

**LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL**

<b>Reference Number</b>	CA18/2/3/10365						
<b>Classification</b>	Accident	<b>Date</b>	15 September 2023	<b>Time</b>	1537Z		
<b>Type of Operation</b>	Training (Part 141)						
<b>Location</b>							
Place of Departure	Pietermaritzburg Aerodrome (FAPM) KwaZulu-Natal Province		Place of Intended Landing	Pietermaritzburg Aerodrome (FAPM) KwaZulu-Natal Province			
Place of Occurrence	Runway (RWY) 16 at Pietermaritzburg Aerodrome (FAPM)						
GPS Co-ordinates	Latitude	28° 43' 48" S	Longitude	032° 04' 48" E	Elevation	2 372 ft	
<b>Aircraft Information</b>							
Registration	ZU-JAR						
Make; Model; S/N	Sling 2 (Serial Number: 156)						
Damage to Aircraft	Substantial			Total Aircraft Hours	637.5		
<b>Pilot-in-command</b>							
Licence Type	Student Pilot Licence (SPL)		Gender	Female		Age	19
Licence Valid	Yes	Total Hours	24.8		Total Hours on Type	24.8	
Total Hours 30 Days	3.6		Total Flying on Type Past 90 Days	16.1			
<b>People On-board</b>	1 + 0	<b>Injuries</b>	0	<b>Fatalities</b>	0	<b>Other (on ground)</b>	0
<b>What Happened</b>							
<p>On Friday, 15 September 2023, a student pilot on-board a Sling 2 aircraft with registration ZU-JAR, took off on a solo consolidation training flight from Pietermaritzburg Aerodrome in KwaZulu-Natal province with the intention to conduct touch-and-go landings on Runway (RWY) 16. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The student pilot reported that on the base leg, the air traffic control officer (ATCO) instructed her to report long final approach for RWY 16 as there was traffic that was back tracking on the runway. She then reduced the engine power to 4000 revolutions per minute (rpm) instead of 3500 rpm so that the aircraft's decent rate is not excessive. This resulted in the aircraft's speed being high on short final approach; subsequently, the aircraft landed hard before it bounced three times. As a result, the sun visor unfolded (dropped) and obstructed the student pilot's view. The aircraft veered off to the right of the centreline. The student pilot applied excessive left rudder to re-align the aircraft but lost directional control, and the aircraft veered off to the left of the runway before it stopped on the grass area. The student pilot switched off the master switch and disembarked from the aircraft; she was uninjured. She then waited for the fire and rescue services personnel.</p> <p>The aircraft sustained damage to the propeller blades (which struck the runway surface during the landing phase), cowling, nose gear, rudder pedal bar, fire wall and the engine mount.</p>							



**Figure 1:** The FAPM layout. (Source: Google Earth)



**Figure 2:** The aircraft after it came to a stop. (Source: Operator)



**Figure 3:** Damage to the propeller tips. (Source: Operator)



**Figure 4:** Damage to the nose gear. (Source: Operator)

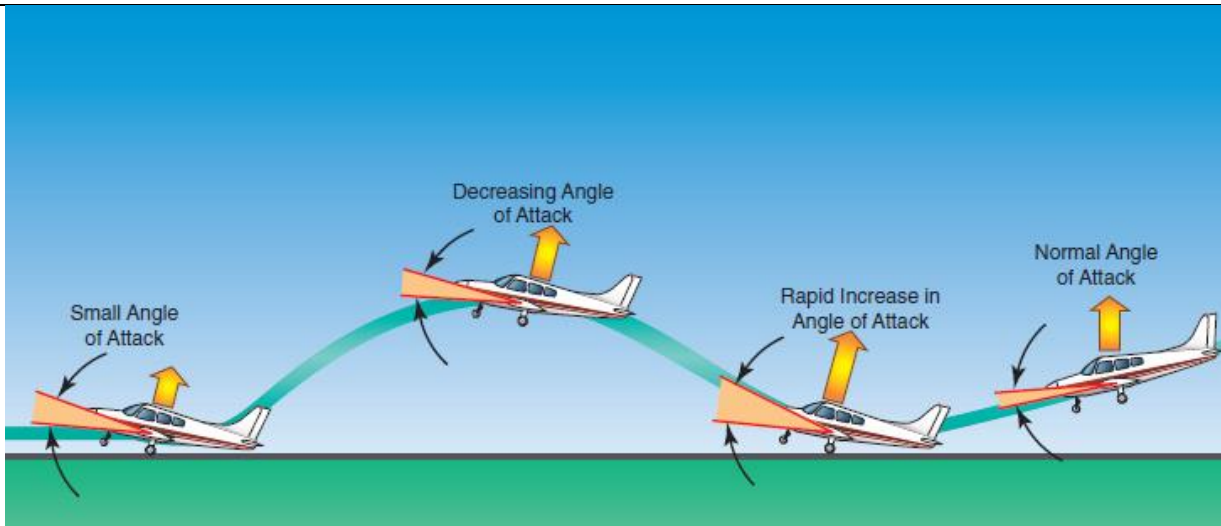


## BOUNCING DURING TOUCHDOWN (Source: FAA-airplane flying handbook chapter 8)

*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. [Illustration 2] 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.*

*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.*



**Illustration 1:** The graphics illustrate the bounce sequence. (Source: Source: FAA- Airplane Flying Handbook, Chapter 8)

The weather information in the table below was obtained from the South African Weather Service (SAWS) recorded for FAPM on 15 September 2023 at 1530Z.

Wind Direction	120°	Wind Speed	6 knots	Visibility	10000 m
Temperature	29°C	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	08°C	QNH	1006		

The student pilot stated that the aircraft's speed was too high on final approach, and she flared too high which led to a hard landing and three bounces on the runway.

## Findings

### 1. Personnel Information

- 1.1 The student pilot had a Student Pilot Licence that was issued on 12 April 2022 with an expiry date of 22 May 2024. The student pilot had flown a total of 24.5 hours under instruction and 0.3 hours as pilot-in-command on the aircraft type, according to the pilot's logbook.
- 1.2 The student pilot was issued a Class 2 aviation medical certificate on 28 January 2022 with an expiry date of 31 January 2027 with no limitations.

### 2. Aircraft Information

- 2.1 The last 100-hour annual inspection that was conducted on the aircraft prior to the accident flight was certified on 5 September 2023 at 602.3 airframe hours. A further 35.2 hours were flown on the aircraft since the last inspection.
- 2.2 The aircraft had a valid Authority to Fly (ATF) certificate that was initially issued on 27 March 2019. The ATF was re-issued on 24 July 2023 with an expiry date of 31 August 2024.
- 2.3 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 17 March 2023.

2.4	The aircraft was issued a Certificate of Release to Service (CRS) on 5 September 2023 with an expiry date of 4 September 2024 or at 702.3 airframe hours, whichever occurs first.
2.5	The aircraft was too high on final approach and the student pilot flared the aircraft too high before it bounced a few times. This was followed by loss of directional control.
3.	<u>Meteorological Information</u>
3.1	The weather did not contribute to this accident.
4.	<u>Conclusion</u>
4.1	The aircraft's speed was too high on final approach, and the initiated flare was too high. This resulted in a hard landing, followed by a few bounces before the pilot lost directional control of the aircraft which veered off to the left of the runway.
<b>Probable Cause(s)</b>	
An unstable approach and a flare that was initiated too high resulted in a hard landing and multiple bounces, which were followed by loss of directional control of the aircraft.	
<b>Contributing Factor(s)</b>	
Failure to execute a go-around after noticing the aircraft's speed was too high.	
<b>Safety Action(s)</b>	
None.	
<b>Safety Message</b>	
To avoid injuries and damage to property, pilots are advised to be vigilant in critical phases of flight such as take-offs and landings.	
<b>About this Report</b>	
<p><i>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.</i></p> <p><i>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.</i></p>	
<b>Purpose</b>	
<i>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.</i>	
<b>Disclaimer</b>	
<i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i>	

**This report is issued by:  
Accident and Incident Investigations Division  
South African Civil Aviation Authority  
Republic of South Africa**