

Dakota Cub Aircraft

Tip Bow Installation Instruction

Read ALL instructions carefully before attempting any installation.

In preparation for the installation of the wooden tip bow, it is necessary to seal the wooden surface with a dope proof spar varnish. Epoxy varnishes are superior for this purpose and provide a very durable finish. Two coats are recommended, and after the installation process is complete, areas that have been cut or drilled should be resealed.

When removing the old bow it is advisable to mark all parts removed and return them to their original position on the wing. The aluminum brace channels should be inspected for cracks at each end. All steel parts should be inspected for damage, cleaned, and epoxy primed. The distance from the inside edge of the bow to the outside edge of the last drag strut should be recorded so the new bow can be installed to that dimension.

We have had the greatest success with tip bow installation when starting at the tail end of the outer aileron rib (1) and progressively work forward. There are three reasons for this:

1. The bows as supplied have been tapered toward the rear and this end is a reasonably close fit to the contour of the outer aileron rib. The tapers fit nicely and only a slight bevel needs to be added to the very end to fit properly.
2. The bows are usually manufactured several inches too long (to fit all models) and need to be cut to length on installation. The front end has not been tapered and in most cases is not adequately curved at the very end (they tend to be straight for the first few inches). This results in the bow contour not fitting the tip leading edge skin contour.
3. By fitting the aft end first you are able to maintain the correct distance to the aileron, keeping the rib tail parallel with the outboard end of the aileron.

After installation at the rib tail, install the bow onto the rear spar attach fittings making sure the bow is arched sufficiently to allow the tip rib to be aligned square with the outer aileron rib. Attach the aft portion of the tip rib, then proceed to the front spar attach fittings. At this point it is necessary to arch the bow to achieve the correct distance as indicated on the wing assembly drawing (or as previously recorded). This dimension varies between models. If you are working on a project that you did not disassemble, this dimension can be best estimated by the overall "look" to the curve as it rounds the front spar fittings. Continue to wrap the bow over the front tip rib, while maintaining square with the spar. Next place the bow over the top of the outer aileron rib. At this point the bow may be marked and trimmed to fit slightly longer (1/8 - 1/4) than the outer aileron rib. Remove the screws securing the nose section to the front spar and move the rib enough to enable the bow to be positioned under it. A slight notch filed in the wooden bow at the inside flange of the rib allows the bow to fit close to the rib surface. After reinstalling the rib attach screws, install a small flat head wood screw through the rib cap strip into the bow. The tip bow bracing can now be installed. The inboard ends are secured to the spars with standard rib attachment screws and the outboard ends are secured to the wooden bow with #6 x 3/8 truss head sheet metal screws.

Note: Not all Pipers had the "doubled" bracing. It is advisable to install the second brace to help stabilize the bow from distorting as the fabric tightens with age. This tightening condition has been known to pull the bow up and eventually distort it enough that it will fail at one of the spar attach fittings.

The tip leading edge skin can now be reinstalled with the outboard tip of this skin being nailed tip and bottom to the bow with 18-20 gauge cement coated nails. With the physical installation complete it is necessary to recheck the varnish for any areas that need re-coating. It is advisable to add varnish on the nails used on the tip leading edge skin and aft end of the outer aileron rib (Piper original rib). Make one last check for the proper aileron to outer aileron rib clearance and you are ready for fabric installation.