

No: 9/90

Ref: EW/G90/06/25

Category: 1b

Aircraft Type and Registration: Pilatus Britten-Norman BN2T Islander, G-TEMI

No & Type of Engines: 2 Allison 250-B17C turbine engines

Year of Manufacture: 1982

Date and Time (UTC): 27 June 1990 at 1320 hrs

Location: Bembridge, Isle of Wight

Type of flight: Private (flight test)

Persons on Board: Crew - 2 Passengers - None

Injuries: Crew - None Passengers - N/A

Nature of Damage: Tailplane, fuselage and right wing buckled, main landing gear broken

Commander's Licence: Commercial Pilot's Licence

Commander's Age: 34 years

Commander's Total Flying Experience: 2,729 hours (of which 930 were on type)

Information Source: Aircraft Accident Report Form submitted by the pilot

A flight test was being carried out in wind conditions of 220°/17 kt, with slight gusts which had not been mentioned in the forecast. The first task was to demonstrate compliance with the requirements of BCAR K2-7 para 3.3, which states that "In the event of sudden failure of the Critical Engine at any point in the take-off conducted in accordance with the recommended technique at any speed up to V_2 it shall be possible to prevent a lateral divergence from the intended take-off path of more than 9.1 m (30 feet)". Paragraph 3.4 goes on to state that "Where the aircraft is airborne at speeds below V_2 , it shall be possible.....to re-land without the display of undue skill on the part of the pilot". V_2 had been calculated on this occasion as 60 Knots Air Speed Indicator Reading (KASIR) and the pilot had decided to demonstrate compliance by using $V_2 \pm 5$ KASIR. Engine failure, for the purpose of the demonstration, was achieved by closing the low pressure fuel cock at a speed which was judged as likely to produce the (seconds later) engine run-down at the chosen speed (60 KASIR, in this case ± 5 kt).

Failure of the left engine was demonstrated to be satisfactory, with the engine run-down occurring at 63 KASIR and with a lateral divergence of 3 m to the left.

A similar demonstration was carried out with a right engine failure but, on this occasion, the engine run-down occurred at about 70 KASIR ($V_2 + .10$). Immediately prior to the run-down, the aircraft became airborne, stated by the pilot to be caused by a gust of wind, and drifted further to the right of the runway centreline than would have been induced by the run-down alone. At a height of 35-40 feet and 25-30 feet right of the centreline, the commander decided that there was insufficient distance remaining to accomplish a stop within the TODA. He therefore continued the take-off, believing that the weight of the aircraft would allow an adequate climb performance. However, the airspeed decayed, perhaps as the gust died down, and, despite the use of full power and flap retraction, the aircraft continued to sink to the ground. The height was too low to allow recovery of the airspeed and the aircraft descended in a high nose attitude, which the commander had maintained in order to increase survivability, and impacted with the ground at about 55 KASIR, beyond and to the right of the runway.

There was no fire and having made the aircraft safe the crew vacated it.

The aircraft was on a positioning flight, single crew, from London Heathrow to Norwich and was climbing out on the Brookmans Park standard instrument departure when at 6000 ft the crew door warning light illuminated and the master warning light came on. As the pilot suspected that the door was at fault, he thumped the door and adjusted the handle to assure himself that it was in fact closed, and the lights went out. However, during the remainder of the flight, both lights kept illuminating. Each time the pilot was able to extinguish them by "bumping" the door and "wiggling" the handle. Since it was dark and the aircraft was in instrument meteorological conditions (IMC) at the time, the pilot reported that the lights caused him considerable distraction.

The flight continued relatively uneventfully until, when some 20 nm from Norwich and at a height of 3000 feet, there was a sudden loud roar and the door "disappeared". Apart from a slight pitch change, there were no handling difficulties and so the pilot reduced speed to lower the noise level, notified ATC and landed without further incident. After landing it was discovered that the door had hinged back over the cabin roof and had not been lost.

The aircraft was examined by the maintenance company responsible for it who examined the door in detail and found no defects associated with the locking mechanism. The door was refitted prior to positioning the aircraft to start for further checks. The door remained closed during this flight.