ACCIDENT

Aircraft Type and Registration:	Yakovlev YAK C11, G-OYAK	
No & Type of Engines:	1 Ashenkov 21 piston engine	
Year of Manufacture:	1945 (Serial no: 1701139)	
Date & Time (UTC):	21 June 2018 at 1630 hrs	
Location:	Field near Little Gransden Airfield, Cambridgeshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Minor)	Passengers - None
Nature of Damage:	Damage to engine and supporting mounts, propeller, flaps and lower fuselage	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	59 years	
Commander's Flying Experience:	3,700 hours (of which 150 were on type) Last 90 days - 40 hours Last 28 days - 20 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The engine started to misfire as the pilot joined the downwind leg at Little Gransden Airfield for a landing on Runway 28. The pilot flew a tighter circuit, but late during the final approach the engine lost power. As the aircraft could no longer reach the runway, the pilot made a successful wheels-up landing and the aircraft touched down 150 m short of the runway threshold (Figure 1). The loss of engine power was most probably due to the magneto coils starting to break down.

History of the flight

The pilot reported that he was undertaking the first flight following the annual maintenance with the intention of carrying out the flight test schedule. The owner, who held a private pilot's licence, was in the rear seat and the intention was to practice aerobatics on completion of the test schedule.

The engine power checks were satisfactory, and the aircraft climbed normally to around 8,500 ft. Following the flight test and aerobatics, the pilot returned to Little Gransden Airfield where he made a full-stop landing before backtracking to the threshold where he took off, with the passenger, to carry out the V_{NE} checks and fly a second session of aerobatics. On returning to the airfield, the pilot made an overhead join and at the start

of the downwind leg the engine started to misfire. The pilot flew a tighter circuit with a short curving base leg and on the final approach moved the throttle to increase the engine power, but the engine did not respond. The pilot exercised the throttle several times, but there was still no increase in engine power. He therefore informed the passenger that he had an engine failure and selected the landing gear UP. The aircraft touched down 150 m short of the threshold of Runway 28 and as the aircraft travelled across the ground it slewed slightly as the propeller dug into the ground before coming to a halt. The passenger was uninjured, but the pilot, who was wearing a helmet, struck his head on the gun sight.

Figure 1

Accident site
(photograph provided by pilot)

Testing of magnetos

The magnetos were type BCM 7MJ, which were designed in the 1950s. The actual age of both magnetos was unknown.

Following the accident, the owner arranged for both magnetos to be removed from the engine to be visually inspected and tested. The testing was halted after both magnetos experienced a dead cut (suddenly stopped working). When the temperature of the magnetos was allowed to return to ambient room temperature, they both operated normally.

Right magneto

The rotor arm in the right magneto was found to be bent, however, this did not affect the operation of this magneto. The magneto was run for two hours at an ambient room temperature of 21°C. After one hour the magneto had reached a temperature of 46°C and after two hours it had reached a temperature of 62°C when a dead cut occurred.

Left magneto

The left magneto was run for one hour at an ambient room temperature of 22°C. After one hour the magneto had reached a temperature of 53°C when a dead cut occurred. It was noted that the coil in the magneto felt soft.

Comment

The passenger had owned the aircraft since 1992 and advised the AAIB that there had been no recent problems with either the aircraft or engine.

The testing of the magnetos indicates that that the most likely reason for the loss of engine power was a breakdown in the coils as the temperature of the magnetos increased. The pilot, who was an experienced YAK pilot, advised the AAIB that he had previously experienced misfiring and a loss of engine power on another YAK-type aircraft that was identified as the magneto coils starting to heat up and break down.