

# REVISION LIST

## CHAPTER 3: WING SYSTEMS

The following list of revisions will allow you to update the Legacy construction manual chapter listed above.

Under the “Action” column, “R&R” directs you to remove and replace the pages affected by the revision. “Add” directs you to insert the pages shows and “R” to remove the pages.

<u>PAGE(S) AFFECTED</u>	<u>REVISION # &amp; DATE</u>	<u>ACTION</u>	<u>DESCRIPTION</u>
3-1	0/02-15-02	None	Current Revision is Correct
3-2	1/09-18-02	R&R	Part number Correction
3-3	1/09-18-02	R&R	Text Correction
3-4 through 3-6	0/02-15-02	None	Current Revision is Correct
3-7	1/09-18-02	R&R	Text and part # correction Cleaned up Graphic
3-8 through 3-11	0/02-15-02	None	Current Revision is Correct
3-12	1/09-18-02	R&R	Part # Correction
3-13	0/02-15-02	None	Current Revision is Correct
3-14	1/09-18-02	R&R	Corrected Fig. 3:F:1
3-15 through 3-25	0/02-15-02	None	Current Revision is Correct
3-26	1/09-18-02	R&R	Text Correction
3-27	1/09-18-02	R&R	Text Correction
3-28 through 3-30	0/02-15-02	None	Current Revision is Correct
3-31 through 3-34	0/02-15-02	None	Current Revision is Correct
3-3	2/06-30-04	R&R	Part number updates.
3-6	2/06-30-04	R&R	New instructions for drilling holes.
3-16	2/06-30-04	R&R	Changed part number.
3-17	2/06-30-04	R&R	Updated graphic, added photo, added instructions.
3-22	2/06-30-04	R&R	Updated instructions.
3-23	2/06-30-04	R&R	Moved fuel pump behind co-pilot seat and adjusted all hydraulic lines accordingly. Added photo.
3-25	2/06-30-04	R&R	Updated hydraulic line support.
3-26	2/06-30-04	R&R	Updated hydraulic lines transition holes. Added photo.
3-27	2/06-30-04	R&R	Corrected location of hole. Added photo.
3-28	2/06-30-04	R&R	Corrected size and location of transition hole. Added photo.

<u>PAGE(S) AFFECTED</u>	<u>REVISION # &amp; DATE</u>	<u>ACTION</u>	<u>DESCRIPTION</u>
3-1	3/12-15-04	R&R	New table of contents with page numbers and part nbr. update.
3-2 through 3-3	3/12-15-04	R&R	Part number updates.
3-5	3/12-15-04	R&R	Part number update.
3-8	3/12-15-04	R&R	Gear door fitting update.
3-12	3/12-15-04	R&R	New inboard gear door hardware.
3-13	3/12-15-04	R&R	New inboard gear and instructions.
3-13b	3/12-15-04	Add	New page (to allow for new instructions on 3-13) with part nbr. update.
3-16	3/12-15-04	R&R	Added new parts.
3-19	3/12-15-04	R&R	Added dimension.
3-23	3/12-15-04	R&R	Added photo showing hydraulic lines crossing main spar.
3-24	3/12-15-04	R&R	Updated hydraulic lines for fuel pump move.
3-25	3/12-15-04	R&R	Added photo and updated dimensions for hydraulic support.
3-27	3/12-15-04	R&R	Updated measurement and carbon layup requirements.
3-29	3/12-15-04	R&R	Updated fuel line openings through bulkhead.
3-35 through 3-37	3/12-15-04	ADD	Add pages.
3-28	4/09-30-06	R&R	Changed hole dia. for seat belt attachment and clarified location.
3-2, 3-15, 3-16	6/08-10-07	R&R	Part changed.
3-3, 3-16, 3-31	6/08-10-07	R&R	Part numbers changed.
3-3, 3-14, 3-16, 3-18, 3-23	7/09-10-08	R&R	Added optional landing lights, part number changes to sequence valve, updated main gear hydraulic cylinder.
3-3, 3-20, 3-21	8/09-01-14	R&R	Added and revised part numbers for Grove wheels and brakes.

## Chapter 3: Wing Systems

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**Note:**  
**Optional Parts available through :**  
 (\*) Lancair Avionics  
 (\*\*) Kit Components, Inc.

## 1. INTRODUCTION

In this chapter various systems are installed in the center wing section. A couple of sturdy padded sawhorses should be used to support the center wing section. Note that after installing some items, such as the gear doors, pitot tube, fuel pump, etc, etc you will remove and store for final assembly.

**WARNING: Fuel and Hydraulic lines must be kept clean and free from dust. Cover ends.**

## 2. PARTS LIST

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM (not included with kit)
<b>PITOT TUBE</b>				
1)	4270	1	Pitot Tube Mounting Flange	
2)	AN5812-12-A	1	Pitot Tube (12 Volt D.C.)	**Yes
3)	44-P	10 ft.	Line	
4)	MS35338-41	4	Lock Washers (included w/ Pitot tube)	
5)	MS24694-S4	4	Machine Screw (Structural)	
6)	MS35207-226	4	Mounting Screws (included w/ Pitot tube)	
7)	266N-04x04	1	Plastic Fitting	
8)	6505-4x4	1	Steel Fitting	
9)	CB9151V5	3	Tie Downs, Click Bond	
<b>MARKER BEACON ANTENNA</b>				
1)	CI 102	1	Marker Beacon Antenna	*Yes
2)	AN3-3A	4	Bolts, Undrilled head	
3)	AN960-10	4	Washers, Flat	
<b>COMMUNICATION ANTENNA</b>				
1)	CI 122C	1	Communications Antenna	*Yes
2)	MS24694-S5	4	Machine Screws (Structural)	
3)	K1000-08	4	Anchor Nuts	
4)	MSC-34	8	Pop Rivets (Flush Head)	
<b>SPARCLOSEOUT</b>				
1)	4214	1	Forward Spar Closeout	



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WING SYSTEMS			

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM <i>(not included with kit)</i>
<b>MAIN GEAR DOORS</b>				
Inboard Gear Doors (for both sides)				
1)	4264-01	1	Inbd Gear Door, Left	
2)	4264-02	1	Inbd Gear Door, Right	
3)	4755	1	<u>Assembly for Inboard Main Gear Door Hydraulic (Optional)</u>	
	4714-01	1	Bracket, Inboard Gear Door, Left	
	4714-02	1	Bracket, Inboard Gear Door, Right	
	4726-01B	1	Bracket, Outboard Gear Door, Left	
	4726-02B	1	Bracket, Outboard Gear Door, Right	
	4787	2	Hydraulic Cylinder Actuator	
	13373	2	Hydraulic Cylinder Spring	
	4766	2	Hydraulic Cylinder Rod	
	4732	2	Bracket, Doubler Inboard Gear	
	4767	2	Spacer	
	4768	2	Spacer	
	F34-14	2	Bearing Rod End, Female	
	F34-15	2	Bearing Rod End, Female	
	4769	2	Spring Retainer	
	AN316-4	2	Check nut	
	AN3-20	2	Bolt	
	AN3-22	2	Bolt	
	MS24665-132	4	Cotter Pin	
	AN310-3	4	Nut, Castle	
	MS24694-S54	8	Screw, Machine	
	AN3-5A	2	Bolt	
	AN3-7A	2	Bolt	
	AN3-10A	2	Bolt	
	AN365-1032A	12	Nut, Nylock	
	AN960-10	22	Washer, Flat	
4)	4728	2	Hinge, Piano (Inboard Gear Door) 10"	
5)	AN3-5A	14	Bolt, Undrilled	
6)	MS24694-S5	26	Machine Screws (Structural)	
7)	AN365-832A	26	Nut, Lock (Metal)	
8)	K1000-3	14	Nut Plates	
9)	MSC-34	28	Pop Rivets, Flush Head	
10)	AN960-08L	28	Washer, Flat	
11)	AN960-10	14	Washer, Flat	
Outboard Gear Door (for both sides)				
1)	4265-01	1	Outboard Gear Door, Left	

**Note:**

**Optional Parts available through :**

**(\*) Lancair Avionics**


**(\*\*) Kit Components, Inc.**

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM <i>(not included with kit)</i>
2)	4265-02	1	Outboard Gear Door, Right	
3)	4725	4	Bracket, Outboard Gear Door	
4)	4727-01	2	Attachment, Outboard Gear Door	
5)	4727-02	4	Receptacle	
6)	BJ-02	8	Ball Joint Assembly	
7)	AN315-3	8	Nut, Check	
8)	AN364-428	4	Nut, Nylock	
9)	AN365-1032A	12	Nut, Nylock	
10)	PH-125-3x3	2	Phenolic Blocks	
11)	GM321	4	Rod, Threaded	
12)	MS24694-S56	12	Screws, Machine (Structural)	
13)	AN960-10	12	Washer, Flat	
14)	AN960-4L	8	Washer, Flat	
<b>MAIN GEAR INSTALLATION</b>				
Main Landing Gear (for both sides)				
1)	4702-01	1	Main Landing Gear (Left)	
2)	4702-02	1	Main Landing Gear (Right)	
3)	4707-01	8	.03" Shim	
4)	4707-02	8	.06" Shim	
5)	4710	2	Axle, Main Gear	
6)	4711	4	Spacer, Axle	
7)	AN4-17A	8	Bolt, Undrilled Shank	
8)	AN5-14A	8	Bolt, Undrilled	
9)	AN5-22A	2	Bolt, Undrilled	
10)	MS24665-292	2	Cotter Pin	
11)	MS21025-20	2	Nut, Axle	
12)	AN365-428A	8	Nuts, Nylock	
13)	AN365-524A	10	Nut, Nylock	
14)	075-00800	2	Torque Plate	
15)	AN960-516	10	Washer, Flat	
16)	AN960-416	8	Washers, Flat	
Over Center Link Attachment (for both sides)				
1)	4705	4	Over Centerlink Attachment	
2)	4706	2	Over Centerlink Reinforcement Plate	
3)	4513	4	Over Center Link Backing Plate	
4)	AN4-15A+4A	8	Bolts, Undrilled	
5)	AN365-428A	8	Nut, Nylock	
6)	AN960-416L	8	Washer, Flat	
Over Center Link (for both sides)				
1)	4709-01	4	Shim 0.032"	



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WING SYSTEMS		

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM	#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM
Over Center Link continued (for both sides)					CENTER WING SECTION HYDRAULICS				
<i>(not included with kit)</i>					<i>(not included with kit)</i>				
2)	4709-02	8	Shim 0.063"		1)	AN3-13A	6	Bolt, Undrilled	
3)	4712-407	2	Hydraulic Cylinder (Main Gear)		2)	AN3-10A	6	Bolt, Undrilled	
4)	4718	1	Left Over Center Link		3)	MS219-DG4	6	Clamp	
5)	4720	1	Right Over Center Link		4)	MS219-DG7	6	Clamp	
6)	4721	4	Over Center Link Arms		5)	AN804-4D	2	Fittings, Tee	
7)	4722	4	Bushing		6)	AN818-4D	38	Fittings, Nut	
8)	4723	2	Spacer		7)	AN819-4D	38	Fittings, Sleeve	
9)	4763	2	Main Gear Up Stop		8)	AN822-4D	6	Fittings, Elbow	
10)	JM-1	2	Actuator Arm for Micro Switch		9)	AN825-4D	2	Fittings, Tee	
11)	F45-19	2	Bearings, Rod End		10)	AN827-4D	2	Fitting, Cross	
12)	AN3-16A	4	Bolt, Undrilled		11)	AN832-4D	6	Fittings, Union	
13)	AN4-44A	2	Bolt, Undrilled		12)	AN833-4D	6	Fittings, Elbow	
14)	AN4-12A	2	Bolt, Undrilled		13)	AN837-4D	7	Fittings, Elbow	
15)	AN4-7A	2	Bolt, Undrilled		14)	AN924-4D	15	Fittings, Nut	
16)	AN5-41A	2	Bolt, Undrilled		15)	BG03-4NJ	20	Hose Fittings	
17)	AN5-20A	4	Bolt, Undrilled		16)	R703	130 in.	Flexible Hydraulic Line	
18)	110-0036 6381K103	4	Bushing		17)	AN365-1032A	12	Nut, Nylock	
19)	AN5-7	2	Bolt, Drilled		18)	PH-250	1	(1/4" x 3.5" x 1.5") Phenolic Block	
20)	MS24665-140	4	Cotter Pin		19)	PH-250	2	(1/4" x 3" x 3") Phenolic Block	
21)	198-0004 9416K77	2	Clip, Safety		20)	5052	240 in.	1/4" Tubing, Aluminum	
22)	198-0003 9416K71	2	End Fitting, Metal Ball Socket		21)	AN960-10	12	Washer, Flat	
23)	198-0005 9416K84	2	End Fitting, Metal Eyelet		<b>LANDING/TAXI LIGHTS</b>				
24)	AN816-4D	4	Fittings, Nipple		1)	4228	1	Landing/Taxi Light Mount	**Yes
25)	160-0004 9416K24	2	Gas Strut		2)	4531	1	Landing/Taxi Light Lens	**Yes
26)	1XE1-T	2	Main Gear Micro-switch		3)	4532	1	Gasket	**Yes
27)	AN310-5	2	Nut, Castle		4)	MS35649-262	6	Nut, Check	**Yes
28)	AN316-5	2	Nut, Check		5)	MS24694-S52	8	Screw, Machine	**Yes
29)	AN365-524A	6	Nut, Nylock		6)	101-0127 91772A157	6	Screw, Machine	
30)	AN365-428A	6	Nut, Nylock		7)	MS21069-06	6	Nut Plate	
31)	AN365-1032A	4	Nut, Nylock		8)	K1000-08	8	Nut Plate	
32)	HC-05-A 4786	2	Sequence Valve		9)	01-0770346-02	1	Landing Light	**Yes
33)	198-0006 9512K73	2	Stud, Ball		10)	01-0770346-04	1	Taxi Light	**Yes
34)	AN960-516	16	Washer, Flat		11)	3614	6	Spring	**Yes
35)	AN960-416	12	Washer, Flat		12)	AN960-6	6	Washer	**Yes
36)	AN960-10	8	Washer, Flat		13)	800-0001	1 (pair)	Main gear landing lights (12 volt)	
37)	110-0002B	4	Bearing, Thrust, over-center link		14)	800-0002	1 (pair)	Main gear landing lights (24 volt)	
38)	112-0034	4	Bushing for new actuator w/bearing & old over-center link w/AN5 bolt hole		<b>SPEED BRAKES</b>				
	or 112-0050	4	Bushing for new actuator w/bearing & new over-center link w/AN3 bolt hole		1)	4530	2	Cover Plates (only used when	**Yes
<b>MAIN GEAR WHEELS &amp; TIRES</b>					2)	4934-12	2	Precise Flight Speed Brakes, 12 Volt	**Yes
1)	AN4-23A	6	Bolt, Undrilled		3)	4934-24	2	Precise Flight Speed Brakes, 24 Volt	**Yes
2)	TU-5.00-5	2	Inner Tube 5"		4)	MS24694-S5	28	Screws, Machine (Structural)	
3)	57-1M 40-151	2	Main Wheel Assembly		 <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">3-3</div> <div style="border: 1px solid black; padding: 2px;">Chapter 3</div> <div style="border: 1px solid black; padding: 2px;">REV. 8/09-01-14</div> </div> <div style="border: 1px solid black; padding: 2px; text-align: center; width: 100%;">WING SYSTEMS</div>				
4)	AN365-428A	6	Nut, Nylock						
5)	TR-GY 5.00-5	2	Tire, Main Gear						
6)	AN960-416	12	Washers, Flat						



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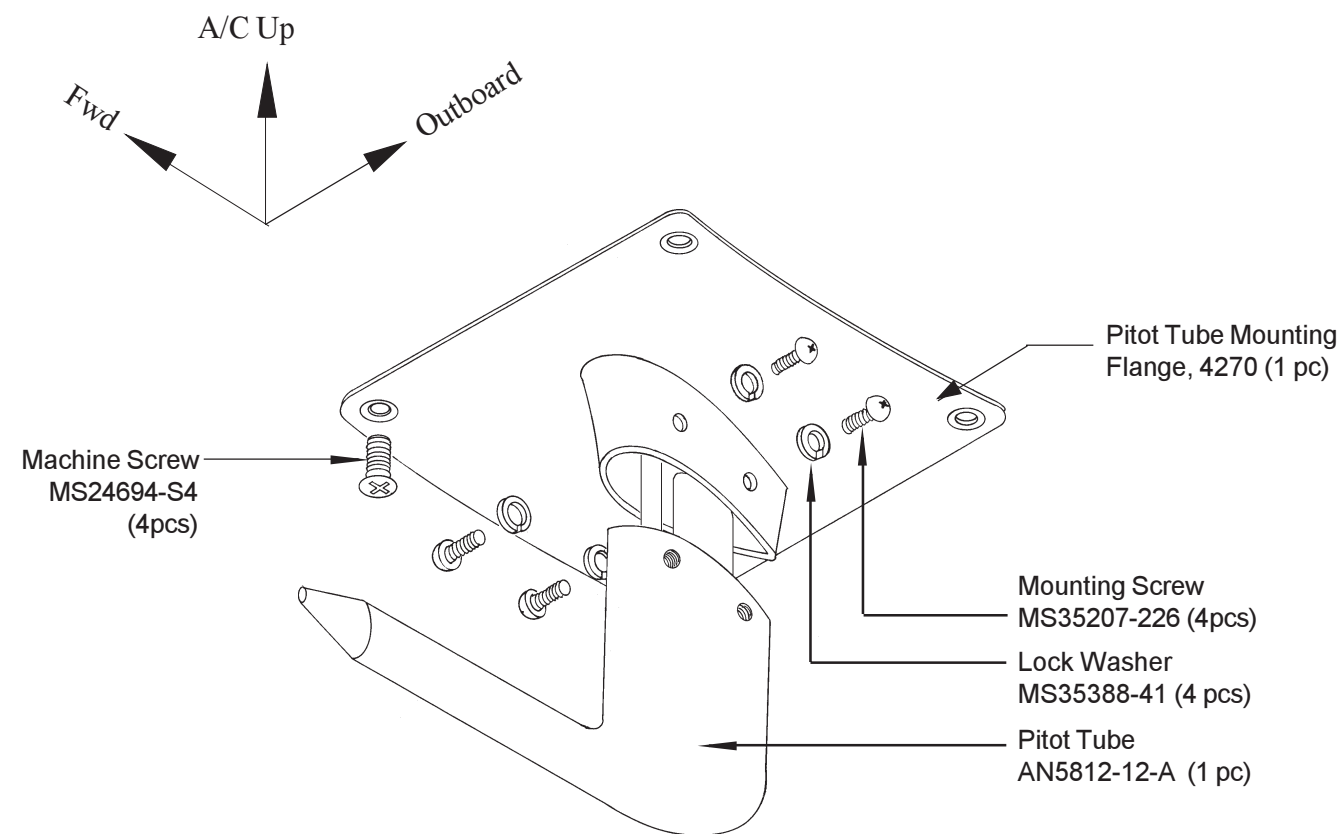
### 3. CONSTRUCTION PROCEDURES

#### A. Pitot Tube (Optional)

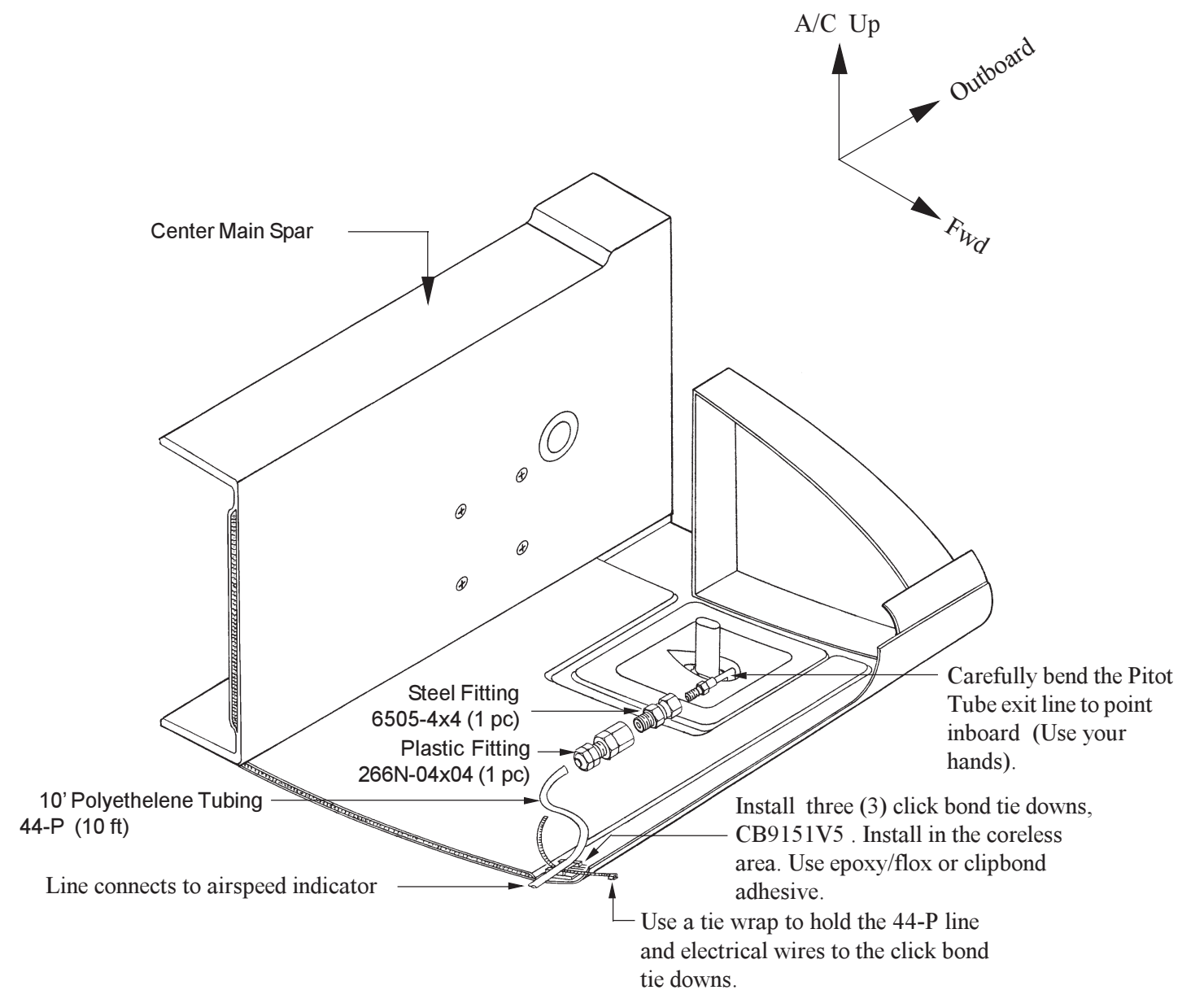
The pitot tube installs in the forward left access panel of the center wing section.

A 1. Install in left forward access panel as shown:

**Mounting Pitot Tube**  
**Fig. 3:A:1**



**Pitot Tube Line & Wires Routing**  
**Fig. 3:A:2**



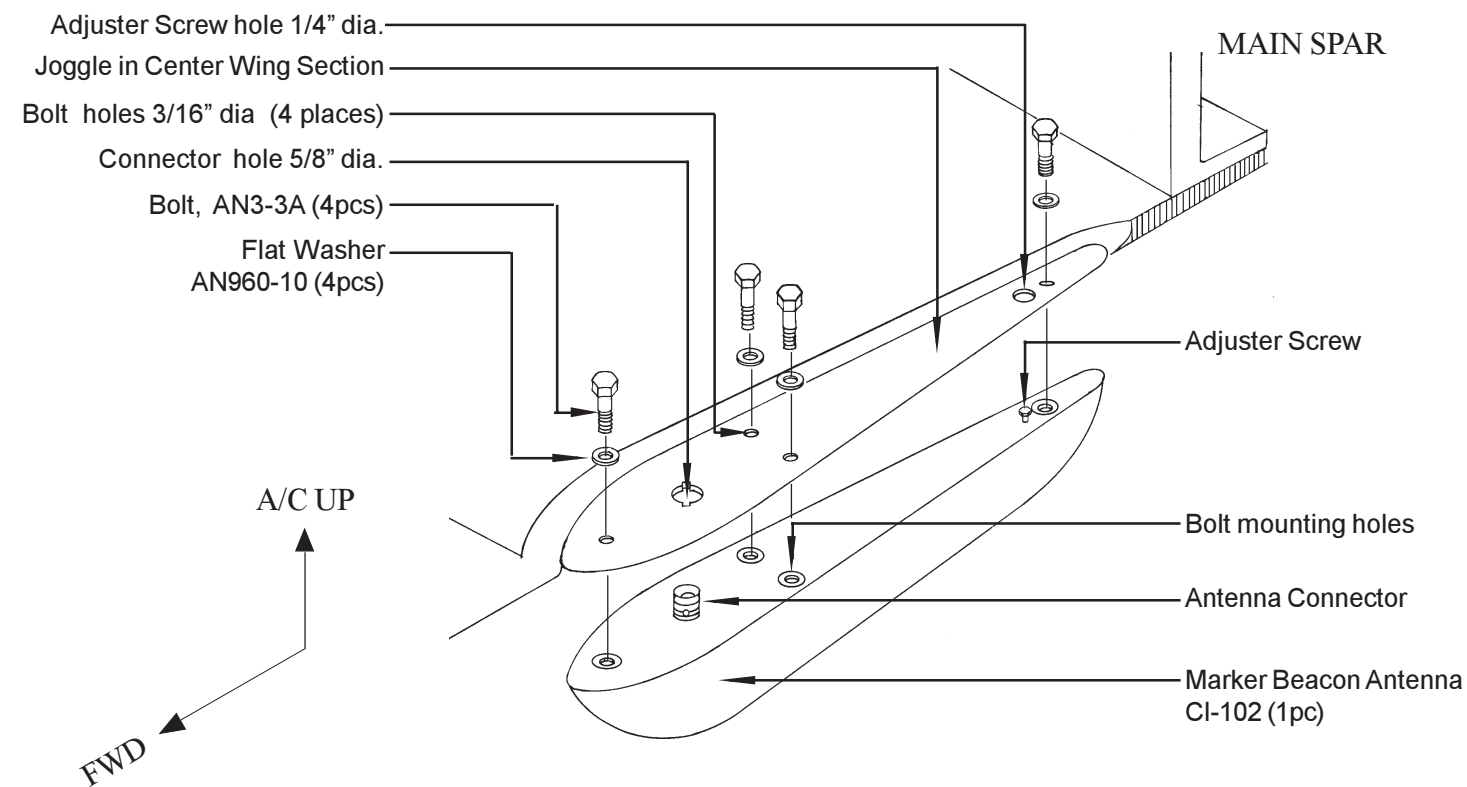
**Note: Optional Parts available through Kit Components Inc.**

## B. Installing the Marker Beacon Antenna (Optional)

The marker beacon mounts in a joggle in the front center of the center wing section.

- B 1.** Drill holes to size as shown. Mount the marker beacon antenna with hardware as shown.

**Mounting the Marker Beacon**  
**Fig. 3:B:1**



## C. Communications Antenna (Optional)

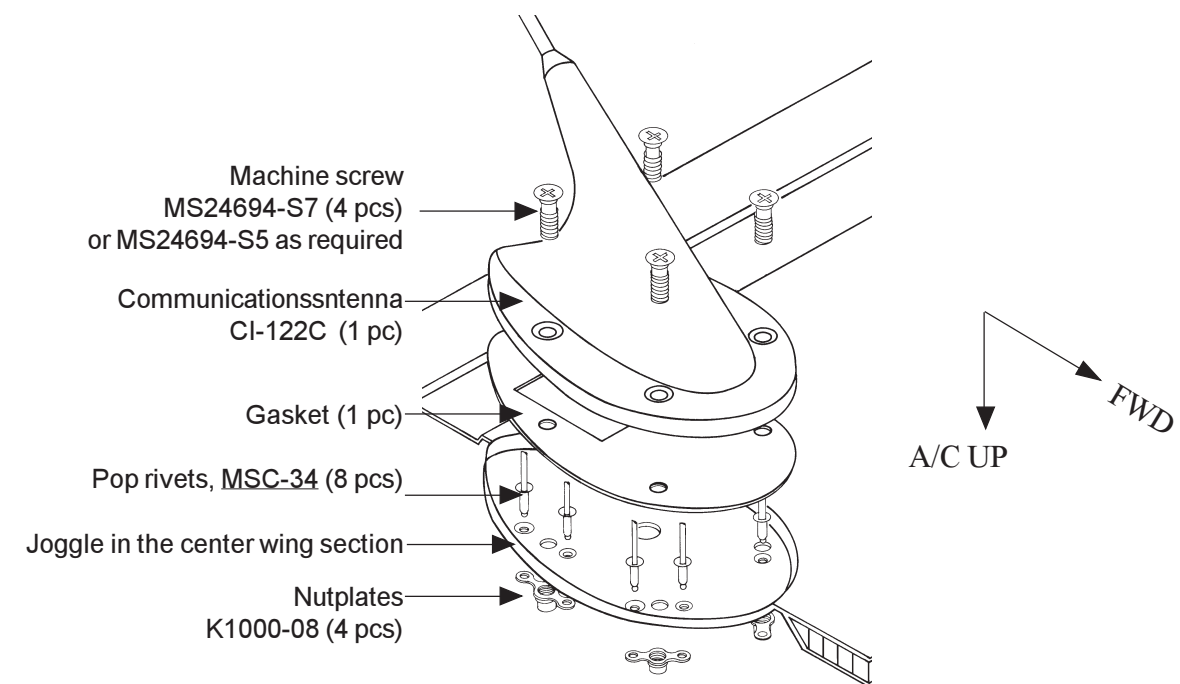
The communications antenna installs in a joggle in the aft center of the center wing section.

- C 1.** Drill the 5/8" hole for the antenna connector.

Using the antenna as a template, drill the four mounting holes using a # 20 drill.

Install the nutplates as shown using a # 40 Drill bit and a 100° countersink for the MSC-34 pop rivets.

**Mounting the Communications Antenna**  
**Fig. 3:C:1**



**Note:**

**If you do not wish to install the marker beacon antenna (or the other antennas of the center wing section) apply three (3) BID to the joggled area and body work with micro.**

**Optional Parts (Antenna) available through Lancair Avionics.**

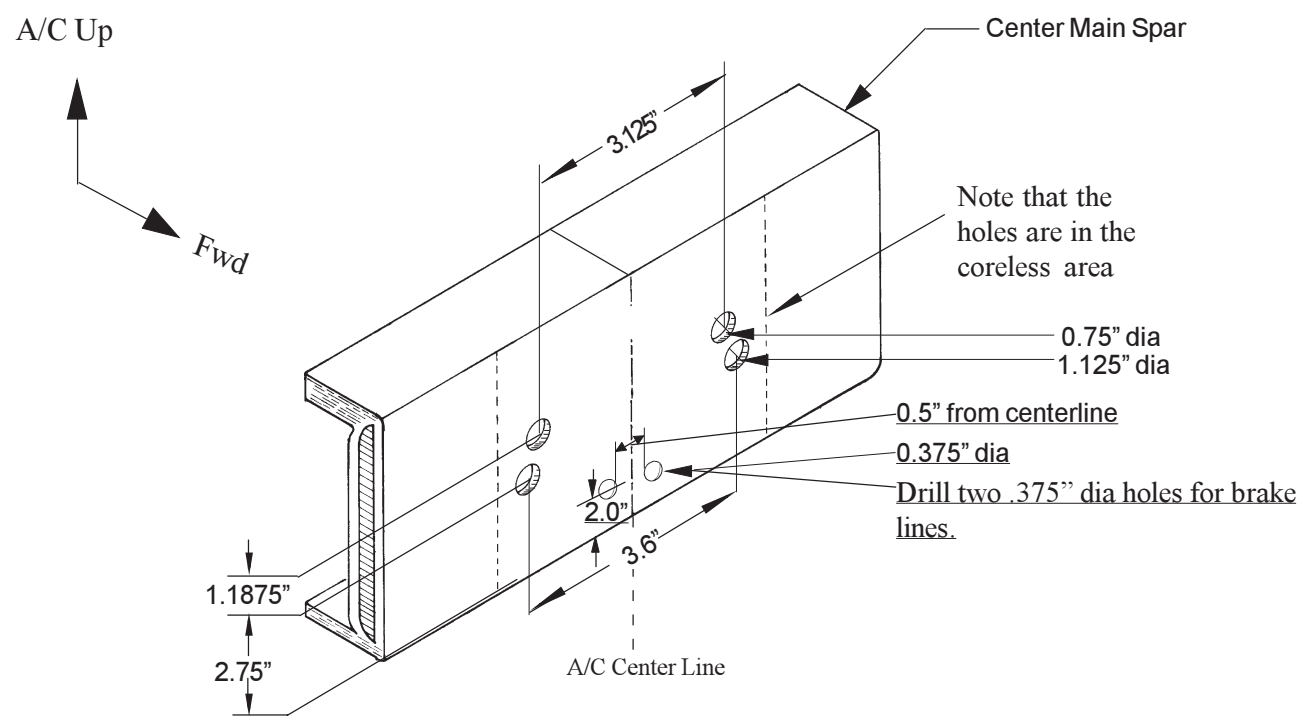
## D. Spar Closeout

- D 1.** Drill the holes for fuel supply (lower two holes) and Fuel return lines (upper) in the Center main spar as shown.
- D 2.** Drill two holes (center two holes) for the brake lines. These two holes should be 0.375" diameter. The placement is approximately 2" from the bottom and 0.5" from the centerline.

**Note:** If you are using a Lycoming engine it is not necessary to install fuel return lines.

**Fuel Supply/Return Holes through Center Main Spar**

**Fig. 3:D:1**

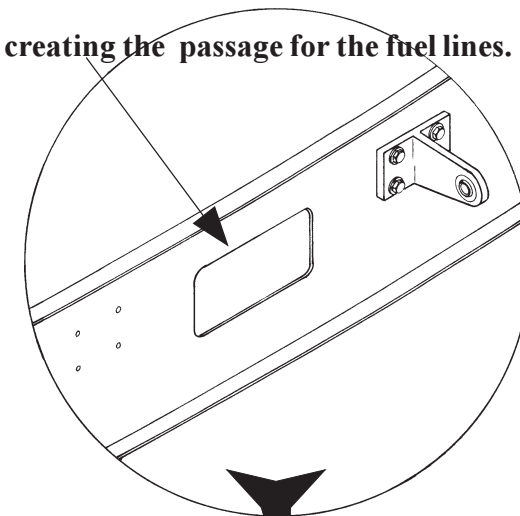
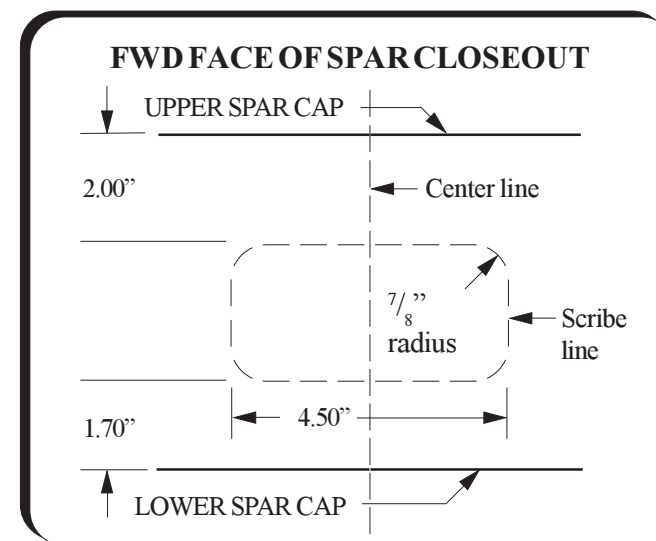


- D 3.** Trim the fuel line transition hole of spar closeout to the scribe line.

**Fuel Line Transition Hole Spar Closeout**

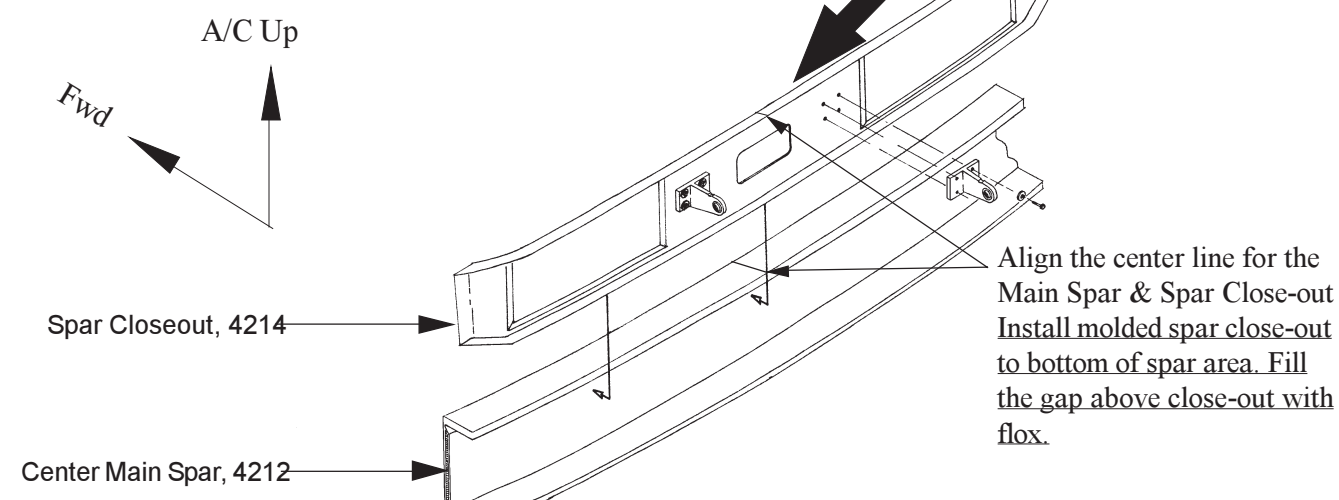
**Fig. 3:D:2**

Prior to bonding in the center spar closeout we suggest creating the passage for the fuel lines.



**Bonding the Spar Closeout to the Center Main Spar**

**Fig. 3:D:3**

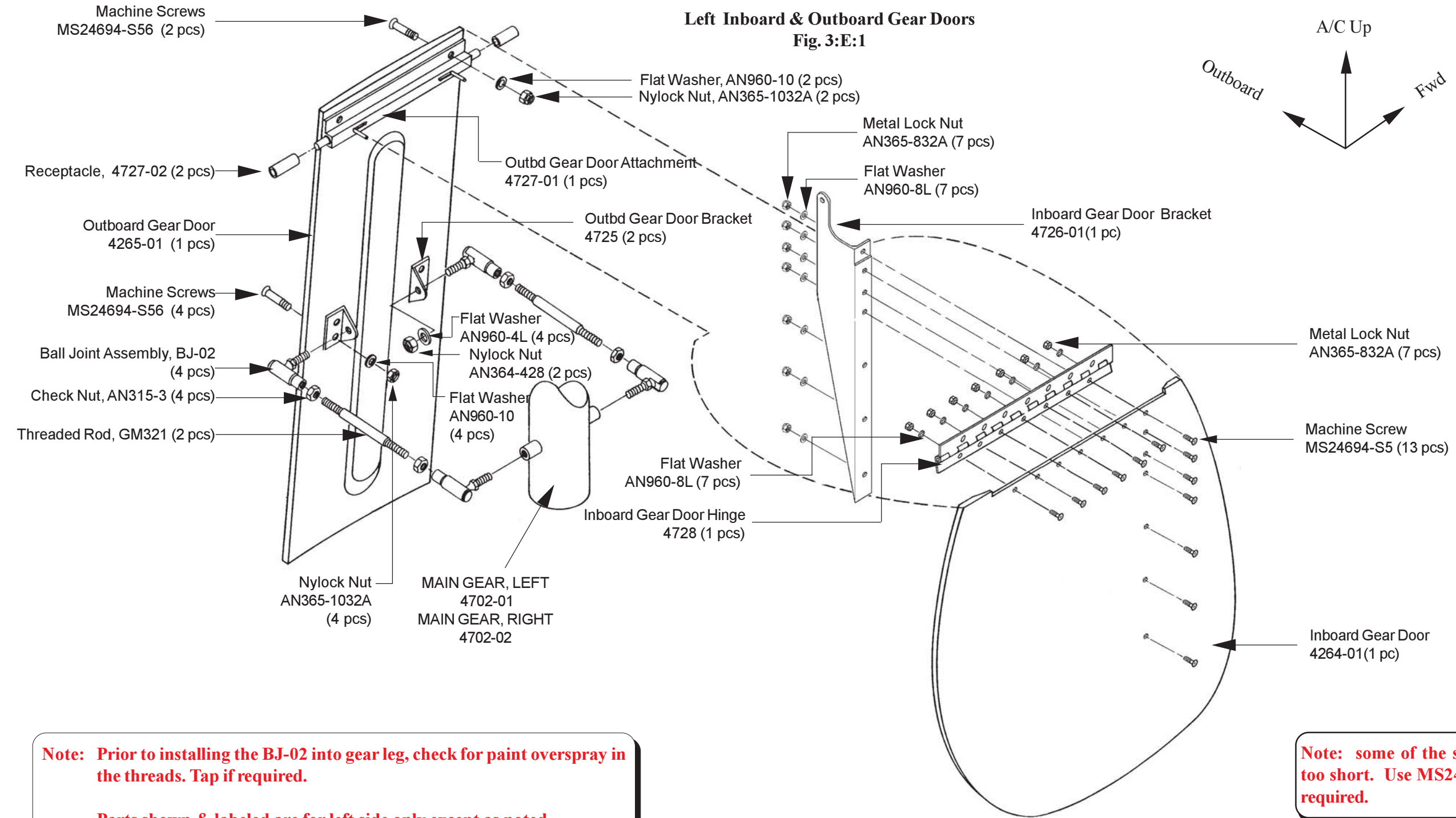


- D 4.** Install spar closeout using epoxy & flox using proper bonding procedures. Center the spar closeout  $\pm 1/8"$ .



## E. Main Gear Doors

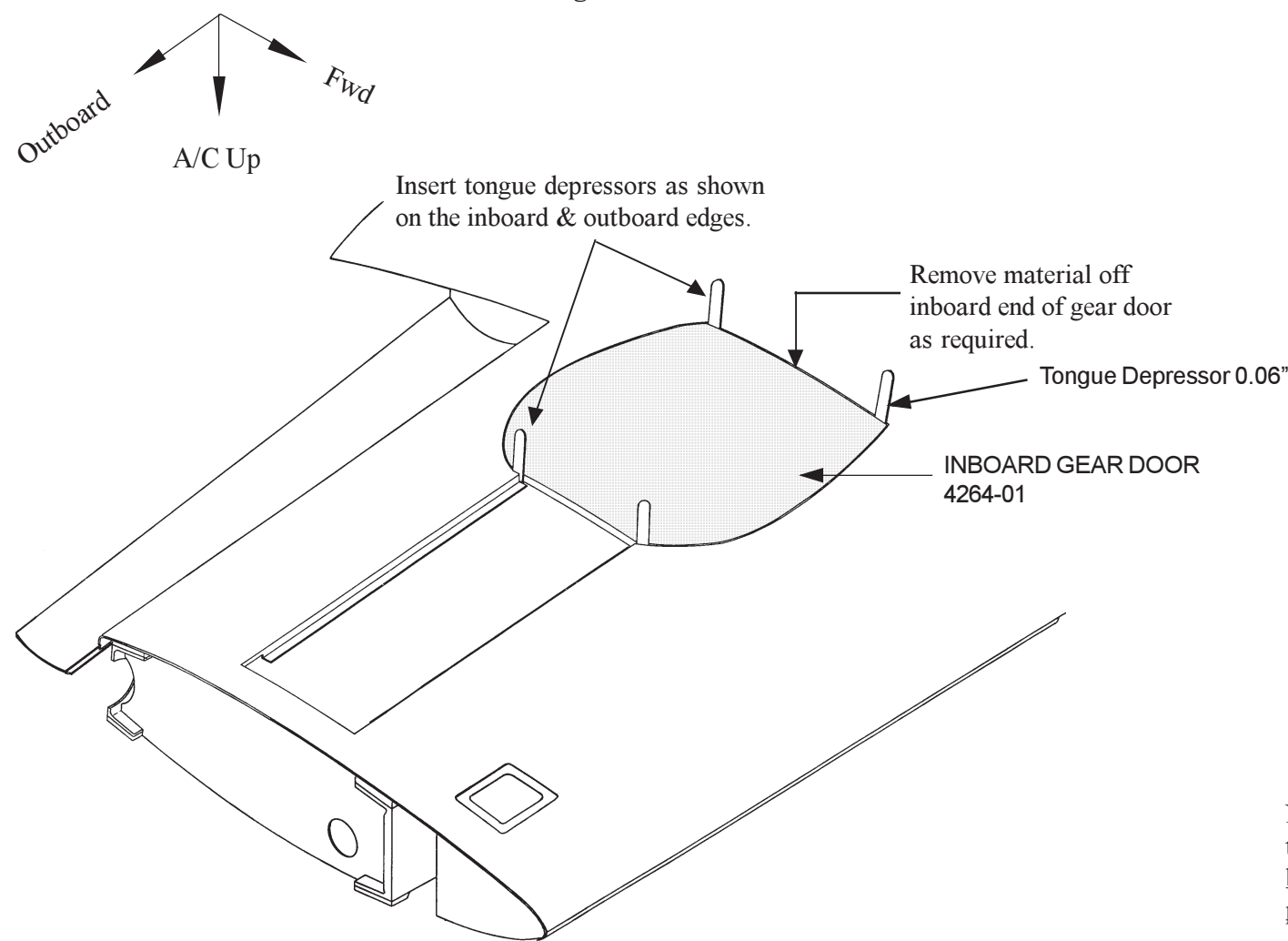
The main gear of the Legacy has two gear doors per side. The outboard gear door is mechanically actuated and the inboard gear door is actuated by a hydraulic cylinder.



## Fitting the Gear Doors

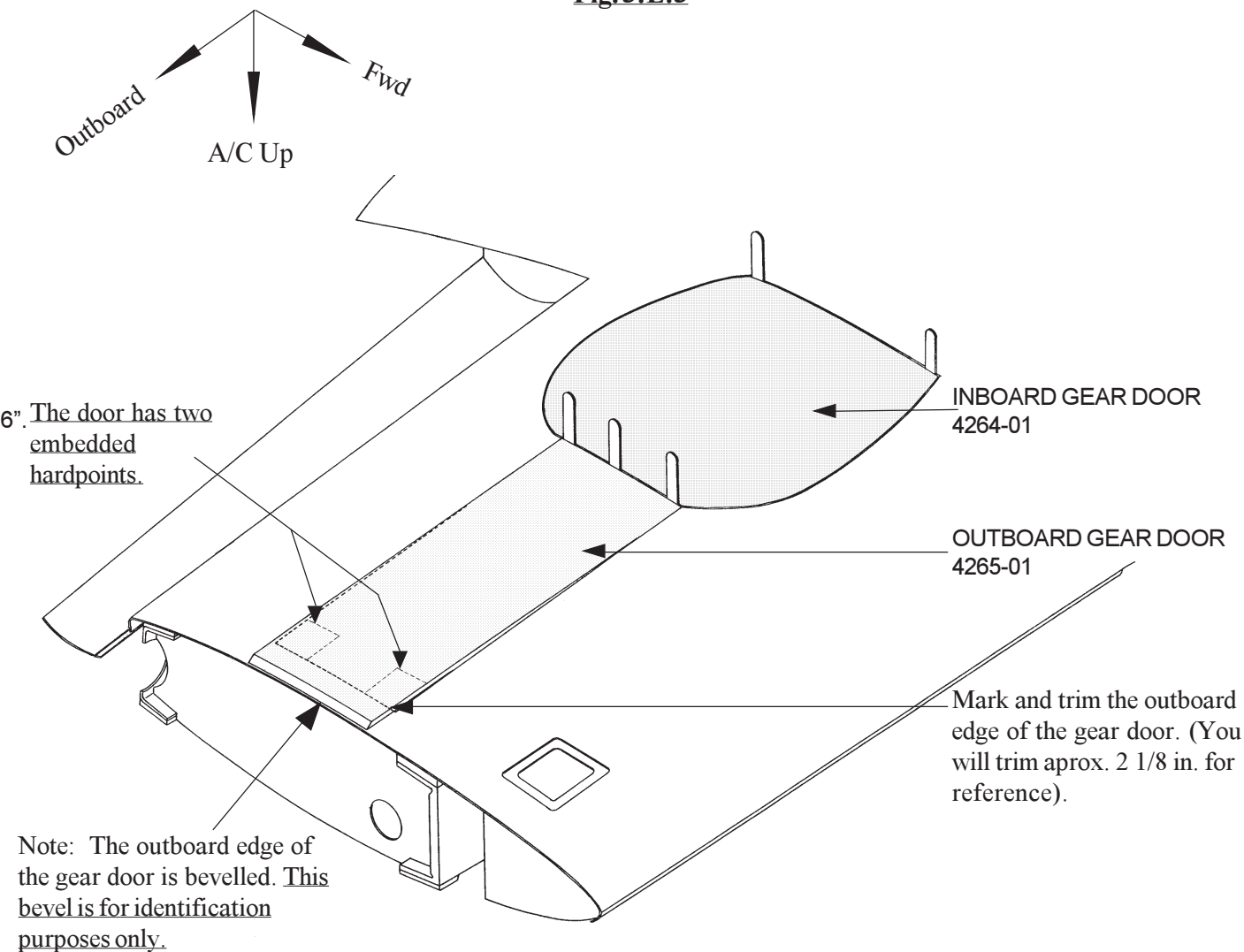
- E 1.** Lightly sand all edges of the gear doors with a sanding block. Be careful not to sand through the structural plies.
- E 2.** Fit the inboard gear door by removing material off the *inboard edge* of the door to give 0.06 in. clearance all around.

**Fitting Gear Doors**  
**Fig. 3:E:2**



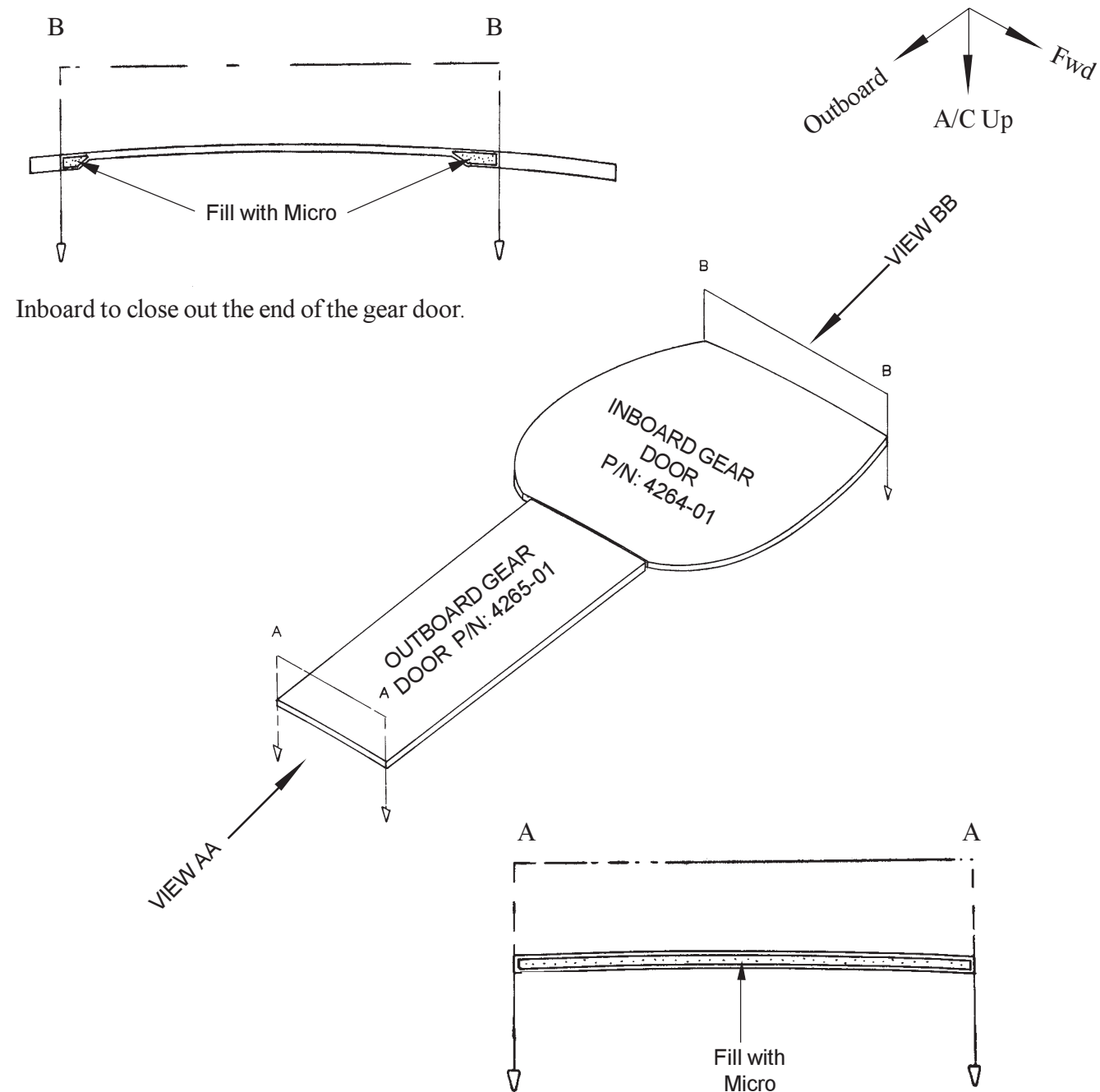
- E 3.** Fit the outboard gear door. With the inboard gear door still in place, drop the outboard gear door in place as shown. From the inside, mark the trim line. Note that the bevelled edge of the gear door is outboard.

**Trimming Outboard Gear Door**  
**Fig. 3:E:3**



**E 4.** Remove 3/16 of the exposed foam core from the inboard end of inboard gear door and the outboard end of outboard gear door. We suggest using a dremel. Fill with Epoxy/Micro mix.

**Micro Filling Gear Doors**  
**Fig. 3:E:4**



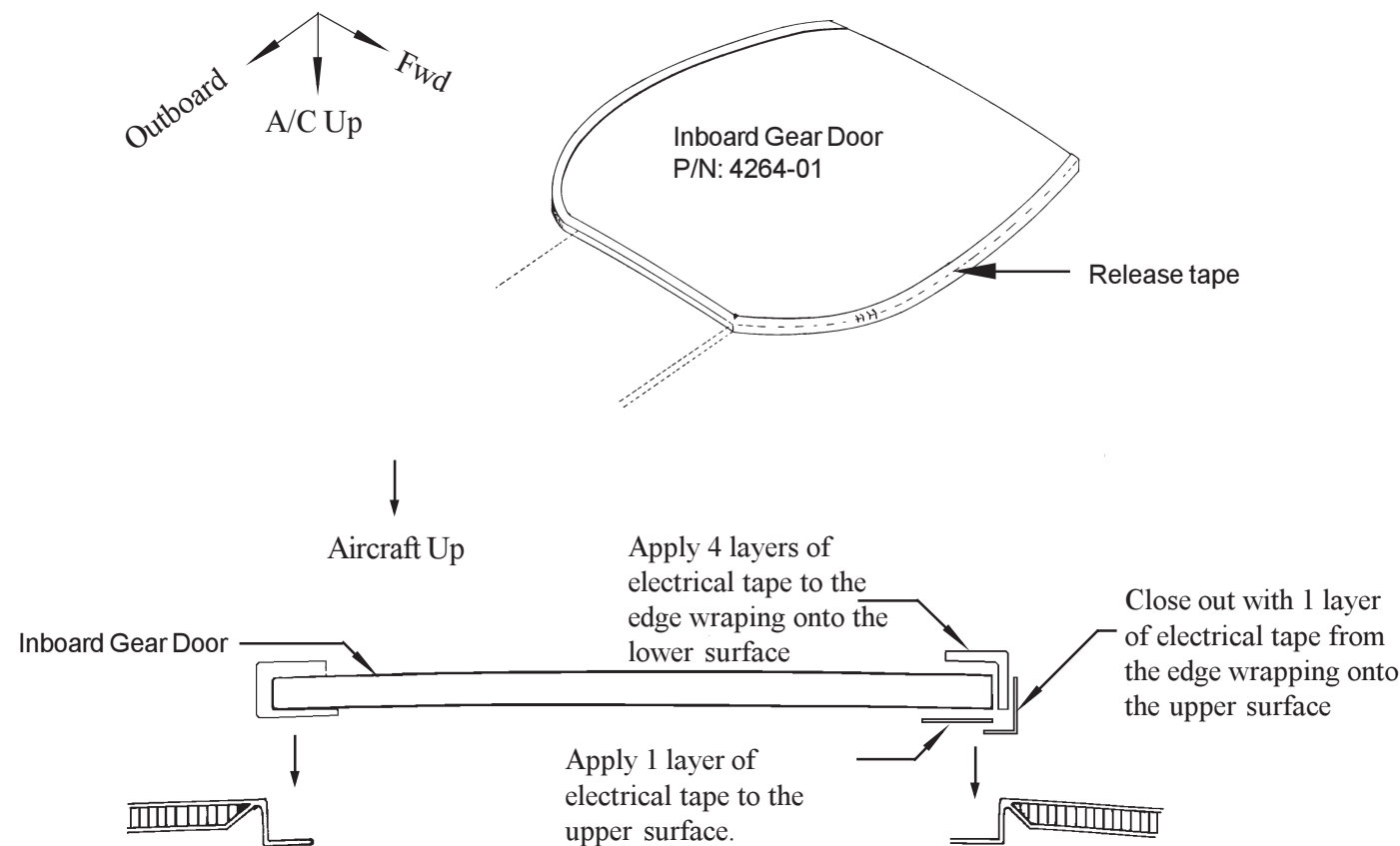
### Gear Doors - Release Tape (Optional)

To get a perfect fit of the gear doors some body work may be required. The end result we are looking for is an even gap around the gear doors and that the gear doors transition nicely to the lower wing skin. This section describes one method for body working the gear doors.

To get an even gear door gap we suggest using electrical tape (referred to as the release tape in this section) as a "spacer". The release applying epoxy/micro with the electrical tape in place will form an even gap between the gear doors and the lower wing skin. Because of the shape of the gear door the doors tend to back lock during the release. Some force is required to remove the gear doors following the release. The correct shape is sanded by hand using the beveled sanding block shown in this section.

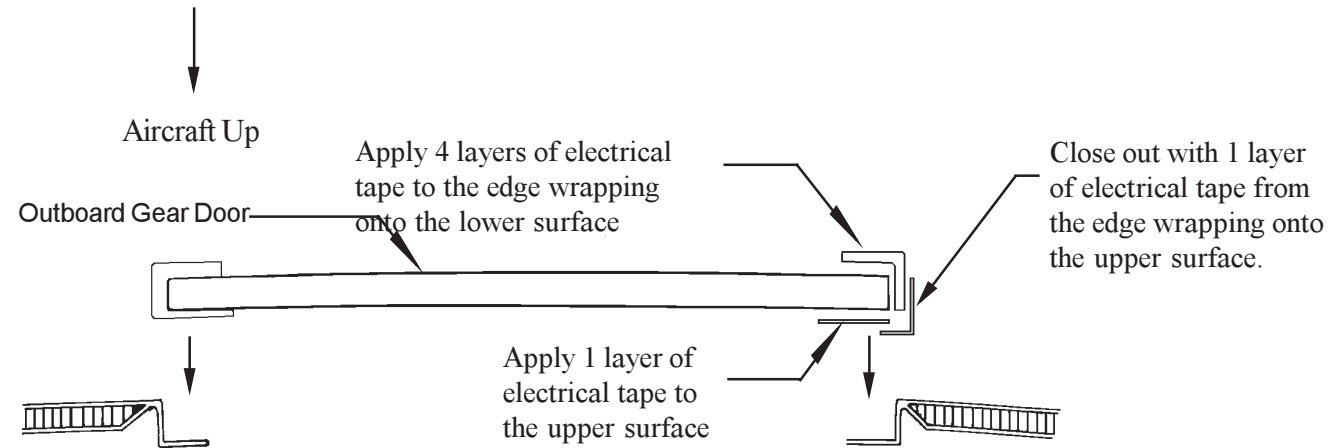
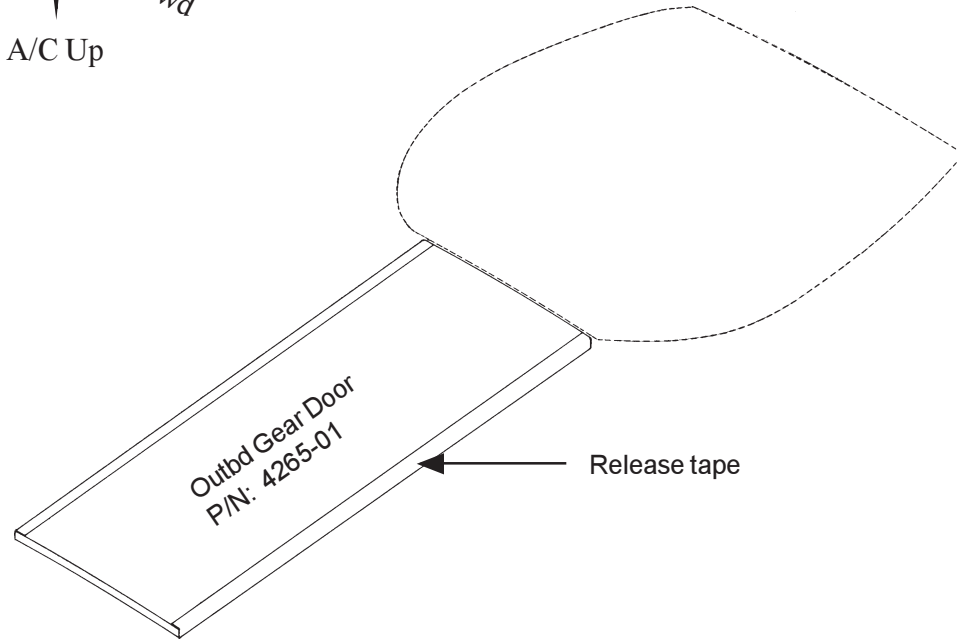
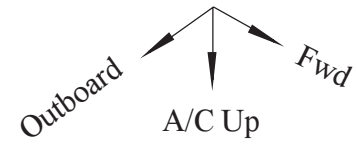
Another method is to apply just one layer of a release tape and while the micro is curing, run a knife blade around the perimeter to create the even gap. Also some body work may be required to blend the gear doors to the lower wing skin.

**Inboard Gear Door Release Preparation**  
**Fig. 3:E:5**

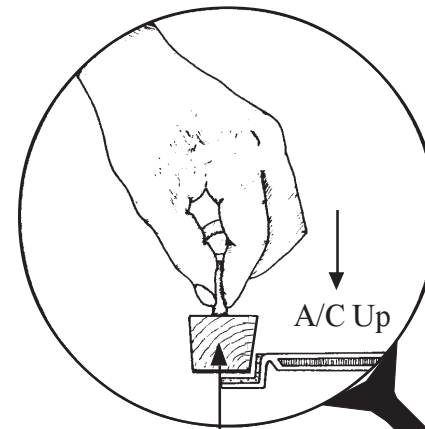
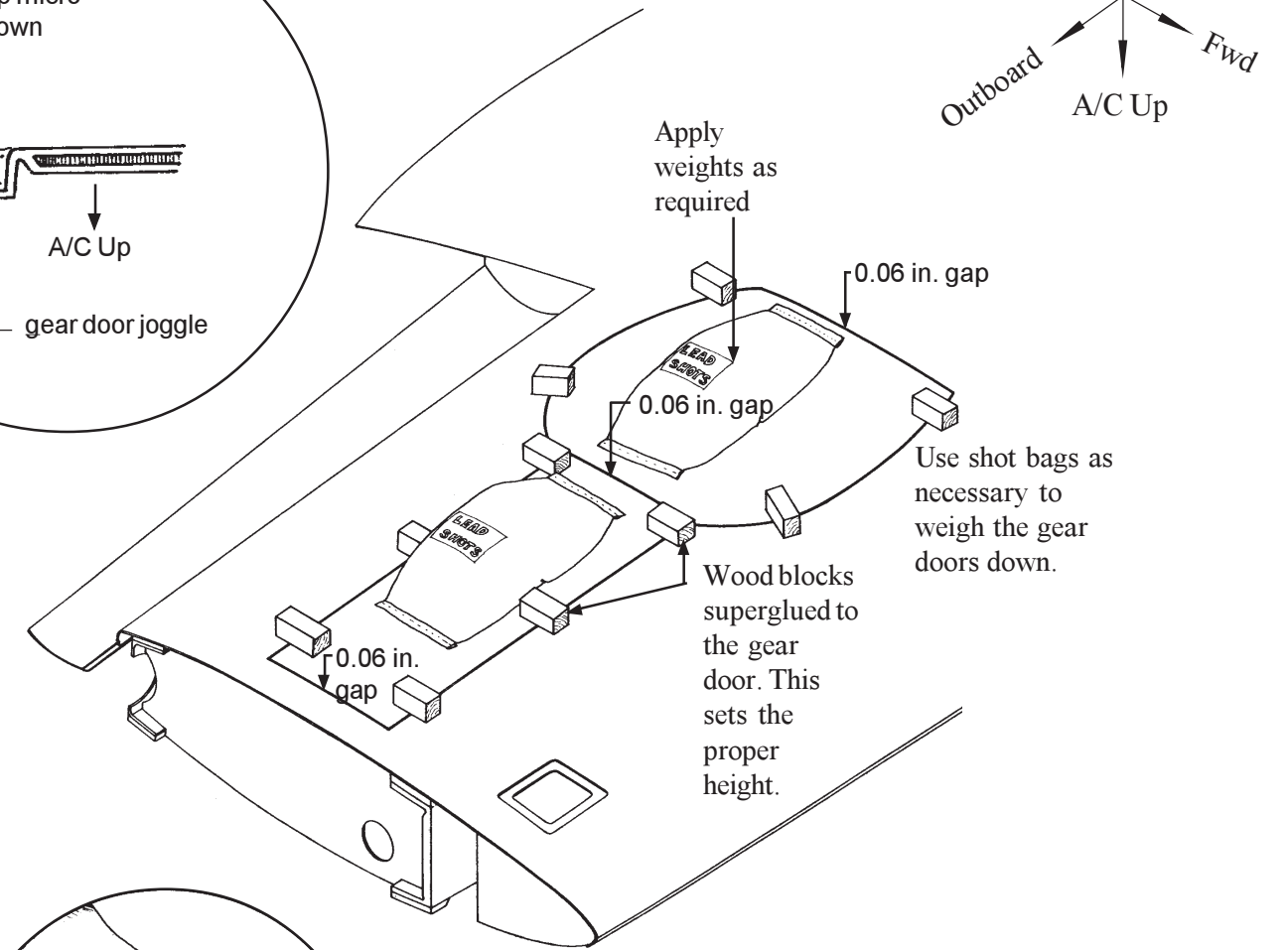
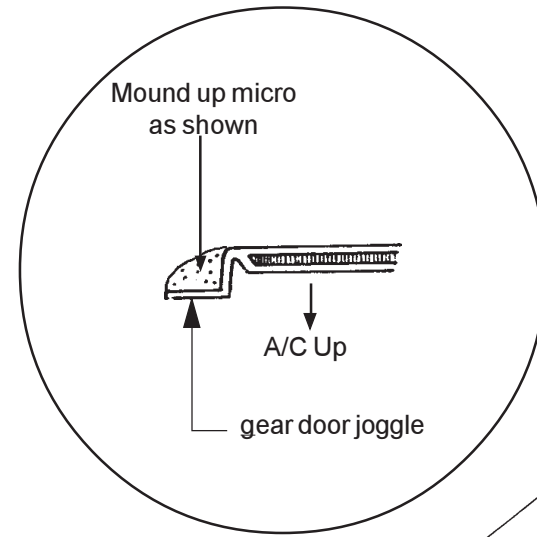


**Outboard Gear Door  
Release Preparation  
Fig. 3:E:6**

Outboard Gear Door

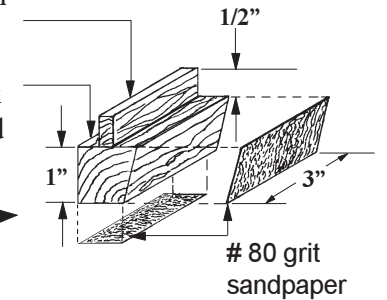


**Gear Door Release  
Fig. 3:E:7**



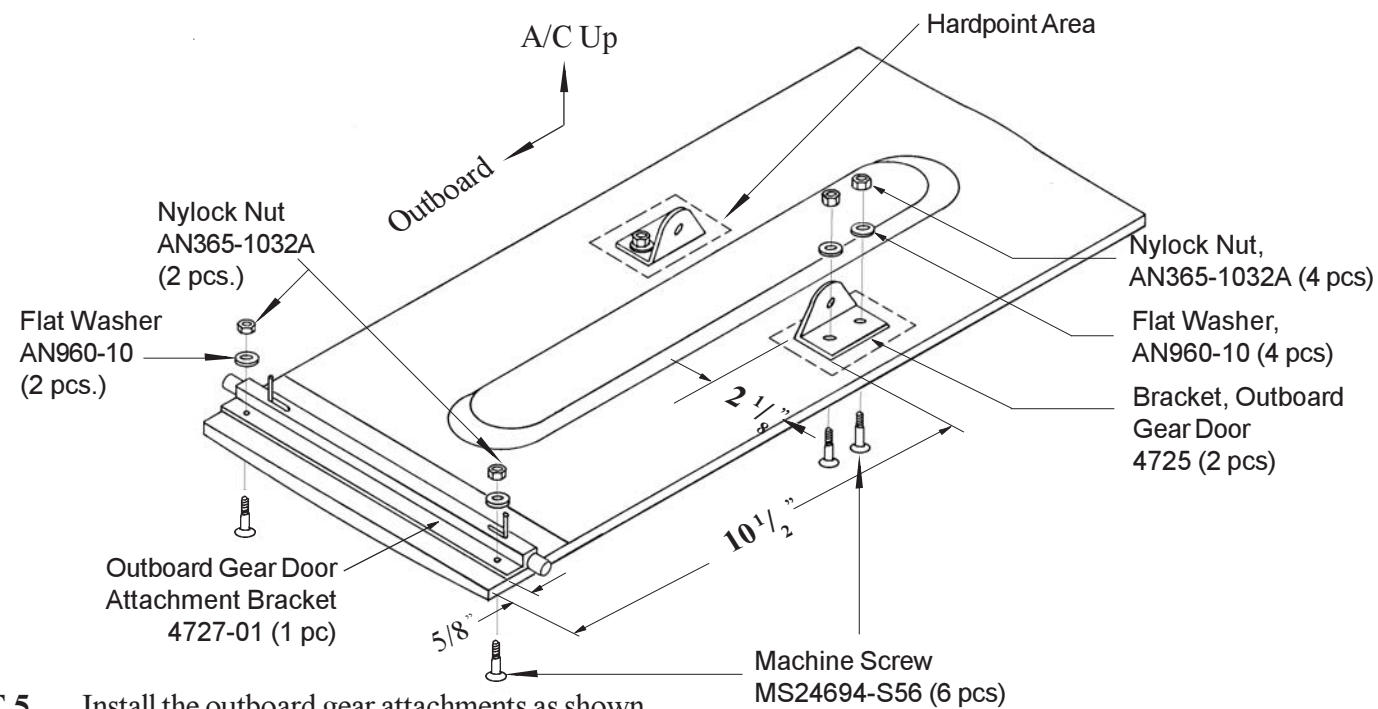
After cure, clean edges up using a small sanding block as shown.

Cut-out a 1/2" x 3" wood piece for a handle. Bevel (3°) one side of a 1" x 1" x 3" block of wood.



## Gear Doors - Outboard Hardware Mounting

**Outboard Gear Door Hardware Mounting**  
Fig. 3:E:8



**E 5.** Install the outboard gear attachments as shown. Countersink the outside of the gear door for the screws.

**E 6.** Install the outboard gear door bracket. Countersink the outside of the gear door for the screws.

**Note:** For outboard gear doors that don't have the hard-points for the outboard gear door attachment bracket screws, it is necessary to install hard-points. Drill the holes as explained above and visually determine if the hard-points are installed. They are identified as follows:

No hard-point - There is foam between the holes.  
Hard-point - There is solid e-glass in the holes.

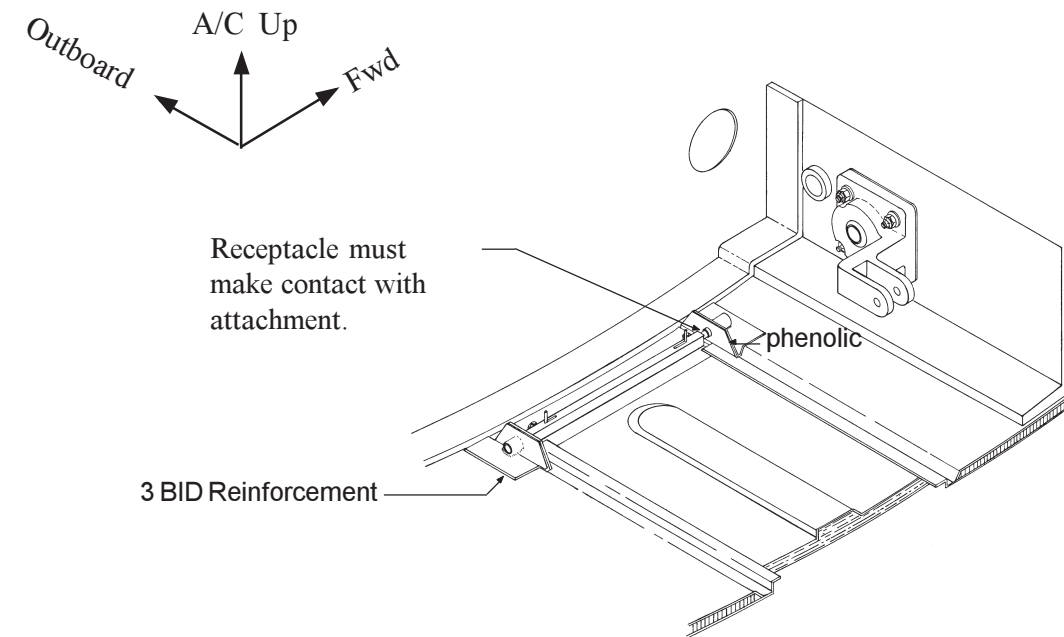
Hard-points are installed as follows:

- (1) Mark screw locations on the inside of the gear door.
- (2) Draw a 5/8" dia. circle centered on the screw locations.
- (3) Remove the **INSIDE LAMINATE ONLY** of the circle you drew.
- (4) Remove 1/4" of the core around the hole and fill it with flox.

## Gear Doors - Installing the Outboard Attachment Receptacles

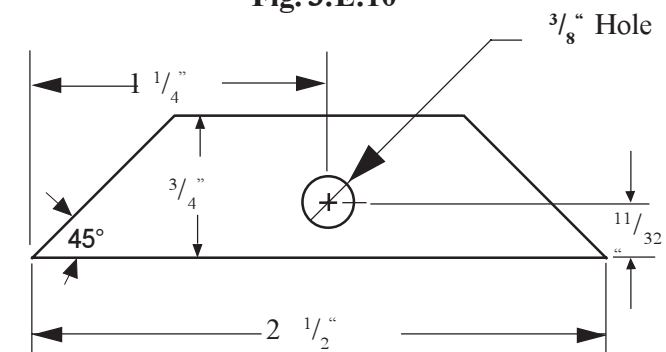
**E 7.** Align the outboard gear door in the joggle. Temporarily secure in place using wood blocks and instant glue.

**Gear Door Alignment**  
Fig. 3:E:9



**E 8.** From a 1/8 in. piece of phenolic, cut out four (4) pieces as shown below.

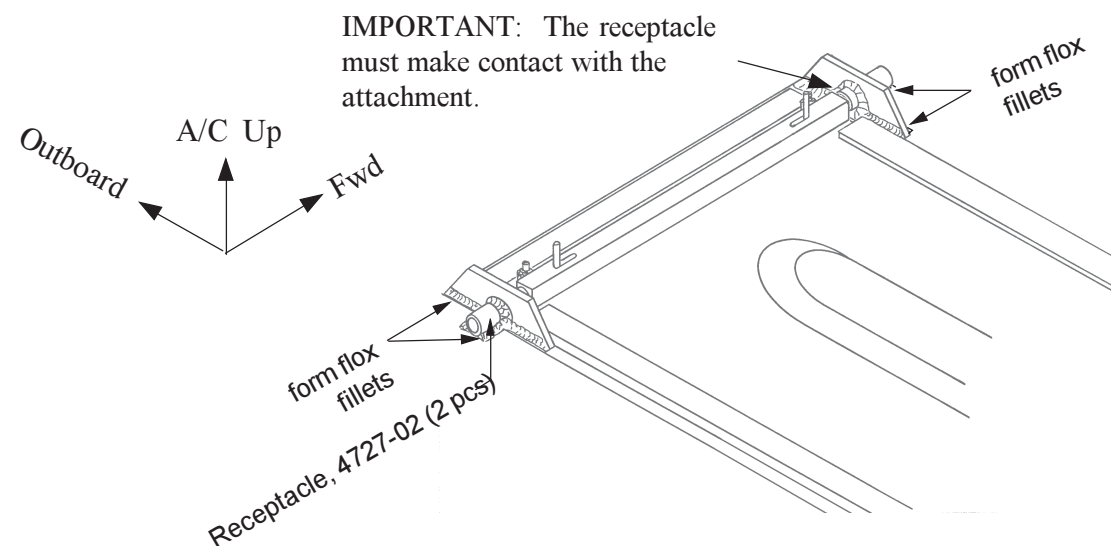
**Receptacle Support**  
Fig. 3:E:10



E 9. Prepare all bonding surfaces by sanding the inside of the stub wing, receptacle and phenolic.

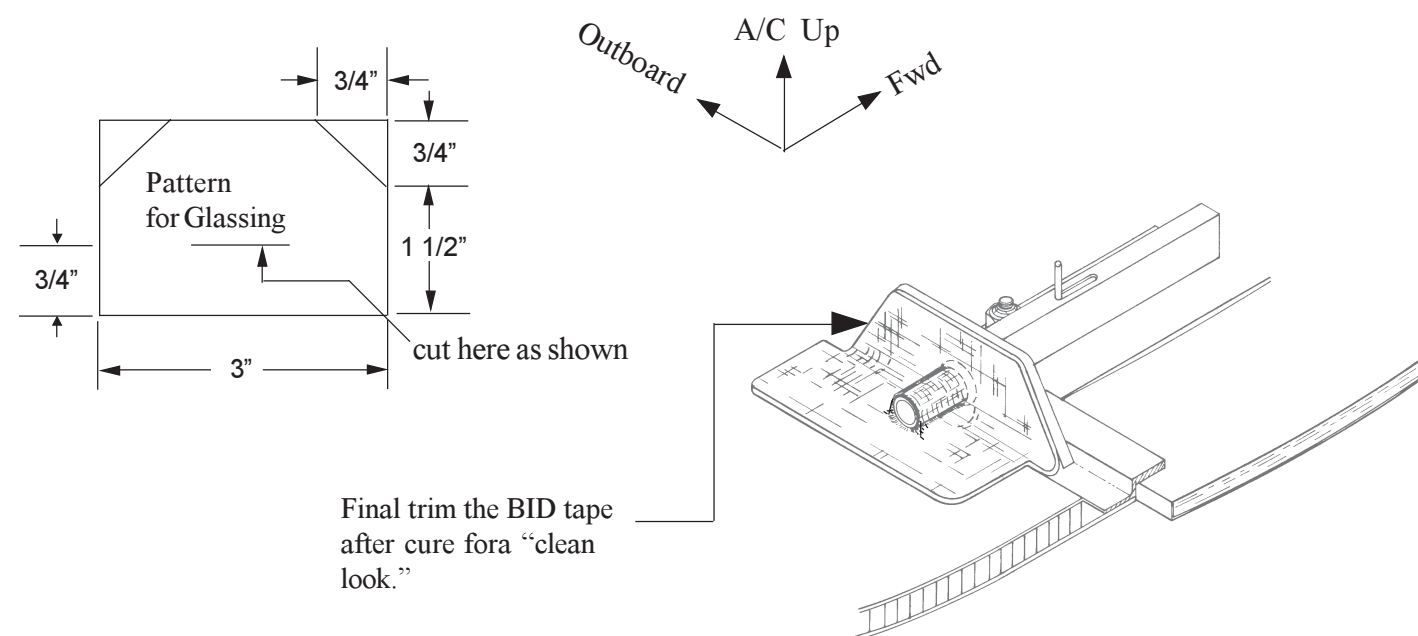
E 10. Install the receptacle and the phenolic with epoxy/flox.

**Receptacle Support Bonding**  
Fig. 3:E:11



E 11. Secure with 3 BID using proper bonding procedures.

**Receptacle Support Reinforcement**  
Fig. 3:E:12

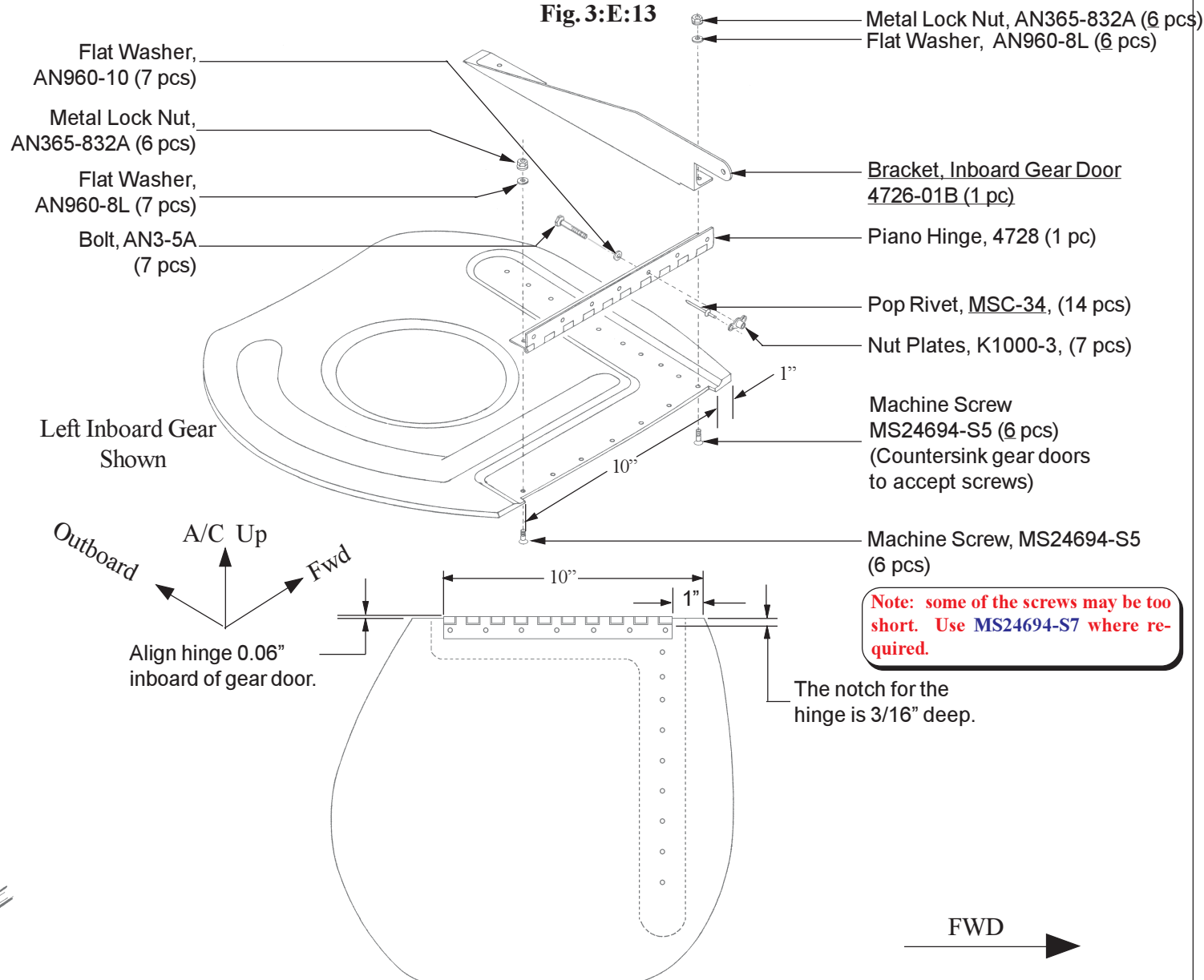


## Installing the Inboard Gear Door

To complete this section the aft loads pad must be installed. Refer to chapter 10 for the aft load pad installation. (The hinges for the inboard gear doors mount to the aft load pads).

Prior to mounting the hinges the inboard gear door must be final trimmed. The inboard edge of the gear door becomes the reference for installing the hinge. Note the 3/16" notch in the inboard edge of the gear door. The notch is to accept the hinge. The .05" sets the gap between the inboard gear door and the joggle. While these dimensions may seem confusing at first we suggest that you study the parts and try to understand the installation process before getting started.

**Inboard Gear Door Hardware Mounting**  
Fig. 3:E:13



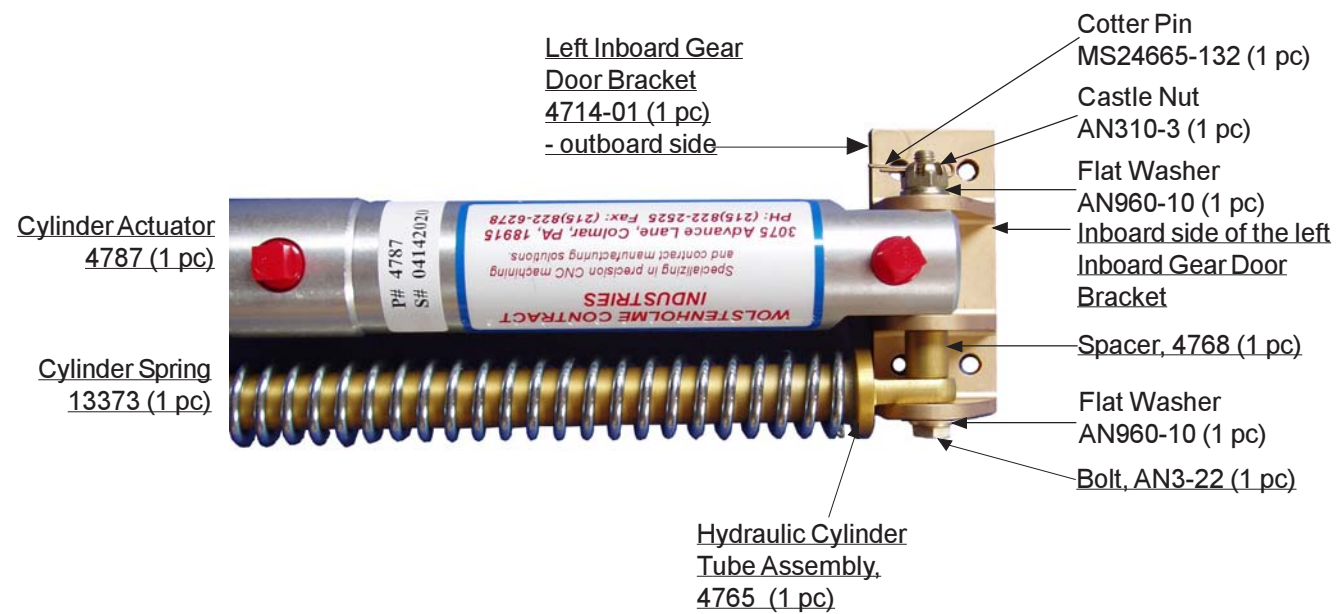
E 12. Install hardware in inboard gear door.

**E 13.** Identify the left indoor gear bracket (4714-01) using the figure below. The outboard edge of the bracket is a 90 deg. side, meaning the face of the bracket and the three bracket arms make a 90 deg. angle on the outboard side. Position the bracket with the two outboard holes over the the two existing holes in the fuselage that are approx. 10” from the cockpit closeout rib. Hold the bracket over the holes and mark the two inboard holes. Drill the inboard holes.

**E 14.** Slide a flat washer, AN960-10, onto bolt AN3-22 then through the inboard gear door bracket, 4714-01, attaching the following in this order: cylinder actuator (4787), spacer (4768), hydraulic cylinder tube assembly (4765), and finish with another flat washer (AN960-10), a castle nut (AN310-3) and secure with cotter pin MS24665-132.

**Inboard Gear Door Hydraulic Cylinder Mounting (part 1)**

**Fig. 3:E:14**



**E 15.** Attach the Left Inboard Gear Door Bracket (4714-02) by aligning its holes with the outboard holes. Countersink the holes in the center wing section for the four screws and install using machine screws, MS24694-S54, with washers, AN960-10L, and nuts AN365-1032A.

**E 16.** Slide the cylinder spring (13373) onto the hydraulic cylinder tube assembly.

**E 17.** Slide a retainer (4769) onto the tube assembly (4765). Then install and tighten a female rod end (F35-14) onto the assembly.

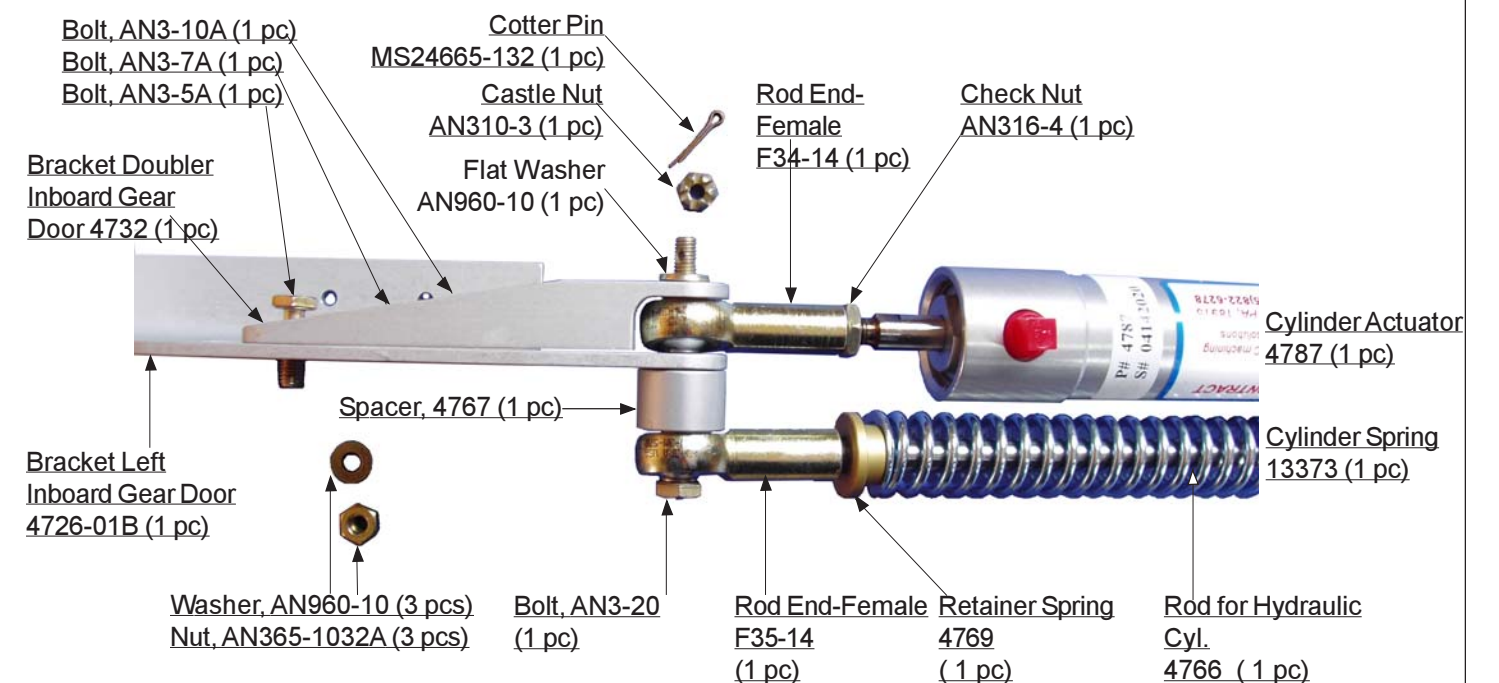
**E 18.** Install and tighten check nut (AN316-4) followed by a female rod end (F34-14) onto the cylinder actuator.

**E 19.** Now assemble the parts for the other end of the cylinder actuator by sliding an AN3-20 bolt through the bracket doubler (4732) and the remaining parts in the following order: rod end of the cylinder actuator, through the bracket (4726-01B), spacer (4767) rod end on the retainer spring, a flat washer (AN960-10), a castle nut (AN310-3) and secure with cotter pin MS24665-132.

**E 20.** Finish bolting the two brackets together, 4732 to 4726-01B, using one each of bolts AN3-5A, AN3-7A and AN3-9A and three each of washers AN960-10 and nuts AN365-1032A.

**Inboard Gear Door Hydraulic Cylinder Mounting (part 2)**

**Fig. 3:E:15**

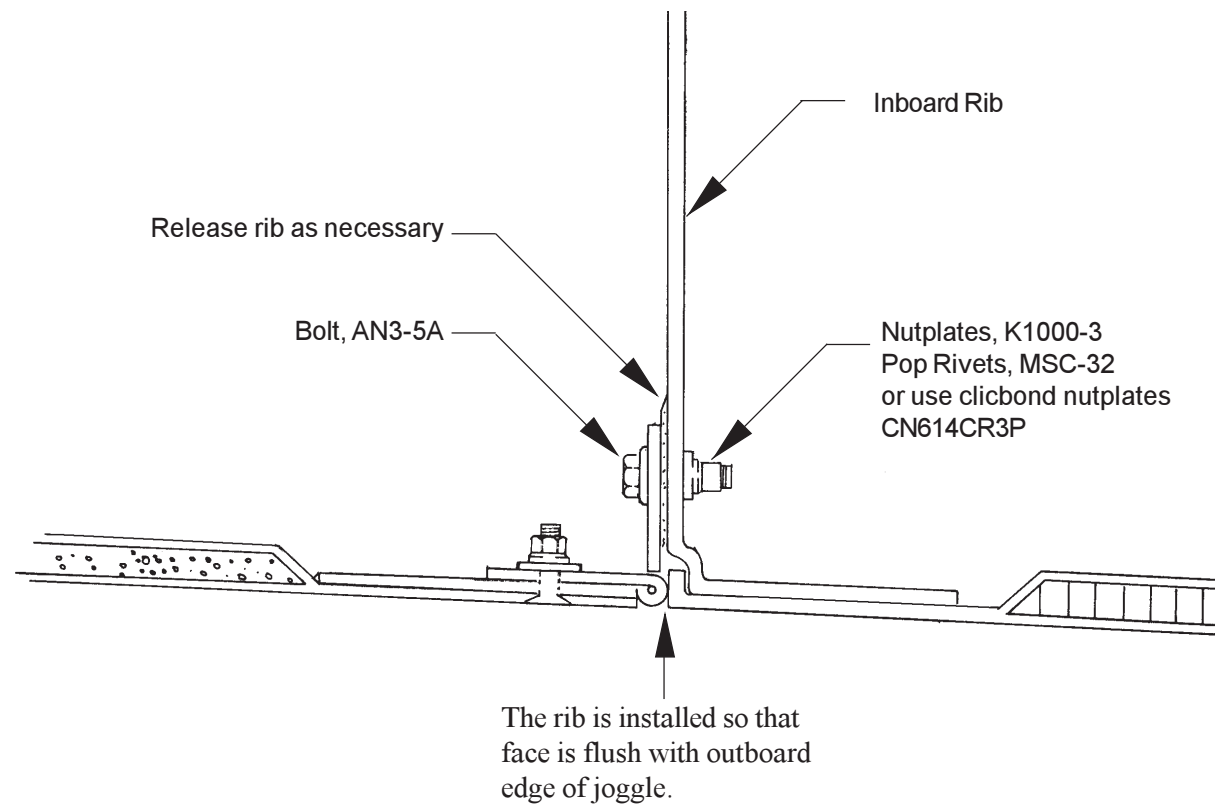


See the previous page for locating and bolting the inboard gear door bracket to the inboard gear door.

**Note: The hydraulic cylinder operation is covered in chapter 16.**

**Inboard Gear Door Hinge Mounting to Inboard Rib**  
**Fig. 3:E:16**

**Note: This step must be completed after the rib is aligned. Refer to Chapter 10, Figure 10:B:2.**



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**Page added due to updates on prev. page for Rev. 3/12-15-04**

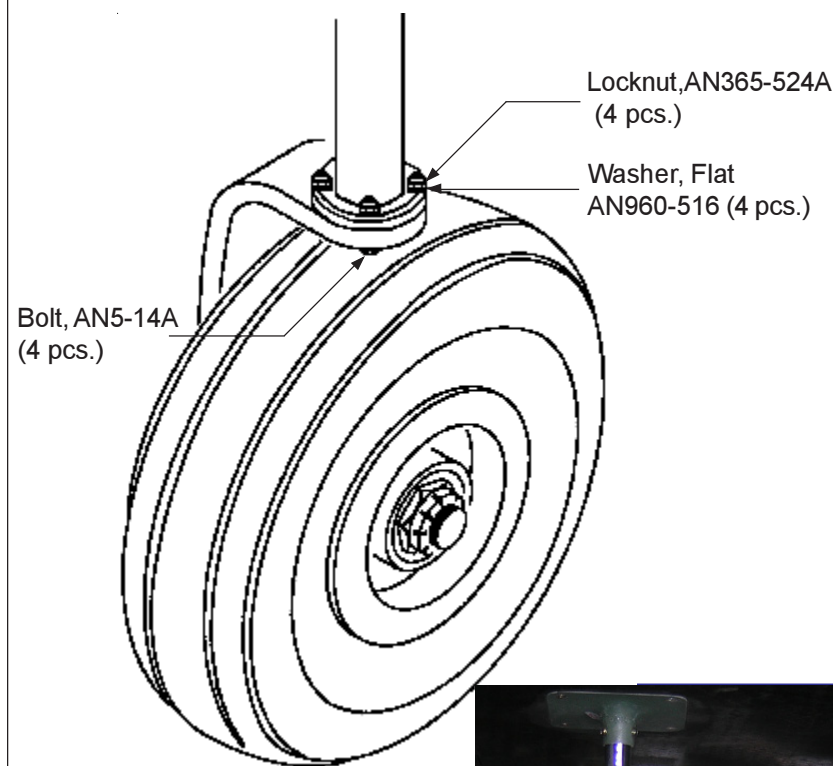


## F. Main Gear Installation

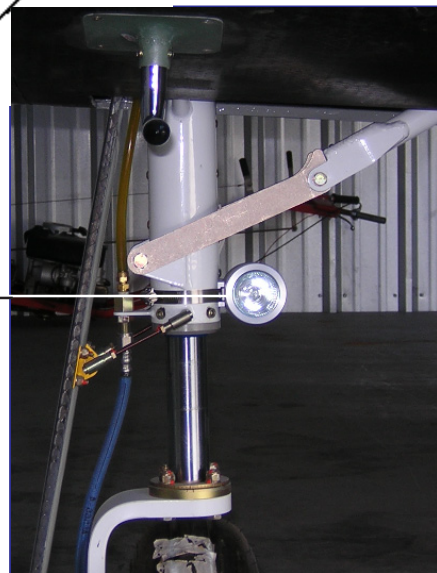
The Legacy landing gear is oleo pneumatic. The landing gear is pre-aligned at the factory however the angle of the gear leg itself must be set as shown later in this section. The first 50 Legacy kits were supplied with a style 1 landing gear and from then on a style 2 landing gear. To identify, style 1 is a one piece type fork as shown and style II has a collar that bolts to the fork as shown on the left. If you have a style 1 type of fork you must comply with service bulletin SB058.

F 1. Assemble the main gear legs as shown.

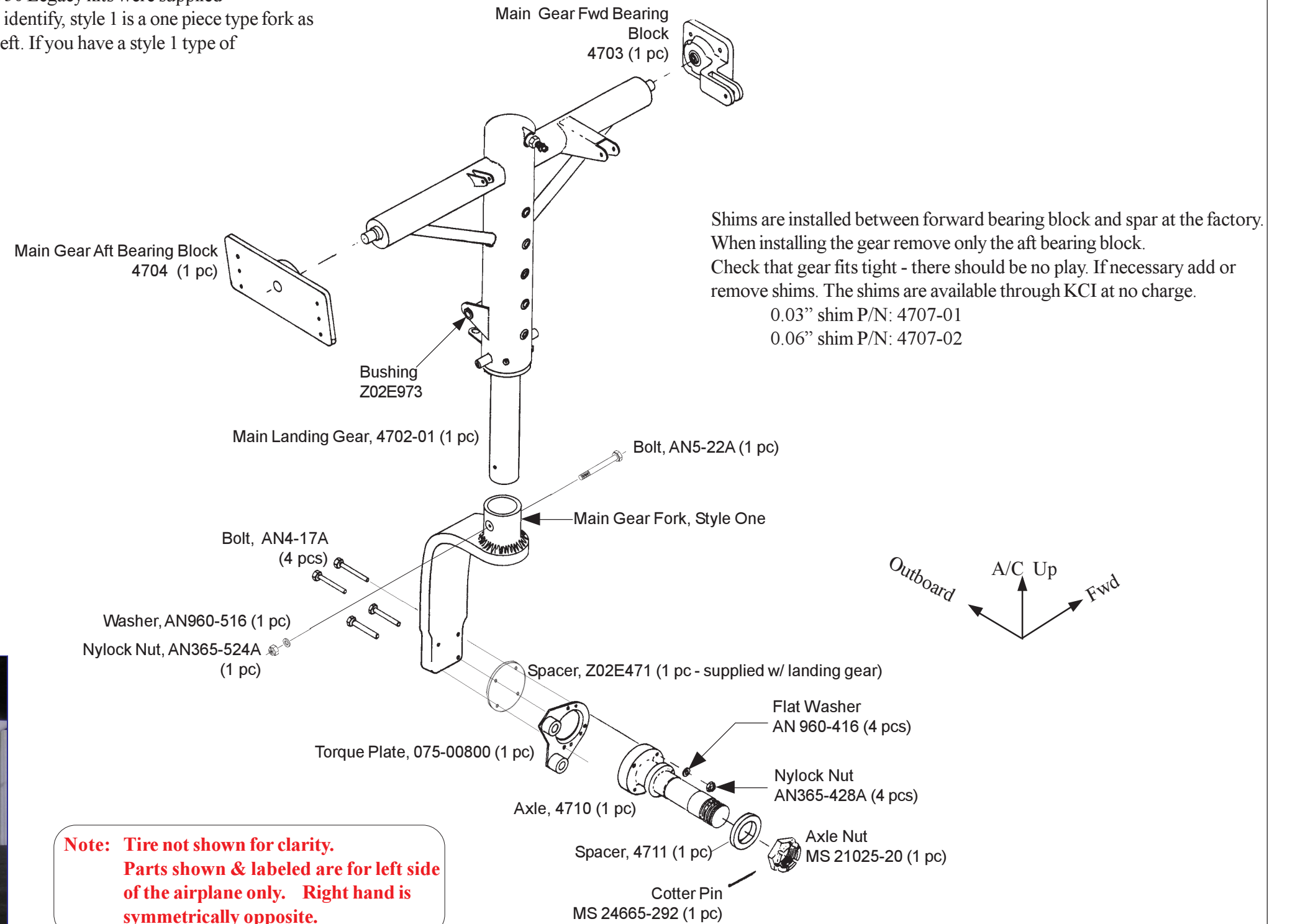
**Main Landing Gear Style II**  
Fig. 3:F:1:b



Optional Landing Lights  
12 volt 800-0001  
24 volt 800-0002  
(Sold by the pair)

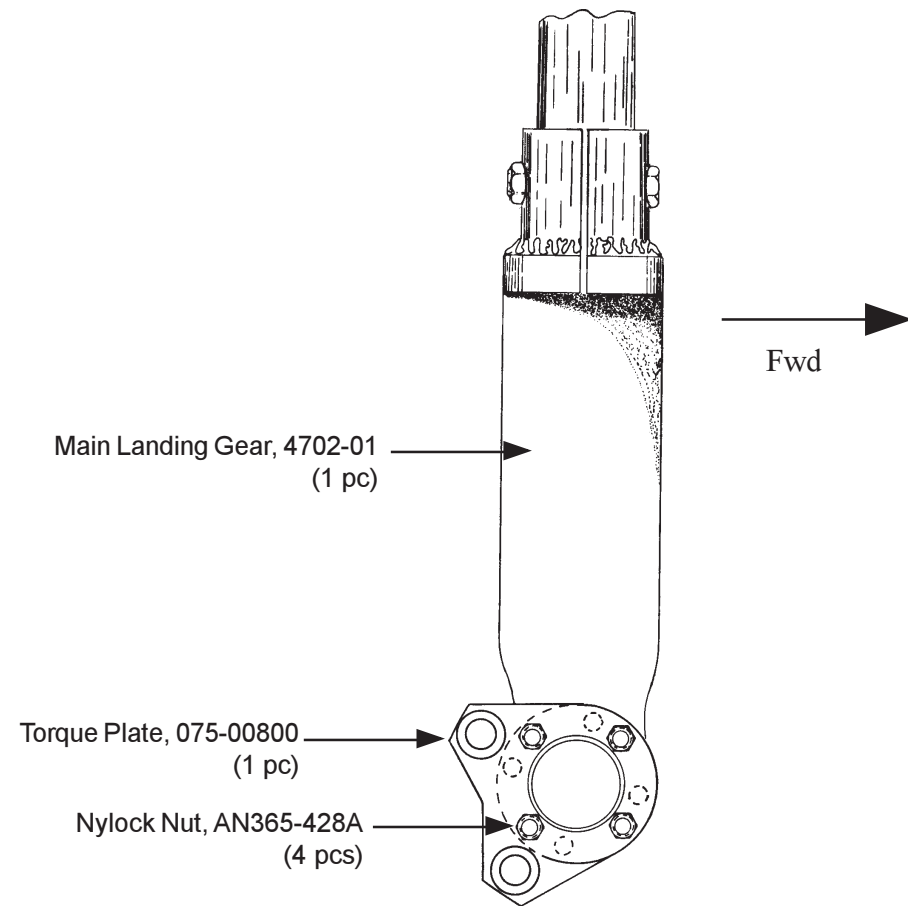


**Main Landing Gear (Exploded View)**  
Fig. 3:F:1



**Note: Tire not shown for clarity. Parts shown & labeled are for left side of the airplane only. Right hand is symmetrically opposite.**

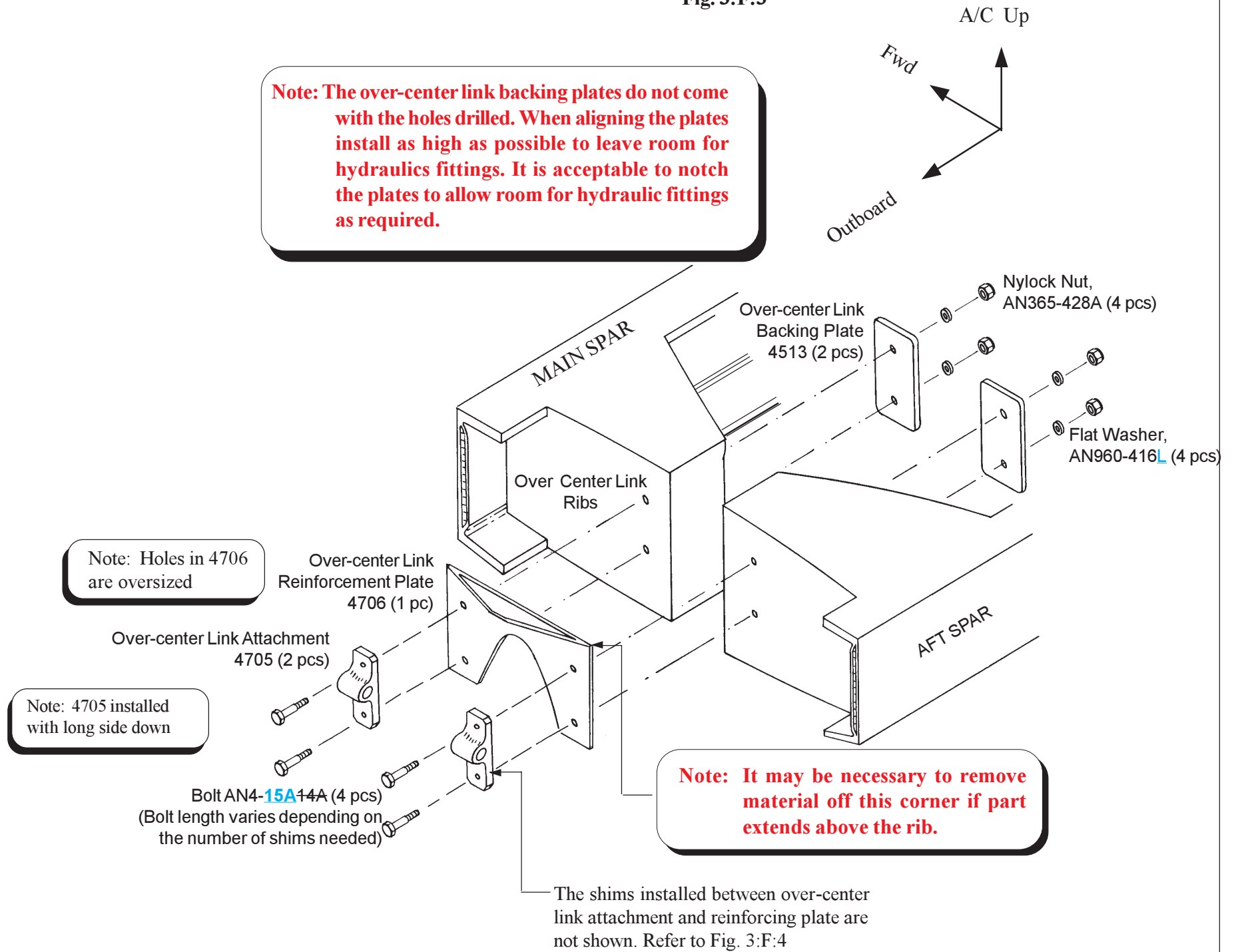
**Torque Plate Positioning**  
Fig. 3:F:2



**Note:**  
Parts shown & labeled are for one side of the airplane only.

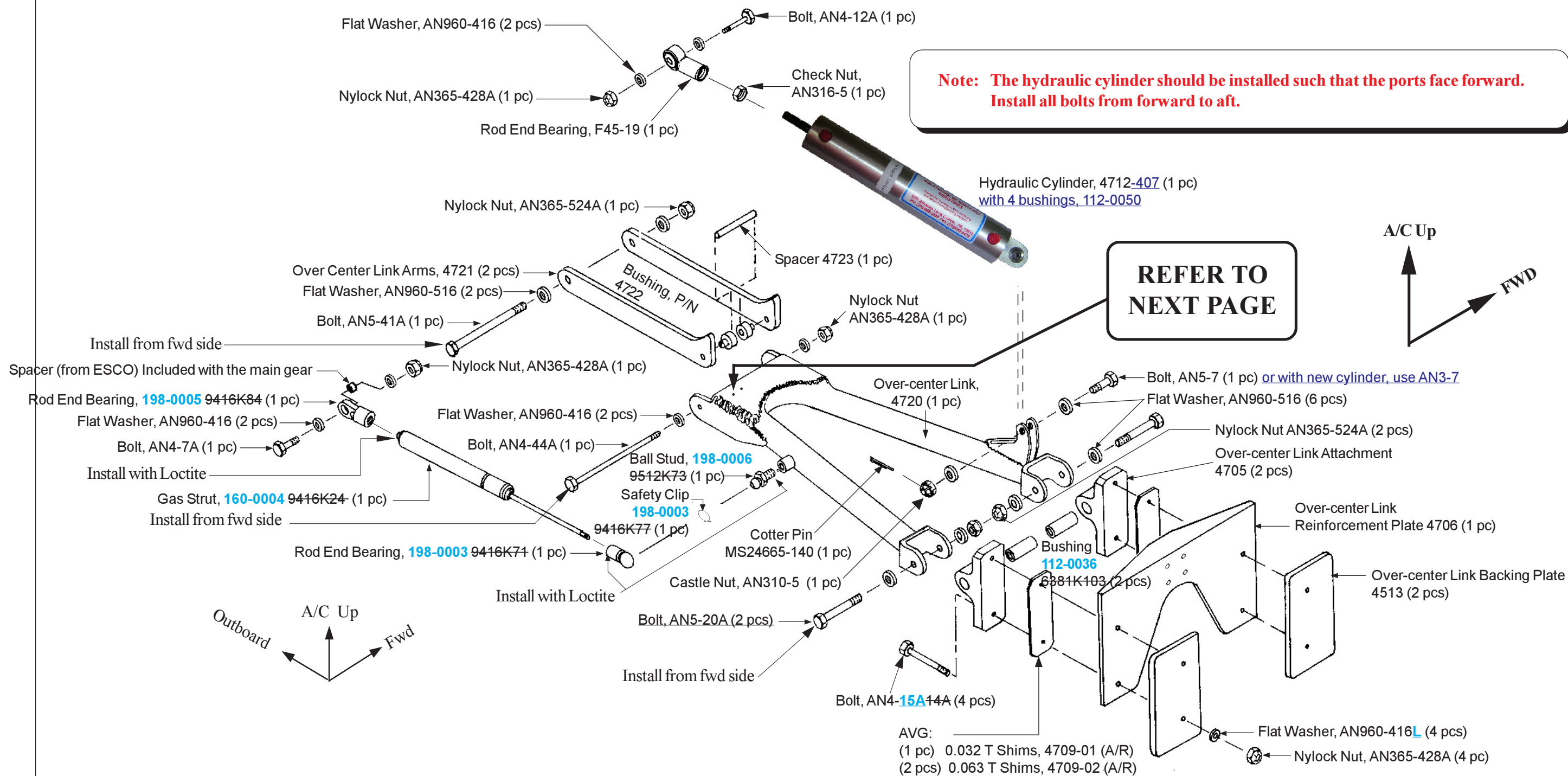
F2. Install the hardware at the center link rib as shown.

**Over Center Link Support Assembly**  
Fig. 3:F:3



### Over Center Link Assembly

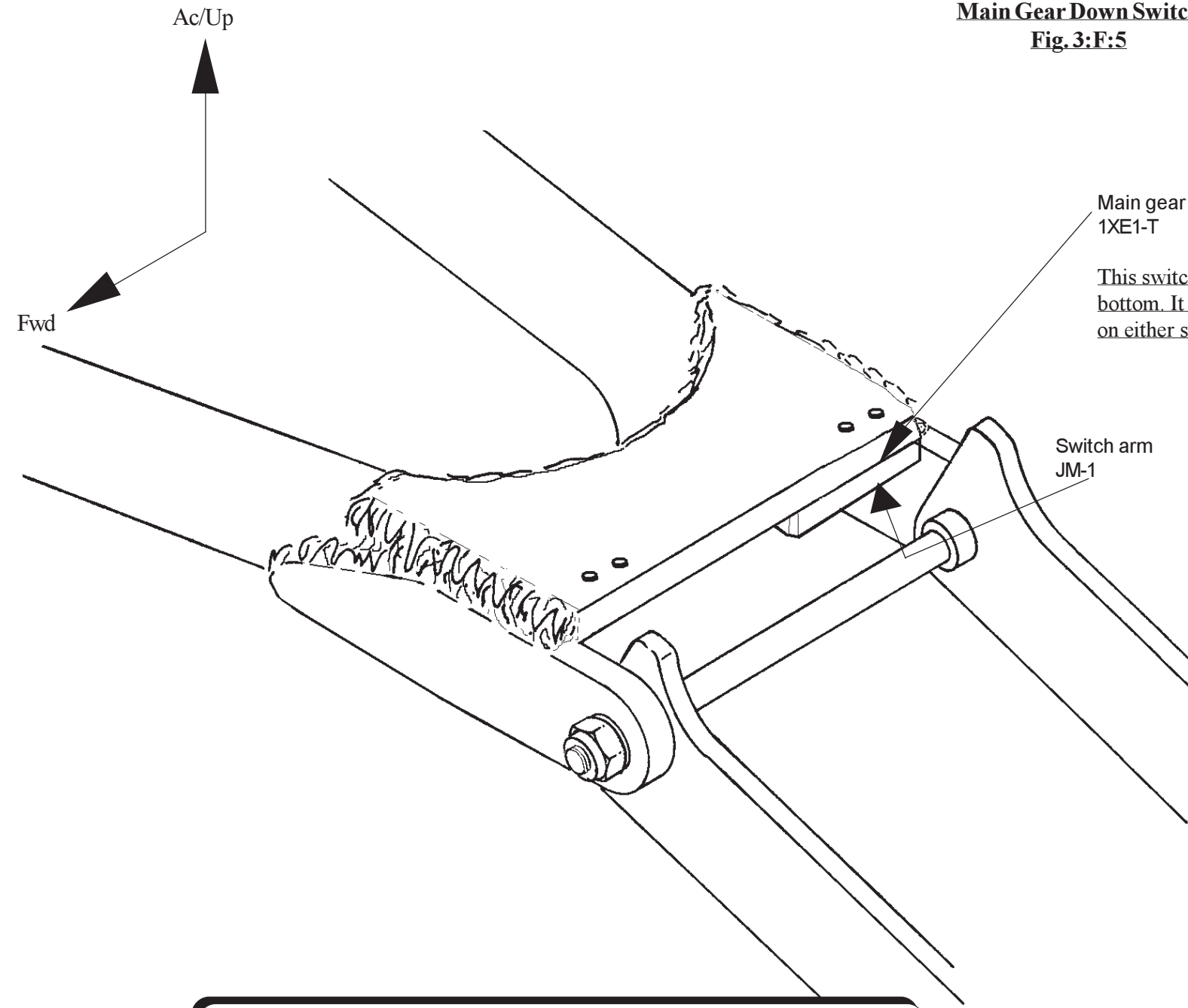
Fig. 3:F:4



**Note** Install the ball stud, part number 198-0006 9512K73 with Loctite 242.



**Main Gear Down Switch**  
**Fig. 3:F:5**



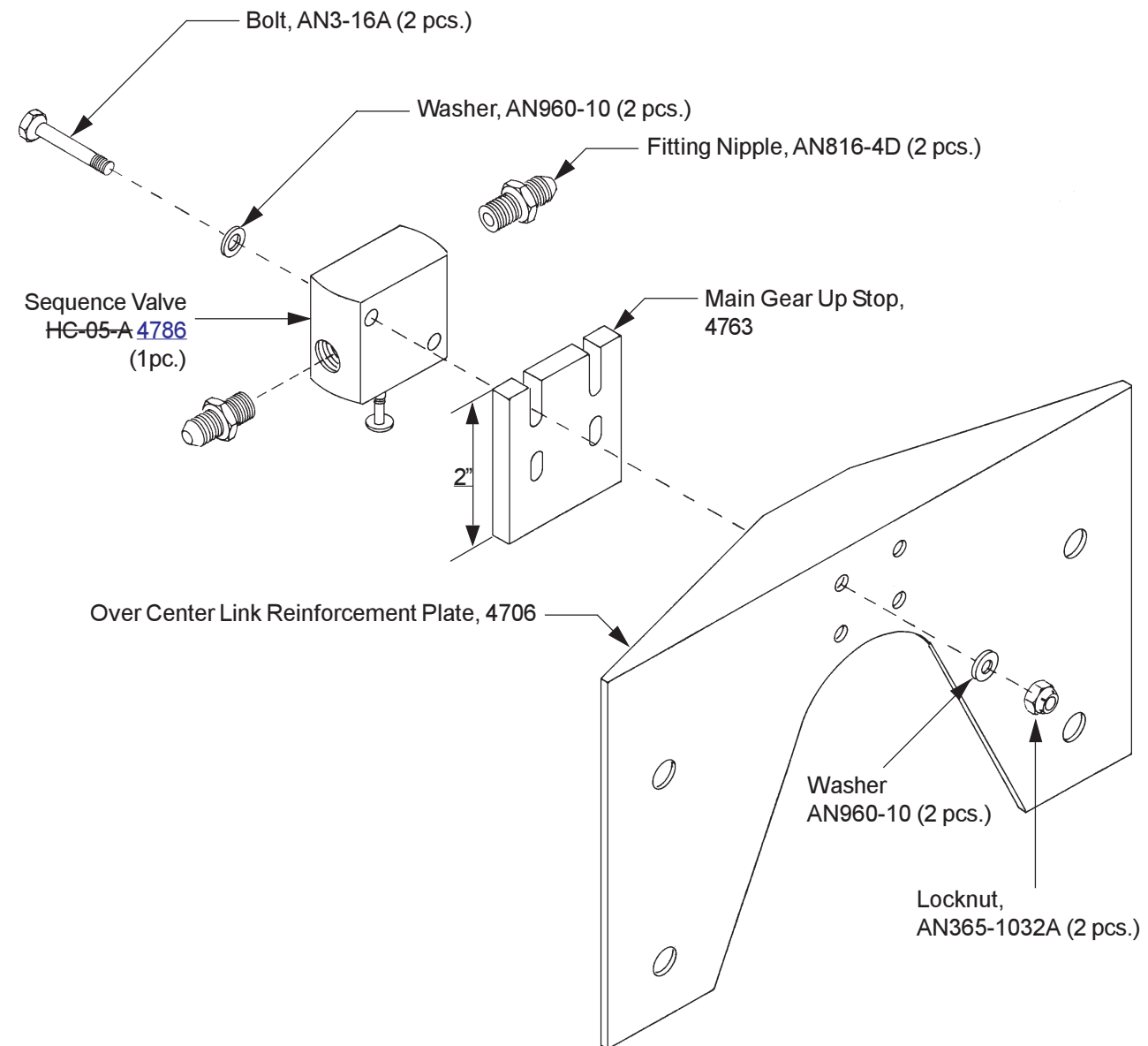
Main gear micro switch 1XE1-T  
This switch installs on the bottom. It can be installed on either side.

Micro switch and switch arm are secured to the 4720 over center linkage with screws provided in the JM-1 packet.



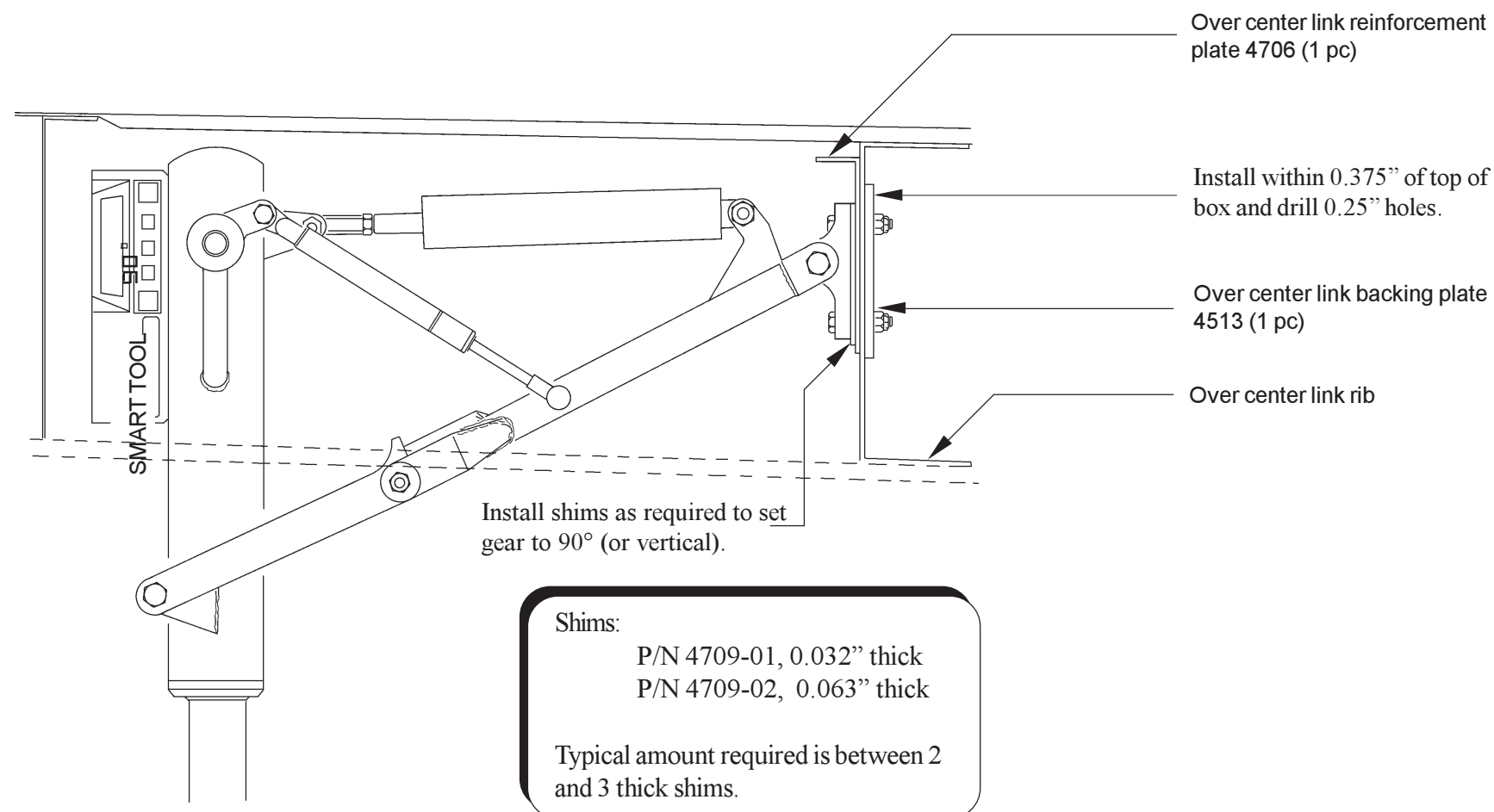
This photograph is taken from beneath the main gear, looking up at the switch.

Sequence Valve/Gear Up Stop  
 Fig. 3:F:7



**Final adjustment of up stop is explained in chapter 16.**

**Over Center Link Reinforcing Plate Shim Installation  
Looking Forward  
Fig. 3:F:8**



**Shims:**  
 P/N 4709-01, 0.032" thick  
 P/N 4709-02, 0.063" thick

Typical amount required is between 2 and 3 thick shims.

**Notes:**

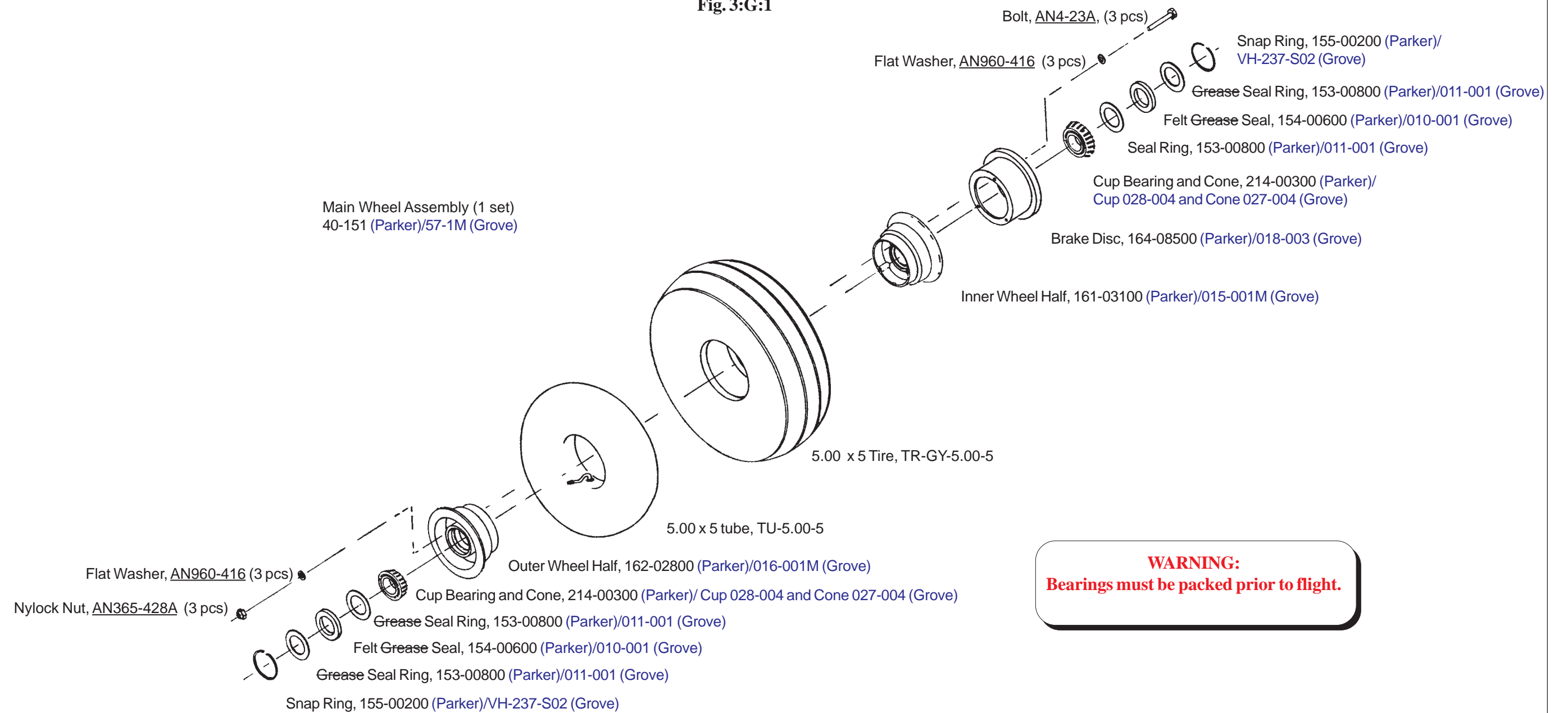
**The aircraft must be level for this step. If the center wing section is bonded refer to Figure 10:A:5. If not, level the center wing section tip to tip.**

**The number of shims are not necessarily the same on the front and the back (but should be very close). With the complete mechanism assembled visually inspect the Z02E973 bushing in the gear leg (Fig. 3:F:1) The bushing should be close to centered. Excessive friction (from binding) may be caused by such a misalignment.**

## G Main Gear Wheels and Tires

The main gear of the Legacy uses 5.00 x 5 wheels & tires. Cleveland wheels and brakes are standard in the kit. Installation of the brakes are in Chapter 18.

**Main Gear Wheels & Tires  
(Exploded View)  
Fig. 3:G:1**

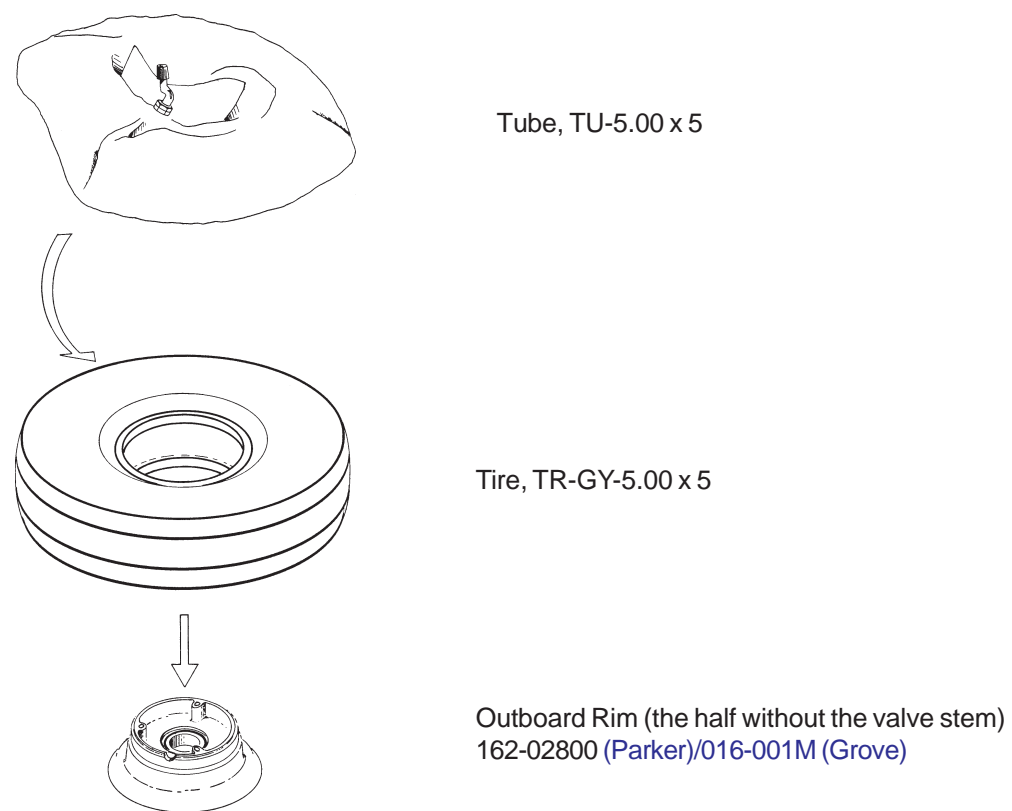


**WARNING:**  
Bearings must be packed prior to flight.

**Note:**  
Parts shown & labeled are for one side of the airplane only.

**G 1.** Insert the 5.00 x 5 tube into the tire. Then inflate the tube with a very small amount of air (just enough to unfold it). This will make the assembly easier and prevent kinks.

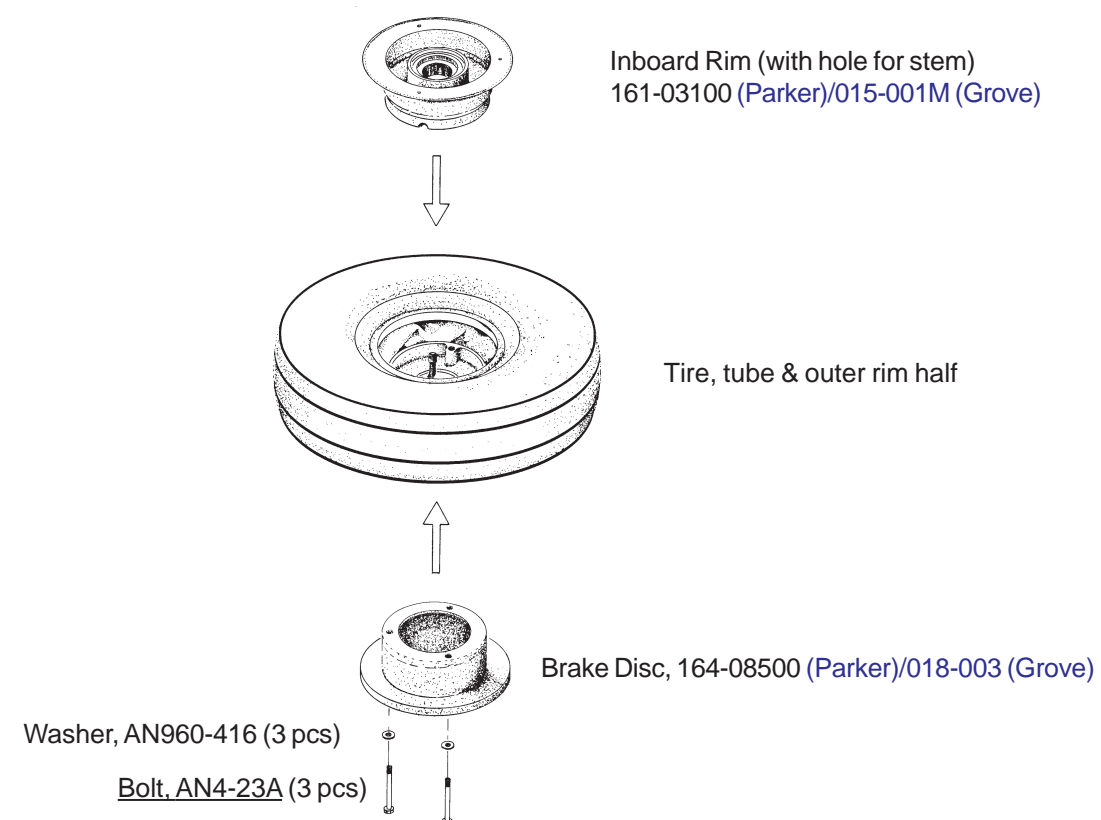
**Wheel Assembly  
Fig. 3:G:2**



**G 2.** Place the tire and tube into the rim you have set on your bench. Push the tire down onto the rim, always avoid pinching the tube. You'll not be able to push the tire all the way onto the rim, the tire will be fully seated with air pressure.

**G 3.** Place the other half of the rim onto the tire, aligning the valve stem hole & the three (3) bolt holes. Pull the valve stem through the rim as you work the rim down. Here is where most people damage the tube. If you're not careful when pushing the rims together, you can easily pinch the tube or stem between the rims. Instant leak! This problem can be avoided by just being careful & aware of the danger.

**Wheel Assembly  
Fig. 3:G:3**



**G 4.** Before the two halves of a Cleveland rim can be secured together, the brake disc assembly must be placed onto the inboard face of the wheel (the side opposite the valve stem). The two rim halves & the brake disc are secured together with the manufacturer supplied bolts and nuts.

**G 5.** Inflate the Goodyear tires 45 to 50 psi. It is a good idea to do this a few times before full inflation. This will help loosen any folds in the tube.



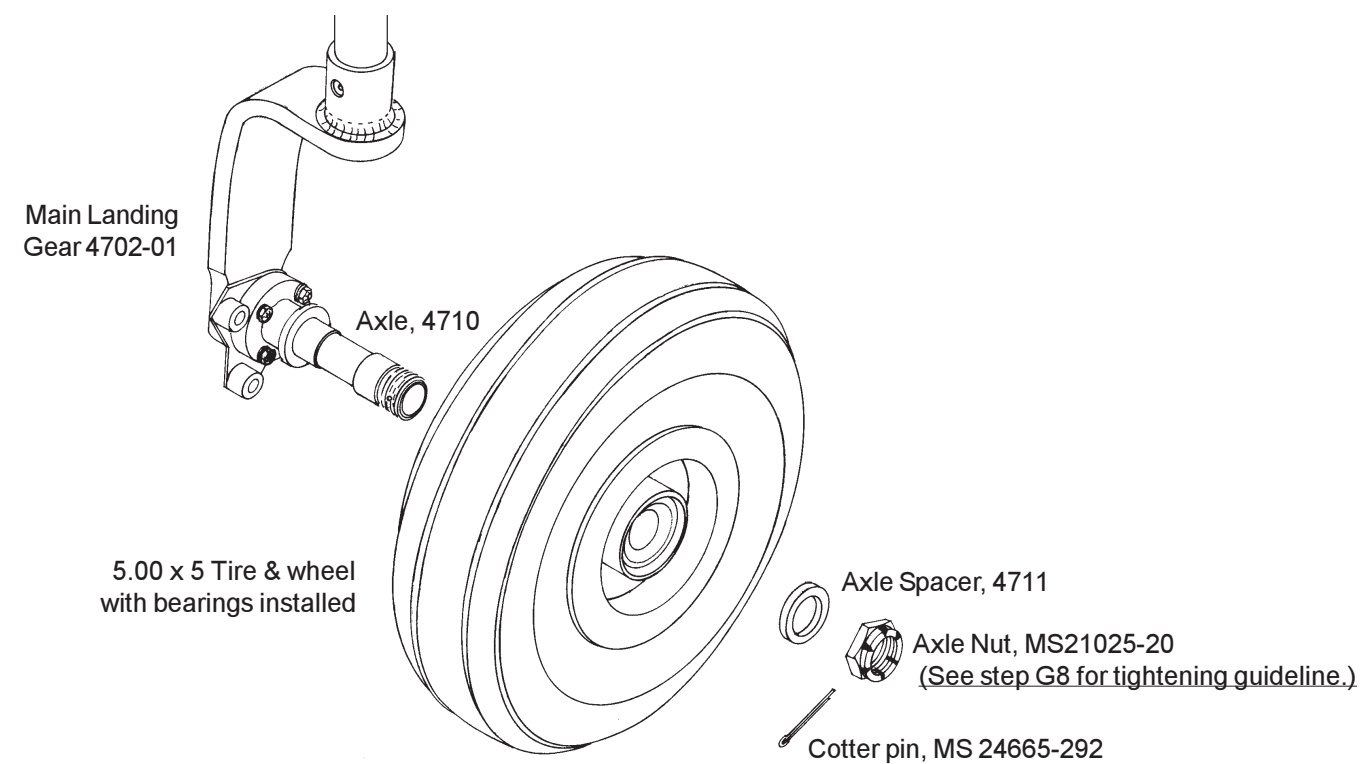
**G 6.** Grease the two wheel bearings with quality grease, making sure the grease penetrates the entire bearing.

**G 7.** Place the bearings into the races of the wheel. On the Cleveland wheel, after the bearings are placed into the race, a seal consisting of two thin steel washers and a felt washer is secured with a retainer ring. The seals and the rings retain the bearings in the wheel.

**G 8.** Now the wheels are ready to be mounted on the axles. Carefully slide the wheel onto the axle until the inboard bearing has been seated. Secure the wheel with an MS21025-20 axle nut. Tighten the nut until there is no slop in the wheel bearings. The axle nut should be tightened so when you spin the wheel it rotates approximately one turn. Then lock the axle nut into position with a MS24665-292 cotter pin.

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**Securing Wheels to Axles**  
**Fig. 3:G:4**



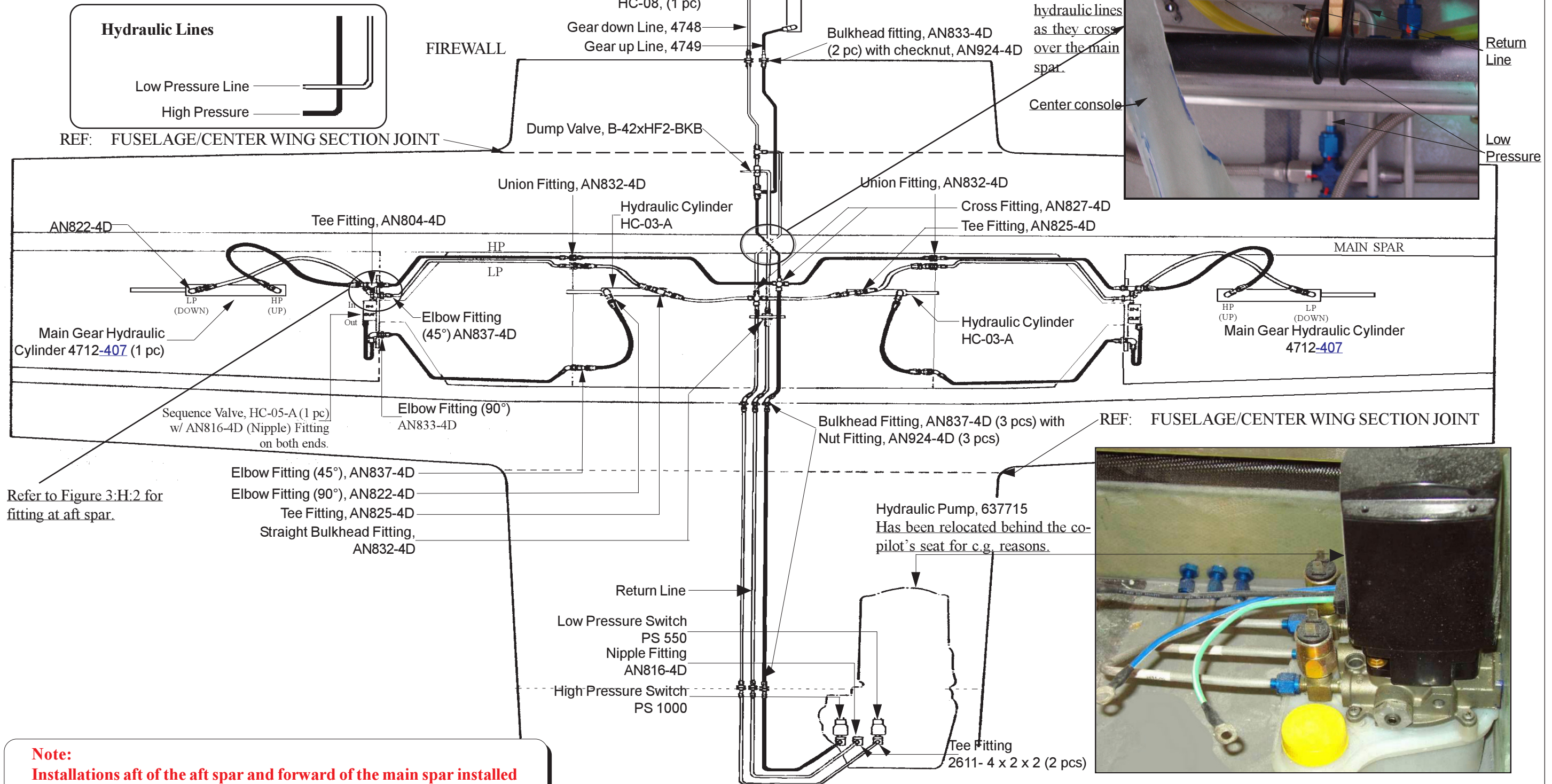
**Note: Parts shown & labeled are for one side of the airplane only.**

## H. Center Wing Section Hydraulics

To view the schematics of all line layouts, see pages 3-35 through 3-37.

Center Wing Section Hydraulic line Schematic drawing

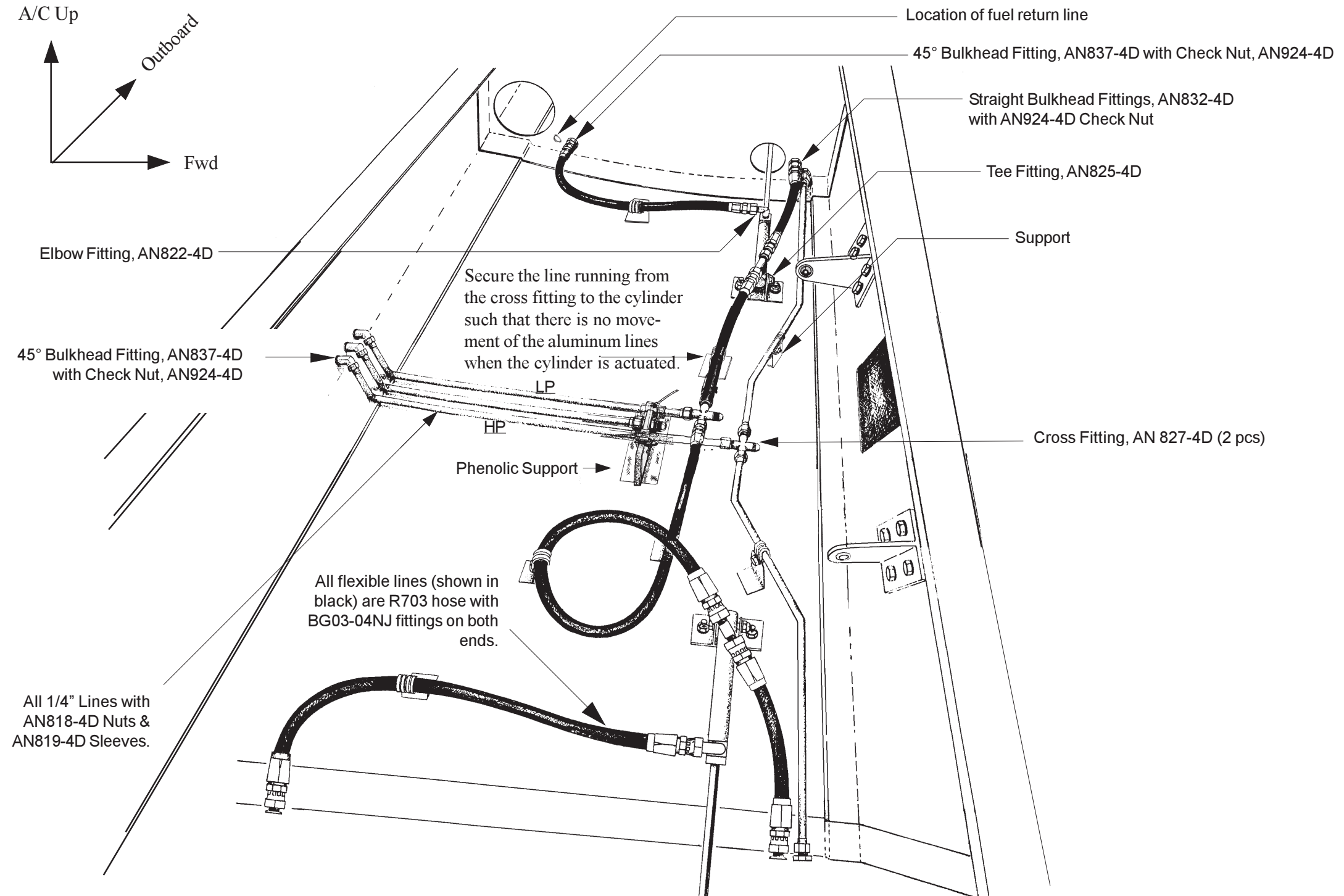
Refer to this photo to review the shape of the hydraulic lines as they cross over the main spar.



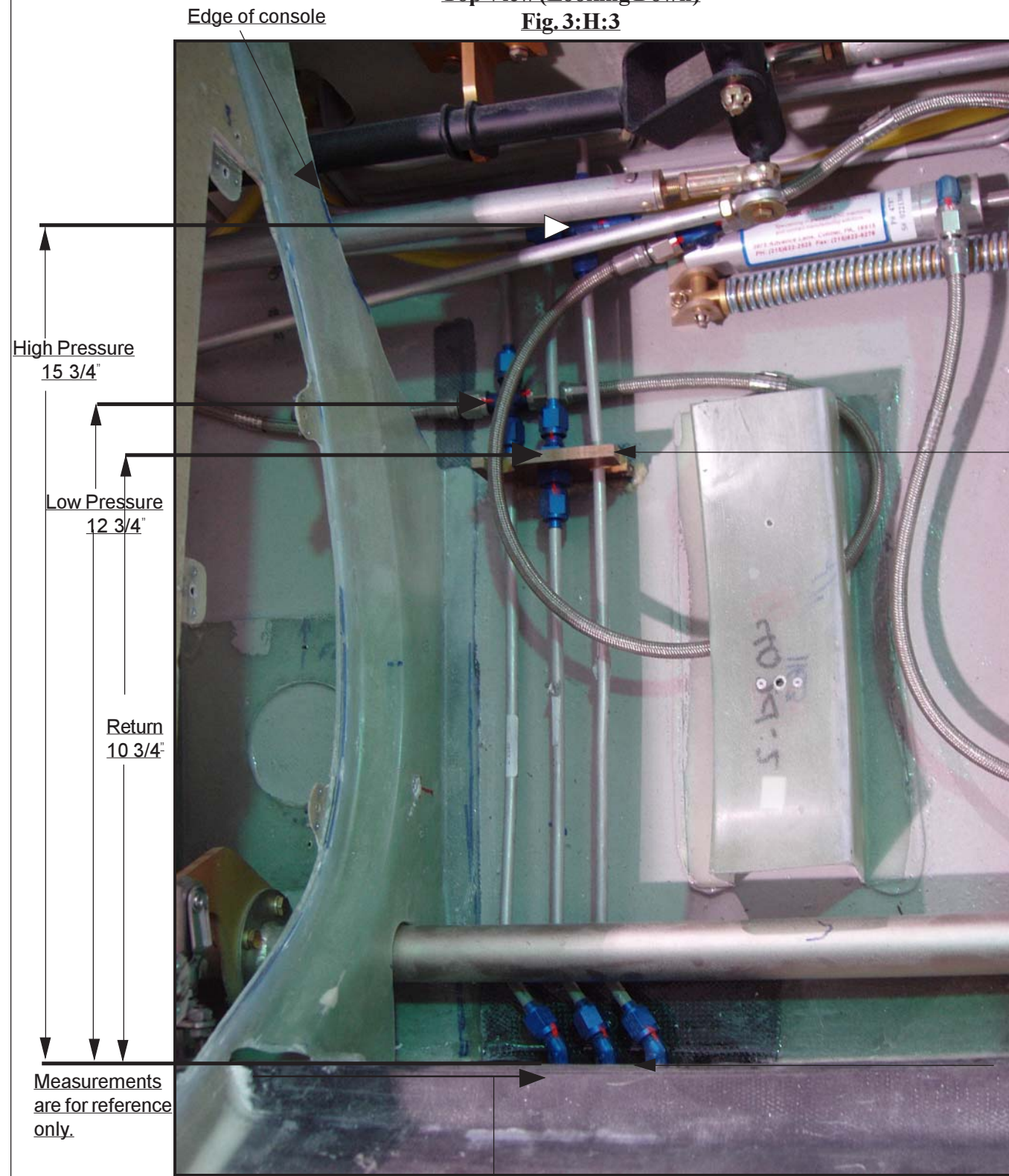
**Note:** Installations aft of the aft spar and forward of the main spar installed in chapter 16. This is a schematic only. Refer to following pages for exact routing.

**Center Wing Section Hydraulic Lines Routing**

**Fig. 3:H:2**

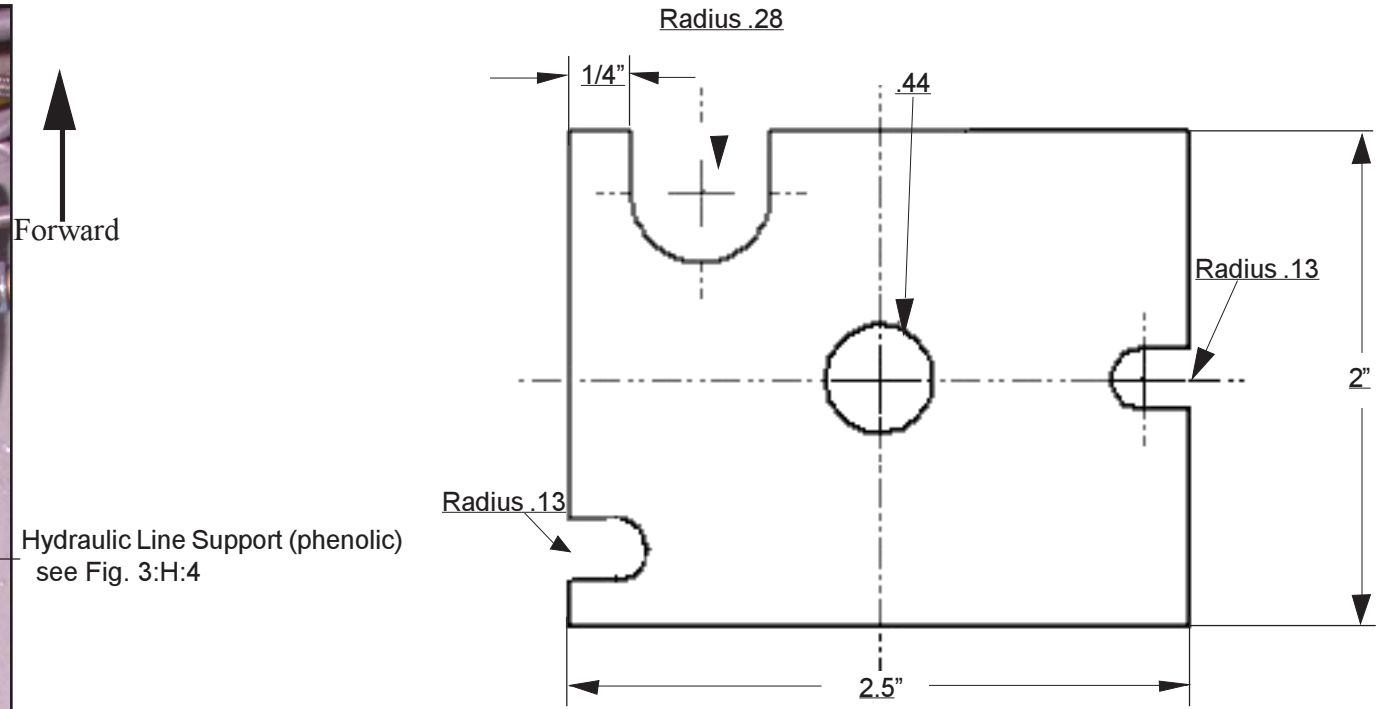


**Positioning of Hydraulic lines  
Top View (Looking Down)  
Fig. 3:H:3**



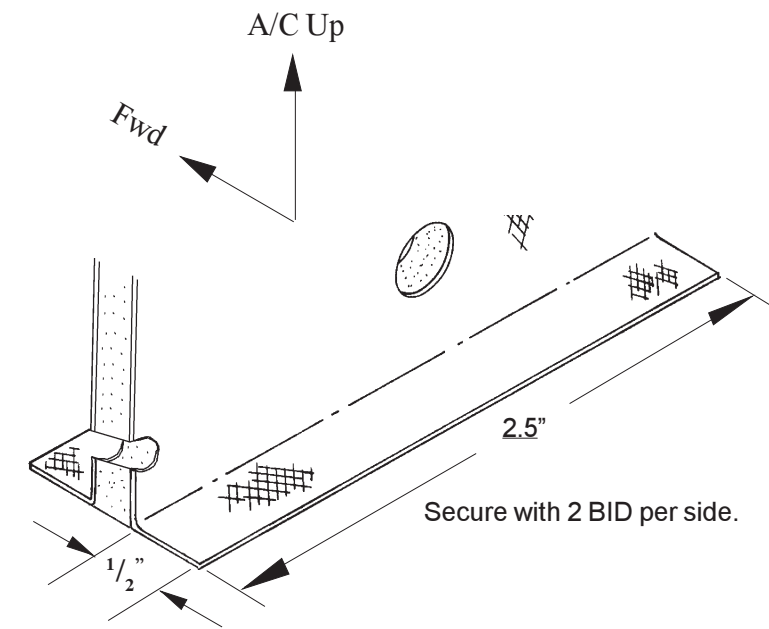
The first hole needs to be located 6" from the center line.

**Suggested Hydraulic Line Support (New layout)  
Fig. 3:H:4**



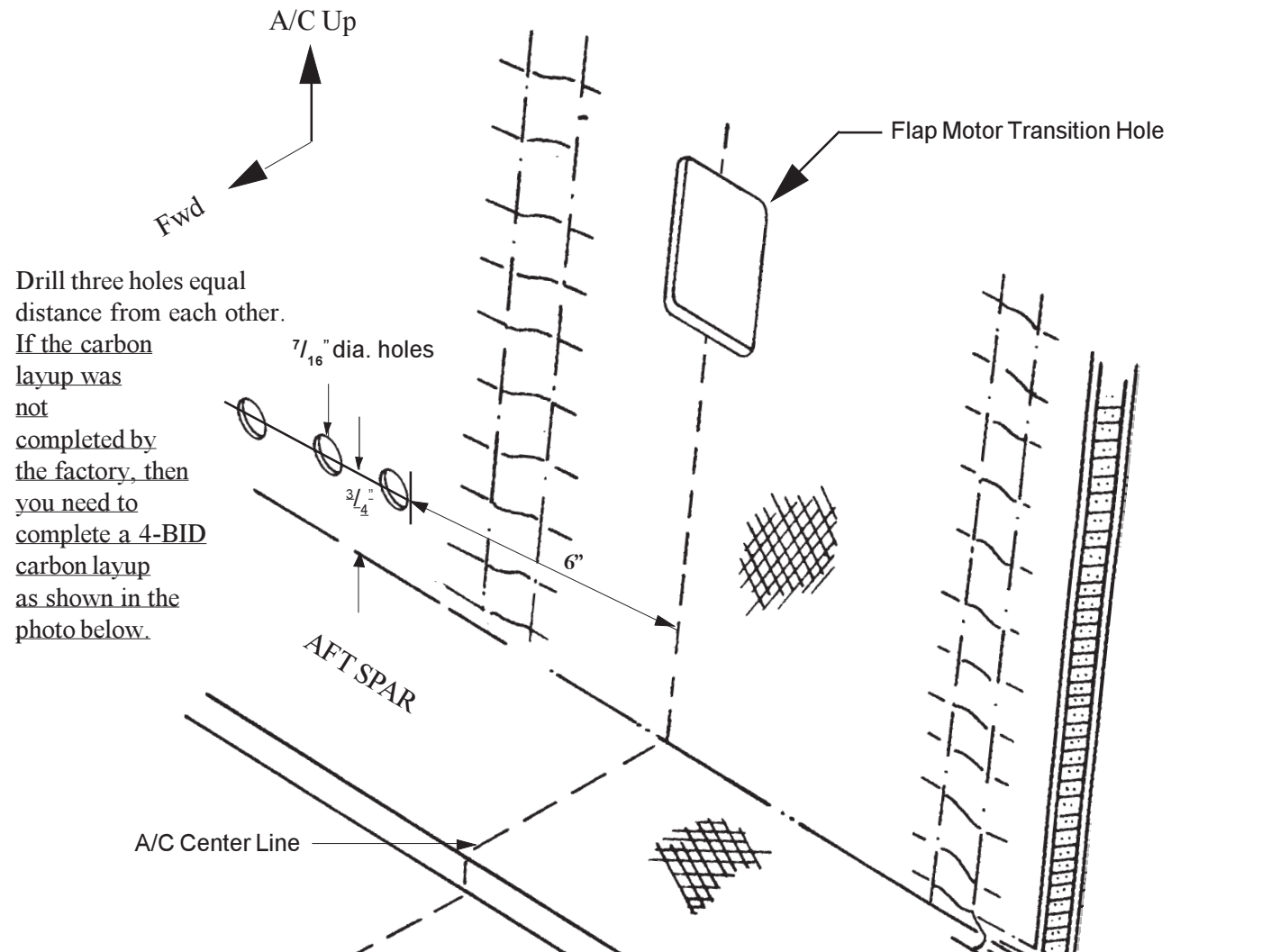
Hydraulic Line Support (phenolic)  
see Fig. 3:H:4

For hole dimensions  
see Fig. 3:H:5

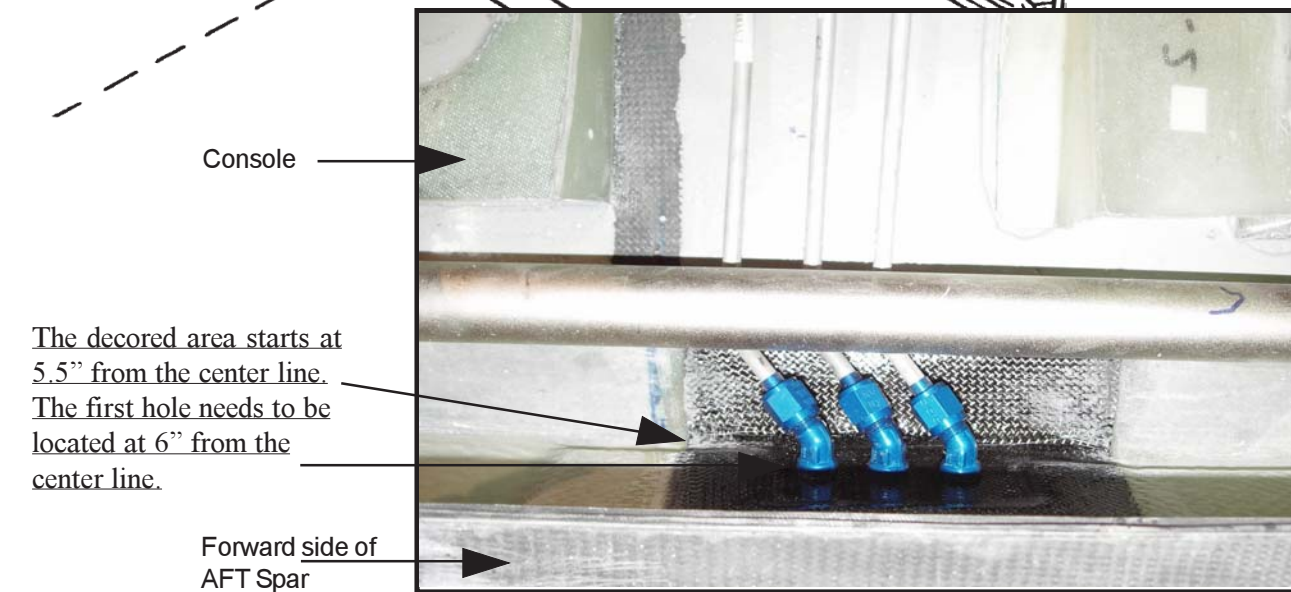


**Aft Spar Hydraulic Line Transition Holes**

**Fig. 3:H:5**



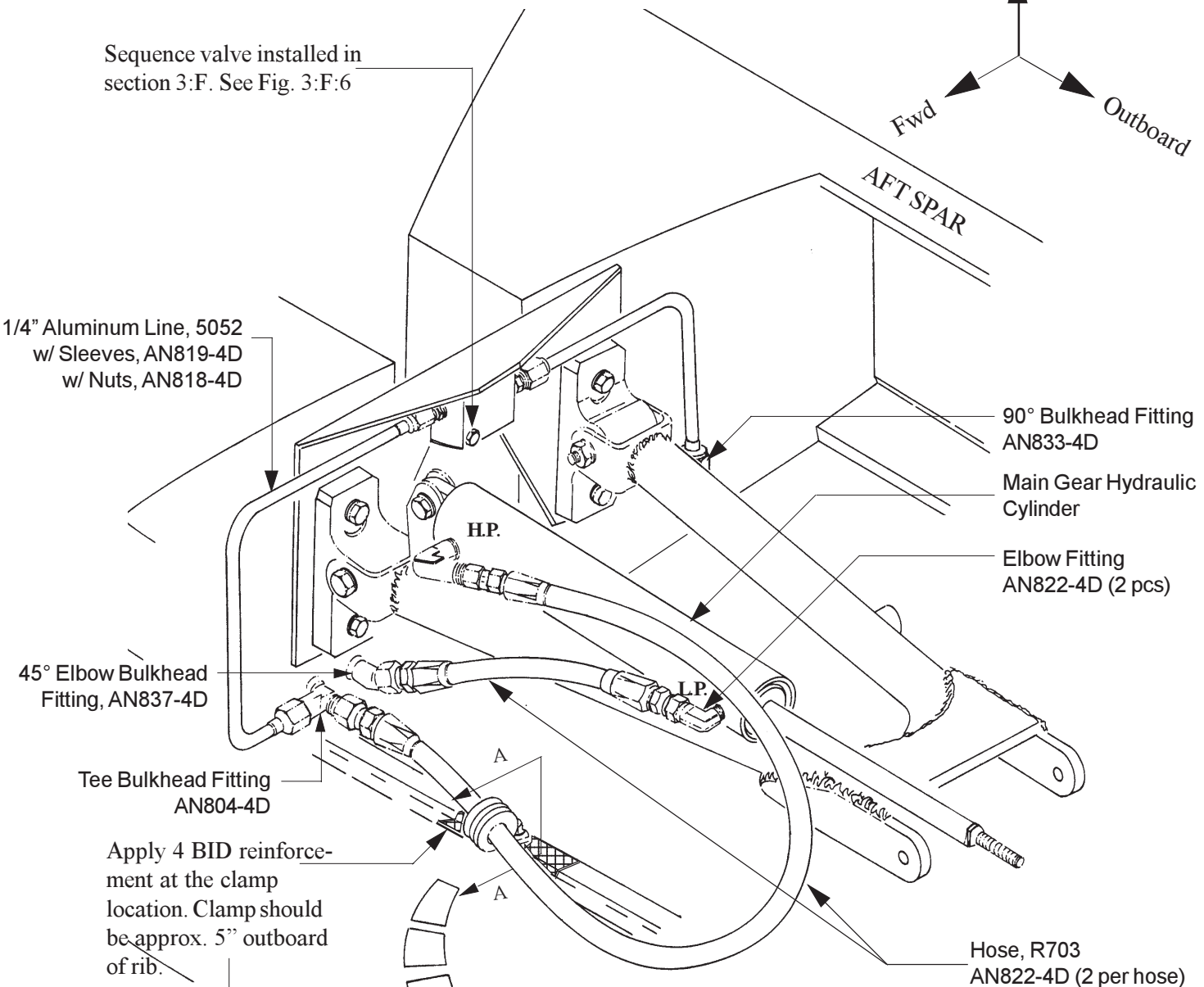
Drill three holes equal distance from each other. If the carbon layup was not completed by the factory, then you need to complete a 4-BID carbon layup as shown in the photo below.



The decored area starts at 5.5" from the center line. The first hole needs to be located at 6" from the center line.

**Sequence Valve Installation**

**Fig. 3:H:6**



Sequence valve installed in section 3:F. See Fig. 3:F:6

1/4" Aluminum Line, 5052 w/ Sleeves, AN819-4D w/ Nuts, AN818-4D

45° Elbow Bulkhead Fitting, AN837-4D

Tee Bulkhead Fitting AN804-4D

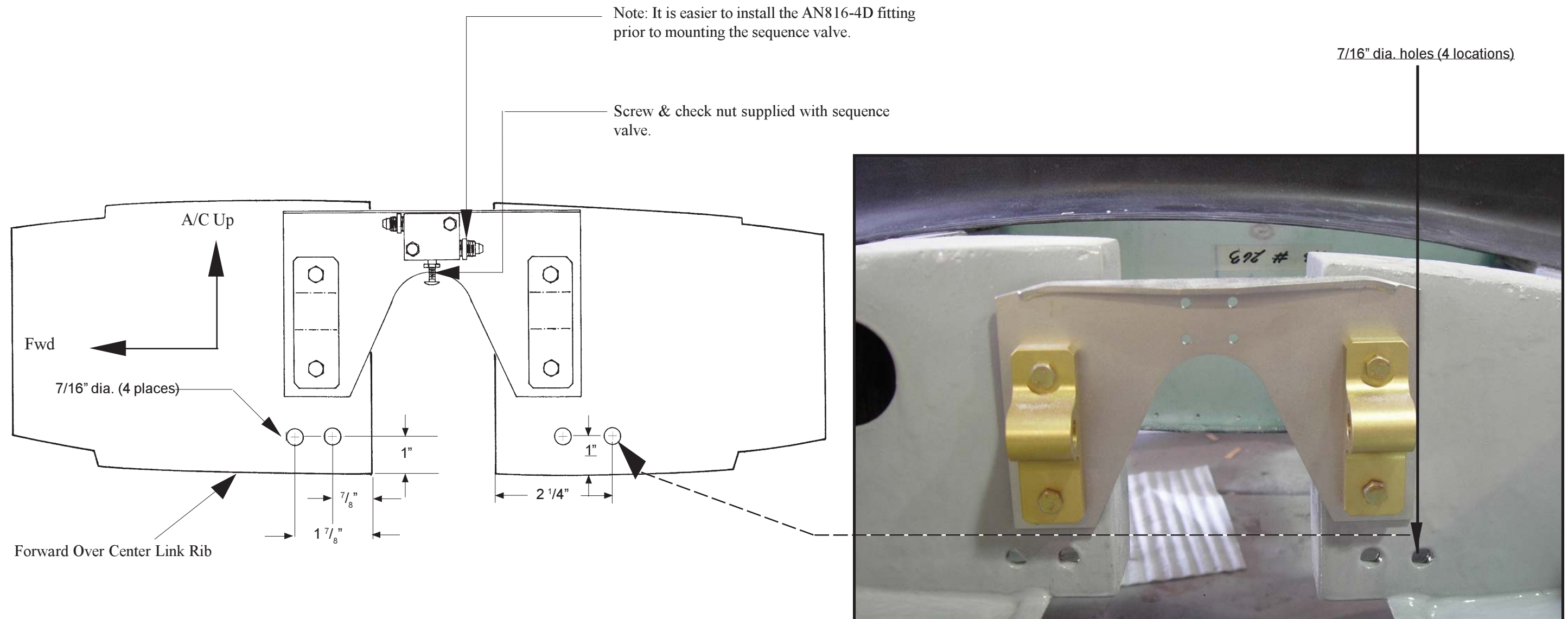
Apply 4 BID reinforcement at the clamp location. Clamp should be approx. 5" outboard of rib.

**Note: Parts shown & labeled are for one side of the airplane only.**

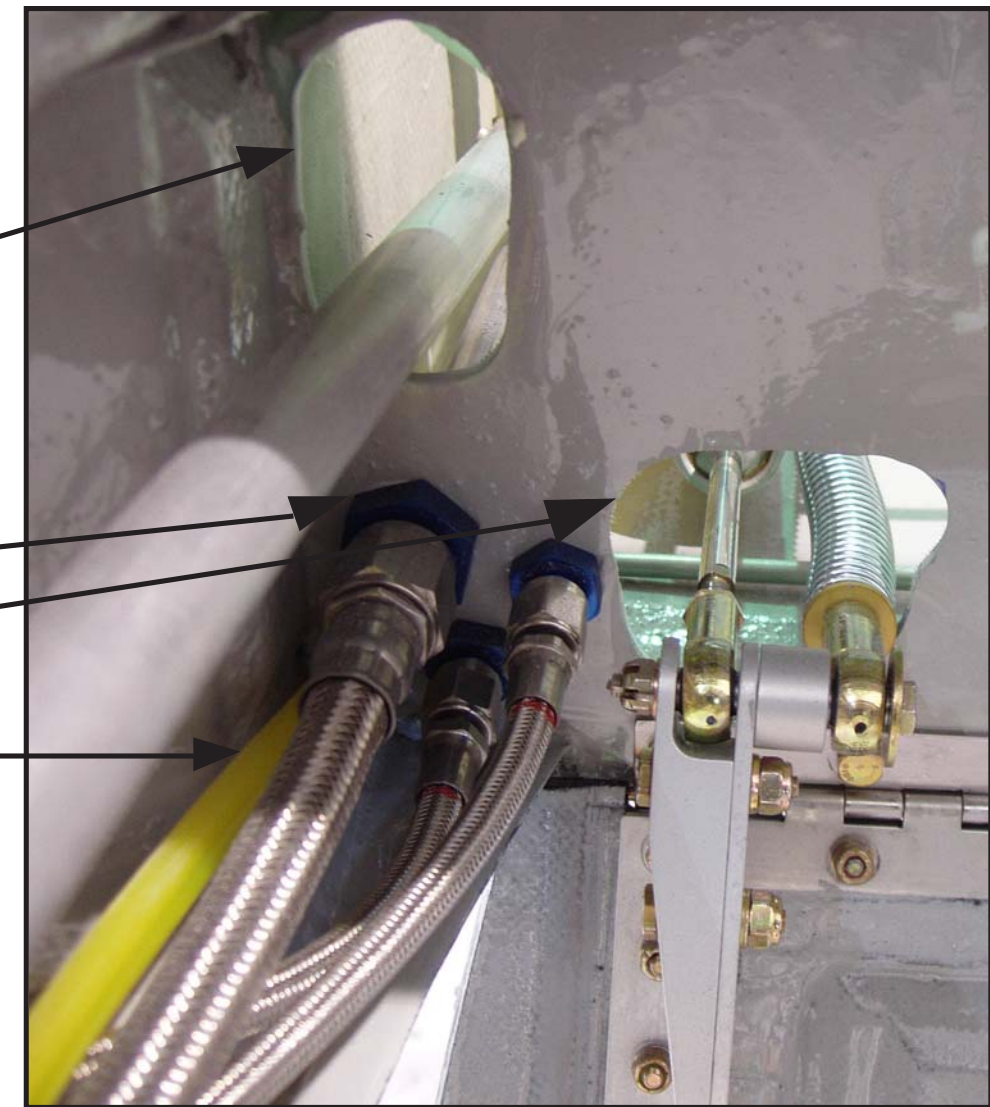
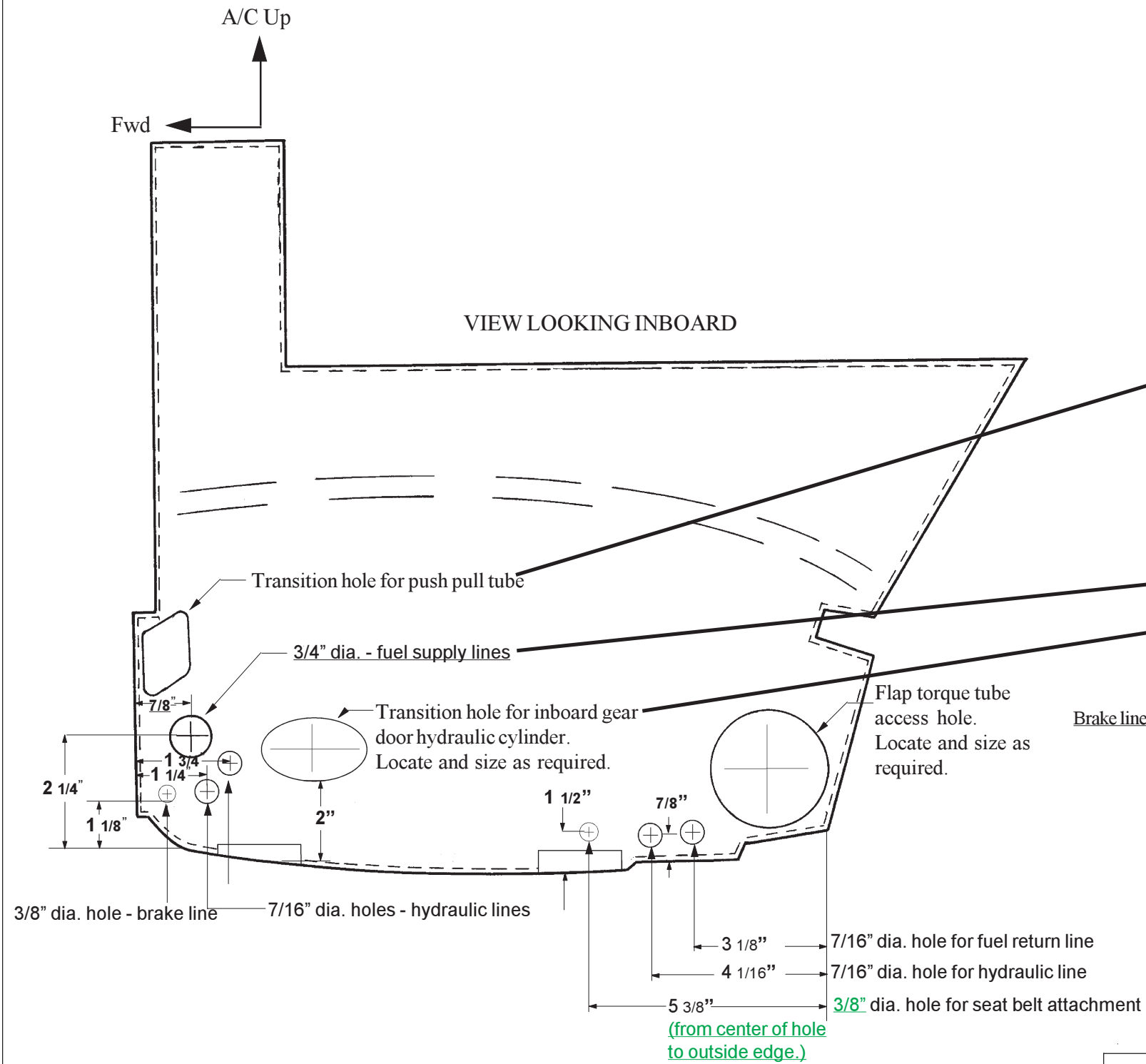
MS21919-DG8 clamp secured with screw, AN960-10 Washer AN365-1032A Nylock Nut

Prior to drilling each hole check the inboard side to ensure that the fitting is installed in a suitable location. It must clear the backing plate (p/n 4513) and mount on the flat surface. It is acceptable to trim a small amount of the backing plate to make room to install the fitting.

**Sequence Valve Installation**  
**Continued**  
**Fig. 3:H:7**



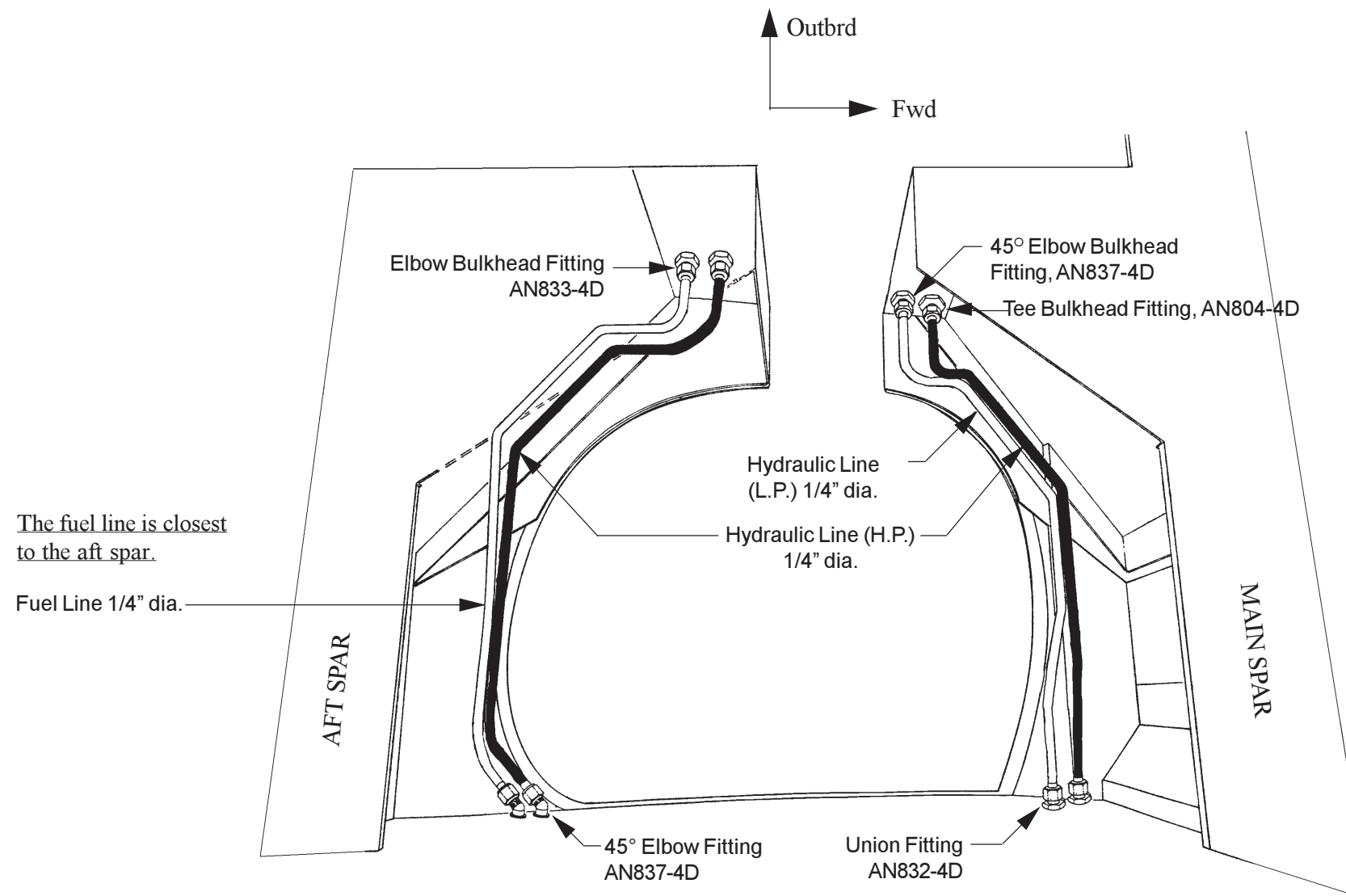
**Transition Holes for Aft Load Pad 19 Rib**  
**Fig. 3:H:8**



### Hydraulic Line Routing through Gear Well

Fig. 3:H:9

The fuel and hydraulic lines on the aft side of the gear well must be kept clear of the flap torque tube. We suggest that you temporarily install the flap tube support brackets for reference. Refer to figure 21:A:1.

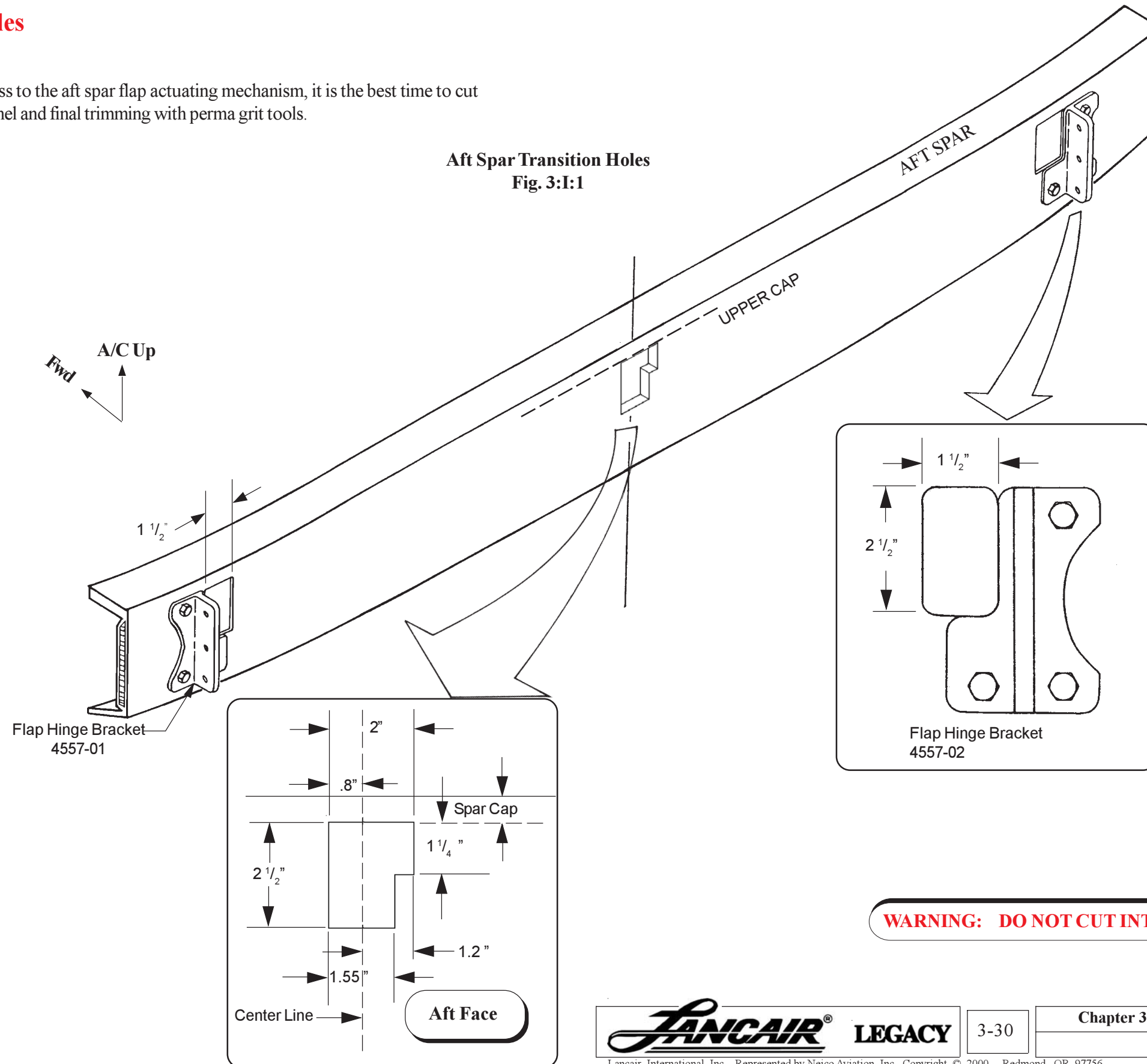


All lines must be kept clear of opening for the tire clearance. Secure the lines using one of the methods described in Chapter 1.



## I. Aft Spar Transition Holes

While you have easy access to the aft spar flap actuating mechanism, it is the best time to cut the holes. We suggest using a dremel and final trimming with perma grit tools.



## J. Landing and Taxi Lights (Optional)

Landing/Taxi Light Exploded View  
Fig. 3:J:1

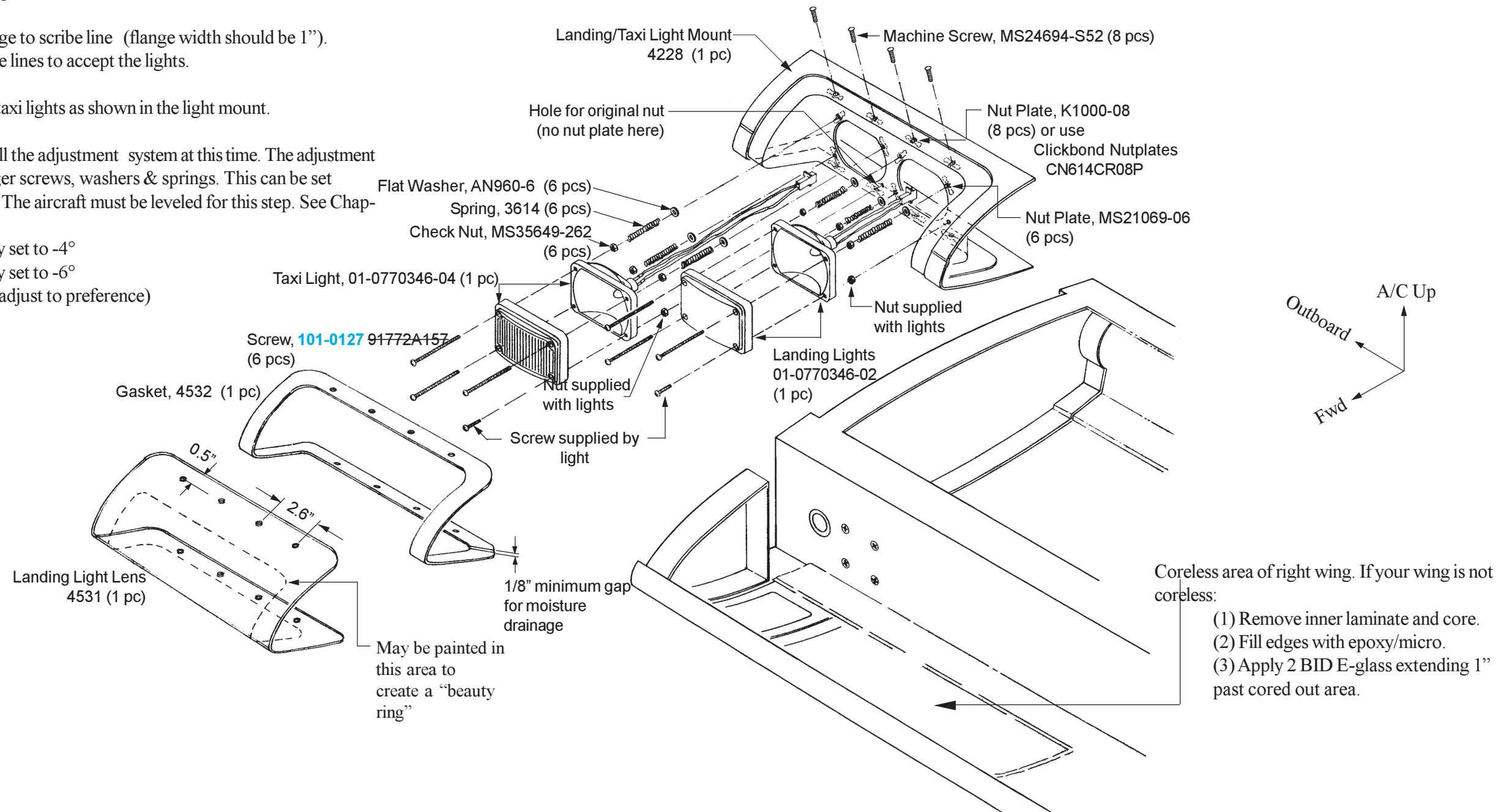
The landing/taxi light kits are available through KCI. They are available for both the left and the right side.

- J 1.** Trim the landing/taxi light mount to the scribe lines. There are two sets of scribe lines:
- 1) Trim the mount flange to scribe line (flange width should be 1").
  - 2) Trim mount to scribe lines to accept the lights.

- J 2.** Install the landing and taxi lights as shown in the light mount.

Note: it isn't necessary to install the adjustment system at this time. The adjustment mechanism consists of the longer screws, washers & springs. This can be set anytime after closing the wing. The aircraft must be leveled for this step. See Chapter 7.

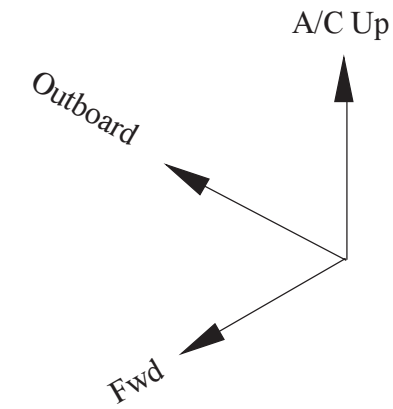
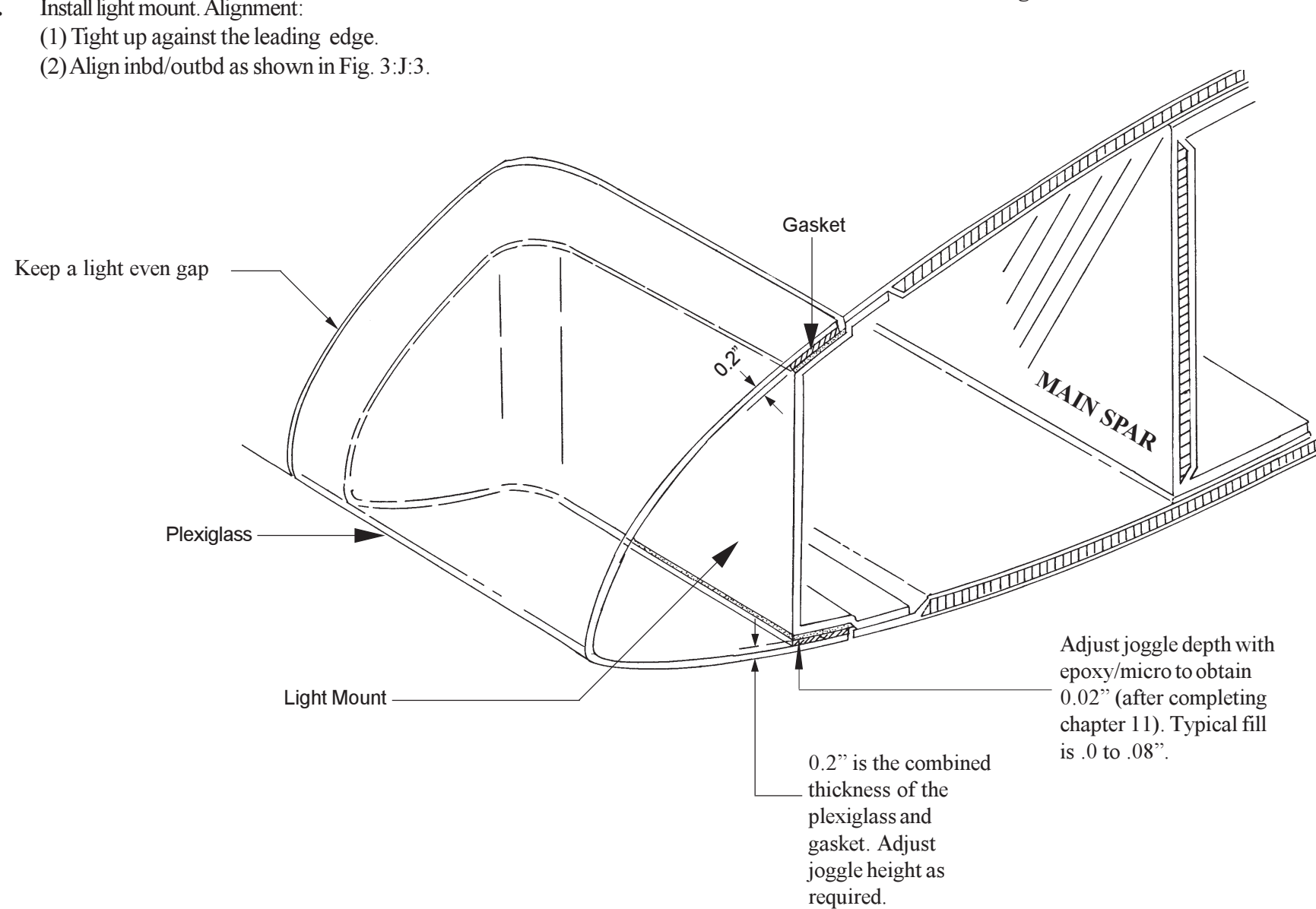
Taxi Light: initially set to  $-4^{\circ}$   
Landing Light: initially set to  $-6^{\circ}$   
(Final adjust to preference)



**Note: Optional Parts available through Kit Components Inc.**

**Cross section of Light  
Assembled View  
Fig. 3:J:2**

- J 3.** Install light mount. Alignment:  
(1) Tight up against the leading edge.  
(2) Align inbd/outbd as shown in Fig. 3:J:3.

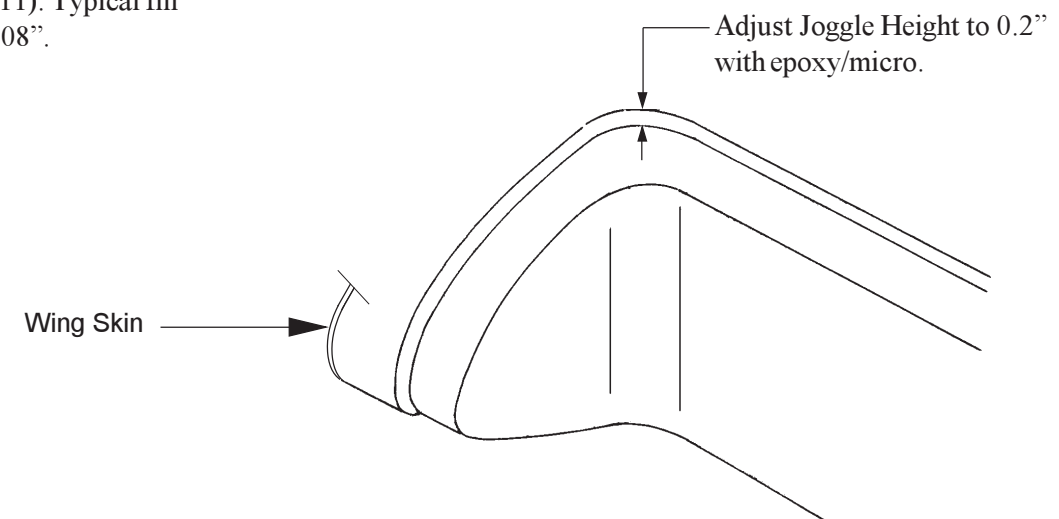


- J 6.** Trim the plexiglass to fit the opening. We suggest temporarily installing small pieces of gasket material to simulate gasket thickness.  
**J 7.** Using a plexiglass drill bit install the lens.

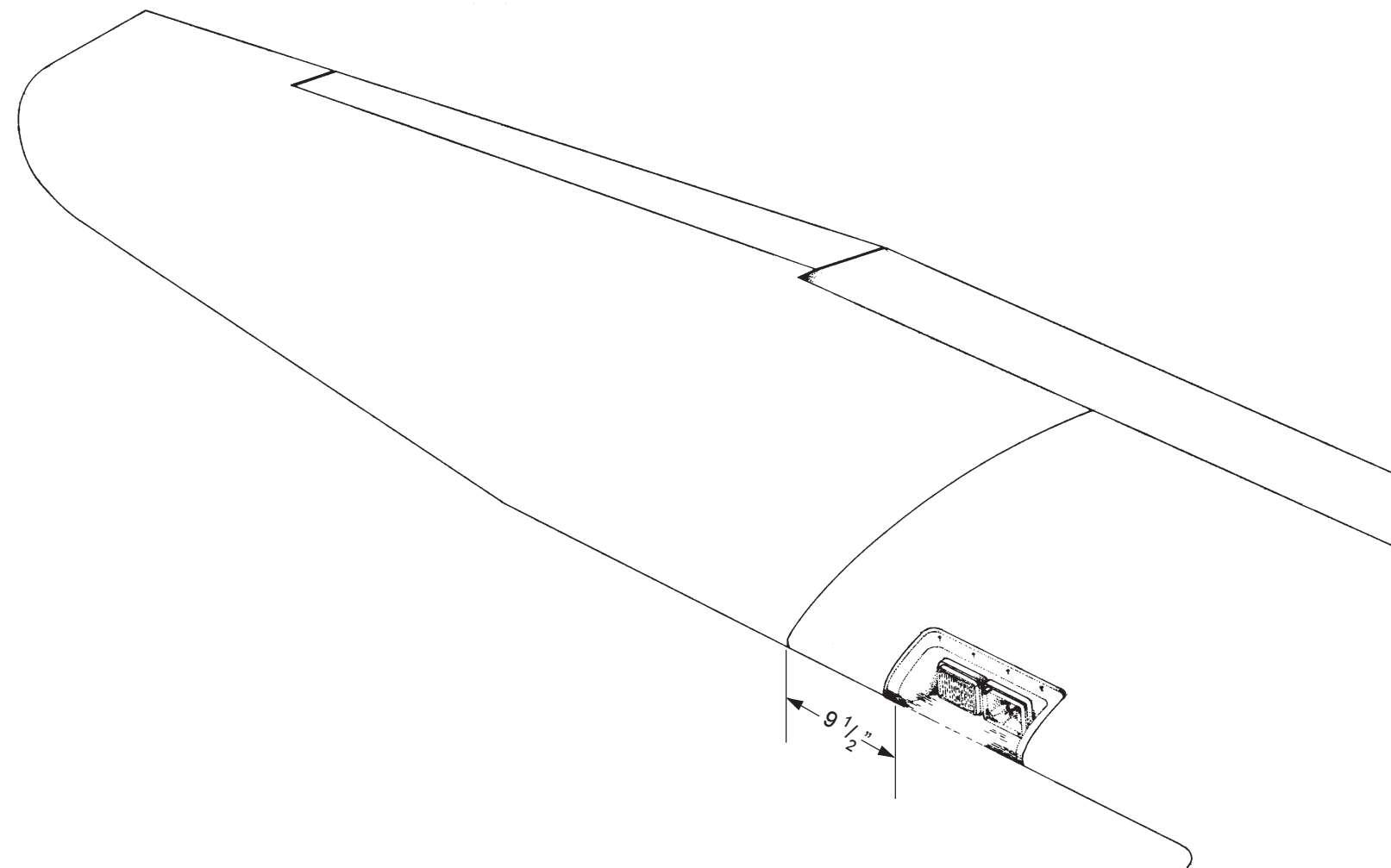
- J 4.** After the wing is closed, trim the skin up to the edge of joggle as shown.  
**J 5.** Adjust joggle thickness to 0.2". At 0.2" the lens will be flush with wing skin.

Adjust joggle depth with epoxy/micro to obtain 0.02" (after completing chapter 11). Typical fill is .0 to .08".

0.2" is the combined thickness of the plexiglass and gasket. Adjust joggle height as required.



Landing/Taxi Light Installed  
Fig. 3:J:3

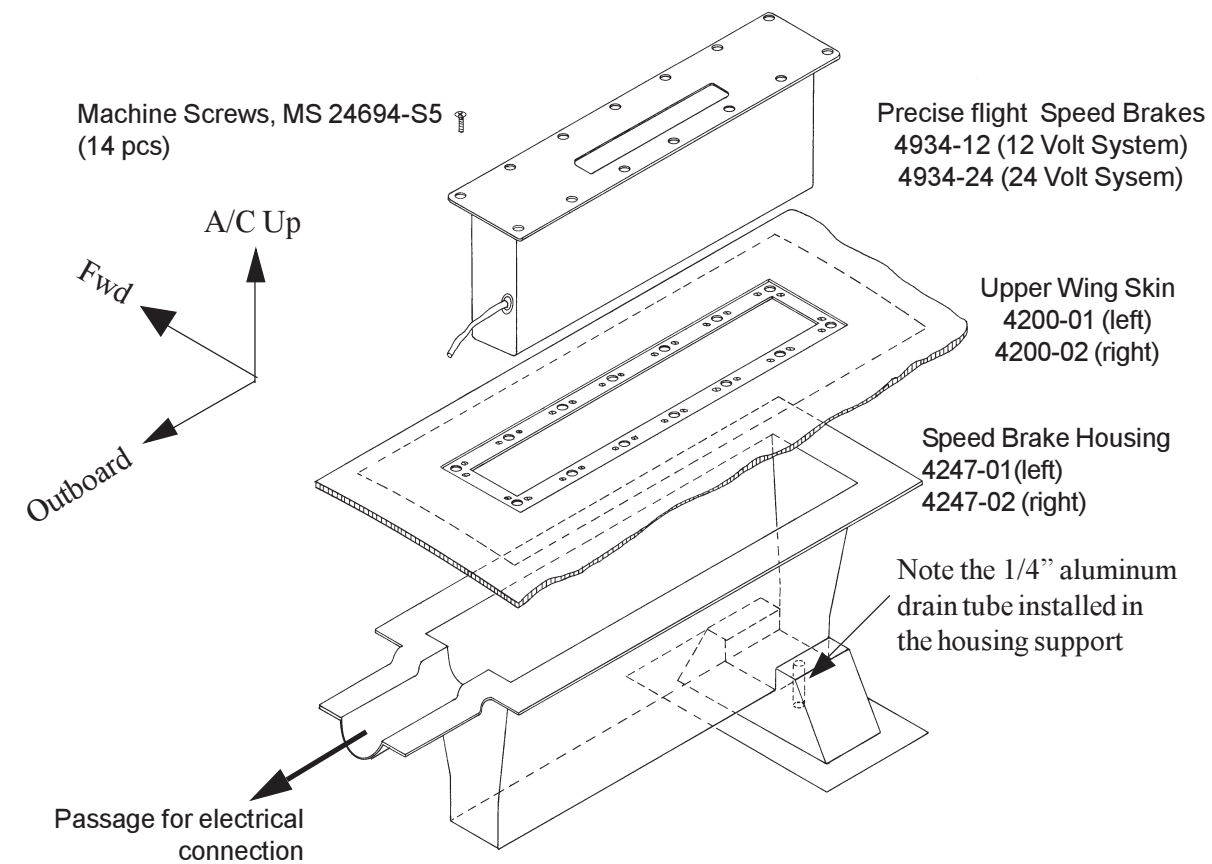


**J 8.** Install the lights. Install the gasket, lights and lens with the adjustment mechanism and set . Note: One of the four screws of the light remains. The adjustment mechanism consists of three (3) screws. The fourth screw is the original screw holding the light together.

**Note:** Beauty ring not shown for clarity  
Optional Parts available through Kit Components Inc.

## K. Speed Brakes (Optional)

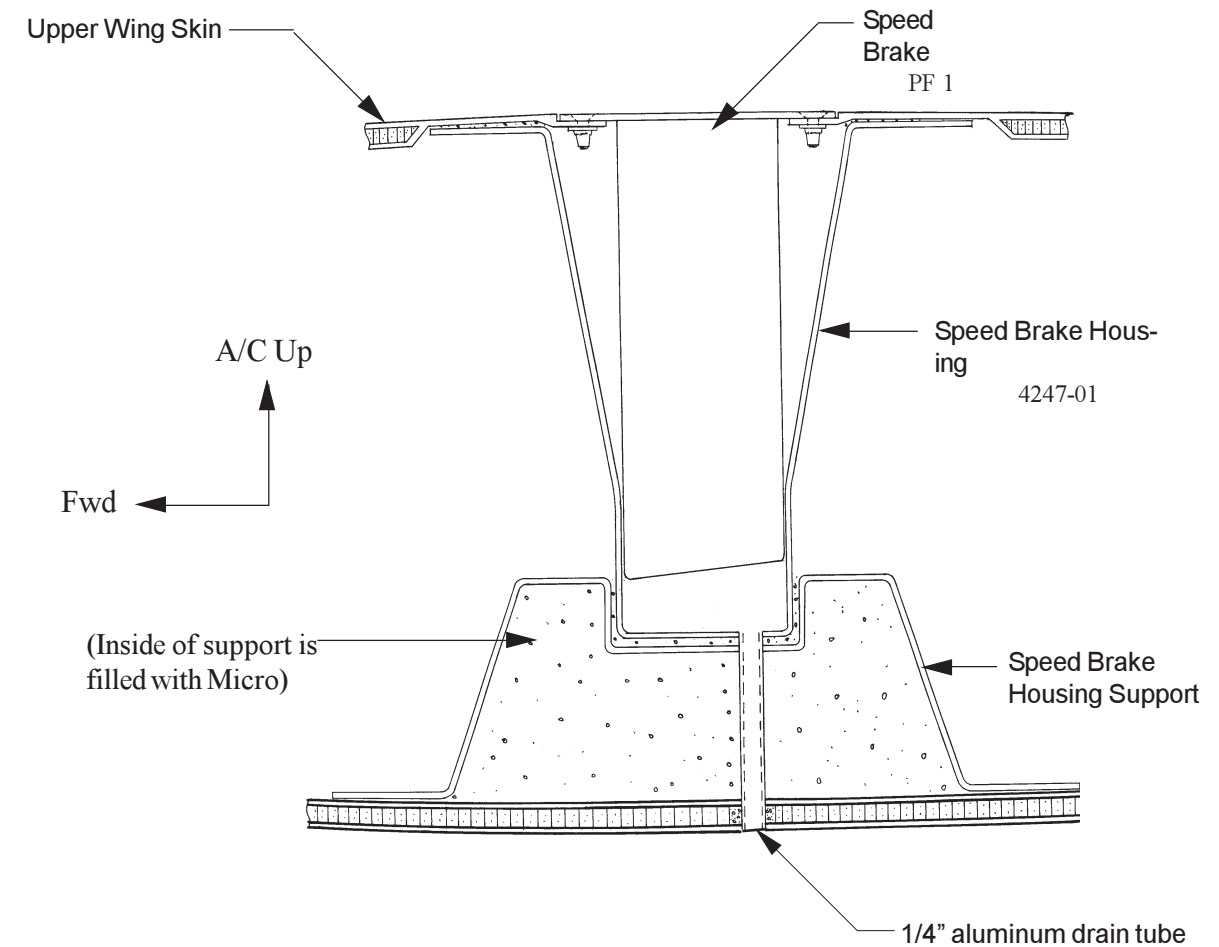
**Speed Brake Installation  
Fig. 3:K:1**



**Note: If you are not installing speed brakes, install cover plates (P/N: 4530) available through Kit Components Incorporated.**

**Note: Optional Parts available through Kit Components Inc.**

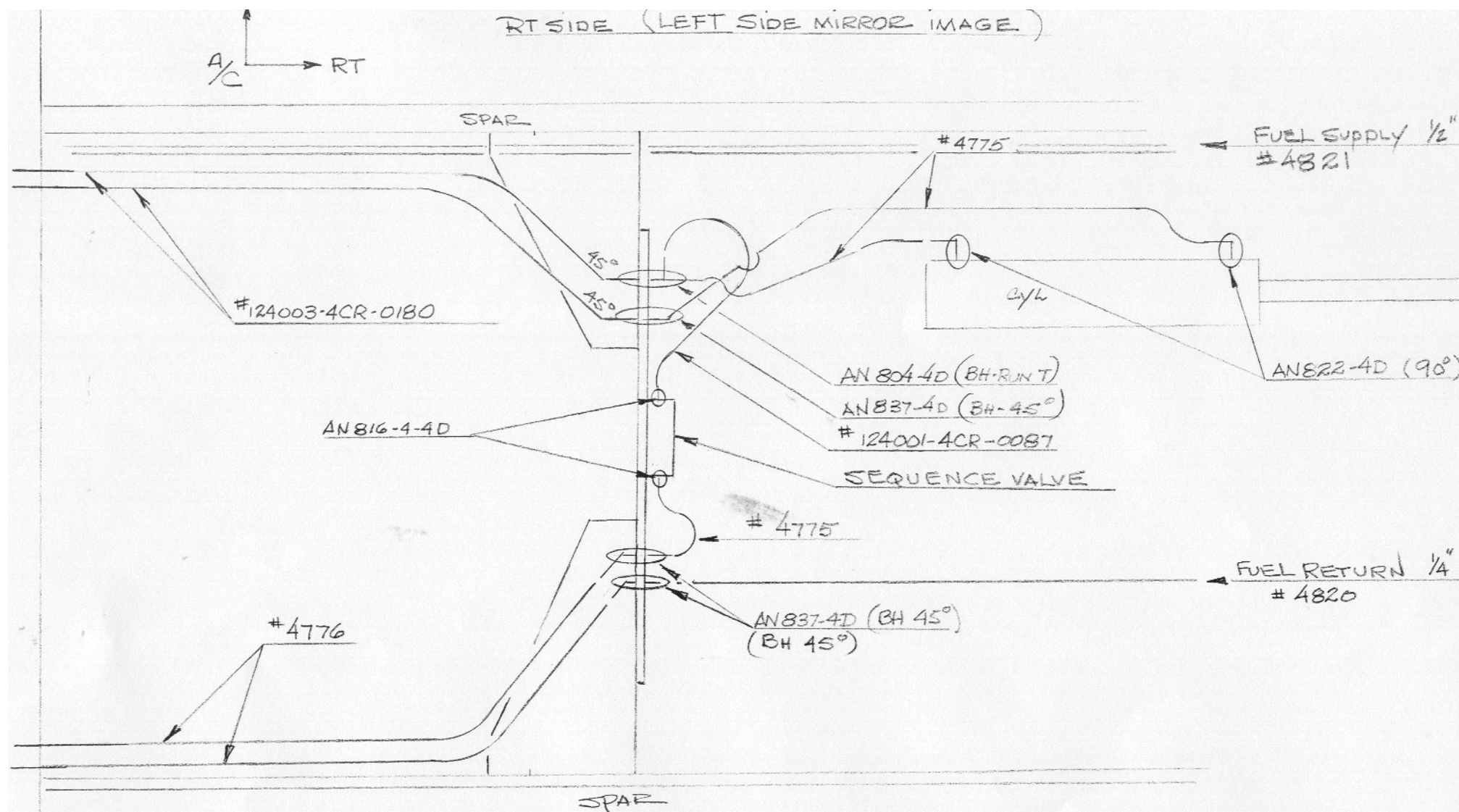
**Speed Brake Drain Tube Installation  
Fig. 3:K:2**



**K 1.** After closing, install the drain tube. Lightly sand the aluminum tube and install such that both ends are flush.

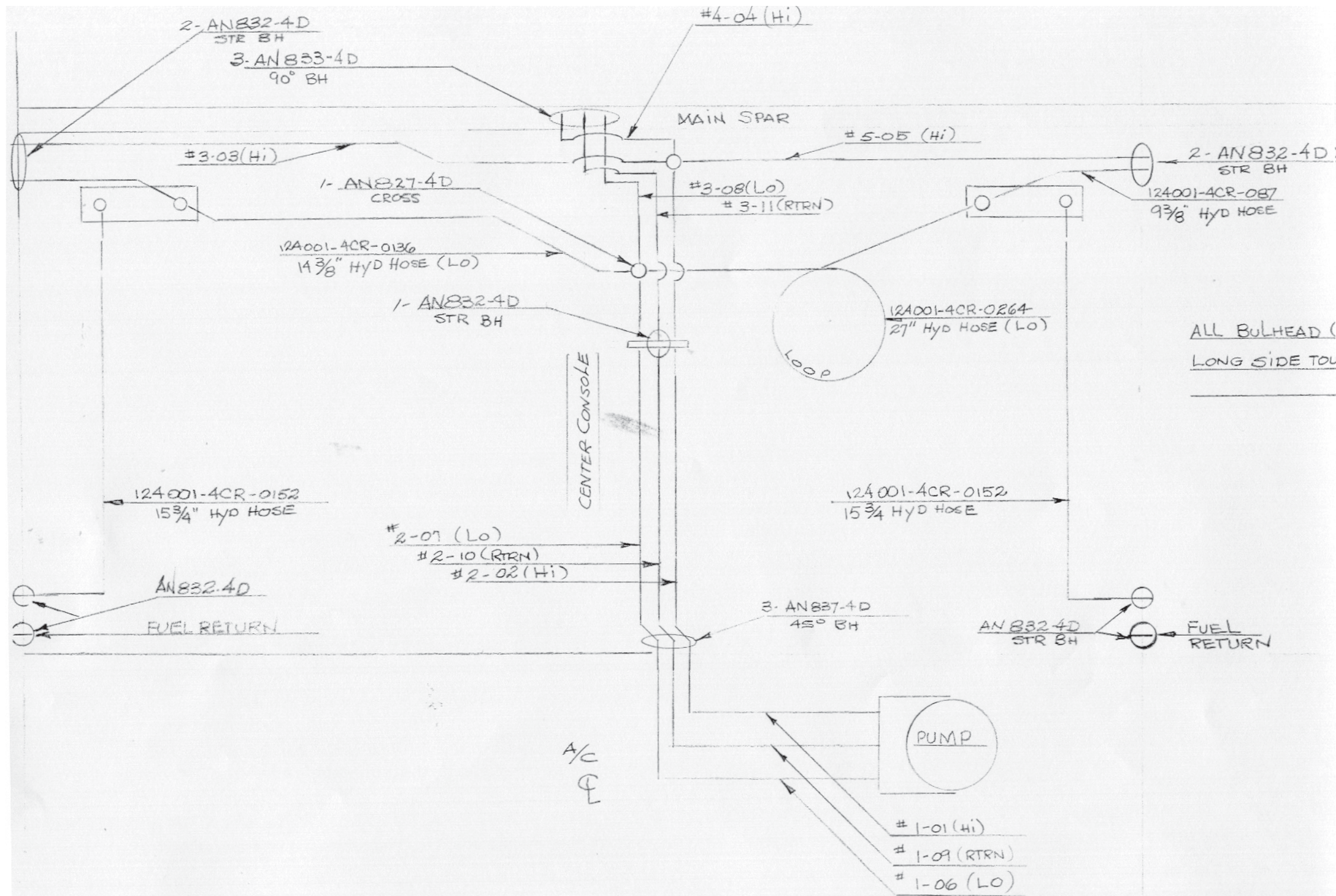
**L. Fuel and Hydraulic Lines Schematics**

**Line Schematics for Wings**  
**Fig.3:L:1**



Line Schematics aft of Main Spar

Fig. 3:L:2



ALL BULHEAD (LONG SIDE TO)

**Fuel Lines with Gascolator and Pump**  
**Fig. 3:L:3**

