SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10215						
Classification	Accident	**Date**	31 August 2022		**Time**	1007Z	
Type of Operation	Training Part 141						
Location							
Place of Departure	Morning Star Aerodrome, Western Cape Province	Place of Intended Landing	Morning Star Aerodrome, Western Cape Province				
Place of Occurrence	On Runway 19, Cape Town International Airport, Western Cape Province						
GPS Co-ordinates	Latitude	33° 58' 2.47" S	Longitude	018° 36' 9.57" E	Elevation	145ft	
Aircraft Information							
Registration	ZU-FTF						
Make; Model; S/N	Sling 2 (Serial Number: 071)						
Damage to Aircraft	Substantial	Total Aircraft Hours	4 313.43				
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)	Gender	Female	Age	27		
Licence Valid	Yes	Total Hours	48.3	Total Hours on Type	48.3		
Total Hours 30 Days	13.5	Total Flying on Type Past 90 Days	47.3				
People On-board	1+0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 31 August 2022 at 0800Z, a student pilot on-board a Sling 2 aircraft with registration ZU-FTF took off from Morning Star Aerodrome with the intention to return to the same aerodrome. This was a planned first solo navigation training flight from Morning Star Aerodrome, via Saldanha Aerodrome and back to Morning Star 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 student pilot stated that the flight from Morning Star Aerodrome to Saldanha Aerodrome proceeded as planned. However, whilst en route to Morning Star Aerodrome, she became uncertain of her position and decided to climb from 3500 to 4000 feet (ft) above ground level (AGL) and, thereafter, contacted the Cape Town Flight Information Service West (FACT FIS) for assistance. FACT FIS tried to direct the student pilot using landmarks, but she was not familiar with the area. As a resolve, FACT FIS decided to route the student pilot to the Cape Town International Airport (FACT) Runway 19 for a full stop landing. The aircraft landed hard and bounced. During the second landing, the nose wheel contacted the ground hard first and the nose gear strut bent backwards. The propeller blades broke off after striking the runway surface. The aircraft skidded for some distance on the runway before it came to a stop. The damage was limited to the nose gear which bent backward, the propeller blades which broke off after striking the runway. The fire and rescue services officials were dispatched to the accident scene. The student pilot was not injured during the accident sequence.

Post-accident:

- According to the South African Weather Service (SAWS) historical data, the following meteorological aerodrome report (METAR) recorded by the automatic weather station on 31 August 2022 at 0900Z and 1000Z showed that there was a south-easterly wind at Langebaanweg.

Wind Direction	100°	Wind Speed	12kt	Visibility	9999m
Temperature	25°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	-2°C	QNH	1017hPa		

Figure 1: The final position of the ZU-FTF aircraft. (Source: ATO)

Figure 2: The broken propeller blades. (Source: ATO)

Figure 3: The bent nose gear. (Source: ATO)

Findings

1.1 The student pilot was initially issued a Student Pilot Licence on 15 May 2022 with an expiry date of 14 May 2023.

1.2 The student pilot was issued a Class 2 medical certificate on 26 April 2022 with an expiry date of 26 April 2027 with no medical waiver.

1.3 The last annual inspection was carried out on 22 July 2022 at 4 227.43 airframe hours, after which a Certificate of Release to Service (CRS) was issued with an expiry date of 21 July 2023 or at 4 327.43 hours, whichever comes first.

1.4 The Authority to Fly (ATF) certificate was issued on 19 January 2022 with an expiry date of 28 February 2023.

1.5 The Certificate of Registration (C of R) was issued to the present owner on 14 June 2022.

1.6 The Approved Training Organisation (ATO) was issued an ATO approval certificate in terms of Part 141 of the South African Civil Aviation Regulations on 8 December 2020 with an expiry date of 31 December 2025. The last audit was conducted on 19 December 2021 by the Regulator (SACAA), and there were no findings recorded.

1.7 During the flight, the student pilot became disorientated about her position and, with the assistance of FACT FIS, she was eventually redirected to FACT. In an interview post-accident, the student pilot stated that she flared the aircraft too high, and it landed hard and bounced. This caused the nose wheel to bend, followed by the propeller blades which struck the runway and, hence, broke off. The aircraft came to a stop on the runway.

1.8 The landing configuration with regards to indicated airspeed (IAS) was 65 knots (kt) and the flaps were set at stage 2 (20%). According to the Pilot's Operating Handbook (POH), full flaps must be selected on final approach for a normal landing.

1.9 The aircraft was high on approach and the flaring was too high; this resulted in the aircraft touching down hard on the runway.

Sling landing procedures: *(Source Sling LSA Pilot Operating Handbook)*

Before Landing
1. Brakes..... CHECK PARK BRAKE IS OFF
2. Fuel Pumps..... BOTH ON
3. Airspeed ..... 75 KIAS
4. Flaps..... 1 STAGE ON DOWNWIND
..... 2 STAGE ON BASE
5. Trim..... AS NEEDED
6. Harnesses..... SECURE
7. Landing Light..... ON

4.8.2 Approach
1. Airspeed ..... 70 – 75 KIAS
2. Flaps..... FULL ON FINAL
3. Trim..... AS REQUIRED
4. Throttle ..... AS REQUIRED(a) (NOT BELOW 3000 RPM)

Normal Landing
1. Airspeed @50 ft ..... 65 KIAS
2. Power..... IDLE IN GROUND EFFECT

3. Flare ..... TO MINIMUM FLIGHT SPEED
4. Touchdown ..... MAINS FIRST (HOLD NOSE WHEEL OFF)
5. Brakes..... APPLY AS NEEDED

Bouncing During Touchdown (Source: FAA-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. he 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.

This is usually the result of the pilot realising too late that the airplane is not in the proper attitude and attempting to establish it just as the second touchdown occurs. The corrective action for a bounce is the same as for ballooning and similarly depends on its severity. When it is very slight and there is no extreme change in the airplane's pitch attitude, a follow-up landing may be executed by applying sufficient power to cushion the subsequent touchdown, and smoothly adjusting the pitch to the proper touchdown attitude. In the event a very slight bounce is encountered while landing with a crosswind, crosswind correction must be maintained while the next touchdown is made. Remember that since the subsequent touchdown will be made at a slower airspeed, the upwind wing will have to be lowered even further to compensate for drift.

Extreme caution and alertness must be exercised any time a bounce occurs, but particularly when there is a crosswind. Inexperienced pilots will almost invariably release the crosswind correction. When one main wheel of the airplane strikes the runway, the other wheel will touch down immediately afterwards, and the wings will become level. Then, with no crosswind correction as the airplane bounces, the wind will cause the airplane to roll with the wind, thus exposing even more surface to the crosswind and drifting the airplane more rapidly. 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.

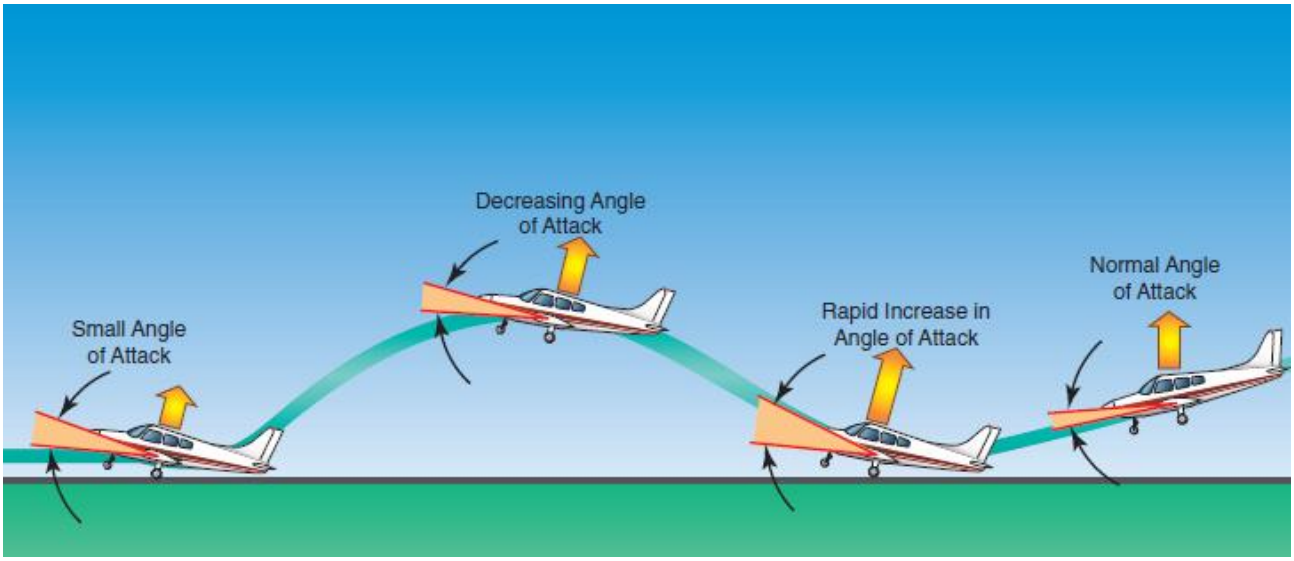

Figure 4: Bouncing during touchdown.

Probable Cause

The aircraft was flared too high during approach for landing and, on touch down, it landed hard and bounced. During the second landing, the nose wheel contacted the ground hard and the nose gear strut bent backward; whilst the propeller blades broke off after striking the runway surface.

Contributing Factor

Limited experience.

Safety Actions

- Following the accident, the ATO took the following corrective actions:
  - The student pilot and the instructor completed a training session in circuit and landing operations the next day following the accident to equip them with airmanship and navigational techniques, and to restore their confidence.
  - The instructor was sent on a crew resource management (CRM) course for additional training on assessment skills and human behavioural skills observation during training. The instructor and the student pilot were offered peer support with Mayday SA.

Safety Message

Pilots should execute a go-around immediately if they recognise that their approach is unstable. This is a proven risk mitigation when it comes to avoiding a hard touchdown which may result in damage to the aircraft and/or injury to persons.

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