

ACCIDENT

Aircraft Type and Registration:	Grob G115E Tutor, G-BYWE	
No & Type of Engines:	1 Lycoming AEIO-360-B1F piston engine	
Year of Manufacture:	2000	
Date & Time (UTC):	24 May 2007 at 1543 hrs	
Location:	Colerne Airfield, Wiltshire	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Nose leg collapsed, propeller damaged and engine shock-loaded	
Commander's Licence:	RAF pilot's qualification	
Commander's Age:	62 years	
Commander's Flying Experience:	4,760 hours (of which 923 were on type) Last 90 days - 65 hours Last 28 days - 35 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

Following a landing at Colerne, the nose leg collapsed. The nose leg sliding tube had been incorrectly reassembled during maintenance. Procedures in place at the maintenance organisation to prevent this had not been carried out.

History of the flight

Following an uneventful training flight, the aircraft had just landed at Colerne, Wiltshire. As the nose was lowered to the ground a slight judder was felt through the airframe, along with a 'clunk' noise. The intention was to carry out a 'touch-and-go' but due to the juddering, this was aborted and the aircraft was slowed down. The handling pilot was then given clearance to backtrack

along the runway. As he applied right rudder to turn the aircraft, the nose leg collapsed. The propeller then struck the runway, causing the engine to stop. The crew shut the aircraft down and exited normally.

Nose landing gear description

The nose leg of the Grob 115 consists of a steel housing secured to the airframe, into which fits a tubular shaft. A diagram of the nose leg is shown in Figure 1. Fitted within the tubular shaft is a gas spring strut shock-absorber. The upper end of the strut is attached to the tubular shaft; the lower end is screwed into the bottom fitting. A sliding tube surrounds the spring strut and the bottom fitting, and is secured at its

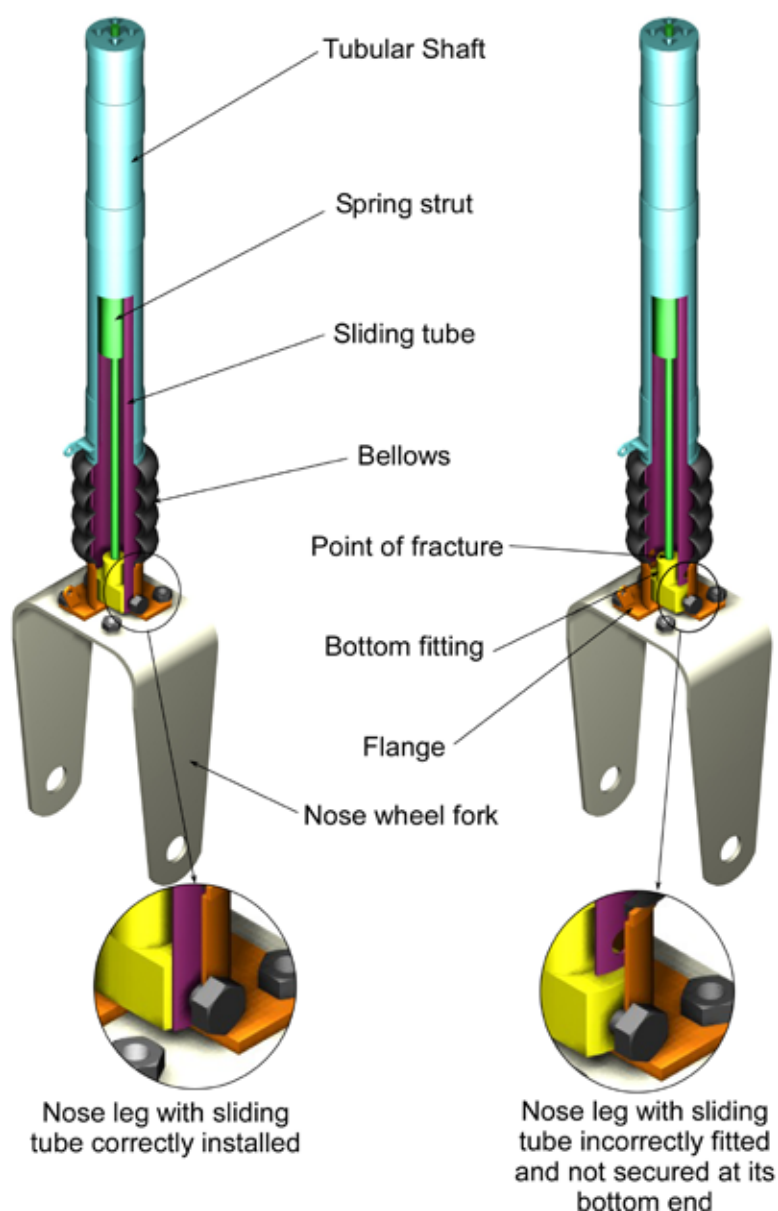


Figure 1

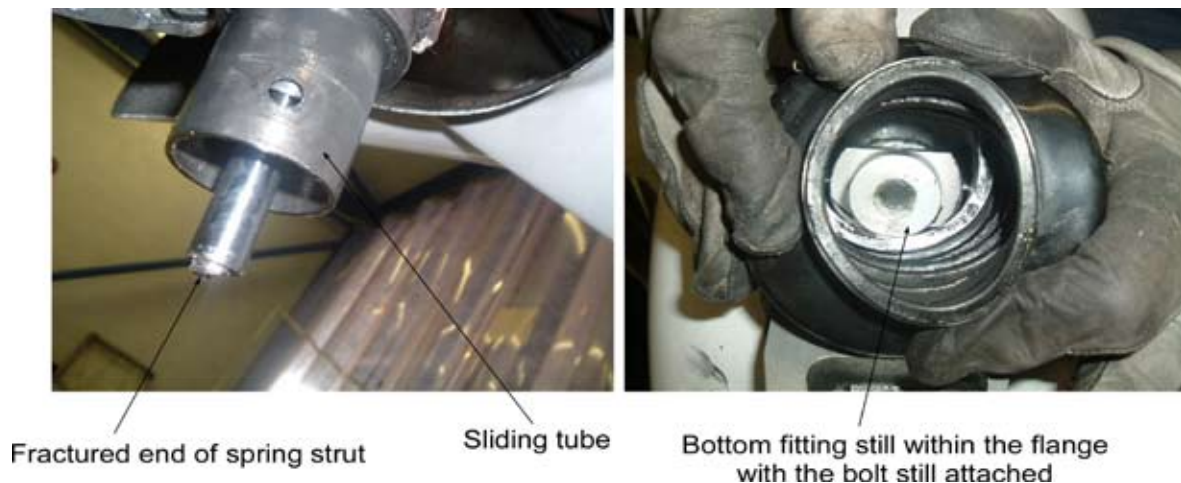
Simplified drawing of the nose leg, with the steel housing, wheel and torque links removed for clarity

bottom end by the same bolt that secures the bottom fitting to the flange.

Examination of the aircraft

An examination of the aircraft by the maintenance organisation found that the gas spring strut had failed at its lower end where it screws into the bottom fitting. The sliding tube was found to have been incorrectly assembled

- it had not been secured to the flange, with the attaching bolt only passing through the flange and bottom fitting (see Figure 2). This failure to secure the sliding tube had allowed it to float freely. It had migrated upwards out of the lower flange and induced high bending loads on the lower end of the gas spring strut. Eventually this had led to its fracture, and the ultimate collapse of the nose leg.

**Figure 2**

Fracture of the spring strut

Maintenance History

The last maintenance carried out on the aircraft was a 50 hr inspection on 12 May 2007. During this inspection the nosewheel bellows were replaced. Replacement of the bellows required the dismantling of the nose leg assembly, in particular the removal of the sliding tube from the lower flange. The maintenance documentation associated with the replacement of the bellows did not show the completion of a duplicate inspection.

Previous occurrences

The AAIB has investigated two previous occurrences of similar nose leg failures on the Grob 115. The first was in February 2003, (G-BVHG EW/G2003/02/07, Bulletin 9/2003). Following this accident the maintenance organisation added additional steps and warnings about the correct installation, in their procedures. The second accident occurred in November 2006 (G-BYVZ, EW/G2005/11/02, Bulletin 2/2006). After this, the maintenance organisation reclassified the nose leg as a critical task, and introduced a duplicate inspection requirement, to ensure that the flange and sliding tube are correctly assembled.

Discussion

The nose leg had failed due to incorrect reassembly of the nose leg sliding tube, following maintenance on the nose leg bellows. Due to similar failures in the past, procedures at the maintenance organisation, in particular the duplicate inspection of any work on the nose leg, had been put in place to prevent recurrence. However, in this instance, the required duplicate inspection had not been carried out on the leg assembly or sliding tube, following the replacement of the bellows. Once the nose leg was fully assembled and the bellows in place, it was not possible to see if the sliding tube had been correctly secured.

The maintenance organisation has promulgated the cause of this and the other accidents, and has restated the level of awareness required and the procedures to be followed when working on the nose leg. The aircraft manufacturer has been made aware of the issue and has been requested, by the maintenance organisation, to consider alternative nose leg bellows that do not require the dismantling of the leg.