Australian Government
Australian Transport Safety Bureau

Engine failure and collision with terrain involving a Cessna 210, VH-ERU

77 km ENE of Cue, Western Australia, on 1 August 2015

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Aviation Occurrence Investigation
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Addendum

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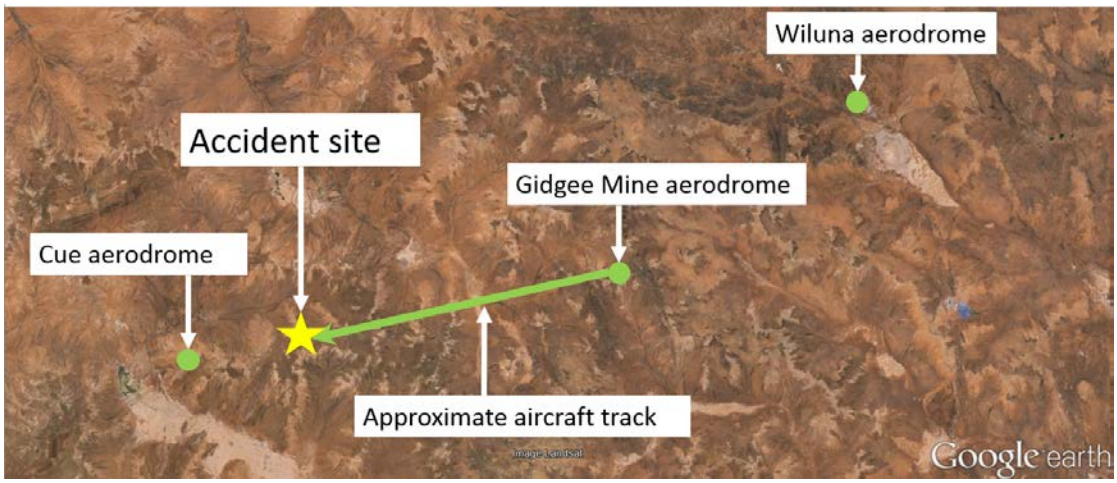
What happened

On 1 August 2015, at about 1110 Western Standard Time (WST), a Cessna 210 aircraft, registered VH-ERU, departed Gidgee Gold mine for a private flight to Cue, Western Australia (Figure 1). The pilot was the sole occupant of the aircraft. The pilot reported that all engine indications were normal from the start and into the cruise at 3,500 ft above mean sea level. The elevation of the terrain in the area was about 1,700 ft above mean sea level.

Figure 1: Aircraft track and accident location



Source: Google earth – annotated by the ATSB

About 25 minutes into the flight, the pilot observed the engine oil temperature rising rapidly. The pilot opened the cowl flaps in an attempt to reduce the engine oil temperature, and noted that the cylinder head temperature and engine oil pressure were still in the normal range. As the pilot tried to determine the cause of the problem, the manifold pressure started to increase. The pilot reduced the throttle to try to decrease the manifold pressure, but it continued to rise.

The pilot then felt a slight vibration in the engine and through the aircraft controls, and broadcast a PAN[1] call on the Melbourne Centre radio frequency. The pilot did not receive any response to the broadcast, probably due to the aircraft's remoteness and low altitude. The aircraft was descending steadily, and the pilot looked for a suitable place to conduct a precautionary landing. However, the surrounding area was heavily treed. After turning towards the north and more open country, the vibration increased, and the pilot broadcast two Mayday[2] calls. Again, the pilot did not receive any response.

When about 500 ft above ground level, the vibration further increased and the engine failed with a bang. Smoke emanated from the engine compartment and over the windscreen, reducing the pilot's visibility through it. The pilot then sighted a fence line to the right and prepared for a forced landing, aiming to touchdown in a cleared area alongside the fence.

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1 An internationally recognised radio call announcing an urgency condition which concerns the safety of an aircraft or its occupants but where the flight crew does not require immediate assistance.

2 Mayday is an internationally recognised radio call for urgent assistance.

The pilot lowered the landing gear and extended the flap. When at about treetop height, the pilot selected the master switch and fuel off. The pilot also tightened the seatbelt and opened the aircraft door. As the pilot flared the aircraft to land, the right wing and strut collided with a tree. The aircraft yawed to the right, and the right main landing gear struck the ground and broke off. Although the pilot applied full left rudder to try to regain control of the aircraft, it collided with another tree and rolled onto its left side, before skidding and coming to rest against a third tree. The pilot suffered minor injuries and the aircraft sustained substantial damage (Figure 2).

The right fuel line ruptured during the impact sequence, causing fuel to run down into the cabin and onto the pilot. The pilot quickly exited the aircraft, concerned about the risk of fire, particularly as there was about 240 L of fuel in the tanks.

After waiting about half an hour for the fuel to stop running into the cockpit, the pilot returned to the aircraft and selected the master switch on. The pilot then made another radio broadcast requesting assistance, and again did not receive any response. The aircraft's emergency locator transmitter (ELT)[3] did not activate on impact, and its light had not illuminated. The pilot then tried, without success, to use the aircraft battery to power the ELT.

At about 1400, the pilot again made radio broadcasts without any response. As there was no mobile phone signal at the accident site, the pilot started walking towards higher terrain. At about 2200, after walking 25 km, the pilot gained mobile phone coverage and was able to call for assistance. After making the call, the pilot lit a fire to provide warmth and to deter a pack of wild dogs that had been circling. At about 0200 on 2 August, low cloud rolled in and it started to drizzle. About an hour later, the pilot provided rescue personnel with the coordinates of the location, obtained from the mobile phone. At about 0730, a rescue aircraft located the pilot and police arrived about 40 minutes later.

Figure 2: Accident site showing damage to VH-ERU

Source: Western Australia Police

[3] Crash-activated radio beacon that transmits an emergency signal that may include the position of a crashed aircraft. Also able to be manually activated.

Pilot comments

The pilot provided the following comments:

- The number three cylinder failed and blew a hole in the top of the engine casing.
- The pilot usually carried a satellite phone, but did not have it on this flight as it was being serviced.
- It was about a 40-minute flight to Cue, and the pilot would normally have advised someone of the planned route and expected arrival time, but omitted to do so on this day.
- The pilot had water, a first aid kit and a lighter in the aircraft, and planned to get a personal location beacon to carry in future.

Aircraft engine

The aircraft was fitted with a Continental IO-520 engine. The pilot had owned the aircraft for about 4 years, during which time the aircraft had accrued about 60 hours of flying time. Shortly after the pilot bought the aircraft, the number three cylinder had failed and been replaced. The pilot had recently replaced the propeller in accordance with an airworthiness directive.

The aircraft was damaged beyond repair. At the time of completing this report, no engineering inspection of the engine had been, or was expected to be, conducted following the accident.

Safety message

The ATSB reminds all pilots to let someone know where they are going, and what time they expect to arrive, before embarking on a flight. Although the incident flight was not in a designated remote area, it demonstrates that it is vitally important to carry emergency supplies, such as water, food, matches (or lighter), and first aid essentials. Where mobile and radio coverage is not available, a satellite phone can provide life-saving access to help.

Electronic locator transmitters installed in aircraft should be tested in accordance with the manufacturer's instructions. The ATSB research report AR-2012-128 found that ELTs function as intended in about 40-60% of accidents. NASA is currently conducting research to find ways to make ELTs more likely to function after a survivable crash.

General details

Occurrence details

Date and time:	1 August 2015 – 1140 WST	
Occurrence category:	Accident	
Primary occurrence type:	Engine failure	
Location:	035° M 77 km Mount Magnet Aerodrome, Western Australia	
	Latitude: 27° 32.93' S	Longitude: 118° 17.60' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company 210E	
Registration:	VH-ERU	
Serial number:	21058520	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – 1 Minor	Passengers – Nil
Damage:	Substantial	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

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.

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

It is not a function of the ATSB to apportion blame or determine liability. At the same time, 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.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.