PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10536

Aircraft Type

Description:

The pilot was on a private hour-building flight that took off from Springs Aerodrome (FASI) in Ekurhuleni, Gauteng province intended for a touch-and-go landing at Heidelberg Airfield (FAHG) in the same province and land back at FASI. After take-off from Runway 03, the pilot initially climbed to 5800 feet (ft) above mean sea level (AMSL). He then turned left towards FAHG to climb further to 6300 ft for his flight. During a turn, the aircraft engine lost power and stopped. With an insufficient height above ground level to return safely to the runway, the pilot surveyed the area, identified an open field, and executed a forced landing. Upon landing, the aircraft impacted an uneven terrain, and it bounced; the nose landing gear bent backward and scraped the ground until the aircraft stopped at approximately 12 meters from the initial point of impact. The aircraft remained mostly intact. The propeller showed no signs of damage, as it was not rotating at the time of impact. The pilot was not injured during the accident, the aircraft sustained damage to the nose landing gear, the engine mountings, and the firewall. The post-accident engine test revealed no anomalies.

Occurrence Details

Reference Number	**:** CA18/2/3/10536
Occurrence Category	**:** Category 2
Type of Operation	**:** Private Part 91
Name of Operator	**:** Mach 1
Aircraft Registration	**:** ZS-ISI
Aircraft Make and Model	**:** Piper PA-28-180
Nationality	**:** South African
Place	**:** Outside FASI on an open field with an uneven surface.
Date and Time	**:** 11 December 2024
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 Piper PA-28-180, which occurred at FASI, Gauteng Province, on 11 December 2024 at 1045Z. 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/s was dispatched to the accident site. Notifications were sent to the State of Registry/Operator/Design/Manufacturer in accordance with CAR 2011 Part 12 and ICAO Annex 13 Chapter 4, the State United States of America (USA) (National Transport Safety Board (NTSB)) 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 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 PA-28-180 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 the 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
AIID	Accident and Incident Investigations Division
AMSL	Above Mean Sea Level
AVGAS LL	Aviation gasoline Low Lead
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FASI	Springs Airfield
FAHG	Heidelberg Airfield
FDR	Flight Data Recorder
ft	Feet
GPS	Global Positioning System
HP	Horsepower
hPa	Hectopascal
kt	Knots
m	Metres
METAR	Meteorological Routine Aerodrome Report
MPI	Mandatory Periodic Inspection
PIC	Pilot In Command
PPL	Private Pilot Licence
RPM	Revolutions Per Minutes
RWY	Runway
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
QNH	Altitude Above Mean Sea Level
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 December 2024 at approximately 1015Z, a pilot onboard a Piper PA-28-180 aircraft with registration ZS-ISI was on an hour-building flight from Springs Airfield (FASI) in Gauteng province to Heidelberg Airfield (FAHG) with the intention to return to FASI. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2. The pilot reported that he conducted a preflight inspection on the aircraft and found no anomalies. This was the sixth flight of the day for the ATO operating the aircraft. The aircraft was taxied and lined up for take-off on Runway 03 (RWY 03). After take-off, the pilot initially climbed to 5800 feet (ft) above mean sea level (AMSL). He turned left towards FAHG and intended to climb further to 6300 ft for his flight. During a turn, the aircraft engine lost power and stopped. With an insufficient height above ground level to return safely to the runway, the pilot surveyed the area, identified an open field, and executed a forced landing. Upon landing, the aircraft impacted an uneven terrain, and it bounced; the nose landing gear bent backward and scraped the ground during the sequence of events.

1.1.3. The aircraft remained mostly intact with substantial damage to the nose landing gear and the nose section. The pilot was not injured during the accident.

1.1.4. The aircraft accident occurred during daylight near FASI in a place with a Global Positioning System determined to be S 26° 14' 34.0", E 028° 23' 50.8" with a field elevation of 5356 ft.

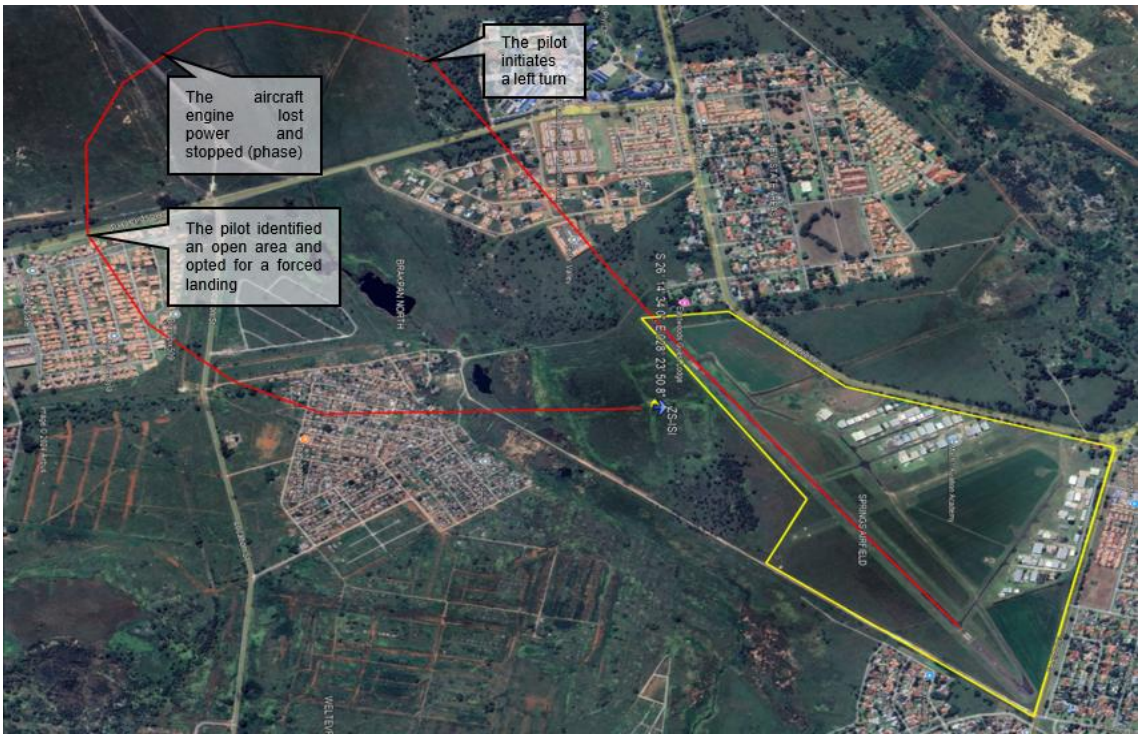

Figure 2: A Google plotting of the take-off route. (Source: Google Earth Map)

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.2.1. No injuries were sustained during the accident sequence.

1.3. Damage to Aircraft

1.3.1. The aircraft sustained damage to the nose landing gear and nose section.

Figure 3: The aircraft as it came to a full stop with the damaged nose landing gear.

1.4. Other Damage

1.4.1. None

1.5. Personnel Information

Pilot in Command (PIC)

Nationality	Indian	Gender	Male	Age	21
Licence Type	Private Pilot Licence				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	31 August 2028				
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	63
Total Past 24 Hours	2.1
Total Past 7 Days	4
Total Past 90 Days	9
Total on Type Past 90 Days	9
Total on Type	53

1.5.1. The pilot is a foreign national (Indian) who holds a Private Pilot Licence (PPL) which the Regulator initially issued on 26 June 2024 with an expiry date of 30 June 2025. The pilot's aviation medical certificate was issued on 3 August 2023 with an expiry date of 31 August 2028. The aircraft was endorsed on his licence and he had a total of approximately 63 hours with a total of 56 hours on the aircraft type.

1.6. Aircraft Information

1.6.1. The aircraft is a four-seater all structures are of aluminium alloy construction and are designed to ultimate load factors. The aircraft is powered by a Lycoming 0-360-A3A four-cylinder, direct drive, horizontally opposed engine rated at 180 horsepower (HP) at 2700 revolutions per minute (RPM). The engine drives a Sensenich model 76EM8S5-0-60 fixed-pitch propeller made from a one-piece alloy forging. The landing gear type is a tricycle fixed landing gear with a nose gear steering mechanism incorporated with a shimmy dampener. The aircraft is designed with two wings fuel tank with a total capacity of 25 gallons with 24 gallons of usable fuel carried.

Airframe:

Manufacturer/Model	Piper Aircraft Company/ PA-28-180

Serial Number	28-474	
Year of Manufacture	1962	
Total Airframe Hours (At Time of Accident)	7840.1	
Last Inspection (Date & Hours)	2 December 2024	7801.1
Hours Since Last Inspection	39	
CRS Issue Date	3 December 2024	
C of A (Issue Date & Expiry Date)	3 October 2024	31 October 2025
C of R (Issue Date) (Present Owner)	9 October 2019	
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:

Manufacturer/Model	Lycoming/ O-360-A3A
Serial Number	L 7259-36A
Part Number	O-360-A3A
Hours Since New	7840.1
Hours Since Overhaul	137

Propeller:

Manufacturer/Model	Sensenich 76EM8S50-0-62
Serial Number	33303K
Part Number	76EM8S50-0-62
Hours Since New	7840.1
Hours Since Overhaul	334

1.6.2. The aircraft maintenance documents such as maintenance logbooks (Airframe, Engine, and propeller), flight folio, and the mandatory periodic inspection (MPI) records were reviewed and studied. No anomalies were noted in any of the documents. The aircraft ‘s latest maintenance was carried out and certified and was issued a certificate of release to service (CRS) on 3 December 2024 at 7801.1 with an expiry date of 2 December 2025 or at 7901.1 airframe hour whichever occurs first.

1.6.3. The engine was overhauled by a Regulator approved Aircraft Maintenance Organisation (AMO) in accordance with the manufacturer’s recommended procedures on 14 November 2024 at 7702.8 total hours. The engine has since accumulated 137 hours following an overhaul on which an MPI was carried out and certified on 3 December 2024 at 7801.1 total hour.

1.6.4. The aircraft was issued a certificate of Airworthiness (C of A) on 3 October 2024 with an expiry date of 31 October 2025. There were no defects noted in any of the aircraft documents. The aircraft had a total of 7840.1 airframe hours at the time of the accident and has accumulated a total of 39 hours following the latest MPI service.

1.7. Meteorological Information

1.7.1. The weather information below was obtained from the Pilot Questionnaire as provided during the report as recorded at Springs Airfield, on 11 December 2024 at 1020Z.

1.7.2. An official weather report has been requested from the South African Weather Service.

Wind Direction	300°	Wind Speed	10 kt	Visibility	9999m
Temperature	32°C	Cloud Cover	Clear	Cloud Base	None
Dew Point	0°C	QNH	Unknown		

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 equipment 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 aircraft accident occurred near the aerodrome in a place with a Global Positioning System determined to be S 26° 14' 34.0", E 028° 23' 50.8" with a field elevation of 5356 ft.

Aerodrome Location	Gauteng Province
Aerodrome Status	Licensed

Aerodrome GPS coordinates	26°14'55.90" South, 028°23'50.90" East	
Aerodrome Elevation	5340 ft	
Runway Headings	03/21	14/32
Dimensions of Runway Used	(1600 X 18) m	(554 X21) m
Heading of Runway Used	033	
Surface of Runway Used	Asphalt	
Approach Facilities	None	
Radio Frequency	115.2MHz	

1.11. Flight Recorders

1.11.1. The aircraft was not 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

Figure 4: Aircraft at the accident site

1.12.1. The aircraft accident occurred following take off on an open field near the FASI. The area at which the aircraft has an uneven surface. The area during heavy rainfall is susceptible to accumulating storm water. This area is also close to an informal settlement situated northwest of the aerodrome at approximately 450 m from the accident site.

Figure 5: The initial impact marks of the left and right main landing gear.

1.12.2. The aircraft's initial touchdown was approximately 12 meters at the bottom of an embankment of the uneven terrain. There were ground marks associated with a hard impact with the main landing gear first which resulted in a bounce onto an embankment. (See Figure 5 above).

Figure 6: Shows the landing gear scrape marks over the embankment

1.12.3. The aircraft was fairly intact with no parts separated and damage was limited to the nose landing gear, engine mountings, and the firewall.

1.12.4. There was no visible sign of damage or contact with the ground on the propeller blades. According to the observation, the propeller had stopped rotating and remained in the same position before landing. (See Figure 7 below).

Figure 7: Aircraft nose section on the ground.

1.12.5. There was sufficient fuel in both tanks and the fuel system, including the fuel filter and carburettor bowl. See Figures 7 and 8).

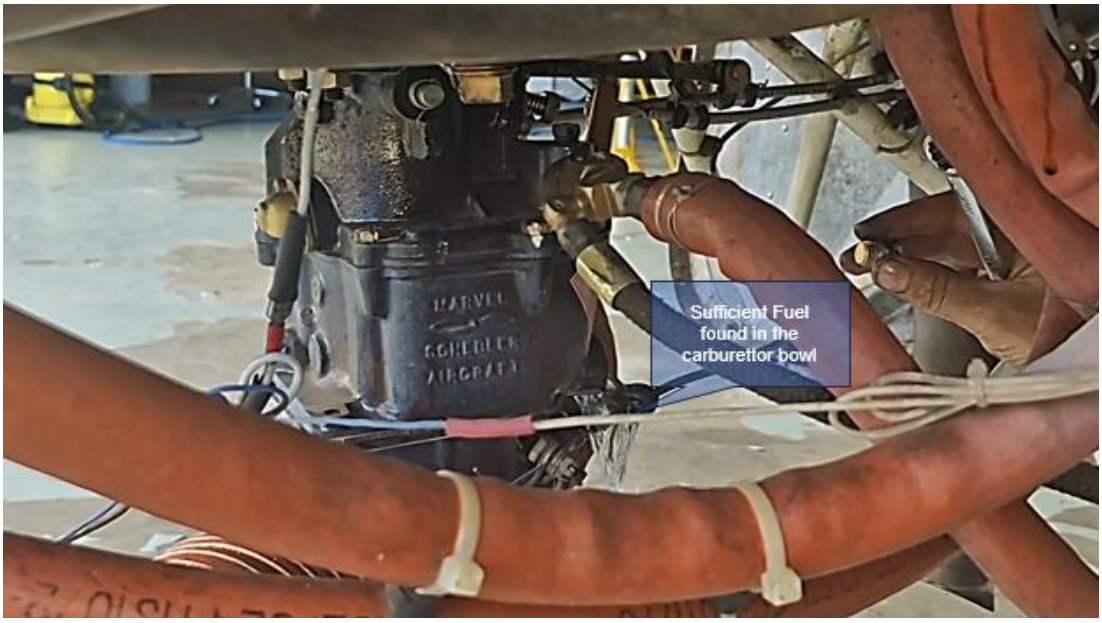

Figure 7: Snapshot of fuel found in the carburettor bowl.

1.12.6. All flight controls and the engine controls were accounted for, and no restrictions were observed that could have contributed to the engine stoppage or impaired the flight.

Figure 8: left fuel tank (left) and right fuel tank (right)

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 considered survivable. The attitude at which the aircraft was landed did not subject the aircraft to severe impact forces that could have caused damage to the cockpit area. The aircraft was intact with no damage to the cockpit area that could have impaired the pilot's life.

1.16. Tests and Research

1.16.1. The preliminary engine test revealed no functional defects. No fuel transfer restriction was observed during the engine run tests. All systems (fuel flow, engine manifold) pressures indicated normal during the test.

1.17. **Organisational and Management Information**

1.17.1. The aircraft was operated under private capacity by a PPL holder pilot on an hour-building flight towards his commercial licence.

1.17.2. The aircraft was operated by the Aircraft Training Organisation (ATO) and held an approved ATO certificate issued by the Regulator on 17 June 2020 with an expiry date of 30 June 2025.

1.17.3. The aircraft maintenance was carried out and certified by an aircraft maintenance organisation that held an AMO-approved certificate issued by the Regulator on 12 February 2024 with an expiry date of 28 February 2025.

1.18. **Additional Information**

1.18.1. To be discussed in the executive 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 is a foreign national (Indian) who held a Private Pilot Licence (PPL) which the Regulator initially issued on 26 June 2024 with an expiry date of 30 June 2025.

2.2.2. The pilot's aviation medical certificate was issued on 3 August 2023 with an expiry date of 31 August 2028.

2.2.3. The aircraft was endorsed on his licence, and he had a total of approximately 63 hours of which 56 hours was acquired on the aircraft type.

2.2.4. The aircraft was issued a certificate of Airworthiness (C of A) on 3 October 2024 with an expiry date of 31 October 2025. There were no defects noted in any of the aircraft documents. The aircraft had a total of 7840.1 airframe hours at the time of the accident and accumulated a total of 39 hours following the latest MPI service.

2.2.5. The aircraft 's latest maintenance was carried out and certified and was issued a certificate of release to service (CRS) on 3 December 2024 at 7801.1 with an expiry date of 2 December 2025 or at 7901.1 airframe hour whichever occurs first.

2.2.6. The aircraft's engine has a total of 7840.1 and has accumulated a total of 137 hours following the last overhaul.

2.2.7. The aircraft maintenance was carried out and certified by an aircraft maintenance organisation that held an AMO-approved certificate issued by the Regulator on 12 February 2024 with an expiry date of 28 February 2025. Their operational specification certificate endorses the aircraft type.

2.2.8. The aircraft was operated under private capacity by a PPL holder pilot on an hour-building flight towards his commercial licence.

2.2.9. The aircraft was operated by the Aircraft Training Organisation (ATO) that held an approved ATO certificate issued by the Regulator on 17 June 2020 with an expiry date of 30 June 2025.

2.2.10. The post-accident engine run test revealed no anomalies.

3. ON-GOING INVESTIGATION

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

3.2. The investigation will look into the powerplant's full functional checks and the organisational factors.

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