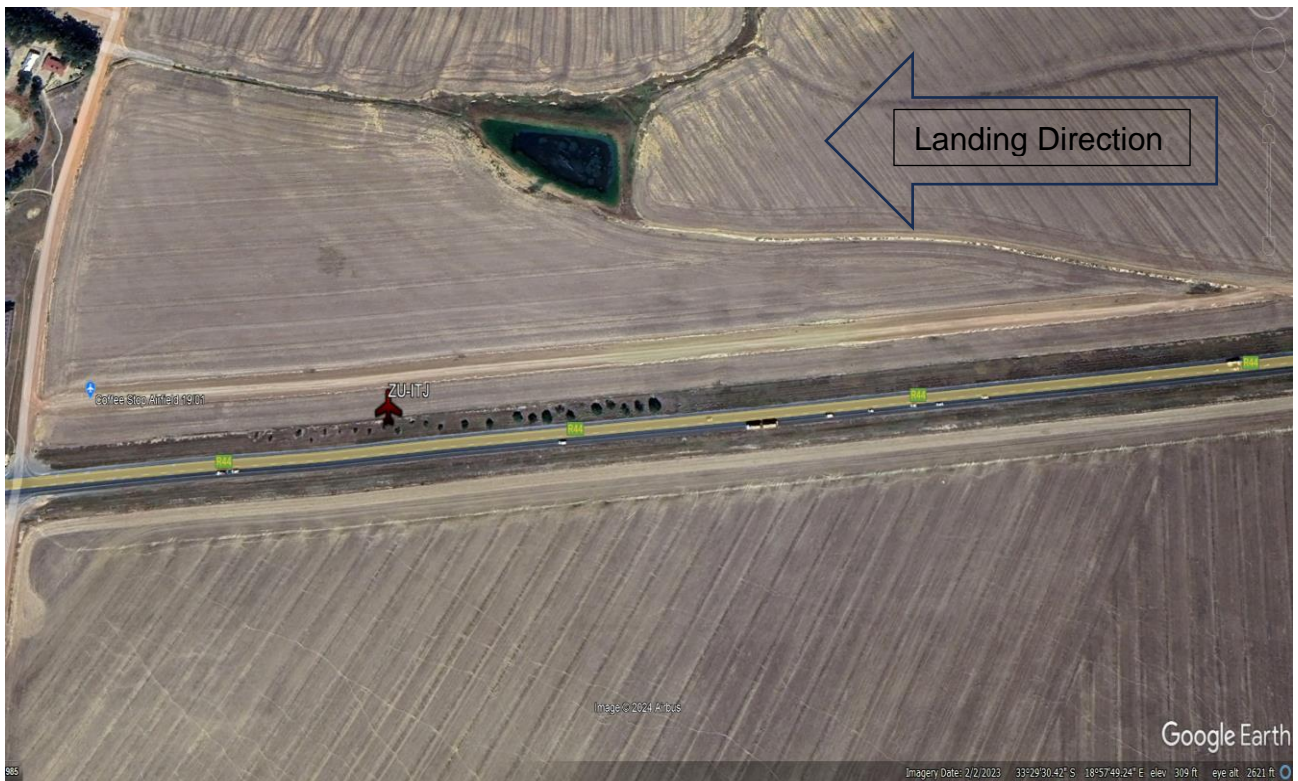


**LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL**

<b>Reference Number</b>	CA18/2/3/10405						
<b>Classification</b>	Accident	<b>Date</b>	27 December 2023	<b>Time</b>	0720Z		
<b>Type of Operation</b>	Private (Part 94)						
<b>Location</b>							
Place of Departure	Morningstar Aerodrome, Western Cape Province			Place of Intended Landing	Craigcor Private Airstrip, Western Cape Province		
Place of Occurrence	Runway 20 at Craigcor Private Airstrip, 33 nautical miles north-east of FACT						
GPS Co-ordinates	Latitude	33° 29'31.67" S	Longitude	018° 57'46.89" E	Elevation	306 feet	
<b>Aircraft Information</b>							
Registration	ZU-ITJ						
Make; Model; S/N	Rans Aircraft; S-21 (Serial Number: 05190048)						
Damage to Aircraft	Substantial			Total Aircraft Hours	176.4		
<b>Pilot-in-command</b>							
Licence Type	Private Pilot Licence (PPL) A		Gender	Male		Age	67
Licence Valid	Yes	Total Hours	1 199.3		Total Hours on Type	176.4	
Total Hours 30 Days	12.3		Total Flying on Type Past 90 Days	12.3			
<b>People On-board</b>	1 + 1	<b>Injuries</b>	0	<b>Fatalities</b>	0	<b>Other (on ground)</b>	0
<b>What Happened</b>							
<p>On Wednesday morning, 27 December 2023, a pilot and a passenger on-board a Rans S-21 aircraft with registration ZU-ITJ took off at 0651Z on a private flight from Morningstar Aerodrome to Craigcor private airstrip, both in the Western Cape province. 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 had successfully landed at Craigcor private airstrip in the past. The runway dimensions of the airstrip measure 800 metres (m) in length and 15 (m) in width. The pilot stated that the 50 minutes flight was uneventful. Upon arrival at Craigcor private airstrip, the aircraft joined four other aircraft at the airstrip. Whilst on approach for landing, the pilot received radio calls that Runway (RWY) 20 was in use, and that the other four aircraft had landed without incident. At this time, the aircraft was overhead the airstrip at 1200 feet (ft) above ground level, and the pilot joined on downwind RWY 20 in accordance with the unmanned aerodrome joining procedures. During final approach, he set the flaps to 30 degrees with a speed of 52 knots (kt).</p>							

According to the pilot, whilst flying over the runway threshold, the aircraft experienced a sudden sharp drop of the left wing, which resulted in the left wing scrapping the runway surface. The pilot elected to execute a go-around and, thus, applied power to take-off and initiate a climb whilst maintaining the runway heading. The aircraft rolled to the left, prompting correction by inputting opposite rudder and aileron. Despite these corrective actions, the pilot lost control of the aircraft and it impacted the runway, and veered off to the left. It rolled through a perimeter fence before it stopped in the bushes approximately 100 metres from the initial impact (with the perimeter fence). The propeller, left wing, left elevator and fuselage were substantially damaged. Both the pilot and the passenger disembarked from the aircraft unscathed.

The accident occurred during day light at Global Positioning System (GPS) co-ordinates determined to be 33° 29'31.67" South 018° 57'46.89" East at an elevation of 306 ft.



**Figure 1:** A view of the accident site. (Source: Google Earth)



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

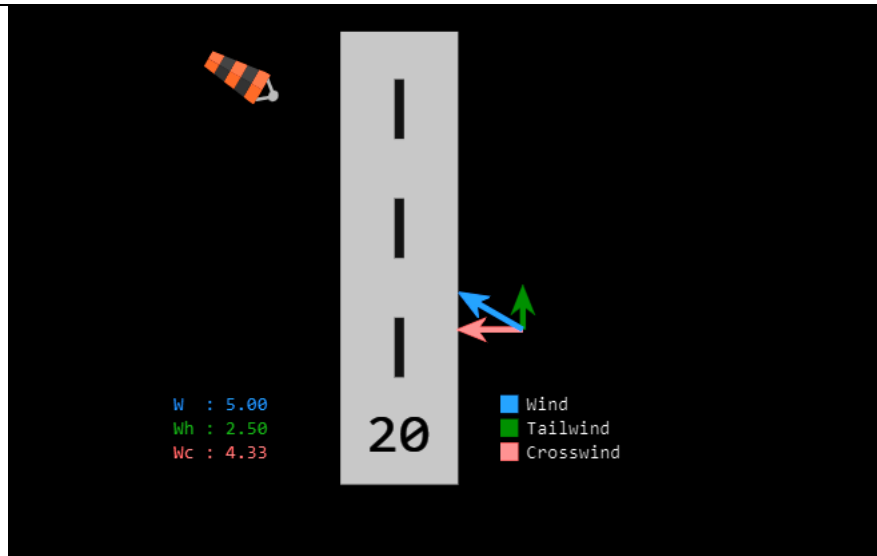
The weather report below was sourced from the South African Weather Service (SAWS), recorded for Cape Town International Airport (FACT) weather station on 27 December 2023 at 0730Z. FACT is located 33 nautical miles (nm) north-east of the accident site.

FACT 270730Z 32005KT 250V040 CAVOK 24/09 Q1011 NOSIG=

According to the pilot questionnaire, the wind velocity was light and variable at 4 knots.

Several other aircraft landed successfully after this accident.

Wind Direction	320	Wind Speed	05 kt	Visibility	10km
Temperature	24°C	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	09°C	QNH	1011 hPa		



**Figure 3:** Crosswind component calculation. (Source: E6BX.com)

According to the crosswind calculation in Figure 3, there was a right crosswind component of 4.33 kt at the time of landing.

Below is an extract from the RANS S-21 Pilot's Operating Handbook (POH) manual:

**Normal Landing**

- Airspeed (on approach) – 57-61 KIAS (66-70 MPH) [flaps UP].*
- Flaps (on final) - AS REQUIRED (below 96 KIAS (110 MPH)*
- Airspeed (on final) - 56 KIAS (64 MPH) [with full flaps]*
- Touchdown*
  - *Taildragger - MAIN WHEELS FIRST OR THREE WHEEL*
  - *Trike - MAIN WHEELS FIRST*
- Landing Roll*
  - *Taildragger - LOWER TAIL WHEEL GENTLY (AFTER MAIN WHEEL TOUCH DOWN)*
  - *Trike - LOWER NOSE WHEEL GENTLY (AFTER MAIN WHEEL TOUCH DOWN)*
- Brake - MINIMUM REQUIRED*

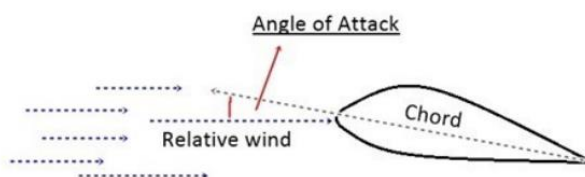
**What is Stall Speed?** (Source: <https://www.aviationfile.com/what-is-stall-speed/>)

*Stall speed is the minimum speed at which an aircraft can maintain level flight or the minimum steady flight speed at which the airplane is controllable, meaning that the lift generated by the wings is no*

longer sufficient to counteract the weight of the aircraft. At this speed, the wing's angle of attack becomes too high, and the airflow over the wing separates, causing a loss of lift and a sudden drop in altitude. This is known as an aerodynamic stall and can be very dangerous, especially at low altitudes or during take-off and landing.

### Angle of Attack (AOA)

The Angle of Attack is the angle at which relative wind meets an Aerofoil. It is the angle formed by the Chord of the aerofoil and the direction of the relative wind or the vector representing the relative motion between the aircraft and the atmosphere.



source: skybrary.aero



Angle of Attack – AOA

## **Findings**

### The Pilot

1. The pilot was initially issued a Private Pilot Licence (PPL) on 30 March 2007. The licence was reissued on 4 February 2022 with an expiry date of 28 February 2024.
2. The pilot had a Class 2 aviation medical certificate that was issued on 30 January 2023 with an expiry date of 28 February 2024, and with a restriction to wear suitable corrective lenses. The pilot was adequately licensed and experienced to conduct the flight.

### Aircraft information

3. The aircraft had an Authority to Fly (ATF) certificate that was initially issued on 18 November 2021. The ATF was renewed on 5 November 2023 with an expiry date of 17 November 2024. The aircraft's Certificate of Registration (C of R) was issued on 1 December 2020 to the present owner.
4. The last annual inspection on the aircraft was conducted and certified on 20 October 2023, and the Certificate of Release to Service (CRS) was issued on 20 October 2023 at 162.9

airframe hours with an expiry date of 19 October 2024 or at 262.9 airframe hours, whichever comes first.

5. The aircraft was maintained by an approved person (AP) with an AP certificate that was issued by the Regulator (SACAA) on 3 January 2022 with an expiry date of 2 January 2024.
6. Following a slower-than-recommended approach speed, the left wing dropped and scrapped the ground which caused the aircraft to drift to the left, depart the runway and roll through a perimeter fence due to loss of directional control. The pilot and the passenger were not injured during the accident sequence. The aircraft sustained substantial damage to the landing gear, propeller, fuselage, left wing and horizontal stabiliser.
7. The aircraft's recommended approach speed is 57-61 kt (66-70 miles per hour) and the final approach is 56 kt (70 MPH) as per POH. The aircraft's final approach was 52 kt with 30 degrees flaps down; this configuration would result in the aircraft experiencing an aerodynamic stall as the slow speed (below the manufactures 56 kts) will lead to loss of lift over the wing. In this occurrence, it caused the left wing to drop during final approach for landing and, subsequently, the pilot lost control of the aircraft.

#### Runway information

- The runway used was RWY 20, which is unpaved (gravel) with dimensions of 800m in length and 15m in width.
- The weather was not considered a factor that could have contributed to this accident.

#### **Probable Cause**

The aircraft experienced an aerodynamic stall on final approach and at a low speed of 52 kt (4 kt less than the recommended speed) with full flaps, which resulted in loss of lift of the left wing and, subsequently, loss of control of the aircraft.

#### **Contributing Factors**

Failure to adhere to the manufacturer's prescripts by not maintaining the final approach speed of 56 kts.

#### **Safety Action(s)**

None.

#### **Safety Message**

In the interest of safety and to avoid injury or damage to property, pilots are advised to always follow the manufacturer's prescripts when operating aircraft.

#### **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 produced without prejudice to the rights of the AIID, which are reserved.

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