SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10231						
Classification	Accident	**Date**	20 October 2022		**Time**	1208Z	
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Virginia Aerodrome (FAVG), KwaZulu-Natal Province	Place of Intended Landing	Virginia Aerodrome (FAVG), KwaZulu-Natal Province				
Place of Occurrence	During landing on the left-side of Runway 05 at FAVG						
GPS Co-ordinates	Latitude	29° 46' 20.77" S	Longitude	031° 3' 26.19" E	Elevation	28 ft	
Aircraft Information							
Registration	ZS-IEI						
Make; Model; S/N	Piper Cherokee PA-28 -140; Piper Aircraft Corporation (Serial Number: 28-26628)						
Damage to Aircraft	Substantial	Total Aircraft Hours	11 527.83				
Pilot-in-command							
Licence Type	Student Pilot Licence	Gender	Male	Age	19		
Licence Valid	Yes	Total Hours	30.7	Total Hours on Type	30.7		
Total Hours 30 Days	12.8	Total Flying on Type Past 90 Days	12.8				
People On-board	1+0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 20 October 2022 at approximately 1100Z, a student pilot on-board a Piper Cherokee PA-28-140 aircraft with registration ZS-IEI took off on a training flight from Runway 05 (RWY 05) at Virginia Aerodrome (FAVG) in KwaZulu-Natal province to the general flying area (GFA), with the intention to land back at the same aerodrome. The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The student pilot reported that he conducted the pre-flight inspection and, thereafter, started the engine with the instructor supervising him. No anomalies were observed post-inspection. The take-off and the flight to the GFA proceeded as expected. The student pilot conducted the solo training exercises at the GFA successfully. At approximately 1150Z, he returned to FAVG for a full stop landing. During approach for landing whilst lining up for RWY 05, he noticed that the aircraft was unstable due to the high-speed approach. However, he committed to land the aircraft and, during touchdown, the aircraft bounced once, which caused the propeller blades to strike the runway surface. The aircraft drifted slightly to the left of the runway centreline and continued in that direction. The pilot applied the right rudder to bring the aircraft back to the centreline but the aircraft rolled to the right and the right wing scraped the ground. The aircraft veered off to the left of the RWY; the nose landing gear broke off before the aircraft came to a stop on the left-side of RWY 05. The nose gear strut, propeller blades and the right-wing tip were damaged. The pilot disembarked the aircraft without assistance. No people were injured during this occurrence.

The weather conditions at the time of the accident flight were as follows: METAR FAVG 201200Z AUTO 04007G17KT //// // ////// 28/19 Q1014 reporting; wind direction: 040; wind speed: 07G17kt; visibility: 9999; temperature: 28ºC; dew point: 19ºC.

Figure 1: The aircraft after the accident. (Source: Operator)

Figure 2: The damaged nose landing gear. (Source: Operator)

According to the pilot, the aircraft's approach was fast and unstable as the landing speed at touchdown was 85 miles per hour (mph).

Approach and landing speed as per the aircraft Pilot's Operating Handbook (POH)

The aircraft should be trimmed to an approach speed of 85 miles per hour (mph) with flaps up. The flaps can be lowered at 115mph if desired and if approach speed is reduced 3mph for each additional notch of flap. Normally the best technique for a short and slow landing is to use full flap and enough power to maintain the desired airspeed and approach flight path. Mixture should be full rich, fuel on the fullest tank, carburetor heat off, and electric fuel pump on. Reduce the speed during the flare out and contact the ground close to the stalling speed of (55 to 65) mph. After ground contact, hold the nose wheel off as long as possible. As the airplane slows down, drop the nose gear and apply the brakes. There will be less chance of skidding on the tyres if the flaps are retracted before applying the brakes. Braking is effective when pack pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels.

Bouncing during landing touchdown (Source FAA-H-8083 Airplane Flying Handbook)

When the airplane contacts the ground with a sharp impact as a 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. [Figure 3] 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.

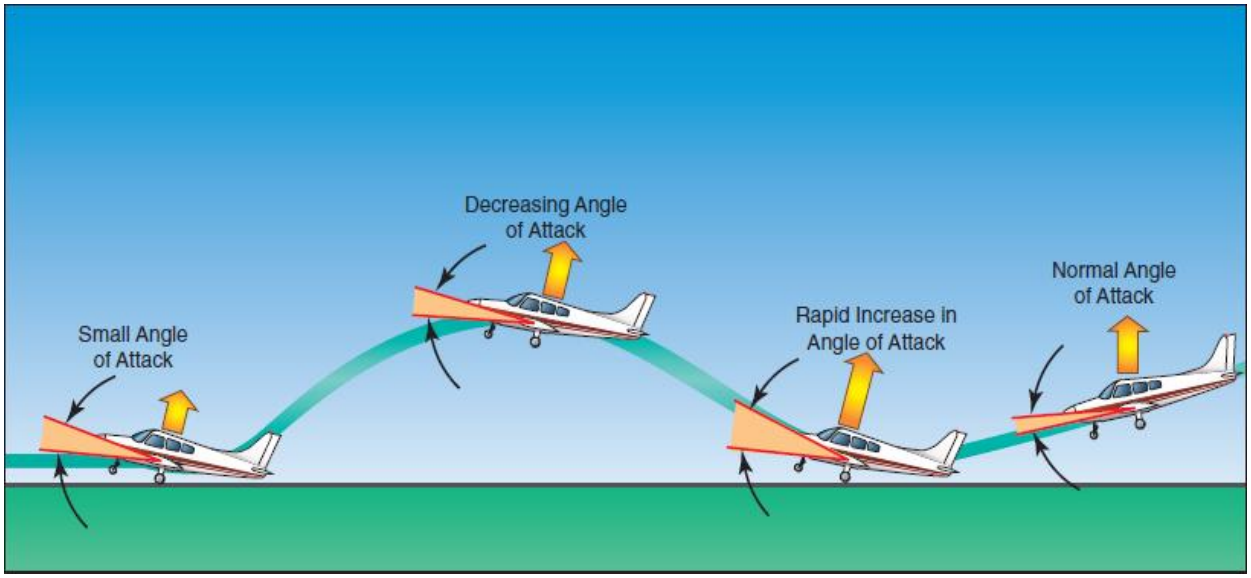

Illustration 1: The aircraft rebounds after touchdown.

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 realizing 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.

Findings

- The instructor, a Mauritian, had a validated Commercial Pilot Licence (CPL) which was initially issued by the Regulator (SACAA) on 26 November 2019 as a Grade III instructor. The licence was reissued on 29 October 2021 with an expiry date of 31 December 2022.

- The instructor's Class 1 medical certificate was issued on 3 October 2022 with an expiry date of 31 October 2023. The instructor had a total of 440.1 flying hours of which 154.1 were accumulated on the aircraft type. The aircraft type was endorsed on his licence.

- The student pilot had a Student Pilot Licence (SPL) which was issued by the Regulator on 19 January 2022 with an expiry date of 18 January 2023. The student pilot's Class 2 medical certificate was issued on 6 January 2022 with an expiry date of 31 January 2027, and with the restriction to wear corrective lenses. The student pilot accumulated 30.7 hours of flight time on the aircraft type.

- The aircraft was issued a Certificate of Airworthiness (C of A) by the Regulator on 22 April 2022 with an expiry date of 31 May 2023. The aircraft was registered to the current owner on 20 October 2021.

- The aircraft was issued a Certificate of Release to Service (CRS) on 4 July 2022 at 11455.63 airframe hours with an expiry date of 3 July 2023 or at 11555.63 airframe hours, whichever comes first. The aircraft had a total of 11527.83 airframe hours at the time of the accident.

- The aircraft maintenance organisation (AMO) which conducted the maintenance on the aircraft had an AMO approval certificate that was issued by the Regulator on 29 March 2022 with an expiry date of 31 March 2023.

- The approved training organisation (ATO) had an ATO certificate that was issued by the Regulator on 10 July 2020 with an expiry date of 31 July 2025. The ATO's training operation was valid; it was issued by the Regulator on 1 August 2022 with an expiry date of 31 July 2023. The aircraft type was endorsed on it.

- The prevailing weather with gusty wind conditions at the time of landing was considered a contributory factor to this accident.

- The aircraft approached and touched down at a high speed, which resulted in a bounce. During the second touchdown (with the nose gear first, which subsequently failed), the propeller contacted the runway surface. In an attempt to correct the condition, the pilot rolled the aircraft to the right and the right wing scraped the ground before the aircraft veered off to the left-side of the runway.

Probable Cause

The aircraft was unstable on approach which led to a hard landing and a bounce. As a result, the pilot lost control of the aircraft which veered off to the left-side of the runway. The nose gear failed before the aircraft came to a stop.

Contributing Factor(s)

The gusty weather conditions that prevailed at the time of landing contributed to the bounced landing.

Safety Action(s)

None.

Safety Message

To prevent these types of accidents, pilots are reminded to always be vigilant during the critical stages of the flight such as take-offs and landings, and to carry out a go-around when unsure.

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 produced without prejudice to the rights of the AIID, which are reserved.

This report is issued by:

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