PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10372

Figure 1: File picture of Titan Tornado S aircraft with registration ZU-ITA. (Source: http://airliners.net)

Description:

On Thursday afternoon, 5 October 2023, a pilot on-board a Titan Tornado S aircraft with registration ZU-ITA took off on a private flight from Ceres Airfield (FACE) in the Western Cape province to New Tempe Aerodrome (FATP) in Bloemfontein, Free State province. The aircraft crashed shortly after take-off, and was destroyed on impact with the ground. The pilot was fatally injured.

Occurrence Details

Reference Number	**:** CA18/2/3/10372
Occurrence Category	**:** Category 1
Type of Operation	**:** Private (Part 94)
Name of Operator	**:** Private
Aircraft Registration	**:** ZU-ITA
Aircraft Make and Model	**:** Titan Tornado S
Nationality	**:** South African
Place	**:** Winterbach Boerdery Farm, Ceres
Date and Time	**:** 5 October 2023, 1500Z
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) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence involving a Titan Tornado S which occurred at Ceres, Western Cape province, on 5 October 2023 at 1500Z. The occurrence was classified as an accident according to the CAR 2011 Part 12 and ICAO STD Annex 13 definitions.

The AIID has appointed an investigator-in-charge to conduct a full investigation. The investigators dispatched to the accident site for this occurrence. A notification was sent to the State of Registry and Operator in accordance with CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) Annex 13 Chapter 4. The AIID will lead the investigation and issue the final report of this accident in accordance with the CAR 2011 Part 12 and ICAO Annex 13.

The information contained in this preliminary report is derived from the information gathered during the on-going investigation into the occurrence. Later, an interim or final report may contain altered information in case new evidence is found during the on-going investigation that requires changes to the information depicted in this report.

The AIID reports are made available to the public at:
http://www.caa.co.za/Pages/Accidents%20and%20Incidents/Aircraft-accident-reports.aspx

Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
   Accident — this investigated accident
   Aircraft— the Titan Tornado S 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

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Abbreviation	Description
º	Degrees
ºC	Degrees Celsius
A/C	Aircraft
ACCID	Accident
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AMSL	Above Mean Sea Level
AP	Approved Person
ATF	Authority to Fly
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CAA	Civil Aviation Authority
CAR	Civil Aviation Regulations
CAVOK	Ceiling and Visibility OK
CPL	Commercial Pilot Licence
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
E	East
ELEV	Elevator
FACE	Ceres Aerodrome
FATP	Tempe Aerodrome
FDR	Flight Data Recorder
ft	Feet
g	gravity
GPS	Global Positioning System
hPa	Hectopascal
IIC	Investigator-in-charge
ICAO	International Civil Aviation Organisation
INCID	Incident
IOC	Investigator-on-call
KM	Kilometre(s)
kt	Knots
m	Metres
METAR	Meteorological Aerodrome Report
MPI	Mandatory Periodic Inspection
NM	Nautical Mile
Q	Quart(s)
QNH	Query: Nautical Height
RWY	Runway
S	South
SACAA	South African Civil Aviation Authority
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 On Thursday, 5 October 2023, the pilot on-board a Titan Tornado S aircraft with registration ZU-ITA took off on a private flight from Stellenbosch Aerodrome (FASH) in the Western Cape province with New Tempe Aerodrome (FATP) in Bloemfontein, Free State province, as the final destination. The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2 According to the pilot's friend, on 4 October 2023, the pilot communicated with him through a WhatsApp message that he needed to fly to Bloemfontein, but was "unhappy" with the aircraft. However, the pilot did not state what his concerns were about the aircraft.

1.1.3 An eyewitness who resides at Winterbach Boerdery Farm near FACE stated that at approximately 1500Z on 5 October 2023, he saw an aircraft land at FACE. Thereafter, he heard the engine revolutions per minute (RPM) being revved up for short periods several times, which suggested that the pilot might have been conducting an engine run after landing, as well as making some adjustments to the engine. This intermittent sequence repeated several times. According to the wife of the pilot, at 1430Z on the same day, she received a phone call from the pilot who stated that he was inspecting the aircraft, but did not elaborate on the matter.

After several engine runs were conducted, which lasted about 2 hours, the eyewitness observed the aircraft when it took off from FACE in a south-westerly direction. Shortly after the aircraft was airborne, the engine became intermittent (starting and restarting). He then observed the aircraft making a 180º turn to the left, and at that point, the left wing dropped. The pilot seemed to be making inputs to recover the aircraft but without success. The aircraft impacted a dense vegetation in a nose-down attitude near Winterbach Boerdery Farm and came to rest in an inverted attitude.

1.1.4 The eyewitness called the Emergency Medical Service (EMS) and the South African Police Service (SAPS). The EMS personnel reported that they found the pilot fatally injured; he was still properly strapped to his seat with a harness. The EMS personnel cut the seatbelt to recover the pilot's body. The aircraft was destroyed by impact forces.

1.1.5 The accident occurred during daylight at Winterbach Boerdery Farm, south-west of FACE, at Global Positioning System (GPS) co-ordinates determined to be 33º19'14" South 19º25'4" East, at an elevation of 1 480 feet (ft) above mean sea level (AMSL).

Figure 2: Accident location. (Source: Google Earth)

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.

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed.

Figure 3: The aircraft at the accident site.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	63
Licence Type	National Pilot Licence (NPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instruments and Night ratings				
Medical Expiry Date	30 November 2023				
Restrictions	Corrective Lenses				
Previous Accidents	None				

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

Flying Experience:

Total Hours	1 882.05
Total Past 24 Hours	TBA
Total Past 7 Days	TBA
Total Past 90 Days	TBA
Total on Type Past 90 Days	TBA
Total on Type	TBA

Note: The hours depicted above were taken during the renewal of the pilot's licence on 14 April 2023.

1.5.1 The pilot was initially issued a National Pilot Licence (NPL) on 24 April 2003. His last licence validation was conducted on 21 April 2023 with an expiry date of 14 April 2025. The aircraft type was endorsed on the pilot's licence. The pilot was issued a Class 4 aviation medical certificate on 30 November 2021 with an expiry date of 30 November 2023.

1.5.2 The flying hours on the pilot's logbook were last recorded on 14 April 2023 during his licence renewal.

1.6 **Aircraft Information** (Source: Titan Tornado S Manual)

1.6.1 The Tornado S is designed to a +6 gravity/-4 gravity (g) load limit capability at 1 140 pounds (lbs) (gross weight 517.1 kilograms). The aircraft has a two-seat in tandem "stretched" fuselage and it is equipped with the Rotax 912S engine. The cruise speed is in excess of 120 miles per hour (mph). The aircraft's fuel capacity is 56.8 litres (L) (15 gallons). Titan Tornado S qualified as a Light Sport Aircraft as defined by the Federal Aviation Administration (FAA).

Airframe:

Manufacturer/Model	Titan Aircraft/Tornado S	
Serial Number	SO3912SOHK0462	
Year of Manufacture	2020	
Total Airframe Hours (At Time of Accident)	57.8	
Last Inspection (Date & Hours)	26 August 2022	41.7
Hours Since Last Inspection	16.1	
CRS Issue Date	26 August 2022	
ATF (Issue Date & Expiry Date)	12 April 2023	11 April 2024
C of R (Issue Date) (Present Owner)	30 September 2020	
Type of Fuel Used	Octane 95 Unleaded	
Operating Category	Private (Part 94)	
Previous Accidents	None	

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

1.6.2 According to available information, the aircraft was first registered to the present owner on 30 September 2020. The Certificate of Release to Service (CRS) was signed out by an approved person (AP) on 26 August 2022 at 41.7 airframe hours with an expiry date of 26 August 2023 or at 141.7 airframe cycles, whichever occurs first.

1.6.3 The aircraft had a valid Authority to Fly (ATF) that was initially issued by the Regulator on 12 April 2023 with an expiry date of 11 April 2024.

1.6.4 Based on the aircraft maintenance records, the last annual inspection on the aircraft was conducted on 26 August 2022 at 41.7 airframe hours. The aircraft had accumulated an additional 16.1 airframe hours in operation since the last inspection; however, the information on the aircraft's flight folio was last recorded on 25 July 2023.

1.6.5 According to available information, the aircraft was built by the owner using the design from the manufacturer (Titan Tornado). The approval to build the aircraft was issued on 9 July 2020 by the Regulator (SACAA).

Engine:

Manufacturer/Model	Rotax 912UL
Serial Number	4417879
Part Number	TBA
Hours Since New	TBA
Hours Since Overhaul	TBA

1.6.6 The engine was recovered from the accident site and transported to an approved aircraft maintenance organisation (AMO) for further testing and teardown inspection.

Propeller:

Manufacturer/Model	Woodcomp/Woodcomp Klassic
Serial Number	1029633L
Part Number	TBA
Hours Since New	TBA
Hours Since Overhaul	TBA

1.6.7 The AP who signed out the last maintenance was reissued an AP Certificate on 24 January 2023 with an expiry date of 24 January 2024.

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 Cape Town International Airport (FACT) on 5 October 2023 at 1500Z. FACT is located 58 miles (94 kilometres) from the accident site.

Wind Direction	180º	Wind Speed	14kt	Visibility	9999M
Temperature	21ºC	Cloud Cover	Scattered (SCT)	Cloud Base	4 000ft
Dew Point	16ºC	QNH	1015hPa		

Note: There is no manned station in the vicinity of Ceres, therefore, FACT is the closest station. The METAR for FACT is referenced in this accident.

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 system 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 The accident occurred approximately 435m from FACE.

Aerodrome Location	Ceres
Aerodrome Status	Licensed
Aerodrome GPS coordinates	33º19’10.0” South, 019º25’20.0” East
Aerodrome Elevation	1900ft
Runway Headings	073º/253º
Dimensions of Runway Used	9/27
Heading of Runway Used	073º
Surface of Runway Used	Grass
Approach Facilities	None
Radio Frequency	119.6MHz, 102.3MHz, 122.3MHz

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 aircraft struck the ground approximately 425 metres (m) south-west of FACE in a steep nose-down attitude. It impacted the ground with the right-side wing tip, and the left- and right-side wings separated from the airframe. The separated wings were found next to the main airframe. The main wheels were still attached to their respective axles. The aircraft came to rest in an inverted attitude on a heading of approximately 203º magnetic. The wreckage was contained in a single location.

Figure 4: The aircraft in an inverted attitude.

1.12.2 The aircraft's right wing tip first impacted the ground before the wings separated from the airframe.

Figure 5: The damaged right-wing tip.

1.12.3 The wings separated from the main airframe and were found lying parallel to the main airframe; the flaps were at an angle of 15º.

Figure 6: The damaged wings.

1.12.4 The instruments were heavily damaged as a result of the impact; they separated from the instrument panel. The auxiliary and fuel pump switches were found in the “OFF” position.

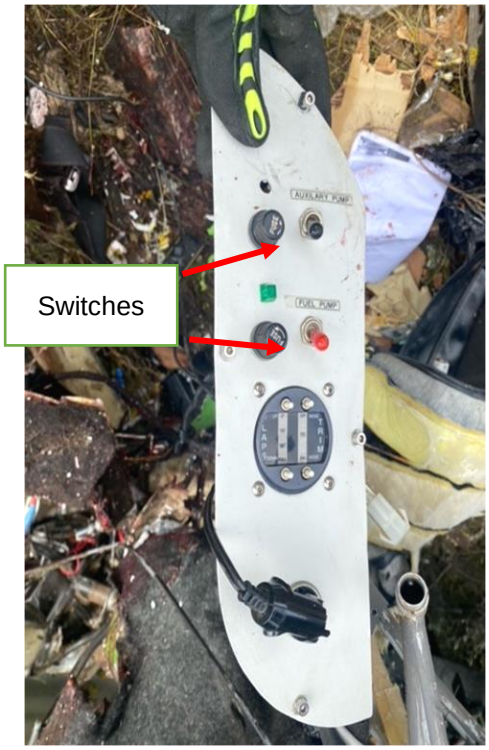

Figure 7: Auxiliary and fuel pump switches (red arrows).

1.12.5 The on-site inspection of the engine and propeller indicated that there was no power at the time of impact; all damage was attributed to the impact forces. One propeller blade tip broke off during the impact sequence which indicated that the engine was not operating at the time of impact with the ground. A piece of the composite blade was found in the vicinity of the accident site. All associated components (fuel pipes,

electrical wires and exhaust system) of the engine were still intact. The engine propeller rotated by hand when checked. The filter was checked and there was fuel inside, and there was no sediment or contamination found.

Figure 8: The engine and the propeller.

1.13 Medical and Pathological Information

1.13.1 To be discussed in the final report.

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 pilot was wearing the safety seat belt harness; however, the injuries sustained by the pilot were not survivable due to the manner in which the aircraft impacted the ground. The pilot's seat was heavily damaged, hence, the EMS had to cut the safety seat belt harness to free the pilot from the wreckage.

1.16 Tests and Research

1.16.1 To be discussed in the final report.

1.17 Organisational and Management Information

1.17.1 The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.18 Additional Information

1.18.1 To be discussed in the final report.

1.19 Useful or Effective Investigation Techniques

1.19.1 To be discussed in the final report.

2 FINDINGS

2.1 General

From the available evidence, the following preliminary findings 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 conclusions 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.

2.2 Findings

2.2.1 The pilot was initially issued a National Pilot Licence (NPL) on 24 April 2003. His last licence validation was on 21 April 2023 with an expiry date of 14 April 2025. The aircraft type was endorsed on the pilot's licence. The pilot was issued a Class 4 aviation medical certificate on 30 November 2021 with an expiry date of 30 November 2023.

2.2.2 The flight was conducted under the provisions of Part 94 of the CAR 2011 as amended.

2.2.3 The aircraft was first registered to the present owner on 30 September 2020. The aircraft was issued an Authority to Fly (ATF) certificate on 12 April 2023 with an expiry date of 11 April 2024.

2.2.4 The aircraft was re-issued a Certificate of Release to Service (CRS) on 26 August 2022 at 41.7 airframe hours with an expiry date of 26 August 2023 or at 141.7 airframe cycles, whichever occurs first.

2.2.5 The propeller blades were curled backwards, which indicated that the engine was not producing power at the time of impact.

3 ON-GOING INVESTIGATION

3.1 The AIID investigation is on-going and the investigators will investigate other aspects of this occurrence which may or may not have safety implications.

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa