



Australian Government

Australian Transport Safety Bureau

Engine failure involving Piper PA-32, VH-FAJ

4 km E of Yea, Victoria, 22 September 2012

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Engine failure involving Piper PA-32, VH-FAJ

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What happened

On 22 September 2012, a Piper PA-32 aircraft, registered VH-FAJ, was being operated on a private scenic flight near Yea, Victoria. On board the aircraft were the pilot and a passenger.

About 5 minutes after departing, at about 1,000 ft above ground level (AGL), the pilot changed the fuel selection from the left main tank to the right tip tank¹. About 3 minutes later, when at about 800 ft, the engine failed. The pilot changed the fuel selection back to the left main tank and placed the fuel mixture and throttle control full forward, but the engine did not respond². As a result, the pilot elected to conduct a forced landing.

The pilot moved the throttle to the idle position and prepared for the landing. During the landing, the pilot noted that engine power had been restored. The aircraft subsequently impacted two fences and sustained substantial damage. Both occupants were uninjured.

Aircraft usage

The aircraft had been refuelled from a bowser before its last flight, about 9 months prior to the accident. Since that time, the aircraft had been stored in a hangar. Consequently, the pilot reported that he had conducted a thorough pre-flight inspection before the accident flight. The pilot also noted that the fuel tanks were near full and he tested the fuel for water, with none observed.

The pilot also conducted a number of circuits, without the passenger on board, and stated that the aircraft operated as normal.

Figure 1: Aircraft damage



Source: Airclaims

¹ The aircraft was fitted with four fuel tanks: left tip tank, left main tank, right main tank, and right tip tank.

² The pilot could not recall selecting the electric fuel pump on when he changed the fuel selection back to the left main tank.

Aircraft examination

An insurance representative attended the site and noted that there was a significant quantity of fuel in all the tanks, apart from the left tip tank, which had been damaged in the accident. There was evidence that fuel had leaked from that tank onto the ground. The insurance representative also found evidence of insects, likely wasps, lodged inside the left and right tip tank vent pipes.

A subsequent examination of the aircraft by a licenced aircraft maintenance engineer (LAME) found evidence of water in the right tip tank and in the fuel filter bowl. The LAME also determined that there was no obstruction in the tip tank from the insects observed in the vent pipe.

Pilot comments

The pilot reported that, several months prior to the accident, he had washed the aircraft. He stated that water may have entered the right tip tank through the fuel filler cap. The pilot further suggested that, while he had visually inspected a sample of the fuel from the right tip tank prior to the flight, he had not smelt it and it was possible that the sample contained water rather than fuel.

Safety message

The deterioration of fuel cap seals can allow for the ingress of water into fuel tanks. CASA Airworthiness Bulletin (AWB 28-008) *Water contamination of fuel because of failure of fuel filler cap* contains information on inspecting fuel filler and caps and conducting pre-flight inspections of fuel filler/caps and fuel samples (www.casa.gov.au/airworth/awb/28/008.pdf).

It is important that the testing of fuel drainage samples for water contamination are positive in nature and do not rely exclusively on the sensory perceptions of colour and smell, both of which can be unreliable (Civil Aviation Order (CAO) 20.2). The CAO details a number of acceptable methods for testing fuel, including:

- Placing a small amount of fuel into a container, before taking samples from tank or filter drain points. The presence of water will be identified by a visible surface of demarcation between the two fluids.
- Using chemical means such as water detecting paper or paste; where a change in colour of the detecting medium will provide a clear indication of the presence of water.

This accident highlights the importance of conducting a thorough pre-flight fuel inspection, particularly when the aircraft has been stored for an extended period. The following publications provide additional information on fuel inspections:

- Fuel system inspection: www.comlaw.gov.au/Details/F2006C00266
- Fuel and oil safety: www.casa.gov.au/newrules/parts/091/download/ac091-365.pdf
- Fuel management: www.caa.govt.nz/safety_info/GAPs/Fuel_Management.pdf

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA-32-260	
Registration:	VH-FAJ	
Type of operation:	Private	
Location:	4 km E of Yea, Victoria	
Occurrence type:	Engine failure	
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – 0	Passengers – 0
Damage:	Substantial	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau 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.