

SECTION 4 - CONSTRUCTION DETAILS

FUSELAGE

The KITFOX fuselage is a rigid structure built of 4130 chrome molybdenum steel tubing. The wire used in the MIG welding process has higher tensile strength than the tubing. The gas mixture used enhances ductility and rust resistance. Critical areas such as the strut attach points are stress relieved in the jig. Most control parts are TIG welded for a neater appearance.

Many KITFOX builders use Stits Epoxy Chromate Primer to protect the steel fuselage and other steel parts against rust and corrosion. Since about November 1, 1990, Denney Aircraft Company has offered as an option a baked-on "powder coat" finish available in any of several colors.

The fuselage is covered with 1.8 oz./yd² Dacron bonded to the frame with Stits Poly-Tac, heat-shrunk and sealed with Stits Poly-Brush. Most builders use Stits Poly-Spray as an ultra-violet light barrier and undercoat, and Stits Poly-Tone and Aero-Thane to provide a beautiful, durable finish coat.

LANDING GEAR AND BRAKES

The KITFOX landing gear is of conventional design with 4130 chromoly main gear weldments and rubber bungees. The main wheels use 20" x 7.00" x 8" balloon type tires that have been buffed smooth. Inflation pressure of 7-9 psi (pounds per square inch) allows soft landings and uniform tire wear. Each KITFOX kit includes a steerable, full swiveling tailwheel. Some early Model 1 KITFOX are equipped with cable-operated mechanical drum brakes, but virtually all Model 2's, 3's and Model 4's are equipped with hydraulic disc brakes.

NOTE: Use only MIL SPEC H-5606A Brake Fluid in the hydraulic system. Do not use automotive brake fluid or hydraulic fluid, it is not compatible with the seals in aircraft brakes.

CONTROL SYSTEM AND SURFACES

The vertical fin, rudder, horizontal stabilizer, and elevator are all built of tubular 4130 chromoly steel tubing and are fabric covered. The control surface hinges have polyethylene bushing inserts, so do not require lubrication. Steel struts brace the horizontal stabilizer to the fuselage.

The KITFOX is equipped with full span flaperons that function both as flaps and as ailerons. The flaperons have a 7/8 inch tubular aluminum spar and are covered with an aluminum skin bonded with an aerospace adhesive to high-density foam ribs. The flap control lever is in the center of the cabin in front of the seat where it is readily accessible to either pilot. It is used to adjust flaperon deflection from 0° to 25°. The flaperon handle serves as the pitch trim control. Small adjustments of the flaperon angle of attack (AOA) changes the center of pressure of the wing, allowing the operator to match the CG with the center of pressure for trim control, from approximately 55 mph and up. The flaperon handle hinges on a friction pad that allows smooth adjustment of the flaperons and holds the flaperon handle wherever it is set.

The full span flaperons also serve as ailerons. They are mounted from metal attach brackets and positioned behind and below the trailing edge of the wing so they provide powerful roll control even after a good portion of the wing has stalled. Aileron input from the stick and flap input from the flaperon control handle are coordinated through the unique differential aileron control system, located behind the seat, to allow full aileron action at any flap setting. The flaperons are hinged near the center of pressure, so aileron control forces are light. With the 2:1 differential aileron control system the aileron deflection is 25° in the up position and 12.5° in the down position.

The flaperons and elevator are linked to the dual control sticks by a system of bellcranks and push-pull tubes with aircraft quality rod ends. Aircraft quality 3/32" diameter cables connect the rudder to the rudder pedals.

A vernier type throttle control, similar to ones used on many other aircraft, is provided as standard equipment in the KITFOX kit.

WINGS

Several factors contribute to the extraordinary short-field performance of the KITFOX. One of these is the unique design of the wing. It is a laminar flow airfoil equipped with full-span flaperons. Distinctive fiberglass drooped wingtips enhance the slow flight characteristics of the KITFOX.

The two spars are identical 2.5-inch diameter tubes of 6061T6 aluminum, with 4 1/2-foot long "I-Beam" type internal stiffeners riveted in place over the strut attach points. A tapered leading edge over the front spar forms the leading edge of the wing. Aluminum diagonal braces between the

spars contribute to the structural integrity of the wing. They are anchored to the spars with steel brackets riveted in place. The wooden ribs also serve as compression struts and are bonded to the spars with epoxy structural adhesive. The adhesive used is 3M "Scotch-Weld", an extremely durable and strong adhesive that is widely used in the aircraft industry. The wing is covered with dacron fabric bonded to the ribs, leading edge and trailing edge with Stits Poly-Tac, then heat-shrunk and sealed with Stits Poly-Brush. Most builders elect to finish the wing with Stits Poly-Spray, the "silver" coat that protects the wing against deterioration caused by ultra-violet radiation, and Poly-Tone or Aero-Thane color coats.

FOLDING WINGS AND TOWABILITY

The wings of the KITFOX can be folded alongside the fuselage so the airplane can be stored in a small space. With the wings folded the airplane is less than 8 feet wide and can be towed on its own gear from the airfield to your garage or carport. This convenient feature of the KITFOX eliminates hangar rental, tie-down fees, exposure to weather and to a great extent, worries about theft and vandalism. The KITFOX wing hinges on the rear spar and the lower lift strut attach point. With practice, the wings can be folded in only 4 or 5 minutes.

NOTE: Do not fold the wing with a full wing tank. Fuel may overflow through the cap or vent and onto the wing. Do not tow the aircraft with more than a couple of gallons in each wing tank as the weight of the fuel puts undue stress on the unsupported wing.

The optional towbar straddles the tailwheel and attaches to the fuselage with two pins. Attachment takes about 3 minutes and you are ready to go! The airplane should not be towed on its own gear for long distances (more than 10 miles). But for trips to the airport at moderate speeds the towbar works fine. For longer trips, the KITFOX can be carried on a trailer without undue stress or wear. Take the weight and stress off of the tailwheel by blocking up the tail at the tailwheel spring area. Denney Aircraft Company offers, as an option, a trailer similar to the one on which we have hauled our own demonstrators tens of thousands of miles without damage. If you build your own trailer, be sure to build a bracket to support the tail during transport. This will prevent straightening or breaking the tailspring.

ENGINES, GEARBOXES AND PROPELLERS

The standard KITFOX engine is the liquid-cooled Rotax 582LC or the Rotax 912 (also liquid-cooled).

The Rotax 582LC is cooled by ram air through a specially designed radiator mounted on the belly of the KITFOX. This fine engine produces 65 h.p. at 6800 rpm. It is a 2-cylinder 2-cycle engine with dual electronic ignition (capacitor discharge) and has an oil injection system to provide lubrication. The Type "C" gearbox, with a 3 to 1 reduction ratio, is standard with the 582. The 582LC Rotax engine-gearbox-prop combination produces about 375 lbs. of static thrust, which is outstanding in relationship to the empty weight of the airplane compared to many other types of aircraft. The Rotax 582 engine is equipped with dual Bing carburetors. For more complete information an operator's manual is supplied with each engine.

The Rotax 912 produces 80 h.p. at 5500 rpm. It is a 4-cycle, 4-cylinder, horizontally opposed engine designed specifically for aircraft use. It has dual electronic ignition with two breakerless capacitor discharge systems completely independent of one another. The reduction unit is integral to the crankcase and the standard gear ratio is 2.27 to 1. The cylinders are air-cooled and the cylinder heads are liquid cooled. The Rotax 912 produces about 435 pounds of static thrust. The Rotax 912 engine is equipped with dual Bing carburetors. The kit includes a carburetor heat system similar to those used on normally aspirated engines in many certified airplanes. See the Rotax 912 Operators Manual, supplied with the engine for more complete information.

A 68 inch diameter 3-blade wooden ground adjustable pitch propeller is standard equipment for the KITFOX with the Rotax 582LC engine and Type "C" gearbox.

A 68-inch diameter 3-blade wooden fixed pitch propeller is supplied with the Rotax 912 engine. A ground adjustable pitch prop is available.

FUEL SYSTEM

The standard fuel cell for the KITFOX equipped with the Rotax 582LC fits between the firewall and the instrument panel and has a capacity of 9.75 U.S. gallons. It is rotationally molded of cross-link polyethylene, a very strong and durable material that withstands extremes of cold and heat. The fuel tanks of many new cars are made of this material, as are the familiar red Fire-Marshall approved "jerry" cans. The standard fuel tank cannot be used if the optional Rotax 912 engine is installed, so the builder must use any of several possible wing tank configurations and the 1 1/2 gallon header tank.

Optional 6 gallon and 13 gallon fiberglass wing tanks are available. One or two wing tanks may be installed in conjunction with the standard fuel tank, or the standard fuel tank may be replaced by a 1 1/2 gallon cylindrical aluminum header tank. Generally, aircraft equipped with the Rotax 582LC will have the header tank installed on the back side of the firewall, while those with the Rotax 912 will have the header tank attached to fuselage crosstubes behind the seat.

Each wing tank has its own shut-off valve to control fuel flow into the standard tank or header tank, there is also a (primary) fuel shut-off valve at the firewall.

The 582LC fuel pump is vacuum operated and the 912 fuel pump is mechanical. They each pump fuel from the standard tank or header tank to the carburetors.

ELECTRICAL SYSTEM

The Rotax 582LC has a 12 volt built-in alternator that produces 170 watts @ 13.5 volts, and a 12-volt starter. A battery, regulator/rectifier, relay, and keyed start switch are included in the kit. The 12 volt battery is mounted in the fuselage aft of the seat, or on the firewall if dual wing tanks and header tank are installed. A master switch activates the system. The 582LC engine features a dual ignition system with breakerless capacitor discharge (CDI).

The Rotax 912 has a 12 volt, 22-amp, 270 watt generator and a 12-volt starter. A battery, regulator/rectifier, relay, and keyed start switch are included in the kit. The battery is mounted aft of the seat. The 912 is equipped with dual CDI (capacitor discharge ignition).

FINISH

The fabric supplied with the KITFOX kit is 1.8 oz/yd² dacron. Stits Poly-Tac and Poly-Brush are provided to secure the fabric to the airframe and seal the fabric after it has been heat-shrunk. Most builders elect to provide ultra-violet protection for the fabric by applying Stits Poly-Spray, which also serves as a sanding base for the color coats of Stits Poly-Tone or Aero-Thane.

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