Australian Government
Australian Transport Safety Bureau

Partial power loss and forced landing, involving a Cessna 172, VH-FPZ

Carlton Hill Station ALA, Western Australia on 10 September 2015

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Aviation Occurrence Investigation
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Addendum

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What happened

Early in the morning on 10 September 2015, the pilot refuelled and prepared a C172 aircraft, registered VH-FPZ, for a private flight departing Carlton Hill Station aircraft landing area (ALA), Western Australia (Figure 1). The pilot, the sole person on board, had planned a routine flight around the station to check stock water supplies. After conducting the before take-off checks, the pilot taxied the aircraft from the hangar to the threshold of runway 12, just before 0550 Western Standard Time (WST).

Figure 1: Location of Carlton Hill ALA

Source: Google earth annotated by the ATSB

The pilot configured the aircraft with 10° flap, and commenced the take-off run in good weather conditions, with a head wind of about 10 kt and a temperature of about 18°C. The aircraft reportedly accelerated normally, with lift-off occurring at around 65-70 kt. As per normal, the pilot allowed the aircraft to accelerate toward the cruise climb speed of about 75-80 kt prior to establishing it in the climb.

At about 150-200 ft above the ground, the aircraft performance rapidly deteriorated. The pilot reported that the revolutions per minute (RPM) dropped from about 2,700 rpm to about 2,000 rpm, and the engine was making an abnormal mechanical sound. The pilot immediately checked the fuel and mixture control settings and applied carburettor heat. However, the aircraft was not able to maintain altitude. With the pilot unable to determine the cause of the partial engine failure, they prepared for a forced landing.

With limited time and options available, the pilot selected a space between trees at the end of the runway to land. They then turned off the fuel, pulled the mixture control to idle cut off, and selected full flap. In the seconds remaining, the pilot steered the aircraft between trees to keep the cabin intact. The wings struck the trees, resulting in the outboard section of the left wing breaking off.

The aircraft travelled a further 20 m, before coming to rest (Figure 2). The pilot, who was not injured, was able to exit via the passenger door. The aircraft was substantially damaged (Figure 3).

Figure 2: VH-FPZ after the forced landing with part of the left wing in the foreground

Source: Pilot

Figure 3: VH-FPZ damage. Note the substantial damage to the left wing and tree impact on right wing

Source: Pilot

Pilot experience and comments

The pilot held a Private Pilot's Licence (Aeroplane) and had a total of about 518 hours at the time of the accident. VH-FPZ was the dedicated aircraft for Carlton Hill station, and the pilot had been flying it since the start of 2015, with about 150 hours on the aircraft.

The pilot reported that everything appeared routine and there were no abnormalities with the aircraft during the pre-take-off engine and instrumentation checks.

The pilot commented that the engine malfunction was unexpected and the event unfolded very quickly.

The aircraft, VH-FPZ

The pilot reported that there were no outstanding defects on the maintenance release and that the aircraft had completed all scheduled maintenance. In the time the pilot had been operating this aircraft, it had had one previous instance of degraded performance. However, in that instance, a post flight engineering inspection was unable to determine a cause.

Weather

The two aerodrome weather reports (METAR) obtained from the Bureau of Meteorology for nearby Kununurra Airport (approximately 20 NM to the south-east of Carlton Hill ALA) did not indicate conditions suitable for carburettor icing.

Post-accident inspection

While a full engine examination has not yet been completed, an examination by a Licenced Aircraft Maintenance Engineer found that the left magneto had failed. This most likely contributed to the aircraft's deteriorated performance.

Safety message

Simulated total loss of power and a subsequent practice forced landing is at the core of a pilot's emergency training. However, data shows that for light single engine aircraft a partial power loss is three times more likely to occur than a complete engine failure.

Confronted with minimal options at low altitude, the pilot in this occurrence had to make important decisions in a short space of time. The ATSB's publication and You Tube video "Managing partial power loss after take-off in single-engine aircraft" is available on the ATSB website. This information highlights the importance of pre-flight decision making and planning, for emergencies and abnormal situations, for each particular aerodrome.

General details

Occurrence details

Date and time:	10 September, 2015 at 0550 WST	
Occurrence category:	Accident	
Primary occurrence type:	Partial power loss	
Location:	Carlton Hill ALA, Western Australia	
	Latitude: 15° 28.83' S	Longitude: 128° 32.38' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company C172N	
Registration:	VH-FPZ	
Serial number:	17273069	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – N/A
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.