AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

			Reference:	CA18/2/3/9993	
Aircraft Registration	ZU-BDY	**Date of Accident**	3 May 2021	**Time of Accident**	0817Z
Type of Aircraft	Magni M16 Gyrocopter		**Type of Operation**	Private (Part 94 NTCA)	
Pilot-in-command Licence Type	National Pilot Licence (NPL)		**Age** 50	**Licence Valid**	Yes
Pilot-in-command Flying Experience	**Total Flying Hours**	190		**Hours on Type**	190
Last Point of Departure	Laingsburg Airfield, Western Cape Province				
Next Point of Intended Landing	Morning Star Airfield, Western Cape Province				
Damage to Aircraft	Destroyed				

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

Baviaan Weg farm, Laingsburg, at Global Positioning System (GPS) co-ordinates determined to be 33°21'00" South 020°74'00" East, at an elevation of 835 feet (ft)

Meteorological Information							
Number of People On-board	1+1	**Number of People Injured**	1	**Number of People Killed**	1	**Other (On Ground)**	0

Synopsis

On Monday morning, 3 May 2021, a pilot and a passenger on-board a Magni M16 gyrocopter with registration ZU-BDY took off on a private flight from Laingsburg Airfield, Western Cape province to Morning Star Airfield in the same province. The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended. Clear weather conditions prevailed at the time of the flight.

The gyrocopter engine stopped whilst en route to Morning Star Aerodrome. The gyrocopter lost thrust and height which led the pilot to execute a forced landing, however, it was unsuccessful. The gyrocopter impacted the ground and a post-impact fire ensued soon after, which destroyed the gyrocopter. The passenger was fatally injured during the accident, and the pilot was hospitalised after sustaining serious injuries.

The investigators had a telephone conversation with the pilot after he was released from hospital. Although the pilot promised to co-operate with the investigation, he is yet to submit the accident questionnaire and respond to the investigators' emails. The approved person (AP) who was responsible for prior two repairs conducted on the gyrocopter following the nose gear accident and the collapse of the hangar roof is also not co-operating with the investigators.

Conclusion

Given the fact that this investigation revealed non-adherence to the Civil Aviation Regulations (CAR) 2011 and the manufacturer's prescripts, as well as the non-cooperation of the pilot and the AP, the investigation has been hindered. Only factual information of the investigation is presented.

SRP Date	14 March 2023	Publication Date	30 March 2023

Occurrence Details

Reference Number	**:** CA18/2/3/9993
Occurrence Category	**:** Category 1
Type of Operation	**:** Private (Part 94 NTCA)
Name of Operator	**:** Roux, Pieter Bredell
Aircraft Registration	**:** ZU-BDY
Aircraft Make and Model	**:** Magni Gyro, Magni M16
Nationality	**:** South African
Place	**:** Baviaan Weg farm, Laingsburg, Western Cape Province
Date and Time	**:** 3 May 2021at 0817Z
Injuries	**:** Pilot was seriously injured, and the passenger was fatally injured
Damage	**:** Destroyed

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.

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.

Investigation Process

The accident was notified to the Accident and Incident Investigations Division (AIID) on 3 May 2021 at about 1217Z. The investigators dispatched to Laingsburg, Western Cape province on 3 May 2021 to conduct an on-site (full scope) investigation. The investigators initiating the on-site investigation process according to CAR Part 12 and investigation procedures. The AIID is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
   Accident — this investigated accident
   Aircraft — the Magni M16 Gyrocopter involved in this accident
   Investigation — the investigation into the circumstances of this accident
   Pilot — the pilot involved in this accident
   Report — this accident report

2. *Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows, or lines.*

Disclaimer

Table of Contents

Abbreviation	Description
AIID	Accident and Incident Investigations Division
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AP	Approved Person
ATF	Authority to Fly
°C	Degree Celsius
CAA	Civil Aviation Authority
CAR	Civil Aviation Regulations
CAVOK	Ceiling and Visibility OK
CVR	Cockpit Voice Recorder
C of R	Certificate of Registration
E	East
ELEV	Elevator
FDR	Flight Data Recorder
ft	Feet
GPS	Global Positioning System
hPa	Hector Pascal
IIC	Investigator-in-charge
IOC	Investigator On Call
KM	Kilometer(s)
kts	Knot(s)
m	Metre
METAR	Meteorological Aerodrome Report
MHz	Megahertz
MPH	Miles per Hour
MPI	Mandatory Periodic Inspection
N/A	Not Applicable
NM	Nautical Mile
Q	Quart(s)
QNH	Query: Nautical Height
RWY	Runway
S	South
SACAA	South African Civil Aviation Authority
SAGPA	South African Gyro Pilots Association
SAWS	South African Weather Service
UTC	Co-ordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1. It was reported that on Thursday, 29 April 2021 at 0700Z, the Magni M22 gyrocopter with registration ZU-BDY, took off with four other gyrocopters with registrations ZU-EZR, ZU-RHI, ZU-CVH and ZU-RHA from Morning Star Airfield in Cape Town, Western Cape province, to take part in an annual event called North Meets South which was organised by the South African Gyro Pilots Association (SAGPA) at Gariep Dam, 358 nautical miles (nm) from Morning Star Airfield. The gyrocopters flew in a fingertip formation. One gyrocopter was a Magni M22 with a fuel tank capacity of 79 litres, and the other four gyrocopters were Magni M16s, each with a fuel tank capacity 69 litres. The flight was conducted in visual flight rules (VFR) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. The gyrocopters first landed at Richmond Airfield, which is 73nm from Morning Star Airfield at approximately 0730Z. The pilot of the accident gyrocopter topped up the main tanks with 69 litres of Mogas fuel, and 50 litres in the aux tanks. After refuelling, the five gyrocopters took off to Laingsburg Airfield, which was 115nm from Richmond Airfield. They landed at approximately 0830Z for another fuel top-up.

1.1.3. The pilot of the ZU-EZR gyrocopter stated that they were flying at approximately 1500 feet (ft) above ground level (AGL) at an average speed of 80 miles per hour (mph).

1.1.4. The pilot of ZU-RHI who was flying behind the accident gyrocopter (ZU-BDY) stated that they were communicating with each other on radio frequency 123.45-Megahertz (MHz) during the flight. The trip to Gariep Dam was uneventful; the pilots arrived at their destination at approximately 1245Z and stayed over for a weekend.

1.1.5. The pilot of ZU-CVH stated that on Sunday, 2 May 2021 at 0904Z, they all topped up their fuel tanks to full capacity (69 litres for Magni M16s and 79 litres for Magni 22) and each gyrocopter carried an extra 50 litres auxiliary fuel tank from Gariep Dam. All gyrocopters were fitted with Rotax 914 Turbo engines. They arrived at Beaufort West Airfield at 1245Z for refuelling and a sleepover at Lemoens Lodge. There were no unusual events as they made their way back to Morning Star Airfield.

1.1.6. According to the pilot of ZU-RHI on Monday, 3 May 2021 at 0838Z, they left Beaufort West Airfield with all gyrocopters topped up to capacity and each with 50 litres of fuel in the auxiliary tanks and headed to Laingsburg Airfield (177nm). The pilots used the fuel bowser at Beaufort West Airfield to uplift fuel.

1.1.7. The ZU-RHI pilot stated that this leg was also uneventful except for the poorly maintained and littered condition of the runway at Laingsburg Airfield. The gyrocopters were all topped up with fuel from the auxiliary fuel tanks that they had carried with them from Beaufort West Airfield. Meanwhile, the pilot of the ZU-BDY gyrocopter collected a passenger who was dropped off earlier (by his brother) at Laingsburg to enjoy a scenic flight back home.

1.1.8. The pilot of ZU-RHI stated that he took off last, but he intended to catch up with the other four gyrocopters in front of him. About 10 to 15 minutes after take-off, he spotted the ZU-BDY gyrocopter flying at a very low speed; thereafter, it suddenly went down. The main rotor hit the ground and broke apart. Immediately after impact, the pilot of ZU-BDY gyrocopter crawled out of the wreckage, but at that time, the gyrocopter caught fire (which was intense), and a big ball of fire erupted, which lasted a few seconds. The pilot of ZU-RHI gyrocopter was approximately 100 to 200 metres behind the ZU-BDY at the time of impact. He then called a Mayday using a two-way radio, thereafter, he initiated a left orbit and, whilst on his second orbit around the wreckage, he noticed that the first of the other three gyrocopters had joined him at the accident site.

1.1.9. The pilot of ZU-RHI gyrocopter further stated that they scanned the area for the closest safe field to land but there was none; thus, they took GPS co-ordinates and alerted local emergency services before they all returned to Laingsburg Airfield for landing.

1.1.10. A witness, who was at his house located approximately 5 kilometres from the accident site, stated: "*I was at home when I noticed the gyrocopter flying very low and, soon after, it started going down very quickly. I then heard a noise and saw some smoke".*

1.1.11. The ZU-BDY pilot sustained serious injuries; the passenger was fatally injured. The gyrocopter was destroyed during the accident sequence and by post-impact fire. The injured pilot was taken to hospital.

1.1.12. On Monday, 15 August 2022, the pilot indicated through a telecommunication call that during the flight the engine lost power and stopped.

1.1.13. The accident occurred during daylight at Baviaan Weg farm at Global Positioning System (GPS) co-ordinates determined to be 33°21'00" South 020°74'00" East, at an elevation of 835 feet (ft).

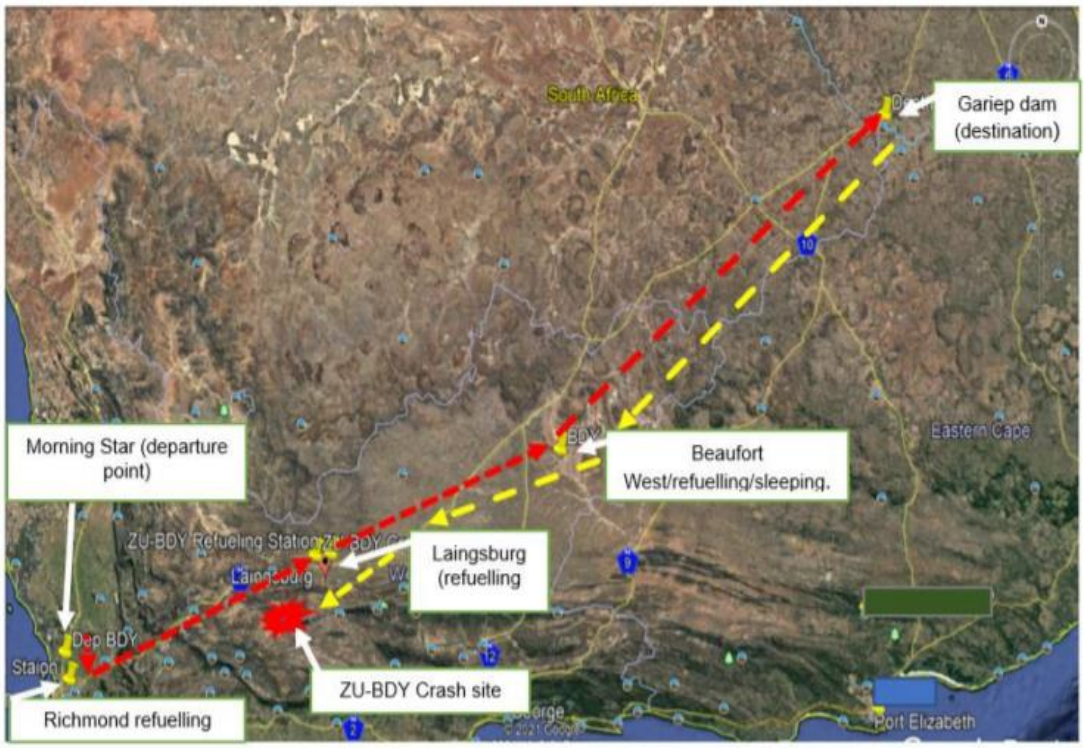

Figure 1: The red line shows the route taken to Gariep Dam; and the yellow line shows the return leg from Gariep Dam to Morning Star Airfield. (Source: Google Earth)

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	1	1	-
Serious	1	-	-	1	-
Minor	-	-	-	-	-
None	-	-	-	-	-
Total	**1**	**-**	**1**	2	**-**

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The aircraft was destroyed by impact and post-impact fire.

Figure 2: The wreckage of the ZU-BDY gyrocopter post-accident.

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	50
Licence Type	National Pilot Licence (NPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Magni Gyro				
Medical Expiry Date	31 December 2021				
Restrictions	Corrective Lenses				
Previous Accidents	Unknown				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant to this accident.

Flying Experience:

Total Hours	190
Total Past 24 Hours	unknown
Total Past 7 Days	unknown
Total Past 90 Days	unknown
Total on Type Past 90 Days	unknown
Total on Type	unknown

Note: The hours depicted above were recorded during the renewal of the pilot's licence on 25 November 2019. The rest of the information was not known as the pilot did not return the pilot questionnaire and did not respond to any communication initiated by the investigators.

1.5.1. The pilot was initially issued a National Pilot Licence (NPL) on 3 May 2016. His licence was reissued on 25 November 2019 with an expiry date of 24 November 2021.

1.5.2. The pilot was issued a Class 1 and Class 2 aviation medical certificate on 10 December 2019 with an expiry date of 31 December 2020.

1.5.3. The pilot was the owner of the gyrocopter. Following the accident, the pilot was supposed to ensure that the following CAR 2011, Part 24.02.6(1)(e) requirements were adhered to:

24.02.6 Period of validity

(1) An authority to fly and a proving flight authority shall be valid until—

(e) the aircraft is involved in an incident or accident that results in major damage to its primary structure.

1.5.4 Following the release of the pilot from the hospital after 3 months, the investigators had a telephone conversation with him regarding the accident and sent him the accident investigation questionnaire. The pilot is yet to return the questionnaire. The investigators made numerous follow-ups with the pilot, but the pilot failed to co-operate with the investigators.

1.5.5 The Approved Person (AP) responsible for the maintenance of the aircraft was also the pilots instructor. The investigation uncovered two previous accidents the gyrocopter was involved in: the first was the failure of the nose gear during landing, and the second was the collapse of the hangar in which the aircraft was parked. Both accidents resulted in substantial damage to the class 1 components of the gyrocopter. The investigation also revealed that the AP was not qualified to undertake any maintenance or repairs to the gyrocopter. This was in contravention of the CAR 2011, Part 44.01.4, SACATS Part 44 which states the following:

"44.01.4 Persons to carry out maintenance

(1) No person may carry out maintenance on an amateur built aircraft or a production-built non-type certificated aircraft, or any component thereof, unless such person—

(a) is appropriately rated or approved on type by the Director or the organisation designated for the purpose in terms of part 149, as the case may be, to carry out maintenance; or

(b) carries out the maintenance under the prescribed supervision of a person authorised by the Director or by the organisation referred to in paragraph (a). A dual check of the maintenance carried out must be performed by a person referred to in subparagraph (a); or

(c) is the owner of the aircraft provided that an appropriately rated approved AMO, AME or Approved Person, rated in accordance with subpart 4 of part 66, performs a dual check on the maintenance which was carried out; or

(d) is an appropriately rated approved AMO, AME or approved person, rated in accordance with subpart 4 of part 66.

1.5.6 There was no evidence of any test flight being carried out in terms of the requirements of the CAR Part 44.01.11, SACATS 44.01.11 and Part 61.19.2(c).

(a) *44.01.11 Test flights*

(1) After any major repair or major modification to an aircraft, test flights shall be carried out in the aircraft under such conditions and in the manner as prescribed in the Document SA-CATS 44.

(2) Only essential crew, as required for the purpose, shall be carried aboard any aircraft undergoing a test flight.

(b) 44.01.11 TEST FLIGHTS

1. General

(a) The flight testing prescribed by regulation 44.01.11 shall be carried out by:

(i) an appropriately rated pilot when a minor modification was carried out;

(ii) an appropriately rated test pilot in terms of Part 61 of these Regulations, if a major modification was carried out

(b) For complex aircraft the manufacturer's test flight procedure(s) may be utilised.

(c) 61.19.2 Requirement for test flight

A test flight shall be carried out—

(c) after maintenance, adjustments or repair to an aircraft which is or likely to affect the flying characteristics of the aircraft and as stipulated in the maintenance manual;

1.6. Aircraft Information

1.6.1. *The Magni Gyro M16 is a two-seater, manufactured in Besnate Italy in 2008. It had a horsepower of 115 turbocharge and a capacity of 69 litres (l) of Mogas fuel. The gyrocopter is fitted with a single Rotax 914 UL engine, driving an ECO–GL–3 propeller. The Magni M16 has three-and a-half hour's endurance at a cruise speed between 65 and 80mph.* (Source: Magni Gyro Pilot Flight Manual)

Airframe:

Manufacturer/Model	Magni Gyro	
Serial Number	MGSA 001	
Year of Manufacture	2008	
Total Airframe Hours (At Time of Accident)	380	
Last Inspection (Date & Hours)	15 August 2020	312.9
Airframe Hours Since Last Inspection	67.1	
CRS Issue Date	15 August 2020	
ATF (Issue Date & Expiry Date)	16 May 2019	31 May 2020
C of R (Issue Date) (Present Owner)	18 February 2013	
Operating Category	NTCA Part 94	
Type of Fuel Used	Mogas	
Previous Accidents	On 16 November 2017, the hangar roof was destroyed by the storm, and it fell on top of the gyrocopter, sustaining substantial damage. Moreover, the gyrocopter was involved in an accident in which the nose gear failed during landing.	

Note: Previous accidents refer to past accidents the aircraft was involved in, when relevant to this accident.

Engine:

Manufacturer/Model	Rotax 914 UL
Serial Number	4418076
Part Number	13071
Hours Since New	380
Hours Since Overhaul	Not reached

Propeller:

Manufacturer/Model	Magni Gyro (ECO-GL-3)
Serial Number	488478489
Part Number	13131
Hours Since New	380
Hours Since Overhaul	Not reached

1.6.2. According to available information, the gyrocopter sustained damage to the nose landing gear, which was not reported.

Figure 3: The picture of the ZS-BDY damaged nose landing gear sustained in the past accident that was not reported.

1.6.3 According to the airframe logbook, on 16 November 2017, the hangar roof which housed the gyrocopter collapsed and the gyrocopter was substantially damaged. Following this accident, the repairs were carried out and signed out by an AP. The occurrences mentioned in paragraphs 1.6.2 and 1.6.3 were not reported. The investigating authority (SACAA) does not have a record of these occurrences in its database. The following Regulatory provisions were not observed by the owner/pilot:

Duties of PIC regarding flight operations CAR Part 91.02.8 (subpart 4g)

A PIC of an aircraft shall—

(g) report any accident or incident involving an aircraft in accordance with Part 12, unless a PIC is incapacitated or an operator has established another means of reporting accidents or incidents, in which case an operator shall initiate the report;

1.6.4 The AP who previously maintained the gyrocopter wrote a letter to the investigation team, stating that an unqualified person had carried out the repairs on the gyrocopter prior to the trip to Gariep Dam and posted them on social media (see Figure 4 and 5). After it was reported that the gyrocopter was involved in an accident, these pictures were removed from social media. Some of the systems that the unqualified person worked on are the rudder, uncovering the body of the gyrocopter, nose landing gear, uncovering the rotor head, and removal of the control rods and the tail section.

Figures 4 and 5: The components worked on by the unqualified person. (Source: Former AP)

1.6.5 According to Magni Gyro Flight Manual, *the engine was introduced in 1996, the Rotax 914 is a turbocharged development of the Rotax 912.*

The Rotax 914 has a turbocharger with an automatic wastegate controller and dual carburettors. It features dual capacitor discharge ignition, liquid-cooled cylinder heads and air-cooled cylinder barrels, an electric starter, a built-in propeller reduction gearbox, dry sump forced oil lubrication and a separate oil tank. It has hydraulic valves that include automatic adjustment. Rotax can provide a purpose-designed air intake, exhaust system and engine mount.

The 914-oil system differs from most dry-sump designs in that lubricating oil is forced into the storage tank by crankcase pressure rather than by a separate scavenge pump. This requires a novel pre-flight inspection procedure: before checking the oil level with the dipstick, the engine is "burped" by removing the oil filler cap and turning the propeller until a gurgling sound is heard, which indicates that all oil has been forced into the tank and the oil level can now be checked accurately.

The 914 is more fuel efficient and lighter than similarly sized traditional engines, but originally had shorter overhauls (TBO), restricting its market potential. On introduction, the TBO was only 600 hours, which was double that of previous Rotax engines but far short of existing engines of comparable size and power. However, by 1999 the TBO had been increased to 1,000 hours, and it was increased again to 2,000 hours in 2010.

Figure 6: The Rotax engine. (Source: Flight Manual)

1.7. Meteorological Information

1.7.1 A weather report was obtained from the South African Weather Service (SAWS) for the day and time of the accident. The Meteorological Aerodrome Report (METAR) was recorded at Laingsburg Airfield on 3 May 2021 at 1200Z. The gyrocopter accident occurred at an open field, 17 nautical miles (nm) west of Laingsburg, Western Cape province at 1217Z.

Wind Direction	020°	Wind Speed	05kt	Visibility	9999m
Temperature	28.6°C	Cloud Cover	CAVOK	Cloud Base	Nil
Dew Point	2.2°C	QNH	1018hPa		

1.8. Aids to Navigation

1.8.1. The aircraft was equipped with standard navigational equipment as approved by the Regulator. There were no records indicating that the navigation equipment was unserviceable prior to the accident.

1.9. Communication

1.9.1. The aircraft was equipped with a standard communication system as approved by the Regulator. There were no recorded defects with the communication system prior to the accident.

1.10. Aerodrome Information

1.10.1. None.

1.11. Flight Recorders

1.11.1. The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor was it required by regulation to be fitted to the aircraft type.

1.12. Wreckage and Impact Information

1.12.1. The gyrocopter accident occurred south-west of Laingsburg. The gyrocopter impacted the ground at an open field in a steep nose-down attitude with its right-side first on a heading of approximately 212 degrees magnetic. The aircraft was found resting on its right side. There was evidence of impact and fire damage. The cockpit was destroyed by post-impact fire.

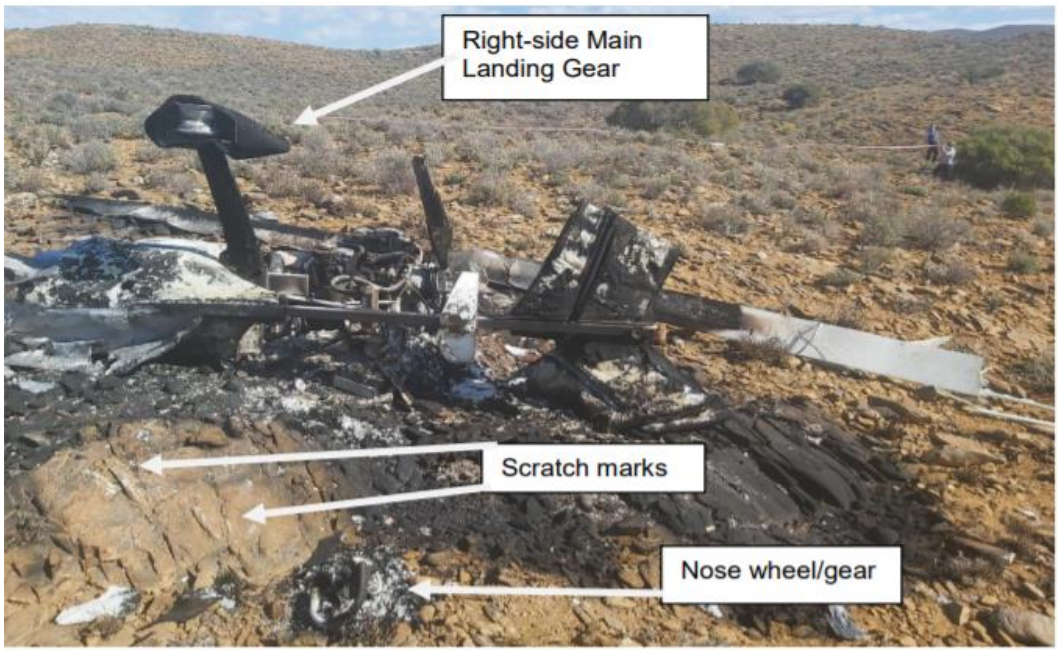

Figure 6: The wreckage shows the gyrocopter resting on its right side.

1.12.2 On-site investigation found that the gyrocopter had enough fuel at the time of the accident. The fuel tank was burnt, and some fuel had spilled onto the ground.

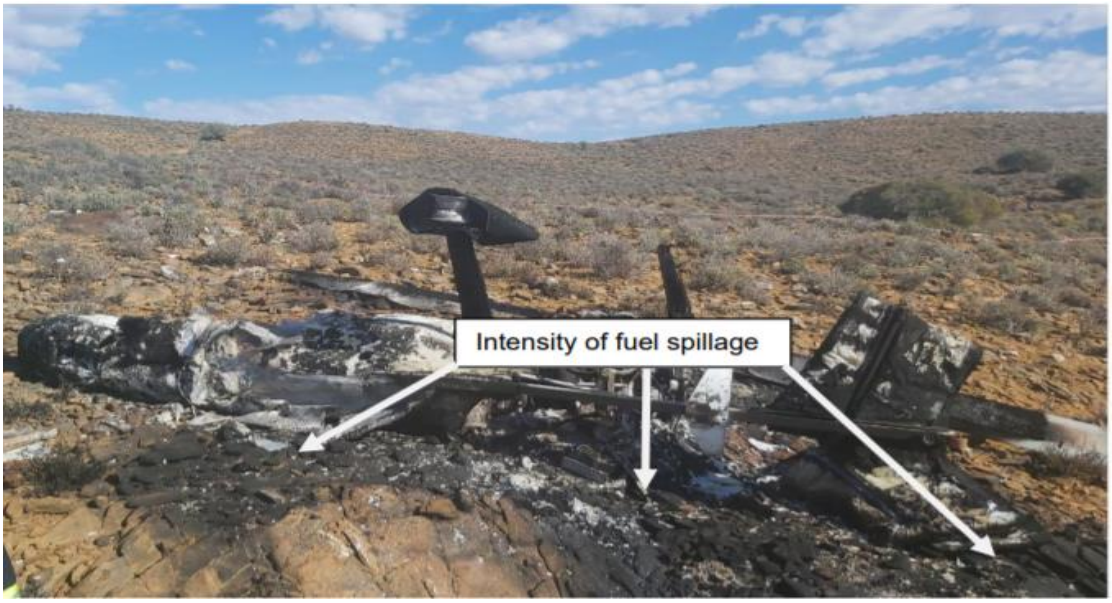

Figure 7: Spilled fuel on the ground.

1.12.3 The engine was still intact except for electrical wiring. Rubber pipes and belts that formed part of the engine were damaged by fire. The engine could not be turned 90° by hand due to the damaged propeller hub during impact.

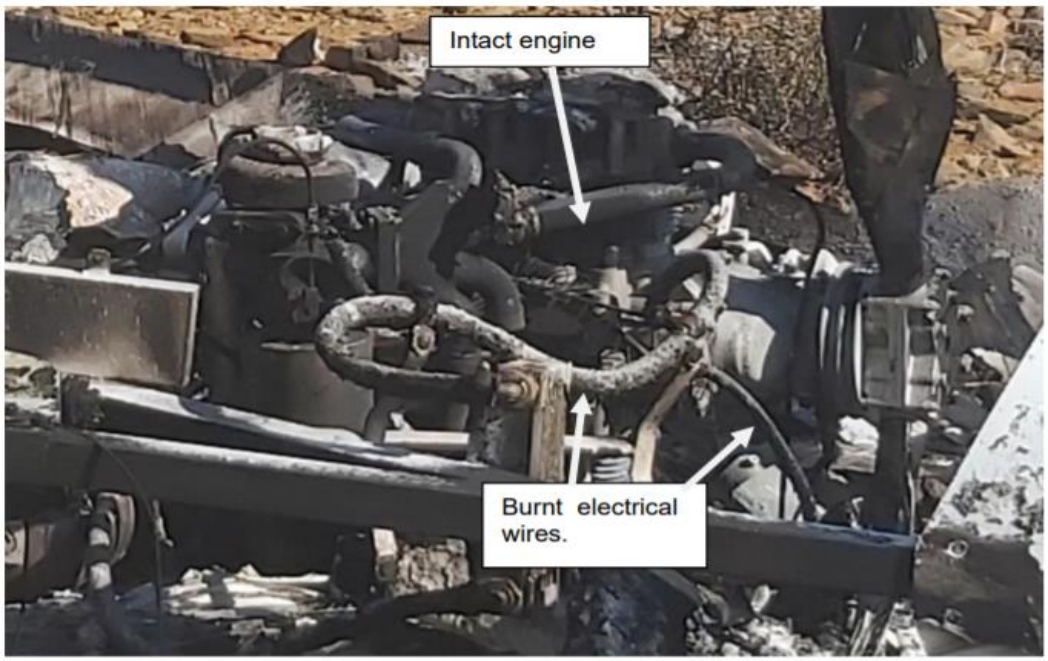

Figure 8: The engine was found still intact.

1.12.4 On-site investigation found that the propeller blades were not turning at the time of impact. They were burnt in the fire.

Figure 9: The burnt propeller blades.

1.12.5 Continuity of flight controls was checked and confirmed to the front with no broken strands on cables.

Figure 10: Continuity of flight controls still intact.

1.12.6 The main rotor blades and the propeller blades were not at full power, which was consistent with the engine failure. Damage sustained by both the propeller blades and the main rotor blades was a result of the impact with the ground and post-impact fire.

1.13. Medical and Pathological Information

1.13.1 The post-mortem report was not available at the time of finalising this report. Should any of the results have a bearing on the circumstances leading to the accident, they will be treated as new evidence and that will necessitate the reopening of this investigation.

1.14. Fire

1.14.1. A post-impact fire ensued, which destroyed the gyrocopter.

1.15. Survival Aspects

1.15.1. The accident was considered not survivable as the cockpit structure was destroyed by impact and post-impact fire. However, the pilot managed to crawl out of the cockpit; the passenger was fatally injured.

1.16. Tests and Research

1.16.1. No test or research was carried out as the aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

1.17. Organisational and Management Information

1.17.1. The flight was conducted in accordance with the provisions of Part 94 (Operation of Non-Type Certified Aircraft [NTCA]) of the CAR 2011 as amended.

1.17.2. The aircraft was privately operated by the owner.

1.18. Additional Information

1.18.1 **Magni Gyro Pilot Flight Manual (FM) Section 4 (Emergency Procedure)**

4.7 Engine Failure

In case of failure of the engine, the following actions are recommended:

In-flight

If at a reasonable altitude:

a) Check magneto switch is set to "both"
b) Check fuel pumps are on
c) Check the fuel gauge to confirm sufficient fuel
d) Check choke is off
e) Attempt engine re-start If the engine fails to re-start
f) Turn off engine magneto switches
g) Flick Master switch to "OFF"
h) Check Harnesses are tight
i) Consider wind speed and direction.
j) Select a forced landing site, into the wind and/or up any slope.

1.18.2 The following information in an extract from the engine manufacturer BRP- Rotax Maintenance Manual. The manual has a disclaimer as per the below statement:

Engine stoppage: in using the engine the operator assumes all risk of use and acknowledges that he/she knows the engine is subject to sudden stoppage (See Appendix A).

1.19. Useful or Effective Investigation Techniques

1.19.1. No investigation techniques were used. The aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

2. ANALYSIS

2.1. General

From the available evidence, the analysis was not made with respect to this accident. This shall not be read as apportioning blame or liability to any organisation or individual.

2.2. Analysis

2.2.1. None since the aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

3. CONCLUSION

3.1. General

From the available evidence, the following findings, causes and contributing factors were not made with respect to this accident. These shall not be read as apportioning blame or liability to any organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusion heading:

- **Findings —** are statements of all significant conditions, events, or circumstances in this accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.
- **Causes —** are actions, omissions, events, conditions, or a combination thereof, which led to this accident.
- **Contributing factors —** are actions, omissions, events, conditions or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident occurring, or would have mitigated the severity of the consequences of the accident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil, or criminal liability.

3.2. Findings

3.2.1. None as the aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

3.3. Probable Cause

3.3.1. None. The aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

3.4. Contributory Factor

3.4.1. None. The aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report. The AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1 None. The aircraft was not maintained in accordance with the regulation or manufacturer's prescripts.

5. APPENDICES

5.1. Appendix A: BRP Engine Maintenance Manual (manufacturer)

This report is issued by:

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

Appendix A

BRP-Rotax
MAINTENANCE MANUAL

USE FOR INTENDED PURPOSE

⚠ WARNING

Explosion hazard.
Flying components can cause serious injuries.
Never run an engine without propeller.

Use	The engine ROTAX® 582 UL DCDI mod. 99 / mod. 17 is intended for use in uncertified aircraft. In case of doubt the regulations of the national authorities or the respective sportive federations have to be observed. Never run the engine without propeller, this inevitably causes engine damage and hazard of explosion.
Uncertified engines	The engine ROTAX® 582 UL DCDI mod. 99 / mod. 17 is uncertified. These engines have not received any safety or durability testing, and conform to no aircraft standards. These engines are meant for use in experimental, uncertified aircraft and vehicles only, in which an engine failure will not compromise safety.
Engine stoppage	In using the engine the operator assumes all risk of use and acknowledges that he/she knows this engine is subject to sudden stoppage.
Maintenance and repair conditions	Use for intended purpose also includes observation of the operational, maintenance and repair conditions prescribed by the manufacturer. This is a crucial factor concerning the reliability of the engine and can increase the durability of the engine.