



LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10566						
Classification	Accident	Date	22 March 2025		Time	0940Z	
Type of Operation	Private (Part 91)						
Location							
Place of Departure	Mossel Bay Aerodrome (FAMO), Western Cape Province		Place of Intended Landing	Mossel Bay Aerodrome (FAMO), Western Cape Province			
Place of Occurrence	Mountainous terrain near Van Wyksdorp in Western Cape Province						
GPS Co-ordinates	Latitude	33°45'25.31" S	Longitude	021°28'48.62" E	Elevation	650 feet	
Aircraft Information							
Registration	ZS-FFG						
Make; Model; S/N	Hawker Beechcraft; Bonanza G36 (Serial Number: E-3845)						
Damage to Aircraft	Substantial		Total Aircraft Hours	1 366.4			
Pilot-in-command							
Licence Type	Private Pilot Licence		Gender	Male		Age	43
Licence Valid	Yes	Total Hours	660.1		Total Hours on Type	158.9	
Total Hours Past 30 Days	11.9		Total Hours on Type Past 90 Days	15.5			
People On-board	1 + 2	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Saturday morning, 22 March 2025, a pilot and two passengers on-board a Beechcraft Bonanza G36 with registration ZS-FFG took off on a private flight from Mossel Bay Aerodrome (FAMO) with the intention to land back at the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011, as amended.</p> <p>The pilot stated that he, together with the two passengers, had flown from Lanseria International Aerodrome (FALA) on Thursday morning, 20 March 2025, to Gariepdam Aerodrome (FAHV); they landed after a 2-hour flight. The aircraft was refuelled with 157 litres of Avgas. Thereafter, they flew to Mossel Bay Aerodrome (FAMO), their final destination, where they landed at 1240Z. They were part of a group of aircraft that were on a “flyaway” long weekend to the coast.</p> <p>On Friday, 21 March 2025, they took a rest day. On Saturday morning, 22 March 2025, they decided to go on a scenic flight; the aircraft was refuelled with 124 litres of Avgas as FAMO, which brought the fuel to full capacity (<i>the total usable fuel capacity is 280 litres</i>). The planned scenic flight route that was to be flown together with other flyaway aircraft was as follows: FAMO - Robinson Pass – Oudtshoorn Airport (FAOH) - de Rust – Kango Caves – Calitzdorp – Gamkapoort – Bosluiskloof –</p>							

Seweweekspoort – Ladismith – Assegaibosch Lodge – Gelukshoop – Puntjie – Saint Sabastian Bay – Vleesbaai – FAMO. The estimated flight time was 2 hours.

The pilot and the two passengers took off from FAMO at approximately 0800Z and commenced the flight along the planned scenic route. The pilot stated: *“A few nautical miles after passing Ladismith and approaching Assegaibosch, we started a descent from 7000 feet above mean sea level. During the descent, I noticed the engine revolutions per minute (RPM) decaying, accompanied by a sudden reduction in fuel flow. I immediately switched on the auxiliary fuel pump and tried switching fuel tanks. The problem persisted. The engine had completely failed.*

“I set an attitude to maintain a steady glide of 110 knots indicated airspeed (KIAS). During the glide, I noted a gravel road on my left-hand side that appeared to be the most suitable landing site. The road was a few nautical miles (nm) from Van Wyksdorp. I briefed my passengers on the situation and that we would attempt a forced landing on the gravel road. During the descent, I broadcast a Mayday call on the frequency being used by the aircraft following the same routing. On short final, I switched the fuel selector to the off position.

“As we approached the road, I noticed power lines running alongside the road, spanning across the road in front of me. Due to the risk of colliding with the wires or pylons, I shifted our course to the right to land parallel to the road. Due to the rough terrain, I opted to keep the gear retracted and attempt a landing on the belly of the aircraft.

“Shortly after altering my course from the road to the rugged hillside, I heard the stall warning coming on and we contacted the ground shortly thereafter. The aircraft continued moving for approximately 50m before the right wing made contact with an object and turned the aircraft 90° to face up the slope. After touchdown and the aircraft coming to rest, I switched off the alternator and battery switches as we evacuated the aircraft. There was no post-landing fire. There were no injuries to any of the occupants.

“Not long after the forced landing, vehicles passing by notified the local authorities. The South African Police Service (SAPS) arrived and helped to secure the scene.”

There was an unlicensed aerodrome approximately 3.0 nautical miles (nm) east of the accident site. According to the property owner, the runway was being used regularly, especially by firefighting aircraft (see Figure 1).

The accident occurred during daylight, 38 nm north-west of FAMO at Global Positioning System (GPS) co-ordinates determined to be 33°45'25.31" South 021°28'48.62" East, at an elevation of 650 feet (ft).



Figure 1: The accident occurred east of the town of Van Wyksdorp. (Source: Google Earth)

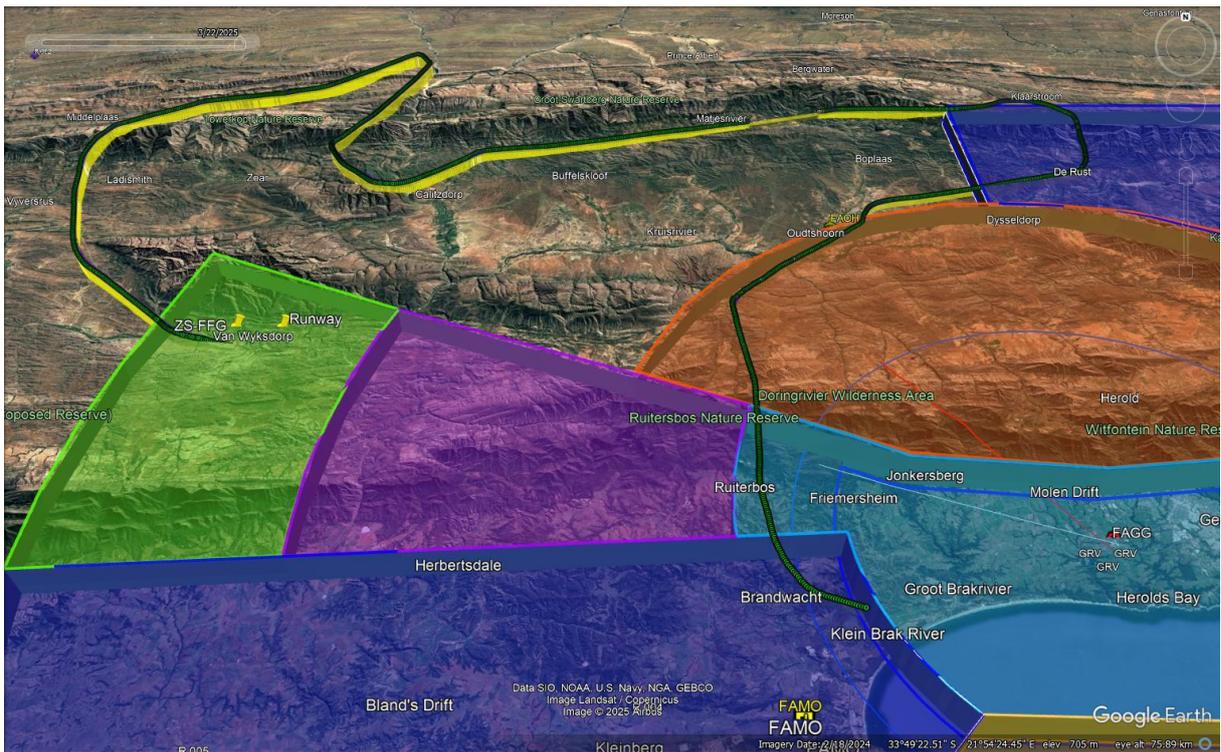


Figure 2: The radar track (green and yellow line) of the flight was picked up near Klein Brak River and stopped close to the accident site. (Source: Air Traffic Navigational Services [ATNS])

Secondary Surveillance Radar (SSR)

With the assistance of Air Traffic and Navigation Service (ATNS), it was possible to obtain the radar track flown by the aircraft. The aircraft was first identified on radar just north of Klein Brak River at 08:24:29Z, 7.0 nm north-east of FAMO. The flight continued as per the layout in Figure 2, turning left at De Rust towards the north, which was followed by another left turn at Klaarstroom. The aircraft continued in a westerly direction near the Swartberg Mountain range. At 09:29:08Z, the aircraft crossed the Swartberg Mountains just north of Ladismith at an altitude of 8 700ft, turning left in a southerly direction. At 09:29:38Z, the aircraft commenced a steady descent at 393 feet per minute (ft/min). At 09:32:25Z, the rate of descent increased slightly to 530 ft/min. At 09:35:51Z, the rate of descent increased to 910 ft/min, and 12 seconds later it increased to 1 575 ft/min; after 33 seconds the rate of descent was 2 070 ft/min. The last radar data plot was captured at 09:37:33Z with the rate of descent at 2 537 ft/min and the aircraft speed at 136 knots.



Figure 3: The file picture of the ZS-FFG aircraft. (Source: FlightZone Aviation Photography)



Figure 4: The aircraft as it came to rest. (Source: Pilot)



Figure 5: The aircraft resting on the steep mountainous terrain, 90° heading to the forced landing point. (Source: Pilot)



Figure 6: A view of the aircraft from the road. (Source: Recovery Team)

On-site Observations by the Recovery Team

The aircraft was recovered on Wednesday, 26 March 2025, four days after the accident had occurred. *The Accident and Incident Investigations Division (AIID) did not dispatch an investigator to the accident site.*

The aircraft was recovered with the wings still attached (see Figure 7 [a][b])). Both wing fuel tanks were drained once the aircraft was recovered and in a level attitude as neither of the tanks had ruptured. Five (5) litres of fuel was drained from the left-wing tank and 75 litres from the right-wing tank. *The aircraft has a total fuel capacity of 280 litres of usable fuel.* A fuel sample was taken from both tanks, and it was of the correct grade with no contamination or sediment noted. The gascolator located on the left side where the fuel selector valve is, was removed, and it contained a small amount of fuel.



(a)



(b)

Figure 7: The aircraft was recovered with the wings still attached to the fuselage. (Source: Recovery Team)

Post-recovery

The aircraft was recovered to an aircraft maintenance organisation (AMO) at Wonderboom Aerodrome (FAWB), Gauteng province. Following an engine inspection, the mechanical integrity was assessed, as well as the ignition, lubrication and fuel systems. The AMO personnel decided to perform an engine ground run after a loaner propeller was fitted to the engine. The fuselage was secured to perform the engine ground run, and fuel was siphoned from a container as the wings were not removed during recovery to transport the aircraft on a trailer bed to FAWB. The engine started normally and was kept running for several minutes. It was then shut down and restarted without difficulty. No abnormal engine parameters were noted during the ground run that would have prevented normal engine operation.

Fuel System (Source: Pilot's Operating Handbook, Section 7, Systems Description)

The engine is designed to operate on aviation gasoline grade 100LL (blue).

Fuel Cells

The fuel system consists of a rubber fuel cell located in each wing's leading edge; with the fuel capacity of two 40 US gallon cells (37 gallons useable). A visual measuring tab is attached to each filler neck of each individual cell. The bottom of the tab indicates 27 gallons of usable fuel in the cell, and the detent slot on the tab indicates 32 gallons of usable fuel in the cell. The engine-driven fuel injector pump delivers approximately 10 gallons of access fuel an hour, which bypasses the fuel control and returns to the cell being used. Three fuel drains are provided, one in each fuel cell sump on the underside of each wing, and one on the fuel selector valve inboard of the left-wing root. These points should be drained before the first flight of the day.

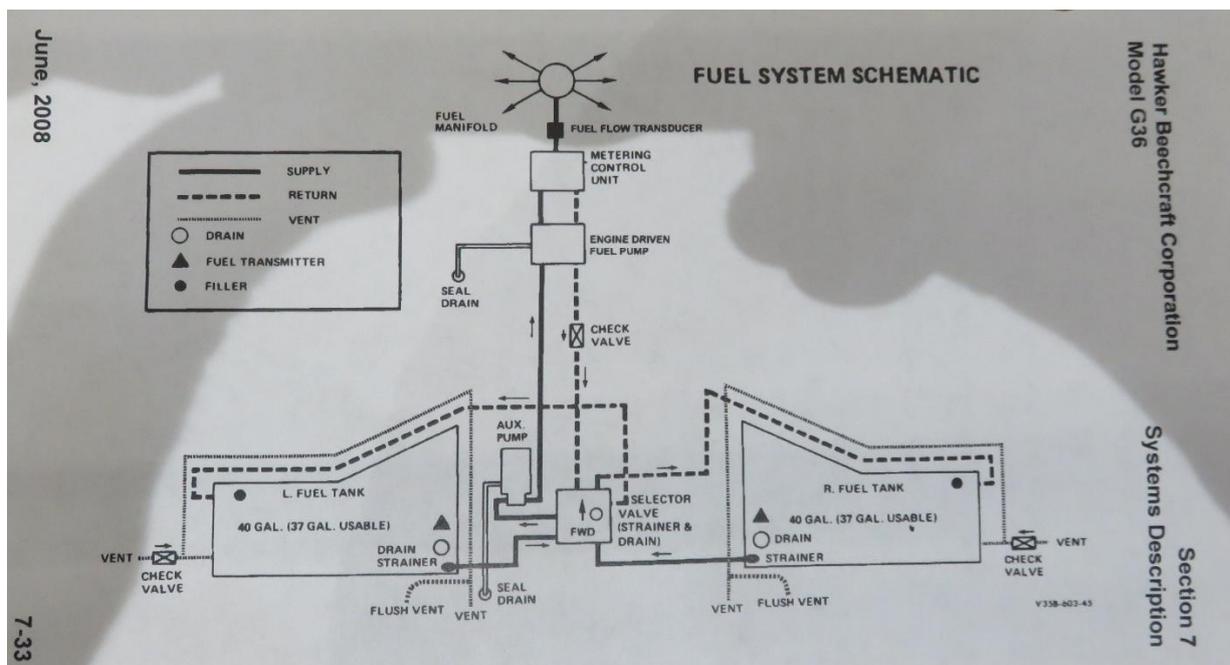


Diagram 1: Fuel system schematic.

Fuel Drains

The fuel system is drained at three locations: one under each wing outboard of the fuselage, and at a low-spot drain at the bottom of the fuel selector valve (accessible through the small door on the underside of the fuselage near the left-wing root). These fuel drains are snap-type valves which are actuated by pushing up and twisting on the valve and then releasing when the desired amount of fuel has been drained. The drain may be locked open.

The three fuel drains should be sampled after refuelling and prior to each flight in accordance with Preflight Inspection in Section 4, NORMAL PROCEDURES. When possible, the inspection of the fuel should be made after sufficient time has been allotted for any contaminants to settle into the sumps. If inspections are made immediately after the airplane has been moved or refuelled, contaminants may be flushed from the sump, or newly added contaminants may not have had time to settle into the sump. Sampling should be conducted with the airplane parked on level ground. Check fuel for the proper grade, type and absence of water, dirt, rust or other contaminants. **WARNING:** Do not fly the airplane with contaminated or unapproved fuel.

Fuel Quantity Indication

Fuel quantity is measured via float-operated fuel level sensors located in each wing tank system. These sensors transmit electrical signals to the engine and airframe interface (GEA) to generate a

left and right usable fuel quantity display in the engine and systems display portion of the multi-function display (MFD) (as can be seen in Figure 8.)



Figure 8: The red arrow indicates the fuel quantity gauge at the bottom left corner of the MFD.

Auxiliary Fuel Pump

The auxiliary fuel pump is a dual-speed, dual-pressure, electrically driven vane-type pump. The pump, located below the pilot's seat, is controlled by a single three-positioned switch. The switch is located on the pilot's subpanel to the left of the landing gear handle. The pump is used to perform the following functions.

LOW POSITION – (1) Minor vapor purging. (2) Increase fuel flow.

HIGH POSITION – (1) Normal start, priming. (2) Extreme vapor purging. (3) To provide fuel pressure in the event of engine-driven pump failure.

Fuel Tank Selection

The fuel selector valve handle is located forward and to the left of the pilot's seat. Take-offs and landings must be made using the tank nearest to full.

The pilot is cautioned to observe that the long, pointed end of the handle aligns with the fuel tank position being selected. The tank positions are placard adjacent to the respective LEFT MAIN,

RIGHT MAIN, or OFF detent. The OFF position is forward and to the left. A stop (lock-out) button prevents inadvertent selection of the OFF position. To select OFF, depress the stop button and rotate the handle to the full clockwise position. Depression of the lock-out stop is not required when moving the handle counterclockwise from OFF to LEFT MAIN or RIGHT MAIN. When selecting the LEFT MAIN or RIGHT MAIN fuel tanks, position the handle by sight and feel for the detent.

WARNING: Position the selector valve handle in detents only. There is no fuel flow to the engine between detents, indicated by the red arc (see Figure 8).

If the engine stops because of insufficient fuel, refer to Section 3, EMERGENCY PROCEDURES, for the ENGINE FAILURE IN-FLIGHT procedures.

Fuel Required for Flight

It is the pilots' responsibility to ascertain that the fuel quantity indication is functioning and maintaining a reasonable degree of accuracy and to be certain of ample fuel for the flight. Take-off is prohibited if the fuel quantity indication is not above the yellow band. A minimum of 13 gallons (50 litres) is required in each tank before take-off. The fuel caps should be removed and the fuel quantity checked to give the pilot an indication of the fuel on board. The airplane must be approximately level for visual inspection of the tank. If it is not certain that at least 13 gallons are in each tank, fuel shall be added so that the amount of fuel will not be less than 13 gallons per tank at take-off. Plan for an ample margin of fuel for any flight.



Figure 9: The fuel tank selector lever of ZS-FFG.

Garmin G1000 Integrated Avionics System (Source: <https://garmin.com/en-ZA/p/6420>)

The G1000 is an all-glass avionics suite designed for installation on a range of business aircraft. It is a seamlessly integrated package that makes flight information easier to scan and process. Its revolutionary design brings new levels of situational awareness, simplicity and safety to the cockpit. The G1000 puts a wealth of flight-critical data at your fingertips. Its glass flight deck presents flight instrumentation, navigation, weather, terrain, traffic and engine data on large-format, high-resolution displays.

The aircraft was equipped with Garmin G1000 Integrated Avionics System, which is an integrated flight, engine, communication, navigation, autopilot and surveillance instrumentation system. The system consists of a primary flight display (PFD), multi-function display (MFD) and audio panel that make up the instrument panel. Neither the PFD nor the MFD contained any navigational Secure Digital (SD) data cards that could be downloaded to obtain flight data.



Figure 10: The Garmin 1000 integrated avionics cockpit layout of the Beechcraft G36.

Findings

1. Personnel Information

- 1.1 The pilot had a Private Pilot Licence (PPL) Aeroplane that was issued by the Regulator (SACAA) on 7 August 2023 with an expiry date of 31 July 2026. The pilot had flown a total of 231.1 hours of which 158.9 hours were on the aircraft type. Flight time on the aircraft type over the past 90 days was 15.5 hours.
- 1.2 The pilot also had a Private Pilot Licence (PPL) Helicopter that was issued by the Regulator (SACAA) on 29 June 2021 with an expiry date of 30 June 2026. The pilot had flown a total of 429.0 hours on helicopters.
- 1.3 The pilot had a Class 2 aviation medical certificate that was issued on 17 July 2020 with an expiry date of 31 July 2025. There were no limitations endorsed on his certificate.
- 1.4 The pilot decided to execute the forced landing with the landing gear and the wing flaps retracted on a mountainous terrain.

1.5 The aircraft came to rest against the mountainous slope at a 90° left-yaw angle heading to the forced landing.

2. Aircraft Information

2.1 The last maintenance inspection of the aircraft was certified on 2 July 2024 at 1 287.0 airframe hours. The aircraft had accrued 79.4 hours since the last inspection.

2.2 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 7 October 2022. The aircraft was manufactured in 2008.

2.3 The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued by the Regulator (SACAA) on 15 May 2008. The latest C of A had an expiry date of 31 May 2025.

2.4 The aircraft had a Certificate of Release to Service (CRS) that was issued on 5 February 2025 with an expiry date of 1 July 2025 or at 1 387.0 airframe hours, whichever comes first.

2.5 The aircraft was fitted with a Continental IO 550-B engine with serial number 688614.

2.6 The aircraft was fitted with a Hartzell PHC-C3YF-1RF propeller with serial number EE6208B.

2.7 The fuel tank selector position could not be determined as the pilot had turned it off before he disembarked from the aircraft.

2.8 The fuel gauge display is located on the bottom left corner of the MFD; the gauge is small, (see Figure 8).

2.9 The aircraft took off from FAMO with full fuel tanks (usable fuel is 280L on the aircraft type). According to the pilot questionnaire, the flight time was 1 hour and 40 minutes. The fact that only 80L of fuel was drained from both fuel tanks after recovery could not be explained as this was an off-site investigation by AIID, and the aircraft was only recovered four days after the accident had occurred.

3. Meteorological Information

3.1 Fine weather conditions prevailed at the time of the flight; the weather had no bearing on this accident.

4.	SSR Data
4.1	From the radar data, it could be seen that the rate of descent (ROD) increased substantially over a short period before the forced landing.
Probable Cause	
The pilot executed a forced landing on a mountainous terrain following an engine stoppage. The cause of the engine stoppage could not be determined with certainty, but it was probably related to fuel supply disruption to the engine during flight as an engine ground run was successfully performed post-recovery without intervention.	
Contributing Factors	
1.	The pilot opted to perform a forced landing on a mountainous terrain as the power lines ran across the dirt road which posed a potential risk for a safe landing.
2.	The pilot was unable to glide to the runway that was located 3nm east of the accident site.
Safety Action	
None.	
Safety Message and/or Safety Recommendation/s	
None.	
About this Report	
<p><i>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 desktop inquiries 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.</i></p> <p><i>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.</i></p>	
Purpose	
<i>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.</i>	
Disclaimer	
<i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i>	

This report is issued by:

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