

Cessna 404 Titan, G-BWLF, 4 September 2001 at 1315 hrs

AAIB Bulletin No: 8/2002	Ref: EW/G2001/09/06	Category: 1.2
Aircraft Type and Registration:	Cessna 404 Titan, G-BWLF	
No & Type of Engines:	2 Continental GTSIO-520-M piston engines	
Year of Manufacture:	1979	
Date & Time (UTC):	4 September 2001 at 1315 hrs	
Location:	Farnborough Airport, Hampshire	
Type of Flight:	Aerial Work	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to nose landing gear, forward fuselage and propellers	
Commander's Age:	46 years	
Commander's Flying Experience:	3,596 hours (of which 470 were on type)	
	Last 90 days - 36 hours	
	Last 28 days - 6 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional enquiries by AAIB	

The aircraft was landing at Farnborough following an aerial survey sortie. The ATIS information gave the wind direction and strength as 300°/15 kt and the runway in use as 07. The pilot elected to make an approach to Runway 25 and a 'crab' approach technique (in which the aircraft's heading is adjusted to maintain a track along the runway centreline) was flown at 120 kt, slowing to a speed at the threshold of 90 kt. Before touchdown, rudder was used to align the aircraft with the centreline.

The pilot reported that the landing and initial ground roll were normal but, after some two to three seconds of nosewheel contact, the aircraft nose dropped slightly and started to judder. He initially thought that the nosewheel tyre had deflated, but the nose continued to drop. Both propellers struck the ground and it was obvious that the Nose Landing Gear (NLG) had collapsed. The pilot managed to keep the aircraft on the centreline as it stopped and, after informing ATC, completed the shutdown and evacuation procedures. Once outside the aircraft, he observed that the NLG leg had broken rearwards and to the left side and was lying under the nose. There was minimal damage to the airframe as a consequence. Upon recovery of the aircraft, it became evident that the right-

hand NLG pivot trunnion lug had broken, allowing the leg to collapse (see Figure 1 (jpg 63 kb)). The failed lug, still in its bearing housing, was removed for examination

An independent metallurgical report into the failure concluded that the lug had fractured in bending overload, probably as a result of excessive side loads. It did, however, note the presence of a low-cycle fatigue crack in the fracture face running roughly around one quarter of the circumference of the lug and reaching a maximum depth of 0.036 inches. This was not considered large enough to have significantly compromised the strength of the lug. However, its presence, in an area known to be prone to cracking on Cessna 310, 335, 340, 401, 402, 404, 411, 414 and 421 aircraft, was cause for concern, as a mandatory Service Bulletin (SB) existed to inspect for cracks such as this.

Cessna SB reference MEB88-5 Revision 2, dated 2 October 2000, requires a repetitive inspection, using both eddy current and fluorescent dye-penetrant methods, of the trunnion lugs. Commencing at 2,500 hours trunnion total time or 5,000 landings (whichever occurs first), the SB specifies a repeat inspection interval of 1,000 landings. The inspection was required to be accomplished within 200 hours from receipt of the SB, for lugs which had exceeded the threshold criteria. The SB also states that there are two possible sizes of lug diameter - 1.19 inches and 1.31 inches (G-BWLF had the smaller size). Whilst no cracks could be tolerated in the smaller size lugs, pending replacement of the larger type, a temporary repair was permissible if spares were not available. Maximum depth of the repair (essentially a 'blending-out' exercise) was 0.050 inches.

Examination of the aircraft's technical records showed that the last inspection had been accomplished some 57 flying hours and 7 months prior to the accident. The metallurgical report also concluded that the specified inspections could not guarantee 100% detection of a crack of the depth now known to have existed on G-BWLF. The report therefore recommended that the manufacturer review the critical crack depth with a view to adjusting the method and frequency of inspection accordingly.

The AAIB has informed both the CAA and the FAA of these findings.