



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/10471	
Aircraft Registration	ZU-IEZ	Date of Accident	15 July 2024		Time of Accident	0700Z	
Type of Aircraft	Bat Hawk			Type of Operation	Private (Part 94)		
Pilot-in-command Licence Type	National Pilot Licence (NPL)		Age	65	Licence Valid	Yes	
Pilot-in-command Flying Experience	Total Flying Hours			101.2	Hours on Type	10.3	
Last Point of Departure	Bundu Inn Airfield, 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)							
At GPS co-ordinates: 25°39'02.9" South 028°02' 48.7" East, at an elevation of 4 265 feet (ft)							
Meteorological Information	Surface wind:180° 5 kts; temperature: 08°C; dew point: -2°C; CAVOK						
Number of People On-board	1 + 1	Number of People Injured	1	Number of People Killed	0	Other (On Ground)	0
Synopsis							
<p>On Monday morning, 15 July 2024, a pilot and a passenger on-board a Bat Hawk aircraft with registration ZU-IEZ were on a private flight from Bundu Inn Airfield to Wonderboom Aerodrome (FAWB) in Gauteng province when the accident occurred. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The pilot stated that whilst en route to FAWB, the aircraft radio made a squelch sound, and he elected to return to Bundu Inn Airfield. Whilst on approach for landing on Runway 27 and at a height of approximately 700 feet (ft) above ground level (AGL), the engine stopped. The pilot tried to restart the engine but with no success. He then executed a forced landing on a field next to an informal settlement in Ga-Rankuwa township. During the landing roll, the left wing impacted a tree and the nose gear hit a rock; as a result, the aircraft nosed over and skidded approximately 20 metres (m) before it came to a stop in an inverted position. The aircraft sustained substantial damage. Both occupants evacuated the aircraft without assistance; the pilot sustained minor injuries and the passenger was not injured.</p>							
Probable Cause/s and/or Contributory Factors							
It is probable that the engine stoppage in-flight was caused by serious carburettor icing conditions.							
SRP Date	8 April 2025		Publication Date	9 April 2025			

Occurrence Details

Reference Number : CA18/2/3/10471
Occurrence Category : Accident (Category 1)
Type of Operation : Private (Part 94)
Name of Operator : Wilhem Otto Wolfgang Jacobs
Aircraft Registration : ZU-IEZ
Aircraft Make and Model : Bat Hawk
Nationality : South African
Place : On a field next to an informal settlement in Ga-Rankuwa
Date and Time : 15 July 2024 at 0700Z
Injuries : Minor
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 involving a Bat Hawk aircraft which occurred on a field on 15 July 2024 at 0700Z. 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. The AIID has appointed an investigator-in-charge to commence with the full investigation. 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 State did not appoint an accredited representative or advisor. The IIC did not dispatch to the accident site. The AIID will lead the investigation and issue the final report of this accident in accordance with the CAR 2011 Part 12 and the ICAO Annex 13.

Notes:

- Whenever the following words are mentioned in this report, they shall mean the following:
Accident — this investigated accident
Aircraft — the Bat Hawk involved in this accident
Investigation — the investigation into the circumstances of this accident
Pilot — the pilot involved in this accident
Report — this accident report*
- 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

This report is produced without prejudice to the rights of the SACAA, which are reserved.

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Abbreviation	Description
°	Degrees
°C	Degrees Celsius
ACCID	Accident and Incident Investigations Division
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AP	Approved Person
ATF	Authority-to-fly
CAR	Civil Aviation Regulations
CAVOK	Cloud and Visibility OK
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FAWB	Wonderboom Aerodrome
FDR	Flight Data Recorder
ft	Feet
GPS	Global Positioning System
hPa	Hectopascal
kt	Knots
m	Metres
MHz	Megahertz
METAR	Meteorological Aerodrome Report
nm	Nautical Miles
NPL	National Pilot Licence
PIC	Pilot-in-command
POH	Pilot's Operating Handbook
QNH	Barometric Pressure Adjusted to Sea Level
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
TBO	Time Before Overhaul
UTC	Co-ordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On Monday morning, 15 July 2024, a pilot and a passenger on-board a Bat Hawk aircraft with registration ZU-IEZ were on a private flight from Bundu Inn Airfield to Wonderboom Aerodrome (FAWB) in Gauteng province when the accident occurred. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2 The pilot stated that whilst en route to Wonderboom, the aircraft radio made a squelch sound, and he elected to return to Bundu Inn Estate Airfield. At approximately 0.59 nautical miles (nm) (1 kilometre) whilst on approach for landing on Runway 27 and about 700 feet (ft) above ground level (AGL), the engine stopped. The pilot tried to restart the engine but was not successful. He then opted to execute a forced landing on a field next to an informal settlement in Ga-Rankuwa township. During the landing roll, the aircraft impacted a tree with the left wing, and the nose gear hit a rock; as a result, the aircraft nosed over and skidded approximately 20 metres (m) before it stopped in an inverted position. The aircraft sustained substantial damage. The occupants evacuated the aircraft without assistance; however, the pilot sustained minor injuries whilst the passenger was not injured. The Emergency Medical Services were notified of the occurrence; they dispatched to the scene within 30 minutes.

1.1.3 The accident occurred approximately 0.6 nautical miles (nm) west of Bundu Inn Airfield at Global Positioning System (GPS) co-ordinates determined to be 25°39'02.9" South 028°02'48.7" East, at an elevation of 4 265 feet (ft).

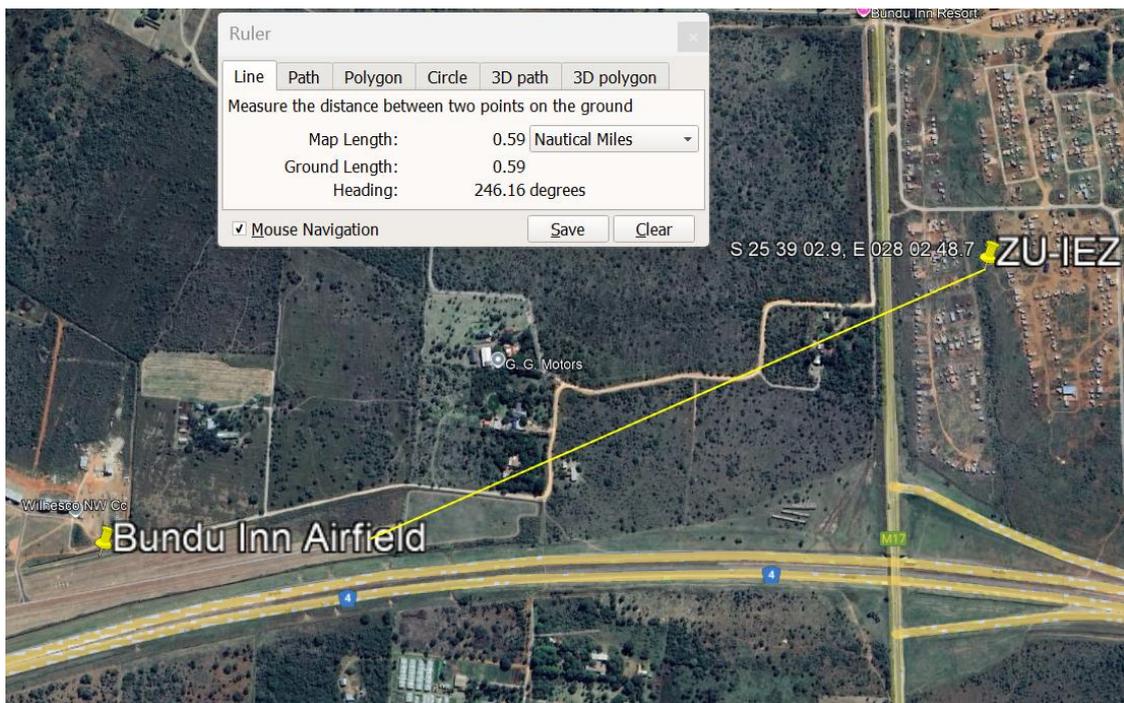


Figure 1: Aerial view of the accident site and the threshold of Runway 27. (Source: Google Earth)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	1	-	-	1	-
None	-	-	1	1	-
Total	1	-	1	2	-

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The aircraft sustained substantial damage.



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

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

1.5.1 Pilot-in-command

Nationality	South African	Gender	Male	Age	65
Licence Type	National Pilot Licence (NPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Nil				
Medical Expiry Date	1 October 2024				
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	101.2
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	10.3
Total on Type Past 90 Days	10.3
Total on Type	10.3

1.5.2 The pilot was initially issued a National Pilot Licence (NPL) on 24 June 2023. The licence was renewed on 17 June 2024 with an expiry date of 16 June 2026.

1.5.3 The aircraft type was endorsed on the pilot's licence. The pilot obtained his Bat Hawk rating on 17 April 2024.

1.5.4 The pilot was issued a Class 4 aviation medical certificate on 14 October 2022 with an expiry date of 1 October 2024 with no medical restrictions.

1.6 Aircraft Information

1.6.1 Aircraft Description (Source: Pilot's Operating Handbook [POH])

The Bat Hawk R is a high wing monoplane with the crew of two seating side-by-side in an under-slung tubular framed structure surrounded by a glass fibre composite fairing. A large wrap-around windshield protects the crew members from the weather. The propeller and the engine are mounted in a tractor position above and in front of the crew. The empennage is conventional in location and layout. The undercarriage is a tricycle arrangement with a steerable nose wheel.

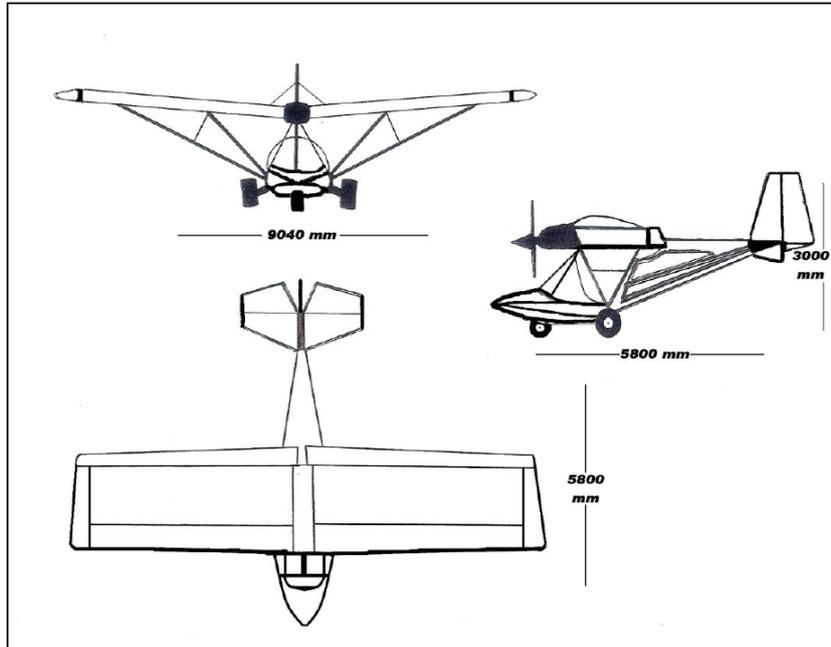


Diagram 1: The three-dimensional view of the aircraft type.

Airframe:

Manufacturer/Model	Micro Aviation SA/Bat Hawk	
Serial Number	0006	
Year of Manufacture	9 September 2019	
Total Airframe Hours (At Time of Accident)	353.2	
Last Inspection (Date & Hours)	5 May 2023	335
Hours Since Last Inspection	18	
CRS Issue Date	22 May 2023	
ATF (Issue Date & Expiry Date)	22 May 2023	30 September 2024
C of R (Issue Date) (Present Owner)	12 May 2023	
Type of Fuel Used	Avgas	
Operating Category	Private (Part 94)	
Previous Accidents	None	

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

Engine:

Manufacturer/Model	Rotax 912 ULS
Serial Number	0011
Hours Since New	353.2
Hours Since Overhaul	TBO not yet reached

Propeller:

Manufacturer/Model	E-Prop
Serial Number	N3700
Hours Since New	353.2
Hours Since Overhaul	TBO not yet reached

1.6.2 The aircraft had a valid Authority-to-fly (ATF) Certificate that was initially issued on 27 September 2019. The ATF Certificate was renewed on 22 May 2023 with an expiry date of 30 September 2024.

1.6.3 The aircraft's Certificate of Release to Service (CRS) was issued on 22 May 2023 at 285.0 hours with an expiry date of 30 September 2024 or at 385.0 hours, whichever comes first.

1.7 Meteorological Information

1.7.1 The weather information below was obtained from the pilot questionnaire.

Wind Direction	180°	Wind Speed	5Kt	Visibility	CAVOK
Temperature	8°C	Cloud Cover	None	Cloud Base	None
Dew Point	-2°C	QNH	Unknown		

1.7.2 The carburettor icing chart below indicates a dew point depression of 6°C at a temperature of 8°C, which gives the relative humidity of 68% and a serious icing probability at any power setting.

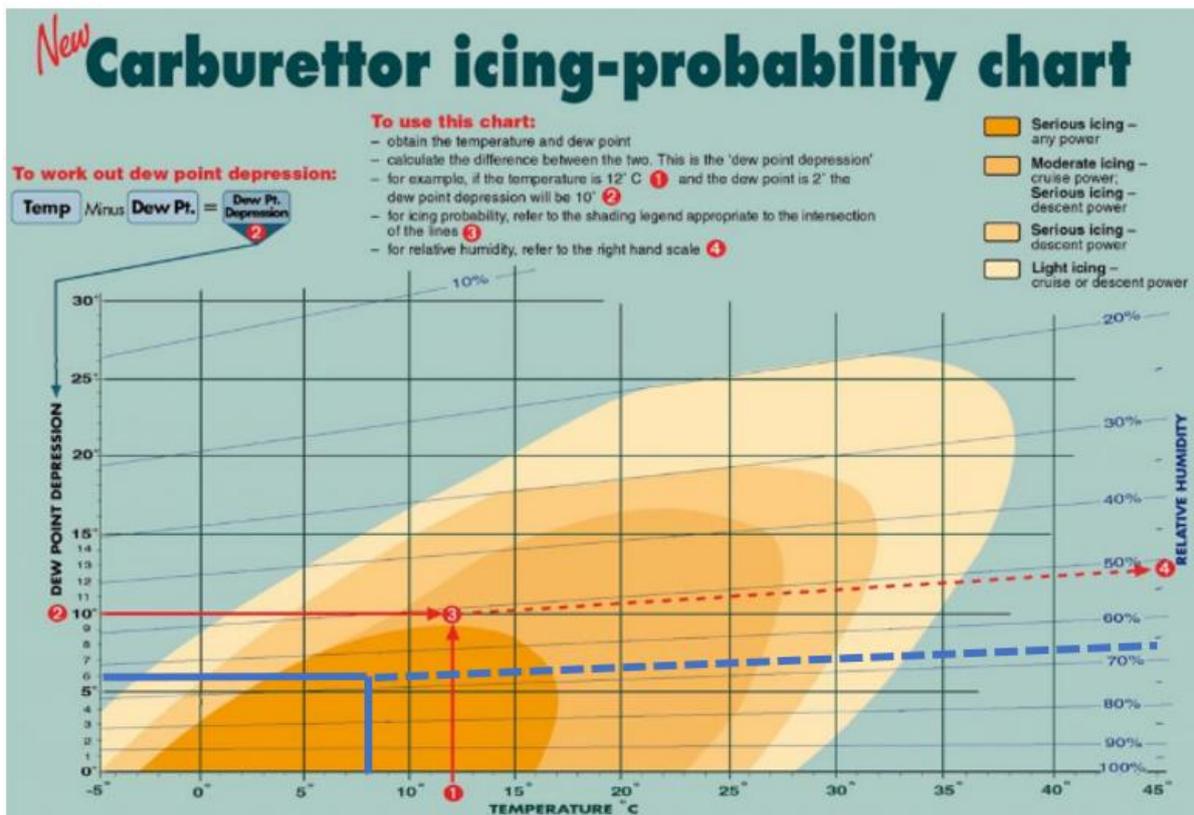


Figure 3: Carburettor icing probability chart.

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 accident occurred approximately 0.6 nm (1km) from the threshold of Bundu Inn Airfield Runway 27.

Aerodrome Name	Bundu Inn Airfield
Aerodrome Location	Gauteng Province
Aerodrome Status	Licensed
Aerodrome GPS coordinates	25°38'43.6" South, 028°02'25.4" East
Aerodrome Elevation	4330 feet
Runway Headings	09 / 27
Dimensions of Runway Used	1000 m
Heading of Runway Used	27
Surface of Runway Used	Gravel
Approach Facilities	Nil
Radio Frequency	124.8 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 During the forced landing, the aircraft impacted a tree and the nose wheel hit a rock; as a result, the aircraft nosed over and came to rest in an inverted position. The accident occurred approximately 0.6 nm north-east of Bundu Inn Airfield. The aircraft's windshield was found shattered and pieces of it were scattered near the nose section. The nose gear was found bent backward. Both wings were damaged.



Figures 4 and 5: The damaged propeller blades.

1.13 Medical and Pathological Information

1.13.1 None.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was considered survivable as the cabin structure was not severely damaged to have caused injury to persons on-board. The Emergency Medical Services were notified of the occurrence, they dispatched to the scene within 30 minutes.

1.16 Tests and Research

1.16.1 The engine was removed from the aircraft and transported to an approved person (AP) facility at Silver Creek Airfield, North West province. One of the propeller blades was found broken and the other was intact; this indicated that the engine was not operating at time of the impact. The general inspection of the engine revealed that the engine was in good

condition. The electrical system was intact, and the ignition coils, leads and spark plug leads were all in place. The carburettor needle and seat seals were checked. The float height was normal when the fuel was added. The mechanical fuel pump was found to be operational. The oil was topped up and the engine was placed on the test bench to be assessed; it started instantly and ran efficiently up to 3000 revolutions per minute (RPM).

1.17 Organisational and Management Information

1.17.1 This was a private flight, conducted under the provisions of Part 94 of the CAR 2011 as amended.

1.17.2 The aircraft was registered to the present owner on 12 May 2023.

1.17.3 The engine was bench-tested by the AP.

1.18 Additional Information

1.18.1 The following information was obtained from Pilot's Handbook of Aeronautical Knowledge FAA-8083-3C

Engine roughness is usually due to carburettor icing which is indicated by a drop in RPM and may be accompanied by a slight loss of airspeed or altitude. If too much ice is allowed to accumulate, restoration of full power may not be possible; therefore, prompt action is required.

The following are the steps to follow with rough running engine:

- *Mixture – Adjust for maximum smoothness.*
- *Electric fuel pump – On*
- *Fuel Selector – Change to other tank to see if fuel contamination is the problem.*
- *Engine Gauges – Check for abnormal readings*
- *Magneto Switch – Left then Right then back to both*

If roughness persists, prepare for a precautionary landing at pilot discretion.

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 pilot had a valid National Pilot Licence (NPL) and medical certificate. The aircraft type was endorsed on his NPL. The pilot had 10.3 hours on type, inclusive of the aircraft conversion.

Machine

- 2.2.2 The AP who conducted the maintenance had issued the aircraft's Certificate of Release to Service (CRS) on 22 May 2023 at 285.0 airframe hours with an expiry date of 30 September 2024 or at 385 airframe hours.

The engine strip was conducted and there were no abnormalities found. During the inspection, the electrical system was found intact; the ignition coils, leads and spark plug leads were all in place. The carburettor needle and seat were checked and found in place. The float height was normal when the fuel was added to the engine. The oil was topped up and the engine placed on the test bench to be assessed; the engine started instantly and ran as expected up to 3000 RPM.

Mission

- 2.2.3 This was a private flight from Bundu Inn to FAWB. Due to the radio fault, the pilot decided to return to Bundu Inn Airfield. During approach for landing, the aircraft lost power, followed by the engine stoppage and a loss of height. The pilot force-landed the aircraft on a field. The investigation found that there was a probability of serious carburettor icing at all power settings and, during descent, the engine stopped likely due to carburettor icing.

Environment

- 2.2.4 The carburettor icing chart indicated that with the dew point depression of 6°C at 8°C temperature, there would be a relative humidity of 68% and a serious icing probability at any power setting; thus, the weather was a factor which may have resulted in the engine stoppage in-flight.

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

3.2.1 The pilot had a National Pilot Licence (NPL) that was initially issued on 24 June 2023. The licence was reissued on 17 June 2024 with an expiry date of 16 June 2026. The aircraft type was endorsed on his licence and logbook.

3.2.2 The pilot had a Class 4 aviation medical certificate that was issued on 14 October 2022 with an expiry date of 1 October 2024 with no medical restrictions.

3.2.3 The aircraft had a valid Authority-to-fly (ATF) Certificate that was initially issued on 27 September 2019. The ATF Certificate was renewed on 22 May 2023 with an expiry date of 30 September 2024.

3.2.4 Maintenance of the aircraft was conducted 18 hours prior to the accident flight. The maintenance documents indicated that all procedures were followed during maintenance.

3.2.5 The engine stoppage was probably caused by carburettor icing.

3.2.6 After touching down and during the landing roll, the aircraft impacted a tree and the nose gear hit a rock; the aircraft nosed over and skidded before it stopped in an inverted position.

3.3. Probable Cause/s

3.3.1 It is probable that the engine stoppage in-flight was caused by serious carburettor icing conditions.

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. None.

This report is issued by:

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