

# Piper PA-24-250, G-APUZ

AAIB Bulletin No: 10/2002 Ref: EW/G2001/05/07

Category: 1.3

**Aircraft Type and Registration:** Piper PA-24-250, G-APUZ

**No & Type of Engines:** 1 Lycoming O-540-A1B5 piston engine

**Year of Manufacture:** 1959

**Date & Time (UTC):** 9 May 2001 at 1935 hrs

**Location:** Turweston Aerodrome, Northamptonshire

**Type of Flight:** Private

**Persons on Board:** Crew - 1 Passengers - None

**Injuries:** Crew - None Passengers - N/A

**Nature of Damage:** Damage to propeller, underside of aircraft and wing structure

**Commander's Licence:** Private Pilots Licence

**Commander's Age:** 44 years

**Commander's Flying Experience:** 875 hours (of which 311 were on type)

Last 90 days - 26 hours

Last 28 days - 14 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot, and further information supplied by the pilot, ATC and the aircraft maintenance personnel

The pilot stated that he flew the aircraft from Blackbushe to Clutton Hill Farm (an airstrip situated some 7.5 nm to the east southeast of Bristol Airport), to allow it to be viewed by two potential purchasers, who were also pilots. A successful landing was made on the grass Runway 07, which is some 590 metres long by 27 metres wide. There is a down slope at the touchdown threshold end of Runway 07. The pilot reported that the surface wind at that time was from 080° at 17 kt.

After arrival, the aircraft and its documentation were examined by the prospective purchasers. A demonstration flight was also carried out, using Runway 07. Towards the end of this flight, on selection of landing gear down, some confusion occurred as to the actual landing gear position.

This was because the navigation lights had been selected on, a condition which also results in the dimming of the green 'landing gear safe' indicator light, which rendered it not visible at that time.

The pilot recognised the problem and the uncertainty was resolved. A landing was then attempted onto Runway 07 at the strip, which has no identification markings, threshold markings or touchdown markings. The pilot executed a go-around from the first approach. The second approach, with rain on the windshield, culminated in "an awkward touchdown" which caused the aircraft to bounce. Once again, the pilot applied the power and executed a go-around.

The pilot was surprised by the extent of the bounce, since the aircraft did not appear to be sinking excessively at the time of ground contact. The pilot then positioned the aircraft for a third landing attempt, which was completed apparently normally. The aircraft was then taxied to the parking area.

Prior to the return flight to Blackbushe, the pilot noted that there was evidence of damage to the upper skin of the right wing. He discussed the condition with the other two pilots that had been aboard the aircraft. He could see rippling of the skin and he recalled that a similar degree of damage had occurred to the left wing over a year earlier, when the skin had "rippled due to some movement in the riveted joints". His recollection was that on the previous occasion the engineers had re-riveted a number of lines of rivets. He now considered that the damage to the right wing had been caused as a result of the bumpy runway and the "awkward ground contact".

The pilot contemplated leaving the aircraft at Clutton Hill until an engineer could inspect it. He considered the situation further and reasoned that, since he had flown a normal go-around, circuit (albeit with the landing gear extended) and landing after the "awkward contact", then a return flight to Blackbushe could be undertaken. He therefore elected to fly the aircraft back to Blackbushe, but decided to leave the landing gear extended for the flight as a precaution.

Unfortunately, after take-off, the pilot retracted the gear as a reflex action. One of the observing pilots at the strip noted that the landing gear did not fully retract. The pilot's subsequent attempts to lower it as he neared Blackbushe, using both the normal and emergency systems, were not successful. As he was in contact with Farnborough ATC at the time, he informed them that he had a landing gear problem. The aircraft carried out a low approach and go-around at Farnborough Airport, during which it was observed that the landing gear was only partially extended.

Farnborough ATC was instrumental in communicating with the aircraft owner's engineering contractor to advise of the nature of the problem. Several attempts at resolving the situation were attempted, but to no avail. The pilot then elected to divert to Turweston Aerodrome, Northamptonshire, which was the engineering contractor's base.

The engineer arranged for the emergency services to be in attendance at Turweston by the time of the aircraft's arrival. The pilot then carried out a successful landing with the landing gear partially retracted. There was no fire and the pilot, who was uninjured, vacated the aircraft by the normal means.

Subsequent engineering examination of the aircraft indicated that displacement of the rear trunnion mounting frame of the right landing gear had occurred, allowing the leg to incline some 10 degrees aft of its normal position. This was, in turn, the result of general sheet-metal distortion in parts of the adjacent wing structure. The displacement of the leg led to fouling against the structure, which

permitted partial retraction but prevented the gear from extending, regardless of the method attempted.

Operation of any mechanical system attached to a structure that has become distorted will generally result in failure of the mechanical system to function correctly as a result of incorrect geometry.

Six days after the accident, the pilot was informed that the aircraft had, in fact, touched down on some "bad ground", some 50 feet short of the unmarked Runway 07 threshold at Clutton Hill Farm, where three short wheel tracks were found in the grass. It was presumed that the structural damage had occurred at this point.