

Tail Section Assembly, Horizontal Stabilizers

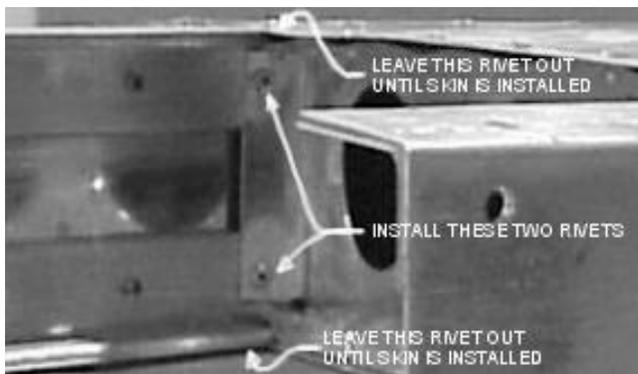
The horizontal stabilizer leading edges and forward spars are bonded together in a fixture at the factory. The builder will assemble the aft portion of the stabilizer structures and attach the skins. Left and right stabilizers are identical until they are match drilled by the builder to the horizontal stabilizer spar carrythru in the fuselage. After they are mounted, they will no longer be interchangeable from side to side.

! CAUTION Acetone, MEK, lacquer thinner, gasoline, paint thinner and many other **solvents can destroy the EPS foam** inside the horizontal stabilizer leading edge. When cleaning in the area of the leading edge, it is important to use a cloth or paper towel that is only damp with the solvent. Dripping any solvent inside the leading edge through drill holes, around rivets heads or through any opening will destroy the EPS foam and **severely weaken the structure**.

Drill all rivet holes with a #30 drill unless otherwise specified.

Match drill the leading edge skin to the existing holes in the horizontal stabilizer forward spar using a hole duplicator.

Install the horizontal stab ribs MT03-64, MT03-65, and MT03-66 in the locations as shown on print **T51-03-INS-0821**. To locate the ribs, measure from the root end of the spar. The inboard four ribs will be installed with the flanges facing toward the root end of the stabilizer. The outboard rib will be installed with the flanges facing the tip. Be careful, the rib location dimensions on the print are to the rib web, not to the centerline or flange. The ribs are secured to the main spar with four rivets each. The two rivets that hold the forward rib flange to the spar will be installed. The two rivets that hold the skin, spar and the rib together will be left out until the skin is installed.



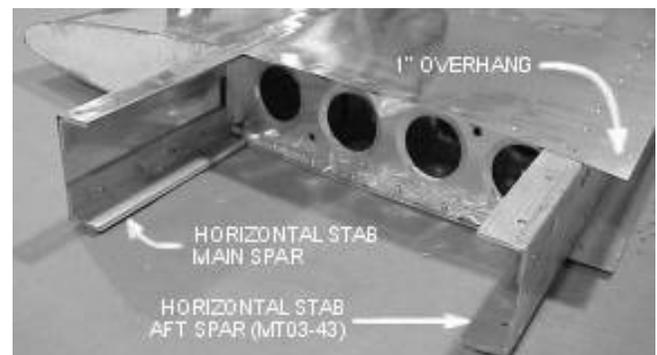
This photo shows a horizontal stab rib riveted to the main spar.

Attach the horizontal stab aft spar MT03-43. Measure from Document No. T51-08-DOC-0004-A
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the root end of the spars to locate the ribs. Four rivets will hold the ribs to the aft spar. Two rivets will be installed and two will be left out until the skin is attached.



Horizontal stabilizer. The skins in the kit are rectangular and will need to be trimmed. Elevator hinges are shown in the photo. They will be installed later when the elevators are fit.



Root end of the horizontal stabilizer.

It is important to keep the structure square and without twist throughout the building process.

The aft skins will slide between the leading edge skin and the main spar. The skins should overhang one-inch beyond the aft spar. Match drill the main spar line. Continue the rivet line to the tip of the spar on approximately 1½" centers. Make sure the ribs will be attached along this rivet line. The spacing may have to be adjusted slightly to accomplish this.

Drill the skins along the centerlines of the rib flanges and along the aft spar on approximately 1½" centers. Cleco the skins in place as you drill. After the skins are fit, mark the skins where they will be trimmed. Remove the skins and trim to fit. Bond the skins to the structure with Uralane and install the rivets.

Tail Section Assembly, Vertical Stabilizer

It is important to level the fuselage prior to the installation because a plumb bob will be used to set the vertical stabilizer in the proper position.

The horizontal stab carrythru's must be installed after installing the vertical structure. Refer to print **T51-03-INS-0822**.

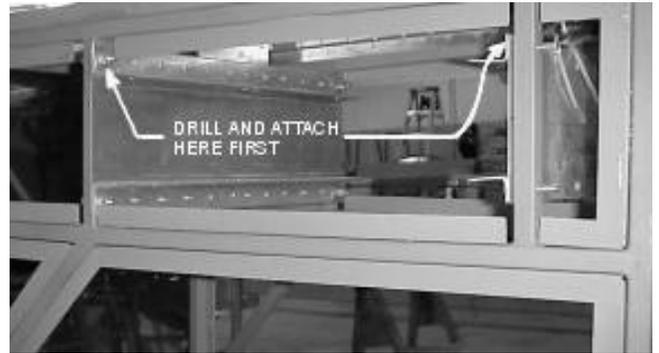
Install the vertical stabilizer to the fuselage. Align the base rib centerline with the fuselage centerline. The base rib attaches in three places. The forward flange (MT04-172) attaches to the U12 bulkhead and frame tabs. The aft flange attaches to the forward vertical spar mount flange, which is welded to the fuselage. The base rib web is attached to the vertical stab base rib bracket, which should be attached to the fwd carrythru.

The upper surface of the vertical stab base rib bracket needs to be aligned with the top surface of the fuselage upper longerons. Refer to print **T51-03-INS-0822**. Clamp a straight edge across the top of the fuselage frame and clamp the bracket to the straight edge. Match drill the four holes from the main spar carrythru into the bracket. Bond the bracket in place and rivet with SD45BS rivets. Later in the assembly, the vertical stab base rib will attach to this bracket. Be the top flanges are attached to the carrythru's and the horizontals are built and fitted, before attaching the vertical stabilizer rib bracket to the fwd carrythru.



Looking back from the lower right side of the fuselage. Shows vertical stab base rib bracket. The bracket will be riveted and bonded to the center of the horizontal main spar carrythru. In this photo the vertical stab base rib is already installed.

Draw a centerline on the vertical stab main spar. Make sure the fuselage is level. Clamp the vertical stab main spar to the fuselage frame. Use a plumb bob to align the spar. Adjust the spar as necessary. With a 3/16 drill bit, drill through the four existing holes in the vertical stab main spar and into the attachment brackets that are welded to the frame.



Looking forward from the left rear of the fuselage. Shows the horizontal main spar carrythru and the horizontal aft spar carrythru mounted in the fuselage.

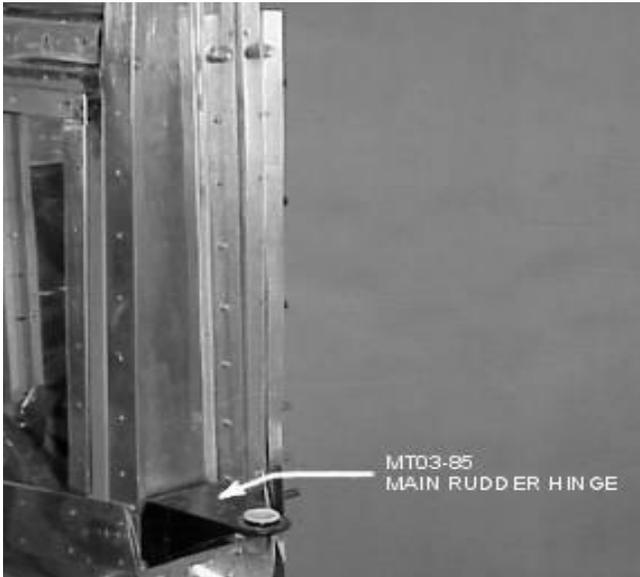
Once the carrythru's have been bolted in place, slide both horizontal stabilizer leading edges in place on the fwd carrythru and clamp to bottom flange. Position the fwd carrythru's top flange to make a snug fit for the horizontal spars & clamp flange in place. Remove horizontals from carrythru and then slide horizontals back in place to check positioning of top flange. Adjust as needed. (There should be no play vertically when horizontals are in place.) When satisfied with the positioning of top flange bond and rivet in place, also install required bolts to fuselage.

There are several small parts that will be attached when the horizontal aft spar is attached to the carrythru. See the exploded view **T51-03-INS-0844** for details. The bolt holes in the horizontal stab center plates (MT03-79, MT03-78) and horizontal aft spar carrythru plate (MT03-87) will be used to locate the mounting holes that need to be drilled. After the holes are drilled, temporarily install AN3-5A bolts to make sure everything is aligned properly.

Repeat the process for the other horizontal stab. Make sure the stabilizers are marked *Right* and *Left* before they are removed.

Refer to prints **T51-03-INS-0843** and **T51-03-INS-0844**. Assemble the two elevator center bearing brackets (MT01-1) to the bearing (MT01-3) with six SD44BS rivets. This assembly will be attached with the four AN3-6A bolts that also hold the horizontal stab center plates in place. The thin center plate (MT03-79) goes between the bearing assembly and the horizontal stab aft spar carrythru. The thick center plate (MT03-78) will be mounted to the front of the horizontal stab aft spars.

Both horizontal stab aft carrythru plates (MT03-87) will mount to the inside of the horizontal stab aft spars so the horizontal aft spars will be sandwiched between the horizontal stab aft carrythru plates and the horizontal stab aft spar carrythru.



Vertical stab main spar, mounting bolts and rudder hinge. The production rudder hinge looks a little different, but mounts exactly the same.

Attach the main spar to the frame at the upper two holes with AN3-6A bolts. The lower two bolts will also hold the main rudder hinge in place. Install the main rudder hinge and the two lower bolts.

Slide the vertical stab forward spar MT03-68 between the vertical stab base rib and the forward vertical bracket on the fuselage. Drill two holes with a 3/16" drill bit and bolt in place with AN3-4A bolts.

Tail Section Assembly, Elevator Installation

Install the elevator center bearing brackets (MT01-1), elevator center bearing (MT01-3) and elevator control horns (MT03-62). Install the outer elevator hinge plate (MT03-92). Center the hinge-pin hole vertically. Set the hinge-pin hole distance 13 21/32" from the horizontal stab main spar forward surface.

Refer to print *T51-03-INS-0846*. Slide the drive tube of one elevator into one of the elevator control horns (MT03-62). Swing the elevator counter-weight into the counterweight slot in the horizontal stab. Temporarily install the hinge-pin (MT03-88) through the outer elevator hinge plate (MT04-154) and through the outboard elevator hinge-pin bushing. Then slide the inner hinge plate (MT03-92) into the elevator slot. Push the hinge-pin through the inner hinge plate and through the elevator inner bushing. Swing the elevator on its hinges far enough that the inner hinge plate can be mounted to the horizontal stab rib (MT03-66). Drill and rivet in place with steel SD42BS rivets.

Rotate the elevator so the drive tube can be match drilled to the driver. Drill thru 1/4" and trial fit an AN4-13A bolt. Repeat the process with the other elevator.

Remove the elevators and cover with fabric.

! VERY IMPORTANT: Follow the instructions in the Poly-Fiber instruction manual. Correct installation, heat shrinking and coating of the fabric is imperative. The Poly-Fiber website may also help answer any technical questions you may have: <http://www.polyfiber.com/techquestions/>.

Reinstall the elevators after they are covered and painted. Install the AN4-13A bolts, AN365-428 lock nuts and the hinge-pins. Each hinge-pin will be held in place with a steel SD42BS rivet.

Tail Section Assembly, Rudder Installation

Refer to print *T51-03-INS-0862*. Install the rudder hinge channel (MT03-75). Trial fit the rudder structure to the vertical stabilizer to make sure there are no clearance problems. Swing the rudder to one side and fit the rudder hinge plate (MT04-154). Install the hinge plate using Uralane adhesive and SD42BS steel rivets.

Remove the rudder structure and cover it with fabric.

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Reinstall the rudder after it is covered and painted. Slide the hinge-pin (MT03-89) in. Rivet the hinge-pin in place with a steel SD42BS rivet. Attach the rudder control cables.

 By Date

 Checked Date

 Approved Date