LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10046						
Classification	Accident	**Date**	6 October 2021	**Time**	1338Z		
Type of Operation	Private (Part 94)						
Location							
Place of departure	Upington Airfield, Northern Cape Province	Place of intended landing	Mossel Bay Airfield, Western Cape Province				
Place of Incident	Karoo Gateway Airport (FABW), Northern Cape Province						
GPS Co-ordinates	Latitude	S32°17´56.97"	Longitude	E22°40´22.83"	Elevation	2929ft	
Aircraft Information							
Registration	ZU-SMP						
Model/Make	Jabiru 430 (Serial Number: 437)						
Damage to Aircraft	Substantial	Total Aircraft Hours	817				
Pilot-in-command							
Licence Valid	Yes	Gender	Male	Age	22		
Licence Type	Commercial Pilot Licence (Aeroplane)						
Total Hours on Type	26.9	Total Flying Hours	273.2				
People On-board	1 + 2	Injuries	0	Fatalities	0	Other (On ground)	0

What Happened

On Wednesday, 6 October 2021, a pilot accompanied by two passengers on-board a Jabiru 430 aircraft with registration ZU-SMP took off on a private flight from Upington Airfield in the Northern Cape province to Mossel Bay Airfield in the Western Cape province. The pilot had planned to land at Karoo Gateway Airport where he intended to refuel the aircraft and then proceed with his journey. Good weather conditions prevailed during the duration of the flight. 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.

The pilot stated that the flight from Upington to Karoo Gateway Airport was uneventful, except for an occasional partial loss of engine power during flight. The engine rpm oscillation happened about six times during the leg from Upington to Karoo Gateway Airport. The pilot stated that he refueled the aircraft at Karoo Gateway Airport to 135 litres, which is full capacity, before lining up on

Runway 08 (RWY08). The pilot then started the take-off run and when the speed had passed 65 knots (kts) approaching 75 kts, the aircraft rotated. When the aircraft was approximately 50 feet (ft) off the ground, the left wing dropped, and the aircraft drifted off to the left. The pilot tried to level the wings. However, the pilot realised that the aircraft was not going to climb further, and he closed (cut-off) the power and opted to land on a field near the runway. During the landing process, the aircraft impacted the ground (left wing first) and spun around, coming to rest facing a southerly direction.

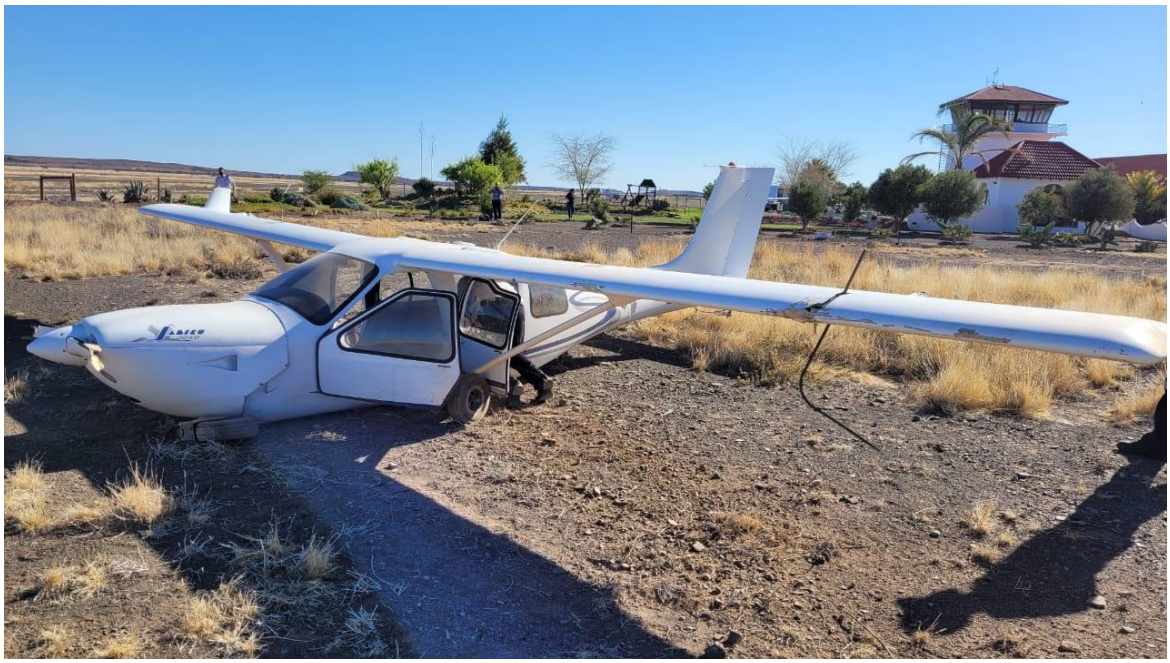


Figure 1: Aircraft at its resting position after the accident. (Source: Pilot)

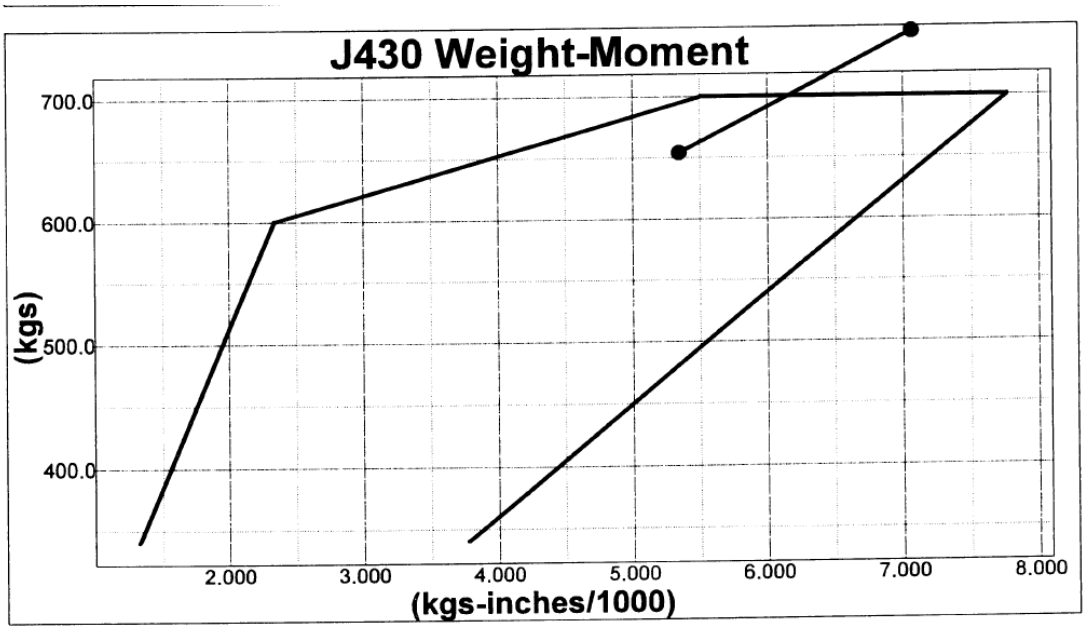
What was found:

On the day of the accident, the aircraft's weight was 751 kilograms (kg) and the maximum take-off weight (MTOW) is 700kg, according to the Pilot's Operating Handbook. The weight and balance calculation moment graph was calculated (as shown in Figure 3) and indicated a centre of gravity (CoG) outside the recommended envelope.

2.4. WEIGHTS and LOADING

Maximum takeoff weight	700 kg
Maximum landing weight	700 kg

Figure 2: Extract from Pilot's Operating Handbook. (Source: POH)



Graph 1: Data of the weight and moment of the aircraft on the accident date. (Source: Pilot)

The density altitude on the day was calculated to be 4733ft, meaning that the pilot would have needed more runway length if the aircraft was within the maximum take-off weight (Figure 3).

Density Altitude Calculator

Elevation	◉ feet	○ m	2929	
Air Temperature	○ deg F	◉ deg C	26.4	
Altimeter Setting	○ in Hg	◉ hPa	1020	
Dew Point	○ deg F	◉ deg C	-4.4	

Calculate Reset

Density Altitude	4733	feet	1443	m
Absolute Pressure	27.07	in Hg	916.7	hPa
Air Density	0.0664	lb/ft3	1.064	kg/m3
Relative Density	86.87	%	86.87	%
Estimated AWOS	4700	feet	1433	m

Figure 2: Density Altitude Calculator on the accident date.

Probable cause:

The pilot took-off with the aircraft at 51kg above its MTOW, which ultimately caused the aircraft to not achieve a positive rate of climb and, subsequently, descended back towards the ground.

Safety Action/s

None.

Safety Message and/or Safety Recommendation/s

Pilots need to take head of their mass and balance calculations prior to undertaking/engaging in operations.

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, 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****.*

About this Report

Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no 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 brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information 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 accident.

This report provides an opportunity to share safety message/s in the absence of an investigation.

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.

Disclaimer

This report is issued by:

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