



Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report – 200601688

Final

Engine power loss – Bankstown Airport – 5 April 2006

VH-ZNZ

Amateur-built Lancair 360



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Amateur-built Lancair 360**

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Published by: Australian Transport Safety Bureau
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ISBN and formal report title: see 'Document retrieval information' on page iii.

DOCUMENT RETRIEVAL INFORMATION

Report No.	Publication date	No. of pages	ISBN
200601688	21 February 2007	32	1 921164 46 8

Publication title

Engine power loss – Bankstown Airport – 5 April 2006, Amateur built Lancair 360

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Acknowledgements

Figures 1 and 2: Google Earth

Figures 5 and 6: VH-ZNZ owner

Abstract

On 5 April 2006, the pilot of an amateur-built Lancair 360 aircraft, registered VH-ZNZ, was conducting circuits at Bankstown Airport, NSW. It was the aircraft's first flight since being repaired after a landing accident in 2003.

Following an overflight and a touch-and-go, the pilot conducted another touch-and-go and shortly after lift-off, at an altitude estimated by witnesses to be between 100 ft and 400 ft, the engine was heard to malfunction. Almost immediately, while still not above 500 ft, the aircraft rolled into a steep right turn. Engine power was heard to return, but sounded intermittent. After turning approximately 90 degrees, the aircraft rolled out of the turn momentarily to about wings level, before the turn steepened again to the right. The aircraft was observed to roll further to the right and descend steeply. The aircraft impacted a taxiway, the pilot was fatally injured and the aircraft destroyed.

The investigation found that the engine power loss was probably due to interruptions of fuel flow to the engine, but could not conclusively determine the reason. The aircraft stalled at a height insufficient to allow the pilot to recover.

The investigation identified a number of safety issues related to stall warning, management of incomplete engine power loss after takeoff, pilot transition training and the provision of information to purchasers of amateur-built aircraft.

Following the occurrence, the Civil Aviation Safety Authority and Sport Aircraft Association of Australia implemented a number of safety actions. As a result of this and other occurrences the Australian Transport Safety Bureau initiated a broader investigation into loss of control following engine power loss after takeoff.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances in order to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau prefers to report positive safety action in its final reports rather than making formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

FACTUAL INFORMATION

Sequence of events

On 5 April 2006, the pilot of an amateur-built Lancair 360¹ aircraft, registered VH-ZNZ, was conducting visual flight rules circuits at Bankstown Airport, NSW. The aircraft had been repaired following a landing accident in 2003, and circuits were planned to check the operation of the aircraft.

The pilot began the circuits on runway 29 Centre and was airborne at about 1429 Eastern Standard Time². The pilot conducted a right circuit at 1,500 ft AMSL³ and overflew runway 29 Right (29R) at 1,500 ft as planned.

The pilot completed another right circuit at 1,500 ft followed by a touch-and-go⁴ on runway 29R. Witnesses who observed the initial takeoff and the touch-and-go, reported that aircraft performance appeared normal and the aircraft engine sounded 'fine'.

Following the touch-and-go the pilot requested another touch-and-go, which was approved by the aerodrome controller for runway 29R, with instructions for a right circuit at 1,000 ft. The aircraft was observed to touch down and lift off at the same approximate positions as the previous touch-and-go, but instead of climbing out as it had previously, it levelled out at a low altitude and accelerated along the runway. At about the end of the runway the aircraft nose was observed to pitch up into a normal climb angle and the aircraft began to climb quickly.

At an altitude estimated by witnesses to be between 100 ft and 400 ft, engine malfunction noises variously described as coughing, spluttering or surging were heard. Some witnesses described hearing an engine power loss consistent with an abrupt throttle reduction. Almost immediately, while still below 500 ft, the aircraft rolled into a steep right turn. Engine power was heard to return, but it was intermittent, and the engine was spluttering and backfiring. Aircraft maintenance engineers who heard the engine noise associated it with fuel starvation⁵. After turning approximately 90 degrees, the aircraft rolled out of the turn momentarily to about wings level, before the turn steepened again to the right. The aircraft appeared to manoeuvre within the airport boundary. A radio broadcast made by the pilot was over-transmitted by another station so that the only understandable words were '... engine problem zulu november zulu⁶'. There were no further radio transmissions from or to the pilot.

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- 1 The aircraft was built from a kit supplied by Neico Aviation Incorporated.
 - 2 The 24-hour clock is used in this report to describe the local time of day, Eastern Standard Time (EST), as particular events occurred. EST was Coordinated Universal Time (UTC) + 10 hours.
 - 3 Above Mean Sea Level. Bankstown Airport is 29 ft AMSL.
 - 4 Landing practice during which an aircraft does not make a full stop after a landing, but proceeds immediately to another take-off.
 - 5 Fuel in tanks is for some reason prevented from reaching the engine.
 - 6 Aircraft callsign in the International Civil Aviation Organization phonetic alphabet.

At a position corresponding to an early downwind position of a very close circuit and at a height not above 500 ft, the turn was seen to quickly steepen and the aircraft's nose dropped into a steep descent. The majority of witnesses reported that the engine noise ceased at about the same time. When close to the ground, the aircraft's nose was seen to rise and the wings move towards level, but the rapid descent continued and the aircraft heavily impacted a taxiway on the north-western part of the airport (figure 1). The pilot was fatally injured and the aircraft was destroyed.

Figure 1: Accident location at Bankstown Airport

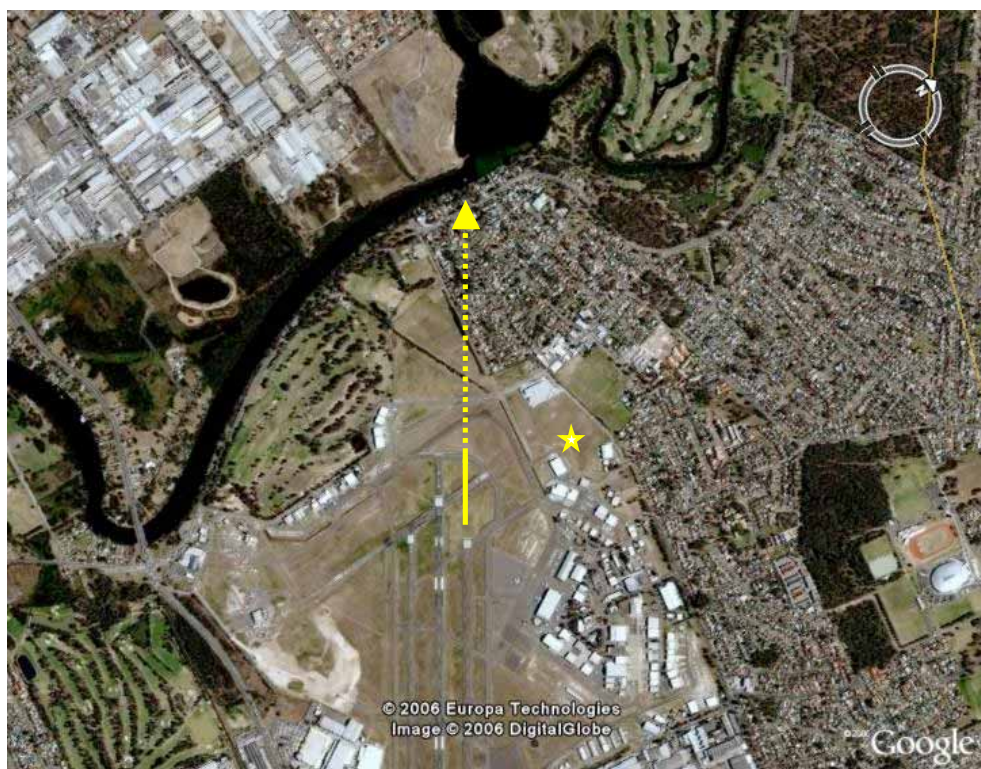


Operating environment

Bankstown airport, located within the Sydney metropolitan area, is the main general aviation airport in the Sydney basin. At the time of the accident there were three parallel runways orientated in a north-west/south-east direction. Runway 29R was 1,100 m long.

In figure 2 the extended centreline of runway 29R is depicted as a series of dots and the accident site as a star. Outside the airport boundary, the area adjacent to the extended centre line of runway 29R was generally populated with houses and was bounded by a river. To the left of the extended centreline was a non-populated area and golf course, also bounded by the river.

Figure 2: Area to north-west of Bankstown Airport



Meteorological information

Digital images recorded of the aircraft in the circuit area and witness information indicated that there was no significant cloud in the vicinity of Bankstown Airport and the visibility exceeded 10 km.

The Bankstown Airport automatic weather station recorded observations at 1-minute intervals. On the last circuit, at the aircraft's approximate downwind position, the wind was recorded as 281 degrees true and was 14 kts gusting to 17 kts. At the approximate time of the touch-and-go the wind was recorded as 281 degrees true and was 13 kts gusting to 19 kts. At the time of the over-transmitted emergency call the wind was 303 degrees true and 10 kts gusting to 12 kts. The recorded air temperature was about 32 degrees Celsius.

Wreckage and impact information

The aircraft impacted the surface of the taxiway upright in a slightly right-wing down, nose-down attitude with indications of right yaw. The aircraft skidded along the taxiway and adjacent grass in the approximate direction of flight, colliding with the nose of a parked twin-engine aircraft before coming to rest 65 metres from the impact point (figure 3).

An oily residue in the accident trail indicated that oil had spilled from the engine crankcase. Discolouration at the initial impact site showed a quantity of fuel had spilled from the right wing tank and little fuel had spilled from the left wing tank. Further along the accident trail there was discolouration on the taxiway consistent with further fuel spillage.

Figure 3: Impact marks on airport taxiway (wreckage circled)



All of the aircraft parts were located at the accident site and examination of the wreckage showed no pre-impact structural or flight control defects. The outer wings and tail section detached during the accident sequence and the fuselage structure was broken in a number of places (figure 4). The aircraft's fuel tanks were ruptured and there was no fuel able to be recovered from the aircraft.

Figure 4: Aircraft wreckage



The investigation found the fuel selector in the MAIN (header tank) position, but an emergency worker later reported that he had moved the selector in a clockwise direction to what he thought was OFF. At the time of impact the fuel selector was probably selected to the LEFT position. The fuel boost pump switch and fuel transfer pump switch were severely damaged and their position at impact could not

