SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10519						
Classification	Accident	**Date**	17 October 2024		**Time**	1040Z	
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Virginia Airport (FAVG), KwaZulu-Natal Province	Place of Intended Landing	Virginia Airport (FAVG), KwaZulu Natal-Province				
Place of Occurrence	Beachwood Golf Course, 0.7 nautical miles from the Virginia Airport (FAVG)						
GPS Co-ordinates	Latitude	29°47´3.45” S	Longitude	031°3’4.23” E	Elevation	20 ft	
Aircraft Information							
Registration	ZU-IDV						
Make; Model; S/N	Sling Aircraft; Sling 2 (Serial Number: 178)						
Damage to Aircraft	Substantial	Total Aircraft Hours	1 723.1				
Pilot-in-command							
Licence Type	Commercial Pilot Licence (CPL)	Gender	Male	Age	24		
Licence Valid	Yes	Total Hours	401.2	Total Hours on Type	352.2		
Total Hours 30 Days	15.4	Total Flying on Type Past 90 Days	6.4				
People On-board	2+0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Thursday, 17 October 2024, a pilot and an aircraft maintenance engineer (AME) on-board a Sling 2 aircraft with registration ZU-IDV took off on a maintenance check flight from Virginia Airport (FAVG) in the KwaZulu-Natal province with the intention to land at the same airport. 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.

The aircraft maintenance organisation (AMO) chief engineer reported that the aircraft was booked for mandatory periodic inspection (MPI) on 20 February 2024. During the MPI, a high coolant temperature defect was identified, and the engineers were working to resolve the fault. Thereafter, a maintenance check flight was scheduled to determine the reason the coolant had a high temperature. (*Prior to the maintenance check flight, the operator conducted a risk assessment.*)

The pilot completed the pre-flight checks as per the Pilot’s Operating Handbook (POH). The aircraft had 70 litres (L) of fuel in the tanks. Thereafter, the aircraft was taxied to the holding point of Runway 05 where the engine run ups were completed; no anomalies were noted prior to departure.

During the take-off climb on Runway (RWY) 05 whilst the aircraft was approximately 500 feet (ft) above ground level (AGL), the engine lost power and the revolutions per minute (rpm) dropped from 5000 rpm to 2 800 rpm. The pilot cycled the power lever but was unsuccessful. He then notified the air traffic control officer (ATCO) about the engine problem and decided to turn back; he executed a teardrop turn to land on RWY 23. He then conducted the fault-finding procedure and switched the fuel tanks. Thereafter, he confirmed if the fuel pump and the magnetos were on. He then side-slipped

to try and increase the aircraft's descent, but the aircraft was not properly configured for final approach and was too high to land on RWY 23. When the aircraft approached the end of the runway, he added power with the hope that the engine would respond so that the aircraft could clear the fence; there was a short burst of power, and the aircraft cleared the fence. The pilot decided to land on Beachwood Golf Course, about 0.7 nautical miles from the airport.

During the landing roll, the nose landing gear broke which caused the propeller to impact the ground; this also damaged the right-side wing. The pilot and the AME were unharmed during the accident sequence. The aircraft sustained substantial damage to the nose landing gear, engine cowlings, propeller and the right wing.

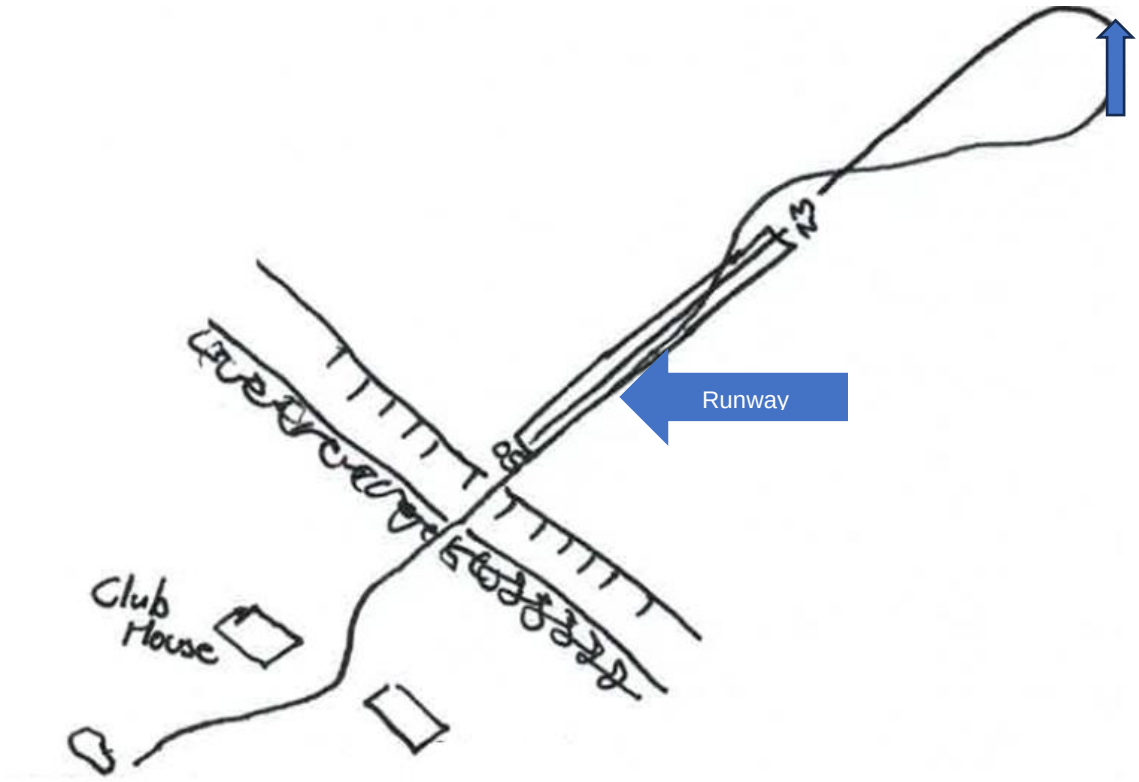

Figure 1: A depiction of the sequence of events. The blue arrow shows the direction of the flight. (Source: Pilot)

Figure 2: The aircraft after it had landed at the golf course. (Source: Pilot)

Figure 3: The damaged right wing. (Source: Pilot)

The pilot obtained the weather report for FAVG from the weather office at King Shaka International Airport prior to the flight. The weather was as follows:

Wind Direction	40°	Wind Speed	16kts	Visibility	>10km
Temperature	33°C	Cloud Cover	None	Cloud Base	Clear
Dew Point	13°C	QNH	Unknown		

After the accident, the aircraft was recovered to the AMO in FAVG. The following tests were conducted after obtaining the go-ahead from the investigator-in-charge (IIC):

According to the technical report on 4 November 2024, the oil cooler was replaced because the originally fitted oil cooler was damaged during the accident. The aircraft was fitted with a Rotax 912 ULS serial number 6783593. The engine blow-bys were conducted on all four-cylinder chambers and no anomalies were detected. During the initial engine ground run, the response from the throttle with the various throttle inputs was normal. The throttle lever input to the engine responded normally. The top spark plugs were removed and inspected for faults; they were found in good condition.

The engine run showed all parameters within the required limits. An inspection was conducted on the fuel system to check for leakage from the fuel tanks to the engine supply lines; no leaks were found. The fuel selector valve was inspected and verified for correct operation; the inspection results were found to be satisfactory for optimal operations. The fuel filters were inspected and there were no foreign objects found in the filters. The fuel in the fuel tanks was also inspected for contamination. The fuel samples were sent to the laboratory for testing. The sample results conformed with all the specifications with respect to the tests conducted (see Figure 4).

Tests	Sample Number: BA58471		SPECIFICATIONS: SANS 1598	
	RESULTS	UNITS	LIMITS	COMMENTS
Density @ 20°C	0.745	kg/l	0.710-0.785	PASS
10% Recovery Temperature	49	ºC	65 max	PASS
50% Recovery Temperature	103	ºC	77-115	PASS
90% Recovery Temperature	160	ºC	185 max	PASS
Final Boiling Point	199	ºC	215 max	PASS
Lead	1	ppm	13 max	PASS
Residue	1.3	%		

Figure 4: Fuel sample results. (Source: Fuel Analysis Report)

TAKE-OFF (Source: Sling 2 POH 2.3)
1. Propeller (if applicable) - AUTO / TO.
2. Take-off power - throttle fully forward (max. 5 800 rpm for 5 minutes).
3. Engine speed - verify rpm (5 500 to 5 800 rpm).
4. Instruments within limits - verify.
5. Rotate - 40 KIAS.
6. Airplane lift-off - 48 KIAS.
7. Wing flaps - retract when speed of 65 KIAS is reached, at minimum height of 300 ft.
8. Electric fuel pump - off (912 ULS)(minimum 300 ft)
Auxiliary electric fuel pump - off (912 iS/914 UL)(300 ft minimum).
9. Brakes - apply briefly brakes to stop wheel rotation.
10. Transition to climb.

Warning
Take-off is prohibited if:

- The engine is running unsteadily or intermittently.
- The engine parameters (instrument indications) are outside operational limits.
- The crosswind velocity exceeds permitted limits (see 2.5).

Caution

- Ensure that engine oil temperature is above 50 °C prior to take off.
- Climbing with engine at 5 800 rpm is permissible for 5 minutes. Thereafter a maximum continuous engine rpm of 5 500 applies.

According to the pilot questionnaire; power setting for take-off was 5100 rpm.

General Disclaimer Regarding Unknown Engine Stoppage for Rotax Engines (Source: Rotax engine maual)
WARNING: In the event of an in-flight engine stoppage, the pilot must follow established emergency procedures. Investigation into the cause of engine stoppage may reveal issues such as fuel contamination, maintenance neglect, or component failure. In some cases, the cause of engine stoppage may remain unknown. Operators and pilots are reminded to always adhere to Rotax's recommended maintenance schedules and guidelines to minimize the risk of engine failure."

Findings

1. The pilot was initially issued a Commercial Pilot Licence (CPL) on 1 January 2024. The licence was reissued on 4 April 2024 with an expiry date of 31 December 2024. The pilot was rated for night, instrument and instructor Grade 3.

2. The pilot was issued a Class 1 aviation medical certificate on 10 October 2024 with an expiry date of 31 October 2025 with the restriction to wear corrective lenses.

3. The last annual inspection of the aircraft was certified on 12 October 2023 at 1 622.8 total airframe hours after which a Certificate of Release to Service (CRS) was issued with an expiry date of 30 October 2024 or at 1 722.8 hours, whichever comes first. This was a maintenance check flight.

4. The Authority-to-fly (ATF) Certificate was initially issued on 12 July 2019. The ATF was reissued on 18 June 2024 with an expiry date of 31 July 2025.

5. The Certificate of Registration (C of R) was issued to the present owner on 19 August 2019.

6. The engine was inspected and the ground run conducted; the performance response from the throttle with various throttle inputs was normal. The throttle lever input to engine also responded normally.

7. Fuel samples were tested for contamination, and none was found. More fuel samples were taken to the lab and were found to conform to all the specifications.

8. The Rotax Engine Manual has a general disclaimer that states: *In some cases, the cause of engine stoppage may remain unknown*.

9. The engine lost power during a climb and the pilot executed a teardrop manoeuvre to attempt to land on Runway 23 but could not do so as the aircraft was too high. Instead, he landed on a golf course located 0.7 nm from Runway 23.

Probable Cause(s)

The pilot performed a forced landing after an undetermined engine power loss.

Contributing Factor(s)

None.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

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 desk top enquiries 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 to apportion blame or liability.

Disclaimer

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