FINAL REPORT

AAIU Synoptic Report No: 2006-004
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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 6 March 2005, appointed Mr. John Hughes as the Investigator-in-Charge to carry out a Field Investigation into this occurrence and prepare a Synoptic Report.

Aircraft Type and Registration:	Lambada UFM-11, EI-DGT
No. and Type of Engines:	1 x Jabiru 2200
Aircraft Serial Number:	14/11
Year of Manufacture:	2000
Date and Time (UTC):	5 March 2005 @ 12.30 hrs
Location:	Abbeyshrule, Co.Longford
Type of Flight:	Private
Persons on Board:	Crew - One Passengers - Nil
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	Nose gear assembly collapsed and propeller tips damaged
Commander's Licence:	PPL
Commander's Details:	Male, aged 59 years
Commander's Flying Experience:	3,080 hours, of which 570 were on type
Information Source:	Pilot of aircraft contacted the AAIU.

1. FACTUAL INFORMATION

1.1 History of the Flight

The aircraft departed Galway Airport, from where it is based, for the 50 NM trip to Abbeyshrule and arrived overhead that airfield at 12.30 hrs. Weather forecast confirmed a northerly wind and the pilot elected to land on Runway (RWY) 28. Due to the strength of the crosswind, the pilot decided to land the aircraft without flaps. A significant amount of rudder was also used due to the crosswind. On landing, at a point approximately 140 metre in from the threshold, all three wheels touched the runway and a slight ballooning of the aircraft took place. The pilot said that the main wheels then touched on again, but he realised that "the nose wheel was not available and lowered the nose with caution at slow forward speed". There were no reported injuries and the pilot exited the aircraft in the normal way.

1.2. Damage to Aircraft

The steering tube of the nose wheel bent rearwards following wheel impact on landing. This allowed the spat, complete with wheel, to rub off the runway surface as the aircraft landed. The wooden propeller blade tips contacted the tarmac surface during the landing and were also damaged.

1.3 Aircraft Information

This side-by-side Czech ultralight aircraft conforms to JAR-VLA (Very Light Aircraft). It has flaperons, rudder and one-piece elevator. Details are as follows:

Wingspan:	11.80 metres
Length:	6.60 metres
Wing Area:	10.80 square metres
Maximum Take-off Weight: (MTOW)	450 kg
Max Cruising Speed:	92 kt
Stalling Speed:	36 kt
Glide Ratio:	20

The nose wheel is held in a fork unit, similar to that on a bicycle (see **Appendix A**). The fork tube is attached to the steering tube through an internal 35 mm long sleeve, which is plug welded to the steering tube at three circumferential locations. A second internal tube (stiffening) extends up the steering tube for about 100 mm, and is held in place by an adhesive.

1.4 Pilots Comments

Due to generally good weather, the flight was undertaken on the basis that, weather-wise, landing at Abbeyshrule was acceptable. The pilot said that the cause of the incident was due to an underestimation of the strength of the wind gust factor. The actual wind condition at the time was, *"Wind at 340°, gusting 14 to 20 kt"*. He also said that, *"the aircraft normally requires a fairly flat nose attitude for touchdown"*. The engine was at idle when the damage to the propeller occurred.

1.5 Aircraft Inspection

A metallurgist examined the nose steering tube and fork and reported as follows:

Localised bending was observed in the steering tube adjacent to the fracture, consistent with sideways loading. Examination of the fracture surfaces with the aid of a stereomicroscope revealed fracture features typical of single event overload failure, with no indication of any pre-existing defect, cracking or corrosion. Some slight lack of penetration/fusion of the plug welds was observed at the edges of two of the holes in the steering tube.

2. ANALYSIS

The rudder control on this aircraft also controls the nose wheel movement, so that the wheel was turned towards wind direction on touchdown. This would have increased the landing

stresses in the steering tube. The weakest point of the fork/steering tube attachment is along the circumference of the tube where the three plug welds are located. This location is also where the 35 mm internal sleeve meets the 100 mm internal stiffening tube. This is, in fact, where the steering tube fractured on impact. This construction facilitates fracture at this location, in the event of possible overload, in order to reduce damage to the front structure and composite skin.

3. CONCLUSIONS

(a) Findings

The aircraft first touched down during a flapless landing in a wing-down condition, causing the nose wheel steering tube to take abnormal loads.

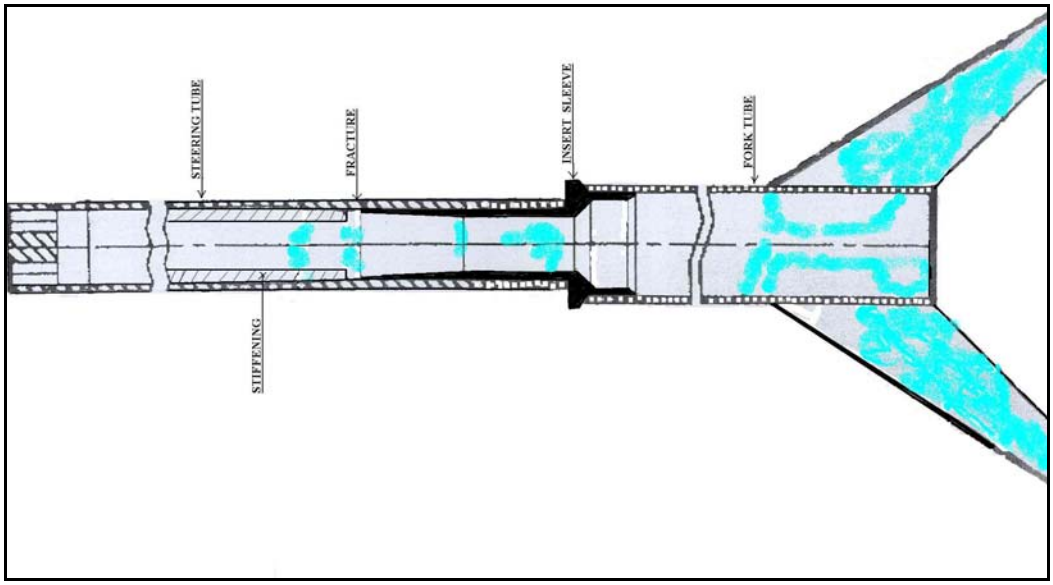
(b) Cause

The abnormal loads caused the nose steering tube to fracture at its designed weakest point.

4. SAFETY RECOMMENDATIONS

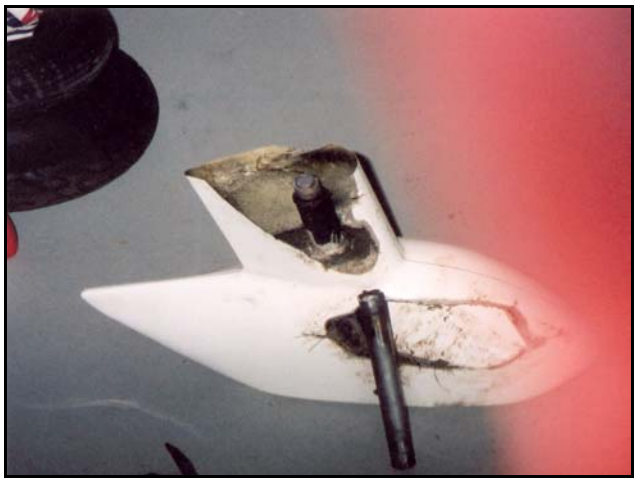
4.1 This report does not sustain any Safety Recommendations.

APPENDIX A



Above sketch shows a cross-section of the nose wheel strut

A serviceable nose wheel strut in a similar aircraft



The fractured nose wheel strut from EI-DGT