Service Bulletin 55

Subject: Wing Fold Mechanism

Applicability: All Sportsman Aircraft delivered before June 2006 with flap track recess cups.

Issue: Flap track interference with aft fuselage and drain pans at wing maximum fold.

Reference: Sportsman Assembly Manual Section IX, steps 25, 26, 29-32 (Mounting wings to fuselage and setting dihedral angle).
Drain pan installation instructions: p/n 632-0958-02

Compliance Time: Prior to first wing fold.

Note: Be sure to read the entire contents of this Service Bulletin to have a complete understanding of all the issues before proceeding with any action.

Discussion and Background Information:

Sportsman fuselages produced before August 2006 have two oval recesses located just behind the upper hatch covers for the purpose of providing clearance for the inboard flap tracks when the wings are fully folded. We have recently discovered that in some cases, the inboard flap tracks contact the fuselage slightly below the recess before the wing is fully retracted. If you never intend to fold the wings or do not ever intend to trailer the plane and therefore, don't need to attain a (road legal) wing fold dimension of 8'6" or less, you may ignore the procedures outlined in this Service Bulletin.

There are three possible remedies for flap track interference outlined below:

A.) Limit wing fold to a width of 13’ 4”.

Folding the wings to a tip-to-tip dimension of 13’ 4” leaves the flap tracks just outside of fuselage contact. This may be enough to gain optimization of shared hangar space for those not concerned with attaining a road-legal width of 8’ 6”.

If you have purchased the Wing Brace Kit 902-01050-01 you may exchange the (2) shorter strut weldments 201-51012-01 for (2) longer strut weldments 201-51011-01. Call or email the Customer Service / Parts department at 360-435-8533 X 221 or parts@glasairaviation.com to make arrangements for this exchange of parts.

B.) Increase dihedral angle to 2 degrees per side if you have not yet drilled the lift struts.

Increasing the dihedral angle from 1.5 to 2.0 degrees will lift the flap track approximately 3/8”, allowing clearance of the flap track into the oval recess cup. We discussed the possibility of making this modification with three aircraft design and aerodynamic engineers, who all agreed that this would be a positive change. In addition to resolving the wing fold issue, this change will lift the wing tip approximately 1.5”, which will force fuel to travel slightly more uphill before venting overboard. Thus, this should improve wing tip fuel venting. In addition, the increase in dihedral will provide a slight improvement in yaw stability. Based upon the above, we intend to change the dihedral angle to 2.0 degrees on future Sportsman aircraft and we will revise the Assembly Manual to reflect this change.

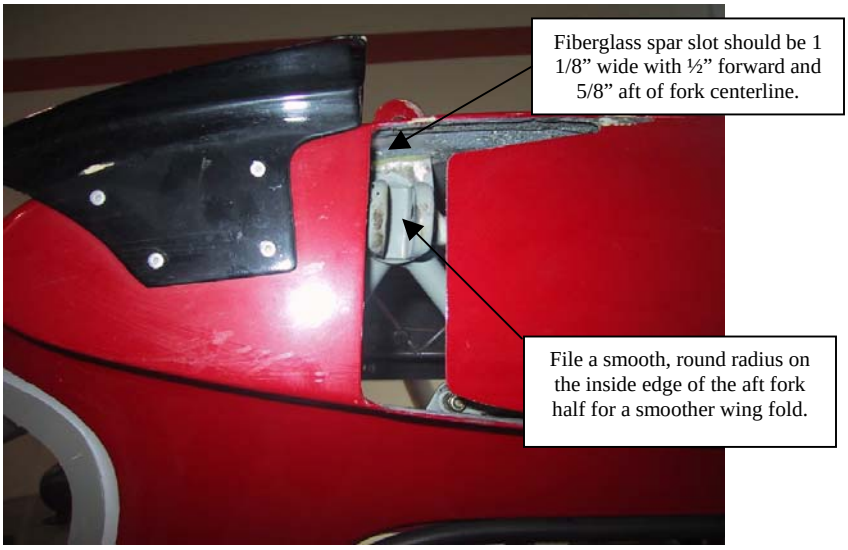
C.) Install a wider recess cup and cover plate.

For those who have previously set dihedral angle at 1.5 degrees, and have encountered flap track interference, we are producing a wider recess cup. This will involve enlarging the recess cutout on the fuselage to a maximum of 1" wider on the outboard sides. Note: The cover plate 101-00040-01 supplied is long enough to cover the extended cups if untrimmed. The joggle edge can be extended after the cover plate is in position, by waxing the cover plate, and filling in a mixture of body filler (Bondo®) up against the cover plate, and sanding flush with the fuselage. Call the Customer Service / Parts department at 360-435-8533 X 221 or parts@glasairaviation.com to order.

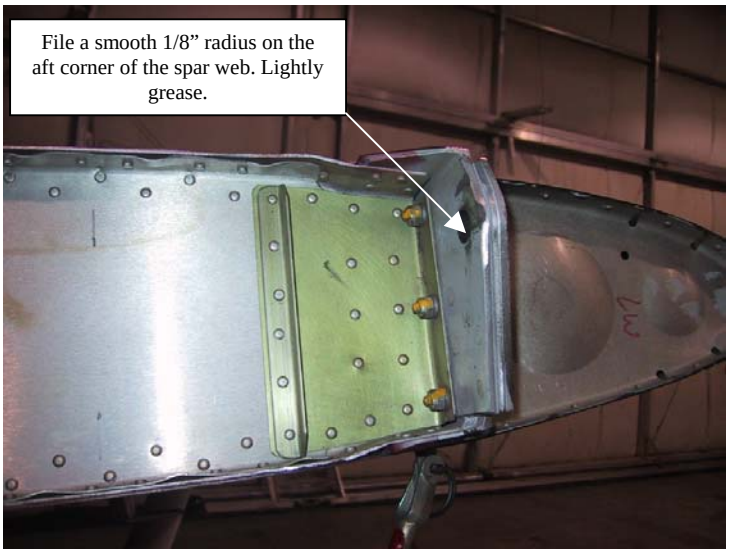
Extended Cup LH	101-00041-01
Extended Cup RH	101-00041-02
Cover Plate	101-00040-01

Pointers for achieving a smoother wing fold:

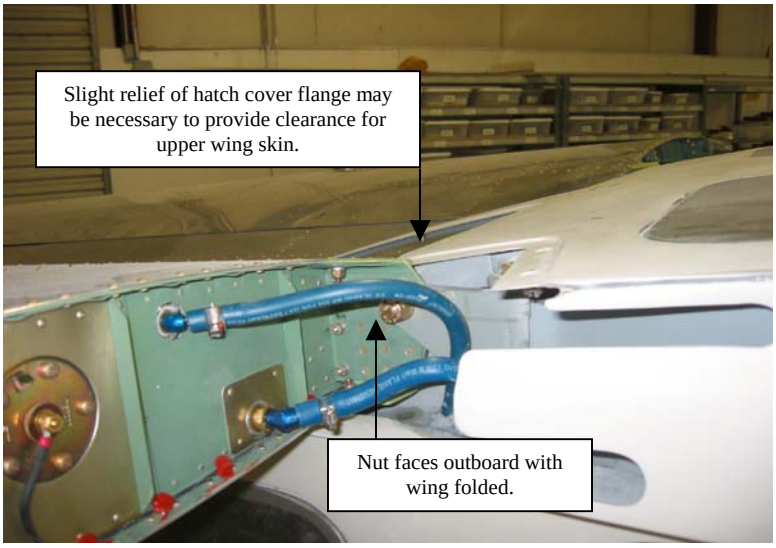
1) Be sure to have adequate clearance slots at the wing root for the main spar. The slot should be a minimum of 1 1/8" wide with ½" forward and 5/8" aft of the center of the cage fork.



2) When the wing folds, there is a slight tendency for the spars to shift or rack slightly aft (compounded in the taildragger configuration), hence the offset clearance slot for the main spar. When the wing is folded back to the fixed, flying position, there is a tendency for the main spar to have a slight offset interference with the edge of the cage fork. To remedy this, file a 1/8" radius on the aft edge of the main spar adjacent to the spar pin bushing as shown in the photo below. Likewise, file a radius on the aft slot edge to correspond with the spar radius contact. Apply a small amount of wheel bearing grease to the contact surfaces.



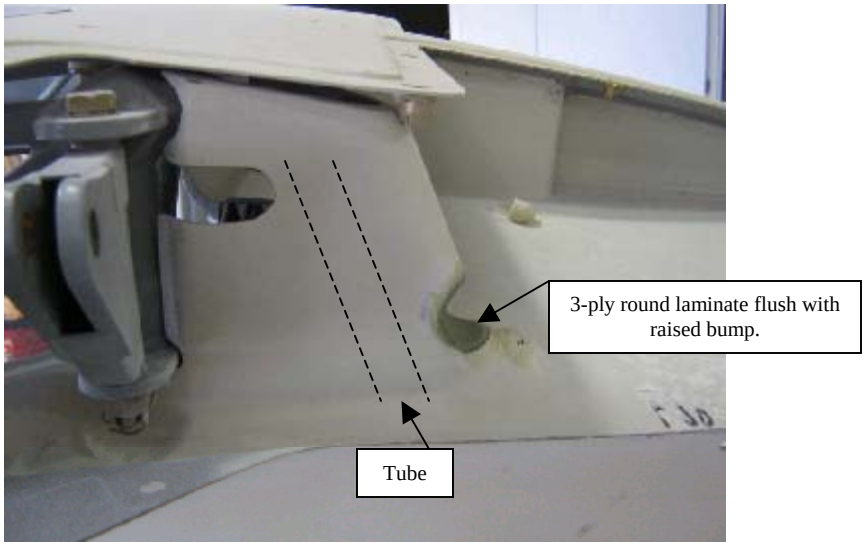
3) Be sure to have the head of the aft spar bolt at the pivot fitting facing aft. This will provide clearance from the cage and drain pans. Also be sure to torque the bolt firmly to minimize racking of the spar in the fitting.



4) Cut a piece of 1/16” thick rubber 1/2 x 1” and glue it in position with contact cement at the back of the cage fork to act as a cushion for the spar since it has a tendency to bottom against the back of the fitting when folding the wing.

5) During the first wing fold, note where the upper and lower wing skins make contact with fiberglass:

A) The lower trailing edge will contact the drain pan just above the bulge as in the photo below. Relieve this area with a 1” drum sander, being careful not to enlarge the notch beyond a 1” diameter. Wax a 1” tube and lay up a 3-ply laminate over the tube to cover 1/2 the circumference. Insert the cured, round ply into the recess until it contacts the steel cage tube, and bond in place. It is much easier to modify the drain pans before they are installed, but if already installed, simply mix up a small batch of resin, thickened with cabosil to serve as a paste adhesive. Tape the rounded ply in place and let cure. Sand the edges flush after cure.



B) The upper trailing edge of the wing will slightly make contact with the upper, aft edge of the hatch cover joggle. Carefully swing the wing to determine the contact point and relieve it with a 1” drum sander.

C) Be sure to plug the wing tank vents before folding the wings.

D) It helps to apply grease to the main spar pin and putting pressure in the center of the forward brace will often be enough to relax any resistance on the pin.

E) With both wings folded, the weight shift is enough to cause the tricycle Sportsman to tilt down onto the tail.

We installed a small "skid" type wheel to the tail for the purpose of moving the plane in the hangar with the tail down. The weight shift will catch you off-guard, so be sure to have a helper fold the wings with you, especially the first few times. Some have fabricated a tail dolly made from a plywood base 20" X 20" square with castoring wheels at each corner. With washers and wood screws, fasten a plastic 5-gallon bucket to the base and fill with cement. Insert a standpipe into the wet cement at the center of the bucket to correspond to the height in the tail and secure to the standpipe with some means of quick disconnect. The weighted dolly allows the plane to be more easily handled with folded wings.

Warning: Always check that the spar pin and safety pin are in place and the vent plugs are removed prior to each flight. We strongly suggest using a printed, laminated checklist for all pre-flight inspections.