AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

			Reference:	CA18/2/3/10491		
Aircraft Registration	**ZS-MCR**	**Date of Accident**	11 September 2024	**Time of Accident**	1155Z	
Type of Aircraft	Piper 34-200T		**Type of Operation**	Training (Part 141)		
Pilot-in-command Licence Type	Airline Transport Pilot Licence		**Age**	44	Licence Valid	Yes
Pilot-in-command Flying Experience	**Total Flying Hours**		12472	**Hours on Type**	66.5	
Last Point of Departure	Springs Aerodrome (FASI), Gauteng Province					
Next Point of Intended Landing	Brakpan Aerodrome (FABB), Gauteng Province					
Damage to Aircraft	Substantial					

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

Brakpan Aerodrome (FABB) on the left side of RWY 36 at GPS co-ordinates: 26°14'06.51" South 028°17'57.07" East, at a field elevation of 5380 feet (ft)

Meteorological Information	Surface wind: 320˚ at 13kts; visibility: 9999m; temperature: 21˚C; dew point: 10˚C; QNH: 1024						
Number of People On-board	2+0	**Number of People Injured**	0	**Number of People Killed**	0	**Other (On Ground)**	0

Synopsis

On 11 September 2024, a flight instructor (FI) and a pilot took off on a training flight from Springs Aerodrome (FASI), Gauteng province, to the eastern general flying area (GFA) with the intention to land at FABB when the accident occurred. The flight was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011, as amended.

The flight started at Brakpan Aerodrome at 1105Z and, during the run-up checks, they noticed a higher-than-normal drop of the left engine revolutions per minute (RPM) and, thus, decided to fly to their aircraft maintenance organisation (AMO) in Springs Aerodrome (FASI). Upon arrival at FASI, the AMO personnel removed and cleaned six spark plugs from the left engine. After testing the magneto drop and confirming if it was within limits, the pair took off again to the eastern general flying area (GFA) to complete simulated instrument flying exercises in preparation for the pilot's upcoming instrument rating test. An hour later, they proceeded to FABB to conduct a few circuits on Runway (RWY) 36 before conducting a full-stop landing. The first circuit was uneventful. During the second circuit, the pilot stated that after the touch-and-go landing, he applied full power and, on initial climb, the aircraft suddenly yawed to the left. This prompted the FI to take control of the aircraft. The FI raised 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 occupants disembarked unharmed.

Probable Cause/s and/or Contributory Factors

The aircraft's left side engine lost power during take-off which led to an unsuccessful landing.

Contributing Factor

The cause of engine failure could not be determined.

SRP Date	9 December 2025	Publication Date	10 December 2025

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
Nationality	**:** South African
Place	**:** Brakpan Aerodrome (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) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence which happened on 11 September 2024 at 1155Z. 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. 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 investigator was dispatched to the accident site for this occurrence.

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 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 Aerodrome
FAOR	O.R. Tambo International Aerodrome
FASI	Springs Aerodrome
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 Aerodrome Report
QNH	Altitude above Mean Sea Level
RWY	Runway
SACAA	South African Civil Aviation Authority
SP	Student 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) on-board a twin-engine Piper 34-200T aircraft with registration ZS-MCR took off from Springs Aerodrome (FASI) to the eastern general flying area (GFA) in preparation for the pilot's upcoming instrument rating test. Visual meteorological conditions (VMC) by day prevailed at the time of the flight. The flight was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011, as amended.

1.1.2. According to the pilot, before take-off from Brakpan Aerodrome (FABB) with the intention to fly to the eastern GFA, the run-up checks were conducted at 1900 revolutions per minute (RPM) during which the left engine RPM dropped by 150 when the left magneto was selected; the normal drop should be 50 RPM or below (the right engine magneto was normal). However, when the right magneto was selected, it indicated a normal drop on both engines. The crew then decided to fly to Springs Aerodrome (FASI) in Gauteng province, where their aircraft maintenance organisation (AMO) was based. Upon their arrival, they explained the anomaly to the aircraft maintenance engineer (AME) who then removed six of the 12 spark plugs (lower section) and cleaned them to troubleshoot/resolve the problem. Thereafter, the magnetos were tested as per the Pilot's Operating Handbook (POH), and they were all found within limits.

1.1.3. Later, the crew took off from FASI to the eastern GFA where they completed several simulated instrument flying exercises. After completing the training exercises, the crew returned to FABB with the aim to conduct touch-and-go circuit training on Runway (RWY) 36. The first circuit was uneventful. During the second circuit's touch-and-go, the pilot applied full power, and the aircraft climbed and yawed to the left. He then moved the left pitch lever to fine; however, the aircraft struggled to climb. The FI announced, "*I have control*". The pilot stated that he noticed the left propeller was windmilling, and that he confirmed on the engine instruments panel that the left engine was not producing power. The FI attempted to feather the left engine and raised the landing gear to reduce drag, but the aircraft was not climbing; it kept yawing to the left. The indicated airspeed (IAS) kept dropping and the aircraft landed in a wheels-up attitude after losing height rapidly. It came to a stop on the left of RWY 36. The aircraft sustained damage to the two propellers and lower airframe; the two occupants were unharmed.

1.1.4. The accident occurred during daytime 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.

1.2.1. The FI and the pilot were not injured during the accident sequence.

1.3. Damage to Aircraft

Figure 1: The aircraft after the accident. (Source: Operator)

1.3.1. The aircraft sustained damage to the underbelly and the right-side propeller, which broke off from the hub.

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	None				

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 had an Airline Transport Pilot Licence (ATPL) that was initially issued 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 had a Class 1 medical certificate that was issued on 2 August 2024 with an expiry date of 28 February 2025 with no restrictions.

Personnel Information – Pilot

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	Corrective for defective distant vision				
Previous Accidents	None				

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

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

1.6. Aircraft Information (Source: www.aircraft24.com)

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 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 more than 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

1.6.2. The two engines were turbocharged and fitted with variable propellers.

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 O.R. Tambo International Aerodrome (FAOR) on 11 September 2024 at 1200Z. FABB is located 6.8 nautical miles (nm) from FAOR.

Wind Direction	320°	Wind Speed	13kt	Visibility	9999m
Temperature	21°C	Cloud Cover	Nil	Cloud Base	N/A
Dew Point	10°C	QNH	1024		

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 Name	Brakpan Aerodrome (FABB)
Aerodrome Location	Brakpan, 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. During the second touch-and-go landing and after initiating a climb, the aircraft yawed to the left and the FI took over the controls and retracted the undercarriage. He also noticed that the left engine was windmilling and the aircraft was not climbing. The indicated airspeed dropped, and the aircraft lost height rapidly, skidded on its belly and came to a stop 65 metres (m) to the left of RWY 36.

Figure 2: The right engine propeller separated from the flange during the accident sequence. (Source: Operator)

1.12.2. The aircraft skidded for approximately 150m before it stopped. The right-side engine propeller separated from the flange, and the left-side propeller sustained damage to one of the blades. The aircraft was lifted and placed on supporting jacks and inspected; the undercarriage was undamaged, the aircraft had minor scratches to the underbelly.

Figure 3: Scrape marks on the underbelly.

1.13. Medical and Pathological Information

1.13.1. The FI and the pilot were not injured during the accident sequence.

1.14. Fire

1.14.1. There was no 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 investigating team was contacted by the insurance-approved aircraft maintenance organisation (AMO) about collecting the engines and logbooks. The logbooks were handed over to the AMO, and the aircraft was repositioned to the AMO hangars. A teardown inspection was completed without any definitive results to the cause of failure. The AMO further indicated that the crankshaft of the right-side engine was broken due to the accident.

1.17. Organisational and Management Information

1.17.1. The AMO which conducted maintenance of 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

Engine Failure After Lift-off (Source: FAA-8083-3A pg. 183)

1.18.1. *A take-off or go-around is the most critical time to suffer an engine failure. The airplane will be slow, close to the ground, and may even have landing gear and flaps extended. Altitude and time will be minimal. Until feathered, the propeller of the failed engine will be windmilling, producing a great deal of drag and yawing tendency. Airplane climb performance will be marginal or even non-existent, and obstructions may lie ahead. Add the element of surprise and the need for a plan of action before every take-off is obvious. With loss of an engine, it is paramount to maintain airplane control and comply with the manufacturer's recommended emergency procedures. Complete failure of one engine shortly after take-off can be broadly categorized into one of three scenarios shown in Figures 4 and 5.*

3.7 ENGINE INOPERATIVE PROCEDURES

DETECTING A DEAD ENGINE

A loss of thrust will be noted and with coordinated controls, the nose of the aircraft will yaw in the direction of the dead engine.

ENGINE SECURING PROCEDURE (FEATHERING PROCEDURE)

The propellers can be feathered only while the engine is rotating above 800 RPM. Loss of centrifugal force due to slowing RPM will actuate a stop pin that keeps the propeller from feathering each time the engine is stopped on the ground. Single engine performance will decrease if the propeller of the inoperative engine is not feathered.

Figure 4: Detecting and securing dead engine procedures. (Source: PA34-200t Seneca II POH)

ENGINE FAILURE DURING TAKEOFF (Below 85 KIAS)

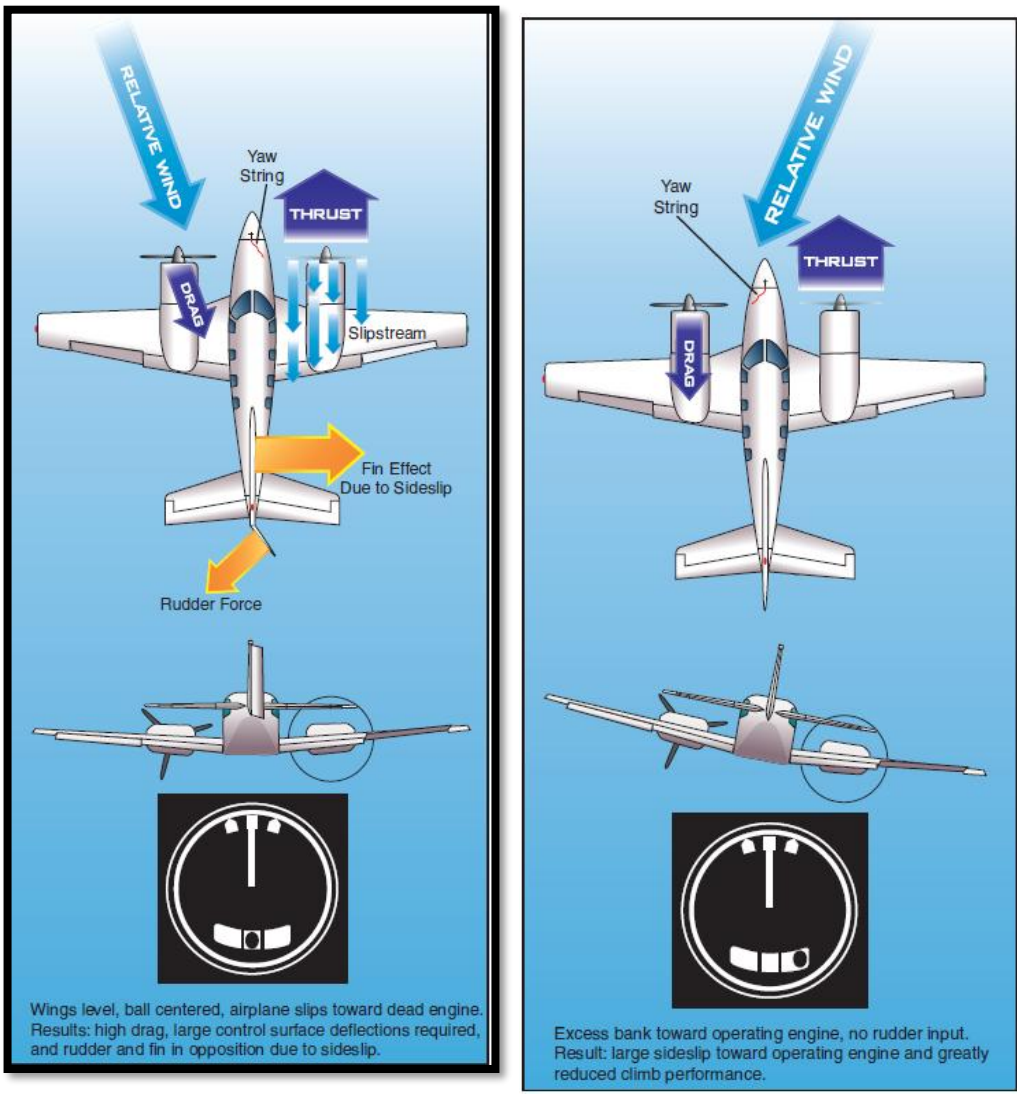
The single engine minimum control speed for this airplane is 66 KIAS under standard conditions.

If engine failure occurs during takeoff ground roll or 85 KIAS has not been attained, CLOSE both throttles immediately, land if airborne, and stop straight ahead. If inadequate runway remains to stop, close the throttles, land if airborne and apply maximum braking. The master switch and fuel selectors should be turned OFF. Continue path straight ahead turning to avoid obstacles as necessary.

ENGINE FAILURE DURING TAKEOFF (85 KIAS or above)

If engine failure during takeoff ground roll or after lift-off with the gear still down and 85 KIAS has been attained the course of action to be taken will depend on the runway remaining. If adequate runway remains, CLOSE both throttles immediately, land if airborne and stop straight ahead. If the runway remaining is inadequate for stopping, the pilot must decide whether to abort the takeoff or to continue. The decision must be based on the pilot's judgment considering loading, density altitude, obstructions, the weather, and the pilot's competence. If the decision is made to continue the takeoff, maintan heading and airspeed. Feather the inoperative engine and when climb is established RETRACT the landing gear. (Refer to Engine Securing Procedures, paragraph 3.7).

Figure 5: Engine failure procedure after take-off. (Source: PA34-200t Seneca II POH)



Figures 6 and 7: Aircraft configuration with left engine inoperative and relative wind from two different sides to maintain selected heading. (Source: FAA-H-8083-3A)

Engine Inoperative – Flight Principles (Source: FAA-H-8083-3A)

1.18.2. *The basic difference between operating a multiengine airplane and a single-engine airplane is the potential problem involving an engine failure. The penalties for loss of an engine are twofold: performance and control. The most obvious problem is the loss of 50 percent of power, which reduces performance by 80 to 90 percent, sometimes even more. The other is the control problem caused by the remaining thrust, which is now asymmetrical. Attention to both these factors is crucial to safe OEI flight. The performance and systems redundancy of a multiengine airplane is a safety advantage only to a trained and proficient pilot.*

1.18.3. *Best single-engine climb performance is obtained at VYSE with maximum available power and minimum drag. After the flaps and landing gear have been retracted and the propeller of the failed engine feathered, a key element in best climb performance is minimizing sideslip.*

With a single-engine airplane or a multiengine airplane with both engines operative, sideslip is eliminated when the ball of the turn and bank instrument is centred. This is a condition of zero sideslip, and the airplane is presenting its smallest possible profile to the relative wind. As a result, drag is at its minimum. Pilots know this as coordinated flight. In a multiengine airplane with an inoperative engine, the centred ball is no longer the indicator of zero sideslip due to asymmetrical thrust. In fact, there is no instrument at all that will directly tell the pilot the flight conditions for zero sideslip. In the absence of a yaw string, minimizing sideslip is a matter of placing the airplane at a predetermined bank angle and ball position. The POH performance charts for single-engine flight were determined at zero sideslip. If this performance is even to be approximated, the zero-sideslip technique must be utilized. There are two different control inputs that can be used to counteract the asymmetrical thrust of a failed engine: (1) yaw from the rudder, and (2) the horizontal component of lift that results from bank with the ailerons. Used individually, neither is correct. Used together in the proper combination, zero sideslip and best climb performance are achieved.

1.18.4. *Three different scenarios of airplane control inputs are presented below. Neither of the first two is correct. They are presented to illustrate the reasons for the zero-sideslip approach to best climb performance. Engine inoperative flight with wings level and ball centred requires large rudder input towards the operative engine. The result is a moderate sideslip towards the inoperative engine. Climb performance will be reduced by the moderate sideslip. With wings level, VMC will be significantly higher than published as there is no horizontal component of lift available to help the rudder combat asymmetrical thrust. Engine inoperative flight using ailerons alone requires an 8 - 10° bank angle towards the operative engine. [Figure 12-17] This assumes no rudder input. The ball will be displaced well towards the operating engine. The result is a large sideslip towards the operating engine. Climb performance will be greatly reduced by the large sideslip. Rudder and ailerons used together in the proper combination will result in a bank of approximately 2° towards the operative engine. The ball will be displaced approximately one-third to one-half towards the operative engine. The result is zero sideslips and maximum climb performance. Any attitude other than zero sideslip increases drag, decreasing performance. VMC under these circumstances will be higher than published, as less than the 5° bank certification limit is employed. The precise condition of zero sideslips (bank angle and ball position) varies slightly from model to model, and with available power and air speed. If the airplane is not equipped with counter-rotating propellers, it will also vary slightly with the engine failing due to P-factor.*

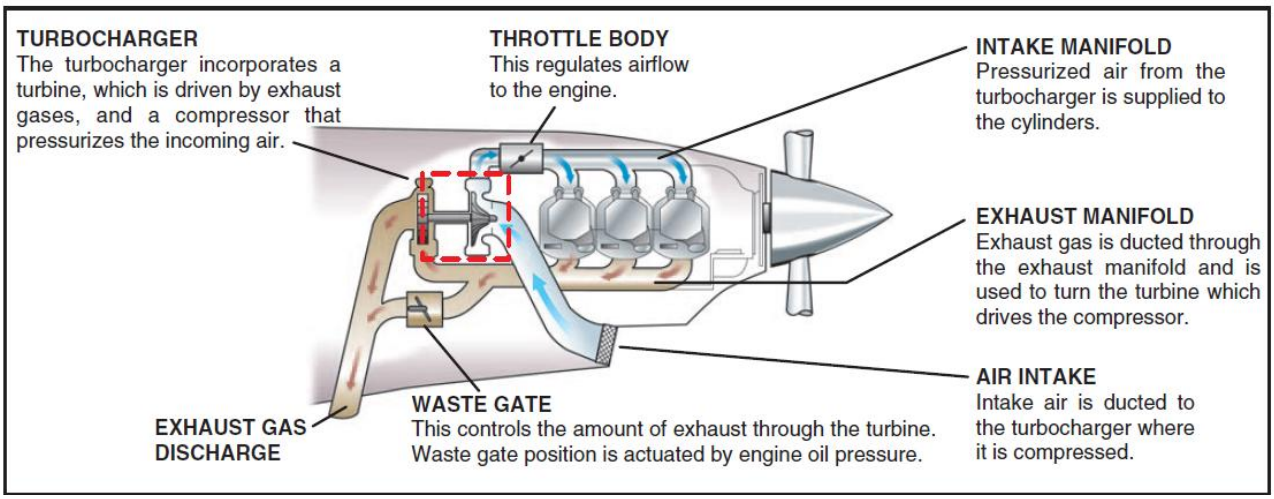


Diagram 1: Schematic of a turbocharged engine. (Source: FAA-H-8083-3A)

Operating Characteristics – Turbocharged Engine (Source: FAA-H-8083-3A)

1.18.5. *First and foremost, all movements of the power controls on turbocharged engines should be slow and gentle. Aggressive and/or abrupt throttle movements increase the possibility of* ***over boosting****. The pilot should carefully monitor engine indications when making power changes. When the waste gate is open, the turbocharged engine will react the same as a normally aspirated engine when the RPM is varied. That is, when the RPM is increased, the manifold pressure will decrease slightly. When the engine's RPM is decreased, the manifold pressure will increase slightly. However, when the waste gate is closed, manifold pressure variation with engine's RPM is just the opposite of the normally aspirated engine. An increase in engine RPM will result in an increase in manifold pressure, and a decrease in engine's RPM will result in a decrease in manifold pressure.*

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 FI had a valid ATPL and medical certificate, and the pilot had a valid CPL and a medical certificate. The purpose of the flight was to prepare the pilot for the CPL instrument rating.

2.2.2. The two pilots stated that during the run-up checks, the left-side engine RPM dropped drastically when they changed magnetos (the drop should not be more than 50 RPM). After take-off, they routed to FASI to have the AME correct the anomaly. The AME removed the spark plugs from the left engine and cleaned them. The AME stated that he checked the magnetos, and they operated within the acceptable limits.

2.2.3. The weather was fine with no clouds and with good visibility at the time of the flight.

2.2.4. The aircraft took off from FASI to the general flying area for the simulated instrument flying exercises before the crew returned to FABB for a few touch-and-go exercises on RWY 36. The FI and the pilot completed the first circuit uneventfully. During the second circuit after touchdown on the runway, the pilot added power to initiate climb and, during the climb, the aircraft yawed to the left, the pilot confirmed on the engine instruments panel that the left engine was not producing power. Therefore, the aircraft produced more drag on the left side due to the windmilling propeller; additionally, it was losing height. The FI took control from the pilot and raised the landing gear up and feathered the left-side propeller to set up the aircraft for a single engine configuration. The engine RPM on the left engine was likely below 800RPM and did not feather as confirmed in Figure 2. The aircraft did not have enough forward speed and the speed dropped even further with more yaw to the left. The aircraft's take-off configuration contributed to the drop in speed; this meant that the rudder was not effective and, thus, resulted in more yaw to the left. The speed was lower than 85 knots (kts) and, in that scenario, the PA34 POH recommends that "both throttles should be closed and if possible, land straight ahead". *The aircraft has turbocharged engines and once the wastegate is opened the engine operates like a naturally aspirated engine; meaning it loses all the boost power it had prior to wastegate opening. If this happens with a single engine, the aircraft would not be able to cope with such reduced power*.

2.2.5. The FI did not follow the recommendation suggested in the POH but assisted the pilot in flying and controlling the aircraft because if one tried to maintain altitude, the aircraft would have likely stalled, and the impact might have been severe than in a controlled descent. The aircraft crashed wheels up on the left of RWY 36 and the right-side propeller broke off. It is likely that it broke off because of increased power during take-off. The FI and the pilot were not injured.

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

3.2.1. The flight instructor (FI) had an Airline Transport Pilot Licence (ATPL) that was initially issued 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.

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

3.2.3. The pilot had a Commercial Pilot Licence (CPL) that was issued on 10 November 2005. The licence was renewed on 10 November 2023 with an expiry date of 30 November 2024.

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

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

3.2.6. 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.

3.2.7. 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.

3.2.8. The left engine was sent for further analysis to the approved AMO; the AMO could not find the reason for engine stoppage. However, the AMO found that the right-side engine crankshaft broke because of impact during the accident.

3.3. Probable Cause/s

3.3.1. The aircraft's left-side engine lost power during take-off which resulted in an unsuccessful landing.

3.4. Contributory Factor/s

3.4.1. The cause of engine failure could not be determined.

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