**ACCIDENT**

| | |
|---|---|
| **Aircraft Type and Registration:** | Piper PA 24, N7456P |
| **No & Type of Engines:** | 1 Lycoming 250 piston engine |
| **Year of Manufacture:** | 1961 |
| **Date & Time (UTC):** | 21 July 2017 at 1055 hrs |
| **Location:** | Retford (Gamston) Airport, Nottinghamshire |
| **Type of Flight:** | Private |
| **Persons on Board:** | Crew - 2 Passengers - None |
| **Injuries:** | Crew - None Passengers - N/A |
| **Nature of Damage:** | Landing gear collapsed causing damage to underside panels and propeller; engine shock-loaded |
| **Commander's Licence:** | Private Pilot's Licence (Federal Aviation Administration, USA) |
| **Commander's Age:** | 59 years |
| **Commander's Flying Experience:** | 1,257 hours (of which 388 were on type)<br>Last 90 days - 1 hour<br>Last 28 days - 1 hour |
| **Information Source:** | Aircraft Accident Report Form submitted by the pilot |

## Synopsis

Downdraughting air, or windshear, was encountered shortly before touchdown and the pilot was unable to prevent the aircraft landing heavily, with consequential collapse of the landing gear.

## History of the flight

The aircraft departed Leeds East Airport and flew to Retford (Gamston) Airport where the pilot intended to execute a touch-and-go landing, before returning to Leeds East. His passenger, in the front right seat, was a qualified Federal Aviation Administration Flight Instructor who was observing the pilot for the purpose of a Flight Review, in accordance with Federal Aviation Regulations. Before departure the pilot obtained a forecast surface wind for Retford which was from 180º at 14 kt. The flight proceeded in a southerly direction at heights between 1,000 ft and 2,000 ft agl and light to moderate turbulence was experienced. Prior to landing at Retford the wind was reported to be from 160º at 10 kt, with no associated warnings of possible turbulence or windshear.

As the asphalt Runway 21 was in use, the pilot approached using an intermediate flap setting (two stages of flap) and increased the airspeed slightly to allow for the crosswind component. The instructor confirmed that the approach appeared to be "fairly stable", with

the landing gear down and flaps set, until approximately 100 ft agl when he noticed the airspeed temporarily reduce by approximately 10 kt. The pilot recalled that the turbulence increased at this height and that he felt the aircraft sink, but that he was able to correct for this. Then, at approximately 20 ft agl, he experienced further sink which he attempted to correct by increasing the power, but the stall warner sounded and he responded by pushing forward on the control column. However, he was unable to escape the downdraughting air and the aircraft struck the runway "fairly hard" and nose first.

According to the passenger, the nose landing gear collapsed on impact and the aircraft skidded along the runway with the propeller striking the surface and causing the engine to stop. The main landing gear collapsed before the aircraft came to a halt. The pilot then turned off the master switches and the fuel while the passenger opened the door and moved the mixture control to CUT OFF. The two occupants evacuated the aircraft (Figure 1) without injury, prior to the arrival of the airport's rescue service.

**Figure 1**

View of N7456P shortly after the crew evacuated

(Photograph courtesy of Dave Grimsdale – Photographer - Retford (Gamston) Airport)

**Pilot's observations**

The pilot reported that he had been landing at and taking off from Retford for 24 years. He had previously experienced worse conditions of windshear, on both available runways, than those encountered during the accident flight. He commented that, because the conditions did not seem bad during the early stages of the approach, he was probably not mentally prepared for the downdraughts which affected the aircraft shortly before touchdown.

When reviewing the accident conditions, the pilot realised that when he experienced the downdraughts he was more or less in the lee of a long line of airport buildings and tall trees, so they may have created some rotor effect. He noted that when the reported wind was passed to him by radio, he was still some three miles from the airfield so, in hindsight, it may have been worthwhile if he had requested a further wind report when he was closer. After the accident, the airport's rescue service recorded the surface wind as being from 150º at 17 kt.

**AAIB Comment**

The International Civil Aviation Organisation (ICAO) has published a '*Manual on Low-level Windshear*' (ICAO Doc 9817) which states that buildings such as hangars and fuel storage tanks commonly cause low-level windshear, particularly at smaller aerodromes. It notes that even when such buildings are not especially tall, they tend to have large lateral dimensions and to be grouped together, thus presenting:

> *'a wide and solid barrier to the prevailing surface wind flow. The wind flow is diverted around and over the buildings causing the surface wind to vary along the runway. Such horizontal wind shear, which is normally very localized, shallow and turbulent, is of particular concern to light aircraft operating into smaller aerodromes but has also been known to affect larger aircraft.'*