

### 14.1 Floor Doublers

1) Put the Fuselage up on a table. Support the cage and tailcone area. Place the aircraft in flight attitude with the floor of the aircraft level. Figure 14.1.1.

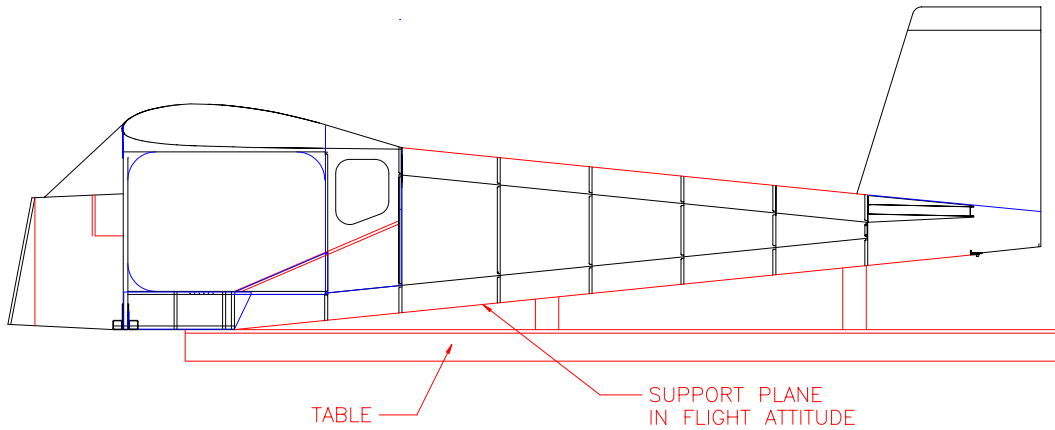


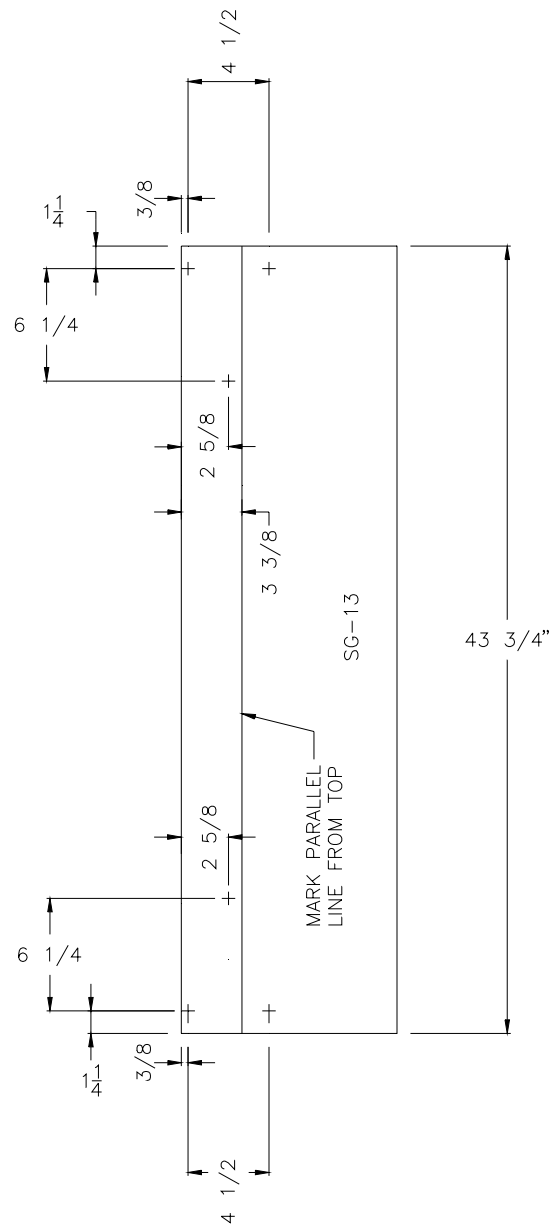
Figure 14.1.1

2) If you haven't already cut the bottom tabs of the FUS 2's flush with the bottom skin (FUS-40). Do not cut the side tabs on the FUS-2. Debur any sharp edges.

3) Next, find the SG-13 (43 3/4" x 12" x .063") plate. Verify the outside measurements of this plate otherwise subsequent ones will be wrong. Measure and mark six bolt holes on the SG-13. See Figure 14.1.2. Be careful how you mark these holes, the measurements are critical for the proper fit of the Spring Gear.

4) In stages drill the six holes out to 1/4".

Figure  
14.1.2



- 5) From the top corner of the SG-13 plate mark a parallel line  $3 \frac{3}{8}$ " down. Figure 14.1.2.
- 6) Remove the cleco's from the bottom skin (FUS-40) and remove it from the aircraft.
- 7) On a flat table lay the SG-13 under the bottom skin (FUS-40) so that the  $3 \frac{3}{8}$ " line you just marked is located at the top edge of the skin. Figure 14.1.3.

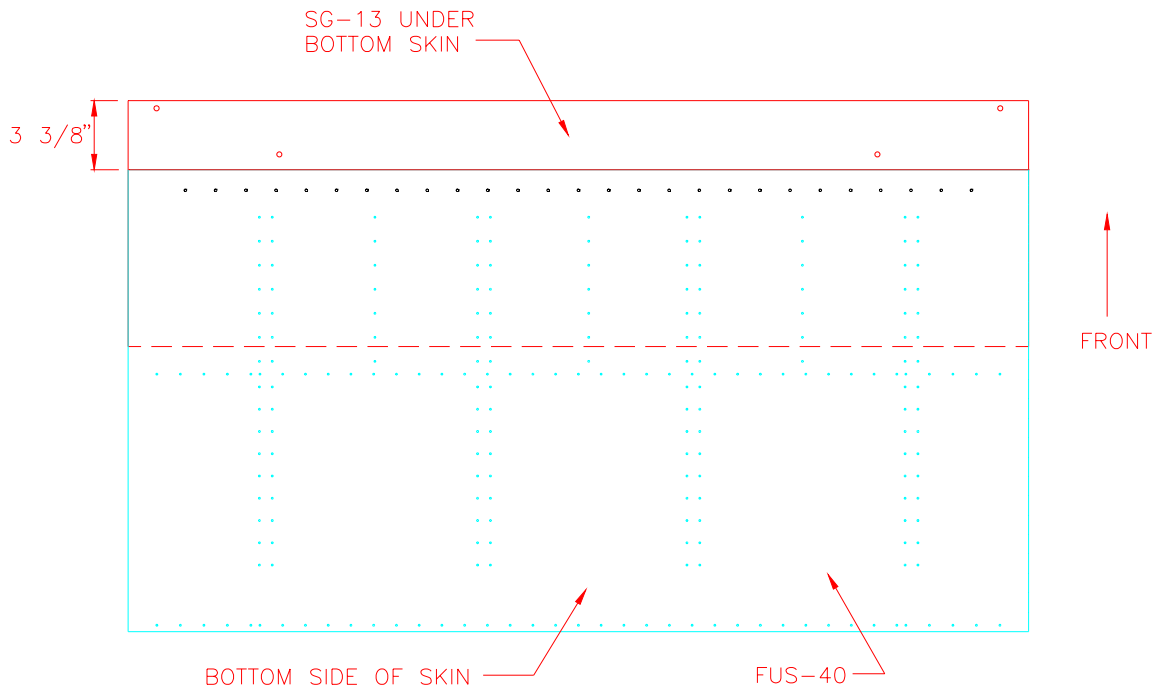


Figure 14.1.3

8) With the two parts clamped together, carefully drill (#30) all the existing channel holes through FUS-40 into SG-13. Then drill the carrythrough holes (#11). Cleco as you go. After all the holes are drilled remove the parts and debur all the holes.

9) Next, carefully place the top of SG-13 under the Front Floor (FUS-7). To hold it in place cleco the SG-13 to the cage with clecos using the line of holes you drilled earlier. Next, clamp FUS-7 so that the 3 3/8" line on SG-13 is flush with the edge on FUS-7. Transfer the holes from FUS-7 through SG-13. Remove the part and debur all holes.

10) Cleco the bottom skin (FUS-40) back onto the bottom of the aircraft.

11) On a table place the SG-7 (43 3/4" x 5 1/4" x .063") under the SG-13 plate so that the top edges are flush to each other. Drill through all carrythrough holes, cleco as you go. Also, carefully transfer the six 1/4" holes through the SG-7 plate. Figure 14.1.4.

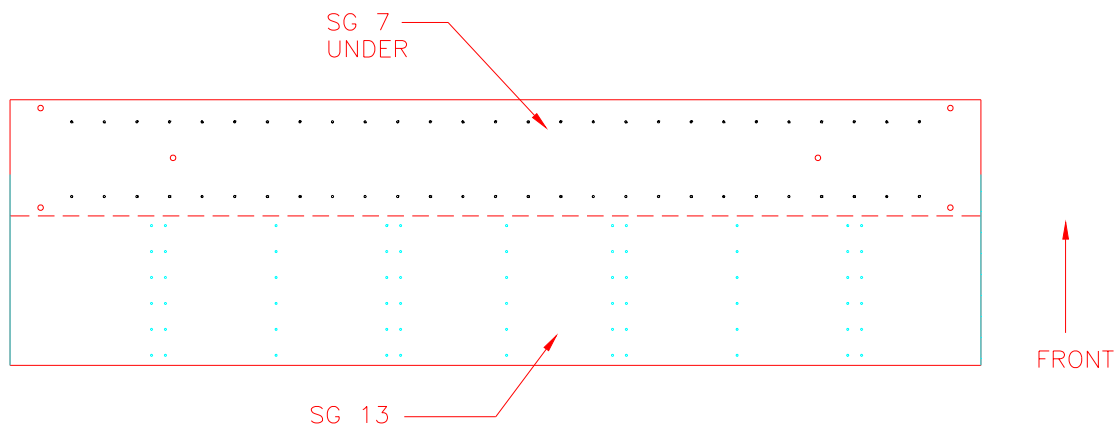


Figure 14.1.4

12) Next, you will lighten the SG-13 by sculpting out the part. First mark a parallel line from the top edge 7 1/4" down on the part. See Figure 14.1.5.

13) On that line mark six lines on the centers between each of the channel rows as per Figure 14.1.5. Cut out these marks with a 2 1/8" hole saw.

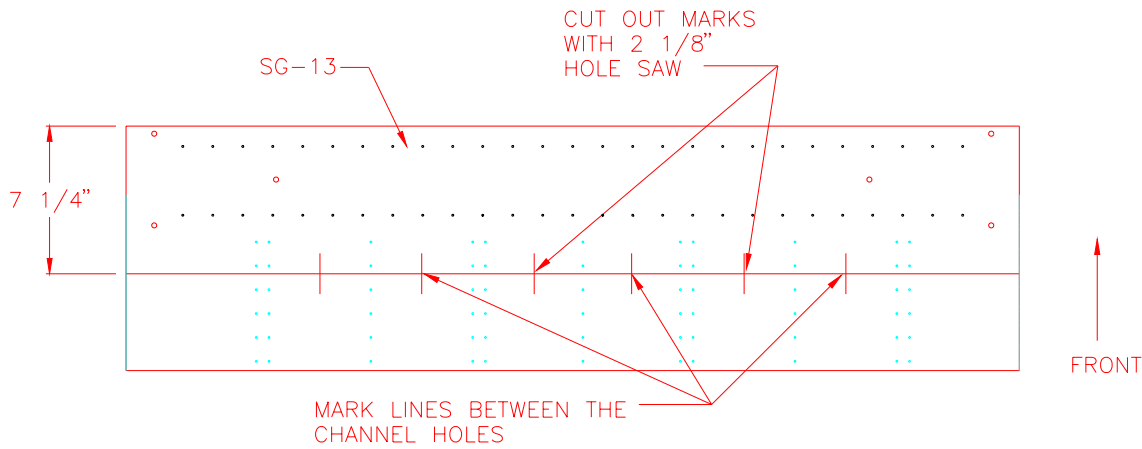


Figure 14.1.5

14) From the bottom channel holes mark line 1/4" from the hole edges down to the bottom of SG-13. Figure 14.1.6. From those marks join a line back to the 2 1/8" holes you just cut. Cut out along these lines. Deburr all edges.

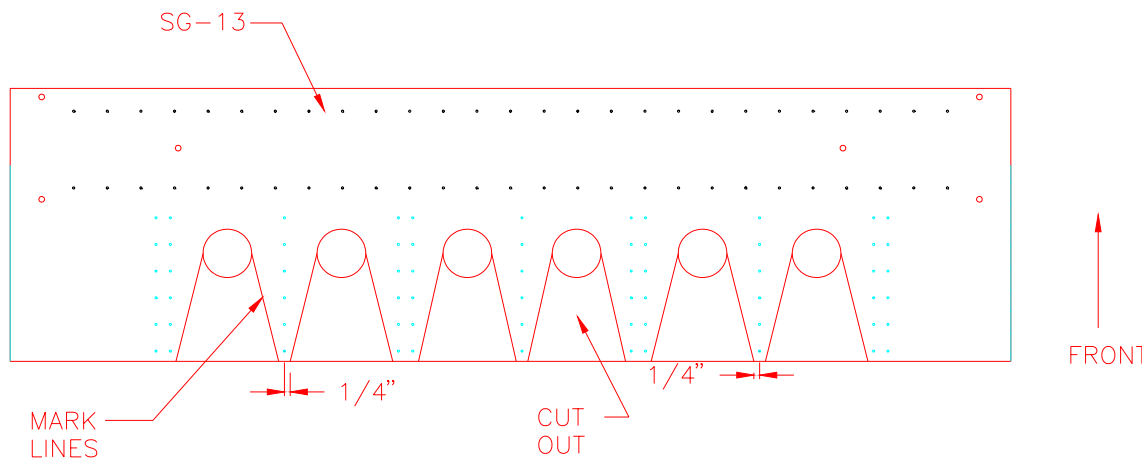


Figure 14.1.6

15) Measure and mark a line 5/16" out from the notch edges. Figure 14.1.7. Mark a 1" nominal rivet pattern. **NOTE:** If a new rivet is going to interfere with an existing channel rivet do not put the new rivet in.

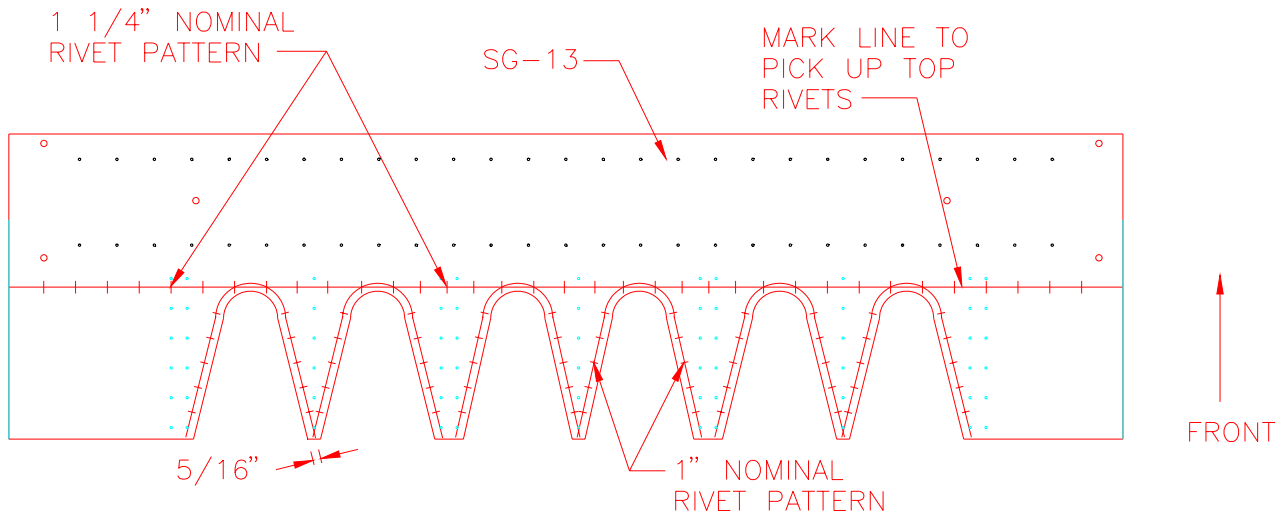


Figure 14.1.7

16) Picking up the two top rivet marks on each  $2 \frac{1}{8}$ " hole, mark a line across SG-13 through these points. Use the intersection of the line on the tops of the cut holes as reference points. Mark a  $1 \frac{1}{4}$ " nominal spacing between each set of  $2 \frac{1}{8}$ " holes. From the two outer holes mark a  $1 \frac{1}{4}$ " nominal spacing to the outside edges of SG-13. Figure 14.1.7.

17) Drill all holes #30 and debur.

18) Remove the Main Cabin Floor (FUS-47) and the Corner Wraps clecoed inside of the Cabin.

19) Take the other SG-13 plate (  $43 \frac{3}{4}$ " x  $12$ " x  $.063$ " ) and cut it to the same dimensions as Figure 14.1.8. This piece now becomes SG-14.

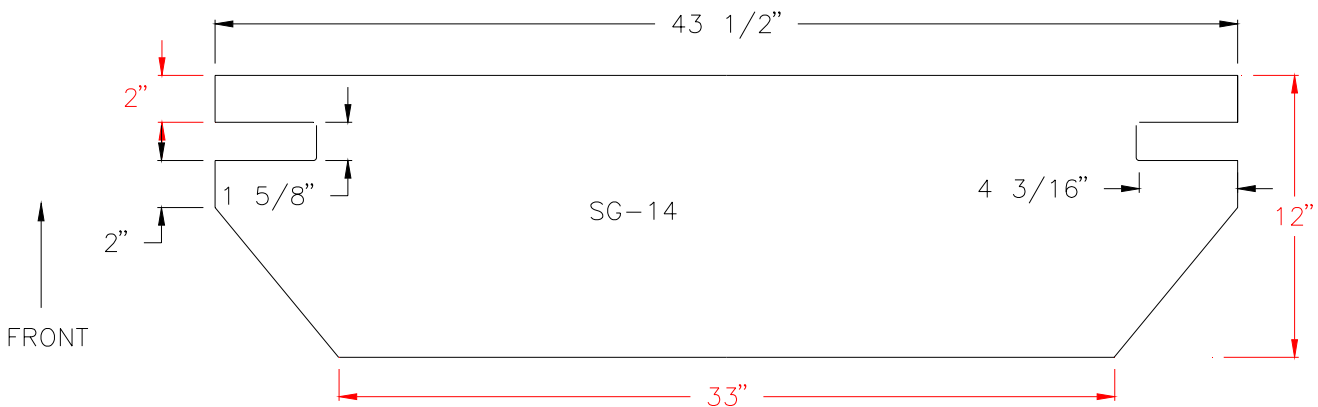


Figure 14.1.8

20) Clamp the SG-14 you just cut under the Main Cabin Floor (FUS-47). Transfer all holes through the FUS-47 into SG-14. Cleco as you go. Make sure you keep the top edges flush with each other, the side tabs on SG-14 will stick out from the Main Cabin Floor.

21) Unclamp the parts. Debur all holes and edges on SG-14.

22) Cleco the Main Cabin Floor (FUS-47) back into the cabin.

23) Next, cut out the other SG-7 ( 43 3/4" x 5 1/4" x .063") plate to match the shape of SG-14. Figure 14.1.9. This piece becomes SG-8.

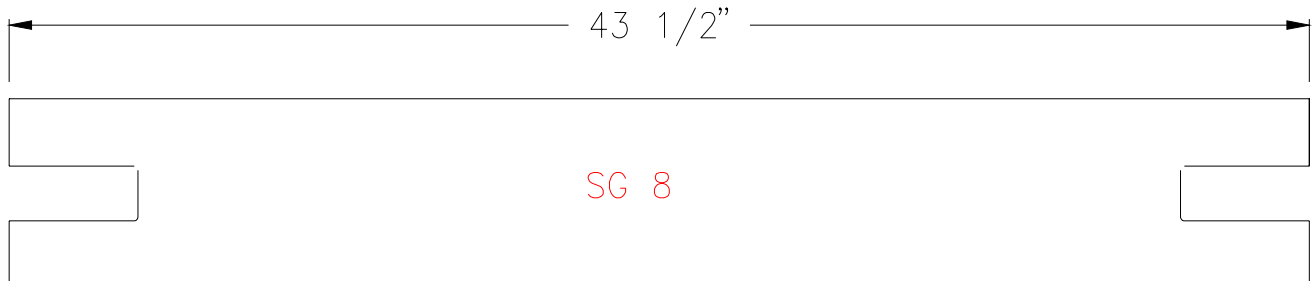


Figure 14.1.9

24) Clamp SG-8 under SG-14 and transfer all the holes. Figure 14.1.10.

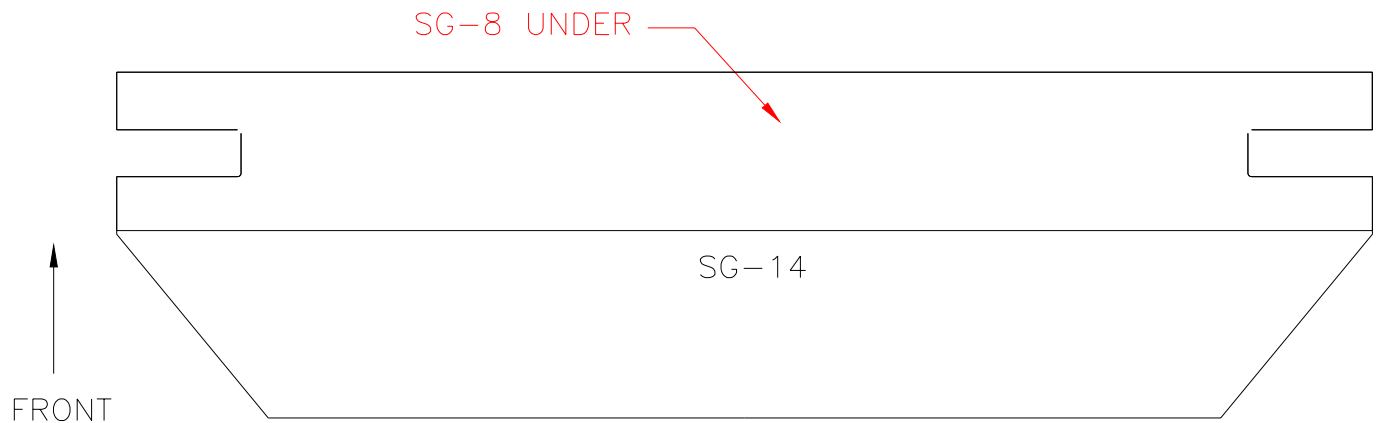


Figure 14.1.10

25) Remove parts. Debur all holes and edges.

26) Again, as you did for SG-13, you will lighten the SG-14.

27) Measure down from the top of SG-14 and mark the two lines as shown in Figure 14.1.11.

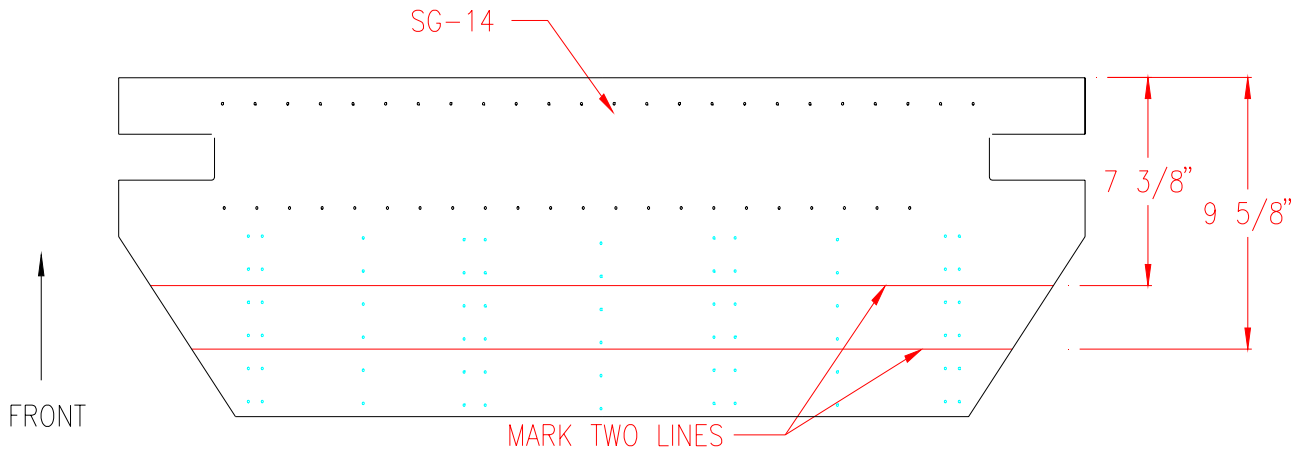


Figure 14.1.11

28) Find the center lines between the existing channel rivet holes and mark on the lines you just drew.

Figure 14.1.12.

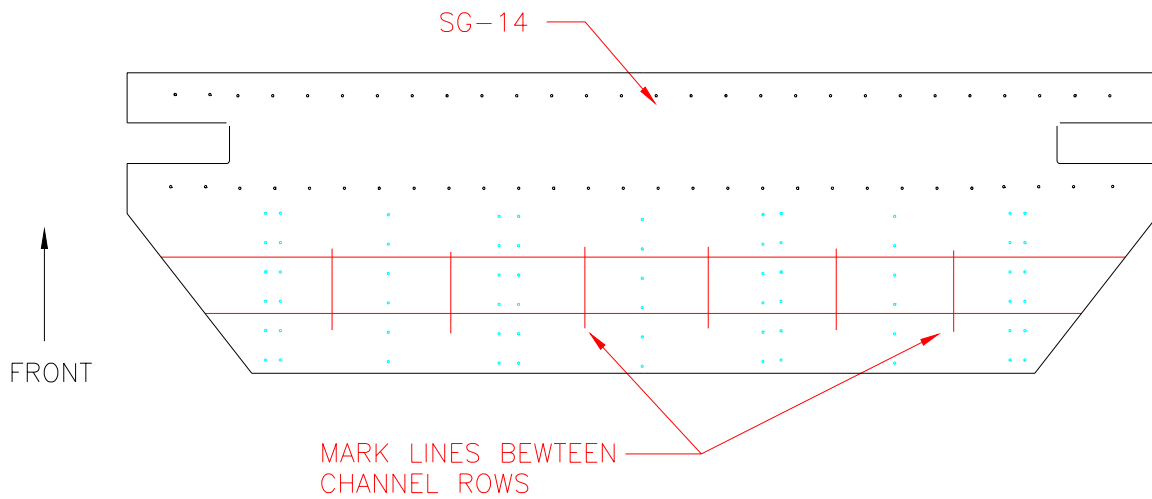


Figure 14.1.12

29) With a hole saw cut out the six holes. Four holes are 2 1/8" and two holes are 1 1/4". Figure 14.1.13.

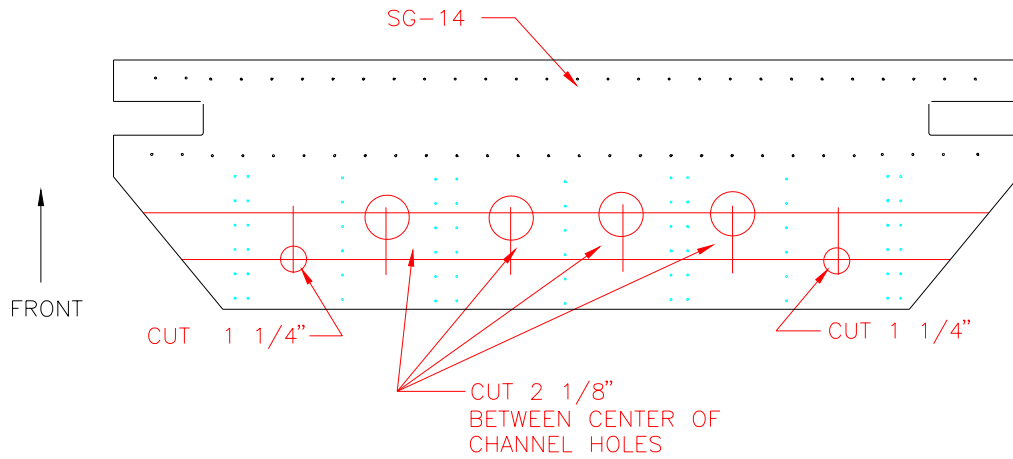


Figure 14.1.13

30) From the center of each bottom existing channel rivet hole measure over  $1/4''$ . Figure 14.1.14. From the outside edges, measure over the distances from Figure 14.1.14. Mark lines at these locations. From these marks draw lines up to the holes you just cut out.

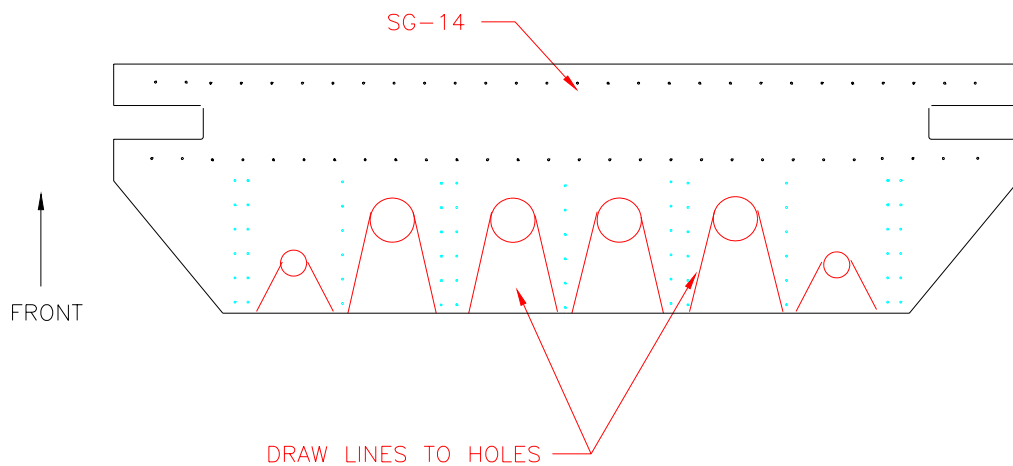


Figure 14.1.14

31) Cut out all the notches.

32) Around each notch you just cut out, mark a line at  $5/16''$ . Figure 14.1.15. On the sides of notches mark out a  $1''$  nominal rivet pattern. **NOTE:** If a new rivet hole is too close to an existing rivet hole do not mark a new hole.

33) On the top of each  $2 1/8''$  notch hole mark out a  $1 1/4''$  nominal rivet pattern. Figure 14.1.15. Draw a line across SG-14 so that it intersects the four notch hole lines. Mark a  $1 1/4''$  nominal rivet pattern between notches as you did previously.

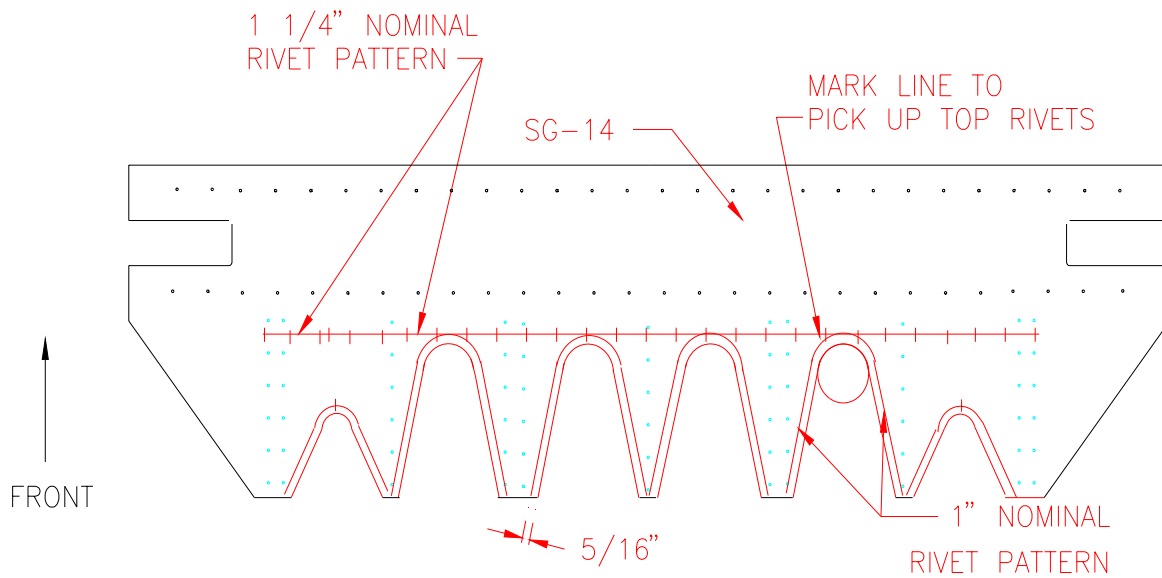


Figure 14.1.15

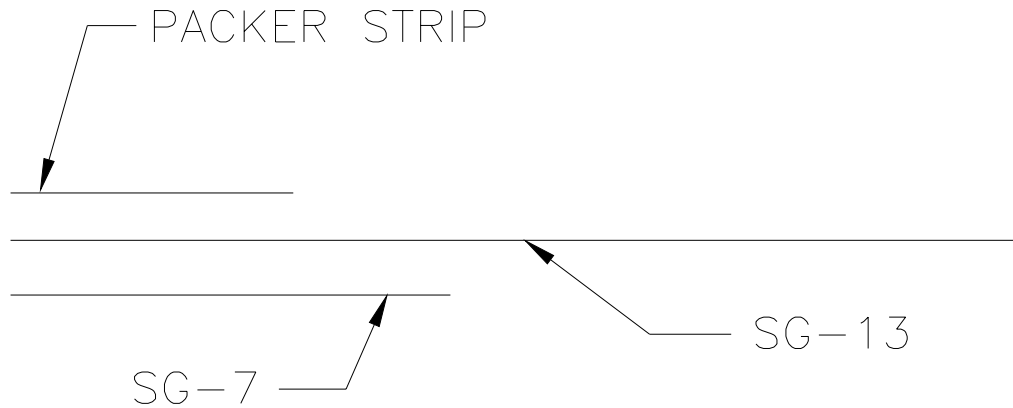
34) Drill all holes #30. Debur all holes and edges.

35) Now make a packer strip to fit under the SG-13. This packer is used to take up the gap between the overhang of SG-13 and FUS-7 Front Floor skin. Cut the packer to 43 3/4" x 3 3/8" from .020 material.

36) Slip this packer under the FUS-7 Front Floor so the forward edge is flush with the front carrythrough tube. Transfer all holes through the FUS-7 into the packer strip.

37) Remove the packer and debur all holes and edges.

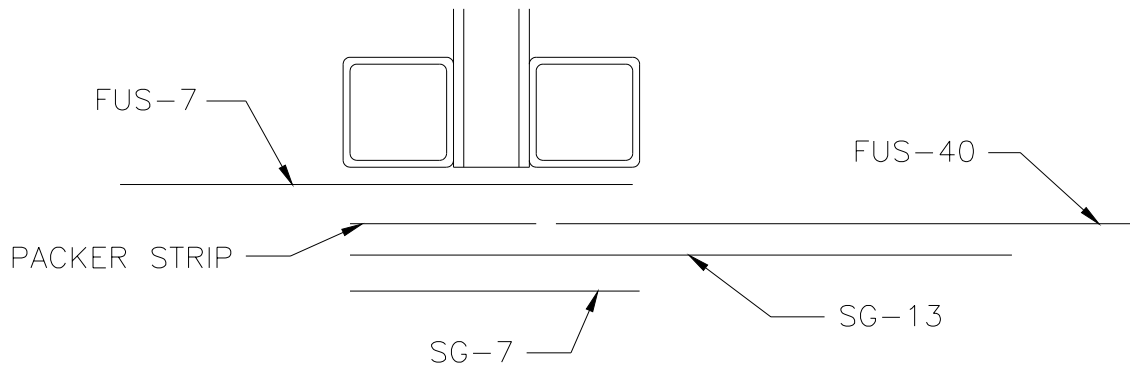
38) Next, cleco the packer strip and SG-7 to SG-13. Figure 14.1.16.



CLECO TOGETHER

Figure 14.1.16

39) Cleco this assembly (SG-7, SG-13 and packer strip) to the carrythroughs along with the bottom skin (FUS-40) and the front floor skin (FUS-7). Figure 14.1.17.



SIDE SKINS REMOVED FOR CLARITY

Figure 14.1.17

40) Make sure that the assembly has plenty of clecos in it to keep it secure.

41) Cleco SG-8 on top of SG-14 and cleco the assembly onto the main cabin floor and carrythroughs with the top edges flush. **NOTE:** You may have to trim the side tabs slightly to fit the parts around the cage uprights.

### 14.2 Inspection Holes

1) Next, on the left side of the aircraft cut a 1 1/2" inspection hole in the lower side panel (FUS-26). Figure 14.2.1. It gives access to the bolt for attaching the nut to hold the Spring Gear in place.

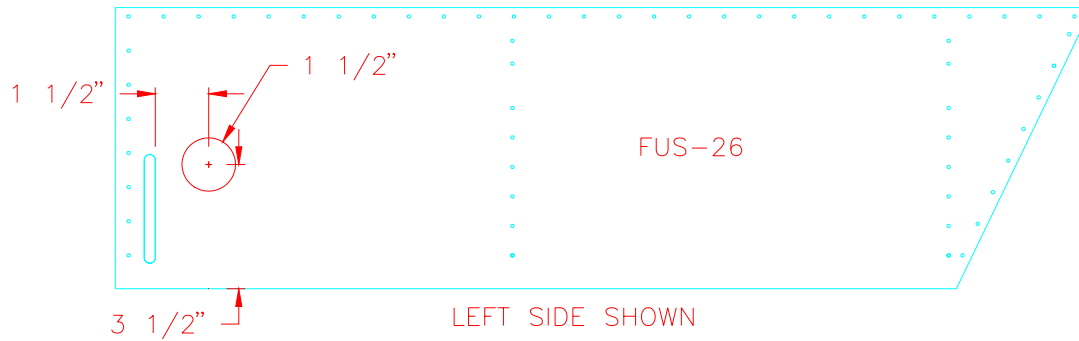


Figure 14.2.1

2) Repeat step for the right side of the aircraft.

3) Cut two 2 3/4" diameter plates out of .032" material (from SG-19). Measure 5/16" in from the edge. Layout a rivet pattern as per Figure 14.2.2. Drill all holes #30. Debur all holes and edges.

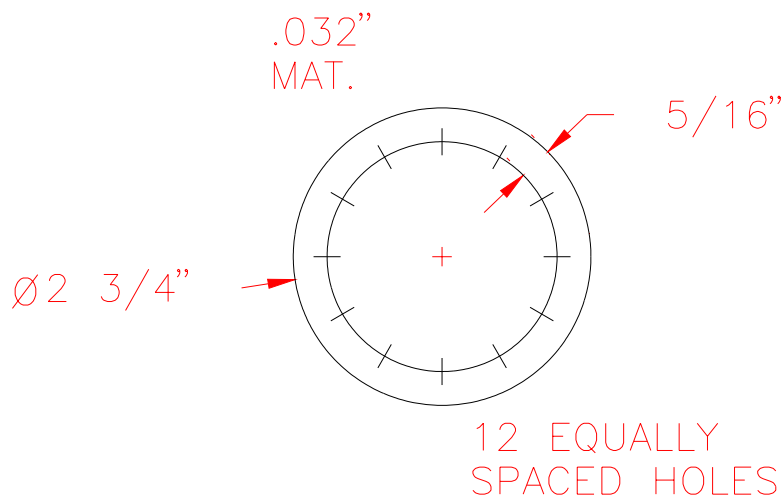
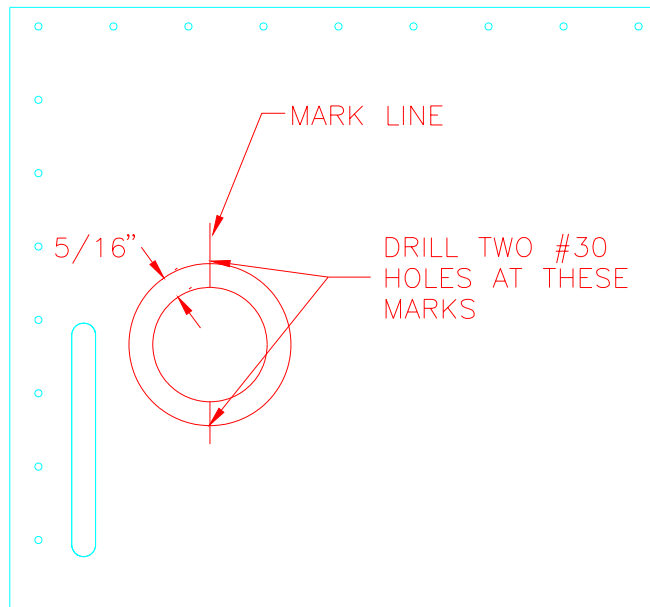


Figure 14.2.2

4) On the left side inspection hole mark a line 5/16" out from the edge of the hole. Figure 14.2.3. Mark a line from the top to bottom of this line. Drill two #30 holes at the intersections.



LEFT SIDE SHOWN

Figure 14.2.3

- 5) Cleco an inspection cover onto the holes and drill #30 the remaining holes using the inspection cover as a drill guide. Remove the cover and debur all holes and edges.
- 6) Repeat steps for the right side inspection hole.
- 7) Put the finished inspection covers away for now.

### 14.3 Spring Gear Install PLEASE REFER TO SPRING GEAR REINFORCEMENT SUPPLEMENT

1) Using a long 1/4" drill bit, drill through the six 1/4" holes on the SG-7. Drill all the way through the cage to the inside of the cabin **NOTE:** These holes must be drilled square to the cage tubes. Have someone help you keep the drill bit square to the work while you are drilling. **IMPORTANT:** On the two outside 1/4" holes that will be going through the carrythroughs, have someone look in the inspection holes to make sure that the drill does not contact the fuel line (if installed) when it breaks through.

**IMPORTANT:** This is a critical area and special care must be taken when drilling out these holes.

- 2) Repeat step using a long 3/8" drill bit for the two inside holes and a long 5/16" drill for the four outside holes.
- 3) Remove the SG-7, SG-13 and the packer strip from the bottom skin (FUS-40) and the front floor (FUS-7). Debur all holes.

- 4) Remove enough clecos from the bottom skin (FUS-40) and front floor (FUS-7) so that you have easy access to the bottom carrythroughs (FUS-5).
- 5) Next, drill the 5/16" holes in the top of the carrythrough out to 7/16" so that a 7/16" crush tube will fit through the top of the carrythroughs. **NOTE:** these 7/16" holes are only drilled in the top of the carrythroughs. The 7/16" crush tube pushes up against the top doublers on final installation. See exploded view at the front of this section and Figure 14.3.1.
- 6) You may have to file out the 7/16" hole slightly so the crush tube fits in easily.
- 7) Cut four pieces of SG-10 raw material 7/16" x .058 round tube 2" long. These are now the crush tubes. Trim these crush tubes so that when they are inside the carrythroughs they sit flush with the top outside edge. Figure 14.3.1.

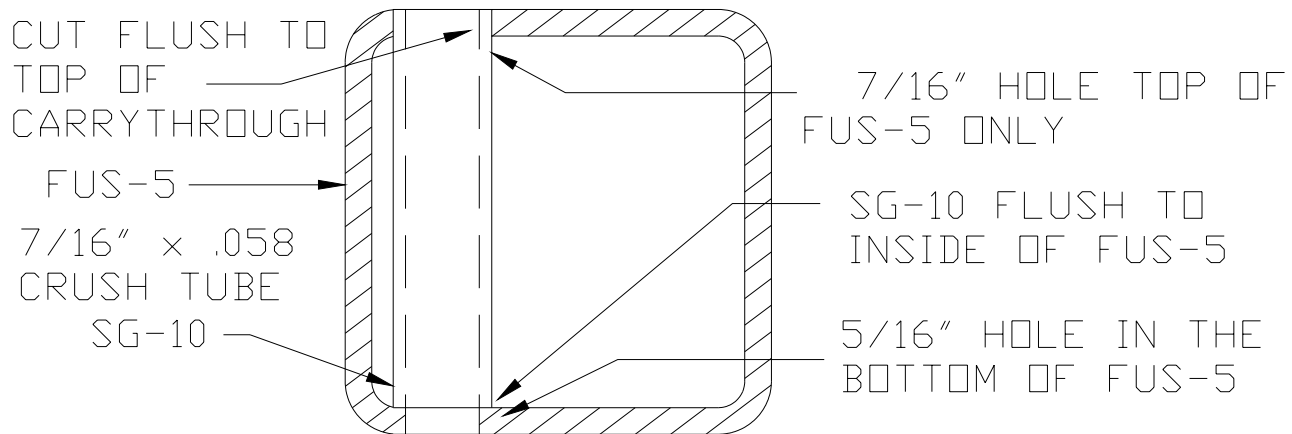


Figure 14.3.1

- 8) You may have to file the top edge of the crush tubes (SG-10) so they fit snug inside the top radius of FUS-5. Figure 14.3.1.
- 9) Get together the four saddles (SG-2), the two spacer top plates (SG-3) and the two bottom plates (SG-4).
- 10) Clamp two saddles (SG-2) together (to get two sets) with the holes lined up. Also clamp a top plate (SG-3) and a bottom plate (SG-4) together (to get two sets) with the holes lined up.
- 11) Drill the holes on the saddles to 5/16" and the top and bottom plates to 3/8". Debur.
- 12) Assemble the parts as per Figure 14.3.2. You can use tape to hold the bolts in place so they don't drop back down. Cleco the assembly back onto the bottom of the aircraft using plenty of clecos.

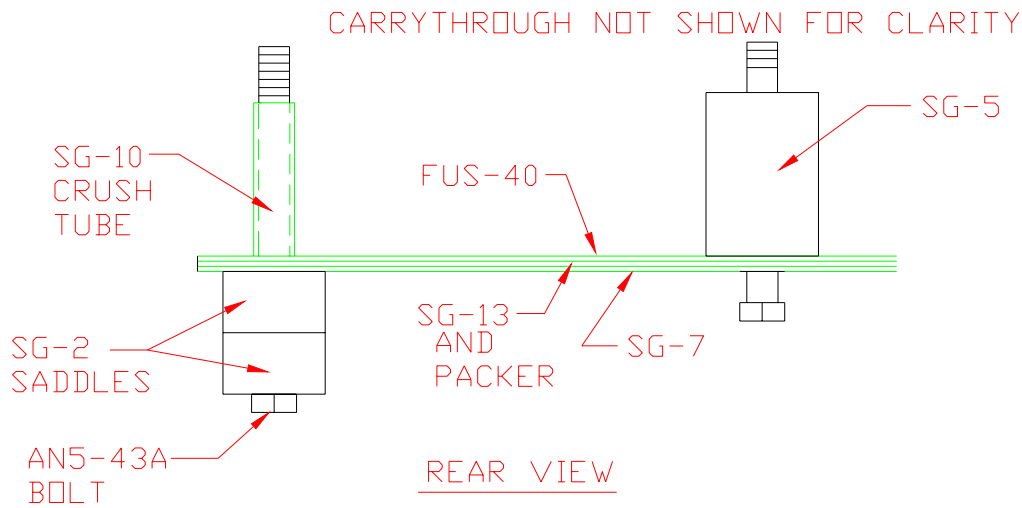


Figure 14.3.2

13) Make sure the crush tubes (SG-10) and the spacer block (SG-5) fit in their proper locations. (The spacer block fits between the two bottom carrythroughs). **NOTE:** When you final install the spacer blocks put some silicone(Proseal) on the outer surface so they stay in place. This is so that if you remove the Spring Gear to mount Floats, the blocks do not move out of position.

14) See Figure 14.3.3 for assembly.

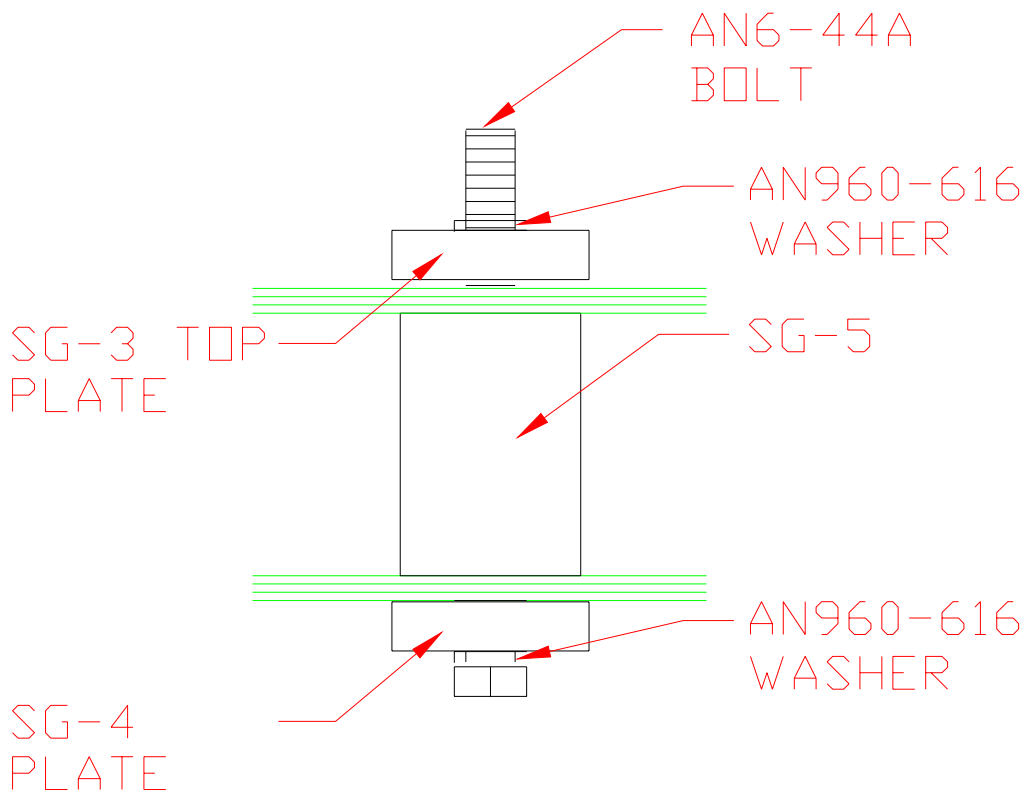


Figure 14.3.3

**NOTE:** In the next few steps you will find some areas where flush rivets are required. In these areas dimple and flush rivet.

15) With the bolts held in place, you may now rivet the bottom skin (FUS-40), the SG-7, SG-13, packer strip and the front floor (FUS-7). Rivet all channel holes with 1/8" rivets (RV-1410). Where there are many thicknesses of material use 1/8" rivets (RV-1414).

16) With the plates riveted in place you can now drill #30 the rivet holes around the sculpted parts of SG-13 through the bottom skin (FUS-40). Rivet these holes with 1/8" rivets (RV-1410).

17) When the bottom is completely riveted you may work inside the cabin. Rivet the SG-14, SG-8 and the main cabin floor (FUS-47) down. Use 1/8" rivets. Again use 1/8" (RV-1414) rivets where the material is thicker. You may also rivet the corner wraps at this time.

18) The entire floor on the inside of the cabin and the bottom skins should be completely riveted at this time. **NOTE:** Do not rivet in the holes used for the Seat Rails at this time.

19) Take the two Spring Gear Legs (SG-1L & SG-1R) and drill the four 3/16" axle mount holes out to 1/4". Be sure that the holes are drilled square to the part.

20) Now, carefully slide a Spring Gear (SG-1R or SG-1L) between the SG-2 saddles. Figure 14.3.4. You will have to drop the two AN5-43A bolts slightly so it fits between the saddles.

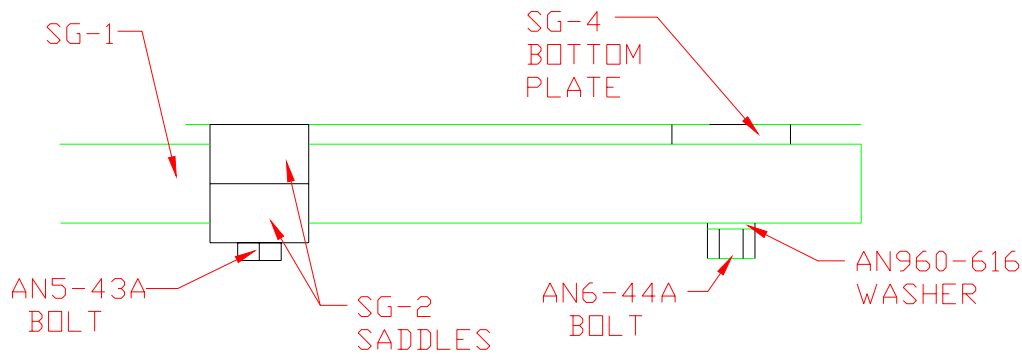


Figure 14.3.4

21) Slide a SG-4 bottom plate between the Spring Gear and the SG-7 plate. See Figure 14.3.4

22) Install your AN6-44A bolt through the end hole of the Spring Gear. Put a AN960-616 washer and a AN365-624 nut on the end of the bolt.

23) Through the inspection hole you drilled on the side of the aircraft put a AN970-5 penny washer (you may have to trim the washer to get it to fit properly), and a AN365-524 nut on the AN5-43A bolts.

24) Repeat step for opposite side.

25) For the other two AN5-43A bolts, use a AN970-5 penny washer and a AN365-524 nut.

26) Tighten down all bolts. Make sure the Spring Gear seats properly between the SG-2 saddles.

**NOTE:** You may have to file the edges of the spring gear slightly to get a good fit.

27) Take an inspection cover and rivet it onto one of the inspection holes with 1/8" rivets.

28) Repeat for opposite side.

29) Square the SG-4 bottom plate so it points to the front of the aircraft. Mark holes as per Figure 14.3.5. Drill #11 and rivet with 3/16" (RV-1631) rivets. Repeat for opposite side. **NOTE:** Drill only through the bottom of the tubes.

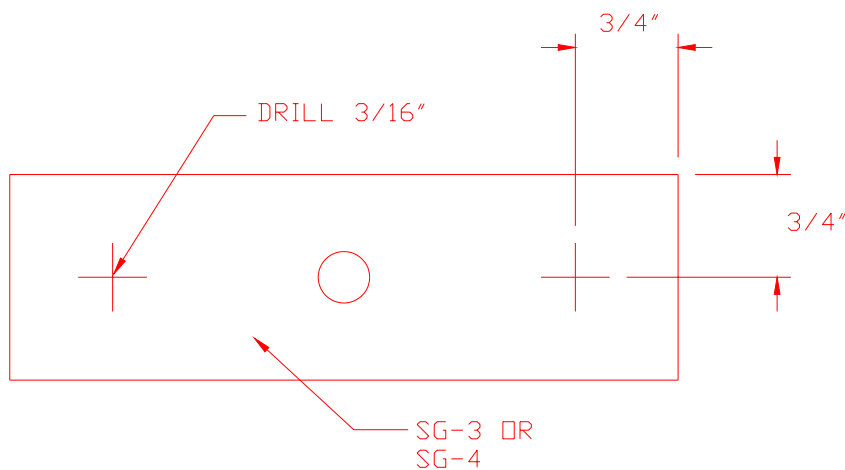


Figure 14.3.5

30) Repeat for the SG-3 top plates inside the aircraft.

31) Recheck all the skins to make sure that all areas are riveted inside the aircraft and on the bottom of the aircraft.

32) Next, you may rivet the Seat Rails in place with 1/8" (RV-1410) rivets. **NOTE:** You may need to put packer strips under the front of the seat rails because of the change in thickness of material where you added the SG-14.

#### 14.4 Fairing Install

1) Take a Plastic Fairing cover (SG-6) and place it over the top of one of the Spring Gear Legs. Adjust it so it sits snug against the bottom skin on the aircraft

2) With a #40 drill, (maintaining a 5/16" edge distance on the Fairing), drill nine holes through the Fairing into the skin. Space the holes so that the Fairing is properly supported.

3) Attach the Fairing to the aircraft using 9 #6 Pan Head screws with 9 - #8 washers (AN960-8).

4) Repeat steps for the opposite side.

**NOTE:** In your kit you will receive two shims (SG-20 & SG-21). These are to be used after you have installed your axles and wheels to align your spring gear if necessary.