

**Aviation Safety Investigation Report
198803450**

Piper PA28-140

17 April 1988

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Occurrence Number: 198803450
Location: 15 km SSE Archerfield QLD
Date: 17 April 1988
Highest Injury Level: Fatal
Injuries:

Occurrence Type: Accident
Time: 1505

	Fatal	Serious	Minor	None
Crew	1	0	0	0
Ground	0	0	0	-
Passenger	2	0	0	0
Total	3	0	0	0

Aircraft Details: Piper PA28-140
Registration: VH-EJK
Serial Number: 28-7225379
Operation Type: Private
Damage Level: Destroyed
Departure Point: Archerfield QLD
Departure Time: 1455
Destination: Archerfield QLD

Approved for Release: January 3rd 1989

Circumstances:

A number of witnesses observed the aircraft operating in the accident area. A common observation was that it was operating at a lower height (probably between 500 and 1000 feet above ground level) than was usually seen of other light aircraft flying over the area. The aircraft was seen to complete a number of level orbits over a chicken farm and then to head south for about two kilometres. While this was occurring the engine sound died and picked up again a few times, as if the pilot was practising setting the aircraft into a glide. The aircraft then flew a level left turn through about 270 degrees before suddenly entering a 30 to 40 degree dive. At close to tree-top height it abruptly changed attitude and entered a steep, perhaps vertical, climb. Some witnesses felt that the pilot was about to fly a loop. As the aircraft climbed, the speed rapidly decayed. During these manoeuvres, the engine note was heard to die and pick up twice. The aircraft was then observed to fall, nose first and right wing slightly low, into a near vertical dive. Apart from completing one or possibly two rotations, it remained in this attitude until lost from sight amongst trees. The aircraft impacted the ground in a 90 degree nose down attitude. When recovered from the wreckage the airspeed indicator was indicating 105 knots. It was established that the engine was operating at impact. No evidence was found of any abnormality in the aircraft or its systems which may have contributed to the accident. No explanation was found for the apparent operation of the aircraft at a relatively low height, or for the dive to a very low level followed by the steep climb. The carburettor fitted to the engine was equipped with an accelerator pump. A characteristic of carburettors of this type is that rapid or "slam" opening of the throttle can temporarily over-fuel the engine and cause the RPM to fluctuate for a short time. It could not be determined whether this characteristic may have been associated with the engine note dying and picking up twice as heard by witnesses in this instance. Investigation established that the the passenger occupying the front right-hand seat had flown 33 hours dual and 3.5 hours solo on Cessna 152 aircraft during 1983/84. The front seats of the aircraft were adjustable fore-and-aft along rails attached to the floor. Examination of the cockpit revealed the adjustment of the front left-hand seat (occupied

by the pilot-in-command) at impact to have been five notches from the front. The front right seat was positioned in the forward-most notch. Tests of these seating positions were conducted in another PA28 aircraft using persons of the same height as those involved in the accident. These tests indicated that the right seat occupant should have been able to comfortably manipulate the engine and flying controls of the aircraft. However, the left seat appeared to be too far to the rear for the pilot-in-command to have been in a normal flying position in relation to the controls. Specific flying techniques are required to recover an aircraft from an extremely nose-high attitude at low speed. The aircraft involved in this accident was observed to develop such an attitude accompanied with low speed, and the low height at which this occurred would have increased the level of pilot skill required to return the aircraft to a safe flight environment. It was established that the pilot-in-command had received no training in the flying techniques required to recover aircraft from unusual attitudes. The seating position tests suggested that the pilot-in-command may not have been manipulating the controls during the final stages of flight, and it is also probable that the person occupying the right-hand seat had not received any training in recovery from unusual attitudes. It is considered probable that once the aircraft had reached the nose-high attitude at low speed, that it was beyond the experience level of either of the front seat occupants to effect a safe recovery, particularly in view of the low height of the aircraft at the time.

Significant Factors:

The following factors were considered relevant to the development of the accident

1. For reason(s) not established, the aircraft performed a manoeuvre which resulted in the adoption of an extremely nose-high attitude at low speed, at a low height above the ground.
2. Recovery of the aircraft from the unusual attitude was probably beyond the capabilities of the pilot-in-command.
3. The position to which the pilot-in-command's seat was adjusted was such that it could have been difficult for him to manipulate the flight and engine controls.