ACCIDENT

Aircraft Type and Registration:	Pilatus P2-05, G-BLKZ
No & Type of Engines:	1 Argus AS 410-A2 piston engine
Year of Manufacture:	1948
Date & Time (UTC):	31 May 2008 at 1659 hrs
Location:	Heath Farm, Barkston Heath, Grantham, Lincolnshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (Minor) Passengers - 1 (Minor)
Nature of Damage:	Damage to the propeller, landing gear, and underside
Commander's Licence:	Private Pilot's Licence
Commander's Age:	48 years
Commander's Flying Experience:	888 hours (of which 3 were on type) Last 90 days - 16 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and preliminary post accident inspection report from a maintenance organisation

Synopsis

Whilst cruising at 2,000 ft the engine failed. During the subsequent forced landing, the landing gear collapsed. The pilot and passenger sustained minor injuries but were able to exit the aircraft without assistance. The aircraft sustained substantial damage.

History of the flight

The pilot reported that the aircraft had departed from RAF Waddington for a planned flight to Spanhoe Airfield and had climbed to 2,000 ft. Cruise power had been set and the engine temperatures and pressures were indicating normal values. Approximately five minutes later, a slight vibration was noted which quickly developed into heavy vibration. Oil was observed to be running from the right side of the engine cowling and onto the windscreen. The pilot reduced power and lowered the landing gear but, at approximately 800 ft agl, the engine stopped. The flaps were lowered and a slight left turn was made to avoid uneven ground and power lines. The aircraft landed heavily in a slightly nose-down attitude and the landing gear collapsed. The pilot and passenger sustained minor injuries but were able to exit the aircraft without assistance. The landing gear was severely damaged, the propeller and underside of the aircraft less so.

Aircraft details

The Pilatus P2 is a tandem two-seat, tailwheel-configured, low-winged all metal aircraft, designed

in the 1940's as an advanced military trainer. The main landing gear is retractable. The type remained in military service until the early 1980's. The Argus engine was originally developed in 1937 and is of a supercharged, inverted V12 configuration, producing around 465 horsepower at full power. This particular aircraft was constructed in 1948.

The engine was rebuilt 2001 and had flown approximately 367 hours prior to the accident. Upgraded pistons, manufactured from a revised specification alloy (introduced to avoid corrosion-induced cracking problems that had been encountered on low utilisation engines), were fitted 49 flying hours and 85 flights before the accident.

The aircraft had been used to fly aerobatics and carried out a series of manoeuvres as part of a flight test for a magazine article a short time before the engine failure.

Engine examination

Initial visual inspection of the engine by the pilot revealed a golf ball sized hole in the crankcase in the vicinity of No 3 cylinder. The missing crankcase parts were found in the bottom of the engine cowling.

Subsequent preliminary investigation, by a maintenance organisation with experience of this type of engine, found that both connecting rods were broken on the third bank of cylinders from the front. The first appeared to have failed at the gudgeon pin and this failure in turn destroyed the second. Both pistons were free to move in their respective cylinders. There was no sign of 'blueing' on the crankshaft, although some 'blueing' had been caused by the flaying rods hitting the cylinder skirts and crankcase wall, indicating the bearing lubrication system had been functioning normally.

Comments

The maintenance organisation commented that this engine had failed in a similar fashion to many other Argus engines they had seen; they reported that they are not a 'strong' engine and have a history of connecting rod and piston failures. They went on to say that, like many other engines of this era, the Argus engine requires delicate handling and smooth power changes.