

**INCIDENT**

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|--|--|-------------------|
| <b>Aircraft Type and Registration:</b> | Zenair CH 601UL Zodiac, G-BZFB   |                   |
| <b>No &amp; Type of Engines:</b>       | 1 Rotax 912-S piston engine  |                   |
| <b>Year of Manufacture:</b>            | 2000 (Serial no: PFA 162A-13547)   |                   |
| <b>Date &amp; Time (UTC):</b>          | 15 June 2013 at 1830 hrs   |                   |
| <b>Location:</b>                       | Glebe Farm, Sibson, Leicestershire   |                   |
| <b>Type of Flight:</b>                 | Private  |                   |
| <b>Persons on Board:</b>               | Crew - 1   | Passengers - None |
| <b>Injuries:</b>                       | Crew - None  | Passengers - N/A  |
| <b>Nature of Damage:</b>               | Loss of propeller blade, nose and left main landing gear collapse, structural damage to wings and firewall |                   |
| <b>Commander's Licence:</b>            | National Private Pilot's Licence   |                   |
| <b>Commander's Age:</b>                | 82 years   |                   |
| <b>Commander's Flying Experience:</b>  | 540 hours (of which 342 were on type)<br>Last 90 days - 13 hours<br>Last 28 days - 5 hours                 |                   |
| <b>Information Source:</b>             | Aircraft Accident Report Form submitted by the pilot and enquiries by the LAA and AAIB                     |                   |

**Synopsis**

The pilot noticed a vibration through the airframe just after takeoff from a private grass strip. This was followed by a 'thud', a slight displacement of the engine cowling and a loss of engine power. The pilot made a forced landing in a wheat field, during which the nose and left landing gear collapsed, and the firewall and both wings were damaged. The power loss was initiated by the failure and detachment of one of the composite propeller blades, resulting in vibration which caused the carburettors to separate from the engine. The detached propeller blade had suffered a structural failure due to a high cycle oscillation about the blade pitch axis which was caused by a missing component within the coarse pitch stop assembly.

**History of the flight**

Shortly after takeoff the pilot became aware of a vibration, followed by a 'thud' with a slight movement of the engine cowling. At this point engine power was lost. The pilot immediately made a left turn and carried out a forced landing into a wheat field. During the landing the nose and left landing gear collapsed and the aircraft sustained damage to the engine firewall and to both wings. The pilot was uninjured. On inspecting the aircraft after the accident he saw that one of the propeller blades was missing and the carburettors had detached from the engine. Part of the propeller blade was found on the runway.

**Engineering investigation**

A detailed examination of the two-bladed Woodcomp Varia composite propeller assembly was carried out by the LAA. It was found that the detached blade had failed circumferentially at its cuff. It was also found that a small stepped washer was missing from the propeller coarse pitch stop mechanism.

Further enquiries by the LAA established that an adjustment had been made to the fine pitch stop and part of that process required the disassembly of the coarse pitch stop. During reassembly the washer had been overlooked and the work had not been checked and signed off by an inspector.

The washer is vital for the correct operation of the pitch control system and is designed to form a spring seat to allow an adjustment bolt to pretension a spring. With no tension in the spring, the propeller blade was free to oscillate about its pitch axis when the engine was running. The resultant high frequency oscillation induced cracks which caused delamination of the composite material throughout the blade and subsequent failure of the blade cuff in tensile overload.

**Safety action**

The LAA has published its findings in an article in the October 2013 issue of the '*Light Aviation*' magazine.