AAIB Bulletin No: 10/93 **Ref: EW/G93/08/31** **Category: 1.3**

Aircraft Type and Registration:	Cessna F177RG, G-BFIV
No & Type of Engines:	1 Lycoming IO-360-A1B6D piston engine
Year of Manufacture:	1977
Date & Time (UTC):	22 August 1993 at 1659 hrs
Location:	Wycombe Air Park, Buckinghamshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to lower cowling, exhaust stub, propeller and forward nose gear door
Commander's Licence:	Private Pilot's Licence with IMC and Night Ratings
Commander's Age:	50 years
Commander's Flying Experience:	1,132 hours (of which 882 were on type) Last 90 days - 20 hours Last 28 days - 11 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and subsequent AAIB examination of the aircraft

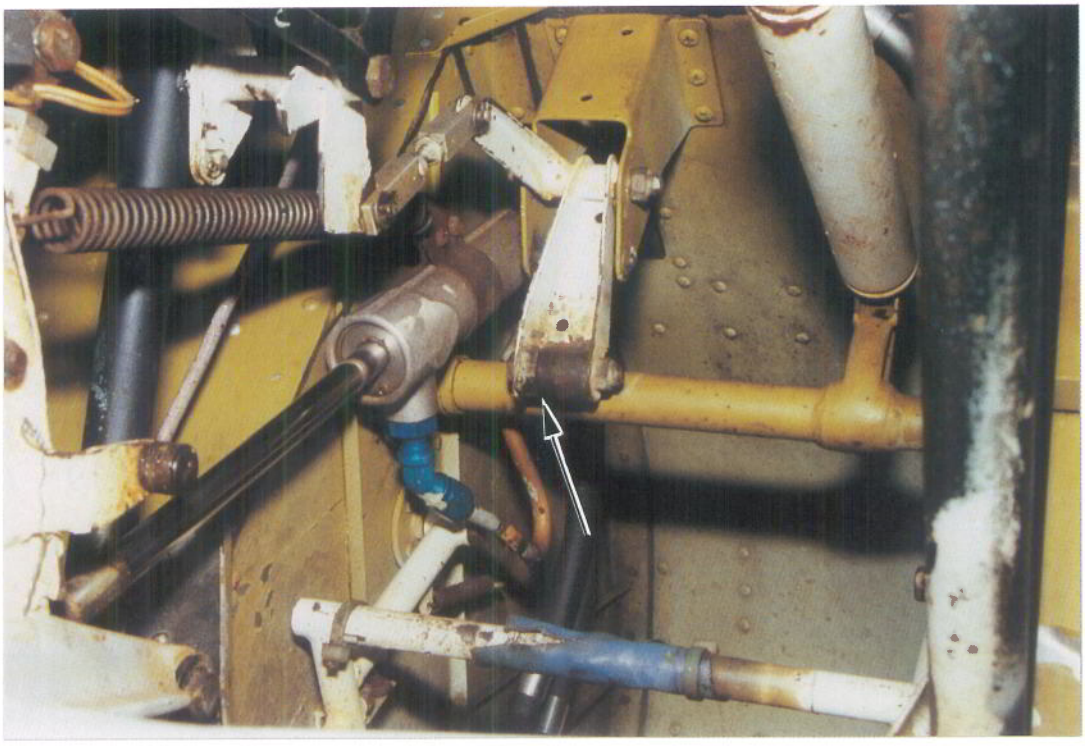
Whilst downwind for Runway 08 at Blackbushe, following an uneventful flight from Sandown, the pilot failed to obtain a green 'DOWN AND LOCKED' indicator light when the landing gear was selected down. The gear was recycled, with the same result. The pilot assumed that the nose gear had not extended correctly, as he was able to see that the main gear was apparently in position. Following a flypast of the control tower, the pilot obtained RT confirmation that the nose gear had failed to extend. As he had ample fuel, the pilot decided to depart to the west in order to assess the situation. Following attempts to lower the gear by means of the emergency handpump, and by carrying out high 'g' manoeuvres, all of which were unsuccessful, the pilot decided to make an emergency landing at Wycombe, as this was where the aircraft was maintained. During a flypast, the tower confirmed that the nose gear was still retracted. On short finals, the pilot selected fuel off, magnetos off and executed a glide landing on the runway, with the emergency services standing by. Despite the application of full up elevator, the propeller had not quite stopped when the nose contacted the runway. The aircraft slid to a halt and the pilot vacated the aircraft without injury. There was no fire.

After the event, the pilot commented that the nose down attitude during the ground roll had been quite alarming, such that he was convinced that the aircraft would have nosed over had the landing been conducted on grass.

Engineering examination subsequently discovered that the nose gear had failed to extend because the uplock hook had caught round the head of the bolt that mounted the uplock roller, - see Figure 1. Further investigation revealed that the hook, which is aligned with the aircraft's longitudinal axis, had been distorted such that the tip of the hook was displaced 0.4 inches to the right. This meant that the hook had been engaging with the extreme right hand edge of the roller, adjacent to the bolt head, and marks on the right of the roller suggested that this state of affairs had existed for some time. It was not clear how the hook had become distorted, or why the hook had hung up on the bolt head on this particular occasion. It was observed however that the bellcrank which carries the roller, and which moves during the retraction/extension process, had some lateral free play of up to approximately 0.1 inches at the roller end. It was thus possible that the hook was likely to engage the bolt head only when the roller bellcrank was at one of its limits of free play.

The aircraft owner was unable to account for the hook distortion. It was of reasonably strong construction, being made from steel plate approximately 0.2 inches thick, and thus would require a substantial load to bend it. It exhibited no witness marks such as could have been made from a hard object. It was possible that it may have been kicked at some time, in an attempt to castor the nosewheel when the aircraft was being manoeuvred on the ground.

Rear of hook bent 0.4" towards camera



View of wheel well looking aft: hook had been engaging RHS of uplock roller (arrowed), adjacent to bolt head.

FIGURE 1. NOSEGEAR UPLOCK DETAILS OF G-BFIV