

# Annual Condition Inspection Guide

Date: \_\_\_/\_\_\_/\_\_\_

Aircraft: \_\_\_\_\_, Registration: N \_\_\_\_\_, TTSN: \_\_\_\_\_, TTSMOH: \_\_\_\_\_

Registration: \_\_, AW Cert: \_\_, W&B: \_\_, Limitations: \_\_, POH (Optional): \_\_

Engine: \_\_\_\_\_, TTSN: \_\_\_\_\_, TTSMOH: \_\_\_\_\_, TTSTOH: \_\_\_\_\_

Compression: Cyl 1: \_\_\_/80, Cyl 2: \_\_\_/80, Cyl 3: \_\_\_/80, Cyl 4: \_\_\_/80

Propeller: \_\_\_\_\_, TTSN: \_\_\_\_\_, TTSOH: \_\_\_\_\_

TXP Check: \_\_\_/\_\_\_/\_\_\_      ELT Check: \_\_\_/\_\_\_/\_\_\_ (If installed.)

**Notes:**

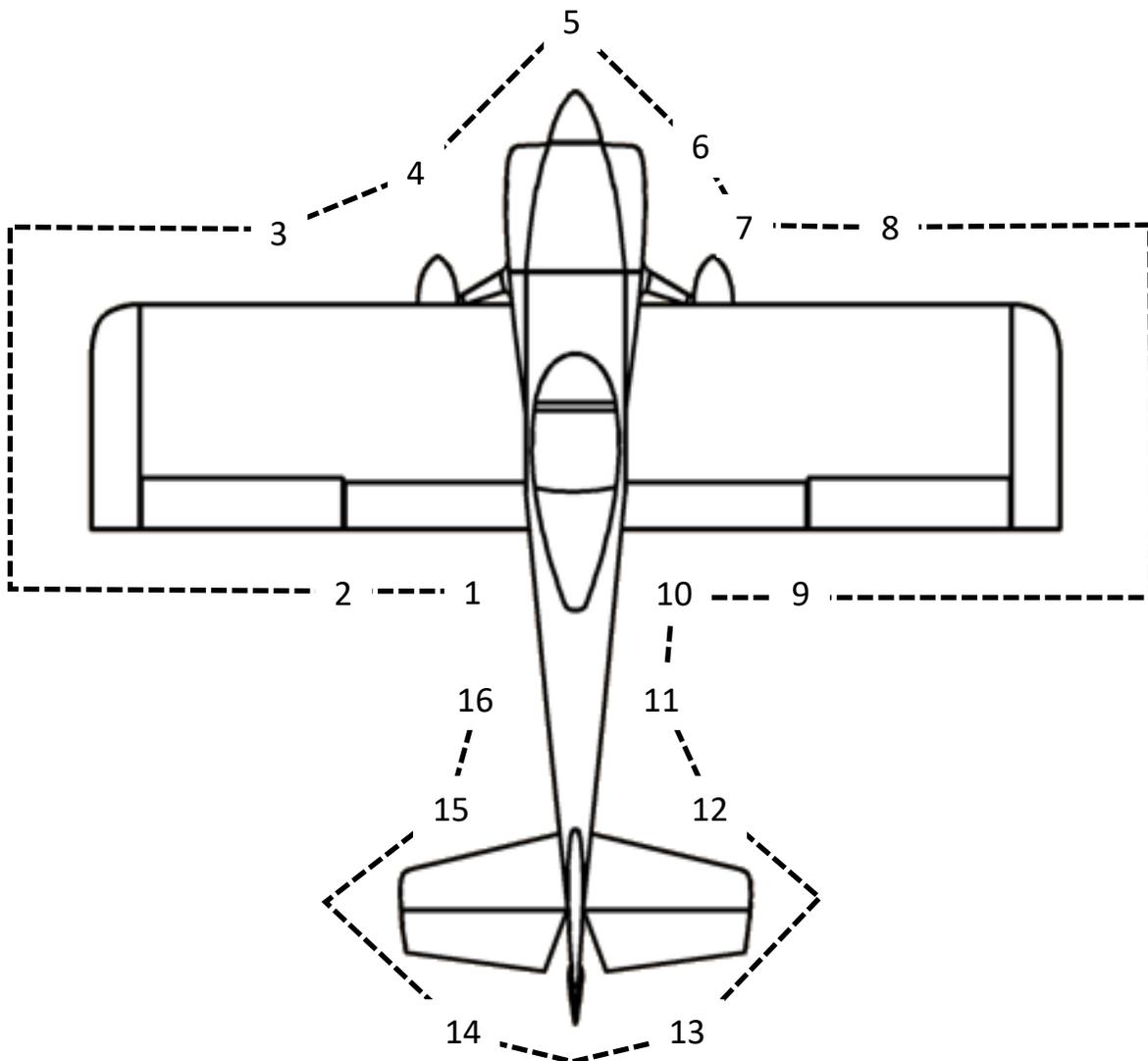
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12 – Right Horizontal and Vertical Stabilizer

- General appearance, OK.
- Forward spar attach bolts on VS, OK.
- Forward spar attach bolts HS, OK.
- Rear spar attach bolts, OK.
- Tip attached securely.

Notes:

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13 – Right Elevator

- General appearance, OK.
- Hinge jam nuts tight.
- Hinge bolts and nuts, OK
- Travel, OK with no clearance issues.
- Elevator horns properly attached.
- Travel is free with no loose play.
- Bell crank bolts properly installed
- Stick moves elevator in proper direction in relation to stick movement.

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14 – Rudder and Left Elevator

- Rudder general appearance, OK.
- Movement of rudder is free and to the stops.
- Clearance to VS, OK.
- Rudder cables installed properly and safetied.
- Rudder hinge jam nuts on rudder are tight.
- Rudder hinge bolts and nuts, OK.
- Rudder rear spar bolts and nuts attach, OK.
- Rudder bottom cap free rotating and not interfering with TW spring. (If TW.)
- Elevator general appearance, OK.
- Elevator hinge jam nuts tight.
- Tail wheel installation, OK. (If Installed.)
- TW springs installation correct and safetied.
- Elevator hinge bolts and nuts, OK
- Elevator travel, OK with no clearance issues.
- Trim tab moves freely.
- Trim tab hinge pin secured.
- Trim tab actuation cable/servo correctly installed.
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

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15 – Left Horizontal and Vertical Stabilizer

- General appearance, OK.
- Forward spar attach bolts on VS, OK.
- Forward spar attach bolts on HS, OK.
- Rear spar attach bolts, OK.
- Tip attached securely.

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16 – Left Rear fuselage

- General appearance, OK.
- Static port unobstructed.
- N number installed forward of HS or VS.
- Data plate installed and correct.
- Step installation, OK.
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- \_\_\_\_\_

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## Alt Belt Tension

**SLIP TORQUE METHOD:** This method consists of installing a torque wrench on the pulley retaining nut and measuring the amount of torque required to make the pulley slip. Turn the torque wrench in a clockwise direction, as viewed from the pulley end, and adjust belt tension accordingly.

SLIP TORQUE	SLIP TORQUE
BELT WIDTH.....NEW BELT.....USED BELT	
.....3/8 Inch	.....11 to 13 Ft.....Lbs. 7 to 9 Ft. Lbs.
.....1/2 Inch	.....13 to 15 Ft.....Lbs. 9 to 11 Ft. Lbs.

If a new belt is being installed the slip torque should be checked to the used belt specification after 1 hour operation, at 25 hours, and each 100 hours thereafter.

### Notes for inspector or builder/owner:

#### 1.SPAP BOLTS

Verify all spar bolts are installed.

Fuel tank-to-fuselage bolts are often too tight, too loose or not safetied. I have seen them all.

Watch the edge distance on the rear spar attach, be sure it is properly torqued/pulled tight and cotter keyed. Castellated nuts and cotter pins are required since this is a rotating surface. Fiber lock nuts are not allowed in this location.

#### 2. CLEARANCES

Many planes have control rods moving too close to structures. Aileron to bellcrank rods thru the rear wing spar and flap actuator rods thru the fuselage are the main ones, but there are other similar places on the plane. Have at least 1/16 inch clearance thru the entire travel, 1/8 inch would better. Watch for anything rubbing on the main aileron tubes inside the fuselage. Keep all wiring and antennae cables clear.

Control clearances are many times too tight. Flap to aileron, aileron to wingtip, elevator to horizontal stabilizer and the rudder horn. (1/8th inch, minimum.)

On a constant speed prop one can clamp a couple of boards to a blade and twist it to verify spinner clearance.

#### 3. CONTROL ANGLES

Many planes do not have enough elevator travel and/or too much rudder travel. Set the angles. Cut out material for the elevator stops and make the stops hit both sides even though they are many times offset and uneven. Build new rudder stops if you have to. Install the aileron stops. Some planes have none.

There have been instances of flaps popping out from under the wing when fully deployed. Look at the amount of flap under the wing and verify. More flap angle than specs is OK as long as it can not come out. The angle is set by the motor travel, not stops.

#### 4. FLIGHT CONTROL RODS

There should be no excess threads on rod ends. If both jamb nuts come loose the rod should not spin off a rod end.

Readjust, add an extra jamb nut, or build a new control rod if necessary.

Be sure there is no way something can go over center.

Ailerons with no stops and auto pilot controls are the places to look.

Check all jam nuts. Many times one or more are found loose on inspection. Mark across the nut and tube with a marker or inspection paint when checked for the final time.

Check and mark all control hardware.

#### 5. FUEL SYSTEMS

Watch out for builder changes to the plans. Aftermarket race car fuel pumps, gascolators after the electric pump on an injected motor, glass fuel filters, added tanks. Think things through carefully.

Loose fuel nuts. Check every one before first flight and mark them with inspection paint. More than one person has had a leak or performance problems from loose fuel nuts.

Fuel pickups should be right against the quick drain. It is easy to verify before adding fuel. Make sure all fuel system service bulletins are complied with.

Fuel selectors can be a common issue. Builders should verify all selector positions. Blow thru it and know what it does. Do not assume. It is also a good idea to run 5-10 gallons thru the lines in both positions.

Verify that you obtain idle/full throttle, full rich/mixture cutoff, and full prop. All controls should have slight spring-back. It is often necessary to drill a hole closer to the pivot on the fuel servo when a quadrant is used.

#### 6. BOLT SELECTION

Many times bolts are found with incorrect thread counts. You do not want a nut bottomed on the shank of the bolt or too few threads showing. The plans are sometimes off, use the correct length fastener for the application.

Horizontal front spar to fuselage seems to be a place for errors. It is the first place to check on the tail.

#### 7. ENGINE

There are many places here for problems. Clamps on the C/S oil line, non-safety wired alternator hardware, covers missing on battery cable ends, plug leads loose, exhaust brackets poorly secured, wire and hose runs unsecured, air intakes not safety wired, no drain hole in FAB/snorkel, missing snuffle valve, engine mounts incorrectly installed, etc. The engine compartment is a place for many small missed items. Look at other planes and use common sense.

#### 8. WEIGHT and BALANCE

Check it carefully and start out in the middle. Add baggage if necessary. First flight is not the time to experiment with the edges of the CG envelope.

#### FINALLY

Have a tech inspector that is very knowledgeable in RV's or several good builders in the area inspect the plane before first flight. Anyone helping to build the plane is a poor candidate for the inspection. A fresh set of eyes can find items repeatedly overlooked. Do not count on the DAR to check things well. It is the builder's responsibility to make sure things are right.