

Jabiru UL, G-MGCA

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Category: 1.1

**Aircraft Type and
Registration:**

Jabiru UL, G-MGCA

No & Type of Engines:

1 Jabiru 2200A piston engine

Year of Manufacture:

1999

Date & Time (UTC):

30 August 2000 at 14:25 UTC

Location:

Redhill Aerodrome, Surrey

Type of Flight:

Private

Persons on Board:

Crew - 1 - Passengers - None

Injuries:

Crew - None - Passengers - N/A

Nature of Damage:

Propeller

Commander's Licence:

Private Pilot's Licence

Commander's Age:

52 years

**Commander's Flying
Experience:**

61 hours (of which 9 were on type)

Last 90 days - 14 hours

Last 28 days - 6 hours

Information Source:

Aircraft Accident Report submitted by pilot and AAIB/DERA examination of propeller material

History of Flight

After an uneventful flight an approach was made to runway 08L at Redhill Aerodrome. The pilot realised that he was going to land too far along the runway and so initiated a go-around. He applied full power and after a few seconds there was a sudden severe vibration and loss of thrust. He made

a MAYDAY call and carried out a forced landing in an unprepared area of long grass beyond the runway but within the airfield boundary. He was uninjured and there was no damage to the aircraft other than to the propeller blades. The pilot, and the chief flying instructor of the club which operated the aircraft stated that the aircraft had not touched down during its approach and go-around.

The aircraft was seen by ATC to begin a go-around near the 26R runway identifying numbers (reciprocal of 08L) and debris was seen to fall from it. The propeller and debris was sent to the AAIB via the Popular Flying Association (PFA) and was examined by composites specialists at DERA, Farnborough.

Propeller Examination

The two bladed wooden propeller is sheathed in glassfibre on its top and bottom surfaces. The wooden core has a polyurethane insert in each blade leading edge over 60% of its span. An adhesive polyurethane anti-erosion strip is wrapped around each blade leading edge and covers the insert and the faired edges of top and bottom fibreglass skins. The debris, which was found adjacent to the runway was the top skin from one of the blades (Blade 1). The bottom skin from this blade was also missing from the propeller but was not found. The propeller core had lost wood from both tips but the nature of the remaining damage to the two blades appeared different.

Blade 2 had lost top skin, wood core and polyurethane leading edge insert to a distance of 11 cm from the tip. The detached piece was reportedly found close to the aircraft. Its outer end face was undamaged and it showed no indication that it had hit the ground while rotating. Inboard its leading edge was crushed and contained impacted vegetation. The wood and top skin fracture was oriented chord-wise with short broken fibres and was probably caused by ground impact of the rotating propeller during the forced landing. There was some biological (plant) material on the exposed fibreglass surfaces. There was some local delamination of the skin from the wood immediately inboard of the fracture which had progressed from the tip inboard.

Blade 1 had lost more tip material and the fractures had run inboard along the grain giving a more jagged fracture line and there was vegetation embedded in the fractures. This evidence was suggestive of a lower fracture rate probably occurring in the forced landing when the propeller had lost most of its rotational speed.

The wood and fibreglass surfaces on blade 2 were examined to assess the sequence of failure, the quality of the original bonding and the nature of the bonding failures. The examination suggested that the lost lower skin was probably the first to fail. From the surface of the wood of the remaining inboard portion of this blade, evidence of good bonding (overload failure of the resin) was seen near the root and leading edge. Towards the tip and trailing edge the resin surface was featureless and it could not be determined whether this was the result of poor bonding or fretting following separation of the bond. The evidence from the detached top skin showed that there had been good bonding inboard but near the tip there had been fretting, showing that there had been some operation following disbonding. The tip also had abrasion damage on its outer surface, indicative of some running damage having been incurred.

The anti-erosion strip was still attached to the top surface fibreglass skin but was torn (spanwise) along the leading edge. Close to the tip there were two small areas where dark brown material was embedded between the anti-erosion strip and the fibreglass surface. This was probably insect debris and it appeared to have become embedded after the anti-erosion strip had been torn. The

examination showed that these features had not been involved in the initiation of the skin delamination.

Summary

The investigation concluded that the material involved in the initiation of this propeller failure was not recovered. Although bonding quality could not be assessed in some areas, the evidence indicated that the separation of both fibreglass skins on one blade had started from the tip, where some pre-existing running damage was present but its cause could not be identified.