ACCIDENT

Aircraft Type and Registration:	Luton LA4A Minor, G-ATKH
No & Type of Engines:	1 Lycoming O-145-A2 piston engine
Category:	1.3
Year of Manufacture:	1967
Date & Time (UTC):	24 September 2005 at 1630 hrs
Location:	Laddingford Airfield, Paddock Wood, Kent
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Broken wheel axle and subsequent damage to landing gear, propeller and cowling
Commander's Licence:	Private Pilot's Licence with IMC rating
Commander's Age:	60 years
Commander's Flying Experience:	1,589 hours (of which none were on type) Last 90 days - 36 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and a metallurgical examination of the wheel axle

Synopsis

The right stub axle failed in overload during a heavy landing made by a pilot who was making his first flight on type.

History of Flight

The pilot, who had over 900 hours experience on tailwheel aircraft, was making his first flight on the Luton Minor. On the day of the accident, he had made four short local flights in his Europa aircraft before being briefed by the owner of the Luton Minor. After flying uneventfully for some 20 minutes, he made an approach to Runway 11 at Laddingford. In a frank statement to the AAIB, the pilot reported that aircraft stalled about 10 ft above the runway and that in the resultant hard and short landing, the right wheel stub axle failed and the right wheel detached. The aircraft came to rest on the lower part of the engine cowling, with the propeller broken and both the right landing gear and its associated fuselage structure damaged.

The pilot was uninjured and he reported that the full RAF type harness fitted was very effective. Importantly, the pilot assessed the cause of the accident as insufficient recent experience of a high drag airframe with little

inertia coupled with too much recent experience of the Europa aircraft with low drag airframe and very powerful all flying tailplane.

Aircraft examination

The right wheel stub axle had failed across its diameter just inboard of the inner face of the brake drum attachment plate. The stub axle was removed from the wheel and brake assembly and submitted to the AAIB for detailed examination. A photograph showing the stub axle is shown in Figure 1 (right).

Previous Stub Axle Failures

In February, 1994 a Luton Minor stub axle failed during a landing at RAF Halton. The subsequent AAIB investigation, including a detailed metallurgical examination (AAIB Bulletin No 5/94), found that that the stub axle had failed across the axle diameter just inboard of the inner face of the brake drum attachment plate, ie, in a similar location to the failure on G-ATKH. It was concluded that:

> *'the failure of the axle had resulted from the stress induced in the last landing, but that the static strength of the assembly, as manufactured, had been adversely affected by very poor quality welding'.*

The PFA noted that two failures had occurred in a similar region on Luton Minor stub axles and, as a result, issued a mandatory inspection; MOD/051/001 Inspection of Axle Welds for Cracks & Corrosion dated 2 March 2001. In this inspection it is noted that:

> *'The undercarriage design is considered adequate if well constructed, however if corrosion is present then cracks may soon appear leading to structural failure'.*

Figure 1

Examination of the Stub Axle

The right stub axle of G-ATKH was the subject of a dedicated metallurgical examination using visual and low magnification techniques. The view in Figure 2 (below) was taken from a view along the axle centre line in an outboard direction, with the landing load being in a direction vertically upwards as depicted.

Figure 2

The examination concluded that:

- Poor welding had resulted in tube wall thinning and some weld burn through
- A region of gas porosity existed; however, this was present on the upper part of the weld in a region subject to compressive loads in the landing gear and would not therefore have adversely affected the strength of the joint, as this would have been the last to separate
- Some corrosion pitting had occurred but, considering the direction of the load that had caused the separation, the resultant reduction in strength was considered minimal
- The separation had resulted from overload bending conditions
- There was no evidence of separation by a progressive mechanism such as fatigue or stress corrosion.

ACCIDENT

Aircraft Type and Registration:	Maule MXT-7-180, G-BZDT
No & Type of Engines:	1 Lycoming O-360-C1F piston engine
Category:	1.3
Year of Manufacture:	2000
Date & Time (UTC):	25 October 2005 at 1700 hrs
Location:	Portadown, Northern Ireland
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Minor) Passengers - N/A
Nature of Damage:	Aircraft damaged beyond economic repair
Commander's Licence:	Private Pilot's Licence
Commander's Age:	42 years
Commander's Flying Experience:	480 hours (of which 290 were on type) Last 90 days - 60 hours Last 28 days - 45 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was being flown to a private grass strip near Portadown where it was occasionally kept. Due to recent rainfall and a strong south-westerly wind the pilot decided to inspect the landing strip by means of a low overflight, prior to landing. He configured the aircraft with two stages of flap, reduced speed and descended to approximately 100 ft agl over the threshold of the strip's south-easterly runway. On flying down the runway he observed surface water patches and, noting a 15 kt crosswind, decided to divert to Belfast International Airport where the aircraft was normally based. Just before he initiated the diversion, and whilst still at 100 ft agl, the aircraft encountered severe turbulence with downdraughts and lost height. Full power was applied and a positive pitch attitude was selected in an attempt to climb away. However, an uncommanded roll to the left led to a nose low attitude and the left wing and propeller struck the ground before control could be regained. The aircraft then cart wheeled onto its right wing before coming to rest against some trees. The pilot, who was wearing a lap and diagonal harness, was rendered unconscious for a short period before vacating the aircraft without assistance.

Evidence indicates that the aircraft flew into an area of turbulence when downwind of buildings and trees adjacent to the runway. In attempting to fly out of the downdraughts whilst at a low airspeed a rapid selection of a positive pitch attitude is likely to have caused the aircraft to stall. An associated wing drop would lead to