**ACCIDENT**

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| **Aircraft Type and Registration:** | Spitfire Mk 26 (scale replica), G-CENI |
| **No & Type of Engines:** | 1 Jabiru piston engine |
| **Year of Manufacture:** | 2007 |
| **Date & Time (UTC):** | 5 May 2008 at 0945 hrs |
| **Location:** | Approximately 1.5 miles west of Aboyne Airfield, Aberdeenshire |
| **Type of Flight:** | Private |
| **Persons on Board:** | Crew - 1 Passengers - None |
| **Injuries:** | Crew - None Passengers - N/A |
| **Nature of Damage:** | Damage to front cowling and propeller |
| **Commander's Licence:** | Airline Transport Pilot's Licence |
| **Commander's Age:** | 56 years |
| **Commander's Flying Experience:** | 17,643 hours (of which 1 was on type)<br>Last 90 days - 6 hours<br>Last 28 days - 2 hours |
| **Information Source:** | AAIB Field Investigation |

**Synopsis**

The aircraft was on its second flight after construction when, at 2,000 ft after an uneventful takeoff and climb, the engine oil temperature increased into the caution range. During the precautionary return to the airfield, and as the landing gear was lowered and locked down, the pilot heard a "bang". As the aircraft descended in the overhead the pilot became aware that throttle movements were having no effect on engine thrust and on base leg he became aware that the propeller was missing. He subsequently carried out a safe glide approach and landing.

**History of the flight**

The accident flight was the second flight after the aircraft's construction. All the pre-flight checks were completed and the takeoff, the 'after takeoff' checks and the climb to 2,000 ft were uneventful. The pilot levelled the aircraft at 2,000 ft, accelerated to 130 kt and reduced the power to 23 inches of manifold pressure and 2,300 rpm. He felt a slight vibration but nothing that alarmed him. He noticed that the cylinder head temperature was normal but the engine oil temperature had started to rise into the 'caution' range and he decided to initiate a return to the airfield, reducing the power to idle. At about 1,000 ft and 80 kt he lowered the landing gear. As the landing gear locked in the DOWN position there was a "bang (not loud)". As this was the first time that the landing gear

had been lowered in the air the pilot double-checked that all the indications were satisfactory for a continued approach, which they were. He did not notice any unusual vibration or engine noise. When the aircraft was overhead the airfield the pilot became aware that there was no change in engine parameters in response to throttle movement, that the engine had stopped, and on base leg he became aware that the propeller was missing. A successful glide approach and landing were carried out.

**Engineering examination**

Examination of the aircraft revealed that the propeller, together with the 'propeller to engine' adaptor flange and 'adaptor flange to crankshaft' attachment bolts, were missing. There was impact damage to the forward right side of the engine cowling. The propeller assembly has not been recovered.

The engine was transported to the manufacturer's UK agent for examination. It was seen that, of the twelve threaded holes in the crankshaft flange, only two showed evidence of distressed threads. The only evidence of 'Loctite' (a proprietary locking compound used in assembly) was at the bottom of the threaded holes and it had the appearance of the grade of 'Loctite' used by the engine manufacturer. There was no evidence of locking compound within the upper threads of any of these holes.

**Other information**

In this combination, once the propeller is fitted to the 'propeller to engine' adaptor flange it is not possible to inspect the 'adaptor flange to crankshaft' attachment bolts.

**Light Aircraft Association (LAA) safety actions**

The LAA have published an article as a 'Safetyspot' in the Engineering Matters section of their August 2008 edition of the magazine '*Light Aviation*', highlighting the problem of inspecting the security of the attachment bolts between propeller adaptor flanges and engine crankshafts when propellers are fitted. The LAA propose to incorporate an item in their Inspectors' Notes (SPARS) highlighting this potential problem area.