

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/10578	
Aircraft Registration	ZU-TNT	Date of Accident	12 April 2025		Time of Accident	1417Z	
Type of Aircraft	Slick 540		Type of Operation		Private (Part 94)		
Pilot-in-command Licence Type		Private Pilot Licence (PPL) (Aeroplane)	Age	45	Licence Valid	Yes	
Pilot-in-command Flying Experience		Total Flying Hours		512.35	Hours on Type	1.6	
Last Point of Departure		Kitty Hawk Aerodrome (FAKT) near Pretoria, Gauteng Province					
Next Point of Intended Landing		Kitty Hawk Aerodrome (FAKT) near Pretoria, Gauteng Province					
Damage to Aircraft		Destroyed					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
On a private farm, approximately 2.8 nautical miles (nm) east of FAKT at Global Positioning System (GPS) co-ordinates determined to be 25°52'12.88"S 028°29'51.72"E							
Meteorological Information		Wind direction: 218°; wind speed: 3 kts; visibility: 10km; cloud cover: CAVOK; cloud base: 1 000ft; temperature: 23°C; dew point: 12°C; QNH: 1024					
Number of People On-board	1+0	Number of People Injured	0	Number of People Killed	1	Other (On Ground)	0

Synopsis

On Saturday afternoon, 12 April 2025, a pilot on-board a Slick 540 aircraft, registered ZU-TNT, took off on a private flight from Kitty Hawk Aerodrome (FAKT) in Boschkop, south-east of Pretoria in Gauteng province, with the intention to return to the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) in accordance with the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

According to the first co-owner of the aircraft, the pilot had performed a pre-flight inspection and did not find anomalies with the aircraft. The aircraft had 60 litres (L) of Avgas 100LL in the tanks. The first co-owner stated that the pilot had started the engine and waited until all the indications were within the green arch before taxiing the aircraft to the threshold of Runway 01. A few minutes later, he commenced with the take-off roll in a northerly direction before rotating and climbing to circuit altitude (1 000 feet [ft] above ground level [AGL]). Thereafter, he conducted approximately three touch-and-go landings on Runway 01 before the aircraft disappeared from the vicinity of FAKT. *From the information gathered during the investigation, it was deduced that the pilot intended to remain within the vicinity of FAKT to practise aerobatic manoeuvres in the aerobatic box located west of FAKT.* The aircraft was later spotted by an eyewitness (at a different location) who observed it when it crashed. The aircraft was found crashed on a private farm approximately 2.8 nautical miles (nm) east of FAKT. Relevant emergency response agencies were activated after the accident was reported, including the local Emergency Medical Service (EMS) and the South African Police Service (SAPS) personnel. The pilot was fatally injured; the aircraft was destroyed.

Probable Cause

The aircraft entered a stall which led to a subsequent spin during an aerobatic manoeuvre; the pilot was unable to recover the aircraft and it crashed.

Contributory Factor

The pilot's limited experience on the aircraft type likely led to task saturation.

SRP Date	11 November 2025	Publication Date	13 November 2025
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Occurrence Details

Reference Number : CA18/2/3/10578
Occurrence Category : Accident (Category 1)
Type of Operation : Private (Part 94)
Name of Operator : Slick 540 (Pty) LTD
Aircraft Registration : ZU-TNT
Aircraft Make and Model : Slick 540
Nationality : South African
Place : On a private farm, approximately 2.8 nautical miles east of Kitty Hawk Aerodrome (FAKT) in Gauteng province
Date and Time : 12 April 2025 at 1417Z
Injuries : Fatal
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 and Incident Investigations Division (AIID) was notified of the occurrence on 12 April 2025 at 1417Z involving a Slick 540 aircraft, 2.8 nautical miles (nm) east of Kitty Hawk Aerodrome (FAKT) in Gauteng province. The occurrence was classified as an accident according to the CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) STD Annex 13 definitions. The notification was sent to the State of Registry and Operator in accordance with the CAR 2011 Part 12 and the ICAO Annex 13 Chapter 4. Investigators were dispatched to the accident site.

Notes:

- Whenever the following words are mentioned in this report, they shall mean the following:
Accident — this investigated accident
Aircraft — the Slick 540 aircraft involved in this accident
Investigation — the investigation into the circumstances of this accident
Pilot — the pilot involved in this accident
Report — this accident report*
- 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

This report is produced without prejudice to the rights of the SACAA, which are reserved.

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Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AP	Approved Person
ATF	Authority-to-fly
CAR	Civil Aviation Regulations
C of R	Certificate of Registration
CRS	Certificate of Release to Service
EMS	Emergency Medical Service
FAKT	Kitty Hawk Aerodrome
FAWB	Wonderboom Aerodrome
FAWK	Air Force Base Waterkloof
Ft	Feet
GPS	Global Positioning System
IAW	In Accordance With
hPa	Hectopascal
Km	Kilometres
Kt	Knots
M	Metres
Nm	Nautical Miles
METAR	Meteorological Aerodrome Report
POH	Pilot's Operating Handbook
PPL	Private Pilot Licence
QNH	Altitude Above Mean Sea Level
RPM	Revolutions per Minute
SACAA	South African Civil Aviation Authority
SAPS	South African Police Service
SAWS	South African Weather Service
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. On Saturday afternoon, 12 April 2025, a pilot on-board a Slick 540 aircraft, registered ZU-TNT, was engaged in a private flight at Kitty Hawk Aerodrome (FAKT) located south-east of Pretoria in Boschkop, Gauteng province, with the intention to land at the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) in accordance with the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.
- 1.1.2. Based on the information gathered from the first co-owner pilot, 50 litres (L) of Avgas 100LL (low lead) was uplifted, which brought the total to 60L. *The subject pilot co-owned the aircraft with two other pilots. One of the pilots is an aerobatic evaluator, he judges the skills and performance of pilots while executing aerobatic manoeuvres during aerobatic competitions.* On the day of the accident, the pilot intended to conduct his first high-energy aerobatic manoeuvres in the Slick 540 aircraft within the designated aerobatic box, west of FAKT. *The aerobatic box has a maximum altitude of approximately 7600 feet (ft). For safety, the aerobatic box can only accommodate one aircraft at a time.* During this time, there was traffic in the aerobatic box. The aircraft that was in the aerobatic box and the ZU-TNT pilot were on FAKT frequency 120.65-Megahertz (MHz). The ZU-TNT pilot conducted three circuits (touch-and-go landings) but did not specify what he would do next. The second co-owner pilot and coach who was on the ground did not communicate with the ZU-TNT pilot whilst he was conducting circuits.
- 1.1.3. After the three circuits were completed at approximately 1412Z, the second co-owner pilot realised that he had lost visual of the aircraft. He then contacted the first co-owner pilot to find out the whereabouts of ZU-TNT. The first co-owner pilot attempted to establish communication via a handheld radio but was unsuccessful. He then made a few phone calls to people in the vicinity of FAKT to find out if they had seen the aircraft. Several minutes later, the first co-owner pilot received a phone call in which he was notified of an accident involving the ZU-TNT aircraft.
- 1.1.4. The first co-owner pilot (a qualified acrobatic pilot with the type rating on the Slick 540) had flown the aircraft earlier on the day of the accident. He also confirmed that the pilot was flying in the circuit, specifically conducting a series of touch-and-go landings whilst he awaited clearance to use the designated aerobatic box for aerobatic manoeuvres.
- 1.1.5. The first eyewitness was in a house across the road from the accident site. He reported that he saw the aircraft pitch up and down twice and, on the third pitch, it did not recover; instead, it entered a flat spin, lost height and crashed on a private farm's field. He stated that the

engine was running until impact. After impact, he noticed that there was no sign of the pilot disembarking from the aircraft. He then called the owner of the house who contacted the emergency services.

- 1.1.6. The second eyewitness was at Welbekend, a property located 2 nautical miles (nm) from the accident site. The second eyewitness reported that whilst inspecting his livestock (cattle), he observed an aircraft that was performing aerobatic manoeuvres north of his position. He noted that the aircraft commenced a right-side roll, followed by a series of additional rolls. He stated that initially, the manoeuvres appeared intentional and controlled; however, as the sequence progressed, the rolls appeared to lose structure and consistency. He later lost visual of the aircraft. Moments later, he heard a loud impact which he estimated to have originated approximately 4 kilometres (km) from his location. He then drove to the area from which the sound had emanated and discovered the crashed aircraft.



Figure 1: The aircraft at the accident site and the approximate location of the first eyewitness (red arrow).



Figure 2: An aerial view of the approximate accident location and the first eyewitness. (Source: Google Earth)

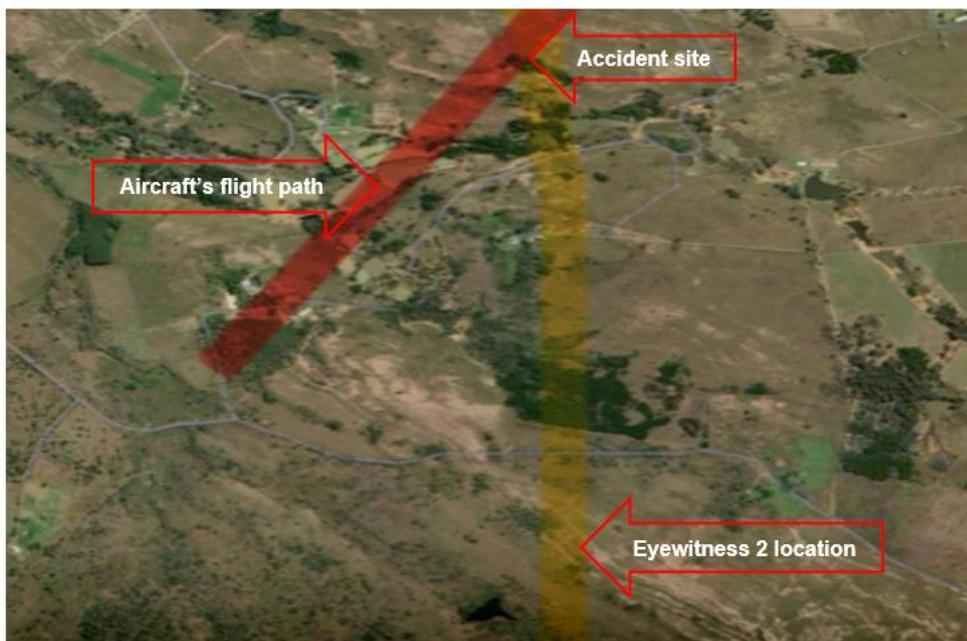


Figure 3: An aerial view of the approximate location of the second eyewitness and the accident site. The yellow line represents the second eyewitness' line of sight. (Source: Eyewitness)

1.1.7. A copy of an aerobatic sequence was found in the aircraft. However, it was reported that the copy (aerobatic sequence) did not belong to the subject pilot because it depicted an advanced sequence used at competitions. It was later determined that it belonged to the first co-owner pilot who had used this sequence during his aerobatic training.

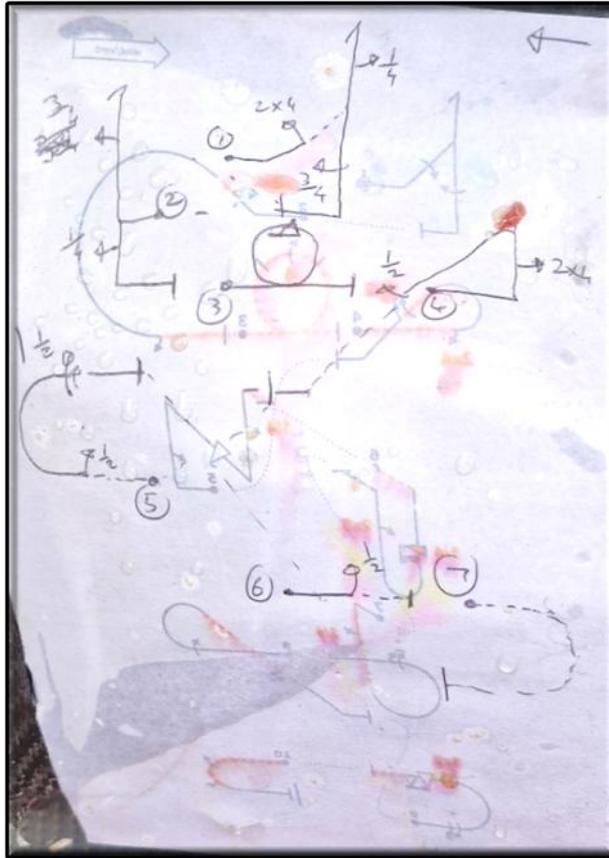


Figure 4: A copy of the aerobatic sequence found in the aircraft.

1.1.8 A video recording sent to the investigators showed the aircraft in a high-speed stall from which the pilot could not recover and with the angle of attack that was not reduced. The aircraft remained in a stall and, thereafter, the resultant spin. The aircraft abruptly rolled to the right, and then to the left before it re-entered a left upright spin. The pilot applied power briefly but then shut it off just before impact.

1.1.9 The accident occurred in daylight on a private farm situated approximately 2.8 nautical miles (nm) east of Kitty Hawk Aerodrome (FAKT) in Gauteng province at Global Positioning System (GPS) co-ordinates determined to be 25°52'12.88"S 028°29'51.72"E.

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.2.1. The pilot was fatally injured.

1.3. Damage to Aircraft

1.3.1. The aircraft was destroyed during the accident sequence.



Figure 5: The aircraft at the accident site.

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	45
Licence Type	Private Pilot Licence (Aeroplane)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night rating				
Medical Expiry Date	31 October 2025				
Restrictions	Yes				
Previous Accidents	Yes				

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

The pilot was previously involved in an accident on 26 July 2023 whilst piloting a different aircraft. The accident was due to a hard landing at Wonderboom Aerodrome (FAWB), Gauteng province.

Flying Experience:

Total Hours	512.35
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	2.2
Total on Type Past 90 Days	1.6
Total on Type	1.6

- 1.5.1. The pilot had a Private Pilot Licence (PPL) that was initially issued by the Regulator (SACAA) on 28 May 2014. The PPL was renewed on 9 May 2023 with an expiry date of 31 May 2025. The pilot had a Class 2 aviation medical certificate with an expiry date of 31 October 2025. The aircraft type was endorsed on his licence.
- 1.5.2. The pilot had accumulated a total of 512.35 flying hours of which 1.6 hours were on the aircraft type. The pilot also had a Night Rating.
- 1.5.3. The pilot had the Sportsman Aerobatic Rating endorsed on his licence; he had accrued approximately 250 aerobatic hours. His first aerobatic competition was in 2019. At his last aerobatic competition in December 2024, he was awarded first place in the Sportsman class. Later, he commenced with training on the Extra 200 model aircraft in preparation to attain his endorsement on the Slick 540.
- 1.5.4. The pilot's PPL had the following aircraft endorsements: Decathlon, PA-32 Piper Cherokee 6-300, Cessna 172, Cessna 210, Cessna 182, Maule M-7-235, Piper 32, Tecnam p-92 Echo and Slick 540. He completed a difference training and additional training required when he transitioned between variants or aircraft types within the same class or type rating; he also focussed on the specific differences between other aircraft and the Slick 540 and was signed out on 26 March 2025.

1.6. Aircraft Information

(Source: Slick 540 Pilot's Operating Handbook [POH])

- 1.6.1. *The Slick-540 aircraft is a single seater approved for all aerobatic manoeuvres. Before flying it, a pilot must be trained and approved by an authorised Slick aircraft representative. The aircraft handles like a typical aerobatic tailwheel airplane during take-off, flight and landing. It reacts normally in stalls and spins and is built to withstand high gravity forces. However, pilots must be aware that extreme gravity loads can exceed human tolerance, so extra care is needed during high gravity force flights. The aircraft should only be flown from paved surfaces. It has a max take-off weight of 795 kilogram (kg) for cruising and 716 kg for*

aerobatics. The empty weight is 550 kg (1210 lb). It is powered by a modified Lycoming AEIO-540 engine producing 294 brake horsepower (bhp) at 2700 revolutions per minute (rpm), with a three-blade constant-speed propeller. Fuel capacity is 36 US gallons, and fuel must be 100LL aviation gasoline. Wingspan is 7.30 metres (m), and the aircraft is 6.05m long. Maximum speed (VNE) is 226 knots (kts) (260 miles per hour [mph]), and normal cruise is around 165 mph using 11.5 gallons per hour. Aerobatic entry speeds vary loops above 120 kts, rolls from 100 to 187 kts, and snap rolls max at 120 kts. Operations must be in daylight and visual flight rules (VFR) only. Flying in known icing is not allowed. Avoid more than 10 seconds in extreme attitudes like vertical, inverted or zero-gravity flight as oil may not circulate properly, risking engine damage.

Airframe:

Manufacturer/Model	Global Composite Solutions/Slick 540	
Serial Number	5400606	
Year of Manufacture	2012	
Total Airframe Hours (At Time of Accident)	559.8	
Last Inspection (Date & Hours)	11 March 2025	536.80
Hours Since Last Inspection	23	
CRS Issue Date	11 March 2025	
ATF (Issue Date & Expiry Date)	10 April 2025	30 April 2025
C of R (Issue Date) (Present Owner)	07 June 2024	
Type of Fuel Used	Avgas 100LL	
Operating Category	Part 94	
Previous Accidents	None	

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

Engine:

Manufacturer/Model	Lycoming /AEIO 540
Serial Number	BPE10305
Part Number	AEIO-540
Hours Since New	559.8
Hours Since Overhaul	TBO not yet reached

According to Service Instruction No. 1009BE, the time between overhaul for Lycoming AEIO 540 is 1400 hours.

Propeller:

Manufacturer/Model	MT Propeller /MTV-9-B-C
Serial Number	0601074
Part Number	MTV-9-B-C
Hours Since New	559.8
Hours Since Overhaul	TBO not yet reached

According to MT Propeller Service Bulletin number R10, the time between overhaul is 2400 hours.

- 1.6.2. The aircraft had a valid Authority-to-fly (ATF) Certificate that was issued by the Regulator on 10 April 2025 with an expiry date of 30 April 2026.
- 1.6.3. The last annual inspection of the aircraft was conducted on 11 March 2025 at 536.80 total airframe hours. The approved person (AP) who conducted the maintenance had issued the Certificate of Release to Service (CRS) on 11 March 2025 or at 536.80 airframe hours with an expiry date of 11 March 2026 or at 636.80 airframe hours, whichever comes first.
- 1.6.4. The Approved Person Certificate was issued by the Regulator (SACAA) on 13 May 2024 with an expiry date of 12 May 2026.
- 1.6.5. The ZU-TNT flight folio was last updated on 12 April 2025 by one of the co-owner pilots (who flew the aircraft just before the accident flight). The (subject) pilot had flown the aircraft on 26 March 2025 and on 31 March 2025, according to his logbook.
- 1.6.6. A review of the maintenance documentation of the aircraft, which includes records of the airframe, engine, propeller, flight folio and annual inspection reports, was conducted. Evidence showed that the aircraft was maintained in accordance with (IAW) the manufacturer's prescribed maintenance procedures.
- 1.7. **Meteorological Information**
 - 1.7.1. The weather information below was obtained from the meteorological aerodrome report (METAR) that was issued by the South African Weather Service (SAWS), recorded at Air Force Base Waterkloof (FAWK) on 12 April 2025 at 1400Z. The accident site was 25km from FAWK.

Wind Direction	218°	Wind Speed	3kts	Visibility	9999m
Temperature	23°C	Cloud Cover	CAVOK	Cloud Base	1000ft
Dew Point	12°C	QNH	1024hPa		

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 navigational equipment was unserviceable prior to the flight.

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 flight.

1.10. Aerodrome Information

1.10.1. The accident occurred on a private farm, situated 2.8nm east of FAKT in Gauteng province.

Aerodrome Name	Kitty Hawk Aerodrome (FAKT)
Aerodrome Location	Pretoria, Gauteng Province
Aerodrome Status	Licensed
Aerodrome GPS coordinates	25°51'42" South, 028°26'49" East
Aerodrome Elevation	4 586 feet (ft)
Runway Headings	01/19
Dimensions of Runway Used	810m x 18m
Heading of Runway Used	N/A
Surface of Runway Used	Asphalt
Approach Facilities	Nil
Radio Frequency	120.65-MHz

1.10.2 The traffic patterns at FAKT are located to the east to ensure that traffic is flown into and out of the aerodrome safely (Runway 01 right-side circuits and Runway 19 left-side circuits). This was established based on the local conditions, including the direction and placement of the patterns, the altitude at which the aircraft are flown, and the procedures for entering and exiting the patterns. The aerobatic box limits of FAKT are from the ground to a minimum of 7 500ft and maximum flight level (FL) 090.

1.11. Flight Recorders

1.11.1. The aircraft was neither 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 accident site was on a field within a farm, approximately 2.8nm east of FAKT. The wreckage was confined to a compact area with a debris field diameter of approximately 23m, indicating a high-energy impact with the ground and with limited forward momentum. Initial ground contact appeared to have been made by the right-wing tip which separated from the main fuselage structure; it was located approximately 2m from the aircraft's final resting position. The left wing had remained intact. The empennage was destroyed. The canopy separated from the fuselage and was located 2.5m from the main wreckage. Analysis of the wreckage distribution and ground scarring suggested that the right wing impacted the ground first, followed by the nose section and the propeller blades. The deformation and fragmentation patterns observed on the wing structures were consistent with a high-velocity impact.



Figure 6: The wreckage was confined to a compact area.

1.12.2. The propeller was examined at the accident site; one of the blades had remained intact whilst damage to the other two blades indicated that the engine was producing a substantial amount of power on impact. The amount of power that was produced could not be determined. Witness marks on the wreckage indicated that the aircraft entered an inadvertent spin from which the pilot could not recover, which rendered ground impact inevitable.

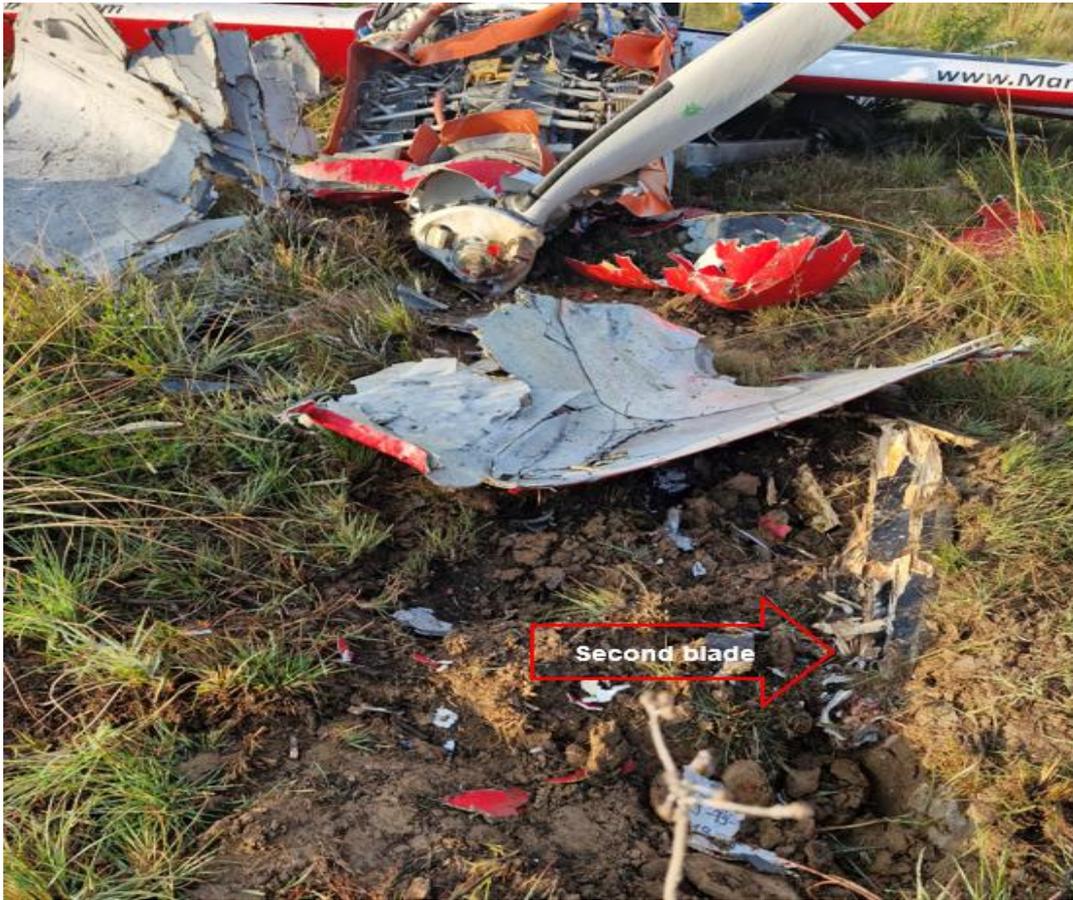


Figure 7: The propeller with one blade still intact; the other two blades were destroyed during the accident sequence.



Figure 8: The third propeller blade at the accident site.

1.12.3. The empennage had separated from the forward fuselage. The upper portion of the rudder was discovered approximately 13m from the main wreckage whilst the remaining rudder structure was located 2m from the primary impact area; this suggested aerodynamic or structural separation during impact. The canopy was recovered 7m from the wreckage which indicated a possible in-flight detachment or ejection upon impact.



Figure 9: The empennage and canopy.



Figure 10: The broken rudder.

1.12.4. The seat restraints (seatbelts) in the cockpit had remained intact and secured, and the flight control linkages and control surfaces, although disturbed, were generally found to be continuous. The left aileron was located approximately 4m from the wreckage, whilst the right aileron had remained attached to the wing in a fully deflected downward position.



Figure 11: The elevator.

1.12.5. The tail wheel bar was found broken (Figure 11), likely due to secondary impact forces. The engine (Figure 12) had remained largely intact and secured to its mounts although it exhibited localised damage which was consistent with a nose-first impact force.

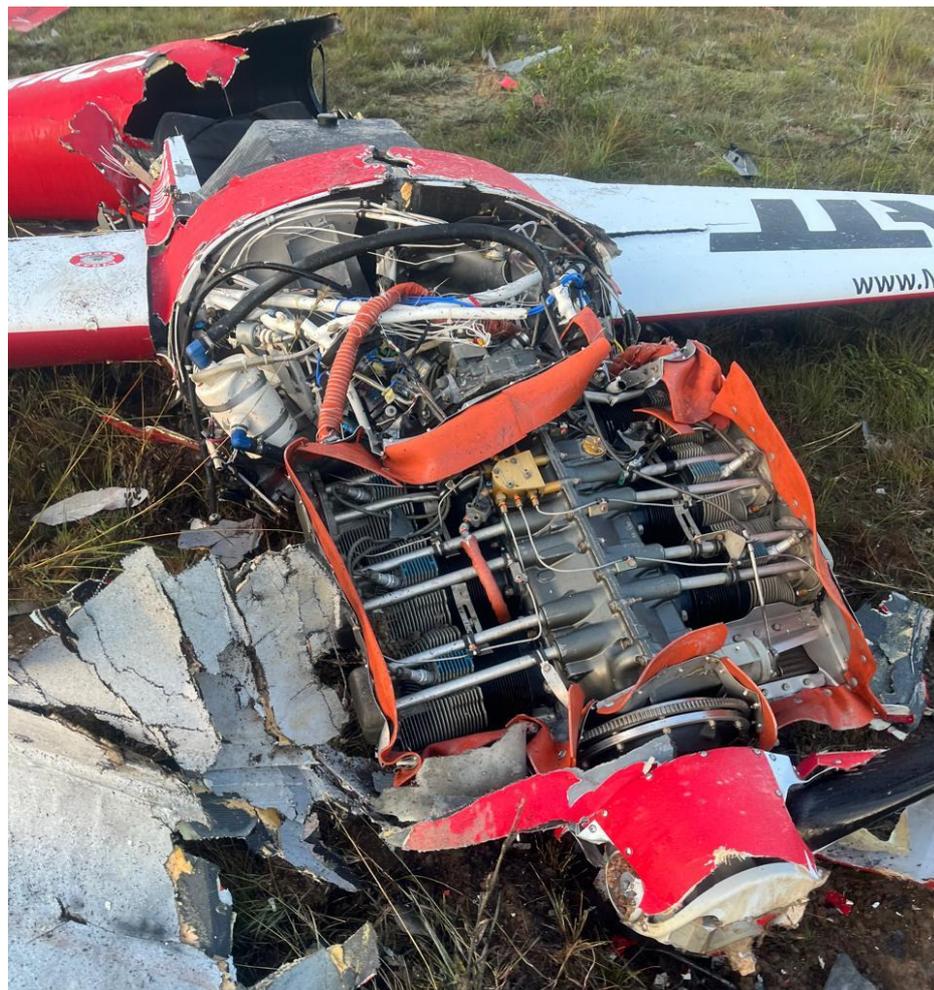


Figure 12: The engine post-impact.

1.12.6. The condition of the wreckage and debris pattern suggested a flat spin with a limited forward speed.



Figure 13: The wreckage distribution at the accident site. (Source: EMS personnel)

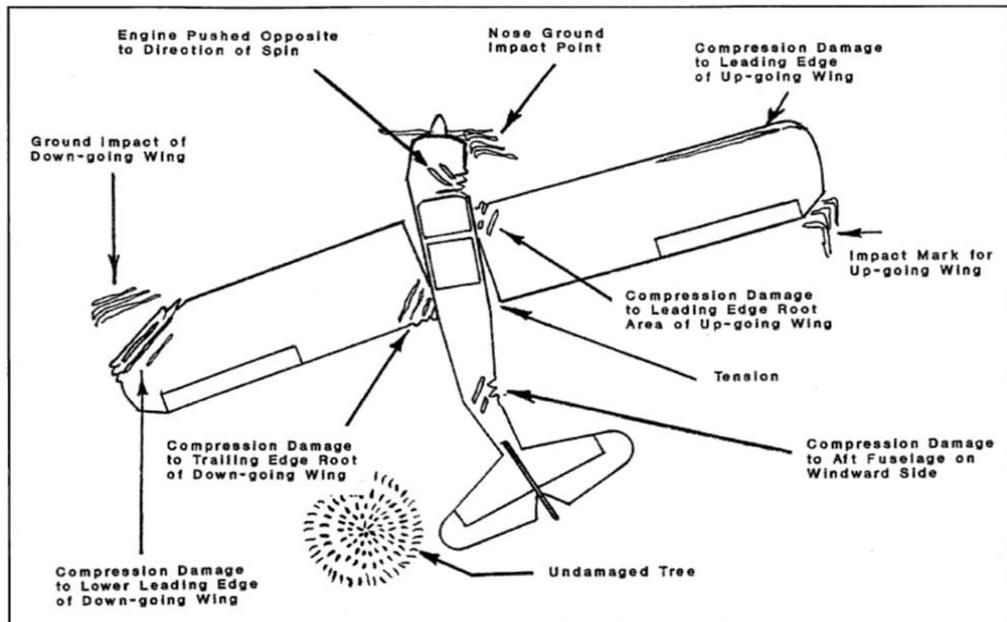


Diagram 1: A diagram indicating a wreckage pattern of a spinning aircraft.

(Source: Aircraft Accident Investigation-Second Edition by Richard H. Wood and Robert W. Sweginnis)

1.13. Medical and Pathological Information

1.13.1. The pilot was fatally injured during the accident sequence. A post-mortem and toxicology examinations were performed. The post-mortem examination results determined that the pilot had succumbed to multiple blunt force injuries. The toxicology results were not available at the time of completion of this report. Should the toxicology examination results reveal a different cause of death, this information will be considered new and will necessitate the reopening of this investigation.

1.14. Fire

1.14.1. There was no evidence of a pre- or post-impact fire.

1.15. Survival Aspects

1.15.1. The accident was considered not survivable due to the high energy at which the aircraft had impacted the ground.

1.16. Tests and Research

1.16.1 Pre-impact video footage analysis

After the accident, an experienced acrobatic pilot was appointed as an expert to this investigation. The video footage that was given to the investigating team was shown to the acrobatic pilot expert. The following was the expert's input:

The expert stated that it was difficult to know exactly what happened before the video was shot or to analyse control inputs without high-definition footage. He further stated that the start of the video appeared to be the final stages of a spin recovery. How it got there was not evident from the video. The beginning of the video showed the last few degrees of spin rotation and recovery to the vertical down line with the power at idle. This was consistent with the visuals of a competition spin. This manoeuvre was part of the standard aerobatic sequences so it might have been part of the practise, but that could not be confirmed from the footage.

Two seconds after the beginning of the video, immediately after the recovery to the vertical down line, it looked like there was an aggressive pitch up/pull on the stick. The energy/speed of the aircraft was low and power was at idle, resulting in a high-speed stall and wing drop. There was an attempt to level the wings; it was not clear what control input were used as the footage was not clear, but there was evidence of continued wing loading and no apparent release of the stick or attempt to reduce the angle of attack. The rotation reversed to the left following the attempt to stop the initial right-wing drop. This opposite rotation was consistent with the aircraft remaining stalled while attempting to level the wings. As a result, the aircraft remained in a stalled condition, resulting in an increased rate of descent. The video sound indicated an increase of power at approximately 7 seconds. Due to the distance of the videographer and time delay, the power application would have happened a few seconds earlier, the resultant torque and slipstream could have contributed to induce or enhance the left spin as well as increase the pitch up tendency.

The initial high-speed stall was not recovered from, and the angle of attack was not reduced. As a result, the aircraft remained in a stall and (thus, the) resultant spin until it disappeared from view of the videographer.

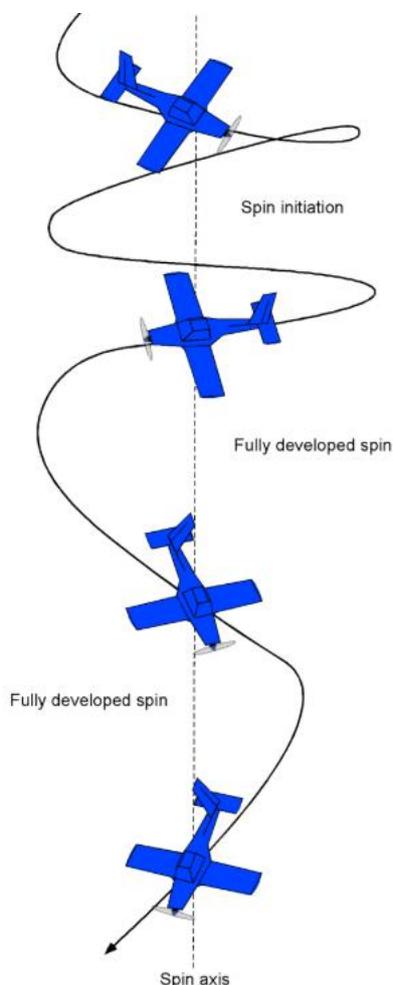


Illustration 1: Stall-spinning aircraft diagram

(Source:<https://eaglepubs.erau.edu/introductiontoaerospaceflightvehicles/chapter/maximum-lift-stalling-spinning/>)

1.17. Organisational and Management Information

1.17.1. The flight was conducted in accordance with the provisions of Part 94 of the CAR 2011 as amended.

1.17.2. The AP who had signed out the last maintenance inspection of the aircraft prior to the accident flight was issued an Approved Person Certificate by the SACAA on 13 May 2024 with an expiry date of 12 May 2026.

1.18. Additional Information

1.18.1. Aerobatic Checks (Source: Slick 540 POH)

1. *No loose articles in aircraft*
2. *Check harness tight when comfortably seated (shoulder harness not over tightened)*
3. *Check cockpit from left to right, in particular:*
 - *Oil pressure steady (no deviation for 15 seconds during pitch from positive to negative or reversed)*
 - *Fuel quantity (maximum 16 US gallons for aerobatics)*
 - *G meter reset (check audio warning if fitted)*
4. *Correct Power Setting:*
 - *For training, maximum 2600 RPM/PM variable/ Mixture full rich*
 - *For competition, Max 2700 RPM, MP variable/ Mixture full rich*
5. *Check for free airspace (announce intentions on relevant frequency)*
6. *Check for sufficient altitude*

1.18.2. Aerobatic Ratings (Source: SA-CAR Part 61 Subpart 27)

Requirements for an aerobatics rating (Graduate)

61.27.1 (1) An applicant for an aerobatics rating (Graduate) must-

- (a) hold at least a valid PPL(A);*
- (b) be a member of an organisation, approved or designated by the Director as an aerobatics sport controlling body, as listed in Document SA-CATS 61;*
- (c) have completed the aerobatics training course prescribed in Document SA-CATS 61;*
- (d) hold the appropriate type rating for the aeroplane; and*
- (e) have passed the skills test demonstrating to an aerobatics examiner, as appointed by an approved or designated aerobatics sport controlling body and ratified by the Director, that he or she can fly a linked sequence of spin, loop, stall turn and roll in a safe and controlled manner.*

(2) The skills test referred to in sub regulation (1) must have been passed within 30 days immediately preceding the date of application.

1.18.3. The following information is an extract from the South African Civil Aviation Technical Standard (SA-CATS) Part 94.02.3 of the CAR 2011:

1.18.4 Minimum Heights (Source: Civil Aviation Regulations)

91.06.32

(1) Except when necessary for taking off, or landing, or except with prior written approval of the Director, no aircraft—

(a) shall be flown over congested areas or over an obvious open-air assembly of persons at a height less than 1 000 ft above the highest obstacle, within a radius of 2 000 ft from the aircraft;

(b) when flown elsewhere than specified in paragraph (a), shall be flown at a height less than 500 ft above the ground or water, unless the flight can be made without hazard or nuisance to persons or property on the ground or water and the PIC operates at a height and in a manner that allows safe operation in the event of an engine failure; and

(c) shall circle over or do repeated overflights over an obvious open-air assembly of persons at a height less than 3 000 ft above the surface.

1.19. Useful or Effective Investigation Techniques

1.19.1. None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was 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 The pilot had a Private Pilot Licence (PPL) that was issued by the Regulator on 28 May 2014. The PPL was renewed on 9 May 2023 with an expiry date of 31 May 2025. The pilot had a Class 2 medical certificate with an expiry date of 31 October 2025. The aircraft type was endorsed on his licence. The pilot had accumulated a total of 512.35 flying hours of which 1.6 hours were on the aircraft type. The pilot also had a Night Rating, as well as a Sportsman Aerobatic Rating; he was recently signed out as competent on the accident aircraft (Slick 540). On the day of the accident, the pilot was supposed to route to the aerobatic box to complete aerobatic manoeuvres that had been briefed and agreed upon by the evaluator and coach who was to observe him. This was merely to critique him; the manoeuvres did not form part of any training.

- 2.2.2 The aircraft was seen in the circuit at FAKT; it later disappeared from sight of the people at the aerodrome. One of the eyewitnesses spotted the aircraft performing a few aerobatic manoeuvres before it crashed approximately 2.8nm east of FAKT.
- 2.2.3 The pilot probably conducted the manoeuvre to be comfortable with the performance characteristics of the aircraft; however, with the high energy, he likely misjudged the recovery altitude required and subsequently crashed.
- 2.2.4 A video footage was submitted to the investigators and analysed by an appointed aerobatic expert. Upon review, the aerobatic expert indicated that the trajectory of the aircraft was consistent with a spin that developed fully. The energy/speed of the aircraft was low and engine power at idle, which resulted in a high-speed stall and a wing drop. There was an attempt to level the wings; however, there was evidence of continued wing loading and no apparent release of the stick or attempt to reduce the angle of attack during the review of the video footage.
- 2.2.5 Post-accident examination of the recovered airframe and engine revealed no evidence of any pre-impact mechanical malfunctions or failures that would have precluded normal operation. Flight control continuity was established from the cockpit to all primary flight controls. Numerous separations were noted in the flight control system with signatures consistent with overload separation.
- 2.2.6 The propeller was examined at the accident site; one blade had remained intact whilst damage on the other two blades indicated that the engine was producing a substantial amount of power on impact. The amount of power produced could not be determined. Witness marks on the wreckage/accident site indicated that the aircraft entered an inadvertent spin from which the pilot could not recover, which rendered ground impact inevitable.
- 2.2.7 On-site investigation indicated witness marks consistent with inadvertent spin and loss of control whilst performing aerobatic manoeuvres.
- 2.2.8 The high workload associated with the manoeuvre and the pilot having recently gained competence in the aircraft could have led to task saturation, possibly affecting the expedient recovery.
- 2.2.9 The pilot performed the aerobatic sequence outside of the aerobatic box and outside of the safety altitude, resulting in a further degraded safety margin. Should he have conducted this manoeuvre within the box parameters, he could have been subjected to critique by the observers who would have provided feedback via a two-way radio communication.

2.2.10 The aircraft was deemed serviceable and no evidence post-accident suggested that a malfunction could have contributed to the delayed recovery from the developed spin.

3. CONCLUSION

3.1. General

From the available evidence, the following findings, causes and contributing factors were 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

Pilot

3.2.1. The pilot had a Private Pilot Licence (PPL) that was issued on 28 May 2014. The pilot's PPL was renewed on 9 May 2023 with an expiry date of 31 May 2025.

3.2.2. The pilot had flown a total of 512.35 hours of which 1.6 hours were on the aircraft type. The pilot also had a Night Rating. The aircraft was endorsed on his licence and logbook. The pilot also had a Sportsman Aerobatic Rating.

3.2.3. The pilot was issued a Class 2 aviation medical certificate with an expiry date of 31 October 2025.

3.2.4. On the day of the accident, the pilot had planned to perform his first high-energy aerobatic manoeuvres on-board the Slick 540 in the aerobatic box under the observation of an evaluator and coach. The manoeuvres were intended to critique, and not for formal training.

Aircraft

- 3.2.5. The last annual inspection of the aircraft was conducted and certified on 11 March 2025 at 536.80 airframe hours. The aircraft had accrued 23 hours since the last annual inspection. The maintenance was conducted in accordance with the Aircraft Maintenance Manual and procedures stipulated by the Regulator.
- 3.2.6. The aircraft had a valid Authority-to-fly (ATF) Certificate that was initially issued on 10 April 2025. The latest ATF Certificate had an expiry date of 30 April 2026.
- 3.2.7. The Certificate of Release to Service (CRS) was issued on 11 March 2025 with an expiry date of 11 March 2026 or at 636.80 hours, whichever comes first.
- 3.2.8. The Certificate of Registration (C of R) was issued to the present owner on 7 June 2024.
- 3.2.9. The aircraft was observed in the circuit at FAKT before it disappeared from view of the evaluator and coach. One of the eyewitnesses reported spotting the aircraft performing aerobatic manoeuvres before it crashed approximately 2.8 nm east of FAKT.
- 3.2.10. The manoeuvres were conducted outside the aerobatic box and below the recommended safety altitude, reducing the safety margin.
- 3.2.11. The video footage reviewed by the aerobatic expert showed the aircraft entering a fully developed spin with low energy and idle engine power. The spin was likely the result of the high-speed stall and wing drop.
- 3.2.12. There was an attempt to level the wings, but no clear evidence of stick release or angle of attack reduction were observed.
- 3.2.13. The pilot likely misjudged the recovery altitude required due to the high-energy manoeuvre and recent aircraft familiarisation which led to task saturation and delayed recovery.
- 3.2.14. The pilot was not supposed to be performing aerobatic manoeuvres outside of FAKT as stated in Part 91 of the Regulation (CAR 2011).
- 3.2.15. Post-accident examination revealed no pre-impact mechanical failures or malfunctions that could have contributed to the accident.

Environment

3.2.16. Fine weather conditions prevailed at the time of the flight.

3.3. Probable Cause/s

3.3.1 The aircraft entered a stall which led to a subsequent spin during an aerobatic manoeuvre; the pilot was unable to recover the aircraft and it crashed.

3.4. Contributory Factor/s

3.4.1. The pilot's limited experience on the aircraft type likely led to task saturation.

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.

5. APPENDICES

5.1. None.

This report is issued by:

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