

**LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL**

<b>Reference Number</b>	CA18/2/3/10386						
<b>Classification</b>	Accident	<b>Date</b>	5 November 2023		<b>Time</b>	1409Z	
<b>Type of Operation</b>	Private (Part 94)						
<b>Location</b>							
Place of Departure	Klipriver Airfield (FAKP), Gauteng Province		Place of Intended Landing	Klipriver Airfield (FAKP), Gauteng Province			
Place of Occurrence	On the grass approximately 70 metres (m) south of Runway 02 threshold at FAKP, Gauteng province						
GPS Co-ordinates	Latitude	26°28'55.06" S	Longitude	28°06'36.45" E	Elevation	4 985 feet	
<b>Aircraft Information</b>							
Registration	ZU-IOX						
Make; Model; S/N	Zenith Aircraft, Zodiac CH 601HD (Serial Number: 6-6719)						
Damage to Aircraft	Substantial			Total Aircraft Hours	51.75		
<b>Pilot-in-command</b>							
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	47
Licence Valid	Yes	Total Hours	199.21		Total Hours on Type	13.91	
Total Hours 90 Days	13.91		Total Flying on Type Past 30 Days	13.91			
<b>People On-board</b>	1 + 0	<b>Injuries</b>	0	<b>Fatalities</b>	0	<b>Other (on ground)</b>	0
<b>What Happened</b>							
<p>On Sunday afternoon, 5 November 2023, a pilot on-board a Zodiac CH 601HD aircraft with registration ZU-IOX took off on a private flight from Klipriver Airfield (FAKP) in Midvaal, Gauteng province, with the intention to perform touch-and-go-landings at the same airfield. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The pilot reported that he conducted a pre-flight inspection and no anomalies were noted. The aircraft had a total of 60 litres (l) of high octane 95 Unleaded automotive fuel in the tanks. The pilot started the engine and taxied to the threshold of Runway 02 where he backtracked in preparation for departure. Pre-departure checks were conducted and the parameters as displayed on the Electronic Flight Information System (EFIS) screen were normal with a positive fuel flow. At 1350Z, the aircraft took off and climbed to 1 000 feet (ft) above ground level (AGL), travelling at an airspeed of 70 knots. The pilot flew a circuit and, later, performed an uneventful touch-and-go-landing on Runway 02. After completing another circuit and whilst on final approach for Runway 02 at approximately 500ft AGL, the engine ran rough and the revolutions per minute (RPM) decreased from 4 300 to 2 500. A few seconds later, the engine stopped.</p>							

The pilot tried to restart the engine, but without success. He then glided the aircraft towards Runway 02; however, he could not reach it; he landed the aircraft on the grass-covered area approximately 70m short of Runway 02 threshold. During the landing roll, the nose gear strut collapsed and the propeller struck the ground. The aircraft sustained substantial damage. The pilot was not injured during the accident sequence.

The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 26°28'55.06" South 28°6'04.36" East, at an elevation of 4 985 ft.



**Figure 1:** The airfield and approximate accident site. (Source: Google Earth)



**Figure 2:** The aircraft in the hangar after it was recovered.



**Figure 3:** Bent nose gear strut and the damaged wheel fairing.

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

*The Zodiac CH 601HD is a two-place, single-engine, low-wing amateur-built aircraft with a fixed tricycle landing gear. The aircraft was manufactured by Zenith Aircraft Company in Canada and is designed for flight training and for personal use. The aircraft has dual control columns which allows it to be flown from either the left or right pilot seat. The flying controls are conventional, with cables operating the control surfaces. The aircraft is powered by a Subaru EA81 four-cylinder, four-stroke, normally aspirated and dual carburettor engine with serial number 343602, rated at 100 brake horsepower (bhp) at 5 400 RPM driving a Warp drive, three-blade ground adjustable fixed pitch carbon fibre propeller with serial number N20278.*

Meteorological Information

An official weather report was obtained from the South African Weather Service (SAWS). In the table below, the noticeable difference between the temperature and the dew point indicates a dry atmosphere where there is no humidity that could cause carburettor icing. The intake manifold on the EA-81 engine model runs the 180-degree water up into the carburettor adapter, the base of the carburettor is lukewarm at all times, therefore, carburettor icing would have not been possible.

Wind Direction	330°	Wind Speed	10 knots	Visibility	9999 m
Temperature	25°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	10°C	QNH	1021hPa		

## Follow up investigation

An approved person (AP) and the investigator-in-charge (IIC) conducted the inspection post-accident which revealed the following:

None of the circuit breakers (CBs) had tripped or popped. The throttle and mixture control levers were found in 'close' position and the carburettor heat was selected to 'cold' position. The throttle and the mixture control cables were appropriately connected to their respective control levers and were responsive. The induction air filter on the underside of the engine cowling was free of dirt or obstruction. The fuel selector was free to rotate with a positive lock on each position – Left, Right and OFF. The fuel supply pipes to the dual carburettors were inspected and were in good condition. Fuel was found in the bowls of both carburettors and in both wing tanks. The fuel totaliser on the EFIS screen indicated 50l of fuel remaining in the tanks. The gascolator on the right-side of the engine firewall contained adequate fuel. The appearance of the fuel in the gascolator and wing tanks was clean and dyed green in colour, consistent with high octane 95 Unleaded fuel type that was uplifted prior to the flight. The gascolator filter or screen was clean with no water or debris present. The gascolator drain valve was locked (closed) and showed no evidence of fuel leak.

The fuel pipes between the auxiliary fuel pump and mechanical pump were disconnected and inspected, they contained fuel. No evidence of fuel pipe leak or disconnection was noted. The spark plugs were removed and inspected for condition, they were all light grey in colour, an indication that they were functioning optimally. The condition of the high tension (HT) leads was generally good, and they were properly fitted. The ignition system which comprises standard points driven coil was tested, and it responded satisfactorily.

The aircraft was recovered to the AP's facility at FAKP for further investigation. On Monday, 6 November 2023, a damaged propeller was replaced with a loaner unit. No fuel was added to the tanks. The fuel flow checks were performed from each tank to the engine, and the tanks were found to be in a satisfactory condition. The fuel selector was determined to be correctly rigged. The engine was started without difficulty. Later, after the engine had warmed up, the engine RPM was increased in stages, and it met all the parameters in accordance with (IAW) the operating manual.

Examination of the aircraft's technical records indicated that the aircraft was properly certificated and maintained IAW the SACAA regulations. There were no open or deferred maintenance items listed in the aircraft flight folio before the accident flight.

Examination of the AP's file at the SACAA facility showed that he had a maintenance licence that was issued IAW the CAR Part 66.04 on 1 August 2022 with an expiry date of 31 July 2024. The AP had A, C, X and W ratings endorsed on his licence.

<b>Findings</b>
<ol style="list-style-type: none"> <li>1. The pilot had a Private Pilot Licence (PPL), Aeroplane. The licence was renewed on 27 May 2023 with an expiry date of 31 May 2025.</li> <li>2. On 5 August 2023, the pilot completed his Zodiac CH 601HD type conversion training at the SACAA Approved Training Organisation (ATO) in FAKP. The pilot had emailed his “Flight Crew Licence Conversion” form CA61-01.3 (Notification of aircraft differences or familiarisation training) and proof of payment to the SACAA on 5 August 2023. Scrutiny into the pilot’s logbook showed that he had the aircraft type endorsed on his licence. The pilot had flown a total of 199.21 hours, of which 13.91 were on type.</li> <li>3. The pilot had a Class 2 aviation medical certificate that was issued on 25 May 2023 with an expiry date of 31 May 2025. The pilot had no restriction listed on his medical certificate.</li> <li>4. The pilot was properly licensed and medically fit for the flight IAW the existing regulations.</li> <li>5. The last annual inspection that was conducted on the aircraft prior to the accident flight was certified on 5 May 2023 at 40 airframe hours by the AP. The aircraft was flown a further 11.75 hours since the annual inspection.</li> <li>6. The aircraft was issued a Certificate of Release to Service (CRS) on 5 May 2023, which was valid until 4 May 2024 or at 140 airframe hours, whichever occurs first.</li> <li>7. The aircraft had a valid Authority to Fly (ATF) certificate which was issued on 15 September 2023 with an expiry date of 14 September 2024. The aircraft was airworthy when it dispatched for the flight.</li> <li>8. The aircraft’s Certificate of Registration (C of R) was issued on 4 June 2019.</li> </ol>
<b>Probable Cause</b>
The pilot landed the aircraft on the grass-covered area short of Runway 02 threshold following an engine stoppage in-flight. The reason for engine stoppage could not be determined.
<b>Contributing Factors</b>
None.
<b>Safety Action</b>
None.
<b>Safety Recommendation/Safety Message</b>
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**

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