SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10074								
Classification	Accident	**Date**	13 November 2021	**Time**	1035Z				
Type of Operation	General Aviation (Part 91)								
Location									
Place of Departure	Pietermaritzburg Aerodrome (FAPM), KwaZulu-Natal	Place of Intended Landing	Magwa Tea Estate, near Lusikisiki, Eastern Cape						
Place of Accident	Magwa Tea Estate, 6nm east of Lusikisiki, Eastern Cape								
GPS Co-ordinates	Latitude	S 31˚23'33.00"	Longitude	E 029˚41'40.71"	Elevation	1722 ft			
Aircraft Information									
Registration	ZS-JZP								
Model/Make	Piper 28R-201T Cherokee Arrow III (Serial Number: 28R-7703039)								
Damage to Aircraft	Substantial	Total Aircraft Hours	4852.32						
Pilot-in-command									
Licence Type	Private Pilot Licence (PPL)	Gender	Male	Age	58				
Licence Valid	Yes								
Total Hours on Type	1510.62	Total Flying Hours	1743.92						
People On-board	1 + 1	Injuries	0	Fatalities	0	Other (on ground)	0		

What Happened

On 13 November 2021 at approximately 0930Z, a Piper 28R-201T Cherokee Arrow III single engine aircraft with registration ZS-JZP took off on a private flight with a pilot and a passenger on-board from Pietermaritzburg Aerodrome (FAPM) to Magwa Tea Estate private strip, near Lusikisiki in the Eastern Cape. The flight was conducted during day light in visual meteorological conditions (VMC) and under the provisions of Part 91 of the Civil Aviation Regulations 2011 as amended.

According to the pilot, they had 4.5 hours fuel endurance and the distance to their destination was 113 nautical miles (nm), which would take approximately 1 hour to complete. The aircraft's weight and balance were within limits and the weather was fine with clear skies and good visibility. The pilot stated that the cruise was uneventful. On arrival at Magwa Tea Estate, the pilot followed the unmanned airfield joining procedure and proceeded to join left downwind for Runway (RWY) 02. He stated that he performed all the downwind checks, thus, making sure that the flaps were lowered to 30° setting, fuel flow was normal, and the landing gear was extended with the three green lights illuminated. The pilot touched down at 75 knots (kts) on the main landing gears and held the nose gear up for a moment. He then allowed the nose gear to drop, however, the nose gear collapsed, and the propeller struck the ground. The aircraft skidded on its lower engine cowling before coming to a stop on the grass runway. The aircraft sustained damages to the propeller (struck the ground), lower engine cowling and the collapsed nose-gear strut.

The Investigation:

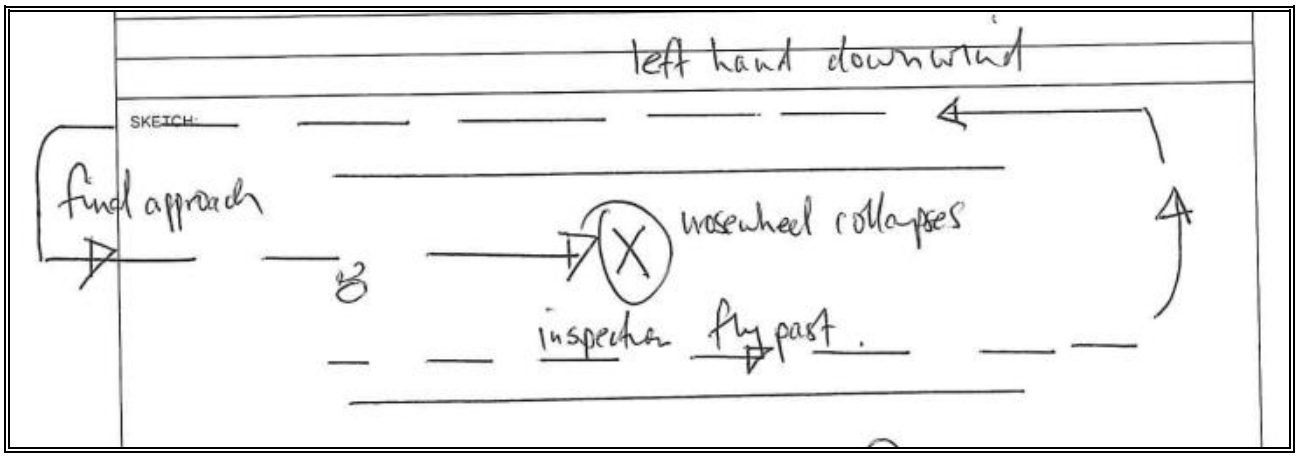

Figure 1: Pilot's illustration of final events. (Source: Pilot)

Figure 2: The last position of the aircraft. (Source: Pilot)

Post-accident inspection of the aircraft by the AMO revealed the following damages:

- The down lock assembly hook had fractured/broken off, leaving the springs only to keep the nose gear in the locked position. Furthermore, the hydraulic actuator shaft was bent, another indication of the failure of the down lock assembly hook.
- The possibility of a slightly rough runway (unpaved) contributed to the collapse of the nose gear assembly.
- The failure of the down lock hook did not interfere with the operation of the gear, i.e., retraction and extension; and even with the broken lock hook, the indication system in the cockpit would indicate the gear is down and locked. However, on landing without the hook to support the system and keep the gear locked in place, the nose gear folded into the up position.
- There are no Service Bulletins (SB) or Airworthiness Directives (AD) regarding the gear down lock assembly. The gear down lock assembly only gets a visual inspection every 50 hours, and the recycling of the undercarriage is done every 100 hours.

- The failed section, which was remaining on the aircraft after the accident, had possible signs of fatigue as indicated by the lower left part of the component in Figure 3, which seems as if (the crack) had occurred earlier when compared to the rest of the damage (or failed components).

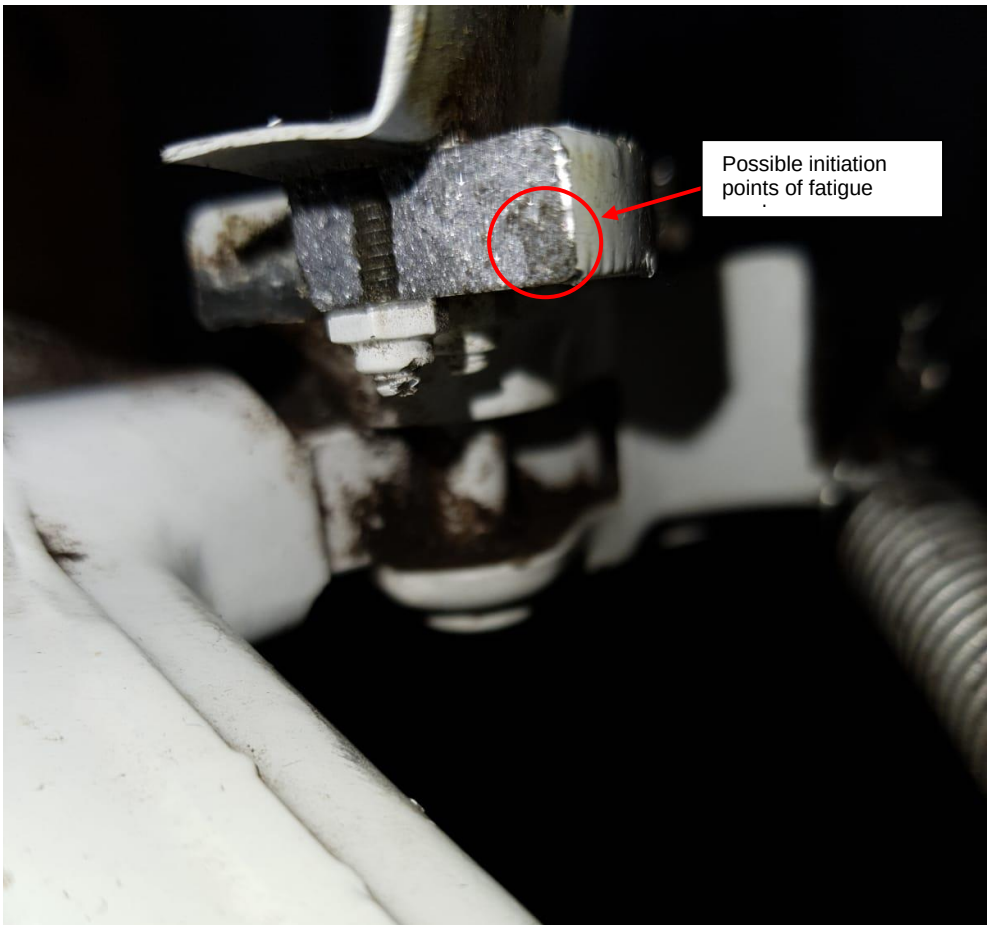

Figure 3: The broken nose gear lock assembly hook. (Source: AMO)

Figure 4: The downlock assembly. Inset shows thickness. (Source: https://cdn11.bigcommerce.com/s-lh7wonygtd/images/)

Probable Cause:
The aircraft's nose gear strut collapsed due to the break off of the nose gear lock assembly hook, probably as a result of fatigue. This resulted in the propeller striking the ground.

Safety Action

None.

Safety Recommendation/s

Since the component is an on-condition unit and the aircraft had over 4800 hours in service, it is recommended that the manufacturer issues an Airworthiness Directive which mandates owners/operators to perform an appropriate non-destructive testing (NDT) on all undercarriage locking components every 2000 hours.

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