

ACCIDENT

Aircraft Type and Registration:	Flight Design CTSW, G-KEVK	
No & Type of Engines:	1 Rotax 912 ULS piston engine	
Year of Manufacture:	2009 (Serial no: 8483)	
Date & Time (UTC):	15 September 2018 at 1742 hrs	
Location:	4.5 miles north of Sywell Aerodrome	
Type of Flight:	Private	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Aircraft damaged beyond repair	
Commander's Licence:	National Private Pilot's Licence	
Commander's Age:	46 years	
Commander's Flying Experience:	541 hours (of which 345 were on type) Last 90 days - 14 hours Last 28 days - 1 hour	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

After completing a local flight, the occupants of G-KEVK were positioning the aircraft for a return to Sywell Airfield. Approximately 5 nm from Sywell, the engine 'coughed' and then stopped. The pilot flying positioned the aircraft for a forced landing in a stubble field. After landing the nosewheel struck a tractor furrow and the nose landing gear collapsed. The aircraft came to rest upside down in the field. Neither occupant was injured.

The cause of the engine failure could not be positively determined although it was suspected that it was caused by issues with the fuel supply. It was possible that there was water in the fuel which the pilots were unable to check, or that air was drawn into the fuel system due to a low fuel level and the design of the system.

History of the flight

G-KEVK was prepared for a local flight from Sywell Airfield, Northamptonshire. Before departure the fuel tanks were checked to ensure that the fuel was more than sufficient for the planned short flight plus contingencies. After departing from Sywell, the two occupants, both qualified pilots on the aircraft type, decided to proceed to Denethorpe Airfield to carry out some circuit practise. Having completed four circuits at Denethorpe, the aircraft departed to the west to do some local sightseeing. Having flown over Market Harborough, the occupants decided that it was time to return to Sywell and began a left turn to position the aircraft for its approach to the airfield.

As they approached approximately 5 nm from the airfield, the pilots heard the engine 'cough' and then stop. The pilot who was flying the aircraft at the time began to scan for a suitable field. He observed that most of the fields appeared newly ploughed but that there was a long field that looked to have a stubble surface although it was not into wind. The pilot considered that there was little or no other choice than to accept a downwind landing into this field as he did not have the height to position the aircraft for an into-wind landing. As a result, the touchdown was at a higher groundspeed than the pilot would have liked. The aircraft type is not fitted with suspension and has disc brakes on its main wheels. The pilot was beginning to apply the brakes gently to avoid locking the wheels when the nose dropped suddenly and the aircraft lurched forward, coming to rest upside down as show in Figure 1.



Figure 1

The final position of the aircraft

Accident site

The aircraft landed in a field of stubble which contained numerous tractor furrows. The CTSW undercarriage is not constructed for rough terrain and photographs of the accident site suggested that the nosewheel struck a tractor furrow before the aircraft speed had been reduced significantly. This caused the collapse of the nose landing gear and pitched the aircraft onto its roof. Both occupants were able to vacate the aircraft unaided and neither suffered any injuries.

In preparation for the aircraft recovery both wings were drained of fuel. It was discovered that one wing was empty of fuel whilst the other contained a significant amount. There was no sign of a leak. Once the aircraft was recovered to an engineering facility, the remains of the propeller were removed, and the engine was connected to a new source of fuel and started. It started immediately and showed no signs of damage.

Aircraft information

The Flight Design CTSW is a high wing, tricycle undercarriage microlight aircraft. The aircraft is of composite construction, primarily made of carbon fibre. Each wing has an integral fuel tank with a capacity of 65 litres (62 litres useable) and fuel is gravity fed. The fuel tanks are interconnected and in normal operations the fuel should feed equally from each tank. However, slight geometric differences or flying with a sideslip can result in one tank feeding faster than the other.

Service Bulletin SB131¹ was released by the manufacturer after a CTSW ran out of fuel with apparently 5 litres of fuel remaining in one tank with the other tank empty². Tests showed that when 5 litres remained in one tank with the other tank empty, it was possible to uncover the fuel feed pipe if the aircraft was flown with sideslip, putting the wing containing fuel on the low side. Uncovering the fuel feed pipe would draw air into the system causing the engine to stop.

Neither pilot was aware of the contents of SB131 which was issued in 2012. Service Bulletins are available to aircraft owners and users through the Type Certificate holder in the country of registration. It is the responsibility of the aircraft owner or operator to seek out information from the Type Certificate holder. These Service Bulletins should be included in the Pilots Operating Handbook for the aircraft so that they are available to all the pilots who fly the aircraft. Many of the Type Certificate holders work closely with owners and the aircraft sporting associations to try and maximise the visibility of bulletins.

The fuel tanks in the CTSW contain no water drain points and there is no requirement to check for the presence of water in the fuel.

G-KEVK was fitted with a Ballistic Recovery System (BRS) which was not used. The pilots did consider using the BRS but, given the wind direction and possible landing areas underneath them, decided that the field landing was the safer option. The pilots flew together frequently and would regularly practise engine failures.

Weight and balance

The maximum weight of a microlight aircraft is governed by regulations set by the CAA. This limits the weight of a two-seat aeroplane to 450 kg which is increased to 472.5 kg if the aircraft is fitted with an airframe-mounted emergency parachute system. G-KEVK was designed with a maximum takeoff weight of 600 kg, which was then limited by the class regulations currently in force.

One of the pilots had completed a weight and balance calculation to ensure the aircraft was below the 472.5 kg maximum weight on takeoff from Sywell. The pilots planned to fly a short flight due to the limited fuel load available to comply with the maximum weight. Subsequent checks of the calculations by the pilots discovered that no account had been

Footnote

¹ Service Bulletin Number SB 131 Issue 1, Issued by P&M Aviation, 18 Jun 2012.

² AAIB report EW/C2009/08/02, G-VINH from AAIB Bulletin 8/2010.

taken of the extra safety equipment on the aircraft. This extra equipment meant the aircraft was actually over its weight limit of 472.5 kg but this had no effect on the subsequent events and the pilot reported no issues with the aircraft performance.

The regulation maximum weight of microlights is currently under review by the CAA in consultation with the aviation sporting associations and other industry stakeholders. Both pilots stated that raising the maximum weight to that for which the aircraft was designed would allow them to carry more fuel without being concerned about the current regulation maximum weight which they consider to be very limiting.

Analysis

The cause of the engine failure could not be positively determined. However, the aircraft engine was run successfully after the aircraft was recovered and a fuel source was attached. This indicated that the engine had not suffered any kind of internal fault and it was likely that the cause of the stoppage was a lack of fuel supply.

It is possible that water in the fuel caused the engine to stop suddenly. There was no requirement in the checklist to check for water in the fuel nor any method by which pilots could check.

It is also possible that one of the wing tanks was empty of fuel which, combined with some sideslip or the turn back to the airfield, caused the fuel feed pipe in the other tank to become uncovered and air to be drawn into the fuel system. This would have stopped the engine but neither pilot was aware of the Service Bulletin detailing this possibility.

The flying pilot positioned the aircraft for a forced landing in a suitable field but was not at a height at which he could manoeuvre to approach the landing into wind. The extra speed of the downwind landing combined with the nose striking a tractor furrow before the speed had decreased pitched the aircraft onto its roof. Neither occupant was injured.

Conclusion

The aircraft engine failed as the pilots prepared for their return to Sywell. The failure was probably due to a fuel supply issue. They were able to complete a forced landing in a field, but the aircraft nose wheel caught in a tractor furrow and the aircraft was pitched onto its roof.

Neither pilot was aware of a Service Bulletin regarding the fuel supply which had been issued in 2012.