SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10191						
Classification	Accident	**Date**	17 July 2022		**Time**	1030Z	
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Wings Park Airfield near East London, Eastern Cape Province	Place of Intended Landing	Wings Park Airfield near East London, Eastern Cape Province				
Place of Occurrence	On the right-side of Runway 09 at Wings Park Airfield						
GPS Co-ordinates	Latitude	32° 49' 17" S	Longitude	27° 50' 18" E	Elevation	1276ft	
Aircraft Information							
Registration	ZU-FXJ						
Make; Model; S/N	Jabiru 170 (Serial Number: 349)						
Damage to Aircraft	Substantial	Total Aircraft Hours	416.8				
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)	Gender	Male	Age	31		
Licence Valid	Yes	Total Hours	33.5	Total Hours on Type	4.8		
Total Hours Past 30 Days	1.5	Total Hours on Type Past 90 Days	2.5				
People On-board	1 + 0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 17 July 2022, a student pilot on-board a Jabiru 170 aircraft with registration ZU-FXJ took off on a first (solo) training flight from Wings Park Airfield in the Eastern Cape province with the intention to conduct exercises at the general flying area (GFA), before returning to the same take-off airfield. Visual meteorological conditions (VMC) by day prevailed at the time of the flight and no flight plan was filed. The aircraft was operated under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The student pilot reported that during the flight back from the GFA whilst on final approach for Runway 09 at Wings Park Airfield, the aircraft was too high and, thus, he elected to execute a go-around. He then flew a circuit and, during the second approach for landing, the aircraft was slower and lower than the recommended height. The aircraft touched down hard on the main landing gear and ballooned. The student pilot then lowered the nose to bring the aircraft closer to the runway, however, the propeller blades struck the ground. The aircraft landed hard on the nose gear which broke off, causing the aircraft to veer off to the right-side of the runway. The student pilot applied the left rudder to correct the condition, however, the aircraft exited the runway and later collided with an embankment where it nosed over and came to rest in an inverted position.

The student pilot switched off the master switch and evacuated the aircraft unassisted. He was not injured during the accident sequence; however, the aircraft sustained substantial damage to the nose gear strut, the propeller blades, lower engine cowling and both wings.

The runway length at Wings Park Airfield is approximately 600m long.

According to the South African Weather Service (SAWS), the weather information in the area was as follows:

Wind Direction	Calm	Wind Speed	<3kt	Visibility	9999m
Temperature	30.6°C	Cloud Cover	Nil	Cloud Base	3500 feet
Dew Point	02.3°C	QNH	1005.2hPa		

Figure 1: The aircraft as it came to rest. (Source: Pilot)

Figure 2: The airport layout with reference to where the accident occurred. (Source: Google Earth)

The Significant Weather (SigWX) showed no significant weather changes in the area where the accident occurred.

The following information was obtained from *https://www.boldmethod.com/learn-to-fly/maneuvers/how-to-recover-from-a-balloon-on-landing-flare/*

How a balloon happens:
When you misjudge your sink rate during landing and the airplane is descending too fast, you have a natural reaction to sharply increase pitch attitude. If you make this mistake, you will not only stop your descent, but you will also actually initiate a climb during the flare. This is called ballooning. It is hazardous, because your height above the ground increases as your airplane approaches a stalled condition. The severity of a balloon on your airspeed and how quick pitch attitude is increased.

How to recover from balloon:
Gently relax back pressure on the yoke while still maintaining a nose-high pitch attitude, descending into a second flare, and touching down. You may have to use a slight amount of power to cushion the landing. This prevents the airplane from decelerating too rapidly and touching down hard. If your balloon is excessive, you should execute a go-around immediately.

Bouncing During Touchdown (Source: Federal Aviation Administration Airplane Flying Handbook chapter 8)

When the airplane 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. Though the airplane's tyres and shock struts provide some springing action, the airplane does not bounce like a rubber ball. Instead, it rebounds into the air because the wing's angle of attack was abruptly increased, producing a sudden addition of lift. The abrupt change in angle of attack is the result of inertia instantly forcing the airplane's tail downward when the main wheels contact the ground sharply. The severity of the bounce depends on the airspeed at the moment of contact and the degree to which the angle of attack or pitch attitude was increased. Since a bounce occurs when the airplane makes contact with the ground before the proper touchdown attitude is attained, it is almost invariably accompanied by the application of excessive back-elevator pressure.

Findings

1. The student pilot was initially issued a Student Pilot Licence (SPL) on 15 February 2021 with an expiry date of 15 February 2023.
2. The student pilot was issued a Class 2 aviation medical certificate on 22 December 2020 with an expiry date of 31 December 2025.
3. The student pilot had flown 2.5 hours during the past 90 days.
4. The student pilot had 4.8 hours on the aircraft type with a total of 33.5 hours.
5. The aircraft was operated under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.
6. The aircraft had a valid Certificate of Registration (C of R) that was issued on 25 February 2022.
7. The aircraft had a valid Certificate of Release to Service (CRS) that was issued on 7 March 2022 at 394.5 hours with an expiry date of 6 March 2023 or at 447.7 hours, whichever comes first. The aircraft had accumulated 416.8 hours at the time of the accident. The aircraft was flown a further 30.9 hours since the last annual inspection.
8. The aircraft had a valid Authority to Fly (ATF) that was issued on 14 April 2019. The ATF was renewed on 10 May 2022 with an expiry date of 30 April 2023.
9. The approved training organisation (ATO) had an ATO approval certificate that was issued by the Regulator (SACAA) on 1 November 2020 with an expiry date of 30 June 2025.
10. The runway length at Wings Park Airfield is approximately 600m long.

Probable Cause
The aircraft was unstable on approach for landing, and it ballooned. As a result, the nose wheel broke off and the aircraft nosed over before it came to rest in an inverted position.
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 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