PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/10180

Figure 1: A picture of the accident aircraft, a Piper PA28-180 Cherokee.

Description:

On 28 June 2022 at approximately 1400Z, a flight instructor and a student pilot on-board a Piper 28-180 Cherokee aircraft with registration ZS-LSC were engaged in a navigation training flight from Swellendam Aerodrome (FASX) in the Western Cape province to Cape Town International Aerodrome (FACT) also in the same province. The pair intended to conduct a touch-and-go landing at FACT and then return to the take-off aerodrome. According to available information, when the aircraft was in communication with FACT tower, they were instructed to join long final for Runway 01. About 6 to 7 nautical miles (nm) before establishing final approach, the oil pressure level dropped and the radio failed, the engine temperature increased, and a loud banging was heard coming from the engine compartment before it stopped. Because the radio had failed, the instructor and the student pilot could not advise FACT tower about their situation. The instructor then took over control and squawked 7700 before identifying an open field in a densely populated area on which to conduct a precautionary landing. During landing, the undercarriage broke off, and the wings and the propeller were damaged. The onlookers invaded the accident scene and stole ‘easily’ removable aircraft parts. The crew sustained minor injuries during the accident sequence.

Occurrence Details

Reference Number	**:** CA18/2/3/10180
Occurrence Category	**:** Category 1
Type of Operation	**:** Training (Part 141)
Name of Operator	**:** 4 Aviators
Aircraft Registration	**:** ZS-LSC
Aircraft Make and Model	**:** PA28-180 Cherokee
Nationality	**:** South African
Serial number	**:** 28-3527
Place	**:** Philippi (Cape Town)
Date and Time	**:** 28 June 2022 1530Z
Injuries	**:** Minor (2)
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 on 28 June 2022 at 1530Z involving a Piper PA 28-180 Cherokee aircraft which occurred at Philippi, in the Western province. 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 (IIC) who dispatched to the accident site to conduct a full investigation. Notifications was sent to the State of Registry/Operator/Design/Manufacturer in accordance with CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. The State of manufacture and design (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, a final report or interim statement may contain altered information in case new evidence is found during the on-going investigation.

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 PA28-180 Cherokee 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 view. 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
°	Degrees
°C	Degrees Celsius
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
C of R	Certificate of Registration
CRS	Certificate of Release to Service
FACT	Cape Town Aerodrome
FASX	Swellendam Aerodrome
ft	Feet
hPa	Hectopascal
ILS	Instrument Landing System
kt	Knots
l	Litres
m	Metres
METAR	Meteorological Aerodrome Report
MHz	Megahertz
MPI	Mandatory periodic inspection
nm	Nautical mile
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
QNH	Altitude Above Mean Sea Level
VOR	VHF Omnidirectional Range
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On 28 June 2022 at approximately 1400Z, a flight instructor and a student pilot on-board a Piper 28-180 Cherokee with registration ZS-LSC were engaged in a navigation training flight from Swellendam Aerodrome (FASX) in the Western Cape province to Cape Town International Aerodrome (FACT), also in the same province. The pair intended to conduct a touch-and-go landing and, thereafter, return to FASX. A flight plan was filed for the flight. The flight was conducted under visual flight rules (VFR) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2 According to available information, the student pilot and the instructor completed pre-flight checks before they got airborne, routing directly to FACT and flying at 4500 feet (ft) above ground level (AGL). A little over an hour, they contacted FACT tower and they were instructed to join and report for long final on Runway 01. Approximately 6 to 7 nautical miles (nm) from FACT as they got ready to turn for final approach, they noticed a low engine oil pressure indication.

1.1.3 Meanwhile, FACT tower advised the instructor and the student pilot to report final approach, but at that point their radio had failed. The instructor noticed that the voltmeter was reading zero Amps, the engine oil temperature was in the red zone, and the oil pressure level was indicating zero. This was followed by a few loud bangs from the engine before it stopped. The pair noticed smoke coming out of the engine compartment and the instructor decided to take over the control of the aircraft from the student pilot. The instructor also noticed that the speed was decreasing at a fast rate and deduced that they would not reach the runway. The student squawked the emergency code “7700” and the instructor identified a suitable area, albeit in a densely populated area, on which to conduct a precautionary landing.

1.1.4 During landing, the aircraft’s undercarriage broke off as a result of an uneven field, approximately 5 nm from the threshold of Runway 01. The accident attracted many onlookers and some of them climbed on the aircraft while others stole some aircraft parts that were easy to remove. The aircraft sustained substantial damages during the accident sequence, and the instructor and the student pilot suffered minor injuries.

1.1.5 The accident occurred in Philippi, Western Cape province, during daylight under visual meteorological conditions (VMC) at the following Global Positioning System (GPS) co-ordinates: 34°01'07.8"S 18°33'45.97"E and at an elevation of 89ft.

Figure 2: The accident aircraft swamped by locals. (Source: Operator)

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The aircraft was substantially damaged.

Figure 3: The aircraft resting on its belly at the accident site. (Source: Operator)

1.4. Other Damage

1.4.1. None.

1.5. Personnel Information: Instructor

Nationality	South African	Gender	Female	Age	30
Licence Type	Air Transport Pilot Licence				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night, Instrument, Flight Instructor Grade II				
Medical Expiry Date	31 December 2022				
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	4000
Total Past 90 Days	85
Total on Type Past 90 Days	16
Total on Type	1000

Personnel Information: Student Pilot

Nationality	South African	Gender	Male	Age	20
Licence Type	Private Pilot Licence (PPL)				

Licence Valid	Yes	Type Endorsed	Yes
Ratings	None		
Medical Expiry Date	31 December 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	87.8
Total Past 90 Days	4.9
Total on Type Past 90 Days	4.9
Total on Type	18

1.6. Aircraft Information

Airframe:

Manufacturer/Model	Piper PA28-180 Cherokee	
Serial Number	28-3527	
Year of Manufacture	1966	
Total Airframe Hours (At Time of Accident)	6807.88	
Last Inspection (Date & Hours)	14 April 2022	6778.93
Hours Since Last Inspection	28.95	
CRS Issue Date	14 April 2022	
C of A (Issue Date & Expiry Date)	29 June 2018	31 August 2022
C of R (Issue Date) (Present Owner)	22 May 2015	
Type of Fuel Used	Avgas 100LL	
Operating Category	Part 141	
Previous Accidents	Unknown	

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

Engine:

Manufacturer/Model	Lycoming (Insert type please)
Serial Number	L-11779-36A
Part Number	0-360-A3A
Hours Since New	6277.83
Hours Since Overhaul	172.83

Propeller:

Manufacturer/Model	Sensenich
Serial Number	31601K
Part Number	76EM855-0-60

Hours Since New	1377
Hours Since Overhaul	TBO

1.7. Meteorological Information

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

Wind Direction	350°	Wind Speed	05kt	Visibility	9999m
Temperature	°C	Cloud Cover	None	Cloud Base	None
Dew Point	°C	QNH	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 records indicating that the navigation 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 never reached the aerodrome; a precautionary landing was performed 5nm south-west of the threshold of Runway 01 at FACT.

Aerodrome Location	FACT	
Aerodrome Status	Licensed	
Aerodrome GPS coordinates	33°58'16.93"South 018°36'15.45"East	
Aerodrome Elevation	150 feet	
Runway Headings	01/19	34/16
Dimensions of Runway Used	3201mX61m	1701mX46m
Heading of Runway Used	N/A	
Surface of Runway Used	Asphalt	
Approach Facilities	ILS, VOR	
Radio Frequency	118.1 MHz	

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. The instructor and the student pilot were given a long final joining clearance for a touch-and-go landing by FACT tower on 118.1-Megahertz (MHz). At 1530Z whilst approximately 6 to 7nm from FACT as they prepared to join long final for Runway 01, the engine oil pressure indication dropped. They tried to contact FACT tower but got no response because their radio had failed – the voltmeter indicated zero Amps. The instructor took over control of the aircraft and advised the student pilot to squawk the emergency code 7700 as it was clear that they needed to perform a precautionary landing.

1.12.2. The engine started making banging sounds and, thereafter, stopped operating. The pair also saw smoke coming from the engine compartment and, thereafter, selected an open field on which to land the aircraft. The undercarriage broke off during the landing roll and the aircraft skidded a few metres before coming to a stop near a puddle of water. Onlookers came in their droves to assist, whilst others had intentions of benefiting from the accident aircraft.

1.12.3. The engine upper casing, engine cowling and the underbelly of the aircraft were damaged.

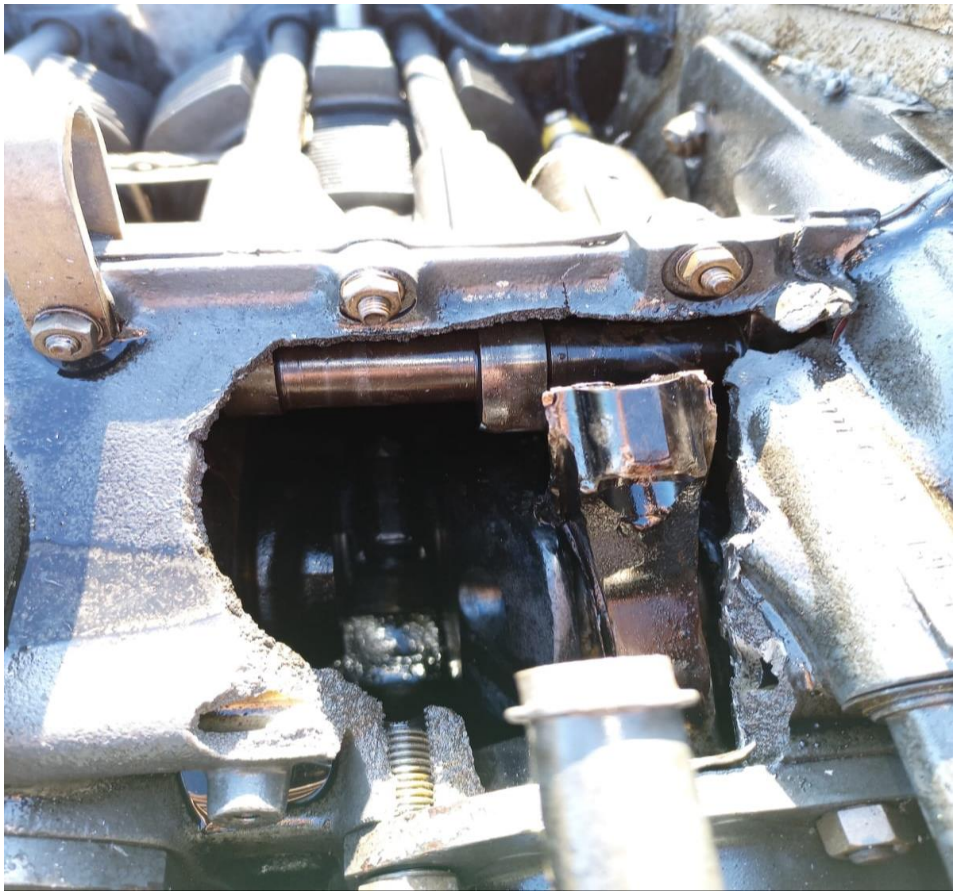

Figure 4: Damage on the engine upper case. (Source: Operator)

1.13. Medical and Pathological Information

1.13.1. The instructor and the student pilot suffered minor injuries and did not require major medical attention.

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 still intact, and the occupants had made use of the aircraft's safety harnesses.

1.16. Tests and Research

1.16.1. The engine is set to be tested to determine the cause of its stoppage.

1.17. Organisational and Management Information

1.17.1. The flight was conducted in accordance with the provisions of Part 141 (training) of the CAR 2011 as amended.

1.17.2. The aircraft had a valid Certificate of Airworthiness originally issued by the Regulator on 29 June 2018 with an expiry date of 31 August 2022.

1.17.3. The aircraft maintenance organisation (AMO) which certified the last maintenance inspection (annual inspection) prior to the accident flight was in possession of an approved AMO certificate that was issued by the Regulator on 29 October 2021 with an expiry date of 31 October 2022.

1.17.4. The operator was in possession of an Approved Training Organisation (ATO) Certificate which was issued by the Regulator on 1 April 2019 with an expiry date of 31 March 2024.

1.18. Additional Information

1.18.1. None.

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 instructor was issued an Airline Transport Pilot Licence (ATPL) on 10 September 2021 with an expiry date of 31 December 2022. The PA-28-180 Cherokee aircraft type rating was endorsed on her licence. The instructor had a Class 1 medical certificate issued on 2 December 2021 with an expiry date of 31 December 2022 with no limitations.

2.2.2. The student pilot was issued a Private Pilot Licence (PPL) on 14 September 2021 with an expiry date of 30 September 2022. His Class 2 medical certificate was issued on 4 December 2020 with an expiry date of 31 December 2025 with no limitations.

2.2.3. The flight was conducted in accordance with the provisions of Part 141 of the South African Civil Aviation Regulations (CAR) 2011 as amended. The operator was in possession of an ATO Certificate which was issued on 1 April 2019 by the Regulator and had an expiry date of 31 March 2024.

2.2.4. The aircraft was issued the Certificate of Airworthiness on 29 June 2018 with an expiry date of 31 August 2022. The aircraft was re-issued a Certificate of Release to Service (CRS) on 14 April 2022 with an expiry date of 30 April 2023 or at 6878.78 airframe hours, whichever occurs first.

2.2.5. The AMO which certified the last mandatory periodic inspection (MPI) prior to the accident flight was in possession of an approved AMO certificate that was issued by the Regulator on 29 October 2021 with an expiry date of 31 October 2022.

2.2.6 The last MPI was carried out on 14 April 2022 at 6778.78 airframe hours. The aircraft had accumulated an additional 28 airframe hours in operation since the last inspection.

2.2.8 The instructor and the student pilot heard a few loud bangs and noticed smoke emanating from the engine compartment before it stopped in-flight, resulting in a forced landing.

2.2.8 The engine sustained damage to the upper casing; further tests and inspections are to be conducted.

2.2.9 After the accident, some community members from a nearby informal settlement ran to the accident scene and helped themselves in some of the aircraft's components, contaminating the accident scene in the process.

3. ON-GOING INVESTIGATION

3.1. The AIID investigation is on-going, and the investigator will look into the cause of the engine failure which may or may not have safety implications.

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa