LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/3/2/1525						
Classification	Serious Incident	**Date**	01 February 2026	**Time**	0735Z		
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Lanseria International Airport (FALA), Gauteng Province	Place of Intended Landing	Lanseria International Airport (FALA), Gauteng Province				
Place of Occurrence	On a field approximately 3.4 nautical miles (nm) south-west of Runway 07 at Lanseria International Airport (FALA)						
GPS Co-ordinates	Latitude	25° 59' 17" S	Longitude	27° 59' 12" E	Elevation	4 517 ft	
Aircraft Information							
Registration	ZS-SDR						
Make; Model; S/N	Piper, PA-28-181 Acher II (Serial Number: 28-7890063)						
Damage to Aircraft	None	Total Aircraft Hours	1 521.9				
Pilot-in-command							
Licence Type	Commercial Pilot Licence (CPL)	Gender	Male	Age	24		
Licence Valid	Yes	Total Hours	2 148.5	Total Hours on Type	1 530.3		
Total Hours 30 Days	95.2	Total Flying on Type Past 90 Days	209.3				
People On-board	1+1	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Sunday, 1 February 2026, a flight instructor (FI) and a student pilot (SP) on-board a Piper PA-28-181 Archer II aircraft registered ZS-SDR were conducting a circuit training flight from Lanseria International Airport (FALA) in Gauteng province with the intention to land at the same airport. Visual meteorological conditions (VMC) 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.

The FI reported that a pre-flight inspection was conducted with no anomalies noted. The SP was the pilot flying (PF) and the FI was the pilot monitoring (PM). After engine start-up, the SP taxied the aircraft to the holding point of Runway 07. Following clearance from the air traffic control officer (ATCO), the SP taxied the aircraft to the threshold of Runway 07 and commenced with the take-off roll. The aircraft rotated and climbed to 1 000 feet (ft) above ground level (AGL). The pair flew a circuit and, whilst on right downwind leg for Runway 07, the ATCO instructed them to extend their downwind leg, thus, continuing to fly parallel to the runway past the normal 45 degrees to the threshold base turn point. The aircraft turned finals and, whilst on approach approximately 5 nautical miles (nm) south-west of the threshold of Runway 07, the engine ran rough and partially lost power.

The FI assumed control of the aircraft and troubleshot the engine to restore power but without success. He then elected to execute a forced landing on a field approximately 3.4nm south-west of Runway 07. The approach was stable and the aircraft landed safely on the field which had an uphill gradient. Immediately after the aircraft came to a stop, the pair completed the after-landing checklist and switched off the master switch. Both occupants were unharmed; the aircraft was not damaged.

Figure 1: The aircraft after the successful forced landing.

The weather information was obtained from the meteorological aerodrome report (METAR) for FALA, recorded on 1 February 2026 at 0730Z.

The METAR indicated a 3-knot (kt) variable wind speed that was blowing from a 30-degree direction. The recorded temperature was 23 degrees Celsius (°C) with a dew point of 14°C. Cloud cover, cloud base and visibility at the time of the serious incident was recorded as ceiling and visibility ok (CAVOK).

Wind Direction	Variable°	Wind Speed	Variable 3kt	Visibility	CAVOK
Cloud cover	CAVOK	Cloud base	CAVOK	QNH	1024 hPa
Temperature	23°C	Dew Point	14°C		

Follow-up Investigation:

On Monday morning, 2 February 2026, the investigating team drove to the forced-landing site. The aircraft was inspected for general condition; it was found intact and no signs of fuel leaks were noted. The engine, propeller and cockpit cabin area were inspected, and no anomalies were found. The engine's sparkplug leads, magnetos and induction pipes were found properly secured and intact, and the propeller was rotated freely by hand with compression felt on all cylinders and with no binding or abnormal noise. This indicated that the engine did not cease to operate.

The fuel tank caps were in place and properly latched. The investigating team removed the fuel caps to examine the fuel level in the tanks. Both tanks contained sufficient fuel and the total fuel in the tanks equated to approximately 34 US gallons (17 US gallons in each tank). The investigators also sampled fuel from the aircraft underwing drain points and the gascolator; all samples were of the correct fuel type, clear and contained no sediment or water.

Figure 2: Fuel sample from the gascolator of ZS-SDR.

The aircraft maintenance engineer (AME) rated on the aircraft examined the aircraft in the presence of the investigating team. The AME noticed that the carburettor throttle control as well the fuel mixture control levers moved freely through their full range of motion. The AME later started the engine and allowed it to warm up. Power was increased in stages during which the AME changed between the left and right fuel tanks, and the engine met all the parameters in accordance with (IAW) the aircraft maintenance manual (AMM).

In-flight Troubleshooting

The FI stated that when the partial engine power loss occurred, he advanced the throttle and the engine sputtered as though it was about to shut down. He then retarded the throttle and leaned the

fuel mixture and, thereafter, advanced the engine throttle; but again, the engine continued to sputter as though it was about to stop or shut down. The FI then reduced the engine throttle to approximately 1 200 rpm, advanced the fuel mixture to full rich, and made the decision to land.

Carburettor Icing-probability Calculation

The temperature (23°C) and dew point (14°C) information obtained from the METAR for FALA was used to calculate the probability of carburettor icing on the day and time of the serious incident flight. The calculation revealed a serious risk of carburettor icing at decent power settings, a moderate risk of carburettor icing at cruise power settings, and a relative humidity of 56%.

Dew point depression = 23°C – 14°C = 9°C

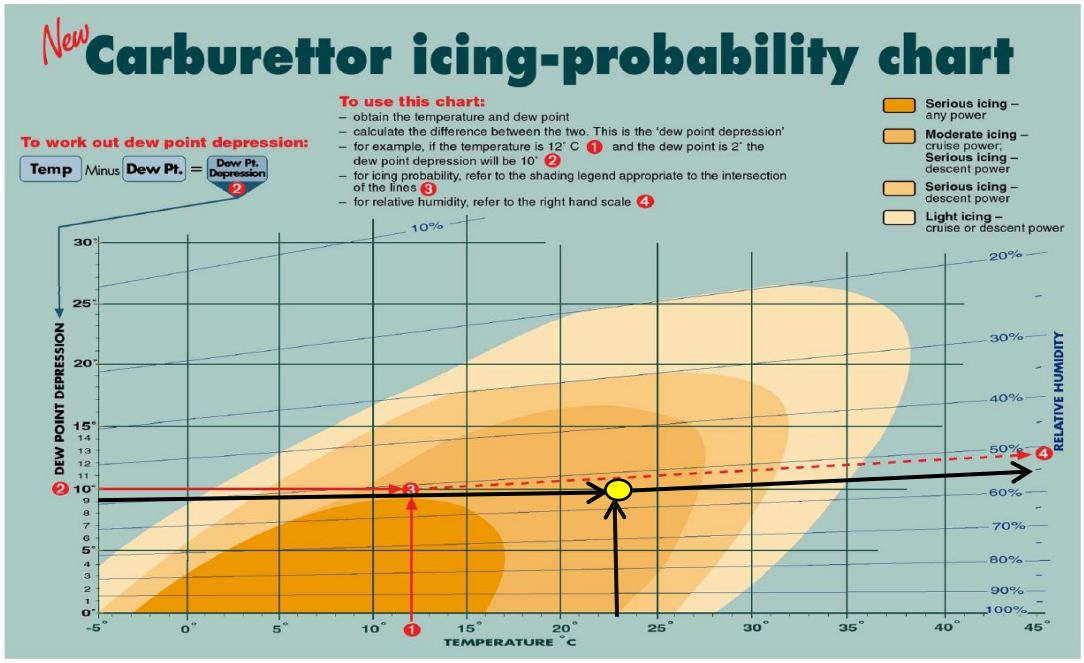

Figure 3: Carburettor icing-probability calculation shown in black.

Causes of Carburettor Icing (Source: https://aerotoolbox.com/carb-icing-calculator/)

A carburettor is still the most commonly used device in light aircraft to atomise and mix the fuel and air required for combustion but is not without its drawbacks; principally a carburettor is susceptible to ice formation in the venturi portion of the device. Any ice build-up will restrict the flow of the mixture to the engine which could result in a loss of engine power and, in extreme cases, an engine failure.

The venturi contraction results in an increase in velocity and corresponding decrease in pressure at the throat (narrowest region). This pressure drop results in a corresponding temperature drop in accordance with the ideal gas law.

The combination of the temperature drop as a result of the geometry of the venturi and the drop due to the latent heat required to vaporise the fuel can quite easily result in a situation where the temperature in the throat drops below freezing. If this happens, then any moisture in the air entering the venturi may freeze and stick to the side of the venturi.

This type of icing is termed fuel evaporation icing and can take place in ambient temperatures as high as 100°F (38°C) under the correct conditions of humidity. Icing is most likely to occur when temperatures are at or below 70°F (21°C) and relative humidity is above 80%.

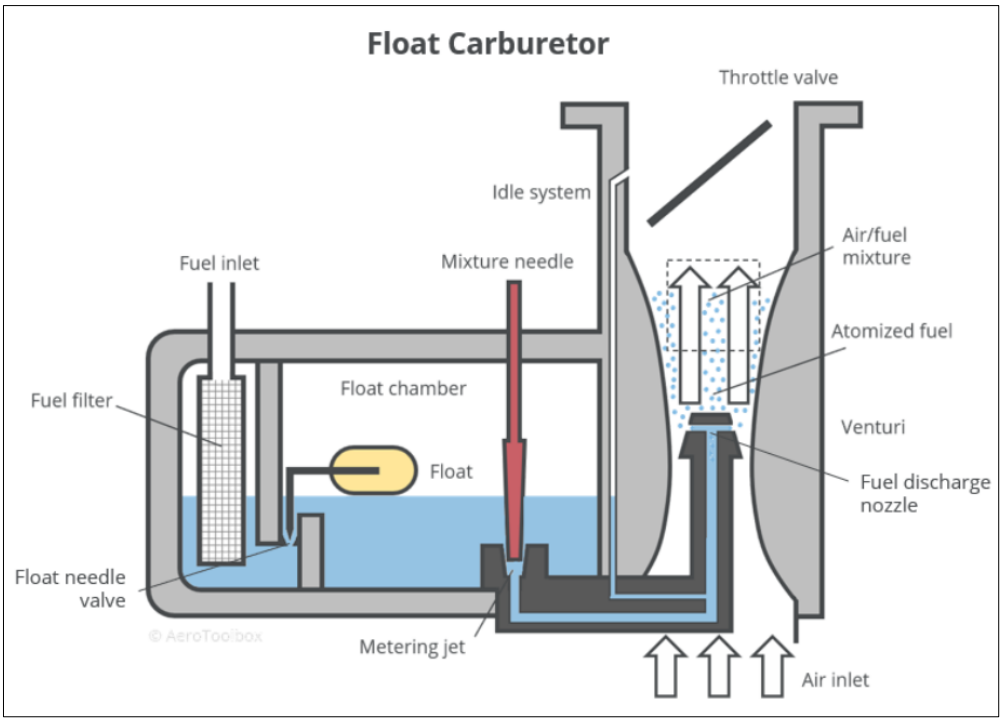

Diagram 1: A typical float type carburettor component.

Findings

1. Personnel Information

1.1. The flight instructor (FI) had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 9 June 2022. The licence was reissued on 6 November 2025 with an expiry date of 31 March 2026. The FI had the aircraft type endorsed in his licence. The FI had accumulated 2 148.5 total flying hours of which 1 530.3 hours were on the aircraft type.

1.2. The FI had a Class 1 aviation medical certificate that was issued on 5 March 2025 with an expiry date of 30 March 2026. The FI had no restrictions listed on his medical certificate.

1.3. The FI had a Grade 2 instructor rating that was issued on 4 November 2025 with an expiry date of 30 November 2028.

2. Aircraft Information

2.1. The aircraft Certificate of Airworthiness (C of A) was initially issued on 25 August 2008. The latest C of A has an expiry date of 30 April 2026.

2.2. The Certificate of Registration (C of R) was issued to the present owner on 26 June 2025.

2.3. The last mandatory periodic inspection (MPI) of the aircraft was certified on 14 January 2026 at 5 690.89 total airframe hours after which a Certificate of Release to Service (CRS) was issued with an expiry date of 14 January 2027 or at 5 790.89 airframe hours, whichever comes first.

2.4. The aircraft had a total of 5 740.38 airframe hours at the time of the serious incident.

3. Environment

3.1. Weather conditions at the time of the serious incident were conducive to the formation of carburettor icing. Relative humidity was approximately 53.58%, temperature was 23°C, and dew point was 14°C. This created a moderate risk for the formation of carburettor icing at cruise power settings.

4. Procedures

4.1. The FI did not open the carburettor heat as part of the in-flight troubleshooting intervention.

5. On-site Examination of the Aircraft

5.1. The aircraft's engine was started at the scene whereafter a forced landing was executed. The engine operation, as well as the aircraft fuel quality and the remaining fuel quantity could not be faulted.

Probable Cause(s)

The aircraft's engine partially lost engine power due to the formation of carburettor ice, thus prompting the flight instructor to execute a forced landing after being unable to restore full engine power.

Contributing Factor(s)
Non-opening of the carburettor heat as part of the in-flight troubleshooting intervention likely prevented the restoration of full engine power.
Safety Action(s)
None.
Safety Recommendation/s
It is recommended that the flight school operator provides training to its flight instructors on the early recognition of carburettor icing symptoms and in-flight emergency procedures to be followed when it is suspected that such a condition might exist.
About this Report
The decision to conduct a limited investigation is based on factors including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation and that will determine the scope of an investigation. For this occurrence, a limited investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up desk top enquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar occurrence. *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.*
Purpose
In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and ICAO Annex 13, 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.
Disclaimer
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This report is issued by:

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