SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division Accident and Incident Investigations Division Form Number: CA 12-57

LIMITED OCCURRENCE INVESTIGATION REPORT

Reference Number	CA18/2/3/10528				
Classification	Accident	**Date**	24 November 2024	**Time**	0825Z
Type of Operation	Private (Part 91)				
Location					
Place of Departure	Bram Fischer International Airport (FABL), Free State Province	Place of Intended Landing	Wonderboom Aerodrome, (FAWB) Gauteng Province		
Place of Occurrence	About 200m from the threshold of Runway 06 at Wonderboom Aerodrome (FAWB)				
GPS Co-ordinates	Latitude 25°39'57" S	Longitude 28°12'44.76" E		Elevation	4 060 ft
Aircraft Information					
Registration	N441AG				
Make; Model; S/N	Textron Aviation, Cessna 172P (Serial Number: 17276091)				
Damage to Aircraft	Substantial	Total Aircraft Hours	14 350		
Pilot-in-command					
Licence Type	Private Pilot Licence (PPL)	Gender	Male	Age	24
Licence Valid	Yes	Total Hours	160.5	Total Hours on Type	25.2
Total Hours Past 30 Days	25.2	Total Flying Hours on Type Past 90 Days			25.2
People On-board	1 + 2	**Injuries** 0	**Fatalities** 0	**Other (on ground)**	0

What Happened

On Sunday morning, 24 November 2024, a pilot and two passengers on-board a Cessna 172P aircraft with registration N441AG took off on an hour-building flight from Wonderboom Aerodrome (FAWB) in Gauteng province to Bram Fischer International Airport (FABL) in Free State province with the intention to return to FAWB. The hour-building flight was towards the issuance of the pilot's Commercial Pilot Licence (CPL). The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

Prior to take-off from FAWB (to FABL), a pre-flight inspection of the aircraft was conducted, and no abnormalities were found. *The distance between FAWB and FABL is 232 nautical miles (nm)*. The aircraft had a total of 35.6 US gallons of aviation gasoline 100 low lead (AVGAS 100LL) at take-off. The flight from FAWB to FABL was uneventful, and approximately 17.24 US gallons of fuel was consumed with approximately 18.36 US gallons remaining in the tanks, including 3 US gallons of unusable fuel (18.36 – 3 = 15.36).

In preparation for the return flight from FABL to FAWB, a pre-flight inspection was conducted; there was no fuel uplift at FABL. The aircraft took off and proceeded to FAWB. Whilst flying above Rosslyn, approximately 7.5nm north-west of FAWB, the pilot contacted FAWB tower to request a priority

landing due to low fuel. At this point, the aircraft's altitude was 6000 feet (ft). The FAWB tower granted the request. During the final approach for landing on Runway 06, the engine stopped, and the aircraft landed on the trees, approximately 200 metres (m) from the threshold of Runway 06. The pilot and the passengers were not injured; however, they were taken to the hospital for a check-up. The aircraft was substantially damaged.

The fuel planning below is calculated in zero wind conditions to indicate the average fuel required for a flight from FAWB-FABL-FAWB on a Cessna 172P aircraft.

Total fuel on-board	35.6 US Gallons
Unusable fuel	3 US Gallons
Fuel burn per/ hour	7.4 US Gallons / Hr
Trip fuel (FAWB – FABL)	17.24 US Gallons
Taxi fuel	1 US Gallons
Trip fuel (FABL – FAWB)	17.24 US Gallons
Taxi fuel	1 US Gallons
Reserve fuel (45 minutes)	5.2 US Gallons
Total fuel required	42 US Gallons

Figure 1: The yellow pin indicates the spot at which the aircraft came to rest. (Source: Google Earth)

Figure 2: The aircraft post-accident. (Source: Operator)

The Aircraft Fuel System and Description: (Source: Aircraft Pilot's Operating Handbook [POH])

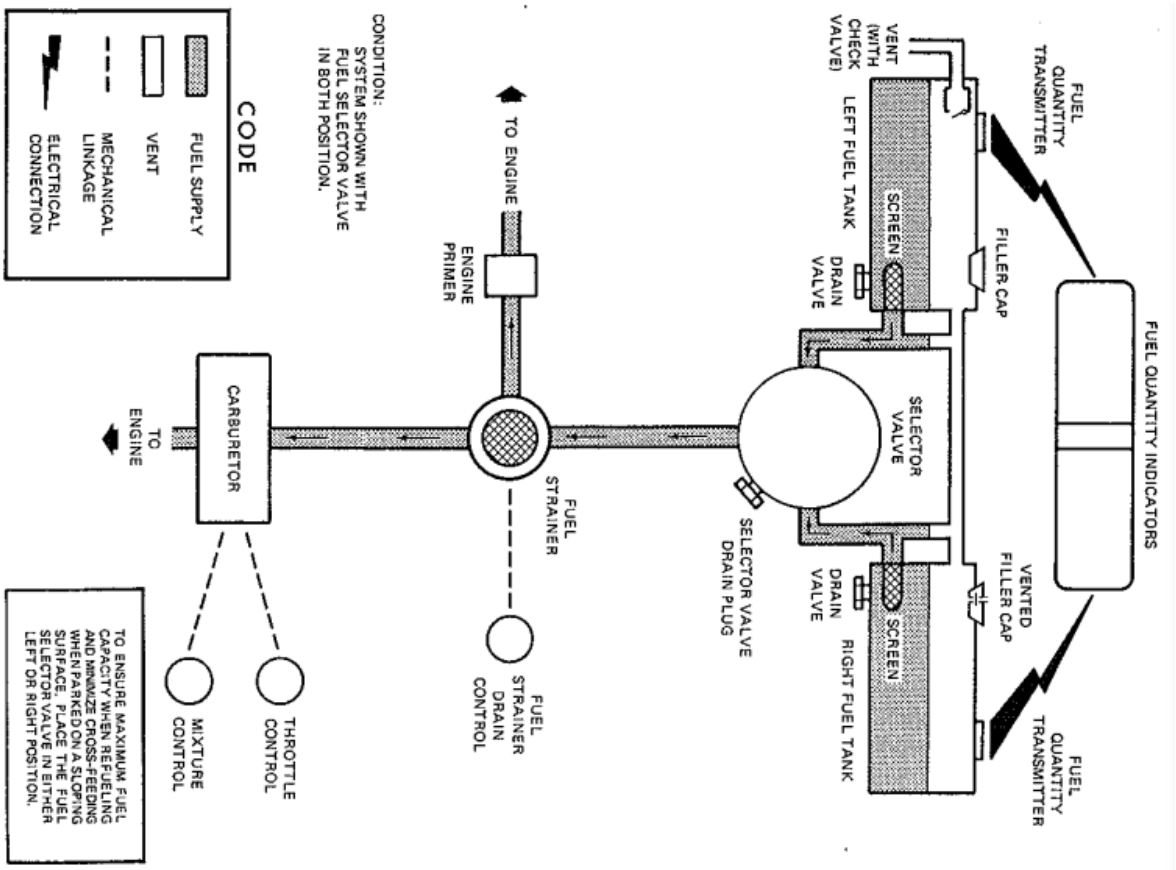

Diagram 1: The aircraft fuel system.

The aircraft was equipped with a standard fuel system consisting of two vented fuel tanks, one on each wing, a four-position selector valve, fuel strainer, manual primer, and carburettor. Fuel flows by

gravity from the two wing tanks to a four-position selector valve, labelled BOTH, RIGHT, LEFT and OFF. With the selector valve in either the BOTH, LEFT or RIGHT position, fuel flows through a strainer to the carburettor. From the carburettor, mixed fuel and air flow to the cylinders through intake manifold tubes. The manual primer draws its fuel from the strainer and injects into the cylinder intake ports.

The fuel selector valve should be in BOTH position for take-off, climb, landing and manoeuvers that prolonged slips or skids. Operation from either left or right is reserved for cruising flights.

Findings

1. The pilot had a Private Pilot Licence (PPL) that was initially issued by the Regulator (SACAA) on 20 November 2020. The licence was renewed on 11 December 2023 with an expiry date of 30 November 2025. The pilot had flown a total of 160.5 hours of which 25.2 were on the aircraft type. The pilot had the aircraft type endorsed on his licence.

2. The pilot had a valid Class 2 aviation medical certificate that was issued on 15 April 2024 with an expiry date of 15 April 2029.

3. The Regulator had issued the aircraft's Certificate of Registration (C of R) to the present owner on 14 November 2014 with an expiry date of 30 November 2027.

4. The aircraft had a valid Certificate of Airworthiness (C of A) that was issued on 20 September 2016.

5. The aircraft's Certificate of Release to Service (CRS) was issued on 8 November 2024 at 1875.2 hours with an expiry date of 31 August 2025 or at 1885.2 hours, whichever occurs first. There were no defects recorded on the aircraft's maintenance documents at the time of the flight.

6. Fine weather conditions prevailed at the time of the flight; the weather was not considered a contributory factor to this accident.

7. The pilot did not have sufficient fuel on-board to safely land at FAWB.

Probable Cause

The aircraft crashed 200m before the threshold of Runway 06 at FAWB due to fuel exhaustion.

Contributing Factor

None.

Safety Action(s)

None.

Safety Message
None.
About this Report
The decision to conduct a limited investigation is based on factors including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation and that will determine the scope of an investigation. For this occurrence, a limited investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up desktop inquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar occurrence. *All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.*
Purpose
In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and not apportion blame or liability.
Disclaimer
This report is produced without prejudice to the rights of the AIID, which are reserved.

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa