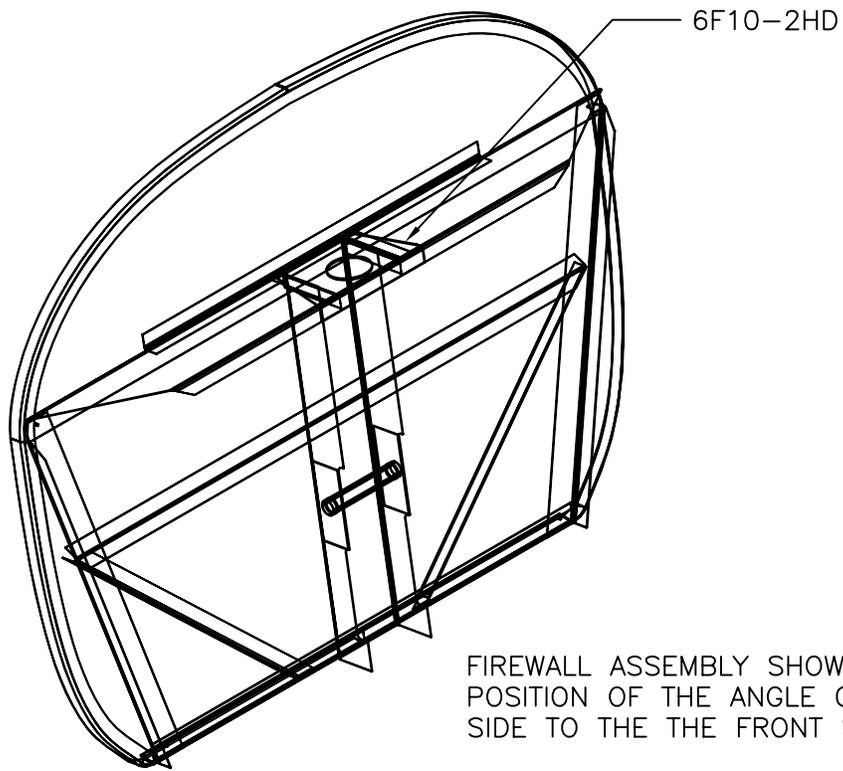


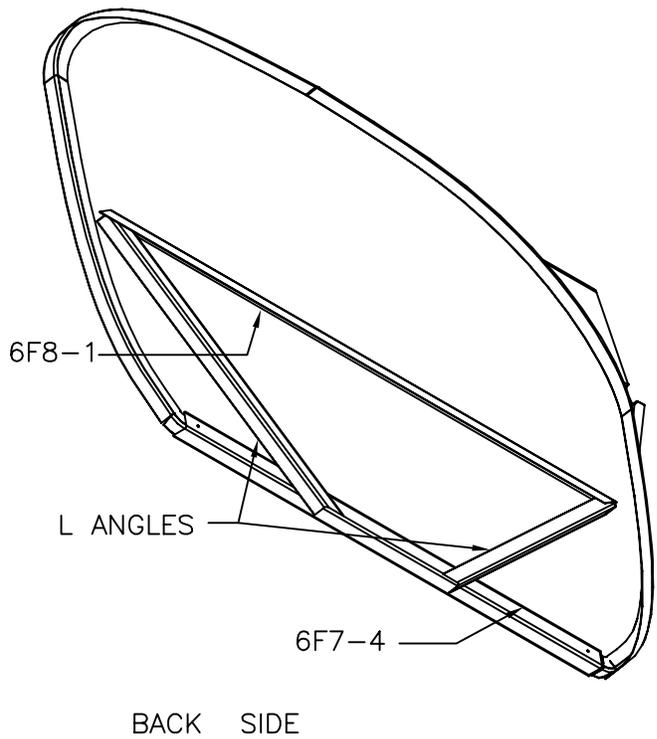
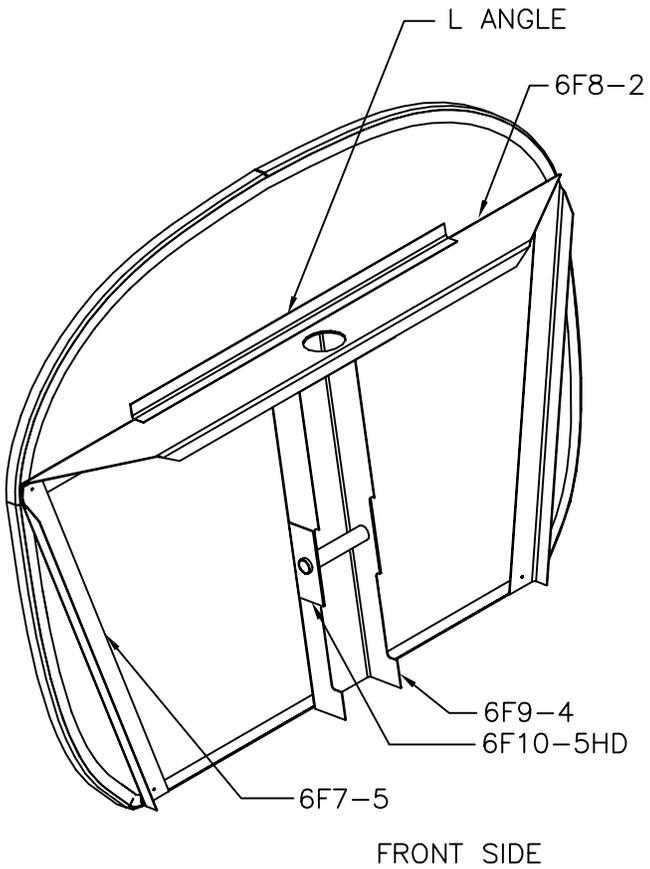
## FIREWALL ASSEMBLY & GEAR RIB ASSEMBLY WORK REPORT

No.	Check	Parts / Tools	Qty
<b><i>Firewall Stiffeners</i></b>			
1	[ ]	6F7-1 Firewall (galvanized steel)	1
2	[ ]	6F8-2 Top Stiffener .040	1
3	[ ]	6F7-5 Side Stiffener .040	2
4	[ ]	6F7-4 Bottom Stiffener .040	1
5	[ ]	6F8-1 Back Stiffener .025	1
6	[ ]	L angle	6
<b><i>Upper Gear Bearing</i></b>			
7	[ ]	6F10-2 Upper Bearing	1
8	[ ]	6F10-5HD Firewall Stiffener Doubler .063	1
9	[ ]	6F9-4 Center Stiffener .040	1
10	[ ]	L angles	2
11	[ ]	L angles	1
<b><i>Engine Mount Fittings</i></b>			
18	[ ]	6F7-2 Upper Engine mount fitting (welded)	1R & 1L
18	[ ]	6F7-3 Lower Engine mount fitting (welded)	1R & 1L
<b><i>Gear rib assembly</i></b>			
19	[ ]	6V5-2 Gear Slides Extrusion 1-1/2" x 1" x 1/8"	8
20	[ ]	6V2-1 Rear Ribs .032	2R + 2L
22	[ ]	6V5-1 Gear Rib Doubler Channel .025	4
23	[ ]	6V6-2 Bellcrank Support Channel .025	2
24	[ ]	6V6-1 Aileron Bellcrank Support Ext. 1-1/2" x 1" x 1/8"	4
25	[ ]	<b>JIG:</b> 16.5mm spacer, approximately 55mm long by 3/4" wide.	

<b>SIGNATURES:</b> Builder _____	date
Inspector _____	date



FIREWALL ASSEMBLY SHOWING THE POSITION OF THE ANGLE ON THE BACK SIDE TO THE THE FRONT SIDE.



FIREWALL ASSEMBLY WITH STIFFENERS ON BACK AND FRONT SIDE

FW-0

ZENITH AIRCRAFT COMPANY, 08/01

## Firewall assembly

**INTRODUCTION:** When feasible it is desirable to plan for a rivet at the intersection of two rivet lines. To this end, the Stiffeners are Clecoed to the Firewall through the pilot holes for the Engine Mount Fitting. The diagonal L Angles are then positioned to intersect with the Stiffeners. The parts are riveted after the 3/8" holes for the Engine Mount Fittings are drilled.

1. Locate the 4 holes for the Engine Mount Fittings on the Firewall 6F7-1

**REFERENCE:** 6-F-8

**NOTE:** FRWD means the front of the aircraft!

**LAYOUT:** a) Draw the aircraft center line perpendicular to the straight bottom. on both sides the Firewall.

b) Locate the 4 Engine Mount Fitting holes (460mm is the vertical distance between the bottom and top holes, the bottom hole is at 15mm from the bottom of the Firewall). Center punch, re-check and drill with #40, see top right diagram on drawing 6F8

**RECOMMENDATION:** a) Use the "Engine Mount Fitting" pilot holes and the center line of the flange (on L angles) to position the stiffeners 6F7-4, 6F7-5 & 6F8-2 on the Firewall.

b) Plan for a 'No Rivet Zone' around the Engine mount Fittings to prevent placing rivets underneath the Engine Mount attachment plates 6E3-2

2. Cleco the Top Stiffener 6F8-2 to the Firewall 6F7-1

**REFERENCE:** 6-F-8

**NOTE:** The longer flange goes against the firewall.

**CUT:** The tapered ends in accordance with the drawing: 160mm along the bottom edge of the front flange, 135mm can be used to layout long the bend radius of the front flange (the cut line starts forward of the rear flange).

**CLAMP:** Clamp the Top Stiffener 6F8-2 to the Firewall.

**CHECK:** a) That the flange center line is visible through the pre-drilled Engine Mount Fitting holes.

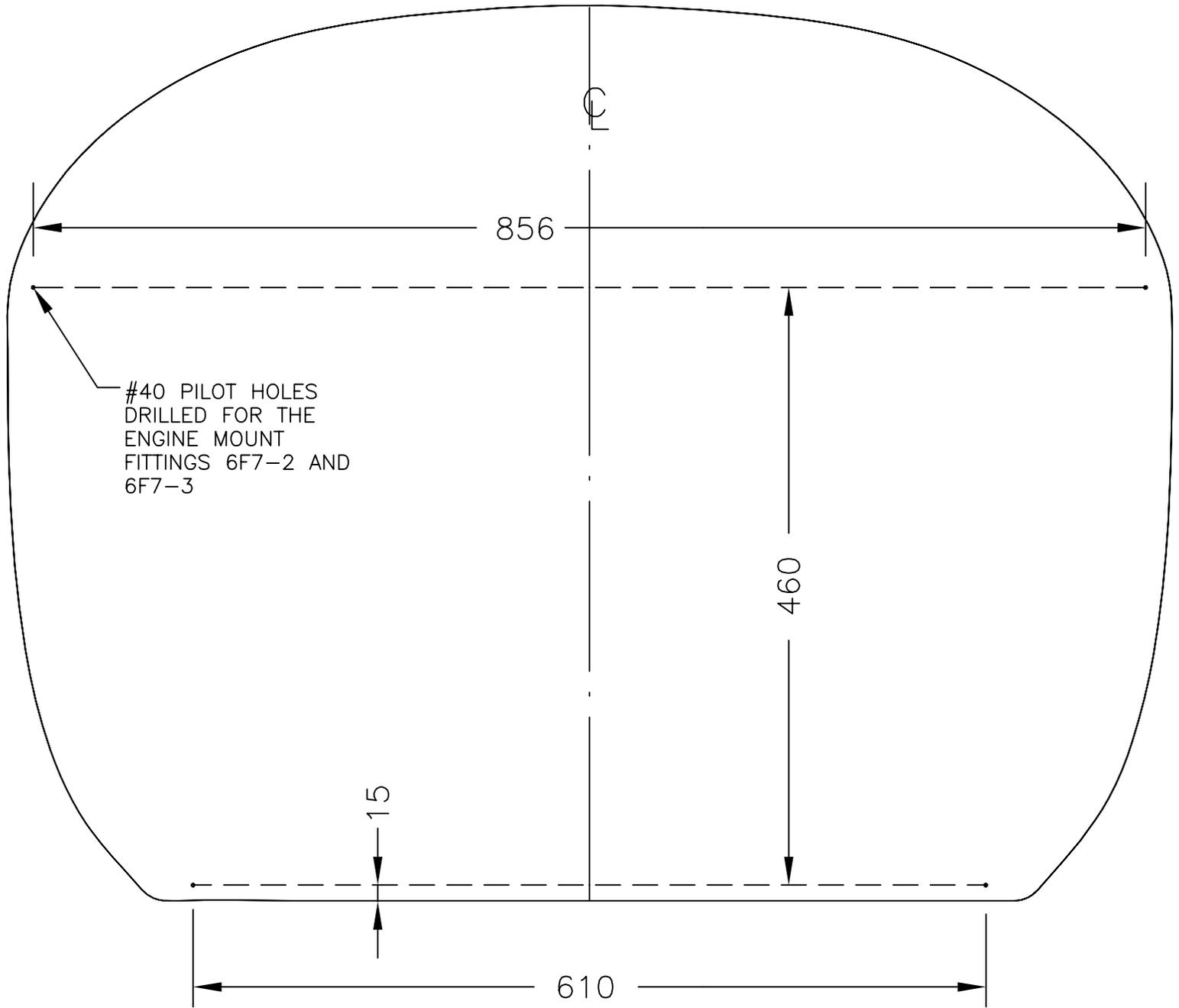
b) Check with a square that the Top Stiffener 6F8-2 is perpendicular to the aircraft center line.

c) That the Top Stiffener 6F8-2 is centered on the firewall left and right.

**BACK-DRILL:** Through the two "Engine Mount Fitting" pilot holes.

**PITCH:** 40mm A4 with a no rivet zone for the engine mount plate from the pilot hole to the next hole at 120mm from the pilot hole for the top "Engine Mount Fitting" (see 6E3 for the size of the top 1/8 steel plate). Wait to layout the remainder of the rivet line until after the Center Firewall Stiffener 6F9-4 is positioned.

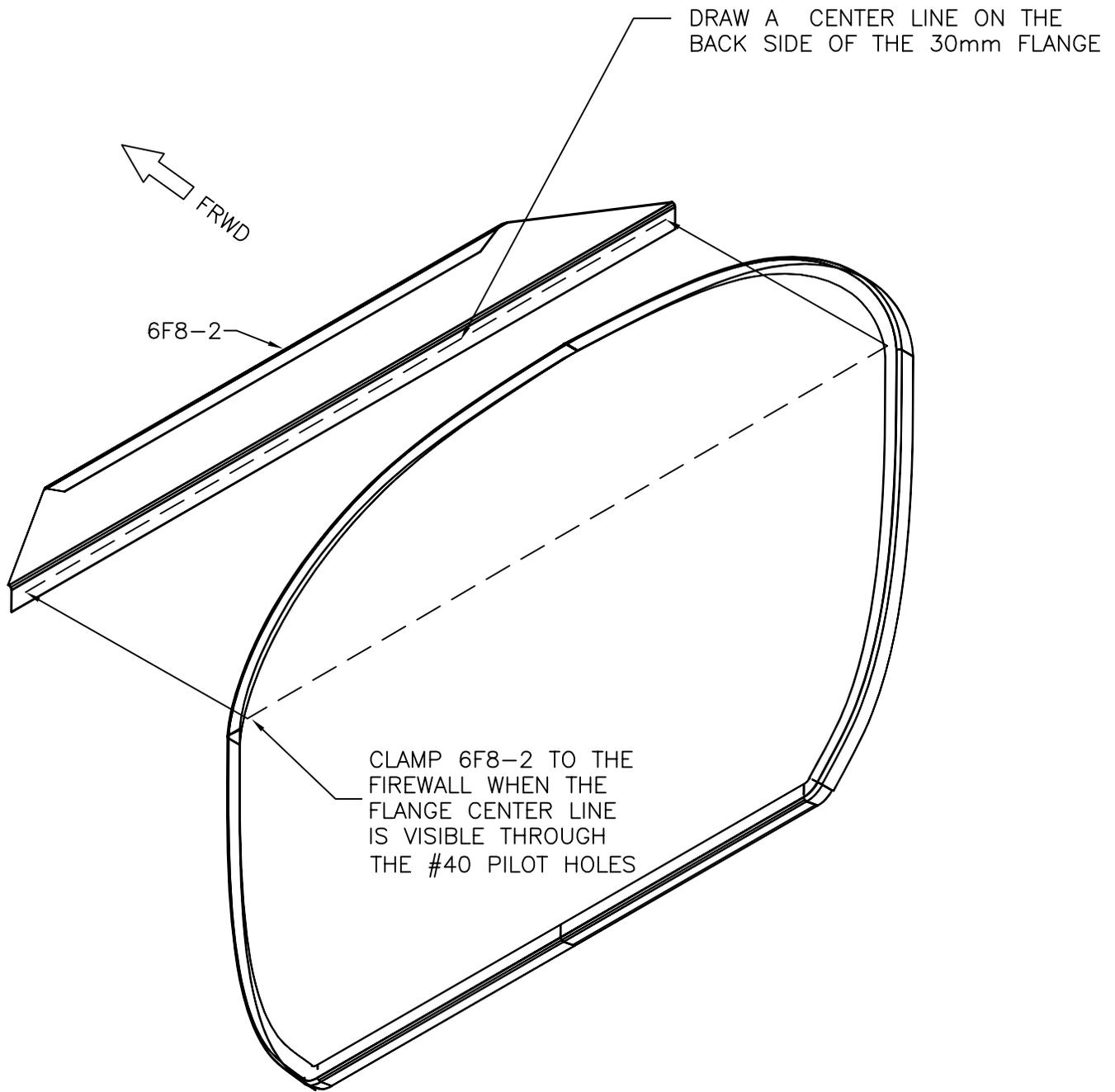
THE AIRCARFT CENTER LINE (CL) IS AT 90 DEGREES TO THE BOTTOM OF THE FIREWALL  
THE BOTTOM HOLES ARE AT 15mm FROM THE BOTTOM OF THE FIREWALL



LOCATION OF THE 4 ENGINE MOUNT FITTING

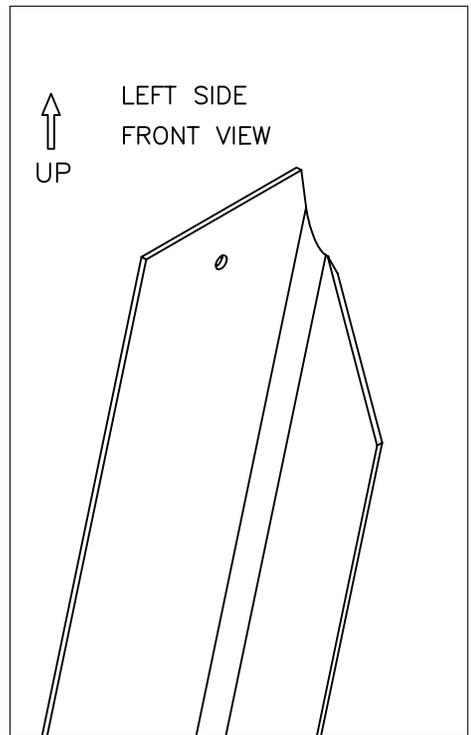
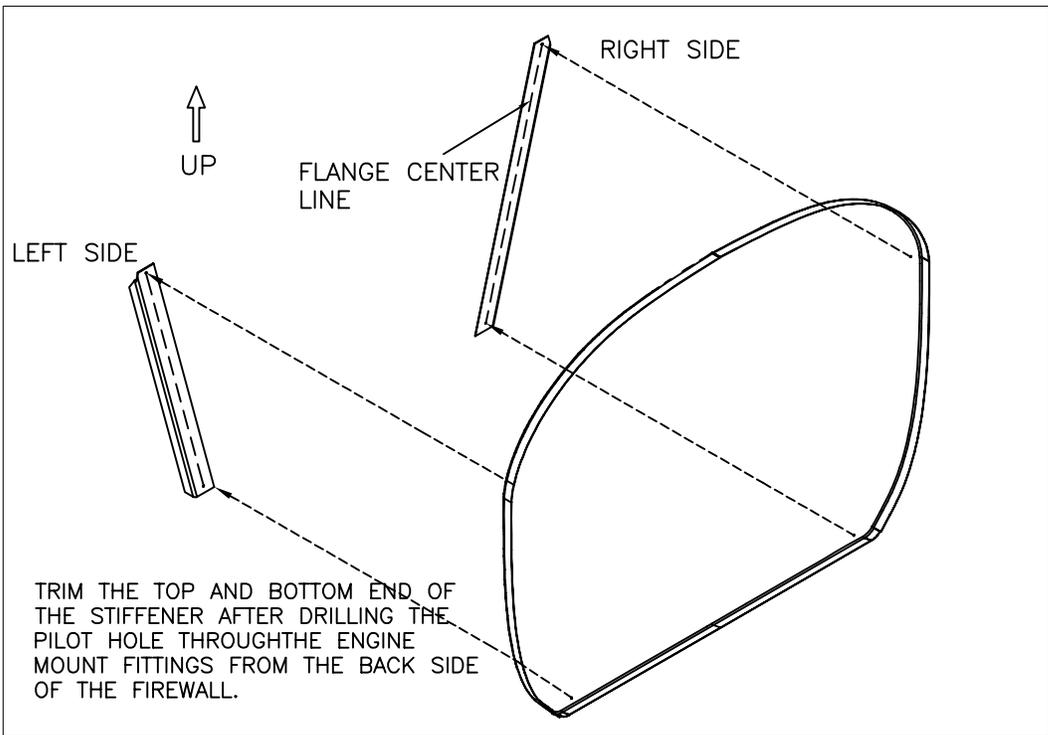
FW-1

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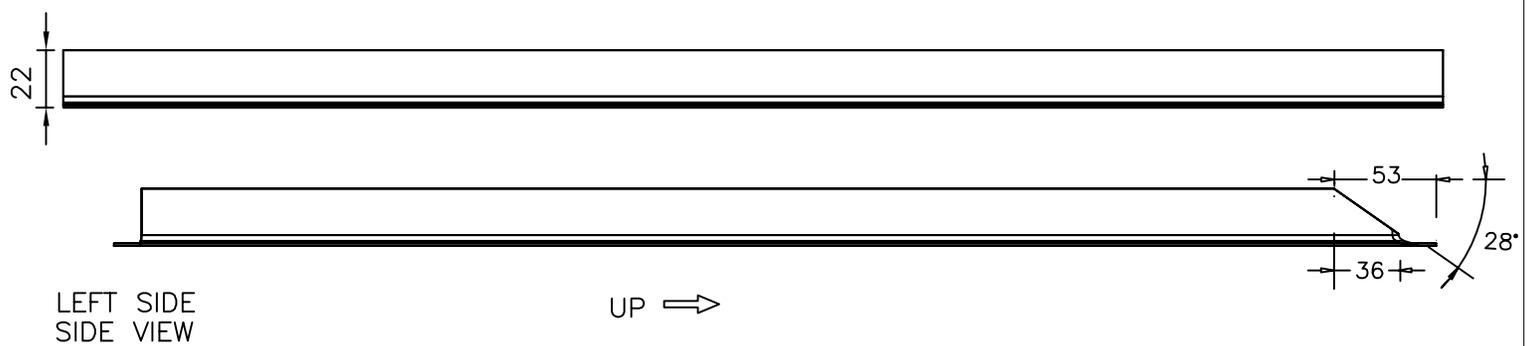
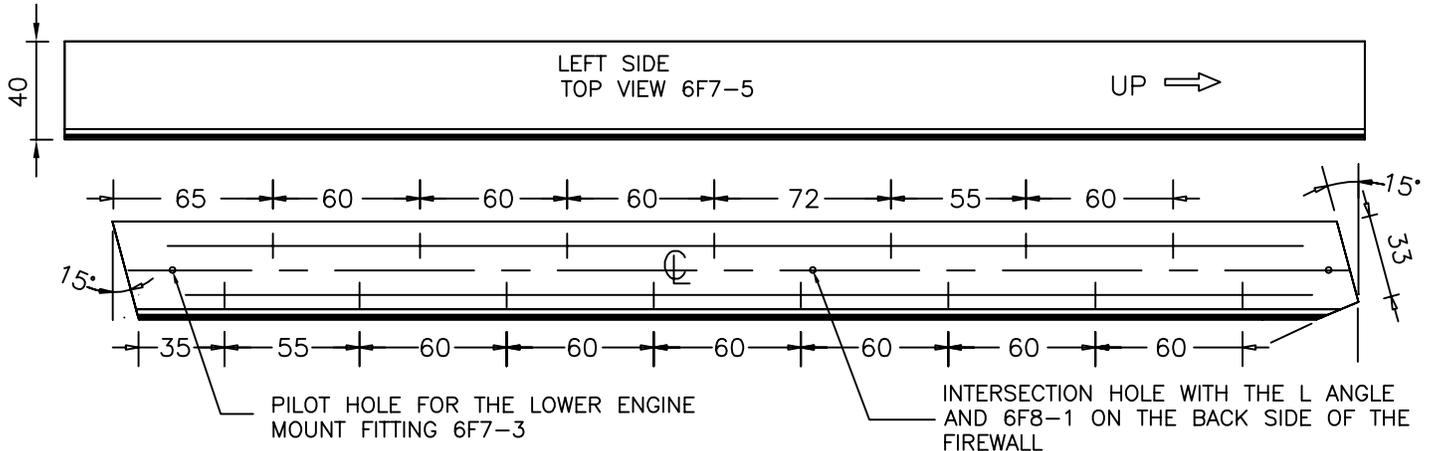


CHECK: FROM THE FRONT SIDE, MAKE SURE THAT THE TOP OF THE FIREWALL TOP STIFFENER 6F8-2 IS LEVEL AND PERPENDICULAR TO THE AIRCRAFT CENTER LINE.

3. Cleco the Firewall Side Stiffener 6F7-5 to overlap over the flange of the Top Stiffener 6F8-2.  
**REFERENCE:** 6-F-8  
**REMOVE:** Un-cleco the Channel to back-drill the Stiffener through the pilot holes.  
**CLAMP:** The Stiffener 6F7-5 with the center line over the “Engine Mount Fitting” pilot holes.  
**BACK-DRILL & CLECO:** Back-drill and Cleco when the flange center line 6F7-5 is visible through the Engine Mount Fitting holes.  
**CUT:** a) Trace and cut the bottom flange flush with the bottom of the firewall.  
           b) Cleco the Top Stiffener 6F8-2 to the Firewall and trim the Side Stiffener to fit inside the Channel 6F8-2 clear of the radius. Cut off any overhang past the edge of the firewall.
  
4. Cleco the Firewall Bottom Stiffener 6F7-4 inside the Firewall.  
**REFERENCE:** 6-F-8, 6-E-3  
**NOTE:** The longer flange (25mm) faces up.  
**CHECK:** The Stiffener is bent at the same angle as the firewall for a good fit.  
**CLAMP:** Clamp the Stiffener 6F7-4 to the Firewall bottom flange.  
**BACK DRILL:** Back-drill through the Engine mount holes.  
**HINT:** Wait to drill the bottom flanges, they are drilled later through 6F5-2  
**PITCH:** The next hole is at 85mm from the pilot hole for the bottom “Engine Mount Fitting” (see 6E3)
  
5. Cleco the Firewall Back Stiffener 6F8-1 inside the Firewall 6F7-1  
**REFERENCE:** Upper diagram on drawing 6-F-8  
**LAYOUT:** Draw a horizontal line on the inside of the Firewall at 289 from the bottom of the firewall. Also draw the diagonal line connecting the top and bottom engine mount fittings. Use a square to check that 6F8-1 is perpendicular to the aircraft centerline.  
**NOTE:** The vertical distance 289mm is measured to the radius of 6F8-1.  
  
**PITCH:** a) Plan for a “no rivet zone” for the Center Firewall Stiffener 6F9-4  
           b) Plan for a “no rivet zone” for the Fuel Tank Straps 6F16-5 (The center of each Strap is 311mm from the aircraft center line, see upper right diagram on 6F8).  
**DRILL & CLECO:** Drill and Cleco the two end holes at 10mm from the end (approximately on the center line of 6F7-4) Also drill the next hole at 40mm.
  
6. Cleco the L Angles underneath the Back Stiffener 6F8-1  
**REFERENCE:** 6-F-8  
**LAYOUT:** measure along the bottom of the Firewall and draw a line at 95mm on each side of the aircraft center line (50+45). This is the outer edge of the diagonal L angle.  
**CUT:** The bottom of the L Angle to overlap the Bottom Stiffener 6F7-4  
**BACK-DRILL:** Back-drill through the end holes for the Stiffener 6F8-1. Drill the bottom hole through the flange center line of the Bottom Stiffener 6F7-4.  
**PITCH:** A4 pitch 40  
**CUT:** Cut the ends of the Back Stiffener. The angle is determined by the position of the diagonal L Angle at 95mm from the aircraft centerline along the bottom of the Firewall.

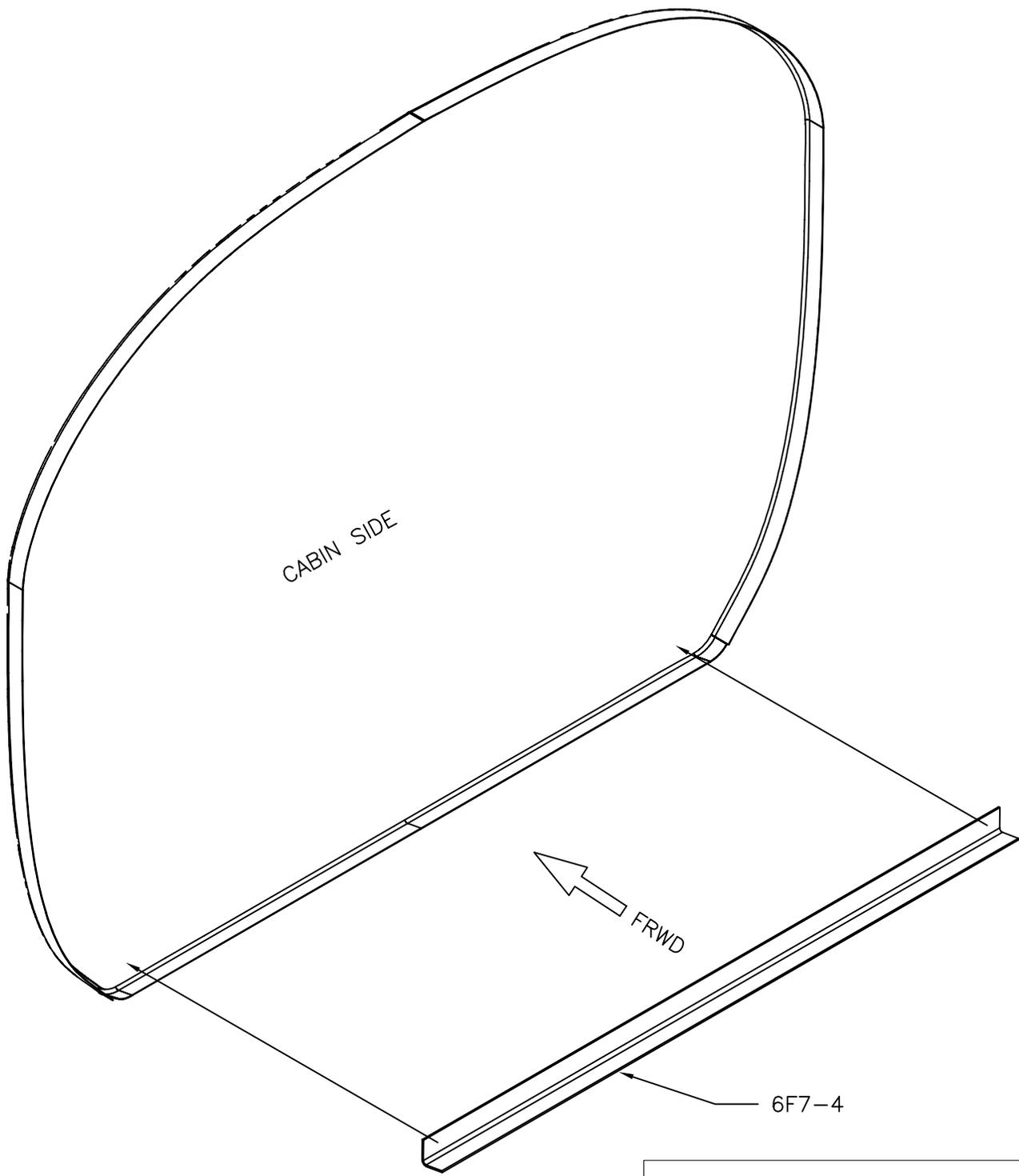


TWO PARALLEL RIVET LINE WITH THE RIVETS OFFSET IN THE MIDDLE: THE FIRST LINE IS AT 10mm FROM THE EDGE WITH 7 #20 HOLES, THE SECOND LINE IS AT 19mm FROM THE FIRST WITH 8 #20 HOLES.



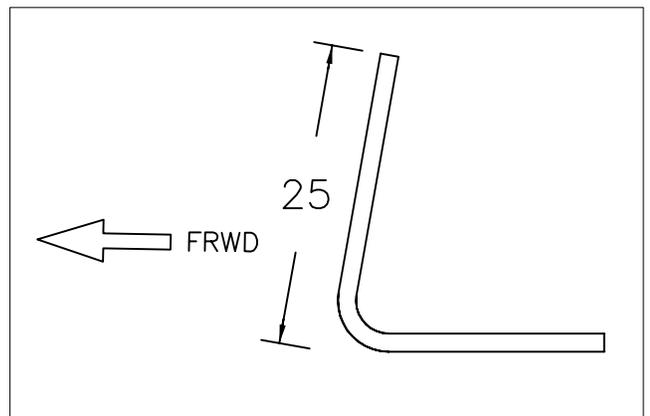
FIREWALL SIDE STIFFENER 6F7-5

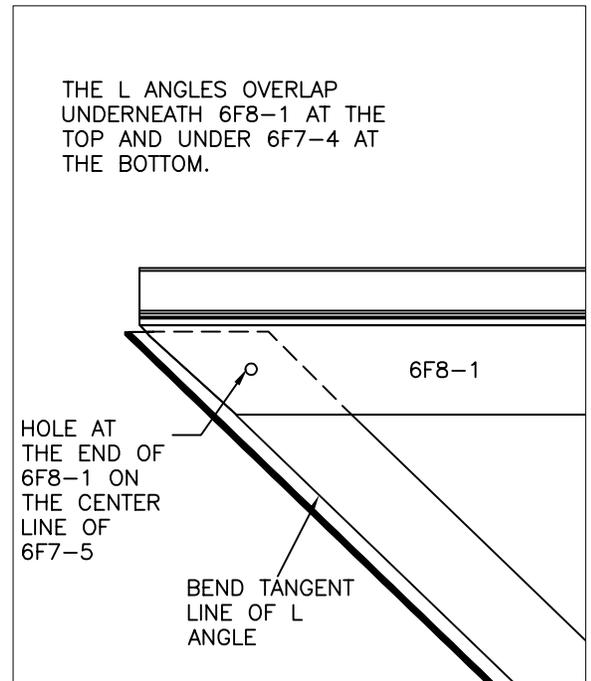
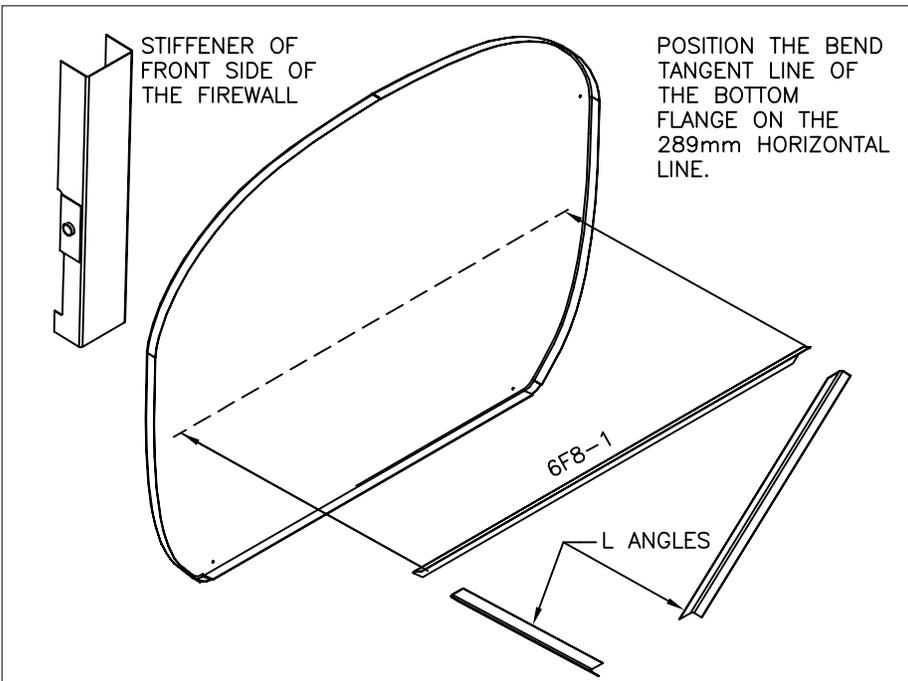
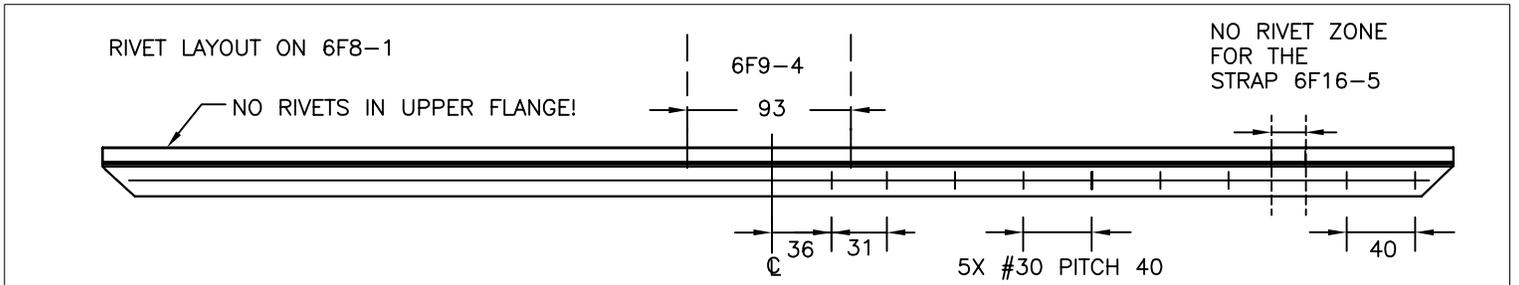
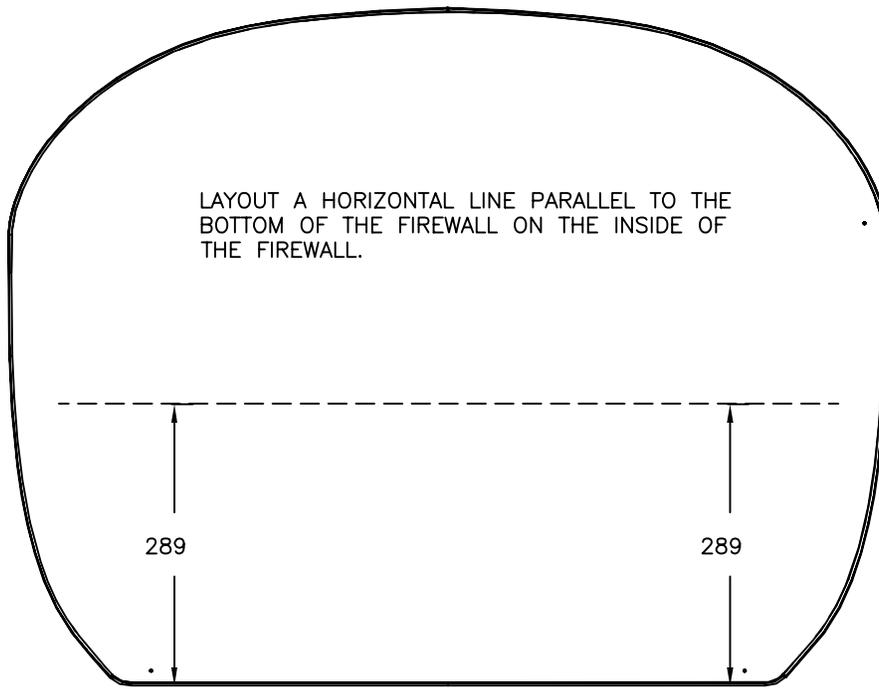
FW-3  
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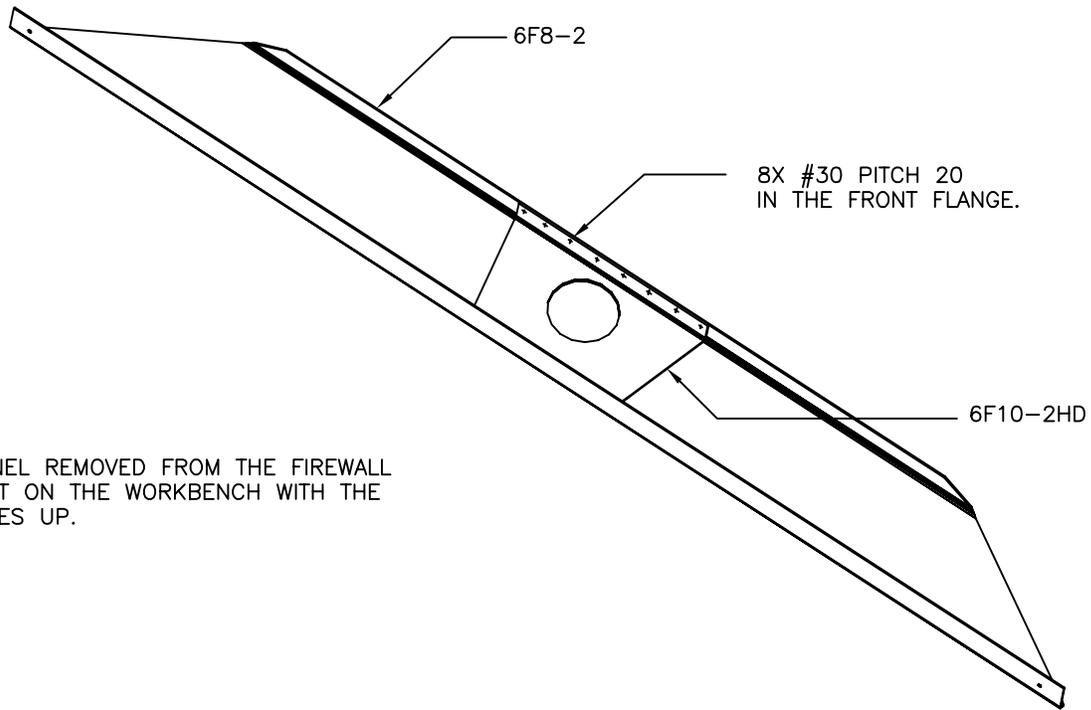
CLAMP THE BOTTOM FLANGES TOGETHER WITH THE 25mm FLANGE AGAINST THE FIREWALL.

FROM THE FRONT SIDE OF THE FIREWALL BACK DRILL THE TWO #40 PILOT HOLES INTO THE STIFFENER 6F7-4

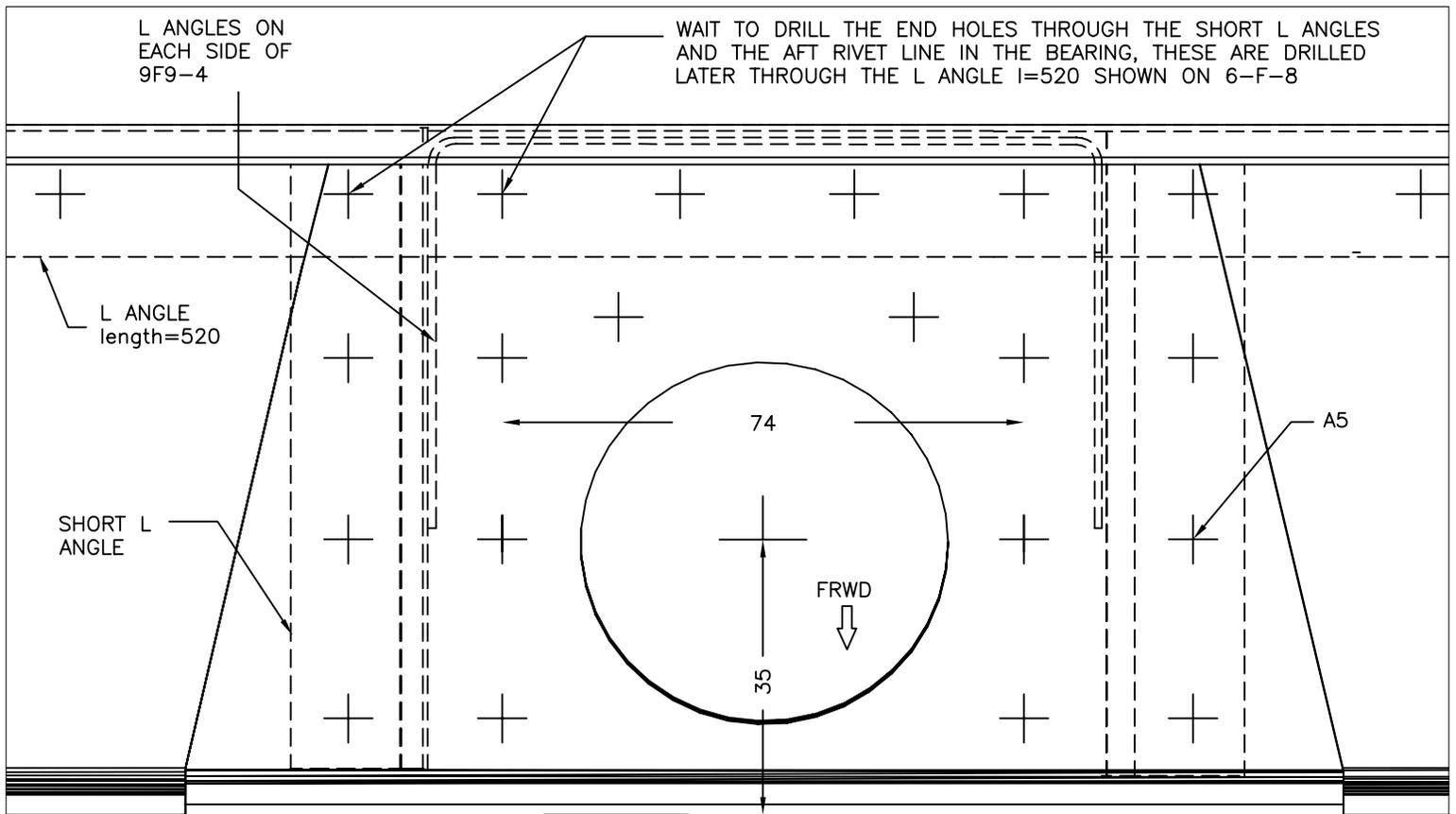




7. Cleco the Upper Bearing 6F10-2 inside the Top Stiffener Channel 6F8-2  
REFERENCE: Third diagram from the bottom left on 6F10, top of the second diagram from the upper right on 6-L-3  
CHECK: For good fit: the flanges are both bent at the same angle, the aft edge of 6F10-2 stops at the bent tangent line of 6F8-2  
CLAMP: Clamp the Bearing to the top of the Stiffener to keep the parts together when drilling through the front flange.  
DRILL: Drill the rivet line through the front flange (total of 8 A5). Drill the remaining holes on top of the Bearing after the L angles are attached to 6F8-2 and the 2" hole is drilled.
8. Rivet the Firewall Stiffener Doubler 6F10-5HD  
LAYOUT & TRIM: Layout and trim the flange of the Doubler as shown on 6F10 for the Gear Leg 6-L-3.  
CLAMP & RIVET: Clamp and rivet to the Center Firewall Stiffener.  
DRILL: Drill the 3/4" hole for the Bungee Pin 6L3-4
9. Cleco the Center Firewall Stiffener 6F9-4 to overlap the flange of 6F8-2  
REFERENCE: Bottom right diagram on drawing 6-F-10  
LAYOUT: Mark two parallel rivet lines inside the Channel, see 6F10.  
PITCH: Locate the center line of the Back Stiffener 6F8-1. Divide the distance between the end holes and the Stiffener for a pitch of 40.  
CLAMP: Position the top edge of the Channel Stiffener 6F9-4 on the bend tangent line of the Firewall Top Stiffener 6F8-2. Clamp the Channel to the Firewall along the bottom.  
CHECK: a) That the Channel 6F9-4 is at 90 degrees to the bottom of the Firewall.  
b) That the Channel 6F9-4 overlaps 6F8-2 and stops at the bent tangent line.  
c) That the Channel is centered on the Firewall!  
DRILL & CLECO: Drill and Cleco the stiffener to the firewall.  
TIP: Place a sheet of aluminum or thin plywood on the inside of the Stiffener 7F8-2 to prevent possible damage by the drill chuck.
10. Position the short L Angle at the top of the Channel 6F9-4 and the Top Stiffener 6F8-2  
REFERENCE: Bottom right diagrams on drawing 6-F-10  
CLAMP: a) Clamp the top flange of the L Angles to 6F8-2  
b) Use a square to hold 6F8-2 at 90 degrees to the Firewall, then clamp the side flange of the L Angle to the Channel 6F9-4  
  
CHECK: 90 degrees between 6F8-2 and 6F9-4  
PITCH: a) 3 holes (A5) in 6F9-4  
b) 4 holes (A5) through 6F10-2 and 6F8-2. (Wait to drill the intersection hole with the L Angle length 520 see 6F8).



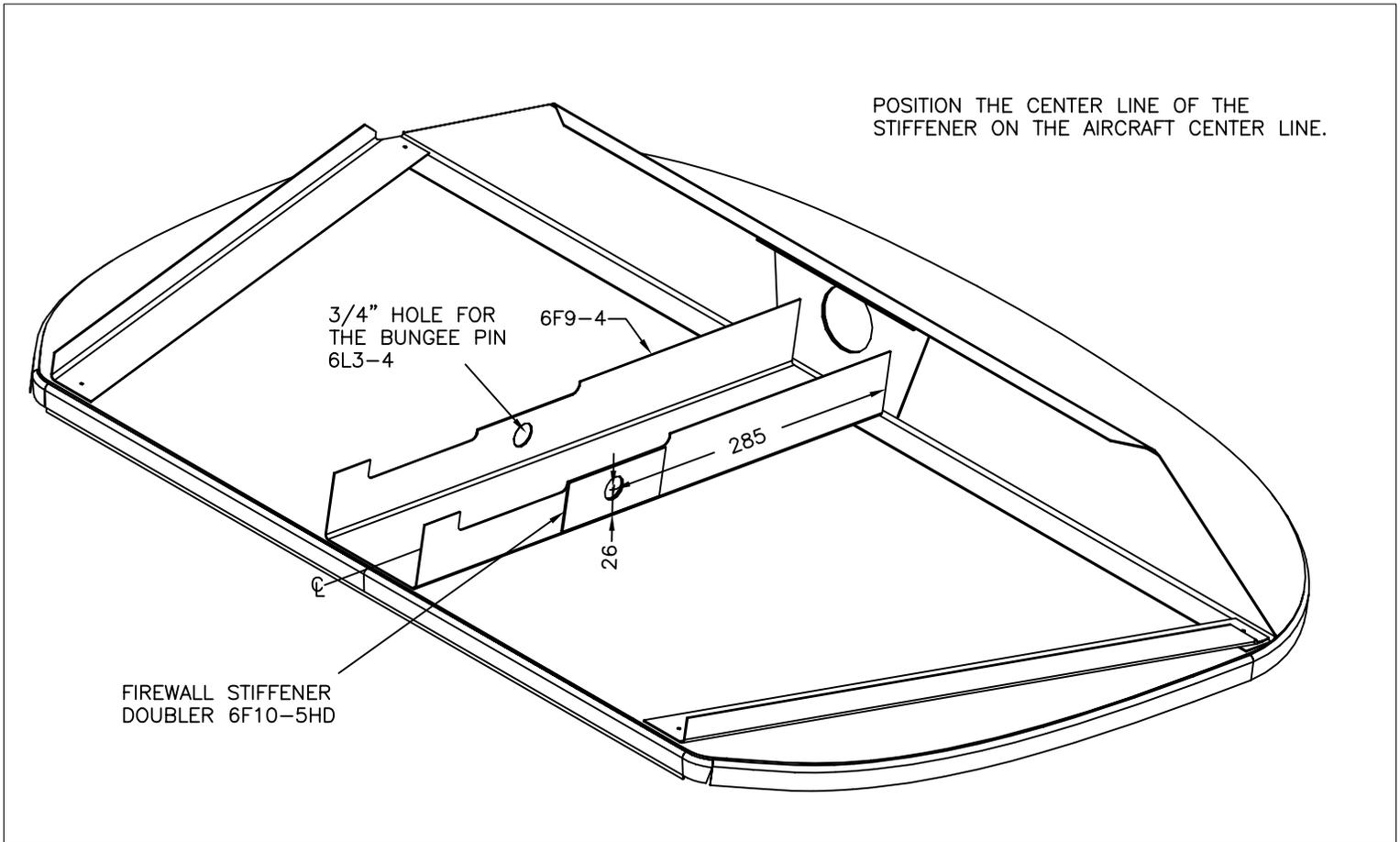
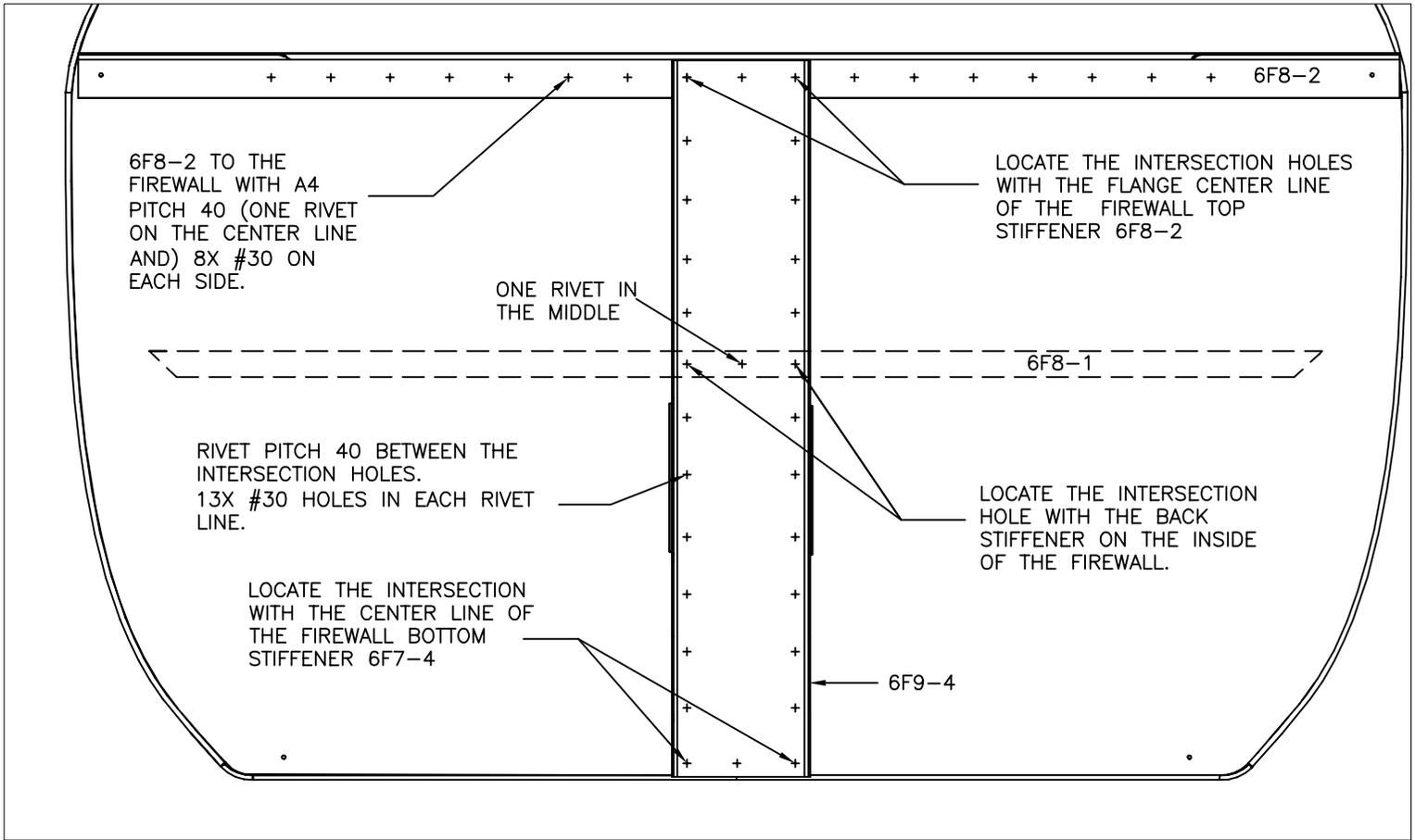
CHANNEL REMOVED FROM THE FIREWALL  
LAYOUT ON THE WORKBENCH WITH THE  
FLANGES UP.



THE CENTER OF THE 2" HOLE IS 35mm FROM THE FRONT FLANGE.

LAYOUT THE POSITION OF THE 3 L ANGLES WHEN  
DRILLING THE UPPER BEARING 6F10-2 TO 6F9-4

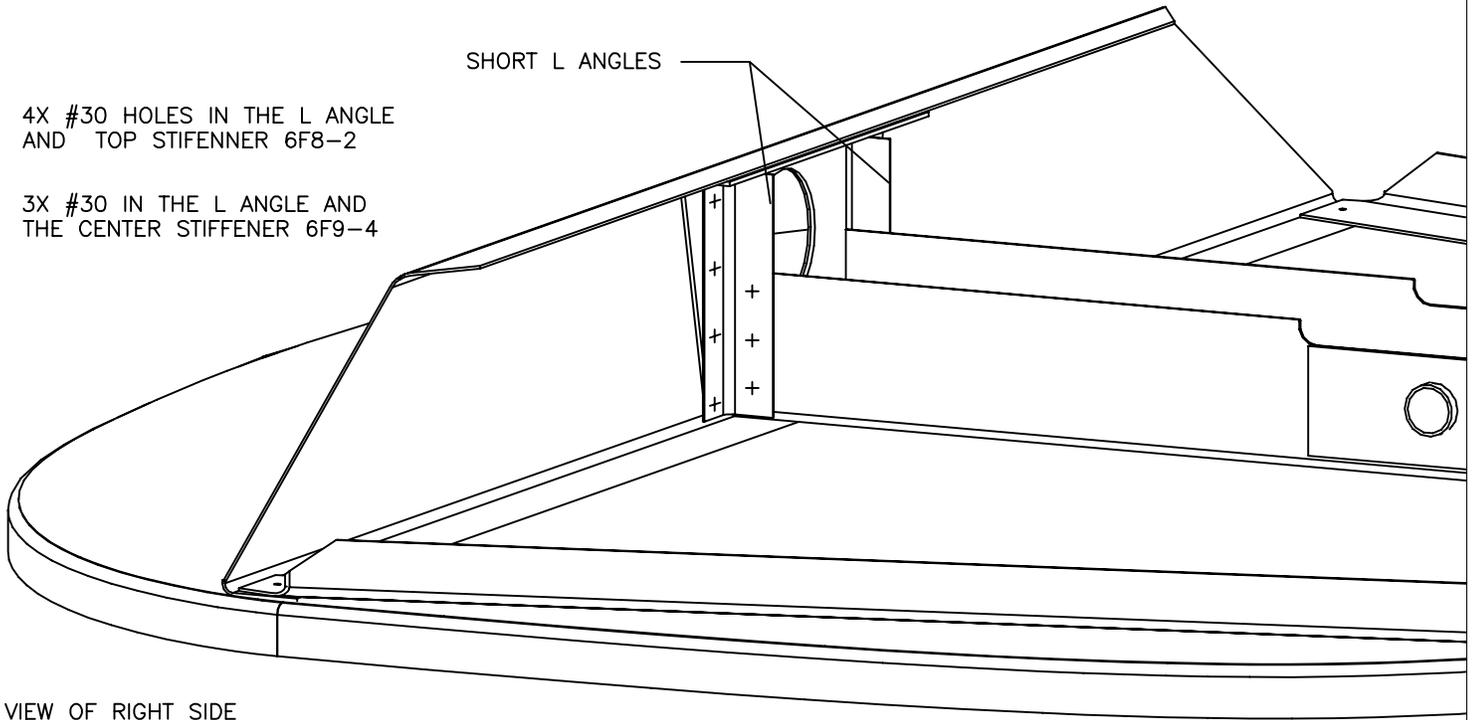
FW-7  
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SHORT L ANGLES

4X #30 HOLES IN THE L ANGLE  
AND TOP STIFFENER 6F8-2

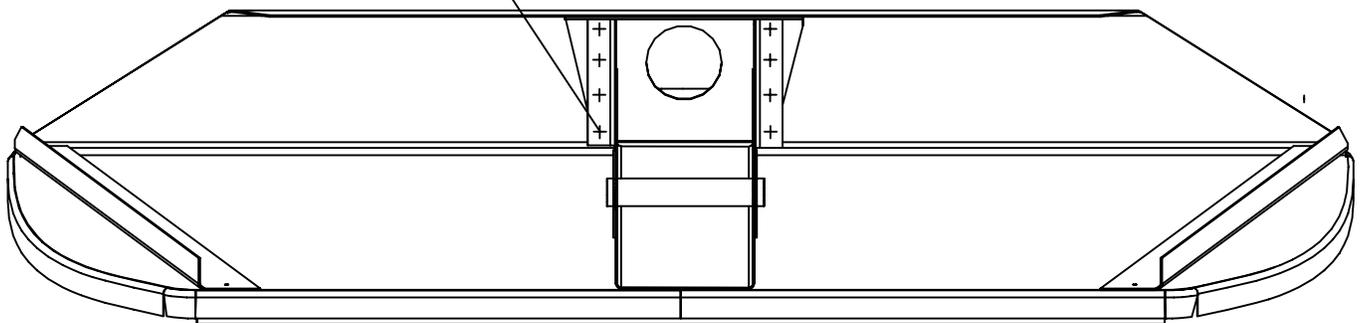
3X #30 IN THE L ANGLE AND  
THE CENTER STIFFENER 6F9-4



VIEW OF RIGHT SIDE

INTERSECTION HOLE WITH THE  
CENTER LINE OF THE L  
ANLGE IN THE CORNER OF  
THE TOP STIFFENER AND THE  
FIREWALL.

SHORT L ANLGES ON EACH SIDE OF THE CENTER FIREWALL  
STIFFENER 6F9-4 TO HOLD THE FIREWALL TOP STIFFENER  
6F8-2 AT 90 DEGREES TO THE FIREWALL.



BOTTOM VIEW LOOKING UP

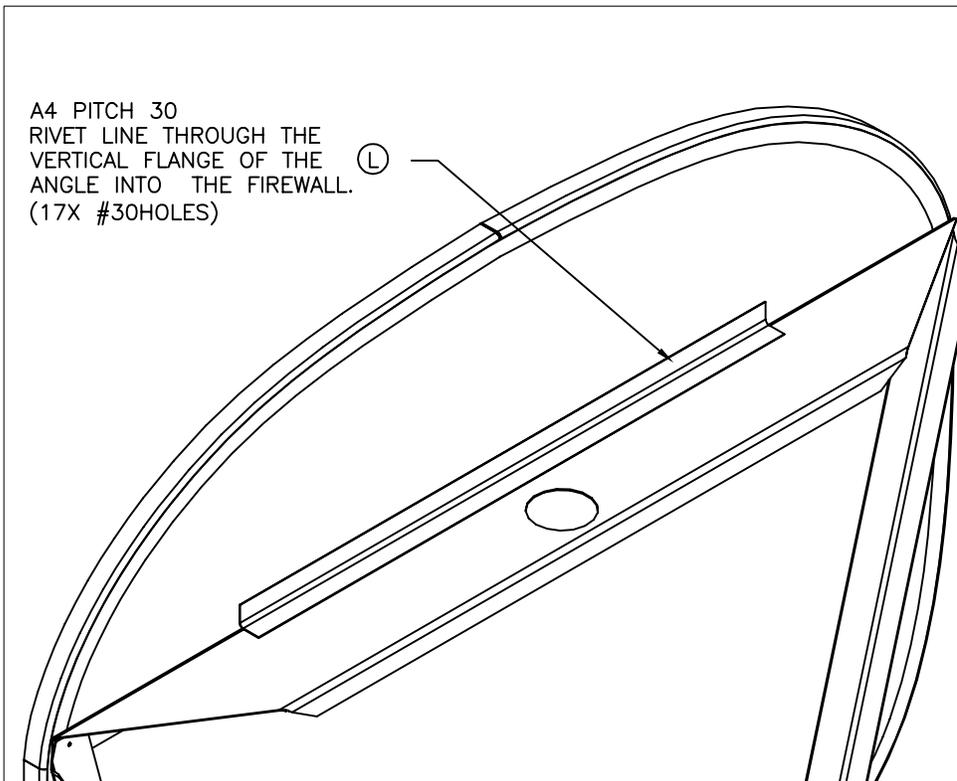
L ANGLES IN THE CORNER OF 6F9-4 AND 6F8-2

FW-10

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11. Cleco the L Angle (l=520mm) in the corner between the Firewall and the top side of the Top Stiffener 6F8-1  
REFERENCE: Upper left diagram on drawing 6-F-8, third diagram from the bottom right on 6-F-10, FW-12  
LAYOUT: Locate the intersection holes with the short L Angles.  
PITCH: A4 pitch 30 in both flanges  
DRILL & CLECO: Drill and Cleco to the Firewall and Stiffeners.  
Tip: Protect the parts from the drill chuck when drilling in tight places. (If necessary, drill from the back side)
12. Finish drilling the hole pattern in the Top Bearing 6F10-2  
LAYOUT: a) Add another row (offset towards the center by 20mm) of 4 A5. The first hole is through the intersection with the L Angle in Step 8.  
RECOMMENDATION: Maintain good edge distance around the 2" hole to prevent placing rivets underneath the Gear Stop Plate 6L3-3.
13. Use a 2" hole saw in a drill press to drill the Top Stiffener and Upper Bearing. Cleco the part together (6F8-2 & 6F10-2) and drill together. Remove and deburr by running a flat file lengthwise over the pieces.  
REFERENCE: 6-F-10, 6-L-3  
SUGGESTION: Do a practice hole to determine if the tool is suitable!  
2" Hole Saw: if the hole is bigger, file the outer teeth: staple a sheet of sandpaper to the workbench and with the hole saw in a hand drill gently press the hole saw on the sandpaper keeping the tool parallel to the workbench. This will file any tooth which is out of alignment! In the hole saw, replace the drill bit with a drill blank or a steel rod to prevent elongation of the 1/4" pilot hole.  
RIVET: 6F10-2 to 6F8-2 through the appropriate holes!
14. Cleco the Stiffeners to the Firewall one at a time to finish drilling the rivet lines in-between the end holes.  
REFERENCE: Middle diagram on 6-F-8  
PITCH: a) Firewall Back Stiffener 6F8-1: A4 pitch 40  
b) Firewall Bottom Stiffener 6F7-4: A4 pitch 40 (see middle diagram on 6F8).  
c) Firewall Top Stiffener 6F8-2: A4 pitch 40  
d) L Angle between the Firewall and 6F8-2: A4 pitch 30  
e) Firewall Side Stiffener 6F7-5: Two parallel rows of rivets. A5 pitch 60  
f) Channel Stiffener 6F9-4: A4 Pitch 40
15. Cut out the Steering Rod opening in the Firewall (tri-gear only!) in accordance with the drawings on 6-F-8.
16. Drill a 3/8" hole for the Upper and Lower Engine Mount Attachments 6F7-2 and 6F7-3.  
DRILLING: Use a 3/8" step drill and open-up the pilot holes. Remove the parts, and deburr by running a flat file lengthwise.

A4 PITCH 30  
RIVET LINE THROUGH THE  
VERTICAL FLANGE OF THE  
ANGLE INTO THE FIREWALL.  
(17X #30HOLES)

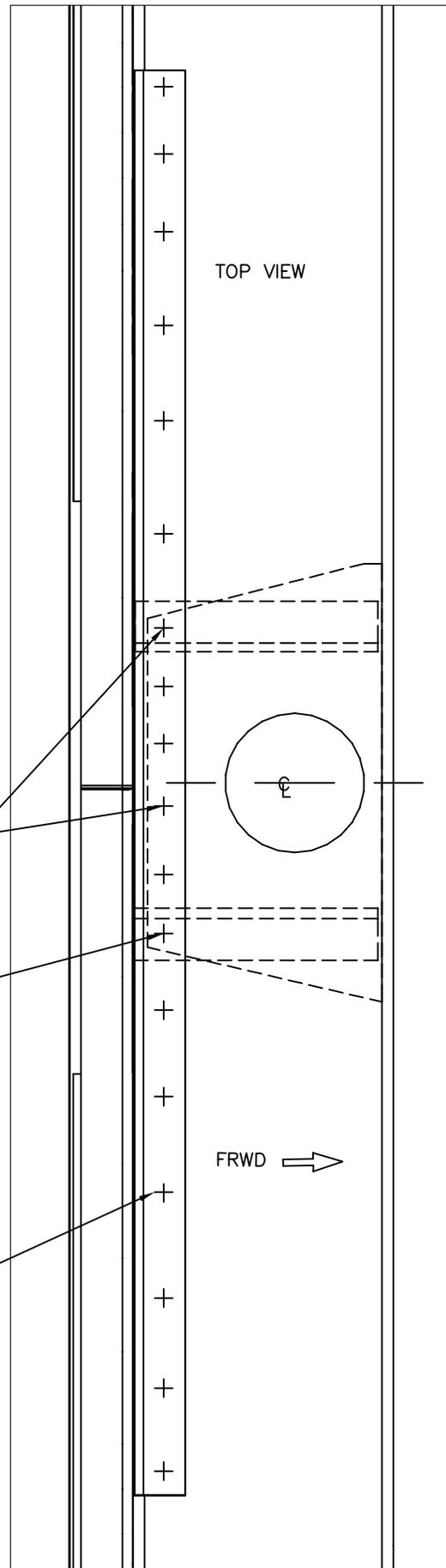


RIVET PITCH IN THE HORIZONTAL FLANGE OF THE L ANGLE

4X #30 BETWEEN THE INTERSECTION HOLES

INTERSECTION HOLES WITH THE SHORT L ANGLES RIVETED TO 6F9-4  
(APPROXIMATELY 56mm FROM CENTER LINE)

A4 PITCH 30 BETWEEN THE END HOLE  
AND THE INTERSECTION HOLE (5X #30  
HOLES).



520mm L ANGLE IN THE CORNER OF  
THE TOP STIFFENER AND THE FIREWALL

FW-11

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17. **RIVETING SUGGESTION:** When riveting above stiffener 6F8-1, place the rivet head on the aft (cabin) side of the Firewall to reduce possible interference with the fuel tank. Rivets into and below 6F8-1 are set from the engine side: the lower profile of the round head will make it easier to attach brackets or fixtures on the Firewall (i.e. battery, Rotax oil tank, overflow bottle, etc.).
18. Bolt the Upper and Lower welded Engine Mount Fittings 6F7-2 & 6F7-3 to the Firewall using washers AN960-616 under the nut AN 365-624 to avoid tightening the nut through the self locking nylon, as shown in the bottom right diagram on drawing 6-F-8.

<p style="text-align: center;"><b>Gear Rib Assemblies;</b> 2 LEFT &amp; 2 RIGHT required</p>
--

19. Cut the Gear Slides 6V5-2 extrusion to 3/4 "x 1-1/2"  
REFERENCE: Top middle diagram on 6V5  
NOTE: The 3/4" flange gets riveted to the Gear Ribs 6V2- 1. The inside distance between the two 3/4" flanges is ?? ?? (to clear outside the two welded tubes on the Lower Bearing Support 6L3-1).  
SAW: The 1/8" extrusions 1" x 1-1/2" to 3/4" x 1-1/2" l=298  
Remember to compensate for the thickness of the saw blade and filling.  
REQUIRED: 4R&4L  
SUGGESTIONS: Use a body file to remove the saw marks to obtain smooth / clean finish.
20. Position the Gear Slides 6V5-2 on the Gear Ribs 6V2-1  
REFERENCE: 6V5  
LAYOUT: The measurements are referenced from the Main Spar Web: The first extrusion is set at 330 along the top, and at 280 along the bottom. The second extrusion is on a 154 mm off-set to the first extrusion. (measured from outside to outside along the top & bottom).  
CLAMP: Both extrusion to the Rib.  
PITCH: 13 A5 rivets pitch 18mm. Top and bottom holes are at 8mm from the flange.  
DRILL & CLECO: #20  
CHECK : The left and right assemblies are identical!

21. Cleco the two diagonal L Angles on the inside of the Rib.

REFERENCE: 6V5

LAYOUT: Trim the end to position the longer (upper) L Angle diagonally across the Rib from the bottom of the aft extrusion to the top of the rib. The bottom L Angle is on a 70mm off-set to the upper L Angle.

CUT: Taper the end of the L Angles to pick up the bottom hole through each Gear Slides.

PITCH: A5 pitch 30

BACK-DRILL & CLECO: To Cleco the L Angle to the Rib Assembly, pre-drill the bottom hole in each L Angle. Then back-drill the intersection hole through the extrusion.

RIVETING: Rivets between the extrusion are pulled from the side of the extrusion (the rivet head has a lower profile than the mandrel!).

22. Cleco the Gear Rib Doubler Channel 6V5-1 flush with the Rib flange.

REFERENCE: 6V5

CLAMP: Clamp the Rib and Channel to a 3/4" piece of extrusion to line up the flanges (they will be riveted to the Spar Web 6V4-1).

PITCH: 13 x A5 in two rows. On the forward rivet line, the end-holes are at 55mm from the top and bottom of the Rib. For the aft rivet line, the end-holes are at 21mm from the top and bottom of the Rib.

DRILL & CLECO: Back drill the holes through the L Angles.

CUT: Trace and cut the top and bottom "day light" corner.

SUGGESTION: Wait to rivet the Gear Rib Doubler Channel 6V5-1 until after the Gear Rib Assembly has been drilled to the Spar 6V4.

23. Cleco the Bellcrank Support Channel 6V6-2 to the outboard Ribs 6V2-1  
REFERENCE: 6V6, 6V14  
LAYOUT: a) Mark a 230mm offset line from the aft Rib flange on both sides of the Rib.  
b) Mark a center line on the inside of Channel 6V6-2  
CUT: Trace and cut the Channel the height of the Rib.  
CLAMP: The Channel to the Rib with the centerline over the 230mm off-set line.  
DRILL & CLECO: The top and bottom rivet lines (2 holes each)
24. Drill the 3/16" hole in the Aileron Bellcrank Support 6V6-1 for the AN3 bolt.  
REFERENCE: 6V6  
LAYOUT: a) Use an adjustable square to locate and mark the mid-point on the inside flanges.  
b) Center punch the hinge hole at 20mm on the mid-point line.  
DRILL PRESS: a) Position the two pieces of extrusion back to back with the 3/4" flat on the table. Clamp the pair together on the 1-1/2" flange and drill a small pilot hole through both pieces.  
c) Use a drill press to back drill the pilot hole with a 3/16 drill bit. Debur with a flat file to avoid countersinking the hole.  
CUT: a) Cut the 1" flange of the extrusion to 20mm..  
b) Taper the 1-1/2" flange in accordance the drawings maintaining good edge distance around hinge hole.  
c) File to a smooth finish until the saw marks are gone!  
REQUIRED: 2 pairs.
25. Rivet the Aileron Bellcrank Support 6V6-1 to the O/B Gear Rib assembly.  
REFERENCE: 6V6  
LAYOUT: The top of the lower Support is up 45mm from the bottom of the Rib (measured along the 230mm off-set line).  
NOTE: The Supports are perpendicular to the 230mm off-set line.  
PRE-DRILL: 3 holes in the 20mm flanges of the Supports with #30  
JIG: 16.5mm spacer approximately 55mm long and 3/4" wide. Through the 16.5mm drill a 3/16" hole at the mid-point.  
POSITION: a) Bolt the 16.5mm spacer block between the Supports to keep the extrusion pair parallel.  
c) Center the mid-point of the Supports over the 230mm offset line  
DRILL & CLECO: #20  
RIVET: A5