

No: 10/90

Ref: EW/G90/03/22

Category: 1b

Aircraft Type and Registration: Piper PA-23-250, G-VHFA

No & Type of Engines: 2 Lycoming IO-540-C4B5 piston engines

Year of Manufacture: 1971

Date and Time (UTC): 27 March 1990 at 1232 hrs

Location: Lydd Airport, Kent

Type of Flight: Private (training)

Persons on Board: Crew - 2 Passengers - 1

Injuries: Crew - None Passengers - None

Nature of Damage: Fuselage underside skin, landing gear doors and propellers damaged, engines shock loaded

Commander's Licence: Private Pilot's Licence with IMC and Instructor's ratings

Commander's Age: 37 years

Commander's Total Flying Experience: 1,880 hours (of which 16 were on type)

Information Source: Aircraft Accident Report Form submitted by the pilot

The aircraft was being used for circuit flying practice, with an instructor, student and passenger on-board. The take off and climb to the downwind position were normal but, during the downwind checks, the landing gear indication lights showed that both main landing gears were down and locked but the nose landing gear was not. The instructor asked the student to check the position of the nose landing gear in the mirror on the left engine cowling. The student thought it was extended but the instructor decided to ask ATC to check the landing gear position. ATC informed the pilot that although at first sight the landing gear appeared to be down, as the aircraft passed close to the tower the position of the nosewheel seemed not to be correct. The landing gear was then selected 'up' and then reselected 'down'. After this only the left main landing gear down-and-locked indication was showing and a check by the tower confirmed this situation.

After recycling the landing gear again, the student was instructed to operate the emergency gas extension system. This action again resulted in only the left main landing gear indicating down-and-locked.

After trying, unsuccessfully, several ways to get the landing gear to lock-down, the instructor elected to retract the landing gear and make a wheels-up landing. ATC informed him that the nose landing gear was partially extended but the wheels-up landing was executed without causing injuries or fire.

Initial investigation showed that, after lowering the landing gear by hand it would retract normally but only the left main landing gear would extend. Further investigation showed that the emergency gas bottle was extremely loose in its mounting and had not sealed against the discharge tube. The interior of the bottom fuselage panels around the gas bottle were wet with hydraulic fluid. It was also found that the spools in the normal/emergency shuttle valves of the main landing gears had swollen and the left valve had stuck in the normal position and the right in emergency.

After replacing the shuttle valves and the emergency CO₂ bottle, the system appeared to work normally but certain characteristics were observed. The left main landing gear locked down easily and unlocked to retract, followed by the nose landing gear and the right main landing gear, whose lock engaged and disengaged with audible effort. Also, the pressure required to lock the nose landing gear down rose very sharply as rearward force, to simulate air resistance, was applied to the nose-wheel. It was also noted that the maximum pressure obtainable on the test rig, which used an identical hydraulic pump to that on the aircraft, was very sensitive to system leakage, as simulated by the manual spill-back control.