Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10491

Figure 1: Piper PA 34-200T Seneca II (ZS-MCR) at the accident site.

Description:

On 11 September 2024 at 1005Z, a flight instructor (FI) and a pilot on-board a Piper PA 34-200T Seneca II aircraft with registration ZS-MCR took off on a training flight from Brakpan Airport (FABB) to Springs Airport (FASI), both located in Gauteng province. After landing at FASI, they taxied the aircraft to the aircraft maintenance organisation (AMO) facility where an aircraft maintenance engineer (AME) opened the left engine (No. 1) cowlings, removed six spark plugs and cleaned them. The engineer also tested the magnetos and confirmed that they were within limits. Thereafter, the FI and the pilot took off from FASI and routed to the eastern general flying area (GFA) to complete simulated instrument flying exercises in preparation for the instrument rating test. After an hour, they proceeded to FABB to complete a few circuits on Runway (RWY) 36 before conducting a full stop landing. During the second circuit after conducting a touch-and-go landing, the pilot applied full power; however, whilst on the initial climb, the aircraft suddenly yawed to the left which prompted the FI to take over the control of the aircraft. The FI feathered the left engine propeller and retracted the undercarriage to reduce drag, but the aircraft failed to climb. The indicated airspeed (IAS) dropped rapidly, and the aircraft continued to yaw to the left whilst losing height. It landed approximately 60 metres (m) to the left of RWY 36. The aircraft was substantially damaged. The crew was not harmed.

Occurrence Details

Reference Number	**:** CA18/2/3/10491
Occurrence Category	**:** Accident Category 1
Type of Operation	**:** Training (Part 141)
Name of Operator	**:** Airborne Aviation
Aircraft Registration	**:** ZS-MCR
Aircraft Make and Model	**:** Piper Aircraft Corporation; PA 34-200T Seneca II
Nationality	**:** South African
Place	**:** Brakpan Airport (FABB)
Date and Time	**:** 11 September 2024 at 1155Z
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 Piper Aircraft PA 34-200T which occurred at Brakpan Airport, Gauteng province, on 11 September 2024 at 1155Z. 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 investigator dispatched to the accident site. The AIID will lead the investigation and issue the final report of this accident in accordance with the CAR 2011 Part 12 and the International Civil Aviation Organisation (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.

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https://www.caa.co.za/industry-information/accidents-and-incidents/accidents-and-incidents-archive/
Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
   Accident — this investigated accident
   Aircraft — the PA 34-200T Seneca II 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
°	Degrees
°C	Degrees Celsius
a/c	Aircraft
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AMSL	Above Mean Sea Level
ATPL	Airline Transport Pilot Licence
CAR	Civil Aviation Regulations
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FABB	Brakpan Airport
FASI	Springs Airport
FDR	Flight Data Recorder
FI	Flight Instructor
FL	Flight Level
Ft	Feet
GPS	Global Positioning System
hPa	Hectopascal
IAS	Indicated Airspeed
ICAO	International Civil Aviation Organisation
IIC	Investigator In Charge
Kt/s	Knot/s
M	Metres
METAR	Meteorological Routine Aerodrome Report
QNH	Query: Nautical Height
RWY	Runway
SACAA	South African Civil Aviation Authority
SP	Pilot
TTSN	Total Time Since New
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
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 11 September 2024, a flight instructor (FI) and a pilot with a Commercial Pilot Licence (CPL) on-board a twin-engine Piper 34-200T Seneca II aircraft with registration ZS-MCR took off on a training flight from Brakpan Airfield (FABB) in Gauteng province to the eastern general flying area (GFA) to prepare for the pilot's instrument rating test. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. According to the FI, during the run-up checks at 1 900 revolutions per minute (RPM), the left engine instruments dropped by 150 RPM when the left magneto was selected, whilst the normal drop should be 50 RPM. The right engine indicated an acceptable magneto drop when both magnetos were selected. The pair then flew to Springs Airport (FASI), also in Gauteng province, where the aircraft maintenance organisation (AMO) for the aircraft is based. On arrival, the pair explained the defect to the aircraft maintenance engineer (AME) who later removed six of the 12 spark plugs (lower section) and cleaned them to resolve the defect (anomaly). Thereafter, the AME refitted all six spark plugs, after which an engine run was conducted. The magneto drop test was conducted as per the Pilot's Operating Handbook (POH) and the engine parameters were within limits.

1.1.3. The crew then took off from FASI to the eastern GFA where they completed a number of instrument flying exercises. After the exercises, the crew returned to FABB with the aim to execute touch-and-go landing exercises on RWY36. After the first circuit and touch-and-go landing, the pilot applied full power; as the aircraft climbed, it yawed to the left. The pilot lowered the left pitch lever to fine; however, the aircraft could not climb further. The FI announced: "I have control" and the pilot stated that he noticed the left propeller windmilling, and that the left engine was not producing sufficient power. The FI retracted the landing gear to reduce drag, but the aircraft still could not climb; it kept yawing to the left. Moreover, the indicated airspeed (IAS) kept dropping. The aircraft landed in "wheels up" attitude after losing height rapidly. It came to a stop on the left of RWY36. The aircraft sustained damage to the two propellers and lower airframe. The crew was unharmed.

1.1.4. The accident occurred during daytime on the left side of RWY36 at FABB at Global Positioning System (GPS) co-ordinates determined to be 26°14'06.51" South 028°17'57.07" East, at a field elevation of 5380 feet (ft).

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.3. Damage to Aircraft

Figure 2: The aircraft after it had stopped. (Source: Operator)

1.3.1. The aircraft sustained substantial damage to both propellers and underbelly.

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information – Flight Instructor

Nationality	South African	Gender	Male	Age	44
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night, Instrument, Instructor Grade 2				
Medical Expiry Date	28 February 2025				
Restrictions	None				
Previous Accidents	Unknown				

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

Flying Experience:

Total Hours	12 472.21
Total Past 24 Hours	1.0
Total Past 7 Days	1.0
Total Past 90 Days	143.39
Total on Type Past 90 Days	1.0
Total on Type	66.5

1.5.1. The FI was initially issued an Airline Transport Pilot Licence (ATPL) on 12 December 2005 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 12 November 2023 with an expiry date of 31 December 2024. The Instructor Grade 2 rating was issued to the FI on 30 August 2024 with an expiry date of 31 August 2027.

1.5.2. The FI was issued a Class 1 medical certificate on 2 August 2024 with an expiry date of 28 February 2025 with no restrictions.

Personnel Information – Pilot under training

Nationality	South African	Gender	Male	Age	45
Licence Type	Commercial Pilot Licence (A)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night				
Medical Expiry Date	31 August 2025				
Restrictions	Defective distant vision				
Previous Accidents	Unknown				

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

Flying Experience:

Total Hours	284
Total Past 24 Hours	3.6
Total Past 7 Days	3.6
Total Past 90 Days	17.5
Total on Type Past 90 Days	13.4
Total on Type	47.7

1.5.3. The pilot was initially issued a Commercial Pilot Licence (CPL) on 10 November 2005. The latest renewed licence was completed on 10 November 2023 and had an expiry date of 30 November 2024.

1.5.4. The pilot was issued a Class 1 medical certificate on 13 August 2024 with an expiry date of 31 August 2025 with a restriction to wear corrective defective lenses for vision.

1.6. **Aircraft Information** (Source: wikipedia.org/wiki/Piper_PA-34_Seneca)

1.6.1. *The PA-34-200T Seneca II is an all-metal aircraft with retractable landing gear, two turbocharged piston engines and seating for up to seven occupants. It is approved for Instruments Flight Rules (IFR) by day and night. The aircraft was certified on 18 July 1974 and introduced as a 1975 model. The new model incorporated changes in the aircraft's control surfaces, including enlarged and balanced ailerons, the addition of a rudder anti-servo tab, and a stabilator bobweight. The "T" in the new model designation reflected a change to turbocharged, six-cylinder Continental TSIO-360E or EB engines for improved performance, particularly at higher altitudes. The Seneca II retained the counter-rotating engine arrangement of the earlier Seneca I. The Seneca II also introduced optional "club seating" whereby the two centre-row seats face rearwards and the two back seats face forward allowing more legroom in the passenger cabin. Gross weights are 4570 lb (2070 kg) for take-off and 4342 lb (1969 kg) for landing, with all weight in excess of 4000 lb (1 800 kg) required to be fuel.*

Airframe:

Manufacturer/Model	Piper Aircraft Corporation/PA 34-200T	
Serial Number	34-7570078	
Year of Manufacture	1975	
Total Airframe Hours (At Time of Accident)	6 180.4	
Last Inspection (Date & Hours)	11 April 2024	6 119.68
Hours Since Last Inspection	60.70	
CRS Issue Date	11 April 2024	
C of A (Issue Date & Expiry Date)	9 September 2024	30 September 2025
C of R (Issue Date) (Present Owner)	20 March 2023	
Type of Fuel Used	Avgas 100LL	
Operating Category	Part 141	
Previous Accidents	None	

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

Engine 1 (Left):

Manufacturer/Model	Continental Motors / BHC-C2YF-2C
Serial Number	809155-R
Hours Since New	2714
Hours Since Overhaul	481.52

Engine 2 (Right):

Manufacturer/Model	Continental Motors / BHC-C2YF-2C
Serial Number	807441-R
Hours Since New	2714
Hours Since Overhaul	481.52

Propeller 1 (Left):

Manufacturer/Model	Hartzell / BHC-C2YF-2CHFT
Serial Number	AN742
Hours Since New	Unknown
Hours Since Overhaul	431.77

Propeller 1 (Right):

Manufacturer/Model	Hartzell / BHC-C2YF-2CHFT
Serial Number	JS-153B
Hours Since New	Unknown
Hours Since Overhaul	296.58

1.7. Meteorological Information

1.7.1. The weather information below was obtained from the pilot questionnaire.

Wind Direction	330°	Wind Speed	12 kt	Visibility	9999 m
Temperature	24°C	Cloud Cover	Nil	Cloud Base	N/A
Dew Point	10°C	QNH	Unknown		

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

Aerodrome Location	Brakpan Airport (FABB)
Aerodrome Location	Gauteng Province
Aerodrome Status	Licensed
Aerodrome GPS coordinates	26°14'06.51" South 028°17'57.07" East
Aerodrome Elevation	5 380 feet

Runway Headings	18/36
Dimensions of Runway Used	1811 m
Heading of Runway Used	360°
Surface of Runway Used	Asphalt
Approach Facilities	None
Radio Frequency	None

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. On the second touch-and-go landing and after initiating a climb, the aircraft yawed to the left and the flight instructor took over the controls and retracted the undercarriage. He also realised that the left engine was windmilling and had feathered the left propeller to avoid drag, but the aircraft still could not climb. The indicated airspeed dropped and the aircraft lost height rapidly, skidded on its belly, and came to a stop 65m to the left of RWY36.

Figure 3: The right engine propeller separated from the flange during the accident sequence. (Source: Operator)

1.12.2. The aircraft skidded for approximately 150 metres before it stopped. The right-side engine propeller separated from the flange and the left-side propeller sustained damage to one of the blades. After lifting and supporting the aircraft on jacks, the undercarriage was lowered; it was no damaged. The aircraft had minor scratches to the underbelly.

Figure 4: Scrape marks on the underbelly.

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 only the propellers and the underbelly were damaged. The cockpit structure was intact as the impact force was minimal.

1.16. Tests and Research

1.16.1. The left engine is scheduled to be sent to an approved AMO for further analysis. The findings will be discussed in the final report.

1.17. **Organisational and Management Information**

1.17.1. The AMO which conducted maintenance on the aircraft had the AMO Certificate that was issued by the Regulator on 2 February 2024 with an expiry date of 31 January 2025.

1.17.2. The training school had a valid Approved Training Organisation (ATO) Certificate that was issued by the Regulator on 11 January 2024 with an expiry date of 31 January 2025.

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 FI was initially issued an Airline Transport Pilot Licence (ATPL) on 12 December 2005 under the provisions of Part 61 of the CAR 2011. The licence was revalidated on 12 November 2023 with an expiry date of 31 December 2024. The FI had an Instructor Grade 2 rating that was issued on 30 August 2024 with an expiry date of 31 August 2027.

2.2.2. The FI was issued a Class 1 medical certificate on 2 August 2024 with an expiry date of 28 February 2025 with no restrictions.

2.2.3. The pilot was initially issued a Commercial Pilot Licence (CPL) on 10 November 2005. The latest renewed licence was completed on 10 November 2023 and had an expiry date of 30 November 2024.

2.2.4. The pilot was issued a Class 1 medical certificate on 13 August 2024 with an expiry date of 31 August 2025 and with the restriction to wear corrective lenses for defective distant vision.

2.2.5. The AMO which conducted maintenance on the aircraft had the AMO Certificate that was issued by the Regulator on 2 February 2024 with an expiry date of 31 January 2025.

2.2.6. The training school had a valid Approved Training Organisation (ATO) Certificate that was issued on 11 January 2024 with an expiry date of 31 January 2025.

2.2.7. The aircraft landed in a “wheels-up” configuration after the failure of the left-side engine. This resulted in the aircraft yawing to the left, followed by the rapid loss of height.

2.2.8. The left engine is to be sent to an approved AMO for further analysis.

3. ON-GOING INVESTIGATION

3.1. The AIID investigation is on-going, and the investigator will be looking 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