FINAL REPORT

AAIU Synoptic Report No: 2006-002
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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 4 August 2004, appointed 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:	X-AIR 582 (5) Microlight, G-CBFT
No. and Type of Engines:	1 x Rotax 582/48-2V
Aircraft Serial Number:	BMAA/HB/190
Year of Manufacture:	2001
Date and Time (UTC):	4 August 2004 @ 16.40 hrs
Location:	Mullingar, Co. Westmeath
Type of Flight:	Private
Persons on Board:	Crew - one Passengers - one
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	None
Commander's Licence:	UK National Private Pilots Licence
Commander's Details:	Male, aged 47 years
Commander's Flying Experience:	302 hours, of which 48 were on type
Information Source:	Phone call to the AAIU from the Pilot of the aircraft.

SYNOPSIS

The aircraft was at an altitude of 1,200 ft. when the pilot noticed a drop in engine power. He increased the throttle to full position but the engine did not increase to full R.P.M. At approximately 1,100 ft the engine stopped completely. The aircraft made an emergency landing into a field near the shores of Lough Ennel.

1. FACTUAL INFORMATION

1.1 History of the Flight

The pilot and the passenger were on a pleasure trip from Clonbullogue, Co.Offaly to Granard, Co. Longford. The aircraft was at a speed of approximately 50 kt and an altitude of 1,200 ft when the pilot noticed a drop in engine power. He increased the throttle to full position but the engine did not increase to full R.P.M. He confirmed that the fuel pressure was satisfactory and that the magneto switch was in the "ON" position. The water and exhaust gas temperatures looked normal.

He immediately looked for a field in which to land, in case the engine stopped. He decided on a freshly mowed field, so he turned towards that field. When he was happy he could land there safely, he tried to ascertain what was wrong. However, at approximately 1,100 ft the engine stopped completely. He completed his landing checks and made a left turn landing in an easterly heading into an up-sloping field on the shores of Lough Ennel. His touchdown speed was 35 mph and the landing roll was 50 metres. There were no reported injuries or damage to property and the pilot and his passenger left the aircraft in the normal way. Both pilot and passenger wore full seat harness.

1.2 Aircraft Information

This X-AIR aircraft is a conventional 3 axis controlled two seater side-by-side ultra light tricycle aircraft fitted with a 65 HP Rotax Type 582-2V engine made in Austria. The liquid cooled engine has double electronic ignition with two plugs per cylinder and double carburettors. The aircraft is fitted with full dual controls. The standard instrumentation includes a water temperature gauge. The engine should be overhauled every 300 hours or 5 years in service. The aircraft was purchased second-hand, directly from the manufacturer's UK agent and its engine had used 110 hrs of its overhaul life at the time of purchase. The present owner stated that the engine oil used was of a type recommended by the engine manufacturer. This engine had only 172 hours in service at the time of failure.

1.3 Performance

At close to sea level, under standard temperature and pressure conditions with the aircraft loaded to its 450 kg maximum all up weight (MAUW) the performance figures include the following:

Stall Speed :	25 knots.	**Rate of Climb:**	1000 ft/min.
Max Speed :	80 kts.	**Distance to Land :**	50 Metres

1.4 Aircraft Inspection

Following the engine removal from the aircraft and a subsequent strip down of the engine, failure was found to be due to a No.1 big-end bearing failure (see **Appendix A**). The engine was subsequently overhauled and a new crankshaft, set of pistons, cross shaft, and a new top and bottom case installed.

The Rotax 582 is a two cyclinder 2 - stroke engine, and over time, the products of combustion will enter the engine crankcase. In 1992, the UK agent for these engines produced a Service Information letter to cover short term and long term protection strategies. The manufacturer also issued Service Information (SI) 3 VL 91-E, 13 UL 94 and 14 UL 94 to cover the maintenance and protection of these engines. A considerable amount of inspection should be carried out at 25 and 50 hrs in accordance with the former SI.

The Specification Sheet for this engine carries the following warning:

"This aircraft engine does not comply with federal safety regulations for standard aircraft. The engine is for use in experimental and ultralight uncertified aircraft only, and only in circumstances in which an engine failure will not compromise safety".

The aircraft has a UK "Permit to Fly" issued on 26 July 2004. It is a requirement of this permit that permission is granted from the IAA in order to legally fly in Ireland. The IAA informed the Investigation that G-CBFT had been given such permission, valid until 30 October 2005.

2. ANALYSIS

CAA Airworthiness Notice No.98B states:

"The flight and landing characteristics of microlight aeroplanes are designed to be such that an engine failure resulting in partial or total loss of power only, is not an unacceptable safety risk".

Lubrication in a two-stroke engine using Mogas fuel is through the normal fuel/oil mixture. Normal lubrication of the engine can be interfered with if an oil other than the recommended oil type is used. The use of such oils can lead to a rapid deterioration of the bearing surface leading to eventual bearing failure.

Running the engine at successively high RPM on start-up before the mixture has had time to warm up could also lead to eventual bearing failure in service.

The manufacturer recommends rebuilding the engine at 300 hours or 5 years. Thus the engine had completed only 57% of its overhaul period.

3. CONCLUSIONS

(a) Findings

The engine lost power in cruise at 1,200 ft.

(b) Cause

Failure of the engine was due to big-end bearing failure.

4. SAFETY RECOMMENDATIONS

This Report does not sustain any Safety Recommendations.

APPENDIX A

Above: A typical X-AIR microlight aircraft

The thumb points to the engine connecting rod and associated big-end bearing which failed in service on G-CBFT.