SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10118				
Classification	Accident	**Date**	11 February 2022	**Time**	0825Z
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 11, Wonderboom Aerodrome (FAWB), Gauteng Province				
GPS Co-ordinates	Latitude	25º 39' 13.19" S	Longitude	028º 13' 34.31" E	Elevation	4 085ft
Aircraft Information					
Registration	ZS-SLY				
Model/Make	Cessna 172M (Serial Number: 172-67263)				
Damage to Aircraft	Substantial	Total Aircraft Hours	9 669.1		
Pilot-in-command					
Licence Valid	Yes	Gender	Male	Age	25
Licence Type	Student Pilot Licence (SPL) Aeroplane				
Total Hours on Type	30.5	Total Flying Hours	30.5		
People On-board	1 + 0	Injuries	0	Fatalities	0	Other (on ground)	0

What Happened

On Friday morning, 11 February 2022, a flight instructor and a student pilot (SP) on-board a Cessna 172M aircraft with registration ZS-SLY were cleared by air traffic control (ATC) for take-off on Runway (RWY) 11 to conduct circuit training at Wonderboom Aerodrome (FAWB), Gauteng Province. The flight was conducted under visual flight rules (VFR) by day and no flight plan was filed. Fine weather conditions prevailed at the time of flight with a light surface wind at 8 knots (kts) and temperature at 27°C.

The flight crew completed three touch-and-go circuits; thereafter, the instructor disembarked the aircraft to allow the SP to conduct a solo consolidation flight. After receiving clearance from ATC, the SP took off from RWY 11 and completed the first circuit uneventfully. During the second circuit landing, the SP stated that the aircraft ballooned and landed hard on its nose gear, thereafter, it bounced before coming to a halt on the runway.

The aircraft sustained substantial damages; however, the SP was not injured during the accident.

Figure 1: Damage to the nose gear oleo stop bolt.
(Source: Operator)

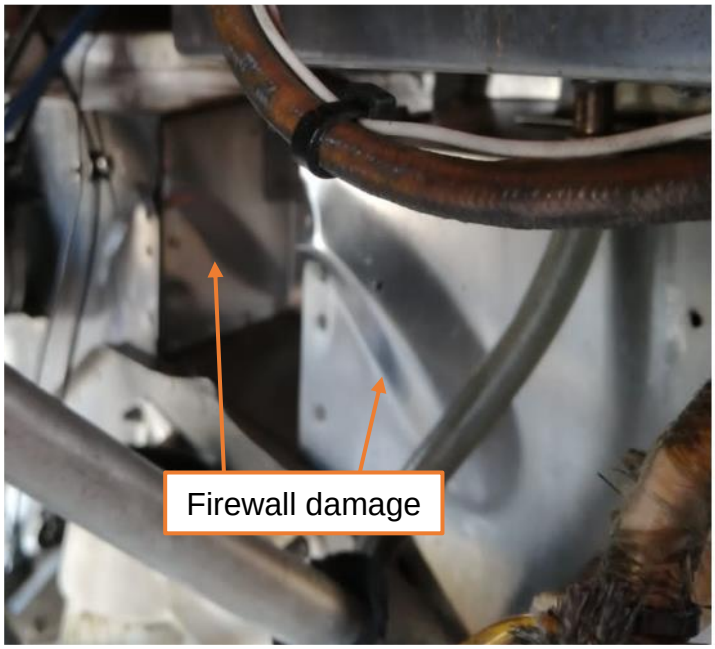

Figure 2: Damage to the firewall. (Source: Operator)

Ballooning During Round Out (Source: Airplane Flying Handbook – Chapter 8)
Any time the airplane floats, judgment of speed, height, and rate of sink must be especially acute. The pilot must smoothly and gradually adjust the pitch attitude as the airplane decelerates to touchdown speed and starts to settle, so the proper landing attitude is attained now of touchdown. The slightest error in judgment and timing results in either ballooning or bouncing.

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 AOA too rapidly.

This not only stops the descent but starts the airplane climbing. This climbing during the round out is known as ballooning. [Figure 8-35] Ballooning is dangerous because the height above the ground is increasing, and the airplane is rapidly approaching a stalled condition. The altitude gained in each instance depends on the airspeed or the speed with which the pitch attitude is increased.

Depending on the severity of ballooning, the use of throttle is helpful in cushioning the landing. By adding power, thrust is 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 is created as power is applied, and it is 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 must 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.

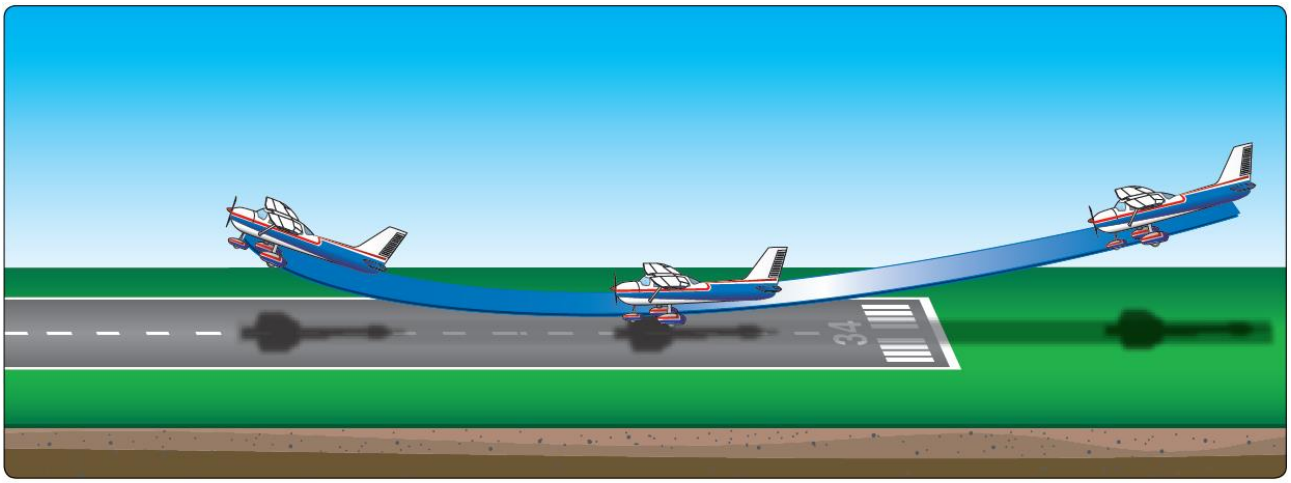

Figure 8-35. *Ballooning during roundout.*

Post-accident investigation revealed the following findings:

- The aircraft was recovered to an aircraft maintenance organisation (AMO) for damage analysis. The AMO found that the stop bolt had sheared at the top of the nose gear oleo and the engine firewall had buckled.
- Examination of the ZS-SLY's flight folio indicated no outstanding defects that required rectification relating to the aircraft's steering control and/or braking mechanism prior to the accident.
- Before the SP flew his solo consolidation circuits, he had completed three circuit-and-landing exercises with a flight instructor without incident.

- The weather condition at FAWB was as follows: METAR FAWB 110800Z 03008KT CAVOK 27/14 Q1021=

  According to the wind component computation, the aircraft landed with a crosswind of 7.88 knots. Although the crosswind was within the maximum demonstrated crosswind of 15 knots, it affected the aircraft more because the airspeed was reduced. After the aircraft ballooned, the flight controls were less effective at a slower speed.

- The SP was reissued a Student Pilot Licence (SPL) Aeroplane on 24 January 2022 with an expiry date of 20 January 2023. The aircraft type was endorsed on the SP's licence. A Class 2 medical certificate was issued to the SP on 4 February 2020 with an expiry date of 28 February 2025, with no restrictions. The SP had a total of 0.5 solo hours on the aircraft type.
- According to the latest Certificate of Release to Service (CRS), the aircraft's last mandatory periodic inspection (MPI) was carried out on 11 August 2021 at 9 578.7 hours. At the time of the accident, the aircraft had accumulated 9 669.1 hours and had flown 90.4 hours since the last MPI.
- The last MPI was carried out by an AMO with a valid approval certificate. The aircraft maintenance engineer (AME) who carried out the last MPI was appropriately licensed to carry out maintenance on the aircraft type.
- All damage to the aircraft was attributable to the impact forces exerted to the firewall and nose landing gear because of the hard landing.

Probable cause:
The aircraft speed was high on approach, resulting in the aircraft ballooning before it landed with the nose gear first, which subsequently broke off.

Contributing factor:
Lack of experience.

Safety Action(s)

Following this accident, the instructor completed a remedial flight with the SP before continuing with solo flights.

Safety Recommendation(s) and/or Safety Message(s)

None.

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, 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****.*

About this Report

Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no 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 brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information 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 accident.

This report provides an opportunity to share safety message/s in the absence of an investigation.

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.

Disclaimer

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa