Aviation Safety Investigation Report 199704134

Piper Aircraft Corp
Lance

20 December 1997

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Occurrence Number: 199704134 **Occurrence Type:** Accident
Location: 22km N Essendon, Aerodrome
State: VIC **Inv Category:** 4
Date: Saturday 20 December 1997
Time: 1535 hours **Time Zone** ESuT
Highest Injury Level: None

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-32R-300
Aircraft Registration: VH-DAH **Serial Number:** 32R-7680498
Type of Operation: Non-commercial Practice
Damage to Aircraft: Substantial
Departure Point: Essendon Vic
Departure Time: 1530 ESuT
Destination: Essendon Vic

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command		70.0	670

Approved for Release: Wednesday, January 7, 1998

The Piper Cherokee Lance (PA32R-300) was prepared for departure from runway 35 at Essendon for a flight to Moorabbin, Phillip Island and return. The outside air temperature was 29 degrees C and the wind was from 320 degrees, gusting between 15 and 25 kt. This resulted in a crosswind of 12 kt and a density altitude of approximately 2,000 ft.

The pilot decided to conduct a flapless takeoff. He had used this take-off configuration successfully on previous departures from Essendon. The pilot reported that during the take-off roll the aircraft accelerated normally and the engine reached its maximum power indications of 2,700 rpm and 27 in of manifold pressure. As the aircraft lifted off at an airspeed of approximately 65 kt the right wing dropped suddenly and the aircraft yawed to the right. The pilot corrected the wing drop and the yaw but then realised that the aircraft was not climbing normally. With maximum power still being applied, the airspeed was still indicating 65 kt.

The pilot retracted the landing gear when he had insufficient runway remaining on which to land, and advised ATC that he had a problem. When the tower controller observed the aircraft at a very low altitude and flying towards a series of high-tension powerlines he activated the 'common-crash' alarm.

The pilot was able to fly the aircraft over the high-tension powerlines at the lowest point of the span, which meant that the aircraft was below the height of the pylons. He stated that he felt the aircraft seemed to be having difficulty remaining airborne and that it only felt normal when he lowered the nose attitude. However, he then had to raise to nose attitude to climb over obstacles. He carried out relevant checks but was not able to identify any problems that may have affected the aircraft's performance.

The pilot was able to keep the aircraft flying until he reached a large paddock suitable for a forced landing. He applied two stages of flap and extended the landing gear for the landing. The surface of the paddock was very rough and sloped downhill from the touchdown point. The pilot was not able to stop the aircraft before it continued across a low embankment and through a fence. The aircraft was substantially damaged. The pilot and his two passengers were not injured and were able to evacuate the aircraft without assistance.

The investigation did not find any evidence of a malfunction with the aircraft, the engine, or associated systems. However, it was found that the elevator trim was in the full nose down position and that the rudder trim was full nose left. This flight was the first after a periodic maintenance check had been carried out. It is likely that the trims were not returned to neutral following the maintenance, and this was not noticed by the pilot during his pre-takeoff checks.

At the take-off weight of approximately 1500kg the PA32R-300 flight manual charts indicate that the take-off safety speed (TOSS) for the aircraft is 72 knots. The nose attitude is required to be raised smoothly for a flapless takeoff, and the aircraft accelerated to a minimum of 72 knots, before the pilot adopts the appropriate attitude to attain a climb speed of 92 knots.

It is likely that the aircraft was adversely affected by a gust of wind as it lifted off. In addition, the incorrect trim tab settings would have resulted in the aircraft flying in an unbalanced condition. This imbalance would have produced extra drag with a resulting reduction in airspeed. To correct the wing drop and yaw the pilot would have had to promptly apply coarse control inputs. Drag would have further increased, with a corresponding reduction in airspeed. It is probable that the aircraft did not have sufficient power to overcome the drag resulting from the low speed and high nose attitude - a condition commonly known as 'flying on the back of the drag curve'. The density altitude and high temperature on the day would have also adversely affected the aircraft's performance.