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To: canard-aviators@canard.com

Subject: [c-a] EZE WING/SPAR INSTALLATION

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Hi Canardians-With more VariEzes coming out of garages, some thoughts on wing alignment and installation might still be in order. Some of this is also pertinent to LongEZs.

The main spar cannot be accurately installed to the VariEze fuselage without the wings correctly attached!--including tightening the taper pin bolts. This is because of the way the VariEze wing attach fittings are initially positioned by hand on each of the raw wing spars-there is room for slight differences between the two wings. This is not a problem though, if the wings are correctly positioned **RELATIVE TO EACH OTHER** for the raw center spar to be microed into place between them, per plans.

MATING VariEze WINGS TO THE CENTER SPAR:

1. Build the wings.
2. Build the raw center spar.
3. Read plans again. Position the wings relative to each other. I did this in the back of a friend's hanger.
 - a. Use the center-wingtop template provided in the plans. Duplicate it. Make two additional wingtop templates-one for the root and tip. Duplicate these. There are now three templates on each wing-use a level on all to determine how identical the two wings are.
 - b. Mark the waterlines on the root and tip. Attach wooden extensions (yardsticks or screen mold, etc) to extend the waterlines out a couple of feet fore and aft.
 - c. Then "fence" around the perimeter with string up to the wood strip waterlines and **WATERLEVEL** each string "plane"-root and tip, up to the appropriate waterline. One spanwise string in front of, and one behind for the wingroots, and an all encompassing rectangle for the tips. Temporary fence stanchions were used at the corners for the string. I used plastic buckets to hold up the wings. Try 'quarts' for the tips and 'fives' for the root, plus shims to get the anhedral right. Scooting them in or out raised the wooden waterline extensions up or down to the waterleveled string nicely. After all waterline extensions are leveled to the string, spend some time checking out the six wingtop templates and see what you have. "Five minute" or bondo the buckets to the wings and floor. (A waterlevel was made with a garden hose and two one foot clear plastic tubes from the hardware store.) I think LongEZs only need one string "plane".

There are probably better string and wing supports than those mentioned

above. Be creative. Care spent in this positioning exercise will make you happy later.

4. Carefully install raw VariEze center spar to wing attach fittings, per plans. Re-check positioning two dozen times, especially after the cat walks over the assembly.

INSTALLING MAIN SPAR TO FUSELAGE

1. Read plans again. Level the fuselage.

2. Install wings to spar, completely. Just dropping in the top taper pins is not enough.

3. When positioning spar/wing unit in fuselage, use WATERLEVEL, wooden waterline extensions and six wingtop templates while shimming and floxing the spar in place, per plans (including measurement between wingtips and nose). Check position of fuselage and wing/spar unit three hundred times, especially after the neighbor leans on the wing while telling you about his/her flying exploits.

Install winglets so that they both point up when the wings are on the airplane.

This would be a good time to confirm canard tip position relative to the waterleveled wings. Some choose to wait until this point to drill the canard attach holes.

All of this is in SUPPORT of the plans and CPs.

The above is just my opinion and I would encourage any useful additional input. I am not receiving the daily canard-aviator's email for now.

Best to you all---Bill
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