



MEMORANDUM OF RECORD

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Air Safety Investigator
Eastern Region

Date: Monday, March 5, 2018
NTSB Accident Number: ERA18LA082

Subject: Mosquito XEL Specifications (Screenshot of Mosquito Helicopter Website)¹

MOSQUITO XEL

ULTRALIGHT AND EXPERIMENTAL HELICOPTER

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Mosquito XEL Helicopter

The Mosquito XEL is especially developed to meet the legal limit for an ultralight helicopter designation in the USA.¹ As such, no pilot certificate is required to fly the XEL in the US. But please note, that one must know how to fly a helicopter before attempting to fly the single-place Mosquito. The XEL is an exact copy of the Mosquito XL, but comes with floats, a vertical stabilizer and the fuel capacity is reduced to 5 US gallons (18 Ltr).

Although the Mosquito XEL will float on calm water, it is not recommended that one operate on water. Depending on the water activity, mast-bumping or even a boom-strike is possible.

The Airframe

The Mosquito XEL airframe is a unibody construction made entirely of high quality fiberglass in a vinyl ester matrix. Body and structure are the same to minimize weight and maximize structural efficiency.

The Engine

Compact Radial Engine's - MZ202, 60-hp, powers The Mosquito a two cycle, two-cylinder engine with the highest power to weight ratio on the market today. This engine employs Reed Induction which yields a very flat torque curve ensuring power is delivered constantly over the required operating range. The MZ202 also has a lower operating speed of 6000 rpm when compared to other engines with similar power range that typically operate at 6500 to 7000 rpm resulting in less stress on the engine and improving reliability. The complete engine package only weighs 69 pounds and comes with a 180-watt alternator that provides power to run the electrical system, which also features an electric start system.

The Power Train

The primary reduction is bolted directly to the engine. A centrifugal clutch on the engine crankshaft permits startup of the engine without the load of the rotor. Power is transmitted from the clutch to the driven pulley of the reduction through an HTD cog belt, one of the highest power to weight ratio power transmission methods available. The driven pulley houses the sprague clutch which permits the rotor to overrun the engine during autorotation.

The Rotor System

¹ Yellow highlight boxes added to show specific specifications regarding ultralight legality.

The Rotor System

The main rotor is a semi-rigid configuration. Main rotor blades consist of an aluminum spar bonded to a wrapped aluminum sheet skin. Foam plugs at both ends prevent interior contamination and pumping losses. The tail rotor is also of a semi-rigid configuration with aluminum skin wrapped around a tube and foam plugs at either end. A 45 degree drag hinge is utilized to maintain tail rotor alignment.

The Control Systems

The control system is unique to the Mosquito. Main rotor control is achieved from the floor mounted joystick and collective through a control mixer in the base of the main mast, then through push tubes in the mast up to the base of the swash plate. The swash plate is contained within the mast and is supported by a push tube located in the rotor shaft. Control rods on either side of the push tube transmit inputs through the rotor shaft to the control lever on top of the rotor shaft and then down to the blade pitch horns through pitch links. The tail rotor is controlled by the foot pedals through a push pull cable to an actuating lever on the tail rotor shaft.

The Specifications

Airframe length	4,90 m / 16,00 ft
Overall Length	6,50 m / 21,50 ft
Width	1,57 m / 62,00 in
Height	2,13 m / 84,00 in
Main Rotor diameter	5,90 m / 19,40 ft
Tail Rotor diameter	1,02 m / 40,00 in
Empty Weight	142 kg / 314 lb
Gross Weight	265 kg / 584 lb
Useful load including fuel	123 kg / 270 lb
Main Tank Capacity	19 Ltr / 5 US GAL
Optional Aux Tank Capacity	n/a
Engine Type	MZ202, 2-cycle, 2-stroke
Engine Power	45 kw / 60 hp
Electrical System	12V DC, 180W alternat.
Main Rotor Speed	540 rpm
Tail Roto Speed	2450 rpm
Fuel Consumption @ cruise	19 L/hr / 5 US GAL/hr
Flight time (max.) without aux tank	1.0 hour
Flight time (max.) with aux tank	n/a
Hover in ground effect (est.)	8000 ft
Hover out of ground effect (est.)	6500 ft
Climb rate (est.)	900 ft/min
Cruise Speed	112 kmh / 70 mph
Max Speed	128 kmh / 80 mph
Floats	YES

The Instruments

The Mosquito XE comes with a basic instrument setup. Actually all you need and which fit into the US ultralight category as well.

1. Altimeter and Airspeed Indicator from MGL Avionics (Model ASX-2)
 - Precision altimeter for ~700 ft up to a maximum of 30,000 ft
 - The altimeter can display altitude in feet or meters. Local pressure can be set in millibars or inches or mercury
 - Airspeed ranges from 16 to 250mph Airspeed can be displayed as IAS or a calculation based TAS
 - Includes a 24 entry automatic flight log
 - Includes an air-distance trip counter and a flight timer
 - Airspeed units can be in miles per hour (mph), kilometer per hour (kph) or nautical miles per hour (knots)
 - Contains a programmable low/high airspeed alarm
 - Records maximum airspeed and altitude reached in permanent memory

