CHAPTER 24
REVISION LIST

The following list of revisions will allow you to update the Lancair IV 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 shown and "R" to remove the pages.

Page(s) affected	Current Rev.#	Action	Description
24-1 thru 24-3	0	None	
24-4 thru 24-6	C12	R&R	Corrected paragraph numbers.
24-5	C14	R&R	Changed dim. in Fig. 24:A:2.
24-8	C12	R&R	Corrected paragraph numbers.
24-10	C12	R&R	Corrected paragraph numbers.
24-11 thru 24-14	0	None	
24-15	C9	R&R	Revised Figure 24:C:1
24-16 thru 24-17	0	None	

CHAPTER 24
INSTRUMENT PANEL

REVISIONS

From time to time, revisions to this assembly manual may be deemed necessary. When such revisions are made, you should immediately replace all outdated pages with the revised pages. Discard the out dated pages. Note that on the lower right corner of each page is a "revision date". Initial printings will have the number "0" printed and the printing date. All subsequent revisions will have the revision number followed by the date of that revision. When such revisions are made, a "table of revisions" page will also be issued. This page (or pages) should be inserted in front of the opening page (this page) of each affected chapter. A new "table of revisions" page will accompany any revision made to a chapter.

ARROWS

Most drawings will have arrows to show which direction the parts are facing, unless the drawing itself makes that very obvious. **"A/C UP"** refers to the direction that would be up if the part were installed in a plane sitting in the upright position. In most cases the part shown will be oriented in the same position as the part itself will be placed during that assembly step. However, time goes on and changes are made, so careful attention should be paid to the orientation arrows.

CONTENTS

1. Introduction

The instrument panel is a relatively simple installation. The placement of it must align with the placement of the gear/flap control quadrant so a quick review of that chapter is recommended.

The instrument panel consists of a fiberglass molded frame with seven aluminum inserts. These inserts serve to mount specific groups of related equipment in a manner that allows for bench assembly and wiring followed by the insertion into the panel frame. This greatly eases the installation and wiring of all components.

While there is some latitude available in the placement of the instrument panel, the following is our recommendation. Factors that must be considered when altering the instrument panel placement are:

Placement:	Issues:
Fwd-aft placement:	Knee room, clearance for the control quadrant.
Vertical placement:	Visibility over the panel, control quadrant alignment, radio & instrument clearance over the aileron connecting rod, fit of the dust cover.

2. SPECIAL PARTS

A. PARTS

1.	Instrument panel frame (fiberglass)
7.	Aluminum panel inserts
1.	Dust cover
1.	Dust cover close out panel
60	Allen head 6-32 screws
4	MS24693-S28 screws
13	MS24694-S7 screws
4	MS24694-S52 screws
13	K1000-08 anchor nuts
4	K1000-3 anchor nuts
65	K1000-06 anchor nuts
180	AN426A-3-5 rivets

B. TOOLS

100° counter sink
#12 drill
#19 drill
#29 drill
#40 drill
sabre saw or equiv.

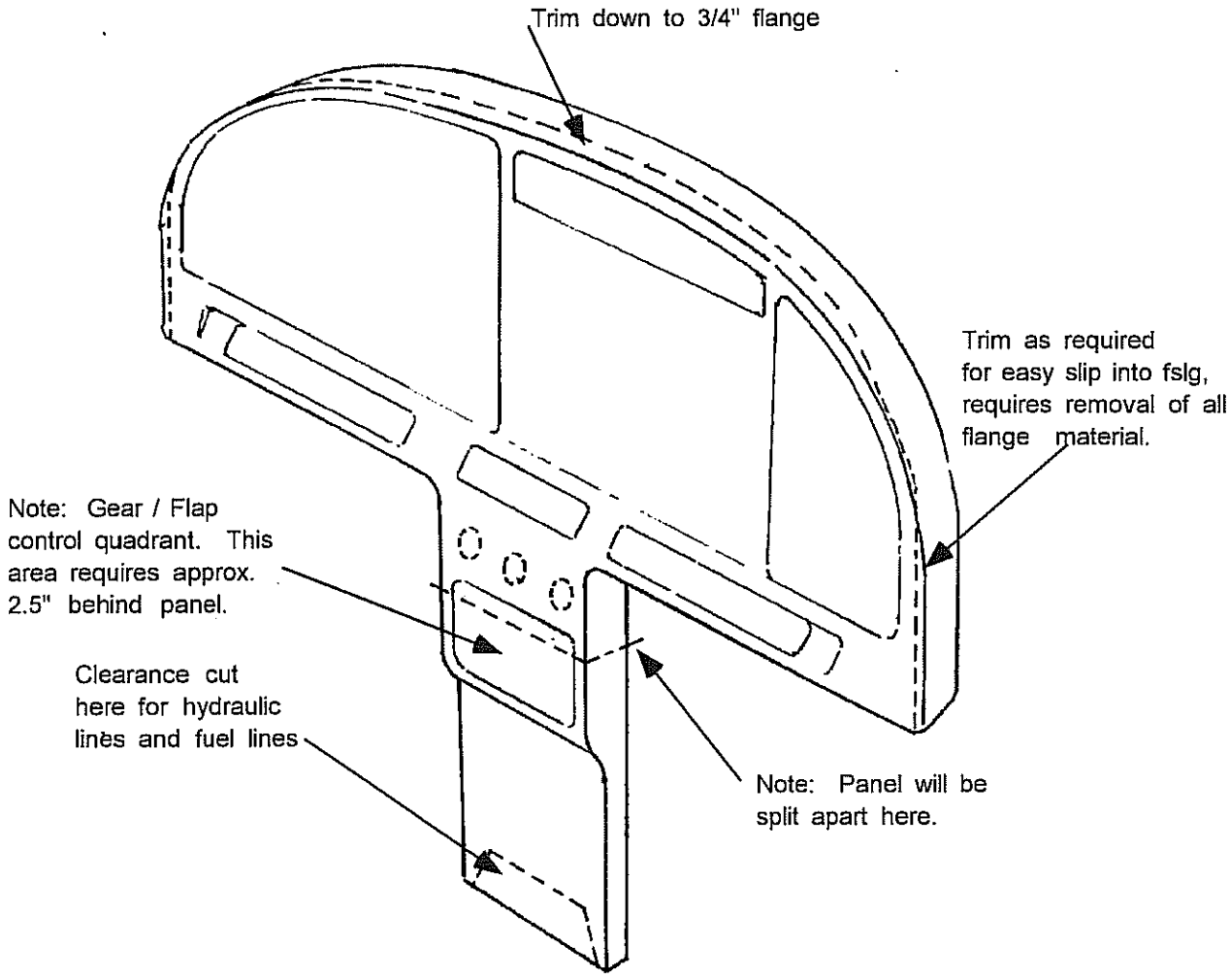
C. SUPPLIES

Fiberglass cloth
resin
sandpaper
tape (release type)
tape (masking or duct type)

3. CONSTRUCTION

A. INSTRUMENT PANEL INSTALLATION

Fitting Instrument Panel
Figure 24:A:1

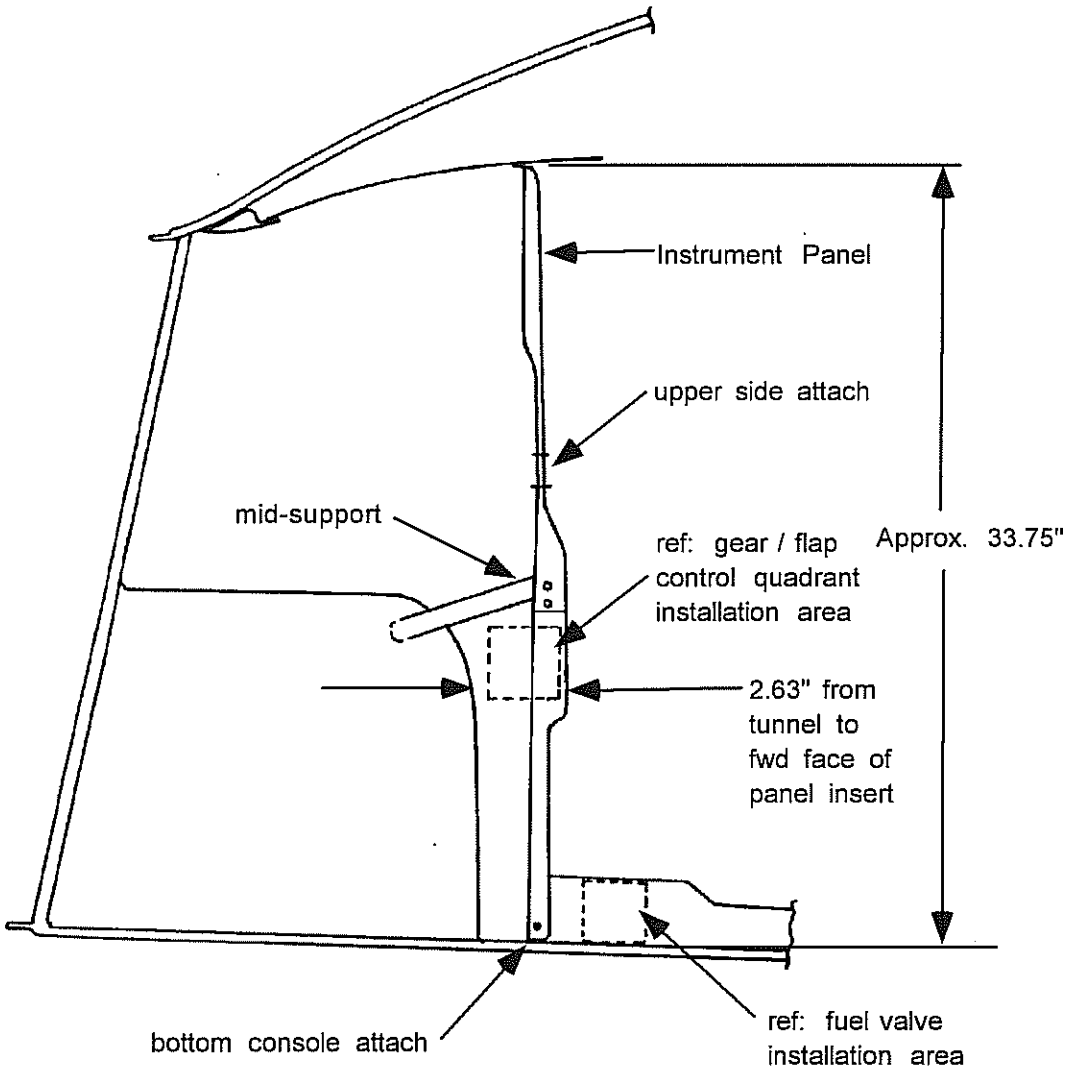


A1. Trial fit the instrument panel into the approximate position. See Figure 24:A:1. It will be necessary to trim a little off each side of the panel so that it slides into appoximate position about 2-5/8" behind the nose gear tunnel.

Do not get too involved with making a real tight fit, or it will later be regretted. Besides, the upholstery, dust cover, etc. will cover the outer 1/4" anyway. Also, remember that the panel will need to be put into the plane after all the other stuff is installed. So, if hours are now spent making a nice tight, "net" fit, more time

later will be spent grinding all of the careful work away! Also note that the bottom of the vertical console should be made removeable for access to the gear/flap control quadrant, directions for doing so are included.

Instrument Panel Location
Figure 24:A:2



The initial "do list" for the fitting of the instrument panel:
a.) Trim the top flange off the panel leaving only 3/4" remaining, the flange should be totally removed on the lower outboard sides where the attachment screws will be installed. (Do this before fitting the panel into the airplane.) In addition, the sides will generally need a little trimming, and that flange will then be cut off in the process.

b.) Trim clearance notches for the left and right control stick torque tubes. See Figure 24:A:3. (This will require a fit-check in the airplane to locate.)
c.) Trim the center bottom of the vertical console area up 2" off of the floor. See Figure 24:A:4. (Do this before you start fitting the panel into the plane.)

Doing these will allow the panel to be roughly fitted into the airplane. This is only a rough fit, so don't get to concerned about its final position,...that will be set next.

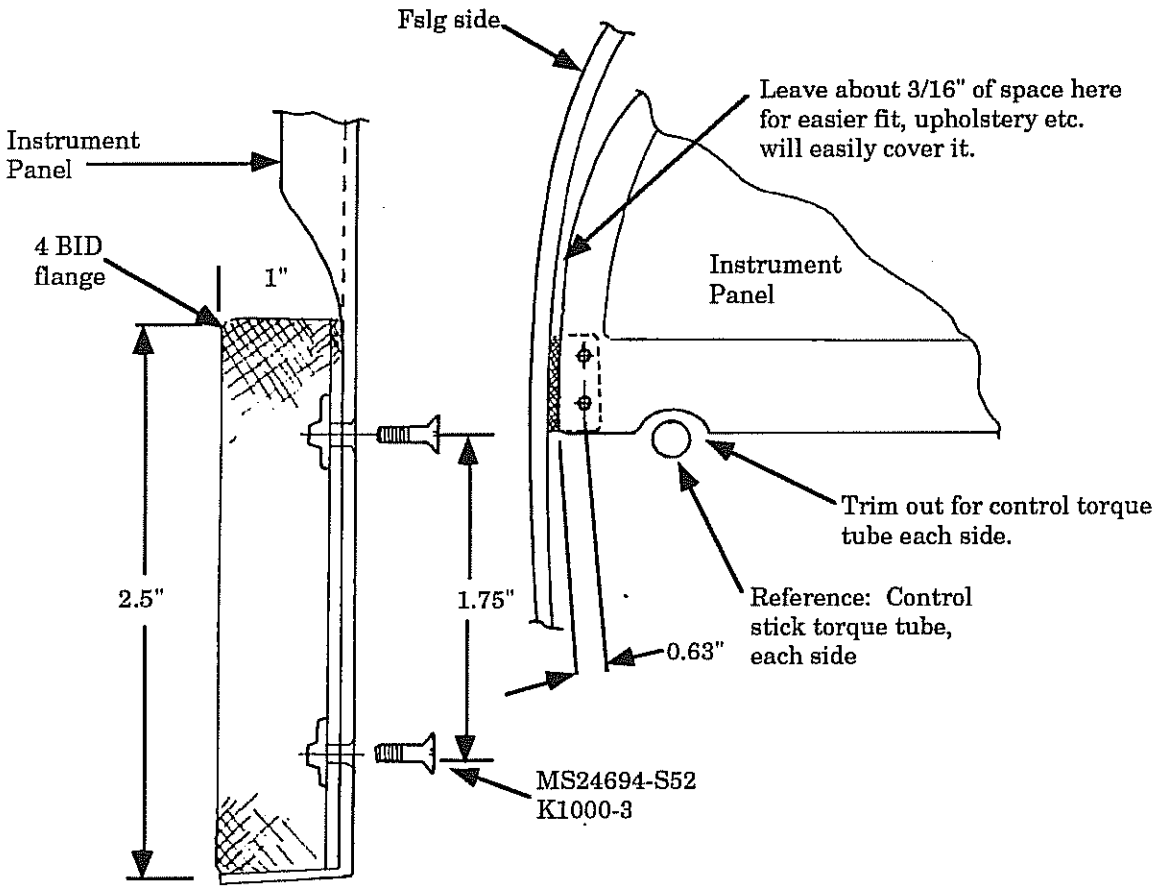
A2. Locate and mark the instrument panel for its final positioning. With the rough fit completed, we recommend the following for final installation: See Figure 24:A:2.
Vertical position: 34.75" up from the floor to the top of the panel. (Measure from the area of the floor which contains the core material, ie: in front of the pilot side.)
Fwd/aft position: Panel is set vertical and allowed 2-5/8" from the aft face of the nose gear tunnel to the fwd face of the gear/flap quadrant panel's aluminum insert.
Left/right: Center panel's vertical column (console) on the nose gear tunnel.

A3. Temporarily hold the instrument panel in place. Use quick set glue to hold the panel in the desired position while performing the following steps.

A4. Install the instrument panel upper side and bottom BID flanges. These are 4 BID flanges layed up on the fwd side of the panel sides and the inner sides of the vertical console base. Use release tape on the instrument panel so that the BID tapes will release from them.

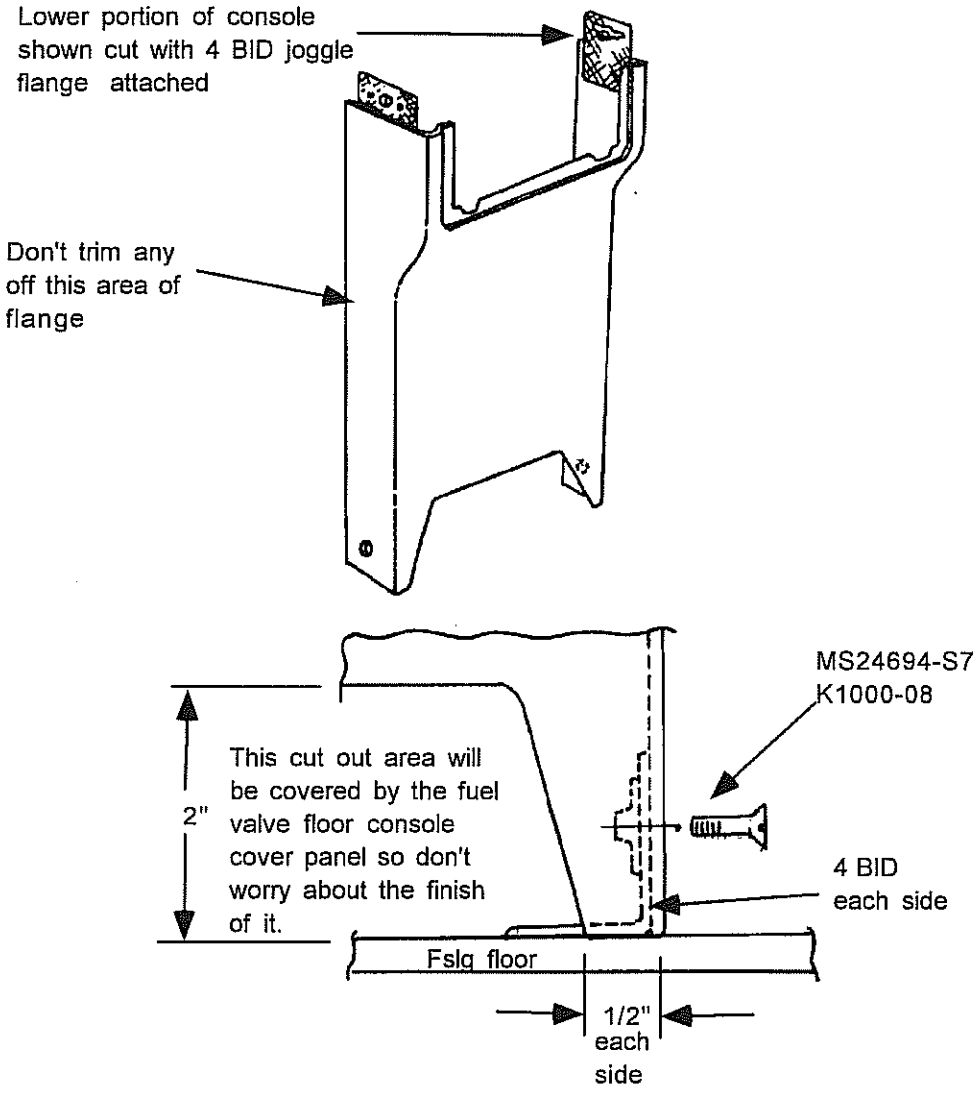
Instrument Panel upper side attach

fig. 24.A.3



Instrument Panel Lower Console Lower Attach

Figure 24:A:4



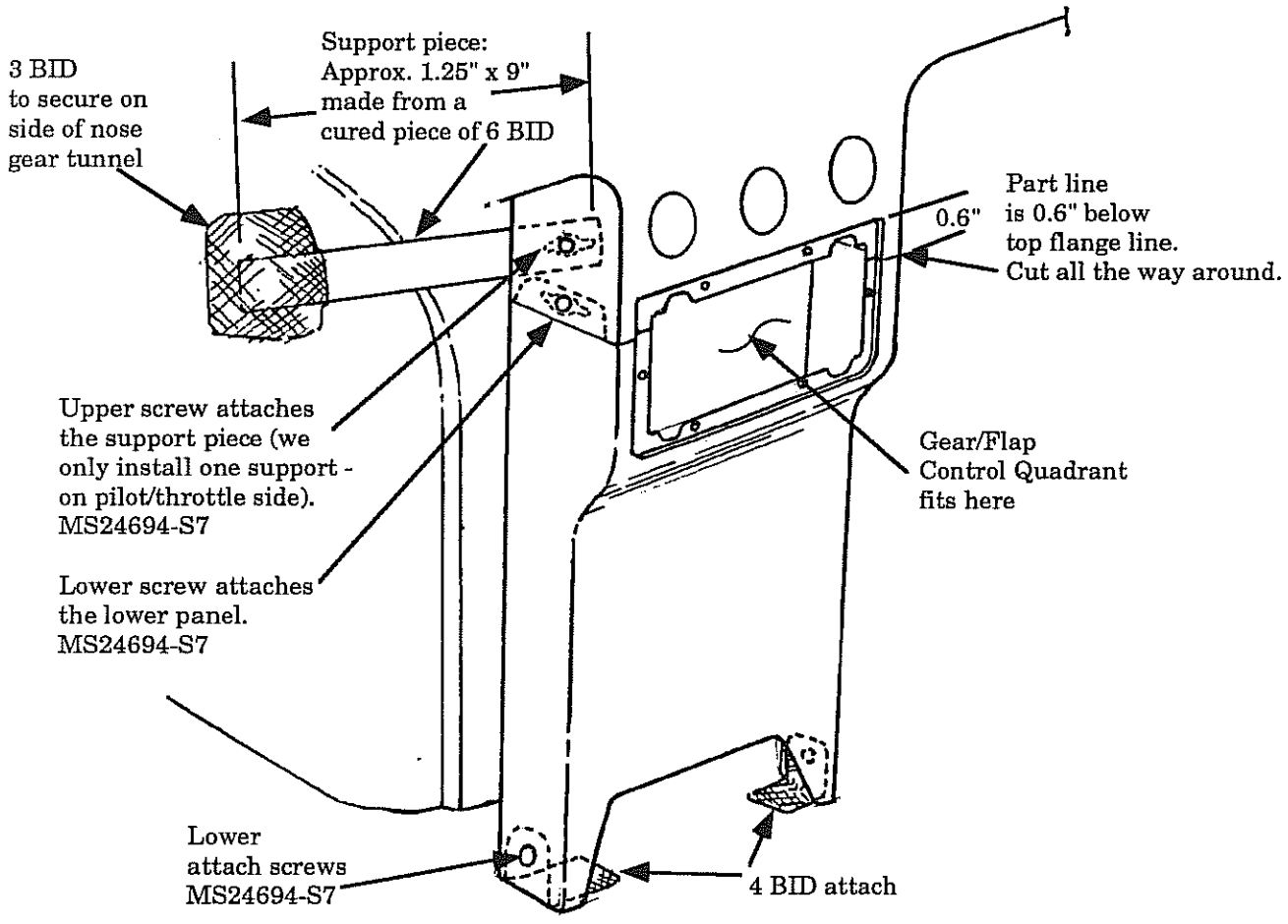
A5. Install the mid-panel support. This is a support piece located just adjacent to the throttle position. It provides fwd/aft support during throttle control use. A support may be installed on each side, but we've found that a single one on the left side is sufficient.

Make the mid panel support piece from a cured piece of 6 BID. Cut it to shape and place in position. Use instant glue to temporarily hold it against the nose gear tunnel side. Lay 3 BID over it to secure.

When positioning the tab inside of the instrument panel/console side, be sure to stay about 3/4" above the area where the gear/flap quadrant will be installed since there is a split in this area which requires one additional attachment tab thus side clearance for an attach screw will be required. See fig. 24.A.5.

Mid-panel attachment

fig. 24.A.5



A6. Drill all attach screw holes. After the above BID tapes have cured in position and before removing the instrument panel, drill for the attach screws. This will provide the locations for the anchor nuts which install onto the BID tapes.

Side screws (4):	Use #12 drill	MS24694-S52 screw	K1000-3 anchor nut
Mid-panel support (1):	Use #19 drill	MS24694-S7 screw	K1000-08 anchor nut
Bottom console screws (2):	Use #19 drill	MS24694-S7 screw	K1000-08 anchor nut

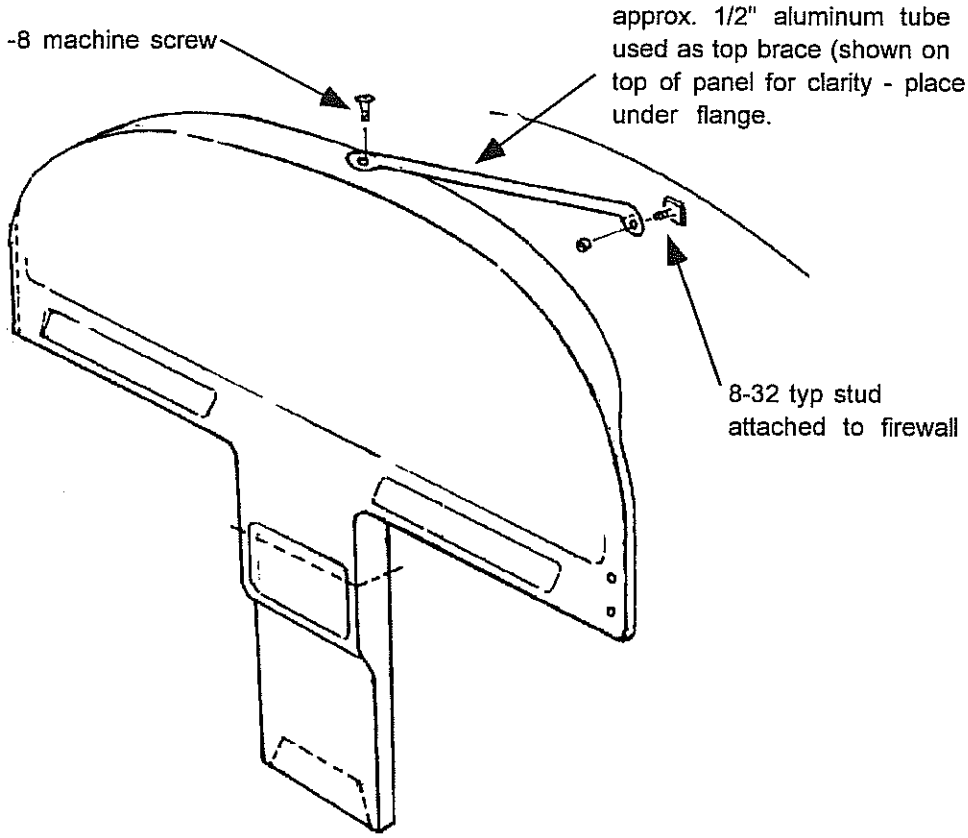
A7. Set the instrument panel attach screw anchor nuts. Remove the panel and install the anchor nuts per Figures 24:A:3 & 24:A:4.

A8. Optional support. Depending upon the type of instrumentation one chooses, it is likely that an additional support at the top of the panel will be needed. This support can be a 1/2" dia. aluminum tube, flattened at both ends to provide area for a #8 screw to be attached. Do not install such a support until the panel components have been positioned, since clearance for instruments and avoinics does require careful attention.

Typically, a support would attach using one MS24694-S7 screw through the 3/4" flange on the panel top. Extend the tube fwd to the firewall and attach it there with a similar stud attached to the firewall aft face. See Figure 24:A:6.

Instrument Panel Top Support Brace Option

Figure 24:A:6



B. INSTRUMENT PANEL DUST COVER

The dust cover is shipped as a two piece unit:

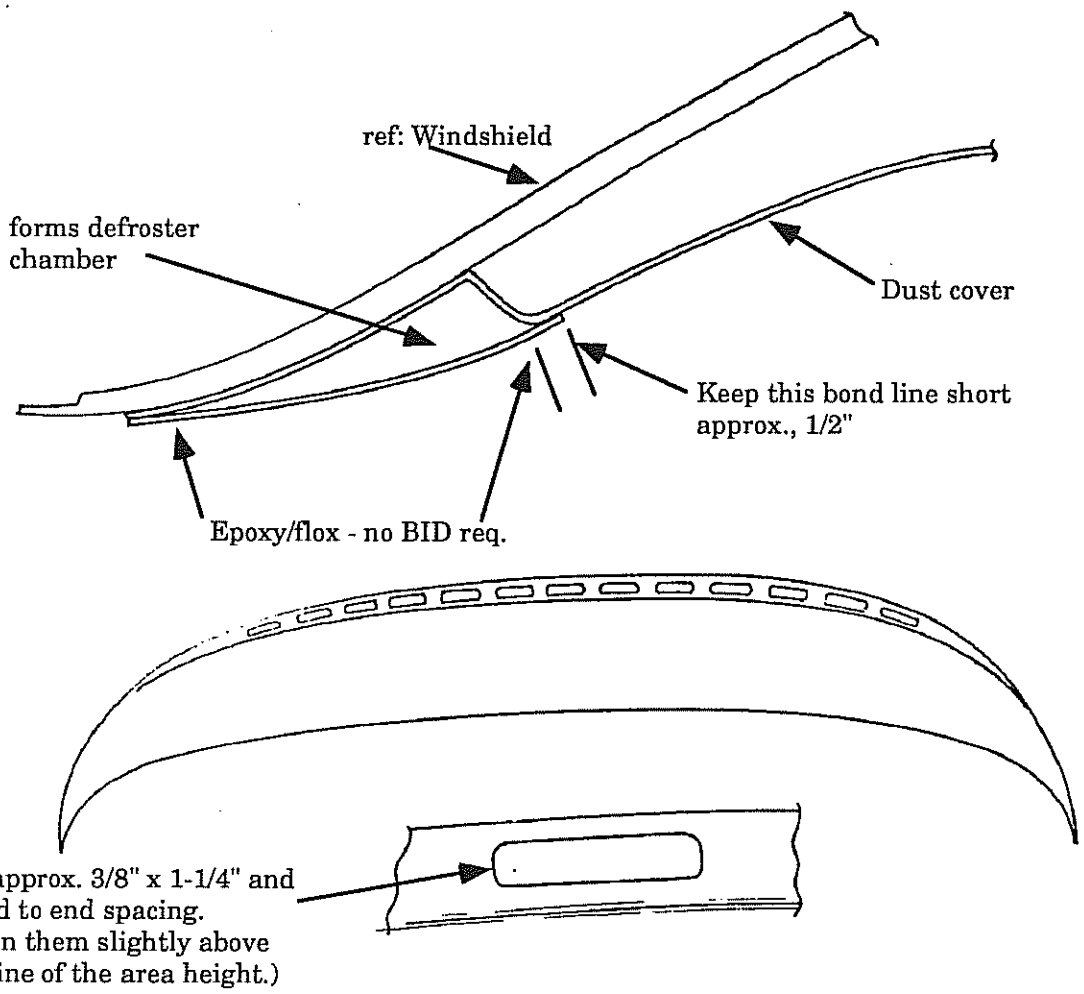
1.) The cover itself with an integrated defroster area

2.) A close out panel which creates the defroster air duct.

In addition, it is recommended that the dust cover be separated from the defroster with the defroster segment bonded into position just below the windshield. The dust cover can then be laid on top of the T.E. of the defroster flange which makes for easier installation / removal.

Dust cover / defroster

fig. 24.B.1



B1. Make a trial fit of the cover / defroster. Slip it into approximate position. Depending on how you trimmed your instrument panel, you'll likely want or need to also trim the sides down a bit on the dust cover as well. Remember, it will fit much tighter with the typical 1/4" foam with leather covering.

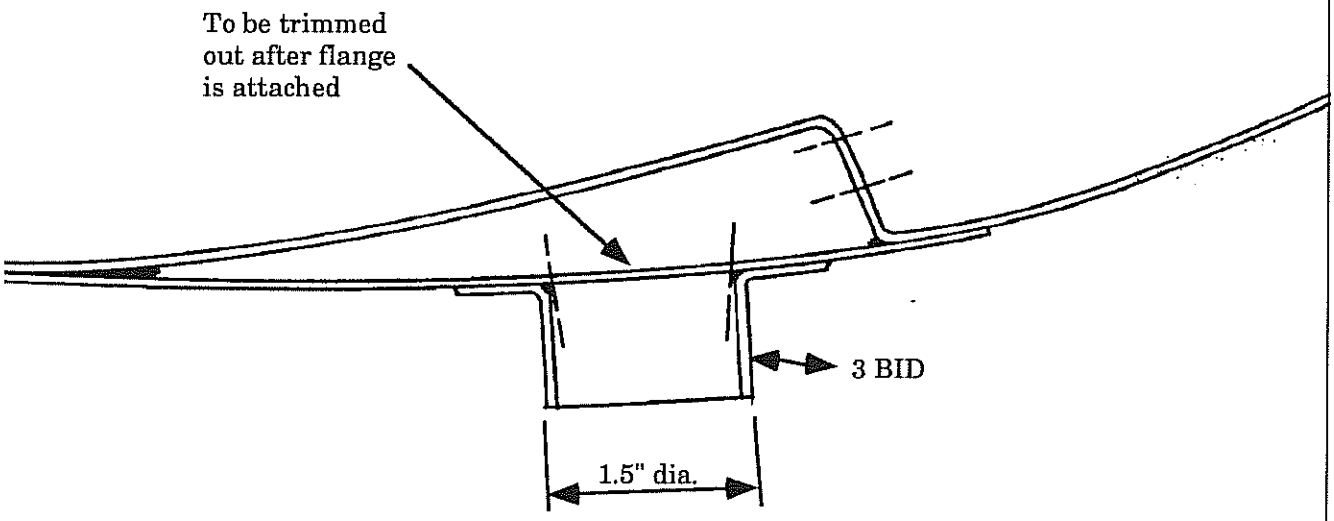
B2. Mark and cut the defroster air exit holes. These are approximately 0.38" high by 1.25" long. Leave about 0.38" spacing between slots. See fig. 24.B.1.

B3. Bond the defroster closeout panel into position. This panel bonds to the under side and is simply attached with epoxy/flox - no BID tapes are required. See fig. 24.B.1 The aft bond joint line should not be more than 1/2" deep. (This is because the cover will be split just aft of this flange joint and the split line should be kept close to the duct itself.)

B4. Make and install the defroster duct flange. Generally, a 1.5" diameter duct line is sufficient. Therefore, from a piece of wood dowel or equivalent, position the duct former approximately in front of the pilot's position and cover it with plastic release tape. Wrap 3 BID around the former then, after cure, remove the former and cut the hole into the defroster chamber. Blow out cuttings with air. See fig. 24.B.2.

Defroster duct flange

fig. 24.B.2

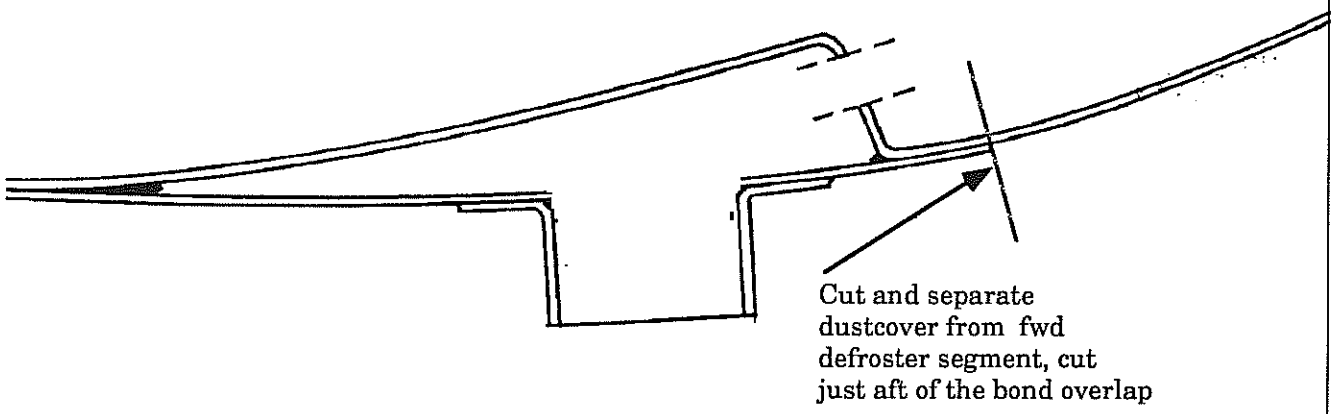


B5. Split the dust cover from the fwd defroster segment. Make a cut about 3/4" to 1" aft of the defroster "step". Cut just aft of the joint line (where the defroster close out attaches to the dust cover itself.) See fig. 24.B.3.

After splitting the dust cover away, simply lay it back on top of the defroster segment and temporarily attach with a couple of dabs of instant glue or equiv. (not too much, just hold it in place for the next step.) See fig. 24.B.4.

Dust cover / defroster separation

fig. 24.B.3

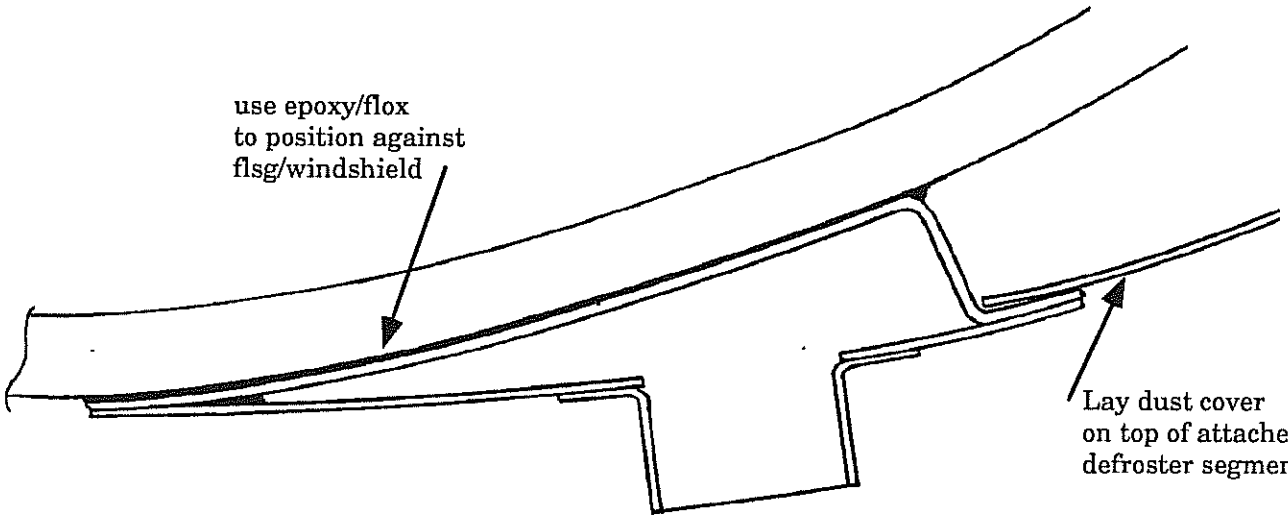


B6. Paint the defroster segment flat black or similar. Before permanently installing the defroster, you may want to consider painting it. It could also be painted later but this is not a bad idea at this time. Since it will have the potential to reflect in the windshield, paint it a flat black or similar.

B7. Bond the defroster segment in position on the fslg. Use epoxy/flox and permanently bond the defroster segment into position on the fslg. Prop it up snug with shims or use a few dabs of instant glue around the perimeter. (Long sticks pushing from the floor area is probably the easiest way.)

Defroster Attachment

fig. 24.B.4



B8. Concerning the final attachment of the dust cover: Generally there are two methods of attaching the dust cover.
Use "velcro" type material to attach at the fwd (defroster flange) area and either:
a.) Attach the aft end (over the panel top) using two or three machine screws with the flange of the panel top securing the anchor nuts. or:
b.) Attach the aft end using a similar strip of velcro.

The typical finish is to cover the dust cover with 1/4" soft foam rubber. Place a bead (1/2" or so) around the T.E. and cover the entire top with leather or similar.

You'll undoubtedly have the dust cover on and off many many times so try to get an nice, easy approach to the attachment.

Also, with the typical manner of entering the Lancair IV, one is often tempted to grap the top of the dust cover and pull when adjusting the seats forward. So, the piece should be well secured or it will be continually get pulled off.

C. INSTRUMENT PANEL INSERTS

The Lancair IV instrument panel comes with seven inserts. This is to allow for easier wiring, etc. as the panels can be individually completed and installed (or removed) with much greater ease. These inserts are aluminum and can be attached with counter sunk screws or cap head screws. We have included cap head screws with this kit. These seven inserts are:

1.) Flight Instrument Insert Panel (left side)
2.) Gear lights,Intercom Insert Panel (center top)
3.) Circuit Breaker Insert Panel (right side)
4.) Switch Insert Panel (lower left side)
5.) Trim Servo Panel (lower center)
6.) Switch, Misc. Insert Panel (lower right side)
7.) Gear / Flap Quadrant Insert Panel (on center console)

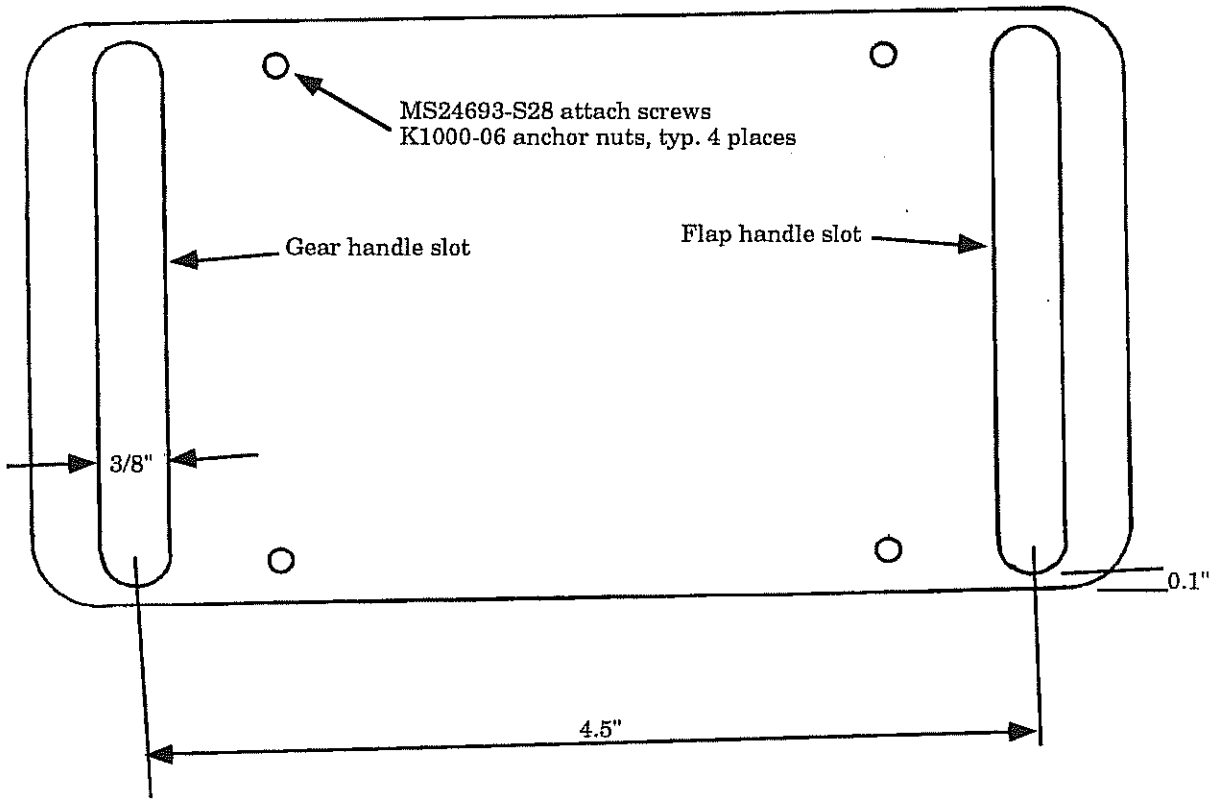
Of primary concern is the Gear / Flap Quadrant Insert Panel since it must align with fixed position hardware behind.

C1. Clearance cut the Gear / Flap Quadrant Insert Panel. The Gear / Flap Quadrant is designed for the two handles to be 5.1" apart. The full vertical movement of these control handles utilize most of the available space on this insert panel face.

Trim the insert panel to allow the gear and flap handles to operate without restriction. See fig. 24.C.1.

Gear / Flap Insert Panel

fig. 24.C.1



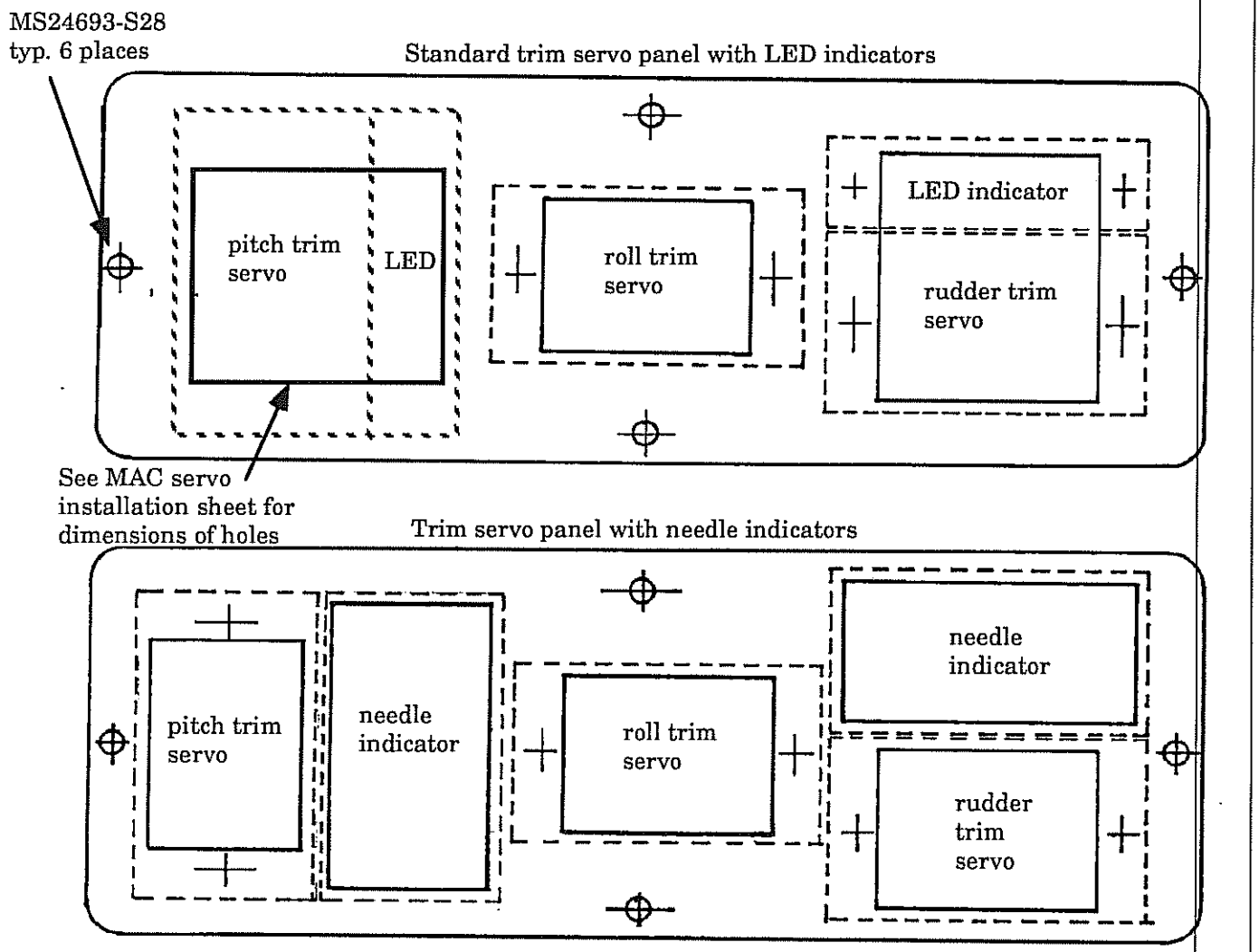
C2. Set the Gear / Flap Quadrant Insert Panel screws. Position them as shown in fig. 24.C.1.

Use: 6-32 cap head screws #29 drill
K1000-06 anchor nuts
AN470A-3-5 rivets #40 drill

C3. Trim Servo Insert Panel. Lancair IV's use electric trim for aileron and elevator and optionally for rudder. This panel provides a good location for the servo rocker switches. See fig. 24.C.2 Two versions are shown in fig.24.C.2. One, is for the standard rocker switches with LED indicators. The other, is for the optional needle indicators. Also see the MAC servo installation sheet (packaged with the MAC servos).

Trim servo insert panel

fig. 24.C.2



C4. <u>See blueprint A-701 for patterns of the other insert panels.</u> Blueprint A-702 has one possible installation alignment for the pilot side, flight instruments for your review.

C5. <u>Throttle, Prop, Mixture control.</u> A great method of installing these big cables is to attach them to a "sub-plate" which is then screwed into position on the fwd side of the instrument panel. This allows one to remove the instrument panel without having to remove these cables from the engine. To make this work, the holes in the instrument panel must be slightly larger than the diameter of the control knobs. With a slight bevel on that set of holes, the appearance can be quite nice. <u>IMPORTANT: Mount these controls has high as possible in the area provided on the instrument panel frame.</u> See fig. 24.C.3.

Throttle, prop, mixture cable attach to panel

fig. 24.C.3