

REVISION LIST

CHAPTER 4: FUEL 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
4-1 through 4-3	0/02-15-02	None	Current Revision is Correct
4-4	1/09-18-02	R&R	Text Correction
4-5	TBA	R&R	Text and fig. 4:C:1 Correction
4-6	0/02-15-02	None	Current Revision is Correct
4-7	01/09-18-02	R&R	Text Correction
4-8	0/02-15-02	None	Current Revision is Correct
4-8	2/06-30-04	R&R	Added arrow for air flow direction.
4-9	2/06-30-04	R&R	Added photo.
4-10	2/06-30-04	R&R	Added photo.
4-1	3/12-15-04	R&R	New table of contents with page numbers and part nbr. change.
4-4	3/12-15-04	R&R	Part nbr. change.
4-11	3/12-15-04	R&R	Changed fuel pump fittings.
4-1, 4-4	5/05-15-07	R&R	Part number change only.
4-1, 4-2, 4-4, 4-10, 4-11	6/08-11-07	R&R	Part numbers changed.
4-8, 4-11	6/08-11-07	R&R	Change to instructions.

Chapter 4: Fuel Systems

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1. INTRODUCTION

Starting at the filter cap, fuel finds its way through various drain holes through the wing tank. Fuel continues through one of the two check valves also called slosh doors. The slosh doors keep the fuel in the inboard bay during uncoordinated flight. Fuel continues through the fuel pickup and through the center wing section to the fuel selector valve. Next stop is the fuel pump, then the gascolator before it reaches the engine.

If you're using a Continental you must install a fuel return system as some fuel is returned back to the wing tanks.

2. PARTS LIST

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM (not included with kit)
GENERAL				
1)	SPRL-M-L	2	Fuel Caps, Metal	**Yes
2)	SPRL-KCI	2	Fuel Caps, Plastic	
FUELSELECTOR				
1)	4021	1	Fuel Selector Valve Mounting Flange	
2)	4808	1	Fuel Selector, Continental	**Yes
3)	EFS 25-2-2B-M	1	Fuel Selector, Lycoming	**Yes
4)	K3000-3	4	Nutplates	
5)	MSC-34	8	Rivet, Cherry	
6)	101-0065 3K146	4	Sockethead Screw	
7)	AN525-832R10	4	Washerhead Screw	
FUELSUPPLYLINES				
1)	4805	2	Flexible Hose # 8 x 9.25'	
2)	4807		Pre-made line	**Yes
3)	4809		Pre-made line	**Yes
4)	165-0000/165-0001/165-0002 85000K83/84/85	10'	Antichafing Material for Fuel Lines	
5)	AN924-8D	2	Check Nut	
6)	MS21919-DG 8	4	Clamps	
7)	CS125-1032-12GCR	4	Click Bond Studs 3/16"	
8)	AN818-8D	8	Coupling	
9)	FU7-2	2	Fitting, with Screen	
10)	AN833-8D	2	Fitting, Elbow (Bulkhead)	
11)	AN832-8D	2	Fitting, Union (Bulkhead)	
12)	5052-.500 x .035	12'	1/2" Aluminum Tubing for Fuel Lines	
13)	AN365-1032A	4	Nut, Nylock	
14)	AN819-8D	8	Sleeve	
15)	AN960-10L	4	Washer, Flat (thin)	

Note:

Optional Parts available through :

(*) Lancair Avionics

(**) Kit Components, Inc.



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Chapter 4

REV.

6/08-10-07

FUEL SYSTEMS

#	PART NO. (P/N)	QTY	DESCRIPTION	OPTIONAL ITEM <i>(not included with kit)</i>
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FUEL VENTLINE CHECK VALVE

1)	545	2	Check Valve	
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FUEL RETURN LINES

1)	4806	2	Flexible Hose # 4 x 12'	
2)	5052-.250 x .035	18'	1/4" Aluminum Line	
3)	85000K83/84/85	10'	Antichafing Material for Fuel Lines	
4)	MS21919-DG 4	6	Clamps	
5)	CS125-1032-12GCR	6	Click Bond Studs 3/16"	
6)	AN818-4D	8	Coupling	
7)	AN 822-4D	2	Fitting, Elbow	
8)	AN833-4D	2	Fitting, Elbow (Bulkhead)	
9)	AN832-4D	2	Fitting, Union (Bulkhead)	
10)	AN924-4D	4	Nut, Check	
11)	AN365-1032A	6	Nut, Nylock	
12)	AN819-4D	8	Sleeve	
13)	AN960-10L	6	Washer, Flat (thin)	

FUEL PROBE (optional)

1)	P-300-C-8	1	Fuel Probe (EI)	*Yes
2)	3010010	8'	Vision Microsystems	*Yes

FUEL boost PUMP kit (optional, PURCHASE ALL AS ONE WITH PUMP KIT)

1)	5456-00-1	1	For 12V Lycoming 540	**Yes
2)	5455-00-1	1	For 12V Continental 550	**Yes
3)	145-0008-5416K32	1	Clamp	**Yes
4)	229-4-1	1	Fitting, Elbow	**Yes
5)	C5365 x 8	2	Fitting, 45 Degree	**Yes
7)	3814-6	1	Hose	**Yes
6)	22-4	1	Splice	**Yes

FUEL DRAIN COVERS

1)	F-391-18	4	Fuel Drain Valve	
2)	4271	4	Fuel Drain Fairing	

Note:

Optional Parts available through :

(*) Lancair Avionics

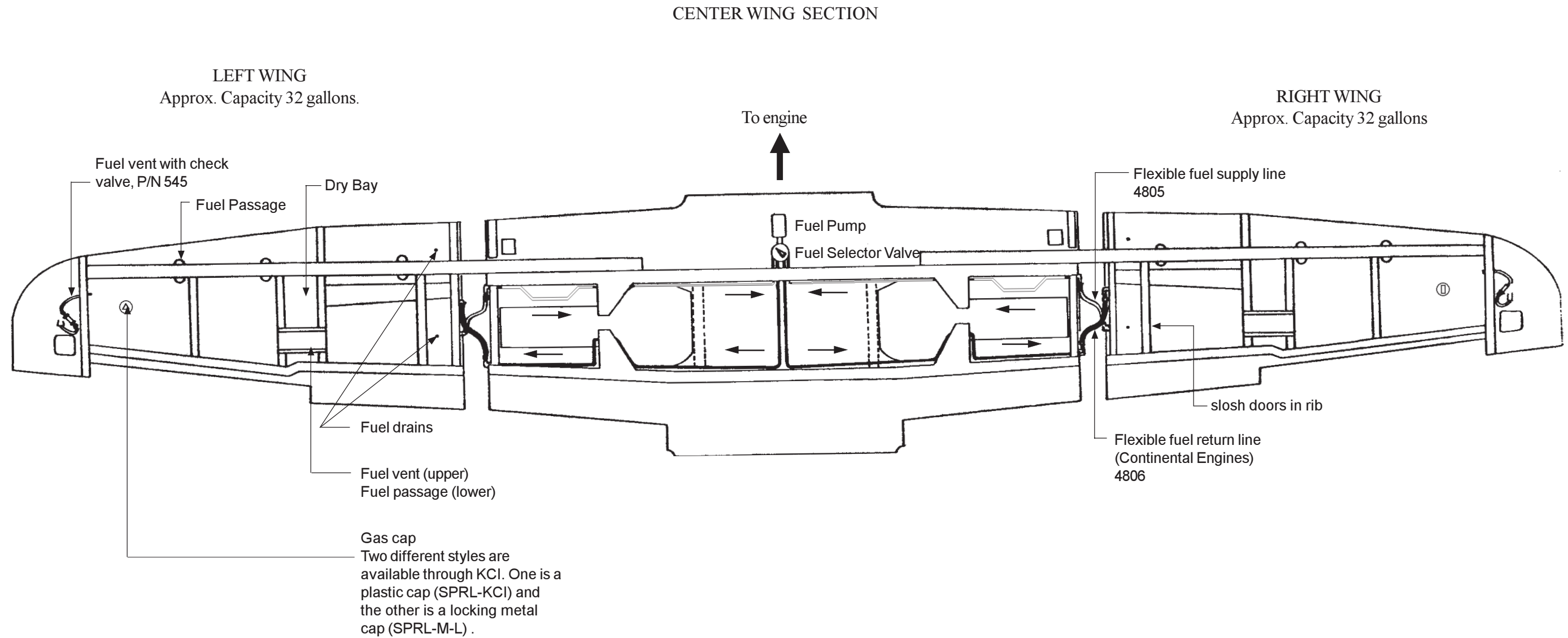
() Kit Components, Inc.**



3. CONSTRUCTION PROCEDURES

A. Legacy Fuel System - General Overview

Legacy Fuel System
Fig. 4:A:1

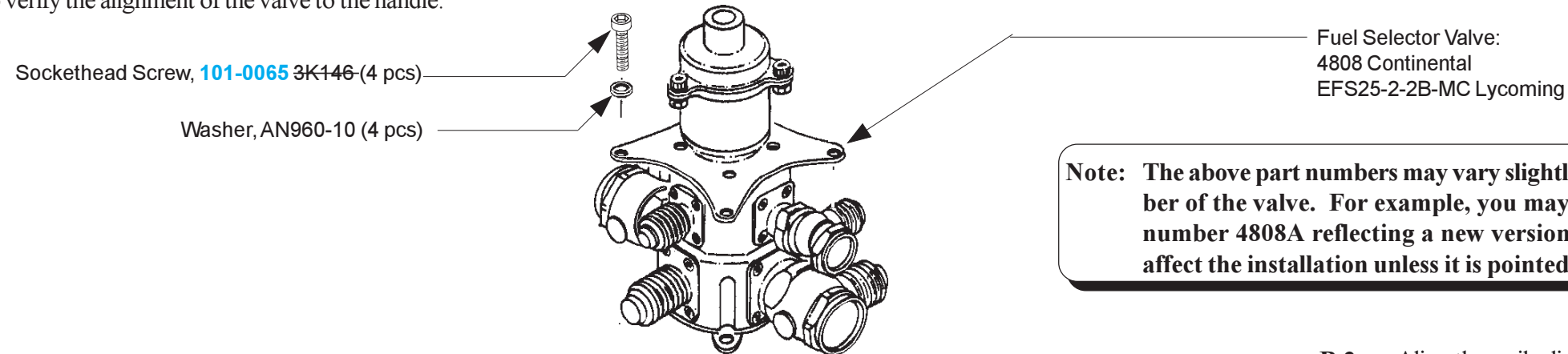


B. Fuel Selector Valve (Optional)

Fuel Selector Mount

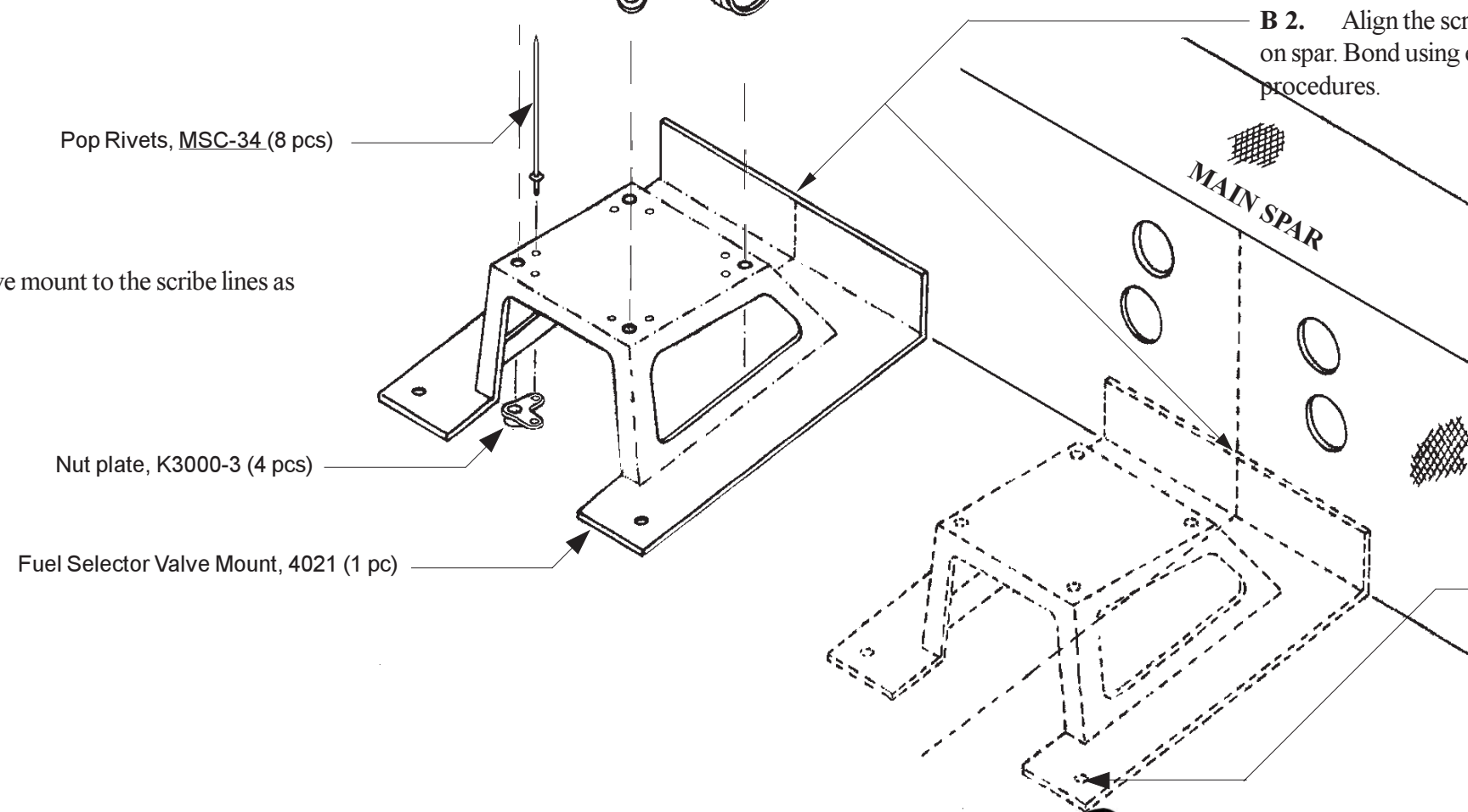
Fig. 4:B:1

The fuel selector valve mounts just in front of the main spar along the fuselage center line. Note that the mount is slightly angled to make the valve parallel to the handle that mounts in the center console. Provided you build everything precise the fuel selector and the fuel selector valve handle will align. We suggest that you also read section 14:G:1 to get a better idea of how the parts align. Prior to permanently mounting the valve it is a good idea to fit the center console to verify the alignment of the valve to the handle.



Note: The above part numbers may vary slightly depending on the revision number of the valve. For example, you may have received a valve with part number 4808A reflecting a new version. The revision will not typically affect the installation unless it is pointed out.

B 1. Trim the selector valve mount to the scribe lines as shown.

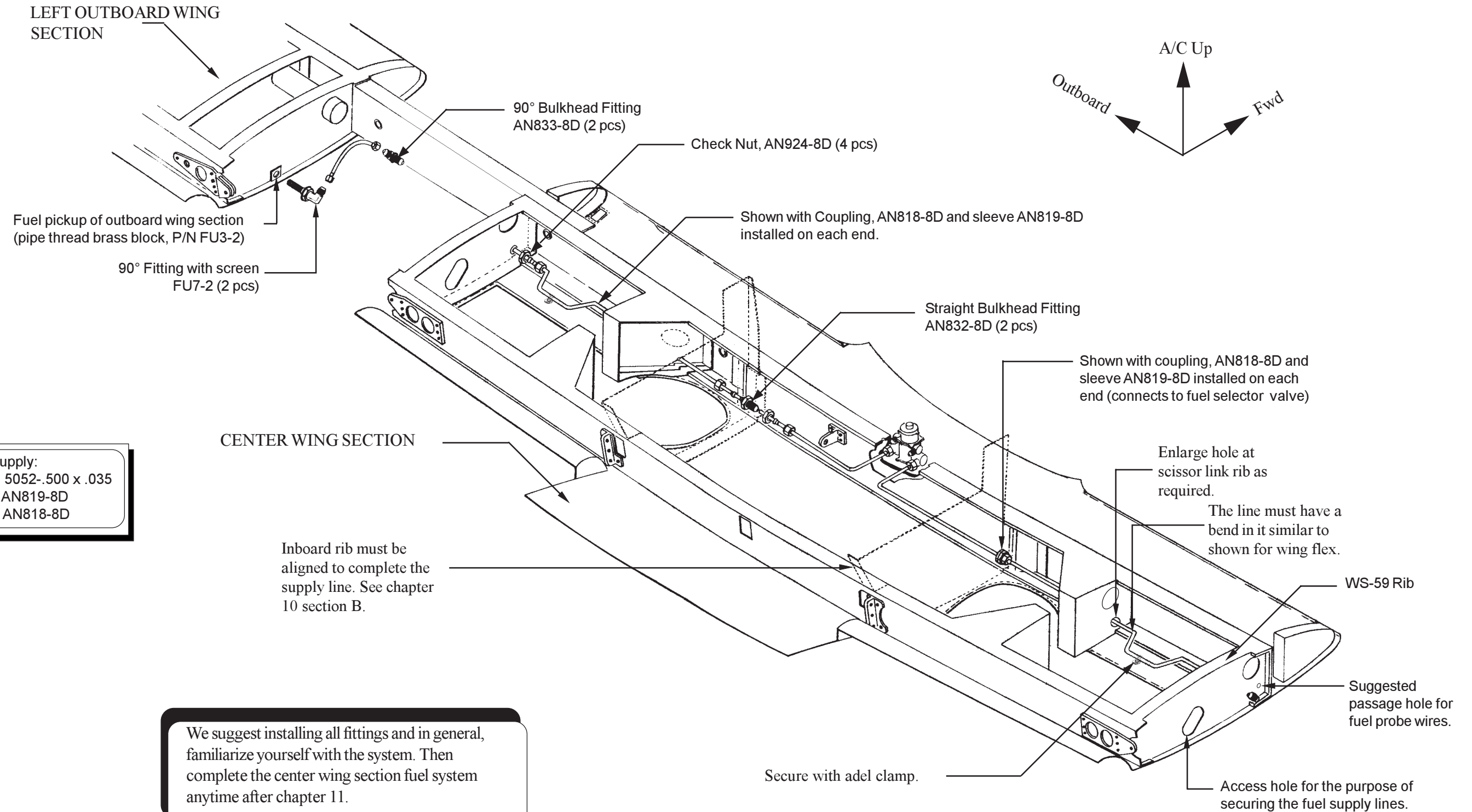


B 2. Align the scribe line of the mount to scribe line on spar. Bond using epoxy/flox using proper bonding procedures.

Drill 1/8" holes for clecos through the mount and inner laminate of center wing section in the cored area. This will help hold the mount in place during bonding. **DO NOT DRILL CLECO HOLES THROUGH SPAR.**

C. Fuel Supply Lines

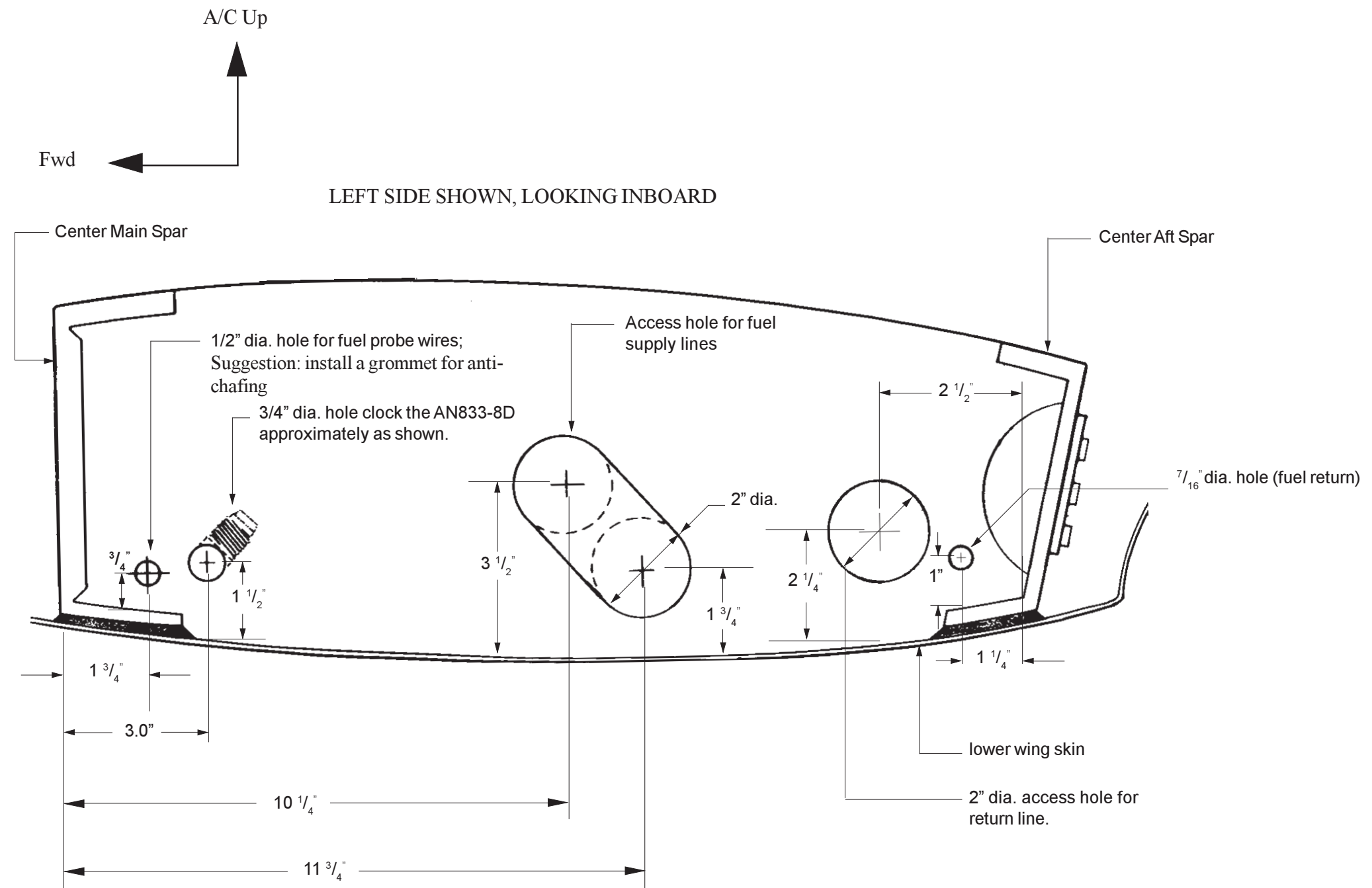
Fuel Supply Lines for Center WingSection
(Exploded View)
Fig. 4:C:1



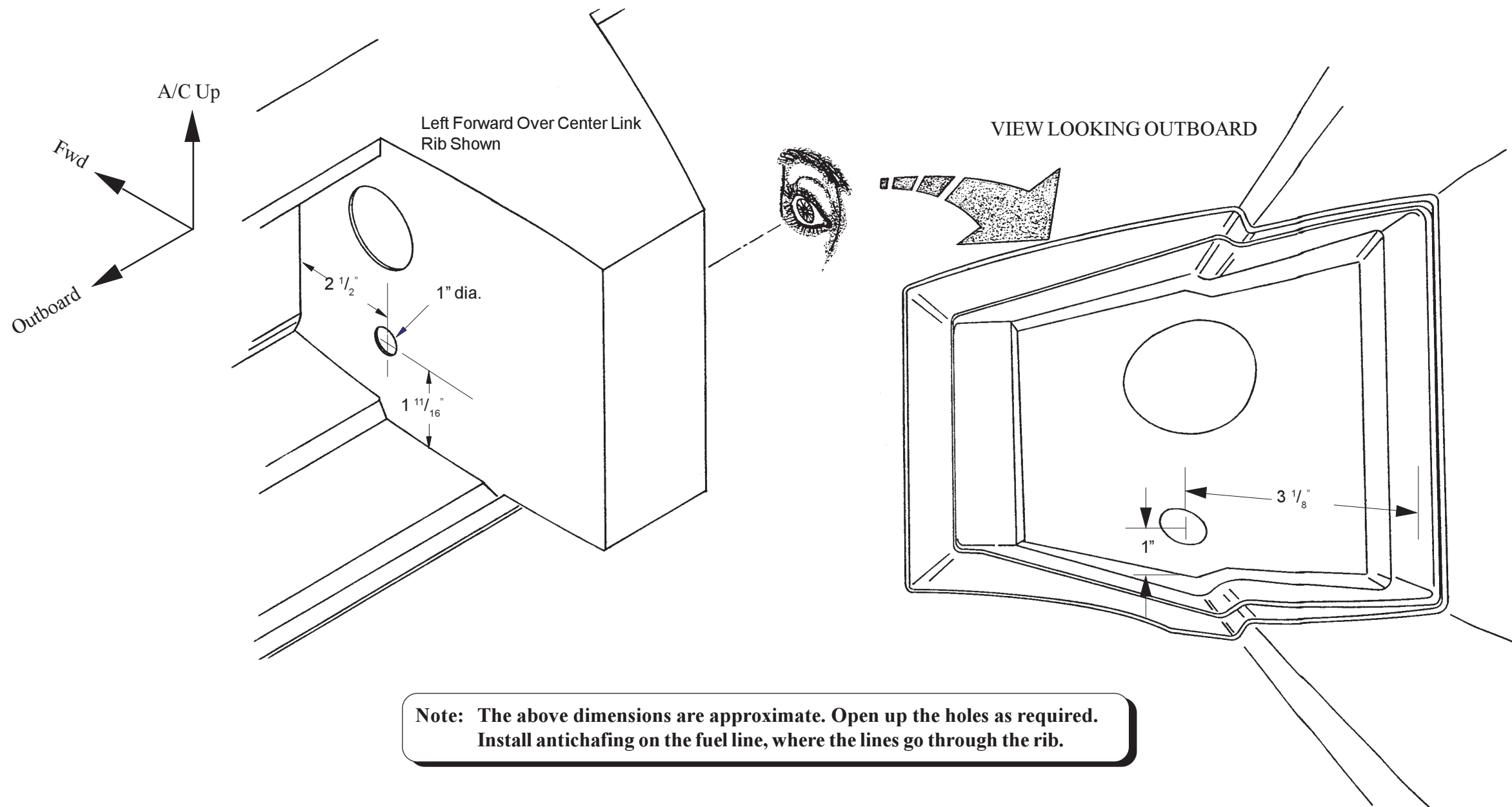
All fuel supply:
lines 5052-.500 x .035
sleeves AN819-8D
nuts AN818-8D

We suggest installing all fittings and in general, familiarize yourself with the system. Then complete the center wing section fuel system anytime after chapter 11.

Fuel System Related Holes of WS 61.5 Rib
 Fig. 4:C:2



Fuel Supply Lines through Over Center Link Rib
Fig. 4:C:3

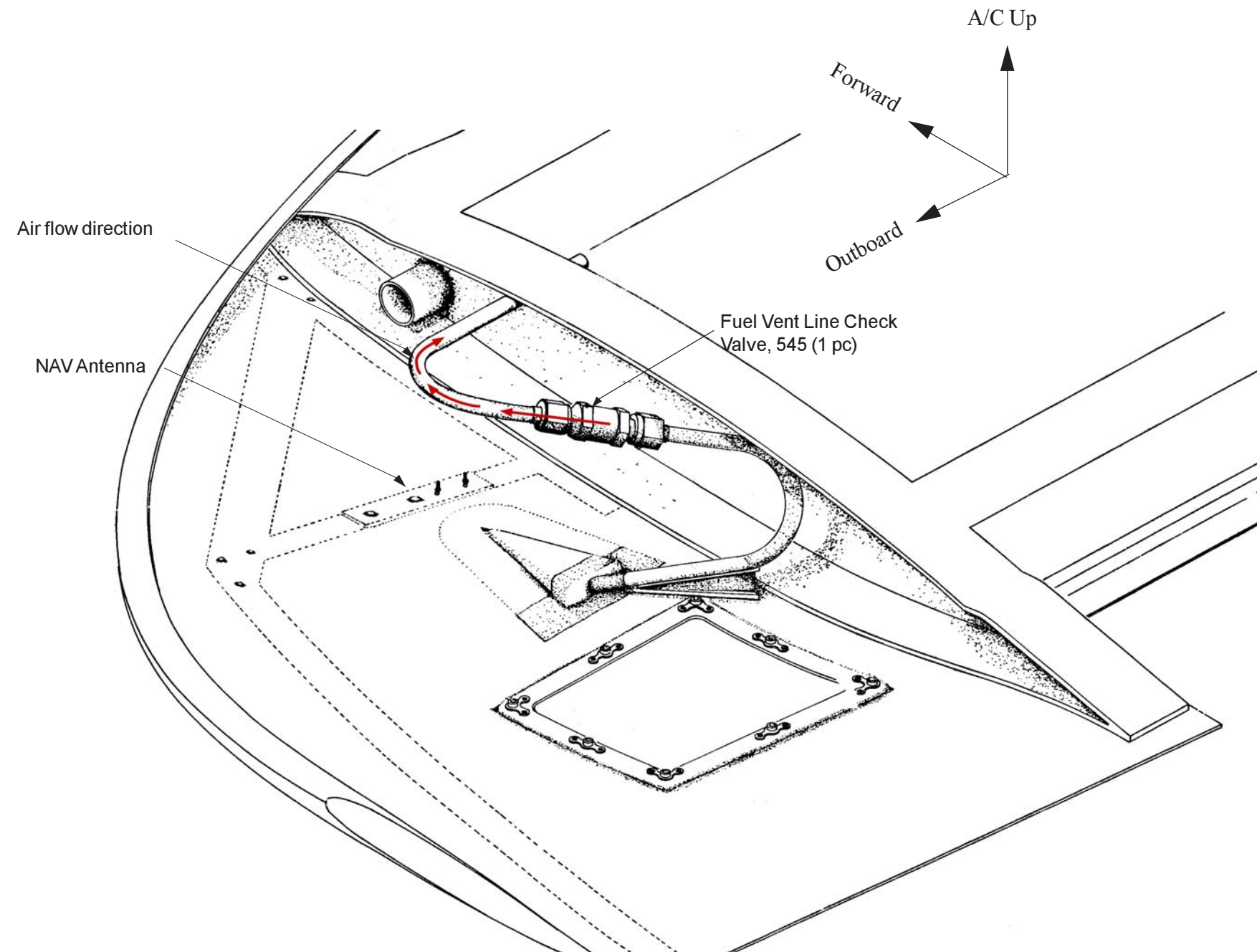


Note: The above dimensions are approximate. Open up the holes as required. Install antichafing on the fuel line, where the lines go through the rib.

D. Fuel Vent Line Check Valve

- D 1. Install the fuel vent line check valve as shown. The red arrow must point towards the tank, which the air flows into.

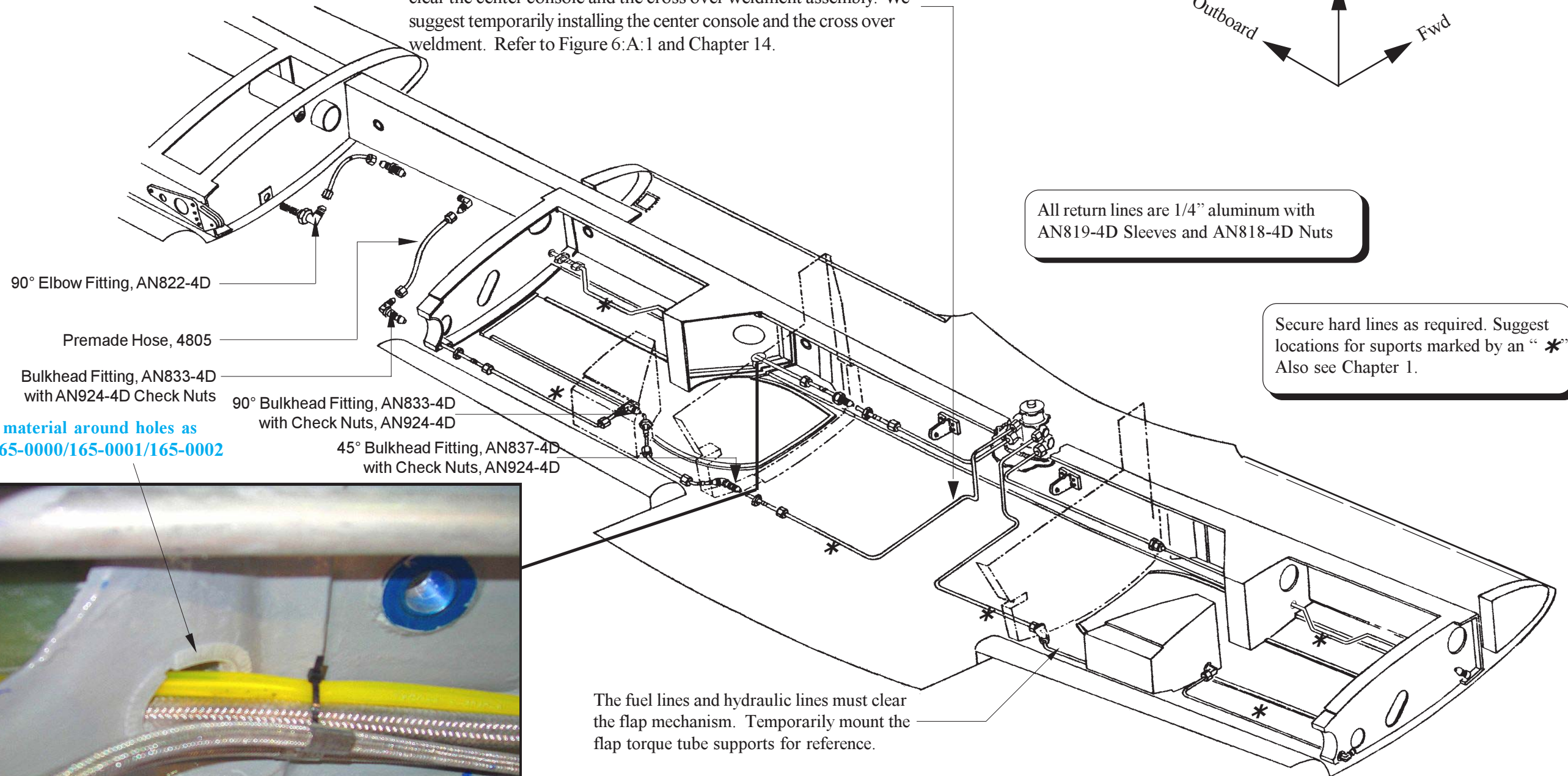
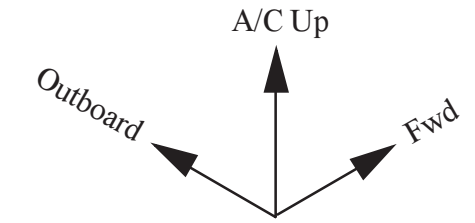
Installing Fuel Vent Line Check Valve
Fig. 4:D:1



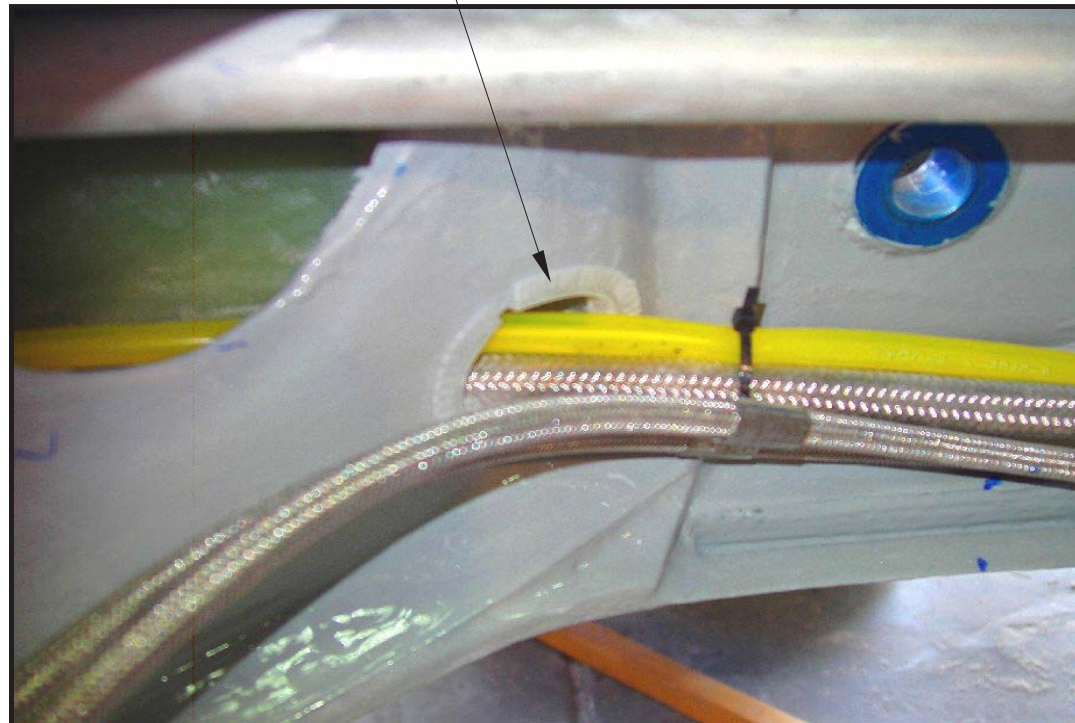
E. Fuel Return Lines

Return Lines
Fig. 4:E:1

Refer to this figure for the approximate routing of lines. The lines must clear the center console and the cross over weldment assembly. We suggest temporarily installing the center console and the cross over weldment. Refer to Figure 6:A:1 and Chapter 14.



Use anti-chaffing material around holes as required. Part #165-0000/165-0001/165-0002



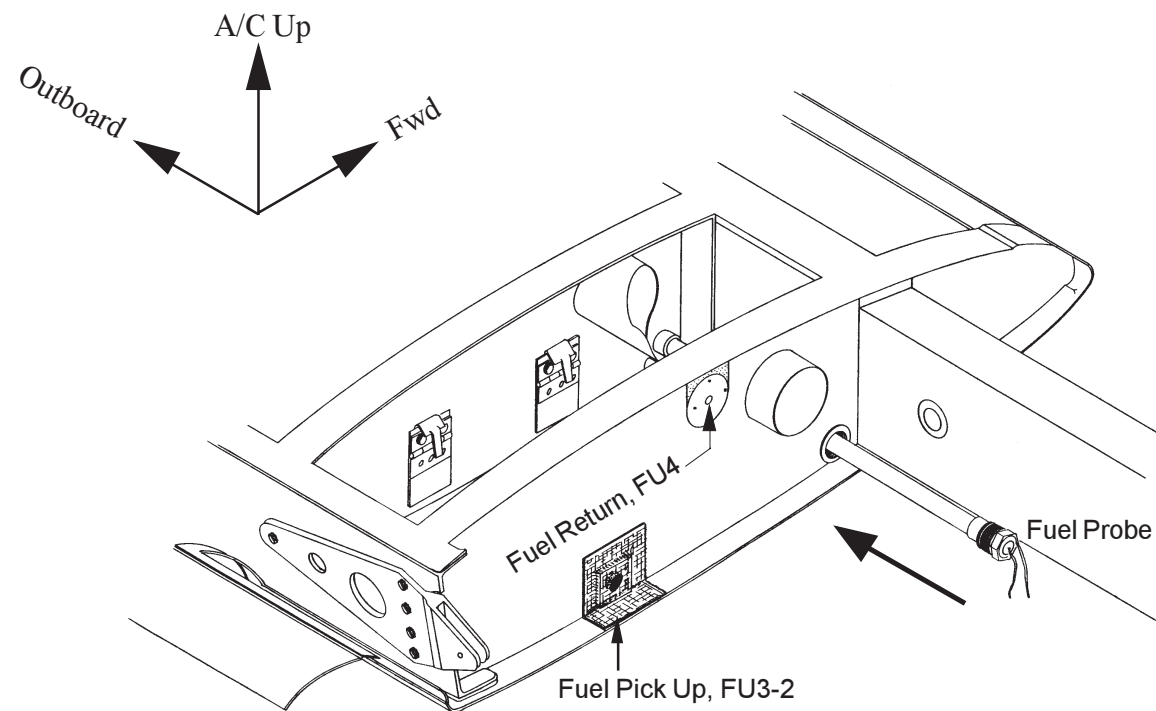
Note: Aft spar not shown for clarity.

F. Fuel Probe (Optional)

F 1. Lancair offers two options for the fuel probes. One is for Vision Micro Systems (VMS) and the other is from Electronics International (EI). The installation is identical. Both systems are available through Lancair Avionics.

Warning: Apply antiseize on the threads of the aluminum fuel probe mount. Without antiseize the fuel probe will cold weld to the aluminum fuel probe.

**Fuel Probe Installation
Fig. 4:F:1**



Fuel Probes VMS P/N: 3050010
Fuel Probes EI P/N: P-300-C-8

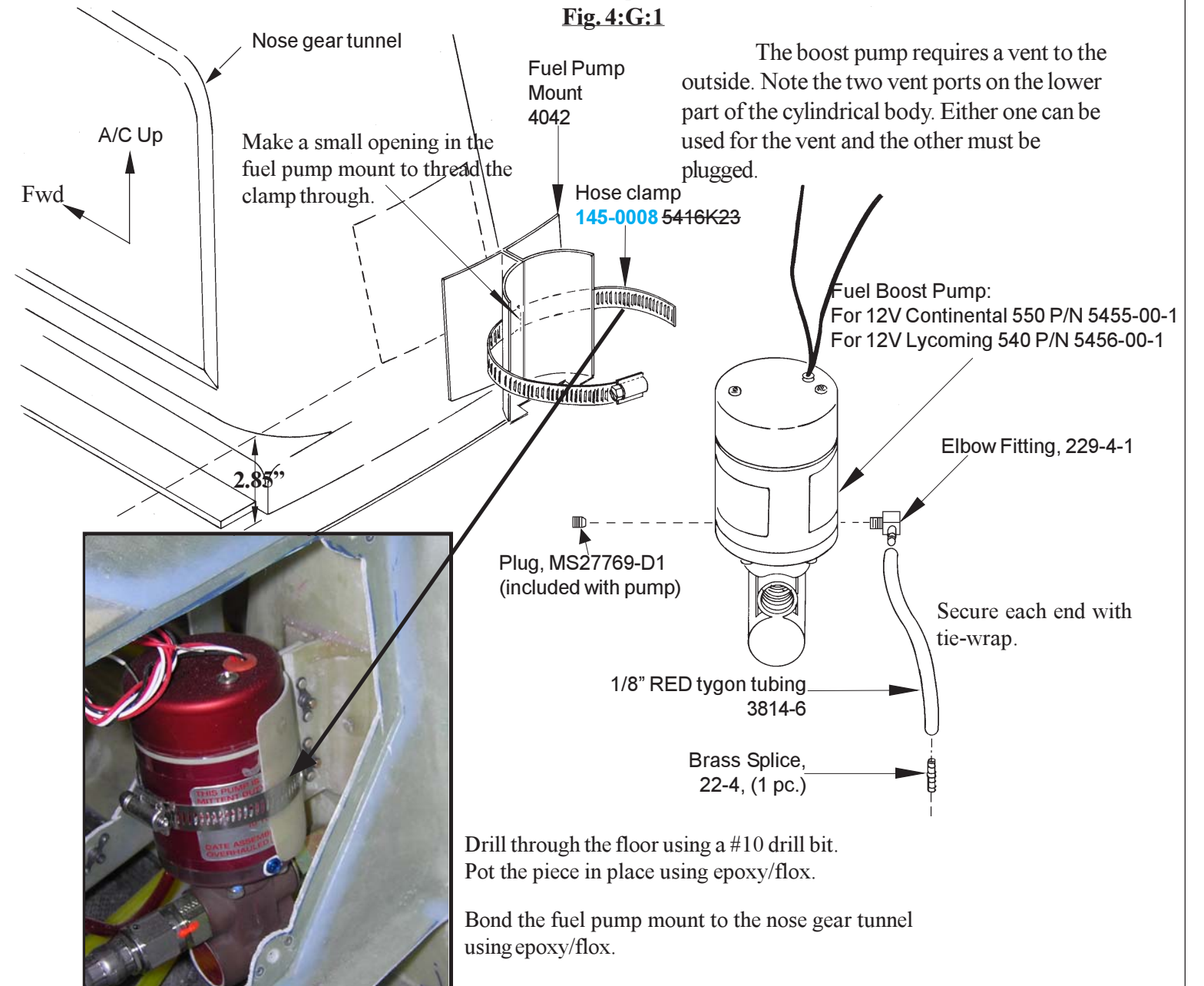
Note: The correct fuel probe length for the Lancair Legacy fuel tanks is 72".

G. Fuel Boost Pump (Optional)

G 1. The type of fuel pump used depends on the type of engine installed. The Continental requires a two-stage fuel pump while the Lycoming a single stage. Two-stage means that the pump has a low boost. Refer to the pilot operating handbook for proper use.

G 2. The new, longer fuel pump mount needs to be cut from web. Adjust the length of the mount as necessary. The piece holding the fuel pump can be either bonded or screwed to the other section of the mount. Refer to the photograph for current installation method.

**Fuel Boost Pump Installation
Fig. 4:G:1**



Refer to Blueprint # 4862 for the location of the fuel supply and fuel return fittings in firewall. Fuel return is not needed with the Lycoming installations. This figure completes the fuel lines installation up to the firewall.

Fuel Line Installation
Fig. 4:G:2

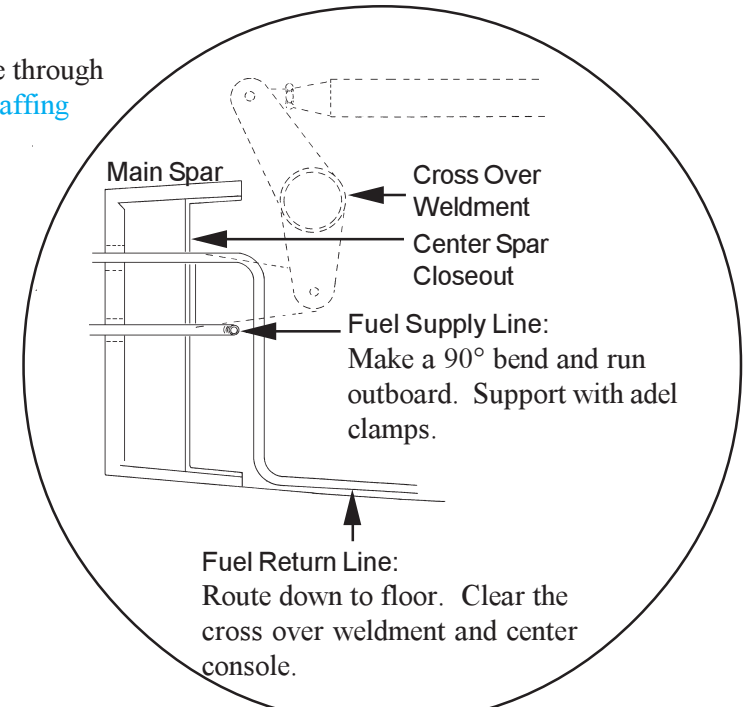
Make a hole in the gusset as shown. Anti-chafe the hole. This is available through KCI, part number 165-0000/165-0001/165-0002 8500K83. Use anti-chaffing material around holes as required.

Sleeve, AN819-8D
Nut, AN818-8D
Optional Pre-made Line, 4809

Secure the fuel lines using adel clamps MS21919-DG8 and standoffs, CS125-1032-12GCR.

Engine Mount Gusset

Fuel Supply Line Tubing 5052-500 x 035



Fuel Return Line:
Route down to floor. Clear the cross over weldment and center console.

Nose Gear Tunnel

Fuel Supply Line, 5052 - .500 x 0.035
Sleeve, AN819-8D
Nut, AN818-8D

Fuel pump fittings:
C5515x8 (1 pc) 90 deg.
C5315x8 (1 pc) straight

Fuel Return Line, 5052 - .25 x 0.035
Sleeve, AN819-4D
Nut, AN818-4D
Optional Pre-made Line, 4807

NOTE: Check that the fuel supply line does not interfere with the floorboards.

H. Fuel Drain Covers

Fuel Drain Fairing
Fig. 4:H:1

H 1. Drill a 7/16" hole centered on the hole of the fairing.

H 2. Fit & bond the fairing in the joggle.

H 3. Safety wire fuel strainer to loop.

