SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10260					
Classification	Accident	**Date**	13 January 2023	**Time**	2020Z	
Type of Operation	Training (Part 141)					
Location						
Place of Departure	Grand Central Airport (FAGC), Gauteng Province	**Place of Intended Landing**	Grand Central Airport (FAGC), Gauteng Province			
Place of Occurrence	Runway 35 at FAGC in Gauteng Province					
GPS Co-ordinates	Latitude	25°59'1.68"S	Longitude	28° 8'19.20"E	Elevation	5148.8 ft
Aircraft Information						
Registration	ZS-TIU					
Make; Model; S/N	Cessna Aircraft Corporation; C172 (Serial Number: 172-81117)					
Damage to Aircraft	Substantial		Total Aircraft Hours	5416.4		
Pilot-in-command						
Licence Type	Private Pilot Licence (PPL)		Gender	Female	Age	24
Licence Valid	Yes	Total Hours	158.7	Total Hours on Type	9.5	
Total Hours Past 30 Days	7.7		Total Hours on Type Past 90 Days	9.5		
People On-board	1 + 0	**Injuries** 0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 13 January 2023, a pilot on-board a Cessna C172 aircraft with registration ZS-TIU was on a solo navigation (night) exercise flight from Grand Central Airport (FAGC) in Gauteng province, with the intention to make a full stop landing at the same airport. The pilot routed to Golf Alpha Victor (GAV) general flying area (GFA), Potchefstroom Airport (FAPS), Klerksdorp Airport (FAKD) and back to FAGC. The pilot had filed a flight plan with search and rescue (SAR). The flight was conducted under visual flight rules (VFR) by night and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended. The pilot reported that she departed at 1835Z, and the aircraft had 38 gallons of fuel with an endurance of 4 hours.

The pilot stated that on arrival at FAGC at approximately 2000Z, she performed an unmanned joining procedure as the tower was unmanned; the runway lights were switched on at the time of her arrival. The pilot turned early on base leg, which resulted in the aircraft being too high on final approach for landing. The pilot then decided to execute a go-around. On the second attempt whilst on final approach and ready to flare, the runway lights switched off (possibly due to load shedding). The pilot performed another go-around. Whilst midway on downwind, a low fuel caution light came on, and the pilot decided that this would be her last circuit. On final approach, she tried switching on the lights

by clicking three times on press-to-talk (PTT) button but that did not work. After flying over the runway orientation numbers imprinted on the edge of the runway at 65 knots, the pilot cut off the power to initiate flaring, but the aircraft floated and finally bounced hard on the runway and ballooned. The pilot then added power to correct the landing, but the aircraft bounced a few more times before she was able to correct the anomaly and bring the aircraft to a stop. The aircraft sustained substantial damage to the propellers, firewall and airframe; the pilot was not injured during the accident sequence.

Figure 1: The damaged propeller blades. (Source: Operator)

Figure 2: The firewall and airframe damage. (Source: Operator)

Findings

1. The pilot was issued a Private Pilot Licence (PPL) on 22 July 2021 with an expiry date of 31 July 2023. Her Class 2 medical certificate was issued on 17 June 2020 with an expiry date of 30 June 2025 with medical restrictions.

2. The mandatory periodic inspection (MPI) on the aircraft was carried out on 9 September 2022 at 5352.5 airframe hours, with the next MPI scheduled for 8 September 2023 or at 5452.5 airframe hours, whichever occurs first. The aircraft was operated for 63.9 hours after the last MPI inspection.

3. The aircraft had a valid Certificate of Airworthiness (C of A) which was originally issued on 18 December 2018 with an expiry date of 31 December 2023.

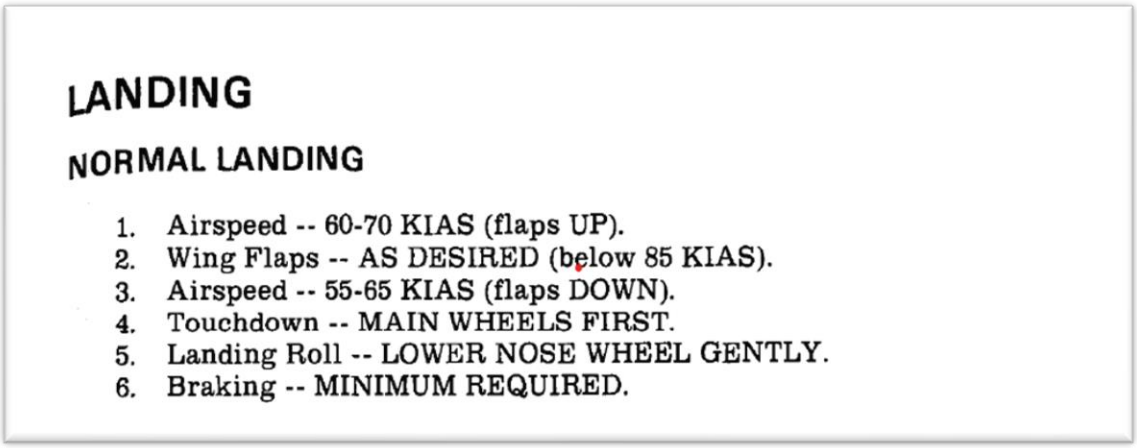
4. The weather report that was received from FAGC on the day of the accident was as follows: surface wind 57° at 03 knots, temperature 28.8°C, dew point 5.16°C no clouds, visibility was greater than 10 kilometres (km).

5. The aircraft had enough fuel left during landing. According to the calculations, the aircraft was flown 3 hours and 8 minutes at a consumption rate of 8.5 gallons per hour, which meant that 26.2 gallons of fuel was used. Therefore, approximately 11.8 gallons of fuel would have remained at the time of landing.

6. On the pilot's questionnaire, the pilot stated that the indicated speed before she flared the aircraft was 65 kts with the flaps down.

7. According to the pilot, the generator activated 5 minutes after load shedding occurred; however, FAGC fire management stated that the generator activates within seconds after load shedding.

8. The pilot was building hours towards her Commercial Pilot Licence (CPL). As the pilot was still in training, the flight instructor responsible checked the fuel remaining in the aircraft the next morning and found that the right-side contained one quarter fuel of maximum capacity and the left-side tank had three quarters. The pilot stated that she had selected both tanks, however, it is not clear why the left tank had more fuel than the right tank.

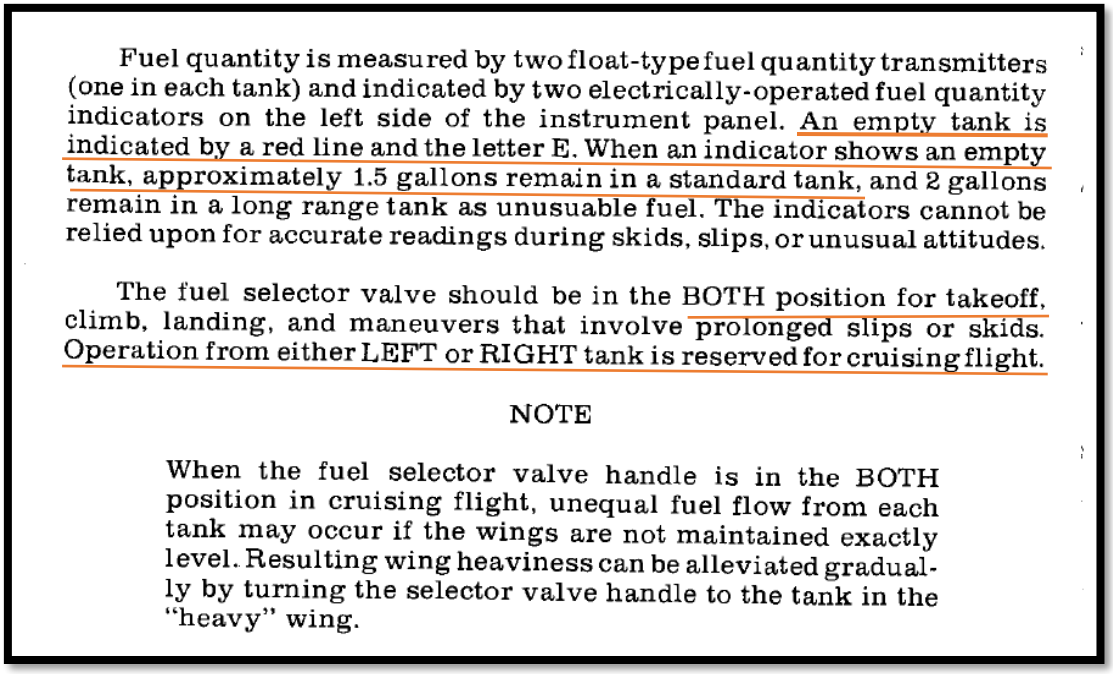


LANDING

NORMAL LANDING

1. Airspeed -- 60-70 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (below 85 KIAS).
3. Airspeed -- 55-65 KIAS (flaps DOWN).
4. Touchdown -- MAIN WHEELS FIRST.
5. Landing Roll -- LOWER NOSE WHEEL GENTLY.
6. Braking -- MINIMUM REQUIRED.

Figure 3: Landing speed. (Source: Cessna 172 Pilot's Operating Handbook)



Fuel quantity is measured by two float-type fuel quantity transmitters (one in each tank) and indicated by two electrically-operated fuel quantity indicators on the left side of the instrument panel. An empty tank is indicated by a red line and the letter E. When an indicator shows an empty tank, approximately 1.5 gallons remain in a standard tank, and 2 gallons remain in a long range tank as unusable fuel. The indicators cannot be relied upon for accurate readings during skids, slips, or unusual attitudes.

The fuel selector valve should be in the BOTH position for takeoff, climb, landing, and maneuvers that involve prolonged slips or skids. Operation from either LEFT or RIGHT tank is reserved for cruising flight.

NOTE

When the fuel selector valve handle is in the BOTH position in cruising flight, unequal fuel flow from each tank may occur if the wings are not maintained exactly level. Resulting wing heaviness can be alleviated gradually by turning the selector valve handle to the tank in the "heavy" wing.

Figure 4: Empty tank description. (Source: Cessna 172 POH)

Floating During Roundout: (Source: FAA-H-8083-3A Airplane Flying Handbook)

If the airspeed on final approach is excessive, it will usually result in the airplane floating. [Figure 5] Before touchdown can be made, the airplane may be well past the desired landing point and the available runway may be insufficient. When diving an airplane on final approach to land at the proper point, there will be an appreciable increase in airspeed. The proper touchdown attitude cannot be established without producing an excessive angle of attack and lift. This will cause the airplane to gain altitude or balloon. Any time the airplane floats, judgment of speed, height, and rate of sink must be especially acute. The pilot must smoothly and gradually adjust the pitch attitude as the airplane decelerates to touchdown speed and starts to settle, so the proper landing attitude is attained at the moment of touchdown. The slightest error in judgment and timing will result in either ballooning or bouncing. The recovery from floating will depend on the amount of floating and the effect of any crosswind, as well as the amount of runway remaining. Since prolonged floating utilizes considerable runway length, it should be avoided especially on short runways or in strong crosswinds. If a landing cannot be made on the first third of the runway, or the airplane drifts sideways, the pilot should EXECUTE A GO-AROUND.

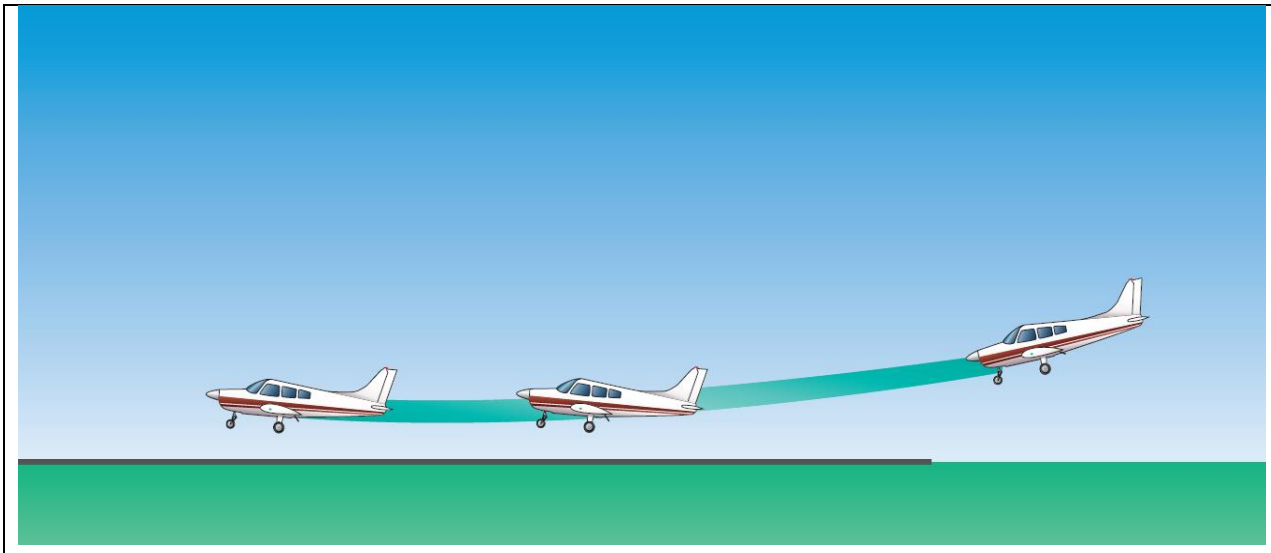


Figure 5: Floating during round out. (Source: FAA-H-8083-3A)

Probable Cause

It is likely that the pilot did not execute the landing technique properly, which resulted in the aircraft floating instead of touching down after flaring.

Contributing Factors

The pilot was distracted by low fuel warning light and the runway lights that switched off during landing.

Safety Action

None.

Safety Message and/or Safety Recommendation/s

None.

About this Report

The decisions 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

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa