



LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number		CA18/3/2/1508					
Classification	Serious Incident	Date	26 September 2025		Time	1105Z	
Type of Operation	Private (Part 91)						
Location							
Place of Departure	Calvinia Airfield (FACV), Northern Cape Province		Place of Intended Landing	Rosebank Private Airstrip, Northern Cape Province			
Place of Occurrence	Roseback Private Airstrip, Northern Cape.						
GPS Co-ordinates	Latitude	30° 49' 21.34" S	Longitude	022° 02' 38.82" E	Elevation	3190 ft	
Aircraft Information							
Registration	ZS-LBS						
Make; Model; S/N	Mooney; M20J (Serial Number: 24-0205)						
Damage to Aircraft	Minor			Total Aircraft Hours	1818.5		
Pilot-in-command							
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	66
Licence Valid	Yes	Total Hours	288.4	Total Hours on Type	96.8		
Total Hours 30 Days	4		Total Flying on Type Past 90 Days			4	
People On-board	1+1	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Friday, 26 September 2025, a pilot and a passenger on-board a Mooney M20J aircraft with registration ZS-LBS took off from Calvinia Airfield (FACV) to Rosebank private airstrip, both situated in Northern Cape 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 upon arrival at Rosebank private airstrip located on his farm, the windsock was fully horizontal which indicated a strong north-westerly crosswind. Based on this observation, the pilot decided that he will use Runway 24 to land, which is approximately 850 metres (m) long. He completed the pre-landing checks and configured the aircraft for approach and landing. The aircraft touched down smoothly at approximately 80 miles per hour (mph) (69.5 knots); however, the touchdown point was deeper into the runway than usual. Shortly after touchdown, the aircraft experienced a sudden lateral movement to the right. The pilot applied the left rudder input to counteract the drift, but the aircraft skidded and veered off to the right side of the runway.</p> <p>After departing the prepared surface, the aircraft's left main landing gear collapsed as it rolled on an uneven terrain. It came to rest a few metres on the right-side of the runway facing it, and with its left wing touching the ground.</p>							

The aircraft sustained substantial damage to the left main landing gear assembly and wing structure. The pilot and the passenger were not injured.



Figure 1: An aerial view of the accident site. (Source: Google Earth Map)

Assessment of the Airstrip and the Surrounding Area

The area's topography indicated a safe landing approach was best conducted via Runway 24 as the surrounding terrain provided more favourable accessibility and approach conditions.



Figure 2: The aircraft as it came to rest. (Source: Pilot)



Figure 3: The damaged sustained by the left main landing gear. (Source: Pilot)

Weather Report

According to the pilot, he obtained the meteorological weather updates using an electronic weather service application.

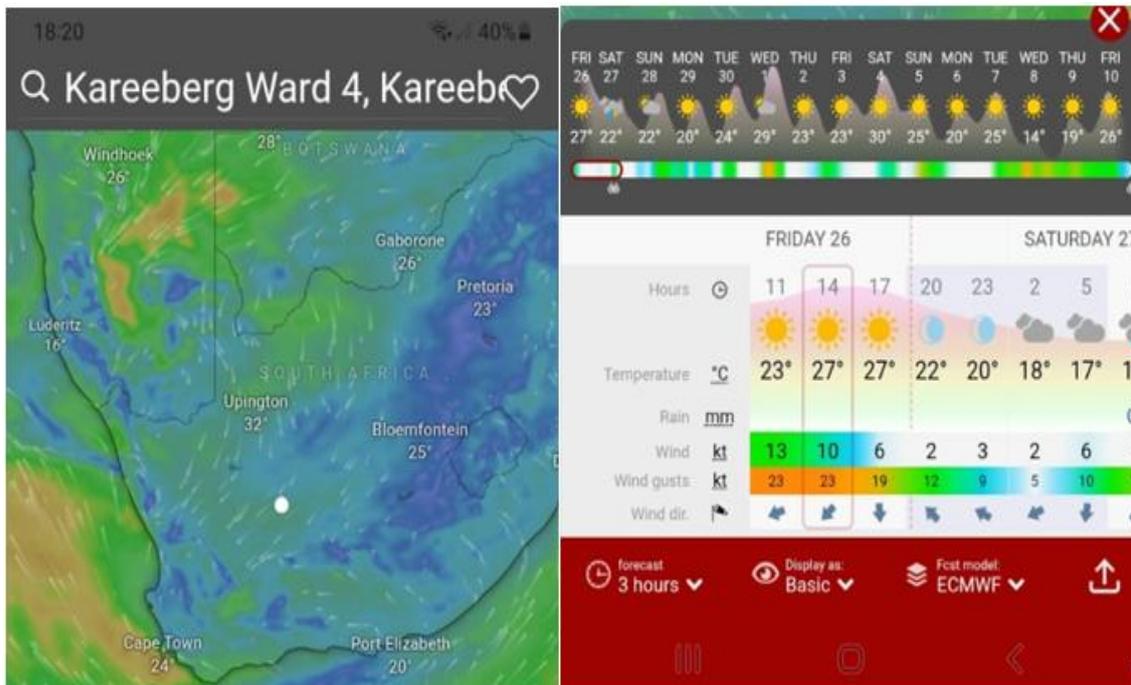


Figure 4: The meteorological weather conditions record from the electronic weather application. (Source: Pilot)

The recorded weather conditions were reported as:

Wind direction: 060°; wind temperature: 23 °C; wind speed: 13 kt; wind gust: 23 kt; visibility: 9999

Wind Direction	060°	Wind Speed	13 Kts	Visibility	10 Km
Temperature	23°C	Cloud Cover	None	Cloud Base	None
Dew Point	None	QNH	Unknown		

The above weather conditions indicated a tailwind component. The wind was blowing north-easterly.

Why Aircraft Take-off and Land into the Wind

(Source: <https://aviationtheoryaustralia.com.au/blog/f/why-aircraft-take-off-and-land-into-the-wind-explained>)

Aircraft take-off and land into the wind primarily to maximise aerodynamic efficiency, improve safety and reduce the required runway length.

1. Principles of Aerodynamics

Lift Generation: Aircraft wings generate lift by moving air over their surfaces. The faster the airflow relative to the wing, the more lift is produced.

Ground Speed vs. Airspeed: The wind blowing opposite to the aircraft's direction reduces the ground speed needed to achieve the required airspeed for lift. For example, if an aircraft needs 100 kts of airspeed to take-off and there is a 20-knot headwind, the aircraft only needs to reach 80 kts of ground speed.

2. Reduced Runway Length

Take-off: By taking off into the wind, the aircraft reaches its required airspeed more quickly, allowing it to lift off using less runway. This is especially critical at airports with shorter runways or in emergency situations.

Landing: Similarly, landing into the wind reduces the aircraft's ground speed upon touchdown, allowing it to decelerate more quickly and use less runway for braking.

3. Improved Control and Safety

Directional Stability: Taking off or landing with a tailwind (wind from behind) can make controlling the aircraft more difficult as it increases ground speed and reduces the relative airflow over control surfaces.

Reduced Risk of Overruns: Lower ground speeds into the wind decrease the risk of runway overruns during take-off or landing, particularly in adverse conditions like wet or icy runways.

Wind Shear and Gusts: Landing into the wind helps the aircraft maintain stability as it reduces the impact of sudden changes in wind speed or direction (wind shear).

4. Fuel Efficiency and Engine Performance

Take-off Climb Performance: A headwind assists the aircraft in climbing more efficiently as the engines do not need to work as hard to overcome inertia. This is especially important for fully loaded aircraft or those operating at high-altitude airports.

Reduced Stress on Brakes and Tyres: Slower ground speeds during landing reduce the wear and tear on braking systems and tyres.

5. Exceptions to the Rule

While taking off and landing into the wind is the norm, there are exceptions:

Crosswinds: Sometimes, wind direction does not align perfectly with the runway. Pilots must use crosswind techniques, such as crabbing or sideslipping, to maintain control.

Operational Constraints: At some airports, terrain, obstacles, or air traffic patterns may require take-offs or landings with a slight tailwind.

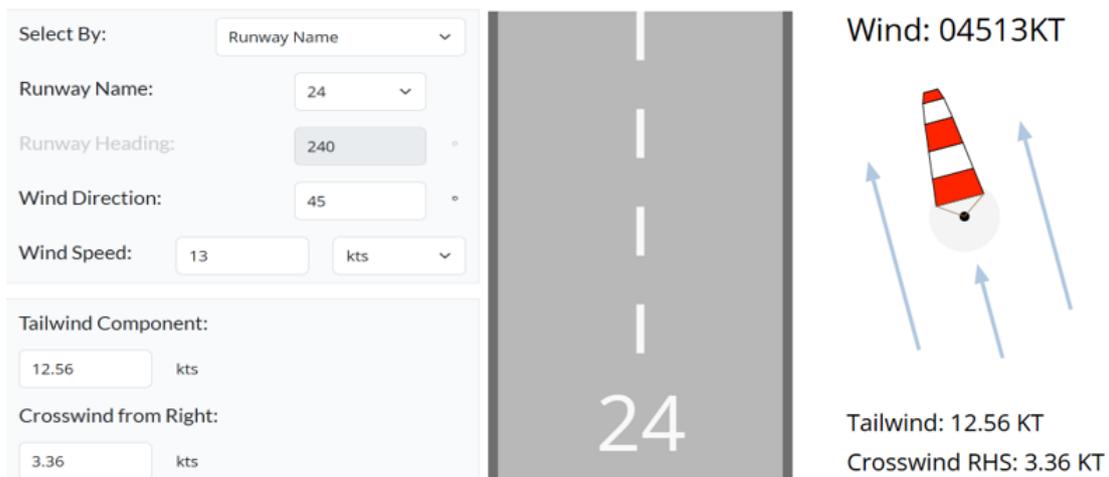


Figure 5: The windsock, associated wind conditions and crosswind component calculation on the day of the serious incident.

Aircraft Performance: *Landing (Maximum Performance)*

Airspeed on Final: 65 KAIS (Full Flaps)

Touchdown: Main wheels first

Landing roll: Lower the nose wheel as quickly as possible

Brakes: Maximum possible without locking the wheels

Findings

Man

1. The pilot had a Private Pilot Licence (PPL) that was initially issued by the Regulator (SACAA) on 15 May 2023. The PPL was reissued on 10 June 2024 with an expiry date of 31 May 2026. The pilot's Class 2 aviation medical certificate was issued on 15 September 2025 with an expiry date of 30 September 2026.

2. The pilot had a total of 288.4 flying hours of which 96.8 hours were accumulated on the aircraft type. The aircraft type was endorsed on the pilot's logbook.

Machine

3. The aircraft had a valid Certificate of Airworthiness (C of A) that was issued by the Regulator on 11 September 2025 with an expiry date of 30 September 2026. The Certificate of Registration (C of R) was issued to the current owner on 5 June 2019.
4. The latest annual inspection of the aircraft was conducted and certified on 11 September 2025 at 1810.5 hours after which a Certificate of Release to Service (CRS) was issued with an expiry date of 10 September 2026 or at 1910.51 hours, whichever comes first. The aircraft had a total of 1818.5 hours at the time of the accident. It had accumulated a total of 8 hours since the annual inspection.
5. The aircraft maintenance organisation (AMO) that conducted the mandatory maintenance of the aircraft had an AMO Certificate that was issued on 13 December 2024 with an expiry date of 31 December 2025. The aircraft type was endorsed on the AMO's operational specifications.

Environment

6. Strong weather conditions of approximately 13 kts with a tailwind component prevailed at the time of the flight as indicated by the windsock and as observed by the pilot; the weather was an attribute to this accident.

Mission

7. During landing, the aircraft encountered strong tailwind conditions that increased the landing speed and the subsequent landing distance. The aircraft, upon touchdown, drifted to the right side of the runway and the right main wheel rolled over an uneven terrain which caused the landing gear to collapse. The aircraft came to a full stop a few metres from the runway.
8. The pilot elected to land on Runway 24 despite the prevailing wind from 060° at 13 kts, gusting 23 kts which resulted in a significant tailwind component during landing. The aircraft touched down with an increased landing distance which, consequently, reduced the available stopping distance. The combination of excessive ground speed due to the tailwind, the reduced landing distance available, and the uneven surface beyond the runway edge contributed to the subsequent runway excursion and the collapse of the left main landing gear after the aircraft departed the prepared surface.

Probable Cause(s)

The pilot failed to correctly assess the prevailing surface wind and, as a result, proceeded to land on Runway 24. The aircraft landed in a tailwind and the pilot lost directional control.

Contributing Factor(s)

1. The pilot made an incorrect assessment of the prevailing surface wind.

Safety Action(s)
None.
Safety Message and/or Safety Recommendation/s
None.
About this Report
<p><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 desktop 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></p> <p><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></p>
Purpose
<p><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></p>
Disclaimer
<p><i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i></p>

This report is issued by:

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