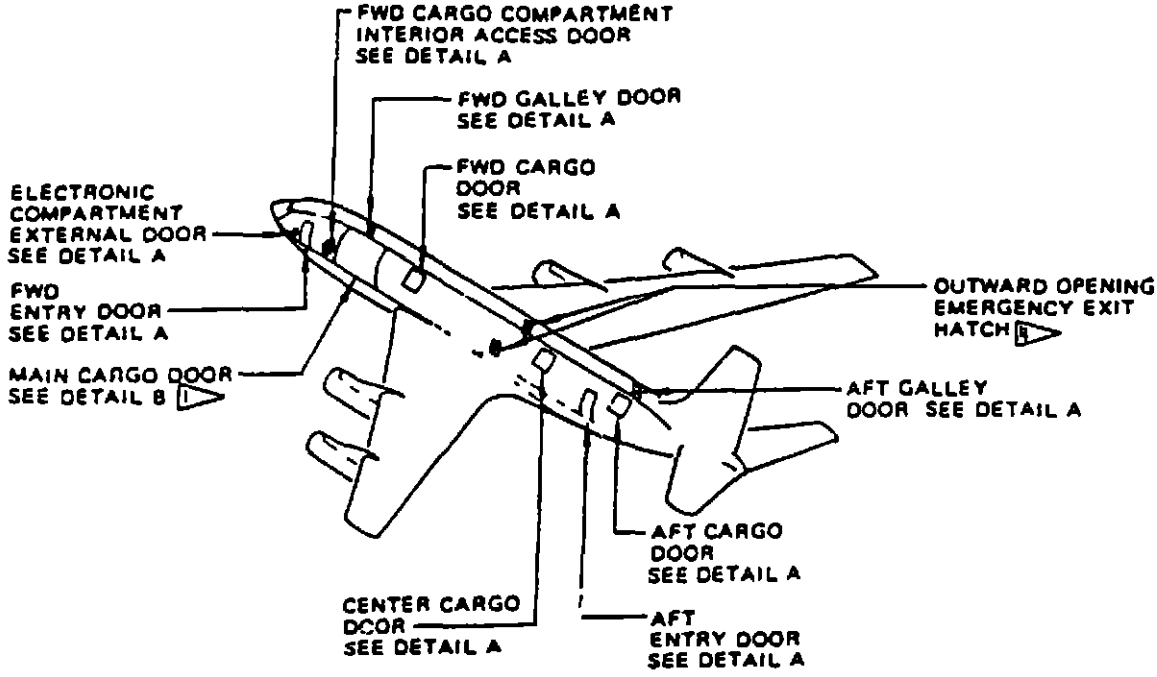
(a) Shim, Laminated 66-36034

(b) Screw, AN515C6-5

(c) Washer, AN935-6

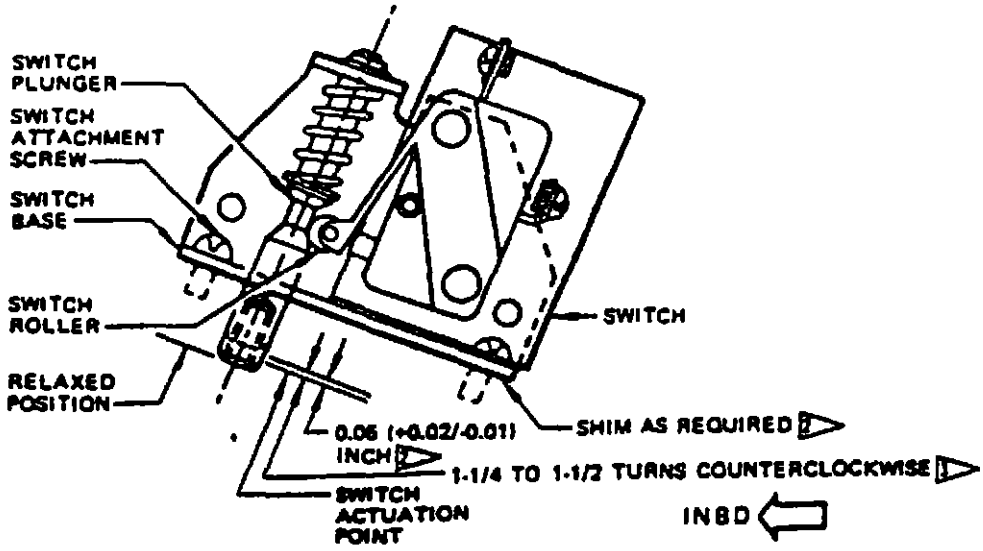
(3) Adjust Door Warning Switches (C2-38 type switch installation)

(a) Loosen the two screws holding the switch assembly to the door latch fittings



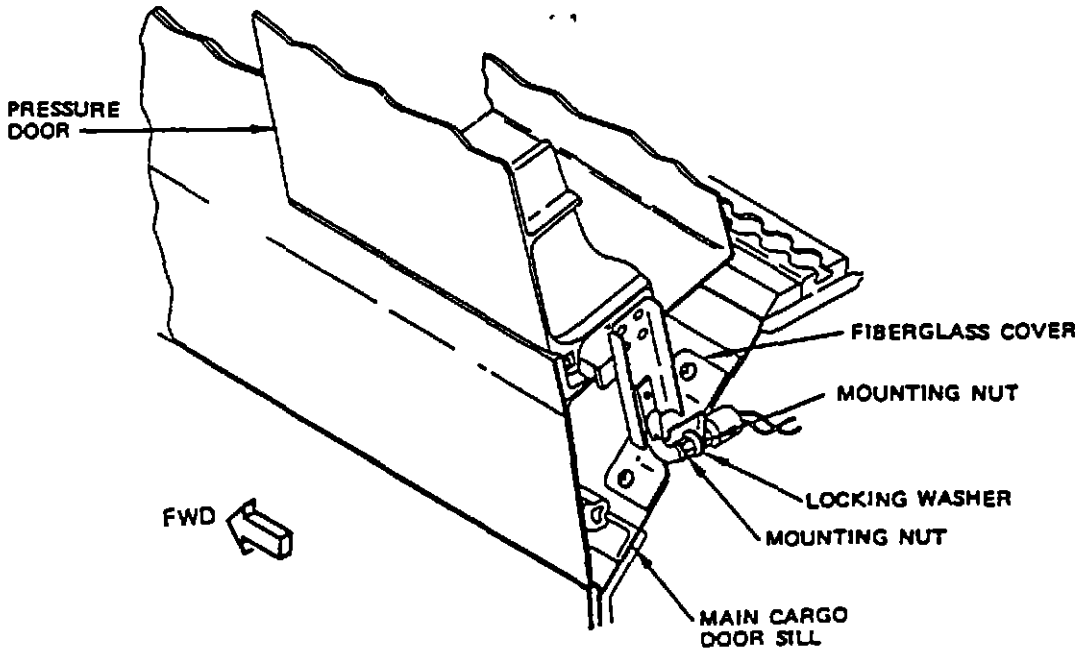
1 *Passenger/Cargo Convertible Airplanes*
2 *C2–38 type switch*
3 *C2–1021–1 type switch*
4 NOT ON TCA LX-N20198
LX-20199

RTCA LX-N19997
LX-N20000



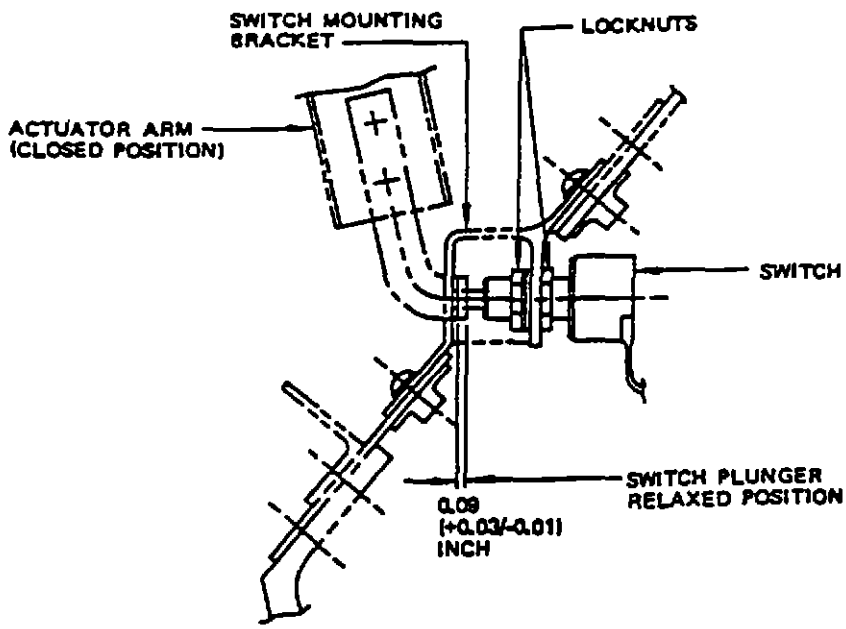
DETAIL A

Door Warning Switch Adjustment
Figure 501 (Sheet 1)



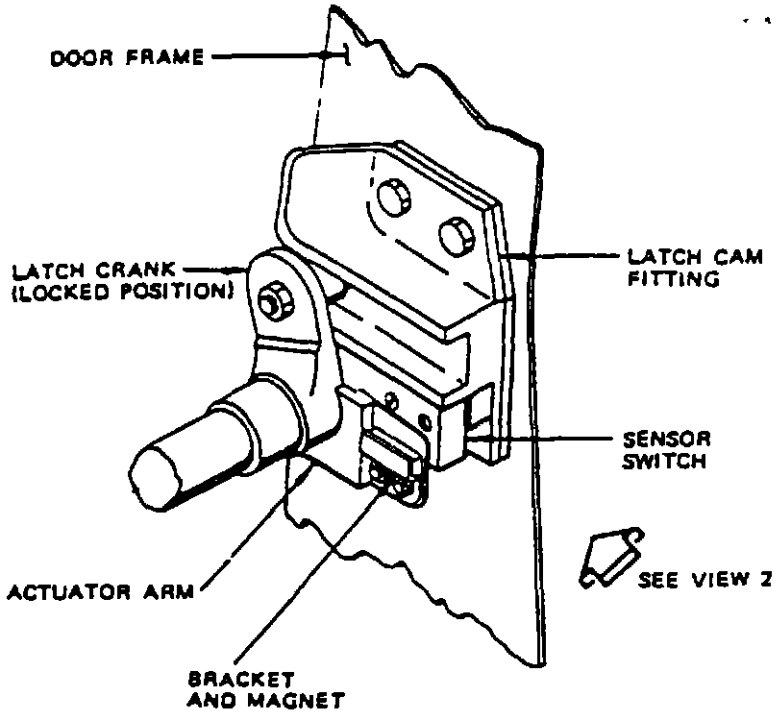
MAIN CARGO DOOR SWITCH ADJUSTMENT

DETAIL B 1



VIEW 1

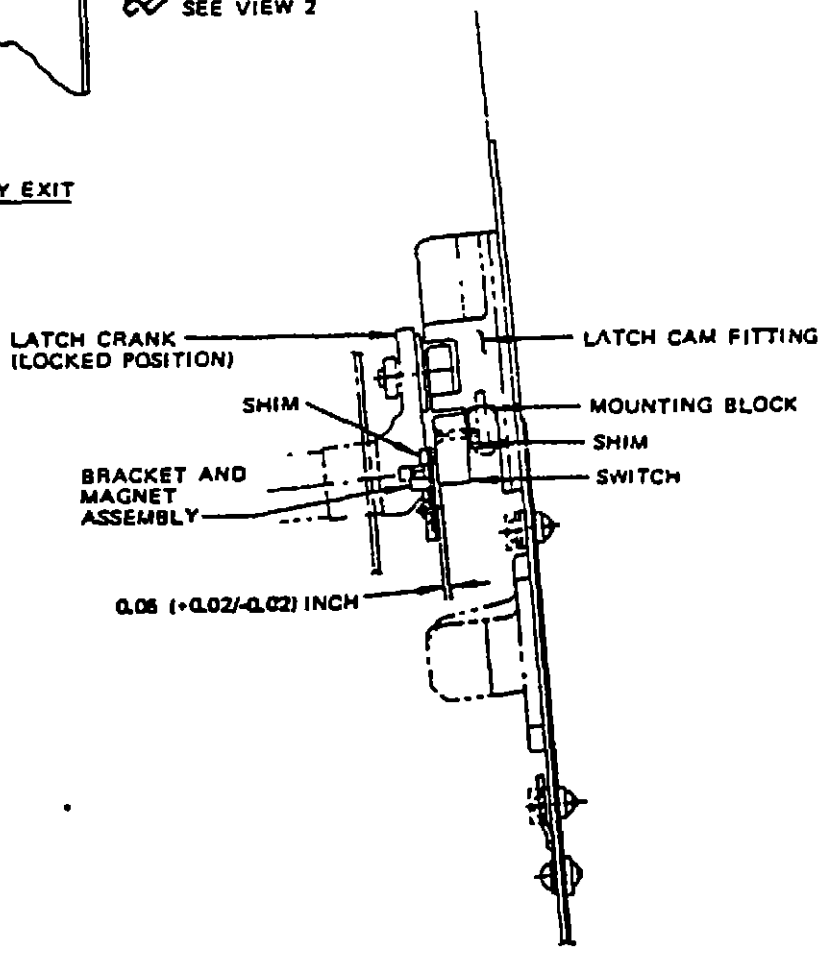
Door Warning Switch Adjustment
Figure 501 (Sheet 2)



NOTE LEFT SIDE SHOWN. RIGHT SIDE OPPOSITE.

OUTWARD OPENING EMERGENCY EXIT HATCH SWITCH ADJUSTMENT

DETAIL C



VIEW 2

Door Warning Switch Adjustment
Figure 501 (Sheet 3)

(b) Install laminated shim and remove laminations so the end of the plunger is depressed 0 05 + 0 02/-0 01 inch past switch actuation point (light out) when door is latched If necessary, insert a round head screw with a spring washer into tapped hole in end of plunger to achieve the proper adjustment

(c) Tighten holding screws and test door warning

(4) Adjust Door Warning Switches (C2-1021-1 type switch installation)

(a) Adjust switch plunger to the minimum length at which switch actuates (light out) when door is latched

(b) On completion of step (a), rotate switch plunger 1-1/4 to 1-1/2 turns counterclockwise

(c) Test door warning.

C Main Cargo Door Warning Switch Adjustment (Fig 501, Detail B)

(1) Adjust the main cargo door warning switches moving the position of mounting nuts on the threaded bushing of the microswitch Adjust each switch so that it actuates when the outer surface of the pressure door is 0 45 + 0 010/-0 020 inch from being flush with outside contour of main cargo door

D Outward Opening Emergency Exit Hatch Door Warning Switch Adjustment (Fig 501, Detail C for effectivity)

(1) Equipment and Materials

(a) Shim - make from 7075-T6, 0 016 inch thick

(2) Adjust Outward Opening Emergency Exit Hatch Door Warning Switch

CAUTION CHECK THAT DOOR RESTRAINING STRAP IS INSTALLED OR ESCAPE SLIDE AIR CYLINDER INFLATION VALVE IS CLOSED PRIOR TO OPENING ESCAPE SLIDE INADVERTENT DEPLOYMENT MAY CAUSE DAMAGE TO ESCAPE SLIDE. REFER TO CHAPTER 25, ESCAPE SLIDE AIR CYLINDER ASSEMBLY (EMERGENCY EXIT HATCHES)

(a) Open emergency exit hatch for access to switch

(b) Adjust switch by inserting shims between switch and latch fitting until switch face is flush with latch fitting

(c) Adjust actuator arm on latch crank to within 0 05 (+/- 0 02) inch of switch face (See view 2)

NOTE Insert shim between actuator arm and latch crank

(d) Adjust magnet and bracket assembly on actuator arm up or down so that switch opens just prior to handle reaching a position 2 degrees 30 minutes from fully locked stop and closes prior to the handle reaching a position 10 degrees 30 minutes from the locked stop Maintain magnet parallel to lower edge of actuator arm

(e) Test door warning

2 Door Warning System Test

A Test Door Warning System

(1) Apply electrical power to airplane and check HYDRAULIC PRESSURE & DOOR WARNING LIGHTS circuit breaker on radio and T-R circuit breaker panel (P5) is closed.

(2) Press test switch, on copilot's sidewall panel , and check that all door warning lights illuminate

(3) Test warning circuit of forward or aft main entry door, or forward or aft galley door

(a) With door open, the two corresponding door warning lights shall be on

(b) Close and lock the door The corresponding door warning lamps shall go out

(c) Determine the corresponding warning lamps will light when the door handle is turned toward the unlatch position before the unlatch point is reached On main cabin doors, check warning circuitry with the inner handle only

(d) Determine that the lamp will go out when latch approaches the locked position and that some handle overtravel is available

(4) Test warning circuit of any cargo compartment door

(a) Close and lock door and check that proper warning lights remain extinguished while locking handle is backed off by two degrees from its fully locked travel stop

NOTE When measuring angles of rotation of the door locking handles in these tests, disregard slack motion when handle changes direction.

(b) Back locking handle off and check that proper warning lights illuminate before handle has rotated eight degrees from its fully locked position

(5) Test electronic compartment access door warning circuit

(a) Close and lock door, rotate latch handle toward UNLOCK position and check that proper warning lights illuminate before point is reached at which door may be opened

(b) Rotate door latch handle toward LOCKED position and check that proper warning lights are extinguished just before door is fully locked Examine switch to check that, when door is fully locked, switch roller has traveled beyond tapered portion of plunger

(6) Test forward cargo interior access door circuit

(a) Ensure that the correct warning light illuminates with the door opened

(b) Check that the warning lamp is extinguished when the door is closed and that some switch overtravel is obtained when the top of the door is pressed forward, with the switch plunger beyond the point of switch opening

(7) Test main cargo door circuit

(a) Open the main cargo door

CAUTION PERSONNEL MUST STAND CLEAR OF MAIN CARGO DOOR PATH

(b) Check, by manually depressing each cargo door warning switch, that operation of only one switch will not cause the main cargo door warning lights to go out The warning lights to be checked include the MAIN CARGO DOOR light on the door warning annunciator panel, in addition to the CARGO DOOR UNL lights on the door control panel and the right wheel well

(c) Close the door and check that the warning lights remain lit when the top edge of the pressure relief doors are at their last fixed position prior to closing

(d) The warning lights must be extinguished when the pressure doors are fully closed

(8) Test outward opening emergency exit hatch circuit (See figure 501, detail D for effectivity)

CAUTION CHECK THAT DOOR RESTRAINING STRAP IS INSTALLED OR ESCAPE SLIDE AIR CYLINDER INFLATION VALVE IS CLOSED PRIOR TO OPENING ESCAPE SLIDE INADVERTENT DEPLOYMENT MAY CAUSE DAMAGE TO ESCAPE SLIDE REFER TO CHAPTER 25, ESCAPE SLIDE AIR CYLINDER ASSEMBLY (EMERGENCY EXIT HATCHES)

(a) Open hatch and check that door warning lamp on annunciator panel illuminates

(b) Close hatch and move handle towards latched position Check that warning light extinguishes prior to handle reaching 2 degrees 30 minutes from fully locked stop

(c) Move handle from fully locked position and check that light illuminates prior to handle reaching a position 10 degrees 30 minutes from the locked stop

(d) Close and lock hatch

(9) If there is no other requirement for electrical power, remove power from airplane

DOOR SEALS - MAINTENANCE PRACTICES

1. Removal/Installation Door Seals

A. General

(1) The airplane doors are sealed with silicone rubber extrusions, fabricated as either of two types. The doors are divided into two groups by the type of seal used.

(a) The seal on both entry doors and on both galley doors consists of a hollow extrusion sealing the door edge, and two channel sections sealing the upper and lower gate hinges. Figure 201 shows the forward entry door seal installation and is typical of these four doors.

(b) The cargo compartment doors, the electronic compartment external door and the emergency escape hatches are sealed by a hollow extrusion around the door edge, a typical section of this seal being shown on figure 202.

B. Equipment and Materials

(1) Leather punch, 0.09-inch diameter

(2) Washers, 0.125-inch inside diameter

(3) Shims, 0.06-inch

(4) Sealant, BMS 5-79, Class B (preferred), BMS 5-19, Class B (optional)

(5) Deleted.

C. Remove Door Seal

(1) Open door.

(2) Bend bulb section of seal away from attaching flange and remove screws attaching seal retainer angle to door.

D. Install Seal (Forward and Aft Entry and Galley Doors)

(1) Open door.

(2) Remove bolts connecting control and stop rods to upper and lower gates, taking care not to disturb their adjustments.

(3) Position seal around door with its longer side at forward (hinge) edge, and with its channel sections correctly located along upper and lower gate hinges. (See figure 201.)

(4) Install seal temporarily at any one corner.

(a) Place seal tightly against flange of locator angle on main part of door and around corner to its location on gate hinge (See detail A, figure 201.)

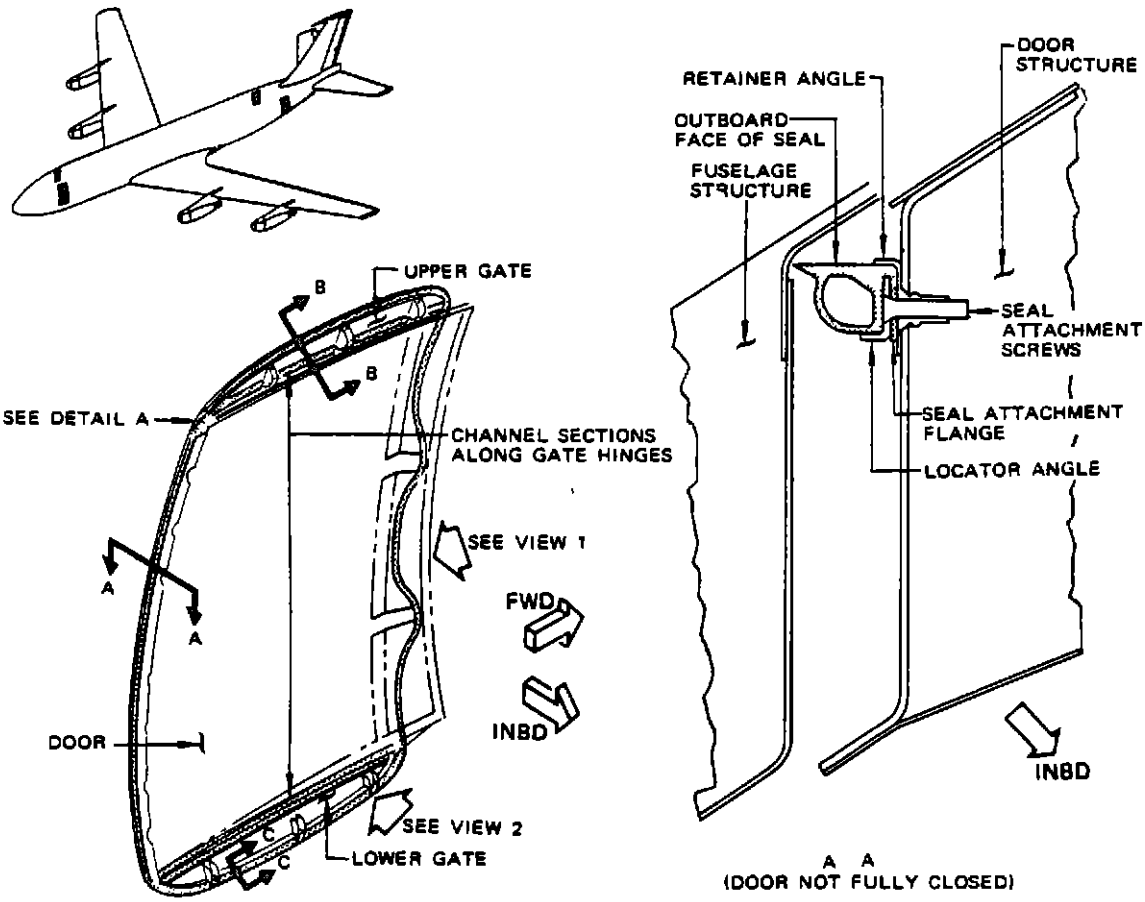
(b) Locate and punch hole in seal attachment flange to align with hole in locator angle, adjacent to corner.

(c) Temporarily install screw and washer, tightening until washer just begins to squeeze rubber.

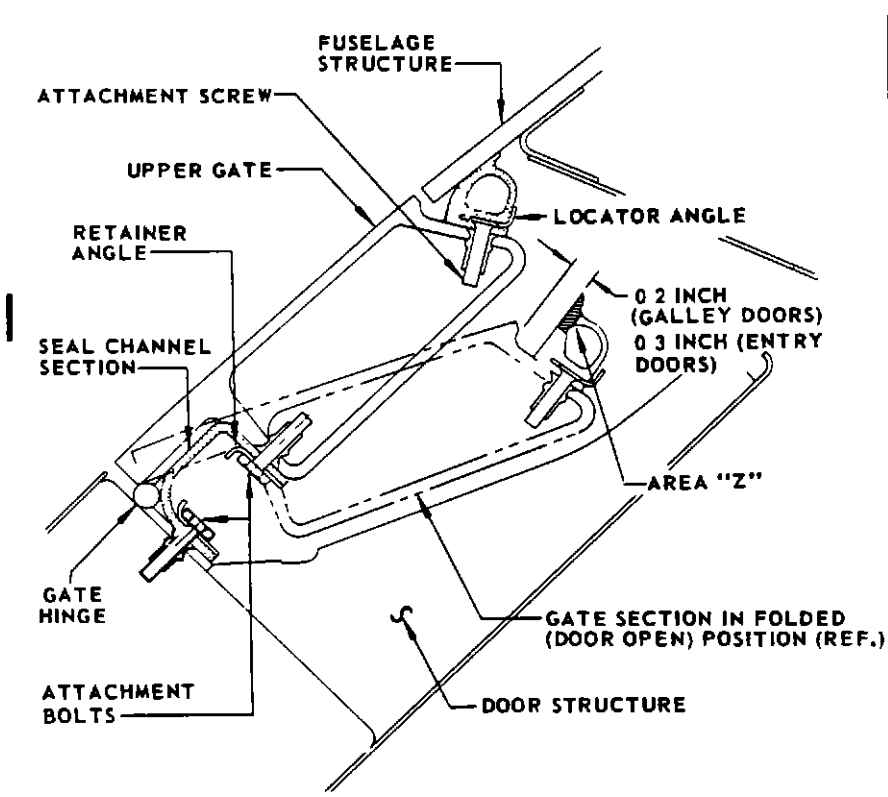
(5) Fit seal at remaining seven corners in similar temporary manner.

(6) Fit seal temporarily along forward (hinge) edge of door, locating and punching holes and installing screws and washers in sequence shown in view 1, figure 201.

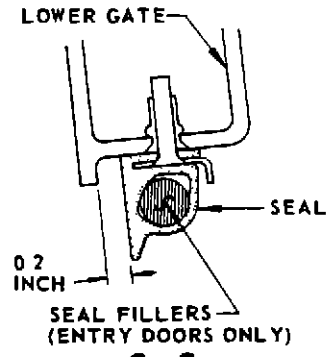
NOTE Seal should be under some tension between points 3 and 4, and under slight compression between points 1 and 4 and between points 2 and 3, in order to maintain angle of 90 degrees between door edge and outboard face of seal.



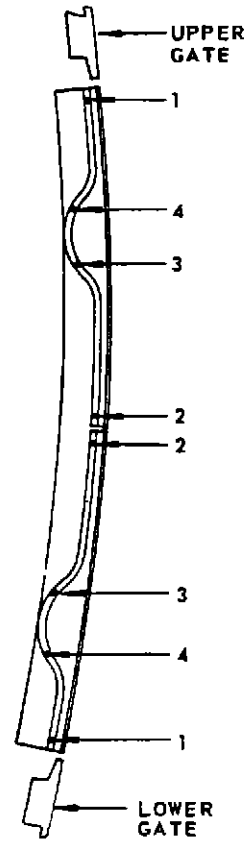
Door Seal Installation
Figure 201 (Sheet 1)



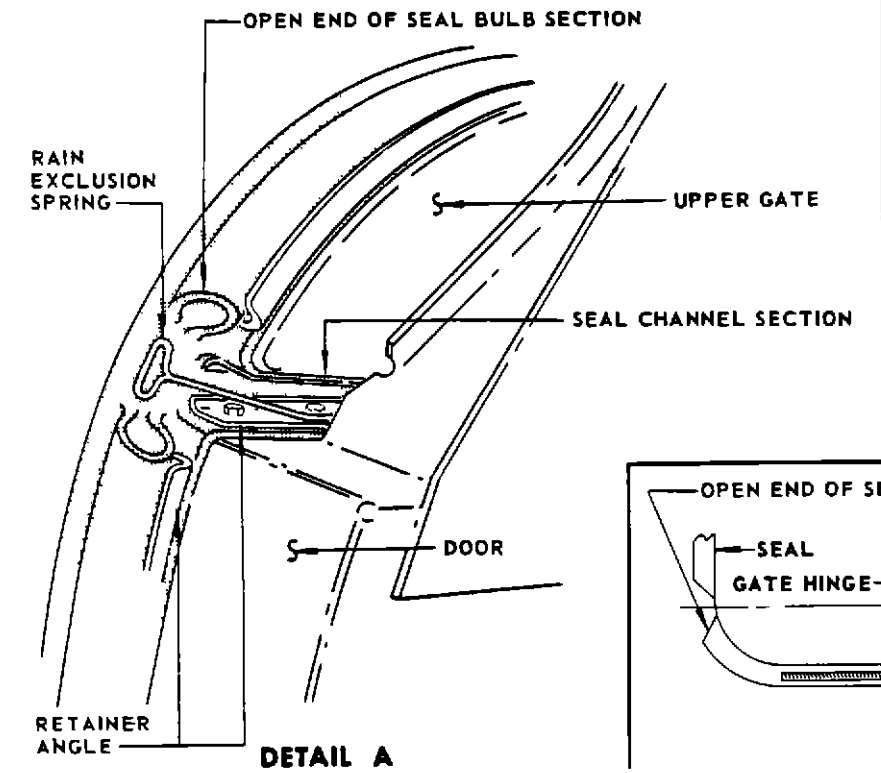
B - B



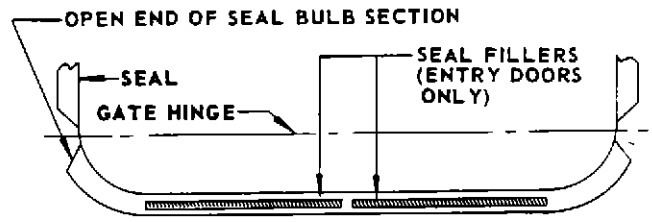
C - C



VIEW 1



DETAIL A



VIEW 2

(7) Locate and punch remaining holes in seal attachment flange all around door and along gate hinges

NOTE. On upper and lower gates no locating angle is fitted and holes must be punched to locate seal parallel to gate edge and in accordance with dimensions on Sections B-B and C-C, figure 201.

(8) Remove all screws, discard washers and install retainer angles, using same screws as were used temporarily.

(9) Install remaining screws in seal retainer angles around edges of door and gates, and install bolts in retainer angles along channel section. Tighten screws and bolts until compression of seal attachment flange just becomes visible.

NOTE. The rain exclusion spring should be installed under the heads of the channel section retaining strip attachment bolts at both ends of both gate hinges (See detail A, figure 201.)

(10) On forward and aft entry doors only, insert 3/8 inch diameter silicone sponge rubber filler into open ends of seal bulb section at each end of lower gate. When installed, both fillers should lie within straight length of seal along lower gate. (See Section C-C and View 2, figure 201.)

(11) On all entry and galley doors, connect control and stop rods at upper and lower gates.

(12) Check seal installation

(a) Tape 0.06 inch shim to stop fittings adjacent to latches and close door until contact is made with shims.

CAUTION: DO NOT ATTEMPT TO CLOSE DOOR COMPLETELY.

(b) Check that when a source of light is moved along forward and aft edges of door outside airplane, no light is visible through these edges from inside airplane

(c) Shim seal locally if necessary to obtain correct installation.

1) Open door.

2) Remove retainer angle attachment screws at each end of length of seal to be shimmed.

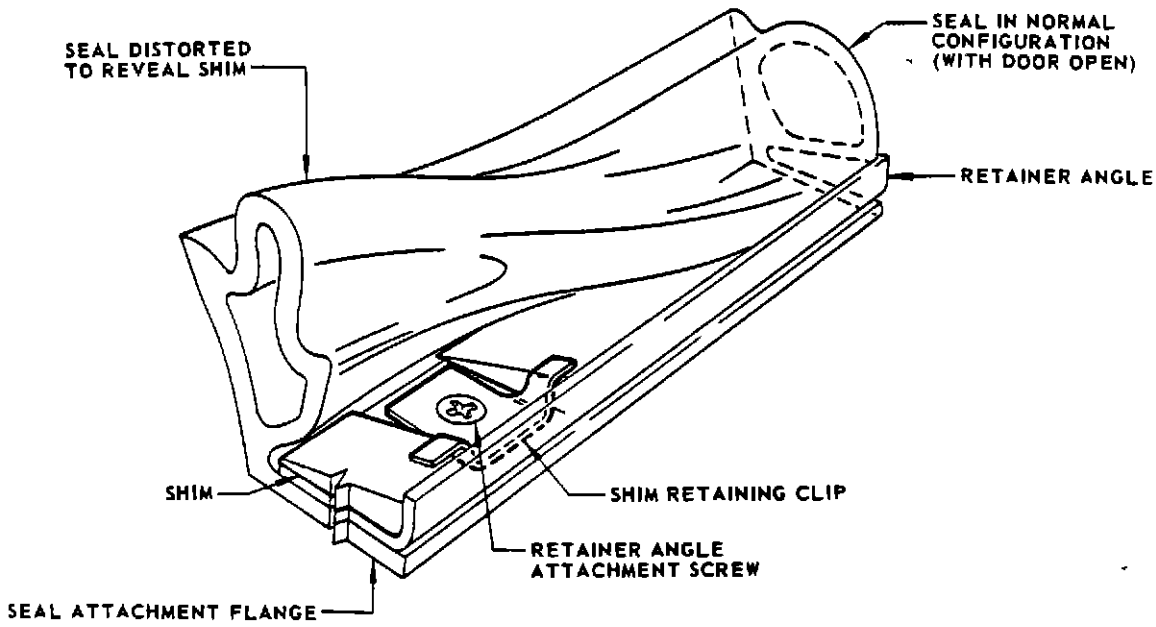
NOTE: The length of individual shims is generally limited to the distance between alternate screws. Where the seal bends to approach the hinge cutouts, however, the shims should be limited in length to the distance between adjacent screws. No shims should be installed in those portions of the seal which butt against the hinge flap gates (between points 3 and 4, figure 201, View 1), as excessive pinching and damage of the seal may result.

3) Cut shim to length required.

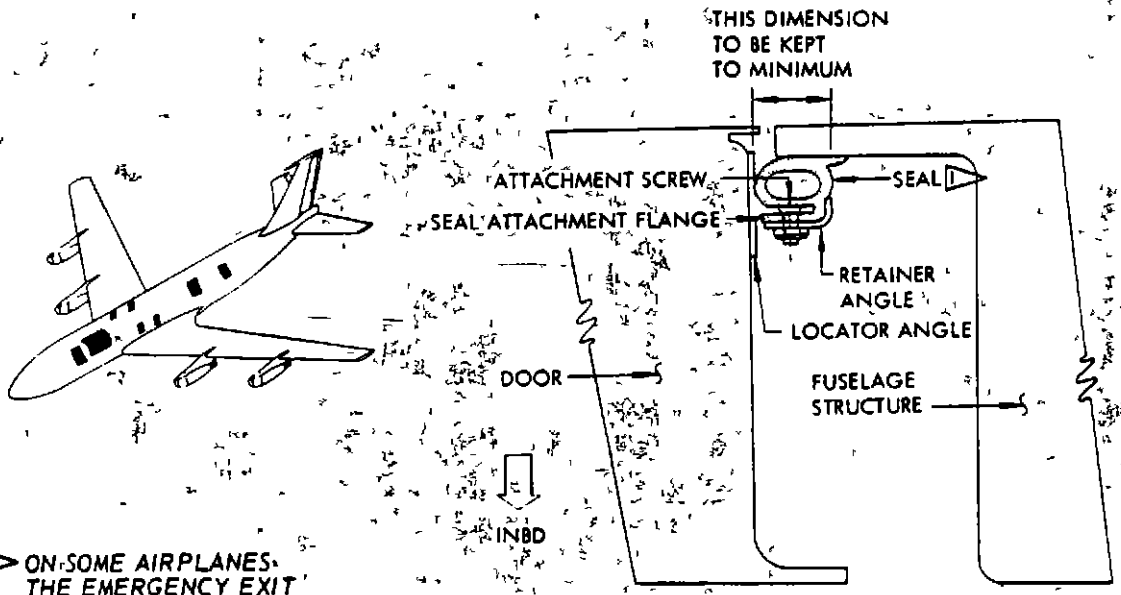
NOTE: Shims should be cut from a wedge-section rubber extrusion (BAC 1521 - 585), or may be made by cutting down part of an old or spare seal to obtain area "Z," shown shaded on Section B-B, figure 201.

4) Trap ends of shim under shim retaining clip (figure 201A) and install retainer angle attachment screws.

5) Check seal installation as described in paragraphs (a) and (b).

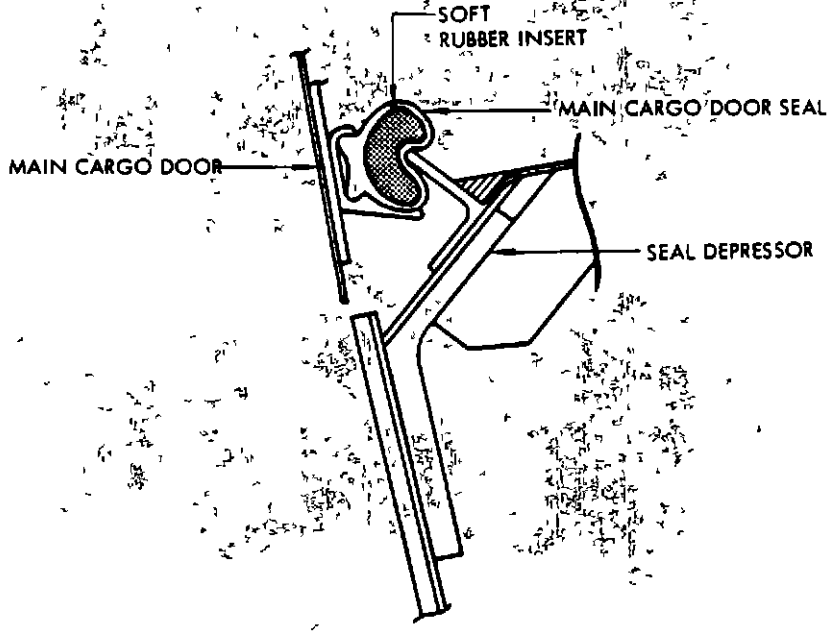


Door Seal Shim Installation
Figure 201A



1 ON SOME AIRPLANES THE EMERGENCY EXIT HATCH SEALS DO NOT HAVE A SEALING LIP

TYPICAL SECTION CARGO COMPARTMENT OR EXIT HATCH SEAL



TYPICAL SECTION MAIN CARGO DOOR SEAL

Door Seal Installation
Figure 202

(d) Open door, remove shims from stop fittings and close door completely.

(e) Check that when source of light is moved around entire edge of door, outside airplane, no light is visible through any part of seal from inside airplane. Shim seal again if necessary until installation is satisfactory.

E. Install Seal (Cargo and Electronic Compartment External Doors and Emergency Exit Hatches)

(1) Open door.

(2) Position seal on locator angles around entire door. (See figure 202.)

NOTE: On cargo compartment doors and emergency escape hatches position location mark on seal approximately at bottom center of door to align prepunched holes in seal flange with holes in locator angles. To obtain equivalent alignment on electronics compartment door seal, position its location mark at center of aft edge of door.

(3) Press seal firmly home on locator angles, position retainer angle on seal attachment flange and install screws.

NOTE: When installing seal on the inward opening station 990 hatch, inject a bead of BMS 5-79, Class B, sealant in the bottom of the seal retainer slot. The sealant should extend across the lower portion of the seal and up 16.0 inches at the forward and aft corners. On all other inward opening emergency escape hatches, the sealant should extend across the lower portion of the seal and up 6.0 inches at the forward and aft corners.

WARNING: SEALANTS MAY CONTAIN TOXIC AND FLAMMABLE COMPONENTS.

(4) Check seal installation

(a) Tape 0 06-inch shim to stop fittings adjacent to latches and close door until contact is made with shims

CAUTION · DO NOT ATTEMPT TO CLOSE DOOR COMPLETELY

(b) Check that when a source of light is moved around seal outside airplane, no light is visible from inside airplane

(c) Open door, remove shime and close door completely

2 Approved Repairs Door Seals

A General

(1) The silicone rubber seals used for pressure sealing doors and hatches are subject to three different types of failure or damage

(a) Delimination of joints occurs where the mechanical bulb seal section joins the diaphragm seal section on the door seals See Fig 203 for this type of joint The fabric-reinforced rubber which forms the joint peels loose from the mechanical or diaphragm seal Primary cause of this failure is poor bonding.

(b) Cuts, nicks, splits or tears in the seal section are primarily a result of lack of care in handling and installation

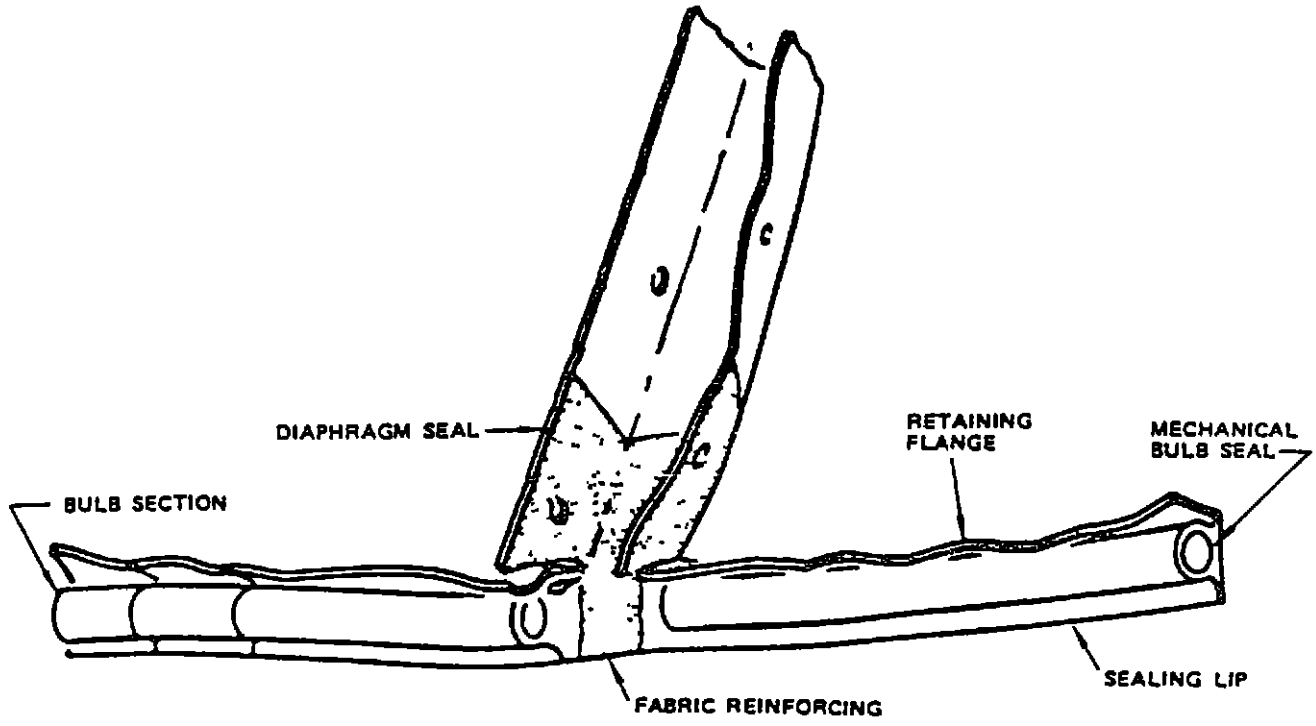
(c) Splice failure occurs on those continuous seals formed by splicing the ends of the extruded bulb section The splices are reinforced with fabric Delamination can occur as described in par (a) On emergency exit hatch seals, the ends of the seal are joined by a thick layer of vulcanized rubber Flexing of the seal causes separation of the bond between this material and the ends of the extruded section

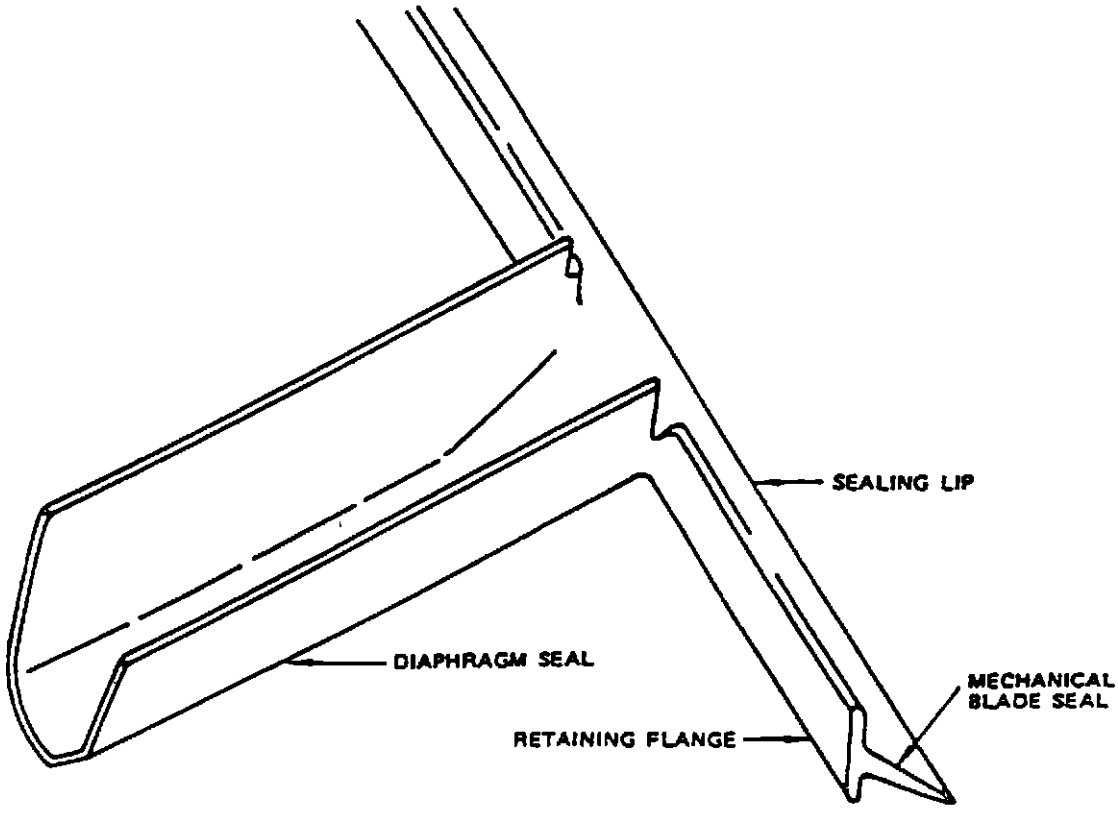
(2) Seal repair procedure for the silicone rubber door and hatch seals may be divided into three general methods

(a) Method A is a procedure for repairs in which the cut, delaminated, or otherwise separated surfaces are rejoined by adhesive only

(b) Method B consists of repairs with an adhesive reinforced with open mesh Dacron D-117 or D-118 fabric The fabric is embedded in the adhesive on the seal surface

(c) Method C repair procedure comprises the replacement of a section of seal using adhesive, and when required, fabric cemented into place





Typical Pressure Seals
Figure 203

C Storage of Adhesives

(1) Adhesives stored for several months should be kept at 40 to 50°F Small stocks of adhesive, for shop use may be stored at 60 to 80°F for a maximum of 6 months

(2) When not in use, keep all containers of adhesive sealed Containers of the Type II adhesives should always be kept sealed when not in use Once the container has been opened, a plug of cured material, which forms in the nozzle or tube tip during storage, must be removed prior to bonding

D Prepare Adhesive

(1) Mix adhesive only as needed and use as soon after mixing as possible

(a) Thoroughly mix 100 parts, by weight of A-4000 resin with 4 5 parts, by weight catalyst Use adhesive as soon as possible after mixing Pot life of A-4000 is 2 to 4 hours at 70°F

(b) Thoroughly mix 100 parts, by weight of SR-529 adhesive base with 4 5 parts by weight SC-3900 catalyst Use adhesive as soon as possible after mixing Pot life of the adhesive is 8 hours at 70°F

(c) Thoroughly mix 100 parts, by weight of Dow Corning 93-076-1/2 or 93-076-2 adhesive base with 10 parts by weight of catalyst Use adhesive as soon as possible after mixing Pot life of the adhesive is a maximum of 2 hours

NOTE The type II adhesives (Dow Corning 731 RTV and Silastic 140 and General Electric RTV 174 are one part adhesives Each has an indefinite pot life until exposed to air

E Prepare Surfaces

(1) Clean both surfaces to be joined, including approximately 2 inches of surrounding area, with clean cheesecloth or gauze pads wet with methyl ethyl ketone

WARNING METHYL ETHYL KETONE IS FLAMMABLE AND TOXIC USE ONLY IN WELL VENTILATED AREA

(2) Wipe dry with clean dry gauze before solvent evaporates

(3) Repeat steps A and B as necessary to completely remove dirt, oil, paint and other soils

NOTE Clean surfaces are essential for good adhesion

(4) Lightly abrade the area to be repaired with 100 grit, or finer, abrasive to roughen the surface Remove the particles with a dry cheesecloth

(5) Apply primer to all surfaces which adhesives are to be applied as follows

(a) Spray or brush light coat of Dow Corning 1200 RTV or S-2260 primer on all materials except silicone rubber and air dry for 30 minutes before applying Dow Corning A-4000, Silastic 140 RTV, Silastic 731 RTV or General Electric SR-529 adhesives

NOTE Primer is not required on silicone rubber

(b) Spray or brush light coat of Dow Corning 1204 primer on all materials except silicone rubber and dry for 1-24 hours before applying Dow Corning 93-076-1/2 or -2 adhesive

(c) Spray or brush light coat of Dow Corning 92-035 primer on silicone rubber and dry for 10 minutes to 24 hours before applying Dow Corning 93-076-1/2 or -2 adhesive

(d) Primer is not required before applying General Electric RTV 174 adhesives

F Repair Delamination at Joints

(1) General

(a) Delamination in a small area (up to 0 50 square inch) may be localized or cover most of that area (extensive) If delamination is localized and the adjoining bond is tight it may be possible to cut off the delaminated area, if extensive, repair can be effected by use of adhesive Repairs to delamination in large areas (over 0 50 square inch) may require complete removal and replacement of fabric reinforcement

(2) Repair small delaminated areas (localized in edge of splice and sealing capability is not impaired)

(a) Cut off loose flap with a sharp knife

(b) Feather edge to discourage further peeling

(c) Apply a light coat of Type I or Type III adhesive (par 2 A (3)(b) or (c))

(3) Repair small delaminated areas (a maximum of 0 50 sq in)

(a) Pull back delaminated flap and prepare faying surfaces per par E

(b) Repair seal using Method A (par 2 A (2)(a) with a Type I adhesive) Allow 5 to 30 minutes drying time before joining surfaces

NOTE The longer times are required at high humidity (over 75 percent relative humidity) or at temperatures below 65°F

(c) Press surfaces together firmly to ensure complete contact

(d) Allow adhesive to cure as long as possible, (preferably 24 hours minimum) before stressing bond

(4) Repair delaminated areas which may result in leaks on propagation of damaged area

(a) Repair delamination on sealing edge (fabric intact)

1) Prepare faying surfaces per par E

2) Repair seal using Method A (par 2 A (2)(a) with a Type II or Type III adhesive (par 2 A (3)(b) or (c))

3) Press surface firmly together as soon as possible after application of adhesive, to ensure complete contact and exclude air pockets

4) Allow adhesive to cure as long as possible (preferably 24 hours) before stressing bond.

NOTE If quick repair is made on seal in place using Type III adhesive, airplane may be pressurized in 1 hour with exception noted in par 2 A(3)

(b) Repair delamination on sealing edge (fabric damaged)

1) Remove damaged fabric by carefully peeling away from seal

2) Prepare seal surfaces per par E

3) Repair seal using Method B (par 2 A(2)(b)) with a Type II or Type III adhesive (par 2 A (3)(b) or (c))

a) Cut a patch of D-117 or D-118 fabric and press it into the wet adhesive on seal surfaces

b) Apply three or four uniform coats of adhesive over the fabric to build up a film of adhesive over fabric

4) Allow adhesive to cure as long as possible, preferably 24 hours, before stressing bond (Ref step (a)2) for exception)

c) Repair delamination away from sealing edge (on flange or channel - intact)

1) Proceed per par 2 F (4)(a)

d) Repair delamination away from sealing edge (on flange or channel - fabric damaged)

1) Remove damaged fabric by carefully peeling away from seal

2) Prepare seal surfaces per par 2 E

3) Repair seal using Method B (par 2 A (2)(b)) with a Type I, Type II, or Type III adhesive (par 2 A (3)(b) or (c))

a) Cut a patch of D-117 or D-118 fabric and press it into the wet adhesive on seal surfaces

b) Apply a coat of adhesive over the fabric

4) Allow adhesive to cure, preferably 24 hours minimum, before stressing bond (Ref step (a)2) for exception)

G Repair Cuts or Splits in Rubber in Joint Area

(1) General

(a) Repair procedures for the above types of damage consist of cleaning and reinforcing the damaged area using Method B (par 2 A (2)(b)) with a Type II or Type III adhesive (par 2 A (3)(b) or (c)) Refer to par 2 F (4)(b) and 2 F. (4)(d)

(2) Repair separated splice bonds (cargo doors and escape hatches)

(a) Clean seal surfaces for approximately 2 0 inches on each side of spice per par E

(b) Cut a patch of D-117 or D-118 fabric a minimum of 2 0 inches wide and long enough to wrap completely around seal

(c) Apply a liberal brush coat of Silastic 140 RTV or Silastic 731 RTV, or General Electric RTV 174 adhesive, or Dow Corning 93-076-1/2 or -2 adhesive to cleaned seal surfaces

(d) Press fabric patch into wet adhesive on seal and wrap it completely around seal, smoothing it into all contours, and trim off excess material

(e) Apply several additional thin coats of adhesive by brush

(f) Feather or fair the edges of the patch, taking special care to get a smooth surface on the sealing lip Avoid using an excessive thickness of adhesive which will produce a stiff, rigid area over the seal lip

J Repair Large Seal Areas or Severely Damaged Seal Sections

(1) General

(a) Large seal areas or severely damaged sections of seal may be repaired using Method C plus Method B (par 2 A (2)(c) plus (b)) with a Type II or Type III adhesive (par 2 A (3)(b) or (c))

(2) Repair Large Seal Area or Severely Damaged Seal Section

(a) Remove the entire damaged area or section

(b) Replace seal area or section with a similar section of a surplus seal cut to the exact length

(c) Locate joint splice in straight section of seal

(d) Make mitered cut on abutting seal surface and fill with a Type II or Type III adhesive.

(e) Apply adhesive to complete the seal

NOTE For an emergency seal repair, Method A (par 2 A (2)(a)) can be used with a Type III adhesive (par 2 A (3)(c))

MAIN CARGO DOOR - DESCRIPTION AND OPERATION

EFFECTIVITY

00-SJL and on

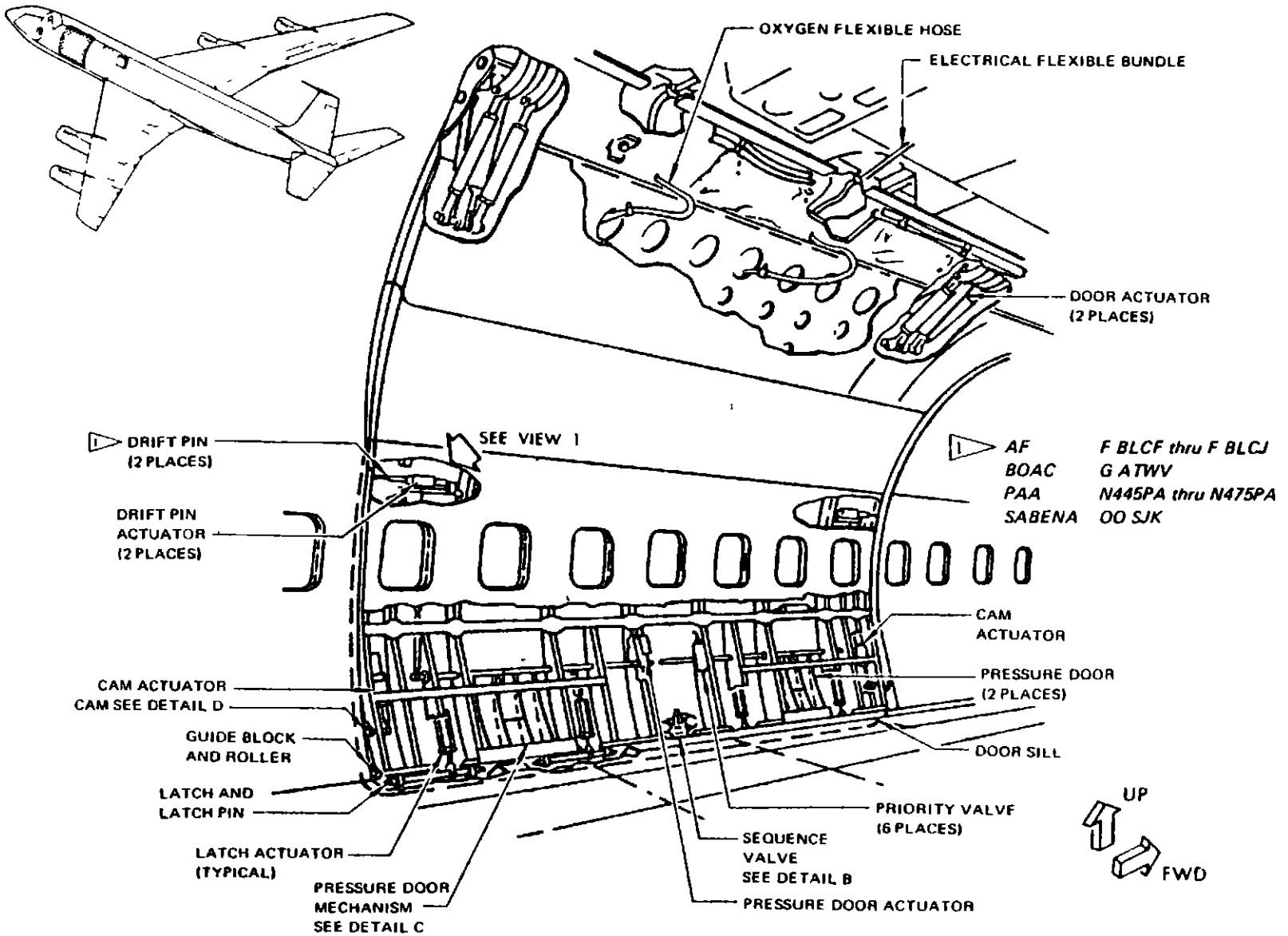
1. General

A. The main cargo door is on the upper left side of the forward fuselage, hinges outward and is hydraulically actuated. Its forward and aft edges are at body stations 483 and 600 +17, respectively, and its lower edge is at the level of the cabin floor. Its upper edge, which is attached to the fuselage by sections of hinge, is adjacent to stringer No S-3 on the upper left side of the fuselage.

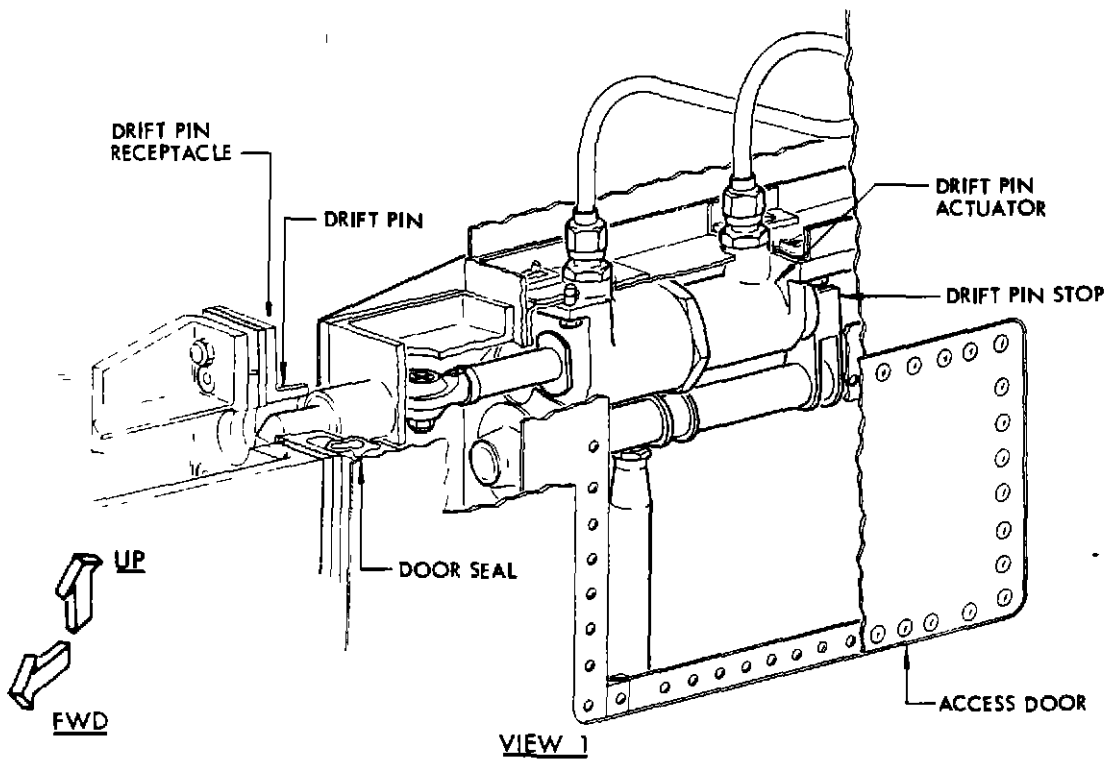
B. The structure of the door consists of an alclad pressure web, forming the exterior surface, reinforced by circumferential and longitudinal frames. Two rectangular openings near the lower corners of the door are closed by inward hinging pressure doors (Fig. 1). The pressure doors release any residual cabin pressure before the main cargo door is opened.

C. A continuous pressure seal around the periphery of the door prevents outward leakage of cabin pressure air and inward leakage of rain. Pressurization loads acting on the door are borne by the door structure in hoop tension, and are trasmitted to the fuselage structure primarily by the door hinge, along the upper edge, and by eight mechanical latches along the lower edge. Distortion is also prevented by two pairs of mating stop pads between each end of the door and its adjacent fuselage frame.

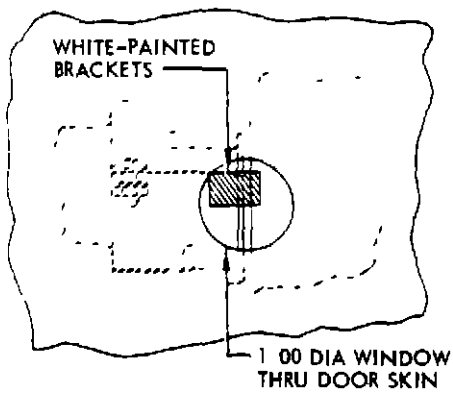
D. The main cargo door is hydraulically operated with hydraulic power supplied by the main cargo door hydraulic pump. In addition to the two actuators which open and close the door, nine other actuators are included in the system to peform the functions associated with locking the door. The hydraulic system is controlled from a cargo door control panel on the aft face of the bulkhead at body station 302. This panel includes a control switch to open or close the door and a manual shutoff valve. Warning lights provide the crew with indications that the locking mechanisms of the door are properly engaged.



Main Cargo Door Mechanism
Figure 1 (Sheet 1)

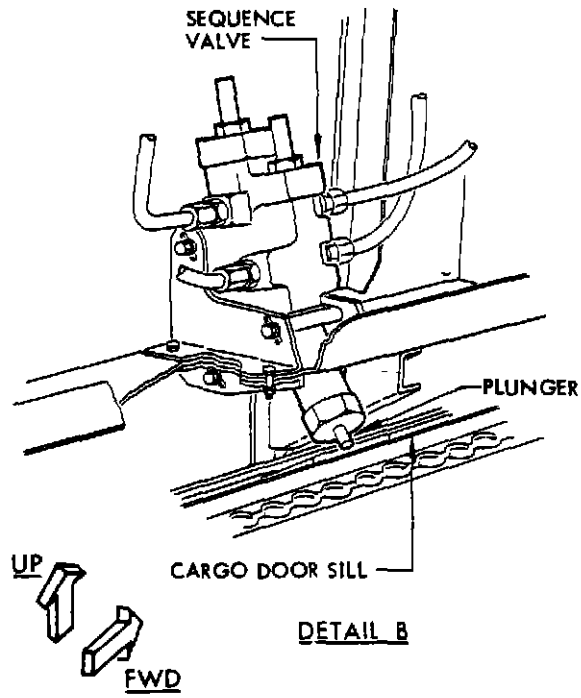


VIEW 1

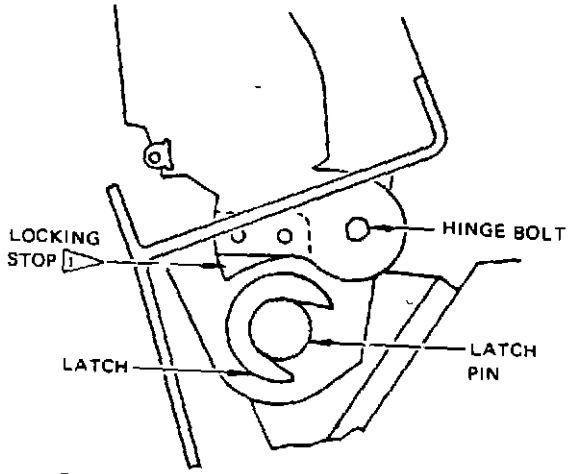


VIEW ON LATCHES AT STATION 542 AND 614 LATCHES AT STA 485 AND 558 OPPOSITE CARGO DOOR IS LOCKED WHEN WHITE-PAINTED BRACKETS ARE VISIBLE AT ALL FOUR VIEWING WINDOWS

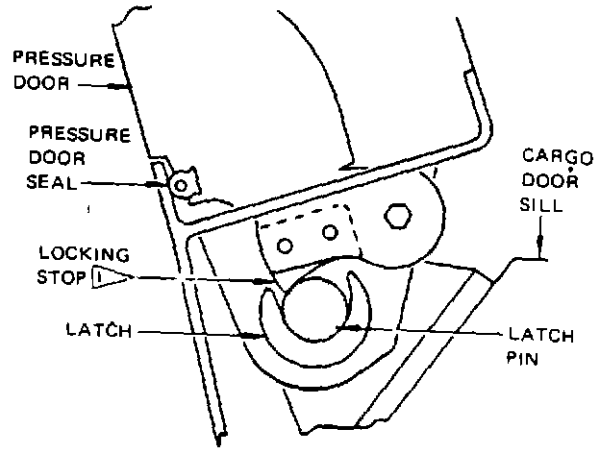
VIEW 2



DETAIL B



CARGO DOOR CLOSED LATCH READY FOR DOOR OPENING (OR DOOR LOCKING PRESSURE DOOR OPEN)

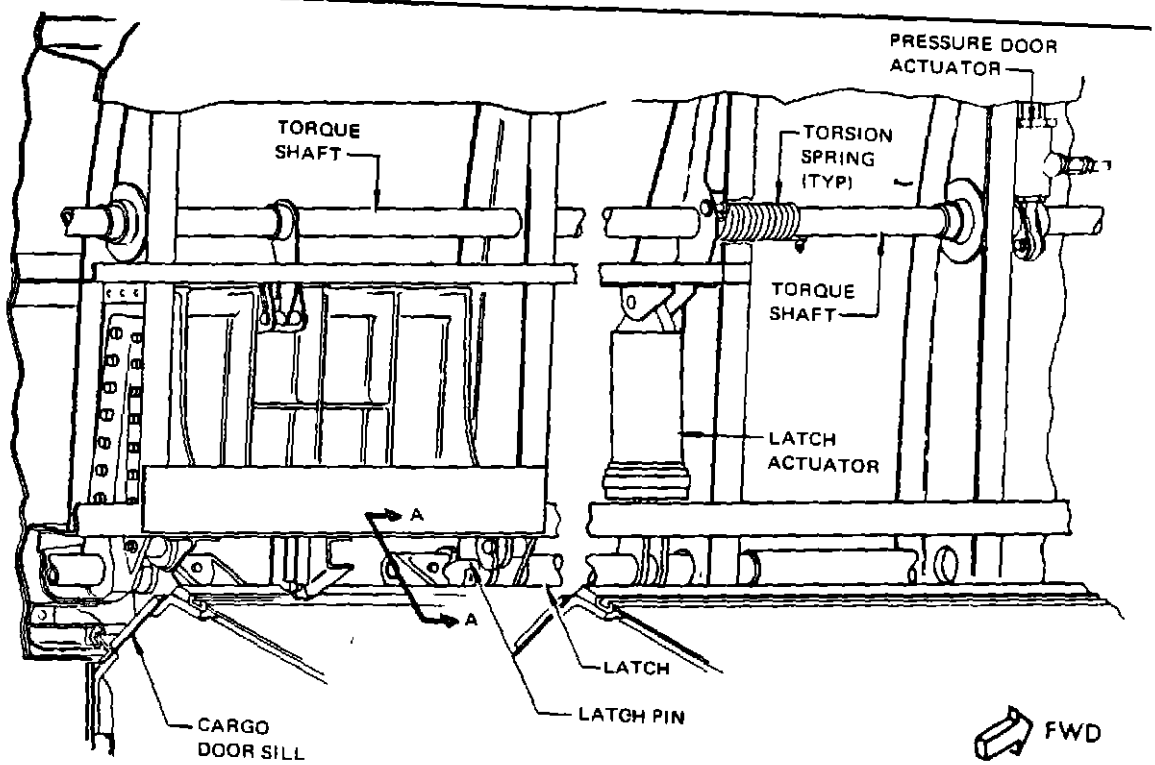


CARGO DOOR CLOSED LATCH FULLY ENGAGED ON LATCH PIN AND PRESSURE DOOR CLOSED

1 *Locking stops are replaceable on all airplanes except*

AF	*F BLCC thru F BLCG*
SABENA	*OO-SJH thru OO-SJK*

DETAIL A-A



LATCH ACTUATOR (TYP)

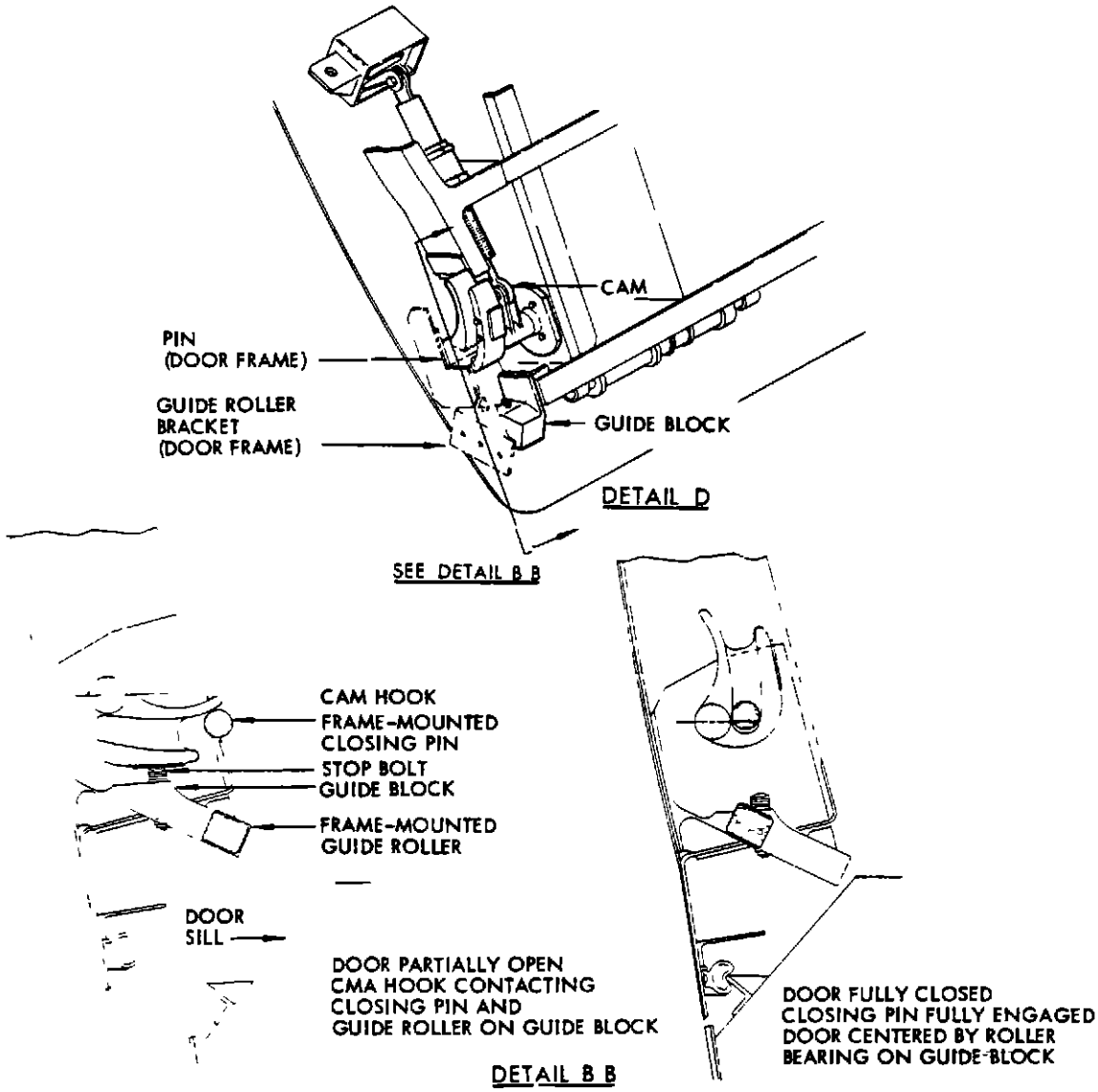
DETAIL C

Main Cargo Door Mechanism
Figure 1 (Sheet 3)

2. Main Cargo Door Actuation Mechanism

A. The hydraulic actuation mechanism of the door consists of two actuation linkages, each has an upper and a lower actuation link and a hydraulic actuator. (See figure 2.) The mechanisms are at the extreme forward and aft ends of the door adjacent to the hinges. The extending end of the actuator and the outboard ends of both links are connected by one common pivot pin. The inboard ends of the upper link and the actuator body are mounted on the door, and the inboard ends of the lower links pivot from two brackets bolted to the fuselage structure.

B. When the door is closed the actuation links lie almost parallel to each other, with the actuator between them. Retraction of the actuator causes the inboard ends of the links to spread apart, thus opening the door.



Main Cargo Door Mechanism
Figure 1 (Sheet 4)

3. Positioning, Latching and Safety Mechanisms

A. The components which position and secure the door in its locked position consists of two cams, two centering guide blocks, four pairs of rotary latches and two drift pins. On later airplanes the drift pin actuators have been removed from the door. (See figure 1 for airplane effectivity.) Eight sections of the simulated air grille can be hinged upward by hand to enable a visual check of the cargo door latches from inside the airplane. The hinged portions of simulated air grille are at the bottom of the door interior lining and are located near the latches. Inspection windows are provided in the cargo door outer skin to enable a visual check of the cargo door latches from outside the airplane. The latch viewing windows are located at WL 206 and body stations 485, 542, 558, and 600 +14. White painted brackets are attached to each latch fitting. When the brackets are visible at all viewing windows, the cargo door is locked. (See figure 1.)

B. Both cams are at the lower corners of the door, one at the forward edge and the other at the aft edge. Each cam is hydraulically actuated, by its own individual actuator, and consists of a specially profiled hook which rotates about an axis parallel to the door hinge line. As the door approaches its fully closed position each cam engages a pin rigidly mounted to the fuselage structure at each end of the door. Rotation of the cams about the pins causes the door to be drawn into its fully closed position. The cargo door is centered, in the final closing and the initial opening movements, by guide blocks at the forward and aft lower corners of the door which bear on guide rollers on the door frame.

C. Each of the four pairs of rotary latches is hydraulically actuated by its own actuator, and consists of a latch fitting at each end of a torque tube mounted along the lower edge of the door. Each latch fitting is in the form of a short hollow sleeve with half of its periphery cut out. As the door is drawn into its fully closed position, the open face of the latch sleeve engages a pin rigidly mounted to the fuselage structure along the door sill. In the fully closed position the centerline of the stationary pins coincides with that of the latch fittings, and rotation of the latch fittings about the pins provides a positive mechanical lock against any outboard movement of the door.

D. On AF airplanes F-BLCF thru F-BLCJ, BOAC airplane G-ATWV, PAA airplanes N445PA thru N475PA, and Sabena airplane OO-SJK, the two drift pins are at the forward and aft ends of the door, one at each end. Each pin is hydraulically actuated by its own actuator and moves parallel to the door hinge line. The ends of the pins are tapered to facilitate engagement with the receptacles on the fuselage structure. The other end of each pin consists of a fork end which is connected to the end of the actuator pushrod The other end of the actuator pushrod extends beyond the body of the actuator to terminate in a special knob fitting. This fitting enables the drift pin to be locked in its extended position by a stop mechanism connected to the pressure doors

E The two pressure doors are inward-opening doors hinged at their lower edges and actuated by a common torque tube which is rotated by one hydraulic actuator. Each pressure door is fitted with an arm which projects below the lower edge of the main cargo door structure to actuate the microswitches for the door warning lights The hinge fittings of each pressure door have two locking stops which engage with the main door latches so that the pressure doors can only close when all four pairs of main door latches are properly rotated into their fully locked position Conversely, the main door latches cannot be released until the pressure doors are opened. (See detail AA, figure 1) The torque tube which actuates the two pressure doors is mounted horizontally within the main door structure above the upper edges of both pressure doors The torque tube is connected to the pressure doors by two cranks which engage a slotted bracket on the upper edge of each pressure door. A crank at the mid-portion of the torque tube is connected to the actuator mounted above the torque tube A torsion spring is installed near the center of the cargo door providing a mechanical back-up for the pressure door actuator. The pressure door actuator rotates the torque tube shaft, closing the pressure doors and locking the drift pins, if installed, and latches. The torsion spring is bolted to the torque tube shaft and the door structure At each end of the torque tube a crank connects to a pushrod. Each of these pushrods extends vertically within the main door structure to an idler crank, and, on airplanes with drift pins installed, an additional pushrod connects from the idler crank to a crank on the drift pin stop mechanism. This mechanism is mounted approximately in the center and at each end of the main cargo door, and consists of a short horizontal torque tube with two cranks. One crank is connected to the pushrod which actuates the mechanism and the other is a special stop block which ensures the sequence of drift pin actuator, if installed, and pressure door operation in the cargo door opening and closing.

4. Main Cargo Door Hydraulic Power System

A. Hydraulic power for cargo door operation is supplied by the main cargo door hydraulic pump. A manual hydraulic pump is also provided for cargo door operation in the absence of electrical power. Control of the door is by means of a motor-operated control valve and solenoid-operated shutoff valve, which is normally operated remotely from the door control panel at the main entry door. The motor-operated control valve can be operated manually in the event of electrical failure. A manual shutoff valve and a solenoid-operated shutoff valve provide a means of removing hydraulic pressure from the door preventing accidental inflight opening of the door (Fig. 5).

5. Main Cargo Door Hydraulic Components

A. General

(1) The components of the hydraulic system are installed within or adjacent to the door, and are also in the right main wheel well. Areas where Skydrol could leak are designated as possible Skydrol contamination areas. Special paint and protective materials have been used to prevent damage in these areas (Ref Chapter 51, Interior and Exterior Finishes). For additional information on Skydrol 500, refer to Chapter 29, Hydraulic Power.

B. The hydraulic components installed within the main cargo door structure comprise four latch actuators, two cam actuators, one pressure door actuator, two drift pin actuators, one sequence valve, three priority valves, three check valves, three pressure relief valves, five flow limiting valves, and a blocking valve.

(1) Latch Actuator

(a) All four latch actuators (Fig. 1) are identical units and are situated above the door latches. The body of each actuator is connected by one bolt to the door structure, and its pushrod end is similarly connected to the crank on the torque tube between each pair of latch fittings. Each actuator body is provided with two ports, one for the door locked and the other for the door unlocked pressure lines.

(2) Cam Actuators

(a) Both cam actuators (figure 1) are identical units and are installed above the cam shafts, to which the pushrod end of each actuator is connected by a bolt. The upper end of each actuator body is connected to the door structure. Two ports are provided on each actuator body, one for the "door locked" and the other for the "door unlocked" pressure line. A compression spring around the outside of the pushrod of each actuator tends to hold the actuator in its extended, or "door unlocked," position.

(3) Pressure Door Actuator

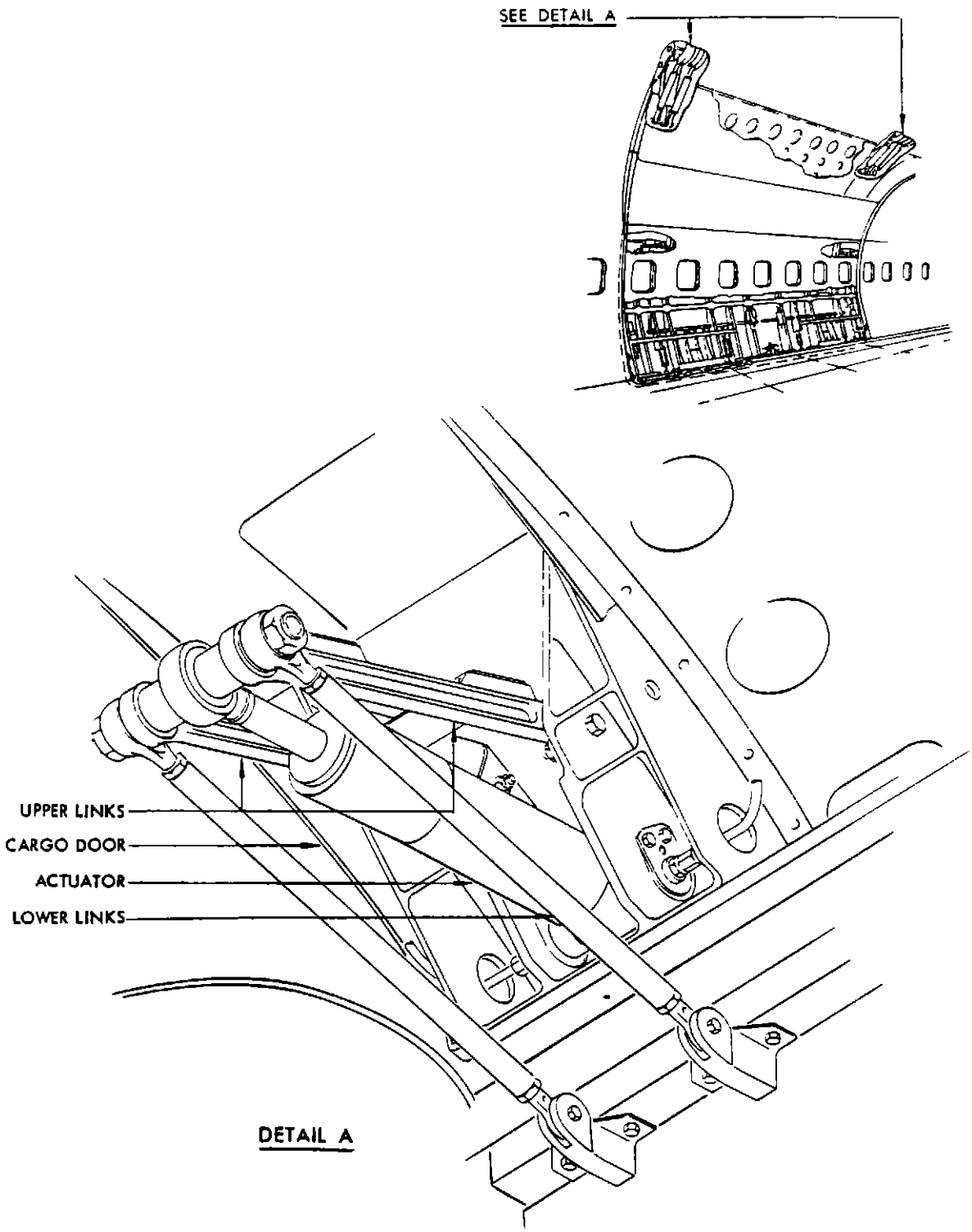
(a) The pressure door actuator (figure 1) is installed above the pressure door actuation torque tube. The upper end of the actuator body is connected by one bolt to the main door structure, and its pushrod end is similarly connected to the crank on the torque tube. Two ports are provided on the body for opening and closing the pressure doors.

(4) Drift Pin Actuators

(a) The two drift pin actuators (figure 1) are identical units installed horizontally at each side of the door, adjacent to the drift pins they actuate. The body of each actuator is bolted to the main door structure, and is provided with two ports, one for "door locked" and the other for "door unlocked" pressure. The actuator pushrod passes right through the body At the end facing the side of the door the pushrod is provided with an eye end which connects to the forked end of the drift pin.

(5) Sequence Valve

(a) The sequence valve (figure 1) is a plunger-type valve installed at the lower edge of the main door. The body of the valve is bolted to the main door structure and is provided with four ports for line connections. The valve plunger protrudes below the lower edge of the door so that it is depressed, against internal spring pressure, by contact with the fuselage structure as the door approaches its closed position. The purpose of the valve is to correctly sequence the hydraulic functions of the door when closing the door.



Main Cargo Door Actuator Mechanism
Figure 2

(5) Check Valves and Priority Valves

(a) The three priority valves and the three check valves are installed in the hydraulic system lines within the door. Two priority valves installed in the "door open" lines, one relieving at 1500 psi and the other at 2500 psi. A third priority valve relieves at 1500 psi and is installed in the door close line to the pressure door actuator. These valves ensure that the pressure doors, the latches, the drift pins, the cams and the door actuators operate in correct sequence. They also provide free flow for hydraulic fluid return when the cargo door is being closed. (See figure 5.)

(7) Pressure Relief Valves

(a) Three pressure relief valves are installed in the hydraulic system lines within the door, and are designed to relieve at 3500 psi. Two are installed in a bypass line to the main actuator close return lines. They relieve pressure buildup which might occur due to blocking valve malfunction. The other relief valve is installed in a bypass to the open return line from the main actuators. Its function is to provide an alternate passage for hydraulic fluid return in case of a malfunction of the flow limiting valve. (See figure 5) All pressure relief valves provide free flow in the opposite direction of their normal operation.

(8) Flow Limiting Valves

(a) Five flow limiting valves are installed in the hydraulic system lines within the door. (See figure 5.) Their purpose is to control the rate of pressure buildup within the door system to provide sufficient time for operation of various hydraulic components and control the speed of the main cargo door during opening and closing.

(9) Blocking Valve

(a) The blocking valve (figure 5) is a dual solenoid type with two outlets, each outlet is connected to the open side of the door actuators. The purpose of the valve is to secure the door in the required open position. With the valve energized (OPEN), a passage for hydraulic return fluid is provided, allowing the cargo door to close. With the valve energized (CLOSED), the passage for hydraulic return fluid is blocked, securing the door in the open position. Power for the valve operation is 28 volt d-c. The valve is energized (OPENED) when the door control switch is moved to the (CLOSE) position. When the door control switch is in the (OFF) or (OPEN) positions, the valve is de-energized (CLOSED). The valve can also be energized (OPENED) through the main cargo door manual close switch, in the right main wheel well, when the door is being manually closed.

C. The hydraulic components installed near the main cargo door are the main door actuators, a manual shutoff valve and a check valve.

(1) Main Cargo Door Actuators

(a) The main cargo door actuators (figure 2) are double-acting piston-type units installed between the upper and lower actuation links at the forward and aft corners of the door. Their function is to open and close the main door. The upper end of the actuator bodies are connected to fittings mounted on the door structure, and the lower ends of their pushrods are connected to the joint between the upper and lower actuation links. Two ports are provided on each actuator body, one for "door open" and the other for "door closed" pressure lines.

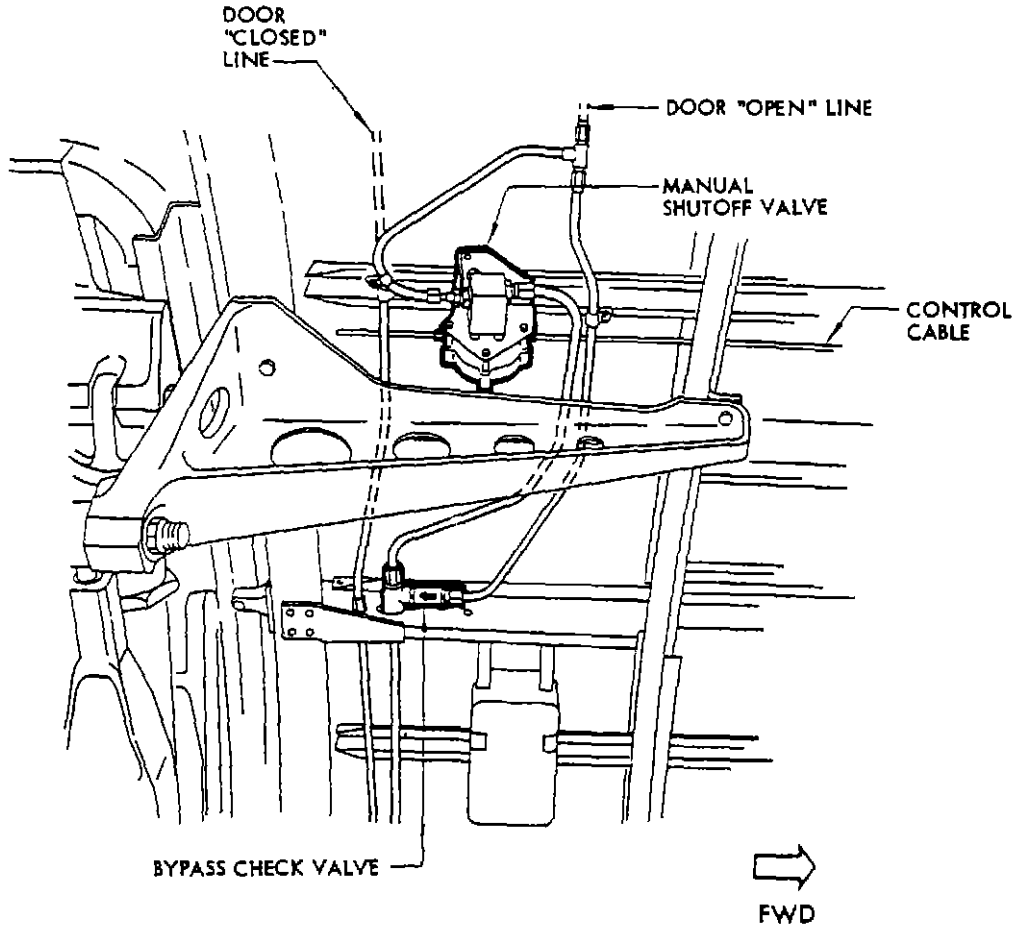
(2) Manual Shutoff Valve

(a) The manual shutoff valve is installed in the hydraulic system "open" line above the fuselage ceiling panelling near the door actuation mechanism. The purpose of the valve is to prevent the door from being inadvertently opened during flight. The valve is operated by a cable leading to the door control panel on the bulkhead at body station 302. (See figure 3.)

(3) Bypass Check Valve

(a) A bypass check valve is installed near the shutoff valve to allow the door to be closed if the shutoff valve is closed. (See figure 3.)

D. The hydraulic components installed in the right main wheel well are the hydraulic control valve, pressure relief valves, manual hydraulic pump, hydraulic shutoff valve, and hydraulic quick-disconnect coupling. (See figure 4.)



Main Cargo Door Manual Shutoff Valve
Figure 3

(1) Hydraulic Control Valve

(a) The hydraulic control valve (figures 4 and 5) is a motor-operated unit which incorporates a lever to provide a manual control. The purpose of the valve is to direct hydraulic pressure to the appropriate lines to open or close main cargo door. Four ports are on the valve body and the motor is a 28 volt dc unit with a split winding to permit rotation in both directions When the manual control lever is moved outboard to POS 1 position, the control valve is in the cargo door open position When the manual control lever is moved inboard to POS 2 position the control valve is in the "cargo door closed" position

(2) Pressure Relief Valves

(a) One pressure relief valve is a 3500 psi unit installed in a bypass line between the pressure line to the control valve and the return line The other pressure relief valve is a 100 psi unit installed in the return line to the reservoir (See figures 4 and 5)

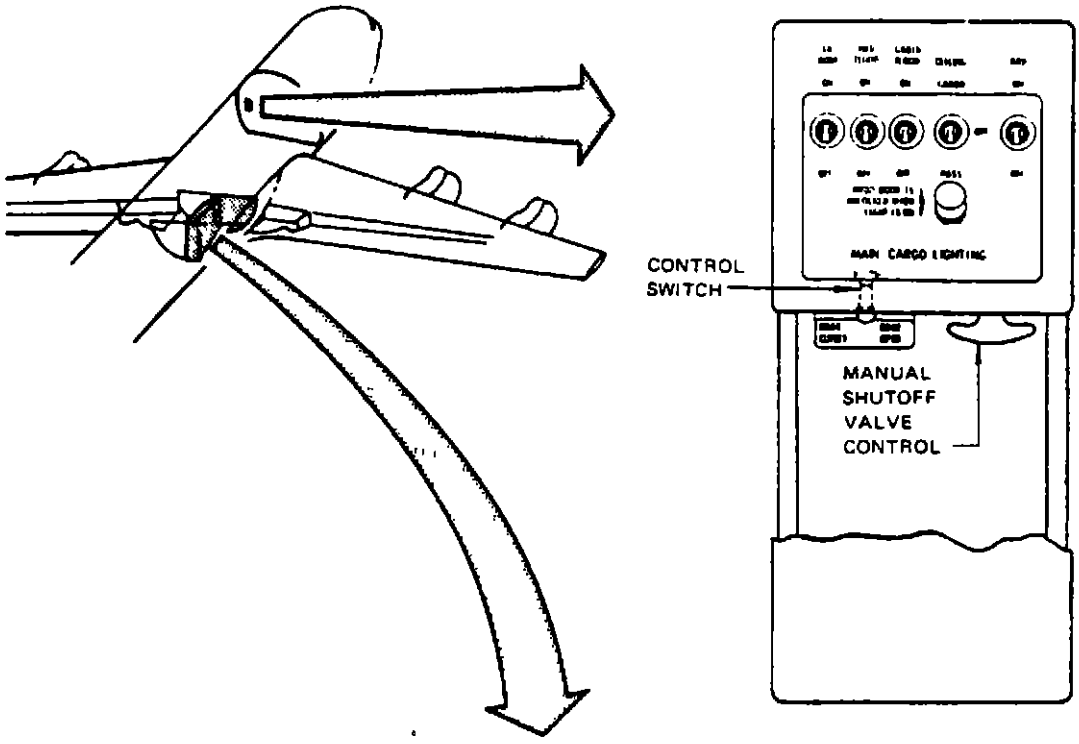
(3) Manual Hydraulic Pump

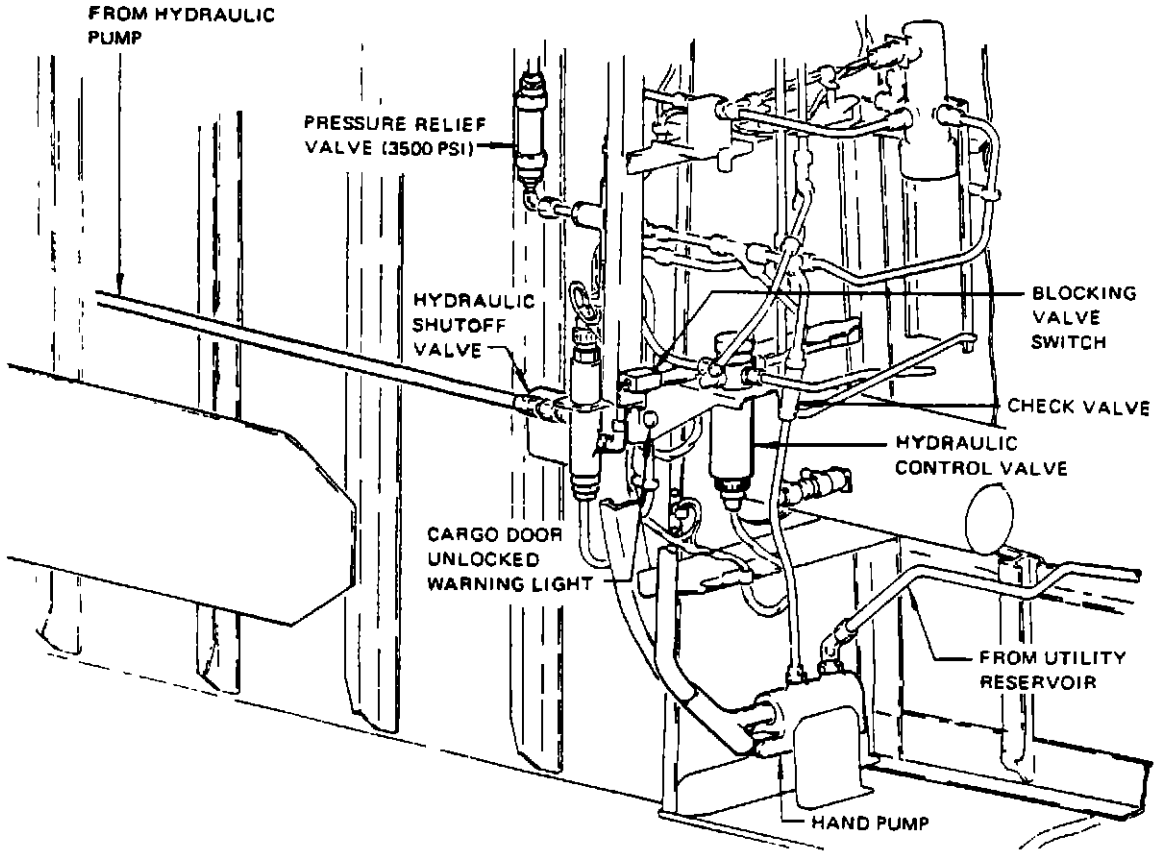
(a) The manual hydraulic pump (figures 4 and 5) is provided to operate the main cargo door in the event that normal hydraulic power is not available Hydraulic pump handle must be bolted in stowed position when pump is not in use

(4) Hydraulic Shutoff Valve

(a) The hydraulic shutoff valve (figures 4 and 5) is a solenoid-operated valve, which is used to shutoff hydraulic pressure from the hydraulic pump Power for valve operation is 28 volts dc. The valve is energized (OPENED) through the hydraulic control valve limit switches, and is de-energized by actuation of the pressure door microswitches and/or the left landing gear safety switch

(5) **Deleted**





Main Cargo Door Hydraulic Component and Control Panel
Figure 4

5A. Main Cargo Door Hold-Open Strut (Fig. 7 for airplane effectivity)

A. The main cargo door hold-open strut (Fig. 7) can be installed at the forward edge of the main cargo door to hold the door in the canopy position. In the installed position the upper hook fitting hooks around a fitting in the door and the lower end is locked into a receptacle in the door frame. The inside and outside tubes are held together with an elastic cord connected between the upper hook and the lower end of the inside tube. If the door is inadvertently closed with the strut installed, rivets attaching an aluminum collar to the strut will be sheared allowing the door to close to a 49-degree position. The door must be stopped at or before this point or damage will occur. The elastic cord used to assemble the strut will allow the door to travel to the full open position without damage. For stowage provisions, Ref Chapter 25, Cabin Accommodations Conversion.

6. Main Cargo Door Control System

A. The main cargo door is controlled by a 28 volt dc electrical circuit which supplies power to operate the main cargo door hydraulic control valve, solenoid shutoff valve and blocking valve. In the absence of hydraulic system power, hydraulic power may be supplied by the manual hydraulic pump in the right wheel well. The main cargo door control system includes three indicator lights. The main cargo door circuit is wired through the landing gear safety relay contacts to prevent the cargo door from being opened or closed when the left landing gear shock strut is extended (Fig. 5)

B. Under normal circumstances with hydraulic and electrical power available, the main cargo door is operated from the door control panel on the aft face of the bulkhead at body station 302 This panel includes a control switch, a manual shutoff valve control handle, and a CARGO DOOR UNL warning light. A cover plate over the face of the panel hinges clear to reveal the controls and the instructional decals on the inside of the cover

(1) The control switch is a two-pole, three-position unit which is normally in its central, or OFF position. To open or close the door the control switch is moved to its OPEN or CLOSE position. In the open position, the switch energizes the motor-operated control valve and the solenoid-operated shutoff valve. In the closed position, the switch energizes the blocking valve, motor-operated control valve, and solenoid-operated shutoff valve.

(2) The manual shutoff valve control operates the manual shutoff valve by means of a cable connection. By shutting this valve, after the main door has been closed, inadvertant opening of the door is prevented.

(3) The CARGO DOOR UNL warning light on the cargo door control panel is de-energized when the main cargo door is closed and latched (Ref 52-7-0, Door Warning System).

C. When hydraulic power is not available, the main cargo door may be opened or closed from the right main wheel well Under these circumstances the hydraulic control valve may be operated by a manual lever, and hydraulic pressure for operating the main cargo door is provided by operating the hand pump.

D. The main door control system includes three indicator lights which are operated by two pressure door position microswitches.

(1) One CARGO DOOR UNL warning light is located on the door control panel at body station 302 and another CARGO DOOR UNL warning light is in the right wheel well near the manual hydraulic pump A MAIN CARGO DOOR warning light is positioned with other door warning lights on the right side of the copilot's sidewall panel. For additional information on the door warning system, see 52-7-0.

7. Main Cargo Door Operation

A. Normal Operation

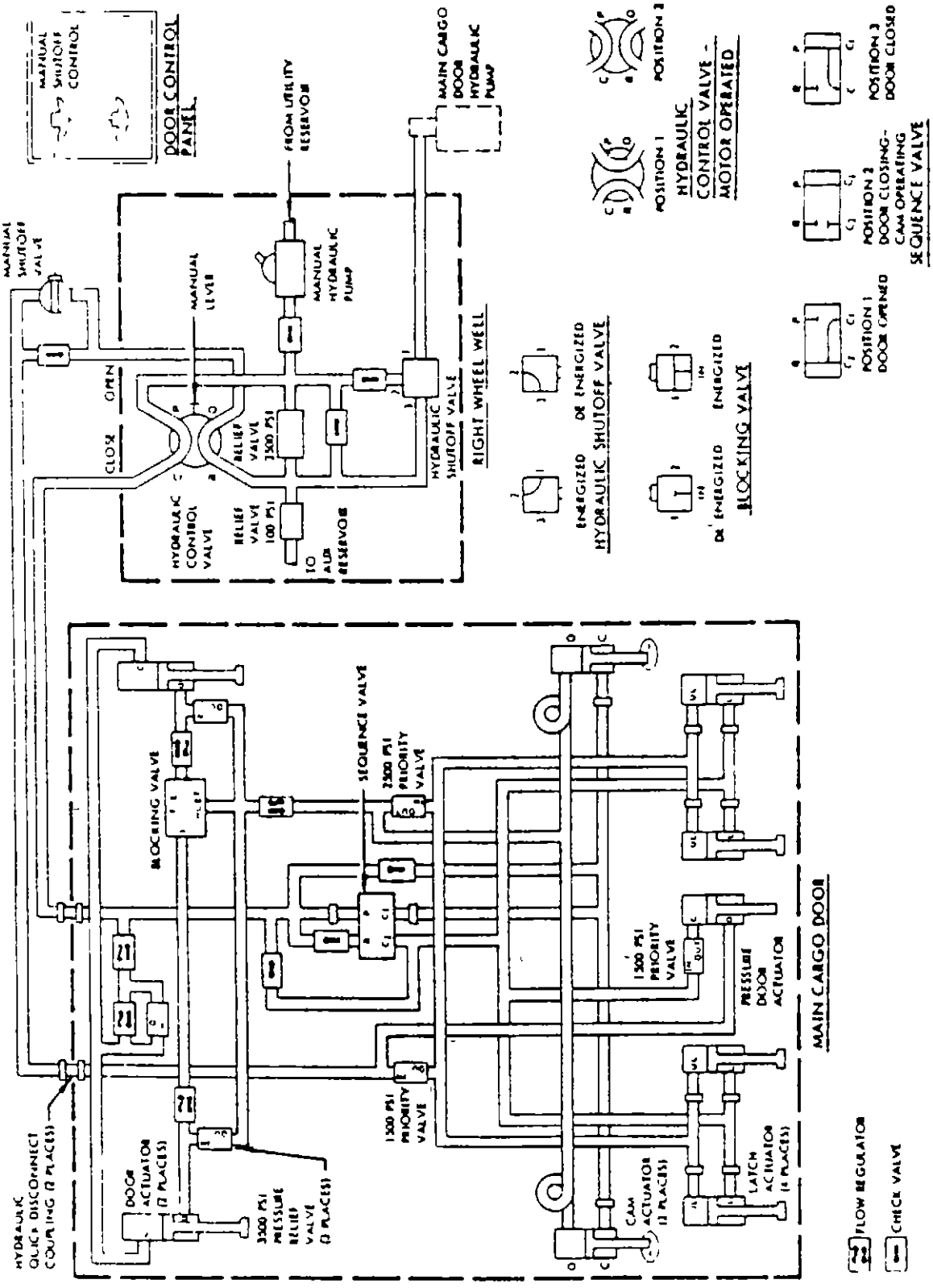
(1) The procedure before opening the main cargo door, if the airplane is in a passenger configuration, is described in Chapter 25, Cabin Accommodation Conversions The following procedure is for an airplane in a cargo configuration.

CAUTION: DO NOT OPERATE THE MAIN CARGO DOOR WITH AIRPLANE JACKED AT JACKING POINT "B" ONLY. OPERATION OF THE DOOR CAN RESULT IN DAMAGE TO BOTH DOOR AND FUSELAGE. REFER TO JACKING, CHAPTER 7

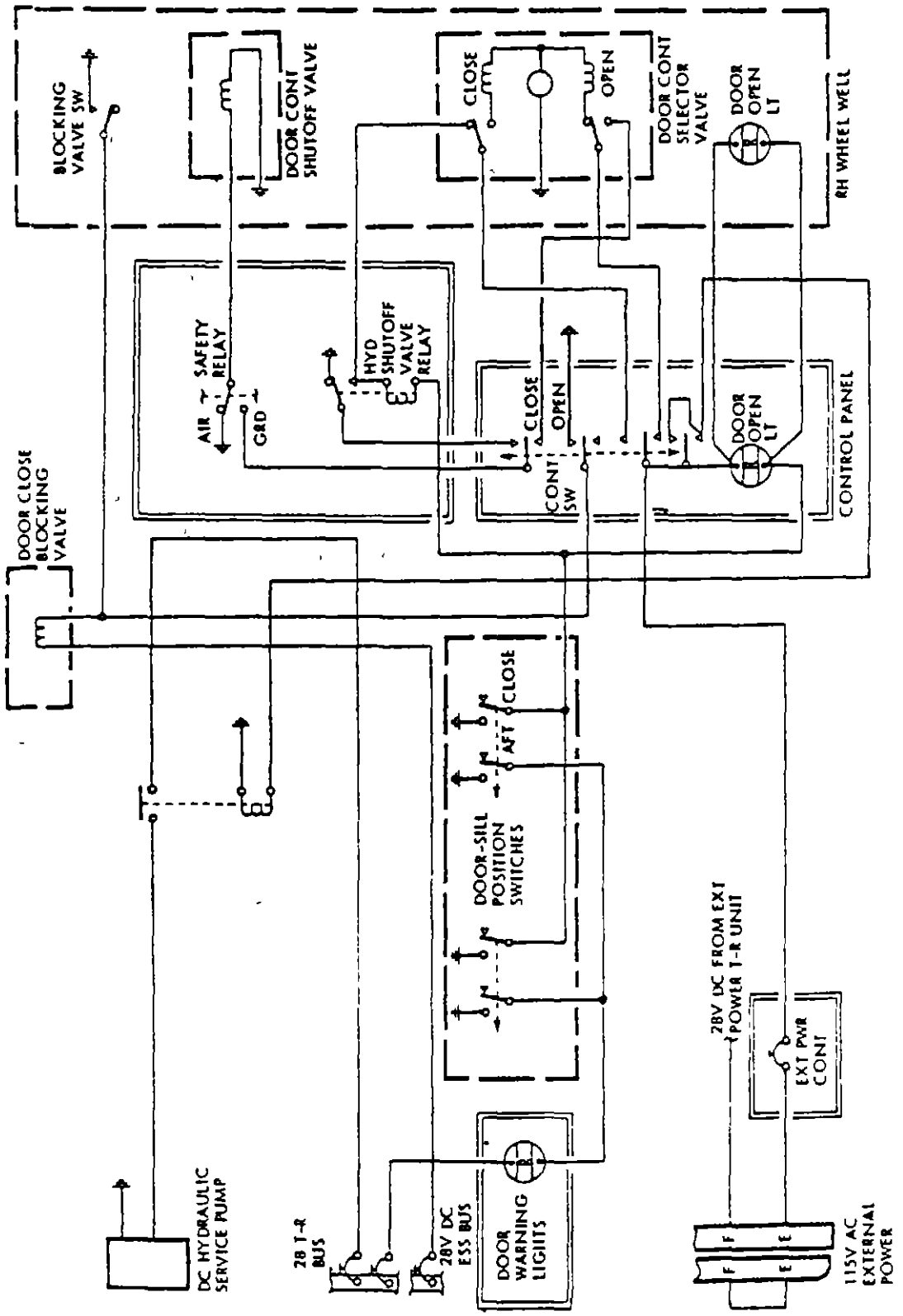
THE MAIN CARGO DOOR MUST NOT BE IN THE CANOPY POSITION WHEN WIND VELOCITY EXCEEDS 60 KNOTS, OR IN THE FULL OPEN POSITION WHEN WIND VELOCITY EXCEEDS 40 KNOTS. THE DOOR ACTUATION SYSTEM IS DESIGNED FOR OPERATION OVER THE FULL TRAVEL OF DOOR IN WINDS UP TO 40 KNOTS. IF IT BECOMES NECESSARY TO CLOSE THE DOOR IN WINDS EXCEEDING 40 KNOTS, AND DIFFICULTY IS EXPERIENCED DUE TO WIND DIRECTION, THE AIRPLANE SHOULD BE MOVED TO POSITION THE DOOR ON THE DOWNWIND SIDE OF AIRPLANE.

(2) Power for operating the main cargo door is provided by a 115-volt ac external power supply (See figure 5.)

(a) When a 115-volt ac power supply is connected to the external power receptacle and the external power switch is moved to ON, the external power selector relay is energized which, in turn, energizes the external power contactor relay. The 115-volt ac external power is then supplied, through the airplane T-R unit, to the 28-volt dc T-R buses, from which the main cargo door can be operated.



Main Cargo Door Schematic
Figure 5 (Sheet 1)
T.R. 52-112



Main Cargo Door Schematic
Figure 5 (Sheet 2)
T.P. 52-112

(3) Before opening the main cargo door, it must be activated as follows

(a) Open the control panel door to reveal the shutoff valve control and control switch

(b) Disengage the handle guard and pull shutoff valve control down to open the shutoff valve.

(4) To open the main cargo door the door control switch is moved to the OPEN position and held in this position until the door is opened to the position required

CAUTION PERSONNEL AND EQUIPMENT MUST BE CLEAR OF MAIN CARGO DOOR PATH

(a) If external electrical power bus is energized and the door control switch is in the OPEN position, 28 volts dc power energizes the power control relay and the OPEN winding in the hydraulic control valve · The valve in the control valve rotates to direct hydraulic pressure to the OPEN line of the door hydraulic system When the valve rotation is complete, a control valve limit switch opens the OPEN winding circuit and closes the pump control relay circuit.

(b) With hydraulic pressure available and the control valve positioned to OPEN hydraulic pressure is directed through the open shutoff valve, along the "open" lines of the door hydraulic system to the pressure door actuator. The priority valves in the "open" lines cause the various hydraulic functions of the door to operate in their proper sequence, as pressure builds up, and the first function is the opening of the pressure doors.

(c) As the pressure door actuator retracts, it rotates the pressure door torque tube, opens the pressure doors and, on airplanes which have drift pins installed, rotates the drift pin stop mechanisms to clear the drift pin actuators When the pressure doors open, the locking stops on the pressure door hinges disengage the door latch fittings to allow subsequent latch operation

(d) As soon as the pressure doors begin to open, the actuator arms on their lower edges allow the door position microswitches to close, thus energizing the CARGO DOOR UNL lights on the door control panel and on the copilot's sidewall panel.

(e) When the pressure door actuator has retracted completely and hydraulic pressure rises to 1500 psi, the appropriate priority valve yields and admits "door open" pressure to all four latch actuators and, if installed, to both drift pin actuators. This causes the latches to rotate and release the latch pins and, if installed, the drift pins to move longitudinally out of engagement with the door frame receptacles.

(f) When the six actuators have reached the limits of their travel and the door is only held in its closed position by the cams, the hydraulic pressure builds up to 2500 psi and the second priority valve operates. Pressure is now delivered simultaneously to the two cam actuators and the two door actuators The two cams rotate to release the door from its closed position as the door actuators begin to raise the door to its open position The door actuators open and raise the main cargo door by retracting As the actuators retract, their lower ends act upon the actuation common pivot pin and force the inboard ends of the actuation links apart, thus opening the door

(g) When the door is opened to the required open position, the door control switch is released and the door blocking valve will secure the door in the open position

(5) To close the main door the door control switch is moved to its CLOSED position and held in this position until the door is completely closed

NOTE : If an operator requires to stop the main cargo door closing, the door control switch must be placed in the "OPEN" position for at least one second.

CAUTION : ALLOWING THE DOOR CONTROL SWITCH TO RETURN TO "OFF" POSITION WILL NOT STOP THE CARGO DOOR CLOSING. THE DOOR CONTROL SWITCH MUST BE PLACED MOMENTARILY IN THE "OPEN" POSITION TO STOP THE CLOSE OPERATION.

(a) As soon as the control switch is in its CLOSED position, the blocking valve is energized (OPEN) to provide passage for hydraulic fluid return through the main actuators open line. Also, the close winding of the control valve is energized and rotates the valve to provide a path for hydraulic pressure to the close line of the door hydraulic system.

When this rotation is complete the limit switches in the control valve open the close winding circuit and energizes the solenoid shutoff valve relay, which energizes the solenoid shutoff valve (OPEN). The limit switches also set up continuity through the open winding of the valve in readiness for a future selection.

(b) With hydraulic pressure available and the control valve positioned to CLOSE, hydraulic pressure is delivered through the close lines of the door hydraulic system The door actuators retract and as the door hinges down from its open position, the pressure inlet port of the sequence valve is closed, thus preventing any other function than that of the door actuators. The restrictor valve in the hydraulic pressure line to the control valve retards the rate at which the door descends

(c) As the door approaches its closed position the plunger of the sequence valve is partially depressed by contact with the fuselage and its pressure inlet port is opened to deliver pressure to the cam actuators At this time the cams have engaged their pins on the fuselage and the cam actuators rotate the cams about the pins

(d) Rotation of the cams on the pins draws the door towards its fully closed position and fully depresses the plunger of the sequence valve This opens the inlet port of the valve to deliver pressure to all four latch actuators and, if installed, to both drift pin actuators, while maintaining pressure on the cam actuators. Thus, while the cams hold the door in its fully closed position, the latches rotate into their locked position and, if installed, the drift pins are moved into the receptacles in the fuselage

(e) When the latches and drift pins, if installed, have operated, hydraulic pressure builds up to 1500 psi and the appropriate priority valve yields to admit hydraulic pressure to the pressure door actuator. The pressure door actuator will rotate the torque tube causing the drift pin stops, on airplanes which have drift pins, to rotate to lock the drift pins and the locking stops engage the latches. The torque tube rotation also closes the pressure doors and depresses the microswitch plungers, which de-energizes the door warning lights on the door control panel and the third crewman's instrument panel, and the solenoid shutoff valve relay, which shuts off auxiliary system pressure. The latches may be checked from outside the airplane through latch inspection windows to ensure that they are locked. To check the latches from inside the airplane, it is necessary to hinge sections of the simulated air grill upwards.

(6) After the main door is closed and known to be locked, the main cargo door hydraulic system must be deactivated as follows, to prevent any inadvertent opening of the door while the airplane is moving:

(a) Push the manual shutoff valve control up to its closed position and move the handle guard under the control handle to secure it.

(b) Close the cover on the door control panel to cover all controls.

B Manual Operation

(1) To operate the main cargo door manually when auxiliary hydraulic power is not available, proceed as follows:

(a) Activate the door as described in paragraph 7.A.(3). (This is necessary to open the shutoff valve.)

(b) Place the motor-operated control valve in the OPEN position.

(2) To close the main cargo door manually when hydraulic power is not available, proceed as follows·

(a) Place the motor-operated control valve in the CLOSE poosition.

(b) Hold the MAIN CARGO DOOR MANUAL CLOSE SW in the ON position.

(c) Operate the hand pump to supply hydraulic pressure for closing the main cargo door.

CAUTION. TO PREVENT DAMAGE TO HAND PUMP AND/OR LANDING GEAR, BOLT HAND PUMP HANDLE IN STOWED POSITION AFTER USING.

(3) The DOOR UNLOCKED warning light will be on when the cargo door is not correctly locked, and off when the cargo door is closed and locked.

CAUTION : TO PREVENT LOCKING STOP DAMAGE, LEAVE THE MANUAL CONTROL LEVER IN THE INBOARD POS 2 "CARGO DOOR CLOSED" POSITION.

C External Manual Opening

(1) When cargo loading prevents access to the inside of the main cargo door and if the door mechanism is unserviceable, use the following procedure to open the main cargo door from outside the airplane

(a) Remove all access panels from exterior of main cargo door

(b) Disconnect cam actuator hydraulic lines. (Refer to figure 6, detail A)

(c) Disconnect hydraulic lines to one or more latch actuators (Refer to figure 6, detail B)

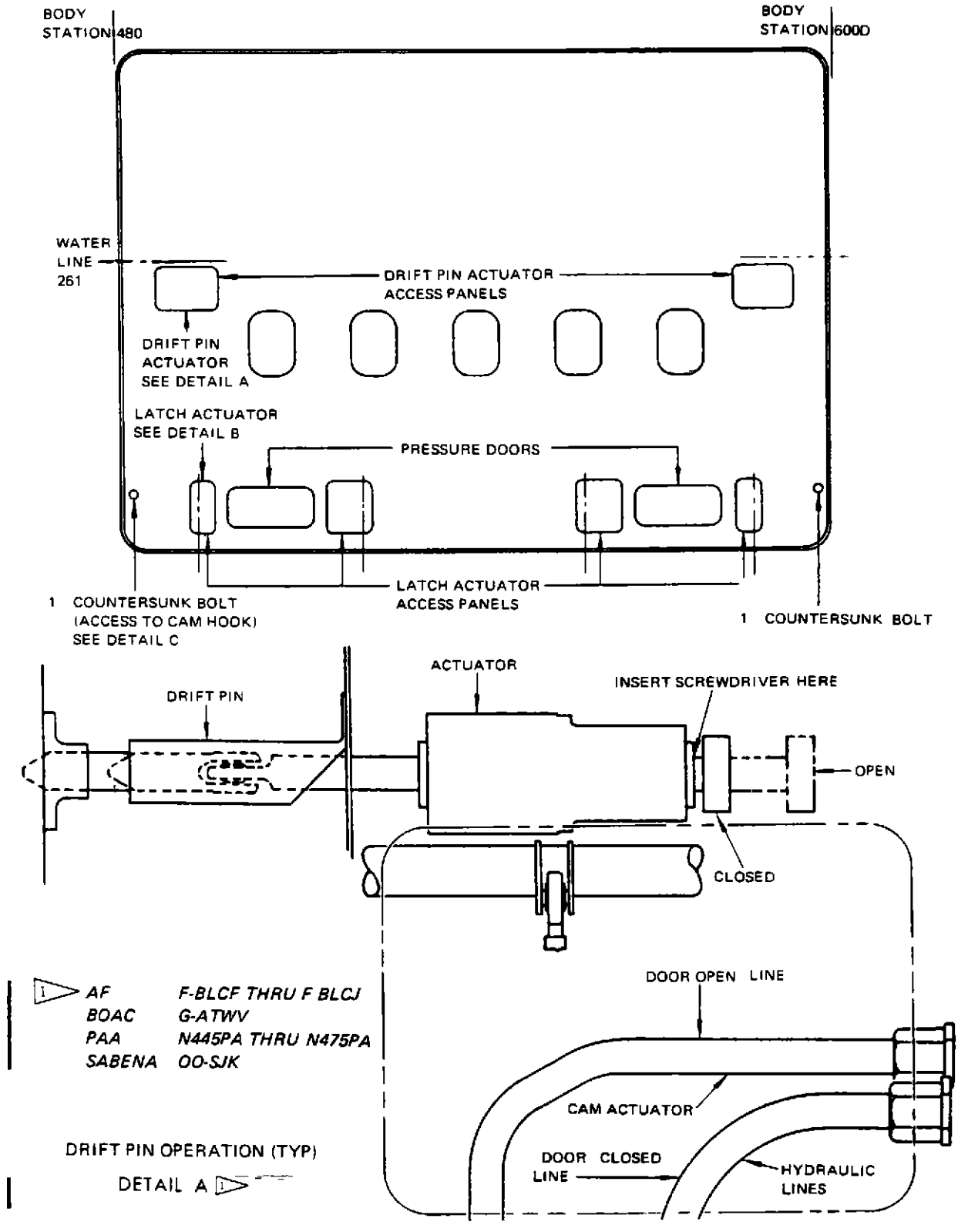
NOTE. Suitable containers or drainage hoses should be provided at all open hydraulic lines to prevent contamination of the airplane with Skydrol 500 fluid

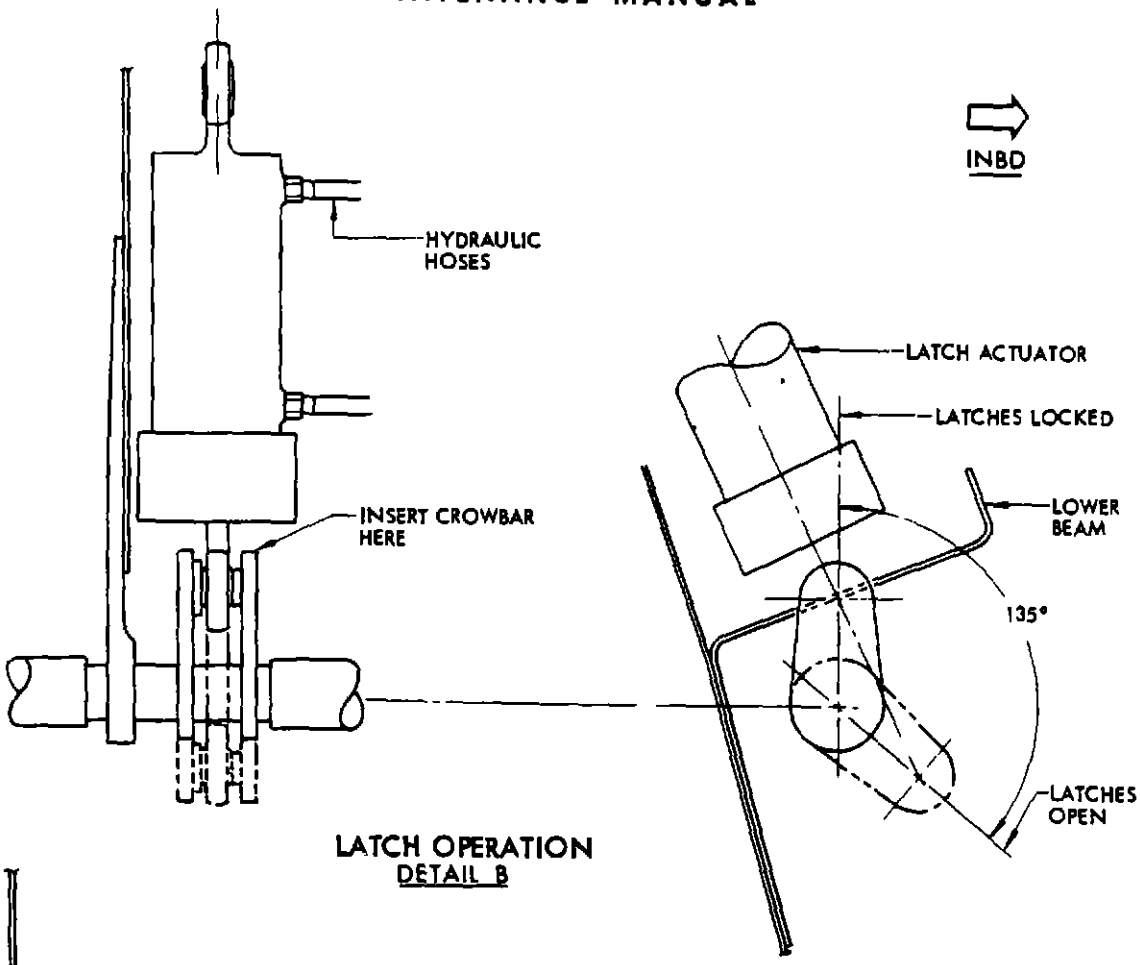
(d) Remove countersunk 5/16 bolts (1, figure 6) at lower forward and aft corners of main cargo door.

(e) Open both pressure doors by having two persons push against top of doors Secure doors in the full open position with wooden wedges or other suitable means.

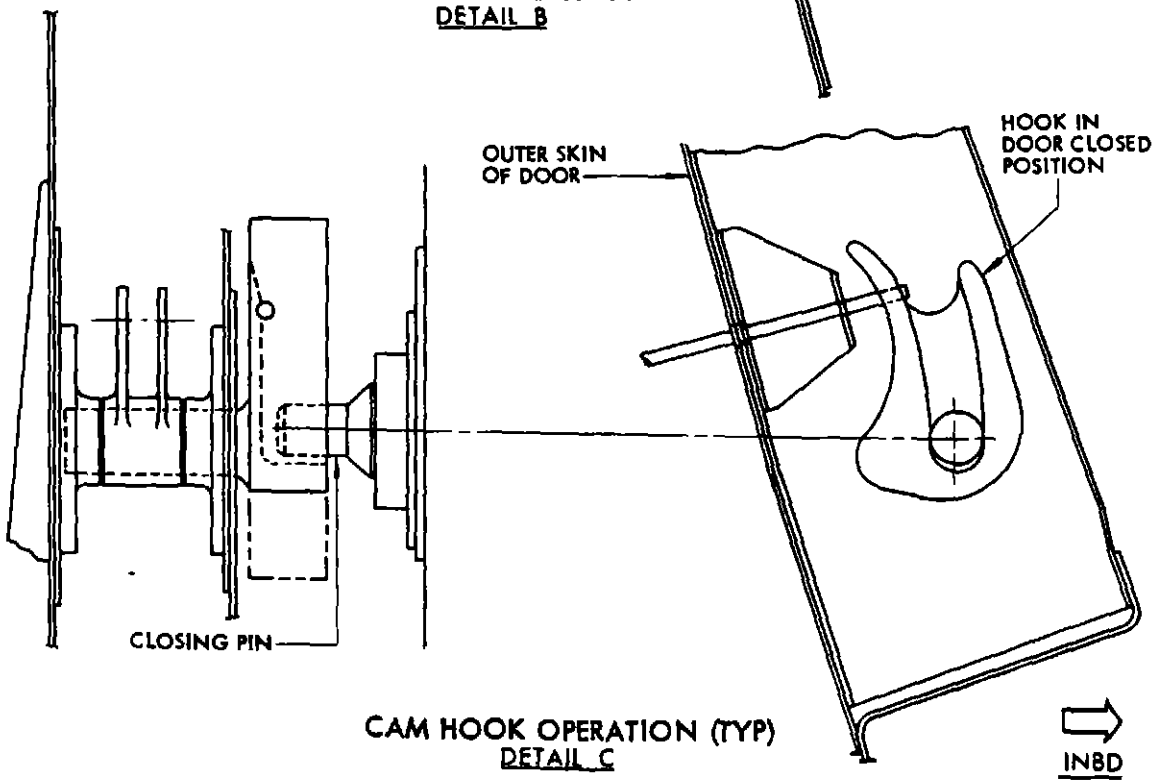
(f) On AF airplanes F-BLCF thru F-BLCJ, BOAC airplane G-ATWV, PAA airplanes N445PA thru N475PA, and Sabena airplane OO-SJK, extract drift pins from receptacles by moving round stop on end of drift pin actuator towards center of door Insert a screwdriver between round stop and actuator body and, after padding the surrounding structure or actuator body, lever the stop towards the center of the door Stop should be moved approximately 1.80 inches until actuator piston bottoms inside actuator

(g) Unlatch four pairs of rotary latches at base of door by - - extending each latch actuator with a crowbar applied to the lever arm connected to the latch actuator rod end. Each lever arm must be rotated 135° until latch actuator piston bottoms inside actuator


BODY STATION 480
BODY STATION 600D
WATER LINE 261
DRIFT PIN ACTUATOR ACCESS PANELS
DRIFT PIN ACTUATOR SEE DETAIL A
LATCH ACTUATOR SEE DETAIL B
PRESSURE DOORS
LATCH ACTUATOR ACCESS PANELS
1 COUNTERSUNK BOLT (ACCESS TO CAM HOOK) SEE DETAIL C
1 COUNTERSUNK BOLT
DRIFT PIN
ACTUATOR
INSERT SCREWDRIVER HERE
OPEN
CLOSED
1 AF F-BLCF THRU F BLCJ
BOAC G-ATWV
PAA N445PA THRU N475PA
SABENA OO-SJK
DOOR OPEN LINE
CAM ACTUATOR
DOOR CLOSED LINE
HYDRAULIC LINES
DRIFT PIN OPERATION (TYP)
DETAIL A 1



LATCH OPERATION
DETAIL B



CAM HOOK OPERATION (TYP)
DETAIL C

External Opening of Main Cargo Door
Figure 6 (Sheet 2)

(h) Drive each cam inboard past its overcenter position by means of a 1/4-inch diameter rod through the holes left by removing bolts in step (f)

CAUTION DO NOT FORCE THE CAMS OVERCENTER UNLESS ALL THE LATCH ACTUATORS AND BOTH DRIFT PIN ACTUATORS HAVE REACHED THE "PISTON BOTTOM" POSITION

(i) Install 5/16 inch diameter eye bolts in place of the countersunk bolts removed in step (d)

(j) Attach cables to the eyebolts and lift the door open with a crane or other means

(k) Secure the door open by installing the door hold-open strut (Ref par D for hold-open strut installation)

(2) To refurbish the airplane after opening door from outside airplane, proceed as follows

(a) Check the drift pin and latch actuator piston rods for damage to the sliding surfaces Replace defective actuators as necessary

(b) Reconnect all hydraulic lines disconnected during opening of the door

(c) Refill and bleed the cargo door hydraulic system

(d) Function test main cargo door operation

(e) Reinstall all access panels and the two 5/16-inch countersunk bolts (1)

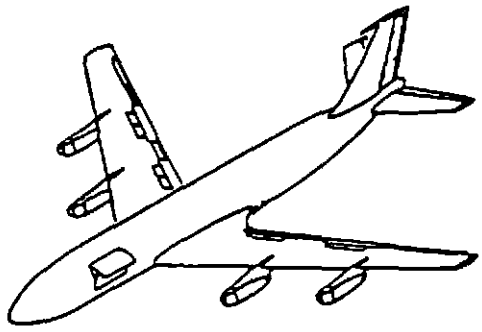
D Main Cargo Door Hold-Open Strut Installation (Fig 7)

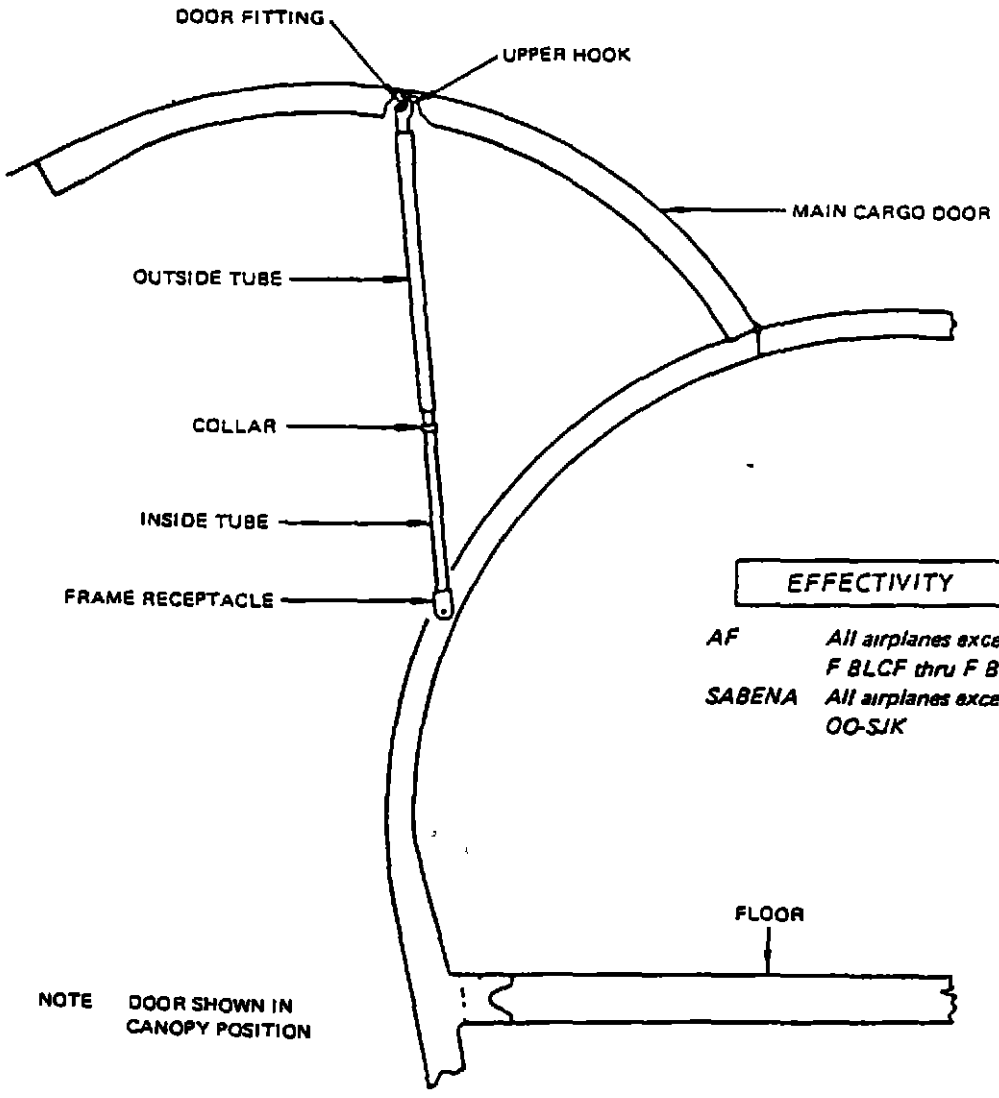
(1) The main cargo door hold-open strut is used to provide positive retention of the cargo door in the canopy position over extended periods of time Proceed as follows to install

(a) Open the door to canopy position

(b) Install personnel safety net across door opening

(c) Withdraw main cargo door hold-open strut from container located just forward of door or along cargo-crew rest partition door





EFFECTIVITY

AF	All airplanes except F BLCF thru F BLCJ
SABENA	All airplanes except OO-SJK

(d) Stand near the edge of the floor at the forward end of the door opening

(e) Raise the hook end of the strut toward the support fitting on the door with the open side of the hook outboard

(f) Hold the strut vertically at arms length with the lower end slightly forward of the door opening and engage the hook with the support fitting

(g) With the upper end of the strut hooked in place, rotate the strut toward the receptacle fitting on the door frame

(h) Insert the oblong end of the locking bolt through the oblong hole of the fitting until the handle can be rotated from OPEN to LOCK position

MAIN CARGO DOOR - MAINTENANCE PRACTICES

1. Activate/Deactivate Main Cargo Door System

   A. Complete instructions for activating a main cargo door for maintenance purposes on airplanes that are operating with the main cargo door in a deactivated configuration may be found in Boeing Service Bulletin 3311. This service bulletin also provides the necessary instructions for deactivating the door after maintenance has been performed.

2. Depressurize Main Cargo Door Hydraulic System

   A. Depressurize main cargo door hydraulic system on airplanes with self-contained cargo door hydraulic system.

      (1) Deactivate main cargo doo. Refer to metal-cal at door control panel.

      (2) Cycle main cargo door as required to depressurize hydraulic system.

      (3) At completion of depressurization requirement, activate main cargo door.

   B. Depressurize main cargo door hydraulic system on airplanes with auxiliary hydraulic system for cargo door operation.

      (1) Position No. 1 auxiliary hydraulic pump switch, on copilot's instrument panel, to OFF.

      (2) Depressurize auxiliary hydraulic system by cycling the spoilers until they no longer respond hydraulically.

      (3) Depressurize utility hydraulic reservoir by slowly unscrewing filler cap three full turns until air has escaped. Tighten filler cap and install retainer pin.

      CAUTION DO NOT REMOVE FILLER CAP UNTIL RESERVOIR IS DEPRESSURIZED OR FLUID WILL ESCAPE.

MAIN CARGO DOOR SERVICING

EFFECTIVITY

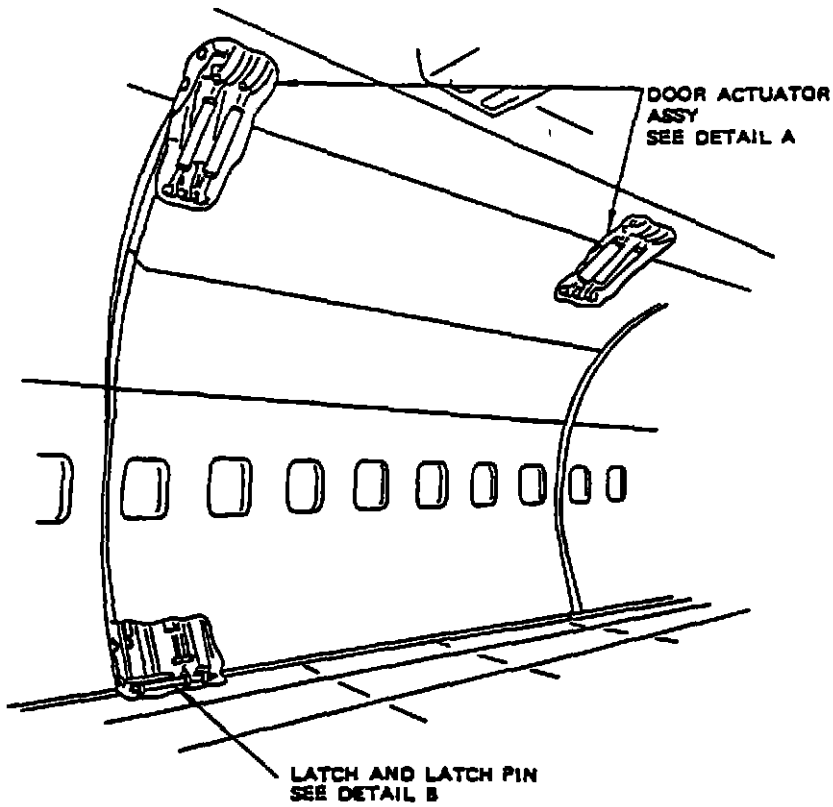
TCA	LX-N20198
	LX-N20199
RTCA	LX-N19997
	LX-N20000

1. Lubricate Main Cargo Door

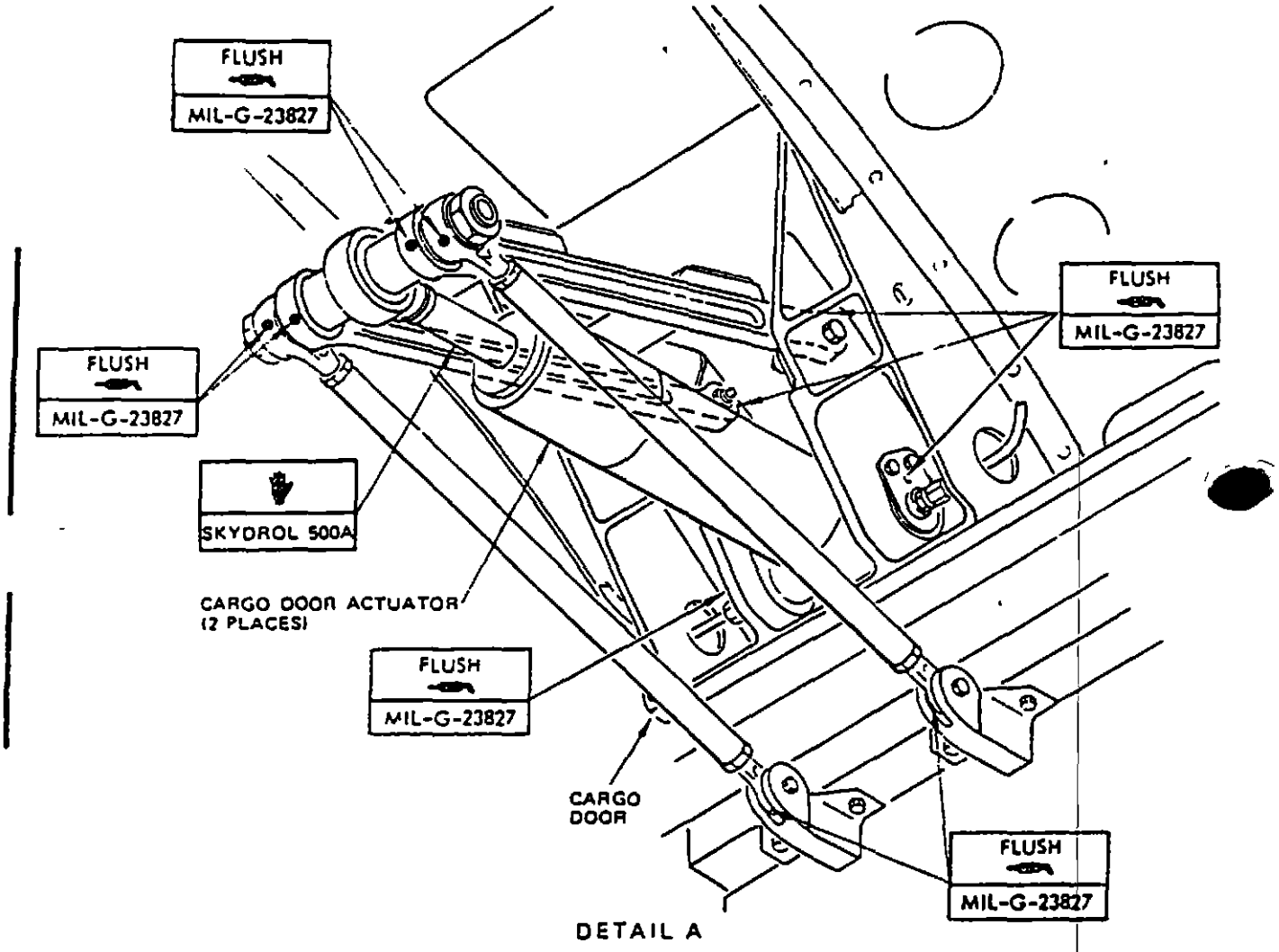
   A. The items requiring lubrication are shown on figure 301.

2. Bleed Main Cargo Door Hydraulic System

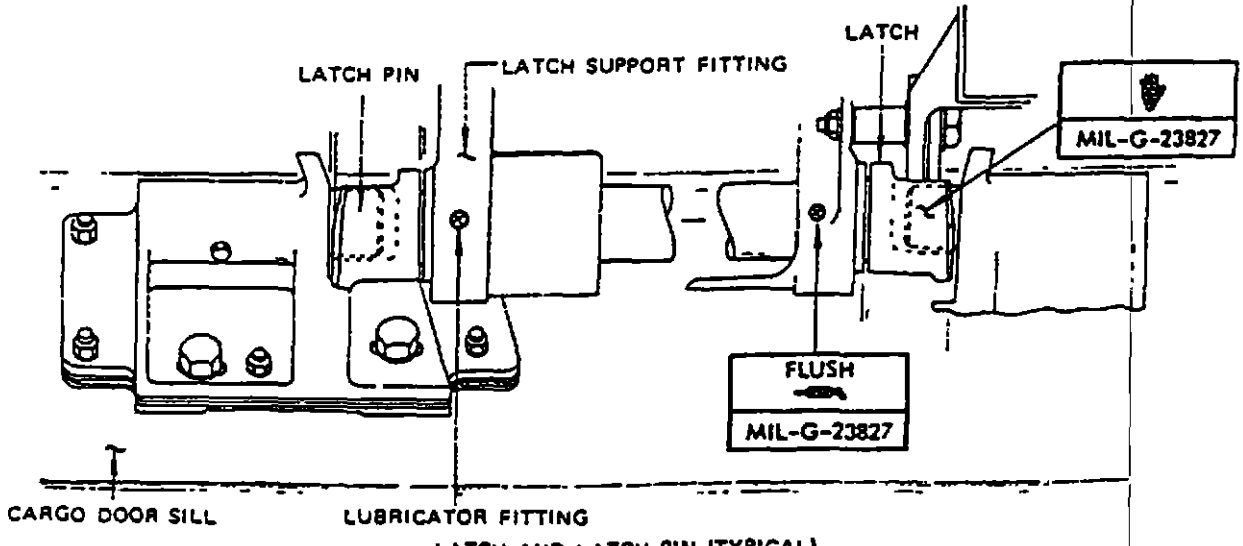
   A. The main cargo door hydraulic system is self-bleeding, and should not require extensive bleeding following normal system maintenance. After work has been accomplished on the cargo door hydraulic system, the cargo door should be cycled several times to bleed any air from the system.



Main Cargo Door Lubrication
Figure 301 (Sheet 1)



DETAIL A

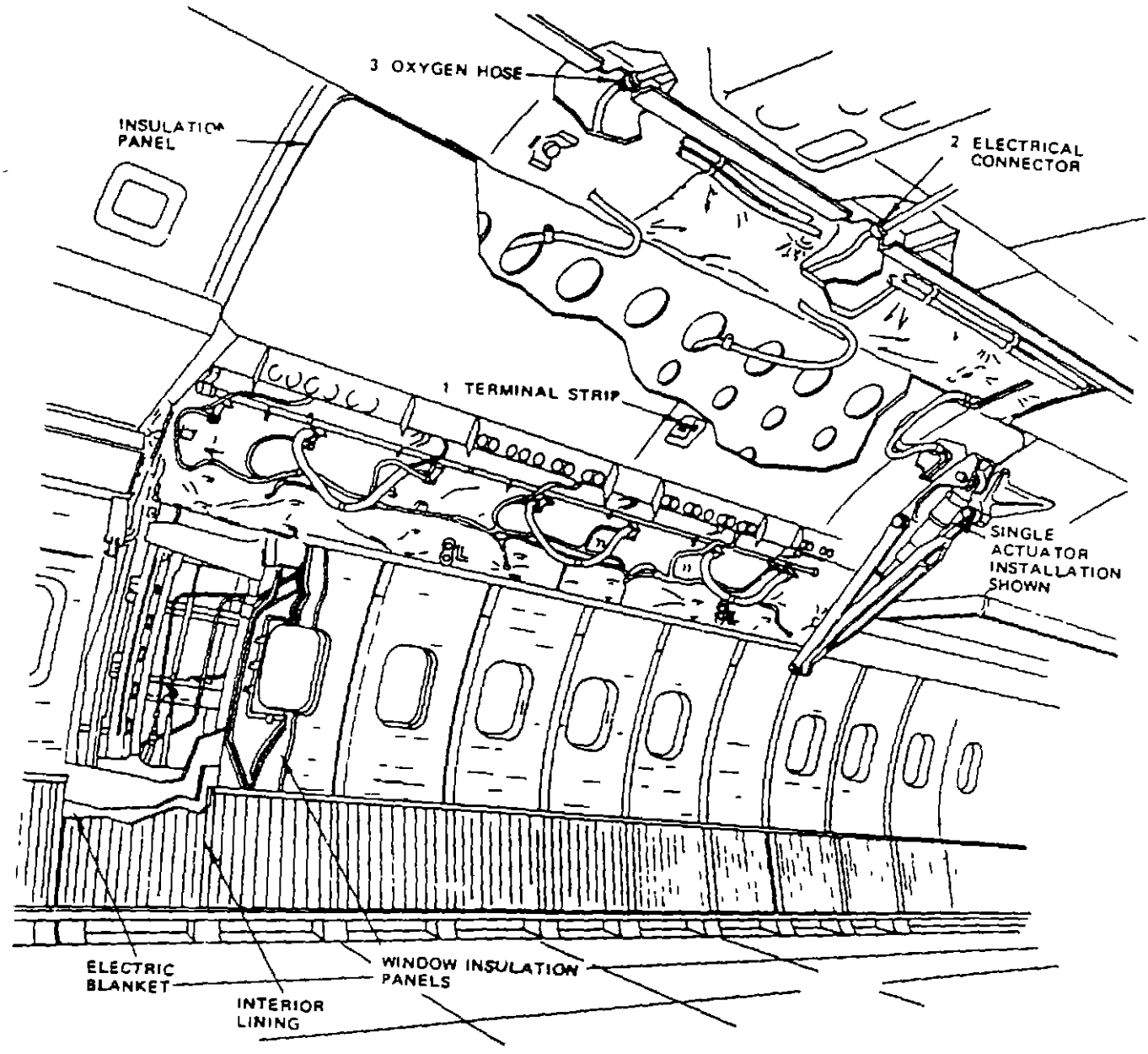


LATCH AND LATCH PIN (TYPICAL)

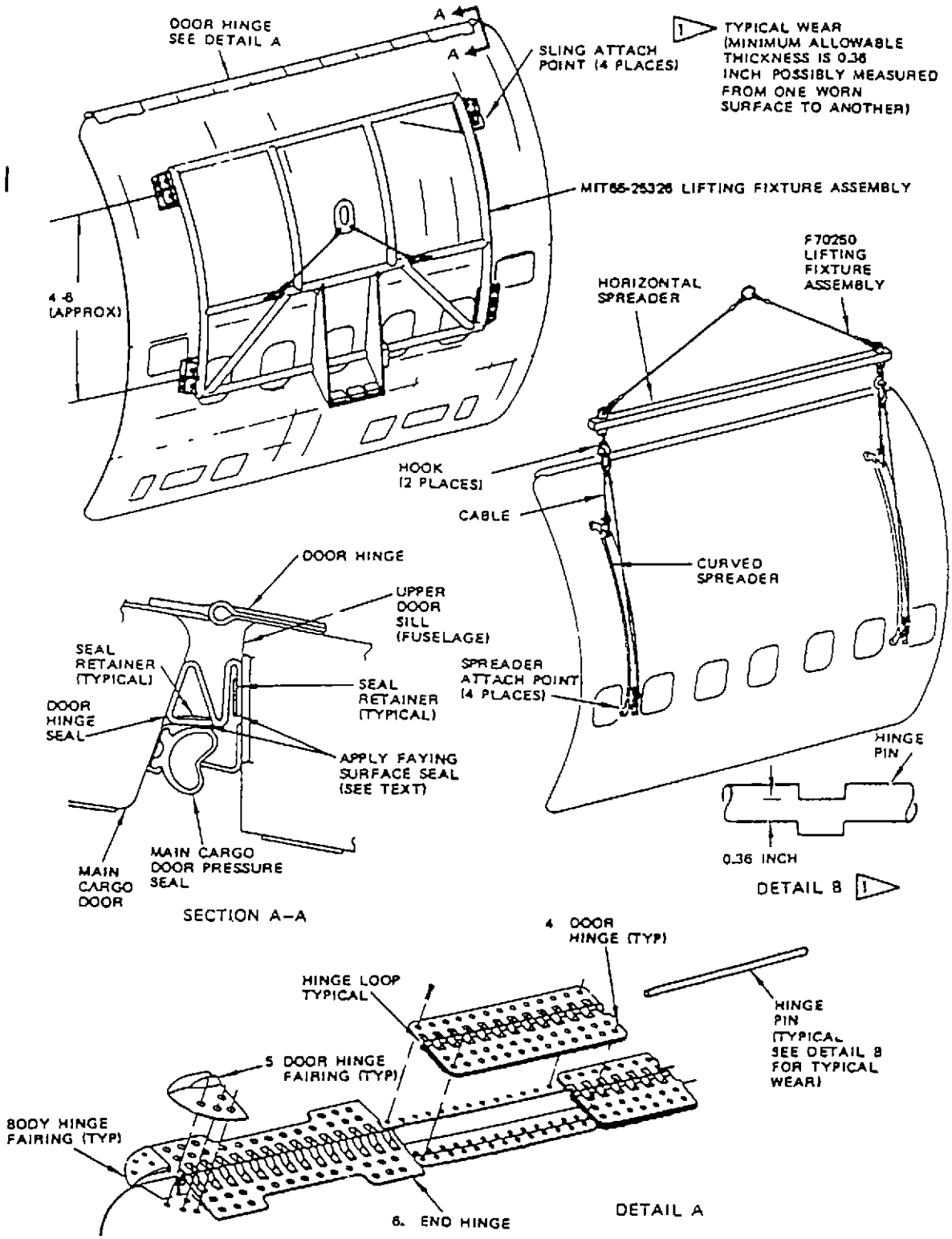
DETAIL B

MAIN CARGO DOOR - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Lifting device for main cargo door
      (1) Lifting Fixture Assembly - Main Cargo Door - MIT65-25326-2 (can be used on either 5 or 7 window main cargo door)
      (2) Lifting Fixture Assembly - Main Cargo Door - F70250-1, -4 (-1 lifting fixture applies to the 7-window door and the -4 applies to the 5- or 7-window door). The -4 is preferred for future procurement
   B. Dry Film Lubricant - MIL-M-7688A or MIL-G-6711 (Ref 13-1-2)
   C. Primer - BMS 10-11, Type 1 (Ref 13-1-4)
   D. Primer - Dow Corning RTV1200 (Ref 13-1-4)
   E. Adhesive - 30-121 (Ref 13-1-4)
2. Remove Main Cargo Door
   A. Remove ceiling panels, actuation mechanism shroud and hatrack or overhead stowage compartment as described in Chapter 25, Passenger Cabin Equipment.
   B. Disconnect electric blankets at terminal strip (1, Fig. 401) in junction box
   C. Remove interior lining with electric blankets and pull electric blanket wiring through conduits
   D. Remove insulation panels from top half of cargo door
   E. Remove insulation panels from around window frames.
   F. Open DOOR WARNING circuit breakers on panel P5 and disconnect cargo door electrical wiring at two connectors above door hinge at body station 550 Protect plugs and receptacles with dust caps.
   G. Unclamp flexible conduit from fuselage structure.
   H. Activate main cargo door and open it until there is a gap of approximately 6 inches at the bottom of the door. Deactivate main cargo door and depressurize main cargo door hydraulic system (Ref 52-11-0, Maintenance Practices).
   I. Disconnect and plug oxygen hose (3).
   J. On cargo door having a single actuator remove actuation linkage as described in 52-11-151. On cargo doors having dual actuators, disconnect each actuator lower links at doorsill.



Main Cargo Door Installation
Figure 401 (Sheet 1)



Main Cargo Door Installation
Figure 401 (Sheet 2)

K. Disconnect and plug hydraulic hoses above door hinge line.

L. Secure main cargo door lifting fixture assembly to main cargo door as follows:

(1) Remove eight countersunk screws from cargo door at lifting fixture attach points. See Fig. 401 for attach point locations.

NOTE: Save countersunk screws for reinstallation in door after fixture is removed.

(2) If MIT65-25326-2 lifting fixture is used, attach with four NAS1103 bolts at lower corners and four NAS1004 bolts at upper corners.

(3) If F70250 lifting fixture is used, proceed as follows:

(a) Position two curved spreader fittings at forward and aft attach points on door and secure to door with special bolts stowed on spreader bars adjacent to attach points.

(b) Attach curved spreaders at cable attachment rings to hooks at either end of horizontal spreader bar.

M. Remove main cargo door hinge seal by removing fasteners securing seal to upper surface of pressure seal mounting channel on door and mounting surface on upper doorsill on fuselage at retainer strips and peeling seal away from mounting surface (seal is joined to surfaces by a faying surface seal) (Ref Section A-A, Fig. 201).

NOTE: Tag removed parts to identify for installation location.

N. Remove attaching screws retaining the two sections of hinge (4) next to forward and aft hinges.

O. Remove hinge fairings (5).

P. Support main cargo door by engaging crane hook in slin g or lifting fixture shackle and raising hook until cables are slightly loaded.

Q. With suitable drifts and a hammer or light rivet gun, drift hinge pins out of hinge sections.

R. Remove main cargo door from airplane.

3. Install Main Cargo Door

A. Check body hinges for allowable wear. If used door or hinge pins are used, check for allowable wear. Hinge loop allowable wear is to 0.08 inch wall thickness. Minimum allowable thickness of hinge pins is 0.36 inch (measured from one worn surface to another) (Detail B, Fig. 401).

NOTE: Hinge pins generally wear to a crankshaft appearance.

B. Using sling or lifting fixture assembly, lift the main cargo door and position it so that the door hinges and body hinges are aligned.

C Clean all hinge pins and lubricate with dry film lubricant.

D Using suitable drifts and a light rivet gun or a hammer, drive all the hinge pins into the hinge sections.

E Install assembled hinge segments (4 and 6) to door and to upper door sill with hinge installation bolts.

F Install hinge fairings (5, Fig. 401) with wet primer applied to bolts and to mating surfaces of hinge fairing and door

G Tighten hinge fairing and hinge attachment screws to values specified in Fig. 401.

H Install main cargo door hinge seal as follows (Section A-A, Fig. 201)

(1) Apply faying surface seal to mating surfaces of hinge seal, pressure seal mounting channel upper surface and upper doorsill on fuselage. Use RTV 1200 primer and 30-121 adhesive (Ref 51-3-0, Maintenance Practices).

(2) Place hinge seal in position along mounting surface on pressure seal mounting channel on door and upper doorsill on fuselage as soon as possible after adhesive application to avoid formation of skin on adhesive that interferes with adhesion.

(3) Place seal retainers in position on outer surface of seal mounting flanges and install bolts and, where applicable, nuts and washers

I Connect oxygen hose (3) and pressure test system as detailed in Chapter 35, Oxygen.

J. On cargo doors having a single actuator, install actuation linkage as described in 52-11-151. On cargo doors having dual actuators, connect each actuator lower links at doorsill.

K. Connect hydraulic hoses at cargo door hinge.

L. Connect electrical connectors (2) above door hingeline.

M. Remove door sling or lifting fixture and replace countersunk screws.

N. Pressurize utility hydraulic system.

O. Bleed cargo door hydraulic system at drift pin actuators and linkage actuator hydraulic connections.

P. Operate cargo door and again bleed hydraulic system at drift pin actuators and linkage actuator.

Q Secure insulation panels around window frames.

R. Install insulation panels at top half of door.

S. Attach interior lining and electric blankets.

T. Connect electric blanket wiring to terminal strip (1).

U. Close circuit breakers.

V. Test wiring circuits on main cargo door.

W Install ceiling panels, actuation linkage shroud and hatrack (or overhead stowage compartment) as described in Chapter 25, Passenger Cabin Equipment.

X. Test main cargo door operation (Ref Main Cargo Door - Adjustment/Test).

MAIN CARGO DOOR - ADJUSTMENT/TEST

1. Adjust Main Cargo Door

A. The following adjustments should be made on the main cargo door mechanism after the door is installed on the airplane.

(1) Measure distance between forward edge of front guide block and aft edge of rear guide block. See dimension A, figure 501. Distance must be 135.90 (± 0.30) inches.

(2) Locate guide rollers on forward and aft door frames to suit location of door cams except that distance from frame to roller surface must not be less than 1.99 inches (detail A), maintaining a 0.15 inch minimum clearance between stop fitting and seal depressor. If clearance is less than 0.15 inch, increase the 1.99 inch dimension by the difference. Distance between forward and aft roller surfaces must be 0.00 (+0.03/-0.00) inch greater than distance between forward and aft cam faces on door.

(3) With AN960C616 washers under the heads of the stop bolts, adjust stop bolts to position cam hooks in open position as shown in detail B or C.

(4) With cargo door positioned as step (3) adjust frame-mounted pins on serrated mountings to contact cam hooks 3.71 (± 0 03) inches from cam pivot center as shown in detail B, or 3.33 (± 0.03) inches as shown in detail C.

NOTE Marking blue should be used to accurately locate the point of contact between the pins and cam hooks.

(5) Check that clearances between the drift pin stop knobs and the stop restrainers is 0.40 when the pressure door actuator is pressurized in the door opening cycle. See detail D.

NOTE Adjust on connecting rods to obtain these clearances.

(6) Adjust, with shims at the attachment bolts, the end clearances between the ends of the pins and the inner faces of the cams to 0.25 inch. See detail E.

(7) Close and lock the door, adjust sequence valve on its slotted attachment holes so that the face of the end cap is within 0.45 (± 0.05) inch of the striker plate on the door sill, as measured along the centerline of the plunger stem.

CAUTION: DO NOT ALLOW THE VALVE TO MOVE WHILE TIGHTENING THE BOLTS.

(8) Back off the frame-mounted stop bolts.

(9) Manually close main cargo door and vary thickness of laminated shims at the eight latch pin fittings to fair bottom edge of door within +0.06/-0.09 inch of body skin.

(10) Adjust as follows the latch pin supports clearances:

(a) Check clearance between each latch shaft and door structure as indicated in detail G. Clearance should be 0.001 to 0.010 inch.

(b) On the two forward latches and the two aft latches, adjust the latch pin supports on the serrated mountings to provide a required clearance of 0.14 (± 0.010) inch between the latch pin supports and the latches when the main cargo door is closed.

(c) On the four intermediate latches, adjust required clearances to 0.080 (± 0.010) inch between the latch pin supports and the latches when the main cargo door is closed.

(11) Adjust drift pin receptacles to align the vertical centerlines of the receptacle bores to within 0.05 inch of the drift pin centers. (See detail H.)

(12) Use hand pump to extend drift pins into receptacles.

CAUTION: ON AIRPLANES WITH HAND PUMP IN RIGHT WHEEL WELL, TO PREVENT DAMAGE TO HAND PUMP AND/OR LANDING GEAR, BOLT HAND PUMP HANDLE IN STOWED POSITION AFTER USING.

(13) and (14) Deleted

(15) Adjust all stop bolts to fair door within +0.060 to -0.090 inch at lower and aft edges and within +0.060 to -0.120 inch at forward edge when cargo door is closed and locked.

2. Test Main Cargo Door

A. The following tests should be done after main cargo door adjustments or when a serviceability check is required:

(1) Manually operate hand pump to check the opening cycle sequence:

CAUTION: PERSONNEL MUST STAY CLEAR OF MAIN CARGO DOOR PATH.

NOTE: For communication between personnel use intercom jacks in panel forward of main cargo door and in electronics compartment.

2. Test Main Cargo Door

A. The following tests should be done after main cargo door adjustments or when a serviceability check is required:

(1) Manually operate hand pump to check the opening cycle sequence:

CAUTION: PERSONNEL MUST STAY CLEAR OF MAIN CARGO DOOR PATH.

NOTE: For communication between personnel use intercom jacks in panel forward of main cargo door and in electronics compartment.

(a) Pressure door actuator operates to fully open pressure doors, rotate drift pin restrainers clear of drift pin stop knobs and move locking stops clear of latches before step (b).

(b) Latch actuators rotate latches and drift pins before step (c).

(c) Cam actuators rotate cam hooks to cocked position and main actuator opens door.

(d) Check that sequence valve plunger fully extends.

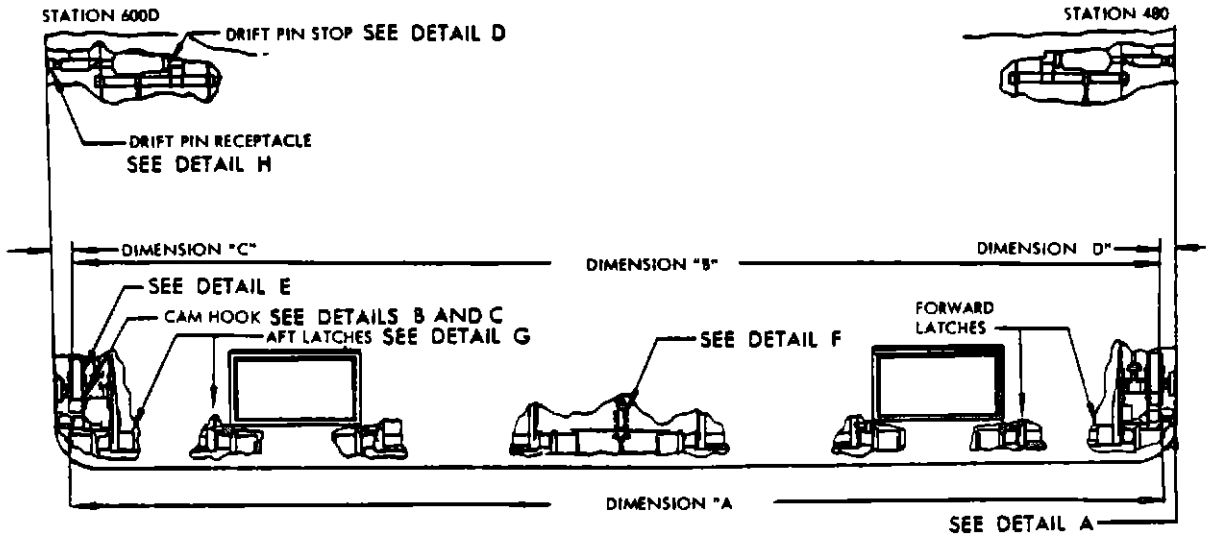
(2) Using manual hydraulic pump pressurize system to check the following cycle sequence.

CAUTION: ON AIRPLANES WITH HAND PUMP INSTALLED IN RIGHT WHEEL WELL, TO PREVENT DAMAGE TO HAND PUMP AND/OR LANDING GEAR, BOLT HAND PUMP HANDLE IN STOWED POSITION AFTER USING.

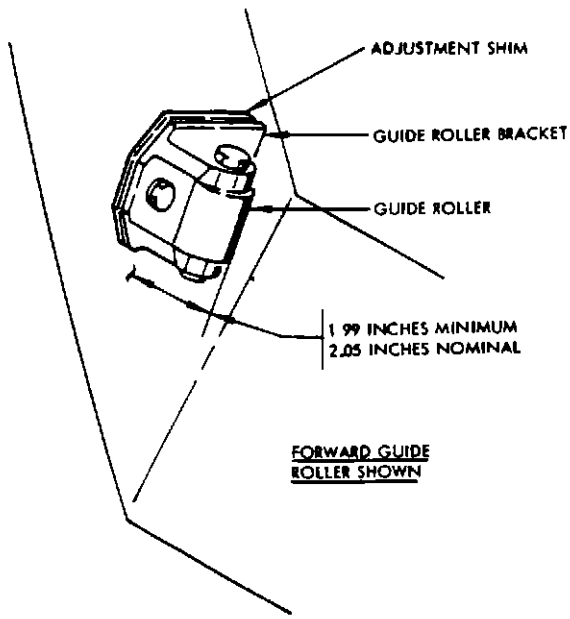
(a) Main actuator closes door to closed position. Sequence valve plunger contacts lower sill before step (b).

(b) Cam actuators pull door to fully closed position before step (c).

(c) Latch actuators rotate latches and pins, drift pin actuators extend drift pins into drift pin receptacles and pressure doors snap closed. Simultaneously with the pressure doors closing, the stop restrainers lock the drift pin stop knobs and stops on pressure door hinges engage periphery cutout on latches.

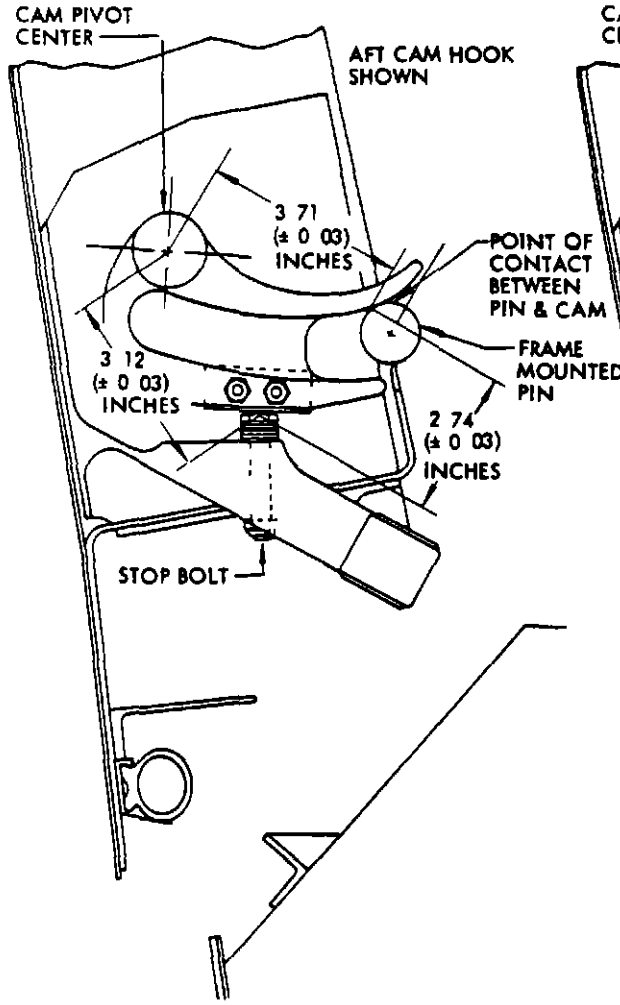


INSIDE VIEW OF MAIN CARGO DOOR
(WITH LINING AND INSULATION PANELS REMOVED)



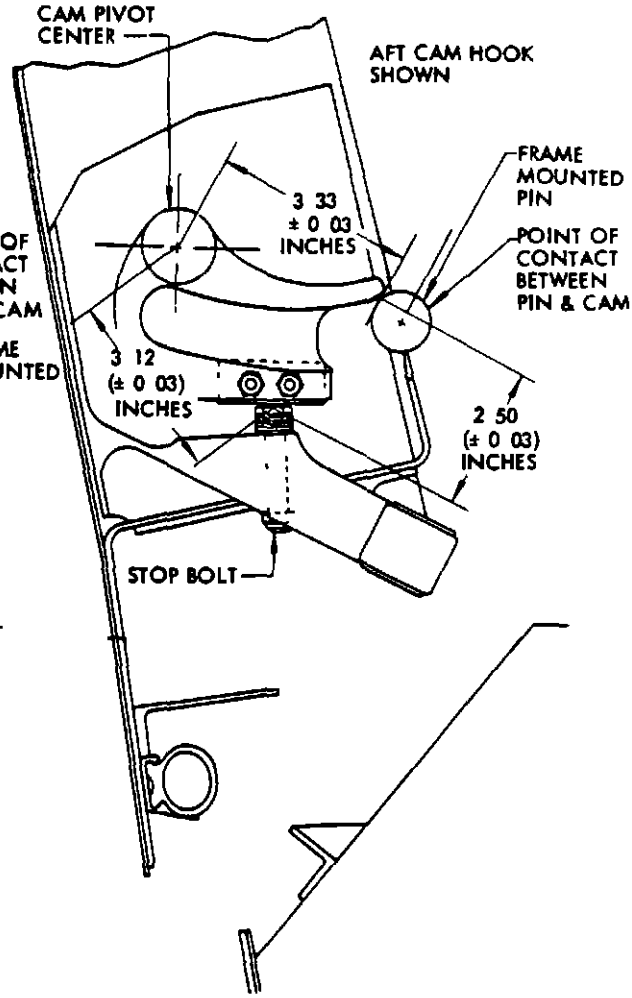
ADJUSTMENT OF GUIDE ROLLER BRACKET
DETAIL A

Main Cargo Door Adjustments
Figure 501 (Sheet 1)



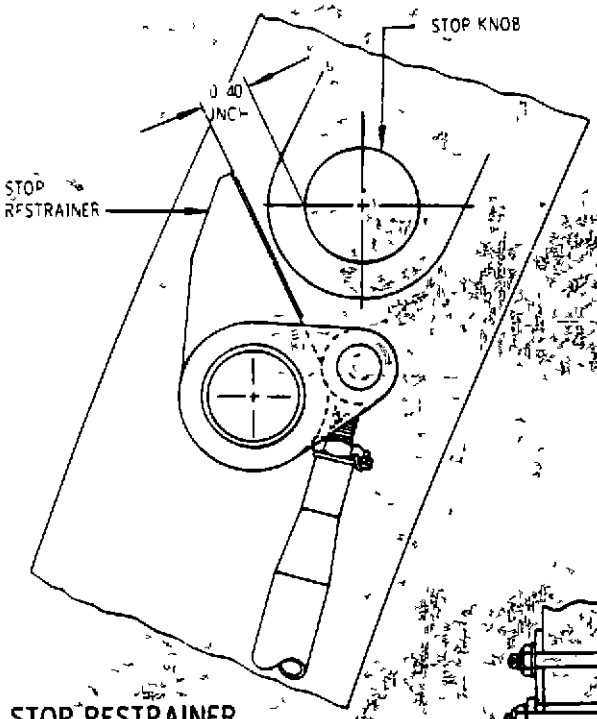
PIN AND CAM ADJUSTMENT ON CARGO DOORS WITH SINGLE ACTUATORS

DETAIL B

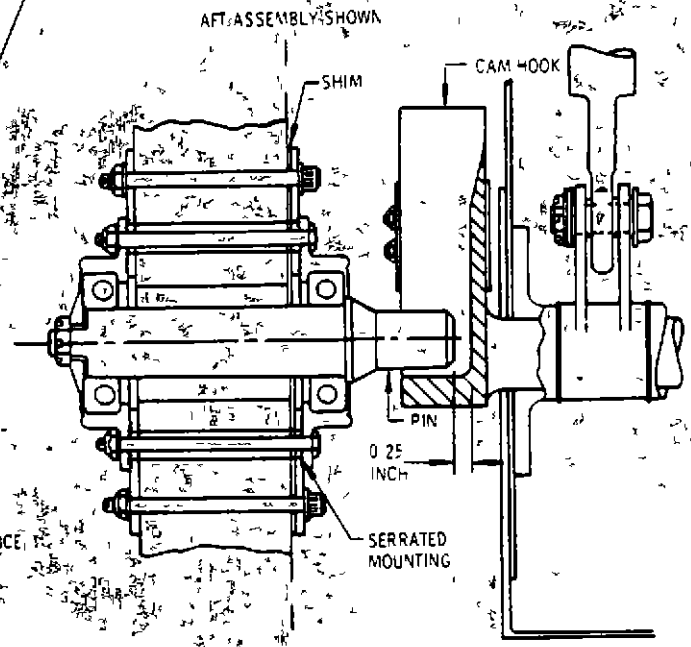


PIN AND CAM ADJUSTMENT ON CARGO DOORS WITH DUAL ACTUATORS

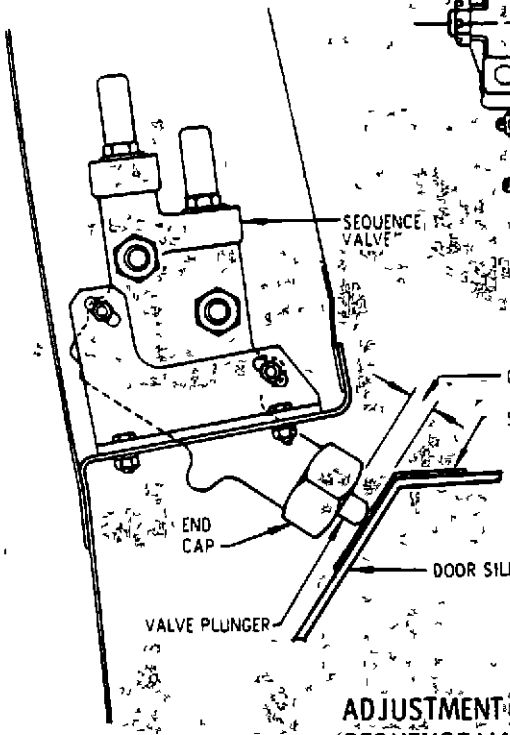
DETAIL C



STOP RESTRAINER ADJUSTMENT
DETAIL D

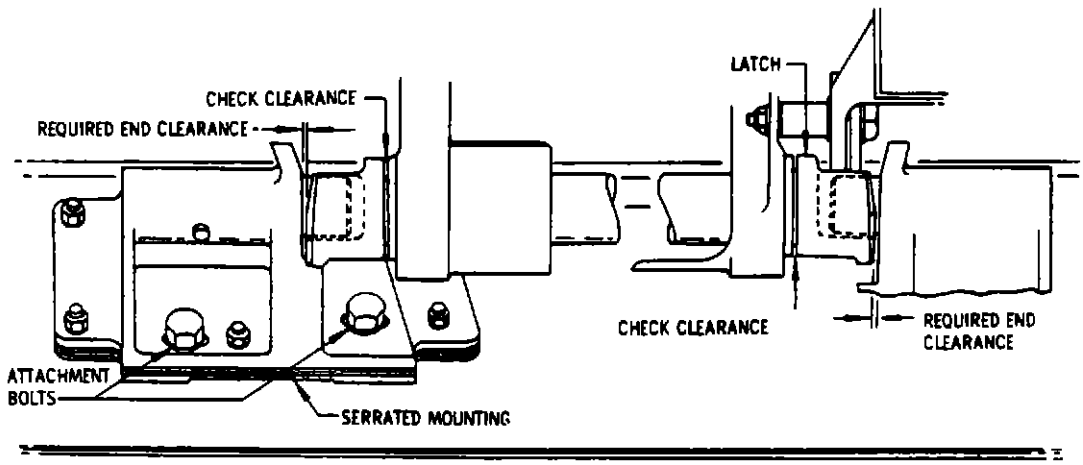


DETAIL E

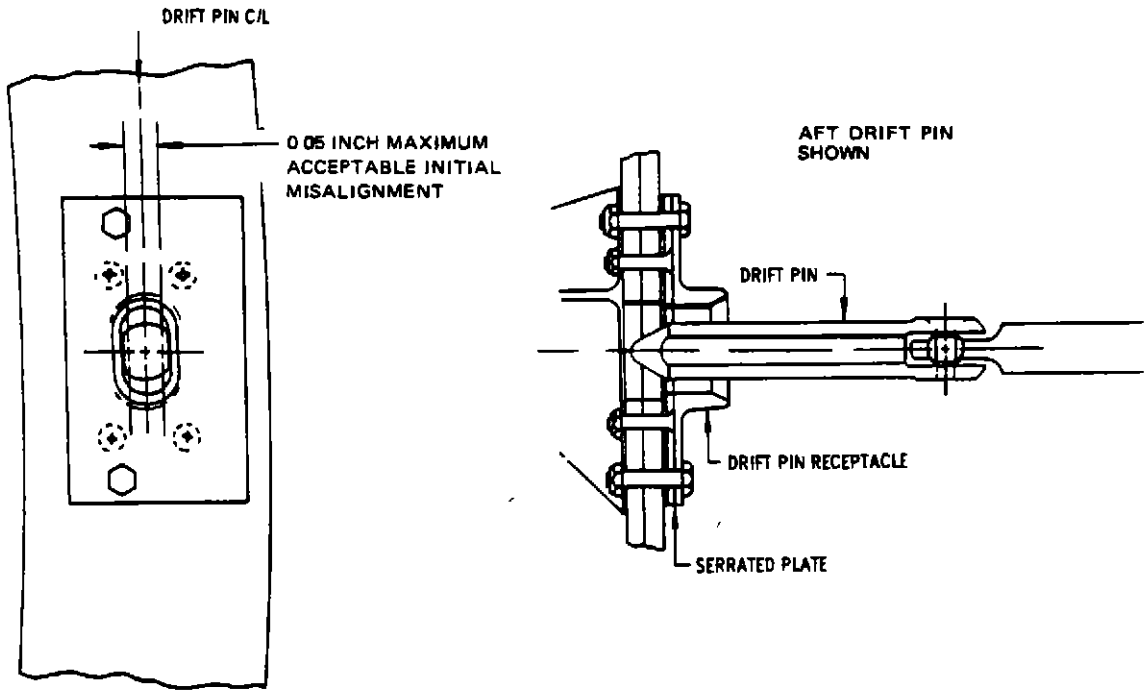


ADJUSTMENT OF SEQUENCE VALVE
DETAIL F

Main Cargo Door Adjustments
Figure 501 (Sheet 3)



(TYPICAL)
LATCH PIN ADJUSTMENT
DETAIL G



DRIFT PIN RECEPTACLE ADJUSTMENT
DETAIL H

MAIN CARGO DOOR - INSPECTION/CHECK

1. General
   A. A procedure for examining locking stops on the main cargo door pressure door is included in this inspection/check section. Excessive wear of the locking stops can make it possible for the pressure door to be cammed open inadvertently by the latch actuators provided the motor operated, hydraulic control valve is mispositioned prior to flight and sufficient wear has occured.
2. Equipment and Materials
   A. Two wood blocks - 2 x 2 x 20 inches
   B. One wood pole - 2 x 2 inches x 10 feet or 2 x 4 inches by 10 feet
3. Examine Main Cargo Door
   A. Examine external skin for loose rivets, cracks, skin wrinkling and corrosion, door hinge fittings for looseness, missing screws and corrosion.
   B. Check main cargo door seal for cracks, tears and correct depressor contact. Examine pressure door seals for tears, cracks and wear.
   C. Check lower edge of door for signs of hydraulic leaks and for cleanliness.
   D. Examine drift pins and drift pin fittings for scores and wear.
   E. Check cam hooks and cam hook pins for loose bolts and excessive wear.
   F. Examine latches and latch pins for cleanliness, loose attachment bolts and signs of excessive wear.
   G. Examine pressure door actuation mechanism for loose attachment bolts, free movement and wear. Examine pressure door locking stops per par. 4.
   H. Examine actuator flexible hoses for signs of chafing.
   I. Check cargo door actuator filters on airplanes with single main cargo door actuator.

3A. Check Main Cargo Door Hydraulic System
   A. Isolation Valve (OO-SJH and SJJ airplanes)
      (1) Pressurize cargo door system by auxiliary 1 pump.
      (2) Position isolation switch in "OFF" position.
      (3) Put manual safety valve in "OPEN" position.
      (4) Put control switch in "OPEN" position. Cargo door should not move or open.
   B. Solenoid Shut-off Valve (All Cargo Airplanes)
      (1) Pressurize cargo door system by auxiliary 1 pump.
      (2) Put isolation switch in "ON" position.
      (3) Put manual safety valve in "OPEN" position.
      (4) Pull breaker on P5 safety relay.
      (5) Put control switch in "OPEN" position. Cargo door should not move or open.
   C. Check Valve (All Cargo Airplanes)(In parallel with manual safety valve)
      (1) Pressurize cargo door system by auxiliary 1 pump
      (2) Put isolation switch in "ON" position.
      (3) Put manual safety valve in "CLOSED" position.
      (4) Put control switch in "OPEN" position. Cargo door should not move or open.

4 Check Pressure Door Locking Stops for Wear (Fig 601)

A. Position the main cargo door as follows.

(1) Using main cargo door control switch or hand pump, open main cargo door about 2 feet

(2) Insert two wood blocks between doors' lower sill and bodys' lower sill as shown in Section C-C, Fig 601 Position each block next to but not touching pressure door microswitch plunger Hold blocks against outboard corner of door sill

(3) Lower door slowly until inboard end of wood blocks contact body sill and door is held open by blocks

(4) With one person inside airplane and one person outside, use wood pole to fully depress sequence valve plunger located at door sills midpoint (Section B-B) While holding plunger in fully depressed position, continue operation of cargo door to position rotary latches in latched configuration and close the pressure doors. Release cargo door control switch or, if hand pump is being used, stop pumping once pressure doors close Remove wood pole Ensure that wood blocks are still in place supporting door

(5) Momentarily move control switch to open position to position motor operated hydraulic control valve in open position

NOTE This action will allow excess hydraulic pressure to be vented to return The door will be held by its own weight

B. Examine pressure door locking stop for wear

(1) Viewing forward and aft along doors lower sill, observe condition of locking stop integral with pressure door hinge fitting.

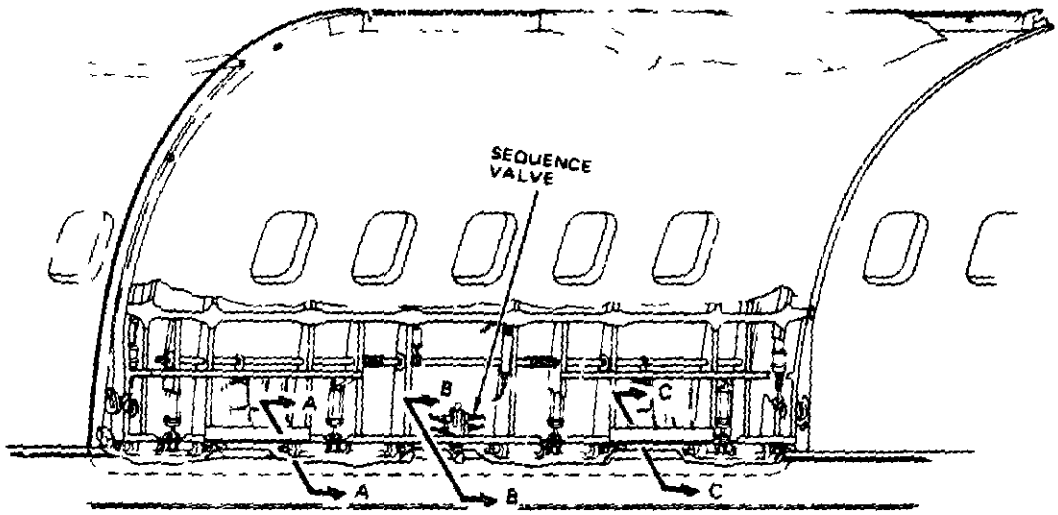
(2) If wear is equal to, or in excess of that shown in Section A-A, Fig. 601, remove pressure door per section 52-11-43, and replace the worn locking stop or lock stop fitting (if fitting does not have a replaceable locking stop) per instructions in Overhaul Manual (Refer to assembly instructions for Main Cargo Door in Overhaul Manual subject 52-36-62). These instructions include assembly of replaceable locking stops and stop fittings as part of the assembly of the pressure door.

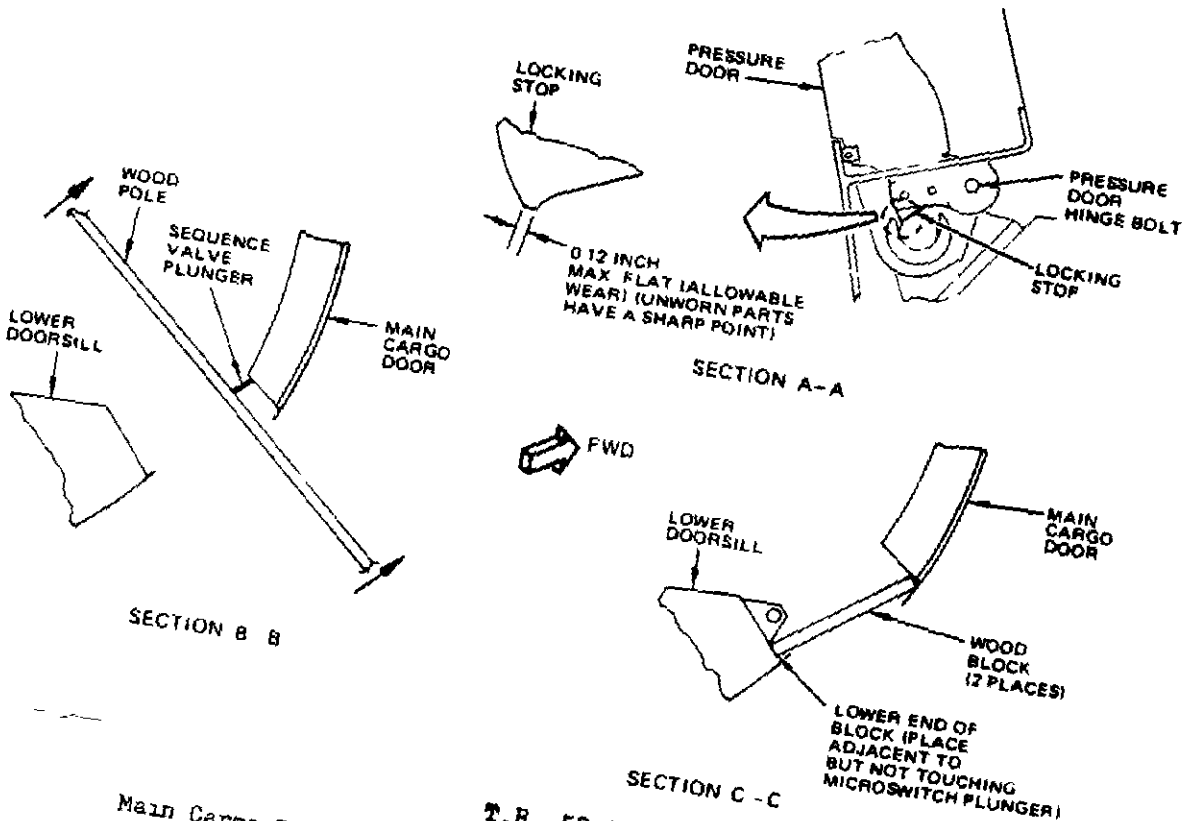
C. Return airplane to normal

(1) Select door OPEN control and open door sufficiently to free the two wood blocks

(2) Remove wood blocks.

(3) Select door CLOSE control and accomplish normal door close operation





T.R. 52-71

Main Cargo Door Pressure Door Locking Stop Examination
Figure 601

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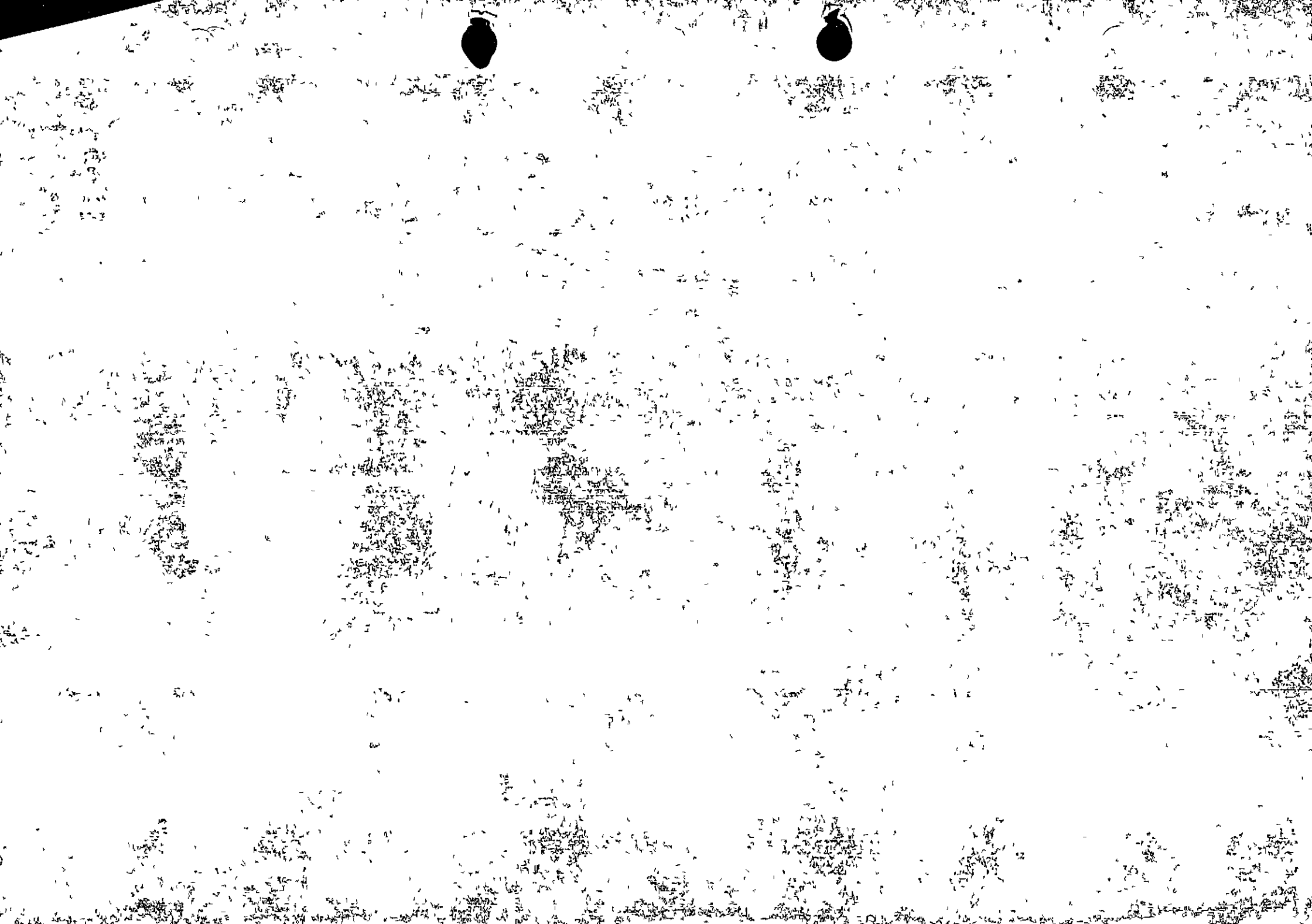


MAIN CARGO DOOR LATCH ACTUATORS - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected actuator and hydraulic lines. Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, "Cleaning and Washing."

2. Remove Main Cargo Door Latch Actuator

   A. Open door to a cocked position and lock the door in this position.

   B Depressurize main cargo door hydraulic system, refer to 52-11-01,"Main Cargo Door - Maintenance Practices."

   C. Remove external access panel at the location of actuator to be replaced

   D. Disconnect and plug the hydraulic lines to the latch actuator. Plug hydraulic fittings on actuator (See figure 401.)

   E. Remove bolt attaching actuator to bell crank or latch mechanism. Collect and tag spacers and washers.

   F. Remove bolt attaching actuator to support bracket on door structure Collect and tag spacers and washers.

   G. Remove latch actuator from cargo door.

3. Install Main Cargo Door Latch Actuator

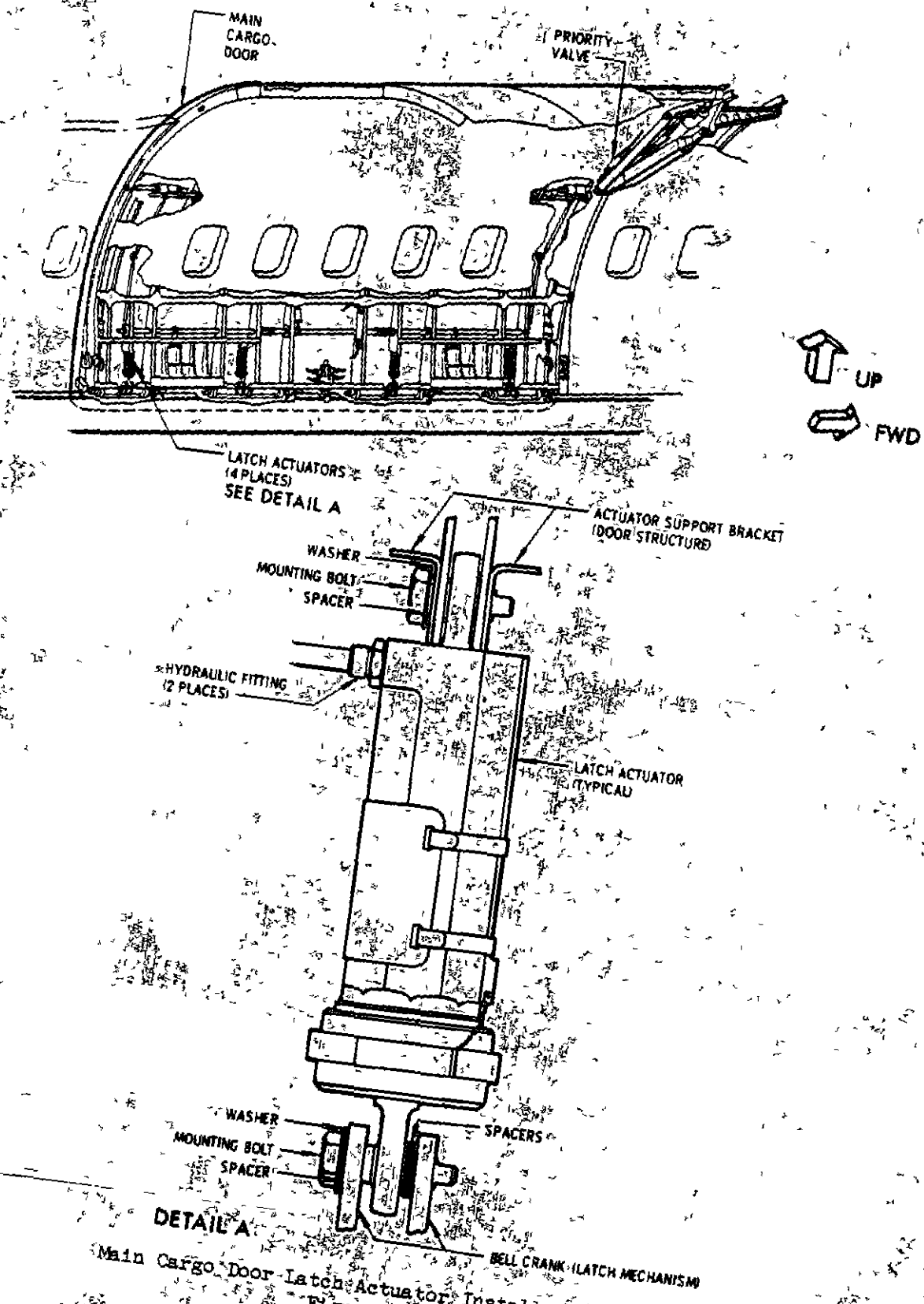
   A. Ensure new latch actuator is filled with Skydrol 500 hydraulic fluid before installation

   B. Position latch actuator in mounting position and install bolt (washers and spacers) through actuator and support bracket or door structure (See figure 401.)

   C. Connect latch actuator to latch mechanism bell crank with bolt washers and spacers.

   D Connect hydraulic lines to latch actuator.

   E Activate main cargo door control system.

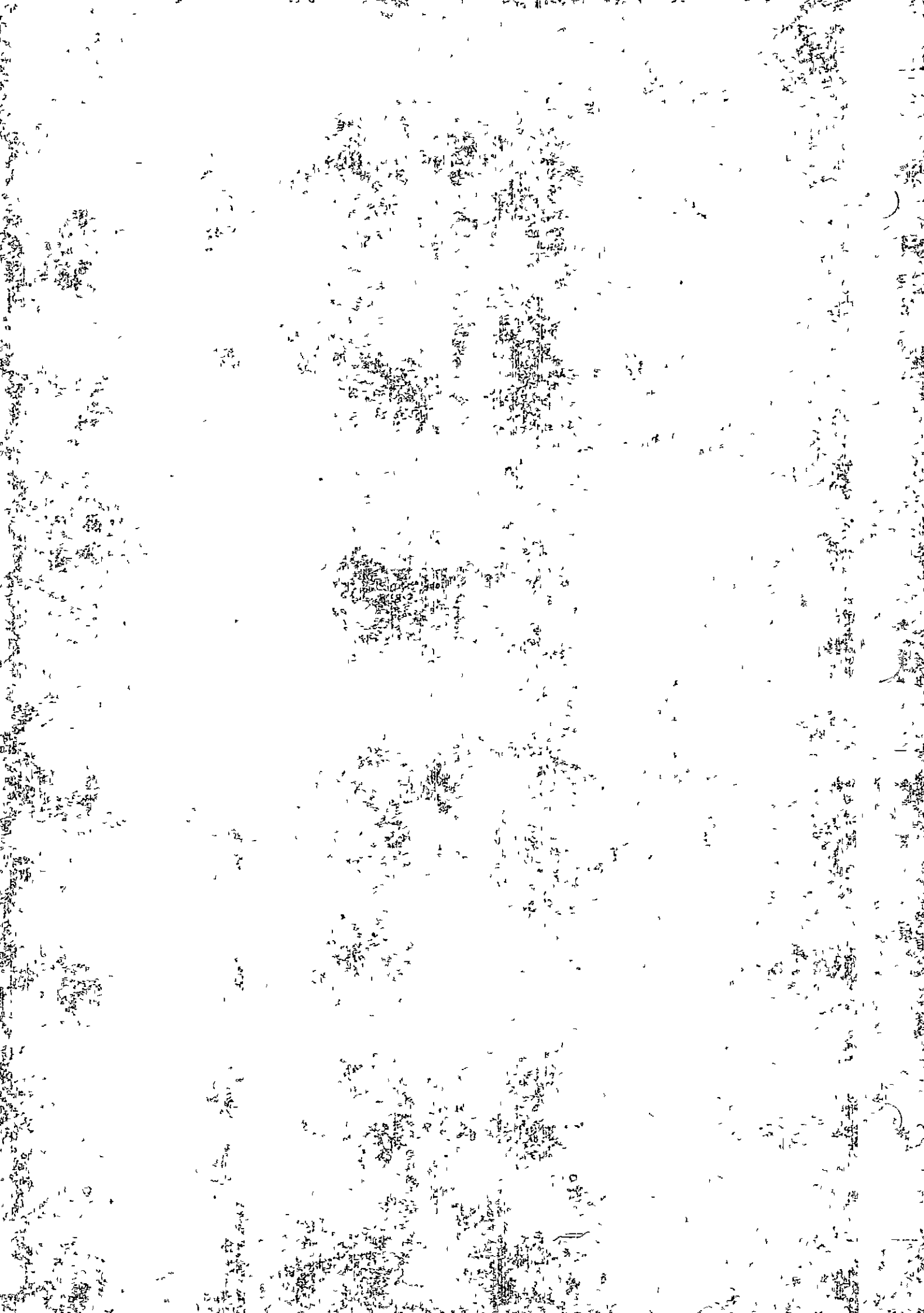


Main Cargo Door Latch Actuator Installation
Figure 401

F. Bleed cargo door hydraulic system by operating the door as necessary to remove air from system. Check for hydraulic leaks and check operation of latching mechanism.

NOTE: On airplanes using auxiliary hydraulic system for cargo door operation, the auxiliary system will have to be pressurized. Position the No. 1 auxiliary pump switch on the copilot instrument panel to "ON."

G Install access panel.



MAIN CARGO DOOR CAM ACTUATOR - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on airplane, decontaminate. Refer to Chapter 12, "Cleaning and Washing."

2. Remove Cam Actuator

   A. Remove interior lining and insulation from main cargo door in the area of cam actuator.

   B. Activate cargo door control system, operate the main cargo door until it is about 8 inches open at the bottom and deactivate the control system.

   C. Depressurize main cargo door hydraulic system. Refer to 52-11-01, "Main Cargo Door - Maintenance Practices."

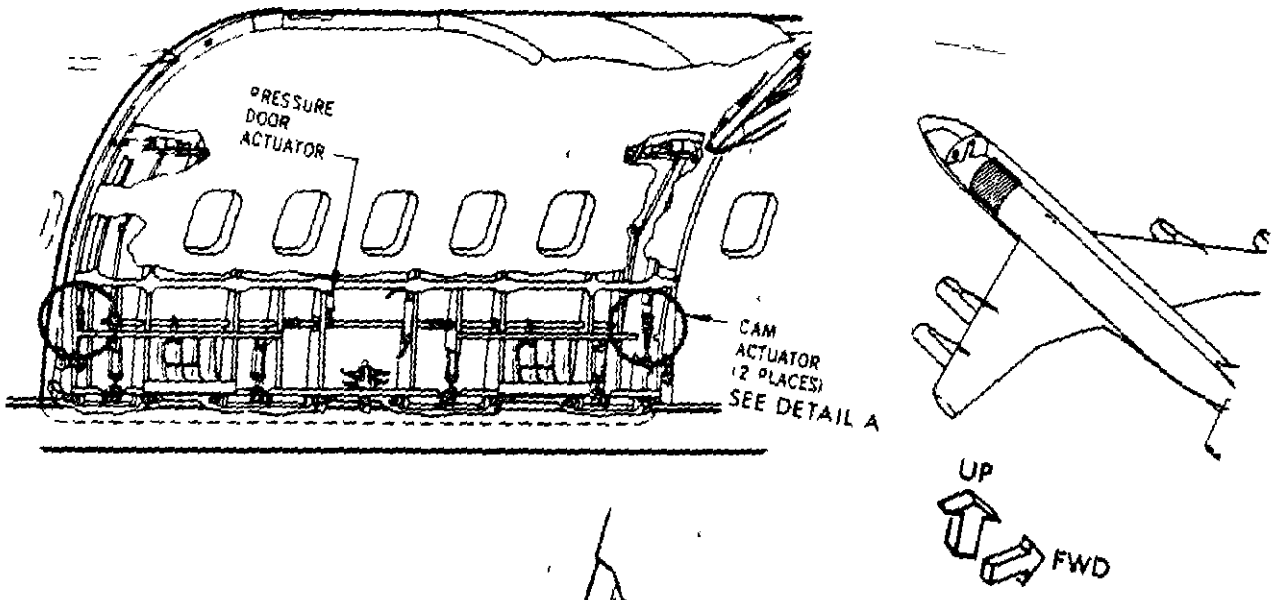
   D. Disconnect and plug the hydraulic lines (1, figure 401) to the cam actuator. Plug hydraulic fittings on actuator.

   E. Remove bolts (3) attaching splice plate to cargo door frame and detach splice plate.

   F. Remove cotter pin, nut, washers and bolt (2) attaching cam actuator to bell crank on hook assembly. Collect and tag washers.

   G. Remove cotter pin, nut, washers and bolt (4) securing cam actuator to structure. Collect and tag washers.

   H. Remove cam actuator from cargo door.



Cam Actuator Installation
Figure 401

3. Install Cam Actuator

A. Ensure that cam actuator is filled with Skydrol 500 before installing on airplane.

B. Position cam actuator in main cargo door and install attachment bolt (4, figure 401), washers, nut and cotter pin to secure actuator to structure

C. Connect cam actuator to bell crank with bolt (2), washers, nut and cotter pin.

D. Remove protective caps and connect hydraulic lines (1) to actuator.

E. Activate main cargo door.

F. Bleed main cargo door hydraulic system by operating the door as necessary to remove air from system. Check door operation and check for hydraulic leaks.

NOTE: On airplane using the auxiliary hydraulic system for cargo door operation, the auxiliary system will have to be pressurized Position the No. 1 auxiliary pump switch on the copilot instrument panel to "ON."

G. Install splice plate on door with attachment bolts (3).

H. Replace interior lining and insulation.

MAIN CARGO DOOR DRIFT PIN ACTUATOR - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, Cleaning and Washing.

2. Remove Main Cargo Door Drift Pin Actuator

   A. Activate main cargo door and open it until there is a gap of approximately 6 inches at the bottom of the door.

   B. Depressurize main cargo door hydraulic system per 52-11-01, Main Cargo Door - Maintenance Practices.

   C. Remove door lining from main cargo door as required in the area of drift pin actuator. Refer to 52-11-171.

   D Disconnect OPEN and CLOSE hydraulic lines. Plug disconnected lines and cap empty ports on actuator. See figure 401.

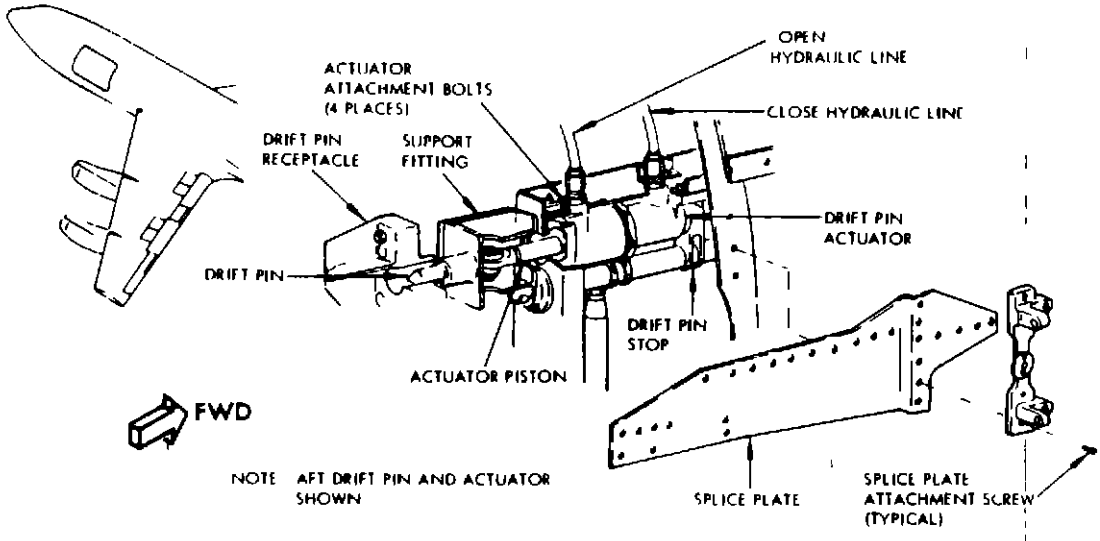
   E. With the actuator in the closed position, disconnect drift pin and actuator by removing cotter pin, nut, bolt and washers.

   F. Push the actuator piston to position shown in figure 401 to make bolt connecting drift pin and actuator piston accessible through hole in support fitting.

   G Remove bolts attaching splice plate to cargo door frame and remove splice plate.

   H. Remove four bolts attaching actuator to door structure.

   I. Remove actuator.



Main Cargo Door Drift Pin Actuator Installation
Figure 401

3. Install Main Cargo Door Drift Pin Actuator

A. If new actuator is to be installed, remove unions from ports of old actuator and install unions, with new O-rings, on ports of new actuator. If old actuator is to be installed, remove unions, install new O-rings and reinstall unions.

NOTE: Lubricate O-ring with Skydrol 500 or equivalent before installation.

B. Install actuator by installing four attachment bolts and tighten bolts to 50-70 pound-inches torque.

C. Pull actuator piston to position shown in figure 401 to make connection between drift pin and actuator accessible through hole in support fitting.

D. Connect drift pin and actuator by installing washers, bolt, nut and cotter pin.

E. Connect OPEN and CLOSE hydraulic lines.

F. Install splice plate.

G. Activate main cargo door control system.

H. Operate the cargo door several times through opening and closing cycles to bleed the system, check for hydraulic leaks and operation of drift pin.

NOTE On airplanes using auxiliary hydraulic system for cargo door operation, the auxiliary system will have to be pressurized. Position the No. 1 auxiliary pump switch on the copilot's instrument panel to ON.

I. Install cargo door lining. Refer to 52-11-171.

MAIN CARGO DOOR PRESSURE DOOR ACTUATOR - REMOVAL/INSTALLATION

1 General

A. A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate Refer to Chapter 12, "Cleaning and Washing "

2 Remove Main Cargo Door Pressure Door Actuator

A Depressurize main cargo door hydraulic system. Refer to 52-11-01, "Main Cargo Door - Maintenance Practices "

B Remove sidewall panels as required to gain access to actuator. Refer to Chapter 25, "Door Lining and Insulation "

C. Disconnect and cap hydraulic lines.

D. Remove bolt attaching actuator to bellcrank

E Remove bolt attaching actuator to support bracket on door structure.

F. Remove actuator from cargo door.

3 Install Main Cargo Door Pressure Door Actuator

A. Ensure that new actuator is filled with Skydrol 500 hydraulic fluid before installation

B Install reducer with new "O" ring in each port.

NOTE: Lubricate O-rings with Skydrol 500 before installation

C Position actuator in main cargo door and install bolt, attaching actuator to support bracket on door structure together with washers (See figure 401.)

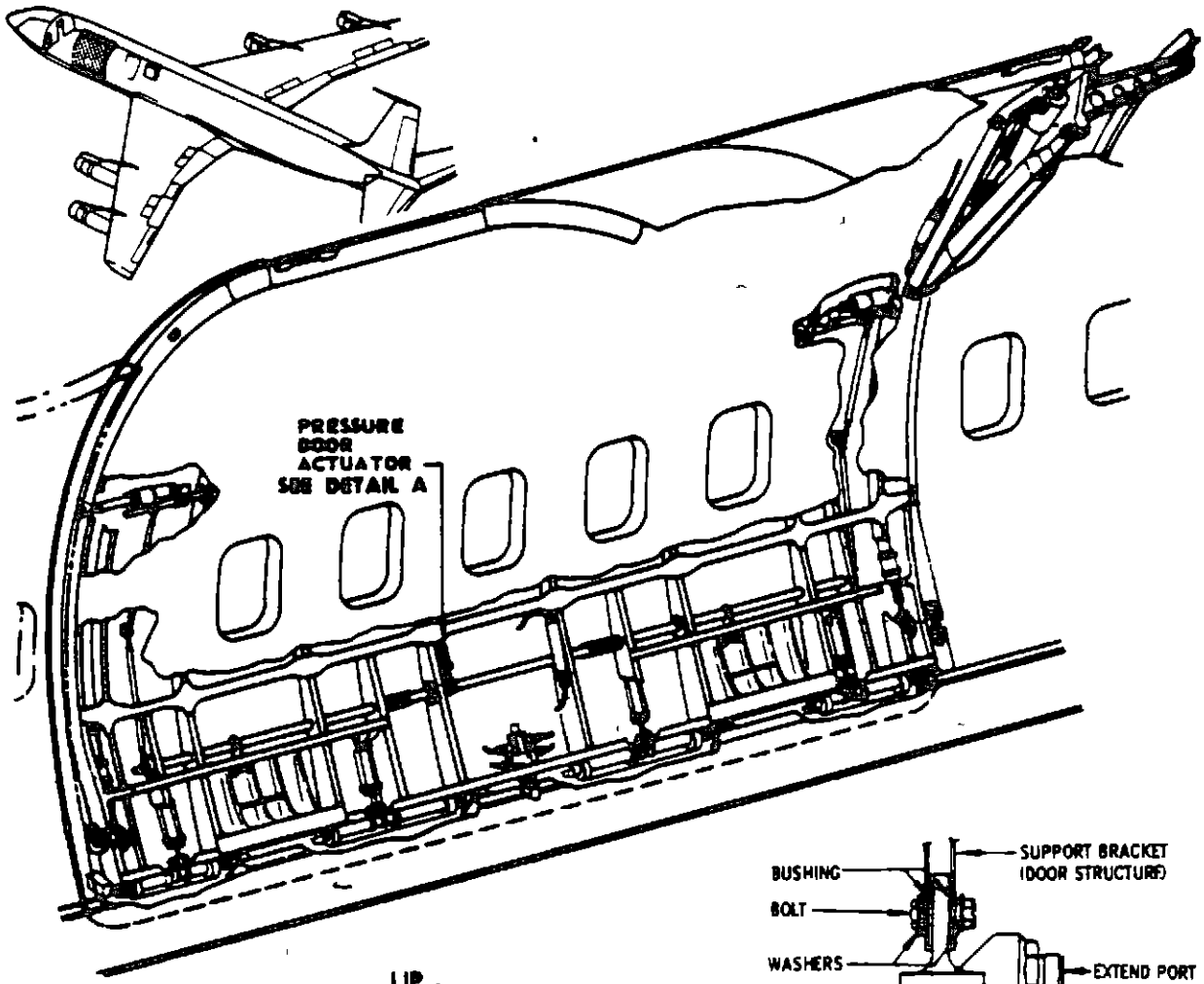
D Connect actuator to bellcrank using bolt and washers

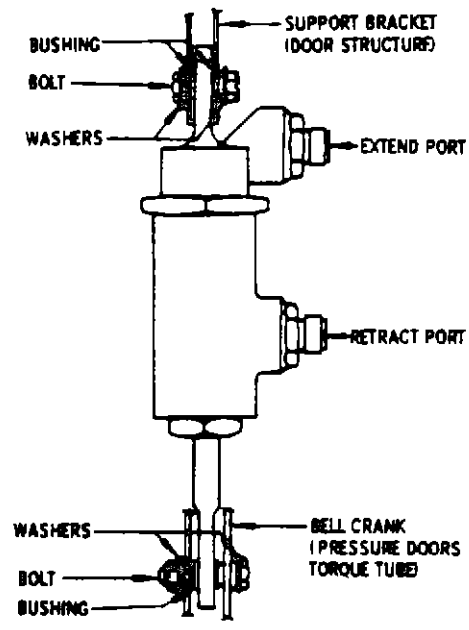
E. Remove cap from hydraulic line and connect hydraulic lines to reducers on actuator body

F Activate main cargo door.

G. Bleed main cargo door hydraulic system by operating the door as required to bleed air from system. Check door operation and check for hydraulic leaks

H. Replace sidewall panels removed for access





DETAIL A
PRESSURE DOOR ACTUATOR

Main Cargo Door Pressure Door Actuator Installation
Figure 401

MAIN CARGO DOOR PRESSURE DOOR - REMOVAL/INSTALLATION

1. Remove Main Cargo Door Pressure Door (Fig. 401)

   A. Depressurize main cargo door hydraulic system (Ref 52-11-01, Maintenance Practices).

   B. Remove sidewall panels as required to gain access to pressure door and attach point fasteners per main cargo door lining removal/installation instructions in section 52-11.

   C. Remove bolt, nut, washers, and spacers at torque tube bellcrank attachment to slotted bracket on pressure door.

   D. Remove bolt, nut, washers, and spacer at door lower hinge attach point at either end of door.

2. Install Main Cargo Door Pressure Door (Fig. 401)

   A. Position pressure door assembly to match skin cutout and contour within ± 0.03 inch.

   B Attach pressure door to main cargo door at lower hinge attach points as shown in section B-B.

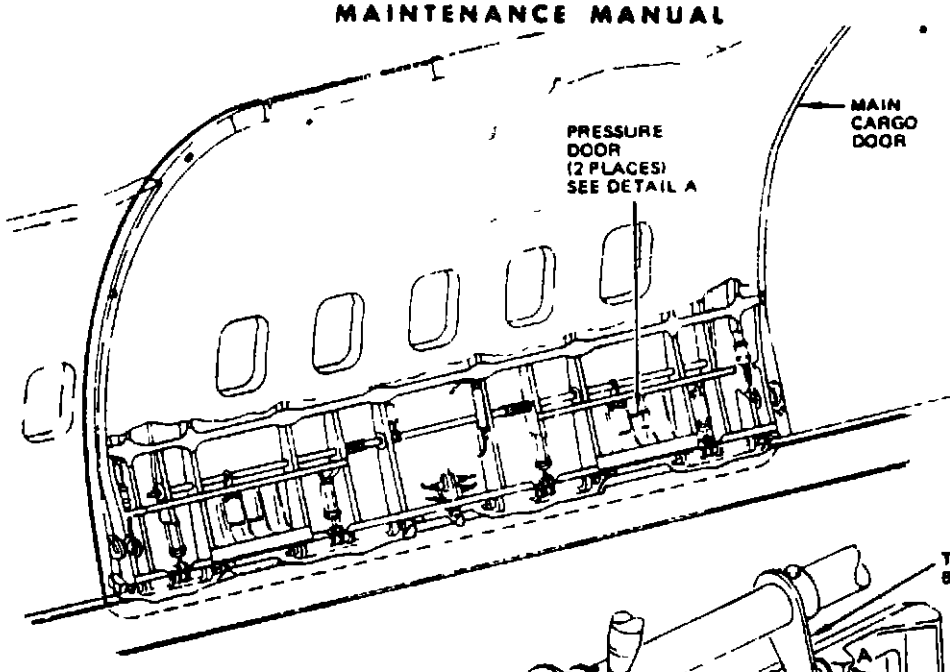
   C. Connect torque tube crank to slotted attach bracket on pressure door as shown in section A-A.

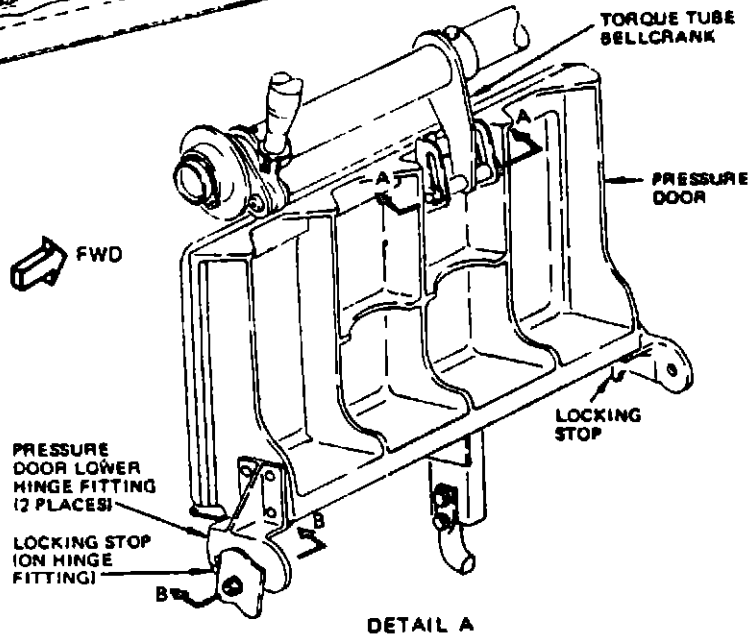
   D Activate main cargo door.

   E. Bleed main cargo door hydraulic system by operating the door as required to bleed air from system. Check door operation and check for hydraulic leaks. Verify pressure door flushness specified in step 4.

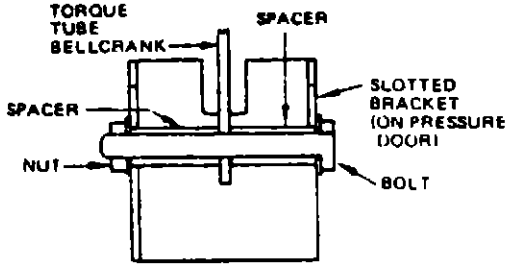
      NOTE: On airplanes using auxiliary hydraulic system for cargo door operation, the auxiliary system will have to be pressurized. Position No. 1 auxiliary pump switch on copilot's instrument panel to ON

   F. Install sidewall panels removed for access.

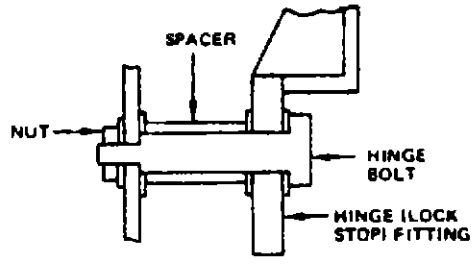




DETAIL A



SECTION A-A



SECTION B-B (2 PLACES)

MAIN CARGO DOOR HYDRAULIC HAND PUMP - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, Cleaning and Washing.

2. Remove Main Cargo Door Hydraulic Hand Pump

   A. Depressurize main cargo door hydraulic system per 52-11-01, Main Cargo Door - Maintenance Practices.

   B. Disconnect and plug hydraulic lines to the pump. (See figure 401.)

   C. Remove mounting bolts and remove pump.

3. Install Main Cargo Door Hydraulic Hand Pump

   A If new pump is to be installed, remove unions from ports of old pump and install unions with new O-rings on ports of new valve.

   NOTE Lubricate O-rings with Skydrol 500 before installation.

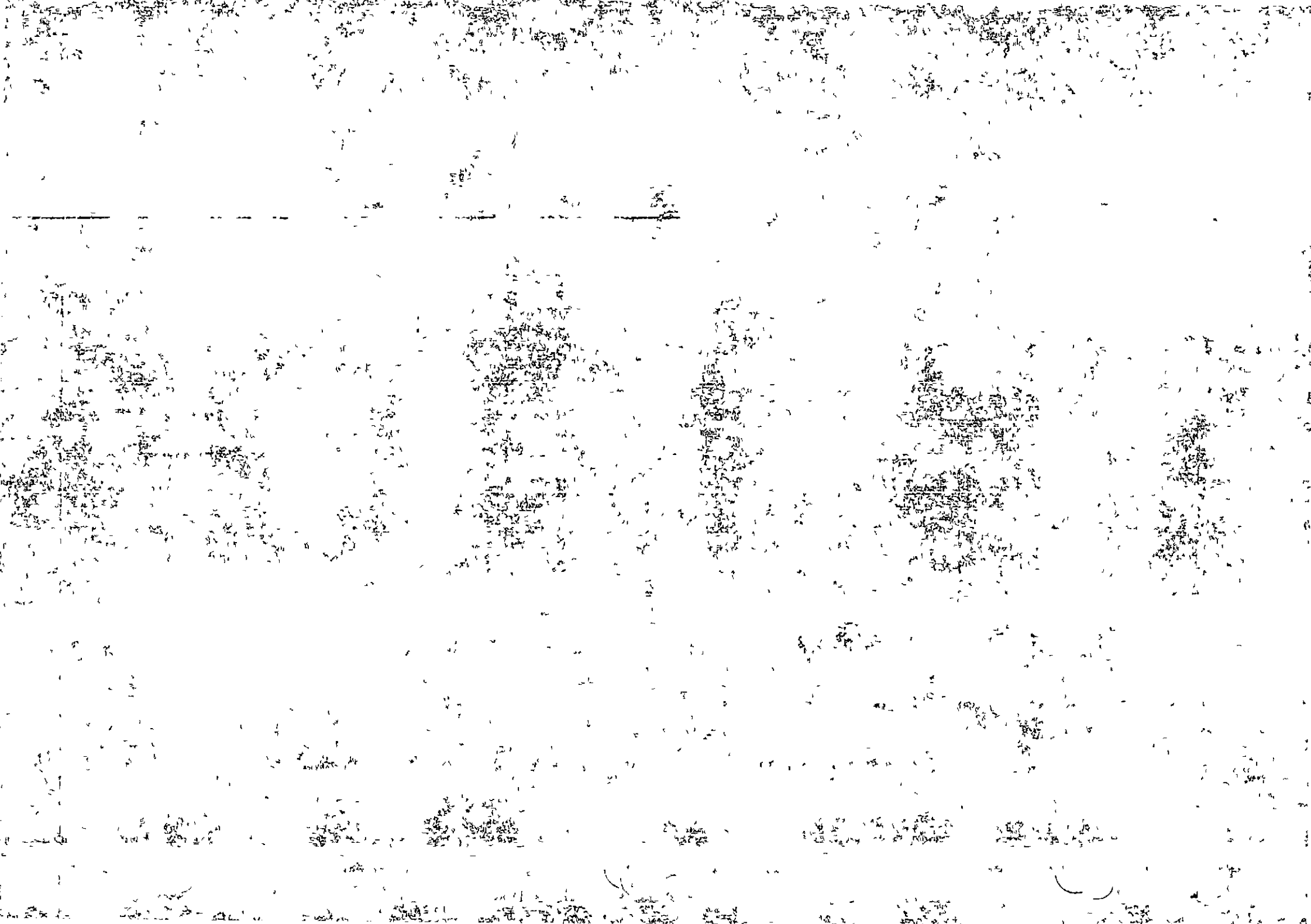
   B. Install pump using mounting bolts. (See figure 401)

   C. Connect hydraulic lines.

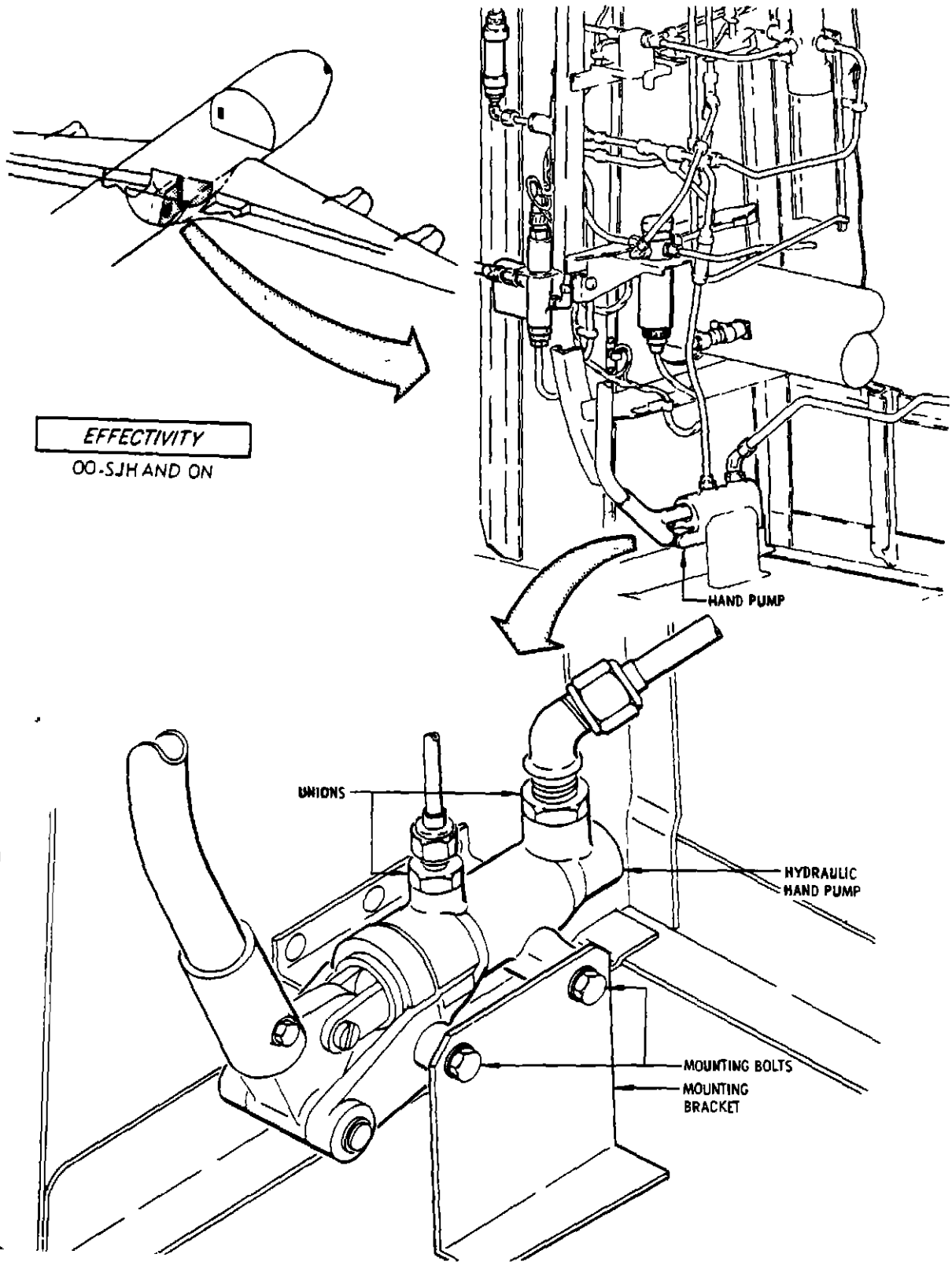
   D. Activate main cargo door control system.

   E. Bleed cargo door hydraulic system by operating the hand pump to open and close the door as necessary to remove air from system. Check for hydraulic leaks.

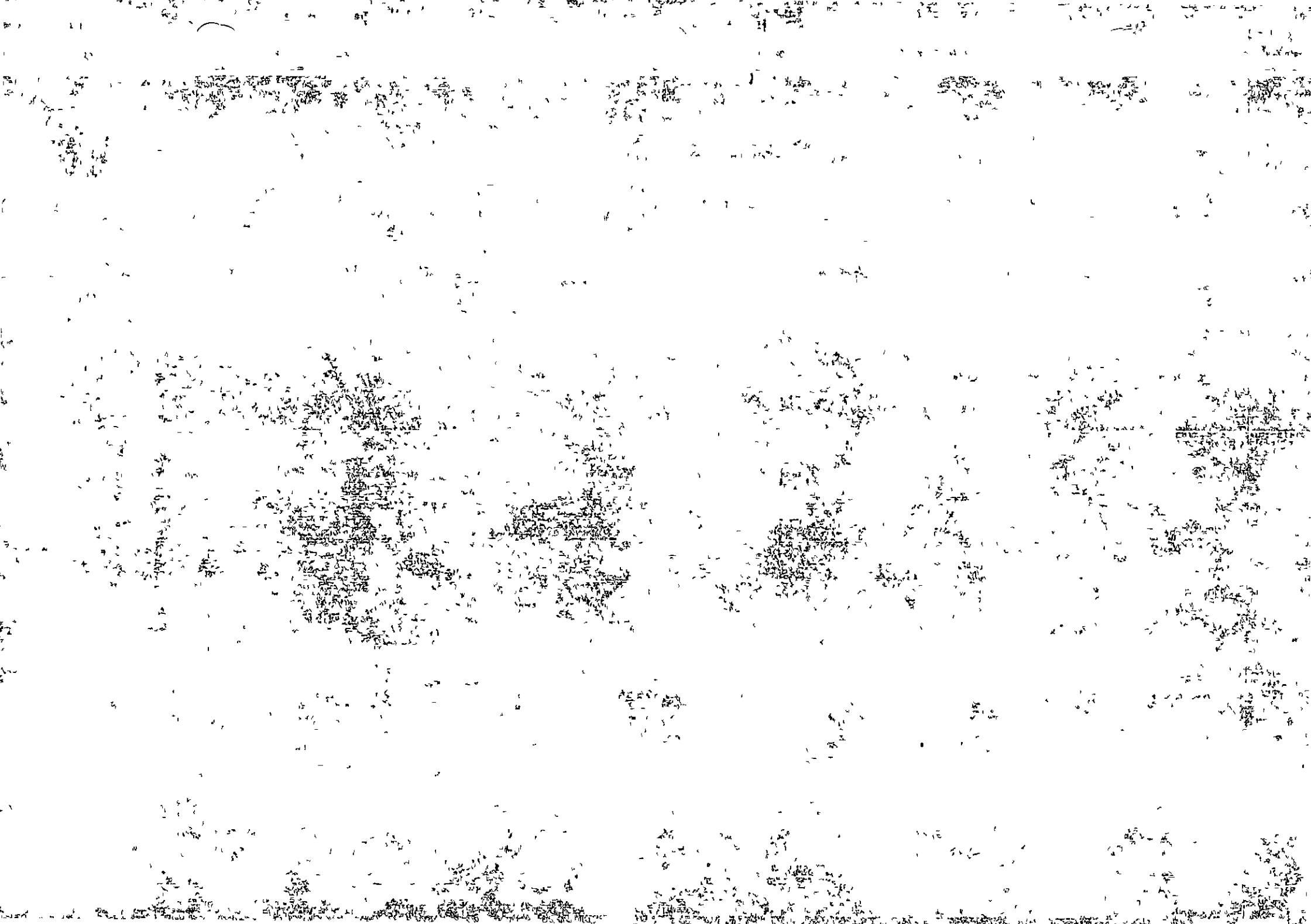
   F. On airplanes with pump installed in light wheel well, install pump handle stowage bolt and lockwire.



EFFECTIVITY
00-SJH AND ON



Main Cargo Door Hydraulic Hand Pump Installation
Figure 401 (Sheet 2)



MAIN CARGO DOOR HYDRAULIC CONTROL VALVE - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, Cleaning and Washing.

2. Remove Main Cargo Door Hydraulic Control Valve

   A. Depressurize main cargo door hydraulic system. Refer to 52-11-01, Main Cargo Door - Maintenance Practices.

   B. Open external power control circuit breaker on J9 external power shield.

   C. Disconnect electrical connector from control valve. (See figure 401.)

   D. Disconnect and plug hydraulic lines.

   E. Remove mounting bolts and remove valve

3. Install Main Cargo Door Hydraulic Control Valve

   A. Install O-rings and unions in valve. (See figure 401.)

      NOTE Lubricate O-rings with Skydrol 500 before installation.

   B. Install control valve using mounting bolts.

   C. Connect hydraulic lines.

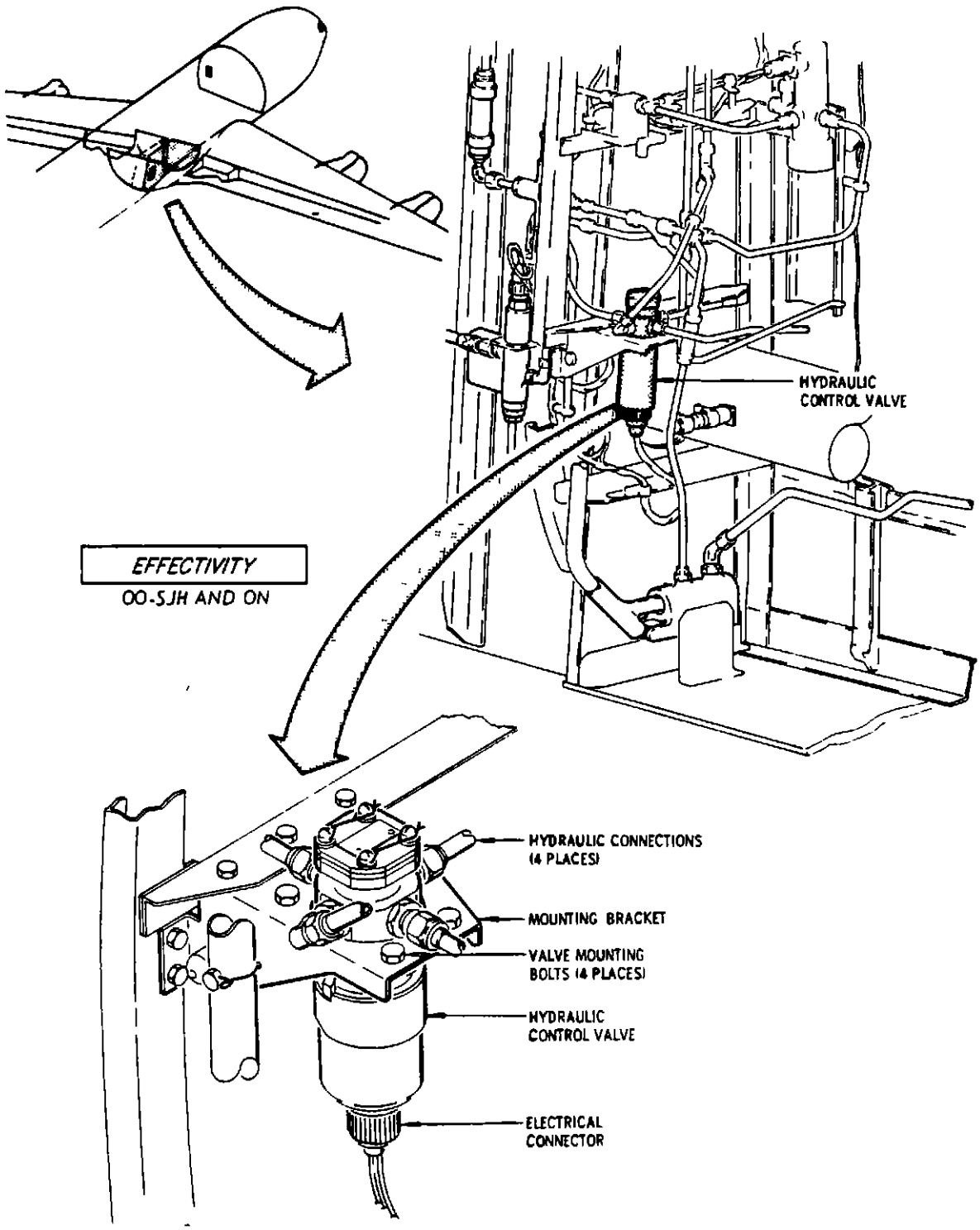
   D. Connect electrical connector.

   E. Close external power control circuit breaker, on J9 external power shield.

   F. Activate main cargo door control system.

   G. Bleed cargo door hydraulic system by operating the door as necessary to remove air from system. Check for hydraulic leaks.

      NOTE On airplanes using auxiliary hydraulic system for cargo door operation, the auxiliary system will have to be pressurized. Position the No 1 auxiliary pump switch on the copilot instrument panel to ON.



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Main Cargo Door Hydraulic Control Valve Installation
Figure 401 (Sheet 2)

MAIN CARGO DOOR SEQUENCE VALVE - REMOVAL/INSTALLATION

1. General

   A. A container will be necessary to catch fluid from disconnected hydraulic lines Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, Cleaning and Washing

2 Remove Main Cargo Door Sequence Valve

   A With door closed and locked, depressurize main cargo door hydraulic system Refer to 52-11-01, Main Cargo Door - Maintenance Practices.

   B Remove sidewall panels as required to gain access to actuator Refer to 52-11-171 Main Cargo Door Lining - Removal/Installation.

   C. Disconnect and cap hydraulic lines

   D Remove mounting bolts attaching valve to mounting bracket on door structure.

   E. Remove valve from cargo door

3 Install Main Cargo Door Sequence Valve

   A Install reducers and new O-rings in each valve port

   B Ensure that valve is filled with BMS 3-11 hydraulic fluid before installation

   NOTE: Lubricate O-rings with BMS 3-11 before installation.

   C. Position valve in main cargo door and install mounting bolts without tightening. (See figure 401)

D Move the valve such that the face of the end cap is 0 40 to 0.50 inch from the striker plate on the door sill as measured along the centerline of the plunger stem.

E Tighten valve mounting bolts to within a torque range of 50 to 70 inch-pounds.

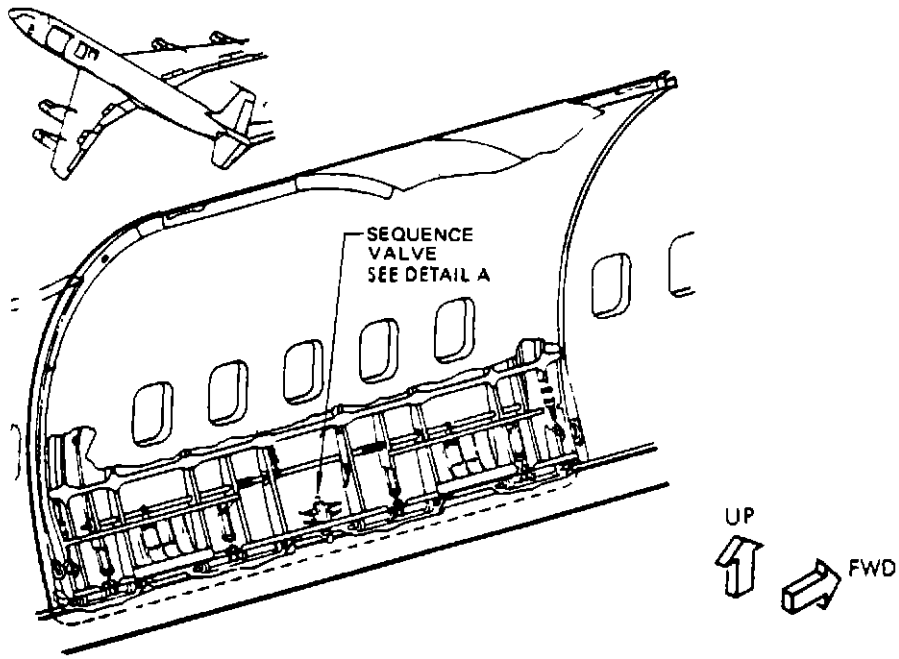
NOTE: Do not allow valve to move while tightening bolts.

F Remove caps from hydraulic lines and connect hydraulic lines to reducers on valve body.

G Activate main cargo door.

H Bleed main cargo door hydraulic system by operating the door as required to bleed air from system. Check door operation and check for hydraulic leaks.

I Replace sidewall panels removed for access Refer to 52-11-171 Main Cargo Door Lining - Removal/Installation



Main Cargo Door Sequence Valve Installation 13
Figure 401 (Sheet 1) Oct 15/69
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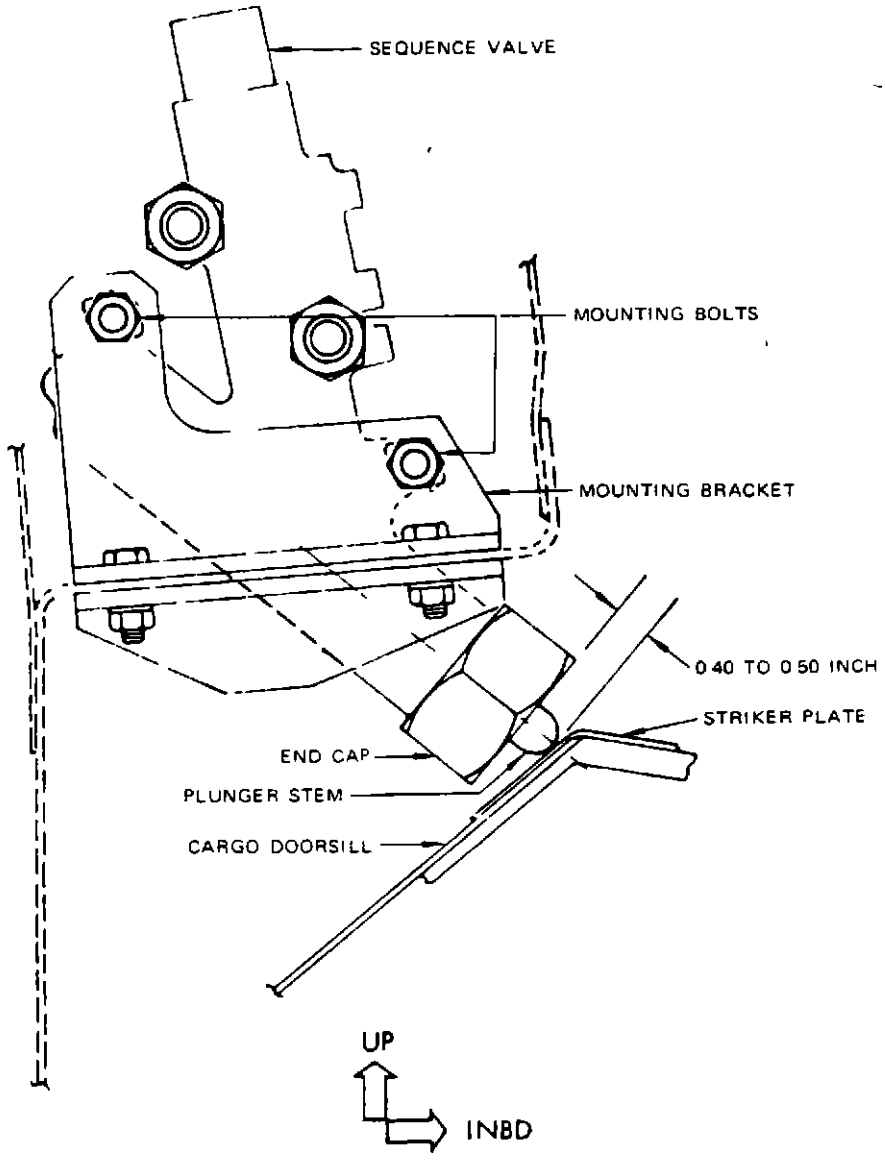
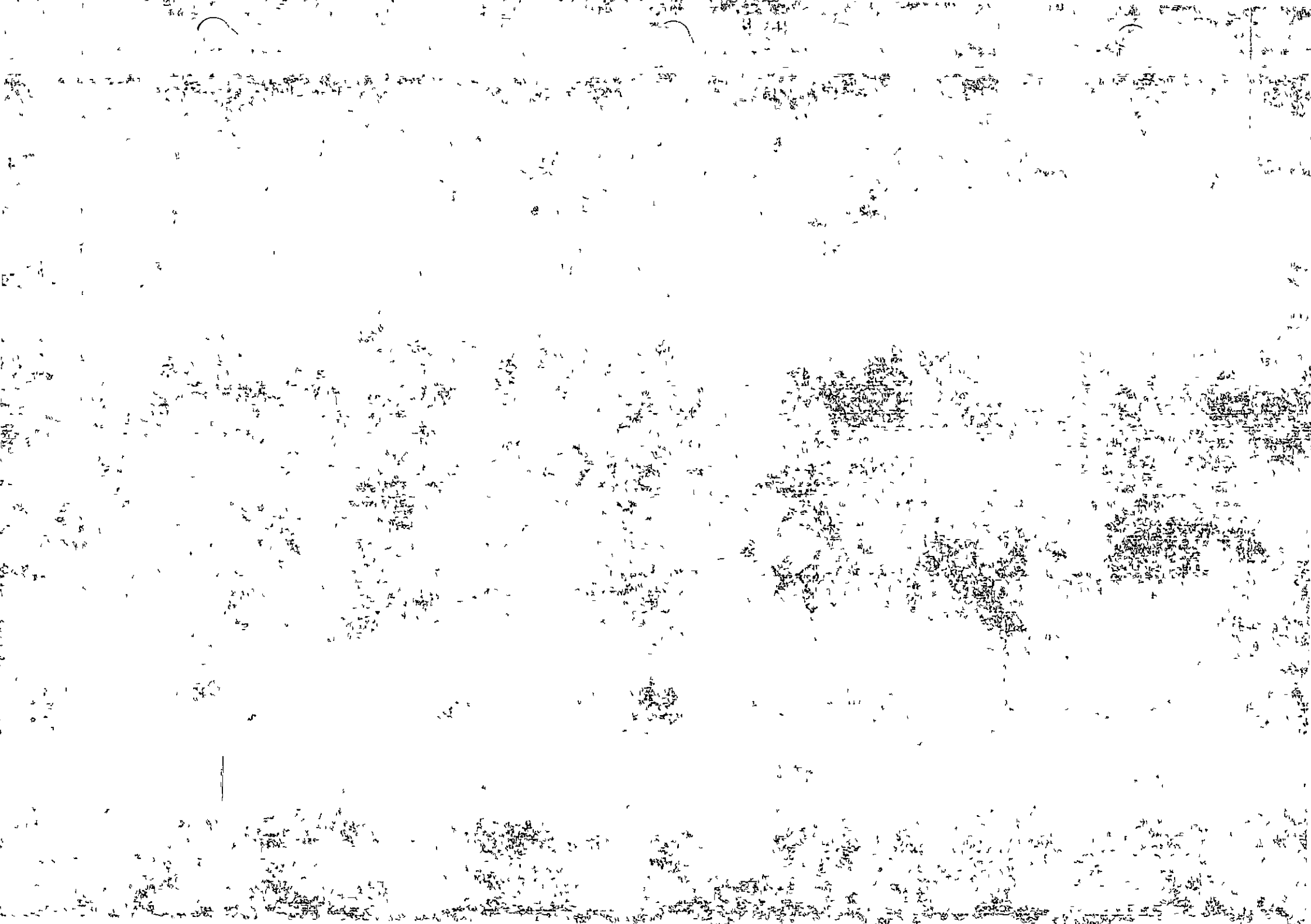

SEQUENCE VALVE
MOUNTING BOLTS
MOUNTING BRACKET
0.40 TO 0.50 INCH
STRIKER PLATE
END CAP
PLUNGER STEM
CARGO DOORSILL
UP
INBD

DETAIL A



MAIN CARGO DOOR MANUAL SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

A A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate. Refer to Chapter 12, "Cleaning and Washing."

2 Remove Manual Shutoff Valve

A. Depressurize main cargo door hydraulic system, refer to 52-11-01,"Main Cargo Door - Maintenance Practices."

B. Remove ceiling and trim panels as required for access to valve

C. Disconnect hydraulic lines and control cable housing from valve. Cap hydraulic lines.

D. Back off set screw at shutoff valve handle housing until handle will rotate.

E. Rotate control handle until control cable is disconnected from valve body.

F Remove mounting bolts attaching shutoff valve to mounting plate and remove valve.

3 Install Manual Shutoff Valve

A. Position valve on mounting plate and install mounting bolts.

B. Remove protective cap and connect hydraulic lines to valve.

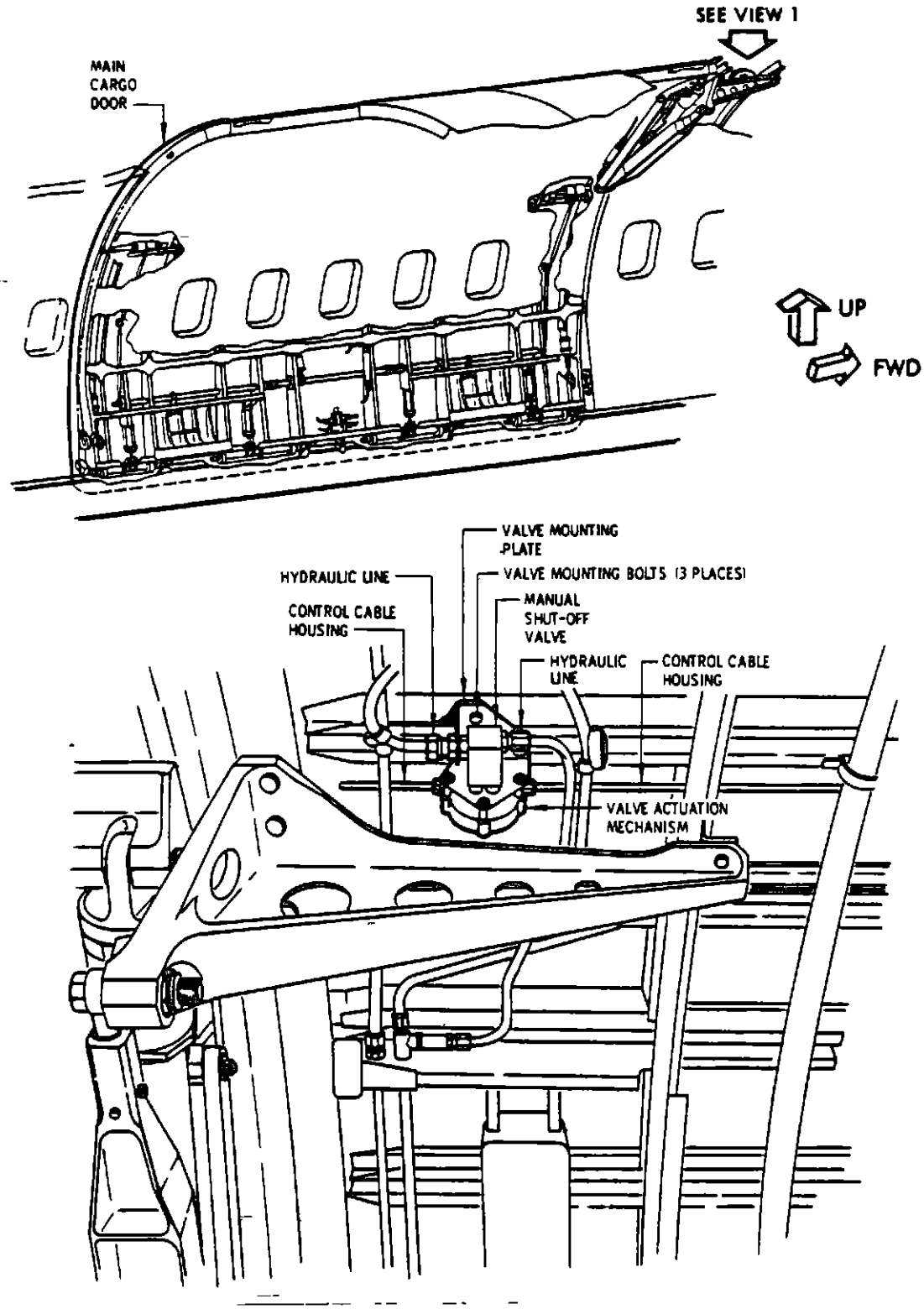
C. Install control cable.

(1) Connect control cable housing to valve.

(2) Push control cable through housing and rotate shutoff valve handle to engage cable end with pulley in valve actuator mechanism. Rotate handle until cable end just protude from end of housing.

(3) Adjust control cable so that valve operates through its full travel in both open and closed positions.

(4) Rotate control handle until set screw aligns with slot in control valve handle. Tighten set screw.



VIEW 1

Main Cargo Door Manual Shutoff Valve Installation
Figure 401

D. Activate main cargo door

E Bleed main cargo door hydraulic system by operating the door as required to bleed air from system. Check for hydraulic leaks.

F Replace ceiling and trim panels removed from access.

MAIN CARGO DOOR HYDRAULIC SHUTOFF VALVE - REMOVAL/INSTALLATION

EFFECTIVITY

All Cargo Airplanes except:
PA N765PA thru N767PA,
N790PA thru N799PA
SN 00-SJH AND ON
AA N7555A thru N7558A
QF VH-EBN thru VH-EBO
CO N17321 thru N17324

1. General

A The hydraulic shutoff valve is bolted to the keel beam in the forward section of the right main landing gear wheel well, at body station 870 and water line 155. (See figure 401.)

B A container will be necessary to catch fluid from disconnected hydraulic lines. Should any fluid spill on the airplane, decontaminate Refer to Chapter 12, Cleaning and Washing.

2. Remove Main Cargo Door Hydraulic Shutoff Valve

A Depressurize main cargo door hydraulic system per 52-11-0, Main Cargo Door - Maintenance Practices.

B Open circuit breaker on external power shield J9.

C On airplanes using auxiliary hydraulic system for cargo door operation, disconnect hydraulic hose from auxiliary system No 1 hydraulic pump at the quick-disconnect coupling and connect it to the stowage receptacle. (See figure 401.)

D Disconnect and plug hydraulic lines

E Disconnect electrical connector.

F Remove mounting bolts and remove valve.

3 Install Main Cargo Door Hydraulic Shutoff Valve

A Check that circuit breaker on external power shield J9 is open.

B If new valve is to be installed, remove unions from ports of old valve and install unions, with new O-rings, on ports of new valve. If old valve is to be installed, remove unions, install new O-rings and reinstall unions.

NOTE Lubricate O-rings with BMS 3-11 before installation.

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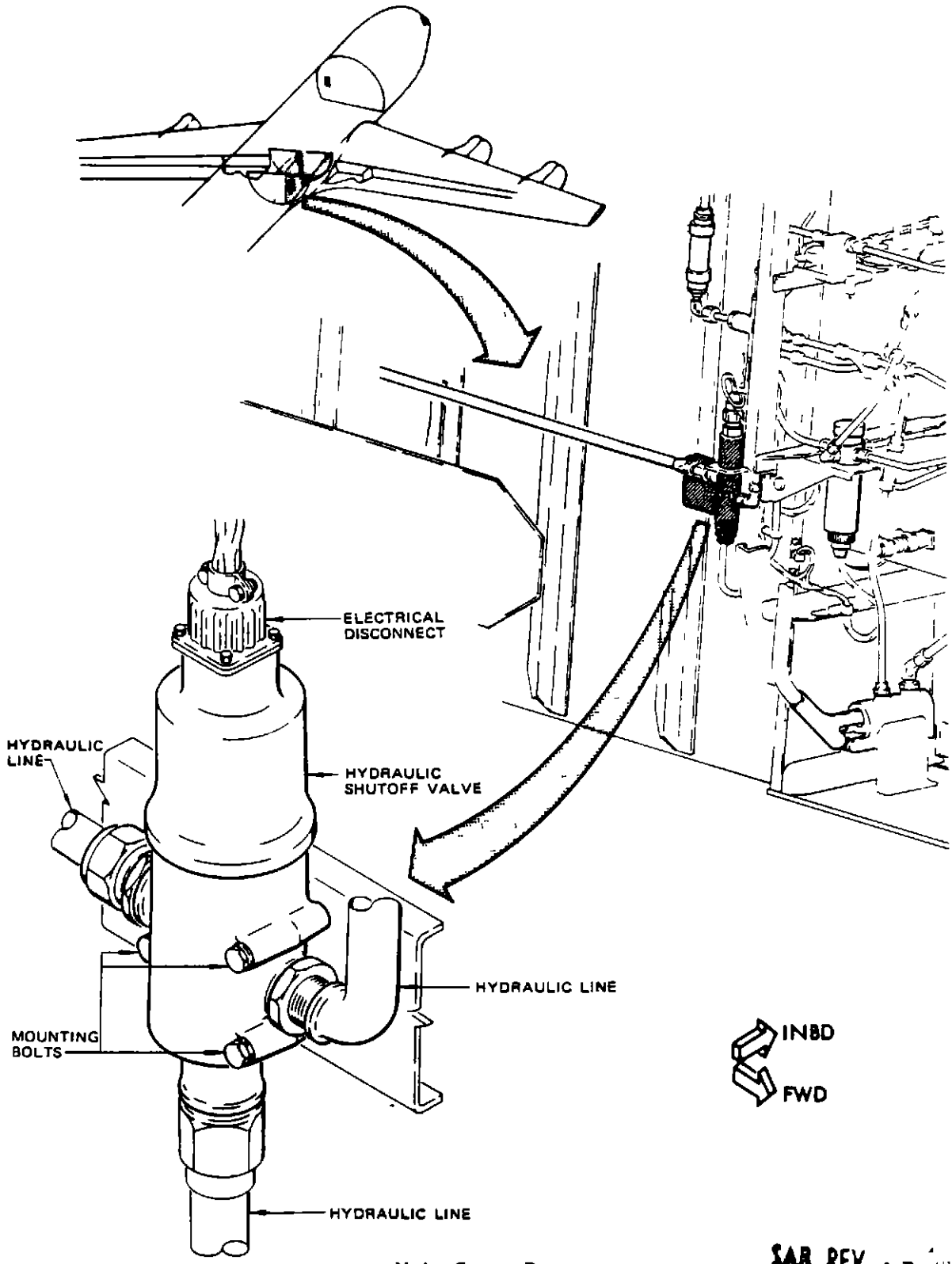


Main Cargo Door
Hydraulic Shutoff Valve Installation
Figure 401

SAB. REV. 17 JUL 1970

C Install valve by installing mounting bolts. (See figure 401.)

NOTE Bonding jumper is installed with aft mounting bolt. Aft mounting bolt, washer and bonding jumper must be clean to provide an electrical ground.

D Connect hydraulic lines to valve

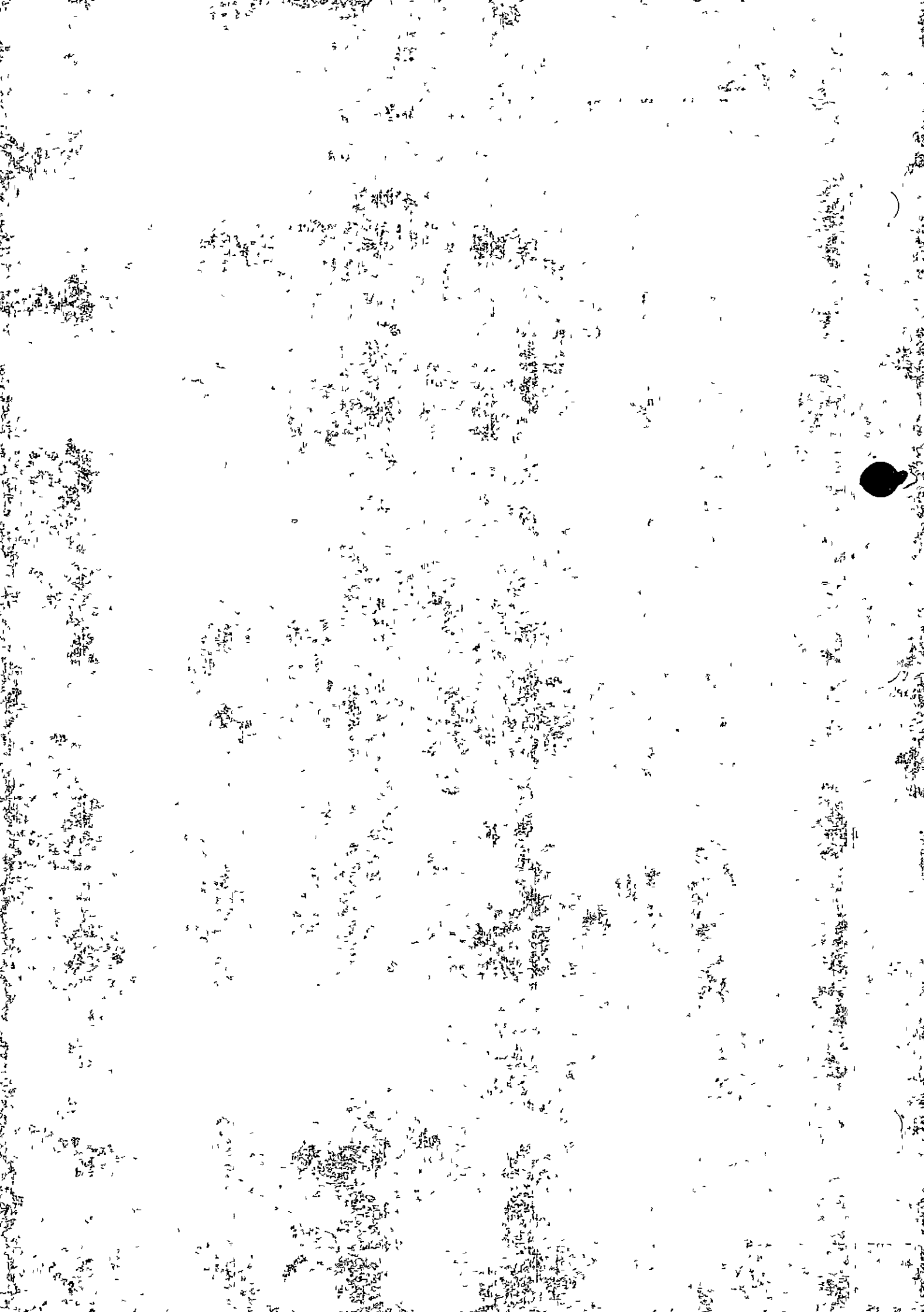
E Connect electrical connector.

F On airplanes using auxiliary hydraulic system for cargo door operation, connect hydraulic hose to quick-disconnect coupling (door activated position)

G Close circuit breaker on external power shield J9.

H Activate main cargo door control system.

I Operate the cargo door several times through opening and closing cycles to bleed the system. Check for hydraulic leaks and operation of shutoff valve.



MAIN CARGO DOOR ACTUATOR - REMOVAL AND INSTALLATION

EFFECTIVITY

AF	ALL CARGO AIRPLANES EXCEPT F-BLCC
DLH	ALL CARGO AIRPLANES EXCEPT D-ABUA AND D-ABUE
PAA	ALL CARGO AIRPLANES EXCEPT N765PA THRU N767PA N790PA THRU N799PA
AA	N7562A AND ON
CAL	N17325 AND ON
QANTAS	VH-EBT AND ON
FLT	N324F AND ON
SABENA	OO-SJK AND ON
NWA	N365US AND ON

1 General

A. A container will be necessary to catch fluid when disconnecting hydraulic lines. Should any fluid spill, decontaminate. Refer to Chapter 12, Cleaning and Washing.

B. Both main cargo door actuators are identical units, therefore, only one maintenance procedure is given.

2. Equipment and Materials

A. Grease, MIL-G-23827

3. Remove Main Cargo Door Actuator

A. Depressurize main cargo door hydraulic system.

B. Remove actuator cover panel.

C Remove drip pan from support rods.

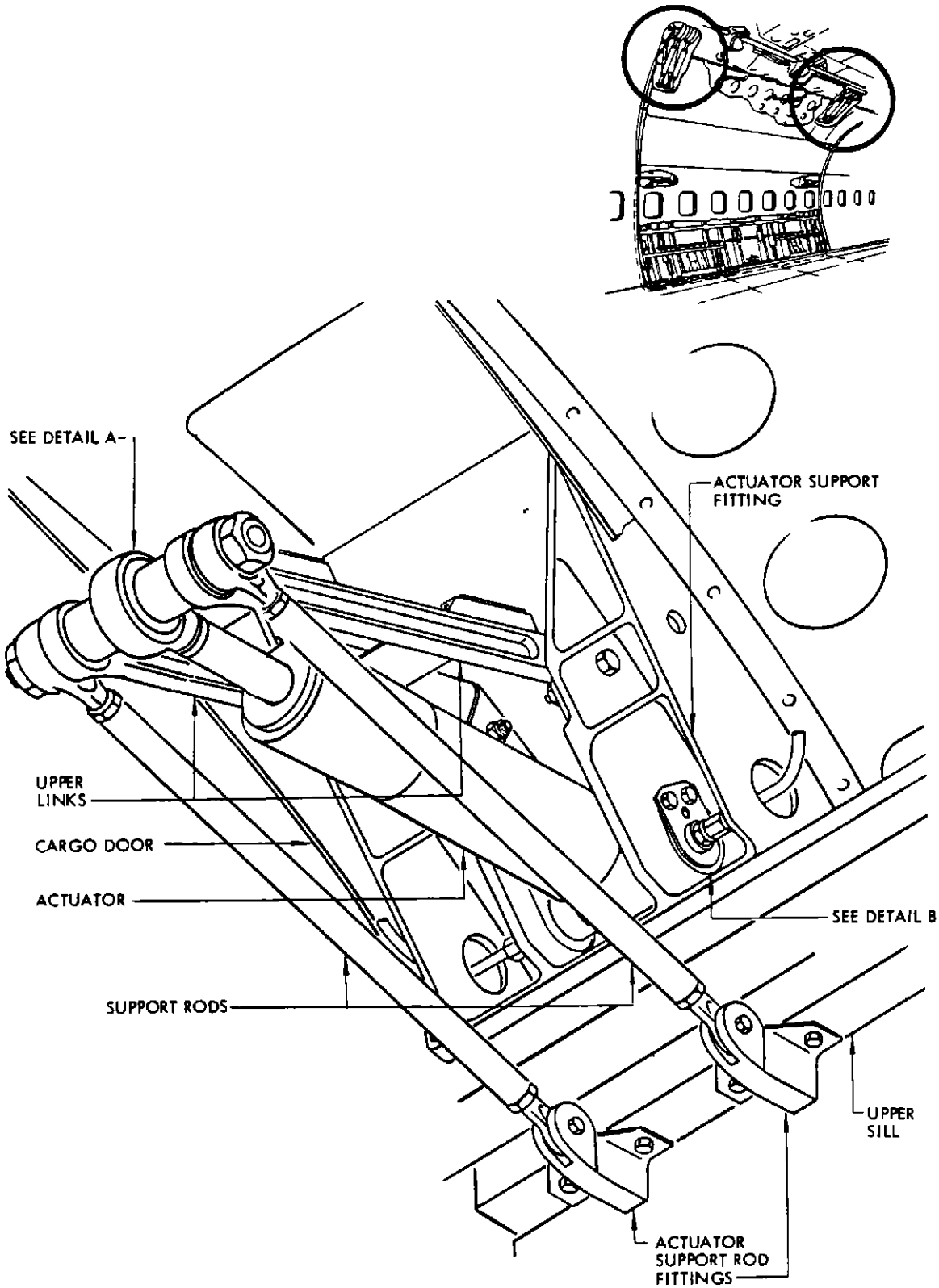
D. Disconnect hydraulic lines from actuator and remove unions (11, figure 401). Plug lines and ports.

E. Remove nuts (7) from shaft (1).

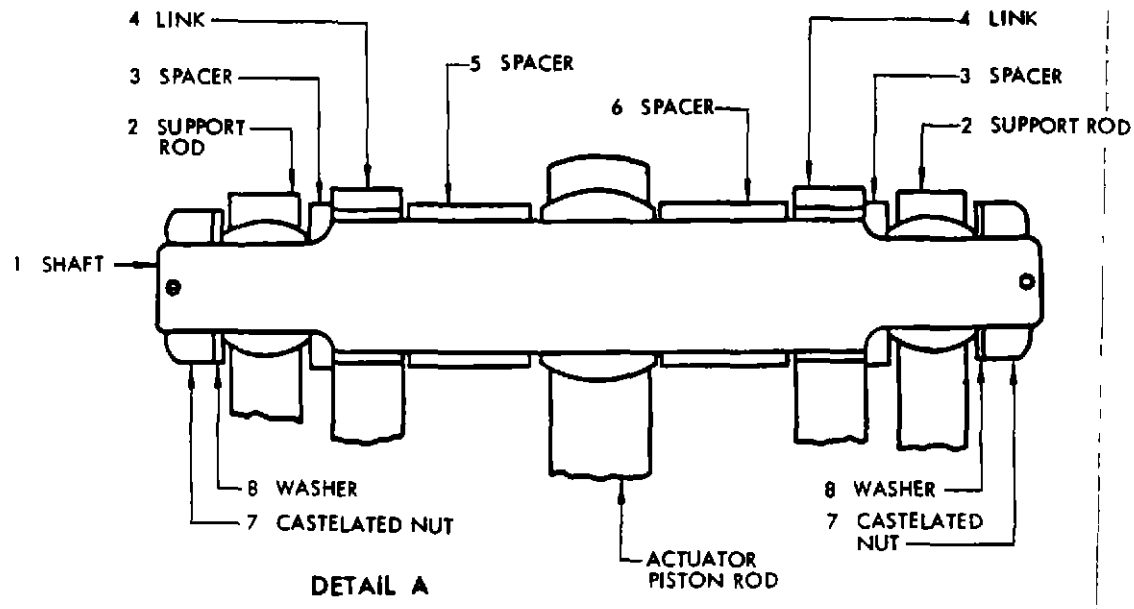
F. Slide shaft (1) in each direction until support rods (2) and links (4) are free. Identify removed spacers for reinstallation.

NOTE: Links should be secured in the up position to facilitate removal of the actuator.

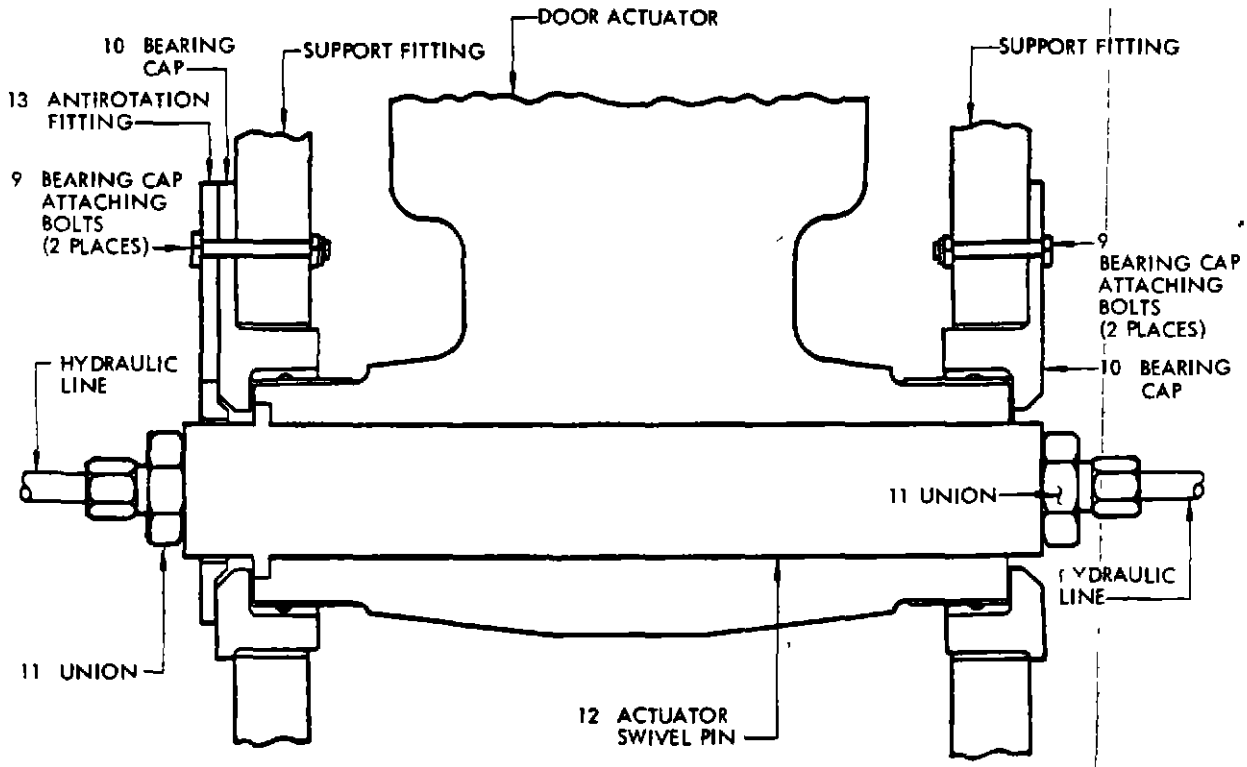
G. Rotate actuator away from door and remove shaft.



Main Cargo Door Actuator Mechanism
Figure 401 (Sheet 1)



DETAIL A



DETAIL B

Main Cargo Door Actuator Mechanism
Figure 401 (Sheet 2)

H. Remove bearings caps (10) and antirotation fitting (13) by removing bolts (9).

NOTE Support actuator when removing bearing caps to prevent damage to actuator and support fittings

I. Remove actuator from actuator support fittings.

CAUTION: CARE SHOULD BE TAKEN NOT TO DAMAGE BEARING SURFACES ON ACTUATOR TRUNNIONS WHEN MANEUVERING ACTUATOR FROM SUPPORT FITTINGS.

4. Install Main Cargo Door Actuator

A. Position actuator in support fittings with integral fluid line inboard. (See figure 401.)

CAUTION: IF ACTUATOR IS INSTALLED INCORRECTLY, THERE WILL BE INTERFERENCE WITH THE DOOR. CARE SHOULD BE TAKEN NOT TO DAMAGE TRUNNION BEARING SURFACES WHEN MANEUVERING ACTUATOR INTO SUPPORT FITTINGS.

B. Coat trunnion bearing surfaces with a thin film of grease.

C. Install bearing caps (10) over actuator trunnion

D. Install antirotation fitting (13) over flats of forward end of actuator swivel pin (12). Install bolts (9)

E. Coat shaft (1) and the inside of all bearings and spacers with a thin coat of grease.

F. Insert shaft (1) in rod end of actuator piston.

G. Install links (4), support rods (2), and spacers as shown in detail A.

NOTE: Install support rods with lube fittings inboard or lube fittings will be inaccessible.

H. Install washers (8) and castelated nuts (7) on shaft (1) Install nuts finger-tight, then tighten to next castelated slot and install cotter pins.

I. Install unions (11) and new O-rings in actuator swivel pin and torque 270 to 300 pound-inches. Connect hydraulic lines.

J. Rotate hook end of torsion spring on catch assembly (5) approximately 180° counterclockwise and hook spring on actuator piston.

K. Pressurize cargo door hydraulic system.

L. Operate cargo door several times through opening and closing cycle to bleed system. Check for hydraulic leaks and operation of actuator.

M Clamp drip pan to support rods.

N. Install actuator cover panel.

MAIN CARGO DOOR LINING - REMOVAL/INSTALLATION

EFFECTIVITY

All Passenger/Cargo Convertible Airplanes except OO-SJK

1. General

A Passenger seats adjacent to the main cargo door should be removed before attempting to dismantle door lining

B. It is important that all parts and fasteners removed can be identified for correct location when reinstalling

2 Equipment and Materials

A. Interior Trim Remover Assembly, F70033 or equivalent for removing snap-on trim without marring or tearing vinyl covering

B Wood Block (3/4 x 1 x 5 inches), to install snap-on trim

3 Remove Door Lining (Refer to figure 401)

A Remove decorative trim molding along top edge of cargo door window panel section.

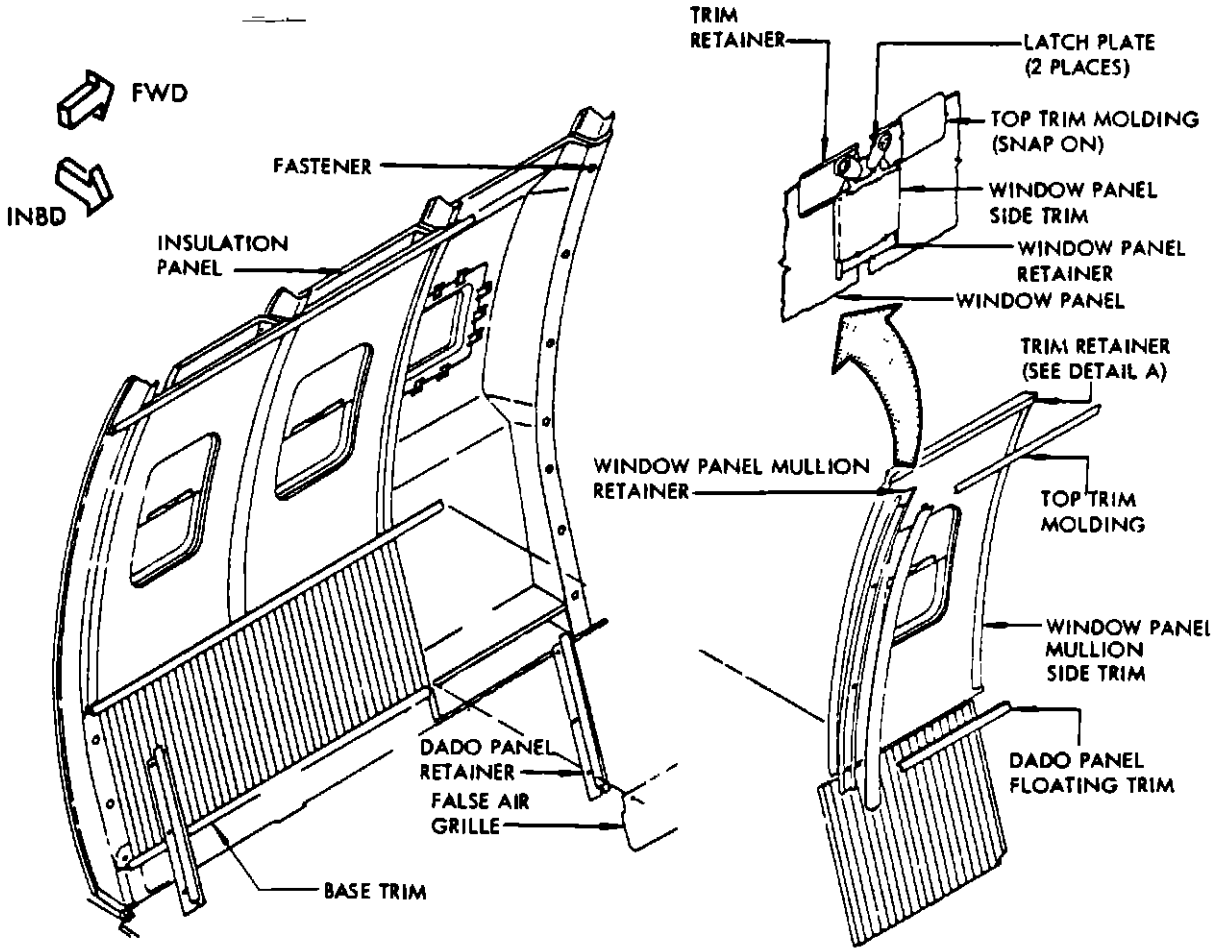
B Remove window panels and/or blank panels

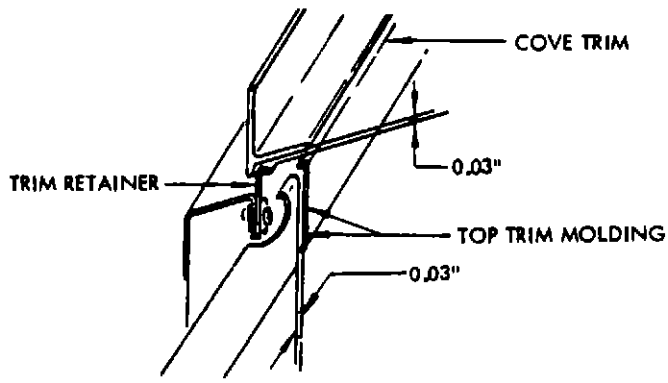
NOTE. These lining panels may be removed individually, leaving the others in place

(1) Release snap-on dado panel floating trim along bottom of window panels

NOTE. On airplanes OO-SJL and on, disconnect bonding strap between floating trim and structure.

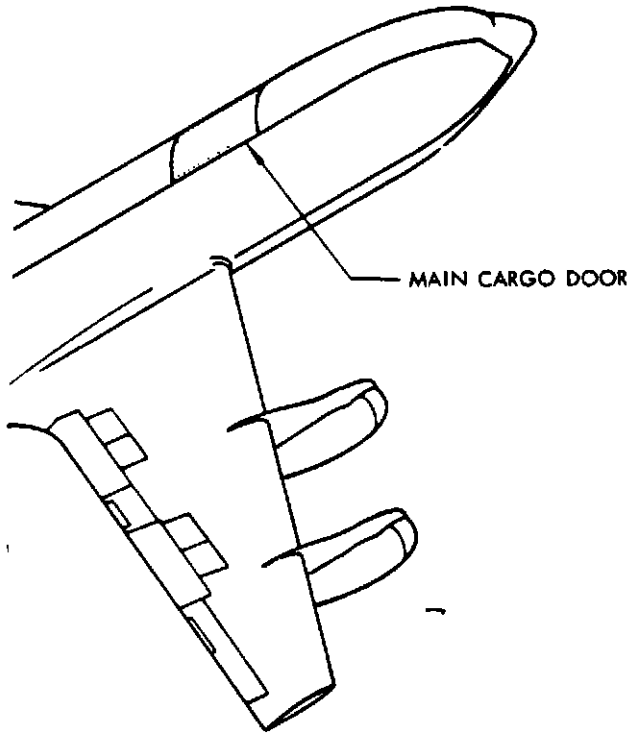
(2) Detach fasteners securing vertical mullion strips and mullion retainers along the intersections of panels and remove mullion

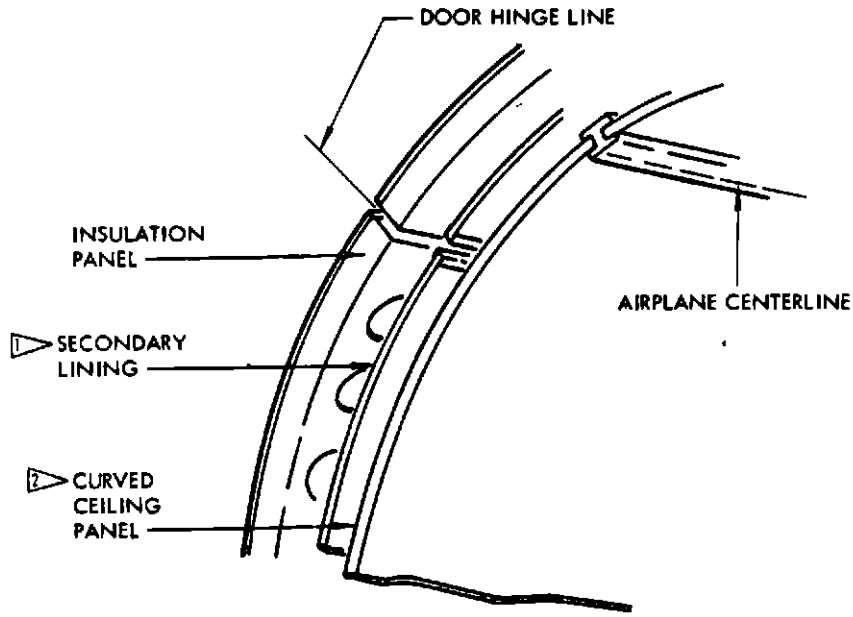




DETAIL A

Main Cargo Door Lining Installation
Figure 401 (Sheet 1)





1 EXPOSED WHEN CEILING PANEL REMOVED IN ANY CARGO CONFIGURATION

2 INSTALLED IN ALL-PASSENGER CONFIGURATION. EXTENDS ACROSS DOOR HINGE LINE

(3) Release panels along fore and aft edges of door.

(a) When airplane is in all-passenger configuration remove gap covers or fasteners through panels along door edges.

(b) When airplane is in any cargo configuration remove protector angles from along door edges.

(4) Lift panels to free bottom edge from dado panel floating trim strip, and remove panels.

C. When all panels in the window section have been removed, remove dado panel floating trim strip.

D. Remove dado panels.

(1) Remove all screws in air grille assembly along bottom edge of door.

(2) Remove protector angles along fore and aft edges of door or fasteners through panels along door edges.

(3) Lift panels upward and sideways to release them from air grille assembly and dado retainers.

(4) As dado panels are removed, remove dado retainers by releasing two quick-release studs in each.

E. Remove cargo door ceiling lining.

(1) Remove the curved ceiling lining panels in the cargo door area to reveal secondary ceiling lining panels on the cargo door. Refer to section 25-10-22, Ceiling Lining and Insulation.

(2) Remove secondary lining.

(a) Remove bolts attaching lower edge of panels and release upper edge of panels by removing screws in horizontal seal assembly strip along top of door.

(b) Remove protector plates and angles, cargo door electrical terminal box cover, and cargo door conduit access cover, depending upon which lining panels are to be removed.

(c) Release all remaining fasteners through panels and remove panels.

4. Install Door Lining (Refer to figure 401.)

A. Install cargo door ceiling lining.

(1) Install secondary lining as follows:

(a) Insert upper edge of secondary lining panels in seal assembly along top of door and install bolts attaching lower edges of panels.

(b) Install protector plates and angles, cargo door terminal box cover, and cargo door conduit access cover as required.

(c) Install fasteners through panels at remaining locations.

(2) Install curved interior ceiling lining panels in cargo door area. (Only in all-passenger configuration.) Refer to 25-10-22, Ceiling Lining and Insulation.

B. Install dado panels.

(1) Ensure that the air grille assembly is properly positioned along bottom edge of door.

(2) Position dado panel retainers and secure using two quick-release studs in each.

(3) Slide dado panel edges into retainer grooves and slide panels downward into air grille assembly groove.

(4) Secure dado panels along door edges by installing protector angles or fasteners through panels along door edges.

(5) Install screw fasteners in lip of air grille assembly along bottom edge of door.

C Place dado panel floating trim strip in position along top of dado panels

NOTE. On airplanes OO-SJL and on, connect bonding strap between floating trim and structure

D. Install window panels and/or blank panels

(1) Ensure that lining panels do not have on insulation blanket.

CAUTION: IF PANELS WITH INSULATION BLANKETS ARE INSTALLED, HEAT DAMAGE CAN RESULT DUE TO HEATER BLANKET BEING SANDWICHED BETWEEN TWO INSULATION BLANKETS.

(2) Set bottom edge of panels into dado panel floating trim and position panels to be secured

(3) Install vertical mullion strips and mullion retainers along intersections of panels.

(4) Secure panels along fore and aft door edges

(a) When airplane is in all-passenger configuration install fasteners or gap covers along door edges.

(b) When airplane is in any cargo configuration install protector angles along door edges.

(5) Engage snap-on dado panel floating trim along bottom of panels securing panels and mullion strips

E. Install decorative trim molding along top edge of window panel section.

MAIN CARGO DOOR HEATING BLANKET - REMOVAL/INSTALLATION

EFFECTIVITY

Doors with Seven Windows

1 Remove Main Cargo Door Heating Blanket

A Open MAIN CARGO DOOR HEATER circuit breaker on 115 volt ac bus N° 4 circuit breaker panel P4

B Disconnect and mark electrical wires in main cargo door heating blanket terminal box

C Remove main cargo door lining Refer to 52-11-171, or 52-11-172, Main Cargo Door Lining

D Attach a 14-foot cord to all wires at terminal box

E Remove main cargo door heating blanket, pulling wires and cord through conduit.

NOTE Cord is to be used as lead when installing new heating blanket

2 Install Main Cargo Door Heating Blanket

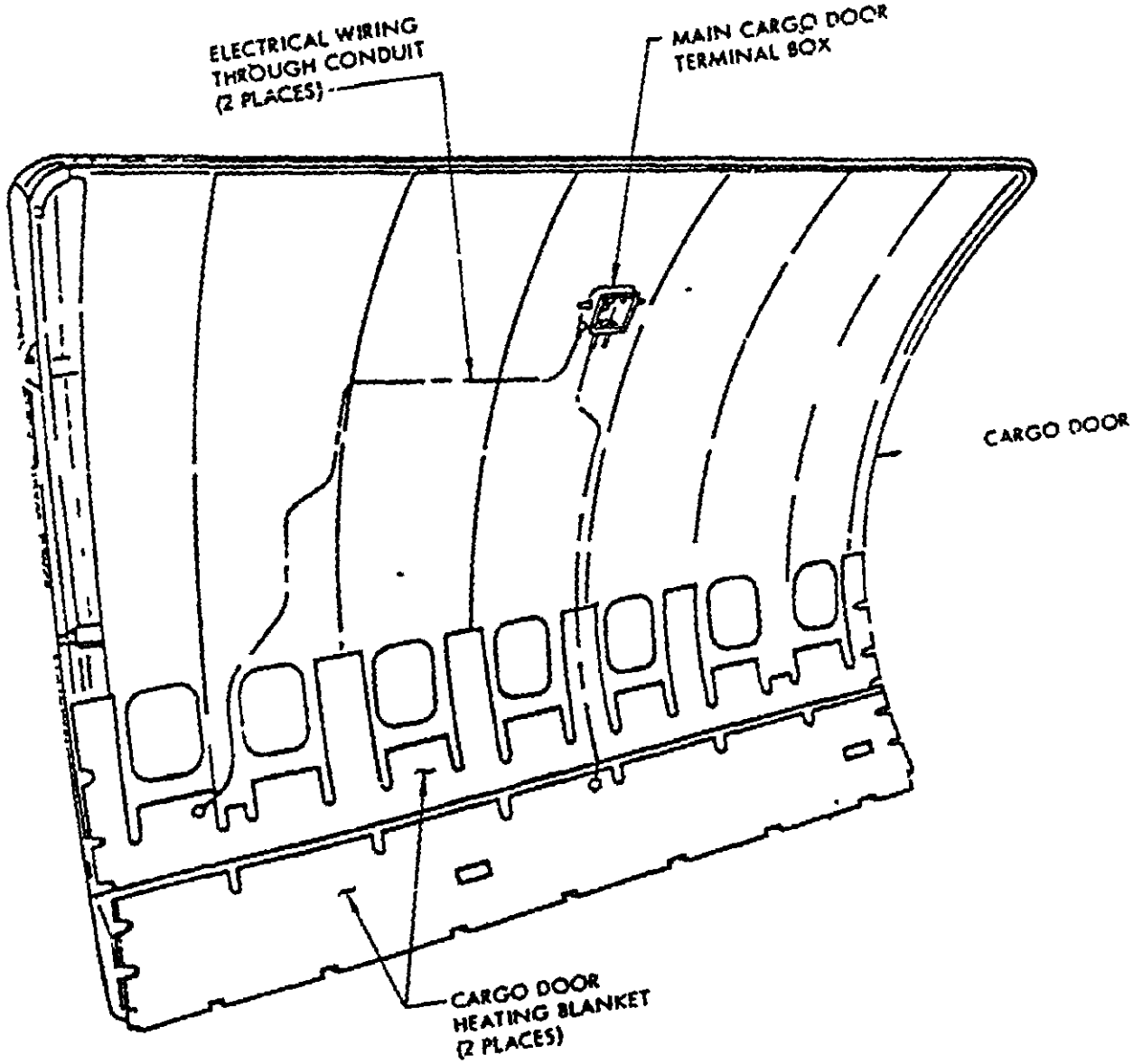
A Attach lead cord to main cargo door heating blanket wires

B Place heating blankets in position and pull wires through conduit with lead cord (See figure 401)

C Disconnect cord and connect wires to terminals

D Perform functional test of heating blankets as described in paragraph 5

E Install main cargo door lining Refer to 52-11-171, or 52-11-172, Main Cargo Door Lining



Main Cargo Door Heating Blanket Installation
Figure 401

MAIN CARGO DOOR INSULATION - REMOVAL/INSTALLATION

EFFECTIVITY

TCA	LX-N20198
	LX-N20199
RTCA	LX-N19997
	LX-N20000

1. General

A. To remove any part of the cargo door insulation all or part of the door lining and door heating blankets may require removal. Refer, as required, to sections 52-11-171, Main Cargo Door Lining - Removal/Installation, and to Chapter 21, Air Conditioning, for heating blanket removal/installation.

B. It is important that the location and inboard face of all insulation blankets removed can be identified correctly when reinstalling.

2 Remove Cargo Door Insulation (Refer to figure 401.)

A. Remove insulation from ceiling section of door.

(1) Remove cargo door ceiling lining panels

(2) Remove two large blanket sections forming inboard insulation layer by pulling them free of double-face tape along top edge.

(3) Remove outboard layer of insulation consisting of small blanket sections located between webs of cargo door frame. (These sections are packed between the webs and are not fastened by any other means. They may be removed without removing the inner skin by pulling them through holes in the inner skin.)

B. Remove insulation from window section of door.

(1) Remove window section lining panels and cargo door sidewall heating blankets.

(2) Remove vertical insulation strips covering door frame webs by pulling them free of the velcro tape.

(3) Remove insulation blankets surrounding windows, removing single face joining tape where required, and carefully freeing from soft rubber seal around window cutouts.

C. Remove insulation from dado panel section of door.

(1) Remove dado panels and cargo door sidewall heating blankets.

(2) Remove four large insulation blankets forming inboard insulation layer, by pulling free of double-face tape at their edges.

(3) Remove outboard layer of smaller insulation sections packed between webs of cargo door frame.

3. Install Cargo Door Insulation (Refer to figure 401.)

NOTE Ensure that each insulation blanket section is installed in correct location and with correct surface facing inboard.

A. Replace bonding tape as required to ensure satisfactory adhesive.

B. Install insulation in dado panel section of door.

(1) Install outboard layer of insulation blankets between webs of door frame.

(2) Install four large insulation blankets to form inboard insulation layer, ensuring that tape on edges holds fast.

(3) Install sidewall heating blankets and dado panel lining to completely secure insulation.

C. Install insulation in window section of door.

(1) Install insulation blankets surrounding windows. Create a good intersection with soft rubber seal around window cutouts and engage single-face joining tape where required.

(2) Secure vertical insulation strips to cover door frame webs, with double-face velcro tape.

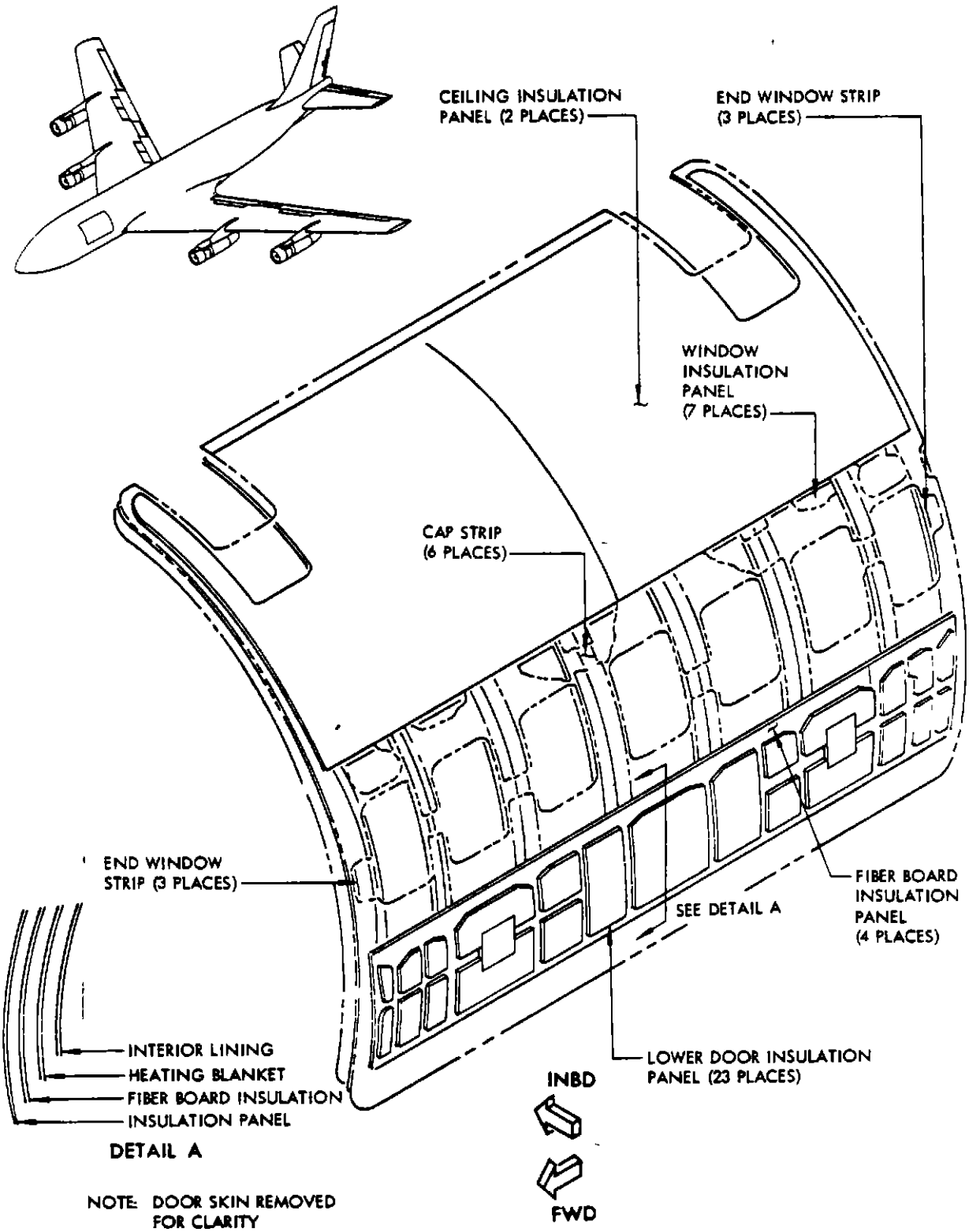
(3) Install window section sidewall heating blankets and lining to completely secure insulation.

D. Install insulation in ceiling section of cargo door.

(1) Pack outboard insulation blanket sections between webs of cargo door frame. (These sections require no fasteners or adhesive, and may be installed by pushing them through holes in the inner skin.)

(2) Set two large inboard blanket sections in position and secure top edges to door frame with double-face tape.

(3) Install ceiling section lining panels to completely secure insulation.



Main Cargo Door Insulation Panels Installation
Figure 401

MAIN CARGO DOOR PRESSURE SEAL - REMOVAL/INSTALLATION

EFFECTIVITY

Cargo Airplanes

1. Equipment and Materials

   A. Small flat plate, approx. 0.091 x 2 x 4 inches, with blunt end used to insert pressure seal into channel.

2. Remove Main Cargo Pressure Seal

   A. Open main cargo door to canopy position.

   B. Apply pressure in either direction from the centerline of the pressure seal. The seal will disengage itself from the mounting channel. (See figure 401.)

   C. Let pressure seal hang loose on main cargo door actuator linkage.

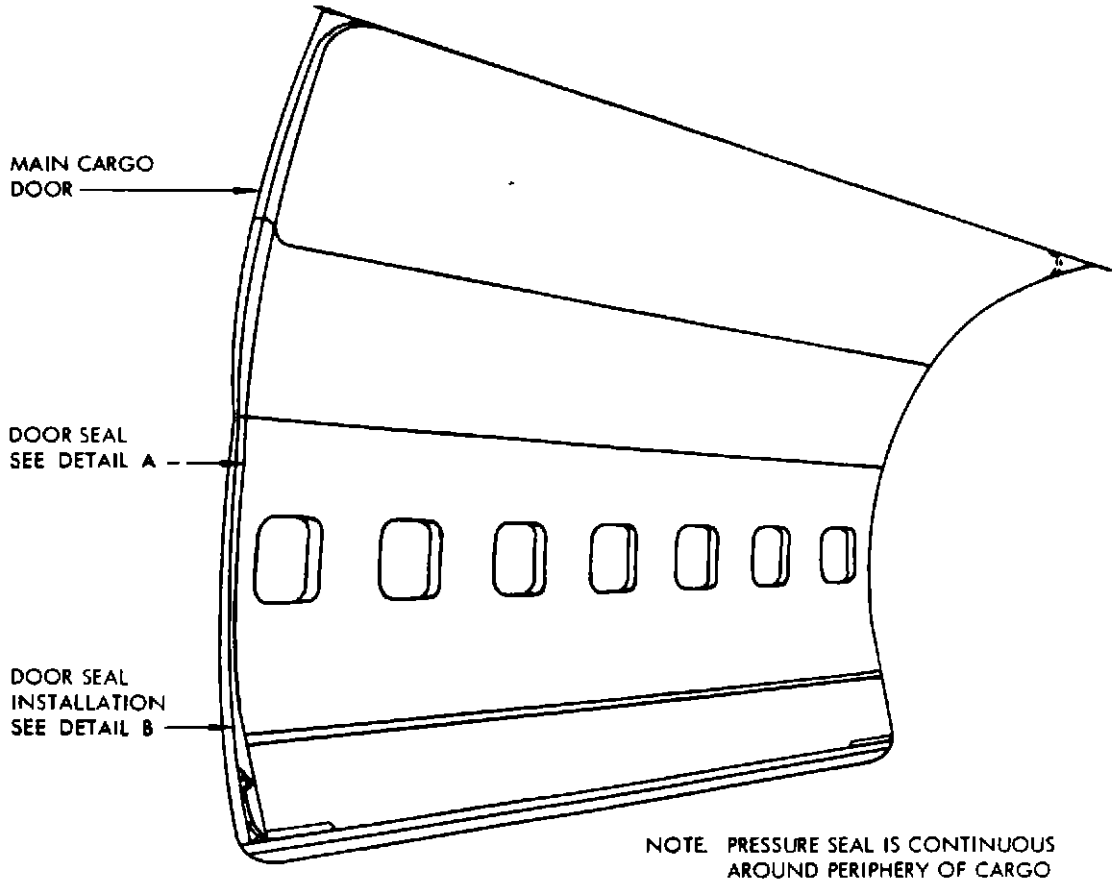
   D. Close main cargo door.

      NOTE: Guide pressure seal to keep from binding in actuator linkage.

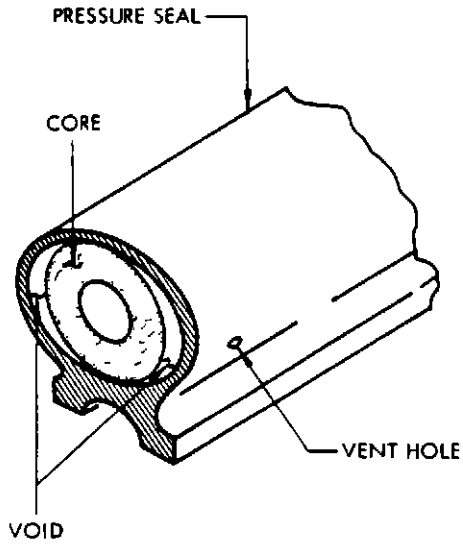
   E Tag main cargo door control panel to prevent operating cargo door.

   F. Disconnect actuator linkage and remove seal.

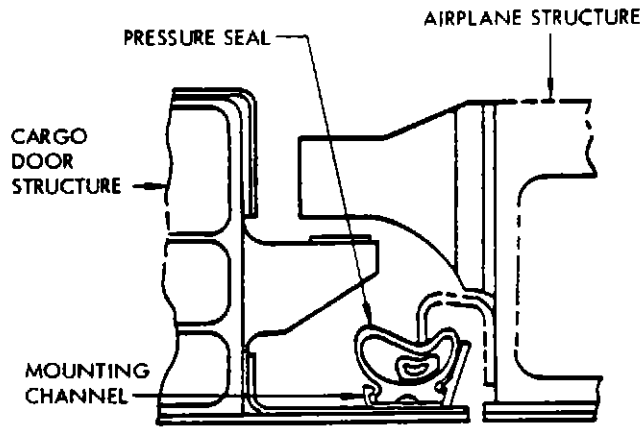
      CAUTION: DO NOT OPERATE MAIN CARGO DOOR WITH LINKS REMOVED FROM DOOR FRAME.



NOTE PRESSURE SEAL IS CONTINUOUS AROUND PERIPHERY OF CARGO DOOR



DETAIL A



PRESSURE SEAL SHOWN WITH DOOR IN CLOSED POSITION

DETAIL B

Main Cargo Door Pressure Seal Installation
Figure 401

3. Install Main Cargo Door Pressure Seal (See figure 401.)

A. Place pressure seal behind the detached main cargo door actuator lower links.

B. Install main cargo door lower actuator linkage.

C. Open main cargo door to canopy position.

NOTE: Guide pressure seal to prevent binding in actuator linkage.

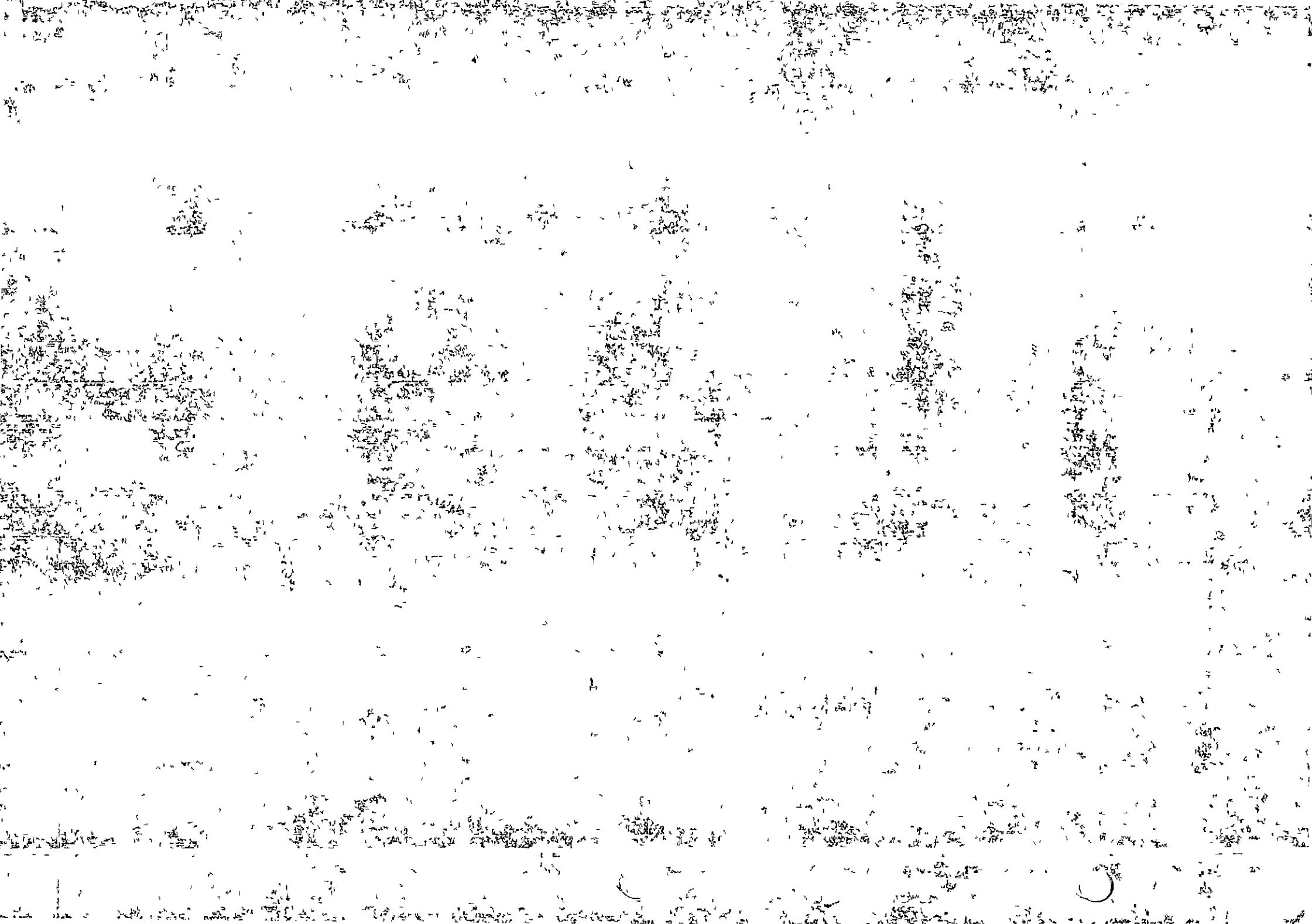
D. Start at any corner and press one side of seal into channel with hand pressure and the opposite side of seal into channel with flat plate.

E. Work seal into channel in continuous direction back to point of starting.

NOTE: Eliminate all wrinkles as seal is worked in.

F. On airplanes not having pressure seals with molded corners, if wrinkles develop in upper corners which cannot be worked out, check door under pressure or chalk seal depressor and check for full contact along seal when door is closed. If there is no air leak or full contact is achieved, seal is satisfactory. If there is a leak or full depressor contact is not obtained, refer to 52-11-201, Main Cargo Door Pressure Seal - Approved Repairs.

G. Remove tag from main cargo door control panel.



MAIN CARGO DOOR PRESSURE SEAL - APPROVED REPAIRS

EFFECTIVITY

Cargo Airplanes

1. General

   A. This procedure is limited to pressure seals that do not have molded corners. Repair of the seal consists of removing wrinkles from the upper corners that allow air leaks when the cabin is pressurized.

2. Equipment and Materials

   A. Dow Corning 30-121

   B. Mylar Film or Equivalent

   C. Masking Tape

   D. D15199 Dacron Fabric

3. Repair Pressure Seal (See figure 801.)

   A. Sandpaper seal in area to be sealed to obtain a base for good adhesion.

   B. Mask area to be sealed to obtain straight edges of sealant.

   C. Apply Dow Corning 30-121 sealant to seal.

   D. Wrap strip of mylar film loosely around seal. With a light stroking motion, slide film over sealant in one pass to obtain a smooth surface. Repeat with clean film if necessary.

   E. Remove masking tape from each end of sealed area and touch up sealant to obtain a gradual transition at each end of sealant.

      NOTE: Sides of sealant may have a step-off where tape has been removed. The final result should be a solid area of smooth white sealant covering ridges of all wrinkles in the seal.

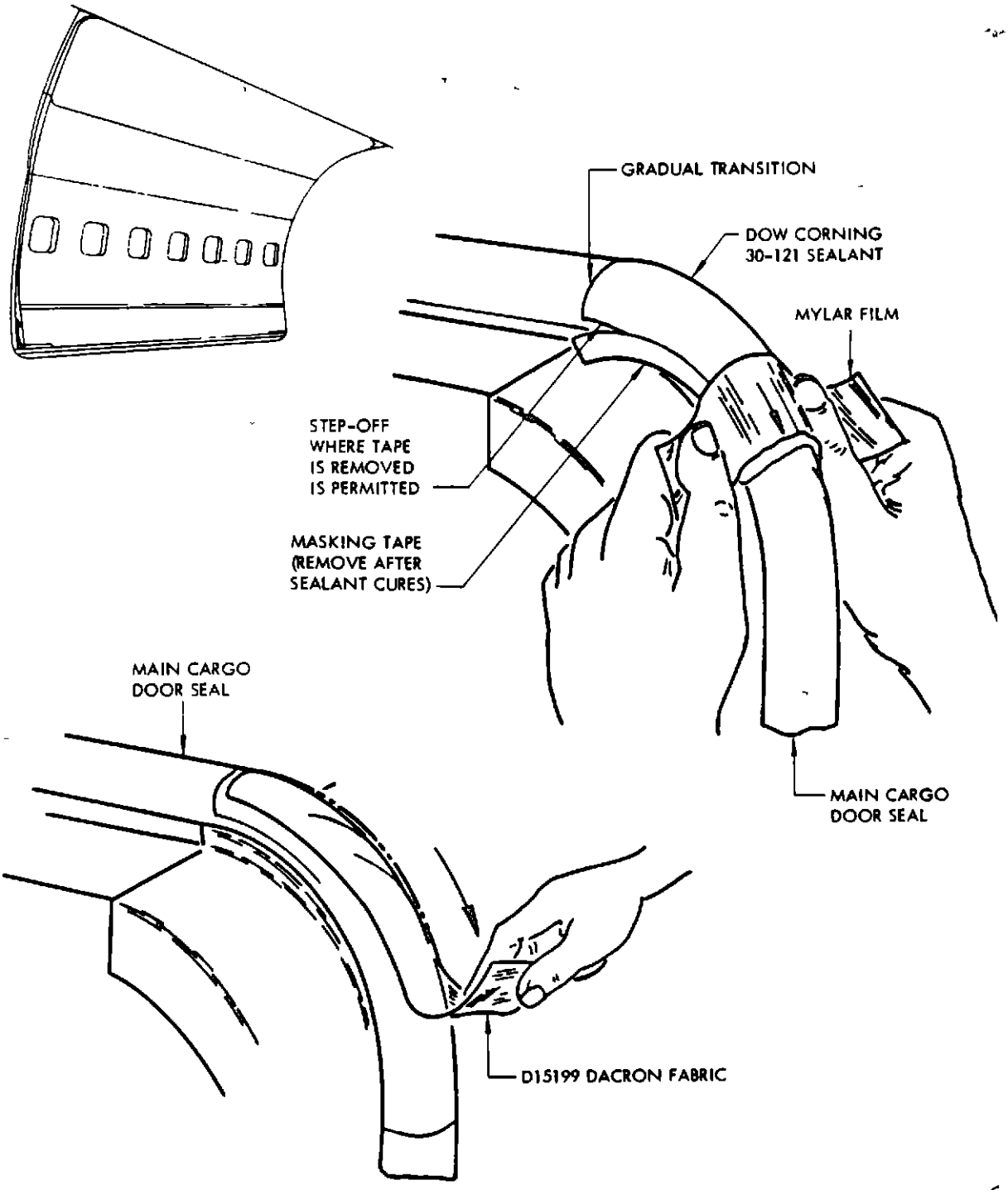
   F. Allow sealant to cure a minimum of 8 hours.

   G. Remove remaining masking tape from sealed area.

   H. Cut a strip of 1-1/2 inch wide D15199 Dacron fabric to length of sealed area.

I. Apply Dow Corning 30-121 sealant to fabric strip. Apply strip to sealed area, taking care that edges of fabric are down firmly. Remove excess sealant immediately.

J. Allow repaired area to cure a minimum of 24 hours before closing main cargo door.



Main Cargo Door Pressure Seal Repair
Figure 801

UNIVERSAL AERIAL REFUELING RECEPTACLE SLIPWAY INSTALLATION
DOORS - DESCRIPTION AND OPERATION

For Universal Aerial Refueling Receptacle Slipway Installation - Doors - Description and Operation, refer to chapter 28-10-01, pages 1 and on

UNIVERSAL AERIAL REFUELING RECEPTACLE SLIPWAY INSTALLATION
DOORS - REMOVAL/INSTALLATION

For Universal Aerial Refueling Receptacle Slipway Installation - Doors - Removal/Installation, refer to chapter 28-10-01, pages 401 and on