

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Cessna 182S Skylane, G-BXZM	
<b>No &amp; Type of Engines:</b>	1 Lycoming IO-540-AB1A5 piston engine	
<b>Year of Manufacture:</b>	1998	
<b>Date &amp; Time (UTC):</b>	24 February 2011 at 1256 hrs	
<b>Location:</b>	White Waltham Airfield, Berkshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 3
<b>Injuries:</b>	Crew - 1 (Minor)	Passengers - 3 (Minor)
<b>Nature of Damage:</b>	Nosewheel, propeller, left wing spar, right wingtip, tail and fuselage	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	44 years	
<b>Commander's Flying Experience:</b>	84 hours (of which 4 were on type) Last 90 days - 8 hours Last 28 days - 6 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and subsequent AAIB enquiries	

## Synopsis

After touchdown the aircraft became airborne again and then bounced a number of times. A heavy touchdown on the nose landing gear following one of the bounces caused the nosewheel to detach. The propeller subsequently struck the ground and the nose landing gear leg progressively dug into the soil, causing the aircraft to pitch over onto its back. The pilot and three passengers suffered minor injuries.

## History of the flight

On returning from a short flight in the local area, the pilot made an approach to grass Runway 25 at White Waltham Airfield. The pilot described the approach

as normal but, as the aircraft passed over the runway threshold, he thought the aircraft was a little high. He did not consider this to be a problem as there was sufficient runway length remaining. The aircraft initially touched down approximately one third of the way along the runway. The pilot reported that while the main wheels were on the ground, but before the nosewheel had made contact with the runway, the aircraft encountered a dip in the runway surface. A gust of wind, coincident with the aircraft coming out of the dip, caused the aircraft to become airborne again. He attempted to correct this by applying a small amount of power, but he was unsuccessful in reducing the rate of

descent and the aircraft touched down quite hard and once again became airborne. Further attempts to control the bounce were unsuccessful. The pilot was aware of hearing a “thump” during the resulting touchdown, but at that point was not aware that the nosewheel had detached from the nose landing gear. The aircraft bounced once more before finally touching down with very little forward speed. The propeller struck the runway and the nose landing gear leg progressively dug into the ground, causing the aircraft to pitch over onto its back. The pilot and three passengers, who were wearing lap and diagonal harnesses, sustained bruising during the accident, but were otherwise uninjured and were able to exit the aircraft unassisted.

The weather conditions at the time of the accident were good, with a reported a wind of 260° at 10 kt gusting to 15 kt.

### Pilot’s experience

The pilot held a PPL and had a total of 84 hours flying experience, of which 22 hours were as Pilot in Command (PIC). He had undertaken his PPL training and subsequent flying on other aircraft types and had recently been checked out by an instructor to fly the Cessna 182. He had a total of four hours experience on the Cessna 182. The accident flight was his first flight as PIC on the type.

### Ground markings

Photographs of the accident site provided to the AAIB show ground markings consistent with a heavy nosewheel touchdown (Figure 1). The nosewheel (Figure 2) was found approximately 10 m to the right of the runway centreline. Subsequent propeller strikes and a furrow caused by the nose landing gear leg contacting the ground are also evident (Figure 3).



**Figure 2**  
Nosewheel



**Figure 1**  
Nosewheel impact mark



**Figure 3**  
Propeller strike and  
ground marks

**Examination of the nosewheel**

The nosewheel yoke had fractured causing the nosewheel to separate from the landing gear. The fracture surfaces of the yoke were examined using a binocular microscope and a scanning electron microscope to determine the failure mechanism. Two distinct regions of fracture were evident indicating a two-stage failure process, resulting from overload of the component. It was concluded that a crack had initially propagated upwards from the base of the yoke due to tensile overload caused by excessive drag loading on the nosewheel. There was also evidence of compressive loading consistent with a hard landing. It is likely that the nosewheel buckled under the compressive loading after one of the bounces, causing compressive failure on one side of the yoke. Drag loading is likely to have arisen from the nosewheel impact shown in Figure 1; the depth of this mark also indicates the presence of significant compressive loading.

It was not possible to determine whether the failure had occurred progressively during multiple impacts of the bounced landing, or solely during one of the impacts.

There was no evidence of fatigue propagation; nor were there any indications of pre-existing damage within the structure of the component.

**Discussion**

Ground marks indicate that the aircraft landed heavily on its nose landing gear after bouncing, causing the nosewheel to detach. The pilot elected to continue the landing rather than initiating a go-around and his attempts to correct the bounces were unsuccessful. Metallurgical examination of the failed nosewheel yoke did not reveal any evidence of fatigue propagation or pre-existing defects which may have contributed to its failure.

The pilot considers that the accident was the result of electing to land rather than initiating a go-around immediately upon becoming airborne after the first touchdown.