

ACCIDENT

Aircraft Type and Registration:	Jabiru J160, G-CFGH	
No & Type of Engines:	1 Jabiru Aircraft PTY 2200A piston engine	
Year of Manufacture:	2008	
Date & Time (UTC):	30 September 2010 at 1535 hrs	
Location:	Ludham Airfield, Catfield, Norfolk	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Minor)	Passengers - 1 (Minor)
Nature of Damage:	Wing strut, nosewheel, nose leg	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	52 years	
Commander's Flying Experience:	1,056 hours (of which 43 were on type) Last 90 days - 56 hours Last 28 days - 13 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional AAIB inquiries	

Synopsis

Following an uneventful flight, the aircraft touched down and veered to the left; the pilot was unable to correct this as it was apparent that the rudder had jammed. The aircraft departed the runway and flipped over onto its back; both occupants suffered minor injuries. The rudder jam was subsequently confirmed and was similar to other incidents involving Jabiru aircraft.

Circumstances of the accident

The aircraft was on its second flight of the day, with no earlier problems having been experienced. After a normal touchdown on the main landing gear on Runway 27 at Ludham, the speed decayed, allowing the

nosewheel to contact the runway surface. The aircraft then veered to the left, which the pilot attempted to correct by applying right rudder. However, the rudder pedals, which on this type of aircraft are connected to the nosewheel, had become jammed so the pilot was unable to prevent the aircraft from departing the left side of the runway. The nosewheel encountered soft ground, with the result that it dug in, causing the aircraft to flip over onto its back. Both occupants, who had sustained cuts and bruises, exited the aircraft via the doors.

Subsequent examination of the aircraft

This aircraft, in common with all UK ‘homebuilt’ Jabiru aircraft, falls under the auspices of the Light Aircraft Association (LAA). Following the accident the pilot concluded that a rudder jam had been responsible for his inability to move the pedals. This view was confirmed by LAA engineers who subsequently inspected the aircraft. It was apparent that the jam had occurred as a result of insufficient clearance between the leading edge of the rudder and the trailing edge of the fin. This was the same cause that has been responsible for a number of previous incidents involving Jabiru control surfaces becoming jammed, resulting in the LAA conducting an extensive investigation. The first of these occurred

early in 2008 and involved a jammed aileron that nearly resulted in the loss of the aircraft. Summaries of these incidents can be found in the ‘Safety Spot’ section of the LAA magazine ‘Light Aviation’, specifically in the March 2008, August 2010 and November 2010 issues. The last mentioned contains details of the accident to G-CFGH.

Figure 1 shows a generic control surface and how hinge deflection can result in a jammed condition. In this example it can be seen that a lack of clearance will result in rubbing, with a jam occurring when the surface moves to the point where there is no longer any overlap.

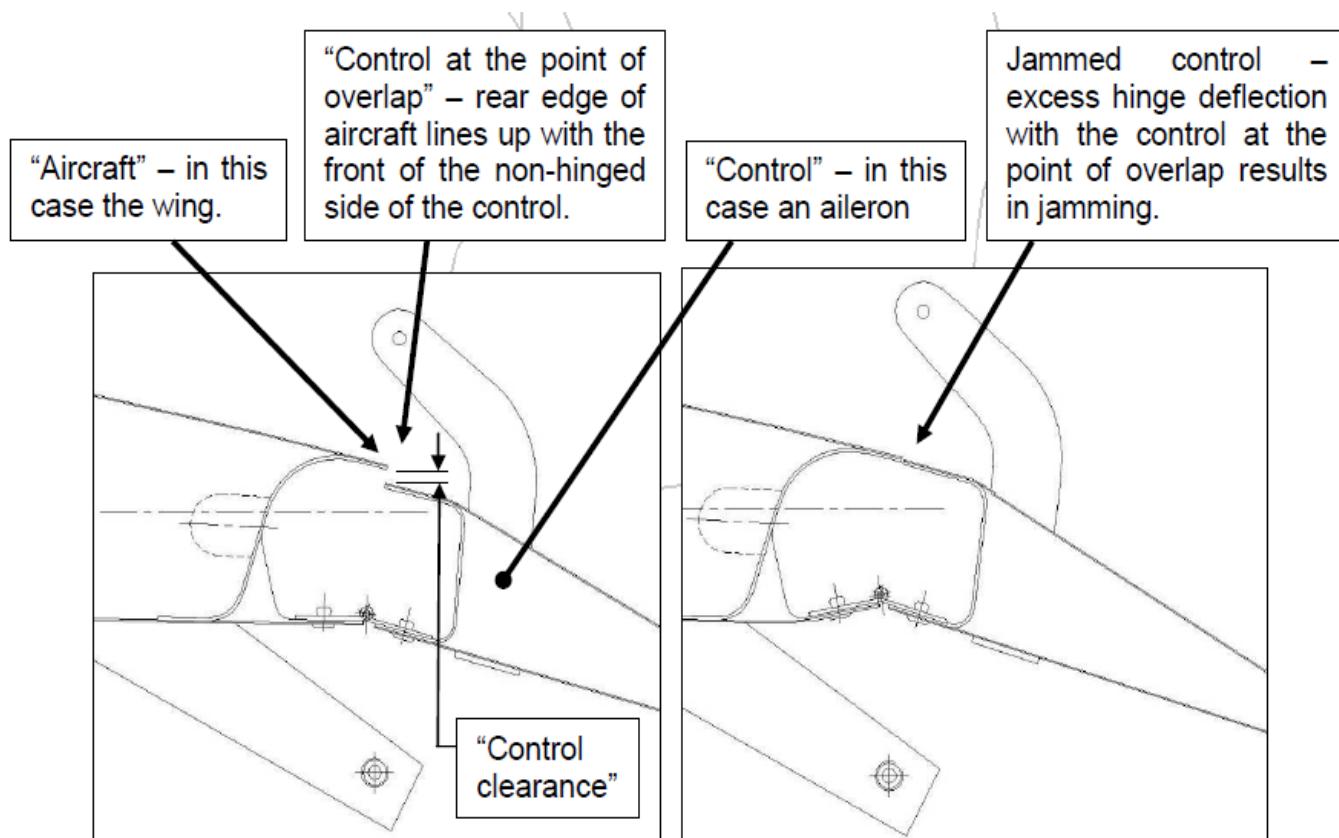


Figure 1

Illustration of a normal and jammed control, taken from JSB 019-2

As a result of the first incident, the LAA issued an Airworthiness Information Leaflet (AIL) MOD/346/001, requiring checks against a Service Letter STSL-004, and applicable to all Jabiru J-Series models, issued on 13 February 2008 by the then UK agents. This was followed, on 29 February 2008, by a manufacturer's Service Bulletin, JSB 019-1, which called for a one-time inspection to check for adequate control surface clearances. The information contained in this SB was considerably more detailed than in STSL-004.

Following the next incident, in July 2010, in which the rudder jammed in flight, the LAA reviewed their advice and re-issued the AILs, this time recommending that checks be conducted against JSB 019-1.

G-CFGH had been checked against JSB 019-1 and was deemed to be compliant. However, the LAA's post-accident examination of the aircraft revealed that the clearance between rudder leading edge and the fin trailing edge was less than the 3 mm specified in the SB. Furthermore, it was apparent that any structural distortions arising from inertial and aerodynamic loads could act to close the gap (refer to Figure 1). Additional vulnerability could arise from there being a number of different control surface designs across the Jabiru range, and differences can occur between aircraft of the same type. There are two basic design configurations; one is where the shrouds of the moving control surface overlap throughout the full range of movement, whilst the other involves less overlap so that, after a small

amount of deflection, the control surface emerges from the trailing edge slot. Also, the fact that most of these are home-built aircraft means that no two examples are likely to be exactly alike.

The LAA wrote a letter, dated 10 November, to all Jabiru owners, re-explaining the reasons for the SB checks. It was additionally asked by the manufacturer to contribute suggestions to the content of a revised SB. These were all accommodated, with the result that the manufacturer subsequently issued JSB 019-2 on 24 November 2010, noting to the LAA that the revision was in response to problems that had occurred only in the United Kingdom. A significant addition in the revised version is a check in which each control is moved through its range of travel whilst pushing against the hinge, with a force of 5-7 kg, in a direction that reduces the control clearance. Any evidence of rubbing would require rectification work before the next flight.

The Australian Civil Aviation Safety Authority issued an Airworthiness Directive on 29 November 2010, which mandated JSB 019-2. The mandate was promulgated in the UK by an Emergency Mandatory Permit Directive issued by the Civil Aviation Authority on 23 December 2010; along with the SBs, it is applicable to all Jabiru aircraft, including factory-built machines. Finally, the LAA stated that they will re-issue their AIL in order to accommodate the changed requirements of JSB 019-2.