SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10194						
Classification	Accident	**Date**	28 October 2022		**Time**	0655Z	
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	Wonderboom Aerodrome (FAWB), Gauteng Province						
GPS Co-ordinates	Latitude	25° 39' 26.93" S	Longitude	028° 12' 53.12" E	Elevation	4110ft	
Aircraft Information							
Registration	ZS-FOR						
Make; Model; S/N	Piper PA-28-140 (SN: 28-24105)						
Damage to Aircraft	Substantial	Total Aircraft Hours	11 548.92				
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)	Gender	Male	Age	26		
Licence Valid	Yes	Total Hours	25.7	Total Hours on Type	25.7		
Total Hours 30 Days	7.7	Total Flying on Type Past 90 Days	12.0				
People On-board	1+0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 28 October 2022 at 0615Z, a student pilot on-board a Piper PA-28 with registration ZS-FOR took off on a circuit training flight from Wonderboom Aerodrome (FAWB) in Gauteng province. The flight was conducted in visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The student pilot stated that he conducted three uneventful circuit-and-landing exercises on Runway 29. Whilst on the fourth circuit during landing and on round-out, the aircraft ballooned. To remedy the situation, the student pilot released the back pressure slightly on the control column which resulted in the aircraft landing hard, followed by a bounce. The student pilot retracted the flaps from 40 degrees to 10 degrees, but the aircraft landed hard again; this time, the nose wheel broke off and the propeller struck the ground. The aircraft veered off to the left-side of the runway. The student pilot responded by applying the right rudder and brakes, but the aircraft continued to veer off and finally exited the runway. The aircraft sustained damage to the nose gear and the propeller blades.

Post-accident:

- According to the Meteorological Aerodrome Report (METAR) supplied by the South African Weather Service (SAWS) on the day of the accident for FAWB, the surface observation from FAWB showed weak (2-5 knots) surface winds and cloud-free conditions.

Wind Direction	270°	Wind Speed	5kt	Visibility	10km
Temperature	21°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	14°C	QNH	1021hPa		

Figure 1: The final resting position of the aircraft at FAWB. (Source: ATO)

Figure 2: The broken nose wheel and the bent propeller blades. (Source: ATO)

Ballooning During Round-out (Source: Federal Aviation Administration (FAA) Airplane Flying Handbook chapter 8)

If the pilot misjudges the rate of sink during a landing and thinks the airplane is descending faster than it should, there is a tendency to increase the pitch attitude and angle of attack too rapidly. This not only stops the descent, but actually starts the airplane climbing. This climbing during the round out is known as ballooning. [Figure 2] Ballooning can be dangerous because the height above the ground is increasing, and the airplane may be rapidly approaching a stalled condition.

The altitude gained in each instance will depend on the airspeed or the speed with which the pitch attitude is increased. When ballooning is slight, a constant landing attitude should be held, and the airplane allowed to gradually decelerate and settle onto the runway. Depending on the severity of ballooning, the use of throttle may be helpful in cushioning the landing. By adding power, thrust can be increased to keep the airspeed from decelerating too rapidly and the wings from suddenly losing lift, but throttle must be closed immediately after touchdown. Remember that torque will be created as power is applied; therefore, it will be necessary to use rudder pressure to keep the airplane straight as it settles onto the runway.

When ballooning is excessive, it is best to EXECUTE A GO-AROUND IMMEDIATELY; DO NOT ATTEMPT TO SALVAGE THE LANDING. Power must be applied before the airplane enters a stalled condition. The pilot must be extremely cautious of ballooning when there is a crosswind present because the crosswind correction may be inadvertently released, or it may become inadequate. Because of the lower airspeed after ballooning, the crosswind affects the airplane more. Consequently, the wing will have to be lowered even further to compensate for the increased drift. It is imperative that the pilot makes certain that the appropriate wing is down, and that directional control is maintained with opposite rudder. If there is any doubt, or the airplane starts to drift, EXECUTE A GO-AROUND.

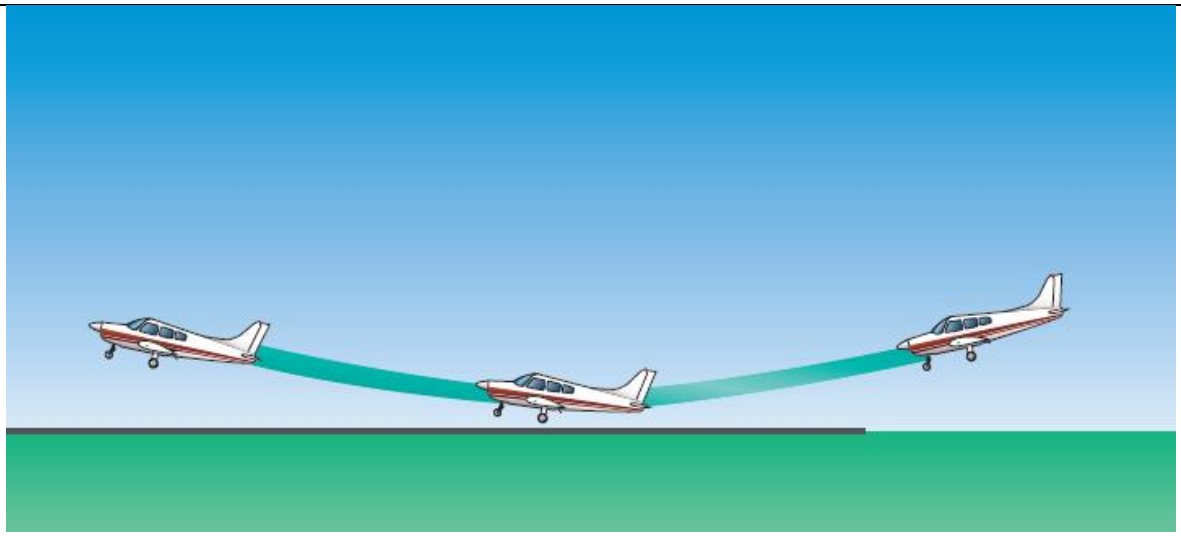

Illustration 1: Ballooning during round-out.

- The landing configuration with regards to indicated airspeed (IAS) was 80 miles per hour (mph) and the flaps were set at 40°.

Approach and Landing: (Source: Pilot's Operating Handbook [POH])

The airplane should be trimmed to an approach speed of about 85 miles per hour with flaps up. The flaps can be lowered at speeds up to 115 miles per hour, if desired, and if approach speed is reduced 3 miles per hour for each additional notch of flap. Carburetor heat should not be applied unless there is an indication of carburetor icing, since the use of carburetor heat causes a reduction in power which may be critical in case of a go-around. Full throttle operation with heat on is likely to cause detonation, full flaps must be selected on final approach for a normal landing.

Findings

1. The student pilot was issued a Student Pilot Licence (SPL) on 9 April 2022 with an expiry date of 8 April 2023.

2. The student pilot was issued a Class 1 medical certificate on 6 January 2022 with an expiry date of 31 January 2023, with a restriction to wear corrective lenses.

3. The aircraft's last annual inspection was carried out on 1 April 2022 at 1578.4 airframe hours, after which a Certificate of Release to Service (CRS) was issued with an expiry date of 31 March 2023 or at 1678.4 hours, whichever comes first.

4. The Certificate of Airworthiness (C of A) was issued on 8 June 2022 with an expiry date of 30 June 2023.

5. The Certificate of Registration (C of R) was issued to the present owner on 26 January 2021.

6. The Approved Training Organisation (ATO) was issued an ATO certificate in terms of Part 141 of the South African Civil Aviation Regulations on 5 June 2018 with an expiry date of 31 May 2023. The last audit was conducted on 24 June 2022 by the Regulator (SACAA). No findings were recorded during the audit.

7. It is likely that the student pilot was too fast during landing and, on round-out, the aircraft ballooned. The student pilot released the back pressure slightly on the control column which caused the aircraft to stall. The aircraft impacted the ground hard and bounced. It then touched down hard with the nose gear first, damaging it before it veered off to the left, exiting the runway.

Probable Cause(s)

It is likely that the aircraft's speed was high on approach and, during the round-out, the aircraft ballooned and landed hard before it exited the runway.

Contributing Factor

The student pilot used an incorrect technique to recover the aircraft instead of executing a go-around.

Safety Action(s)

Pilots should elect to execute a go-around when the aircraft is not stable on approach (speed high/not on the normal glide slope [high/low in height]). This accident could have been averted should a go-around been executed.

Safety Message and/or Safety Recommendation/s

Pilots operating aircraft are urged to conduct a go-around and not commit to land the aircraft when the approach profile is not suitable. This is to prevent damage to the aircraft which could be caused by hard landing and a possible injury to self and/or occupants.

About this Report

The decisions 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