AAIB Bulletin No: 11/95 **Ref: EW/G95/09/18** **Category: 1.2**

Aircraft Type and Registration:	Piper PA-23-250 Aztec, G-YSFT
No & Type of Engines:	2 Lycoming IO-54-C4B5 piston engines
Year of Manufacture:	1976
Date & Time (UTC):	27 September 1995 at 1422 hrs
Location:	Bournemouth (Hurn) Airport, Dorset
Type of Flight:	Private
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Underside of nose around landing light scraped, one propeller bent, nosewheel doors destroyed
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	52 years
Commander's Flying Experience:	10,400 hours (of which 1,820 were on type) Last 90 days - 85 hours Last 28 days - 12 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB engineering investigation

After takeoff for a handling check, following a repair to the nose landing gear, the nose gear retracted normally. The aircraft was climbed to 4,000 feet and a stall was carried out in the clean configuration, followed by a stall in the landing configuration, after which the landing gear was retracted apparently normally.

The pilot then elected to conduct a second stall in the landing configuration. However when the landing gear was selected to 'down', although the main gear locked down satisfactorily, the nosewheel 'down-and-locked' indication did not illuminate. On checking the mirror on the left engine cowling, the crew could see that the nose leg was extended to a position some 45° to the vertical. The landing gear was then retracted. Although, from the view in the mirror, the nose gear appeared to retract, the 'gear up' light did not illuminate. The gear was then reselected down, resulting in the main gear extending fully and the nose gear again extending to the 45° position.

Attempts were made to lower the nose leg fully by holding the gear selector down against the self-cancelling feature; obtaining hydraulic pressure from both the engine driven and hand operated pumps; and by application of 'g' at various airspeeds (including low airspeed). None of the techniques used were successful in extending the nose gear. The flaps were actuated and operated normally, which confirmed the presence of sufficient hydraulic fluid and satisfactory pressure. Since it was also apparent to the crew, from their use of the hand operated hydraulic pump, that considerable pressure was being 'resisted', they considered it inappropriate to use the emergency free fall system and elected to land with the nose gear in a known unsafe condition.

Air Traffic Control at Hurn was advised of the situation and the emergency services were stationed near the point at which it was anticipated that the aircraft would come to rest. A landing was made on the mainwheels and the nose lowered gently until it subsided onto the runway, the landing light cover being the part which took the weight. After the aircraft had come to rest the crew got out unassisted. The aircraft was subsequently recovered to the operator's hangar with the nose supported on a trolley. When the nose was lifted off the trolley, the nose landing gear extended fully. At the time of recovery, both the nose gear doors were observed to be broken into several pieces, some which had to be collected from the runway.

The aircraft was put on jacks and, using the aircraft's manual hydraulic pump, a series of retraction and extension tests were performed which indicated that the gear was operating normally. During these tests, the damaged nose gear doors were completely removed from the aircraft although the door hydraulic actuator and operating linkage were still installed.

It was also observed that, during gear retractions, the nose gear door actuator stroked to the doors closed position immediately the retraction cycle had initiated. Whilst the actuator was stroking, there was a 'screeching' sound which was considered consistent with restricted hydraulic flow. It was also observed that the operating plunger of the gear door timer check valve moved as the hydraulic pump was actuated, although it was not being mechanically pushed by any part of the nose gear. After the timer valve had been changed, the sequencing of the gear door actuator occurred correctly and there was no movement of the timer valve plunger until it was mechanically sequenced.

The timer check valve which had been removed was dismantled and it was found that some of the seals had become hardened and 'set'. Examination of the broken nose gear doors showed that their only damage resulting from the groundslide was localised abrasion of the forward inner corners of both doors. The other damage that they had suffered appeared, however, consistent with that to be expected from their being held against the nose leg during a retraction cycle.