FINAL REPORT

AAIU Synoptic Report No: 2005-025
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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 24 May 2004, 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:	Thruster TST Mk1 Microlight, G-MTKD
No. and Type of Engines:	1 x Rotax 503 DCDI
Aircraft Serial Number:	867-TST-024
Year of Manufacture:	1987
Date and Time (UTC):	24 May 2004 @ 18.00 hrs
Location:	In field south of Kilrush, Co. Kildare
Type of Flight:	Leisure
Persons on Board:	Crew - One Passengers - Nil
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	Damage to composite nose
Commander's Licence:	Irish PPL
Commander's Details:	Male, aged 27 years
Commander's Flying Experience:	120 hours (of which 55 were on type)
Information Source:	Station Manager, ATC Dublin

1. FACTUAL INFORMATION

1.1 History of the Flight

The microlight aircraft took off from the Kilrush Airfield and climbed to between 1,500 and 2,000 ft. Suddenly the aircraft engine RPM dropped and then the engine stopped. The pilot put the aircraft into a glide, switched off the ignition and fuel and made a radio call on the local frequency. He chose a landing field below, planned the approach and landed in the field. He exited the aircraft uninjured through the pilot's door. He called for local assistance on his mobile phone and after de-rigging his aircraft, it was taken back to the hangar at the airfield. The pilot was not aware that he was obliged to contact the AAIU and report the incident.

1.2 Damage to the Aircraft

The aircraft pitot head, which was fixed to the nose, was bent and the composite structure of the nose was damaged when the aircraft's nose wheel hit a sharp dip in the field on landing.

1.3 Pilots Report

The Pilots Report Form indicated that the cause of the engine failure was found to be a fuel blockage in the primer bulb.

1.4 Aircraft Information

The Thruster TST Mk1 is a two seat 3 axis microlight with a maximum all up weight (MTOW) of 361 kg and is manufactured in the UK. The fuel supply system for the Rotax 503 engine incorporates a primer bulb, which is used for starting the engine from cold (**See Appendix A**). The fuel enters the bulb at one end through a non-return valve (which consists of a small plastic or steel ball at the inlet to the bulb). When the bulb is squeezed the ball blocks the inlet and at the same time the fuel is forced out through the valve at the other end and up to the engine.

1.5 Additional Information

In June 2002, an Airworthiness Directive (AD) was issued by another microlight manufacturer, which related to a problem with the fuel primer bulb fitted to some engines. The primer bulb outlet valve is held in place by a snap-in plastic ring. If the snap-in ring detaches, the valve can float around inside the primer bulb and block the outlet in a random manner, causing fuel starvation to the engine. The AD outlines a process of locking the snap ring with locking wire.

2. ANALYSIS

Some microlights do not require a primer bulb to be fitted in the fuel supply line to prime the engine, particularly if the supply line to the engine is short. If not fitted, some owners turn the propeller prior to starting. The danger of the ball blocking the outlet fuel supply was considered sufficient to require an Airworthiness Directive and, in one case, a Service Bulletin to be issued to cover this malfunction. Other operators have installed a flexible bypass line to the primer bulb but, if not operated properly, this may defeat the whole purpose of the primer system. In this incident, the inlet ball came loose due to wear and found its way up to the outlet of the primer bulb.

The Investigation is of the opinion that any modifications to the primer bulb should be conducted by the manufacturer of the bulb or the manufacturer of the aircraft. In the meantime, the microlight manufacturer should recommend that the primer bulb, in its present form, be replaced every 300 flying hours or two years, whichever comes first.

3 CONCLUSIONS

(a) Findings

The inlet ball valve of the primer bulb came loose due to wear and found its way up to the primer bulb outlet.

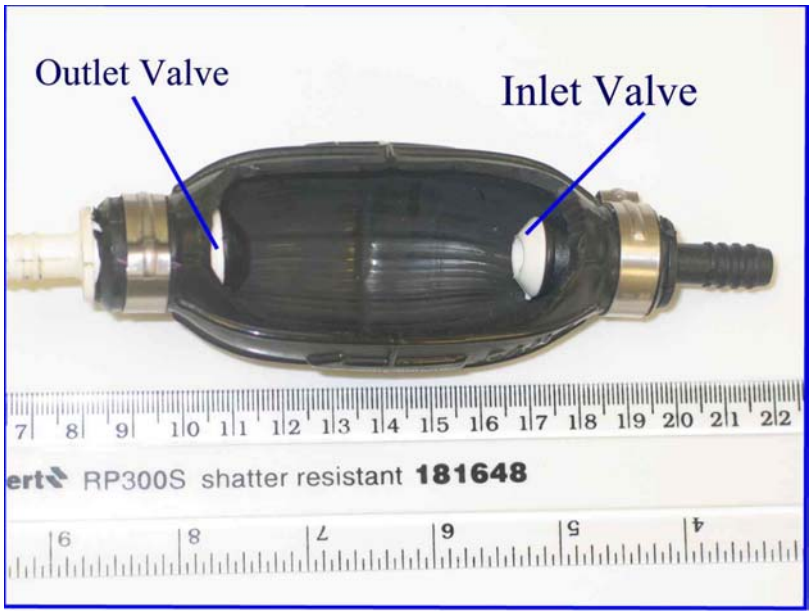
(b) Cause

The inlet ball valve blocked the supply of fuel to the engine resulting in engine fuel starvation and engine stoppage.

4. Safety Recommendations

It is recommended that the aircraft manufacturer require that the primer bulb be replaced every 300 flying hours or two years, whichever comes first. **(SR 24 of 2005)**

APPENDIX A



Cut-away view of similar type of Primer Valve showing the inlet and outlet snap-in rings which retain the ball valves in place.