**ACCIDENT**

| | |
|---|---|
| **Aircraft Type and Registration:** | Socata TB9 Tampico, G-BIZE |
| **No & Type of Engines:** | 1 Lycoming O-320-D2A piston engine |
| **Year of Manufacture:** | 1981 |
| **Date & Time (UTC):** | 4 May 2008 at 1730 hrs |
| **Location:** | 1 nm north of Gloucestershire Airport (formerly Staverton) |
| **Type of Flight:** | Private |
| **Persons on Board:** | Crew - 2 Passengers - None |
| **Injuries:** | Crew - None Passengers - N/A |
| **Nature of Damage:** | Main wheel spats detached, damage to the tailplane leading edge and aircraft step |
| **Commander's Licence:** | Private Pilot's Licence |
| **Commander's Age:** | 56 years |
| **Commander's Flying Experience:** | 2,500 hours (of which 1 was on type)<br>Last 90 days - 8 hours<br>Last 28 days - 3 hours |
| **Information Source:** | Aircraft Accident Report Forms submitted by both the pilots |

**Synopsis**

During a syndicate check flight on a new aircraft type, the pilot did not switch between fuel tanks to the fullest tank as required. Whilst flying a final circuit, the selected tank ran out of usable fuel although the gauge read just under a quarter full. The engine stopped due to fuel starvation and the pilot carried out a forced landing in a nearby field, resulting in minor damage to the aircraft.

**Background**

The aircraft had recently been purchased by a 20 member syndicate. The trustee committee for the syndicate placed a requirement on the remaining syndicate members to complete a check ride with an instructor and an approval flight with a member of the committee in order to be approved to fly the new aircraft solo. The three committee members were also new to the aircraft and had conducted a check flight with an instructor prior to commencing the approval flights. The trustees were not instructors themselves and had no formal training in this respect; as such the syndicate member under review was the commander of the aircraft during the approval flight. The designated trustee in this accident was also the chairman of the syndicate and this was his first member approval flight in the aircraft. He had a PPL with IMC rating and 234 hours total experience. Two of his 137 hours PIC were on this aircraft type.

**History of the flight**

The syndicate member undergoing review (hereafter referred to as PIC) returned from a successful check flight with an instructor in the aircraft. He met the trustee (hereafter referred to as the PNF) and went straight back out to the aircraft. The PNF reports that the PIC had already completed the pre-flight checks in his absence. The PIC and PNF then discussed the approval flight in the aircraft and agreed that they would undertake a short local flight including some tight turning and stall manoeuvres, then complete two touch-and-go circuits prior to landing.

The aircraft departed the airfield at 1715 hrs and the flight around the local area was completed without incident, though the PNF comments that the PIC appeared "a little stressed". After the first touch-and-go landing the PIC attempted to continue with the takeoff, but the PNF felt this was not appropriate due to the attitude and position of the aircraft relative to the runway and told the PIC to reject the takeoff, which he did before taxiing the aircraft off the runway. The PIC and PNF then discussed whether to fly another circuit. During this time the PIC was cautioned by air traffic control for obstructing the taxiway. It was agreed that they would fly another circuit and the PIC took off and flew around the circuit normally. On the base leg of the circuit the PNF became aware of a "knocking" sound coming from the engine. As the aircraft turned on finals he requested that the PIC transmit a PAN call due to his growing concern over the noise, which the PIC then did.

As the aircraft descended below 500 ft agl and was approximately 1 mile from the runway threshold, the engine cut out. The PIC did not attempt to restart the engine and prepared for a forced landing in a nearby field. The aircraft landed safely with only minor damage to the landing gear and the tailplane. The PNF states that the noise remained after the aircraft came to rest, though the engine was not running. However, it ceased when he selected the electric boost pump to OFF, indicating that the sound was that of the pump running dry. The PNF returned to the aircraft the following morning and confirmed that the noise was again present with the left tank selected, but with the right tank selected the noise abated and the indicated fuel pressure returned to normal.

**Discussion**

Both the PIC and PNF submitted accident report forms for this accident. Each suggested the cause of the accident was that the PIC did not switch to the appropriate fuel tank to ensure an uninterrupted supply of available fuel to the engine. The PIC candidly observed this was due to inadequate checks being carried out on the downwind leg of the circuit.

The TB9 Pilot Information Manual quotes a figure of 79 litres total and 76 litres usable fuel quantity per tank. After the accident the left tank was drained recovering about one litre of fuel, despite the gauge reading just under a quarter full, between 15 and 20 litres of fuel were later recovered from the right tank, which had indicated just less than half full (Figure 1). This does suggest both gauges were 'over-reading' by a similar amount. Airworthiness Directive 1999-062(A) was issued for the TB9 by the DGAC to highlight fuel gauges over-reading at low electrical power supply voltage. However, the maintenance facility repairing the aircraft confirmed the directive was not applicable to this aircraft because of the modification standard. Due to the level of disassembly required to recover the aircraft, it has not been possible to confirm whether any fault existed in the fuel quantity indication system at the time of the accident.


**Figure 1**

Whilst taking these issues into account, it is generally accepted that light aircraft fuel content gauges should not be relied upon, particularly at low tank quantities and with varying aircraft attitudes. The TB9 Pilot Information Manual reflects best practice in requiring a pre-flight inspection of the physical tank quantity. With knowledge of the approximate engine fuel burn rate this gives a secondary indication of remaining fuel in each tank. The CAA-published General Aviation Safety Information Leaflet (GASIL) Issue 2 of 2008 highlights the importance of this technique, particularly when converting to a new aircraft type.

The ambiguous nature of the seniority relationship between the PIC and PNF during the flight may also have been contributory in the accident. As the PIC was an experienced 2,500 hour private pilot, having another pilot exert a level of control and influence during the flight may have been unfamiliar and therefore possibly distracting. Combined with a lack of familiarity with the aircraft type this may have increased his susceptibility to error.

Flight instructors and examiners have a recognised authority with regard to supervision of other pilots. Specific training and associated experience helps them to judge the competence of a pilot and to recognise when a situation requires intervention to maintain safety. This prevents ambiguity and helps to avoid tension in the cockpit, which can lead to human factors related issues. As such, being checked on a new aircraft type, with a qualified instructor, has clear safety benefits which may not be as assured with other forms of approval flights.