AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/10550	
Aircraft Registration	ZS-MKY	**Date of Accident**	4 February 2025			**Time of Accident**	1300Z
Type of Aircraft	Piper PA28-180			**Type of Operation**		Training (Part 141)	
Pilot-in-command Licence Type	Commercial Pilot Licence (CPL)			**Age**	24	Licence Valid	Yes
Pilot-in-command Flying Experience		**Total Flying Hours**		490.9		**Hours on Type**	469.6
Last Point of Departure	Wonderboom Aerodrome (FAWB), Gauteng Province						
Next Point of Intended Landing	Wonderboom Aerodrome (FAWB), Gauteng Province						
Damage to Aircraft	Substantial						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
Approximately 3.7 nautical miles west of Runway 29 (GPS co-ordinates: 25°38'51.99" South 028°10'17.78" East) at an elevation of 3 999 feet (ft)							
Meteorological Information	Surface wind: 270°/05kts, temperature: 32°C, cloud cover: scattered, cloud base: 2400ft, dew point: 18°C, visibility: 10km, QNH: 1018hPa						
Number of People On-board	2 + 0	**Number of People Injured**	0	**Number of People Killed**	0	**Other (On Ground)**	0

Synopsis

On Tuesday afternoon, 4 February 2025, a flight instructor (FI) and a pilot on-board a Piper PA28A-180 aircraft with registration ZS-MKY took off on a planned navigational training flight from Wonderboom Aerodrome (FAWB) to Brits Aerodrome (FABS) and Pilanesberg Aerodrome (FAPN), before returning to FAWB. The engine was started at 1230Z after which run-up checks were completed. The aircraft took off from Runway 29 at 1258Z. Shortly after take-off, approximately 500ft above ground level (AGL), the engine suddenly lost power which reduced from 2700 revolutions per minute to idle speed. The FI took control of the aircraft and troubleshot the anomaly during which the engine briefly regained power but later stopped. Unable to maintain altitude, the FI conducted a forced landing near Onderstepoort, Pretoria. The aircraft sustained damage to the left wing and propeller. No person was injured during the accident.

Post-accident examination of the aircraft, including detailed testing and inspection of the engine and its associated systems, did not reveal any mechanical defects, system failure or operational anomaly that could explain the loss of engine power in-flight. The engine components, fuel system, ignition system and control linkages were found intact and functional.

Probable Cause

The engine lost power during the climb phase and the reasons were undetermined. This necessitated a forced landing on an unsuitable terrain.

SRP Date	9 September 2025	Publication Date	11 September 2025

Occurrence Details

Reference Number	**:** CA18/2/3/10550
Occurrence Category	**:** Accident (Category 2)
Type of Operation	**:** Training (Part 141)
Name of Operator	**:** Thompson Aviation
Aircraft Registration	**:** ZS-MKY
Aircraft Make and Model	**:** Piper Aircraft Corporation; PA28-180
Nationality	**:** South African
Place	**:** Near Onderstepoort, Pretoria, Gauteng Province
Date and Time	**:** 4 February 2025 at 1300Z
Injuries	**:** None
Damage	**:** Substantial

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, 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 to apportion blame or liability.

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.

Investigation Process

The Accident and Incident Investigations Division (AIID) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence on 4 February 2025 at 1330Z. The occurrence was classified as an accident according to the CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) STD Annex 13 definitions. Notifications were sent to the State of Registry, Operator, Design and Manufacturer in accordance with the CAR 2011 Part 12 and the ICAO Annex 13 Chapter 4. The States did not appoint an accredited representative and advisor. Investigators did not dispatch to the accident site.

Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
   Accident — this investigated accident
   Aircraft — the Piper PA28-180 Cherokee involved in this accident
   Investigation — the investigation into the circumstances of this accident
   Pilot — the pilot involved in this accident
   Report — this accident report

2. *Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.*

Disclaimer

Table of Contents

Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AIID	Accident and Incident Investigations Division
AMM	Aircraft Maintenance Manual
AMO	Aircraft Maintenance Organisation
CAR	Civil Aviation Regulation
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CPL	Commercial Pilot Licence
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
E	East
FABS	Brits Aerodrome
FAPN	Pilanesberg Aerodrome
FAWB	Wonderboom Aerodrome
FDR	Flight Data Recorder
FI	Flight Instructor
ft	Feet
GPS	Global Positioning System
hPa	Hectopascal
km	Kilometres
kt	Knots
m	Metre
METAR	Meteorological Aerodrome Report
MHz	Megahertz
POH	Pilot's Operating Handbook
PPL	Private Pilot Licence
QNH	Barometric Pressure adjusted to Sea Level
RPM	Revolutions per Minute
RWY	Runway
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1. On Tuesday afternoon, 4 February 2025, a flight instructor (FI) and a pilot on-board a Piper PA28A-180 aircraft, registered ZS-MKY, took off on a navigational training flight from Wonderboom Aerodrome (FAWB) in Gauteng province with the intention to fly to Brits Aerodrome (FABS) and Pilanesberg Aerodrome (FAPN), both located in North West province, before returning to FAWB. The training flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. The FI reported that a standard pre-flight inspection of the aircraft was conducted in accordance with the applicable checklist. During this inspection, no anomalies, irregularities or fluid leaks were observed, and all systems appeared serviceable. A review of the aircraft's flight folio revealed no recorded outstanding defects or deferred maintenance items before the flight.

1.1.3. The flight instructor reported that the engine was started at 1230Z; thereafter, they spent 15 to 20 minutes performing the run-up checks. They then took off at 1258Z from Runway 29. The take-off was normal with no anomalies noted. They completed the after-take-off checks after reaching an altitude of 300 feet (ft) above ground level (AGL). At approximately 500 ft AGL, the engine lost power and the revolutions per minute (RPM) dropped to idle speed (from 2700 to 1000 RPM). The FI took control of the aircraft and attempted to troubleshoot the anomaly by selecting different power settings, but there was no improvement in the engine performance. The engine regained power briefly but lost it soon after; as a result, the aircraft began to descend. The FI opted to land straight ahead of his flight path in a densely vegetated area near Onderstepoort, Pretoria, Gauteng province.

1.1.4. The pilot, who was the pilot flying (PF) stated that the take-off and climb phases to 300 ft were uneventful. However, upon reaching 500 ft, he noticed that the engine RPM were fluctuating. Shortly thereafter, the engine lost power. He then attempted to turn on the electrical fuel pump, but it had no effect. The FI took over the control of the aircraft and conducted a forced landing.

1.1.5. The aircraft sustained damage to the left wing and the propeller blade. The crew was not injured.

1.1.6. The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 25°38'51.99" South 028°10'17.78" East, at an elevation of 3 999 ft.

Figure 1: An aerial view of the accident site and the aerodrome. (Source: Google Earth)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	1	1	-	-	-
Total	**1**	**1**	**-**	-	**-**

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The left wing and the propeller blade sustained damage during the forced landing.

Figure 2: The aircraft at the accident site. (Source: Operator)

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Flight Instructor (FI)

Nationality	South African	Gender	Male	Age	24
Licence Type	Commercial Pilot Licence (CPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instruments and Instructors Grade III				
Medical Expiry Date	31 May 2025				
Restrictions	None				
Previous Accidents	None				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant to this accident.

Flying Experience:

Total Hours	490.9
Total Past 24 Hours	0
Total Past 7 Days	4
Total Past 90 Days	73.5
Total on Type Past 90 Days	65.4
Total on Type	469.6

1.5.1. The flight instructor was initially issued a Commercial Pilot Licence (CPL) on 30 June 2023 under the provisions of Part 61 of the CAR 2011. The CPL was revalidated on 20 January 2025 with an expiry date of 31 January 2026.

1.5.2. The flight instructor was issued a Class 1 medical certificate on 30 May 2024 with an expiry date of 31 May 2025.

1.5.3. During the post-accident interview, the FI stated that there was no mechanical failure or malfunction prior to the flight.

Pilot

Nationality	Nigerian	Gender	Male	Age	25
Licence Type	Private Pilot Licence (PPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	30 September 2029				
Restrictions	None				
Previous Accidents	CA18/2/3/10383 on 28 October 2023 The pilot omitted to adjust the fuel mixture and added power; he misread the set 1500 RPM to indicate power loss. This resulted in the pilot conducting a forced landing which was unsuccessful				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant to this accident.

Total Hours	75.6
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	11.3
Total on Type Past 90 Days	11.3
Total on Type	11.3

1.5.4. The pilot had a foreign Private Pilot Licence (PPL); he was in the process of converting it into a South African licence.

1.5.5. The pilot had a Class II medical certificate that was issued on 6 September 2024 with an expiry date of 30 September 2029, with no waivers.

1.6. **Aircraft Information** (Source: Pilot's Operating Handbook)

1.6.1. *The Piper PA-28-180 Cherokee is a family of two-seat or four-seat light aircraft built by Piper Aircraft and designed for flight training, air taxi and personal use. The PA-28-180 family of aircraft comprises all-metal, unpressurised, single piston-engine airplanes with low-mounted wings and tricycle fixed landing gears.*

Figure 3: The ZS-MKY aircraft. (Source: Operator)

Airframe:

Manufacturer/Model	Piper/ PA-28 Cherokee	
Serial Number	28-1171	
Year of Manufacture	1964	
Total Airframe Hours (At Time of Accident)	7487.94	
Last Inspection (Date & Hours)	23 January 2025	7478.25
Airframe Hours Since Last Inspection	9.69	
CRS Issue Date	3 December 2024	

C of A (Issue Date & Expiry Date)	6 August 2024	31 August 2025
C of R (Issue Date) (Present Owner)	30 October 2023	
Operating Category	Training (Part141)	
Type of Fuel Used	Avgas 100LL	
Previous Accidents	Saturday 28 October 2023 CA18/2/3/10383 The pilot reported that during descent to FAWA, the engine revolutions per minute reduced to 1500 RPM and, thereafter, performed engine power loss procedure as well as switched fuel tank selection, but to no avail. He identified an open field on which to perform an emergency landing. The aircraft's nose gear collapsed during landing on a ploughed field. The aircraft sustained damage to the propeller blades, engine cowling and the right-side wing tip. Probable Cause(s): The pilot omitted to adjust the fuel mixture and added power, as well as misread the set 1500 RPM to indicate power loss. This resulted in the pilot conducting a forced landing which was unsuccessful.	

Note: Previous accidents refer to past accidents the aircraft was involved in, when relevant to this accident.

1.6.2. According to the Pilot's Operating Handbook (POH), "*when an aircraft is suffering from high density altitude, its performance degrades significantly, and several clear warning signs may appear — both before and during flight". Below are the key signs and symptoms for density altitude:*

Before Take-off

Longer Take-off Roll.

The aircraft takes more runway than usual to become airborne.

Acceleration feels sluggish; the aircraft seems "heavy."

Poor Climb Performance

- *Climb rate is noticeably lower than normal.*
- *Aircraft may struggle to gain altitude after lift-off.*
- *Angle of climb is shallower — dangerous near obstacles or rising terrain.*

Take-off Performance

- *Take-off Ground Roll: Approximately 1 800 ft.*
- *Take-off Distance Over 50-ft Obstacle: Approximately 3000 ft.*

1.6.3. Engine Power Loss (Source: Pilot's Operating Handbook [POH])

The most common of engine power loss is mismanagement of the fuel. Therefore, the first step to take after engine power loss is to move the fuel selector valve to the tank not being used. This will often keep the engine running even if there is no apparent reason for the engine to stop on the tank being used. If changing to another tank does not restore the engine:

1. Check fuel pressure and turn on electrical fuel pump if OFF.

2. Push mixture control to full "RICH".

3. Check ignition switch. Turn to best operating magnetos left, right or both.

Engine Power Loss During Take-Off

The proper action to be taken if loss of power occurs during take-off will depend on circumstances.

1. If sufficient runway remains for a normal landing, land straight ahead.

2. If insufficient runway remains, maintain a same airspeed and make only a shallow turn to avoid obstructions. Use of flaps depends on circumstances. Normally, flaps should be fully extended for touchdown.

3. If you have gained sufficient altitude to attempt a restart, proceed as follows:

a. Maintain safe airspeed

b. Fuel selector - switch to another tank containing fuel

c. Electric fuel pump - check on

d. mixture - check rich

e. Carburettor heat – on

Engine:

Manufacturer/Model	Lycoming/O-360-A3A
Serial Number	L-5785-36
Hours Since New	7 487.94
Hours Since Overhaul	819.94

1.6.4. According to the Aircraft Maintenance Manual (AMM), the engine time between overhaul (TBO) is 2000 hours. The engine was last overhauled on 11 January 2020 at 6668.0 total hours.

1.6.5. No modifications were conducted on the aircraft, and all Service Bulletins (SB) and Airworthiness Directives (AD) were complied with.

1.6.6. The engine was removed from airframe ZS-MKY on 28 October 2023 due to engine shock loading, at a total engine time of 7278.25 hours.

1.6.7. The engine was installed on ZS-MKY airframe on 15 February 2024 at 7 278.25 total flying hours.

1.6.8. The information below is an extract from the POH:

Lycoming carburetted engines rely on a carburettor to mix fuel and air, with a venturi creating a pressure drop to atomise fuel before it enters the cylinders. These engines are typically four-stroke, horizontally opposed, air-cooled and naturally aspirated, offering a compact design that enhances aerodynamics. These engines use a dual magneto ignition system for redundancy and reliability, along with manual mixture control to optimise fuel burn at varying altitudes. However, carburettor icing can be an issue due to fuel vaporisation cooling the carburettor throat, necessitating a carb heat system to prevent ice formation. Most models rely on ambient air for cooling, minimising weight and complexity, though some versions feature turbocharging for better high-altitude performance.

Figure 4: The picture of the Lycoming engine.

Propeller:

Manufacturer/Model	Sensenich 76EM
Serial Number	102068K855-0-60
Hours Since New	2 689.94
Hours Since Overhaul	209.69

1.6.9. According to the manufacturer's guidelines, the time between overhaul (TBO) for the propeller is 2000 hours.

1.6.10. The propeller was overhauled on 2 April 2024 at 2 480.25 flying hours. At the time of the accident, the propeller had accumulated 209.69 flying hours since the overhaul.

1.7. Meteorological Information

1.7.1. The weather information below was obtained from the meteorological aerodrome report (METAR) that was issued by the South African Weather Service (SAWS), recorded at FAWB on 4 February 2024 at 1300Z. The accident site was 3.7nm from FAWB.

Wind Direction	270°	Wind Speed	05kt	Visibility	9 999m
Temperature	32°C	Cloud Cover	SCT	Cloud Base	2400ft
Dew Point	18°C	QNH	1018hPa		

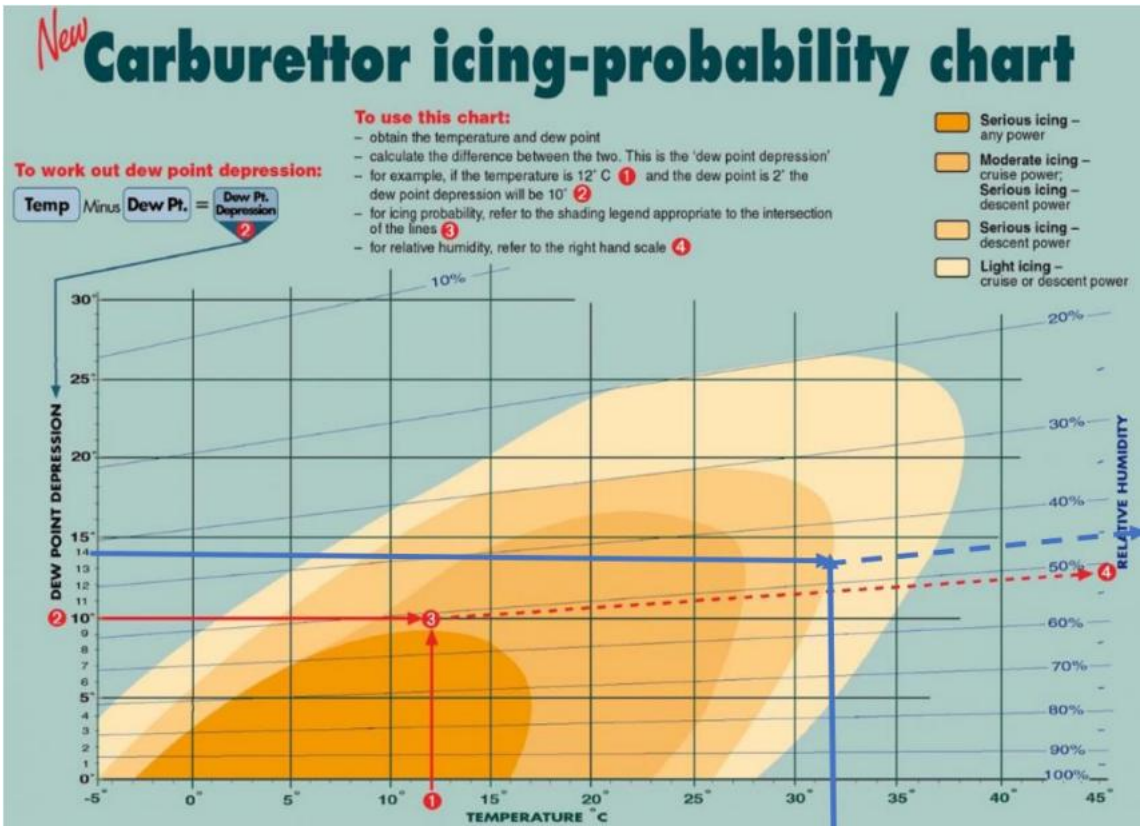

Figure 5: Icing-probability Chart.

1.7.2. According to the carburettor icing probability chart, the meteorological conditions at the time of the flight indicated a dew point depression of 14°C, with an ambient air temperature of 32°C and a dew point of 18°C. These values corresponded to a relative humidity of approximately 45%. Based on these parameters, the probability of carburettor icing was

assessed as low to negligible. The aircraft was in the climb phase when these environmental conditions were recorded. A climb phase is generally associated with high engine power settings, which reduces the likelihood of carburettor ice formation. No indications of carburettor icing were reported by the flight crew during this phase.

1.8. Aids to Navigation

1.8.1. The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA). There were no records indicating that the navigational equipment was unserviceable prior to the flight.

1.9. Communication

1.9.1. The aircraft was equipped with a standard communication system as approved by the Regulator. There were no recorded defects with the communication system prior to the flight.

1.10. Aerodrome Information

1.10.1. The crew took off from FAWB with the intention to land at the same aerodrome after routing to FABS and FAPN.

Aerodrome Location	Pretoria
Aerodrome Status	Licensed
Aerodrome GPS coordinates	25°38'51.99" S 28°10'17.78" E
Aerodrome Elevation	4 070ft
Runway Headings	273.2°/93.2°
Dimensions of Runway Used	1 828m x 30m
Heading of Runway Used	273.2°
Surface of Runway Used	Asphalt
Approach Facilities	VOR/DME NDB approaches, RNAV/GNSS approaches and a VOR/DME
Radio Frequency	257.5-MHz

1.11. Flight Recorders

1.11.1. The aircraft was neither equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor was it required by regulation to be fitted to the aircraft type.

1.12. Wreckage and Impact Information

1.12.1. The flight instructor executed a forced landing near Onderstepoort, Pretoria, approximately 3.7nm west of FAWB Runway 29. The aircraft was forced landed on a densely vegetated area.

Figure 6: The aircraft at the accident site. (Source: Operator)

1.12.2. The left and the right wings, as well as the landing gears and the propeller were damaged during the forced landing. The aircraft was recovered in its entirety without it being disassembled. It remained structurally intact as it was found which ensured that all components were preserved in their original condition for examination.

Figure 7: The damaged left wing.

Figure 8: The bent propeller blade.

1.13. Medical and Pathological Information

1.13.1. None.

1.14. Fire

1.14.1. There was no pre- or post-impact fire.

1.15. Survival Aspects

1.15.1. The accident was considered survivable as there was no damage to the cockpit and cabin areas that would have caused serious injury to the crew. The crew had their safety harnesses on during the flight, and they did not fail during the accident sequence.

Figure 9: A view of the cockpit after the accident. (Source: Operator)

1.16. Tests and Research

1.16.1. Post-accident, the engine, a Textron Lycoming O-360-A3A Serial Number L-5785-36, was inspected and subjected to a bench test for power checks at an approved aircraft maintenance organisation (AMO). The engine was run to maximum power, and no anomalies were found.

1.16.2. Although the engine achieved 100% power during post-event bench testing, a full teardown inspection was conducted as part of the investigation process to determine the root cause of the reported loss of power during take-off.

1.16.3. Bench testing confirmed that the engine could produce rated performance under controlled conditions; however, it did not provide insight into internal mechanical conditions that may intermittently or conditionally affected performance under actual flight loads and dynamics. A teardown inspection allows for a detailed examination of critical internal components—such as fuel delivery systems, internal seals and bearings—for signs of abnormal wear, foreign object damage, thermal distress or partial failure that could lead to transient or progressive power loss.

1.16.4. The external part of the engine was examined before it was stripped down in the presence of the investigator.

Fuel System

1.16.5. On 6 February 2025, a detailed inspection of the aircraft's fuel system was conducted as part of the investigation. Fuel was drained from both the left and right tanks in accordance with standard maintenance and safety procedures. The drained fuel was visually and physically inspected for quality and contamination.

The inspection confirmed that the fuel in both tanks matched the correct grade and specification as outlined in the aircraft Pilot's Operating Handbook (POH). No evidence of water, sediment, microbial growth or foreign particulate matter was found during the examination. The fuel was determined to be clean, uncontaminated and suitable for operational use at the time of inspection.

Figure 10: A sample of fuel drained for inspection.

1.16.6. The fuel system injector servo was bench-tested, and no fault was found.

1.16.7. The flow divider, fuel nozzles and fuel pipes were bench-tested, and no faults were found.

Ignition System

- The magnetos were bench-tested, and no faults were found.
- The spark plugs high-tension (HT) leads were bench-tested, and no faults were found with the spark plugs.

Figure 11: Inspected ignition system.

1.16.8. The crankcase, crankshaft connecting rods, camshaft and assessor gears were all inspected and showed no mechanical anomalies.

1.16.9. The propeller and its governing system were examined and did not exhibit any pre-impact damage. Therefore, the governing system was ruled out as a possible cause of loss of engine power.

1.16.10. The engine drive train was rotated by turning the propeller by hand; compression was evident on all four cylinders and all rockers/valves moved normally. Both magnetos remained secured to the engine. Examination showed that the magneto to engine timing was set according to the manufacturer's specification and was tested for functionality. The propeller and its governing system were examined and did not exhibit any pre-impact damage. The propeller was rotating when the aircraft struck the ground. Approximately 7 quarts of oil was found in the oil tank; the minimum safe quantity was 2 quarts, according to the POH. Examination of the aircraft revealed that fuel was present in the tanks and in the fuel lines that led to the injectors.

Figure 12: The aircraft's engine.

1.17. Organisational and Management Information

1.17.1. The flight was for training purpose and was operated under the provisions of Part 141 of the CAR 2011 as amended.

1.17.2. The approved training organisation (ATO) was issued an Approved Training Organisation Certificate on 28 September 2022 with an expiry date of 30 November 2027. The training operation (Part 141) and the aircraft type were endorsed on the ATO's Certificate.

1.17.3. The aircraft was maintained by an approved aircraft maintenance organisation (AMO). The AMO was issued an AMO Certificate on 14 August 2024 with an expiry date of 31 August 2025.

1.18. Additional Information

1.18.1. None.

1.19. Useful or Effective Investigation Techniques

1.19.1. None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was made with respect to this accident. This shall not be read as apportioning blame or liability to any organisation or individual.

2.2. Analysis

Man

2.2.1. The flight crew was appropriately licensed and medically fit to undertake the flight in accordance with the South African CAR 2011. The flight instructor had a valid Class 1 medical certificate that was issued on 30 May 2024 with an expiry date of 31 May 2025 and, therefore, complied with medical fitness requirements for instructional duties.

2.2.2. The pilot had a foreign Private Pilot Licence (PPL) and was in the process of converting it to a South African licence. He had a valid Class II aviation medical certificate that was issued on 6 September 2024 with an expiry date of 30 September 2029. He had no restrictions or waivers listed on his medical certificate. Although Class II certification is typically associated with private operations rather than instructional training, his status as a student under instruction aligned with regulatory allowances during the licence conversion process. Therefore, there was no indication that licensing or medical fitness contributed to this accident.

Machine

2.2.3. The aircraft was operated under the auspices of an approved training organisation (ATO) and the flight was conducted in compliance with Part 141 of the CAR 2011.

2.2.4. The aircraft had a valid Certificate of Registration (C of R) that was issued on 30 October 2023, as well as the Certificate of Airworthiness (C of A) that was issued on 6 August 2024; both of which were current at the time of the flight. The aircraft was maintained by a certified aircraft maintenance organisation (AMO) with a valid certificate that was issued on 14 August 2024 with an expiry date of 31 August 2025.

2.2.5. The recent annual inspection was completed on 23 January 2025 at 7478.25 airframe hours. At the time of the accident, the aircraft had 7478.94 airframe hours. This indicated that 9.69 hours had been flown since the last inspection, and that the aircraft was within its maintenance cycle. The Certificate of Release to Service (CRS) was issued on 3 December 2024; it was valid at the time of the flight. Additionally, no defects were recorded in the flight folio which confirmed that the aircraft was considered airworthy at the time of dispatch.

2.2.6. There were no recorded modifications, and all applicable Service Bulletins (SB) and Airworthiness Directives (AD) were complied with. The engine had been overhauled on 11 January 2020 at 6668 total hours and had accumulated 819.94 hours since overhaul. It underwent post-accident tests and inspections which revealed no mechanical anomalies or signs of malfunction that could have contributed to the loss of power. Moreover, the propeller was overhauled on 2 April 2024; it accumulated 209.69 hours since the overhaul which was well within normal operating limits.

2.2.7. The ATO had an ATO Certificate that was issued on 13 November 2024 with an expiry date of 30 November 2027, and the training operations and aircraft type were properly endorsed on the certificate. Maintenance records confirmed compliance with all applicable regulations and procedures.

2.2.8. In summary, all technical and maintenance-related evidence supported the conclusion that the aircraft was airworthy at the time of the flight, and no pre-existing mechanical fault contributed to the loss of power.

2.2.9. During the climb phase, the aircraft experienced loss of engine power. The flight instructor assumed control and initiated fault-finding procedures as outlined in the aircraft Pilot's Operating Handbook (POH), but these actions were unsuccessful. A forced landing was executed in Onderstepoort, Pretoria. The aircraft was force-landed on a densely vegetated area.

Environment

2.2.10. Weather conditions at the time of the flight were fine and stable; the weather had no bearing on the outcome of the accident. While the carburettor icing charts indicated potential for icing at descent power, the aircraft was operated at take-off power in which the likelihood of carburettor ice was significantly reduced. Even if the carburettor ice had formed during ground operations, the ambient temperature of 32°C and the 20-minute ground time would likely have dissipated any accumulated ice. Therefore, carburettor icing was not considered a contributing factor to this accident.

2.2.11. The aircraft took off normally within the prescribed power and performance parameters, and density altitude was within limits, playing no role in the event.

Aerodrome

2.2.12. The flight was conducted from Wonderboom Aerodrome (FAWB), which comprised two runways. The crew used Runway 29 for take-off, which is 1828 metres long and 30 metres wide. The intended return to the same aerodrome further confirmed the suitability of the

facility and its operational readiness. No aerodrome-related factors contributed to this accident.

3. CONCLUSION

3.1. General

From the available evidence, the following findings, causes and contributing factors were made with respect to this accident. These shall not be read as apportioning blame or liability to any organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusion heading:

- **Findings —** are statements of all significant conditions, events, or circumstances in this accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.
- **Causes —** are actions, omissions, events, conditions, or a combination thereof, which led to this accident.
- **Contributing factors —** are actions, omissions, events, conditions or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident occurring, or would have mitigated the severity of the consequences of the accident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil, or criminal liability.

3.2. Findings

Pilots

3.2.1. The flight crew was properly licensed, qualified and medically fit to undertake the flight in accordance with the existing regulations.

3.2.2. The flight instructor had a Class 1 medical certificate that was issued on 30 May 2024 with an expiry date of 31 May 2025. The flight instructor was properly certified and medically fit to undertake the flight.

3.2.3. The pilot had a foreign Private Pilot Licence (PPL) and was in the process of converting it into a South African licence. He had a valid Class II aviation medical certificate that was issued on 6 September 2024 with an expiry date of 30 September 2029, and with no waivers.

Aircraft

3.2.4. The aircraft experienced a similar occurrence on Saturday, 28 October 2023, during which the pilot conducted an unsuccessful forced landing. The investigation found that the pilot had omitted to adjust the fuel mixture; he added power incorrectly and misread the engine RPM.

3.2.5. The aircraft was issued a Certificate of Registration (C of R) on 30 October 2023.

3.2.6. The aircraft was maintained by an approved aircraft maintenance organisation (AMO). The AMO had an AMO Certificate that was issued on 14 August 2024 with an expiry date of 31 August 2025.

3.2.7. The aircraft had a Certificate of Airworthiness (C of A) that was issued on 6 August 2024. The latest C of A had an expiry date of 31 August 2025.

3.2.8. The last annual inspection of the aircraft was conducted and certified on 23 January 25 at 7478.25 airframe hours. The accident occurred at 7487.94 total airframe hours, which meant that the aircraft had accrued 9.69 airframe hours since the last maintenance inspection.

3.2.9. The aircraft had a Certificate of Release to Service (CRS) that was issued on 3 December 2024 at 3905.6 airframe hours. The CRS was valid until 2 December 2025 or at 4005.6 airframe hours, whichever occurred first.

3.2.10. No defects were recorded in the flight folio at the time of the flight. The aircraft was airworthy when it was dispatched for the flight.

3.2.11. No modifications were conducted, and all Service Bulletins (SBs) and Airworthiness Directives (ADs) were complied with.

3.2.12. The engine was last overhauled on 11 January 2020 at 6668 flying hours. At the time of the accident, the engine had accumulated an additional 1 756.94 hours since the overhaul.

3.2.13. The engine underwent tests and inspections, and no anomalies were found. There was no evidence of any defects or malfunction in the aircraft that could have contributed to the accident.

3.2.14. The propeller was overhauled on 2 April 2024 at 2 480.25 flying hours. At the time of the accident, the propeller had accumulated 209.69 flying hours since overhaul.

ATO

3.2.15. The ATO had an Approved Training Organisation Certificate that was issued on 13 November 2024 with an expiry date of 30 November 2027. The training operations (Part 141) and the aircraft type were endorsed on the ATO's operations specifications.

3.2.16. The flight was conducted in accordance with the provisions of Part 141 of the Civil Aviation Regulations 2011 as amended.

Environment

3.2.17 Fine weather conditions prevailed at the time of the flight; the weather conditions had no bearing to this accident.

3.2.18 A carburettor icing potential chart indicated that conditions were conducive to icing at descent power. However, the aircraft was operated at take-off power, making carburettor ice unlikely.

3.2.19 The aircraft took off normally within the specified range, therefore, density altitude had no bearing to this accident.

Aerodrome

3.2.20 FAWB is a licensed aerodrome with two runways. The crew used Runway 29 for take-off, which is 1 828m long and 30m wide. The crew had planned to land back at the same aerodrome.

3.3. Probable Cause

3.3.1. The engine lost power during the climb phase and the reasons were undetermined; this necessitated a forced landing on an unsuitable terrain.

3.4. Contributory Factor/s

3.4.1. None.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report. The AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1. None.

5. APPENDICES

5.1. Appendix A: FAWB layout chart.

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa

Appendix A: FAWB layout chart