SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/3/2/1464						
Classification	Serious Incident	**Date**	29 December 2024		**Time**	1315Z	
Type of Operation	Private (Part 91)						
Location							
Place of Departure	Potchefstroom Aerodrome (FAPS), North West Province	Place of Intended Landing	Beaufort West (FABW) Aerodrome, Western Cape Province				
Place of Occurrence	Runway 26 at Beaufort West Aerodrome (FABW), Western Cape Province						
GPS Co-ordinates	Latitude	32° 18' 00.0" S	Longitude	022° 40' 00.0" E	Elevation	2 932 ft	
Aircraft Information							
Registration	ZS-JLP						
Make; Model; S/N	Piper Aircraft; PA28-180 (S/N:28-7505115)						
Damage to Aircraft	Minor	Total Aircraft Hours	5 867.46				
Pilot-in-command							
Licence Type	Private Pilot Licence (PPL)	Gender	Male	Age	66		
Licence Valid	Yes	Total Hours	662.4	Total Hours on Type	23.67		
Total Hours 30 Days	1.8	Total Flying on Type Past 90 Days	5.7				
People On-board	1 + 1	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Sunday, 29 December 2024, a pilot and a passenger on-board a Piper PA28-180 aircraft with registration ZS-JLP took off on a private flight from Potchefstroom Aerodrome (FAPS), North West province, to Beaufort West (FABW), Western Cape province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot reported that he conducted the pre-flight checks and no anomalies were noted. At 0910Z, the aircraft embarked on a 4-hour flight from FAPS to FABW; the flight was uneventful. Upon arrival at FABW, the indicated approach air speed for landing on Runway (RWY) 26 was 70 knots (kts) with 25° flaps setting; the headwind was approximately 8 kts and the left crosswind was 9 kts. The aircraft touched down hard with the rear main wheels on the runway, followed by a bounce. It then oscillated, which became increasingly excessive, and the propeller blades struck the runway surface before the aircraft came to a complete stop. The pilot was able to taxi the aircraft to the apron without further complexity. The occupants were not injured; the aircraft sustained damage to the propeller blades.

Figure 1: An overview of FABW. (Source: Google Earth)

Figure 2: The aircraft after the serious incident. (Source: Pilot)

Figures 3 and 4: Damage to the propeller (left) and propeller marks on the runway (right). (Source: Pilot)

The meteorological aerodrome report (METAR) was obtained from the South African Weather Service (SAWS) which was issued for FABW (Beaufort West Airport meteorological office) on 29 December 2024 at 1300Z. FABY 291300Z AUTO 21007G17KT CAVOK 37/01 Q1011=

Wind Direction	210	Wind Speed	07G17 kt	Visibility	9999 m
Temperature	37ºC	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	01ºC	QNH	1022hPa		

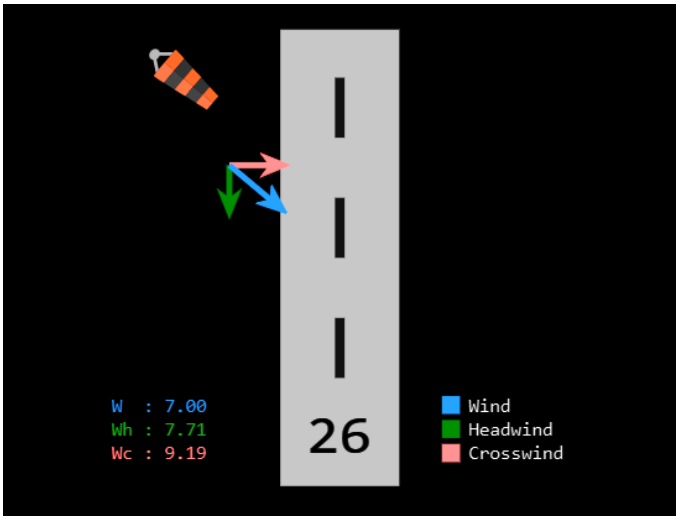

Figure 5: The average wind component on the day of the serious incident. (Source: e6bx.com)

Approach and Landing (Source: PA28-180 Pilot's Operating Handbook)

Before landing checklist:

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 miles per hour (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.

The pilot stated that the aircraft approached RWY 26 at an indicated airspeed of 70 knots (kts) with 25° flaps. At this speed, the aircraft would have been slow as the maximum speed on approach is 115 MPH (100 kts) with flaps up. This aircraft's speed on approach should have been 112 MPH (97 kts) as the Pilot's Operating Handbook (POH) recommends. For every flap selection, the speed is reduced by 3 MPH (2.6 kts). Slow speed on approach would result in rapid loss of height and a bounce after touchdown.

Bouncing During Touchdown (Source: http://airplanegroundschools.com/Approaches-and-Landings/)

When the airplane contacts the ground with a hard 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.

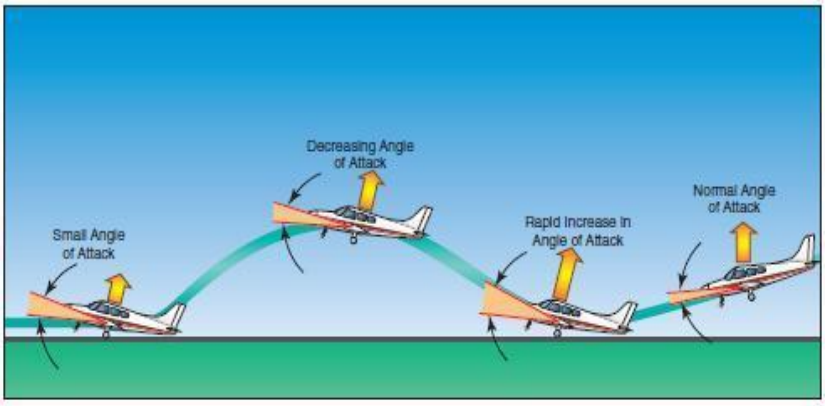

Figure 6: Bouncing during touchdown.
(Source: http://airplanegroundschools.com/Approaches-and-Landings/)

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 air speed 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.

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

1. Personnel Information

1.1 The pilot had a Private Pilot Licence (PPL) that was initially issued on 8 July 2009. The PPL was reissued on 24 June 2024 with an expiry date of 30 June 2026.

1.2 The pilot was issued a Class 2 aviation medical certificate on 3 June 2024 with an expiry date of 30 June 2025 with a restriction to wear corrective lenses. The pilot was adequately qualified and licensed to conduct the flight; he had 23.67 hours on the aircraft type and 5.7 hours in the preceding 90 days.

2. Aircraft Information

2.1 The last mandatory periodic inspection (MPI) of the aircraft was conducted and certified on 5 August 2024 at 5 783.50 airframe hours. The aircraft had accrued 83.96 hours after the MPI.

2.2 The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued on 29 June 2012. The latest C of A had an expiry date of 30 June 2025. The aircraft's Certificate of Registration (C of R) was issued to the present owner on 15 October 2021.

2.3 The aircraft was issued a Certificate of Release to Service (CRS) on 5 August 2024 with an expiry date of 5 August 2025 or at 5 883.50 airframe hours, whichever occurs first.

2.4 The aircraft was maintained by an aircraft maintenance organisation (AMO) with an AMO Certificate that was issued by the Regulator (SACAA) on 20 May 2024 with an expiry date of 31 May 2025.

2.5 The aircraft approached at a speed of 81 MPH (70 kts) with 25° flaps setting instead of a speed of 112 MPH (97 kts) as recommended by the MOP. As a result, the aircraft touched down hard on the runway and it bounced, which led to the propeller damage.

3. Environment

The weather report obtained from the SAWS indicated gusty crosswind conditions at the time of landing which can be attributed as a contributory factor to the accident.

Probable Cause(s)
The aircraft approached at a slow speed and it rapidly lost height, which led to a hard touchdown and a bounce, damaging the propeller.
Contributing Factor(s)
Incorrect configuration.
Safety Action(s)
None.
Safety Message and/or Safety Recommendation/s
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

This report is issued by:

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