REPORT

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Aircraft Type and Registration:	Pegasus XL-R, G-MWUE
No. and Type of Engines:	One, Rotax 447 Air Cooled
Aircraft Serial Number:	SW-WA-1513
Year of Manufacture:	1991
Date and Time (UTC):	13 February, 2000, 1700 hours
Location:	Baltray Beach, Co. Louth
Type of Flight:	Private
Persons on Board:	Pilot – One Passenger - One
Injuries:	Pilot – Serious Passenger - Serious
Nature of Damage:	Extensive
Commanders Licence:	UK Private Pilots Licence (Aeroplanes)
Commanders Age:	29 Years
Commanders Flying Experience:	58 hours
Information Source:	ATC Watch Manager, Dublin Airport. AAIU Field Investigation

1. History of Flight

In an Aircraft Accident Report Form submitted by the pilot he said that take-off with one passenger was about 16.30 hours on a lovely sunny Sunday afternoon, with very little wind from an East North Easterly direction. His passenger was also the owner of the aircraft.

He flew eastwards towards the coast from the Drogheda area where he maintained 500-550ft above the beaches and turned in a southerly direction. On reaching Baltray Beach the pilot said he noted a slight drop in engine revs so he descended low over the beach to see if it was suitable for a landing. However, he noticed deep footprints in the sand and concluded that the beach was not suitable to land on. Accordingly, with Baltray Golf Course immediately to his right, he applied full power to gain altitude and a more promising landing area. As he approached the mouth of the River Boyne Estuary the engine suddenly went to idle/tick-over. There was no response from the foot throttle.

Rather than land in the river or sea the pilot banked the aircraft hard right and crash landed on the beach, striking it hard on its starboard side. Some family members, who were close by, witnessed the accident. They helped the injured pilot and passenger clear of the wreckage and summoned medical assistance. The pilot and passenger received serious injuries, necessitating hospitalisation in excess of 48 hours.

In a statement the pilot said that the low altitude and sudden loss of power rendered his chances of reaching the relative safety of the nearby golf club impossible.

2. Technical Examination

(a) Engine Information

A two cylinder, 2-stroke cycle Rotax 447 engine, powers the Pegasus XL-R. The engine is equipped with one spark plug in each cylinder. A single magneto assembly powers the spark plugs. Within this assembly are two coils, each coil provides ignition to one spark plug.

(b) Examination of the Engine

The engine was found to be in good condition and did not appear to have been damaged in the accident. However, the earth lead to one of the magneto coils was found to be broken. The brass connection tab at the end of the lead was broken. The location of this lead is such that it is well protected and it is unlikely that the tab was damaged in the accident or subsequently. The broken connection tab was subjected to detailed metallurgical examination with the following results.

- Failure of the connection occurred over a period of time, through the propagation of a fatigue crack, to the point that the small remaining intact ligament failed through overload.
- The examination did not reveal any indication of a material or manufacturing defect associated with the fracture.
- There was no indication of arcing associated with the fracture. This would indicate that the separation of the connector was sudden and total.

3. Discussion

Failure of the earth connection of the magneto coil would result in the sudden and total failure of the spark to one of the two engine cylinders. This in turn would lead to a power loss to the propeller exceeding 50%.

Standard aircraft engines feature two totally separate magneto systems, each with its own spark plug in each cylinder. This is known as dual ignition. With such a system, the loss of one complete magneto system, or any component of that system, results in a relatively minor loss of power, thereby permitting a safe landing in the event of the failure of one ignition system.

The single ignition system on the Rotax 447 engine has no such safety protection. Therefore such aircraft should be operated in a manner whereby an engine failure cannot be considered a remote possibility, but rather as a distinct probability. Consequently manoeuvres such as low runs, which would require normal engine power to be available for a safe recovery, should not be attempted in aircraft equipped with such engines. Such aircraft should be flown in manner that, following an engine failure at any time, the flight can be safely completed using a glide (powerless) landing.

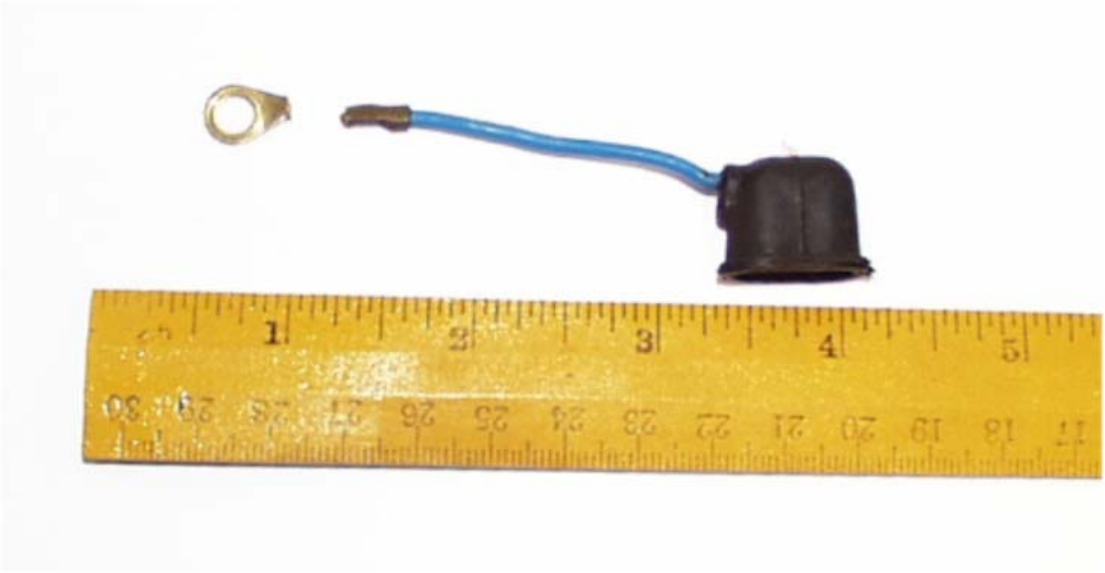

Fig 1

The failed magneto lead showing the separated tab to the left of picture