SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/9994										
Classification	Accident	**Date**	3 May 2021	**Time**	1155Z						
Type of Operation	Private (Part 91)										
Location											
Place of Departure	Ithala Game Lodge Airstrip, KwaZulu-Natal Province	Place of Intended Landing	Wonderboom Airport (FAWB), Gauteng Province								
Place of Accident	Runway 29 at Wonderboom Airport (FAWB) Gauteng Province										
GPS Co-ordinates	Latitude	S 25°39´13"	Longitude	E 028°13´40"	Elevation	4091 feet					
Aircraft Information											
Registration	ZS-NVE										
Model/Make	Cessna 402C										
Damage to Aircraft	Substantial	Total Aircraft Hours	12 410								
Pilot-in-command											
Licence Valid	Yes	Gender	Male	Age	26						
Licence Type	Commercial Pilot Licence (Aeroplane)										
Total Hours on Type	177.1	Total Flying Hours	1 491.4								
People On-board	1 + 0	Injuries	0	Fatalities	0	Other	0				
What Happened											

On 3 May 2021 at approximately 1045Z, the pilot on-board a Cessna 402C aircraft with registration ZS-NVE was repositioning the aircraft from Ithala Lodge Airstrip to Wonderboom Airport (FAWB). The flight was conducted under Instrument Flight Rules (IFR) by day.

According to the pilot, the flight from Ithala Lodge Airstrip to FAWB was uneventful. On arrival at FAWB, the pilot was cleared in-bound to join overhead right visual approach for Runway (RWY) 29 and to make a descent to an altitude of 7000 feet (ft). The pilot was instructed to report right downwind RWY 29. Upon reaching right downwind, the pilot maintained an altitude of 7000ft and proceeded with downwind checks, which included extending the flaps, lowering the landing gear and observing that the three green lights were on (which indicated that the three landing gears were extended and locked).

The pilot stated that he confirmed on both the base leg and final approach leg that the three green lights were on. After touchdown on RWY 29, approximately 200 to 300 metres from the runway

threshold, the nose landing gear collapsed and the aircraft subsequently stopped in the middle of the runway.

The aircraft sustained damages to the nose cone, nose gear doors, pitot tube and both the left and right engine propeller blade tips. The pilot did not sustain any injuries during the accident.

Figure 1: Aft view of the aircraft's final position. (Source: Pilot)

According to the aircraft maintenance organisation (AMO) technical report, the nose landing gear lowered to the down and locked position when the nose of the aircraft was lifted during recovery from the runway. The aircraft was towed on its main landing gear (wheels) to the hangar where it was placed on jacks. The landing gear system was first inspected to establish if there were any damages; thereafter, it was tested, and it operated normally (eight fault-free retractions were carried out).

According to the Cessna Airworthiness Directive (AD) and Service Bulletin (SB) listings, there were no relevant ADs or SBs relating to the landing gear system of a Cessna 402C.

The pilot disputed the technical report, with regards to the date the tests were done, stating that the retraction tests were not carried out on 3 May 2021 (the day of the accident) but on 4 May 2021. The pilot and the owner were present on the day of the retractions. The pilot disagreed with the determination that it was likely that he retracted the landing gears instead of the flaps after landing because it is not possible to retract the landing gear when the aircraft's weight is on the landing gear. The pilot further stated that it is not easy to mistake the flaps lever for the landing gear lever as the flaps lever is situated on the co-pilot's side; also, one has to lean over to reach the flaps lever whereas the gear lever is located at the pilot-in-command's (PIC) side above the right knee. Post-accident, the investigating team dispatched to the hangar to examine the landing gear retractions. The investigating team found that when the landing gear lever was engaged to retract position, the right main landing gear retracted first, followed by the nose landing gear and, lastly, the left main landing gear. When the landing gear system is extended, the main landing gears face slightly out, which keep them from retracting when they are on the ground.

Landing gear

Source: Cessna Aircraft company Model 401/402 Maintenance Manual

General - Description and operation

1.General

A. The hydraulic power system is open-centre type with constant displacement engine-driven pumps which use MIL-H-5606 hydraulic fluid. The function of the hydraulic system is for extension and retraction of the landing gear. The hydraulic fluid continuously circulates through the filters, manifold valve reservoir and pumps.

Landing gear

Source: Cessna Aircraft company Model 401/402 Pilot Operating Handbook (POH)

General - Description and operation

During ground operation, accidental gear retraction, regardless of gear switch position, is prevented by a safety switch located on the left landing gear shock strut. When the weight of the airplane is on the landing gear, the shock struct is compressed, allowing the safety switch to open, thus preventing electrical power from reaching the landing gear motor.

The landing gear doors are mechanically linked to their respective landing gears, retracting and extending with each landing gear.

The landing gear is operated by a switch which is identified by a wheel-shaped knob. The switch positons are up ,off (centre) and down. To operate the the gear, pull out the landing gear switch and move to the desired position. This allows the electrical power to energise the landing gear motor, bring the landing gear toward the selected position. The motor will continue to run until the up or down limit switch on the gear box disconnects the electrical power to the landing gear motor.

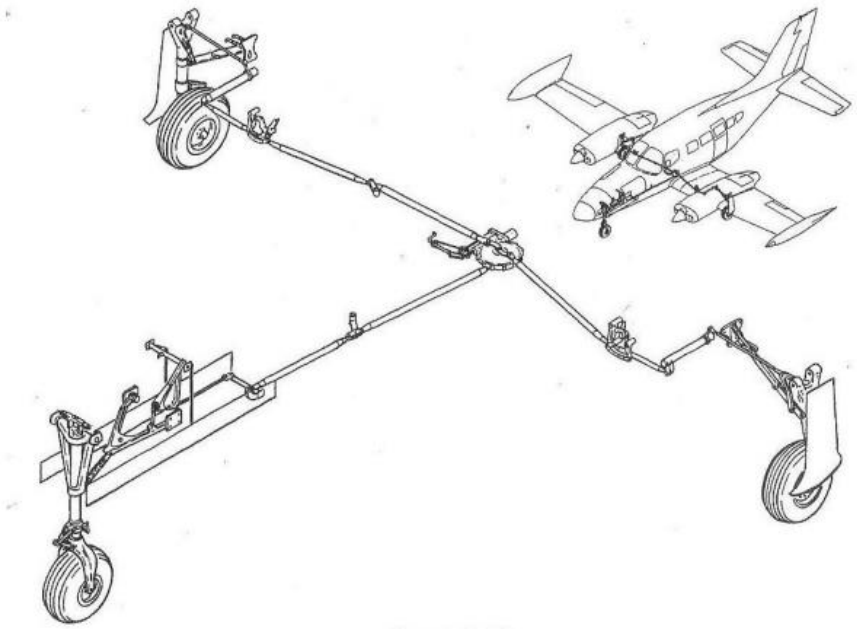

Diagram 1: Landing gear system.

Figure 2: Location of the landing gear lever and the flaps selector lever.

Before landing checklist:

1. Seat belts and shoulder harness-Secure
2. Propeller Synchrophaser -OFF (optional system)
3. Fuel Selectors- Left engine - left main (feel for detent)
Right engine - right main (feel for detent)
4. Auxiliary fuel pumps -ON
5. Alternate air controls-Check in
6. Wing flaps - Down 15° below 160 KIAS
7. Landing gear - Down below 140 KIAS
8. Landing gear position indicator lights - Check down lights ON
Unlocked light -OFF
9. Mixtures - Full rich or lean as required for smooth operation
10. Propellers - Full forward
11. Wing Flaps - Down 45° below 140 KIAS
12. Minimum multi-engine approach speed - 95 KIAS at 6200 pounds
Refer to section 5 for speeds at reduced weights
13. Air minimum control speed - 82 KIAS

According to the airframe logbook, the mandatory periodic inspection (MPI) was conducted on 7 January 2021 in which five landing gear retraction tests were carried out.

What was found:

- When the aircraft was lifted off the ground during recovery, the nose wheel moved to the down and locked position.
- The AMO indicated that the landing gear system was inspected to establish if there were any damages; thereafter, the landing gear was recycled eight times, and each time the landing gear was recycled, it engaged into the down and locked position. The landing gear operated normally without fault.

- It could not be determined why the nose gear collapsed as it operated well during post-incident tests.

Probable cause

The nose landing gear collapsed during the landing roll; the cause of the collapse could not be determined.

Safety Action/s

None.

Safety Message

It is important that pilots lower the landing gear system and ensure that all three landing gears are in the down and locked position during the downwind checks as per the POH checklist.

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****.*

About this Report

Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no 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 brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information 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 accident.

This report provides an opportunity to share safety message/s in the absence of an investigation.

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.

Disclaimer

This report is issued by:

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