SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10517						
Classification	Accident	**Date**	16 October 2024		**Time**	1450Z	
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Wonderboom Aerodrome (FAWB), Gauteng Province	Place of Intended Landing	Wonderboom Aerodrome (FAWB), Gauteng Province				
Place of Occurrence	Runway 06 at Wonderboom Aerodrome (FAWB)						
GPS Co-ordinates	Latitude	25° 39' 19.00" S	Longitude	028° 13' 17.00" E	Elevation	4 095 ft	
Aircraft Information							
Registration	ZS-SUJ						
Make; Model; S/N	Cessna Aircraft Company; C172M Skyhawk (S/N: 17261667)						
Damage to Aircraft	Substantial	Total Aircraft Hours	8 504.18				
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)	Gender	Male	Age	19		
Licence Valid	Yes	Total Hours	44.2	Total Hours on Type	44.2		
Total Hours 30 Days	7.2	Total Flying on Type Past 90 Days	21.6				
People On-board	1 + 0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Wednesday afternoon, 16 October 2024, a student pilot (SP) on-board a Cessna C172M Skyhawk aircraft with registration ZS-SUJ took off on a solo training flight from Wonderboom Aerodrome (FAWB) in Gauteng province with the intention to return to the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The SP reported that he took off from Runway (RWY) 06 at 1315Z and headed to the general flying area (GFA); the flight was uneventful. Upon his return to FAWB, he joined the circuit on downwind leg RWY 06. During final approach at 70 knots (kts) (80 miles per hour [MPH]) with flaps selected to 30 degrees, he noticed the aircraft's high sink rate. The SP then closed the throttle when the aircraft was over the runway threshold and, during the flare, the aircraft ballooned. He added power to correct the anomaly, but the aircraft landed hard and bounced multiple times on the runway. Consequently, the nose gear strut failed, and the propeller struck the runway surface. The aircraft skidded on its lower engine cowling for approximately 380 metres (m) before it stopped on the left of the runway centreline.

The SP turned off the master switch and exited the aircraft; he was not injured. The aircraft sustained substantial damage.

Figure 1: An overview of the accident site. (Source: Google Earth)

Figure 2: Damage sustained to the nose gear and the propeller blades. (Source: FAWB-ARFF)

The meteorological aerodrome report (METAR) was obtained from the South African Weather Service (SAWS), issued for FAWB on 16 October 2024 at 1500Z.

FAWB 161500Z 03008KT CAVOK 23/08 Q1022=.

Wind Direction	030	Wind Speed	08 knots	Visibility	9999 m
Temperature	23ºC	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	08ºC	QNH	1022hPa		

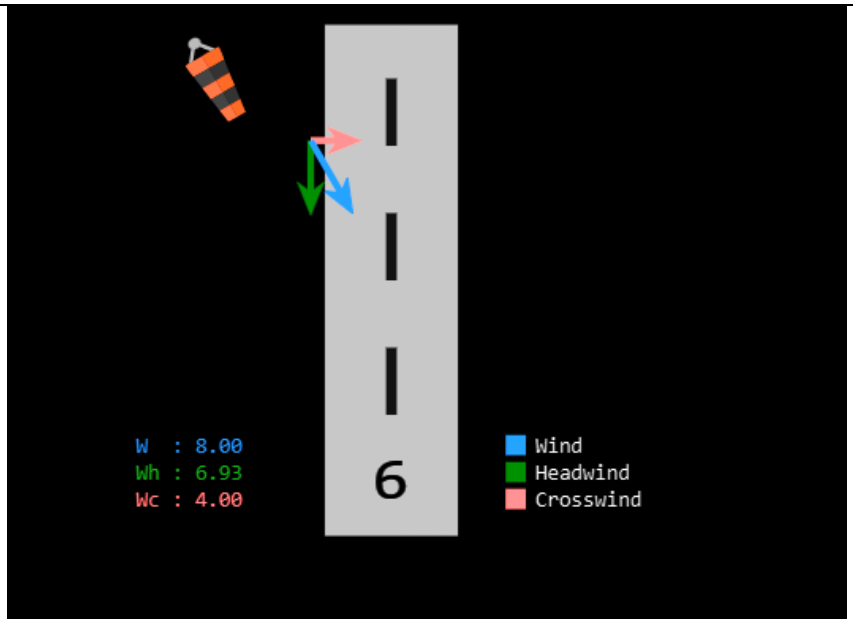

Figure 3: The average wind component calculations at the time of the accident. (Source:e6bx.com)

Aircraft Performance: Before Landing (Source: Pilot's Operating Handbook (POH)

BEFORE LANDING.

(1) Fuel Selector Valve -- BOTH.
(2) Mixture -- RICH.
(3) Carburetor Heat -- ON (apply full heat before closing throttle).
(4) Airspeed -- 70 - 80 MPH (flaps UP).
(5) Wing Flaps -- AS DESIRED.
(6) Airspeed -- 65 - 75 MPH (flaps DOWN).

The airspeed with flaps down must be 65-75 miles per hour (MPH) but the pilot reported that he was at 80 MPH.

Bouncing During Touchdown (Source: FAA-airplane flying handbook chapter 8)

When the aeroplane contacts the ground with a sharp impact as the result of an improper attitude or an excessive rate of sink, it tends to bounce back into the air.

When a bounce is severe, the safest procedure is to EXECUTE A GO-AROUND IMMEDIATELY. No attempt to salvage the landing should be made. Full power should be applied while simultaneously maintaining directional control and lowering the nose to a safe climb attitude. The go-around procedure should be continued even though the airplane may descend, and another bounce may be encountered. It would be extremely foolish to attempt a landing from a bad bounce since airspeed diminishes very rapidly in the nose-high attitude, and a stall may occur before a subsequent touchdown could be made.

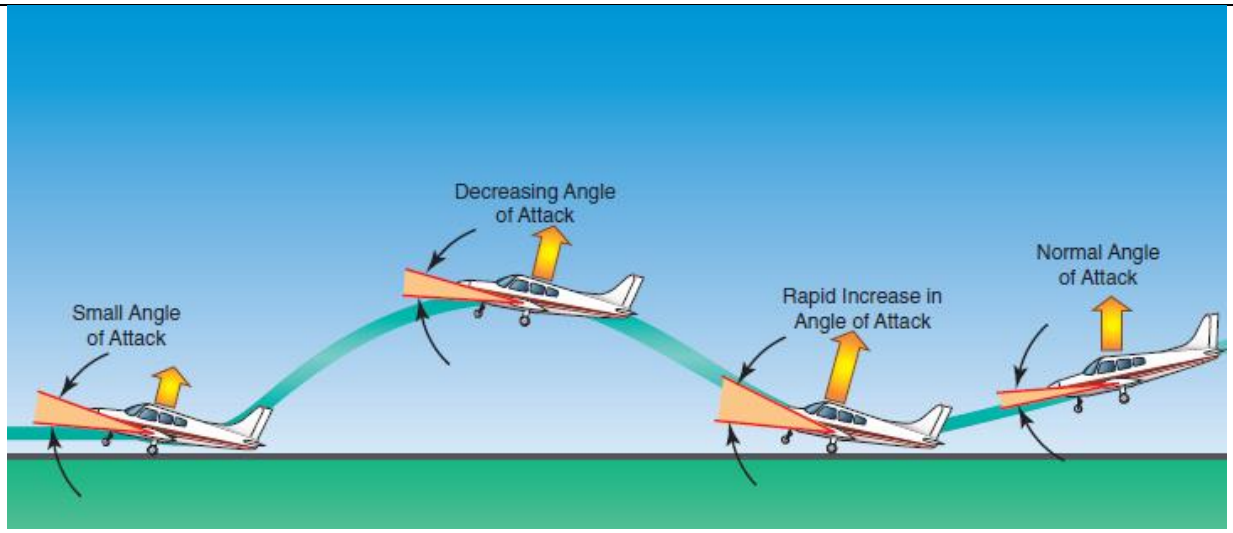

Illustration 1: A depiction of the bounce. (Source: Source: FAA-airplane flying handbook chapter 8)

Findings

1. Personnel Information

1.1 The SP had a Student Pilot Licence (SPL) that was issued on 30 March 2024 with an expiry date of 29 March 2025.

1.2 The SP had a Class 2 aviation medical certificate that was issued on 13 March 2024 with an expiry date of 31 March 2029 with no restrictions. The SP was adequately assessed and approved to undertake the flight.

2. Aircraft Information

2.1 The last mandatory periodic inspection (MPI) of the aircraft was conducted on 9 September 2024 at 8 419.05 airframe hours. The aircraft had accrued 85.13 hours since the last MPI.

2.2 The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued on 8 October 2015. The latest C of A had an expiry date of 31 October 2024.

2.3 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 27 May 2020.

2.4 The aircraft had a Certificate of Release to Service (CRS) that was on 9 September 2024 with an expiry date of 9 September 2025 or at 8 519.04 airframe hours, whichever occurs first. The aircraft was properly certified and serviceable for the flight.

2.5 The aircraft was maintained by an aircraft maintenance organisation (AMO) with an AMO Certificate that was issued by the Regulator (SACAA) on 20 May 2024 with an expiry date of 30 June 2025. The aircraft was certified at the time of the flight.

2.6 The training organisation was issued an Approved Training Organisation (ATO) Certificate by the Regulator (SACAA) on 25 November 2022 with an expiry date of 31 February 2028.

2.7 With the aircraft's flaps configuration set at 30 degrees, it is likely that the pilot reduced power and the aircraft flared which significantly reduced the forward speed; the aircraft dropped height and touched down hard on the runway. It then bounced which caused damage to the nose gear.

3. Environment

Good weather prevailed at the time of the flight; the weather did not contribute to the accident.

Probable Cause(s)

It is likely that the aircraft approached at a high speed and height which prompted the pilot to reduce engine power and the aircraft flared. As a result, the aircraft's height dropped, followed by a hard touch down and several bounces with damage to the nose gear.

Contributing Factor(s)

Lack of experience.

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