

PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10287



Figure 1: File picture of the ZS-URC. (Source: Owner)

Description:

On Monday, 17 April 2023 at 1245Z, a De Havilland DHC-22 Chipmunk aircraft with registration ZS-URC was involved in an accident at Thorn Valley farm near Wings Park Aerodrome in the Eastern Cape province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight. The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot reported that after take-off, he turned left to route towards Stutterheim and when he was approximately 6 kilometres (3.2 nm) from Wings Park Aerodrome, the engine idled uncommanded whilst at a height of approximately 1400 feet (ft). The pilot applied carburettor heat, closed the throttle and attempted to restart the engine but without success. He then decided to conduct an emergency landing on the farm. Whilst on final approach, the aircraft collided with trees before it came to a stop. The pilot tried to open the canopy to exit the aircraft but found that it had jammed. He then hit the bottom part of the canopy window with the palm of his hand to dislodge it and exit the cockpit. The pilot sustained minor safety harness bruises.

The aircraft was substantially damaged during the accident.

Reference Number :CA18/2/3/10287
Name of Owner : DH Chipmunk cc
Name of Operator : DH Chipmunk cc
Manufacturer : DE Havilland Aircraft Company
Model : DHC-22 (Veteran)
Nationality : South African
Registration marking : ZS-URC
Place : Thorn Valley Farm, Eastern Cape Province
Date : 17 April 2023, 1245Z
Injuries : None
Damage : Substantial

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 involving a Chipmunk DHC-22 (Veteran) aircraft which occurred in Thorn Valley farm in East London, Eastern Cape province, on 17 April 2023 at 1245Z. 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 the investigation. Notifications were sent to the State of Registry, Operator, Design and Manufacturer in accordance with the CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. The States did not appoint an accredited representative and advisor. 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.

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 DHC-22 (Veteran) involved in this accident

Investigation — the investigation into the circumstances of this accident

Pilots — the pilots 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:

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

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ABBREVIATION	DESCRIPTION
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AP	Approved Person
ATF	Authority to Fly
CAR	Civil Aviation Regulations
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FDR	Flight Data Recorder
ft	feet
GPS	Global Positioning System
Kt	Knots
PIC	Pilot-in-Command
METAR	Meteorological Aerodrome Report
MHz	Megahertz
QNH	Barometric pressure adjusted to sea level
SACAR	South African Civil Aviation Regulation
SAWS	South African Weather Service
UTC	Co-ordinated Universal Time
VMC	Visual Meteorological Conditions
Z	Zulu (Term for Universal Coordinated Time – Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

- 1.1.1 On Monday, 17 April 2023 at 1245Z, a De Havilland DHC-22 Chipmunk aircraft with registration ZS-URC was involved in an accident at Thorn Valley farm near Wings Park Aerodrome in the Eastern Cape province. The pilot was engaged in a scenic flight towards Stutterheim with the intention to land back at the take-off aerodrome. Visual meteorological conditions (VMC) by day prevailed at the time of the flight. The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.
- 1.1.2 On the day of the accident, the pilot arrived at the hangar where the aircraft was parked and, thereafter, started his pre-flight checks which included checking for fuel. The fuel level was at the top mark when he opened the fuel caps for inspection. The pilot started up the engines and, once the systems checked out, he taxied towards the threshold of Runway (RWY) 09 where he made a blind transmission call on frequency 125.2-Megahertz (MHz) to state his intentions.
- 1.1.3 After take-off, the pilot turned left to route towards Stutterheim. When he was approximately 6 kilometres (km) (3.2 nautical miles) from Wings Park whilst at a height of approximately 1400 feet (ft), the engine idled uncommanded. As a resolve, the pilot applied carburettor heat, closed the throttle and attempted to restart the engine but he was unsuccessful. He then made a left turn to execute an emergency landing on the spot he had identified on the farm. However, he was not satisfied with the initially identified landing spot and elected to change it. He made a turn to the right to perform a forced landing on the newly identified spot, however, the aircraft came short of the second selected area. He then decided to keep the wings level and landed ahead. On final approach, the aircraft's right wing collided with trees before touchdown, and the aircraft came to an immediate stop shortly thereafter.
- 1.1.4 Whilst the pilot was still in the cockpit trying to exit the aircraft, he smelled fuel that might have been leaking. The pilot stated that he was unable to open the canopy; as a resolve, he hit the bottom part of the canopy window with the palm of his hand to dislodge it and, thereafter, climbed out of the cockpit. The pilot sustained minor safety harness bruises. The aircraft was substantially damaged.
- 1.1.5 The eyewitness, a farm owner, stated that he heard the sound of the aircraft whilst he was standing outside his farmhouse; he then noticed that the engine sound had stopped. Soon after, the aircraft came into view but disappeared from his line of sight

before he heard a bang. The eyewitness stated that he ran towards the direction at which the aircraft had disappeared and caught sight of the pilot who flagged him down to his location.

- 1.1.6 The accident occurred during daylight in Thorn Valley farm at Global Positioning System (GPS) co-ordinates determined to be 32°48'23.2" South 027°46'50.1" East at an elevation of 1332ft.



Figure 2: Aerial view of the crash site depicted by the yellow pin. (Source: Google Earth)



Figure 3: Direction of take-off depicted by an arrow on RWY 09. (Source: Google Earth)



Figure 4: The initial landing site that the pilot chose.

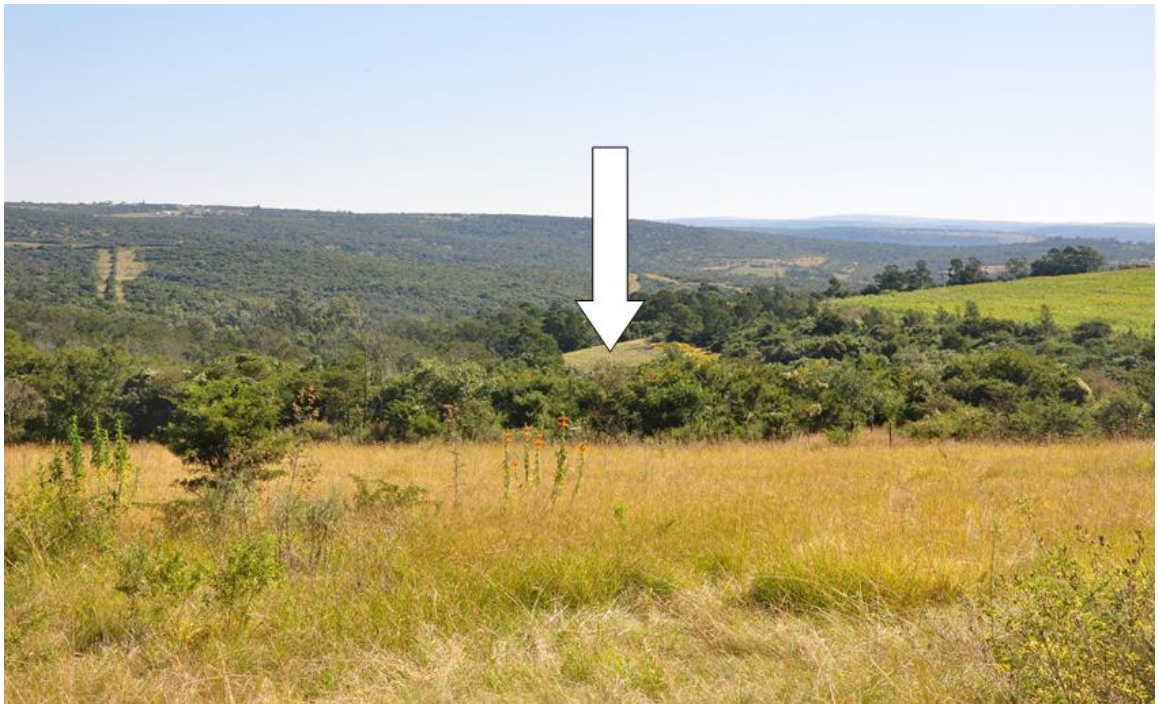


Figure 5: The second landing site that the pilot chose.

1.2. Injuries to Persons

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

1.3. Damage to Aircraft

1.3.1 The aircraft sustained substantial damage.



Figure 6: The wreckage post-accident.

1.4. Other Damage

1.4.1 None.

1.5. Personnel Information:

Pilot-in-command (PIC)

Nationality	South African	Gender	Male	Age	57
Licence Type	Private Pilot Licence (PPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night				
Medical Expiry Date	28 February 2024				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	633.2
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	4.5
Total on Type Past 90 Days	1.6
Total on Type	39.7

- 1.5.1 The pilot was initially issued a Private Pilot Licence (PPL) on 30 November 2000 under Part 61 of the South African Civil Aviation Regulations (CAR). The latest licence renewal had an expiry date of 28 February 2025.
- 1.5.2 The pilot was issued a Class 2 medical certificate on 2 February 2023 with an expiry date of 28 February 2024 and with the restriction to wear corrective lenses.

Approved Person (AP)

Nationality	South African	Gender	Male	Age	67
Licence Type	Approved Person (AP)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Airplanes including microlights				
Restrictions	None				
Previous Accidents	None				

- 1.5.3 The approved person (AP) who carried out the last mandatory periodic inspection (MPI) on the aircraft prior to the accident flight had an Approved Person certificate which was issued on 27 September 2021 with an expiry date of 26 August 2023. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on the accident aircraft type.

1.6. Aircraft Information

- 1.6.1 DHC-22 (Veteran) Chipmunk (Source: Chipmunk T10 Pilot's Operating Handbook)

The Chipmunk T MK 10 is designed as a basic trainer aircraft and has a fixed undercarriage, fully castoring tailwheel, and totally enclosed tandem cockpits with full dual controls. The leading edges of the wings and tail plane, and the fuselage are metal covered, the remainder of the wings and the control surfaces are fabric covered.

The aircraft is powered by a Gipsy Major Mk.8 engine, driving a fixed pitch metal wooden propeller. When flown solo the pilot should occupy the front cockpit.

Fuel system

Fuel tanks

Fuel is carried in two flexible 9 gallon (340 liter) tanks, mounted one in each wing, and is fed to the engine from both tanks simultaneously, non-return valves preventing the contents of one tank being transferred to the other. The valves also prevent the engine cutting if one tank is empty. Each tank is vented to the atmosphere and has a ball valve which seals the vent when the aircraft is inverted.

Fuel contents gauge

A direct reading fuel contents gauge is fitted in the top of each tank, next to the filler caps. The red figures indicate the contents when the aircraft is in the ground attitude and the white figures when in the flying attitude. In-flight, the gauges can only be read accurately from the front cockpit.

Airframe:

Manufacturer/Model	De Havilland Aircraft Company	
Serial Number	C1-0706	
Year of Manufacturer	1956	
Total Airframe Hours (At Time of Accident)	9899.2	
Last maintenance carried out (Hours & Date)	9851.96	4 April 2022
Hours Since Last inspection	47.24	
Authority to fly (Issue Date)	6 January 2020	
Authority to fly (Expiry Date)	31 January 2024	
C of R (Issue Date) (Present Owner)	21 June 2005	
Type of Fuel Used in the Aircraft	Avgas LL100	
Operating Categories	Private (Part 94)	
Previous Accidents	None	

1.6.2 According to available information, the aircraft was first registered to the present owner on 21 June 2005. The Certificate of Release to Service (CRS) was reissued on 4 April 2022 with an expiry date of 3 April 2023 or at 1085.35 hours, whichever occurs first.

1.6.3 The annual inspection was carried out on 4 April 2022 at 9851.96 airframe hours. The aircraft was issued a Certificate of Release to Service (CRS) on 4 April 2022 with an expiry date of 3 April 2023 or at 9951.96 hours, whichever occurs first. The aircraft was flown on 16 and 17 April 2023 past the calendar days of the CRS.

1.6.4 The aircraft was last refuelled on 16 April 2023 with 21 litres, bringing the fuel to full capacity.

Engine:

Manufacturer/Model	De Havilland (Rolls Royce) Gipsy Major 10-2
Serial Number	1142/A640612
Hours Since New	1174.40
Hours Since Overhaul	383.4

Propeller:

Manufacturer/Model	P-Prop DH DRG
Serial Number	5220
Hours Since New	545.48
Hours Since Overhaul	TBO not reached

1.7. Meteorological Information

1.7.1 The weather information entered in the table below was obtained from the South African Weather Service (SAWS) report that was issued for East London on 17 April 2023 at 1200Z.

Wind Direction	040°	Wind Speed	11 knots	Visibility	9999
Temperature	26°C	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	20°C	QNH	1008 hPa		

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA). There were no recorded defects with the navigational equipment prior to the flight.

1.9. Communication

1.9.1 The aircraft was equipped with 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 Wings Park Aerodrome is an unmanned and unlicensed airport with a single runway oriented 09/27.

Aerodrome Location	Eastern Cape Province
Aerodrome Status	Unlicensed
Aerodrome Co-ordinates	S32°49'31.52" E 027°50'02.73"
Aerodrome Altitude	1276 ft
Runway Headings	09/27
Runway Dimensions	843 X 19.15
Runway Used	N/A
Runway Surface	Grass
Approach Facilities	None
Radio Frequency	125.2 MHz



Figure 7: Wings Park Aerodrome. (Source: Google Earth)

1.11. Flight Recorders

1.11.1 The aircraft was neither fitted with a flight data recorder (FDR) or cockpit voice recorder (CVR), nor was it required by regulation.

1.12. Wreckage and Impact Information

1.12.1 The aircraft impacted the trees whilst flying at an approximate heading of 003 degrees; the impact caused the aircraft to rest at a heading of 081 degrees. The right wing impacted the trees and the fuselage was torn as a result, which cause the empennage to fold and contact the left wing. The right wing sustained impact damage to the leading edge, flaps and ailerons. The left-wing flaps and ailerons were also damaged. The left horizontal stabiliser was torn due to impact forces. The rudder, horizontal stabiliser and aileron cables were checked and found to have continuity from the controls to the control surfaces. When the propeller struck the trees, the

blades broke in half with one part remaining attached to the spinner. The canopy remained intact but could not be opened due to the bent rail. The pilot dislodged the Perspex glass to exit the cockpit. The pilot had also turned off all switches and levers before he made his exit.

1.12.2 The fuel tanks remained intact, however, there was a smell of fuel at the site. Approximately 27 litres from the left-wing fuel tank and about 15 litres from the right-wing fuel tank was drained. The right landing gear had rotated to the right whilst the left landing gear and the tail wheel remained intact post-accident.



Figure 8: Damage to the left wing.



Figure 9. The torn empennage.



Figure 10: The engine did not separate completely from the aircraft.



Figure 11: The piece of the propeller that broke off.



Figure 12: The piece of the propeller that remained attached to the spinner.

1.13 Medical and Pathological Information

1.13.1 None.

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 survivable because the cockpit structure was not deformed and the pilot had made use of the four-point safety harness.



Figure 13: The canopy and fuselage were still intact with only the bent canopy rail.

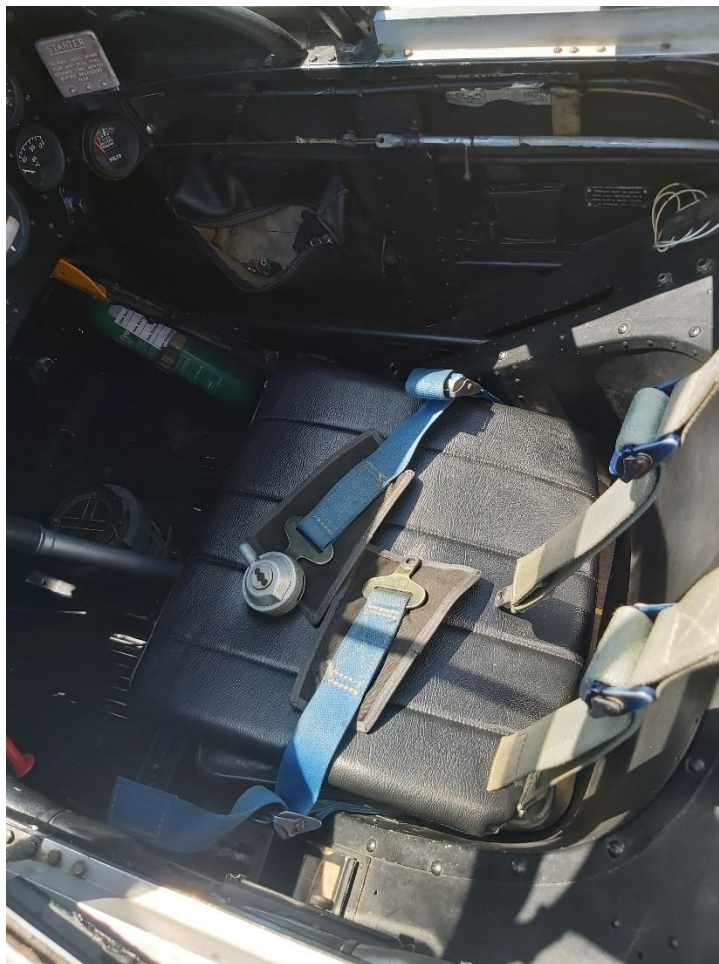


Figure 14: The four-point harness used by the pilot.

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 in accordance with the provisions of Part 94 (General Aviation) of the CAR 2011 as amended.

1.17.2 The aircraft maintenance organisation (AMO) that carried out the last maintenance inspection prior to the accident flight had an approved AMO certificate which was issued by the Regulator on 28 February 2023 with an expiry date of 27 February 2024.

1.18 Additional Information

1.18.1 To be covered 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 particular 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 Private Pilot Licence (PPL) on 30 November 2000 under Part 61 of the South African Civil Aviation Regulations (CAR). The latest renewed licence had an expiry date of 28 February 2025.

2.2.2 The pilot was issued a Class 2 medical certificate on 2 February 2023 with an expiry date of 28 February 2024 and with the restriction to wear corrective lenses.

2.2.3 The flight folio was last updated on 16 April 2023.

2.2.4 The AMO that carried out the last maintenance inspection prior to the accident flight had an approved AMO certificate which was issued by the Regulator on 28 February 2023 with an expiry date of 27 February 2024.

2.2.5 The AP who performed the last MPI on the aircraft prior to the accident flight had an AP certificate. The AP certificate was issued on 27 September 2021 with an expiry date of 26 August 2023. According to the reviewed records, the aircraft type was endorsed on his certificate and he was rated on the aircraft type.

2.2.6 The annual inspection on the aircraft was carried out on 4 April 2022 at 9851.96 airframe hours. The aircraft was issued a Certificate of Release to Service (CRS) on 4 April 2022 with an expiry date of 3 April 2023 or at 9951.96 hours, whichever occurs first.

2.2.7 The aircraft was last flown on 16 and 17 April 2023, past the calendar days of the CRS.

2.2.8 The aircraft had 52.76 hours remaining until the next inspection, but had lapsed on calendar days on the CRS by 14 days.

3. On-going Investigation

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

4. APPENDICES

4.1 None.

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