SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10173						
Classification	Accident	**Date**	16 June 2022		**Time**	1200Z	
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Klipriver Airfield, Gauteng Province		Place of Intended Landing		Klipriver Airfield, Gauteng Province		
Place of Occurrence	Klipriver Airfield						
GPS Co-ordinates	Latitude	S 26°28´52.7"	Longitude	28°06´41.41"	Elevation	5000ft	
Aircraft Information							
Registration	ZU-EZJ						
Make; Model; S/N	Bush Cat; Z194 (Serial Number: CH 081)						
Damage to Aircraft	Substantial		Total Aircraft Hours	486.7			
Pilot-in-command							
Licence Type	National Pilot Licence (Aeroplane)		Gender	Male	Age	67	
Licence Valid	Yes	Total Hours	4486	Total Hours on Type	1000		
Total Hours 30 Days	2.6		Total Flying on Type Past 90 Days	7.9			
People On-board	1 + 1	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Thursday, 16 June 2022, a student pilot accompanied by an instructor on-board a Bush Cat Z194 aircraft with registration ZU-EZJ took off on a training flight around Klipriver Airfield in Gauteng province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight. No flight plan was filed for the flight. The aircraft was operated under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The aircraft took off from Klipriver Airfield; and it performed well during the exercises. The instructor then briefed the student pilot, who was on his last part of his skills test, that they were going to perform a precautionary fly-pass overhead Runway 25, followed by a circuit. During the fly-pass whilst inspecting Runway 25 at 50 feet (ft) above ground level and travelling at 60 miles per hour (mph) with two notches of flap setting, the flight instructor opened the throttle halfway down the runway, but the engine did not respond. The flight instructor requested the student pilot to open the throttle on his side, and there was still no response from the engine. The throttle lever seemed to have gotten stuck (jammed);and the engine revolutions per minute (RPM) indication was just above idle. The instructor tried to troubleshoot the problem with no success; meanwhile, the aircraft continued to lose height. Due to insufficient runway left, as well as power lines and a perimeter fence

ahead, the flight instructor elected to turn left to join Runway 20. Thereafter, he tried to manipulate the throttle lever again, but there was still no response. The chance of landing on Runway 20 was slipping through as the remaining runway length was getting shorter for the pilot to land, this was in addition to the trees and lamp posts at the end of the runway which posed an obstacle. The flight instructor then decided to execute a slow landing with partial power on a clear patch of land to the left of Runway 20. There was a barbed wire fence on the aircraft's flight path; the pilot tried to clear it but it caused the aircraft to stall before touchdown.

The aircraft sustained substantial damage, however, the flight instructor and the student pilot were unharmed.

Figure 1: The aircraft as it came to rest. (Source: Pilot)

Findings

- The flight was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended. The flight school was issued an Approved Training Organisation (ATO) certificate on 10 August 2021 with an expiry date of 31 July 2023. According to the reviewed records, the aircraft was listed on the ATO certificate.

- The last 100-hour mandatory periodic inspection (MPI) prior to the accident flight was carried out on 7 May 2022 at 467.5 hours. The aircraft was issued a Certificate of Release to Service (CRS) on 7 May 2022 with an expiry date of 6 May 2023 or at 567.5 hours, whichever occurs first. The aircraft had 80.8 hours remaining before the next inspection. The aircraft maintenance engineer (AME) who carried out the last MPI was appropriately licensed to maintain the aircraft type. The last inspection on the engine control system, which was of the correct installation, operation, condition and security, was carried out on 7 May 2022.

- Aircraft logbooks and maintenance history records were reviewed and all documents were found in order with no outstanding Service Bulletins (SB).

- The Pilot's Operating Handbook (POH) does not have this specific failure of the "stuck throttle" in its content but the closest to that (in the POH) is the "engine failure at altitude" which states the following: "*Trim aircraft for best glide (60 miles per hour). Fuel starvation is the most likely cause of engine stoppage. Attempt restart if sufficient altitude allows. Follow your flight school's approved emergency landing procedure if restart is not possible*." This procedure was followed by the flight instructor.

- The aircraft was issued an Authority to Fly (ATF) on 6 June 2019 with an expiry date of 30 June 2022. The aircraft's Certificate of Registration (C of R) was issued to the current owner on 25 June 2008.

- The flight instructor requested the student pilot to open the throttle on his side (left hand-side) and there was still no response from the engine. The throttle lever was stuck (jammed).

- The aircraft was recovered to the Approved Training Organisation (ATO) hangar. The investigator visited the aircraft maintenance organisation (AMO) where the aircraft was kept. He established that, indeed, both throttle levers were stuck (jammed) after his examination.

- It was discovered that the Nylatron pulley was worn out and the Nico press sleeve on the cable had damaged the groove of the pulley, causing it to get stuck in the grove and disabling the movement of the cable.

- The Bush Cat Z194 aircraft is a Cheetah aircraft with a few modifications and upgrades.
- The manufacturer issued an advisory Service Bulletin (SB) to inform owners of the new throttle system on 22 July 2022. This advisory SB served to inform owners of an area of added attention that was needed in the maintenance of older Cheetah aircraft. The advisory is also

for ensuring non-aluminium throttle pulley systems integrity as well as to advise owners/operators that full engine control could still be obtained with one throttle system active.

- This relates to the throttle system and, in particular, the smooth movement and operation thereof, based on the potential of the old system becoming worn after extensive use.

Figure 2: Defective throttle.

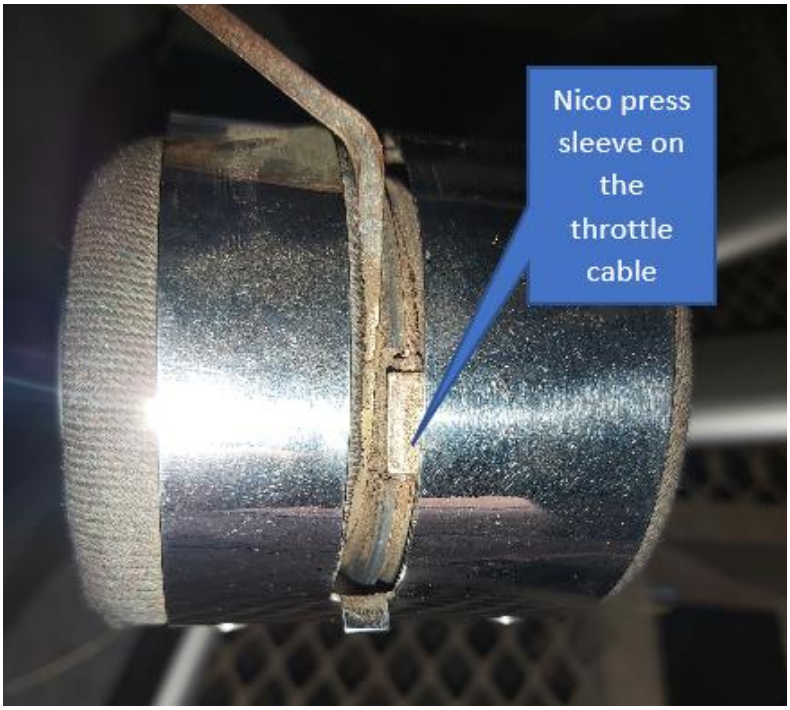

Figure 3: Throttle showing Nico press sleeve on the cable.

Figure 4: New pulley made of aluminium (sealed item before installation on the aircraft).

Probable Cause

The throttle lever got stuck (jammed) due to restriction of the throttle cable which was above idle, and the resultant loss of engine power and height led to the unsuccessful forced landing.

Contributing Factor

The Nico press sleeve moved into the pulley grove, restricting further movement of the throttle cable.

Safety Action(s)

Following the incident, the manufacturer issued an advisory Service Bulletin (SB) CH 017-07-2022 effective 22 July 2022 to inform owners of the new throttle system. The manufacture has since issued a mandatory Service Bulletin (SB) CH 018-10-2022 effective 14 October 2022 which supersedes CH 017-07-2022.

Safety Message and/or Safety Recommendation/s

None.

About this Report

Decisions to conduct a limited investigate 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
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This report is issued by:

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