

ACCIDENT

Aircraft Type and Registration:	X-Air 582, G-BZUP	
No & Type of Engines:	1 Rotax 582/48-2V piston engine	
Year of Manufacture:	2000	
Date & Time (UTC):	4 December 2008 at 1410 hrs	
Location:	Londonderry Park, on approach to Newtownards Airfield, Co. Down, Northern Ireland	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to right main wheel, nosewheel and propeller	
Commander's Licence:	Private Pilot's Licence (Microlight) with Instructor rating	
Commander's Age:	60 years	
Commander's Flying Experience:	3,008 hours (of which 104 were on type) Last 90 days - 117 hours Last 28 days - 43 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

During final approach to the airfield the engine stopped suddenly. The instructor carried out a forced landing in a field, during which the right main landing gear and nose gear collapsed. The engine stoppage was the result of fuel exhaustion which was possibly caused by an abnormally high fuel flow, due to contamination within the fuel jamming a carburettor needle valve open.

History of the flight

The X-Air 582 is a high-wing microlight aircraft with a two-stroke Rotax 582 engine mounted forward of the leading edge of the wing (see Figure 1). A

student pilot, who was the owner of the aircraft, was undertaking flying instruction with an instructor. Prior to the first flight of the day the instructor conducted the pre-flight checks with the student observing. He also oversaw the student refuelling the aircraft to just over the 35 litre level. The instructor reported that the first flight of the day lasted 39 minutes and was uneventful. After landing, the fuel level was marginally over the 25 litre level, so the fuel consumption had been about 15 litres/hr. Prior to the second flight of the day the instructor confirmed that the fuel level was still at the 25 litre level. The planned flight duration was one



Figure 1

X'Air 582 micro-light aircraft

hour so he was expecting to return with about 10 litres remaining.

The flight in the local area was uneventful and the aircraft returned to the airfield to join overhead about 45 minutes after departure. The instructor flew the aircraft and ‘descended deadside’ to join Runway 22 while briefing the student on his actions, pointing out circuit traffic and carrying out the pre-landing checks. He observed the fuel level at the 10 litre mark. During final approach, at a height of about 300 ft, the engine stopped suddenly. The instructor realised that he could not glide to the runway so he carried out a sideslipping turn to the left to land crosswind in a field immediately below, and to the left of, the final approach path. On landing the right mainwheel sunk into waterlogged ground and its axle sheared, resulting in the aircraft pitching forward, shearing the nosewheel fork and damaging the propeller. The aircraft remained upright and came to rest in a very short distance. The instructor and student were able to exit the aircraft normally and there was no fire.

Pilot’s examination of the aircraft

Prior to lifting the aircraft on to a trailer, the pilot attempted to siphon the remaining fuel into a container but only found a “couple of cupfuls” in the tanks. The following day he examined the aircraft in more

detail with an inspector from the British Microlight Aircraft Association (BMAA). They discovered that the front air filter was very oily and, on removal of the front carburettor bowl (the engine was fitted with dual carburettors), they discovered small black particles in the bottom of the bowl and a small area of aluminium corrosion. The rear carburettor bowl contained a smaller amount of the same material. The BMAA inspector had encountered a similar situation previously, in which particles in the carburettor had restricted closure of the needle valve, resulting in a fuel overflow condition. The fuel would overflow the carburettor and exit via the vent pipes. They examined the remaining fuel system and found no evidence of split lines or fuel leakages. A small amount of similar contamination was found in the bottom of the fuel tanks.

Pilot’s assessment of the cause

The pilot concluded that the engine failure was caused by fuel exhaustion due to an abnormally high fuel usage during all or part of the last flight. He also believed that he may have made a mistake when he observed 10 litres of fuel remaining while joining overhead. The aircraft is fitted with two fuel tanks, one behind each seat, connected at their base by a fuel hose. To check the fuel level the instructor, seated in the right seat, had to look over his left shoulder to read the level indicated on the left tank located behind the student’s seat. The instructor reported that he checked the fuel level while in a left bank and, if the turn had not been coordinated, the fuel could have sloshed from the right tank to the left tank and provided an erroneously high reading. The instructor was also very busy at the time, briefing the student while carrying out the pre-landing checks, and thought that he might also have been subject to ‘expectation bias’, as he was expecting there to be about 10 litres of fuel remaining.

Discussion

It is possible that some of the black particles in the carburettor bowls became lodged in the needle valve and jammed it open at some point during the final flight. This would have resulted in excess fuel venting overboard. The BMAA inspector was aware of this having occurred previously and considered that, although the vent lines were above the windshield, the propeller's slipstream and aircraft's forward speed

would have been sufficient to blow the escaping fuel over the wing, allowing it to disappear undetected in flight. The oily front air filter was also consistent with an engine running excessively rich, which can cause oil blow-back. The source or composition of the black particles found in the carburettor bowls was not established. However, since similar particles were found in the fuel tanks it is likely that the contamination was introduced during refuelling.