



LIMITED SERIOUS INCIDENT INVESTIGATION REPORT

Reference Number		CA18/3/2/1353					
Classification	Serious Incident	Date	15 July 2021	Time	1020Z		
Type of Operation	Private (Part 91)						
Location							
Place of Departure	Virginia Aerodrome (FAVG)	Place of Intended Landing	Kruger Mpumalanga International Airport (FAKN)				
Place of Incident	KwaDukuza, about 16 nautical miles (nm) north of King Shaka International Airport (FALE)						
GPS Co-ordinates	Latitude	S 29° 22' 29.5"	Longitude	E 031° 19' 07.3"	Elevation	29ft	
Aircraft Information							
Registration	ZS-LRO						
Model/Make	Piper PA-28-140 Cherokee						
Damage to Aircraft	None	Total Aircraft Hours	7155.8				
Pilot-in-command							
Licence Type	Private Pilot Licence (Aircraft)	Gender	Male	Age	18		
Licence Valid	Yes						
Total Hours on Type	13.6		Total Flying Hours	91.6			
Pilot Monitoring							
Licence Type	Commercial Pilot Licence (Aircraft)	Gender	Female	Age	26		
Licence Valid	Yes						
Total Hours on Type	18.1		Total Flying Hours	459.1			
People On-board	2 + 2	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On 15 July 2021 at about 0915Z, two pilots accompanied by two passengers on-board a Piper PA-28-140 Cherokee aircraft with registration ZS-LRO departed Virginia Aerodrome (FAVG) on a private flight to Kruger Mpumalanga International Airport (FAKN). The pilot seated on the left seat was the pilot flying (PF), and the pilot seated on the right seat was the pilot monitoring (PM). The PF had a Private Pilot Licence (PPL), and the PM had a Commercial Pilot Licence (CPL).</p> <p>According to the PF, who was piloting the aircraft at take-off, the cockpit instruments were functioning normally during take-off and climb; however, approximately 20 minutes into the flight whilst cruising at 1000 feet (ft) above ground level (AGL), the engine began to run rough, followed by a slight reduction in the engine's revolutions per minute (rpm). The PM, who had taken over control of the aircraft at that stage, stated that because they were 16 nautical miles (nm) north of King Shaka International Airport (FALE), they decided to turn left to FALE for a precautionary landing, provided that the engine could still produce sufficient power.</p>							

The PM stated that while routing towards FALE, the engine continued to lose power and could not maintain the airspeed required to sustain the flight; and subsequently, the aircraft was rapidly losing altitude. After an unsuccessful fault-finding exercise as well as not being able to restore engine power, the PM contacted FALE tower on frequency 125.75-Megahertz (MHz) to notify them of their emergency. However, due to the rapid loss of altitude, the PM began scanning the area for a suitable place to land; she spotted a dirt road on a private farm which was on the left-side of the aircraft's path. The PM landed the aircraft successfully with no damages to the aircraft and no injuries to the people on-board.

What was found:

Post-incident examination of the engine's right-side magneto after it was removed from the engine revealed that 11 teeth of the nylon distributor gear were stripped. All teeth fragments were found inside the magneto housing. The magneto was cleaned, whereafter a new nylon distributor gear was fitted in accordance with (IAW) *Continental Ignition System Service Manual X42002-3* dated August 2011. The magneto was fitted to the engine, and the engine was test-run and found to be operating satisfactorily.

According to the *Airworthiness Bulletin (AWB) 74-055 Issue 3 of 20 October 2014*, there are several reasons that could cause the nylon distributor gear failure. *The nylon or "plastic" distributor gears could suffer problems due to ageing, and suffer hardening of the gear material and fatigue cracking; tooth failures may also be attributed to:*

- *Prop strikes*
- *High temperature*
- *Kick back during starting before fire events (i.e., if the engine was started with both magnetos/right magneto)*
- *Magneto "locking devices" being left in the magneto*
- *Lightning strikes*
- *Incorrectly installed gears*
- *Any other event which could cause shock on the gear trains of the back gears and distributor gear (i.e., mishandling of distributor gear while being installed, thereby, damaging the teeth)*

The magneto had operated for 114.33 hours since its time between overhaul (TBO), thus, the magneto had been in operation for 23% of the 500 hours TBO. There were no previous incidents or technical defects that were recorded in the aircraft documents that could have indicated that any of the above possibilities had occurred; thus, the cause of the nylon distributor gear failure was undetermined.

Probable cause:

Power loss due to right-side magneto failure in-flight because of the failure of the nylon gear, which led to the failure of the engine ignition system.

Safety Action

None.

Safety Message

To avoid injury or damage to property, pilots are advised to land at the nearest airport from where an emergency occurs, especially when they are experiencing an engine power loss and a rapid loss of height.

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

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This report is issued by:

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