

Section O. Final Inspection Checklist

The purpose of this guide is to offer advice and guidance for the annual inspection of your aircraft. We have assembled an exhaustive checklist to provide a system for checking all nuts, bolts, fittings, safety wire, cotter pins, systems, etc. Unlike a normal preflight inspection, this checklist follows a system-by-system approach. The intent is to make you think about the entire system that you are checking and to make certain that nothing has been overlooked.

Whatever you do, the most important thing to do is think. While you are inspecting a system (flight controls, for example) think about what the system is supposed to do. Look for any reason that the system might not function as intended.

While no checklist can ensure that you built the aircraft correctly, there are certain things that should be paramount in your mind. Cotter pins and safety wire are incredibly important. A missing cotter pin is an accident looking for a time to happen. Throughout the history of aviation there have already been many pilots and aircraft that have come to grief because a cotter pin was left out. Don't add your name and N-number to the list.

While most accidents in a Kitfox™ tend to be more of the fender-bender type instead of the "smoking hole in the ground" type, you should not be involved in either. A review of the statistics of accidents involving homebuilt aircraft shows that engine failures play a role in about one out of three, and fuel system problems are most often cited as the cause. These problems include fuel contamination, obstructed fuel vents, incorrectly assembled or adjusted carburetors and linkages, carburetor ice, fuel system leaks, and fuel mismanagement.

Terms used in this checklist are defined as follows:

Security- Proper fastener torque or tightness, correct hardware, installation robust enough to withstand service loads.

Lubrication- Application of a lubricant as specified in the builder's manual.

Thread engagement- Rod end bearings are threaded in far enough to cover the witness hole in the bearing shank; also, fastener threads extend beyond the end of a nut.

Assembly- All required components are properly fitted together.

Operation- Device moves to the full extent of its required travel without binding, chafing, etc.

Freedom of movement- Smooth travel of pivots and bearings; also, making certain that opposing rod ends are not clocked so that they force each other to bind against their mountings (links and push-pull tubes should be able to rotate slightly without binding).

Chafe protection- Clamps or ties are in place to hold parts firmly to each other or firmly away from each other; also, sleeves or sheaths used for abrasion protection.

Routing- Wire runs and hose runs which prevent damage by heat, moving or vibrating parts, etc.; also, free from kinks, tension, or twists that might impair function.

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Remove the following items for inspection:

- Engine cowlings
- Spinner
- Seat pan
- Wing root fairings
- Tail access covers
- Stabilizer brace access panels
- Turtledeck
- Inspection covers
- Center console sides
- Aft floorboards
- Fiberglass wingtips (if attached with machine screws)
- Wheelpants, if installed
- Baggage compartment

ENGINE

Engine Controls

- Check engine end of throttle control for security and proper operation.
- Check cockpit end of throttle control for security and proper operation.
- Check engine end of mixture control for security and proper operation, if applicable.
- Check cockpit end of mixture control for security and proper operation, if applicable.
- Check engine end of propeller control for security and proper operation, if applicable.
- Check cockpit end of propeller control for security and proper operation, if applicable.
- Check carburetors for synchronization, if applicable.
- Check choke cables at carburetors for security and adjustment, if applicable.
- Check cockpit end of choke control for security and freedom of operation, if applicable.

Engine Oil System

- Check oil tank for security.
- Check all oil lines for routing around hazards, chafe protection, and attachment.
- Check oil cooler, if installed, for attachment security.
- Check magnetic plug and drain fittings, as applicable, for security, safety wire.
- Check oil filter for security.
- Check oil quantity and reinstall oil filler cap.

Engine Cooling System

- Check coolant reservoir for security, if applicable.
- Check all coolant lines for routing, security, and chafe protection, if applicable.
- Check cabin heat exhaust muff for security, ducting, and proper operation, if applicable.
- Check cabin heater for security and hose or duct routing, if applicable.
- Check engine baffling for security and seal condition, if applicable.
- Check coolant level and secure filler cap, if applicable.

Ignition System

- Check electronic ignition module brackets for security, if applicable.
- Check magnetos for timing and security and check P-lead connection, if applicable.
- Check ignition leads for routing and chafe protection.
- Check all spark plugs for proper torque (see engine manufacturer's manual).
- Reinstall spark plug leads on spark plugs and ensure tight connections.
- Check wiring and installation of ignition switch.

Induction System

- Check carb heat box for security, if applicable.
- Check carb heat actuator cable for security and proper operation, if applicable.
- Check carb heat ducting and clamps for security and chafe protection, if applicable.
- Check carb heat muff on the exhaust pipe for security, if applicable.
- Check engine air filter(s) for security.
- Check alternate intake air source for security and proper operation, if applicable.

Exhaust System

- Check each cylinder's exhaust flange nuts for security.
- Check the pipe-to-muffler connection for each cylinder.
- Check the muffler attachment brackets or springs for security.
- Check for adequate clearance between the exhaust outlet and lower cowl.

Spinner and Prop

- Check prop blade angle and adjust, if applicable.
- Check prop hub bolts and prop attachment bolts for proper torque.
- Safety wire prop attach bolts, if applicable.
- Install spinner and verify attachment security, if applicable.
- Check for positive clearance between spinner and cowl.
- Check propeller governor for proper operation and security, if applicable.

Engine Electrical

- Check starter cable connection for security.
- Check starter cable for proper routing and chafe protection.
- Check alternator wires for routing and chafe protection.
- Check all wiring that passes through the firewall for chafe protection.
- Check engine ground cable for security (both ends).
- Check engine instrumentation wiring for security, routing, and chafe protection.

Engine Miscellaneous

- Check engine mount and associated hardware.

AIRFRAME

Primary Flight Controls

Rudder

- Check rudder hinge rod ends for proper thread engagement, lubrication, attachment hardware security, check nut security, and freedom of movement (3 places).
- Check rudder cable links for proper hardware, security, and cotter pin (one per link).
- Check the rear rudder cable eyes and sleeves for proper swage.
- Check the four rudder cable pulleys at the base of the rear seat bulkhead for security, freedom of movement, and anti-derail cotter pins.
- Check the front rudder cable adjustment links for proper hardware and assembly, adjustment, and cotter pin (one per link).
- Check the front rudder cables eyes and sleeves for proper swage.
- Check the rudder pedal torque tube mounting brackets for security.
- Check the rudder pedal return springs for proper installation and condition.

Horizontal Stabilizer and Elevator

- Check all elevator hinge points for proper assembly, lubrication, hardware security, and freedom of operation.
- Check rear elevator push-pull tube rod end for proper thread engagement, attachment hardware security, lubrication, check nut security, and freedom of movement.
- Check stabilizer brace attachment at the stabilizer for security, both sides.
- Check stabilizer brace attachment hardware at the fuselage for security, both sides.
- Check stabilizer brace rod ends for proper thread engagement, lubrication, freedom of movement, attachment hardware security, check nut security, both sides.
- Check the rear stabilizer attachment point for proper assembly and hardware security.
- Check the front stabilizer attachment point for proper assembly and hardware security.
- Check elevator trim system for proper assembly, attachment hardware security, lubrication, check nut security, and freedom of movement.
- Check elevator trim control assembly for proper lubrication, freedom of movement, and hardware security.

Flaperons

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- Inspect flaperon for cracks, dents, or damage.
- Check flaperon drain holes are free of obstructions.
- Inspect the flaperon mass balance weights for security.
- Check the flaperon hinges for proper hardware, security, lubrication, and freedom of movement.
- Check the flaperon control horns for proper installation, security, and freedom of movement.
- Check flaperon connect tube top rod end bearings for security, lubrication, thread engagement, horn attachment security, check nut security, and safety clip (one per rod end).
- Check flaperon connect tube bottom rod end bearings for security, lubrication, thread engagement, and check nut security.

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Cabin Area Controls

- Check both control sticks for security and freedom of movement.
- Check control stick connect tube rod end bearings for security, lubrication, check nut security, thread engagement, and freedom of movement.
- Check control column bearing block for security.
- Check control column mounting bracket for security.
- Check control column travel stops for adjustment and check nut security.
- Check left control stick pivot-to-bellcrank link for thread engagement, lubrication, security, check nut security, and freedom of movement.
- Check aileron idler bellcrank for security, lubrication, freedom of movement, and cotter pin.
- Check aileron push-pull tube rod end bearings for security, thread engagement, lubrication, check nut security, and freedom of movement.
- Check the mixer idler bellcrank for security, lubrication, and freedom of movement.
- Check the aileron actuator link for rod end thread engagement, check nut security, lubrication, hardware security, and freedom of movement.
- Check aileron bellcrank pivot pin retaining straps for security.
- Check elevator forward connect tube rod end bearings (between the control column and idler bellcrank) for security, thread engagement, lubrication, check nut security, and freedom of movement.
- Check the elevator idler bellcrank for security, lubrication, freedom of movement, and cotter pin.
- Check the forward rod end bearing on the aft elevator push-pull tube for security, thread engagement, lubrication, check nut security, and freedom of movement.
- Check flap handle assembly for security, proper operation, lubrication, and cotter pin.
- Check flap connect tube rod end bearings for security, thread engagement, lubrication, check nut security, and freedom of movement.
- Check flaperon mixer assembly pivot bolts for security, lubrication, freedom of movement, and safety wire (1 place per pivot).

Fuel System

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- Check wing tank fittings for security.
- Check sight gauges for condition, leaks, and fitting security.
- Check drain fittings for security, leaks, and proper operation.
- Check hose clamps for security.
- Check routing of hoses to header tank (flow must be continuously downhill in flight attitude).
- Check hose routing to header tank for security, service loop, and chafe protection.
- Check vent line to be free from kinks or restrictions.

Left Wing

- Check wingtip for security, if installed.
- Check lift strut rod ends for security, thread engagement, lubrication, and check nut security.
- Check lift strut attachment at the fuselage for security and cotter pin (one place).
- Check all four jury strut attachment points for hardware security.
- Check the front spar pin for security and lock pin.
- Check the rear spar pivot bolt for security and cotter pin.

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Right Wing

- Check wingtip for security, if installed.
- Check lift strut rod ends for security, thread engagement, lubrication, and check nut security.
- Check lift strut attachment at the fuselage for security and cotter pin (one place).
- Check all four jury strut attachment points for hardware security.
- Check the front spar pin for security and lock pin.
- Check the rear spar pivot bolt for security and cotter pin.

Landing Gear

Main Gear

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- Check the gear mount pivot block for proper assembly and security.
- Check roll pins (inboard of pivot blocks) for security.
- Check axle mounting bolts for security.
- Check wheel bearings for lubrication.
- Check axle nut for proper pre-load and cotter pin.
- Check wheel through-bolts and nuts for security.
- Check tire for proper inflation.

Tailwheel

- Check tailwheel spring mounting bolt for security and cotter pin.
- Check tail spring clamp bolts for security.
- Check tailwheel assembly mounting bolt for security.
- Check tailwheel steering chains and springs for security.
- Check tailwheel wheel bearing for lubrication.
- Check tire pressure for proper inflation, if appropriate.

Nose Gear

- Check nose gear pivot brackets for security and proper lubrication.
- Check top bolt on shock strut assembly for security.
- Check rod end bearing at the bottom of the shock strut assembly for security, thread engagement, lubrication, check nut security, and freedom of movement.
- Check nose wheel fork Belleville washer stack for proper assembly.
- Check nose wheel fork axle nut for security, proper preload, and cotter pin.
- Check that the moisture barrier plug is intact at the bottom of the nose gear strut.
- Check nose wheel fork for lubrication, freedom of movement.
- Check nose gear wheel bearings for lubrication, proper preload, freedom of movement, and cotter pins.
- Check wheel through-bolts for security.
- Check tire for proper inflation.

Brake System

- Check brake pedals for security and freedom of movement.
- Check each master cylinder for security, check nut security, and cotter pins (2 places per cylinder).
- Check fittings on each master cylinder for security.
- Check reservoir attachment and fittings for security.
- Check reservoir for proper fluid level.
- Check reservoir plug to ensure vent hole is unobstructed.
- Check lines between master cylinders and reservoir for security, routing, and chafe protection; recheck with the rudder pedals in their extremes of travel.
- Check lines from master cylinders to wheel cylinders for security, routing, and chafe protection; recheck this with the rudder pedals in their extremes of travel.
- Check wheel cylinder fittings for security.
- Check wheel cylinder caliper pins for security and lubrication.
- Check wheel cylinder brake pad mounting bolts for security.
- Check brakes for proper operation, firm pedal pressure, and free from leakage.

Miscellaneous

Electrical

- Check battery for security, liquid level, vent caps tight, vent tube open, and connections are tight.
- Check master solenoid for security, tight connections, and proper operation.
- Check all panel-mounted devices for security, labeling.
- Check each circuit one at a time for proper operation.
- Check panel wiring for security, routing, and chafe protection.
- Check airframe wiring for security, routing, and chafe protection.
- Check landing light (if installed) for security and proper operation.

Pitot-Static System

- Ensure static port is secure and free from obstructions.
- Check static port fitting security and line routing.
- Check static fittings on the flight instruments for security.
- Check pitot tube is installed securely and free from obstructions.
- Check pitot line to airspeed indicator for security and routing.
- Check pitot fitting on airspeed indicator for security.

- Check engine instruments for proper range markings.
- Ensure magnetic compass card is filled out.
- Verify weight and balance and paperwork are complete.

Miscellaneous

- Check door attachments for security and cotter pins (2 places per door).
- Check door gas spring for security, safety clips, and proper operation.
- Check door latches for security and proper operation.
- Check seat belts for security.
- Check windshield and skylight for security.
- Check that required passenger warning placard is displayed.
- Check that the airspeed range markings are displayed.
- Check all installed antennas for security and tight connections.
- Check tail skid for security, if applicable.
- Check cargo compartment and cargo restraint system for security.