

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		CA18/2/3/10572	
Aircraft Registration	ZS-KSL	Date of Accident	1 April 2025		Time of Accident	0730Z	
Type of Aircraft	Cessna 152		Type of Operation		Training (Part 141)		
Pilot-in-command Licence Type		Commercial Pilot License (CPL)	Age	76	Licence Valid	Yes	
Pilot-in-command Flying Experience		Total Flying Hours		6 380	Hours on Type	3 100	
Last Point of Departure		Virginia Aerodrome (FAVG), KwaZulu-Natal Province					
Next Point of Intended Landing		Virginia Aerodrome (FAVG), KwaZulu-Natal Province					
Damage to Aircraft		Substantial					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
Approximately 300 metres from the threshold of Runway 05 (GPS co-ordinates: 29°46'33.5" South 031°03'18.1" East); elevation of 46 feet (ft)							
Meteorological Information		Surface wind: 060°/2kts; temperature: 28°C; dew point: 21°C; Cloud Cover: CAVOK; QNH: 1011hPa					
Number of People On-board	2+0	Number of People Injured	2+0	Number of People Killed	0	Other (On Ground)	0

Synopsis

On Tuesday morning, 1 April 2025, a Grade II flight instructor (FI) and a pilot on-board a Cessna 152 aircraft with registration ZS-KSL took off on a training flight from Virginia Aerodrome (FAVG) in Durban, KwaZulu-Natal province, with the intention to return to the same aerodrome. 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.

The air traffic control officer (ATCO) who was on duty stated that the aircraft departed from Runway 05 at 0624Z, with a fuel endurance of four hours. It routed to the general flying area (GFA) where the pilots completed a few training exercises. After 40 minutes, the pair routed back to FAVG and performed a successful touch-and-go landing on Runway 05. Thereafter, they flew another circuit during which they requested to perform another touch-and-go landing on the same runway. The FI stated that on final approach whilst the aircraft was approximately 250 feet (ft) above ground level (AGL), they encountered windshear. He instructed the pilot to advance the throttle to increase engine power, but the engine was unresponsive. The aircraft impacted some trees on the Beachwood Golf Course, approximately 300 metres (m) short of the threshold of Runway 05. The aircraft came to rest in an upright position on the trees. The ATCO activated the crash alarm, and the Aerodrome Rescue and Firefighting (ARFF) team dispatched to the accident scene.

The pilots sustained minor injuries. They were taken to a hospital for further examination and they were discharged on the same day. The aircraft sustained substantial damage during the accident sequence.

Probable Cause/s and/or Contributory Factor

The aircraft lost engine power due to carburettor icing during a touch-and-go landing and it impacted some trees.

Contributing Factor:

1. Carburettor icing

SRP Date

9 September 2025

Publication Date

10 September 2025

Occurrence Details

Reference Number : CA18/2/3/10572
Occurrence Category : Accident (Category 2)
Type of Operation : Training (Part 141)
Name of Operator : AAA 4 Pilots Flight School
Aircraft Registration : ZS-KSL
Aircraft Make and Model : Cessna 152
Nationality : South African
Registration : ZS-KSL
Place : 300m from the threshold of Runway 05 at Virginia Aerodrome (FAVG),
KwaZulu-Natal Province
Date and Time : 1 April 2025 at 0730Z
Injuries : Minor
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 an occurrence involving a Cessna 152, approximately 300 metres (m) from the threshold of Runway 05 at Virginia Aerodrome (FAVG), KwaZulu-Natal province, on 1 April 2025 at 0730Z. 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. Notification was sent to the State of Registry and Operator 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 an advisor. Two investigators were dispatched to the accident site.

The AIID reports are made available to the public at:

<https://www.caa.co.za/industry-information/accidents-and-incidents/>

Notes:

- Whenever the following words are mentioned in this report, they shall mean the following:
Accident — this investigated accident
Aircraft — the Cessna 152 involved in this accident
Investigation — the investigation into the circumstances of this accident
Pilot — the pilot involved in this accident
Report — this accident report*
- 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

This report is produced without prejudice to the rights of the SACAA, which are reserved.

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Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
ARCC	Aeronautical Rescue Coordination Centre
ARFF	Aerodrome Rescue and Firefighting
ATCO	Air Traffic Control Officer
ATO	Aviation Training Organisation
CAR	Civil Aviation Regulations
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CPL	Commercial Pilot Licence
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FAVG	Virginia Aerodrome
FDR	Flight Deck Recorder
FI	Flight Instructor
ft	Feet
GPS	Global Positioning System
GF	General Flying
GFA	General Flying Area
hPa	Hectopascal
KIAS	Knots Indicated Air Speed
kt	Knots
Lbs	Pounds
m	Metres
METAR	Meteorological Aerodrome Report
MPI	Mandatory Periodic Inspection
POH	Pilot's Operating Handbook
PPL	Private Pilot Licence
QNH	Barometric Pressure Adjusted to Mean Sea Level
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
TML	Limited period of 6 months' validity of the medical certificate
TSI	Technical Service Instructions
VMC	Visual Meteorological Conditions
VML	Valid only with correction for defective distant, intermediate and near vision
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

- 1.1.1. On Tuesday morning, 1 April 2025, a Grade II flight instructor (FI) and a pilot on-board a Cessna 152 aircraft with registration ZS-KSL were engaged in a recurrency training flight when the accident occurred. The pilots took off from Virginia Aerodrome (FAVG) in Durban, KwaZulu-Natal province, with the intention to return to the same aerodrome. 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 air traffic control officer (ATCO), the aircraft had fuel endurance of four hours. The pilots departed from Runway 05 and proceeded to the designated general flying area (GFA) to conduct a flight training exercise. These exercises were successfully completed at an altitude of approximately 3500 feet (ft), south of Illovo River near Durban.
- 1.1.3. The FI stated that the duration of the flight from departure at FAVG to the GFA, as well as training took about 40 minutes before the pilots routed back to FAVG to perform touch-and-go landing exercises (circuits). Visibility during the flight was greater than 10 kilometres. The first touch-and-go was successfully executed on Runway 05 with stage two flaps selected. The aircraft then climbed to 500 ft above ground level (AGL), joined the right-side circuit and levelled off at 800ft. On the downwind leg, all relevant checks and procedures for a flapless landing were completed. The FI also stated that the carburettor heater was in the “off” position. The pilots requested to conduct another touch-and-go landing on Runway 05. On final approach, the ATCO cleared the pilots for a touch-and-go landing as no unstable wind conditions had been reported. The FI stated that whilst the aircraft was approximately 250ft above ground level (AGL), they encountered windshear; he then instructed the pilot to increase power. The pilot attempted to apply power but the engine was unresponsive. The aircraft descended and impacted the treetops in an upright position on Beachwood Golf Course, approximately 300 metres (m) short of the threshold of Runway 05. The pilots performed the engine shutdown checks and, thereafter, disembarked from the aircraft unassisted. They sustained minor injuries during the accident sequence.
- 1.1.4. After the accident, the ATCO on duty activated the crash alarm and the Aerodrome Rescue and Firefighting (ARFF) personnel were dispatched to the accident site. The Aeronautical Rescue Coordination Centre (ARCC) was also notified of the accident and, thereafter, a full-scale emergency response was initiated, including the deployment of the local Emergency Medical Services (EMS) personnel. After the arrival of the EMS personnel, the pilots were given first aid and, later, taken to a hospital for further examination. Both pilots were

discharged on the same day. The aircraft was substantially damaged.

1.1.5. The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined as 29°46'33.5" South 031°03'18.1" East, at an elevation of 46ft.

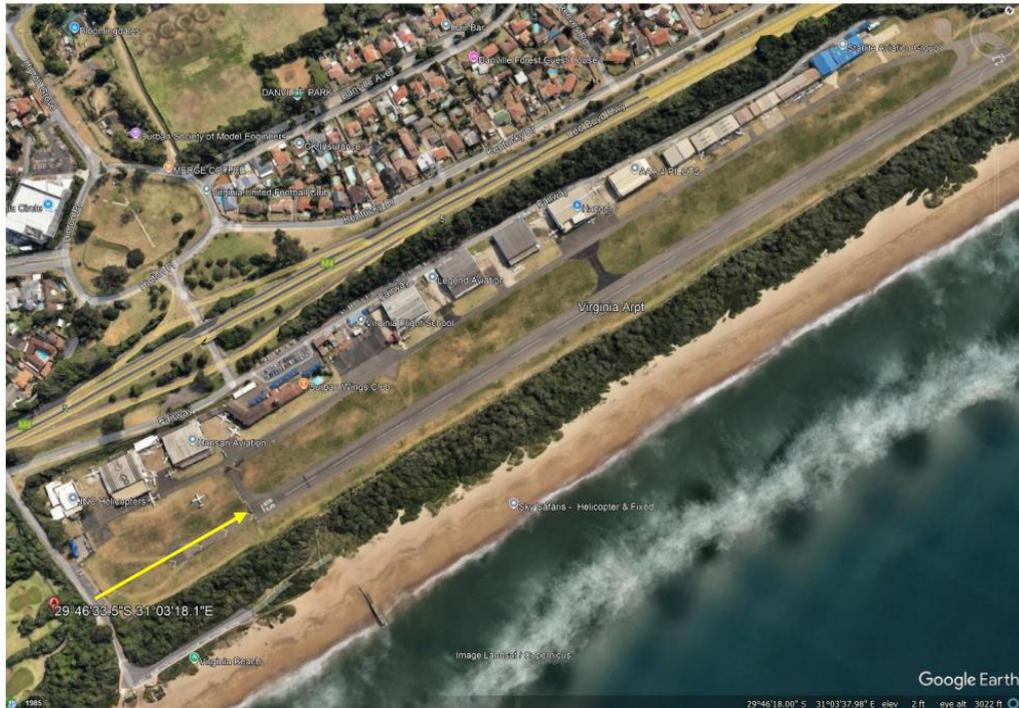


Figure 1: Aerial view of the accident site. The yellow arrow indicates the distance between the crash site and FAVG Runway 05 threshold. (Source: Google Earth)



Figure 2: The aircraft and the emergency vehicles at the accident site. (Source: Operator)

1.2. Injuries to Persons

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

Note: Other means people on the ground.

1.3. Damage to Aircraft

1.3.1. The aircraft sustained substantial damage.



Figure 3: The aircraft after it was removed from the treetops.

1.4. Other Damage

1.4.1. During the crash, fuel spilled on the golf course, but the ARFF responded quickly and took action to mitigate the fire hazard and risks.

1.5. Personnel Information

1.5.1 Flight Instructor (FI)

Nationality	South African	Gender	Male	Age	76
Licence Type	Commercial Pilot Licence (CPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instructor Grade II (A), Night rating (A), Test Pilot rating (Class 2) - A, Instrument rating (A)				
Medical Expiry Date	31 May 2025				
Restrictions	VML (Valid only with correction for defective distant, intermediate and near vision) TML (Limited period of 6 months validity of medical certificate)				
Previous Accidents	None				

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

Flying Experience:

Total Hours	6 380
Total Past 24 Hours	0
Total Past 7 Days	3.2
Total Past 90 Days	45
Total on Type Past 90 Days	40
Total on Type	3 100

1.5.2 The FI had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 18 August 1997. The latest CPL had an expiry date of 30 June 2025. The FI had a Class 1 aviation medical certificate that was issued on 23 November 2024 with an expiry date of 31 May 2025. The aircraft type was endorsed on his licence.

1.5.3 Pilot

Nationality	Indian	Gender	Male	Age	28
Licence Type	Private Pilot Licence (PPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night rating (A)				
Medical Expiry Date	31 August 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	203.8
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	6
Total on Type Past 90 Days	6
Total on Type	66.8

1.5.4 The pilot had a Private Pilot Licence (PPL) that was initially issued by the Regulator (SACAA) on 19 July 2019 with an expiry date of 30 April 2025. The pilot had a Class 2 aviation medical certificate that was issued on 30 August 2024 with an expiry date of 31 August 2025. The aircraft type was endorsed on his licence.

1.5.5 The pilot had language proficiency Level 6 in accordance with the ICAO standards.

1.6. Aircraft Information

1.6.1. Aircraft Description

The following information is an extract from the Pilot's Operating Handbook (POH) Cessna 152:

The aircraft is a high-wing, all-metal, two-seat, single-engine airplane with tricycle landing gear, designed for general utility operations. The aircraft is powered by a Lycoming O-235-L2C engine. It is a four-cylinder, horizontally opposed, air-cooled engine with overhead valves and a carburettor. The engine uses a wet sump oil system and produces 110 horsepower at 2550 revolutions per minute (RPM). Key components mounted at the front of the engine include the starter, a belt-driven alternator, and an oil cooler. At the rear, dual magnetos are installed on the accessory drive pad. The engine is also designed to accommodate a vacuum pump and a full-flow oil filter.

Airframe:

Manufacturer/Model	Cessna Aircraft Company	
Serial Number	152-84728	
Year of Manufacture	1981	
Total Airframe Hours (At Time of Accident)	9 116.75	
Last Inspection (Date & Hours)	07 December 2024	9 036.91
Airframe Hours Since Last Inspection	79.84	
CRS Issue Date	07 December 2024	
C of A (Issue Date & Expiry Date)	14 September 2014	30 September 2025

C of R (Issue Date) (Present Owner)	20 June 2024
Operating Category	Standard Normal Category (Aeroplane)
Type of Fuel Used	Avgas 100LL
Previous Accidents	None

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

Engine:

Manufacturer/Model	Textron Lycoming
Serial Number	L-2179915
Part Number	O-235-L2C
Hours Since New	9 036.91
Hours Since Overhaul	1 316.74

Propeller:

Manufacturer/Model	McCauley Propeller
Serial Number	K5863
Part Number	1A103/TCM
Hours Since New	9 037.31
Hours Since Overhaul	577.8

- 1.6.2. The aircraft had a valid Certificate of Airworthiness (C of A) that was issued by the Regulator on 14 September 2014 with an expiry date of 30 September 2025.
- 1.6.3. The last mandatory periodic inspection (MPI) of the aircraft was conducted and certified on 7 December 2024 at 9 036.91 airframe hours. The aircraft maintenance organisation (AMO) that maintained the aircraft had issued the Certificate of Release to Service (CRS) on 7 December 2024 at 9 036.91 airframe hours with an expiry date of 7 December 2025 or at 9 136.91 airframe hours, whichever comes first.
- 1.6.4. The mass and balance calculation of 1 617.05 pounds (lbs) was within the maximum allowable take-off weight of 1 670 (lbs) for the aircraft, according to the Pilot's Operating Handbook (POH).

A/C REG: ZS-KSL		LIC NO: 	
MASS & BALANCE			
STATION	WT(lbs)	ARM(IN)	MOM/1000
BEW	1175.05	31.02	36924.66
PILOT/ PAX	284	39.0	11076
BAGGAGE	10	64.0	640
ZFW	1470.05	33.08	48640.66
FW(6LBS/USG)	147	39.0	5733
TOTAL A/C WT	1617.05	33.6	54373.66
DATE: 01-04-2025		INST SIGN: 	

Figure 4: Mass & Balance calculation.

1.6.5. A review was conducted of the aircraft’s maintenance documentation, including records for the airframe, engine, propeller, flight folio and MPI reports. These documents indicated that the aircraft was maintained in accordance with the manufacturer’s prescribed maintenance procedures. All applicable Service Letters (SL), Service Bulletins (SB), Technical Service Instructions (TSI) and Supplementary Inspection Documents (SID) were complied with during maintenance activities. These procedures which ensured continued airworthiness of the aircraft were conducted by the approved AMO and the aircraft owner.

1.6.6. According to the ATCO, the aircraft had a fuel endurance of approximately four hours at departure. Fuel upload records indicated that the aircraft had about 66 litres (L) of fuel on-board at the time of take-off. Approximately 50L of fuel remained in the tanks after the accident.

1.7. Meteorological Information

1.7.1. The weather information below was obtained from the pilot questionnaire forms, completed by the two pilots.

Wind Direction	060°	Wind Speed	10kt Gusting 15kt	Visibility	>10km
Temperature	24°C	Cloud Cover	CAVOK	Cloud Base	>5000
Dew Point	22°C	QNH	1011hPa		

1.7.2. Visibility was more than 10km, and the reported ceiling and visibility Ok (CAVOK) conditions indicated no significant weather phenomena such as thunderstorms, gust fronts or low-level turbulence. Additionally, the temperature, dew point and pressure values were within normal ranges, with no signs of instability or convective activity.

1.7.3. The FAVG ATCO stated that there were no reports from other pilots regarding windshear on the day of the accident.

1.7.4. The calculated dew point depression suggested that the weather conditions at the time of the accident were favourable for the formation of serious icing at descent power. These conditions increased the likelihood of carburettor icing during the landing phase (as indicated by the black solid and dotted lines, along with the round spot in Figure 5).

Temperature	24°C
Dewpoint	22°C
Dewpoint depression	2°C
Relative humidity	86%

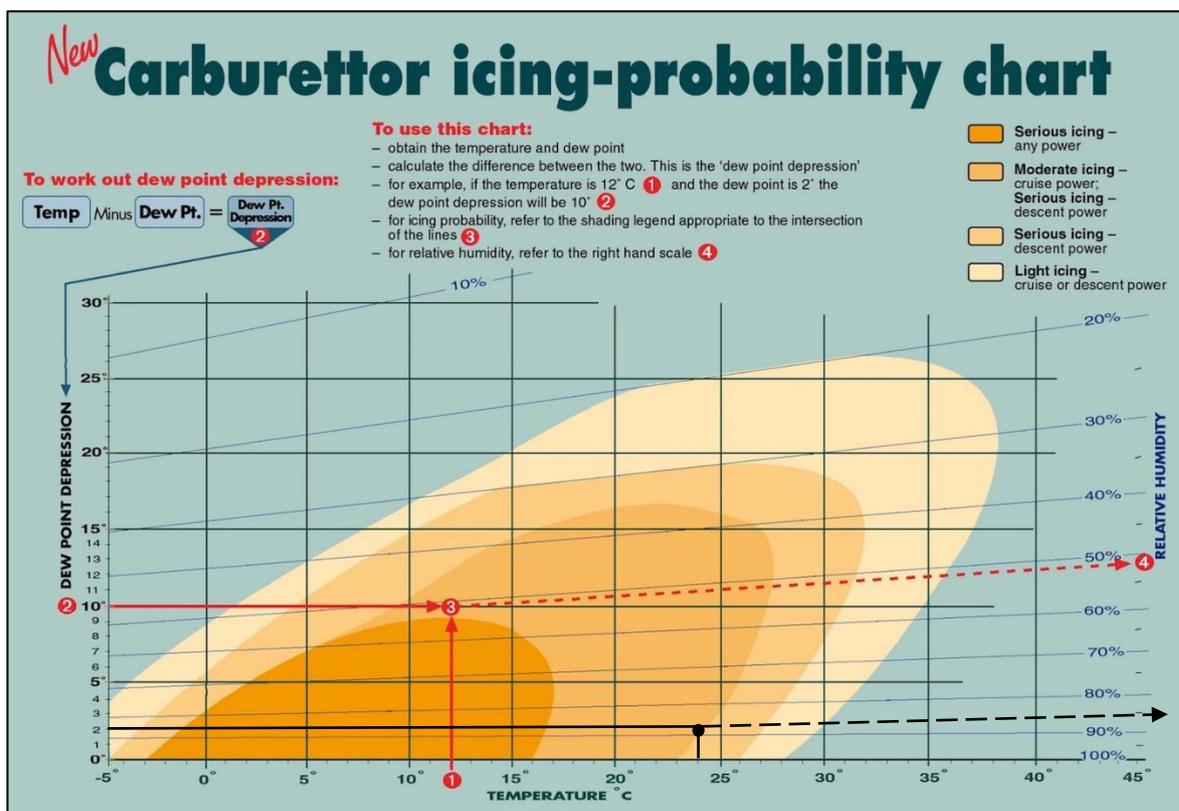


Figure 5: The Carburettor icing-probability chart calculations.

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 before 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 before the flight. The pilots were communicating with the ATCO on the very high frequency (VHF) 120.60-Megahertz (MHz).

1.10. Aerodrome Information

1.10.1. The accident occurred approximately 300m from the threshold of Runway 05 at FAVG.

Aerodrome Name	Virginia Aerodrome (FAVG)
Aerodrome Location	Durban, KwaZulu-Natal
Aerodrome Status	Licensed
Aerodrome GPS coordinates	29°46.15.00" South, 031°03.37.00" East
Aerodrome Elevation	20 feet
Runway Headings	05/23
Dimensions of Runway Used	925m x 22m
Heading of Runway Used	05
Surface of Runway Used	Asphalt
Approach Facilities	Runway lights
Radio Frequency	120.60-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 aircraft impacted the trees on Beachwood Golf Course, approximately 300m short of the threshold of FAVG Runway 05. Upon inspection of the aircraft after the accident, the engine oil level was found at the maximum mark after a dipstick check was conducted. There was no trace of oil leakage at the accident site. A significant amount of fuel leaked from the fuel tanks, and the ARFF team administered foam to avoid the possibility of a post-impact fire. The instrument panel had remained intact; the engine was also found intact.



Figure 6: The aircraft at its resting position on top of the trees.

1.12.2. The aircraft came to rest in an upright position on top of the trees. Despite remaining upright, it sustained substantial damage. The fuselage exhibited significant structural deformation, and various components of the airframe showed signs of impact-related stress and breakage.



Figure 7: The right-side view of the aircraft.

1.12.3. The empennage partially detached from the aircraft after impact. As a result, both the elevator and rudder sustained substantial damage. Despite this, the associated control cables were found intact, indicating that the control linkages had remained connected.



Figure 8: The severed empennage.

1.12.4. The nose landing gear exhibited clear signs of deformation, likely resulting from the forces experienced during impact. Despite the damage, the nose gear remained securely attached to the fuselage, indicating that the attachment points maintained structural integrity. Additionally, the propeller blades had slightly bent inwards, suggesting that the engine was not producing significant power at the moment of impact. The nature of damage to both the nose gear and propeller is consistent with a relatively low-energy impact.



Figure 9: Damage to one of the propeller blades.

1.13. Medical and Pathological Information

1.13.1. After the accident, it was determined that the pilots sustained minor injuries. A medical evaluation confirmed that there were no signs of incapacitation or any other medical issues that could have contributed to the cause of the accident.

1.14. Fire

1.14.1. There was no pre- or post-impact fire. However, there was significant fuel spillage. The ARFF responded promptly and took the necessary actions to mitigate a fire hazard and other risks.

1.15. Survival Aspects

1.15.1. The accident was considered survivable. The aircraft came to rest on top of the trees; this helped prevent structural intrusion into the cockpit and cabin areas. The occupants were properly secured with seat belts at the time of the accident, and they had assumed the brace position before impact. The characteristics of the accident were consistent with a low-impact crash at a shallow angle. Additionally, the seat rails remained intact, and the seats did not shift during impact.

1.16. Tests and Research

1.16.1. The aircraft was recovered to a hangar at FAVG. A fuel sample was drained from the gascolator, and no fuel contamination was observed.

1.16.2. The following components were examined by the AMO based at FAVG on 3 April 2025 to determine an alleged throttle control failure of the aircraft (as per the FI and the pilot statements after the accident).

The Throttle Control Cable:

Make: McFarlane FAA PMA

Part Number: MC9863056-1

Batch Reference: JO#33196

Eligibility Reference: McFarlane Aviation Product Page

Findings:

- I. After removal, the throttle control cable was inspected and found to be in good condition with no visible signs of wear or damage.



Figure 10: The throttle control cable.

The Carburettor:

Make: Marvel Schebler

Model: MA-3 PA

Findings:

- I. The carburettor was removed and thoroughly inspected. Adequate fuel was found in the carburettor float bowl, ruling out fuel starvation as a contributing factor to the accident.
- II. The carburettor levers, shaft and butterfly valve were examined for any signs of damage, wear or defects that could have contributed to the throttle control failure.
- III. The carburettor was determined to be in good condition.



Figure 11: The carburettor.

Starter Bendix:

Specification: The Precision Aircraft Starter's Bendix gear, used on a Lycoming O-320 engine is designed to disengage automatically when the engine reaches a speed of approximately 400 revolutions per minutes (RPM) at the crankshaft.

Findings:

- I. It was observed that the Starter Bendix remained engaged, indicating an attempted engine restart. The Bendix can only disengage when the engine is rotating, and on similar Lycoming engines, it typically disengages at approximately 400 RPM.

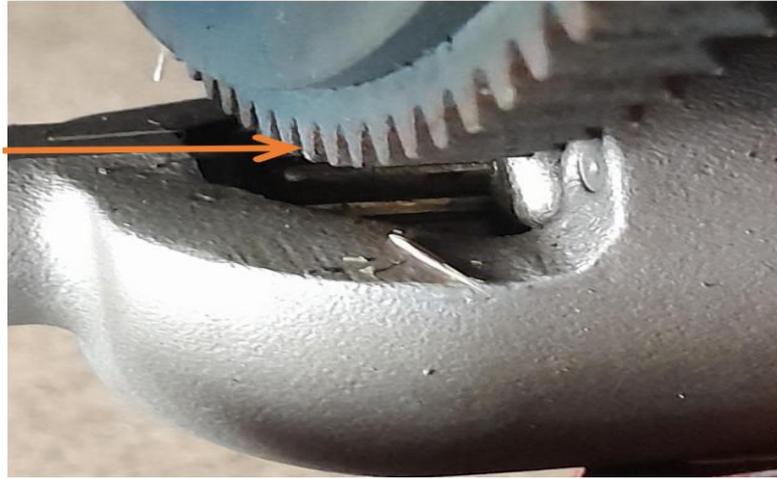


Figure 12: Engaged Starter Bendix.

1.17. Organisational and Management Information

1.17.1. This was a training flight conducted under the provisions of Part 141 of the CAR 2011 as amended.

1.17.2. The approved training organisation (ATO) had an ATO Certificate that was issued on 4 December 2020 with an expiry date of 30 June 2025.

1.17.3. The ATO had an approved training programme as required by the Regulator.

1.17.4. An incomplete SACAA ad hoc audit was conducted on 19 December 2024. The inspector was unable to ascertain the level of safety compliance of the operator in line with Part 140 of the CAR 2011. At the time of the investigation, the ATO had a valid operations specification.

1.17.5. An audit by the SACAA was conducted on 16 April 2025 after which the SACAA inspector issued the ATO with three Level 3 findings (a response containing a corrective action plan was required to be submitted to the Director of Civil Aviation within 14 days).

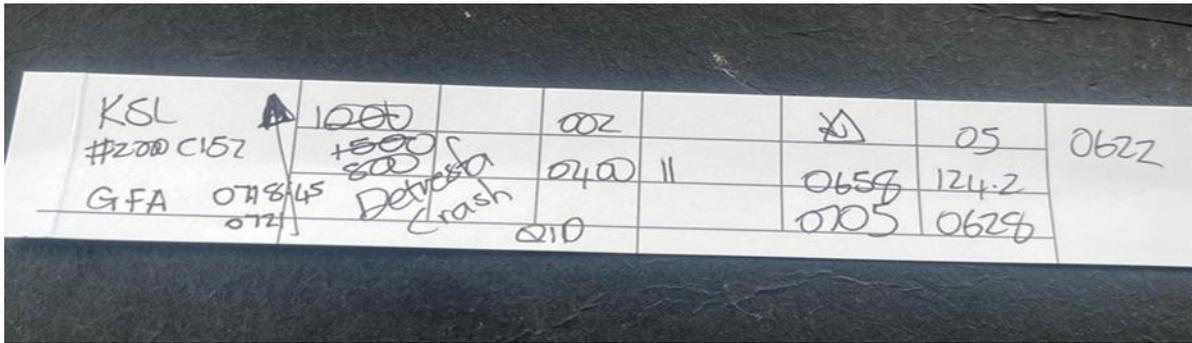
1.18. Additional Information

1.18.1. Flapless approach requirements according to the Cessna 152 Manual:

“In a no-flap landing, a slightly higher approach speed should be used. The approach should be made with power and a shallower than normal glide path. Touchdown should be made at the lowest possible speed consistent with safety.”

During a go-around, flapless approach speed ranges between 60-70 knots Indicated Airspeed (KIAS).

1.18.2. The ATC flight progress strip with ZS-KSL information.



1.18.3. Carburettor icing according to the ICAO Annex 3 and Document 9760:

According to the ICAO, carburettor icing during descent could significantly affect an aircraft's performance by restricting or blocking airflow to the engine due to ice forming inside the carburettor. This occurs because of the cooling effect caused by fuel vaporisation and pressure drop within the carburettor, especially when engine power is reduced during descent. *The result can be a gradual or sudden loss of engine power, rough running or even engine failure if not promptly addressed. This poses a serious risk during the approach and landing phases where altitude and time to recover are limited.* During severe cases of carburettor icing, the throttle valve could become stuck due to ice build-up.

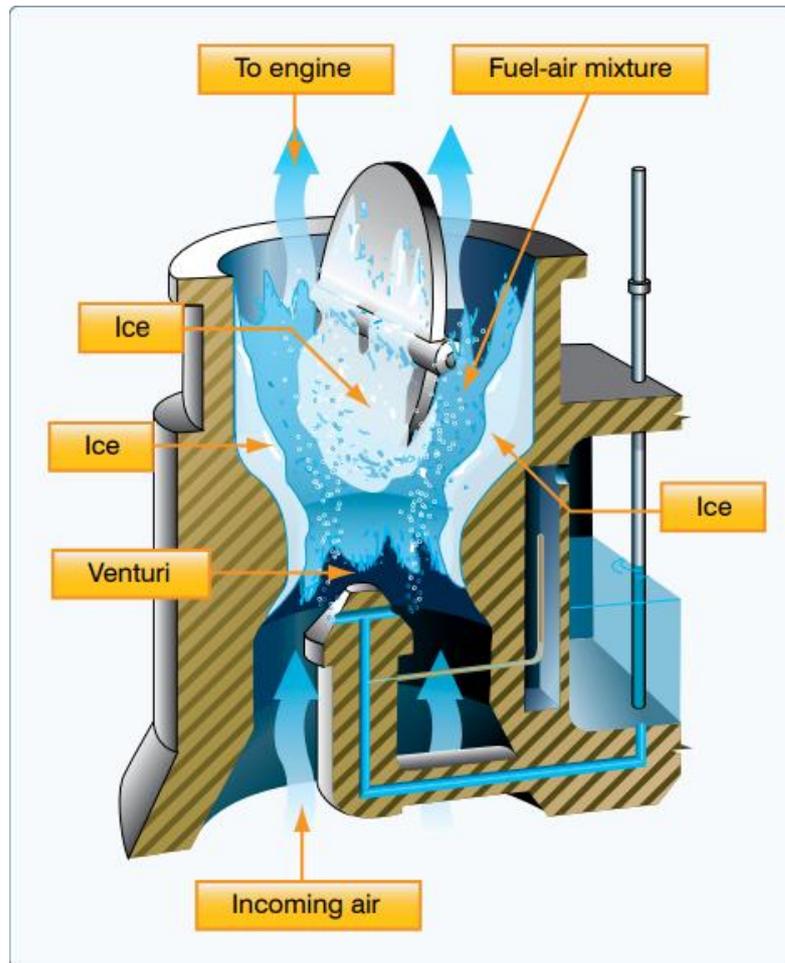


Figure 13: Typical carburettor ice build-up.

The following information is an extract from the Cessna 152 Pilot's Operating Handbook (POH):

CARBURETOR ICING

A gradual loss of RPM and eventual engine roughness may result from the formation of carburetor ice. To clear the ice, apply full throttle and pull the carburetor heat knob full out until the engine runs smoothly; then remove carburetor heat and readjust the throttle. If conditions require the continued use of carburetor heat in cruise flight, use the minimum amount of heat necessary to prevent ice from forming and lean the mixture slightly for smoothest engine operation.

Carburetor ice, as evidenced by an unexplained drop in RPM, can be removed by application of full carburetor heat. Upon regaining the original RPM (with heat off), use the minimum amount of heat (by trial and error) to prevent ice from forming. Since the heated air causes a richer mixture, readjust the mixture setting when carburetor heat is to be used continuously in cruise flight.

The use of full carburetor heat is recommended during flight in very heavy rain to avoid the possibility of engine stoppage due to excessive water ingestion. The mixture setting should be readjusted for smoothest operation.

Contributing Factors to Carburettor Icing:

1) Temperature and Humidity Conditions

- Most likely to occur between -5°C and +20°C.*
- High relative humidity (above 60%) increases risk significantly.*

2) Low Power Settings

- Cruise descent or prolonged idle power, where throttle is nearly closed, increases venturi effect and likelihood of ice.*
- Common during approach or training exercises involving power changes.*

3) Moisture in the Air

- Water vapor in the intake air can freeze as it passes through the carburettor's venturi, where pressure drops and temperature drops rapidly.*

4) Lack of Carb Heat Usage

- Not using carb heat routinely in suspected conditions or at low power settings increases risk.*

5) Engine Design and Fuel System

- The Cessna 152's float-type carburettor is more prone to icing compared to fuel-injected systems: The Cessna 152 is equipped with a float-type carburettor, which is inherently more susceptible to carburettor icing than fuel-injected engine systems. In a float-type carburettor, air passes through a venturi, where pressure drops and fuel is drawn in to mix with the airflow. This pressure drops, combined with the evaporation of fuel, causes a significant temperature to drop often as much as 20°C or more. If moisture is present in the air, this cooling effect can cause water vapour to freeze inside the carburettor throat, forming ice on the throttle plate and venturi walls. Carb ice can begin to accumulate even when ambient temperatures are well above freezing, particularly in humid conditions. The risk is heightened during operations at low power settings, such as during descent. By contrast, fuel-injected systems deliver fuel directly into the intake manifold or cylinders, bypassing the venturi effect of a carburettor. Since there is no abrupt pressure drop at the point of fuel mixing, and no throttle plate within the airflow path in the same way, the cooling effect is minimised, making fuel-injected engines less prone to icing.*

Symptoms of carburettor icing:

1) Gradual Drop in RPM

- A slow, steady decrease in engine RPM is one of the first signs.*
- Often occurs without any immediate engine roughness.*

2) *Engine Roughness or Vibration*

- *As ice builds up and airflow is disrupted, the engine may run unevenly.*
- *This is more noticeable if RPM drop is not addressed promptly.*

3) *Poor Engine Response to Throttle Input*

- *Lagging or weak response when throttle is advanced.*

4) *Temporary RPM Increase After Carb Heat Application*

- *Applying carb heat causes a further drop in RPM initially (due to hot, less dense air),*
- *Followed by a gradual increase if ice melts and normal airflow is restored.*

1.18.4. Windshear according to the ICAO Annex 3 and Document 9750:

ICAO defines windshear as “a sudden change in wind speed and/or direction over a relatively short distance, which can be vertical, horizontal, or both.

- *Vertical windshear: Change in horizontal wind speed/direction with height.*
- *Horizontal windshear: Change in horizontal wind speed/direction across horizontal distance (e.g. along a runway)”*

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

Flight Instructor (FI)

2.2.1. The FI had a Commercial Pilot Licence (CPL) that was issued on 18 August 1997. The licence was renewed on 6 July 2024 with an expiry date of 30 June 2025. The FI had flown a total of 6 380 hours of which 3 100 hours were on the aircraft type. The FI had a Night rating as well as a Grade II instructor’s rating for the aircraft type. The aircraft type was endorsed on his licence and logbook. The FI met the regulatory requirements to undertake the training flight.

2.2.2. The FI was issued a Class 1 aviation medical certificate on 23 November 2024 with an expiry date of 31 May 2025. *FIs undergo medical examinations every 6 months.* The FI was medically fit in accordance with Part 67 of the CAR 2011.

Pilot

2.2.3. The pilot had a valid Private Pilot Licence (PPL) with an expiry date of 30 April 2025. The pilot had flown a total of 203.8 hours of which 66.8 hours were on the aircraft type. The aircraft was endorsed on his licence and logbook. The pilot had a Class 2 medical certificate that was issued on 30 August 2024 with an expiry date of 31 August 2025. Therefore, the pilot was qualified and medically fit to undertake the flight.

2.2.4. The pilot had a language proficiency Level 6 according to the ICAO standards, indicating that there were no language barriers.

Aircraft

2.2.5. The last mandatory periodic inspection (MPI) of the aircraft was conducted and certified on 7 December 2024 at 9 036.91 airframe hours. The aircraft had accrued 79.84 hours since the last MPI. The maintenance was conducted in accordance with the Cessna C152 maintenance manual as well as the procedures stipulated by the Regulator.

2.2.6. The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued on 14 September 2014. The latest C of A had an expiry date of 30 September 2025.

2.2.7. The Certificate of Release to Service (CRS) was issued on 7 December 2024 with an expiry date of 7 December 2025 or at 9 136.91 hours, whichever comes first.

2.2.8. The Certificate of Registration (C of R) was issued to the present owner on 20 June 2024.

2.2.9. During the examination of the throttle control cable, it was determined that the cable was in good condition with no visible signs of wear or damage. This eliminated the throttle control cable as a contributing factor.

2.2.10. There was sufficient fuel for the flight (approximately four-hour endurance/66L) and the post engine inspection indicated that there was still approximately 50L of fuel in the system. Therefore, it is unlikely that the engine experienced fuel starvation.

2.2.11. During a post-recovery engine examination, the engine was rotated without any restriction.

2.2.12. According to the Cessna 152, a flapless approach requires a higher approach speed (74 KIAS) and shallower glide path, which typically results in a longer descent at a reduced engine power setting and which may increase the risk of carburettor icing.

Environment

2.2.13. Based on the weather conditions on 1 April 2025, windshear was unlikely to be a factor. Wind conditions were variable with excellent visibility and no signs of turbulence or convective activity. Overall, the stable weather did not support windshear development. The FAVG ATC stated that other pilots operating at the aerodrome on the day of the accident did not report windshear on final approach, and no unstable wind conditions were reported during the touch-and-go landing on RWY 05 at the time of the accident.

2.2.14. The weather conditions at the time of the accident (temperature 24°C, dew point 22°C, dew point depression, relative humidity 86%) fell within the serious icing range at descent power. The relative humidity of 86% increased the risk of carburettor icing significantly. The aircraft was on a flapless approach at a low power setting during descent phase, which increased the risk of carburettor icing. There was no application of carburettor heat during this critical phase, which exacerbated the risk. The symptoms of engine unresponsiveness that were reported are consistent with carburettor ice-induced power loss. Severe carburettor icing may have prevented the pilot from increasing power. Based on this, it is likely that the aircraft experienced serious carburettor icing during the landing (approach) phase.

2.2.15. The mission was a recurrent training flight aimed at renewing the pilot's PPL, which was due to expire on 30 April 2025. The pilots departed from FAVG, completed general flying exercises, and returned to FAVG to perform touch-and-go landings. The crash occurred during a touch-and-go landing due to carburettor icing, which resulted in the aircraft descending and impacting trees short of RWY 05 at FAVG.

Approved Training Organisation (ATO)

2.2.16. The ATO had a valid ATO Certificate that was issued on 4 December 2020 with an expiry date of 30 June 2025.

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

Crew

- 3.2.1. The FI had a valid Commercial Pilot Licence (CPL) that was renewed on 6 July 2024 with an expiry date of 30 June 2025.
- 3.2.2. The FI had flown a total of 6 380 hours of which 3 100 hours were on the aircraft type.
- 3.2.3. The FI also had an Instrument rating and a Grade II instructor's rating for the aircraft type. The aircraft type was endorsed on his licence and logbook.
- 3.2.4. The FI was medically fit; he was issued a Class 1 aviation medical certificate on 23 November 2024 with an expiry date of 31 May 2025.
- 3.2.5. The pilot had a valid Private Pilot Licence (PPL) with an expiry date of 30 April 2025.
- 3.2.6. The pilot had flown a total of 203.8 hours of which 66.8 hours were on the aircraft type. The aircraft was endorsed on his licence and logbook.
- 3.2.7. The pilot had a Class 2 aviation medical certificate that was issued on 30 August 2024 with an expiry date of 31 August 2025.

Aircraft

- 3.2.8. The last mandatory periodic inspection (MPI) of the aircraft was conducted and certified on 7 December 2024 at 9 036.91 airframe hours. The aircraft had accrued 79.84 hours since the last MPI.

- 3.2.9. The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued on 14 September 2014. The latest C of A had an expiry date of 30 September 2025.
- 3.2.10. The Certificate of Release to Service (CRS) was issued on 7 December 2024 with an expiry date of 7 December 2025 or at 9 136.91 hours, whichever comes first.
- 3.2.11. The Certificate of Registration (C of R) was issued to the present owner on 20 June 2024.
- 3.2.12. The throttle control cable was in good condition, ruling it out as a contributing factor.
- 3.2.13. The aircraft had sufficient fuel, and no signs of fuel starvation were found.
- 3.2.14. Post-accident engine inspection found no mechanical faults, and the propeller rotated freely.
- 3.2.15. A speed of 74 KIAS at go-around with flapless approach was applied.
- 3.2.16. The engine was unresponsive during a go-around at 250ft AGL, likely due to carburettor icing and throttle restriction, which resulted in continued descent.

Environment

- 3.2.17. The weather conditions were stable with no indication of windshear, making it an unlikely contributing factor.
- 3.2.18. During descent power, the weather conditions indicated a severe carburettor icing probability.
- 3.2.19. The aircraft impacted some trees 300m short of the threshold of Runway 05 at FAVG.

Approved Training Organisation (ATO)

- 3.2.20. The ATO had an ATO Certificate that was issued on 4 December 2020 with an expiry date of 30 June 2025.
- 3.2.21. The ATO had an approved training programme.

3.3. Probable Cause

- 3.3.1. The aircraft lost engine power due to carburettor icing during a touch-and-go landing and it impacted some trees.

3.4. Contributory Factor/s

3.4.1. Carburettor icing.

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**