Australian Government
Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report – 200700361

Preliminary

Engine failure
Cecil Park, NSW
5 February 2007
VH-HYY, Cirrus SR22

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Figure 1 – NSW Police Air Wing.

Abstract

On 5 February 2007, a Cirrus SR22 aircraft, registered VH-HYY, with a pilot and one passenger, was being operated on a private flight from Canberra, ACT to Bankstown NSW. As the aircraft approached the Cecil Park area, the pilot reported to air traffic control that the engine had lost power and that he was attempting a forced landing. Soon after, the aircraft impacted terrain close to the M7 freeway in Cecil Park and both occupants sustained serious injuries.

The investigation is continuing.

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.

The ATSB performs its functions in accordance with the provisions of the Transport Safety Investigation Act 2003 and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to enhance safety. To reduce safety-related risk, ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not the object of an investigation to determine blame or liability. However, an investigation report must include factual material of sufficient weight to support the analysis and findings. 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.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to proactively initiate safety action rather than release formal recommendations. However, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation, a recommendation may be issued either during or at the end of an investigation.

The ATSB has decided that when safety recommendations are issued, they will focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on the method of corrective action. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations. It is a matter for the body to which an ATSB recommendation is directed (for example the relevant regulator in consultation with industry) to assess the costs and benefits of any particular means of addressing a safety issue.

About ATSB investigation reports: How investigation reports are organised and definitions of terms used in ATSB reports, such as safety factor, contributing safety factor and safety issue, are provided on the ATSB web site www.atsb.gov.au.

FACTUAL INFORMATION

On 5 February 2007, a Cirrus SR22 aircraft, registered VH-HYY, with a pilot and one passenger, was being operated on a private flight from Canberra, ACT to Bankstown NSW. At approximately 1616 ESuT[1], as the aircraft approached the Cecil Park area, the pilot reported to air traffic control (ATC) that the engine had lost power and that he was attempting a forced landing. Soon after, the aircraft impacted terrain close to the M7 freeway in Cecil Park and both occupants sustained serious injuries (figure 1).

Figure 1: Aerial view of accident site showing relationship to M7 freeway[2]

Witness reports

Witnesses reported that the aircraft appeared to be conducting an approach to land on the M7 freeway, but that just prior to impact, the aircraft veered to the right away from the road. Witnesses indicated that the aircraft struck the ground in a nose-down, right wing-low attitude.

One witness who was travelling south on the M7 freeway reported that the aircraft was 'coming straight at him low over the road' and that there had been 'an explosion in front of the propeller, smoke and sparks coming from the left side of the aeroplane and white pieces falling from the aircraft onto the centre of the road'.

Another witness who had been travelling north on the M7 freeway, and was immediately behind the aircraft, reported that the aircraft appeared to be preparing

1 The 24-hour clock is used in this report to describe the local time of day, Eastern Summer Time (ESuT), as particular events occurred. Eastern Summer Time was Coordinated Universal Time (UTC) + 11 hours.

2 Photograph supplied courtesy of NSW Police Air Wing.

to land in the north-bound lane of the freeway, but it suddenly banked steeply to the right just prior to impact. He also reported that he heard a bang that sounded 'like a car backfiring' and that a piece of the aircraft had been ejected onto the road. That witness also reported that another person, who had stopped on the freeway, had removed the ejected piece of aircraft from the road and placed it into their car.

Air Traffic Control information

The ATC radio and radar was recorded for the latter part of the flight. The following table represents a summary of communications between the pilot and the Bankstown Aerodrome Controller (ADC) and includes the approximate aircraft height above ground level (AGL) where relevant:

Table 1: Summary of radio communications

Time (ESuT)	From	To	Comments
16:16:00	HYY	ADC	At approximately 800 ft AGL the pilot of HYY reported an emergency to ATC stating that the engine had lost power.
16:16:11	ADC1	HYY	ATC acknowledged the pilots transmission and requested his position.
16:16:15	HYY	ADC	The pilot reported he was over a freeway.
16:16:22	HYY	ADC	The pilot reported that he was going to attempt to land on the freeway.
16:16:33	HYY	ADC	At approximately 400 ft AGL, The pilot reported that he was going to deploy the parachute [CAPS].
16:16:41	ADC1	HYY	ATC requested the aircraft location to deploy emergency services but no further response was received from HYY.

Pilot information

The pilot of the aircraft was experienced in the operation of the SR22 aircraft and held both a current US private pilot's licence and an Australian Special Pilot Licence. He held a valid medical certificate and had recently completed a flight review in the US.

Aircraft wreckage examination

Examination of the aircraft wreckage was carried out with the assistance of representatives from the engine, airframe and Cirrus Airframe Parachute System (CAPS) manufacturers. That examination indicated that the aircraft had impacted the ground approximately 10 metres after contacting some medium-sized gum trees, in approximately a 20 degrees right-wing low, 30 degrees nose-down attitude. The landing gear and empennage had separated from the fuselage on initial ground impact and the aircraft had then travelled a further 15 metres uphill before coming to rest. Both wing fuel tanks had been breached during the impact but all fuel caps

were secure. A review of refuelling documentation indicated that the aircraft had sufficient fuel on board for the intended flight.

VH-HYY was fitted with a CAPS parachute that was designed to recover the aircraft and occupants to the ground in the event of an impending accident. The CAPS is activated by the pilot pulling a red T-handle mounted beneath a removable cover on the cabin ceiling. Activation of the CAPS by the T-handle fires a rocket that exits through the aircraft skin, dislodging a concealed fibreglass cover, and deploying the parachute. Despite an extensive air and ground search, the fibreglass cover was not located in the vicinity of the accident site.

Prior to impact, the CAPS system had been activated by the pilot. However, the parachute system had only partially deployed. The CAPS rocket had fired and exited the aircraft but it became entangled in the rear section of the empennage. As a result, the parachute did not deploy.

Figure 2: CAPS rocket entangled in empennage

An examination of the propeller damage and ground scars indicated that the propeller was windmilling and was not rotating under power (figure 3).

Figure 3: Propeller as found at accident site

Engine history and examination

The aircraft was fitted with a Continental IO-550N-27B engine, Serial Number 917232. The engine had been fitted to the aircraft since new in 2004. Both the airframe and the engine had accumulated over 700 flight hours since that time.

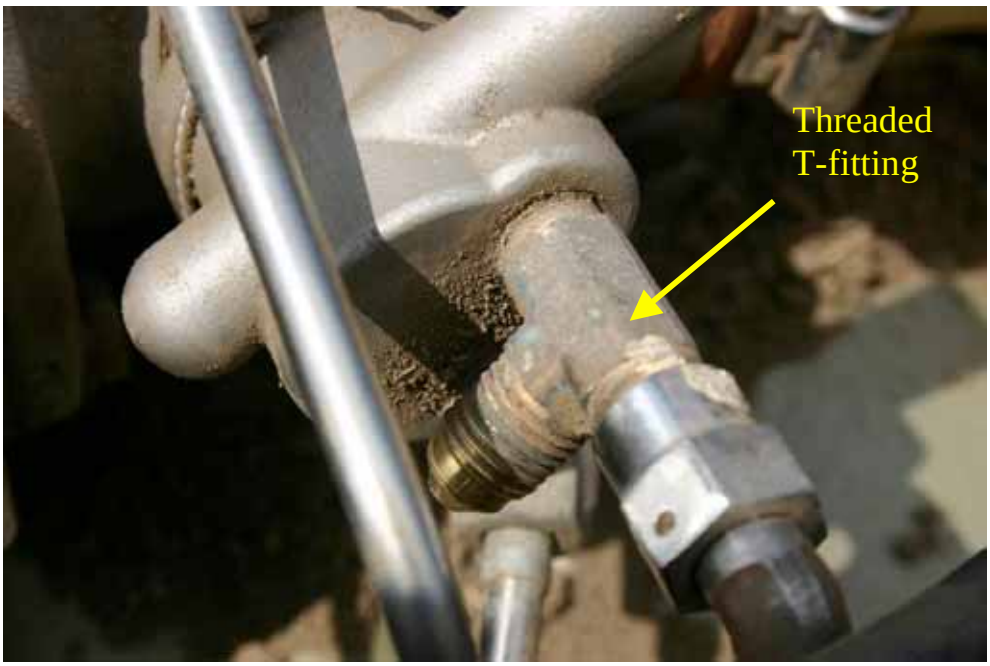
On 14 October, 2006, the engine and propeller had been damaged following a heavy landing and propeller strike incident. As a result of that accident, the propeller had been replaced and the engine was removed from the aircraft for bulk-strip and repair. The repaired engine was re-fitted to the aircraft on 24 January 2007 and, since that time, had accumulated approximately 7 hours time in service.

Examination of the aircraft engine at the accident site found that a steel blanking cap from the engine's fuel supply system was missing (figure 4). That cap covered a test port on a threaded 'T- fitting' that led to the engine fuel control unit. The test port allowed for the checking of un-metered[3] fuel pressure from the engine driven fuel pump. The cap was normally fastened to the T-fitting and a torque applied to it to ensure that it remained securely fastened. A small, red, plastic, blanking cap, of a

3 Un-metered fuel pressure is the fuel pressure supplied from the outlet of the engine driven fuel pump (EDP) and before it is ported into the fuel control unit.

similar size to the missing steel cap, was found beneath the engine at the accident site.

Figure 4: Threaded T-fitting with evidence of blanking cap missing



Engine testing

The engine was removed from the aircraft and taken to an appropriate test facility where it was examined prior to attempting engine runs. The test port on the fuel system threaded T-fitting was connected to a line with a cap secured to the end. The engine was then started and operated normally with the test port line capped. However, each time the cap was removed, the engine stopped within 3 seconds.

The investigation is continuing and will include:

- a review of the aircraft and engine maintenance procedures
- an examination of the CAPS components from VH-HYY
- a review of the CAPS system operation.