

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10233				
Classification	Accident	Date	19 November 2022	Time	0502Z
Type of Operation	Private (Part 91)				
Location					
Place of Departure	Vereeniging Airport (FAVV), Gauteng Province		Place of Intended Landing	Vereeniging Airport (FAVV), Gauteng Province	
Place of Occurrence	710m north-west of Runway 21 threshold at FAVV				
GPS Co-ordinates	Latitude	26° 33' 25.9" S	Longitude	27° 57' 35.9" E	Elevation 4893 ft
Aircraft Information					
Registration	ZS-DUR				
Make; Model; S/N	Cessna 172E (172-51496)				
Damage to Aircraft	Substantial		Total Aircraft Hours	4001.6	
Pilot-in-command					
Licence Type	Commercial Pilot Licence (CPL) Aeroplane		Gender	Male	Age 22
Licence Valid	Yes	Total Hours	205.6	Total Hours on Type	29.5
Total Hours Past 90 Days	3.4		Total Hours on Type Past 90 Days		0.1
People On-Board	1 + 2	Injuries	0	Fatalities	0
Other (on ground) 0					
What Happened					
<p>On 19 November 2022, a pilot and two passengers on-board a Cessna 172E aircraft with registration ZS-DUR took off on a private flight from Vereeniging Airport (FAVV) in Gauteng province with the intention to land back at the same airport. The flight was conducted in 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 rotated from Runway 03 at 50 knots (kts) (57miles per hour [mph]) with flaps at first notch (10°). During rotation, a crosswind from the right caused the aircraft to drift to the left whilst in the climb. The pilot further stated that after take-off, the aircraft struggled to climb and, soon after, the stall warning sounded. Thereafter, the aircraft lost height whilst in a left-wing low attitude. One of the passengers stated that the take-off roll took longer than normal, and that the aircraft only lifted off towards the end of the runway. The passenger further stated that shortly after take-off, he heard a continuous buzz (sound) whilst the aircraft tilted and drifted to the left, and losing height.</p> <p>The left wingtip impacted the ground first, and was severed. The nose wheel touched down hard and impacted an anthill before the nose gear strut broke off at the attachment points; the aircraft nosed over and came to rest in an inverted position on the electrically charged perimeter fence, approximately 710 metres (m) north-west of Runway 21 threshold.</p>					

The aircraft sustained substantial damage to the nose landing gear strut, both propeller blades, both wing tips and the empennage structure. The pilot and both passengers were not injured during the accident sequence.



Figure 1: The ZS-DUR aircraft as it came to rest on the electrically charged perimeter fence.

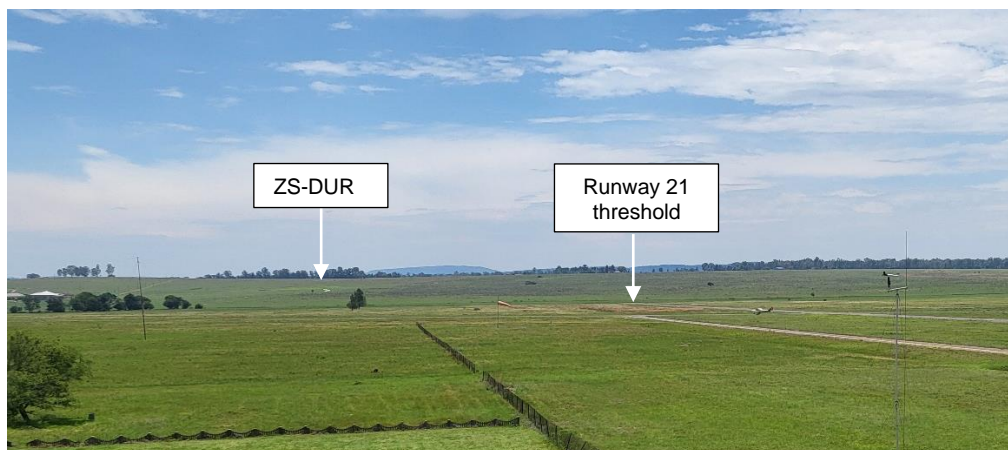


Figure 2: The accident site with reference to the airport.

Wreckage examination revealed that the left wing was buckled with bent and compression load damage. The left wing tip was severed, which correlates with the aircraft impacting the ground with the left wing tip first as evidenced by dirt and grass on the wing tip skin. The nose undercarriage broke off from the attachment points and both propeller blades bent backwards, an indication that the aircraft experienced power loss which contributed to the stall shortly after take-off. The engine was intact and still secured to the cradle; it had signs of minor damage due to impact. The flight control

continuity was established by manually moving the control cables. Both fuel tanks had adequate fuel still remaining; the examination of fuel did not show signs of contamination. Also, fuel was of the correct grade (Avgas).



Figure 3: The damaged wing with the severed left wing tip.



Figure 4: The severed nose undercarriage and bent propeller blades.

Findings
<ol style="list-style-type: none"> 1. The pilot was issued a Commercial Pilot Licence (CPL) Aeroplane on 20 September 2022 with an expiry date of 30 September 2023. The aircraft type was endorsed on his licence. A Class 1 medical certificate was issued to the pilot on 1 March 2022 with an expiry date of 31 March 2023, and with a restriction to wear corrective lenses. 2. The aircraft was initially issued a Certificate of Airworthiness (C of A) on 31 August 2007 with an expiry date of 31 August 2023. 3. The mandatory periodic inspection (MPI) carried out on the aircraft prior to the accident flight was conducted on 28 October 2022 and was certified at 4000.3 airframe hours. The aircraft was issued a Certificate of Release to Service (CRS) on 28 October 2022 with an expiry date of 27 October 2023 or at 4100.4 hours of flight time, whichever occurs first unless the aircraft is involved in an accident or becomes unserviceable. 4. The weather conditions did not contribute to this accident. The aircraft was within its weight and balance limits and, thus, had not contributed to the cause of the accident. 5. The take-off distance required for the aircraft type is 865 feet (264m) and FAVV Runway 03 length is 1 500m. There was ample distance for the aircraft to take-off and even to abort the take-off if the aircraft was struggling to attain rotation speed. It is probable that the take-off run was not initiated at the threshold of Runway 21. 6. It is likely that during the take-off roll, the pilot had limited runway length remaining and had to rotate at 50kts (57mph) before the aircraft reached its rotation speed of 60mph. This, inadvertently, caused the aircraft to stall shortly after take-off.
Probable Cause
The aircraft lifted off before it reached rotation speed and stalled shortly after take-off.
Contributing Factors
It is likely that the pilot did not use the required runway length for the aircraft type at take-off.
Safety Action
None.
Safety Message
Pilots are advised to always plan their flights whilst taking into consideration the following measures: runway length, take-off distance, weight of the aircraft, temperature and density altitude amongst others. The accident would have been averted if the pilot had considered the above measures.
About this Report
<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</i>

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**