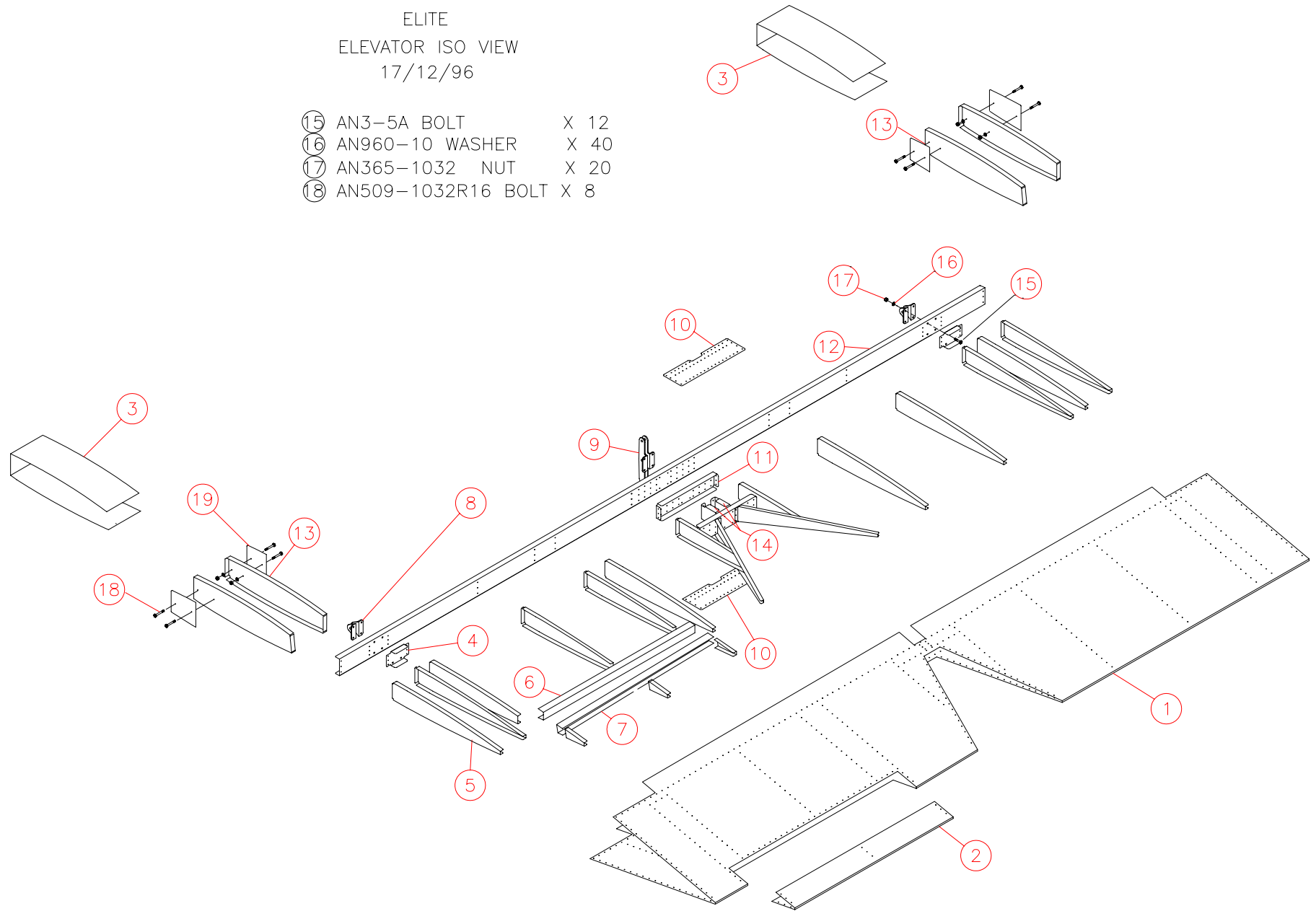


ELITE
ELEVATOR ISO VIEW
17/12/96

- ⑮ AN3-5A BOLT X 12
- ⑯ AN960-10 WASHER X 40
- ⑰ AN365-1032 NUT X 20
- ⑱ AN509-1032R16 BOLT X 8



	NAME	NO.	AMOUNT
1	ELEVATOR SKIN	EL-400	1
2	ELEVATOR TRIM SKIN*	EL-405	1
3	ELEVATOR TIP SKIN	EL-408	2
4	ELEV/RUD HINGE DOUBLER	EL-307	2
5	ELEV/RUD RIB	EL-403	15
6	FRONT TRIM SPAR	EL-406	1
7	REAR TRIM SPAR	EL-407	1
8	ELEV/RUD HINGE	EL-300	4
9	ELEV/RUD HORN	EL-301	2
10	ELEVATOR CENTER GUSSET	EL-305	2
11	ELEVATOR CENTER DOUBLER	EL-304	2
12	ELEVATOR SPAR	EL-401	1
13	TIP RIB	EL-402	4
14	ELEVATOR STIFFENER RIB	EL-312	2
15	3/16" BOLT	AN3-5A	20
16	WASHER	AN960-10	58
17	NUT	AN365-1032	29
18	MACHINE SCREW	AN509-1032R14	8
19	TIP WEIGHT BACKING PLATE**	EL-412	4
	PARTS NOT SHOWN		
	PIANO HINGE	1419 D00SS	1
	1/8" x 3/16" AVEX RIVETS	RV-1410	Approx. 1100
	MACHINE SCREW	AN525-832 R 10	4
	FIBER NUT	AN365-832	4
	ELEVATOR TIP WEIGHT	EL-37	3
	TRIM HORN	EL-36R	1
	TRIM HORN	EL-36L	1
	SERVO BACKING PLATE	EL-316	1
	ELEV/RUD INSPECTION COVERS	EL-409	5
	RAW STOCK	EL-412	1

* Cut from EL-400

** Made from EL-412 raw stock

Elevator Assembly

To assemble the *Elite* Elevator, you will need the following tools:

1. Drill
2. Tape Measure
3. Felt Marker
4. #40,#30, 3/16” Drill Bits
5. 3/32”, 1/8” and 3/16” Clecos
6. Cleco Pliers
7. Two 3/8” Wrenches
8. Aviation Snips
9. Riveter
10. Fluting Pliers or Stretcher/ Shrinker
11. 4’ Level
12. Square
13. Masking Tape
14. ¼” Round File and Flat File

3.1 Spar Assembly

- 1) Layout all the parts as in the Exploded view. **NOTE:** Do not handle the Elevator Skin (EL-400) until it is needed during assembly.
 - 2) Using the four 3/16” holes, cleco the Elevator Center Doubler (EL-304) to the center of the Elevator Spar (EL-401). Drill all #40 holes that are within the area of EL-304, into EL-401. Drill these #40 holes to #30.
- Figure 3.1.1.

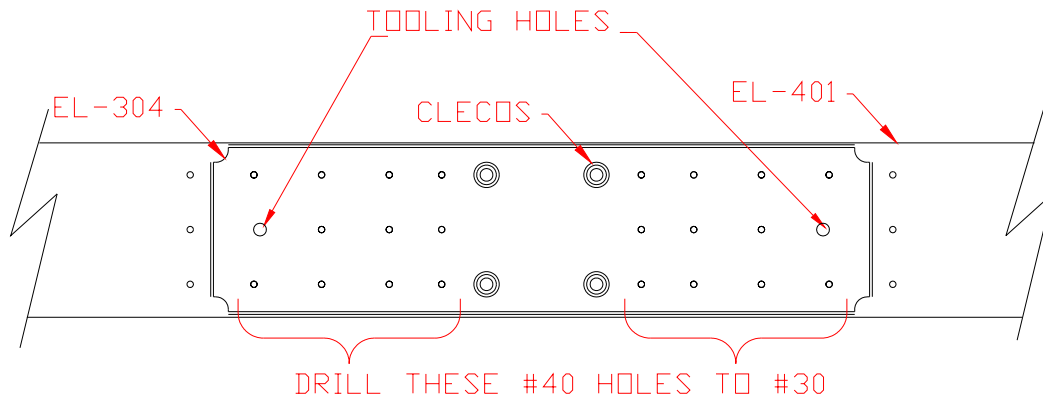


Figure 3.1.1

- 3) Remove the Elevator Center Doubler from Elevator Spar. Debur the #30 holes.
- 4) Chromate the two mating surfaces and rivet the two parts together using 1/8” avex rivets (RV-1410). **NOTE:** Rivet from the Spar side to the doubler.
- 5) On one end of the Elevator Spar, cleco an Elev/Rud Hinge Doubler (EL-307) using the four 3/16” holes in the parts. Figure 3.1.2. Repeat for the other end.

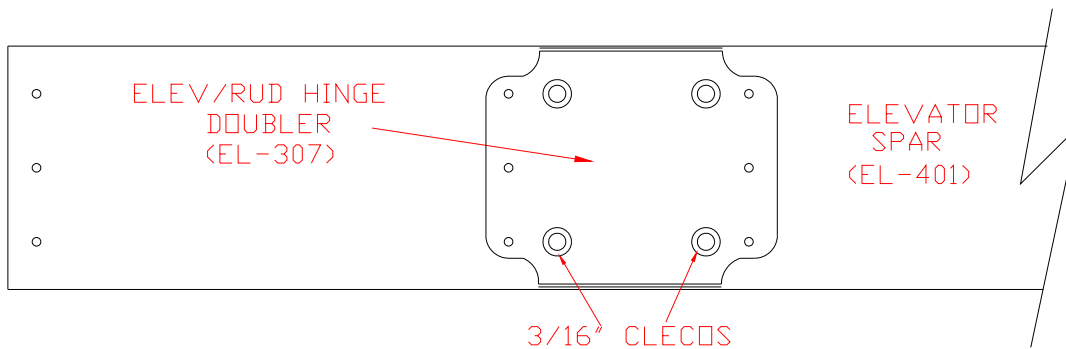


Figure 3.1.2

3.2 Rib Install

- 1) Cleco the Elev/Rud Ribs and Tip Ribs to the Elevator Spar as in Figure 3.2.1. **NOTE:** The ribs will need to be straightened, this can be done by using fluting pliers or a shrinker. Temporarily place the Elevator Skin on the spar assembly. Mark the rivet locations on the Elev/Rud Ribs and carefully remove the skin. When you straighten the ribs, flute in between the rivet locations.

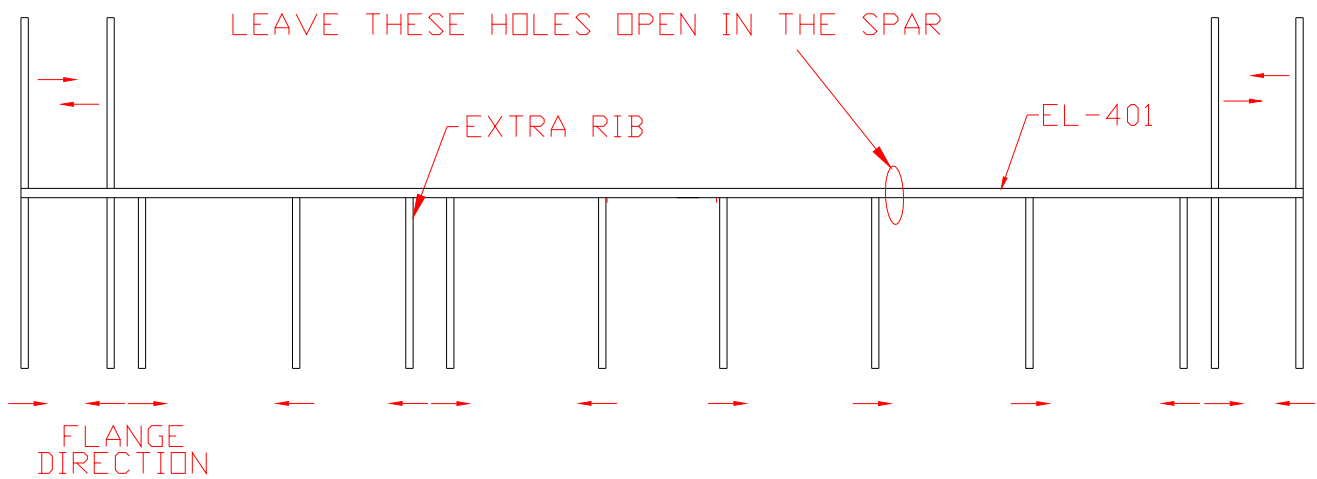


Figure 3.2.1

- 2) Drill the #40 holes that are common to the Elevator Spar, Elev/Rud Ribs and the Tip Rib to #30.
- 3) Remove the Elev/Rud Ribs and Elev/Rud Hinge Doubler. Debur the holes. **NOTE:** Mark the parts to ensure they are replaced in their correct positions.
- 4) Chromate the mating surfaces of the Elev/Rud Hinge Doubler and the Elev/Rud Hinges.
- 5) Attach the Elev/Rud Hinge Doubler and Elev/Rud Hinge with AN3-4A Bolt. Figure 3.2.2. Repeat for the other end of spar.

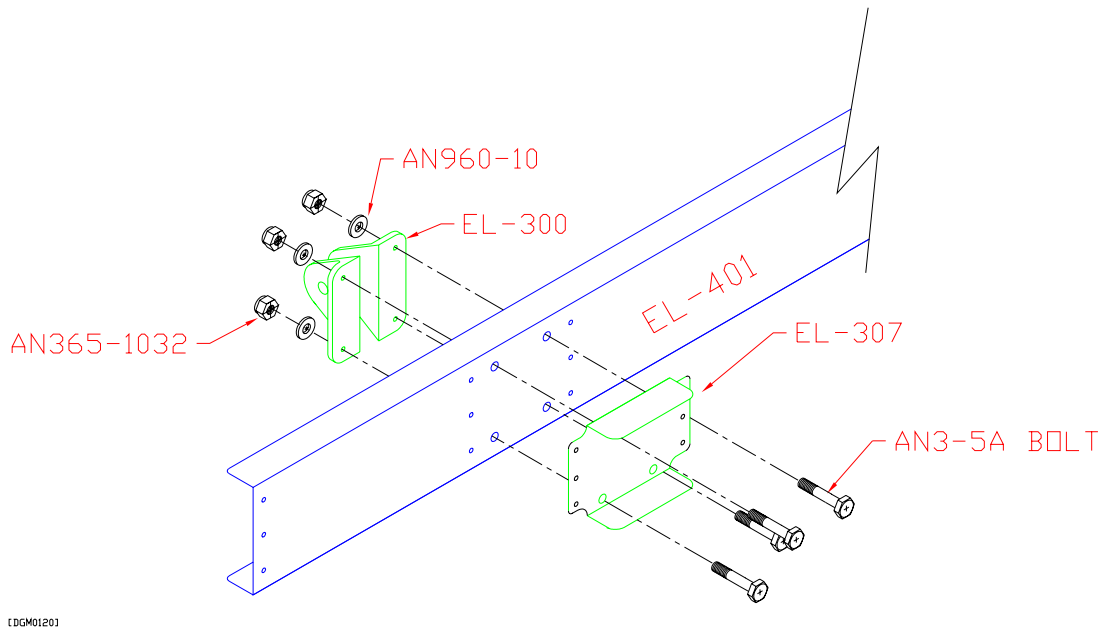


Figure 3.2.2

- 6) Chromate the mating surfaces of the Main Spar and the Elev/Rud Ribs. Rivet the ribs to the Main Spar with 1/8" avex rivet (RV-1410).
- 7) On the Elev/Rud Ribs, mark a center line along each of the flanges.

3.3 Skin Install

- 1) Cleco the Elevator Skin to the ribs using the guide hole in the Elev/Rud Rib that corresponds to the Skin.

Figure 3.3.1. **NOTE:** Allow the skin to over hang the table.

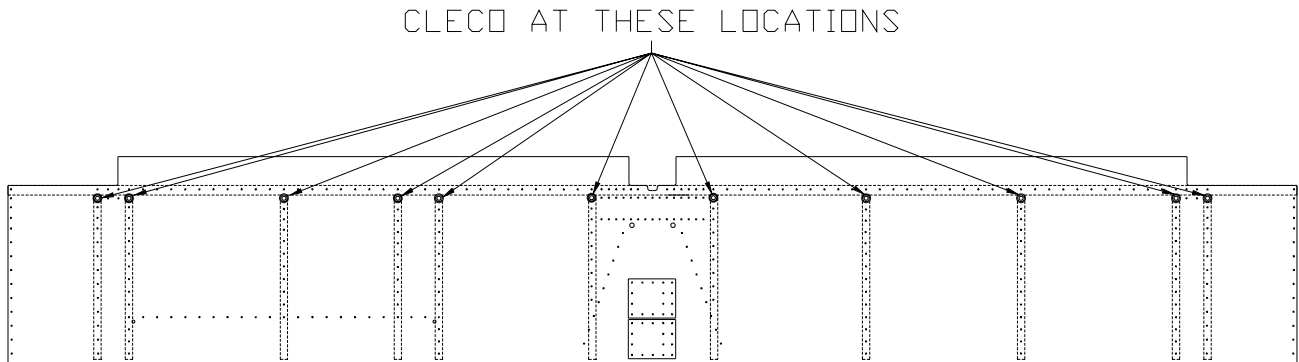


Figure 3.3.1

- 2) Working from the spar to the trailing edge and one hole at a time across the length of the Skin, drill #40 holes into the Ribs, keeping the line visible through the holes. Cleco. **NOTE:** The center two ribs and three ribs that are behind the trim tab will not have rivets to the end of the ribs.
- 3) Place two 2" x 4"s on the table. Turn the Skin and Spar assembly over onto the 2" x 4" so that the clecos do not interfere with the table. Figure 3.3.2. Cleco the Skin to the ribs using the guide hole.

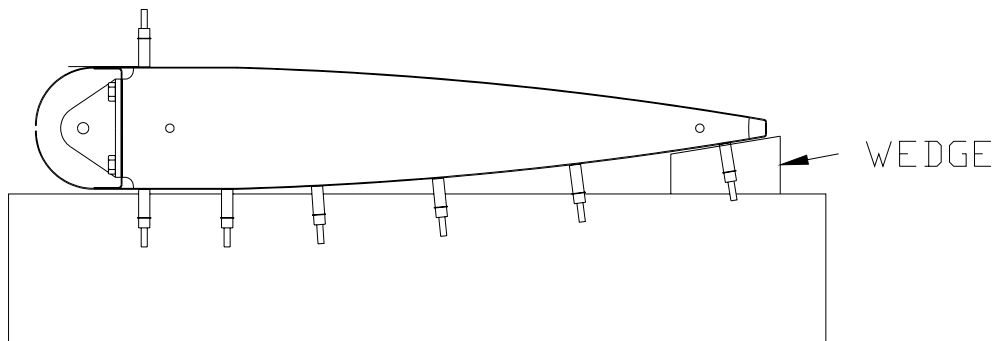


Figure 3.3.2

- 4) Level the assembly so that there is no twist. Figure 3.3.3. **NOTE:** This is an important step to have done correctly. Please be careful on leveling.

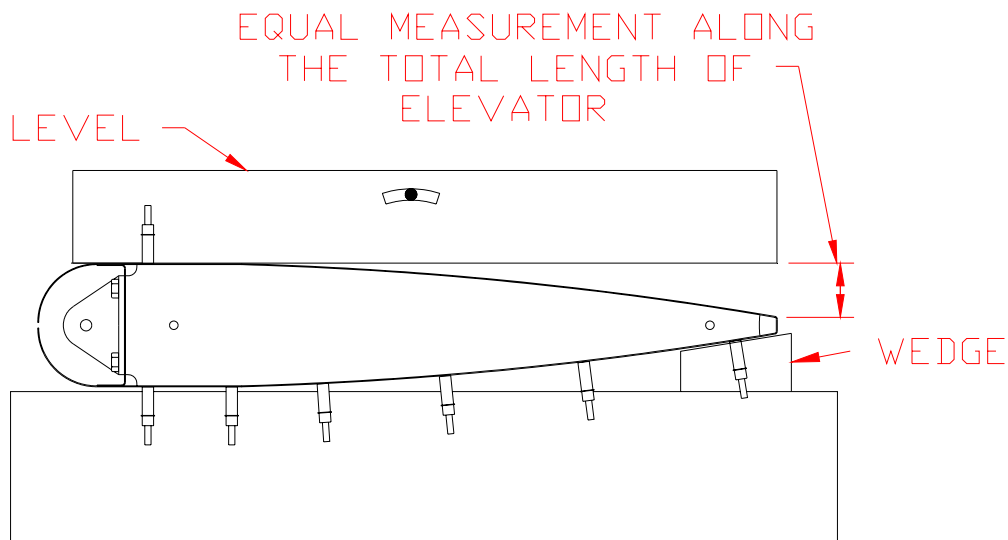


Figure 3.3.3

- 5) Drill the #40 holes into the spar using the skin as a guide. Cleco often.
- 6) Remove the clecos on the bottom of the Elevator. Continue drilling the #40 holes from the Skin into the ribs keeping the centerline visible.
- 7) Cleco the Elevator Skin to the Spar Assembly.
- 8) Drill the #40 holes into the Hinge Doubler and Center Doubler.
- 9) Drill all #40 holes that were drilled into the Doublers, Elevator Spar and Ribs to #30.
- 10) Remove the Elevator Skin and debur all the holes.

3.4 Center Ribs

- 1) Mark the center two ribs $5/16$ " from the last hole. Trim at this mark. See Figure 3.4.1.

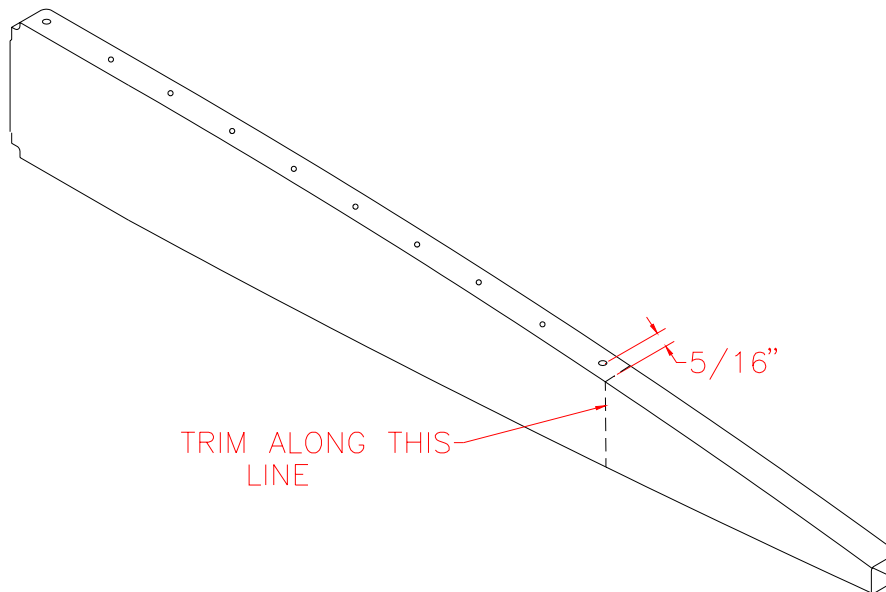


Figure 3.4.1

NOTE: Save the cut offs for use in the trim tab.

- 2) Repeat step for the ribs behind the trim location.
- 3) Cleco the Elevator Skin on to the spar assembly (one side only). Figure 3.4.2.

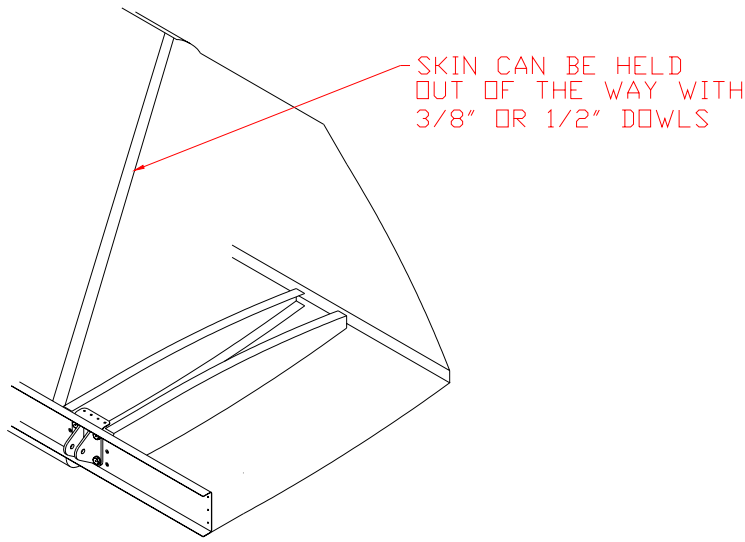


Figure 3.4.2

- 4) Mark the center of the top and bottom flanges of the second Elevator Center Doubler (EL-304). Cleco the two Elevator Stiffener Ribs (EL-312) to the Elevator Spar. Figure 3.4.3.

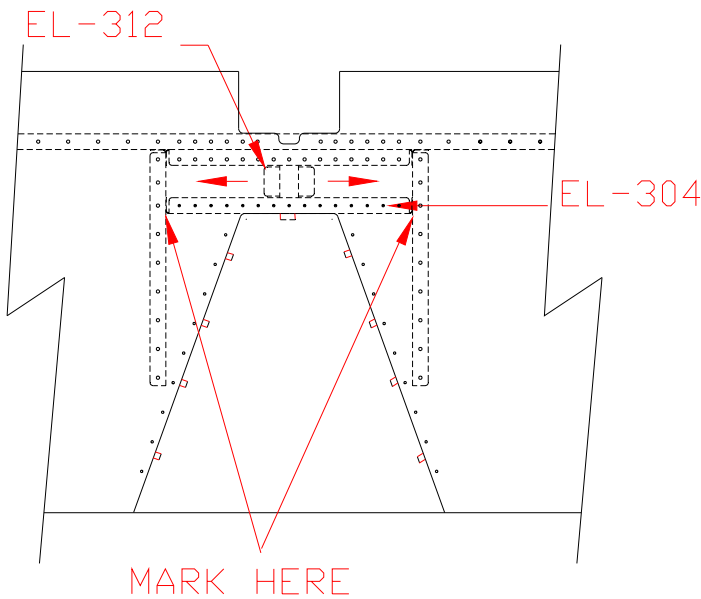


Figure 3.4.3

- 5) Cleco the second Elevator Center Doubler to the Elevator Stiffener Ribs. Mark the Center Doubler location onto the two center ribs. Figure 3.4.4. **NOTE:** Lower the Top Skin onto the center section to make sure the center line drawn on the Elevator Stiffener Rib is visible through the pre-punched holes in the skin.
- 6) Prop the Skin open.

- 7) Center the Elevator Center Doubler along the height of the ribs on the marks that were drawn earlier.
- 8) Using a long drill, drill the three #40 holes from the Elevator Center Doubler into each rib. Cleco.
- 9) Cleco the Elevator Skin onto the Spar Assembly and drill the #40 holes into the Elevator Center Doubler top and bottom flanges.
- 10) Position an Elev/Rud Rib on top of the skin over the trim marks made on the outside surface of the skin.
Mark the rib where it will need to be trimmed to fit the center section. Figure 3.4.4.

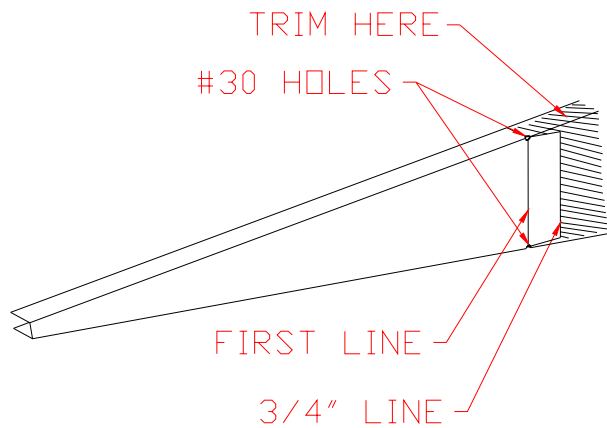


Figure 3.4.4

- 11) Mark a second line $\frac{3}{4}$ " from the first. Drill two holes in the corners at the first line. Trim as in figure 3.4.4.
- 12) Bend the flanges so it matches to the Elevator Center Doubler.
- 13) Mark a line along the center of the upper and lower flanges of the rib.
- 14) Repeat steps for the other rib.
- 15) Remove the clecos from one side of the Elevator Skin from the Spar Assembly and prop open.
- 16) Using the trim lines marked on the inside surface of the skin, mark on the Elevator Center Doubler where the ribs will be placed. Figure 3.4.5.

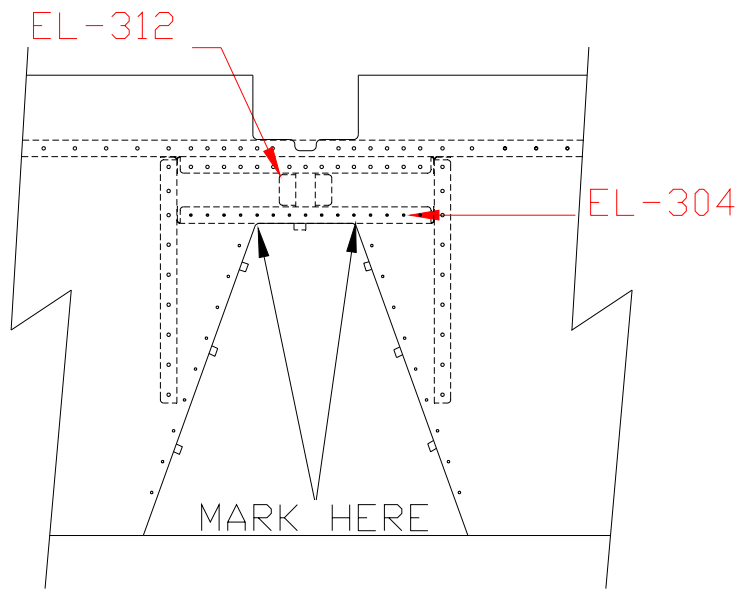


Figure 3.4.5

- 17) Remove the Elevator Center Doubler. Position the rib on the Elevator Center Doubler where the rib location mark was made. Back Drill #40 holes through the Elevator Center Doubler into the rib. Repeat for the other rib.
- 18) Cleco and assemble back onto the Elevator assembly.
- 19) Close the Skin and drill through the #40 holes from the Skin into the rib. Make sure the center line on the rib flange is visible through the pre-punched holes.
- 20) Cleco Elevator Center Gussets (EL-305) into place, top and bottom.
- 21) Drill all new holes to #40. Remove the Skin and debur.
- 22) Drill all the new holes in the Elevator Center Gusset and the new center ribs to #30.

3.5 Trim Tab Install

- 1) Cut out the Elevator Trim Skin along the tabs as in figure 3.5.1.

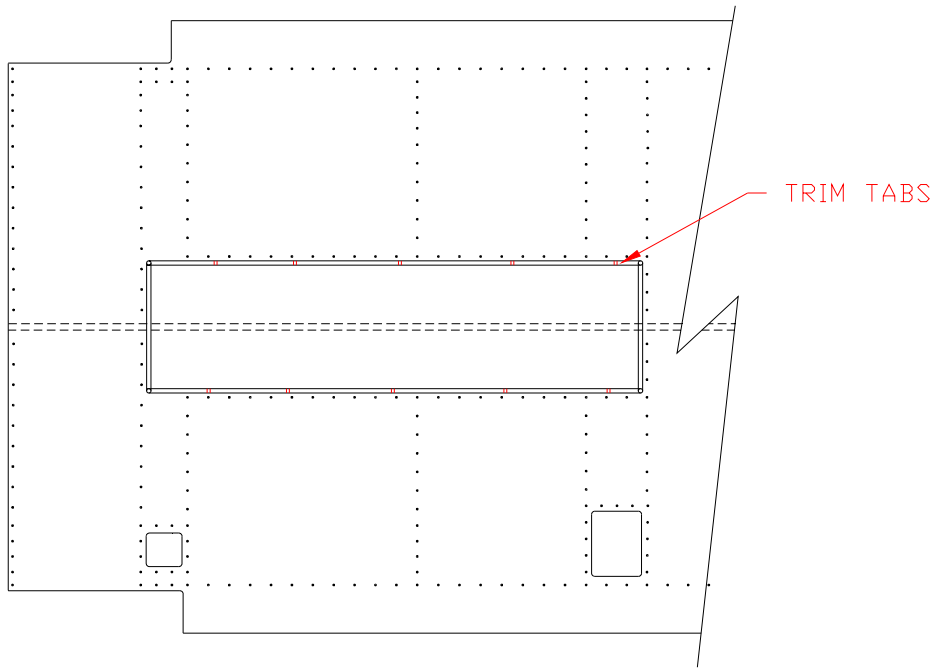


Figure 3.5.1

- 2) Set aside the Elevator Trim Skin cut out. **NOTE:** Be careful handling the Elevator Trim Skin so you don't crease it.
- 3) Trim the tabs that remain on the Elevator Skin off and lightly file the edges.
- 4) Debur the Elevator Skin.
- 5) Chromate all mating surfaces.
- 6) Cleco the skin onto the elevator spar assembly.
- 7) Rivet together using 1/8" avex rivets (RV-1410). Rivet only one of the two Elevator Center Gussets. Leave the access hole for the Elevator Horn open until it is installed.
- 8) Cut the center from the Elevator Skin and smooth with a file. See Figure 3.5.2.

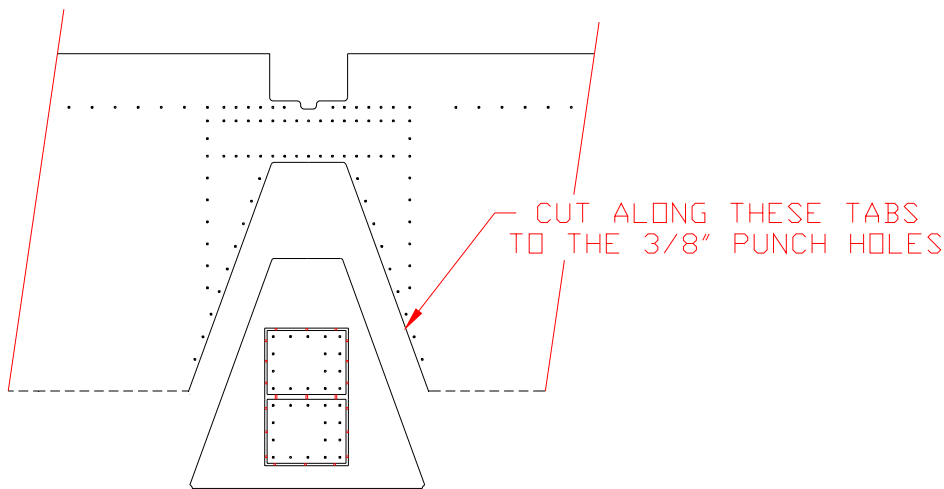


Figure 3.5.2

- 9) Trim the Front Trim Spar (EL-406) to fit between the two ribs at the trim location.
- 10) Trim a piece of Piano Hinge (1419 D00SS) ½” shorter than Front Elevator Trim Spar. **NOTE:** Remove the hinge pin before cutting. Cut the hinge pin ¾” longer than hinge.
- 11) Mark the center of the hinge material. Mark the center of the Trim Tab space.
- 12) Position the Hinge material under the Elevator Skin so the two center lines match up. Drill the #40 holes from the Elevator Skin into Hinge material. Figure 3.5.2.

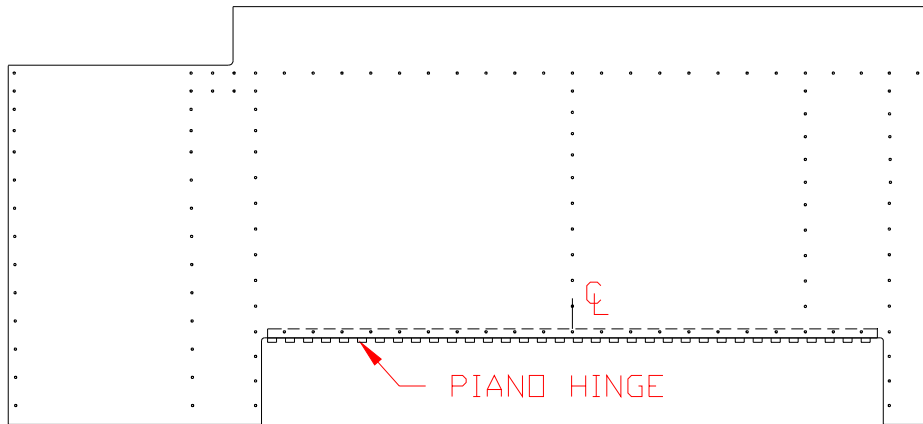


Figure 3.5.2

- 13) Remove and debur the hinge.
- 14) Draw a line along the center of the top and bottom flanges of Front Elevator Trim Spar.
- 15) Position the Front Trim Spar so the line is visible through the #40 holes in the Elevator skin and drill all holes to #40. Cleco.
- 16) Drill the #40 holes on the bottom side of the Elevator Skin into the Front Trim Spar.
- 17) Remove the clecos on the top side and insert the Piano Hinge between the Front Trim Spar and Elevator Skin. Cleco.
- 18) Drill the #40 holes out to #30.
- 19) Remove Front Trim Spar, Piano Hinge and Elevator Skin.
- 20) Debur. Chromate the mating surfaces and rivet the Front Trim Spar, Piano Hinge and Elevator Skin together with 1/8” avex Rivets (RV-1410).
- 21) Trim the Elevator Trim Skin as in Figure 3.5.3.

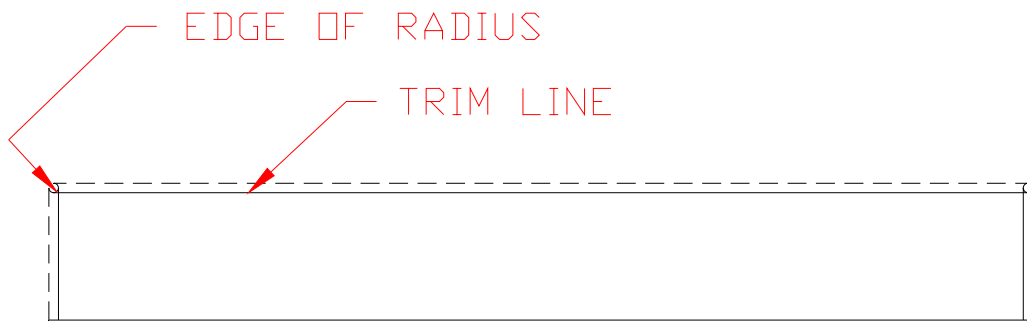


Figure 3.5.3

22) Mark a line 1/4" from the edge and a line 5/16" from the ends. Figure 3.5.4.

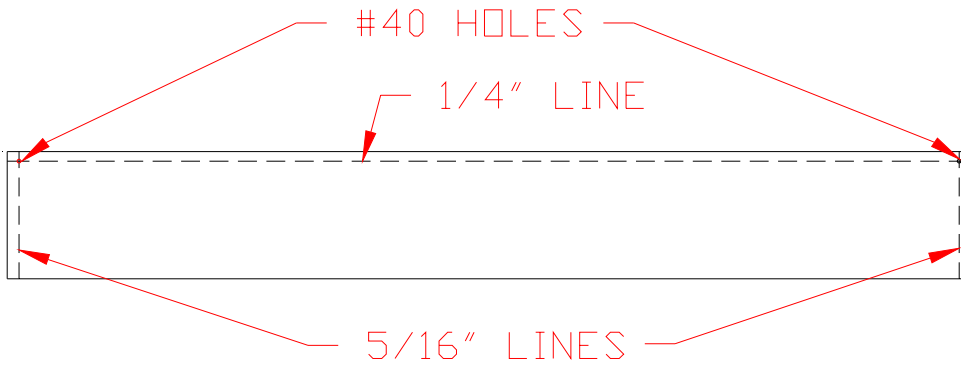


Figure 3.5.4

23) Drill #40 holes where the two line intersect. Figure 17.

24) Between these two holes drill #40 holes at approximately 1 1/4" spacing.

25) Connect the second half of the Hinge to the first with a Hinge pin. Center the Elevator Trim Skin in the gap and drill the #40 holes into the Hinge from the Elevator Trim Skin. Figure 3.5.5.

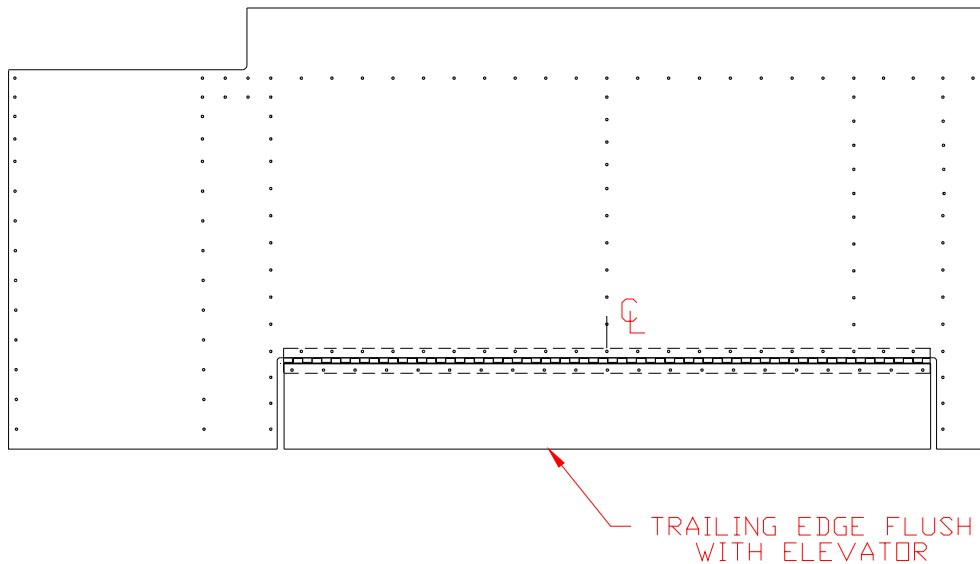


Figure 3.5.5

26) Remove the Trim Skin.

27) Position the Trim Rear Spar (EL-407) as in Figure 3.5.6.

28) Drill the #40 holes from the Elevator Trim Skin into the Rear Trim Spar.

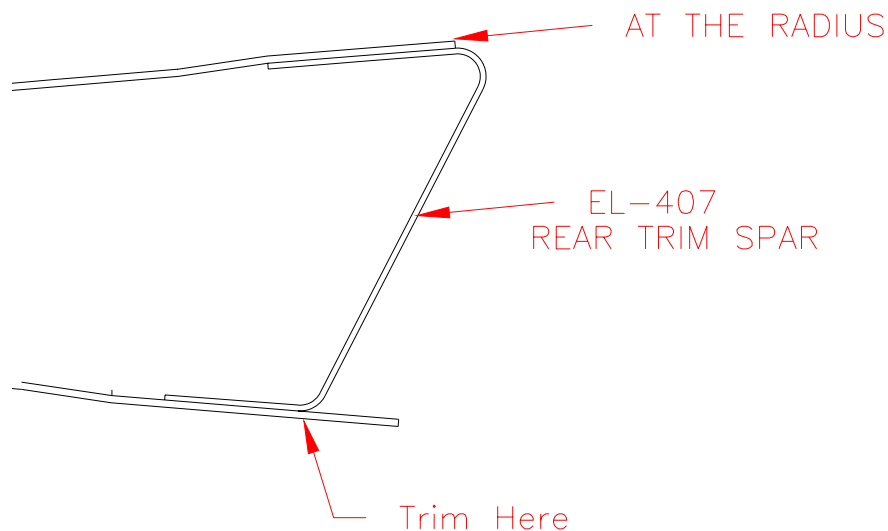


Figure 3.5.6

- 29) Insert the Piano Hinge between the Elevator Skin and Spar. Cleco.
- 30) Using the Spar, mark a line where the skin will be trimmed. **NOTE:** Measure from the trailing edge to ensure that the line is square.
- 31) Remove the Spar and Piano Hinge.
- 32) Trim the Skin along the line.
- 33) Mark a line, 5/16" in from the three edges. Drill a #40 hole where the lines intersect.
- 34) Between the two holes, along the line, drill #40 holes at an approximate spacing of 1 1/2".
- 35) Cleco the Spar and Hinge back onto the Skin.
- 36) Transfer the #40 holes from the Skin into the Spar. Cleco.
- 37) Drill the #40 holes out to #30.
- 38) Disassemble and debur. Re-assemble with clecos.
- 39) Cut the ribs. **NOTE:** The flange direction of the middle rib is not important.
- 40) Position a Rib flush with the end of the Skin. Drill three #30 holes on the top and bottom sides of the Skin at 5/16" from the edge. Cleco. **NOTE:** The flanges of the ribs are easily bent.
- 41) Repeat for the other end rib.
- 42) Position the third Rib in the center of the Trim. **NOTE:** Remove clecos as needed.
- 43) Disassemble the trim and debur.
- 44) Chromate the mating surfaces and rivet together with 1/8" avex rivets (RV-1410).
- 45) Connect the Trim to the Elevator with the Hinge Pin.

3.6 Servo Mount

- 1) With the Elevator on its back, check to ensure that the Servo Backing Plate (EL-316) fits to the holes in the Skin. **NOTE:** You will have to trim EL-316 to fit.
- 2) Position the Servo on the Servo Backing Plate so it will fit into the hole provided in the skin. Using the Servo, drill the four mounting holes.
- 3) Mount the Servo to the Servo Backing Plate with four Screws (AN525-832 R10), four washers (AN960-8) and four nuts (AN365-832). **NOTE:** Make sure that the Servo is pointing the right direction.
- 4) Drill the two Trim Horns (EL-36R & EL-36L) as in Figure 3.6.1.

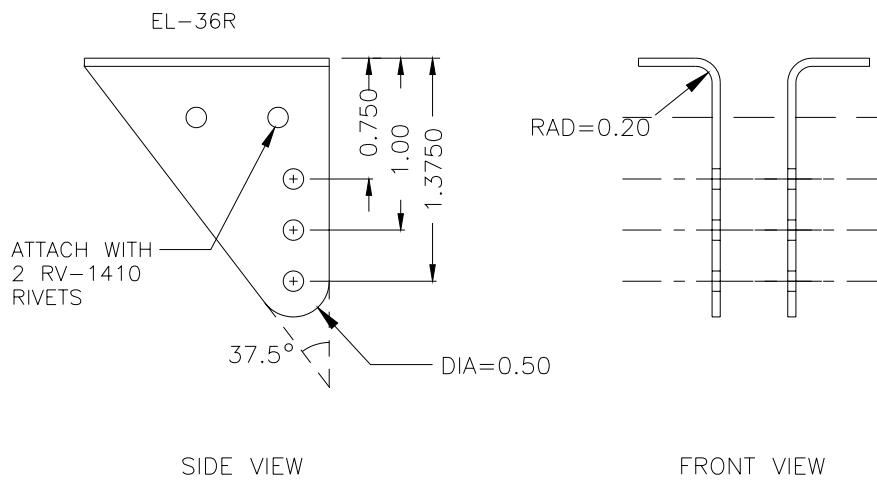
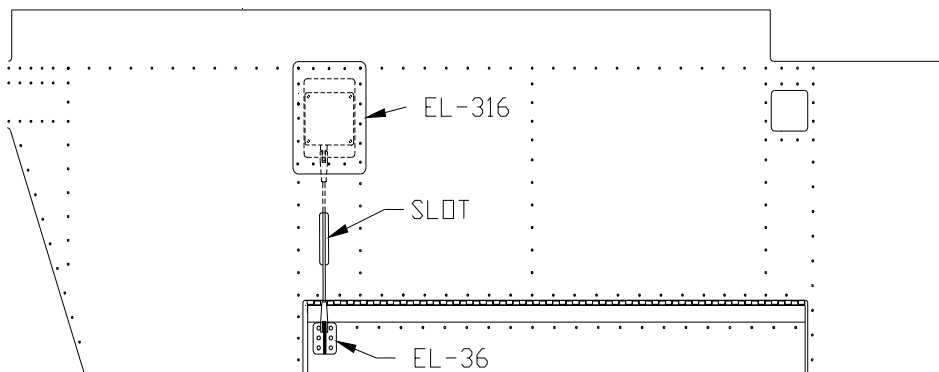


Figure 3.6.1

- 5) Mount the Trim Horns to the trim with six 1/8" avex rivets (RV-1410). Position so it is in line with the Servo output shaft. Figure 3.6.2.
- 6) Drill a small slot in the Elevator Skin for the Push-Pull rod to exit from the Servo. Enlarge as needed to allow full travel of the Servo. Any 12 volt battery will allow you to cycle the Servo through its distance.

Figure 3.6.2



NOTE: Final adjustments should be made when installing to the airplane. Attaching the wires to the servo and running of the wires will be done at that time.

3.7 Tip Skin Install

- 1) Position the Elevator Tip Skin (EL-408) to the Outboard Tip Rib and Inboard Tip Rib. Figure 3.7.1.
- 2) Drill #40 holes from the Elevator Tip Skin into the Tip Ribs keeping the ribs flush with the skin. Figure 3.7.1.

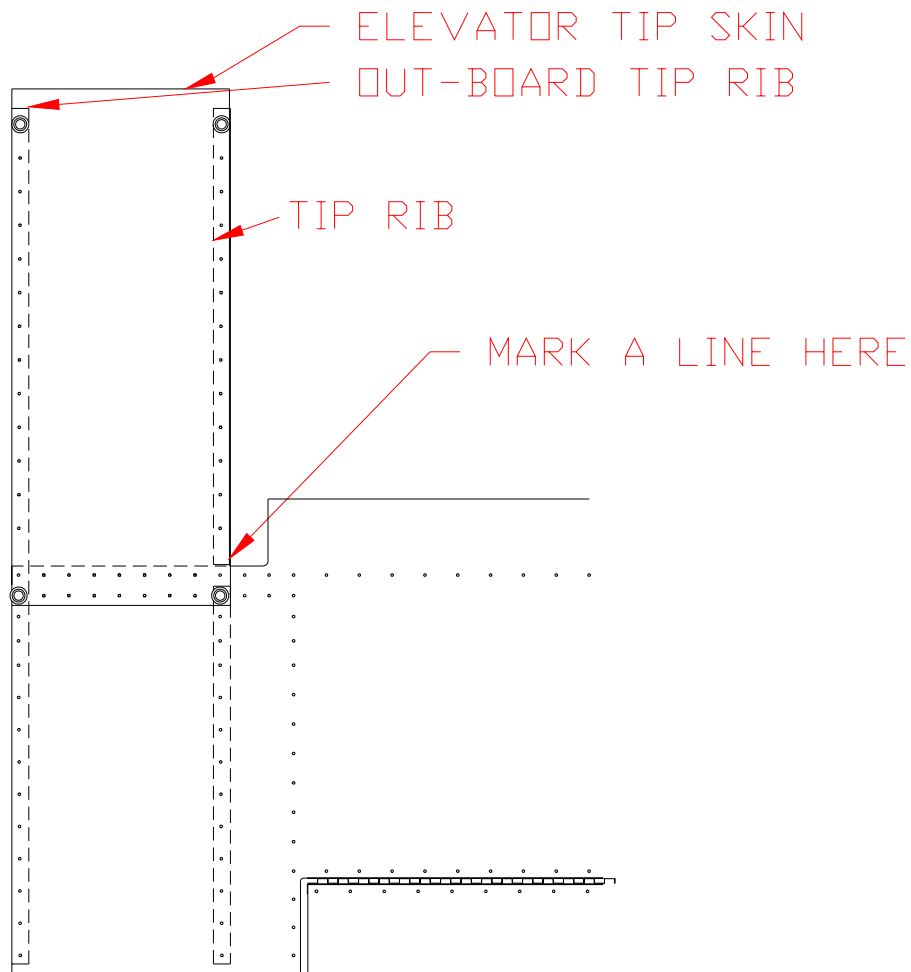
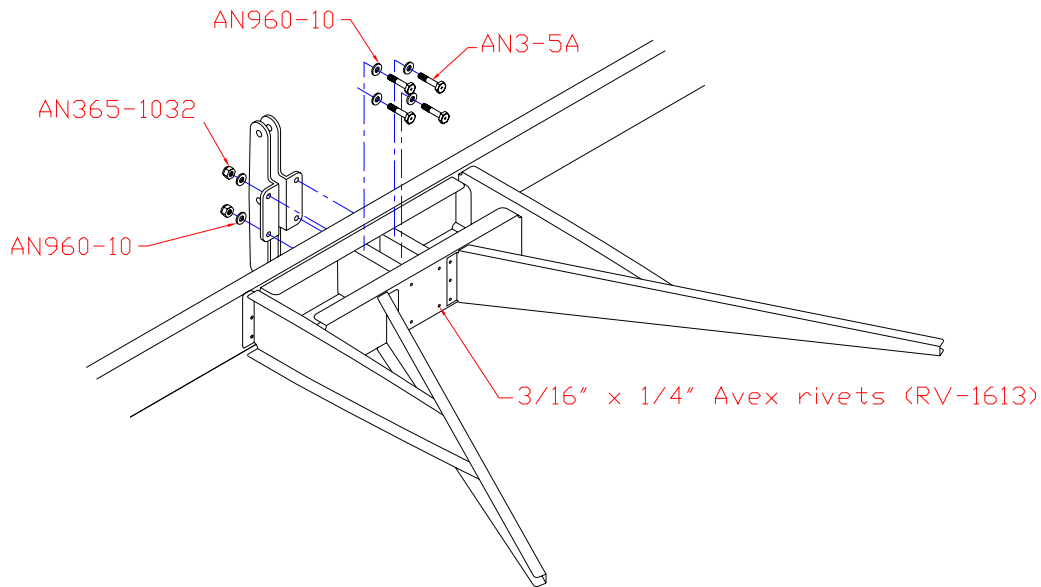


Figure 3.7.1

- 3) Keeping the line visible through the #40 holes in the Elevator Tip Skin, transfer the holes into the Tip Ribs. Cleco. **NOTE:** It is expected that what you do to the top side, you will do to the bottom side at the same time.
- 4) Drill through the Elevator Skin and the Elevator Spar using the Tip Skin as a drill guide.
- 5) Drill the rivet line aft of the Spar line with a #40.
- 6) Drill all #40 holes to #30.
- 7) Remove the Tip Skin. Debur all parts.

- 8) Chromate the mating surfaces of the Ribs and Elevator Skin.
- 9) Install the two Elev/Rud Horns to the center of the Elevator as in Figure 3.7.2. The main spar will need notching.



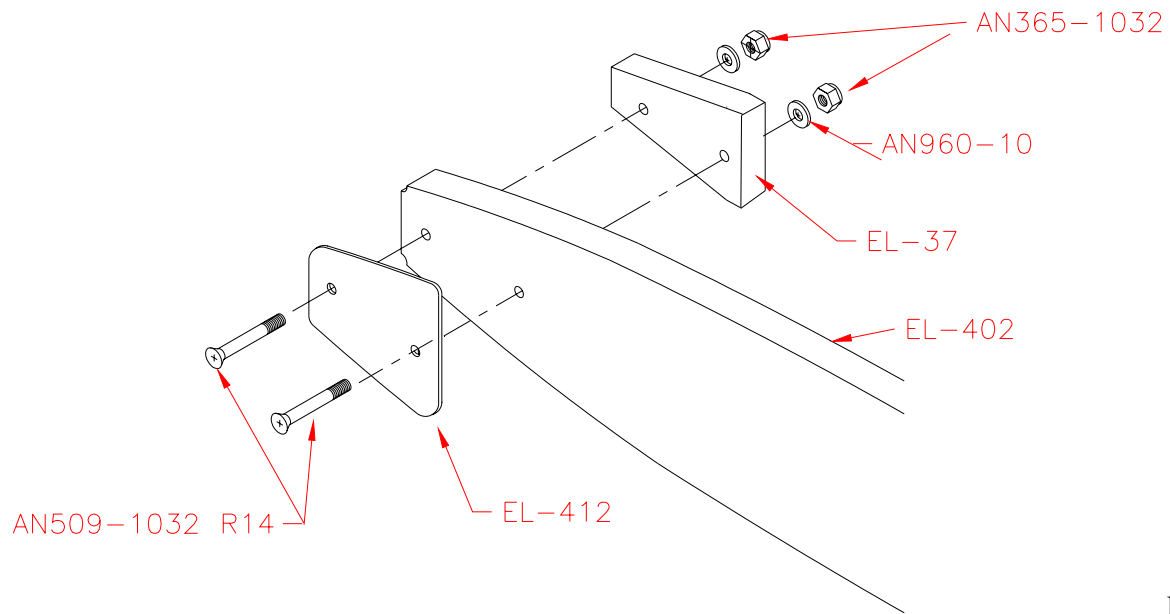
SKIN HAS BEEN REMOVED FOR CLARITY

EDGM01111

Figure 3.7.2

3.8 Elevator Weight Install

- 1) Get the Elevator Tip Weights. Cut one EL-37 Tip Weight in half.
- 2) Using the Tip Rib as a jig, draw out the shape of the Tip Rib on the raw stock (EL-412) provided. You will cut out two large and two small pieces.
- 3) Drill two 3/16" holes in the new Weight Backing Plates, using the tooling hole as a guide and drilling the other aft of that.
- 4) Using the backing plates as a guide, drill 3/16" holes through the weights and countersink. See figure 3.8.1.
- 5) Dimple the ribs and EL-412's and assemble the Elevator Tip Weight to the outboard Tip Rib as in Figure 3.8.1.



Figure

3.8.1

6) Mount the Elevator Tip Weight to the inboard Tip Rib as in Figure 3.8.2.

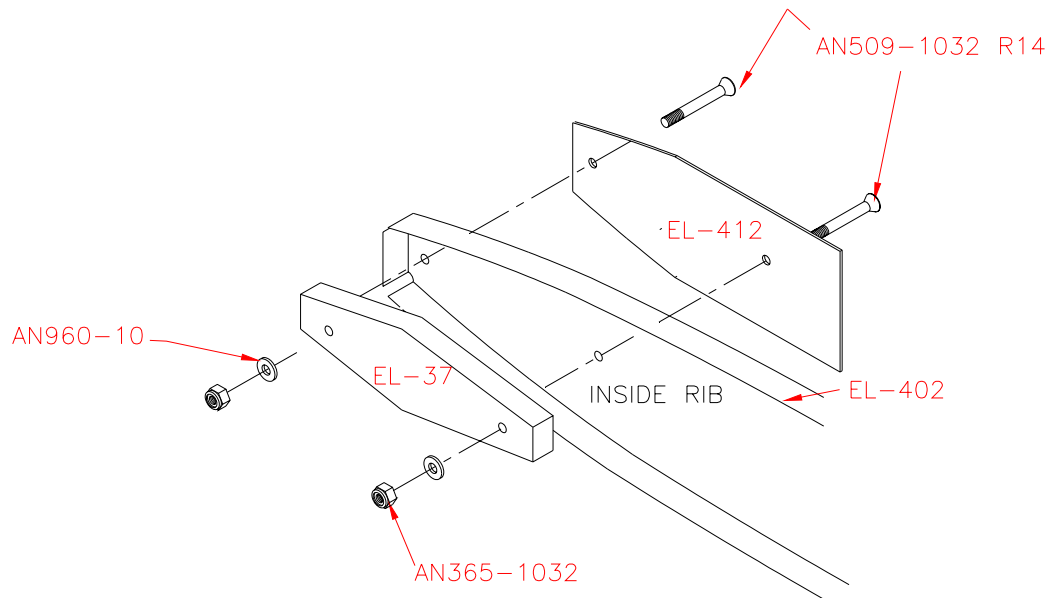


Figure 3.8.2

3.9 Inspection Covers

- 1) Trim out the Elev/Rud inspection covers from the center section cutout. Drill the #40 holes to #30 and rivet to the Elevator with 1/8" avex Rivets. **NOTE:** Stainless Steel screws or other suitable connectors can be substituted.
- 2) Drill the #40 holes in the Elevator Center Doublers to #30. Debur
- 3) Rivet the Elevator Center Doublers to the Elevator with 1/8" avex rivets (RV-1410). Figure 3.9.1.

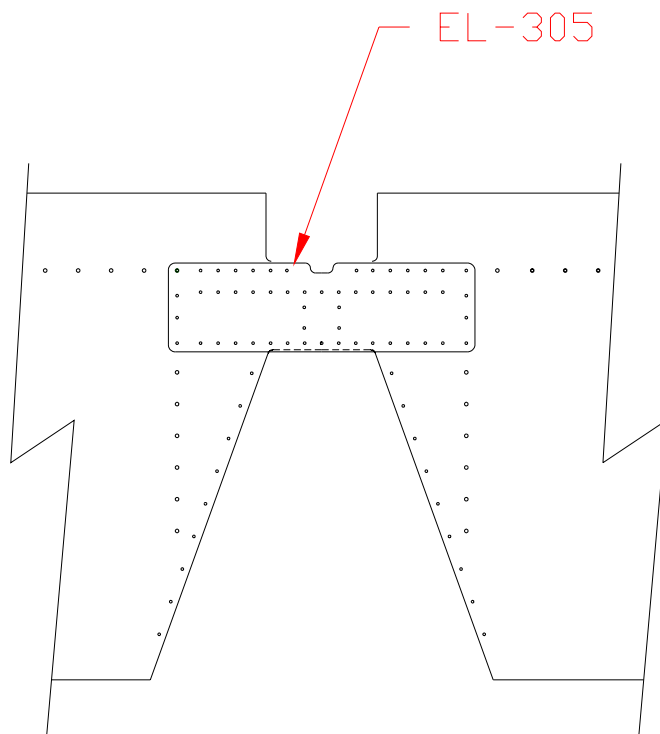


Figure 3.9.1

- 4) Rivet the remaining #30 holes with 1/8" avex rivets (RV-1410).
- 5) Draw a line up 5/8" from one edge of the Elevator Leading Edge along the entire length.. Overlap the other side of the Leading Edge up to the mark and secure with masking tape.
- 6) Draw a rivet line 1/4" up from the overlapped edge. Layout and drill #40 holes every 3 1/2" (not critical). Drill all holes out to #30.
- 7) Debur, chromate and rivet together using 1/8" (RV 1410) avex rivets.

3.10 Elevator Stops

The Elevator/Rudder stops are two part assemblies.

- 1) Find the four El-410 Stop Blocks. On the center of the radius layout and drill a #11 hole through the part. Countersink the hole to suit a AN509-1032-19R machine screw. Figure 3.10.1.

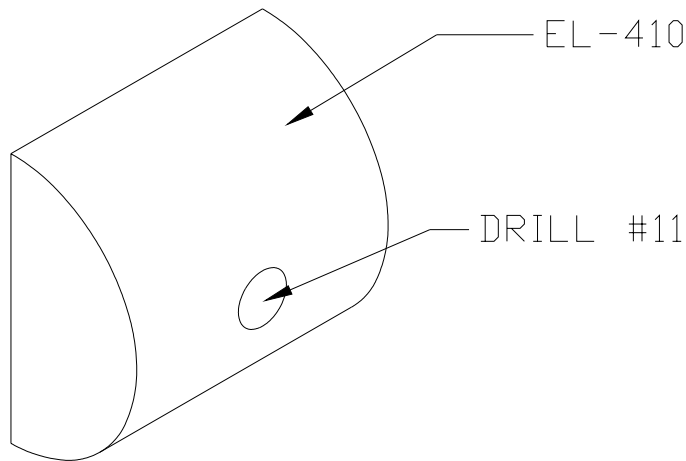


Figure 3.10.1

- 2) Using an EL-410 as a drill guide, drill through a RU-404 Stop Attach angle. Mark the top edge of the Stop Block on the Stop Attach angle and trim. Repeat for all four Stop Attach angles. Debur all parts. Figure 3.10.2.

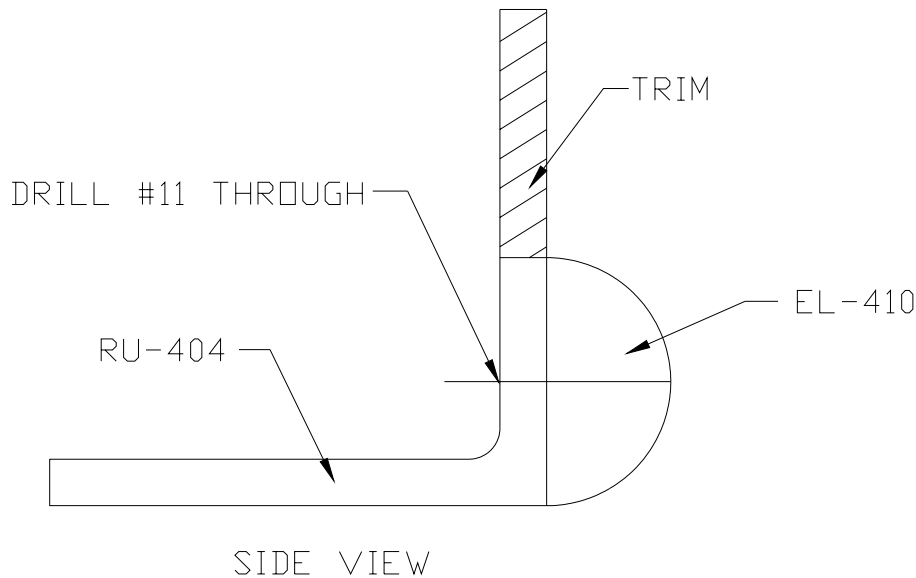


Figure 3.10.2

- 3) Assemble all four Stops using AN509-1032-19R C/S machine screws, AN960-10 washers and AN365-1032 fiber nuts. **NOTE:** Two of the assemblies will be used later for the Rudder stops.
- 4) Find the finished Stabilizer and temporarily bolt it to the Elevator. Deflect the Elevator UP to 25° from neutral.
- 5) Slide a Stop up against the Elevator Horn. You will notice that a 1/16” packer must be made. At this point you can determine how big the packer should be and a convenient hole placement for mounting the parts.
- 6) Mark a line down the center of the flange on the Stop Attach angle that goes on top of the Stabilizer skin. Layout and drill two #11 holes through the angle. Place the angle and the packer back on the Stabilizer skin and drill #11 through. Figure 3.10.3.

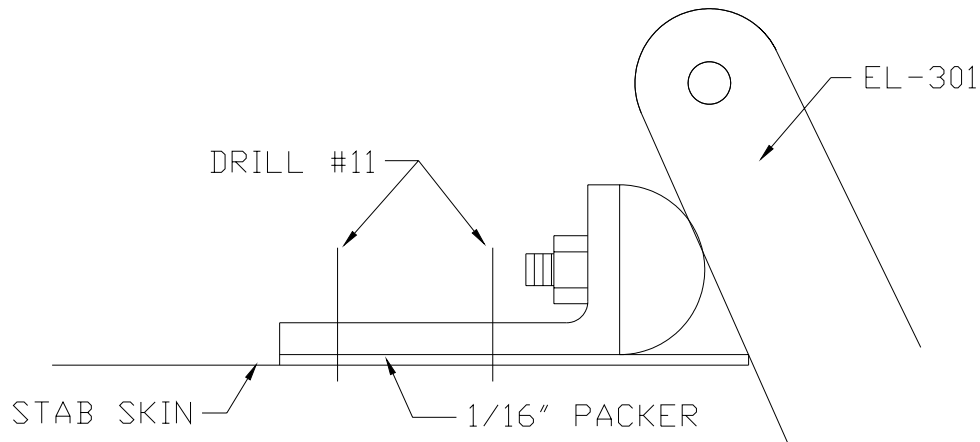


Figure 3.10.3

- 7) Remove the parts, debur, chromate and rivet to the Stabilizer skin using RV-1619 avex rivets.
- 8) Flip the Stabilizer/Elevator assembly over and repeat for the other side. Correct Elevator deflection is 25° and 25° down (8" each side of neutral at the Elevator trailing edge).
- 9) After you have finished the Fuselage repeat this procedure for mounting the two Rudder Stops. The Stops will go on the Fuselage. You will mount them with 25° in each direction.

NOTE: The Stops can be adjusted by adding shims between the RU-404 and the EL-410.