Piper PA-28-161 Cherokee Warrior II, G-BPWZ

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Aircraft Type and Registration:	Piper PA-28-161 Cherokee Warrior II, G-BPWZ
No & Type of Engines:	1 Lycoming O-320-D3G piston engine
Year of Manufacture:	1983
Date & Time (UTC):	10 August 1997 at 1615 hrs
Location:	Field, near Whitehaven, Cumbria
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 3
Injuries:	Crew - Serious - Passengers - Minor
Nature of Damage:	Substantial damage to engine and airframe
Commander's Licence:	Private Pilot's Licence with IMC and Night Ratings
Commander's Age:	51 years
Commander's Flying Experience:	342 hours (of which 304 were on type)
	Last 90 days - 5 hours
	Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was returning to Liverpool following an uneventfulflight to Kirkbride. When abeam Workington the pilot initiateda climb from 1,500 feet to 2,500 feet in order to clear the restrictedarea at Sellafield. As the aircraft reached 2,300 feet the enginesuddenly ran very roughly, with no improvement on using the throttle,but the engine indications were normal. A full engine failuredrill was carried out, including changing fuel tanks, checkingthe magnetos and fuel pump, and applying carburettor heat, butthe rough running continued. The pilot therefore decided to carryout a forced landing.

A Mayday call was transmitted and the transponder code set toemergency. The call was acknowledged, and the pilot was instructedto change frequency to 121.5 MHz.

Only one field appeared suitable for a forced landing and thesubsequent touchdown was made just inside the boundary wall, withfull flap selected. However the aircraft subsequently collidedwith an earth/stone embankment, since the available landing distancewas no more than 150 metres. The collision caused substantialdamage to the aircraft and the pilot sustained a fractured ankle.

Subsequent examination of the engine by a maintenance organisationrevealed that the engine had suffered a broken cam follower forthe No. 2 cylinder inlet valve. This had resulted in the lossof the hydraulic lift function of its associated tappet, leadingto the push-rod becoming bent. The consequent disruption to valveoperation had caused significant mechanical damage to the engine.

A UK overhaul agent for this type of engine reported that theyhad experienced a small number of such failures over the years.However, the CAA database had only one record of a similar failurewithin the last 20 years.

The engine had been overhauled in the USA in October 1994, beforebeing installed in G-BPWZ later that month. It had achieved 1,128hours at the time of the failure. The engine manufacturer requiresthat in the event that the camshaft is renewed, new cam followersshould also be installed. If the old components are utilised,the manufacturer advised that the cam followers should be reinstalledin their original locations in order to avoid potential changesin wear patterns. The cam followers should not be re-profiled,although this has been known to occur at some overhaul agents.In the case of this engine, the overhaul release documentationdid not contain detailed information on component replacement.