

ACCIDENT

Aircraft Type and Registration:	Piper PA-18-180 Super Cub, G-BEUA	
No & Type of Engines:	1 Lycoming O-360-A4 piston engine	
Year of Manufacture:	1964	
Date & Time (UTC):	8 April 2006 at 1100 hrs	
Location:	Dunstable Airfield, Bedfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Right landing gear collapse	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	48 years	
Commander's Flying Experience:	294 hours (of which 46 were on type) Last 90 days - 7 hours Last 28 days - 2 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and report by repair organisation	

Synopsis

After landing, with very little forward speed, the right wing dropped and the wing tip touched the ground. The attachment lug for the left side of the inverted 'A' frame landing gear support had failed, as a result of a fatigue mechanism, allowing the landing gear to collapse.

History of the flight

The aircraft had landed after completing its second glider tow of the morning when, at low ground speed, the right wing dropped and the wing tip hit the ground. The engine was shut down with the propeller remaining clear of the ground. After leaving the aircraft, the pilot found that the left fuselage attachment lugs for the

under-fuselage 'A' frame had failed, causing the right landing gear to collapse.

Aircraft history

The aircraft had been operating from Dunstable, almost exclusively involved in glider towing operations, since 1979. It had been completely refurbished in December 1992. At the time of the incident, the aircraft had completed 11,750 flying hours and approximately 58,000 landings.

In July 1994, the aircraft suffered a similar failure of the left 'A' frame, see AAIB Bulletin 9/94. An examination

of the failed components revealed that the attachment lugs had failed due to a fatigue mechanism. At that time, the aircraft had completed 8,790 hours and approximately 36,700 landings.

Examination

The 'A' frame is attached to the lower fuselage steel tube longerons at a fitting, with an aft and forward lug, welded to the tubes. A detailed examination of the failed components was carried out by the engineer who had been involved in the investigation of, and rectification of, the 1994 landing gear collapse. He reported that the entire fracture surface of aft lug was discoloured, whereas only 75% of the fracture surface of the forward lug was discoloured.

Each lug is thickened on their inner face by the addition of a washer around the 'A' frame attachment bolt hole, which is welded in position. The weld bead extends around the outer 2/3 of each washer. The nature of the fracture surfaces indicated that cracks in both lugs had

progressed as a result of a fatigue mechanism. The rear lug appeared to have failed completely, before the remaining un-cracked portion of the forward lug failed in overload. The origin of the both cracks appeared, as in the 1994 event, to have been close to the run-out of the weld beads holding the washers in place, where significant stress concentrations can be expected.

Since the replacement of the attachment lugs in 1994, the aircraft had carried out approximately 21,300 landings. The geometry of the joint between the 'A' frame and the attachment lugs is such that a crack in this area is unlikely to be detected visually during a daily inspection or 50 hour check, particularly since the area is prone to contamination by oil, dust and dirt. The surface of the field at Dunstable, whilst entirely suitable for gliding and glider towing operations, is not as smooth as most airfields used by powered aircraft and, as such, the landing gear of an aircraft regularly operating from such a surface would be expected to sustain higher loads than when operating from a paved surface.