Puma Sprint, G-MNFX

AAIB Bulletin No: 12/2004	Ref: EW/C2004/08/04	Category: 1.4
Aircraft Type and Registration:	Puma Sprint, G-MNFX	
No & Type of Engines:	1 Rotax 447 engine	
Year of Manufacture:	1985	
Date & Time (UTC):	15 August 2004 at 1900 hrs	
Location:	Arclid Industrial Estate, Hemmingshaw Lane, Sandbach, Cheshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Serious)	Passengers - 1 (Serious)
Nature of Damage:	Damaged beyond economic repair	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	70 years	
Commander's Flying Experience:	374 hours (of which over 230 were on type)	
	Last 90 days - 2 hours 48 minutes	
	Last 28 days - 0	
Information Source:	AAIB Field Investigation	

Synopsis

During a normal landing on a grass strip, the nose wheel assembly became detached from the microlight causing it to roll forward seriously injuring the pilot and passenger. The failure of the nose wheel assembly was caused by a fatigue fracture of the 'snoot', which grew from a probable defect in the weld securing the nose wheel mounting bush to the 'snoot'.

History of the flight

The aircraft departed from its home airfield at Egerton Green, near Nantwich, for a local flight to Arclid where the pilot intended to land before returning to Egerton. The pilot reported that the weather conditions were smooth and the windsock at Arclid was seen to be hanging limply. The approach height and speed for a landing on Runway 02 were normal and the microlight touched down rear wheels first. As the nose wheel was lowered the microlight rolled-over forwards causing the pilot and passenger to be seriously injured even though the passenger in the rear seat was restrained in the

aircraft by his four-point harness and the pilot by his lap strap. A witness who landed shortly after the accident reported that the weather was "warm and dry with a wind speed and direction of 10 mph and 200º". The condition of the 420 metres grass runway was observed as dry and firm.

Examination

Inspection of the wreckage revealed that the 'snoot' (a forward extension of the keel tube, see Figure 1) had fractured at the nose wheel mounting location, resulting in the nose wheel assembly becoming detached from the microlight. Marks on the ground indicated that the remainder of the snoot, still attached to the keel tube, had scraped along the ground for approximately 5 metres before it dug in, causing the microlight to roll forward. As a result, the trike and wing sustained substantial damage.

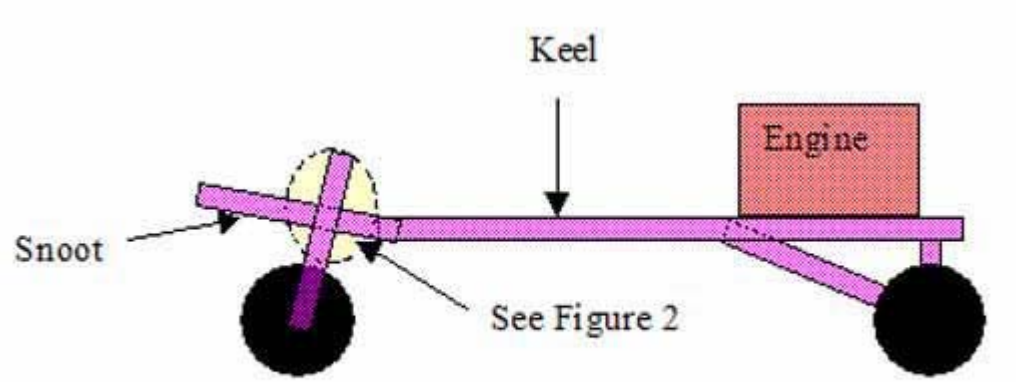

Figure 1 - Diagram indicating the location of the snoot fracture

Inspection of the snoot revealed the presence of a fatigue crack running approximately half way around the circumference of the snoot and which had its origin in the weld that secured the nose wheel mounting bush to the snoot. The nature of the fracture face of the remainder of the circumference indicated that it had failed in overload. A crack was also present, approximately 4 mm in length, running from the weld towards the lower edge of the bush, and a small dent was apparent on the lower surface of the snoot between the bush and keel tube, Figure 2.

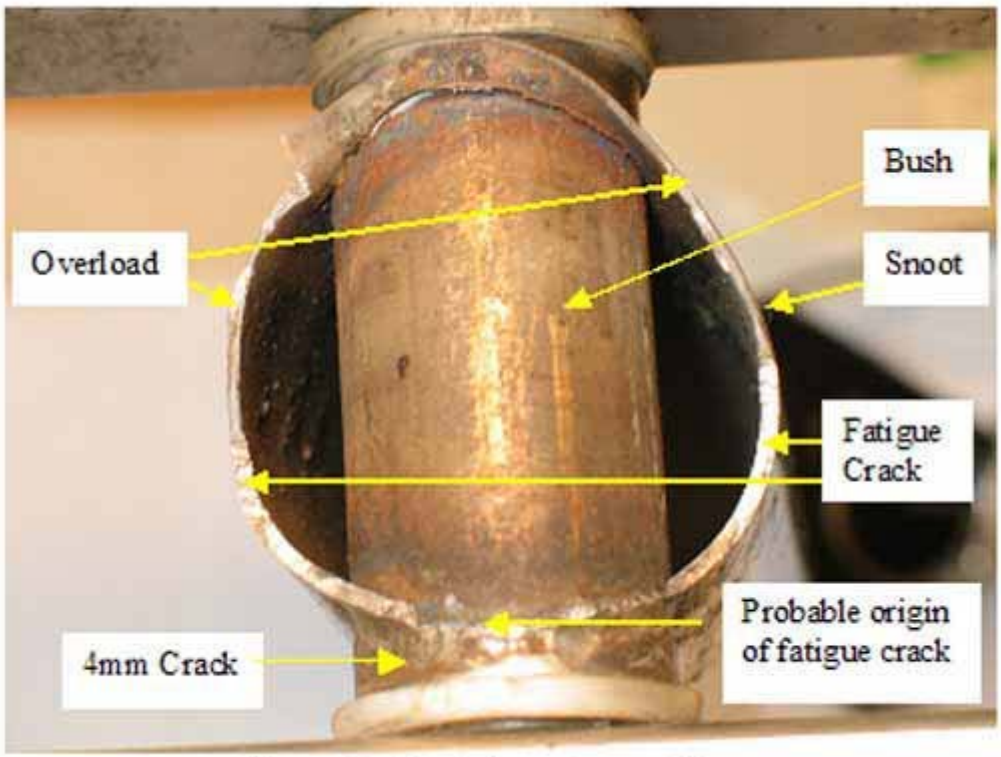

Figure 2 - Detail view of snoot failure

Background

The organisation who now hold airworthiness responsibility for the Puma Sprint, Medway Microlights, have stated that this is the first reported failure of this type. Damage to the snoot usually occurs as the result of a heavy landing, which causes the snoot to fail in buckling at a point between the bush and keel tube. The snoot was fitted to this microlight in 1988, 16 years, 270 flying hours and approximately 500 flights prior to the accident. The same design is used on the Raven and Raven X microlights.

Analysis

Whilst there was a small dent on the lower surface of the snoot there was no other damage on the microlight to indicate that a heavy landing had occurred on this or any previous occasion; it is, therefore, probable that the small dent occurred during the roll-over. The fracture face of the snoot indicated that the fatigue crack grew from a defect in the bush-to-snoot securing weld and that on the accident flight the fatigue crack had grown to a critical length such that the remaining material was insufficient to take normal landing loads. Consequently, during the landing the remaining intact cross section of the snoot failed in overload.

Given the location of the crack, it is unlikely that such a crack would have readily been discovered during the pre-flight inspection. The following recommendations are therefore made.

Safety Recommendation 2004-89

It is recommended that Medway Microlights should require the welds securing the nose wheel assembly mounting bush to the snoot fitted to Puma Sprint, Raven and Raven X microlight aircraft, to be inspected for cracks at the earliest opportunity.

Safety Recommendation 2004-90

It is recommended that Medway Microlights review the maintenance and inspection requirements and life expectation of the snoot assembly fitted to the Puma Sprint, Raven and Raven X microlight aircraft.