

9.5 Forward Fuselage Assembly

- 1) Take two FUS-340 engine mount brackets and add five #30. holes. Figure 1.

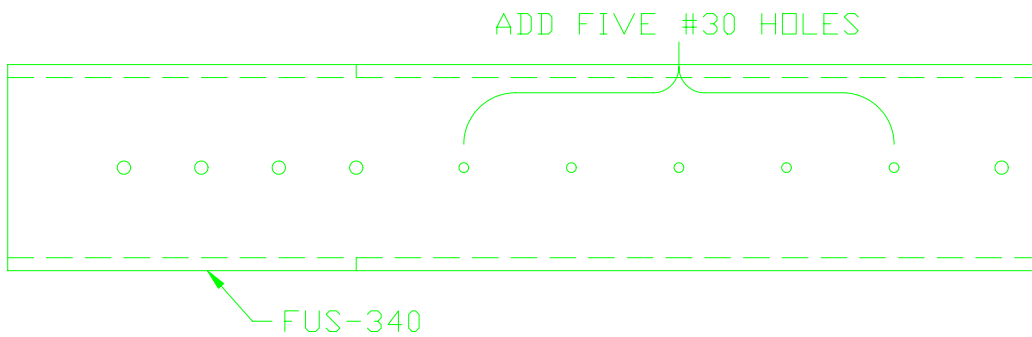


FIGURE 1

- 2) Cut two 14 15/16" lengths from RAWST-7 (1 1/2 x 1 1/2 x 1/8 angle).
- 3) Nest one of the FUS-340 brackets into one of the angles cut from RAWST-7. Back drill the bottom holes to #30 and the side holes to #11. Figure 2.

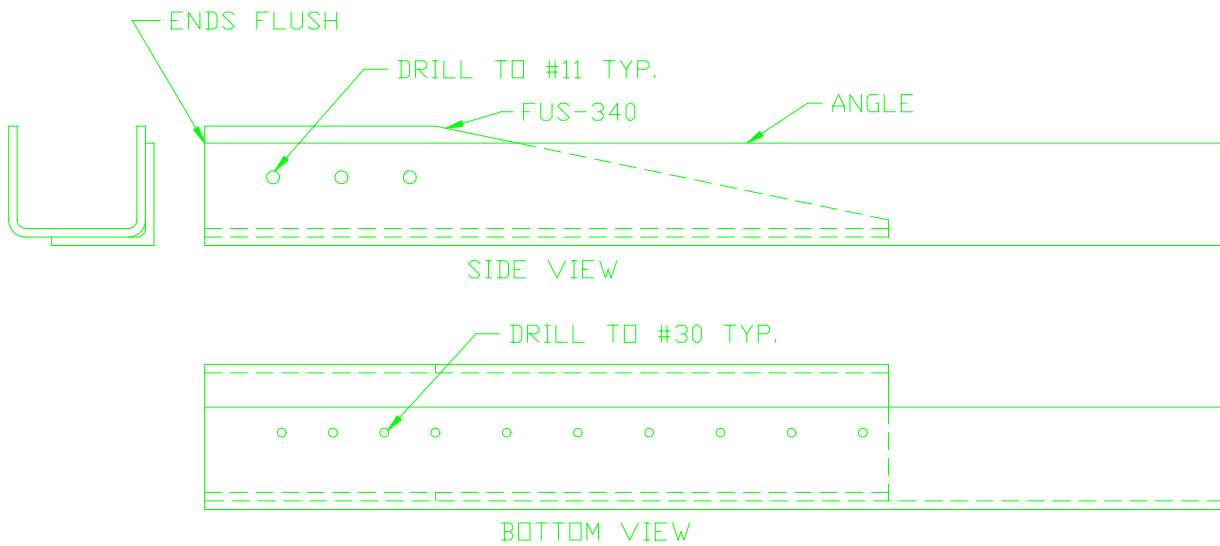


FIGURE 2

- 4) Repeat for the other FUS-340 bracket but make the opposite hand. Figure 3.

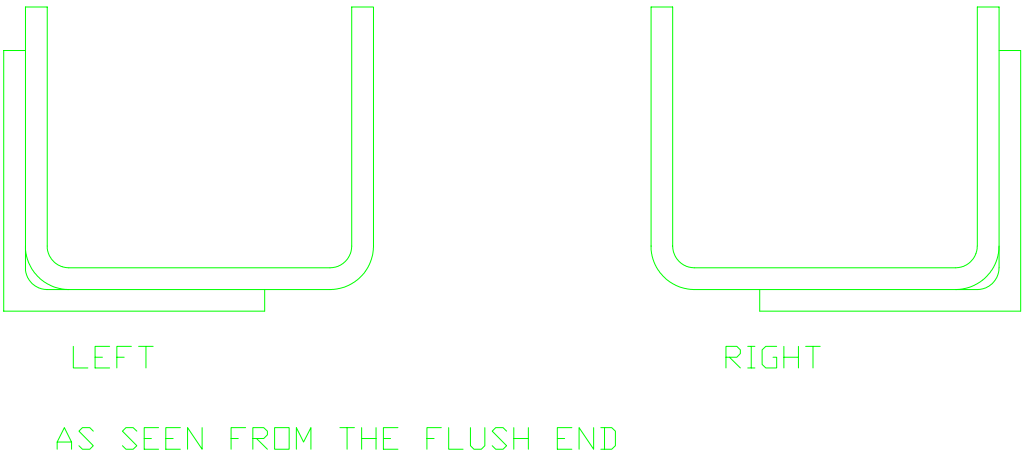


FIGURE 3

- 5) Insert a FUS-341 engine mount fitting into FUS-340 engine mount bracket and drill the six side holes to #11. Figure 4.

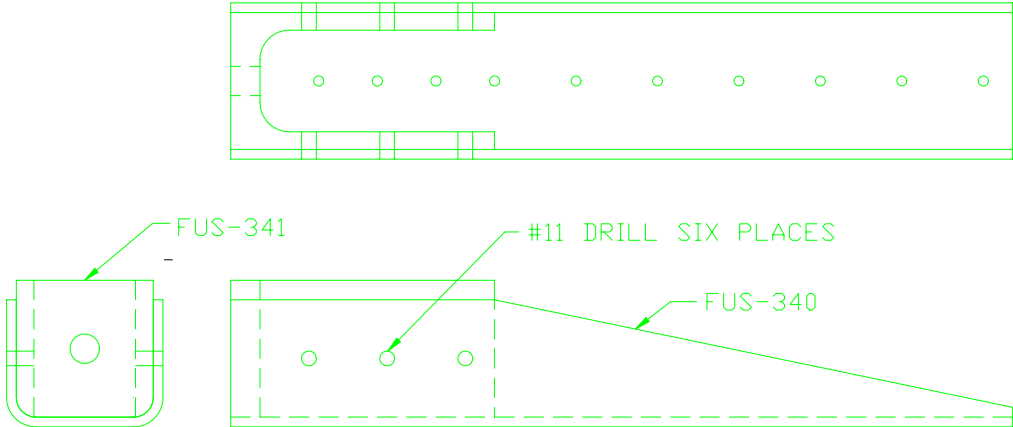


FIGURE 4

- 6) In two CC-37 delrin bearing drill two #11 holes and trim as in Figure 5. Countersink the two holes.

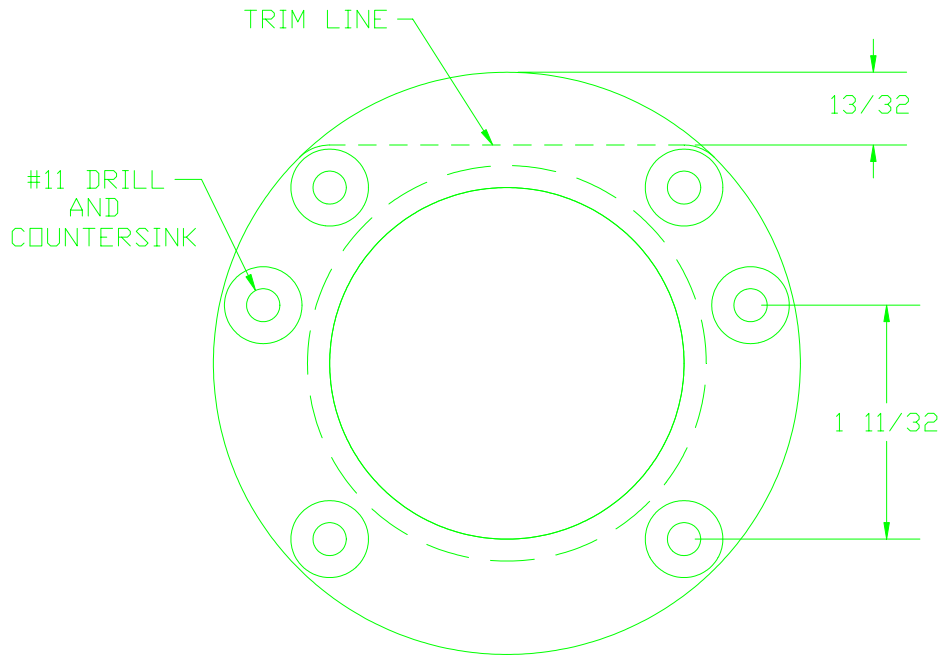
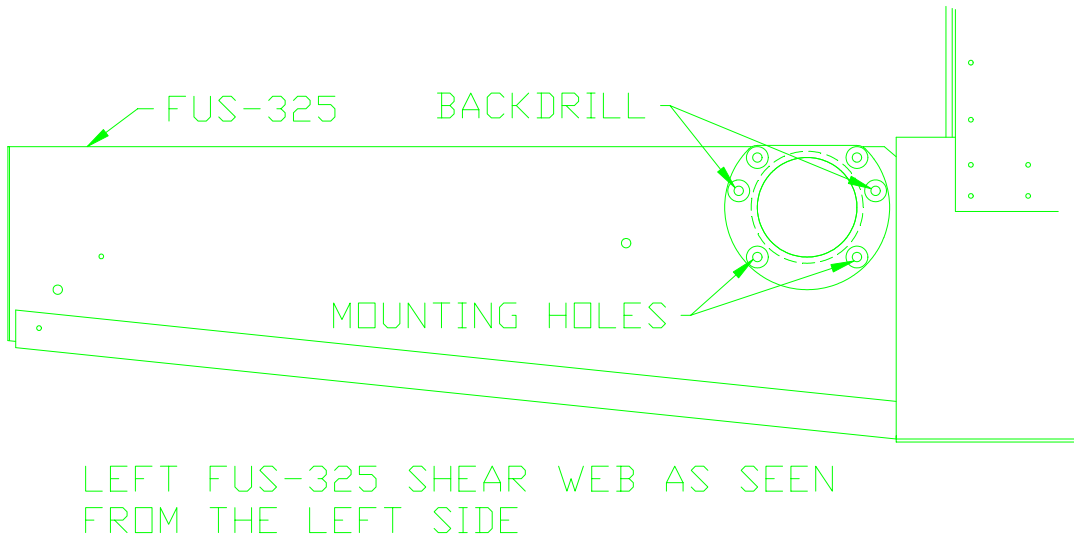


FIGURE 5

- 7) Drill out to #11 the two mounting holes in each outside FUS-325 shear web. Figure 6.
- 8) Cleco or bolt the trimmed bearings in place. The bearing flange should face inwards. Back drill the two holes drilled in step 5. Figure 6.



LEFT FUS-325 SHEAR WEB AS SEEN FROM THE LEFT SIDE

FIGURE 6

- 9) Position the left 14 15/16" angle on the inside of the left FUS-325 shear web. The top of the angle must be flush with the top of the side to side carrythroughs **NOT** the shear webs. Back drill the three angle holes into the shear web and the one shear web hole into the angle. Figure 7.

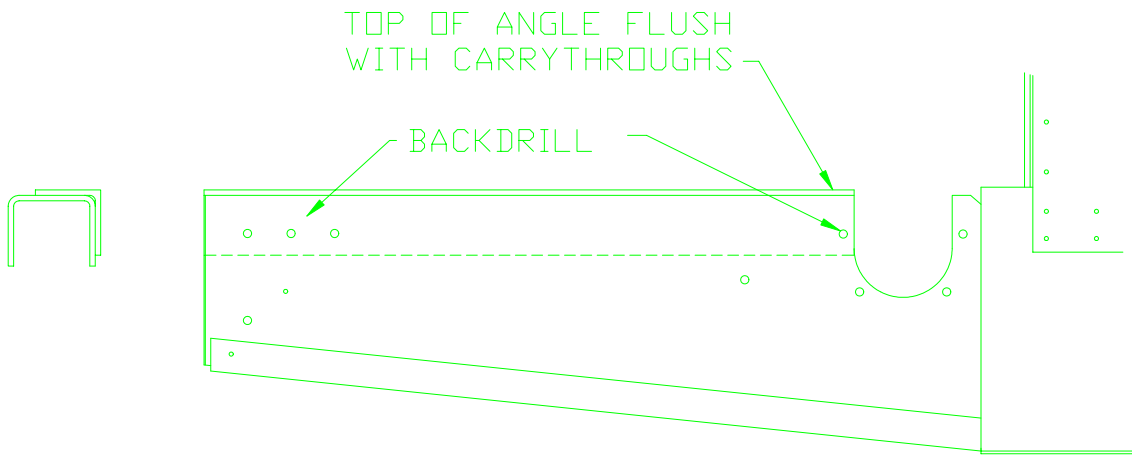


FIGURE 7

10) Position the FUS-300 engine mount bracket and drill seven extra #11 holes through shear web, angle and bracket. Figure 8.

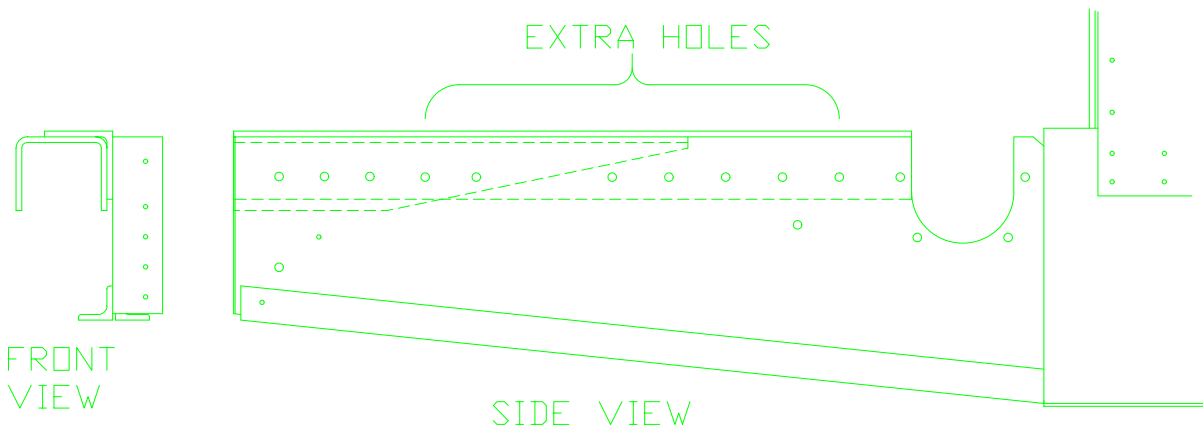


FIGURE 8

11) Mount the angle, FUS-341 and FUS-340 permanently. Figure 9. Do not mount the delrin bearing at this time..

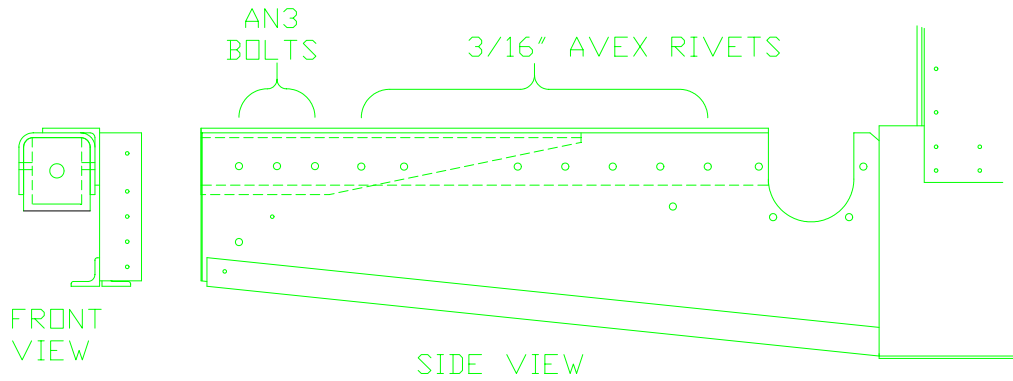


FIGURE 9

- 12) Repeat for other side.
- 13) From RAWST-10 (0.032 6061-T6) cut two pieces 22" x 7 1/4". These will become side skin doublers FUS-330.
- 14) Place one doubler on the work bench with a FUS-329 front side skin over it with the flanges facing up. Back drill all holes to #40. Figure 10.

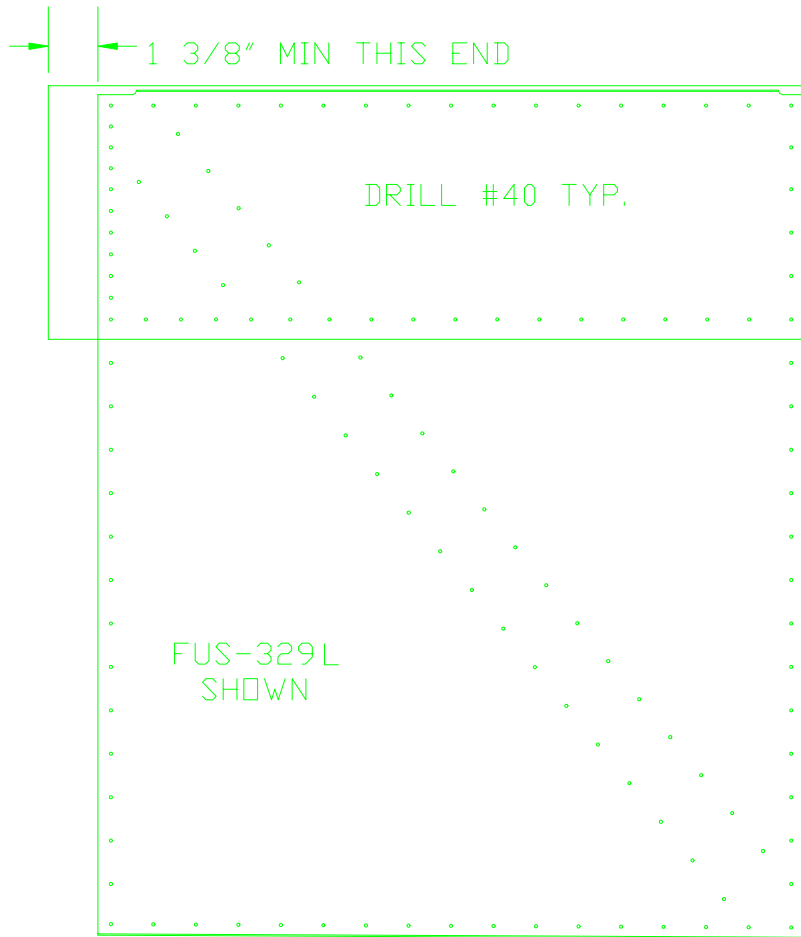


FIGURE 10

- 15) Trim the doubler as in Figure 11.

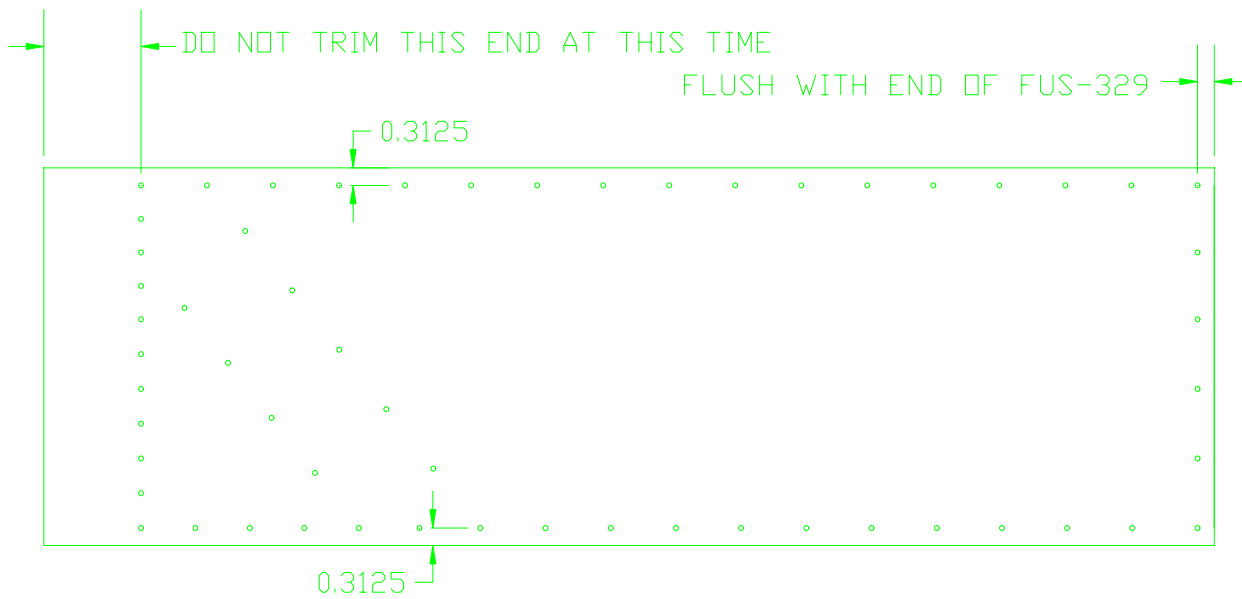


FIGURE 11

16) Cleco the side skins and doublers in place. The doubler now goes behind the side skin. The doubler aft end should go behind the post skin. Back drill the missing holes in the doubler. Figure 12.

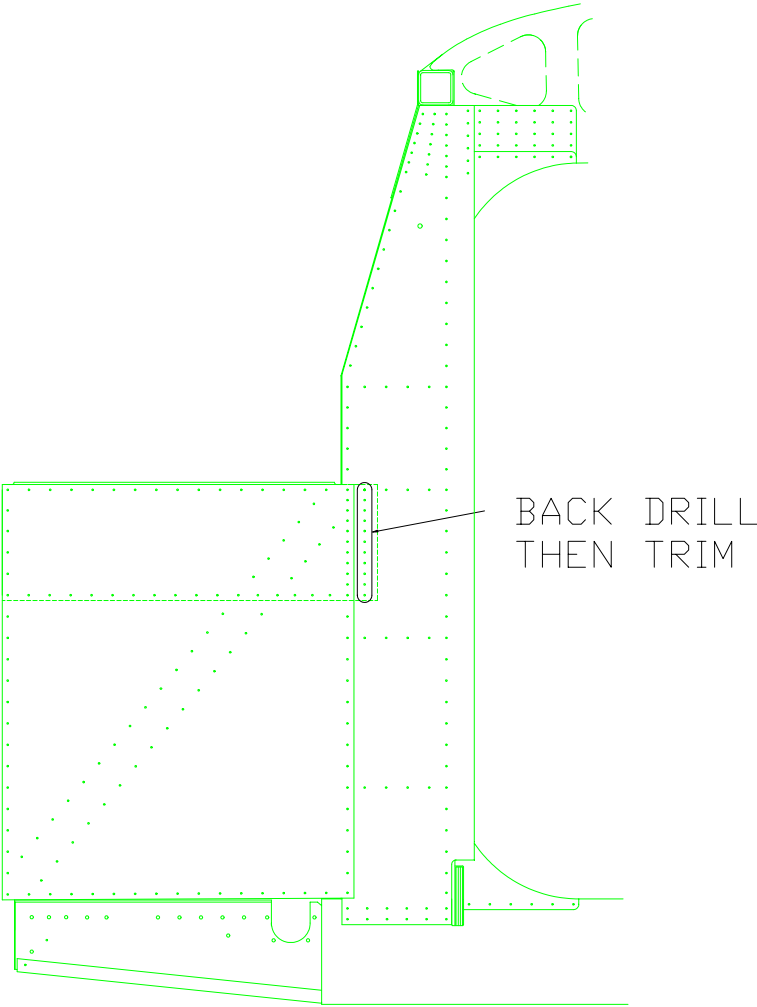


FIGURE 12

- 17) Remove and trim the aft end of the doubler to have 5/16" edge distance.
- 18) Drill #40 holes along the top of the two inboard FUS-325 shear webs. Figure 13.

DRILL TWELVE #40 HOLES

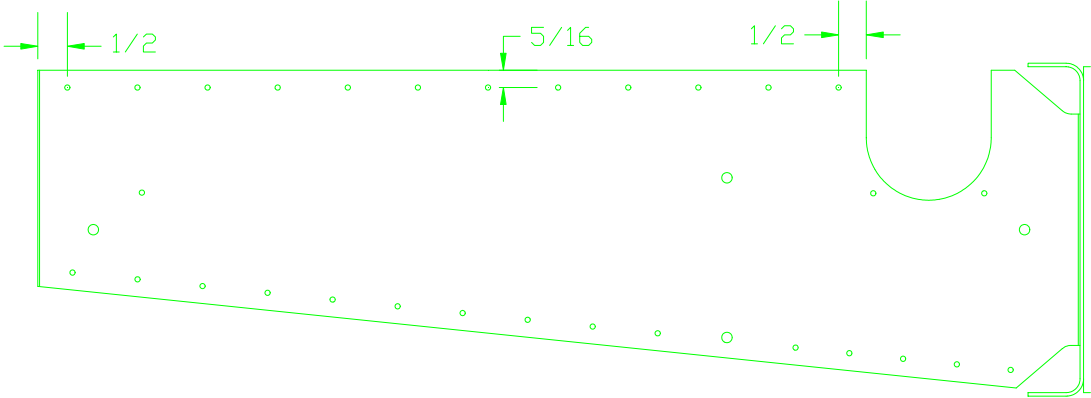


FIGURE 13

- 19) Cut two pieces of 5/8" x 5/8 x .050 to 14 15/16 long.
- 20) Position on the upper inside surface of each inside shear web so the top is flush with the carrythroughs. Drill to #30 and install with 1/8 avex rivets. Figure 14.

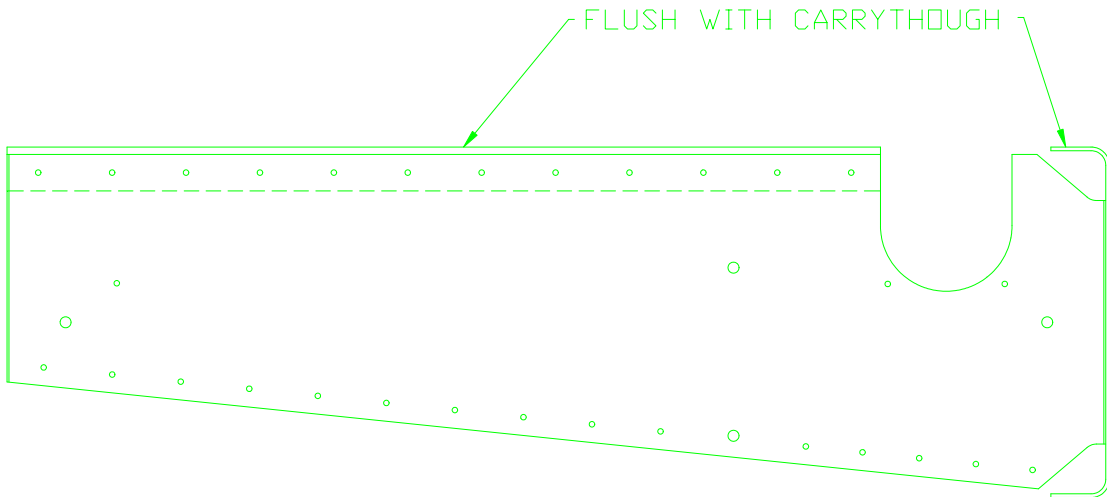


FIGURE 14

- 21) Cleco the side skins and doublers back in place.
- 22) Lay the FUS-328 firewall flanges down on a work bench. Draw a vertical line down the center. Draw two parallel lines 14 3/16" to each side and two parallel lines 1 17/32" to each side. Turn the firewall over and draw a vertical center line on this side as well. Figure 15.

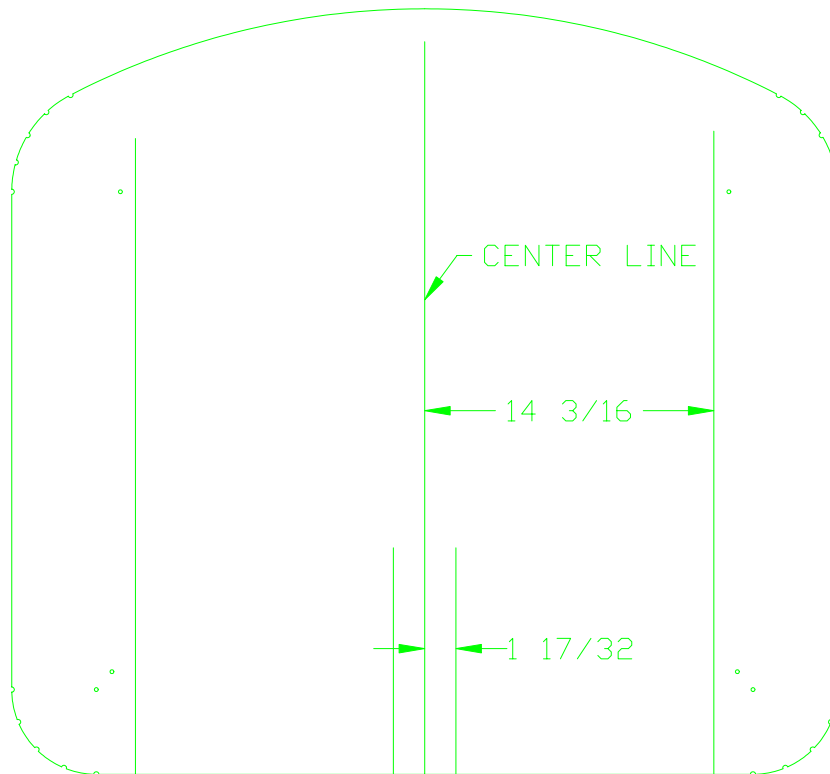


FIGURE 15

23) On each 1 ½ x 1 ½ x 1/8 angle holding, the engine mount brackets and engine mount fittings, draw a line center to the engine mount fitting hole. Figure 16.

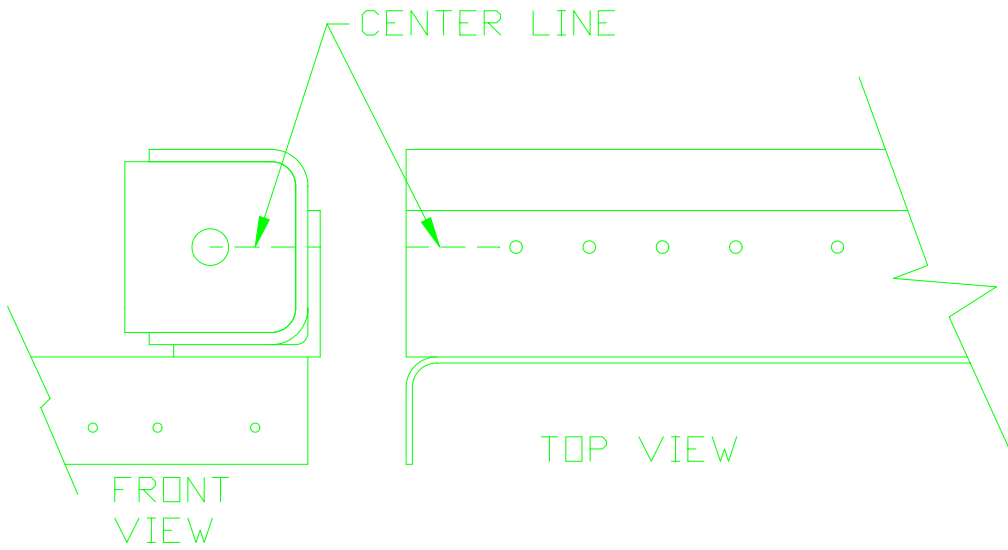


FIGURE 16

24) Cleco the firewall to the two FUS-329 front side skins. Through the FUS-329's, back drill the firewall side flanges. Cleco securely. Figure 17.

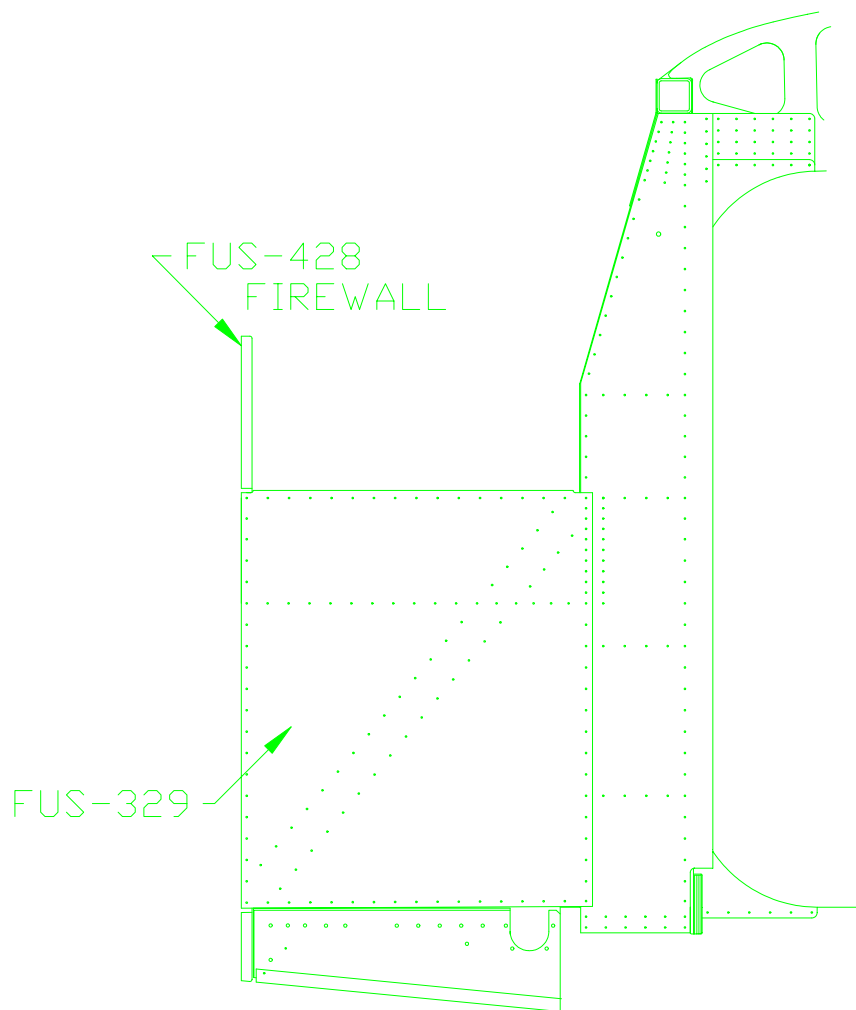


FIGURE 17

- 25) Align the center line drawn in step 23 to the line drawn on the back of the firewall $14 \frac{3}{16}$ " from the center line. On the firewall mark a horizontal line at the top of the $1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{8}$ " angle.
- 26) Repeat for the other side.
- 27) Remove the firewall. Measure from the top of the angle to the center of the engine mount fitting hole. Figure 18. Measure down the same distance on the firewall. Where this line intersects the vertical line on the firewall drill a $\frac{3}{8}$ " hole. Repeat for other side.

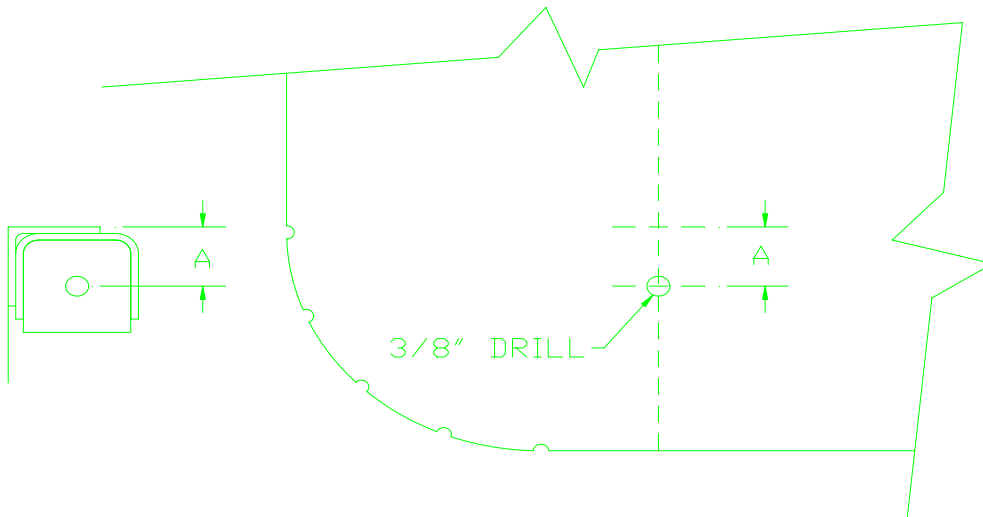


FIGURE 18

28) On the front face of the firewall, draw a line from center to center of the two 3/8" holes just drilled. Draw a parallel line 23 5/8" above the first line. Draw two vertical lines offset from the firewall center line 19 3/8".

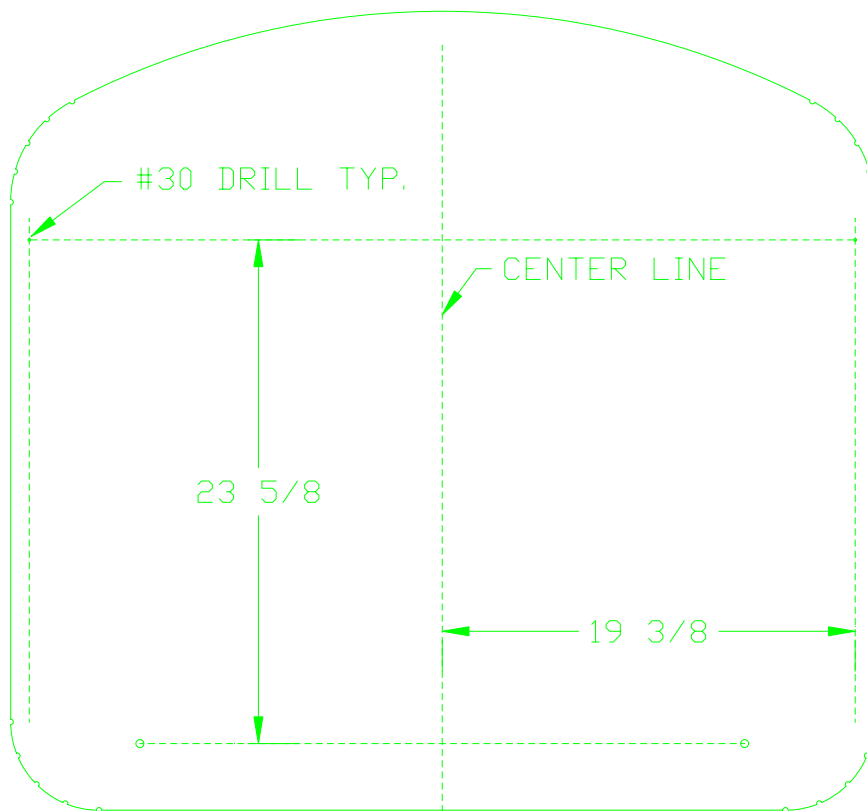


FIGURE 19

Figure 19.

29) Drill #30 holes at the intersections. Figure 19.

30) Trim a FUS-386 channel to 40" long.

31) Center the channel horizontally and vertically over the two #30 holes. Back drill and cleco. Figure 20.

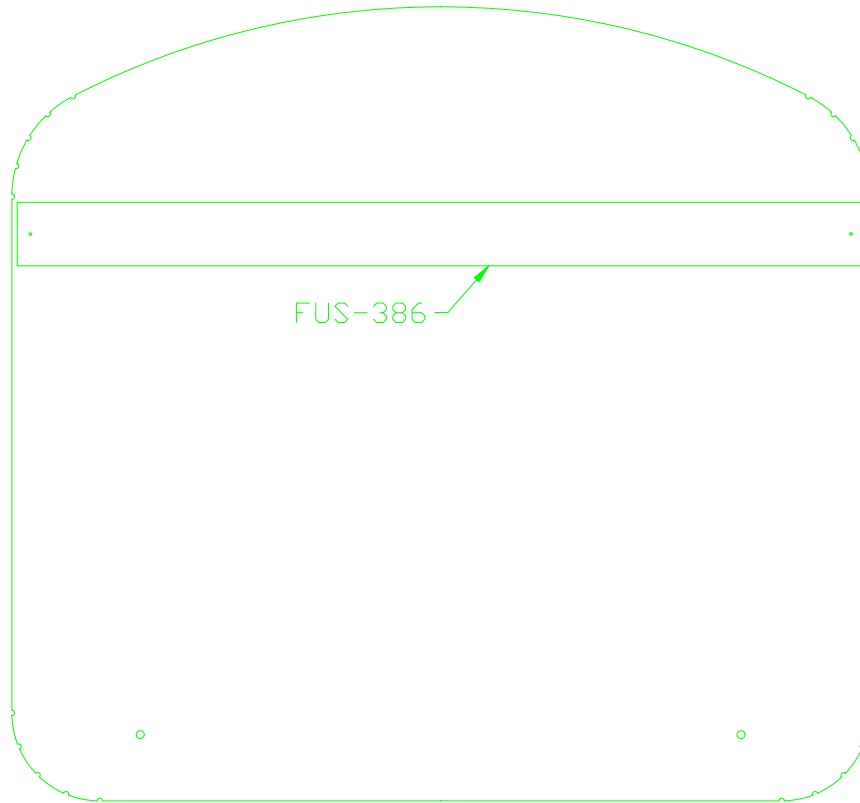


FIGURE 20

32) **NOTE:** If building the Trike version read chapter 11 now.

Layout and drill two rows of #30 holes at a nominal spacing of $1 \frac{1}{4}$ ". Drill out the two engine mounting holes to $\frac{3}{8}$ ". Rivet the channel in place with $\frac{1}{8}$ " avex rivets. Figure 21.

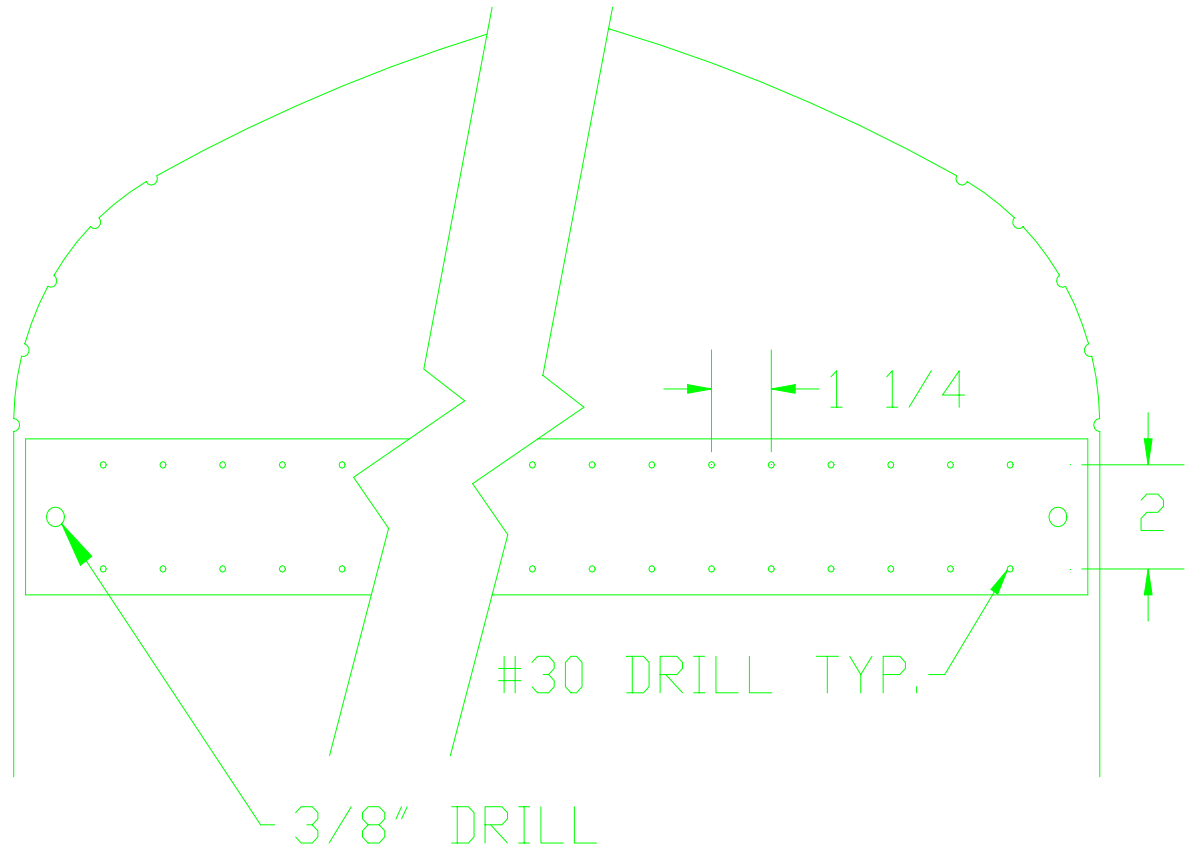


FIGURE 21

- 33) Replace the firewall. Install short 3/8" bolts through the engine mount fittings and firewall.
- 34) Back drill to #30 the firewall through the two outer FUS-325 shear web flanges.
- 35) Back drill through the center two FUS-325 shear webs into the firewall as well. The inside surface of each web should line up with the parallel lines (drawn in step 22) 1 17/32" from the center.
- 36) Remove the cleco at the front of the bottom angles on one of the outer FUS-325 shear webs. Move the front of one angle up or down so it is flush with the bottom of the firewall flange. Back drill the angle. Position the other angle and back drill. Rivet in place with 1/8 avex rivets. Repeat for other side. Figure 22.

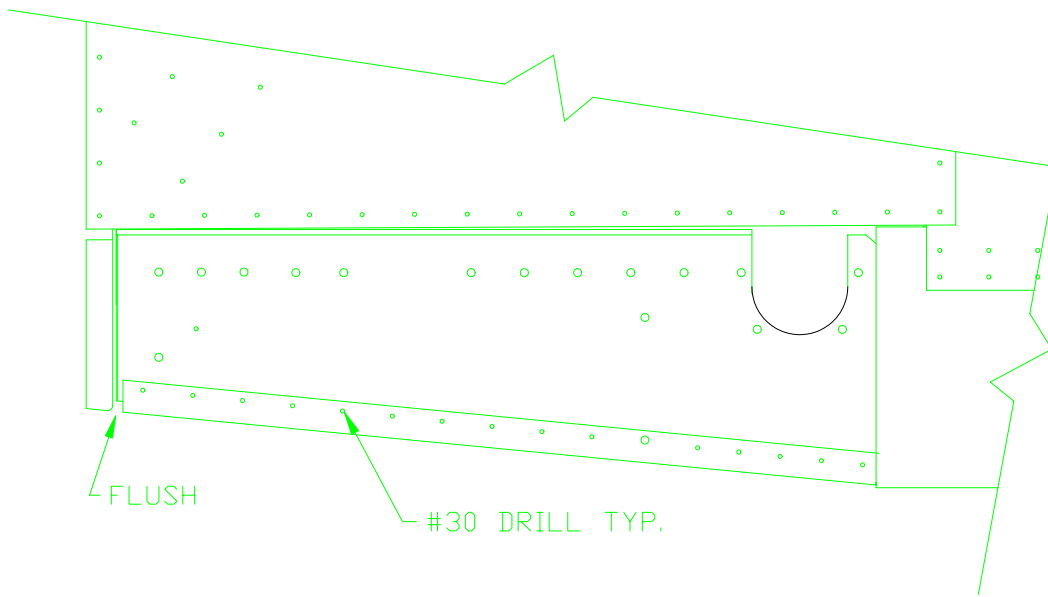


FIGURE 22

37) Cut two pieces of $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$ angle to fit the bottom of the two center FUS-325 shear webs. These shear webs go on the outside surfaces of the shear webs and so have to be short enough to fit inside the shear web end flanges. Drill to #30. Rivet in place with $\frac{1}{8}$ avex rivets.

38) In each of the two remaining FUS-340 engine mount brackets drill a #30 hole pattern as in Figure 23.

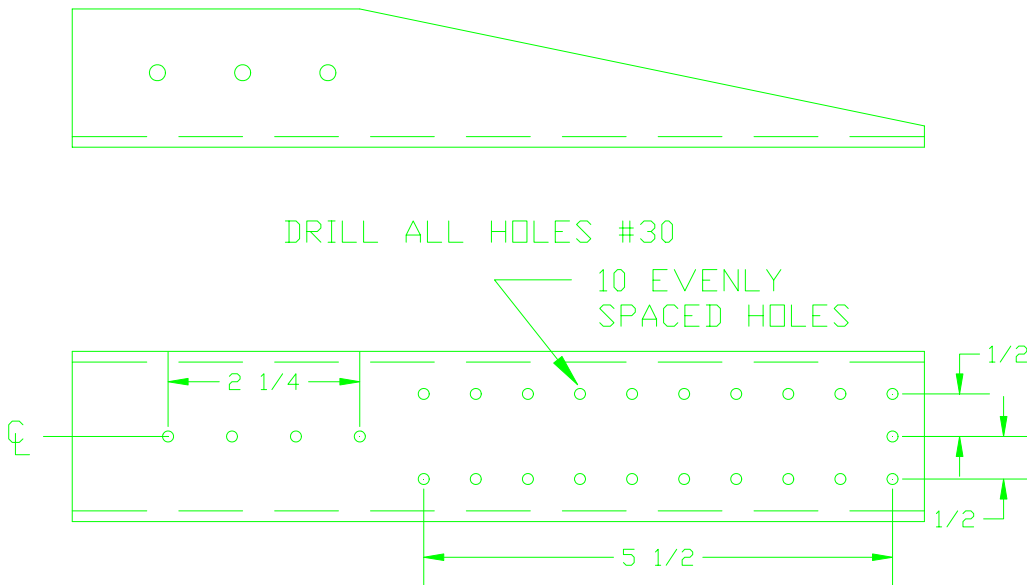


FIGURE 23

39) Nest a FUS-341 engine mount fitting into one of the just drilled engine mount brackets. Position to the inside of the firewall with a short $\frac{3}{8}$ " bolt. Ensure the engine mount bracket is pushed up against the firewall. Back drill the front side skin and doubler to #30. Figure 24.

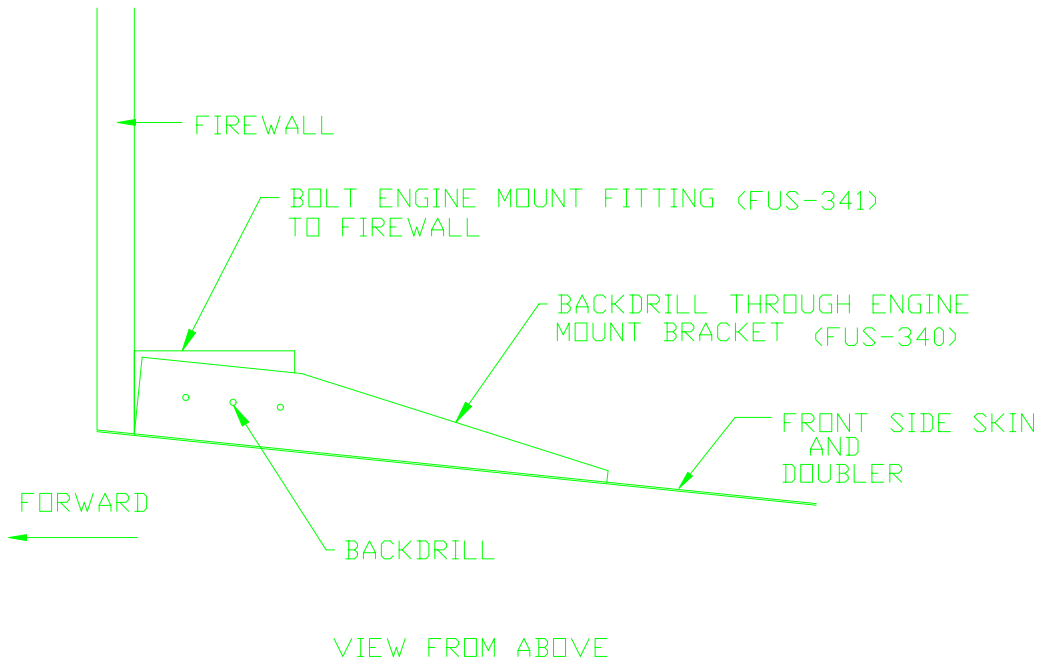


FIGURE 24

- 40) Drill the six #30 pilot holes through FUS-341 using FUS-340 as a drill guide.
- 41) Drill out the engine mount bracket and side skin and doubler to #11.
- 42) Remove the firewall, front side skins and doublers.
- 43) For each front side skin and doubler cut a length of FUS-12 witches hat to fit as in Figure 25. Trim ends at 45°. Back drill to #30.

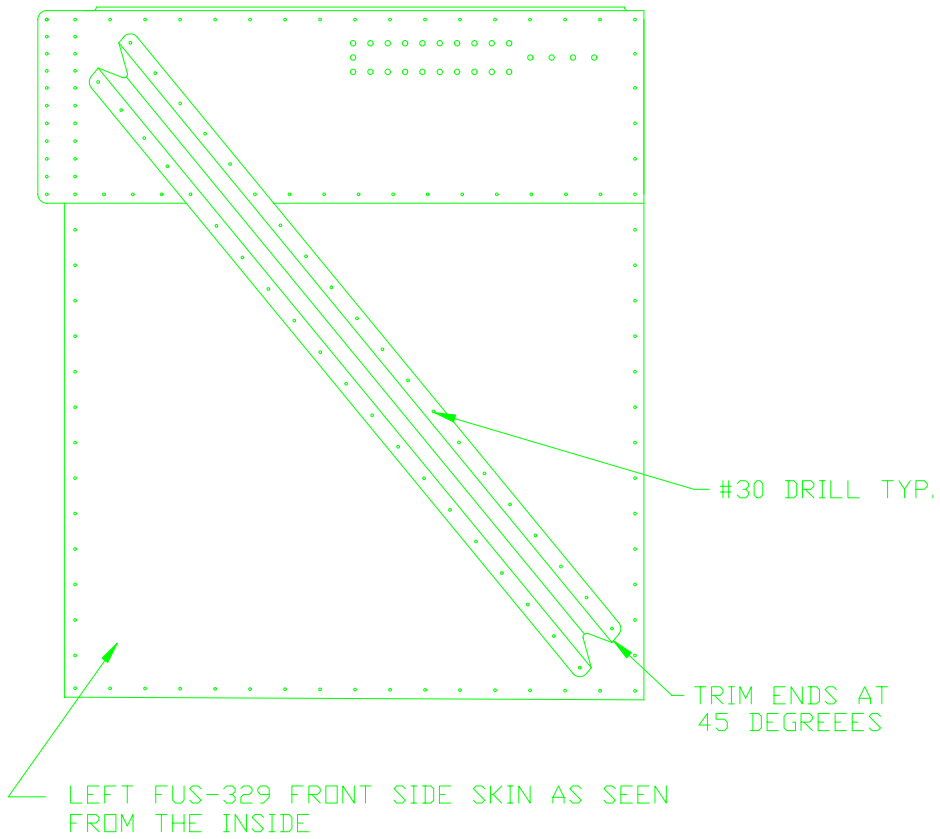


FIGURE 25

44) For each side cut a length of 5/8 x 5/8 x .050 angle(RAWST-8) to stiffen the doubler and front side skin.

Figure 26.

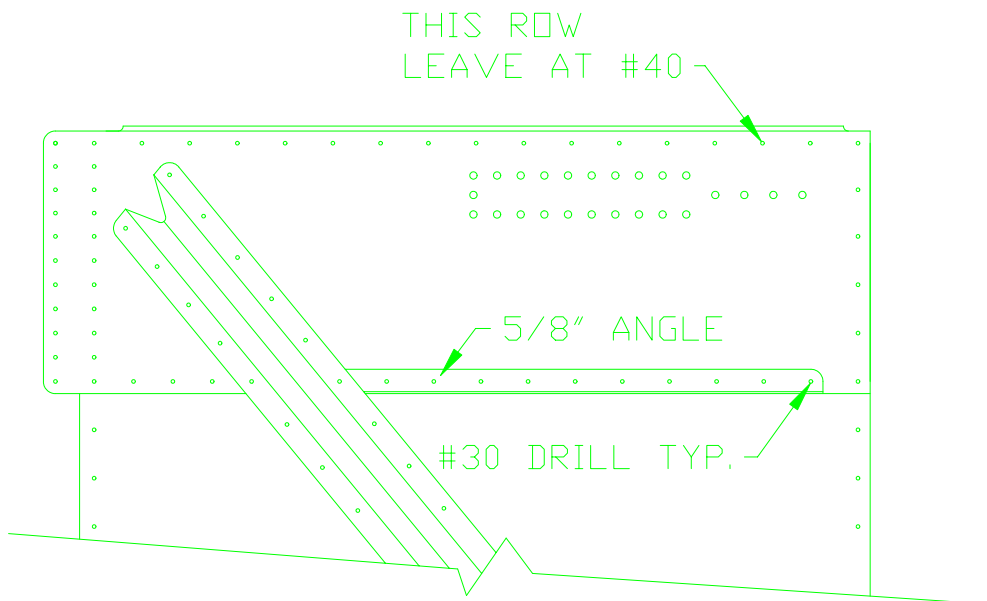


FIGURE 26

45) Drill out the six holes joining the engine mount brackets and fittings to #11. Bolt together with AN3 bolts.

46) Rivet the front side skins, doublers, 5/8 angle, witches hat and engine mount brackets together with appropriate avex rivets. Figure 27.

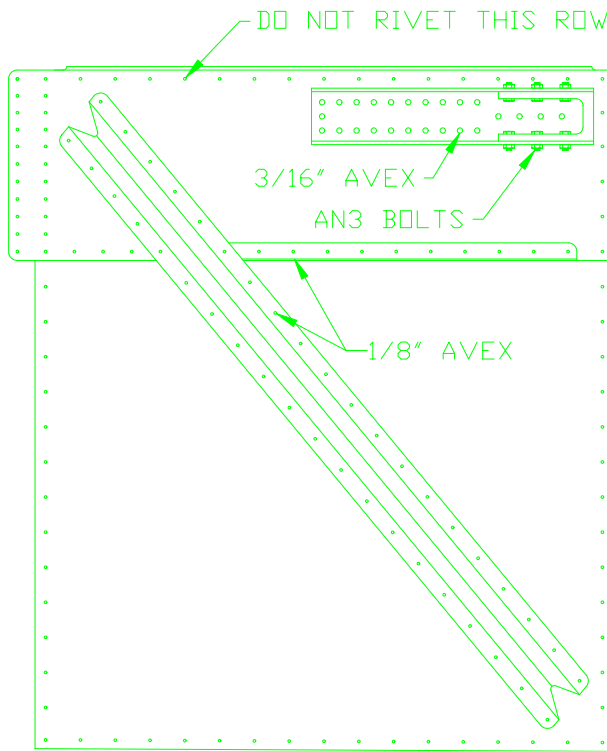


FIGURE 27

47) Cleco the instrument panel (FUS-327) into place. it slides between the inside post skins (FUS-305) and post channels. Figure 28.

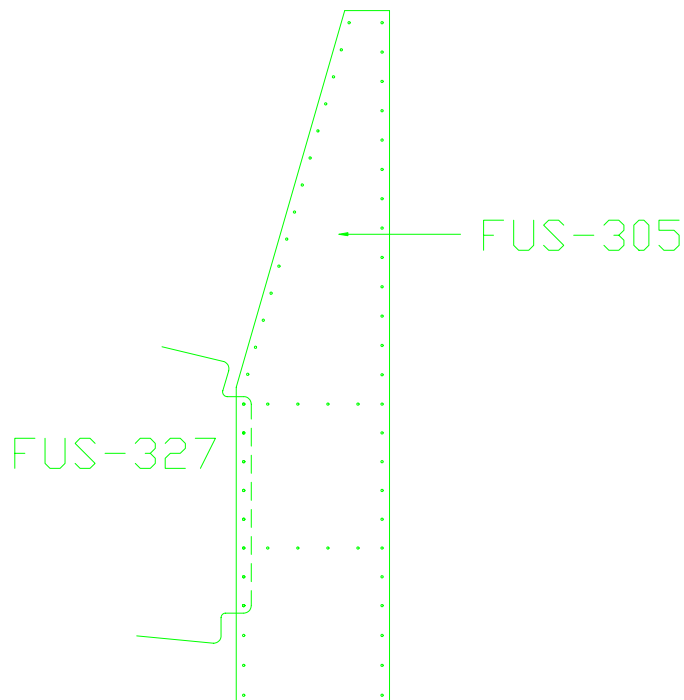


FIGURE 28

- 48) Back drill the instrument panel but do not rivet in place at this time as it will be a lot easier to mount the instruments on the bench.
- 49) Cleco the front side skins and firewall back in position.
- 50) Cleco the FUS-383 forward bottom skin to the FUS-376 bottom floor skin.
- 51) Clamp the front of FUS-383 to the firewall bottom flange. Back drill the #40 holes through the two outboard rivet holes in the firewall flange also drill a hole in the flange at the center of the firewall.
- 52) Drill a #40 rivet line between the three holes with a nominal spacing of 1".
- 53) Drill #30 holes through shear web angles using the prepunched holes in the forward bottom skin as a guide. Copy a row for the second angle on each side.
- 54) Draw a center line on the top flanges of the instrument panel.
- 55) Cleco the FUS-332 (front top skin) to the firewall.
- 56) Ensure the instrument panel is centered between the posts. Trace the outline of the instrument panel on the bottom surface of the front top skin. Trace both the front face and flanges of the instrument panel.
- 57) Remove the front top skin. In the center of each drawn flange out line drill a row of #40 holes with 1 1/4" nominal spacing. The edge distance at the ends of each flange should be 5/16".
- 58) Replace the front top skin and back drill the instrument panel.
- 59) Check the front line traced on the front top skin. Remove the skin and trim. Replace the skin but do not rivet at this time.

60) Draw a horizontal line $4 \frac{5}{8}$ " up from the bottom of the firewall. Measure the distance "A" from the $\frac{3}{8}$ " holes to the bottom of the firewall. Figure 29.

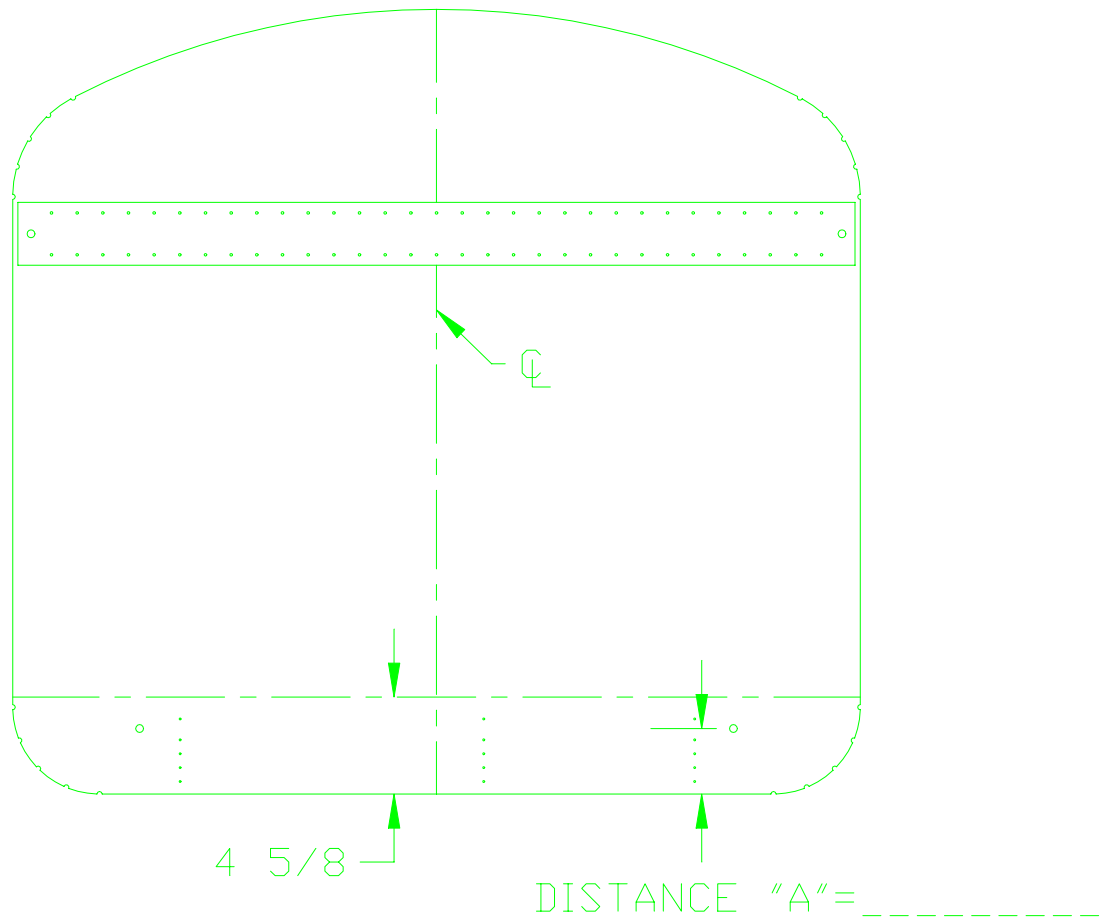


FIGURE 29

61) From .063 Rawstock-25 cut out two doublers $5'' \times 4 \frac{1}{2}''$. Drill $\frac{3}{8}''$ holes as in Figure 30.

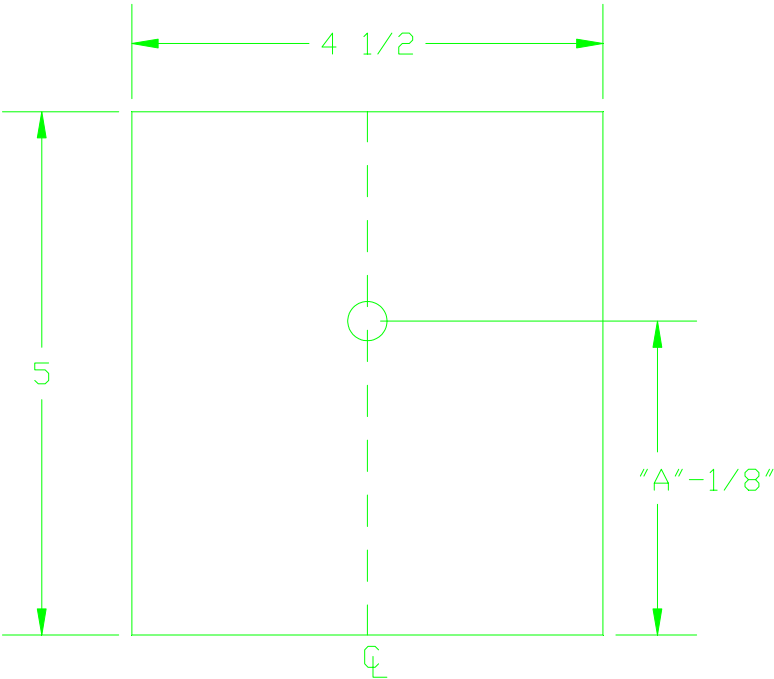


FIGURE 30

62) Use a short 3/8" bolt to position a doubler on the firewall. Figure 31. Back drill through the holes in the FUS-325 shear web flange. to #30.

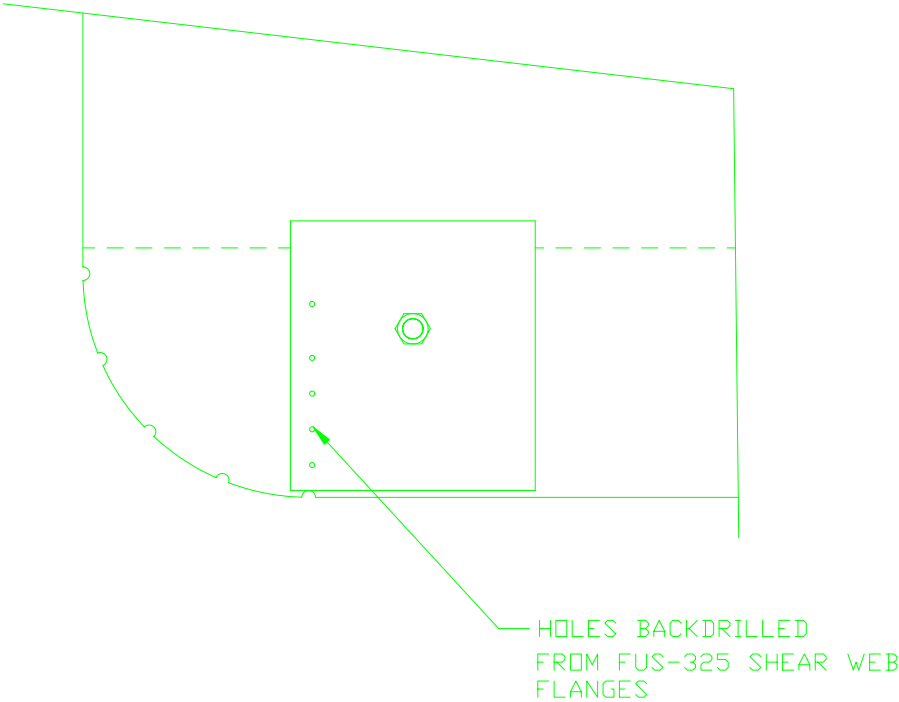


FIGURE 31

63) Add extra holes and trim as in Figure 32.

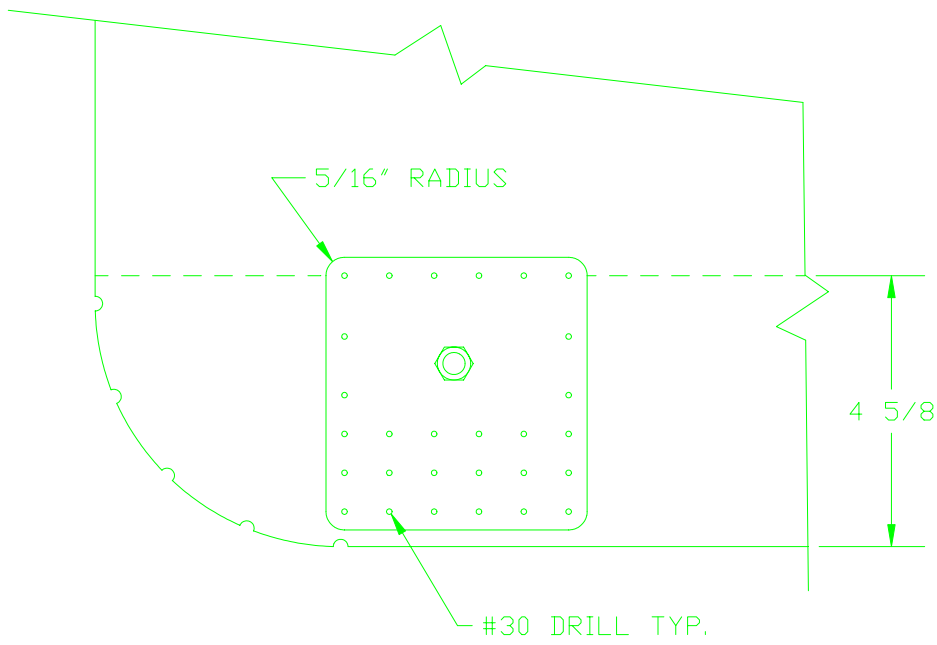


FIGURE 32

- 64) Repeat for other side.
- 65) Cut four lengths of FUS-12 witches hat to fit the firewall as shown in Figure 33. Drill #30 holes with a 1 1/4" nominal spacing. **NOTE:** Cut the ends at 45 degrees for a better appearance. Rivet it place with 1/8" avex rivets. Rivet doublers in place except for top row. The top row will rivet through the floor flange later.

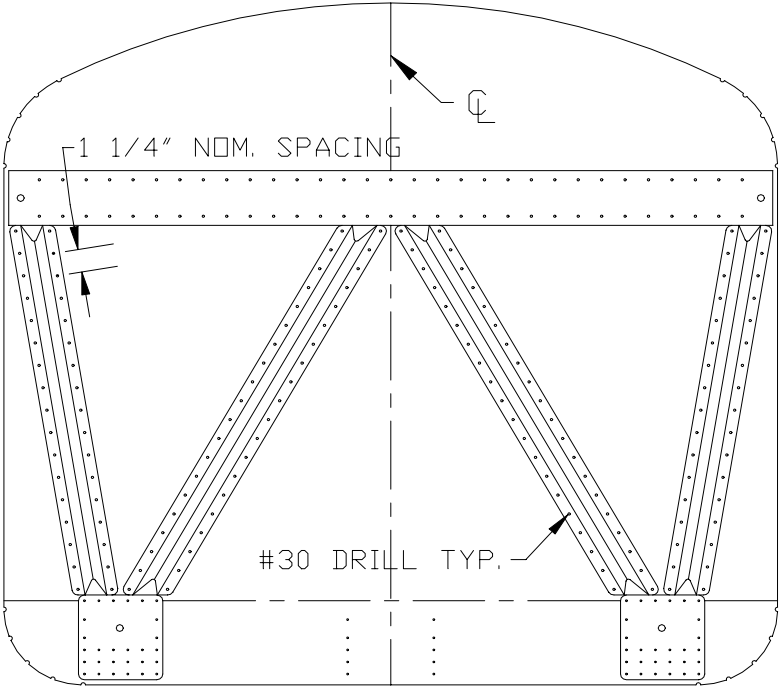


FIGURE 33

66) Drill four 3/8" hole at the bottom center of the firewall as in Figure 34.

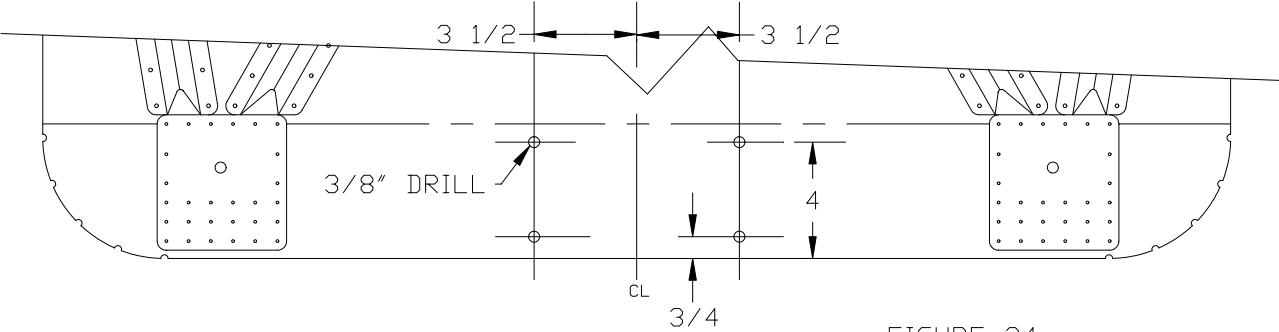


FIGURE 34

67) From FUS-386 channel cut four 4 11/16" lengths for rudder cable pulley mounts. Trim flanges and drill as in Figure 35.

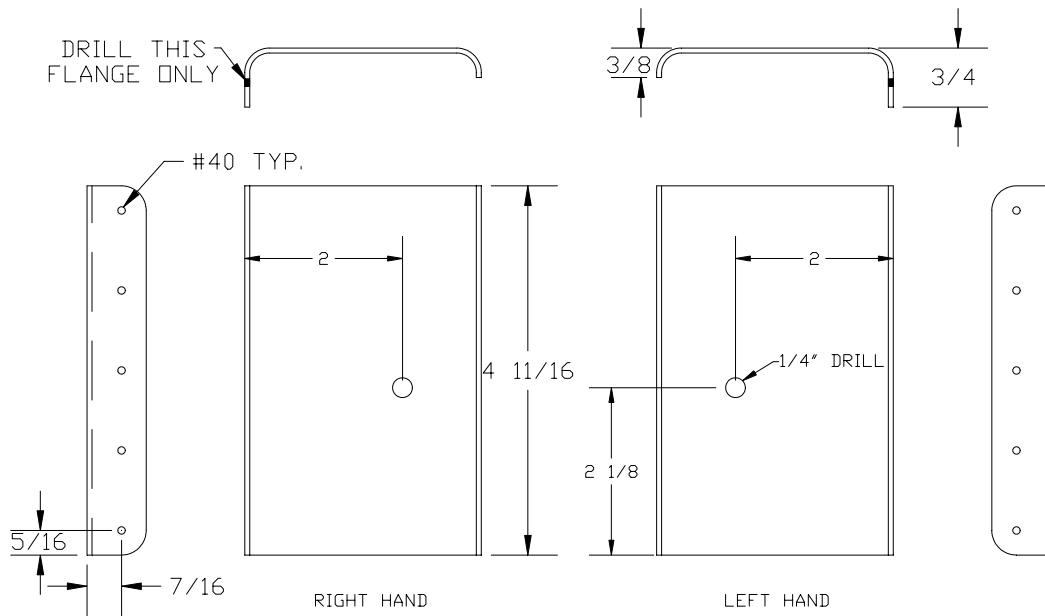


FIGURE 35

68) Assemble two pulley units as shown in Figure 36.

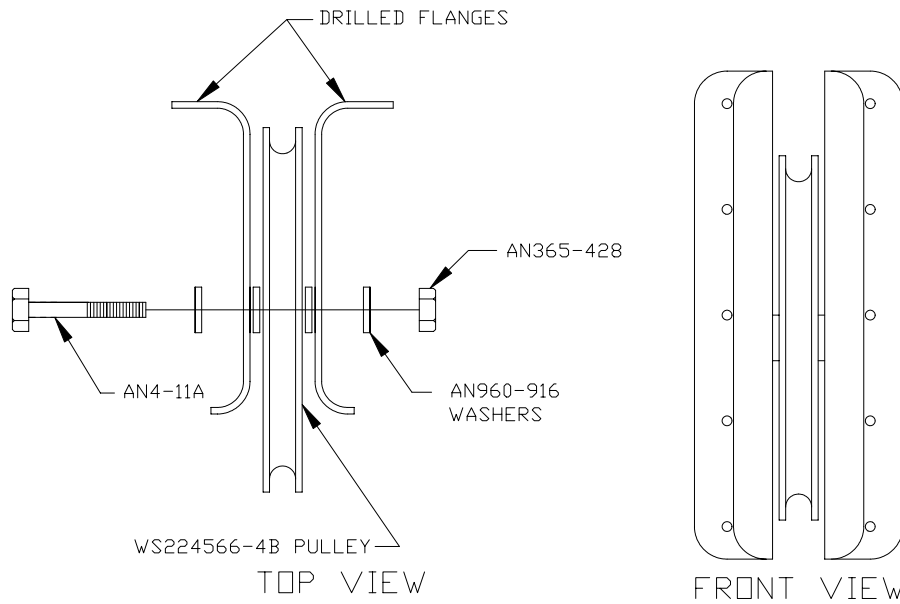
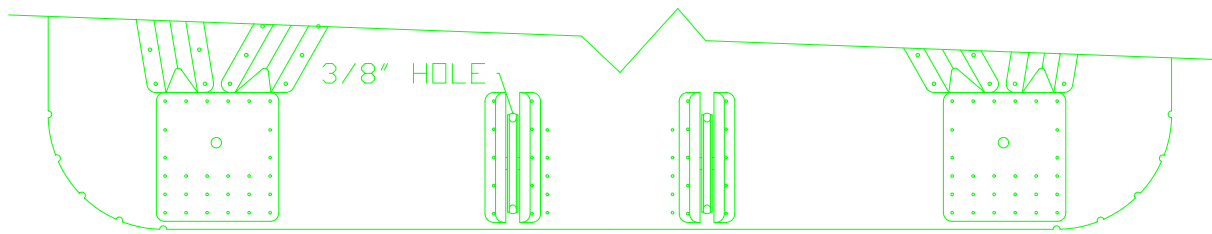


FIGURE 36

69) Position the pulley assemblies on the firewall as in Figure 37. The pulleys should be centered between the 3/8" holes. Back drill to #30.



CENTER THE PULLEYS VERTICALLY AND HORIZONTALY
THEN BACK DRILL TO #30

FIGURE 37

70) Rivet pulley assemblies in place with 1/8" avex rivets. Do not put rivets in the top holes at this time.