

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10208						
Classification	Accident	Date	14 August 2022	Time	1200Z		
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Brakpan Airfield (FABB), Gauteng Province		Place of Intended Landing	Brakpan Airfield (FABB), Gauteng Province			
Place of Occurrence	Runway 18 at Brakpan Airfield (FABB)						
GPS Co-ordinates	Latitude	26°14'00.85"S	Longitude	28°17'59.03" E	Elevation	5383 ft	
Aircraft Information							
Registration	ZU-RGV						
Make; Model; S/N	Auto-Gyro GmbH (Serial Number: ZA 10S10)						
Damage to Aircraft	Substantial			Total Aircraft Hours	343.6		
Pilot-in-command							
Licence Type	National Pilot Licence (NPL) & Airline Transport Pilot Licence (ATPL)		Gender	Male	Age	65	
Licence Valid	Yes	Total Hours	19 095.0	Total Hours on Type	115.0		
Total Hours Past 90 Days	60.0		Total Hours on Type Past 90 Days	5.0			
People On-board	1 + 1	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On 14 August 2022, a pilot and a passenger on-board an Auto-Gyro GmbH Gyrocopter with registration ZU-RGV took off on a private flight from Brakpan Airfield (FABB) in Gauteng province, with the intention to return to the same take-off aerodrome. 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.</p> <p>The pilot reported that he carried out the pre-flight checks, and no anomalies were found. He then taxied the aircraft to the holding point of Runway 18 in preparation for take-off. After ensuring that all the engine indications were within the green arch, the pilot taxied the aircraft to the threshold of Runway 18 and commenced with the take-off roll. The gyrocopter pre-rotated at a speed of approximately 120 main rotor (MR) revolutions per minute (RPM) and, at that time, a sudden gust of wind tilted the main rotor to the far-aft position, which was beyond the gyrocopter's take-off operational angle. This resulted in the main rotor blades coming into contact with the propeller blades and the vertical stabiliser. The gyrocopter came to a stop on the runway; it sustained substantial damage to the rudder and the propeller blade tips. The pilot and the passenger were not injured during the accident sequence.</p>							

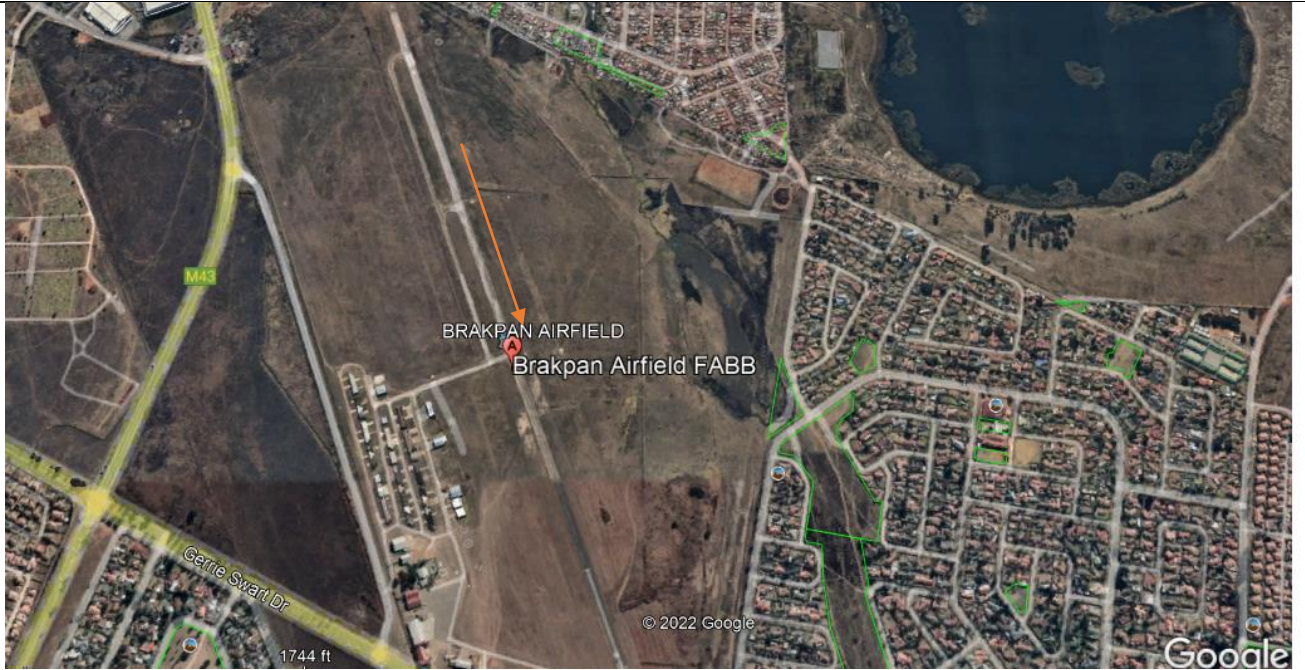


Figure 1: The arrow shows the direction of take-off at FABB. (Source: Google Earth)



Figure 2: Damaged propeller blade tips. (Source: Pilot)



Figure 3: Damaged rudder. (Source: Pilot)

Findings

1. Personnel Information

- 1.1 The pilot was issued a National Pilot Licence (NPL) and an Airline Transport Pilot Licence (ATPL). The NPL was initially issued on 25 February 2003. His last validation for the NPL was conducted on 1 April 2021 with an expiry date of 31 March 2023. A gyrocopter type rating was endorsed on his licence. The pilot's Class 2 medical certificate was issued on 2 December 2021 with an expiry date of 31 March 2023 and with a restriction to wear suitable corrective lenses. The pilot had a total of 115 flying hours on the gyrocopter type.

The pilot's ATPL was initially issued on 9 February 2016. His last validation was conducted on 27 October 2022 with an expiry date of 30 November 2023. His Class 1 medical certificate was issued on 31 March 2022 with an expiry date of 31 March 2023, and with a restriction to wear suitable corrective lenses. The pilot had 19 095 total flying hours on the ATPL.

2. Aircraft Information

- 2.1 The aircraft's Certificate of Registration (C of R) was issued to the current owner on 28 October 2019. The aircraft was issued an Authority to Fly (ATF) on 18 January 2018 with an expiry date of 31 October 2022.
- 2.2 According to the latest Certificate of Release to Service (CRS), the aircraft's last annual inspection was carried out on 23 September 2021 at 331.3 airframe hours. At the time of the accident, the aircraft had 343.6 airframe hours. It was flown a further 12.3 airframe hours since the last annual inspection.

- 2.3 Examination of the flight folio showed no outstanding defects.
- 2.4 The last aircraft maintenance was carried out by an approved person with a certificate that had expired on 31 December 2018.
- 2.5 The weather information below was obtained from the Springs Automatic Weather Station (AWS) which is based at Springs Aerodrome (FASI). The weather information was issued by the South African Weather Service (SAWS) on 14 August 2022 at 1200Z. FABB is located 5 nautical miles (nm) from FASI.
- FASI 141200Z 30311G17KT CAVOK
- 2.6 Extract from the Pilot's Operating Handbook (POH):

Section 2: Limitations

2.2 Environmental Limitations

Maximum wind speed or gust intensity40 kts

Maximum demonstrated crosswind component for take-off and landing ...20 kts

According to the above extract and weather report, the wind was 13kt which is below the maximum wind speed or gust intensity. The weather did not contribute to this accident.

Section 4: Normal Procedures

4.8 Take-off Procedure

- Check relative wind*
- Maintain control stick in forward position with right hand*
- Switch pneumatic mode selector to FLIGHT and return to brake with left hand*
- Hold wheel brake without having locking pawl engaged*
- While holding wheel brake adjust 2000 RPM with throttle*
- Activate and hold pre-rotator*
- Let pneumatic clutch fully engage (stabilization at about 100 rotor RPM). If necessary release pre-rotator button momentarily and press again to maintain engine RPM within green arc, respectively prevent engine from stalling!*
- Carefully increase throttle at a rate of ~ 20 RRPM/sec to 200 RRPM to a max. 220 RRPM*
- Release pre-rotator button*
- Gently move control stick fully aft (stick travel ~ 1 sec.). In a strong headwind be prepared to stop movement before nose wheel rises!*
- Release wheel brake with throttle unchanged*
- Monitor rotor speed and adequately increase throttle to take-off power*

2.7	Although the pilot attributes the gust of wind to be the cause of the accident, the POH states that the maximum wind speed or gust intensity is 40 knots (kts) and the maximum demonstrated crosswind component for take-off and landing is 20 kts. According to the weather information, the wind was 303° at 11 kts gusting 17 kts.
2.8	The POH states that the gyrocopter must be rotated at 200 rotor RPM; however, the pilot rotated the gyrocopter at 120 rotor RPM.
Probable Cause	
The gyrocopter was rotated at low rotor RPM, which caused the main rotor blades to tilt to the far-aft position beyond the take-off operational angle; this resulted in the main rotor blades contacting the propeller blades and the tail section (rudder) of the gyrocopter.	
Contributing Factors	
<ul style="list-style-type: none"> • Incorrect take-off technique. • Pilot's limited experience on the gyrocopter. 	
Safety Action	
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 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.</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	
<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>	
Disclaimer	
<i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i>	

This report is issued by:

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