

REVISION LIST

CHAPTER 21: FLAP SYSTEM COMPLETION

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.

PAGE(S) AFFECTED	REVISION # & DATE	ACTION	DESCRIPTION
21-1 through 21-2 21-3	0/02-15-02 1/09-18-02	None R&R	Current revision is correct Corrected Fig. 21:A:1 Text correction
21-4 through 21-10 21-11	0/02-15-02 1/09-18-02	None Add	Current revision is correct Added Fig. 21:D:1
21-10	2/06-30-04	R&R	Corrected figure 21:C:2 and added photo.
21-1	3/12-15-04	R&R	Updated table of contents with page numbers.
21-2	3/12-15-04	R&R	Updated parts list.
21-5	3/12-15-04	R&R	Changed rivet part number.
21-2	4/09-30-06	R&R	Removed invalid part number.
21-3	4/09-30-06	R&R	Updated invalid part number.

Chapter 21: Flap System Completion

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1. INTRODUCTION

The Legacy uses slotted type flaps. That means the flaps pivot about a point below the wing. As the flaps deploy they follow an arc moving aft and down. The flaps depend on airflow through the flap slot, hence the reason for the gap opening up as the flaps are deployed.

The flaps are operated by an electric motor. The electric motor mounts aft of the aft spar and passes through the aft spar. The travel is set by two limit switches.

2. PARTS LIST

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM <i>(not included with kit)</i>
CENTER TORQUE TUBE SUPPORT				
1)	4310-01 FB	1	Left Flap	
2)	4310-02 FB	1	Right Flap	
3)	4551-01	2	Inboard Flap Mount Spacer	
4)	4551-02	2	Outboard Flap Mount Spacer	
5)	4553	2	Flap Hinge, Inboard, Wing Side	
6)	4554	2	Flap Hinge, Outboard, Wing Side	
7)	4555	2	Flap Hinge, Inboard, Flap Side	
8)	4556	2	Flap Hinge, Outboard, Flap side	
9)	4559-01	1	Flap Torque Tube, Left	
10)	4559-02	1	Flap Torque Tube, Right	
11)	4560	2	Flap Actuator Support Bracket	
12)	4562-01	1	Flap Tube Support Bracket, Left	
13)	4562-02	1	Flap Tube Support Bracket, Right	
14)	4580	1	Flap Activator Arm	
15)	FL1061-03	2	Flap Torque Tube Bushing	
16)	FL1A	1	Flap Motor Clevis	
17)	FL1	1	Flap Motor	
18)	FL6	1	Flap Motor Bracket	

Note:

Optional Parts available through :

(*) Lancair Avionics

(**) Kit Components, Inc.



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#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM <i>(not included with kit)</i>
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CENTER TORQUE TUBE SUPPORT (CONTINUED)

19)	AN3-7A	6	Bolt, Undrilled	
20)	AN3-9A	6	Bolt, Undrilled	
21)	AN3-10A	4	Bolt, Undrilled	
22)	AN3-13A	2	Bolt, Undrilled	
23)	AN3-16A	2	Bolt, Undrilled	
24)	AN3-27A	2	Bolt, Undrilled	
25)	AN4-10A	12	Bolt, Undrilled	
26)	FL1060-01	2	Bushing Block	
27)	FL1060-02	2	Bushing Block Sleeve	
28)	AN365-428A	12	Locknut	
29)	AN365-1032A	8	Locknut	
30)	K1000-3	4	Nutplates	
31)	MSC-34	8	Rivets	
32)	MS24694-S63	4	Screws, Machine	
33)	AN960-10	22	Washer, Flat	
34)	AN960-10L	2	Washer, Flat	
35)	AN960-416L	12	Washer, Flat	

FLAP INSTALLATION

1)	4550-05	4	Flap Pin	
2)	4550-06	4	Circlip	
3)	6061T6 -.500 x .035	12"	Aluminum Pushrod	
4)	F34-14	4	Bearings, Rod End	
5)	AN316-4	4	Checknut	
6)	AN470AD4-12	8	Rivets	
7)	AN490HT-8P	4	Rod End	

FLAP MOTOR INSTALLATION

1)	FL2	1	Housing and Switches	
2)	AN365-1032A	2	Locknut	
3)	PH-250-3 x 5	1	3" x 5" Piece of Phenolic	
4)	LY1	2	Relays	
5)	MS24694-S54	2	Screws	
6)	AN960-10	2	Washer, Flat	



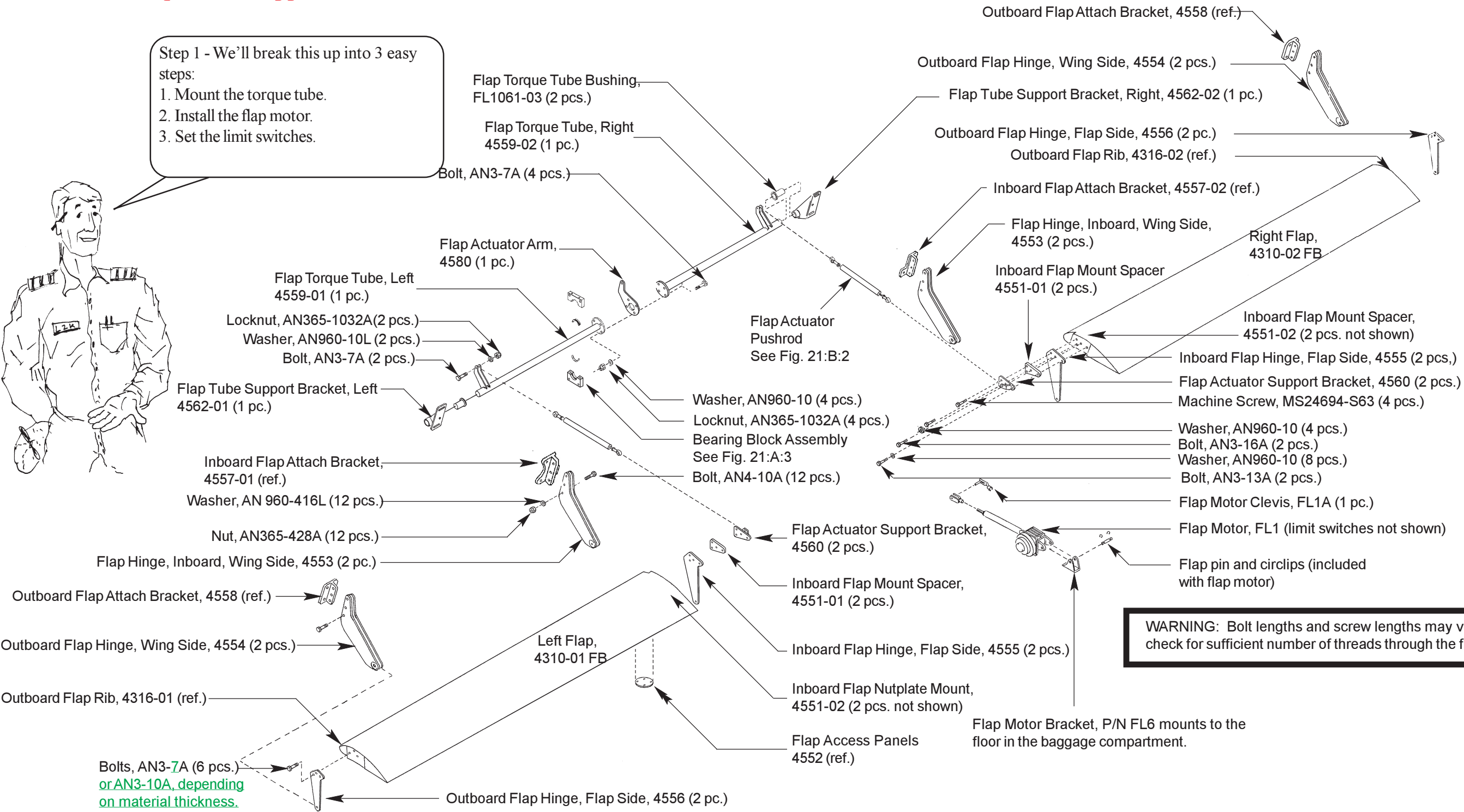
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3. CONSTRUCTION PROCEDURES

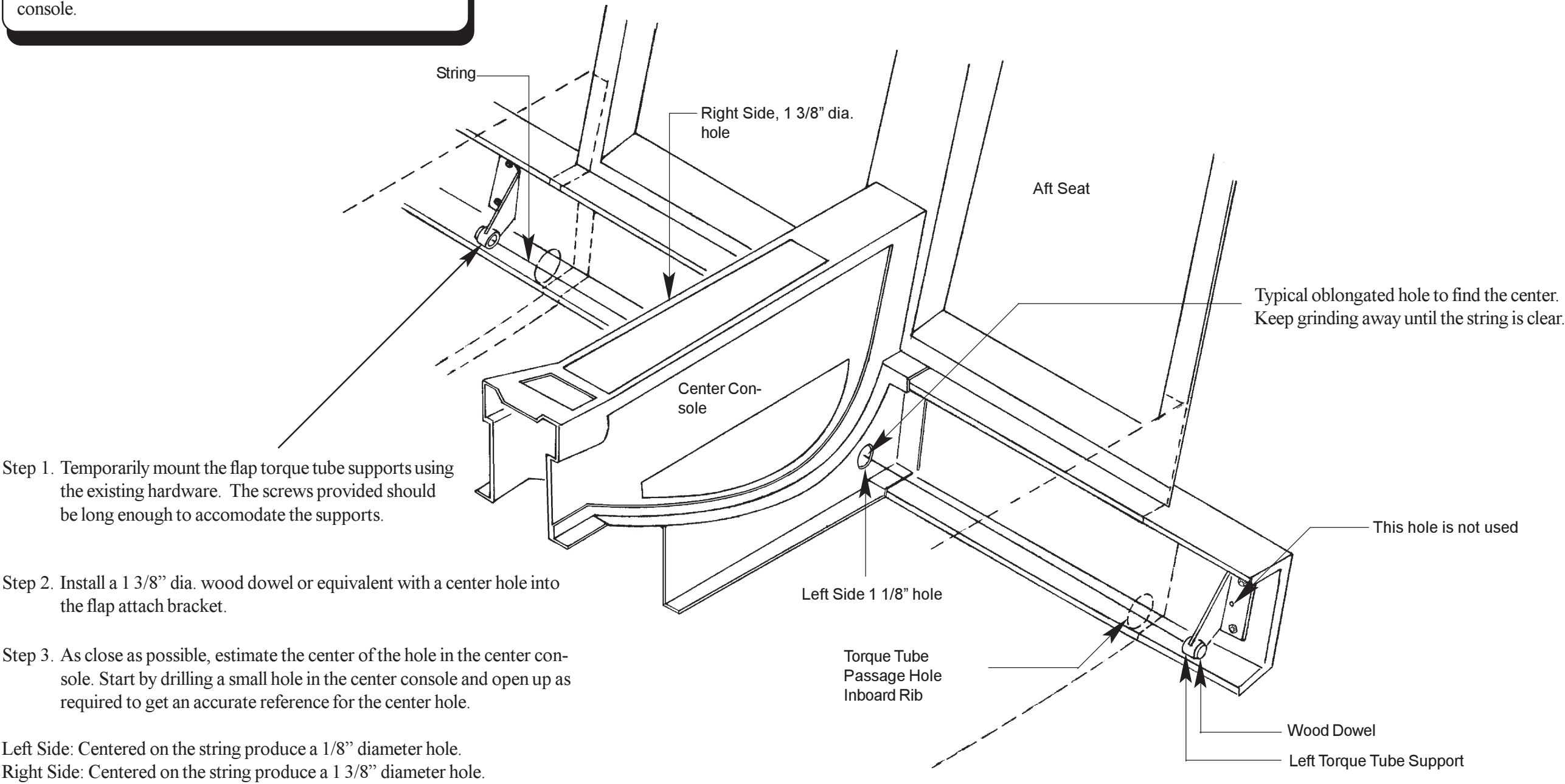
A. Center Torque Tube Support

Flap Assembly Exploded View
Fig. 21:A:1



Locating Torque Tube Center Fig. 21:A:2

In order to mount the torque tube we must first establish the center line of the torque tube in the center console.



Step 1. Temporarily mount the flap torque tube supports using the existing hardware. The screws provided should be long enough to accomodate the supports.

Step 2. Install a 1 3/8" dia. wood dowel or equivalent with a center hole into the flap attach bracket.

Step 3. As close as possible, estimate the center of the hole in the center console. Start by drilling a small hole in the center console and open up as required to get an accurate reference for the center hole.

Left Side: Centered on the string produce a 1/8" diameter hole.
Right Side: Centered on the string produce a 1 3/8" diameter hole.

PULL THE STRING TIGHT!

Mounting Center Bearing Block
Fig. 21:A:3

Once you have drilled the 1 1/8" diameter hole, position the bearing block on the center console. The bearing block (including the hardware) must clear the floor and be below the seat support flange. Angle the bearing block to accomplish this. Once aligned, drill the four 3/16" diameter mounting holes. Next produce a slot large enough to accommodate the flap torque tube.

Secure K1000-3 nutplates with MSC-34 rivets.

Seat Support Flange

Center Console Flange

Yes sir, it is a tight installation!

If you need to, it is acceptable to remove material off the center console flange and/or material off the lower aft edge of the bearing block.



Slot for the flap torque tube.

Locknut,
AN365-1032A (2 pcs.)

Washer,
AN960-10 (2 pcs.)

Flap Bushing Block Sleeve,
FL1060-02 (2 pcs.)

Bushing Block,
FL1060-01 (2 pcs.)

Washer,
AN960-10 (4 pcs.)

Bolt
AN3-27A (2 pcs.)

Bolt,
AN3-10A (4 pcs.)



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21-5

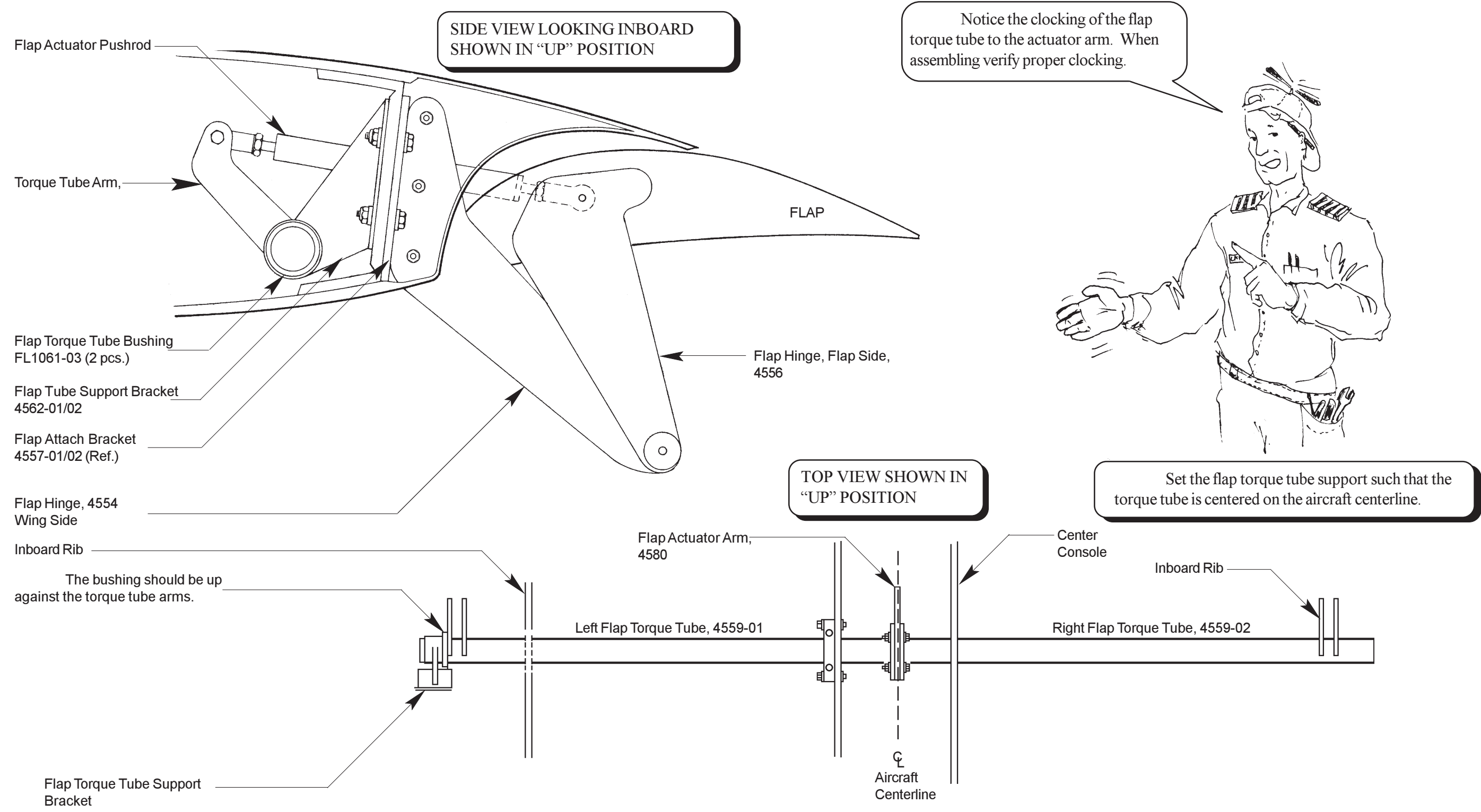
Chapter 21

REV.

3/12-15-04

FLAP SYSTEM COMPLETION

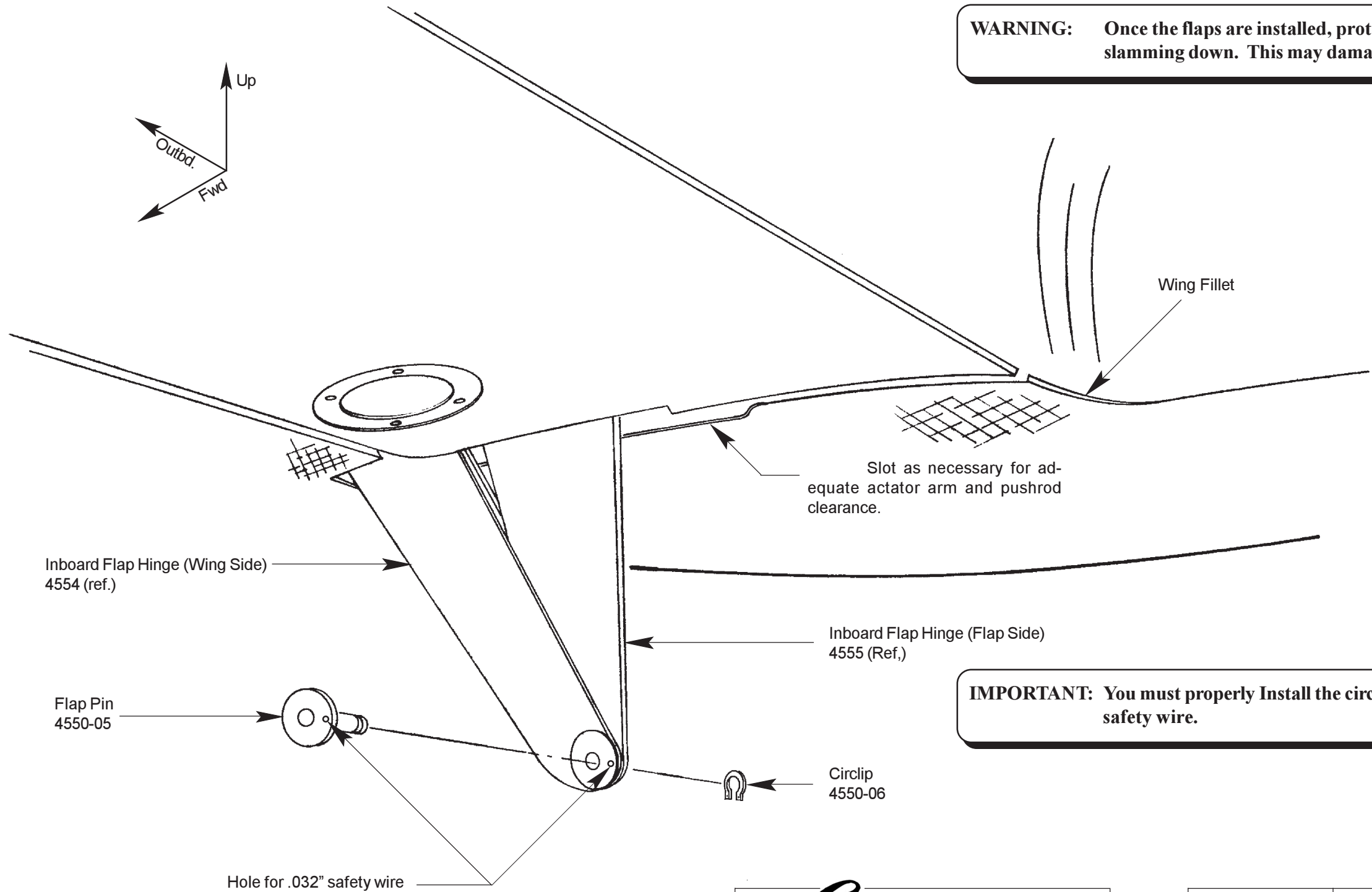
Flap Torque Tube Support Installation
Fig. 21:A:4



B. Flap Installation

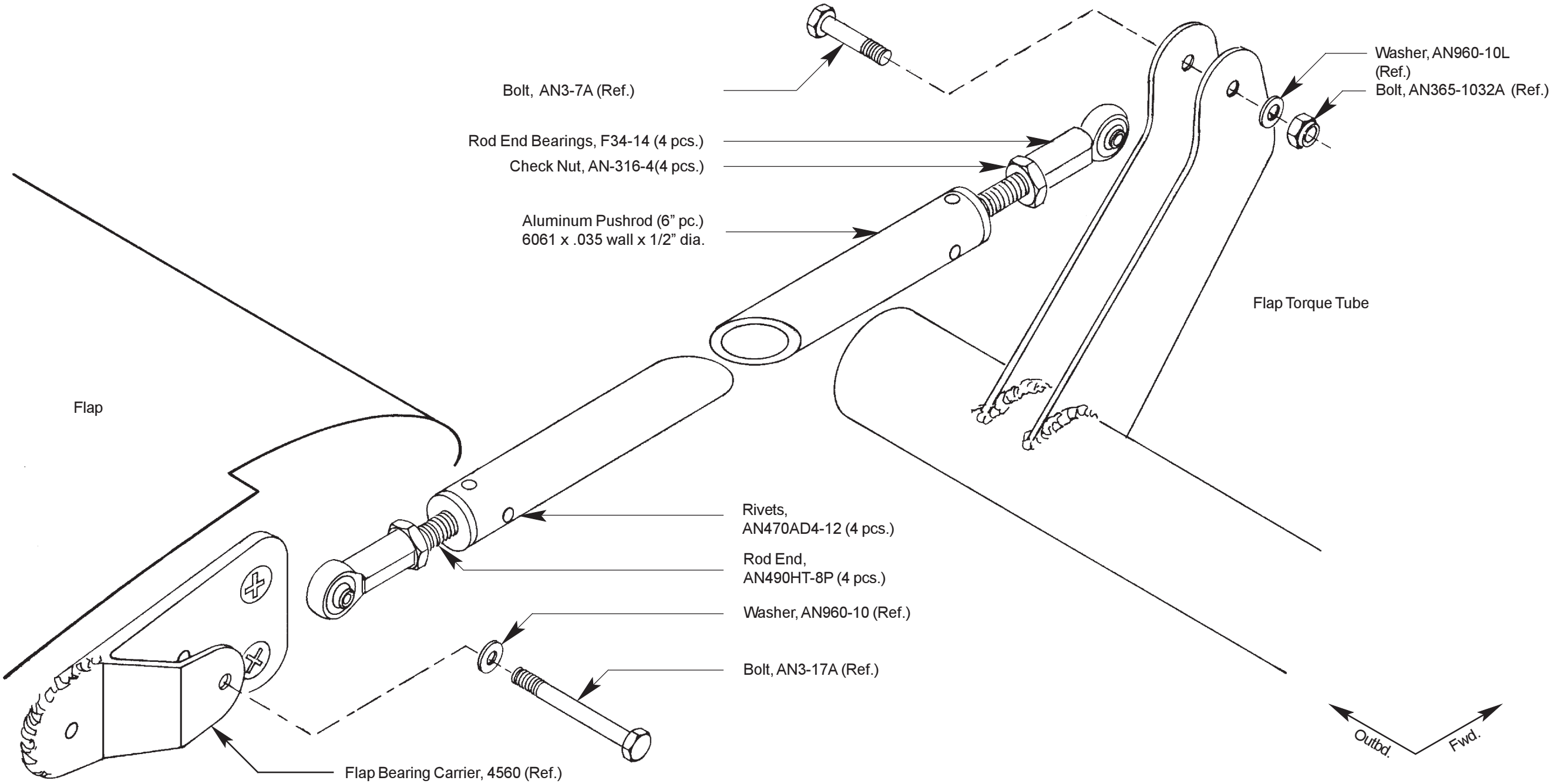
Flaps Installation
Fig. 21:B:1

WARNING: Once the flaps are installed, protect them from slamming down. This may damage the flap hinges.



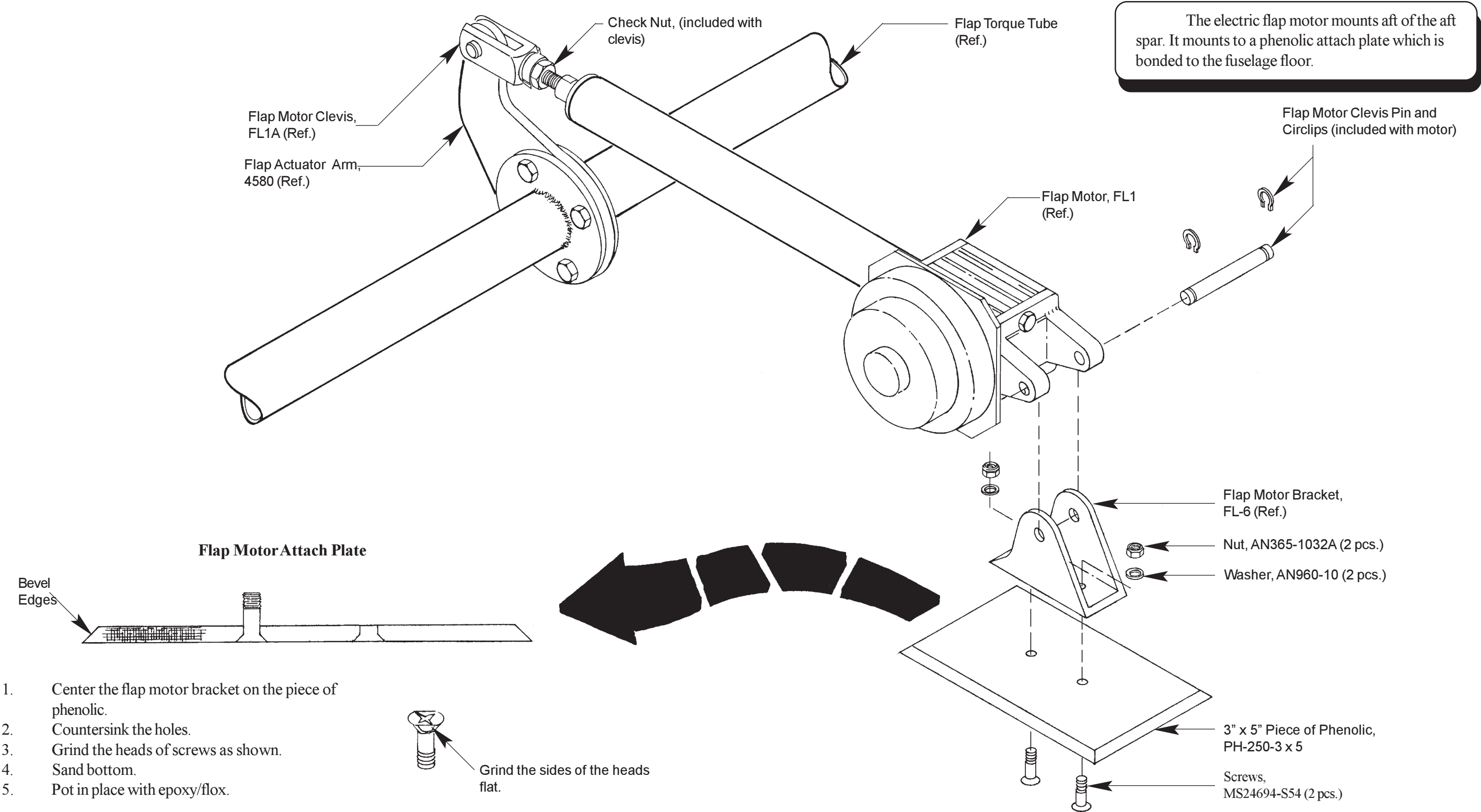
IMPORTANT: You must properly install the circlip and safety wire.

Flap Actuator Pushrod Installation
Fig. 21:B:2



C. Flap Motor Installation

Flaps Actuator Mechanism Exploded View
Fig. 21:C:1



Flap Motor Alignment

- 1. The flap installs on the aircraft center line
- 2. The aft edge of the flap bracket is 17 1/2” aft of the aft spar.

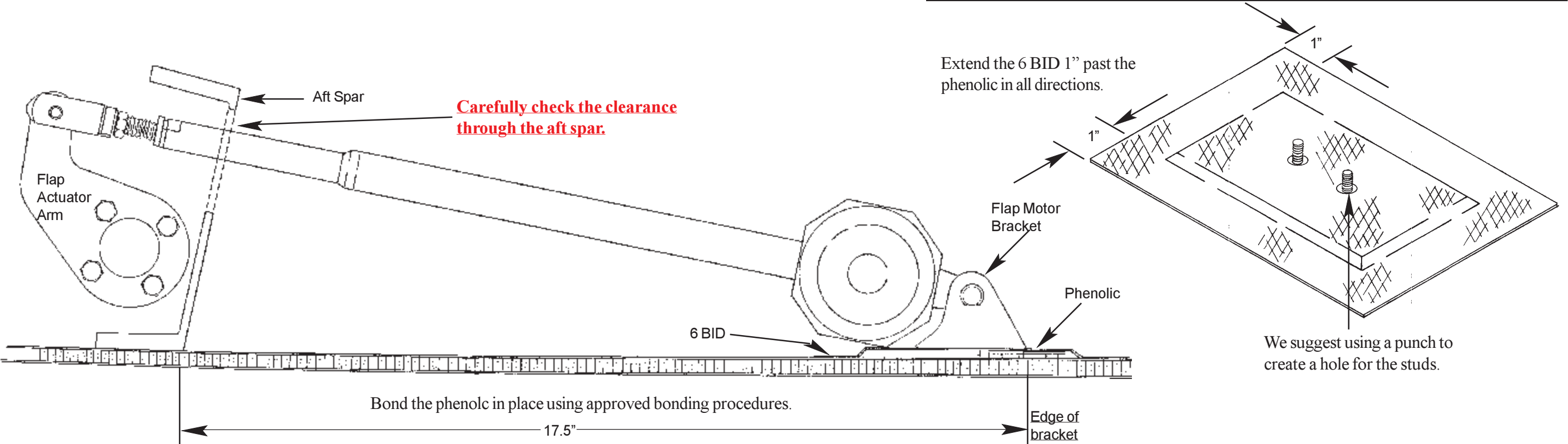
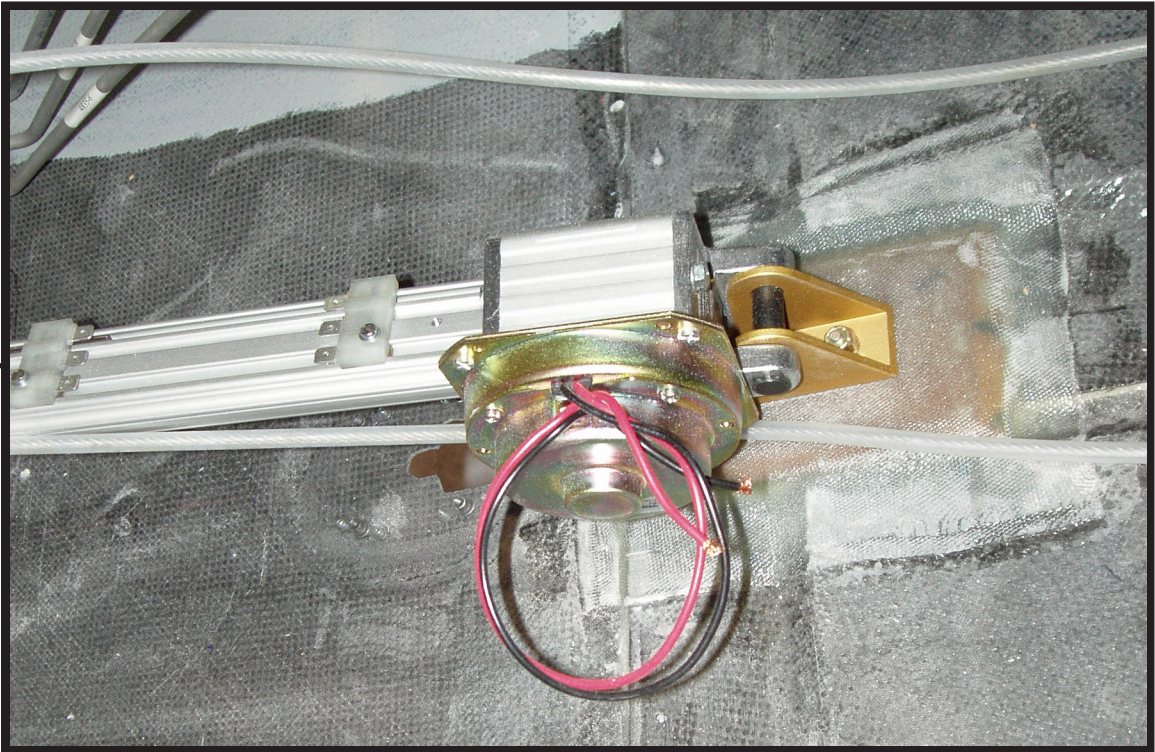
Flap Adjustments

The flaps can be adjusted at each of the rod ends as well as adjusting the flap motor.

- 1. The flaps should be adjusted to be symmetrical. Use the short push rods to adjust as necessary. Be sure to tighten the check nuts when completed. Also check the tag wire holes of the rod end bearings to ensure you have enough thread.
- 2. Set the micro switches so the control horn stops approximately 1/4” (4mm) short of the aft shear panel. See Chapter 27.
- 3. Set the micro switches so the maximum flap deflection is 40°. Perhaps the easiest method of accomplishing this is to use a SMART level or inclinometer.

Flap Motor Location
Fig. 21:C:2

Note that the sensor cants slightly clockwise.



D. Bonding the Wing Trailing Edge

In Chapter 10 you closed out the inboard wing section. We suggested you hold off on closing out the trailing edge in the flap cove area. The reason for holding off on this is to check for adequate flap/trailing edge clearances. We recommend reading this entire section before getting started.

- 1. Use a rigid straight edge such as a “U” channel to hold the trailing edge straight. We suggest using bondo to secure the straight edge.
- 2. Install the flap. Move to the full up position. One method for determining the “full up” position is to install the aileron. The aileron should align to the wing tip, and flap to the aileron. Note that the flap may actually be moved past the “full up” position. With the flap in place, visually inspect the trailing edge gap. You should have approximately 1/8" gap. Most likely, you will need to trim some off the trailing edge to get the gap you need. Once you have sufficient gaps, you are ready to bond the trailing edge.
- 3. Using approved bonding procedures, bond the trailing edge.

Bonding Wing Trailing Edge
Fig. 21:D:1

