SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10432						
Classification	Accident	**Date**	18 March 2024	**Time**	0930Z		
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Karoo Gateway Aerodrome (FABW), Beaufort West, Western Cape Province	Place of Intended Landing	New Tempe Aerodrome (FATP), Bloemfontein, Free State Province				
Place of Occurrence	Karoo Gateway Aerodrome (FABW)						
GPS Co-ordinates	Latitude	32°18'6.12" S	Longitude	022°39'54.36" E	Elevation	2932 ft	
Aircraft Information							
Registration	ZU-DSH						
Make; Model; S/N	Yakovlev; Yak 55 (Serial Number: 880501)						
Damage to Aircraft	Substantial	Total Aircraft Hours	370.5				
Pilot-in-command							
Licence Type	Commercial Pilot Licence	Gender	Male	Age	24		
Licence Valid	Yes	Total Hours	860	Total Hours on Type	35		
Total Hours 30 Days	24	Total Flying on Type Past 90 Days	20				
People On-board	0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Monday morning, 18 March 2024, a pilot on a Yak 55 aircraft with registration ZU-DSH had planned to conduct a private flight from Karoo Gateway Aerodrome (FABW) in Beaufort West, Western Cape province, to New Tempe Aerodrome (FATP) in Bloemfontein, Free State province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight. The flight was planned to be conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he completed the pre-flight inspection on the aircraft with no anomalies found. He then refuelled the aircraft to full capacity in preparation for the flight. Upon pre-setting the aircraft for an engine pre-start procedure, the pilot asked two people to assist him to exert power on the aircraft to keep it in position; this was to prevent it from moving as soon as the engine starts. The pilot intended to start the engine using the propeller hand-cranking method. This was due to an existing defect on the aircraft's engine start system. *The pilot stated that the method was taught to him as an alternative to start the engine should he experience a challenge*. At this stage, no person was on-board the aircraft, and the aircraft's parking brakes were not engaged. Moreover, there were no chocks placed on the main wheels to prevent the aircraft from rolling. The pilot successfully started the engine but because there was no person on-board the aircraft to control it, it rolled forward and impacted the fuel bay perimeter fence before the pilot had an opportunity to climb in and take control. The aircraft sustained substantial damage to the propeller, right main gear and the right-wing tip. No person was injured. The fuel bay perimeter fence was also damaged.

The accident occurred during start-up at the apron at FABW at Global Positioning System (GPS) co-ordinates determined to be S 32°18'6.12" E 022°39'54.36", at a field elevation of 2932 ft.

Figure 1: Aerial view of FABW and the accident site. (Source: Google Earth)

Figure 2: The aircraft after the accident. (Source: Pilot)

Figure 3: The damaged propeller and the perimeter fence.

Aircraft Engine Start Procedure (Source: Pilot's Operational Handbook)

3.2 ENGINE START

3.2.1 Preparation for engine start

Propeller Control Lever ..... Full Fine
Fuel Shut-off Cock ..... Open
Magneto switch ..... Off
BATT ..... Off
IGN ..... Off
Cowl Gills ..... Open / Close
Throttle ..... Set (30% of full travel)
Propeller ..... Pull through 10 blades by hand (Cold Only)
Fuel Primer ..... Select CYL and Prime 2 – 3 Pumps

3.2.2 Engine start

BATT ..... On
Generator ..... On
Engine Instruments ..... On
IGN ..... On
Fuel Primer ..... Select SYS and Pump
Magneto Switch ..... Both
Start Button ..... Press

Note:

1. *To assist the start, additional fuel may be fed to the cylinders by operating the primer in the CYL position when the engine begins to fire.*

2. *When the engine begins to fire, the throttle may be moved back and forth within the 1/3 to 1/2 full range to produce a stable run.*

When the engine stabilises, proceed as follows.
Throttle .....Set for 40% RPM
Oil Pressure..... Observe (1Kg/cm2 within 20 secs)

3.2.3 No Start

BATT ..... Off
IGN ..... Off
Generator ..... Off
Magneto Switch ..... Off
Propeller ..... Pull through 10 blades by hand (Cold Only)
CAUTION:
DO NOT REPRIME ENGINE
Repeat the start

Findings

1. The pilot had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 31 May 2022. The licence renewal was conducted on 17 November 2023 and the licence was issued with an expiry date of 30 November 2024. The pilot's Class 1 aviation medical certificate was valid; it was issued on 25 November 2023 with an expiry date of 30 November 2024.

2. The aircraft type was endorsed on the pilot's licence. He accumulated 776.70 flying hours on fixed-wing and helicopters. The pilot had a total of 35 hours on the aircraft type.

3. The aircraft had an Authority to Fly (ATF) Certificate that was issued by the Regulator on 2 August 2023 with an expiry date of 30 September 2024. The Regulator issued a Certificate of Registration (C of R) to the current owner on 15 May 2016.

4. The aircraft was issued a Certificate of Release to Service (CRS) on 16 June 2023 at 340.8 airframe hours with an expiry date of 16 June 2024 or at 440.8 airframe hours, whichever comes first.

5. The Approved Person (AP) who conducted maintenance on the aircraft had an Approved Person Certificate that was issued by the Regulator on 25 August 2022 with an expiry date of 24 August 2024.

6. The aircraft had an existing engine starter problem which was not repaired (fixed). Therefore, to start the engine, the pilot used a method which was not in line with the approved procedures.

7. The pilot used an engine start procedure which was not included in the Pilot's Operating Handbook for this aircraft type, and which was not approved by the regulatory authorities.

8. The aircraft (with no person on-board, the parking brake not engaged, and the wheel chocks not placed on wheels) was started using an unapproved procedure which resulted in the aircraft rolling forward and impacting the fuel bay perimeter fence.

Probable Cause(s)
The aircraft's engine was started using an unapproved procedure which resulted in the aircraft rolling forward and impacting the fuel bay perimeter fence.
Contributing Factor(s)
1. The landing gear brakes were not engaged as per the engine start procedure. 2. The cockpit was not occupied at the time of engine start. 3. Disregard of the regulations and the manufacturer-approved aircraft starting procedures.
Safety Action(s)
None.
Safety Message
In the interest of safety and to avoid injuries or damage to property, pilots are encouraged to follow the regulations and manufacturer-approved procedures.
About this Report
The decision to conduct a limited investigation 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 desktop inquiries 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