

Jabiru LSA : Handling Notes

Introduction

These handling notes are based on flying a Jabiru equipped with the Jabiru 2200 85 hp air cooled, fixed drive engine, fitted with a fixed pitch wooden propeller. The aircraft is of mainly composite construction. The surface finish is excellent. The Flight Manual supplied by the manufacturer should be read in conjunction with these notes. This Manual is rather thin on aircraft flying qualities, but Jabiru engine handling, safety, and airmanship topics are covered thoroughly. The Jabiru LSA is certificated for flying training in Australia.

Cockpit and Flying Controls

The cockpit is roomy with plenty of shoulder and leg space. The side by side seats are not adjustable. The ailerons and elevator are controlled by a single centrally mounted stick between the pilots seats which comes to hand easily. Dual throttle levers are fitted to the front of the seats between the pilots' legs. This arrangement makes it difficult to see the exact position of the throttle setting at a glance. There is no throttle friction device. The unusual layout of stick and throttles quickly becomes perfectly natural to use, but for flying instruction the single centrally mounted stick could be a disadvantage in some circumstances. The field of view is what one might expect from a high wing monoplane. As with many high wing monoplanes it is not possible to see either above or behind the aircraft. A 65 litre fuel tank is fitted in the cockpit behind the seats where the fuel contents can be seen clearly. Apart from useful small recesses under the seat cushions, and side pockets in the cockpit doors, the only storage space is behind the seats around the fuel tank from which small items could migrate to the rear fuselage area unless some form of net or retainer is fitted.

Taxying

The steerable nose wheel is operated by moving the rudder pedals and makes taxiing straightforward. The main wheel brakes operate hydraulically via a hand control mounted on the central consol. A wheel brake parking catch is fitted. When turning on soft surfaces, with Standard Wheels fitted, use of the wheel brakes and nose wheel steering together tends to make the wheels slide and the turning radius diameter is then increased. The normal minimum turning radius is around 20 ft. Minimum radius turns are achieved by using nose wheel steering and careful application of power without brake application. The turning

radius in both directions is about the same. The view ahead and to each side while taxiing is virtually unobstructed. The main wheels can just be seen with the cabin doors closed.

Take Off

The flaps should be set to the first stage for take off. A gentle swing to the left on starting the take off run, due to P effect, is easily controlled with rudder. The nose wheel should be raised at 45 KIAS and the aircraft flown off at 55 KIAS. Achieve 65 KIAS and when established in the climb, and at around 200 ft, raise the flaps and continue the climb at 70 KIAS. There is a mild nose up trim change as the flap retracts. The flap limiting speed of 70 KIAS can easily be exceeded, particularly at light weights.

Controllability

The rate of roll using the ailerons alone is relatively slow but the rudder is powerful and a co-ordinated turn, using plenty of rudder, makes for a more respectable roll rate. Control forces are pleasantly light with the elevator and aileron being about the same for a given deflection. Rudder forces are about twice those of the aileron and elevator. Elevator trim is achieved by a spring bias system. At 60 KIAS with full flap, the trim is fully back and a slight nose down out of trim condition remains. This feature, combined with the limited up elevator movement, results in a certain lack of elevator power at low IAS which could prevent a full round out during a precautionary landing if the speed were allowed to fall too low with low power just before the flare.

Stability

Longitudinally the aircraft is very stable both stick free and stick fixed. Directional stability is somewhat weak which means that considerable attention must be paid to achieve balanced flight. The combined lateral and directional stabilities are quite satisfactory, although the rudder does not centralise quickly on release in a side slip. The ailerons are not powerful enough to hold more than about 15* bank in a straight side slip. However, overall, the Jabiru is pleasant to fly and is not limited in any way by its stability characteristics.

Stalling

At the maximum gross weight of 430 kg the straight flight power off stalling speeds (KIAS) are:

Flaps up 54

1st Stage flap 51

Full flap 45

At all flap settings, with idle power, natural stall warning buffet is minimal and there is no significant tendency for a wing to drop. If the stall is held with the stick on the back stop the aircraft gently rolls to the left into a slow descent. Stall recovery is immediate on releasing back stick pressure and lowering the nose. The ailerons are effective at the stall.

With flaps retracted, power at settings up to full throttle, and right rudder to maintain balance, the stall is equally benign and with the stick on the back stop the aircraft gently rolls to the right and enters a spiral dive. Recovery is immediate on reducing power, correcting the yaw, and moving the stick forward.

Accelerated stalls are also benign, and the aircraft can be held in a turn in either direction at full power just above the stall without any tendency to roll out of or into the turn.

Trim

As mentioned in earlier, it is not possible to trim out the nose down moment with full flap set at 60 KIAS. In this approach configuration the trim lever is fully back. When increasing power in flight the trim lever tends to move back.

Engine Handling

The Jabiru 2200 runs very smoothly in all phases of flight. Engine noise in the cockpit is low. Response to throttle opening is rapid. Since the engine is air cooled, and no form of air cooler shutter is fitted, careful attention must be paid to keeping the cylinder head temperature above the lower limit when operating at low power. This is particularly noticeable during descent. As the aircraft is very clean aerodynamically, it is quite difficult to descend at a reasonable rate without the CHT falling below the lower limit of 100°C. The best technique to achieve a good rate of descent is to side slip. Extended taxiing, and use of high power on the ground, will generate a risk of high CHTs. For proper engine care it is important to study the engine handling advice contained in the Jabiru Flight Manual.

Performance

At the maximum gross weight, at around sea level, the take off and landing performance should comfortably allow operations from a grass strip of some 550 metres take off and landing distance under standard conditions. However, soft ground under grass can extend the length of the take off run and distance significantly. This observation is based on the use of Standard Wheels. BigFoot wheels, with lower tyre pressures, are available.

Cruise

The Jabiru cruises comfortably at 90 KIAS at 2 -3000 ft using about 2600 rpm. Higher speeds are practicable if conditions allow cruising above V_a (91 KIAS). The stability of the Jabiru allows heading and height to be maintained in smooth air with very few control inputs.

Landing

Apart from the small residual nose down moment in the approach configuration with full flap, landing the Jabiru is straightforward in every respect. The aircraft is very tolerant and easy to handle in cross winds up to the maximum of 14 knots. The wing down technique should be used for cross wind landings.