

REVISION LIST

CHAPTER 24: MISCELLANEOUS 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.

PAGE(S) AFFECTED	REVISION # & DATE	ACTION	DESCRIPTION
24-1 through 24-2	0/02-15-02	None	Current revision is correct
24-3	1/09-18-02	R&R	Corrected fig. 24:A:2
24-4 through 24-16	0/02-15-02	None	Current revision is correct
24-1	3/12-15-04	R&R	Updated table of contents with page numbers and modified parts list.
24-2	3/12-15-04	R&R	Updated pitot tube part nbrs.
24-4	3/12-15-04	R&R	Updated part nbrs.
24-6	3/12-15-04	R&R	Updated part nbrs.
24-1, 24-3, 24-14	6/08-10-07	R&R	Adjustments to static port and added part numbers.

Chapter 24: Miscellaneous Systems

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1. INTRODUCTION

This Chapter includes the odds and ends that didn't end up anywhere else! They are all optional items and you may not be installing all of them. They are options we recommend but you may choose to install a different brand such as a different brand of autopilot. All options are available through Kit Components or Lancair Avionics. Call for details.

2. PARTS LIST

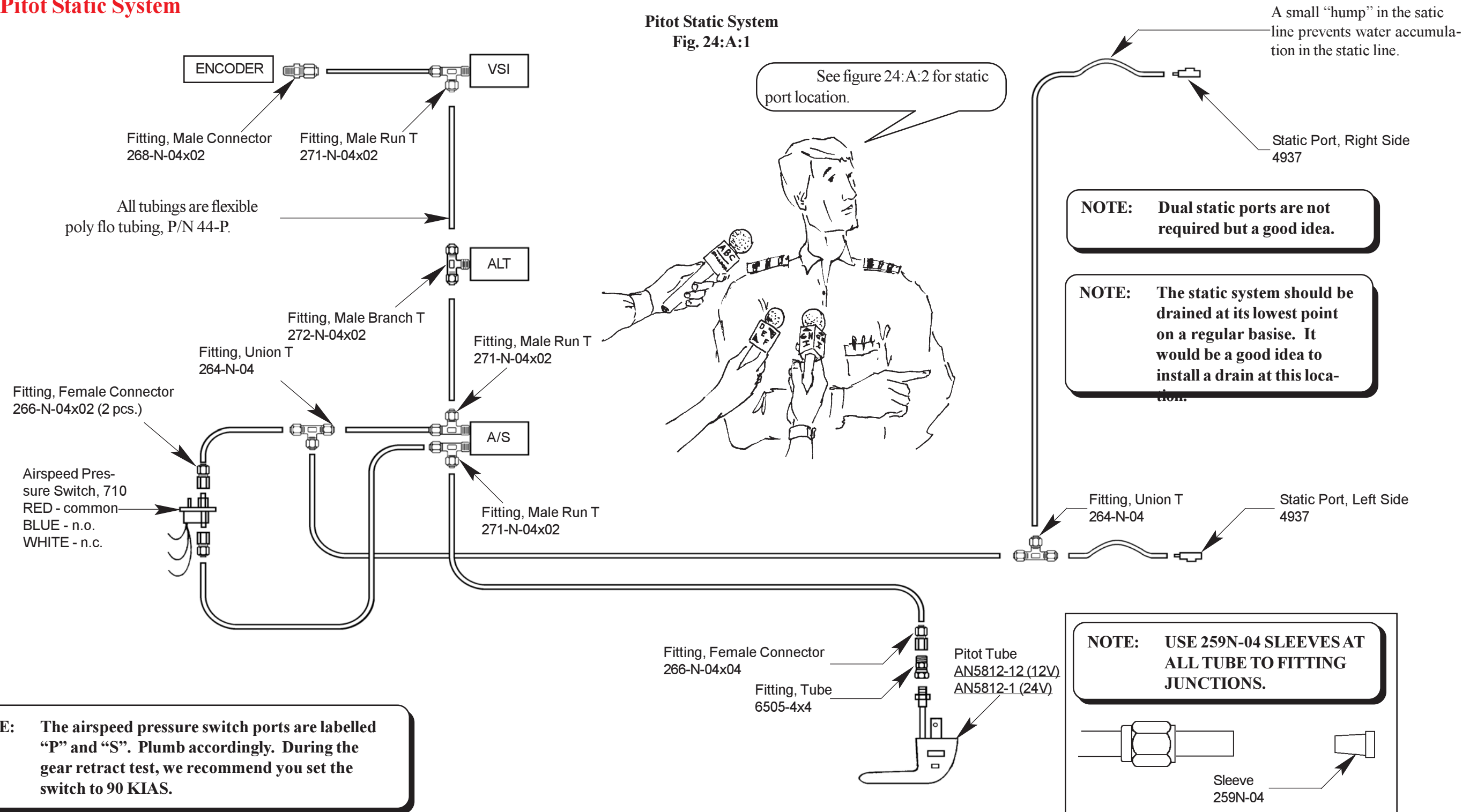
#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM
PITOT STATIC SYSTEM				
<i>(not included with kit)</i>				
1)	4937-A	1	Pitot Static System	**Yes
2)	268-N-04x02	1	Fitting, Male Connector	**Yes
3)	271-N-04x02	3	Fitting, Male Run T	**Yes
4)	272-N-04x02	1	Fitting, Male Branch T	**Yes
5)	264-N-04	2	Fitting, Union T	**Yes
6)	266-N-04x02	2	Fitting, Female Connector	**Yes
7)	266-N-04x04	1	Fitting, Female Connector	**Yes
8)	6505-4x4	1	Fitting, Tube	**Yes
9)	AN5812-12	1	Pitot Tube	**Yes
10)	44-P	24'	Poly Flo Tubing	**Yes
11)	259N-04	18	Sleeve	**Yes
12)	710	1	Squat Switch	**Yes
13)	4937	1	Static Port, Right	**Yes
14)	4937	1	Static Port, Left	**Yes

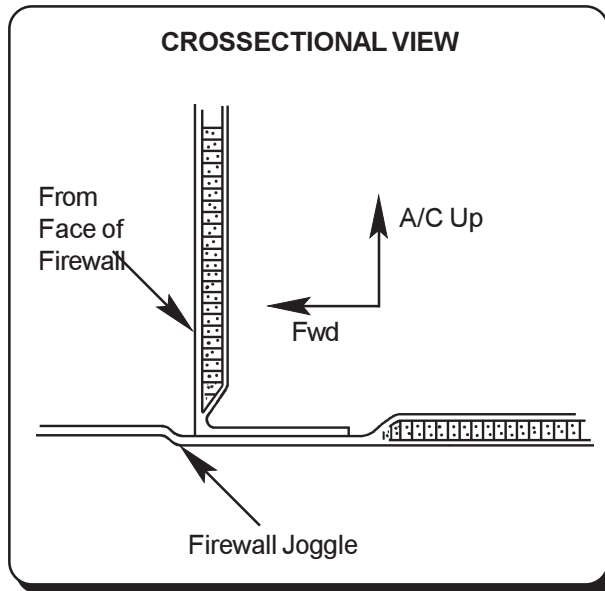
#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM
ELT INSTALLATION				
1)	4355	1	Bracket, Mounting	*Yes
2)	K1000-3	4	Nutplates	*Yes
3)	MSC-34	8	Rivets	*Yes
4)	AN526-1032-R10	4	Screws	*Yes
STORM SCOPE INSTALLATION				
1)	NY-163	1	Antenna	*Yes
2)	NY163	1	Cable	*Yes
3)	002-11503-002	1	Dealer's Literature Package	*Yes
4)	WX-500	1	Install Kit	*Yes
5)	002-11504-002	1	Owner's Literature Package	*Yes
6)	WX-500	1	Processor, WX-500	*Yes
TRANSPONDER ANTENNA INSTALLATION				
1)	K1000-3	4	Nut, Anchor	*Yes
2)	MSC-34	8	Rivets	*Yes
3)	MS24694-S51	4	Screw, Machine	*Yes
AUTOPILOT INSTALLATION (TRU-TRAK,)				
1)	4039-01	1	Autopilot Mount Bracket	*Yes
2)	4039-02	1	Aft Mounting Bulkhead	*Yes
3)	4080	1	Mount Bracket (Roll)	*Yes
4)	4944	1	Spacer	*Yes
5)	DSP-B	1	Autopilot Servo (Pitch) KCI #901-0021	*Yes
6)	DSB-B	1	Autopilot Servo (Roll)	*Yes
7)	MM-3	2	Bearing, Rod Ends (Pitch)	*Yes
8)	CM3B-14	2	Bearing, Rod Ends (Roll)	*Yes
9)	AN3H-3	8	Bolt, Drilled	*Yes
10)	AN3-7A	1	Bolt, Undrilled	*Yes
11)	AN3-10A	1	Bolt, Undrilled	*Yes
12)	AN3-37A	2	Bolt, Undrilled	*Yes
13)	AN315-3	2	Nut, Check	*Yes
14)	AN315-4	2	Nut, Check	*Yes
15)	AN365-1032A	4	Nut, Nylock	*Yes
16)	L101	1	Pushrod, Roll	*Yes
17)	L102	1	Pushrod, Pitch	*Yes
18)	CD315-12	1	Spacer	*Yes
19)	AN970-3	5	Washer, Area	*Yes
20)	AN960-10	10	Washer, Plain	*Yes



3. CONSTRUCTION PROCEDURES

A. Pitot Static System

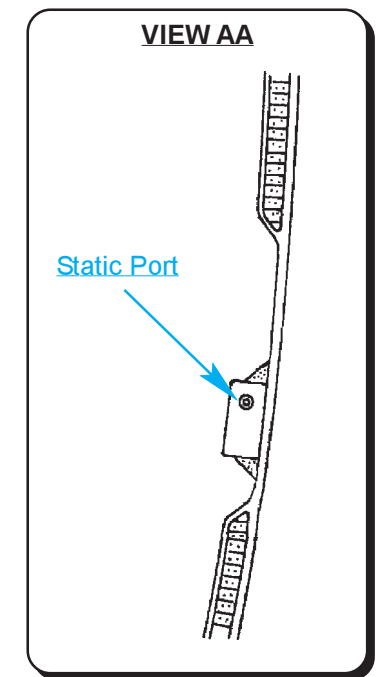
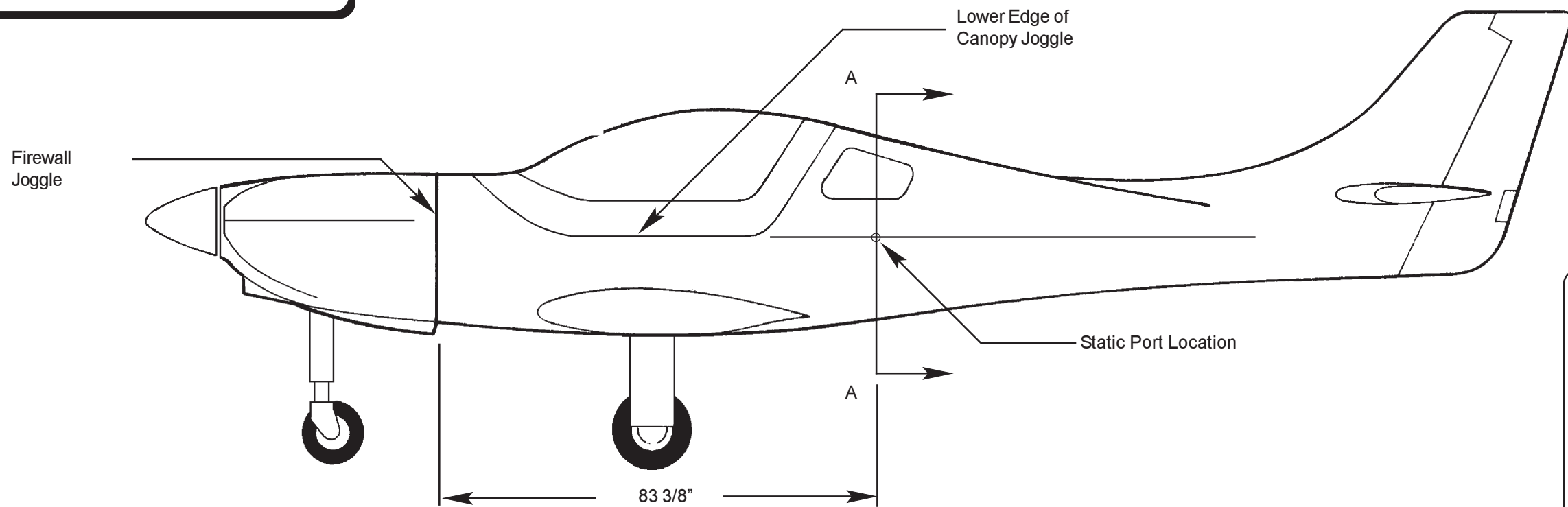




Static Port Installation
Fig. 24:A:2

Static Port Installation

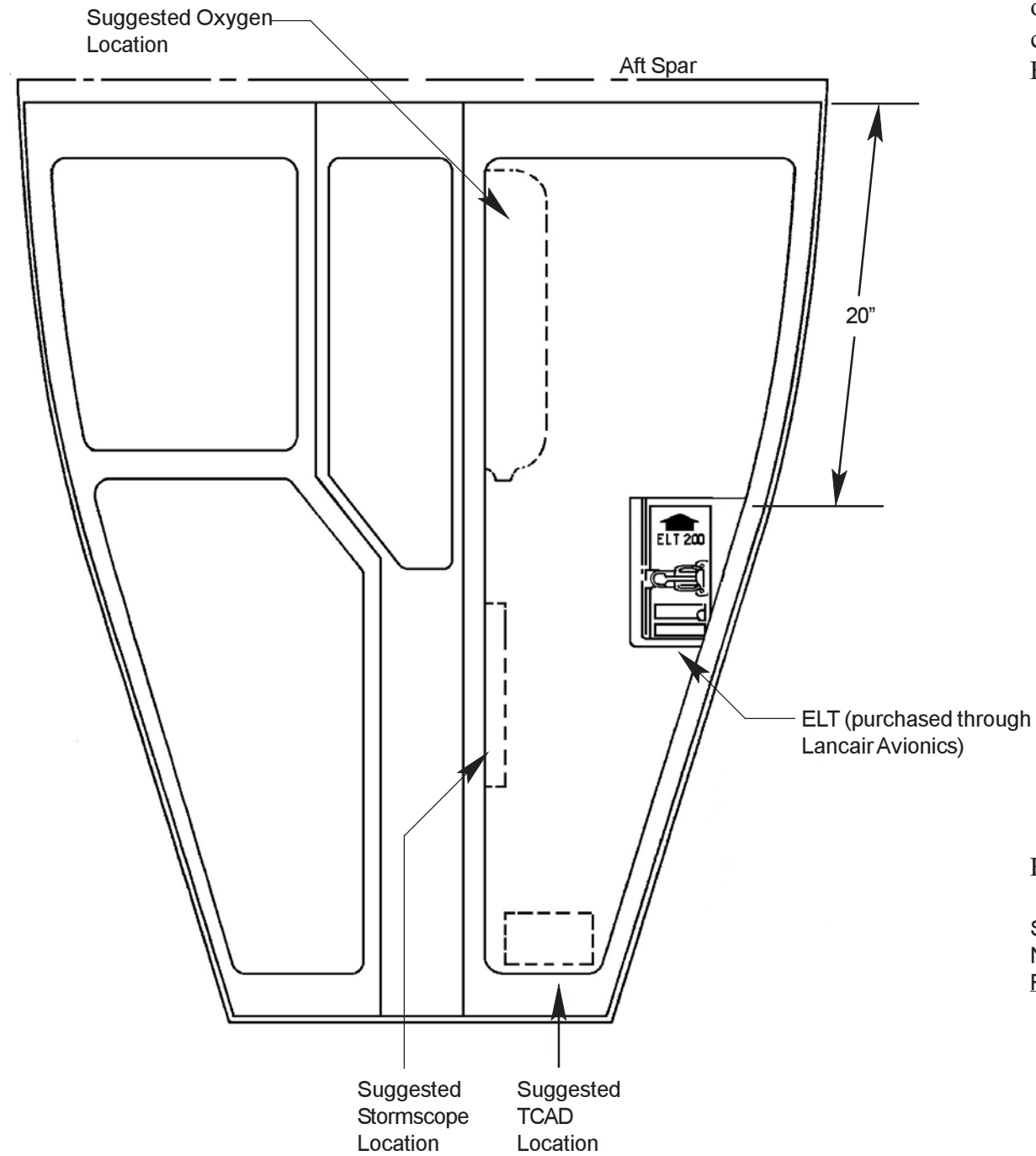
- A 1.** Using the lower edge of the canopy joggle, extend a line aft. We suggest using a long flexible straight edge or level the aircraft and use a water level.
- A 2.** Measure 83 3/8" back from the firewall joggle.



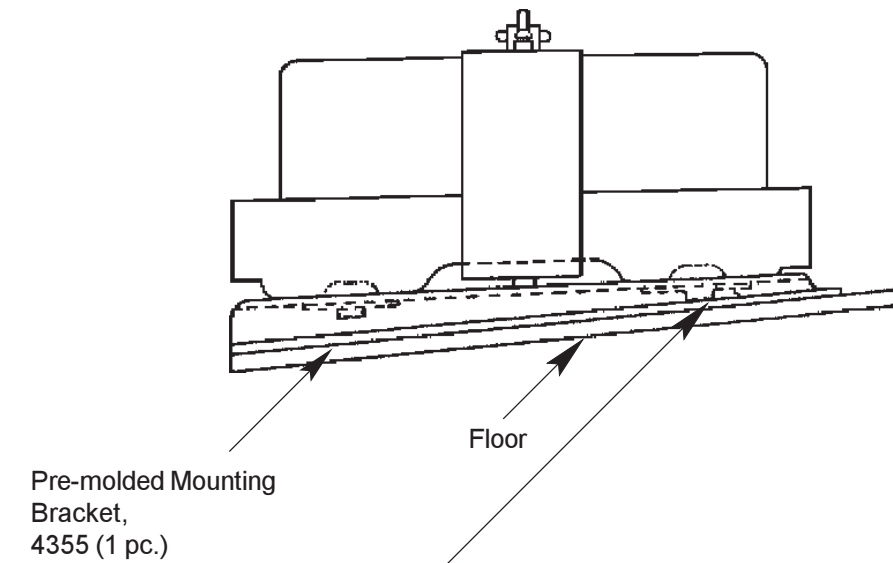
- A 3.** Verify that the hole will be in the unidirectional carbon fiber.
- A 4.** Drill the hole [in the lower edge of the unidirectional belt. See View AA for location.](#)
- A 5.** To avoid water accumulation in the lines, we suggest you angle the line slightly up. This will help water drain back out through the static port.
- A 6.** Bond in place using epoxy/flox.

B. ELT Installation

ELT Installation
Fig. 24:B:1



We recommend the ARTEX ELT-200 for the Legacy available through Lancair Avionics. This illustration is only a suggestion for the mounting of the transmitter. All mounting instructions included with the ELT must be complied with. Note that for optimum performance an external antenna must be installed. We suggest installing the ELT underneath the right floorboard as shown. It should be installed as far right as possible.



Hardware used to secure ELT mounting tray:

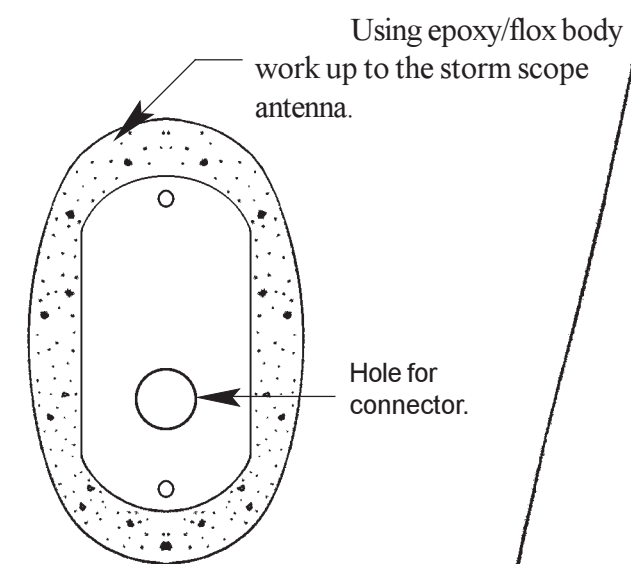
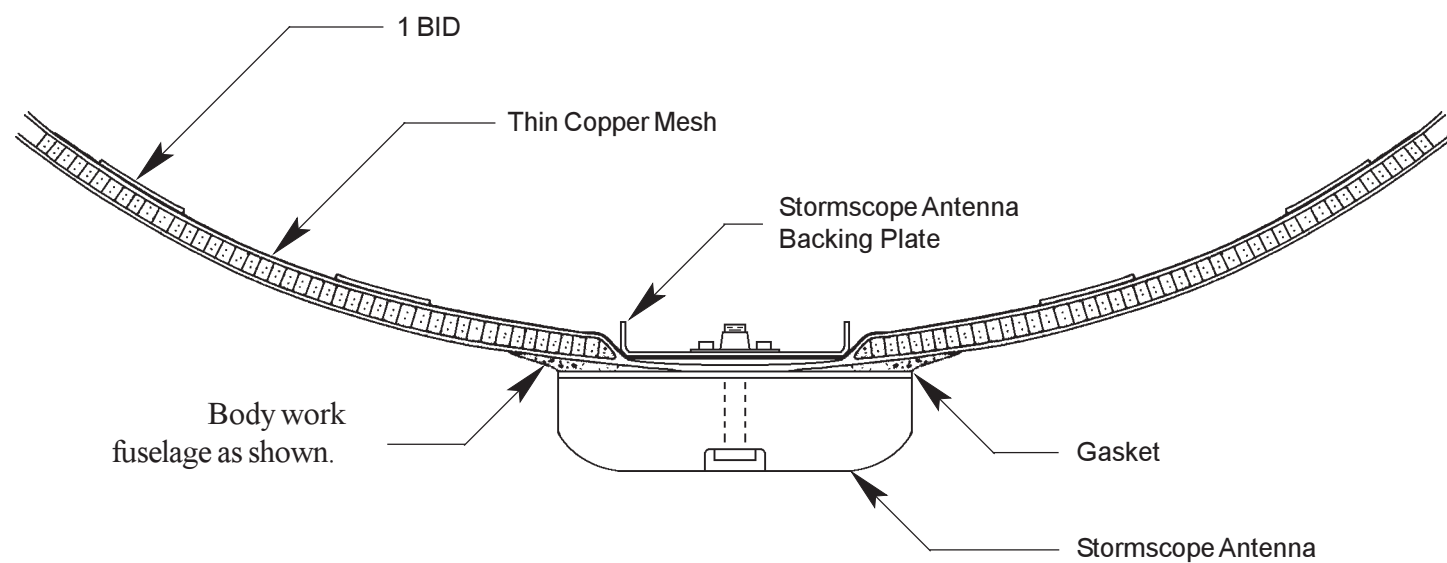
- Screws, AN526-1032-R10 (4 pcs.)
- Nutplates, K1000-3 (4 pcs.)
- Rivets, MSC-34 (8 pcs.)

C. Storm Scope Installation*

Storm Scope Installation
Fig. 24:C:1

The exact location of the BF Goodrich Stormscope antenna has to be determined by Skin mapping the aircraft. This is done with sensitive equipment while the engine and all avionics are powered up. The stormscope will not work if placed incorrectly. Please contact the Lancair Avionics department to make arrangements for skin mapping.

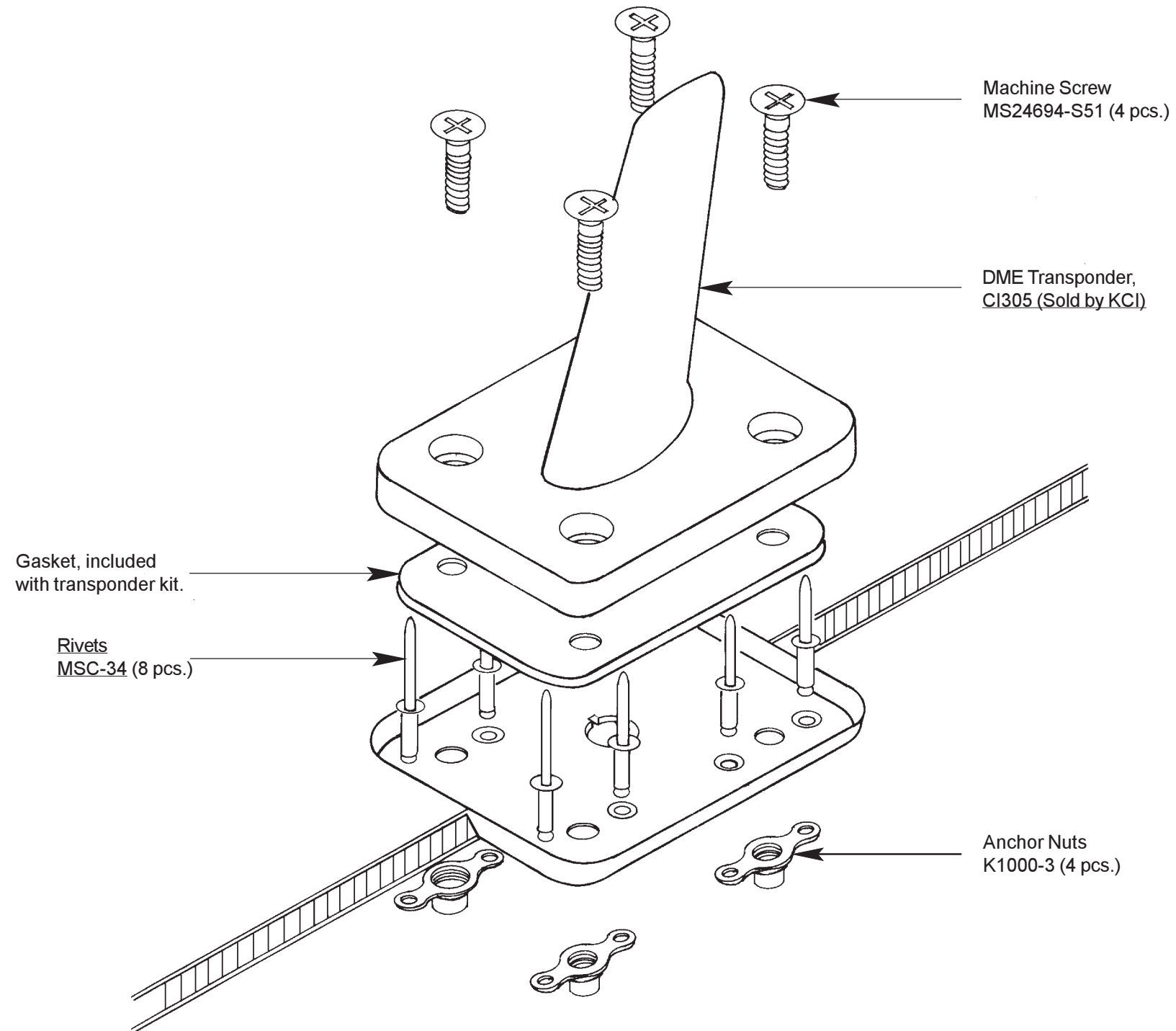
Skin mapping may be performed either after or before the aircraft is painted. If after paint, the mounting area will have to be repainted. There must be at least 2' x 2' copper mesh on the inside of the fuselage centered on the backing plate. This serves as the ground plane for the antenna.



NOTE: These instructions are for reference only. Refer to the BF Goodrich Installation Instructions.

D. Transponder Antenna Installation

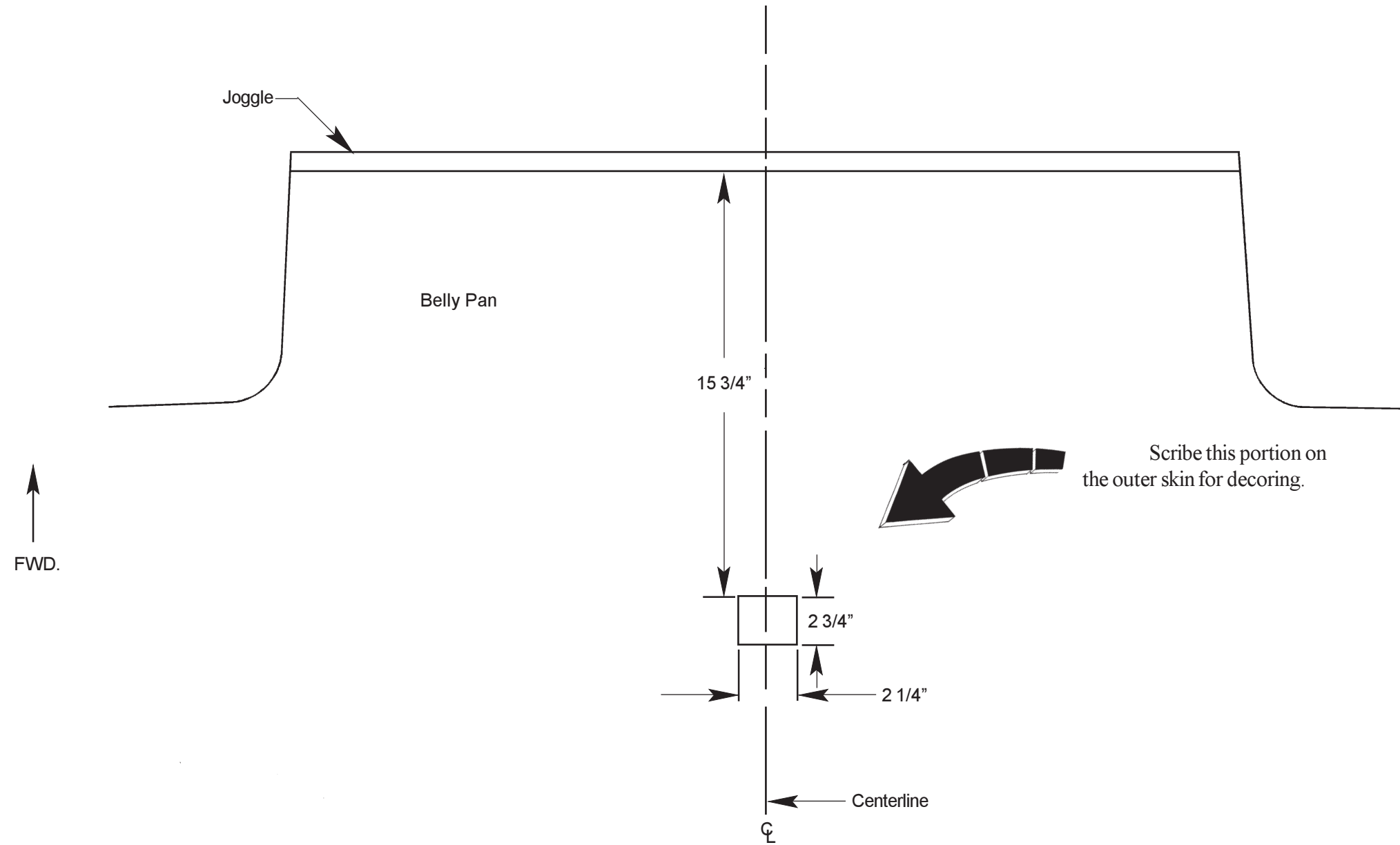
Transponder Antenna Exploded View
Fig. 24:D:1



Locating the Position of the Transponder Antenna
Fig. 24:D:2

The transponder antenna is installed on the belly pan. Kits starting from FB 148 have recessed joggles to accommodate the base plate of the transponder antenna. For earlier kits, an alternative process is explained on the succeeding paragraphs.

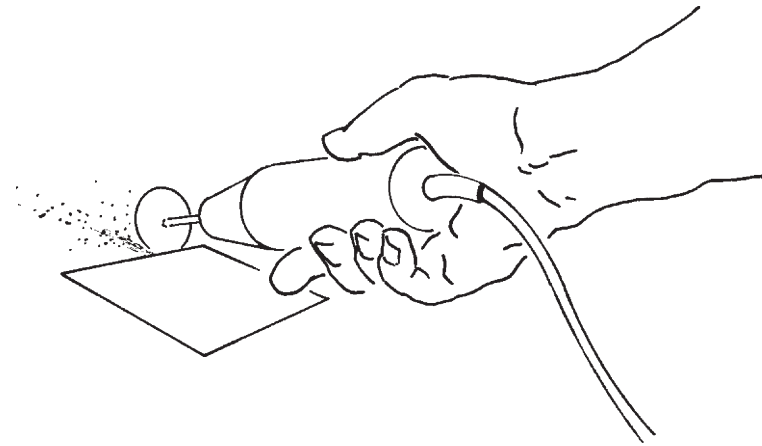
- D 1.** Locate the position of the antenna on the belly pan using Fig. 24:D:2 as reference.



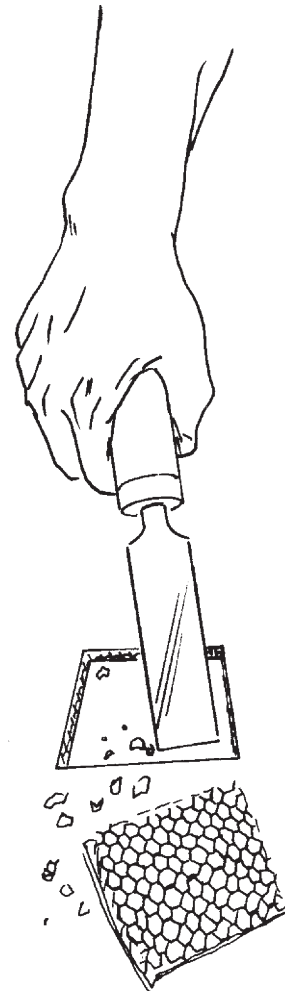
Decoring The Area For The Transponder Antenna
Fig. 24:D:3

D 2. Decore the area from the outer skin.

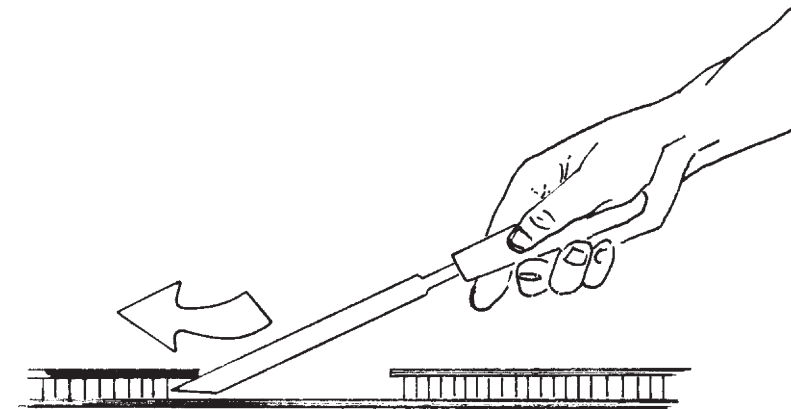
- ① Use a Dremel or equivalent tool to cut through outer skin and core.



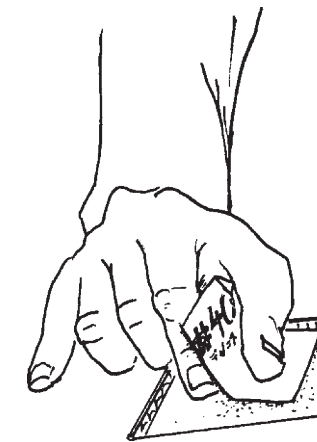
- ② Pop out the outer skin and core using a chisel.



- ③ Dig the core 1/4" back from the perimeter of the decored area.



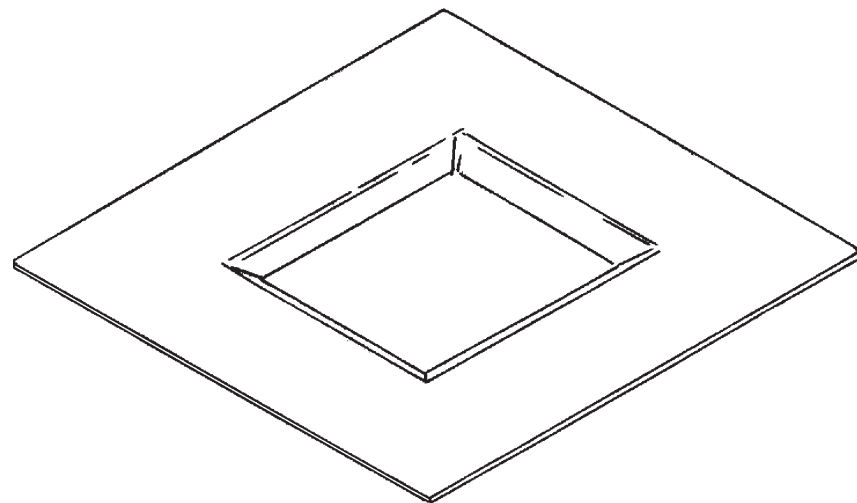
- ④ Sand the decored area with a # 40 sandpaper to remove the core remains.



- ⑤ Vacuum and dewax the decored area. Form a bevel around the perimeter using micro. Let cure.



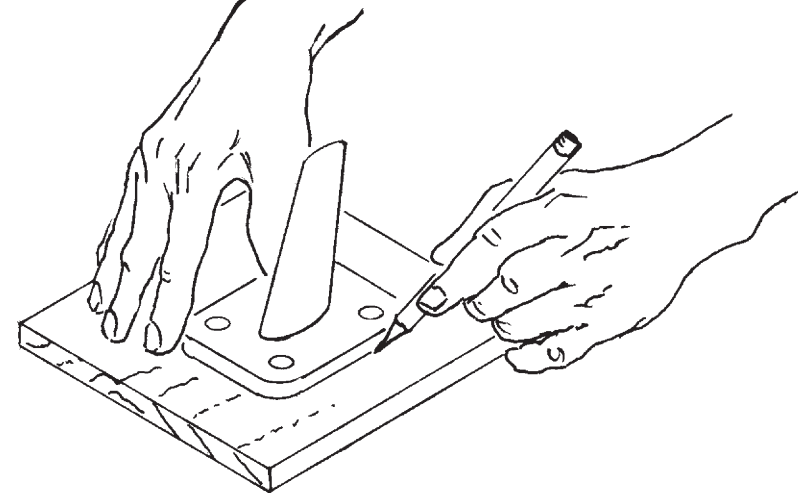
- ⑥ Sand the bevel smooth and round off the corners a bit.
- ⑦ Dewax the skin around the decored area. Sand and clean.
- ⑧ Reinforce with four bid overlapping 1" around the perimeter.



Preparing Wood Pattern for Release
Fig. 24:D:4

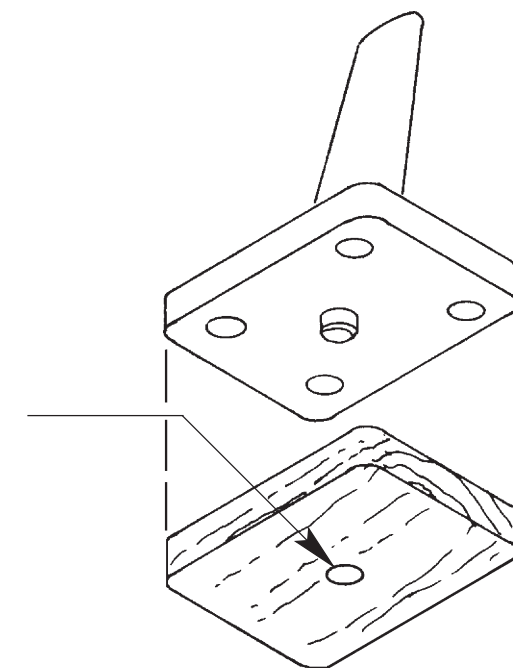
D 3. Use the transponder antenna's base to make a wood pattern for release.

- ① Cut a piece of wood patterned to the base of the antenna. Use a 1/2" piece of solid wood.

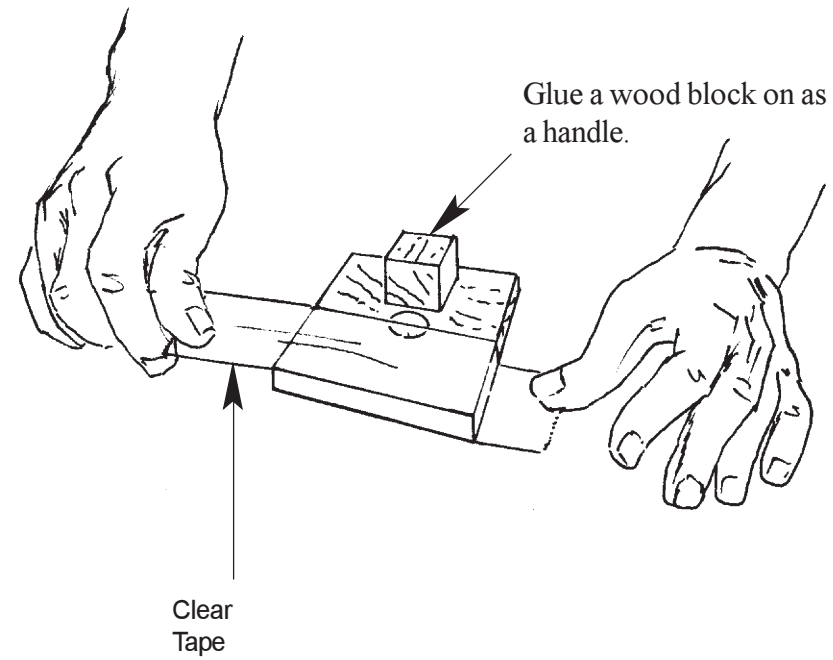


- ② Finish sanding the wood pattern to the exact size of the base.

Pre-drilled hole for the antenna's male connector.

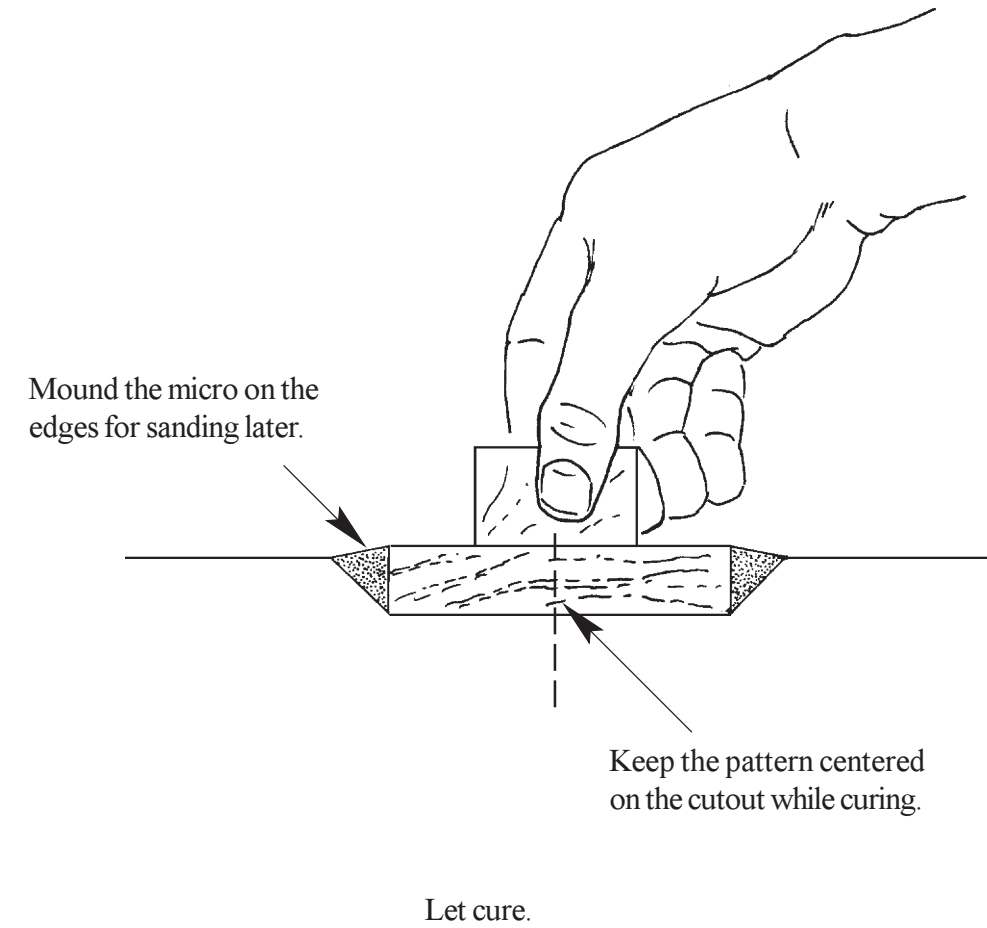


③ Cover the pattern with clear tape.



Releasing The Wood Pattern Fig. 24:D:5

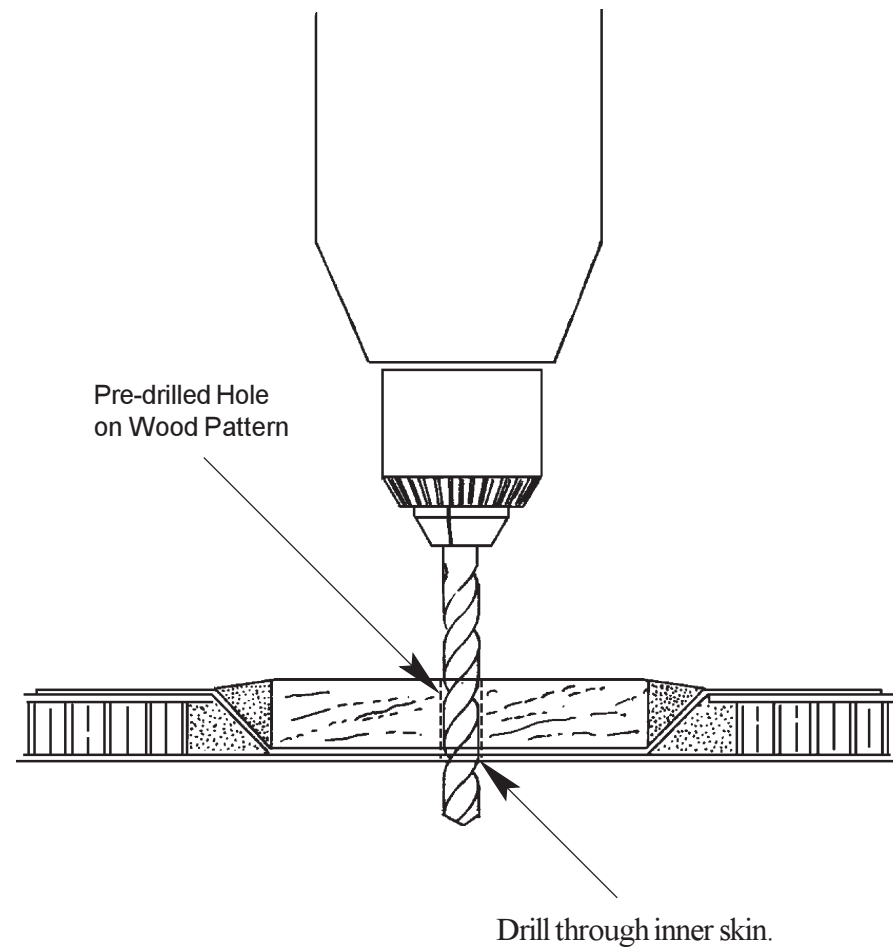
D 4. Release the wood pattern on the decorated area. Keep the pattern centered on the cutout.



Drilling Hole for the Cable Connector

Fig. 24:D:6

D 5. Drill the hole for the antenna's connector by drilling through the hole on the wood pattern.

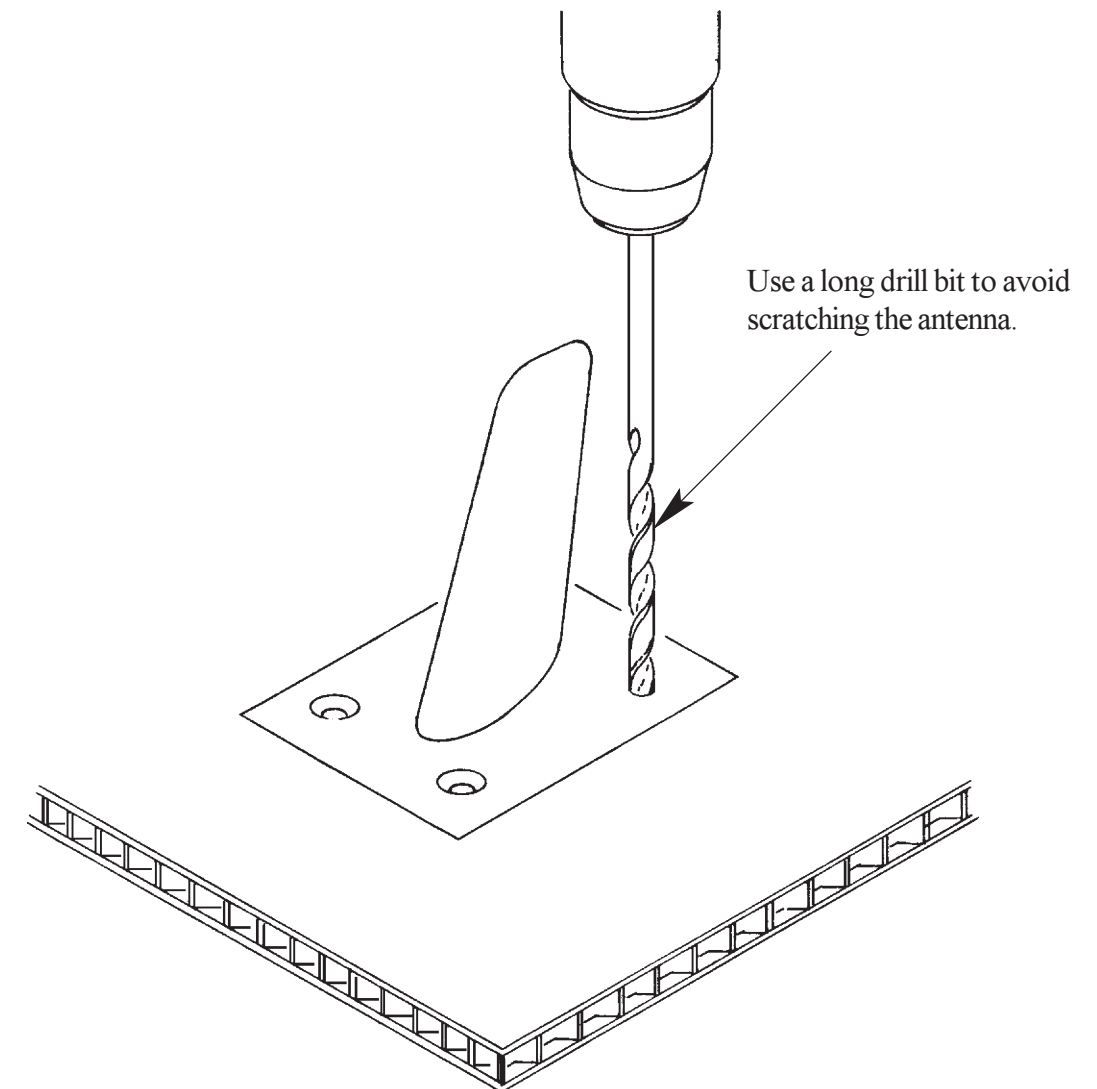


D 6. Remove the wood pattern and sand the mounded edges flat.

Drilling for Nutplates

Fig. 24:D:7

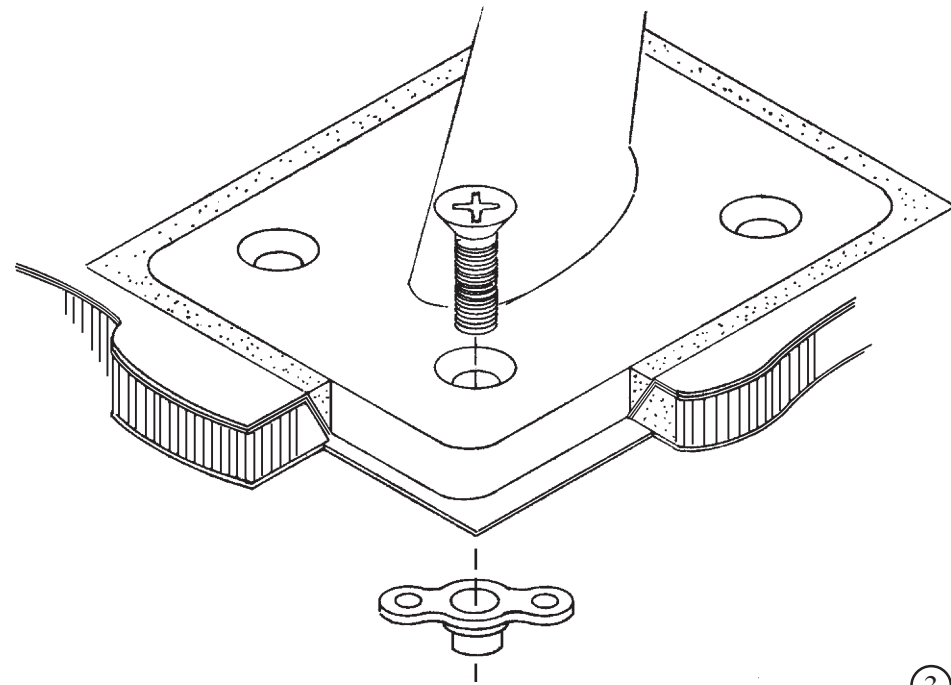
D 7. Put the antenna in place and drill through the 4 mounting holes on the base for nutplates installation.



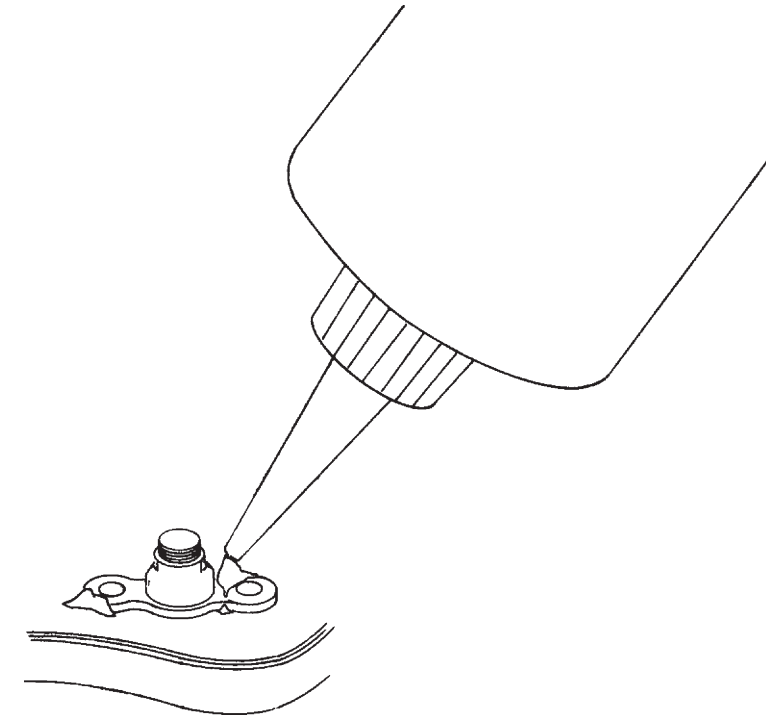
Installing Nutplates
Fig. 24:D:8

D 8. Install nutplates.

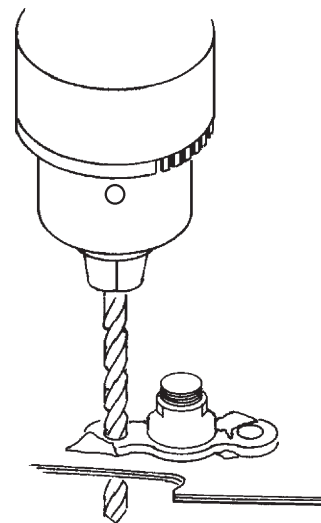
① Install screws.



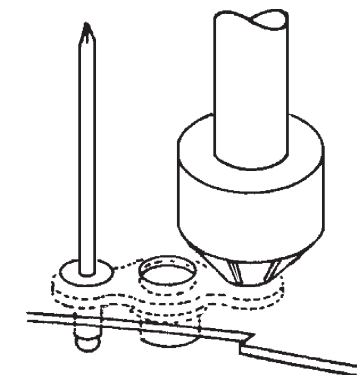
② Use instant glue to hold the nutplates in place.



③ Drill for pop rivets.



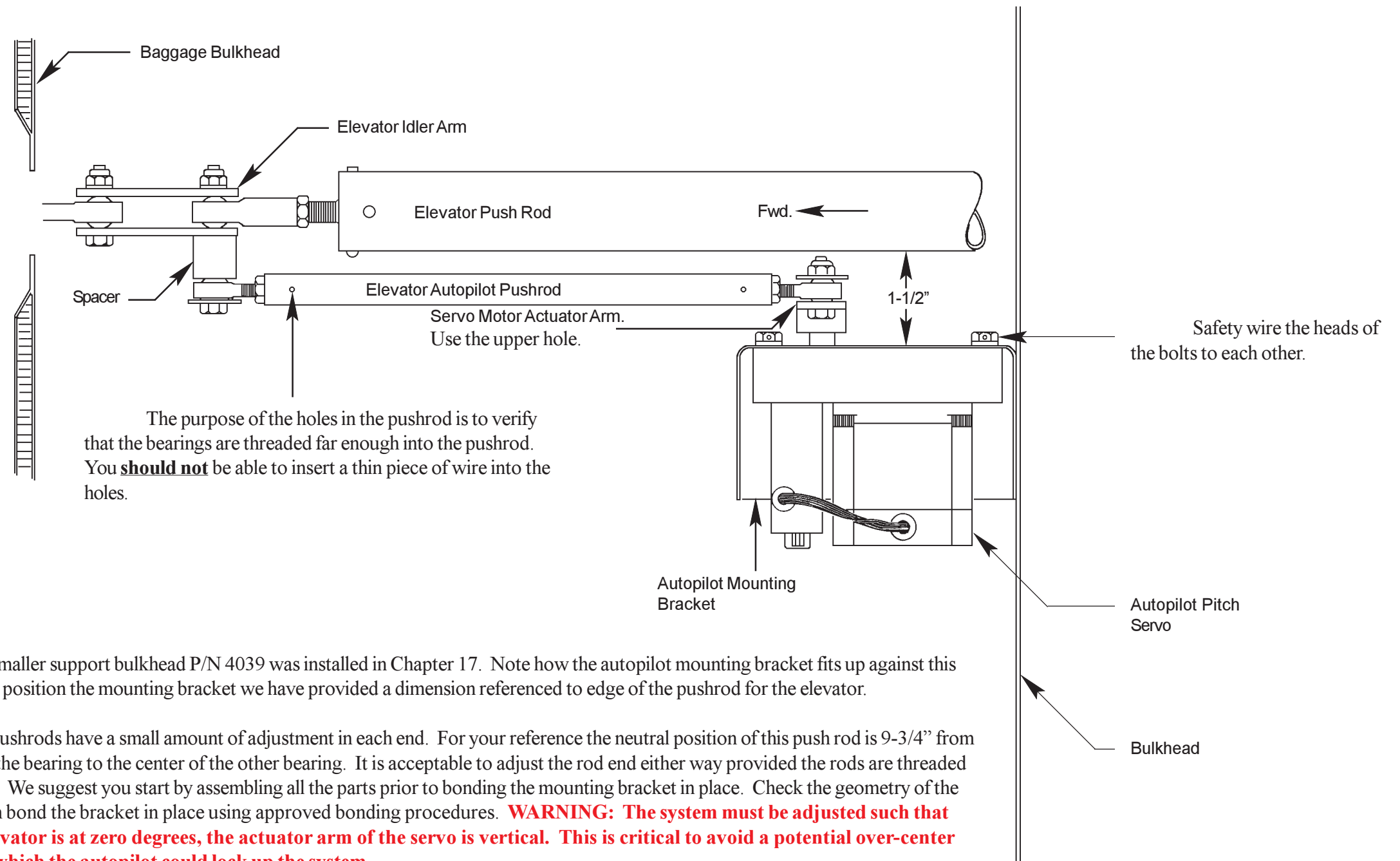
④ Countersink the rivet holes from the outside and secure with countersink pop rivets.



D 9. Mount the Antenna using MS 2469-S51 screws.

E. Autopilot Installation (TRU-TRAK)

Autopilot Pitch Configuration
Fig. 24:E:1

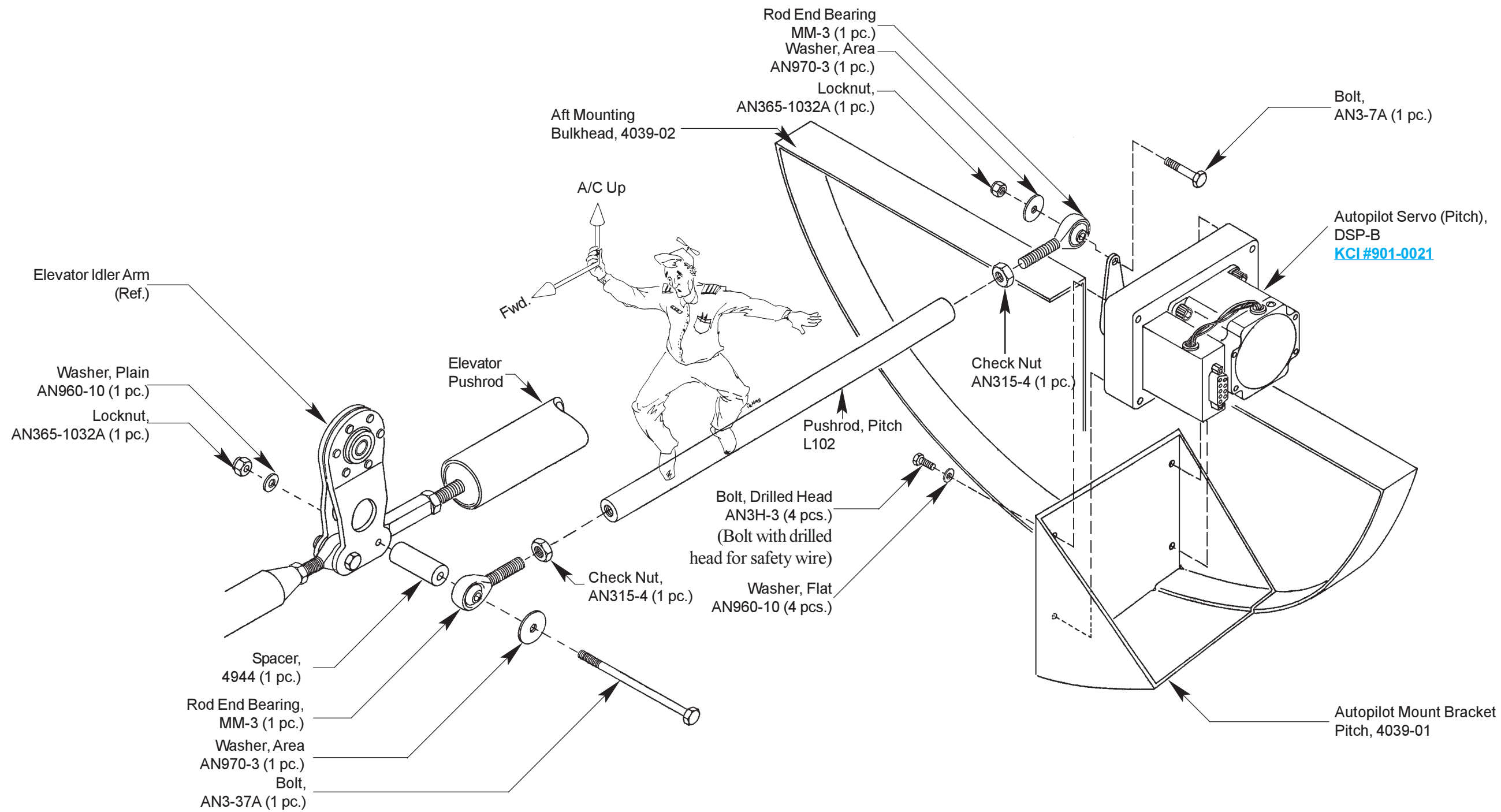


The smaller support bulkhead P/N 4039 was installed in Chapter 17. Note how the autopilot mounting bracket fits up against this bulkhead. To position the mounting bracket we have provided a dimension referenced to edge of the pushrod for the elevator.

The pushrods have a small amount of adjustment in each end. For your reference the neutral position of this push rod is 9-3/4" from the center of the bearing to the center of the other bearing. It is acceptable to adjust the rod end either way provided the rods are threaded far enough in. We suggest you start by assembling all the parts prior to bonding the mounting bracket in place. Check the geometry of the system. Then bond the bracket in place using approved bonding procedures. **WARNING: The system must be adjusted such that when the elevator is at zero degrees, the actuator arm of the servo is vertical. This is critical to avoid a potential over-center situation in which the autopilot could lock the system.**

Autopilot Pitch Servo Installation

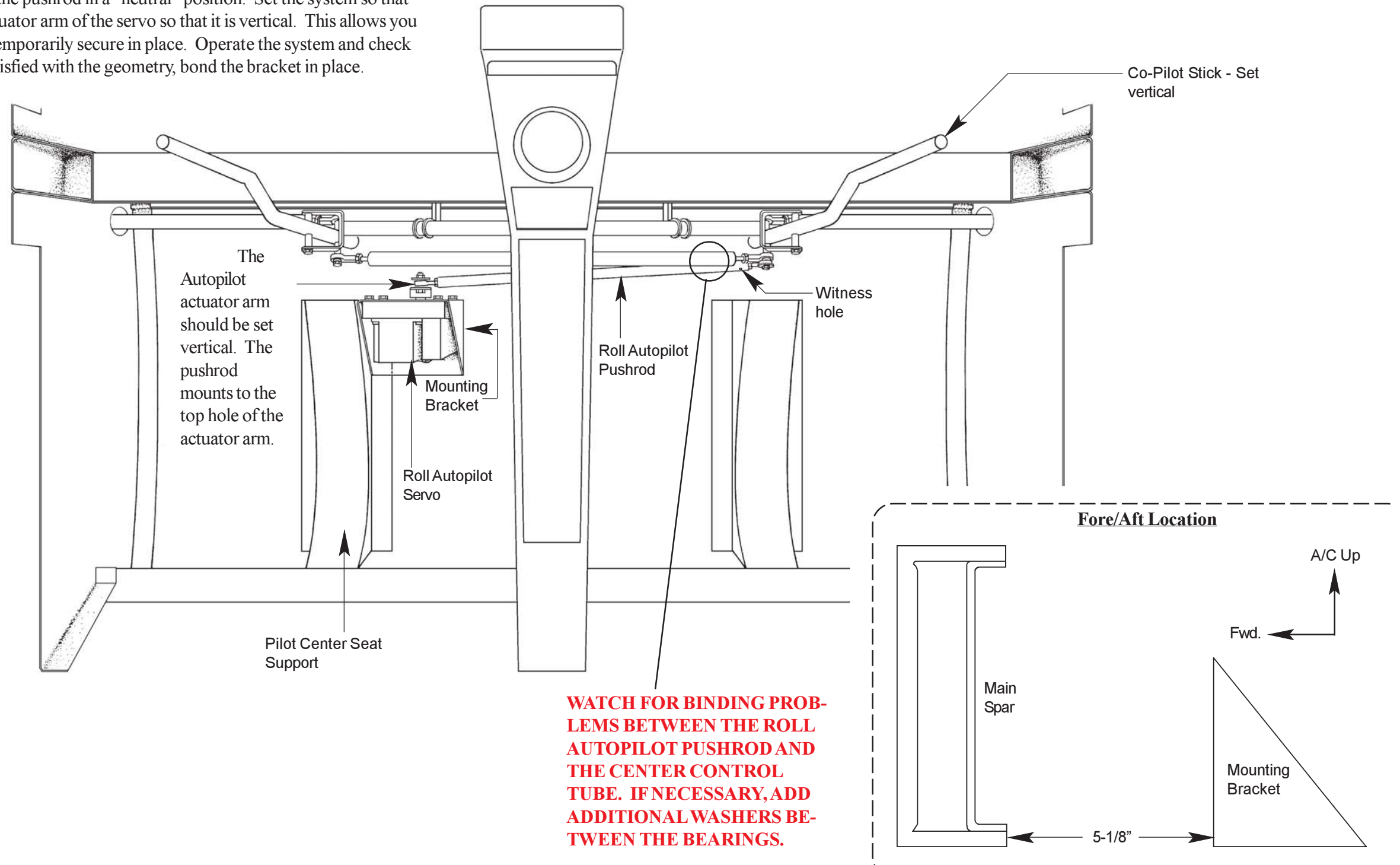
Fig. 24:E:2



Autopilot Roll Configuration

Fig. 24:E:3

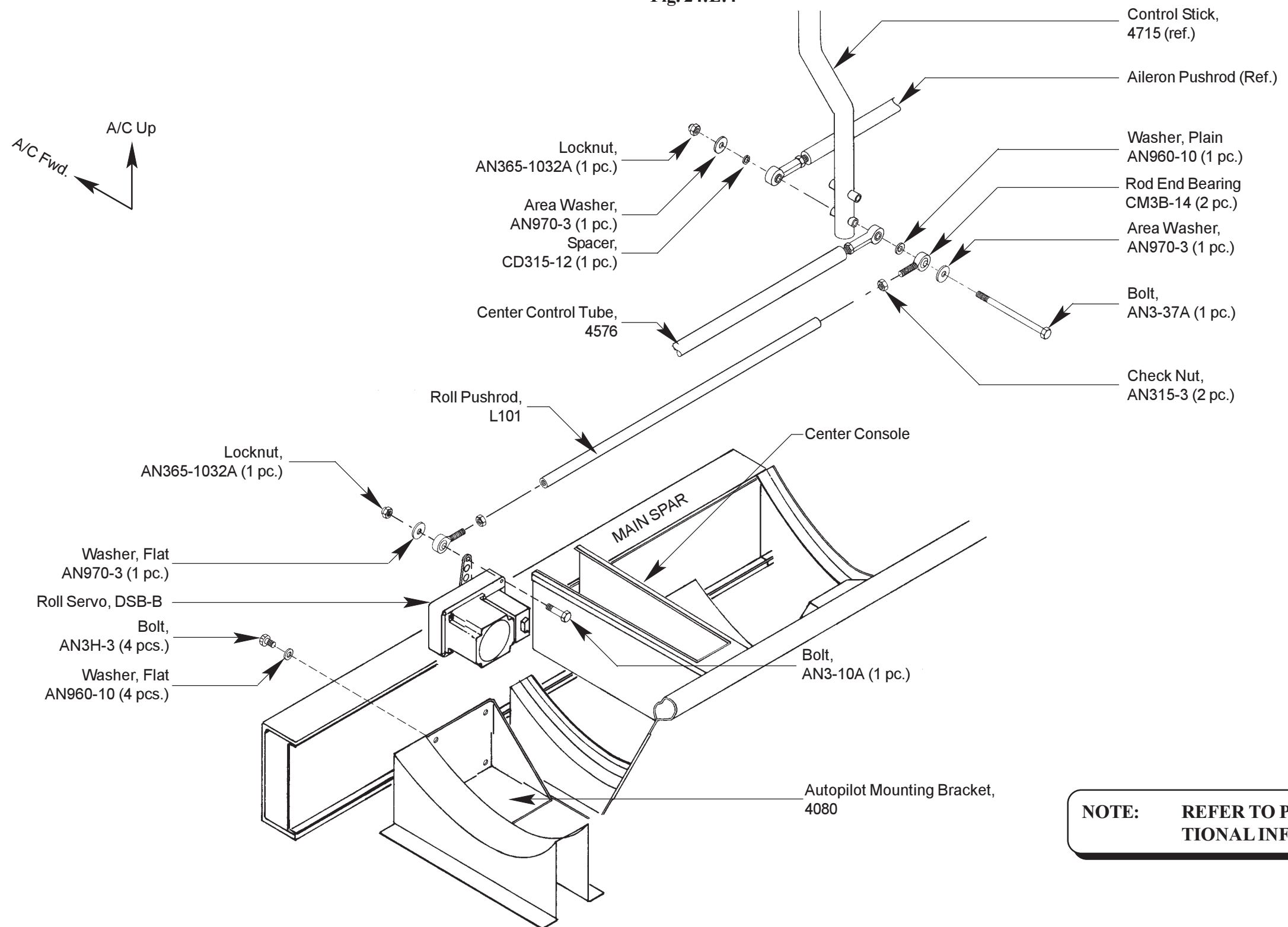
The autopilot roll servo installs underneath the pilot's seat. Note that we provide a dimension from the spar to the autopilot mounting bracket. However to locate the autopilot left-right we suggest you assemble the whole system. Start by adjusting the roll pushrod such that the pushrod measures 18-1/2" from center to center. This puts the pushrod in a "neutral" position. Set the system so that the control stick is vertical and set the actuator arm of the servo so that it is vertical. This allows you to determine the position of the servo. Temporarily secure in place. Operate the system and check for clearance between all parts. Once satisfied with the geometry, bond the bracket in place.



WATCH FOR BINDING PROBLEMS BETWEEN THE ROLL AUTOPILOT PUSHROD AND THE CENTER CONTROL TUBE. IF NECESSARY, ADD ADDITIONAL WASHERS BETWEEN THE BEARINGS.

Autopilot Roll Servo Installation

Fig. 24:E:4



- Control Stick, 4715 (ref.)
- Aileron Pushrod (Ref.)
- Washer, Plain AN960-10 (1 pc.)
- Rod End Bearing CM3B-14 (2 pc.)
- Area Washer, AN970-3 (1 pc.)
- Bolt, AN3-37A (1 pc.)
- Check Nut, AN315-3 (2 pc.)

- Locknut, AN365-1032A (1 pc.)
- Area Washer, AN970-3 (1 pc.)
- Spacer, CD315-12 (1 pc.)
- Center Control Tube, 4576
- Roll Pushrod, L101
- Locknut, AN365-1032A (1 pc.)
- Washer, Flat AN970-3 (1 pc.)
- Roll Servo, DSB-B
- Bolt, AN3H-3 (4 pcs.)
- Washer, Flat AN960-10 (4 pcs.)

- Center Console
- MAIN SPAR
- Bolt, AN3-10A (1 pc.)
- Autopilot Mounting Bracket, 4080

NOTE: REFER TO PAGE 6-3 FOR ADDITIONAL INFORMATION.



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MISCELLANEOUS SYSTEMS		