Aviation Safety Investigation Report 199702473

Piper Aircraft Corp
Aztec

02 August 1997

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Aviation Safety Investigation Report

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Occurrence Number: 199702473 **Occurrence Type:** Accident
Location: 4km N Merriwa
State: NSW **Inv Category:** 4
Date: Saturday 02 August 1997
Time: 0909 hours **Time Zone** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**1**

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-23-250
Aircraft Registration: VH-ABX **Serial Number:** 27-3650
Type of Operation: Non-commercial Business
Damage to Aircraft: Destroyed
Departure Point: Borah NSW
Departure Time: 0907 EST
Destination: Bourke NSW

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Private	75.0	515

Approved for Release: Wednesday, March 25, 1998

notitle
FACTUAL INFORMATION

The aircraft had taken off from its base airstrip for a flight of about 2 hours to the west. The pilot, who was the aircraft owner, was the only occupant and the only freight was the pilot's personal effects. The planned flight had been conducted several times in the past and it was the pilot's habit to fly over a relative's house about 6 km south of the airstrip before setting course and climbing to cruise altitude. On the accident flight, one eye witness thought the aircraft seemed to be flying lower than it had on previous occasions, this witness then lost sight of the aircraft and was not aware that it had crashed until later. Another person in a house between the airstrip and crash site also heard the aircraft but did not see it as it had turned sooner than on previous flights and passed on the other side of the house from where he was sitting.

Two additional witnesses about 4 km to the south of the crash site did not see the aircraft but heard its engines. Both of these witnesses reported that the engines sounded normal and that they seemed to be operating at high power. A short time after first hearing the aircraft noise, one witness heard three bangs in quick succession and saw smoke rising in the near distance. When he realised he could no longer hear the sound of the aircraft, he notified emergency services.

A ground search was begun immediately and a rescue helicopter was launched to assist in the search. The helicopter sighted the wreckage shortly after arriving in the area, landed a short distance away so medical personnel could attend the pilot who had sustained fatal injuries. The aircraft was not fitted with an Emergency Locator Beacon (ELT).

The pilot

The owner/pilot had first qualified for a private pilot's licence in 1949 but had only recently commenced flying again after a break of many years. He had undergone a period of instruction on single-engine aircraft to regain currency in general flying and had then undertaken a type endorsement on the PA-23, using his own aircraft for the training flights.

He had completed a PA-23 type endorsement about 2 weeks prior to the accident after logging a total of 10 hours dual instruction and 30 minutes solo and had logged about 6 hours in command since the endorsement. He is believed to have flown a total of about 75 hours on the PA-23 type with some of these hours being flown with another type-rated pilot on board as pilot in command. He had a total of about 515 hours aeronautical experience, including about 175 hours multi-engine, since commencing flying in 1949.

He had been delivered to the aircraft by a relative about 30 minutes before the accident and was reported to have been in good health and frame of mind.

The aircraft had a current Certificate of Airworthiness and maintenance release. It was well below maximum allowable takeoff weight and was within centre of gravity limits.

The weather at the time was reported to be fine with ceiling and visibility unlimited. Wind was reported as light and variable and the temperature was about 5 degrees Celsius.

Wreckage information

The aircraft impacted the ground on a slightly up-sloping, ploughed, sown paddock about 7 km from its takeoff point in a high-speed, shallow angle, right-wing-low attitude. The aircraft was destroyed by impact forces so that the tail section, up to the rear bulkhead of the cabin, was the largest mainly-intact piece remaining. The wreckage trail was about 140 metres long from the first contact of the right wingtip and the furthest piece of wreckage, the oil cooler of the left engine.

Both wings were destroyed during the break-up sequence and both engines were dislodged from their mountings. The crankshaft of the left engine was broken at the propeller flange, dislodging the propeller about half way along the wreckage trail. This engine continued to bounce along the direction of flight and finally came to rest just past the relatively intact tail section near the end of the wreckage trail. Examination of the components on site revealed that the landing gear was retracted and flaps were in the 'up' position at impact.

Both engines, both propellers, the instrument panels and various other components were recovered from the crash site for further examination. Measurements were made of significant ground marks such as propeller slashes.

ANALYSIS

Ground marks revealed that the aircraft had cartwheeled when the right wing dug into the soft soil. The aircraft had taken off with almost full fuel in the four wing tanks and both fuel cells in the right wing were ruptured and the fuel ignited as the wing crumpled. When the aircraft cartwheeled, the near-vertical, nose-first impact of the left engine and propeller broke the crankshaft at the propeller extension flange. The propeller was found early in the wreckage trail as the engine, now without a propeller, continued to bounce until it finally come to rest near the end of the wreckage trail. As the aircraft continued to cartwheel, the outer fuel cell in the left wing ruptured and the fuel ignited but although fuel from the inner cell was lost when the rubber cell was torn, it did not ignite.

There was no obvious evidence at the crash site that any part of the aircraft had failed and all components, although severely damaged by impact, appeared to be on site.

Because of the nature of the impact sequence, it appeared that the pilot had become incapacitated or distracted shortly after takeoff and the aircraft had been allowed to descent unwittingly until it flew into the ground.

Several scenarios were considered during the investigation to determine the reason for this apparently serviceable aircraft descending into the ground.

Pilot incapacitation was considered a possibility due to the pilot's age and the fact that he was known to be a heavy smoker but no conclusive indications of incapacitation were found during a post-mortem examination.

The cabin door was found on the crashsite with little structural damage and the possibility of it having opened in flight just after takeoff was considered. Examination of the door and the broken hinges tended to indicate that it had been shut at impact.

Although three witnesses heard the aircraft between the time it took off and the time it crashed, all of them reported that the engines sounded 'normal'. Both engines and propellers were dismantled and examined and some defects were found.

Two pieces of rubber which appeared to have come from a flexible fuel hose were found in the engine-driven fuel pump of the left engine. It was not possible to positively determine what effect these pieces would have had on the fuel supply to the engine but it is considered that they would not have a detrimental effect on the running of the engine. Examination of the propeller from the left engine indicated that it was under power at impact.

The diaphragm of the fuel distribution valve of the right engine was found to be torn when dismantled. If this diaphragm had been in this condition before impact, it would have allowed fuel to flow from the vent hole into the engine compartment. A fuel flow of up to 12 litres per hours is thought to have been likely which would have caused staining, increased fuel consumption, decreased fuel flow indication and a strong odour of fuel. It is considered likely that the diaphragm was damaged on impact. Examination of the propeller from the right engine indicated that it was under power at impact.

Calculations made from measurements of the propeller slash marks found at the site revealed an airspeed at impact of about 160 kts. This airspeed figure is consistent with the speed that would be achieved by a lightly loaded aircraft with both engines operating normally at climb power during the short time of the accident flight.

Examination of the aircraft instruments revealed very little reliable information but index marks on the face of the attitude indicator tended to confirm that the aircraft was in a slight nose-down, slight right-wing-low attitude at impact. No reasons could be given to explain witness statements that the aircraft was flying lower and had turned sooner and was flying more to the south than on previous flights.

The pilot's low time on type and small amount of recent flying experience would probably have allowed any problem, even a minor one, to distract him from safely flying his aircraft.

FINDINGS

The aircraft appeared to be serviceable when it flew into the ground in a slight nose-down, right-banked attitude soon after taking-off.

Both engines were developing power at impact.

SIGNIFICANT FACTOR

The aircraft failed to adopt a normal climb profile after takeoff and descended into the ground at high speed.