

# Pitts Model 12 Aileron and Cove Rigging

This procedure is used to set up and rig the ailerons and coves in HP Pitts Model 12 wings. Note that this procedure should be used before the precover test rigging procedure and again at final rigging after covering and paint is completed.

## **PREPARING THE WINGS:**

- Wings should be built as per the HP wing assembly instructions.
- Check all rib and cove block areas of the wings to be sure there are no bumps or wood parts protruding which would prevent the coves from fitting nicely.
- Check the alignment of each of the 4 three hinge sets (3 hinges per wing) making sure they are aligned both vertically and chord wise. This should have been addressed during wing assembly. Adjust as needed.

## **FITTING COVES:**

- The aileron coves are formed aluminum parts. These are provided with 3 hinge slots laser cut. Note the differences between the upper and lower coves.
- The coves are over bent slightly by design so that they will hug the wing and help hold shape during alignment with the ailerons.
- Select the correct cover for the wing being worked with. Trial fit it to the wing and note an amount to be trimmed from the inboard end of the cove. If the inboard end is too long, the cover will not slide onto the 3 hinge blocks.
- Trim inboard end as needed to allow the slots in the coves to center around the 3 hinge blocks. Up to 1/16" gap between the end of the cove and the wing rib is acceptable.
- Check the fit of the tip end of the cove. Trim as needed to best match fiberglass tip.
- Remove cove from wing and place on top of wing aligning the slots with the hinges and ends with the rib and tip. This should be at the rear end of the wing ribs. Mark the coves to indicate the location of the drag wire blocks. Attachment screws are to avoid the drag wire blocks.
- Draw a centerline down the middle of the concave part of the cove. Along this line note the drag wire block no drill areas. Use the existing jig forming holes as a centerline reference.

- Mark a hole spacing of 6 to 8 inches along this centerline avoiding the blacked out areas. Use the existing jig holes as 2 of the holes required.
- Install the cover to the wing once again.
- Find the drag wire in the Strut area touching the cove near the centerline portion of the cove. Press or tap on this spot to form a small dent in the cove.
- Remove the cove and cut a  $\frac{3}{4}$ " hole at this dent using a  $\frac{3}{4}$ " hole saw or uni-bit.
- Mark the center of the  $\frac{3}{8}$ " wide spar filler stick on the fiberglass wing tip and on the 2" wide ply over on the rib inboard of the aileron bay. These marks should extend out from the area of the wing wire the cove will cover.
- Reinstall the cove and see the protruding drag wire end. This is normal and will be on all 4 coves.
- Install #4x $\frac{1}{4}$ " screws in about half the holes along the centerline of the cove securing it to the cove block on the rear face of the spar.
- Install the aileron with all 3 hinge pivot bolts.
- Note there should be approximately .200-.225 gap between the cove and aileron at neutral but, the aileron will hit the cove when deflected to near full travel.
- Make about a dozen  $\frac{1}{16}$ " thick ply spacers approximately 1"x $\frac{1}{2}$ ". You can use scrap gusset material for this.
- Rotate the aileron nose up while inserting 6 shims between the nose of the aileron and the cove. Hold the shims in place with masking tape to the aileron.
- Continue to deflect the aileron until the chord line of the aileron is aimed directly at the sharp bend in the cove. Leave the aileron in this position.
- Transfer the marks for the center of the  $\frac{3}{8}$ " spar filler sticks to each end of the cove. These marks will be used to locate the screw holes.
- Flip the wing over and repeat the shimming, deflection to the sharp corner and marking at the spar filler.
- Remove the cove and layout a 4 to 5" hole pattern for the holes along the spar area of the coves, top and bottom.
- Note which wing this cove is fitted to.
- Reinstall cove and half center screws again.

- Using the ailerons and shims once again, install 4 or 5 screws on top and bottom of the cove.
- Check operation of the aileron and be sure it does not contact the cove.
- Repeat for remaining coves.
- When performing the precover test rig, all 4 coves and ailerons must be installed on the wings.
- Note a notch will have to be cut into the top of both lower coves to allow the slave strut to be installed. The notch should be large enough to have 1/8" min clearance to the slave strut through full aileron travel.

### **FINAL INSTALLATION AFTER COVER AND PAINT**

- Note, the coves are designed to be installed AFTER the wings are covered and painted. Do not install the coves on the wings prior to covering.
- The process for final installation of the coves is basically the same as the test fitting.
- Install all screws along the centerline.
- Use shims again to space the cove off the aileron.
- Install all screws along the top and bottom.