ACCIDENT

Aircraft Type and Registration:	Denney Kitfox Mk 2, G-BWHV
No & Type of Engines:	1 Rotax VL 582 piston engine
Year of Manufacture:	1997
Date & Time (UTC):	18 July 2006 at 1212 hrs
Location:	Treforest Industrial Estate, Pontypridd
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 Passengers - 1
Nature of Damage:	Aircraft destroyed
Commander's Licence:	National Private Pilot's Licence
Commander's Age:	53 years
Commander's Flying Experience:	241 hours (of which 110 were on type) Last 90 days - 3 hours Last 28 days - 3 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The aircraft suffered a substantial loss of engine power and crashed into an industrial estate following an attempted forced landing into school playing fields.

History of the flight

The pilot and passenger, his wife, had planned a local flight and took off from Cardiff Airport at about 1145 hrs (UTC), departing to the north. Crossing the M4 motorway, clear of controlled airspace, they descended to 1,000 feet for a timed climb to 2,000 feet, their assigned height. The timed climb was satisfactory and the pilot turned up the Rhonda Valley towards Pontypridd for local flying.

Turning back for the return into Cardiff, the pilot retuned the radio for the Cardiff ATIS and was making a turn to the left when he and his passenger heard loud screeching sounds, and bangs, from the engine. The pilot throttled back and checked the engine instruments, which were normal. He found that the engine would run at about 4,000 rpm - he commented that, normally 5,000 to 5,500 rpm was needed to maintain height, with idle at about 3,000 rpm, so the aircraft was descending at this point.

The pilot looked for landing fields but could see nothing suitable in the upper valley. He decided that he could not clear the valley, towards Cardiff, so he selected the Hawthawn playing-fields, near the Treforest Industrial

Estate, as his only landing site. He set up for an approach over the open end of the playing-fields but, at the 'threshold' found himself still 2 to 3 metres high and much too fast. He managed to put the wheels on the grass twice but bounced each time and, assessing that the row of trees at the far end of the field was too close, opened the throttle.

The aircraft cleared the trees and the pilot was turning to the left, for another attempt into the same field, when the engine cut completely. The aircraft descended towards industrial buildings and the left landing gear leg struck a roof, spinning the aircraft around so that it fell next to the building it hit, chopping off the tail on a brick wall.

The crew compartment came to rest inverted on the A4054 road and the pilot told his wife to wait for him to help get her out. He released his harness and crawled out of the rear of the compartment, to reach the passenger side of the aircraft. Meanwhile his wife had released her harness and the pilot was able to help her out. Together they reached the grass at the side of the road and became aware of people coming to assist. There was no fire and the passenger and pilot were taken to hospital, although they assessed their injuries as minor. Both seats were equipped with full 'four-point' harnesses.

Examination

The Rotax 582 is a two-cylinder two-stroke engine driving the propeller, in this installation, through a simple reduction gearbox. In the case of G-BWHV, the engine was later modified with a factory-provided rotary hydrodamper unit, to reduce the level of vibration. The design of this damper is conventional, with a toroidal mass, enclosed within a cylindrical body, moving in a viscous fluid to provide rotary vibration damping.

The engine from G-BWHV was later examined at an overhaul agency. The major failure identified within the engine, before its impact with the ground, was in the hydrodamper, where the small outer flange of the cylindrical body had separated, resulting in the loss of the viscous fluid. It was not clear what mechanism had caused the subsequent loss of power but the engineer examining the engine considered it possibly due to contamination from the fluid released from the damper. Examination of the fracture surface by a metallurgist indicated the failure had been through a fatigue mechanism, starting with fatigue origin points on the inner surface of the flange.

The engine manufacturer was consulted on this flange failure and commented that they had not seen any similar cases.

Analysis

The pilot considered that the failure to make a satisfactory forced landing at the first attempt was at least partly due to a lack of recent practice of glide approaches to an actual landing: his most recent practice to a completed landing had been in September 2005, although he had done a practice, to 500 feet, the previous day. He assessed that, in the approach to the playing fields, he should have gone further downwind but was intimidated both by the state of the engine and the presence of the industrial buildings. He also considered that, to reduce energy on approach, a sideslip would have helped but that he did not realise he was too high and fast until it was too late.