AAIB Bulletin: 10/2012	G-BHPK	EW/C2012/01/04	
ACCIDENT			
Aircraft Type and Registration:	Piper J3C-65 Cub	Piper J3C-65 Cub, G-BHPK	
No & Type of Engines:	1 Continental Mo	1 Continental Motors Corp A65-8F piston engine	
Year of Manufacture:	1943 (Serial no:	1943 (Serial no: 12161)	
Date & Time (UTC):	28 January 2012	28 January 2012 at 1523 hrs	
Location:	Priory Farm, Tibe	Priory Farm, Tibenham, Norfolk	
Type of Flight:	Private		
Persons on Board:	Crew - 1	Others - 1	
Injuries:	Crew - None	Others - 1 (Fatal)	
Nature of Damage:	Damaged propell	Damaged propeller	
Commander's Licence:	National Private	National Private Pilot's Licence	
Commander's Age:	38 years	38 years	
Commander's Flying Experience:	370 hours (of wh Last 90 days - 4 h Last 28 days - 4 h	370 hours (of which 2 were on type) Last 90 days - 4 hours Last 28 days - 4 hours	
Information Source:	AAIB Field Inves	AAIB Field Investigation	

Synopsis

A Light Aircraft Association (LAA) coach, who had been coaching the pilot, vacated the aircraft and stepped into the path of the rotating propeller, receiving fatal injuries.

History of the flight

The pilot was undergoing training to convert onto tailwheel aircraft. The training was conducted at Priory Farm, a small grass airfield where the aircraft was based, and which was familiar to both the pilot and his LAA coach. On the morning of the accident they had flown some circuits and conducted general handling in the local area before returning to the airfield for lunch. The pilot reported that the coach had considered the engine had been overfilled with oil and that after the flight he had looked at the engine for signs of oil having been expelled.

In the afternoon they flew again, conducting a number of circuits until the coach considered the pilot was proficient to fly the aircraft solo. After landing on Runway 01 the aircraft was taxied back to the threshold, brought to a halt and the engine was left running. The coach undid his harness and disconnected his headset, although witnesses could not recall whether he removed it. Having opened the window and door panel, the coach vacated the aircraft by climbing out to the front of the wing struts and stood between the struts and the propeller. He then helped close the window and door before talking briefly to the pilot. The pilot then saw the coach turn away towards the front of the aircraft. At this point the pilot turned his attention back inside the cockpit. Another witness also saw the coach at this time turn towards the front of the aircraft. He reported that the coach, having turned around, stepped forward into the arc of the propeller. The propeller struck the coach, killing him instantly.

Aircraft examination

One propeller blade displayed evidence of impact damage approximately 10 cm from the tip. The impact had caused the propeller to split along the length of both blades. The coach's headset was found by the aircraft in a badly damaged condition. Later examination showed this damage to be consistent with the coach having been wearing the headset and it having been struck by the propeller. There was no other identifiable aircraft damage or defects that might have contributed to the accident.

Aircraft description

The J3C-65 is a two-seat civilian variant of the Piper Cub, fitted with a 65-horsepower Continental engine, and was used extensively as a training aircraft during World War II.

G-BHPK had a one-piece propeller of wooden construction with a metal plate reinforced leading edge. It had a clear varnish finish and light green painted tip sections (Figure 1). The propeller has to be hand-swung in order to start the engine and when hot, the engine can be hard to restart. For this reason it is not unusual for the engine to be left running whilst people are entering or exiting the aircraft between flights. The owners of the aircraft reported that due to the low power of the engine, the wind buffet from the propeller at idle is not particularly strong.



Figure 1 Aircraft front elevation



Figure 2 Aircraft side elevation

The aircraft has a tailwheel configuration, with a high wing supported by two lift struts per wing. The struts extend from the bottom of the fuselage, below the mid-point of the cockpit, outboard to the underside of the wing. There are two seats in a tandem configuration. If operated solo, due to centre of gravity limitations, the pilot occupies the rear seat. It is therefore normal for the instructor or coach to occupy the front seat during training.

The aircraft is not equipped with a conventional door, but has two horizontally hinged panels on the right side of the fuselage; one opening upwards and one downwards, to allow access to the cockpit (Figure 2). There is a step just to the rear of where the wing struts attach to the fuselage. This step is used to assist in climbing into the aircraft. The step is awkward to use for occupants exiting from the front seat, as it is located well to the rear and is out of sight when manoeuvring backwards over the struts. The struts are not intended, nor permitted, to be used as a step. As a result, some front seat occupants find it easier to exit the aircraft by stepping out forwards onto the ground directly next to the seat, using the tyre as a step, which places them in front of the wing struts and close to the propeller.

Pathology

The post-mortem findings and the damage to the propeller indicate that the coach was struck once on the head by the propeller. The injuries sustained were consistent with the coach having had his head down to some extent at the time this happened. The coach had no apparent medical conditions which may have contributed to the accident. **G-BHPK**

Coach's background

The LAA coach was 67 years old and had had formerly been a pilot in the RAF for thirty years. On leaving the RAF he had flown as an airline pilot until his retirement. His logbook recorded he had flown 14,709 hours at the time of the accident.

He was a respected and experienced coach with the LAA and had flown a large number of different types of light aircraft.

Previous incidents

A review of reported accidents involving propellers reveals that since 1991 there have been a total of 15 involving light aircraft. Of these, 10 occurred whilst attempting to start the engine by hand-swinging the propeller. A further five occurred when disembarking passengers or ground personnel were hit by rotating propellers.

Analysis

Witness evidence indicates the coach stepped, rather than tripped or stumbled, into the path of the propeller. The evidence shows that the coach was wearing his headset; this would have reduced his ability to hear the noise of the engine and propeller. In addition, the wind buffet from the propeller at idle is reportedly not particularly strong. Whilst the propeller had tips in a different colour, the colour used might not have presented an obvious visual cue to the presence of the rotating propeller.

Safety action

As a result of this accident, opinion was sought on whether the engine should be left running whilst embarking and disembarking on this and other similarly configured types of aircraft. Whilst there are hazards in leaving the engine running, it was considered equally hazardous having to hand-swing the propeller in order to restart an engine, especially when it is hot.

The LAA already includes instruction on hand-swinging propellers to its coaches as part of their training. They now propose to broaden the scope of this training to include the additional dangers posed by propellers whilst entering and leaving aircraft.

Finally, this accident illustrates the value of the procedure used by some pilots of following a path along the edge of the wing to ensure clearance from the propeller when vacating or approaching such aircraft.

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