SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10503						
Classification	Accident		**Date**	1 October 2024		**Time**	0755Z
Type of Operation	Training Part 141						
Location							
Place of Departure	Mafikeng Aerodrome (FAMM), North West Province		Place of Intended Landing	Mafikeng Aerodrome (FAMM), North West Province			
Place of Occurrence	Runway 22 at Mafikeng Aerodrome (FAMM)						
GPS Co-ordinates	Latitude	25° 47' 35.2" S	Longitude	025° 33' 02.1" E		Elevation	4200 ft
Aircraft Information							
Registration	ZS-LCC						
Make; Model; S/N	Piper Aircraft Corporation; Piper PA-28-181 (Serial Number: 28-8190301)						
Damage to Aircraft	Substantial			Total Aircraft Hours	5036.1		
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)		Gender	Female	Age	19	
Licence Valid	Yes	Total Hours	46.9	Total Hours on Type	46.9		
Total Hours 30 Days	5.7		Total Flying on Type Past 90 Days		16.2		
People On-board	1+0	**Injuries** 0	**Fatalities**	0	**Other (on ground)**	0	

What Happened

On Tuesday morning, 1 October 2024 at approximately 0635Z, a student pilot (SP) on-board a Piper PA-28-181 Cherokee with registration ZS-LCC took off on a solo training flight from Mafikeng Aerodrome (FAMM) in North West province to the general flying area (GFA). 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.

The SP reported that the take-off phase and the flight to the GFA were uneventful. Upon reaching the GFA, she conducted Exercises 15 (steep turns), 16 (forced landing) and 17 (precautionary landing). After completing the exercises, she returned to FAMM for a full-stop landing. FAMM has a single asphalt runway orientated 04/22 and is 4.5 kilometres long. Approximately 5 nautical miles (nm) from the aerodrome, the SP reported her position and her intention to conduct a full-stop landing to the air traffic control (ATC) officer. The ATC cleared the SP to join the right-side circuit for landing on Runway (RWY) 22 and to report downwind. The ATC advised the SP of the prevailing weather conditions which were as follows: wind direction: 210 degrees, velocity: 18 knots (kts), and ceiling and visibility okay (CAVOK).

According to the SP, the wind was strong whilst she was on the downwind leg. She reported final approach and was cleared for landing. During approach whilst flying at a speed of 75 kts, a gust of wind from the left pushed the aircraft slightly to the right of the runway's centreline. The SP brought the aircraft back to the centreline; however, she positioned it slightly to the left of the centreline. She then flared the aircraft, which was too early and high, and it touched down hard with the left main landing gear first; it bounced before it came to a stop on the runway's centreline facing slightly to the right. The aircraft sustained damage to the left main landing gear. The SP was not injured during the accident.

On final approach, the ATC communicated the weather report that was obtained from the South African Weather Service (SAWS) to pilot, which was surface wind: 21018KT; CAVOK 10/M09 Q1023; wind direction: 210°; wind speed: 18kt; air temperature: 10 and visibility: CAVOK

Figure 1: The aircraft after it had stopped. (Source: Operator)

Figure 2: The damage on the left main undercarriage. (Source: Operator)

Aircraft Information (Source: Pilot's Operating Handbook)

A Piper PA-28-181 is a four-seater single-engine aircraft with a low-wing configuration equipped with a retractable tricycle landing gear system.

Aircraft Normal Procedure: Approach and Landing (Source: Pilot's Operating Handbook)

When on final approach, the airplane should be trimmed to an approach speed of 76mph IAS (66 kts AIS) with flaps extended. The flaps can be lowered at a speed of up to 115 MPH IAS (100 kts AIS).

According to the pilot questionnaire, the flaps were set at 45 degrees and the landing speed was at 86.3 MPH IAS (75 kt).

Pilot's Experience

The SP had 46.9 flying hours at the time of the accident. On 29 July 2024, after reaching 30 hours of dual flight instruction, the SP received a letter from the Approved Training Organisation (ATO) recommending that she adds 3 hours of dual flight training in accordance with Part 61.02.7 of the CAR as amended. After flying 0.9 hours of the recommended additional 3 hours, she was approved for solo flight at 30.9 total hours.

The investigator reviewed the SP's training record and found no indication of concerns regarding flight safety that would warrant discontinuation of the training.

The regulation below specifies the procedure to be followed when a SP fails to receive a recommendation for solo flying after 30 hours of dual instruction and when the SP shows no progress after solo recommendation at 40 hours of dual flight in airplanes.

61.02.7 DISCONTINUANCE OF FLIGHT TRAINING

[TS 61.02.7 inserted by the Director on 6 August 2016 through SA-CATS 2/2016 w.e.f. 28 November 2016.]
1.
Failure to be recommended for solo flight after 30 hours (Aeroplane) or 40 hours (Helicopter) of dual flight training

(1) A student pilot who fails to be recommended for solo flight after completing 30 (A) hours or 40 (H) hours of dual flight training, shall undergo a flight assessment by the CFI of the ATO where he or she is receiving flight training.

(2) If the CFI cannot recommend solo flight for the student, then the following shall apply:

(a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect. The student shall acknowledge receipt of the letter.

(b) A training program of up to 5 hours of dual flight instruction shall be designed and implemented to address the knowledge, skills, and attitude of the student pilot.

(c) Once the additional 5 hours of dual flight instruction are flown (35 (A) or 45 (H)), a recommendation must be made by the responsible flight instructor for solo flight. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director.

Bounces Landing (Source: Airplane Flying handbook: FAA-8083-3A)

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 tires 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 the 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 realizing too late that the airplane is not in the proper attitude and attempting to establish it just as the second touchdown occurs.

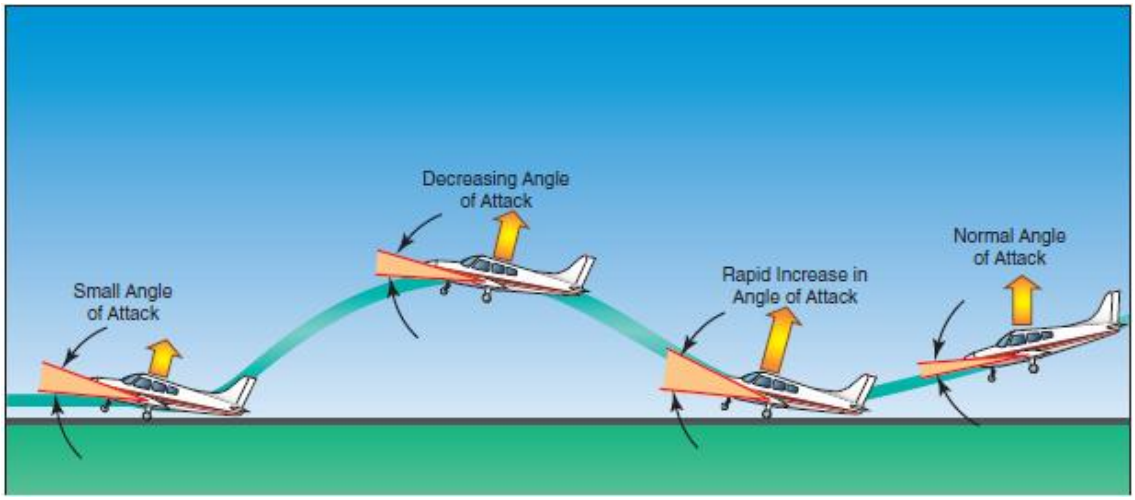

Figure 3: Illustration of a bounce landing.

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.

Findings

Man

1. The flight was authorised by the flight instructor who had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 24 January 2019. The licence was reissued on 29 September 2024 with an expiry date of 31 August 2025. His Class 1 aviation medical certificate was issued on 4 September 2024 with an expiry date of 30 September 2025.

2. The SP is a Zimbabwean national and had a Student Pilot Licence (SPL) Airplane that was initially issued by the Regulator on 19 April 2023 with an expiry date of 1 May 2025. Her Class 2 aviation medical certificate was issued on 2 December 2022 with an expiry date of 31 December 2027 with no restrictions. The aircraft type was endorsed on her licence.

3. The SP accumulated a total of 46.9 flying hours of which approximately 6 hours were on solo flying. The SP was recommended for solo flight after completing 30.9 hours of dual training. The training records indicated no concerns regarding flight safety that would warrant discontinuation of training.

4. The SP approached and landed in windy condition. The SP had limited experience flying in unfavourable conditions, hence, her decision to continue to land.

Machine

5. The aircraft had a Certificate of Airworthiness (C of A) that was issued on 19 December 2023 with an expiry date of 28 February 2025. The Certificate of Registration (C of R) was issued to the owner of the aircraft on 21 January 2022.

6. The mandatory periodic inspection (MPI) of the aircraft was conducted and certified by an aircraft maintenance organisation (AMO) after which the Certificate of Release to Service (CRS) was issued on 13 September 2024 at 5005.2 airframe hours with an expiry date of 13 September 2025 or at 5105.2 airframe hours, whichever comes first. The aircraft had 5036.1 hours at the time of the flight, which meant that the aircraft accrued 30.9 hours after the last MPI.

7. The AMO which conducted maintenance had an AMO Certificate that was issued by the Regulator on 21 August 2023 with an expiry date of 31 August 2025. The aircraft type was endorsed on the AMO's maintenance and operational specifications (Ops Specs) document that was issued on 21 August 2023 with an expiry date of 31 August 2024. The aircraft was serviceable and no aircraft systems defects were recorded in the logbooks.

8. The aircraft's approach speed of 75 kts was higher than the recommended speed of 66 kts. An early flare increased the aircraft's descent rate prematurely which caused it to drop too fast and, subsequently, landed hard. This may have been due to poor judgment or overcompensation after the wind gust.

Environment

9. The reported wind conditions (210° at 18 knots) on the final approach were a significant contributing factor. The strong wind from the side (left gust pushing the aircraft to the right) affected the aircraft's stability during approach and landing.

Probable Cause(s)

The aircraft landed hard due to strong wind conditions.

Contributing Factor(s)

1. The SP's lack of experience resulted in the failure to execute a go-around.
2. Strong wind conditions prevailed at the time of landing.

Safety Action(s)

The ATOs must conduct and regularly review and distribute updates on best practices for landing in strong winds to all student pilots and instructors.

Safety 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 desktop inquiries 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