

# Pitts Model 12 Wing Leading edge Installation

This procedure is used to install molded plywood leading edges included in the Pitts Model 12 kit. Nine (9) molded leading edge sections are required per aircraft; 2 each per lower wing and 5 for the upper wing.

## **PREPARING THE WINGS:**

- Make sure all rib and spar assembly is completed.
- All wood which will be hidden under the LE skin should be epoxy varnished. Do not varnish surfaces that will be used for bonding the LE skin to the wing frame.
- Pitot system should be installed and tested for leaks.
- Flying and lading wire lugs and AN665 terminal ends should be installed.
- Wing should be properly trammed and free of twist.

## **LOWER WING:**

- Sand all nose ribs such that all have a consistent shape. Basically, level and true the nose ribs. This should not require a large amount of sanding. Do this using a long narrow sanding board with 80 grit paper.
- Install the inboard leading edge (LE) section first. It will extend from the inboard edge of the butt rib to the outboard edge of the mid span double rib,
- Place the inboard LE on the wing and hold snugly in place with several bungee cords hooked to the truss ribs. Make an identifying mark on the LE so you can know which side is up and the location on each wing.
- With LE on wing, mark each end for trimming. Remove the LE and trim to length leaving 1/8" to 1/4" surplus material to extend past the nose ribs on each end.
- Reinstall the LE and hold in place with bungees as before. Mark the rear edges of the LE skin for trimming flush with the rear face of the wing spar. Simply use a pencil and mark the inside of the LE skin between all ribs. Remove the LE and extend any lines as needed. Trim and sand upper and lower rear edges.
- Install the LE once again and check all trimming and fit to be proper and snug to nose ribs. Adjust as needed for best fit. Mark each rib and walk way ply with pencil to show the point of overlap of LE skin.
- Remove skin from wing.

- Flushing In walkway. With the LE skin overlap previously marked on the walkway ply, scarf the walkway ply to accept a match scarf inside the LE skin in that area. This is done by sanding a matching taper on the ply.
- Sand the nose ribs and cap strips on the butt rib and walkway rib from the pencil mark forward down so that the LE skin will fit flush to the walk ply. Tape this nose rib sanding forward on the rib about 3". Do not sand farther forward on the rib than 3" as this will change the fit of the LE.
- The spar fill strip between rib #2 and #3 will need to be sanded such that it tapers from the lower #1 and #2 rib height back up to normal rib height. This is a small elevation change that will not be seen in the final covered and painted wing.
- Reinstall LE and check fit adjust as needed. Make a few alignment marks from ribs to LE so that the skin can be installed in this location once epoxy is applied.

### **BONDING LE TO WING:**

*Items needed per LE section installation:*

Mixing cups  
 Small glue brush  
 Bondo squeegee  
 10 ft of tacking strips  
 2 bungee cords  
 3 small ratchet straps  
 4 to 6 sticks 1" square x 48" long for even pressure under straps  
 staple gun with 1/2" staples  
 A willing helper

- LE skin installation is best done with 2 people. One will apply epoxy to the wing while the other will coat the inside of the LE.
- This procedure will be used for all LE sections. Refer back to this section as required for info on the bonding procedure.
- Make approximately 10 ft of tacking strips. These should be made from scrap 1/8" ply or paint mixing sticks. Cut to 1/2" wide. Splitting paint sticks lengthwise works well for this.
- Cover each tacking strip with clear 2" packing tape which will act as a release barrier so that the strips will not become bonded to the LE skin.
- Each LE section requires approximately 2 oz of T-88 for installation. Mix 1 oz. of T-88 in each of two small plastic unwaxed paper mixing cups.

- Level wing again and be sure there is no twist.
- Bungee or strap the wing to the horses so it does not move.
- Apply epoxy to the nose ribs, spar fill sticks and scarf joint on walk way ply top and bottom of the wing. Do the underside first and then the top side to avoid dripping.
- A second worker should apply a thin, even coat of T-88 to the entire inside of the LE skin. Do this by pouring a small amount into the bottom of the “V” and spread to the edges with a squeegee. Make sure 100% of the interior surface is covered with epoxy. This acts as both the bonding adhesive at the ribs and spar plus the internal sealer for the skin.
- Put skin in place on wing. Hold in place with 2 bungee cords. Align with marks.
- Slip 2 or 3 pressure sticks under the bungees on top and bottom. Space evenly between spar and front of LE.
- Install 3 ratchet straps around LE, over pressure sticks and around rear spar. Sung up but not very tight. Adjust strap and stick positioning for best pressure. Tighten straps for good snug pressure.
- Tap on front of LE with soft rubber mallet to be sure the skin is fully seated.
- Staple LE on through tacking strips along the spar and around each end.
- Wipe up any excess epoxy on back of spar and on end ribs.
- Recheck level of wing then let dry overnight.
- Remove straps, bungees, sticks, tack strips and staples. Take care to not damage the skin when removing staples.
- Sand each end flush to rib faces.

## **OUTBOARD SKIN:**

- Mark I strut bolt locations on rear of front spar so that they can be found later.
- Sand a ½” wide scarf in the mid span rib end of the previously installed inboard LE skin.
- Sand a matching scarf inside one end of the outboard skin to be fitted to the wing.
- Repeat fitting procedure as was used for inboard section. Mark, trim, fit, etc.
- Locate and cut wire exit hole as shown in kit instruction drawings.
- Locate pitot tube exit point and drill 1/8” center hole. This hole will be opened to proper size after LE is installed.
- Check wing is zero twist again, strap to horses.
- Prepare task strips, glue, etc as before.
- Install leading edge, glue, staple etc. Be sure to use tape or wax paper at scarf joint.
- After drying overnight, remove straps, sticks, strips and staples.
- Sand ends clean.
- Drill open I strut bolt holes.

## **UPPER WING:**

- The same prep as used on the lower wing is used for the upper wing LE installation. The wing needs to be level and straps down.
- The sections are installed in this order: Center Section, Inboard wing L & R, outboard wing L & R.
- Center Section LE Skin:
  - Fitting this skin is much like the inboard lower wing skin. This one is to be fitted flush with the center section tank bottom ply and tank cover ply. This will require sanding the nose ribs as was done at the inboard end of the lower wing.
  - A shim will be needed on the center section spar forward of the existing tank skin and shim. This shim will need to be 1/16" thick or as needed to make the LE skin flush with the tank skin. Note that 1/16" ply like used for rib gussets is actually slightly thicker than it is named. So, you will need to sand it to be the proper thickness.
  - The tank bottom skin will be scarf sanded as the walk way ply was on the lower wings. This is done on the **BOTTOM SKIN ONLY!** The upper skin is the removable tank cover and cannot be scarf sanded.
  - Sand a matching scarf inside the lower edge of the LE skin. Fit the skin to the SC tank bottom ply scarf.
  - Fit the upper edge of the LE skin to butt against the tank cover. The LE will need to be trimmed to fit up to the tank cover ply. A shim will be bonded to the spar as on the lower side to allow the LE to fit flush to the tank cover.
  - Bond upper and lower shim in place.
  - Fit trim and install CS skin as before on lower wings. Take care to **NOT** get glue on the tank cover.
  - After removing straps, strips and staples, sand the ends of the skin flush with nose ribs.
  - Sand a 1/2" wide scarf on both ends of CS skin.
  - Make and install a 3/8" or 1/2" thick block to the nose rib on each end of the CS skin. This block should be the same shape as the nose rib and extend 1/2 to 2/3 of the way back to the spar. It is there to give added structural support to the wing skin at that joint. Added glue area.

- Fit inboard skins. Notch as needed around wing strut fitting.
- Trim inboard end to match sweep and scarf joint.
- Sand scarf inside inboard end to match CS skin.
- Mark and trim outboard end and rear edges.
- Level wing and bond on as before.
- Strip and clean up then sand outboard end flush to rib.
- Sand Scarf on outboard end.
- Fit up outboard skin, trim inboard end to match sweep, scarf to match, etc.
- Trim rear edges and tip end.
- Locate and cut wire exit hole as shown in kit instruction drawing.
- Level wing and bond in place.
- Strip and clean up.