

Center Section Assembly

Familiarization

The main center section spar and rib structure have been assembled in a fixture at the factory. Much of the structure is bonded and permanently riveted together. Some parts are fit but temporarily held together by aluminum pop rivets. The areas that are not bonded will need to be removed or partially removed during assembly then bonded and riveted later as required.

The skins have been pre-fit. The leading edge skins and lower aft skins have been temporarily riveted in place with some aluminum pop rivets. The skins will need to be removed for dimpling and to allow better access to some areas during assembly. If desired, the lower aft skin can remain in place to provide stability to the structure during some of the assembly. It will need to be removed for dimpling and riveting prior to installing the fuel system.

The main gear legs are also temporarily assembled. They will need to be disassembled so they can be painted.

Main Gear and Linkage

Refer to print *T51-03-INS-0588*. Remove the AN3-21A bolts that hold the main gear shafts to the main gear shaft front bushings. This will allow the main gear shafts to slide back. Several 1.5" dia. stainless steel shim washers will drop out as the shafts are slid back. Note where the washers are located for later assembly. Usually, one shim washer will be located behind the gear leg and one or more will be located ahead of the gear leg. These are used to set the endplay. The gear legs should move freely and have little or no endplay.

Remove hardware and compress upper & lower strut together and mask anything required before painting or remove the scissors (drag link) assembly. Remove the AN4-24A bolt that holds the main gear lower weldment to the oleo strut and remove the lower weldment. Using snap ring pliers, remove the snap rings. Slide the oleo strut assembly out of the upper main gear weldment. Paint the parts as desired. (If gear legs are disassembled, it is highly recommended to replace all O-rings before reassembly.)

Refer to print *T51-03-INS-0588* and *T51-03-INS-0589* for reassembly instructions.

! CAUTION: When reassembling the oleo strut, be sure the snap ring is properly seated. If the snap ring is not seated correctly, the oleo could blast apart with extreme force when it is pressurized and fully extended. Also, if an oleo is going to be disassembled after it has been

pressurized, release all the pressure, unscrew the oleo valve, and aim the oleo away from anyone, including yourself, prior to removing the snap ring. Check all O-rings before re-assembly, most likely these will need to be replaced.

Slide the bellcrank front bearing and bellcrank rear bearing onto the main gear bellcrank as shown on print *T51-03-INS-0590*. Be sure to lubricate the bearings prior to assembly. Attach the bellcrank front bearing to the front spar with (4) AN3-7A bolts and (4) AN960-10L washers where the 4 nut-plates have been pre-attached. Slide the bellcrank rear bearing back and over the main gear bellcrank spacer and into place on the main spar. Attach with (2) AN3-10A bolts and (2) AN960-10L washers. If the spacer is too long, some length may be sanded off so it will fit. The bellcrank should swing freely in the bearings with very little end play.

Attach a 5/16 ball joint and a 3/8 ball joint to each hydraulic cylinder as shown in print *T51-03-INS-0590*. Two jam nuts at each ball joint will allow adjustment at each end.

Assemble the two main gear adjusting links. The links can be adjusted by adding AN960-616 or AN960-616L washers as needed.

Install the over center stop bolts (AN3-3A bolts, AN960-10L washers, AN365-1032 stop nuts) to the main gear bellcranks as shown on print *T51-03-INS-0599*.

Assemble the hydraulic cylinder mounts to the main spar as shown on print *T51-03-INS-0590*. Attach the cylinder end of the hydraulic cylinders to the mounts on the spar. Attach the rod end of the hydraulic cylinders to the main gear bellcranks. Attach the links to the main gear bellcranks and to the upper gear leg weldment clevises. The bellcrank end of the link will need spacer MG03-127 installed in the ball joint so a 1/4" diameter bolt can be used (AN4-14A bolt, AN960-416 washers, AN365-428 lock nut).

When the gear is fully extended, the link and bellcrank should rotate so they are in a straight line and then over center to just beyond a straight line. This will assure the link and bellcrank won't reverse direction and allow the gear to retract. Over center adjustments can be made by installing or removing washers on the over center stop bolts.

Extend and retract the gear legs to make sure the locks engage all the way, to make sure the roll pin contacts the steel plate and to make sure the legs are clear of the return springs. Some adjustments may need to be made to the ball joints and over center stop bolts to allow the gear to travel

through its full range and to allow locking systems to work properly.

Trimming the Leading Edge Skins

Before removing any parts, mark them so you will remember exactly where they go.

Before installing the outer wing panels to the center section, check the fit of the 3/8" main wing bolts (AN176-20 close tolerance bolt). Make sure they slide into the outer wing panel main spar fittings and make sure they slide into the 3/8" holes at the center section main wing fittings. These holes were reamed at the factory and should fit very closely. The bolts should not be a press fit, but should also not have any looseness.

Inspect fittings to make sure they have no sharp edges or burrs. If there are any sharp edges or burrs, lightly wet sand the affected area with #400 or finer sandpaper. Clean the fittings with a soft cloth and compressed air after any sanding.

Temporarily install a wing in the center section by sliding the outboard wing main spar fittings into the center section main spar sockets. **Be sure to lubricate the fittings with some grease to prevent galling the fittings.** This is a tight fit. Several people may be needed to steady the structures. Slide the wing all the way in so the bolt holes align. If the wing won't go all the way in, look closely to see where the interference is. Sometimes small spots of adhesive, foam or aluminum may need to be trimmed or filed. **CAUTION: Make sure not to scratch or gouge the wing fittings!** Wrapping the fittings in tape prior to trimming or filing can prevent scratches. When the holes are aligned, install the 3/8" main wing bolts (AN176-20 close tolerance bolts) without nuts for now. If the bolts don't fit, the wing is probably not all the way in. **Do not use a tapered punch or similar tool to align the fittings!** Using a tapered tool damages the fittings. The wing needs to be in all the way to get the bolts in. If the bolts fit when the assembly was apart, they will fit when the assembly is together.

With the outer wing panel installed, the center section #4 strake rib should be slightly inside the outer wing leading edge skin. Make sure the rib is square with the forward spar. Using a fine tip marker, trace around the inside edge of the rib making a line inside the outer panel skin. This line will be used as a guide for trimming the outboard leading edge skin.

Remove the outboard wing panel and install the center section leading edge skin. This time trace around the

outside edge of the rib. This will be the trim line for the center section leading edge skin.

Carefully trim the leading edge skins on both the center section and outer wing panel. Re-install the outer wing panel. The leading edge skins should come together just before the outer wing panel is all the way in. Mark where further trimming is needed. Remove the outer panel again. Carefully sand the excess material from the skin edges as necessary. Repeat this process several times until the skins fit together as desired.

Installing the Center Section Leading Edge Skins

Remove the outer wing panels and remove the center section leading edge skins. Countersink the skins. The countersunk Pop rivet angle is 120°, so use a 120° countersinking tool. Bond the leading edge foam blocks in place. Re-install the #4 strake rib flanges. Bond and Cleco the leading edge skins in place. Slide the center section wing skin strips between the leading edge skins and the main spar before setting the rivets. Rivet the skins to the ribs and forward spar with SK42BS rivets. Rivet the skin to the main spar with SK48BS rivets except for the inboard 4 rivets and the outboard 8 rivets. For those 12 rivets, refer to the rivet callout on print *T51-03-INS-0604*.

Installing the Fuel Tanks

Temporarily install the fuel gauge mount as shown on print *T51-03-INS-0611*. Trial fit the fuel gauge. It will be necessary to file away some of the lower inside radius of the insert fitting with a rat-tail file. After the fuel gauge mount and fuel gauge fit well, remove them and clean any metal from inside the tank.

The fuel tanks rest on three foam saddles that are supported by three aluminum hat section stringers. The lower aft skins need to be clecoed in place. Fit the hat sections on 5" centers as shown on print *T51-03-INS-0609* and *T51-03-INS-0610*. From the inside of the fuel tank bay, drill and cleco each hat section to the rib flanges. Along each hat section flange layout a drill pattern on approximately 1½" centers. Drill #30 holes and cleco. Remove the hat section stringers and lower skins. Install the fuel tank from the bottom. While holding the tank in place, install one of the hat section stringers. The tank should stay in place. Install the other two stringers. Slide the three foam saddles between the tank and the hat section stringers. The foam saddles should be equally spaced and placed without interfering with the drain flange. Cleco the lower skin back in place.

Re-install the fuel gauge mount and fuel gauge. Adjust the angle of the fuel gauge so it can be viewed from the pilot's seat.

Install the inlet tube, inlet adapter, and elbow. Install the clear filler tube. The filler necks have been machined .040 undersize so the filler caps will fit flush to the upper skin when installed. Using reference lines, determine where the filler necks will be located. Cut a 1 7/8" hole for each filler neck. The holes may need to be enlarged slightly over 1 7/8" so the fuel caps won't hang up on the skin when they are removed. Temporarily install the filler necks in the clear filler tubes with the hose clamps left loose. Cleco the skins back in place. Adjust the filler necks in the clear tubes until they meet with the skin. Remove the skin and tighten the hose clamps.

Matting center section to the fuselage

Be sure the clean all holes on the fuselage and the center section from any debris. Grease the bolt holes as well as the bolts before assembling.

When matting the center section to the fuselage the following hardware is required and there are 2 per wing.

- Fwd & Aft (AN5-6A bolts, AN960-516 washers and AN365-524 Lock nuts)
- Center (AN6-13A bolt, AN960-616 washer and AN365-624 Lock nut)

By

Date

Checked

Date

Approved

Date