AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/10362	
Aircraft Registration	ZU-IHA	**Date of Accident**	2 September 2023			**Time of Accident**	1618Z
Type of Aircraft	Apollo T			**Type of Operation**		Private (Part 105)	
Pilot-in-command Licence Type	Private Pilot Licence (A)			**Age**	61	**Licence Valid**	Yes
Pilot-in-command Flying Experience		**Total Flying Hours**	7 641.0	**Total Hours on Type**		1 259.1	
Last Point of Departure	New Tempe Aerodrome (FATP), Bloemfontein, Free State Province						
Next Point of Intended Landing	New Tempe Aerodrome (FATP), Bloemfontein, Free State Province						
Damage to Aircraft	Substantial						

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

On the maizefield west of New Tempe Aerodrome (FATP) at GPS co-ordinates determined to be 29° 02' 14.06" South 26° 08' 24.1" East, at about 4 526 feet (ft) above mean sea level (AMSL)

Meteorological Information	Surface Wind: 290°/02kt; Temperature: 23°C; Dew Point: 8°C; Visibility: 9999m						
Number of People On-board	1 + 7	**Number of People Injured**	0	**Number of People Killed**	0	**Other (On Ground)**	0

Synopsis

On Saturday afternoon, 2 September 2023, a pilot on-board the Apollo T aircraft with registration ZU-IHA was conducting a sport parachute drop operation overhead New Tempe Aerodrome (FATP) in Bloemfontein, Free State province, when the accident occurred. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 105 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot reported that the aircraft took off from Runway 10 at 1602Z with seven (7) parachutists and climbed to 11 000 feet (ft) above ground level (AGL). He then routed towards the drop zone abeam FATP where all parachutists safely jumped out of the aircraft. As the aircraft was descending and at 1 600ft AGL left downwind for Runway 01, the engine suddenly lost power with no warnings on the instruments. The pilot followed the in-flight engine failure checks, made an emergency radio call on FATP frequency 131.3-Megahertz to inform other aviators in the vicinity of his position and that he will be performing a forced landing. The pilot landed on a maize field approximately 0.83 nautical miles (nm) west of FATP. The aircraft sustained damage to the nose landing gear strut and the propeller blades; the pilot was unharmed.

Probable Cause

Undetermined engine power loss during a descent, followed by an unsuccessful forced landing on the maize field approximately 0.83 nautical miles (nm) west of FATP.

SRP Date	16 January 2024	Publication Date	18 January 2024

Occurrence Details

Reference Number	**:** CA18/2/3/10362
Occurrence Category	**:** Accident (Category 1)
Type of Operation	**:** Private (Part 105)
Operator Type	**:** Private
Aircraft Registration	**:** ZU-IHA
Aircraft Make and Model	**:** Lockheed Corporation / Apollo T
Nationality	**:** South African
Place	**:** Open field near New Tempe Aerodrome (FATP)
Date and Time	**:** 2 September 2023 at 1618Z
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) was notified of the occurrence on 2 September 2023. The occurrence was classified as an accident according to the CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) STD Annex 13. A notification was sent to the South African Civil Aviation Authority as the State of Registry and Operator in accordance with the CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. The investigator-in-charge (IIC) 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 Apollo T 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

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Table of Contents

Abbreviation	Description
AIID	Accident and Incident Investigations Division
A/C	Aircraft
AAD	Automatic Activation Devices
AMSL	Above Mean Sea Level
ATF	Authority to Fly
ACCID	Accident
AGL	Above Ground Level
AP	Approved Person
AMO	Aircraft Maintenance Organisation
AIP	Aeronautical Information Publication
°C	Degrees Celsius
CAA	Civil Aviation Authority
CAR	Civil Aviation Regulations
CVR	Cockpit Voice Recorder
C of R	Certificate of Registration
EMM	Engine Maintenance Manual
FCU	Fuel Control Unit
FDR	Flight Data Recorder
FABL	Braam Fisher International Airport
FATP	New Tempe Aerodrome
FAWB	Wonderboom Aerodrome
Ft	Feet
GPS	Global Positioning System
HP	Horsepower
hPa	Hectopascal
IAS	Indicated Air Speed
IIC	Investigator-in-charge
Kts	Knots
KM	Kilometres(s)
Kts	Knot(s)
Mph	Miles per hour
M	Metre
MHz	Megahertz
N/A	Not Applicable
NM	Nautical Mile
RPM	Revolution Per Minute
ITT	Internal Interstage Temperature
IAW	In Accordance With
QNH	Query: Nautical Height
SACAA	South African Civil Aviation Authority
SAHPA	South African Hang-Gliding Association
SAWS	South African Weather Services
STC	Standard Operating Procedure
VMC	Visual Meteorological Conditions
PSI	Pounds Per Square Inch
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1. On Saturday afternoon, 2 September 2023, a pilot reported at New Tempe Aerodrome (FATP) in Bloemfontein, Free State province, to prepare for the sport parachuting drop flight overhead the same aerodrome. The Apollo T aircraft with registration ZU-IHA was to be utilised for this operation. Upon arrival at the operator's facility at FATP, the pilot conducted a pre-flight inspection on the aircraft and nothing abnormal was found. The pilot stated that the aircraft had 107 litres (l) of Jet A1 fuel. Once the aircraft was ready for the flight, the pilot alerted the seven (7) skydivers who had just completed inspecting their gear in accordance with (IAW) the standard operating procedures (SOP) of the South African Hang Gliding and Parachute Association (SAHPA) to ensure that the parachutes were all fitted with serviceable automatic activation devices (AAD), and that the altimeters were serviceable. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 105 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. The pilot reported that he started the engine and allowed it to warm up. At 1602Z, he taxied the aircraft to the threshold of Runway 10 and communicated his intentions on FATP frequency 131.3-Megahertz (MHz). Thereafter, the pilot increased the engine power to 2 000 revolutions per minute (RPM) / N2. The engine torque indicated 105 pounds per square inches (psi); the interstage turbine temperature (ITT) was at 600ºC; and the N1 (engine power) was at 101 percent (%). At this point, the engine was feeding from the right fuel tank. After confirming that the engine parameters were within the acceptable limits, the pilot released the park brake and commenced with the take-off run. The aircraft rotated and climbed to 11 000 feet (ft) above ground level (AGL). At this stage, the pilot had donned his supplementary oxygen mask because the aircraft had a non-pressurised cabin. Furthermore, all seven parachutists had oxygen bottles attached to their individual gear, and they each had their oxygen masks on to help them breath properly. The pilot then retarded the engine power lever to 1 900 RPM whilst routing in the direction of the drop zone where all seven-parachutist jumped out uneventfully.

1.1.3. During this time, the engine instruments indicated normal with positive oil pressure indication and fuel flow. As the aircraft was in descent at 1 600ft AGL left downwind for Runway 01, it suddenly lost engine power without warning/indication on any of the instruments. The pilot followed the in-flight engine failure checks and, thereafter, made an emergency radio call on FATP frequency 131.3 MHz to alert other aviators in the vicinity about his predicament and position, and that he will be performing a forced landing. The pilot landed on a maize field approximately 0.83 nautical miles (nm) west of FATP. The aircraft sustained damage to the nose landing gear strut and the propeller blades. The pilot disembarked from the aircraft unharmed.

1.1.4. The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 29° 02' 14.06" South 26° 08' 24.1" East, at about 4 526 feet (ft) above mean sea level (AMSL).

Figure 1: View of the accident site and the runway used for take-off. (Source: Google Earth Maps)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	1	-	7	8	-
Total	**1**	**-**	**8**	**8**	**-**

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

Nationality	South African	Gender	Male	Age	61
Licence Type	Private Pilot Licence (PPL)				
Licence Issue Date	13 May 2023	Licence Expiry Date	31 May 2025		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night and test pilot ratings				
Medical Class	Class 2				
Medical Issue Date	28 November 2022	Medical Expiry Date	30 November 2023		
Limitations	Suitable corrective lenses				
Previous Accidents	None				

Flying Experience:

Total Flying Hours	7 641.0
Total Hours Past 24 Hours	0
Total Hours Past 7 Days	7.5
Total Hours Past 90 Days	86.5
Total Hours on Type Past 90 Days	86.5
Total Hours on Type	1 259.1

1.5.1 The pilot was initially issued a Private Pilot Licence (PPL) on 28 July 2005. His last licence validation was on 13 May 2023 with an expiry date of 31 May 2025.

1.5.2 The pilot was issued a Class 2 aviation medical certificate on 28 November 2022 with an expiry date of 30 November 2023.

1.5.3 The approved person's (AP's) file at the South African Civil Aviation Authority (SACAA) facility revealed that the pilot had a maintenance licence that was issued IAW the CAR Part 66.04 on 15 February 2023 with an expiry date of 14 February 2025. The AP had A, C and W ratings endorsed on his licence. In addition, the AP had the aircraft type and engine model endorsed on his Approved Person Certificate.

1.6. Aircraft Information

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

The Apollo T is formerly a single engine, six seat, light utility Aermacchi AL-60 Trojan aircraft manufactured by Lockheed Corporation in the United States of America (USA). The aircraft comprised non-pressurised cabin, however, it is equipped with a supplementary oxygen supply system for pilot use whilst operating at high altitudes. It was initially powered by a Lycoming IO-720-A1A 8-cylinder fuel injected engine rated at 400 horsepower (hp) and was later fitted with a Diemech M601D turbo-prop engine capable of developing 650 house power (hp), driving the Avia V508D three-bladed aluminium alloy reversable pitch propeller. The aircraft has short take-offs and landing capability and is designed for operation from unprepared landing areas.

Figure 3: The file picture of the accident aircraft. (Source: www.flightzone.co.za)

1.6.2 *Fuel system*

The Apollo T aircraft fuel system comprises six fuel tanks (three in each wing) connected as a unit with the capacity of 320l of which 6l (3l per side) is unusable. The quantity of fuel in the main fuel tanks is digitally indicated in the centre of the instrument panel and is viewed from either pilot seat. There is one gauge for each wing totalling all three small tanks in each tank which are calibrated in litres.

Figure 4: The two digital fuel gauges (yellow window) on the instrument panel.

Fuel flows from the wing tanks through the filters located at the aft-fuselage area. The fuel filter set assures clean fuel at the fuel pump entry. The fuel filter is complemented with the by-pass valve, which opens when the fuel pressure drop in the fuel filter exceeds the adjusted level. There is a signaller of impending by-pass valve intervention that at a higher-pressure loss of the fuel filter provides for signalisation by a warning lamp. Fuel to the engine is controlled by a hydro-pneumatic fuel control unit (FCU). The FCU adjusts fuel for a variety of feedback conditions including throttle demand, propellor speed, and acceleration compensation. The acceleration compensation uses a beryllium copper evacuated bellows in combination with the P_3 air to meter the fuel to the engine.

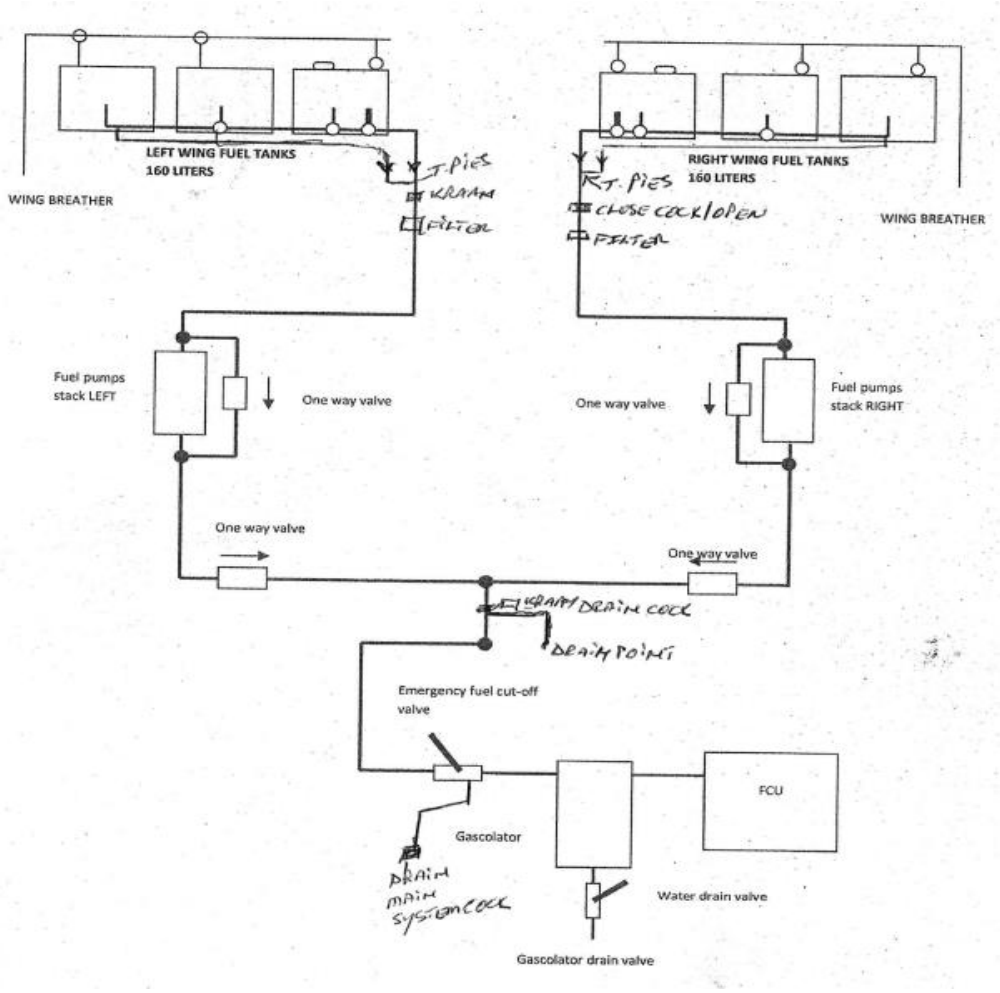

Figure 5: The Apollo T fuel system schematic.

Airframe:

Manufacturer/Model	Lockheed Corporation / Apollo T	
Serial Number	AC001	
Year of Manufacture	2015	
Total Airframe Hours (At Time of Accident)	1 884.0	
Last Annual Inspection (Date & Hours)	18 August 2023	1 869.4
Hours Since Last Inspection	14.6	
CRS Issue Date	18 August 2023	
Authority to Fly (Issue Date & Expiry Date)	11 December 2022	31 January 2024
C of R (Issue Date) (Present Owner)	18 September 2015	
Type of Fuel Used	Jet A1	
Operating Category	Private (Part 105)	
Previous Accidents	Nil	

Engine:

Manufacturer/Model	Diemech Turbines / Diemech M601D
Serial Number	901003
Part Number	Unknown
Hours Since New	831.4
Hours Since Overhaul	TBO Not reached (3 000 hours)

Propeller:

Manufacturer/Model	Avia propeller Ltd / Avia V508D
Serial Number	01065713
Part Number	Unknown
Hours Since New	6 063.3
Hours Since Overhaul	63.3

1.6.1 Engine (Source: Engine Maintenance Manual [EMM])

The Diemech M601D engine is a two-spool engine comprising a gas generator that drives a power turbine, which drives a reduction gearbox. The gas generator compressor consists of two axial flow stages and one centrifugal stage. Inlet air enters the compressor section radially just forward of the accessory section and travels forward through the compressor. The exiting compressor air enters an annular combustor to mix with fuel for the combustion process.

The gas generator turbine nozzles then direct the expanded flow path gases to the gas generator turbine, which directs the exiting gases to the power turbine for the final power extraction before exiting the engine forward of the compressor inlet. The power turbine drives the propeller by means of the reduction gearbox. The accessory gearbox, which is located on the aft end of the engine drives all engine accessories by a direct shaft coming from the compressor spool. Typical engine accessories are the main fuel pump, FCU, starter/generator, hydraulic pump, and the propeller governor, which is driven by the reduction gearbox located at the front of the engine.

The oil system is a circulatory pressure system with an integral oil tank incorporated into the accessory gearbox. This system provides lubrication for all areas of the engine and oil pressure for the torque meter and propeller pitch control. The powerplant is controlled by three sets of levers. The power lever controls the power output of the engine and the propeller blade angles in Beta and reverse. The propeller lever controls the propeller speed via the primary propeller governor and emergency propeller feathering. The condition lever actuates the fuel shutoff valve and if an emergency circuit is on, controls the engine power.

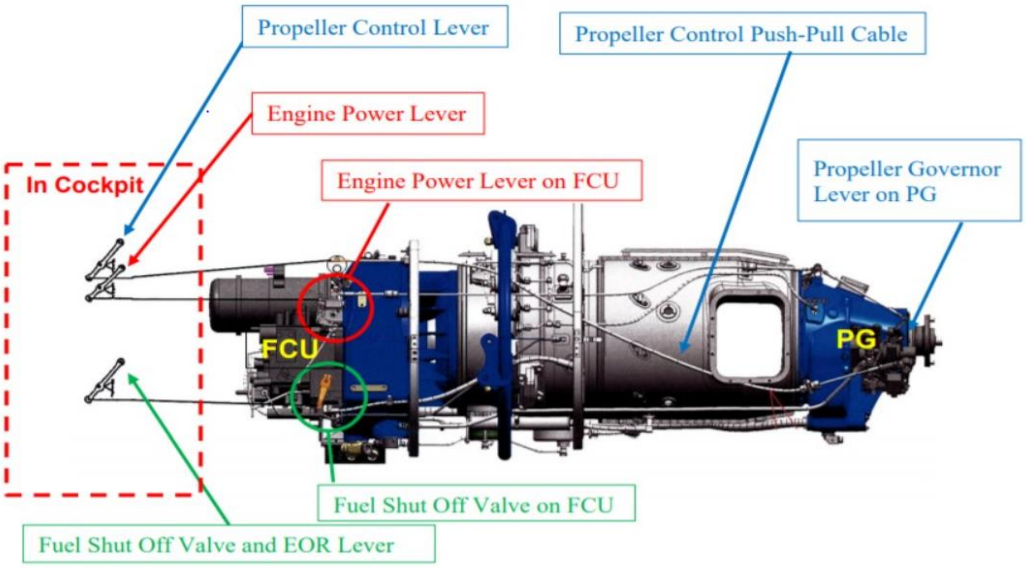

Figure 6: Engine control schematic (propeller not shown).

1.7. Meteorological Information

1.7.1 The weather information below was obtained from Bram Fischer International Airport (FABL) forecast. The large gap between the temperature and the dew point (in the table) indicated a dry atmosphere where there was not much moisture that could lead to a reasonable cloud development in the lower levels. The weather conditions were clear and favourable for flying at the time of the flight.

Wind Direction	290º	Wind Speed	02kt	Visibility	9999m
Temperature	23ºC	Cloud Cover	CAVOK	Cloud Base	NIL
Dew Point	8ºC	QNH	1019 hPa		

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 aerodrome information IAW the Aeronautical Information Publication (AIP).

Aerodrome Location	Bloemfontein, New Tempe (FATP)	
Aerodrome Co-ordinates	S29º 02'14.0" E026º08'.24.1"	
Aerodrome Elevation	4 526 feet AMSL	
Runway Dimensions	1 200 x 15m and 1 300 x 10m	
Runway Designations	10/28	01/19
Runway Used	10	
Runway Surface	Asphalt	
Aerodrome Status	Licensed	
Approach Facilities	Runway lighting	

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 pilot performed a forced landing on a maize field approximately 0.83 nautical miles (nm) west of FATP. During the landing roll, the nose gear strut attachment bolts sheared off, and the nose gear collapsed which caused the propeller blades to strike the ground.

1.12.2. The left-side main landing gear leg bent slightly backwards. However, the aircraft came to rest in an upright position. The airframe and the cockpit cabin area remained intact. The aircraft sustained damage to the engine intake, the lower engine cowling, and all the propeller blades.

Figure 7: The aircraft at the accident site. (Source: Pilot)

1.13. Medical and Pathological Information

1.13.1. Not applicable to this occurrence.

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 because the cockpit structure remained intact, and the pilot had made use of the aircraft safety harness.

1.16. Tests and Research

1.16.1 Post-accident examination of the aircraft by the AP at the accident site indicated that the fuel caps above the wings were in place and properly locked into position. The oil and fuel systems showed no evidence of a disconnection or a leak. The engine power lever was found to have been correctly connected to the FCU with no evidence of restrictions from the cockpit. The fuel condition lever showed nothing abnormal. The fuel gauges indicated 30l on the left-side tank and 31l on the right tank.

Figure 8: The fuel gauges showing the amount of fuel in the tanks post-accident. (Source: Pilot)

1.16.2 Fuel was drained from the tanks and was found to be of the correct grade and free of contaminants. After opening the engine cowlings, no evidence of damage was found on the engine casing/components. The main fuel filter was half and the filter element was free of obstruction. The fuel purge system was found pressurised and the fuel shutoff valve was in the open position. Fuel was found in all lines throughout the engine. During the investigation, no evidence of abnormalities was found in the FCU or fuel pumps. No evidence of malfunction in the fuel system was found. Damage to the propeller blades indicated that there was little or no rotation at the time the propeller impacted the ground.

Figure 9: The engine main fuel filter. (Source – Aircraft Maintenance Organisation)

1.16.3 The fuel vents/lines were inspected and nothing abnormal was noticed. The wings were removed from the fuselage and the aircraft was recovered to the aircraft maintenance organisation (AMO) facility in Wonderboom Aerodrome (FAWB) in Gauteng province for further investigation. Scrutiny in the technical records entries indicated that the aircraft was compliant with all applicable airworthiness requirements. The aircraft had been correctly maintained and was appropriately certified for release to service prior to the accident flight. There were no open or deferred maintenance items listed in the aircraft's flight folio before the accident flight.

1.16.4 On Monday morning, 9 October 2023, engineers at the AMO removed a damaged propeller from the engine flange. Later a serviceable propeller was fitted to allow the engine ground run by engineers in the presence of the investigator-in-charge (IIC). With the wings removed from the fuselage, fuel supply pipes which normally connect to the wing tanks were dipped into 25l containers (depicting left and right tanks) containing Jet A1 fuel to allow the engine ground run.

Figure 10: Fuel pipes dipped into the two 25l containers with fuel filters visible on each side.

1.16.5 Later, the engine was started and was allowed to warm up before power was increased in stages. The engine met all the parameters IAW the EMM. A hot engine start was also performed, and no irregularities were found. No signs of erroneous fuel gauge readings were observed during the engine run. The fuel tanks were inspected for possible blockages such as rags, and nothing was found.

Figure 11: The aircraft during the engine ground run.

1.17. Organisational and Management Information

1.17.1 This was a private flight conducted under the provisions of Part 105 of the CAR 2011 as amended.

1.17.2 The last 100-hour annual inspection that was conducted on the aircraft prior to the accident flight was certified on 18 August 2023 at 1 869.4 airframe hours by the AP certified by the SACAA. The accident occurred at 1 884.0 total airframe hours, meaning that the aircraft was flown a further 14.6 airframe hours since the last annual inspection.

1.17.3 The aircraft was issued a Certificate of Release to Service on 18 August 2023 with an expiry date of 5 August 2024 or at 2 000 airframe hours, whichever occurs first.

1.18. Additional Information

1.18.1. Engine failure during flight (Source: POH, Page 58)

- *Fly the aircraft*
- *Indicated Air Speed (IAS)……. 90 mph*
- *Pitch trim ……. FULL NOSE UP*
- *Flaps……. FIRST SETTING*
- *Confirm engine is dead…….N1 INDICATES 0%*

- *Plan descent to emergency field*
- *If aircraft is empty……. 80-85 miles per hour (mph) glide if the aircraft has skydivers on board……. 90-95 mph glide*
- *Confirm fuel starvation or mechanical failure. If fuel is sufficient and no mechanical failure, a restart can be attempted above 3 000ft AGL. The aircraft descent rate is from 1 200ft per minute. If there is no time to restart the engine, concentrate on flying.*

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

The Pilot

2.2.1. The pilot was initially issued a Private Pilot Licence (PPL) on 28 July 2005. His last licence validation was on 13 May 2023 with an expiry date of 31 May 2025.

2.2.2. According to the pilot's questionnaire, the pilot had flown a total of 7 641.0 hours, of which 1 259.1 were on the aircraft type.

2.2.3. The pilot was issued a Class 2 aviation medical certificate on 28 November 2022 with an expiry date of 30 November 2023.

Weather

2.2.4 Fine weather conditions prevailed at the time of the flight; the weather had no bearing to this accident. The large gap between the temperature and the dew point indicated a dry atmosphere where there is not much moisture that could lead to a reasonable cloud development in the lower levels.

The Aircraft

2.2.5 Post-accident examination of the technical documentation indicated that the last 100-hour annual inspection on the aircraft was certified on 18 August 2023 at 1 869.4 airframe hours. The aircraft was issued a Certificate of Release to Service (CRS) on 18 August 2023 with an expiry date of 5 August 2024 or at 2 000 airframe hours, whichever occurs first. The aircraft was flown a further 14.6 airframe hours since the last inspection. The aircraft maintenance history was scrutinised, and all the entries were found to be in order and properly certified. No evidence of an open or pending defects was found. The aircraft was maintained by the SACAA approved person (AP) who was issued an AP certificate on 15 February 2023 with an expiry date of 14 February 2025.

2.2.6 The aircraft fuel system was checked post-accident and was found intact with no evidence of a leak. The fuel tanks had sufficient fuel that was free of contaminants. The aircraft was recovered to the AMO at FAWB for further investigation. On Monday morning, 9 October 2023, engineers at the AMO removed a damaged propeller. Later a serviceable propeller was fitted to allow the engine ground run by engineers in the presence of the IIC. With the wings removed from the fuselage, fuel supply pipes which normally connect to the wing tanks were dipped or placed into 25l containers (depicting left and right tanks) filled with Jet A1 fuel to conduct engine ground run.

2.2.7 Later, the engine was started and was allowed to warm up before power was increased in stages. The engine met all the parameters IAW the EMM. A hot engine start was also performed, and no irregularities were found.

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 was initially issued a Private Pilot Licence (PPL) on 28 July 2005. His last licence validation was on 13 May 2023 with an expiry date of 31 May 2025.

3.2.2. The pilot was issued a Class 2 aviation medical certificate on 28 November 2022 with an expiry date of 30 November 2023.

3.2.3. The flight was conducted under visual flight rules (VFR) by day. The aircraft was operated under the provisions of Part 105 of the CAR 2011 at the time of the accident.

3.2.4. The aircraft was issued a Certificate of Registration (C of R) on 5 December 2022.

3.2.5. The aircraft was issued the Authority to Fly (ATF) certificate on 11 December 2022 with an expiry date of 31 January 2024.

3.2.6. The last 100-hour annual inspection conducted on the aircraft before the accident was certified on 18 August 2023 at 1 869.4 airframe hours.

3.2.7. The aircraft was issued a Certificate of Release to Service (CRS) on 18 August 2023 with an expiry date of 5 August 2024 or at 2 000 airframe hours, whichever occurs first. The aircraft was flown a further 14.6 airframe hours since the last annual inspection.

3.2.8. The aircraft was maintained by the AP who was certified by the SACAA.

3.2.9. The AP was issued an AP Certificate on 15 February 2023 with an expiry date of 14 February 2025.

3.2.10. The engine was started during the investigation process, and it met all the parameters IAW the EMM. A hot engine start was also performed, and no irregularities were found. No signs of erroneous fuel gauge readings were observed during the engine run. The fuel tanks were inspected for possible blockages such as rags, and nothing abnormal was found.

3.3. Probable Cause/s

3.3.1 Undetermined engine power loss during descent, followed by an unsuccessful forced landing on the maize field approximately 0.83 nautical miles (nm) west of FATP.

3.4 Probable Cause/s

3.4.1 None.

5. SAFETY RECOMMENDATIONS

5.1 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.

5.2 Safety Message

5.2.1 None.

6 APPENDICES

6.1 None.

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