

Jabiru SK, G-JABA

AAIB Bulletin No: 10/2003	Ref: EW/G2003/06/17	Category: 1.3
Aircraft Type and Registration:	Jabiru SK, G-JABA	
No & Type of Engines:	1 Jabiru 2200A piston engine	
Year of Manufacture:	2000	
Date & Time (UTC):	21 June 2003 at 1353 hrs	
Location:	200m north of the boundary of Popham Airfield, Hampshire	
Type of Flight:	Test flight	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Minor)	Passengers - 1 (Minor)
Nature of Damage:	Both wings damaged, roots of horizontal stabiliser damaged, engine cowlings, propeller and spinner severely damaged. Engine mount and firewall damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	43 years	
Commander's Flying Experience:	440 hours (of which 98 were on type)	
	Last 90 days - 2 hours	
	Last 28 days - 0 hours	
Information Source:	Aircraft Accident Report form submitted by the pilot, and other investigations made by the AAIB	

The pilot planned to conduct a test flight of the aircraft for renewal of the Permit To Fly. It was refuelled to a weight of 430 kgs. The owner/handling pilot was accompanied on this flight by another pilot whose intended role was to record relevant instrument readings. The other pilot had previous experience on the Jabiru type.

An engine power check was carried out which was satisfactory. The aircraft then commenced a normal takeoff from Runway 08 which, at Popham, requires an early left turn to avoid a filling station and a row of trees, the aircraft track then follows the approximate alignment of Runway 03. At about 300 feet, a vibration was noted which gradually became worse over a period of 20 to 30 seconds such that it finally appeared to the pilot that one cylinder was not firing at all. Insufficient power remained to maintain height and the aircraft was too high to land safely on Runway 03. The only available option was to land straight ahead in a field.

Unfortunately, the crops in the field were unexpectedly tall and as the wheels sank into them, the aircraft pitched down, the nose landing gear was torn off, and the aircraft continued for some 20 yards before coming to rest inverted. The starboard wing obstructed the opening of the passenger door but both occupants were able to exit via the pilot's door.

Examination of the engine by the AAIB revealed no evidence of external damage, although one blade of the propeller was splintered. The damaged propeller appeared to be free to turn. The plugs were removed and all appeared to have a similar appearance. A boroscope inspection of the interior of the cylinders revealed no evidence of damage, seizure, scoring or other unusual features. On removal of the rocker covers and further rotation of the propeller, however, it was noted that no movement of the inlet valve in the forward left-hand cylinder took place.

Closer examination revealed that the adjuster for the valve clearance, mounted on the inlet valve rocker arm, had become slack and had migrated away from its correct position so that the maximum valve clearance was approximately 0.3 inch. This only reduced to zero when the relevant push rod projected to its maximum extent.

The adjuster takes the form of a threaded rod with a hemispherical recess at one end in contact with a matching end on the push-rod. A 'screw-driver slot' is machined at the opposite, exposed, end. This rod is screwed into a threaded hole in the rocker arm and secured by a lock nut mounted on the external thread of the rod. The nut is tightened against the exposed face of the arm, locking the whole assembly and thus preventing the rod from rotating. Preservation of the valve gap is thus a function of correct tightening of the lock nut rather than action of a positive locking medium such as a locking tag or lock wire. The lock nut was present on its thread but was slack and free to turn and was therefore not performing its function.

The UK agents for the engine type are not aware of any problems with this type of adjuster. A previous design, which encountered some difficulties, was discontinued some time ago and replaced by the adjuster design installed on this aircraft.

It is considered that the adjuster became slack on this occasion as a result of insufficient torque being applied to the lock nut on the last occasion that adjustment was carried out. The owner/pilot reported that all cylinders were removed for re-work and were re-installed during the check prior to the test flight. Such action would require the valve clearances to be re-set after re-installation of the cylinders. It is presumed that insufficient torque was applied during adjustment at that time, or that tightening of the lock nut was overlooked.