

PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10552



Figure 1: The file picture of the ZU-IUV aircraft. (Source: <https://surfacezero.com>)

Description:

On Friday afternoon, 21 February 2025, a pilot and an aircraft maintenance engineer (AME) on-board a De Havilland DH-82A (Tiger moth) aircraft with registration ZU-IUV took off on a private flight from Rand Airport (FAGM) in Gauteng province with the intention to land back at the same aerodrome. Visual meteorological conditions (VMC) prevailed at the time of the flight which was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

The aircraft took off from Runway (RWY) 35 and, whilst on a climb, the engine ran rough. The pilot declared an emergency as well as relayed to the air traffic control (ATC) personnel that he would make a left turn to return to the airport's RWY 11. As he turned the aircraft to the left, he observed that the airspeed was reducing and that the aircraft was losing height. He then aimed to land on an open area between RWY 35 and 11. However, the aircraft passed RWY 11 and came to a stop 150m from the edge of the runway. The aircraft sustained damage to the lower right wing, propeller, engine cowling and right undercarriage. The pilot and the AME were not injured.

Occurrence Details

Reference Number : CA18/2/3/10552
Occurrence Category : Accident (Category 2)
Type of Operation : Private (Part 94)
Name of Operator : Warne Aviation
Aircraft Registration : ZU-IUV
Aircraft Make and Model : De Havilland Aircraft DH-82A
Nationality : South African
Place : Rand Airport, Gauteng Province
Date and Time : 21 February 2024 at 1204Z
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) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence involving a De Havilland aircraft DH-82A which occurred at Rand Airport, Gauteng province, on 21 February 2024 at 1204Z. 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 AIID has appointed an investigator-in-charge to conduct a full investigation. The investigator did not dispatch to the accident site. Notifications were sent to the State of Registry, Operator, Design and Manufacturer in accordance with the CAR 2011 Part 12 and the ICAO Annex 13 Chapter 4. The States did not appoint an accredited representative and/or advisor. The AIID will lead the investigation and issue the final report of this accident in accordance with the CAR 2011 Part 12 and the 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:

- Whenever the following words are mentioned in this report, they shall mean the following:*
Accident — this investigated accident
Aircraft — the DH-82A 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

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
AIID	Accident and Incident Investigations Division
ASI	Airspeed Indicator
ATC	Air Traffic Control
A to F	Authority-to-fly
ATPL	Airline Transport Pilot Licence
C of R	Certificate of Registration
CRS	Certificate of Release to Service
ft	Feet
hPa	Hectopascal
kt	Knots
m	Metres
METAR	Meteorological Aerodrome Report
MPH	Miles per Hour
PAPI	Precision Approach Path Indicator
RWY	Runway
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
SCT	Scattered
UTC	Co-ordinated Universal Time
QNH	Query Nautical Height (Altitude Above Mean Sea Level)
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

- 1.1.1. On Friday afternoon, 21 February 2025, a pilot and an aircraft maintenance engineer (AME) on-board a De Havilland DH-82A (Tiger moth) aircraft with registration ZU-IUV took off on a private flight from Rand Airport (FAGM) in Gauteng province with the intention to land back at the same airport. Visual meteorological conditions (VMC) prevailed at the time of the flight which was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.
- 1.1.2. The pilot stated that on 20 February 2025, the engine sounded rough whilst the aircraft was being flown; as a result, after landing, the spark plugs were cleaned, and the gaps were checked to ensure that the spacing (between the spark plugs) was correct. On the day of the accident, the aircraft was refuelled with 40 litres (L) of Avgas. The pilot also completed the pre-flight checks before take-off. *The flight was intended to check if the roughness of the engine was corrected.* However, after take-off, the pilot and the AME discovered that the radio was unserviceable and, thus, had to land back to sort out the anomaly; the aerial had disconnected after the pilot bumped into it whilst manoeuvring in the cockpit.
- 1.1.3. At 1204Z, the duo took off again from Runway (RWY) 35 and, whilst on a climb, the engine ran rough. The pilot declared an emergency and the tower air traffic control (ATC) personnel instructed them to turn right; however, the pilot rejected the instruction because of the built-up area to the right. He then told the ATC that he would turn left and aim to reach RWY 11. As he was turning left, he observed that the aircraft was losing height and that the speed was reducing and nearing the red mark of 45 miles per hour (MPH) on the indicated airspeed (IAS) (see Figure 2). He then decided to land on an open space between RWY 35 and 11.
- 1.1.4. The aircraft passed RWY 11 and, as it was not straight and level, it impacted a heap of grass with the right undercarriage before it stopped 150 metres (m) from the runway (RWY 11). The aircraft sustained damage to the right undercarriage, right wing, engine cowling and propeller. The pilot and the passenger (AME) were not injured.
- 1.1.5. The accident occurred during daylight at FAGM, approximately 150m from RWY 11 at Global Positioning System (GPS) co-ordinates determined to be 26°14'41.7" South 28°08'26.7" East at an elevation of 5453ft.



Figure 2: An airspeed indicator of the aircraft.

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.2.1. The pilot and the passenger (AME) were not injured.



Figure 3: The ZU-IUV at the accident site. (Source: Pilot)

1.3. Damage to Aircraft

1.3.1. The aircraft damage was substantial; it included the right undercarriage, right wing, engine cowling and propeller.

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	66
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night, Instrument, Test, Instructor G1, DFE				
Medical Expiry Date	30 September 2025				
Restrictions	Yes				
Previous Accidents	Yes. Details in final report.				

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

Flying Experience:

Total Hours	23961
Total Past 24 Hours	2.5
Total Past 7 Days	8.5
Total Past 90 Days	65
Total on Type Past 90 Days	15.5
Total on Type	60

1.5.1. The pilot was initially issued a Private Pilot Licence (PPL) on 1 February 1982. He had an Airline Transport Pilot Licence (ATPL) that was renewed on 17 September 2024 with an expiry date of 31 March 2025.

1.6. Aircraft Information

1.6.1. The De Havilland DH.82 Tiger Moth is a single-engine, biplane, taildragger aircraft with two seats in tandem configuration. It is typically powered by a De Havilland Gipsy III 120 hp engine.

Airframe:

Manufacturer/Model	De Havilland Aircraft Company DH-82A	
Serial Number	84811	
Year of Manufacture	1935	
Total Airframe Hours (At Time of Accident)	1521.0	
Last Inspection (Date & Hours)	12 April 2024	1519.2
Hours Since Last Inspection	1.8	
CRS Issue Date	17 April 2024	
ATF (Issue Date & Expiry Date)	08 May 2024	25 June 2025
C of R (Issue Date) (Present Owner)	18 May 2023	
Type of Fuel Used	Avgas	
Operating Category	Part 94	
Previous Accidents	Yes	

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

Engine:

Manufacturer/Model	De Havilland Engine Company Gipsy
Serial Number	82599
Hours Since New	Unknown
Hours Since Overhaul	Unknown

Propeller:

Manufacturer/Model	De Havilland Propellers
Serial Number	3093
Hours Since New	Unknown
Hours Since Overhaul	Unknown

1.6.2. The last maintenance inspection of the aircraft was conducted and certified by an approved aircraft maintenance organisation (AMO) on 12 April 2024 at 1521 airframe hours. The aircraft had accrued 1.8 hours since the last maintenance inspection at the time of the accident.

1.6.3. The present owner of the aircraft acquired it in 2021 at 1519.0 airframe hours; the aircraft was undergoing restoration. The investigation found that the aircraft was involved in an accident in the past; the details of the accident will be discussed in the final report.

1.7. Meteorological Information

1.7.1. The following weather information was obtained from FAGM weather server, recorded on 21 February 2024 at 1130Z.

Wind Direction	315°	Wind Speed	12kt	Visibility	9999m
Temperature	24°C	Cloud Cover	SCT	Cloud Base	Unknown
Dew Point	17°C	QNH	1020hPa		

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 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. Rand Airport (FAGM)

Aerodrome Location	Germiston, Gauteng Province
Aerodrome Status	Licensed
Aerodrome GPS coordinates	26°14'31.12" South, 28°09'04.88" East
Aerodrome Elevation	5483 feet
Runway Headings	11/29 & 17/35
Dimensions of Runway Used	(35)1197X15m (11)1597X15m
Heading of Runway Used	350°
Surface of Runway Used	Asphalt
Approach Facilities	PAPI
Radio Frequency	Tower 118.7MHz

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. After take-off from RWY 35, the engine ran rough and the pilot declared an emergency. Thereafter, he made a left turn to return to the aerodrome but before he could reach

RWY 11, he lost height and speed. The aircraft landed with the right undercarriage first and came to a stop past RWY 11. The aircraft sustained damage to the lower right wing, right undercarriage (which collapsed), engine cowling and the propeller.



Figures 4 and 5: Damage to the propeller, lower right-wing and right undercarriage.

1.13. **Medical and Pathological Information**

1.13.1. None.

1.14. **Fire**

1.14.1. There was no pre- or post-impact fire.

1.15. **Survival Aspects**

1.15.1. The accident was survivable as the cabin was intact after the occurrence. The aircraft landed within the airport parameters.

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 aircraft maintenance engineer (AME) who conducted maintenance of the aircraft had an AME Licence that was initially issued by the Regulator on 1 April 1997. The AME

Licence was renewed on 16 August 2023 with an expiry date of 2 August 2025. The AME had the aircraft and engine series endorsed on his licence.

1.18. **Additional Information**

1.18.1. To be discussed in the final report.

1.19. **Useful or Effective Investigation Techniques**

1.19.1. None.

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 had an Airline Transport Pilot Licence (ATPL); his first licence (Private Pilot Licence) was issued on 2 January 1982. The ATPL was reissued on 17 September 2024 with an expiry date of 31 March 2025. The aircraft type was endorsed on his licence.

2.2.2. The pilot had a Class 1 aviation medical certificate that was issued on 12 September 2024 with an expiry date of 31 March 2025 with medical restrictions.

2.2.3 The last maintenance inspection of the aircraft was conducted and certified on 12 April 2024 at 1521 airframe hours by an approved aircraft maintenance organisation (AMO). The aircraft had accrued 1.8 hours since the last maintenance; the next annual inspection was scheduled for 17 April 2025 or at 1621.2 airframe hours, whichever comes first.

2.2.4 The aircraft had an Authority-to-fly (ATF) Certificate that was initially issued on 6 September 2021. The latest ATF was reissued on 8 May 2024 with an expiry date of 25 June 2025.

2.2.5 The Certificate of Registration (C of R) was issued to the present owner on 18 May 2023.

2.2.6 The aircraft maintenance engineer (AME) who conducted maintenance of the aircraft had an AME Licence that was initially issued by the Regulator on 1 April 1997; it was renewed on 16 August 2023 with an expiry date of 2 August 2025. The aircraft and engine series were endorsed on the AME's licence.

3. ON-GOING INVESTIGATION

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

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**