

**LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL**

<b>Reference Number</b>	CA18/2/3/10310						
<b>Classification</b>	Accident	<b>Date</b>	23 May 2023	<b>Time</b>	1438Z		
<b>Type of Operation</b>	General Aviation and Operating Flight Rules (Part 91)						
<b>Location</b>							
Place of Departure	Laseria International Airport (FALA), Gauteng Province		Place of Intended Landing	Laseria International Airport (FALA), Gauteng Province			
Place of Occurrence	Runway 07 at Laseria International Airport (FALA), Gauteng Province						
GPS Co-ordinates	Latitude	S25°56'30.91"	Longitude	E027°55'19.98"	Elevation	4 478 ft	
<b>Aircraft Information</b>							
Registration	ZS-IKY						
Make; Model; S/N	Piper Cherokee, PA 28-140 (Serial Number: 28-7225160)						
Damage to Aircraft	Substantial		Total Airframe Hours	8 321.25			
<b>Pilot-in-command</b>							
Licence Type	Private Pilot Licence (PPL)			Gender	Male	Age	28
Licence Valid	Yes	Total Hours on Type	2.7	Total Flying Hours	104.7		
Total Hours 90 Days	23.5		Total Hours on Type Past 90 Days	2.7			
<b>People On-board</b>	1 + 1	<b>Injuries</b>	0	<b>Fatalities</b>	0	<b>Other (on ground)</b>	0
<b>What Happened</b>							
<p>On Tuesday afternoon, 23 May 2023, a pilot and a passenger on-board a Piper Cherokee PA28-140 aircraft took off from Lanseria International Airport (FALA) in Gauteng province. The intention was to conduct circuit-and-landing exercises at the same airport. This was a hire-and-fly flight to build hours towards the pilot's Commercial Pilot Licence (CPL). The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The pilot stated that he conducted two touch-and-go landings on Runway 07 (RWY 07) using the right-hand circuit. During the third circuit, which was to become the final circuit, the air traffic control (ATC) officer on duty instructed the pilot to perform two left-hand orbits to accommodate other traffic and to re-join the circuit for a full stop landing.</p> <p>According to the pilot, during the approach for landing, the indicated airspeed (IAS) was 65 knots (kts) with the flaps set at 25° and the rate of descent at 500 feet (ft) per minute. The pilot reported that during the flare, the aircraft ballooned and bounced on touch down. After settling on the runway,</p>							

the pilot lost directional control of the aircraft. To regain control, he applied the brakes at different strengths which caused the aircraft to veer off to the left of the runway. The aircraft skidded for 23 metres from the edge of the runway before it came to a stop facing a northerly direction. During the sequence of events, the nose gear collapsed, and the right wing and the propeller blades contacted the runway surface.

According to the ATC officer, ZS-IKY was cleared for landing on RWY 07 and the pilot readback correctly. During touch down, it appeared as though the landing was normal but a few moments later, the aircraft veered off the runway.

The Airport Rescue and Firefighting (ARFF) personnel were requested to attend to the ZS-IKY aircraft. The ATC officer activated a crash alarm, and more ARFF vehicles were dispatched to assist. Because the aircraft was not clear off the RWY, the RWY was temporarily closed for fixed wing aircraft and a Distress Phase (Detresfa) signal was activated. Also, all relevant stakeholders (flying schools and airport management) were informed. Traffic operating under visual flight rules (VFR) which was still airborne was diverted to Grand Central Airport (FAGC) and, thereafter, co-ordination between ATC officer and the Air Traffic Service Unit (ATSU) was concluded. There was only one traffic on ground that was delayed; apart from that, there was no inbound traffic, and the delay was short. After permission was granted to move the aircraft, a RWY inspection was conducted. Later, the RWY was re-opened after it was cleared, and all the sectors affected were advised of the update. A Distress signal was cancelled and the airfield resumed its normal operations. All VFR traffic that had diverted to FAGC turned back and landed safely at FALA. No other traffic was affected.

The aircraft sustained substantial damage to the right wing tip, nose gear, lower engine cowling and propellers. No persons were injured.



**Figure 1:** Overlay of the accident site. (Source: Google Earth)



**Figures 2 and 3:** The aircraft after it was repositioned from the runway edge. (Source: Operator)

### The Balloon: Excess Energy and Its Trade-offs

*For this discussion we are defining a balloon as that seemingly uncommanded, and definitely unwanted, gain of altitude that sometimes occurs when we pull the airplane level in ground effect. The airplane magically “balloons” upward and surprises us.*

*There are two primary reasons balloons happen: excess airspeed (kinetic energy) and too much pressure on the elevator in the flare for the speed at hand.*

*The faster the airplane is moving, the more effective the elevator will be, and the more lift the wing will be generating. So less pressure on the yoke is required to bring up the nose while trying for a mains-only touchdown. When we are too fast and we try to flare, what we thought was a normal increase in pressure on the yoke results in the nose coming up the way we want it to—but the airplane gains altitude at the same time. This is almost guaranteed to be the result of too much airspeed. Not only is the elevator more effective, but with lift being a function of airspeed and angle of attack, increase both of those and the airplane naturally climbs.*

*Some believe balloons can be caused by “bouncing” off of ground effect, but that is something of a misnomer. Ground effect is not so much a cushion as it is the result of decreased drag caused by, among other things, the ground interrupting the formation of the wingtip vortices. This aggravates the effect of being overly aggressive with the elevators.*

*In the moment, all we know is that when we should be slowly sinking toward the runway while increasing the nose attitude, just the opposite is happening: We are going uphill. It is at this point, when the airplane begins moving away from the runway, that we should immediately stop the process that is in progress.*

*The airplane is gaining altitude. At the same time, what excess airspeed it had is rapidly deteriorating, and we are painting ourselves into an aerial corner. The airplane will run out of speed while far too high and fall out of the air like a manhole cover, which sets up a serious bounce—or worse. So, how do we stop this before something ugly happens?*

*First, if an airplane balloons, it is usually because of the aforementioned hard pull. However, a strong gust can sometimes do the same thing, causing a momentary increase in lift. Regardless, the first move is to arrest the upward movement immediately. The longer we wait to relax the back-pressure and get the nose back down, the more serious the situation becomes, and we are talking a second*

or two. We are also talking very small control movements. A change in stick pressure is all that is needed to get rid of just enough pitch attitude (by lowering the angle of attack) to cap off the balloon and stop it from getting worse. If we slam the nose down, we are likely to see the runway coming up to meet us much more forcibly than we would like. If we wait too long and run out of speed, the same thing happens. However, just pitching the nose level does not always solve the situation because at that moment, we are high and slowing down.

Here is where judgment comes in: We have to decide whether we have enough speed left to fly back down from our too-high position. Or should we add just a hint of power to soften the touchdown? Experienced pilots know their airplane and the situation well enough to recognize when they need power. When in doubt, feed in just a hint of power to soften the touchdown.

The real goal is to be at the proper threshold speed in the first place. Failing that, if you are fast, be patient with the airplane. Just skate along on ground effect, and enjoy the ride while waiting for the speed to dissipate. Do not try to rush things by squeezing the nose up. Wait until it starts to settle before introducing elevator. Then just barely pressure the yoke and do your best to keep the airplane from touching down. This is especially difficult in Cessnas with full flaps down. None of this is a problem, but life is much easier if the speed over the threshold is correct.

Or just forget all that and go around.

Flap Setting (Source: Pilot's Operating Handbook [POH])

The flaps have three extended positions: 10, 25 and 40 degrees.

Standard Brake System (Source: POH)

The standard brake system for the Cherokee consists of a hand lever and master cylinder which is located below and behind the left centre of the instrument sub-panel. The brake fluid reservoir is installed on the top left front face of the firewall. The parking brake is incorporated in the master cylinder and is actuated by pulling back on the brake lever, depressing the knob attached to the handle and releasing the brake lever. To release the parking brake, pull back on the lever to disengage the catch mechanism and allow the handle to swing forward. Optional toe brakes are available to supplement the standard hand lever and parking brake system.

Pre-landing Checks (Source: POH)

Before landing check list:

1. Fuel - on proper tank
2. Electric fuel pump - ON
3. Mixture - set
4. Flaps - set (115 MPH MAX)
5. Seat belts - fastened



The airplane should be trimmed to an approach speed of about **85 MPH with flaps up**. The flaps can be lowered at speeds up to 115 MPH, if desired, and the approach speed reduced **3 MPH for each additional notch of flaps**. The amount of flap used during landings and the speed of the aircraft at contact with the runway should be varied according to the landing surface and conditions of wind and airplane loading.

It is generally good practice to contact the ground at minimum possible safe speed consistent with existing conditions. Normally, the best technique for short and slow landings is to use full flap and enough power to maintain the desired airspeed and approach flight path. **Reduce the airspeed during flare out and contact the ground close to stalling speed**. After ground contact hold the nose wheel off as long as possible. As the airplane slows down, drop the nose and apply the brakes. There will be less chance of skidding the tires if the flaps are retracted before applying the brakes. Braking is most effective when back pressure is applied to the control wheel, putting most of the airplane weight on the main wheels. In high wind conditions, particularly in strong crosswinds, it may be desirable to approach the ground at higher-than-normal speeds with partial or no flaps.

The South African Weather Service (SAWS) meteorological aerodrome report (METAR) on the day and time of the accident was presented as follows:

FALA 231400Z 31008KT 9999 FEW025 18/08 Q1022 NOSIG=

Wind Direction	310°	Wind Speed	8 kt	Visibility	9999 m
Temperature	18°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	08°C	QNH	1022hPa		

## Findings

1. The pilot was issued a Private Pilot Licence (PPL) on 26 April 2023 with an expiry date of 30 April 2024. The pilot was issued a Class 1 aviation medical certificate on 17 March 2023 with an expiry date of 28 March 2024.
2. The pilot conducted a conversion/difference training from Cessna 172 to Piper 28 on 19 May 2023. He flew 1.7 dual hours with a Grade II instructor; the hours were endorsed on his logbook. At the time of the accident, the pilot was flying as pilot-in-command (PIC) for the first time on the aircraft type; he flew approximately 1.0 hours. According to the South African Civil Aviation Technical Standard (SACATS) 61.09.5 a (i) *the minimum hours required is 2 hours*.
3. The ATC officer was initially issued an Air Traffic Service Licence on 1 November 2013, which was revalidated on 27 July 2022 with an expiry date of 26 July 2023. The ATC officer was issued a Class 3 medical certificate on 18 November 2021 with an expiry date of 30 November 2025 with no medical waivers. The ATC officer had a FALA rating endorsed on his licence.

4. The aircraft was issued a Certification of Registration (C of R) on 11 May 2023.
5. The aircraft's last mandatory periodic inspection (MPI) was conducted on 15 May 2023 at 8 299.4 airframe hours and at 2313.4 Hobbs meter reading, with an expiry date of 12 May 2024 or at 8 399.4 Hobbs meter, whichever occurs first. At the time of accident, the aircraft had 8321.25 airframe hours and 2338.8 Hobbs meters. The aircraft was flown a further 21.85 hours since the last MPI.
6. The aircraft was fitted with a serviceable nose gear during the recovery phase and was towed to the hangar. The brakes were tested whilst the aircraft was being towed, and they were found serviceable.
7. The Certificate of Airworthiness (C of A) was initially issued on 10 July 2019 with an expiry date of 31 May 2023.
8. The aircraft was unstable on approach due to high speed during the flare, thus, the aircraft ballooned and landed hard on all gears and bounced. The pilot lost control of the aircraft and it veered off to the left of the RWY.
9. According to the POH, the approach airspeed should be kept at about 73 kts with the flaps up. The pilot stated that during approach, the speed was kept at 65 kts with the flaps offset at 25°. The POH states that the '*approach speed can be reduced by 2.6 kts for each additional notch of flaps*', therefore, the speed on approach was supposed to be kept at 68 kts. The POH further states that it is '*good practise to contact the ground at minimum possible safe speed consistent with existing conditions*'. It also states that pilots should '*reduce the airspeed during flare out and contact the ground close to stalling speed [Stalling Speed (flaps down) 49kts]*'. The speed at which the aircraft touched down was 65 kts which was more by 14 kts.
10. The weather had no effect to this accident.

**Probable Cause**

The aircraft was unstable on approached due to high speed during the flare, thus, the aircraft ballooned and landed hard on all gears which led to the subsequent bounce. The pilot lost control of the aircraft and it veered off to the left of the runway.

**Contributing Factor**

None.

**Safety Action**

None.

**Safety Recommendation/Message**

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**

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