

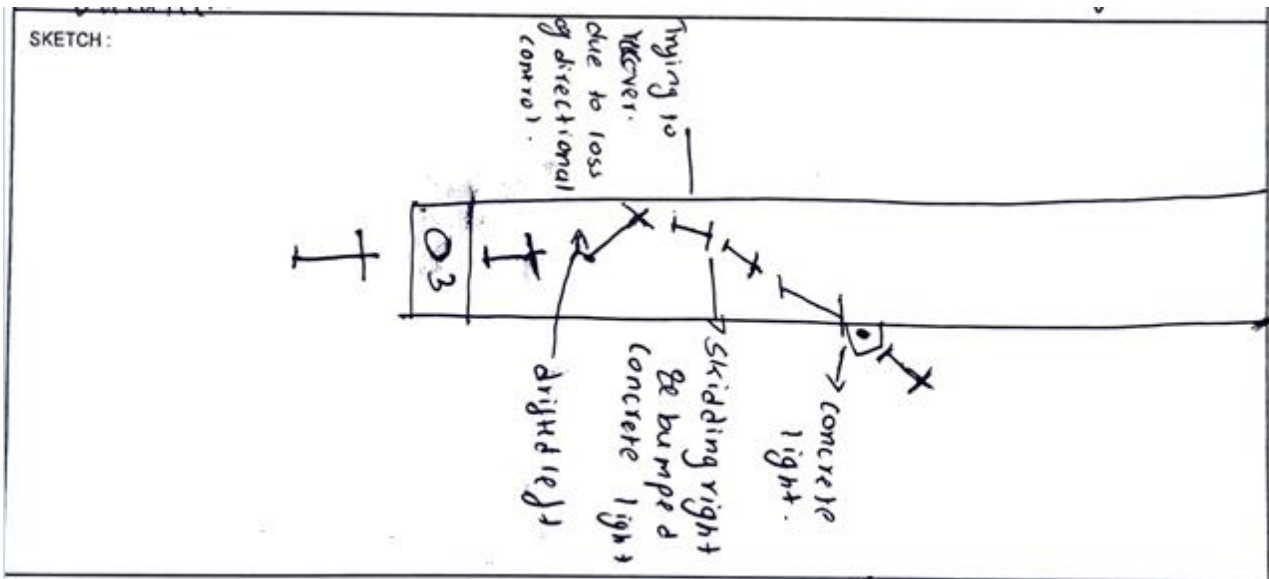


<b>LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL</b>
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<b>Reference Number</b>	CA18/2/3/10276						
<b>Classification</b>	Accident		<b>Date</b>	4 March 2023		<b>Time</b>	0645Z
<b>Type of Operation</b>	Private (Part 91)						
<b>Location</b>							
Place of Departure	Brakpan Aerodrome (FABB), Gauteng Province		Place of Intended Landing	Vereeniging Aerodrome (FAVV), Gauteng Province			
Place of Occurrence	Brakpan Aerodrome (FABB), Gauteng Province						
GPS Co-ordinates	Latitude	26° 34' 15.48" S	Longitude	027° 57' 32.38" E	Elevation	4 862 ft	
<b>Aircraft Information</b>							
Registration	ZS-DPN						
Make; Model; S/N	Piper 28-180 Cherokee (Serial Number: 28-1175)						
Damage to Aircraft	Substantial			Total Aircraft Hours	5 768.91		
<b>Pilot-in-command</b>							
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	19
Licence Valid	Yes	Total Hours	74.48		Total Hours on Type	69.48	
Total Hours 30 Days	3.42		Total Flying on Type Past 90 Days	10.36			
<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 4 March 2023, a pilot and a passenger on-board a Piper Cherokee PA-28-180 aircraft with registration ZS-DPN took off on a private flight (hour building) from Brakpan Aerodrome (FABB) in Gauteng province to Vereeniging Aerodrome (FAVV) in the same province. 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 reported that the flight from FABB to FAVV was uneventful. On their return to FABB, the pilot joined overhead the airfield at 6800 feet (ft) and initiated a descent to 5800ft on the western side of the aerodrome. The assessed wind conditions depicted by the windsock indicated Runway 03 as the favourable runway on which to land. The pilot made a radio call informing other aircraft (traffic) in the vicinity of the aerodrome that he would be joining right downwind for Runway 03 for landing. After joining right downwind for Runway 03, the pilot commenced the pre-landing checks, thereafter, turned right for final approach and extended the flaps to 45 degrees.</p> <p>He maintained an approach speed of 80 miles per hour (mph) and was comfortable as the runway length was sufficient (1.6km). Upon landing, the aircraft bounced, and the pilot lost directional control of the aircraft. He tried to recover by applying the right rudder but was unsuccessful. As a result, the nose gear strut broke off and the nose wheel assembly separated from the fork. The aircraft skidded and veered off to the right side of the runway and collided with a runway light before it came to a</p>							

stop on the grass. The pilot switched off the master switch and, together with the passenger, disembarked from the aircraft unassisted.

The aircraft sustained damage to the left-wing, nose gear, landing light and underbelly.



**Illustration 1:** The sketch of the sequence of events. (Source: Pilot questionnaire)



**Figure 1:** The aircraft at the accident site. (Source: Operator)



**Figure 2:** The front view of the aircraft and the nose wheel assembly that detached from the fork.  
(Source: Operator)

**Post-Accident:**

- Below is the weather information supplied by the South African Weather Service (SAWS) on the day and time of the accident for FAVV.

Wind Direction	310°	Wind Speed	12kt	Visibility	10km
Temperature	19°C	Cloud Cover	Scattered	Cloud Base	1000 feet
Dew Point	14°C	QNH	1022		

- A post-accident interview with the pilot revealed that he flared the aircraft too high, bounced, and lost directional control.

*APPROACH AND LANDING (Source: CHEROKEE 180 OWNER'S HANDBOOK)*

*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*

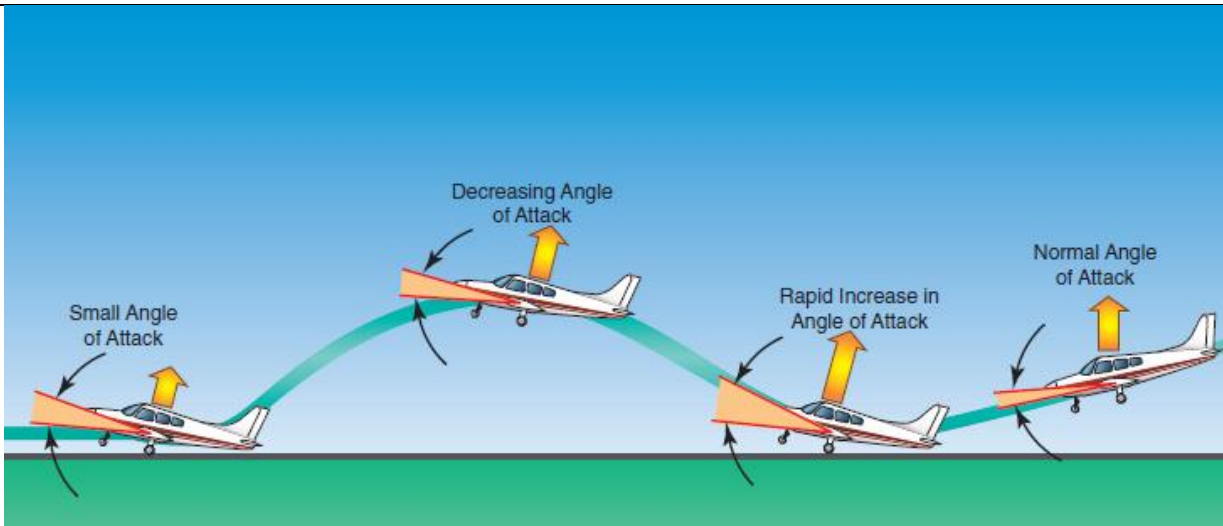
*The airplane should be trimmed to an approach speed of about 85 MPH with flaps up. The flaps can be lowered at speeds up to 115 MPH, if desired, and the approach speed reduced 3 MPH for each additional notch of flaps. Carburettor heat should not be applied unless there is an indication of carburettor icing, since the use of carburettor 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. 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 tyres 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.'*

**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 2:** Illustration depicting the bounce. (Source: Source: FAA-airplane flying handbook chapter 8)

### Findings

1. The pilot was initially issued a Private Pilot Licence (PPL) on 30 November 2022 with an expiry date of 30 November 2023. His Class II medical certificate was issued on 3 August 2022 with an expiry date of 3 August 2027 with no restrictions.
2. The last 100-hour Mandatory Periodic Inspection (MPI) on the aircraft was certified on 17 February 2023 at 5 744.26 total airframe hours. The aircraft had accumulated 5 768.91 hours at the time of the accident, meaning that it was flown a further 24.6 hours after the MPI.
3. Fine weather conditions prevailed at the time of the flight. The weather had no bearing to this accident.
4. The Certificate of Airworthiness (C of A) was initially issued on 19 December 2011. The latest C of A had an expiry date of 31 December 2023.
5. The Certificate of Registration (C of R) was issued to the present owner on 26 January 2021.
6. The landing configuration with regards to indicated airspeed (IAS) and flaps was 80 miles per hour (mph) and stage 3 (45%). According to the Pilot's Operating Handbook (POH), full flaps must be selected on approach for a normal landing (see checklist above).
7. The pilot stated that he flared the aircraft too high, and it bounced and landed hard, followed by loss of directional control. The aircraft skidded to the right and exited the runway. The left-wing tip contacted the ground, and the nose gear and landing light broke.

8. The aircraft was high on approach and, therefore, the flaring was too high. As a result, the aircraft touched down hard on the runway and bounced.
<b>Probable Cause(s)</b>
The aircraft was flared too high during landing and, thus, landed hard and bounced; the pilot lost directional control and the aircraft exited the runway.
<b>Contributing Factor(s)</b>
Incorrect landing technique.
<b>Safety Action(s)</b>
None.
<b>Safety Message</b>
Pilots should be vigilant during critical stages of flight such as take-offs and landings.
<b>About this Report</b>
<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>
<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>
<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**