SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10411						
Classification	Accident	**Date**	20 January 2024		**Time**	0750Z	
Type of Operation	Parachutes and Drop Zone (Part 105)						
Location							
Place of Departure	Carletonville Aerodrome (FACR), Gauteng Province	Place of Intended Landing	Carletonville Aerodrome (FACR), Gauteng Province				
Place of Occurrence	Open field north-east of Carletonville Aerodrome (FACR) at GPS 26°21'47.59"S 27°21'58.01"E, at an elevation of 4835 feet						
GPS Co-ordinates	Latitude	26°21'49.19.5"S	Longitude	027°22'30" E		Elevation	5 000 ft
Aircraft Information							
Registration	ZU-FFT						
Make; Model; S/N	Comp Air Inc; 7 SLX (Serial Number: 10077SLXT08)						
Damage to Aircraft	Destroyed		Total Aircraft Hours	105.4			
Pilot-in-command							
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	62
Licence Valid	Yes	Total Hours	7 851.7	Total Hours on Type		26.5	
Total Hours 30 Days	6.8		Total Flying on Type Past 90 Days	20.1			
People On-board	2+3	**Injuries**	0	**Fatalities**	0	**Other (on the ground)**	0

What Happened

On Saturday morning, 20 January 2024, two pilots and three skydivers on-board a Comp Air 750 SLX aircraft with registration ZU-FFT took off on a skydiving exercise from Carletonville Aerodrome (FACR) in Gauteng province. The intention was to drop-off the skydivers overhead the aerodrome. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 105 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that they used Runway 13 for take-off with the intention to climb to flight level (FL) 150 to drop-off the skydivers. Whilst on an initial climb past 200 feet (ft) above ground level (AGL), the crew observed white smoke emanating from the exhaust, as well as noticed the drop in pressure compressor speed (N1) which was followed by the engine failure. The crew aborted climb, and the aircraft made a left turn. The crew identified an open field between houses on which to perform a precautionary landing. During the landing roll, the aircraft impacted a small tree with its left wing which caused the aircraft to make a 360° turn before it stopped approximately 900 metres (m) north of FACR.

The main landing gears, propellers and the left wing were damaged during the accident. The two pilots and the three sky-divers were unharmed.

The accident occurred during daylight, north-east of FACR at Global Positioning System (GPS) co-ordinates determined to be 26°21'49.19.5" South 027°22'30" East, at an elevation of 5 000 feet (ft).

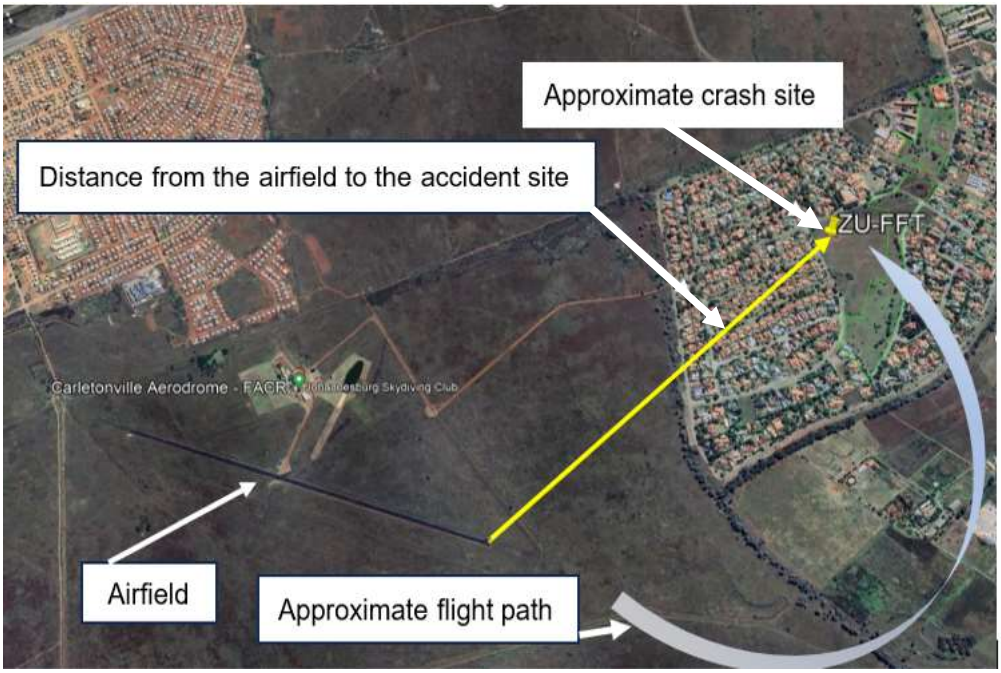

Figure 1: Aerial view of the accident site. (Source: Google Earth)

Figure 2: The ZU-FFT after it came to a stop at the accident site. (Source: Operator)

Another pilot who regularly flew the aircraft reported that in 2018, the aircraft maintenance organisation (AMO) responsible for the aircraft installed a throttle quadrant which was typical to those found in Van's RV (Richard Van Grunsven) model aircraft. The quadrant did not have a latching condition lever to secure the fuel in the "on" position and lacked the necessary travel distance required for controlling the fuel valve on the Fuel Control Unit (FCU). As a result, he experienced problems with the condition lever which tended to move backward, cutting fuel supply to the engine during flight (see Figure 3). The pilot had to figure out how to fly the aircraft by constantly holding the condition lever to prevent it from moving backward during flight. The condition lever could not be operated in bypass mode as it could not travel far enough. The pilot had reported this issue to the AMO.

The AMO stated that the aircraft was flown by four pilots with no issues except for the complaint about the beta stop that was not installed on the throttle lever. Following the complaint, the AMO installed the beta stop on the aircraft.

On the day of the accident, the pilot stated: "*I flew the first load and landed, idling, waiting for the next load. The co-pilot asked if he could do the next take-off. He is highly experienced and I allowed [the request]. Immediately after take-off, the engine failed.*"

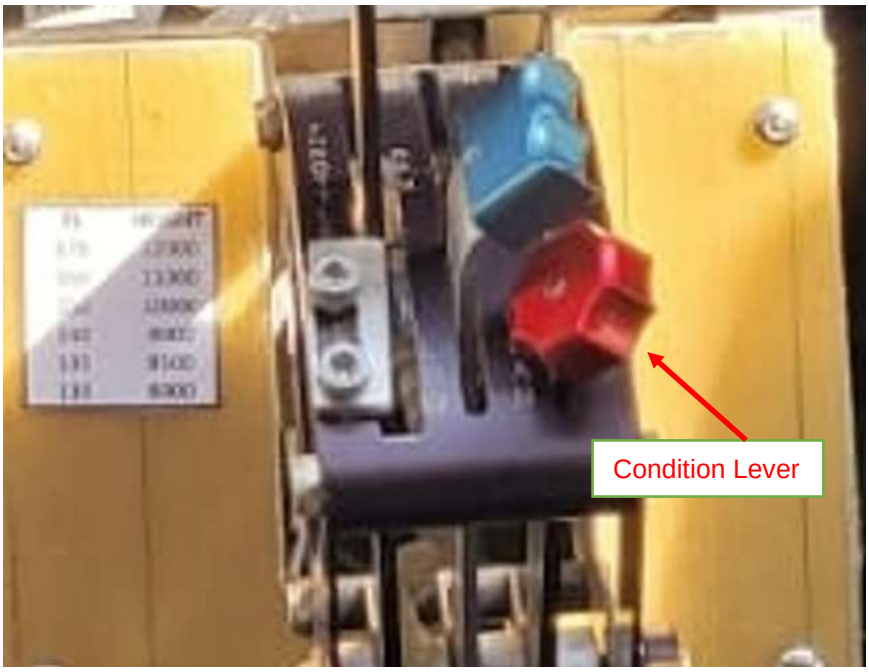

Figure 3. The quadrant with the condition lever moved backward. (Source: Operator)

During investigation, it was determined that the condition lever does not latch when pushed forward; it moves freely back and forth, thus, cutting off fuel supply to the engine.

The original equipment manufacturer (OEM) was contacted to get advice on the matter and to supply the requested documents; namely, the Pilot's Operating Handbook (POH), the Aircraft Maintenance Manual (AMM), and the Illustrated Parts Catalogue (IPC). However, the OEM did not respond, and the operator stated that they could not locate the documents. Furthermore, these documents could not be found in the Regulator's library; only the indexes of the Aircraft Maintenance Manual (AMM) and the Pilot's Operating Handbook (POH) were found.

Post-accident, the engine was taken to an approved AMO for testing and inspection.

The following are the findings from the AMO:

Engine: Walter 601 Z (8)
Engine serial number: 903002-Z
Engine strip down after accident. It has been reported that the engine failed after take-off. On inspecting the engine, the power turbine could not be turned. Upon splitting the power turbine and gas generator, the engine was able to turn freely with no restrictions. A visual inspection has been carried out on the Gas turbine. No inner damage to turbine blades and compressors was found. The outer casing was found to be distorted (Figure 3). This could be a result of the accident. No mechanical defects could be found on the visual inspection. After talking to one of the pilots that were in the aircraft at the time of the accident, revealed that the engine shut down because the condition lever was not properly in the gate, probably not properly rigged. For the engine to shut down moving the condition lever will only take approximately a centimetre from the gate. (Figures 5 & 6 show the condition lever not at the gate and at the gate.)

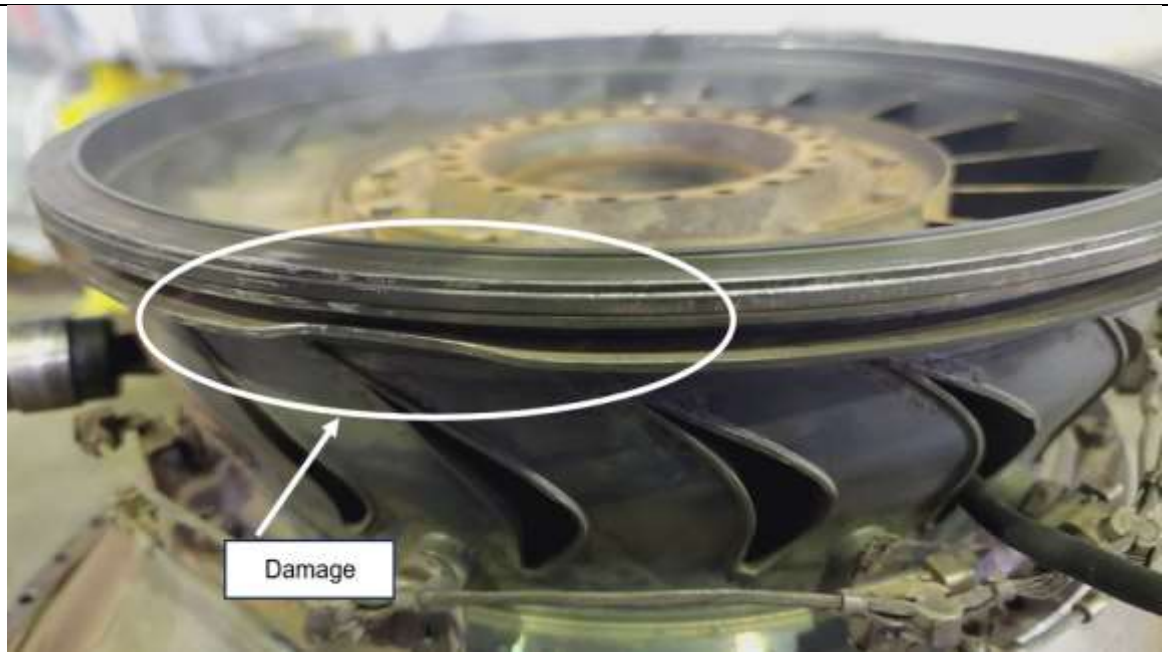

Figure 4: The damaged outer casing.

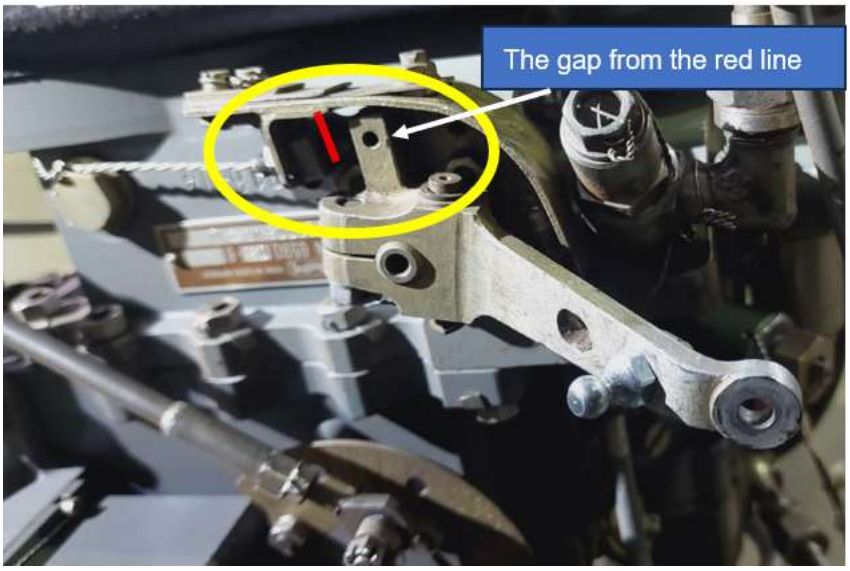

Figure 5: The condition lever which is not at the gate (with a gap).

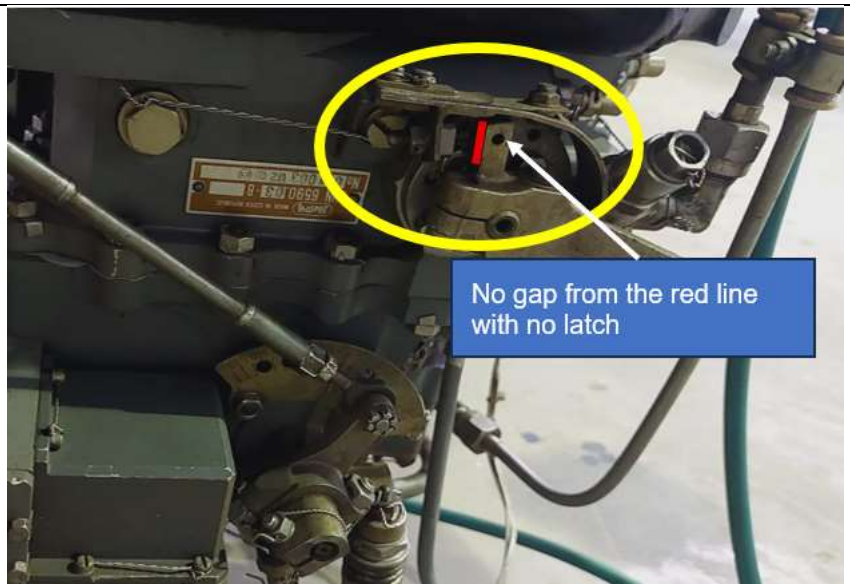

Figure 6: The condition lever at the gate (with no gap).

Condition Lever (Source: https://skybrary.aero/articles/condition-leve)

Description

A condition lever is a pilot-actuated control that is located within the throttle quadrant of an engine-equipped aircraft. It is utilised to control some functions of both the propeller and the engine. These functions vary from installation to installation.

Functions of the Condition Lever Can Include Any of the Following:

Fuel cut-off. Most condition levers incorporate a fuel cut-off position. Selection of this position will result in fuel to the engine being electrically or mechanically shut off, resulting in engine shut down due to fuel starvation. In some installations, this condition lever position is rendered non-functional by the weight on wheels switches anytime that the aircraft is not on the ground. The condition lever must be moved from cut-off to "run" (start/feather in some cases) position when starting the engine.

Findings

Pilot

1. The pilot was initially issued a Private Pilot Licence (PPL) on 28 July 2005. His last validation was conducted on 19 May 2023 and the licence was issued with an expiry date of 31 May 2025. The aircraft was endorsed on the pilot's licence. A Class 2 medical certificate was issued to the pilot on 27 November 2023 with an expiry date of 30 November 2024.

Aircraft

2. The aircraft's Certificate of Registration (C of R) was issued to the current owner on 7 August 2019. The Authority to Fly (ATF) was initially issued on 19 April 2012. The latest ATF was reissued on 15 February 2023 with an expiry date of 20 February 2024.

3. The last mandatory periodic inspection (MPI) was certified on 2 August 2023 at 94.0 airframe hours. At the time of the accident flight, the aircraft had a total of 105.2 airframe hours. The aircraft accrued 11.2 hours since the last MPI.

4. The aircraft was issued a Certificate of Release to Service (CRS) on 2 August 2023 at 94.0 airframe hours with an expiry date of 1 August 2024 or at 194 airframe hours, whichever occurs first. There were no defects recorded in the flight folio at the time of the flight.

5. The aircraft maintenance organisation (AMO) which certified the last maintenance inspection before the accident flight had an approved AMO certificate that was issued by the Regulator on 13 June 2023 with an expiry date of 30 June 2024.

6. The condition lever did not have a latching mechanism, which caused it to move back and forth freely during flight and, thus, cutting off fuel supply to the engine.

7. The AMO found out that the condition lever was not properly rigged or in the gate.

Probable Cause

Lack of latching mechanism on the condition lever caused it to move freely during flight and cut off fuel supply to the engine, which resulted in engine failure.

Contributing Factors

Fitment of the condition lever that was not properly rigged.

Safety Action(s)

None.

Safety Message and Recommendation

None.

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 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 apportion blame or liability.
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This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa