SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10128						
Classification	Accident	**Date**	26 February 2022	**Time**	1500Z		
Type of Operation	Private (Part 94)						
Location							
Place of Departure	New Tempe Aerodrome (FATP), Free State Province	Place of Intended Landing	Lindbergh Lodge, North West Province				
Place of Occurrence	18 nautical miles from Lindbergh Lodge, North West Province						
GPS Co-ordinates	Latitude	27º 29' 14.81" S	Longitude	025º 27' 15.61" E	Elevation	4 250ft	
Aircraft Information							
Registration	ZU-ECY						
Model/Make	Thunderbird MKVI (Serial Number: TDE 85)						
Damage to Aircraft	Substantial	Total Aircraft Hours	272.0				
Pilot-in-command							
Licence Valid	Yes	Gender	Male	Age	52		
Licence Type	National Pilot Licence (NPL)						
Total Hours on Type	140	Total Flying Hours	140				
People On-board	1 + 1	Injuries	0	Fatalities	0	Other (on ground)	0

What Happened

On Saturday afternoon, 26 February 2022, a pilot and a passenger on-board a Thunderbird MKVI aircraft with registration ZU-ECY took off on a private flight from New Tempe (FATP) Aerodrome in Bloemfontein, Free State province, destined for Lindbergh Lodge in Wolmaransstad, North West province. This was a return flight to Lindbergh Lodge. The flight was conducted under visual flight rules (VFR) by day and no flight plan was filed. Fine weather conditions prevailed at the time of the flight with a light surface wind at 6 knots (kts) and temperature at 28°C.

According to the pilot, about 20 miles (17nautical miles) from FATP whilst in cruise, the engine temperature indication increased to maximum, which is 195°C on this aircraft. The pilot elected to execute a precautionary landing on an open field because he could not clearly understand what could have triggered the abnormal function of the cylinder head temperature indication.

During landing, the right main landing gear broke off and the nose wheel collided with a rock, causing the aircraft to nose over. This resulted in the propeller striking the ground. The aircraft came to rest in a vertical attitude (nose down/tail high position).

The aircraft sustained substantial damages; however, both occupants were not injured during the accident sequence.

Figure 1: The aircraft as it came to rest after colliding with a rock. (Source: Owner)

Post-accident investigation revealed the following findings:

- The pilot was reissued a National Pilot Licence (NPL) on 19 March 2021 with an expiry date of 18 March 2023. The Thunderbird MKVI aircraft type was endorsed on the pilot's licence. A Class 4 medical certificate was issued to the pilot on 9 July 2020 with an expiry date of 30 June 2023 with no restrictions.
- The aircraft was recovered to the aircraft's manufacturer for damage analysis. The manufacturer's aircraft maintenance organisation (AMO) that had carried out the last annual inspection of the ZU-ECY aircraft found that a water pipe (anti-freeze) which provides water to a water jacket around the radiator became loose; this gradually led to water loss and the subsequent overheating of the engine (a Rotax 912 ULS). The engine was inspected and no damage was found. A new water pipe clamp was fitted. The water coolant was changed during the last annual inspection.
- Examination of the ZU-ECY's flight folio indicated no outstanding defects relating to the aircraft's engine prior to the accident.
- According to the aircraft's airframe logbook, the aircraft's last scheduled annual inspection was certified on 2 February 2022 at 271.9 total hours. At the time of the accident, the aircraft had accumulated 272.0 hours and had flown a further 0.35 hours since the last annual inspection.
- The last annual inspection was carried out by the AMO with a valid approval certificate. The approved person (AP) who carried out the last annual inspection was appropriately licensed to carry out maintenance on the aircraft type.

- Based on the information recorded in the aircraft's flight folio following the completion of the annual inspection, the aircraft was ground-run by the AP and was found to be satisfactory in all respect.
- All damage to the aircraft was attributable to impact forces exerted to the undercarriage due to the rough terrain. Damage to the propeller was caused when the aircraft nosed over after colliding with the rock on its path.

Probable cause

The engine temperature increased to maximum in cruise phase because the water pipe disconnected in-flight, resulting in an unsuccessful precautionary landing.

Contributing factor

It is likely that the water pipe clamp on the radiator was not secured correctly following the last annual inspection. As a result, the water pipe became disconnected in-flight and caused water to leak out, which led to high engine temperature indication.

Safety Action(s)

None.

Safety Message

Approved persons should always ensure security of components in all work done as required by the manufacturers' specifications and the regulations.

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

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