

Piper PA-28-161, G-LSFT

AAIB Bulletin No: 12/2000 Ref: EW/G2000/10/10 Category: 1.3

Aircraft Type and Registration: Piper PA-28-161, G-LSFT

No & Type of Engines: 1 Lycoming O-320-D3G piston engine

Year of Manufacture: 1985

Date & Time (UTC): 16 October 2000 at 1254 hrs

Location: Bournemouth International Airport

Type of Flight: Training

Persons on Board: Crew - 2 - Passengers - None

Injuries: Crew - None - Passengers - N/A

Nature of Damage: None

Commander's Licence: Commercial Pilot's Licence with Instrument Rating

Commander's Age: 27 years

Commander's Flying Experience: 735 hours (of which 450 were on type)
Last 90 days - 164 hours
Last 28 days - 35 hours

Information Source: Aircraft Accident Report Form submitted by the pilot and information supplied by the maintenance organisation

The aircraft was engaged on a circuit training detail from Runway 26 at Bournemouth International Airport. Having completed several circuits, the crew were directed to report 'finals' behind an Aztec, which was visible to them. Having positioned on left base, the instructor began to feel light headed and his vision became impaired. The student later indicated that he thought that the instructor had passed out at this point. The instructor's condition then improved somewhat and he noted that the carbon monoxide detector had turned 'Black'. He asked the student to open the DV window on his side and instructed him to breathe in some fresh air. ATC were notified that the crew had a 'CO indication', however, the tower controller did not hear what sort of indication and asked the crew to clarify but did not receive a reply.

Due to his condition, the instructor elected to get the aircraft on to the ground as soon as possible. Having difficulty in communicating with his student, he closed the throttle and lowered full flap, selecting open land alongside the river just short of the airfield for a landing. At this point the instructor released his harness, leant across the student and breathed some of the air entering through the DV window. This seemed to clear his head and he decided that he could land the aircraft on the airfield. ATC observed the aircraft descending steeply on base leg and so contacted

the Airport Fire Service, alerting them to 'Local Standby' and indicating that the aircraft had suffered an engine failure.

The aircraft was then cleared to land after the Aztec, which was just vacating the runway. It landed safely leaving the runway at intersection D2 but halted on the active side of the Holding Point. The two occupants vacated the aircraft quickly through the door with the student complaining of 'drunken feelings'. The fire service and an ambulance attended and the crew were administered oxygen. The cabin heater had not been in use at any time during the flight.

The aircraft maintenance company were alerted and they saw that the aircraft was parked at the side of Runway 26. On arrival at the aircraft with a vehicle and tow bar, they saw that the aircraft crew were being looked after by the emergency services and the maintenance team were told that carbon monoxide contamination was suspected. The engine compartment was inspected and, as no obvious defects were apparent, the aircraft was taxied back to the hangar with the door and DV window open. When the engineer got out of the aircraft he felt unwell for some minutes.

The aircraft was moved into the hangar and the engine cowlings were removed. The firewall was well sealed and the exhaust system, the muffler of which had been replaced 50 flying hours previously, was intact with no cracks visible. However, the slip joint at the entry of the left front (No 2 cylinder) stack to the muffler exhibited a significant gap. (Figure 1) The exhaust boxes were removed and pressure tested with no faults found. The exhaust was re-assembled and the seal at the sliding joint improved including the use of a high temperature sealant. The 'scat' hose joining the exhaust shroud to the cabin heat distributor box was found to have small pin holes in it and the cabin heat control was adjusted to give a more positive closure.

After extensive ground runs, an air test was carried out with a specifically briefed observer and with two carbon monoxide detectors onboard. During the $\frac{1}{2}$ hour flight various selections of cabin heat/screen defrost were used with no adverse effects felt by the occupants and the carbon monoxide indications did not change from the 'as new' condition. The aircraft has now flown several times with no further reports of cabin air contamination.