SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10513								
Classification	Accident		**Date**	25 September 2024		**Time**	1630Z		
Type of Operation	Private (Part 94)								
Location									
Place of Departure	Elandsvlei Farm Private Airstrip in Piketberg, Western Cape Province		Place of Intended Landing		Elandsvlei Farm Private Airstrip in Piketberg, Western Cape Province				
Place of Occurrence	During landing on Runway 02 at Elandsvlei Farm private airstrip in Piketberg, Western Cape Province								
GPS Co-ordinates	Latitude	32°47'.58" S	Longitude	018°51'.49" E		Elevation	514 feet		
Aircraft Information									
Registration	ZU-IGP								
Make; Model; S/N	Babst C. F; Carl Babst Raven Z090 (Serial Number: 200901)								
Damage to Aircraft	Substantial			Total Aircraft Hours		571.2			
Pilot-in-command									
Licence Type	National Pilot Licence (NPL)			Gender	Male		Age	53	
Licence Valid	Yes	Total Hours		898.6	Total Hours on Type			604.9	
Total Hours 30 Days	9.9			Total Hours on Type Past 90 Days		9.9			
People On-board	1+1	**Injuries**	0	**Fatalities**	0	**Other (on ground)**		0	

What Happened

On Wednesday, 25 September 2024, a pilot and a passenger on-board a Carl Babst Raven Z090 aircraft with registration ZU-IGP were on a private flight from Elandsvlei Farm private airstrip in Piketberg, Western Cape province, with the intention to land at the same airstrip. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he conducted a pre-flight inspection of the aircraft and no abnormalities were found. The aircraft had a total of 27 litres (l) of Avgas 100LL fuel in the tanks. The pilot started the engine in front of the hangar which was situated north of the runway and waited for it (engine) to warm up. He later taxied the aircraft to the threshold of the gravel Runway 02 in preparation for departure. *The runway is 540 metres (m) in length*. Upon reaching the threshold of Runway 02, the pilot executed a 180° (degrees) turn, thus, facing south and performed the pre-departure checks. At 1555Z, the pilot opened the throttle to 5 500 revolutions per minute (RPM) and commenced with the take-off run. The aircraft rotated and climbed to 2 000 feet (ft). After levelling off the aircraft, he retarded the throttle to 5 000 RPM whilst cruising at a speed of 125 miles per hour (mph).

After approximately 35 minutes of flight time, the aircraft returned to the airstrip. Whilst overhead the airstrip, the pilot checked the windsock and the wind direction favoured landing on Runway 02. The pilot commenced with the approach for landing on Runway 02. Before the aircraft could reach the threshold at approximately 60 mph and 30 ft above ground level (AGL), the pilot flared the aircraft. The aircraft then lost height and landed hard on the grass area approximately 20 metres (m) short of the runway threshold and rolled until it stopped on the gravel runway. The aircraft sustained substantial damage. Both the main gear landing gear boxes that are built into the centre section part of the wing with the ribs attached to them pushed upwards and the main landing gear oleos bent during the accident sequence. The pilot and the passenger were unharmed.

The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 32º47'.58" South 018º51'.49" East, at an elevation of 514 feet (ft).

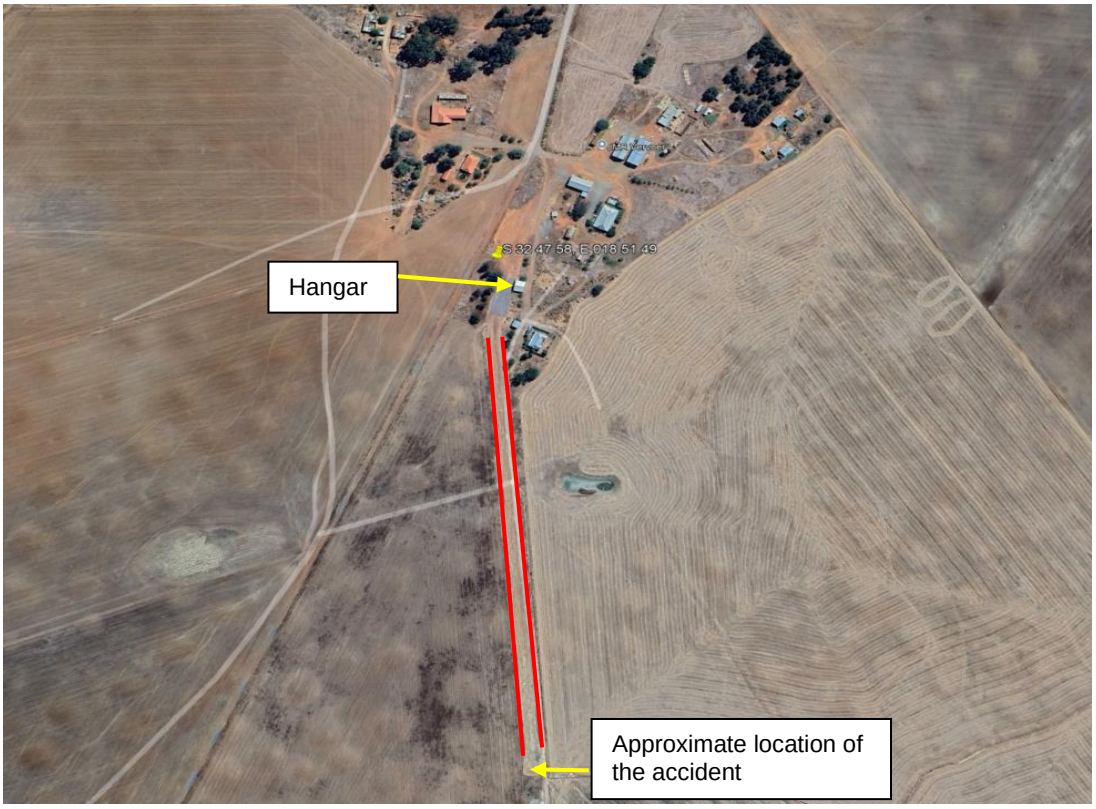


Figure 1: Elandsvlei Farm runway and the approximate location of the accident. (Source: Google Earth)

Figure 2: The runway and the direction of landing. (Source: Pilot)

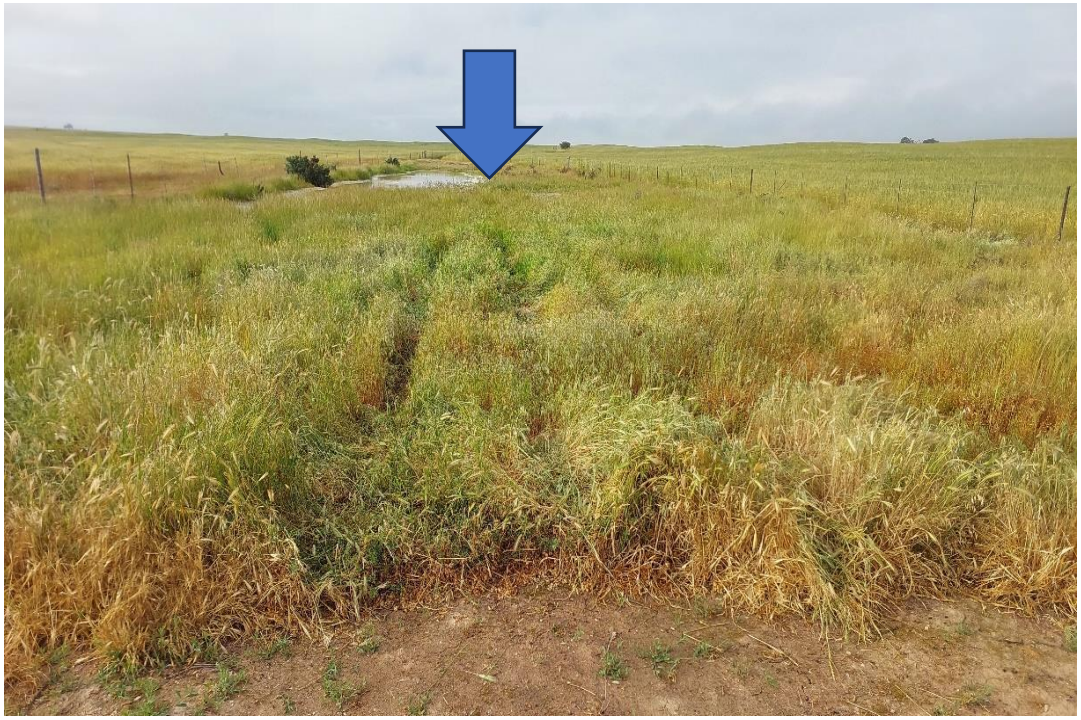


Figure 3: The direction of landing and the impression marks left by the aircraft's main wheels and the tail, short of the threshold of the gravel runway. (Source: Pilot)

Figure 4: The aircraft after it was recovered from the accident site. (Source: Pilot)

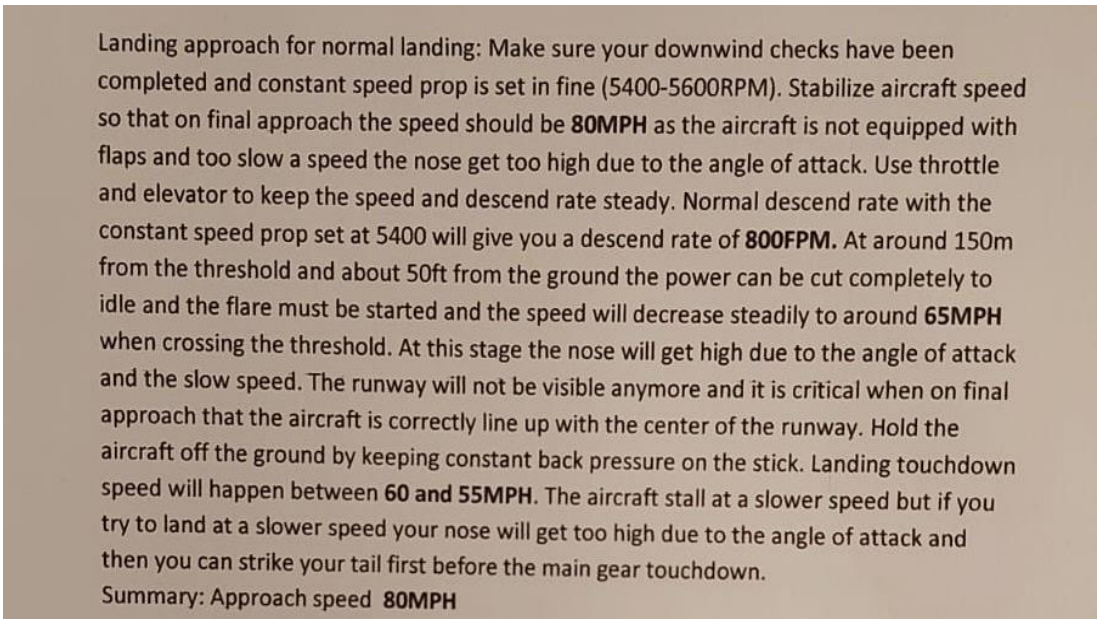
Figure 5: Damage sustained to the left side of the main gear landing gear box. (Source: Pilot)

Meteorological Information

The weather information entered in the table below was obtained from the pilot questionnaire.

Wind Direction	036º	Wind Speed	5 knots	Visibility	9999 m
Temperature	18ºC	Cloud Cover	8	Cloud Base	7 000ft
Dew Point	Unknown	QNH	Unknown		

Before landing checks in accordance with (IAW) the Pilot's Operating Handbook (POH):



Landing approach for normal landing: Make sure your downwind checks have been completed and constant speed prop is set in fine (5400-5600RPM). Stabilize aircraft speed so that on final approach the speed should be **80MPH** as the aircraft is not equipped with flaps and too slow a speed the nose get too high due to the angle of attack. Use throttle and elevator to keep the speed and descend rate steady. Normal descend rate with the constant speed prop set at 5400 will give you a descend rate of **800FPM.** At around 150m from the threshold and about 50ft from the ground the power can be cut completely to idle and the flare must be started and the speed will decrease steadily to around **65MPH** when crossing the threshold. At this stage the nose will get high due to the angle of attack and the slow speed. The runway will not be visible anymore and it is critical when on final approach that the aircraft is correctly line up with the center of the runway. Hold the aircraft off the ground by keeping constant back pressure on the stick. Landing touchdown speed will happen between **60 and 55MPH**. The aircraft stall at a slower speed but if you try to land at a slower speed your nose will get too high due to the angle of attack and then you can strike your tail first before the main gear touchdown.
Summary: Approach speed **80MPH**

Findings

1. Personnel Information

1.1 The pilot had a National Pilot Licence (NPL) that was initially issued by the Regulator (SACAA) on 8 October 2022 with an expiry date of 7 October 2024. The pilot had flown a total of 898.6 hours, with 604.9 hours flown on the aircraft type.

1.2 The pilot was issued a Class 4 aviation medical certificate on 14 December 2023 with an expiry date of 31 December 2026.

1.3 The pilot was required to wear corrective lenses for defective distant vision (VDL) whilst flying, according to his aviation medical certificate.

2. Aircraft Information

2.1 The last 100-hour annual inspection of the aircraft before the accident flight was certified on 17 March 2024 at 543.7 airframe hours. The aircraft accrued 27.5 hours since the last inspection.

2.2 The aircraft had a valid Authority-to-Fly (ATF) Certificate that was initially issued on 12 March 2020. The latest ATF was issued on 28 March 2024 with an expiry date of 31 March 2025.

2.3 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 13 August 2015.

2.4 The aircraft was issued a Certificate of Release to Service (CRS) on 17 March 2024 with an expiry date of 17 March 2025 or at 643.7 airframe hours, whichever occurs first.

2.5 The aircraft's maximum take-off mass is 540 kilograms (kg). The aircraft weighed 530.3kg when it landed, which meant that it was operated within its allowable weight limit at the time of the accident.

Probable Cause(s)

The air speed was decreased to below 65 mph during the flare, consequently, the aircraft lost lift and landed hard on the grass area approximately 20m short of the threshold of Runway 02.

Contributing Factor(s)

None.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

In the interest of safety and to avoid injury and damage to property, pilots should be vigilant during the critical phases of flight such as take-offs and landings; this accident could have been avoided if the pilot executed a go-around after noticing that the aircraft was low in height and speed.

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