LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10557										
Classification	Accident		**Date**	1 March 2025			**Time**	0830Z			
Type of Operation	Private (Part 94)										
Location											
Place of Departure	Howick Aerodrome (FAHC), KwaZulu-Natal Province		Place of Intended Landing	Howick Aerodrome (FAHC), KwaZulu-Natal Province							
Place of Occurrence	On a maize field, 1.4 nautical miles (nm) east of Howick Aerodrome (FAHC)										
GPS Co-ordinates	Latitude	29°33'05.58" S	Longitude	030°14'12.24" E			Elevation	3 650 feet			
Aircraft Information											
Registration	ZU-WAG										
Make; Model; S/N	Kitplanes for Africa (KFA); Explorer (Serial Number: 164-12-13)										
Damage to Aircraft	Substantial			Total Aircraft Hours			351.5				
Pilot-in-command											
Licence Type	National Pilot Licence			Gender	Male			Age	48		
Licence Valid	Yes	Total Hours		311.7		Total Hours on Type			286.6		
Total Hours Past 30 Days	3.1			Total Hours on Type Past 90 Days			20.8				
People On-board	1 + 0	**Injuries**	0	**Fatalities**	0		**Other (on ground)**		0		

What Happened

On Saturday morning, 1 March 2025, a pilot on-board a KFAB Explorer aircraft with registration ZU-WAG took off from Howick Aerodrome (FAHC) in KwaZulu-Natal province with the intention to land at the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he took off on a local flight from Runway 34 at FAHC at 0700Z to conduct upper air work (see Figure 1). After being airborne for approximately 1 hour and 30 minutes (1.5 hours), he returned to FAHC and joined the circuit on right downwind for Runway 34 at a height of 4 100 feet (ft), which was approximately 500ft above ground level (AGL). He stated: *"On initiating downwind, I noticed that the aircraft was not handling correctly similar to when one encountered strong crosswind conditions (the wind was light and variable), and that if I tried to bank the aircraft, I had no aileron authority. I attempted to assess what was going on and realised neither the ailerons nor the flaps were working. In my attempt to steer the aircraft with rudder only, it started to yaw out of control. I realised I was not going to be able to turn onto base leg for Runway 34 without losing complete control of the aircraft and the possibility of entering a low-altitude stall/spin scenario.*
Below and ahead of me was a cultivated maize land with a timber plantation ahead of it. At that point, I realised my best chance was to land as slowly as possible in the maize field below me. I set the

aircraft up using the elevator and rudder to keep the wings level, I switched the engine off, closed the fuel and stalled the aircraft into the maize field. I came to a stop in the maize."

The aircraft sustained substantial damage; the pilot was not injured.

The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 29°33'05.58" South 030°14'12.24" East, at an elevation of 3 650 feet (ft).

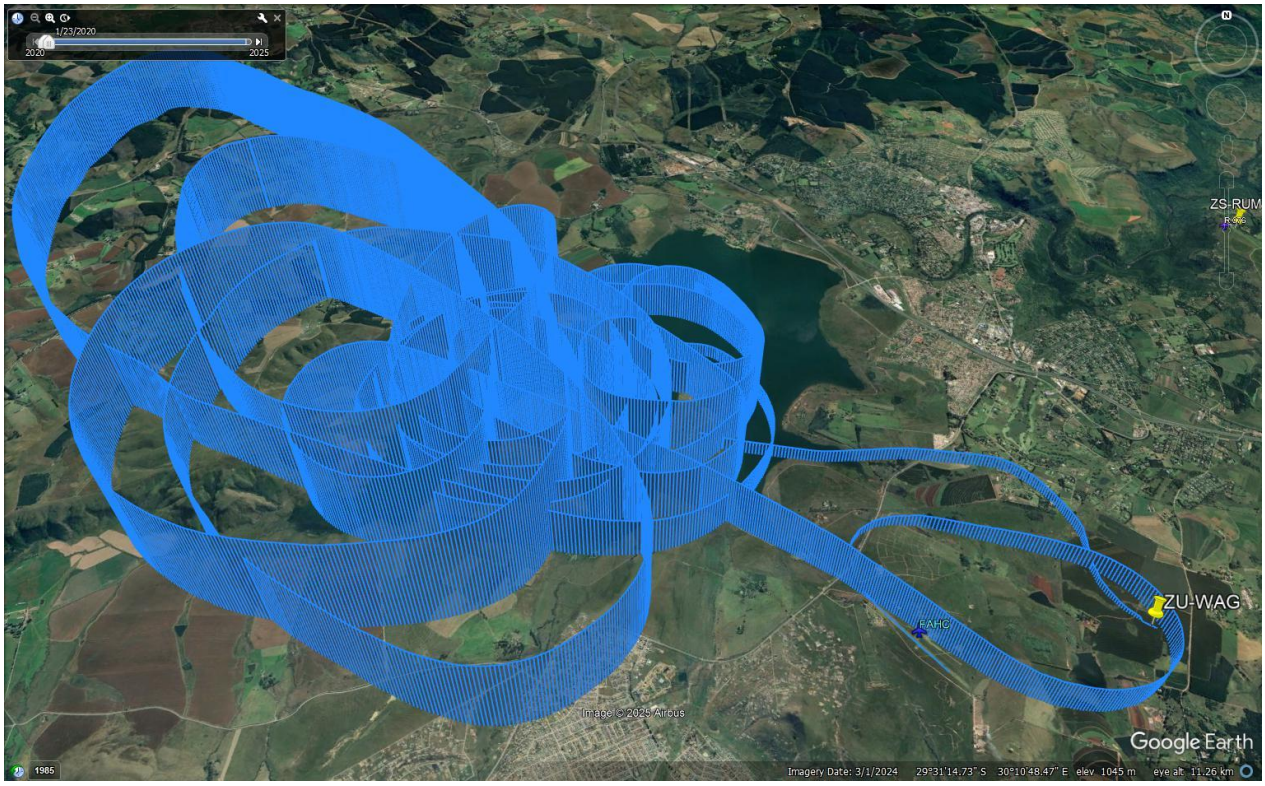

Figure 1: The flight profile and the location of the accident site indicated by the yellow pin. (Source: Google Earth; Pilot)

Figure 2: The aircraft when it was collected on 27 February 2021 after being sold. (Source: Owner)

Figure 3: The aircraft before the accident. (Source: Owner)

Figure 4: The aircraft as it came to rest in a maize field. (Source: Pilot)

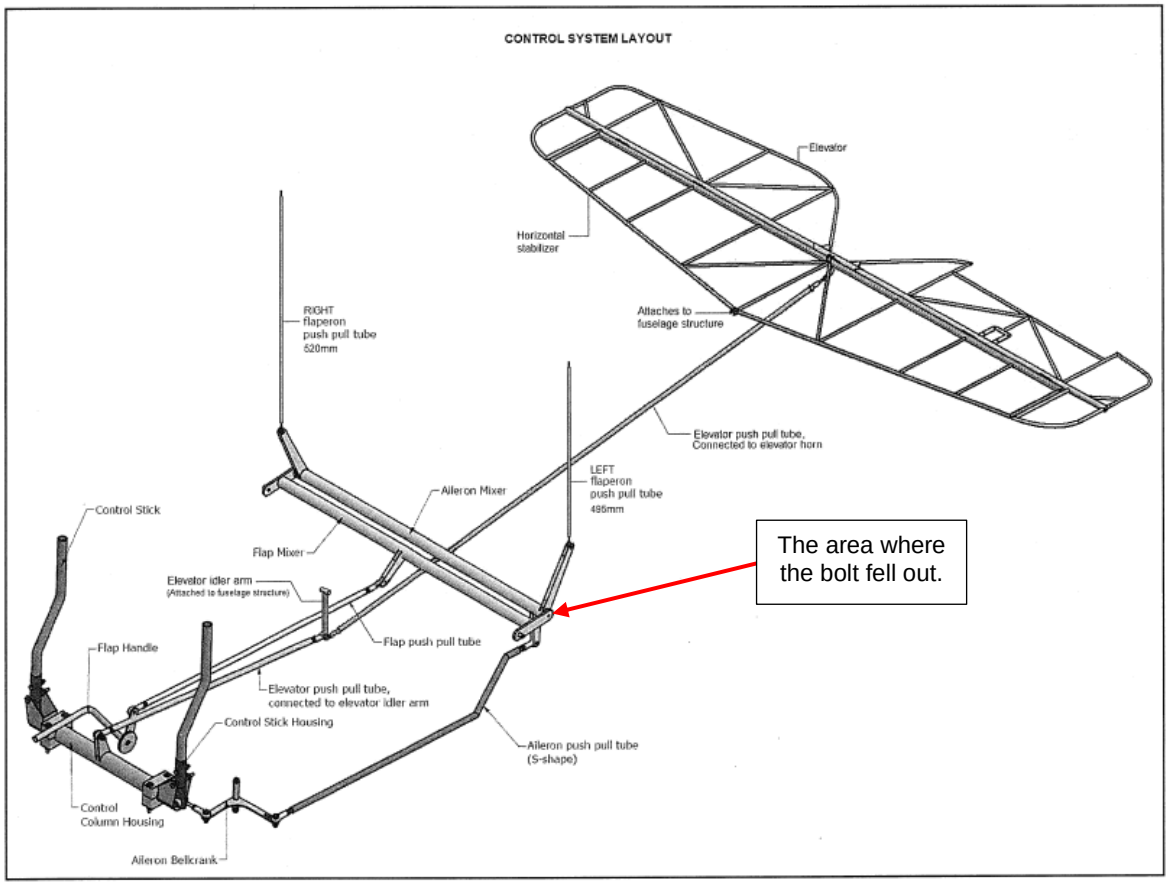

Diagram 1: The flight control system installation. (Source: Fuselage Assembly Manual)

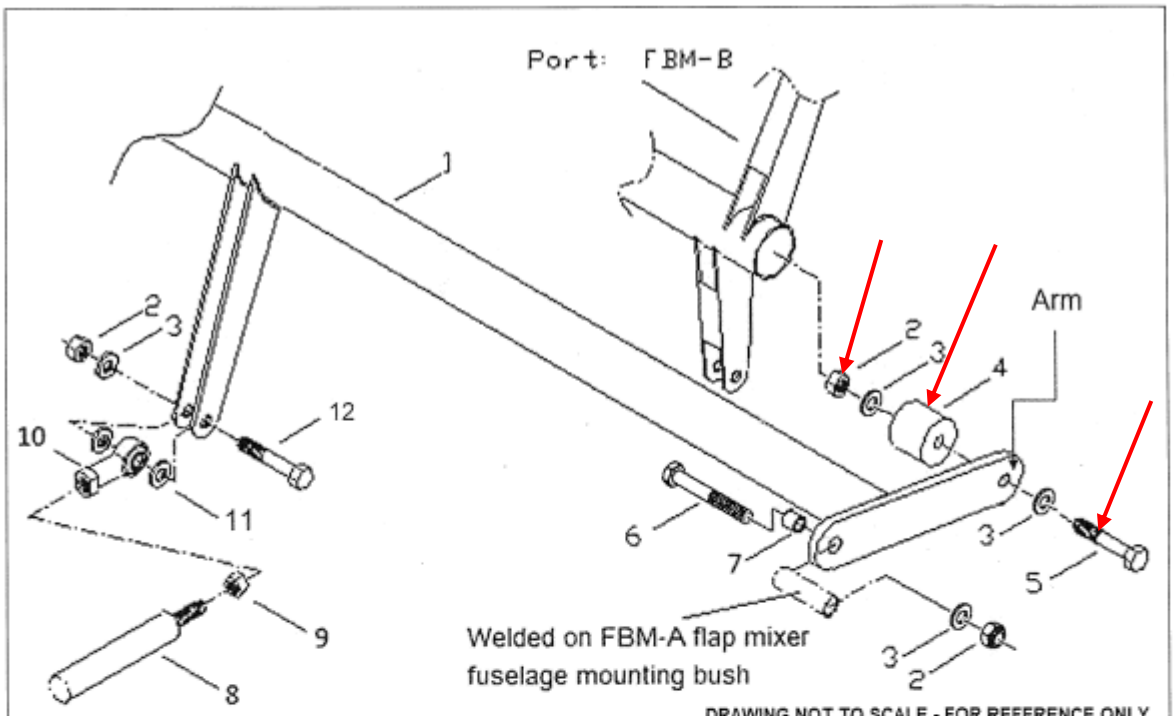

Fig #	Part #	Part description	Qty	Notes
1	FBM-A	Mixer, flap	1	
2	NY006	Nylok, M6	4	
3	W006	Washer, M6	6	
4	FBR-2	Bearing, ø 23 x 20. Nylon	2	Already counter sunk
5	B0635	Bolt M6 x 35	3	
6	B0655	Bolt M6 x 55	2	FBM-A to fuselage
7	BB8006	Bronze Bush ø 8 x 6mm	2	
8	FCT-3	Push-Pull tube, 660mm	1	To flap handle; Safari, Safari XL and Explorer
9	N006	Lock nut. M6	1	
10	FC-1	Rod-end. Female M6	1	
11	W006	Washer M6	2	Only needed to take up play
12	B0630	Bolt M6 x 30	1	

Diagram 2: The aileron/flap mixer assembly. (Source: Fuselage Assembly Manual)

The bolt (item 5) became dislodged from the bush (item 4).

There was no evidence of a self-locking nut (item 2) fitted to either side of the bushes as illustrated.

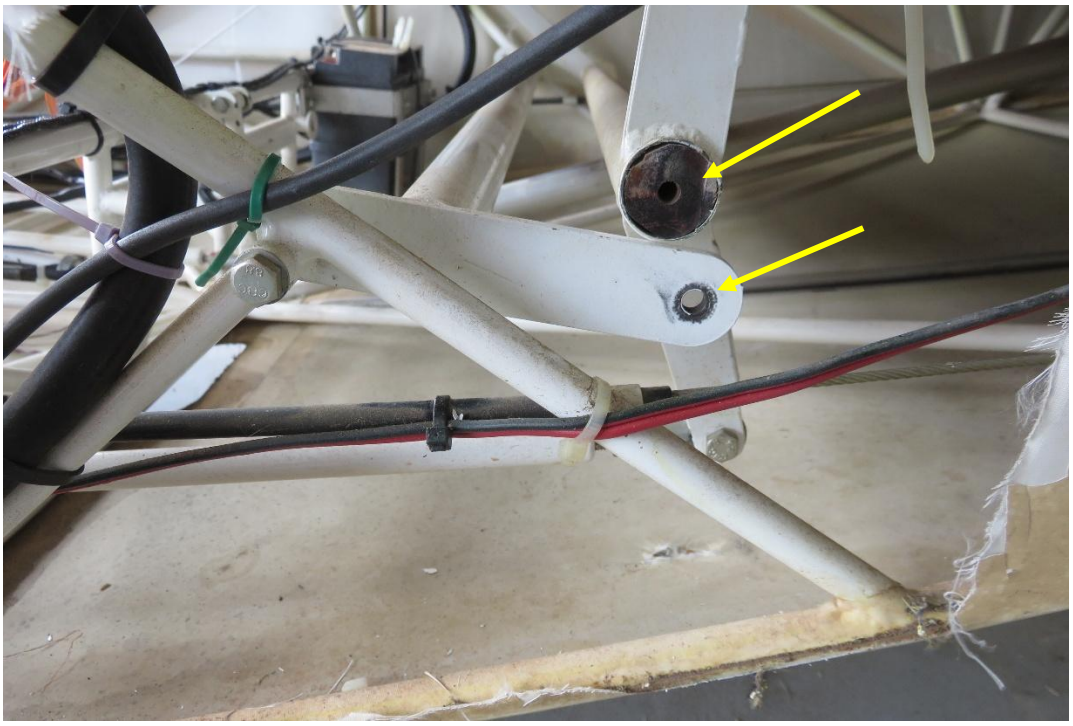

Figure 5: The fabric was cut to access the mixer assembly on the left side. The yellow arrows indicate the missing bolt.

Figure 6: The fabric was cut to access the mixer assembly on the right side. The bolt was still in position.

Figure 7: The bush that was installed in the aileron/flap mixer assembly was manufactured from wood, which was in contradiction to the aircraft's Fuselage Assembly Manual guidelines.

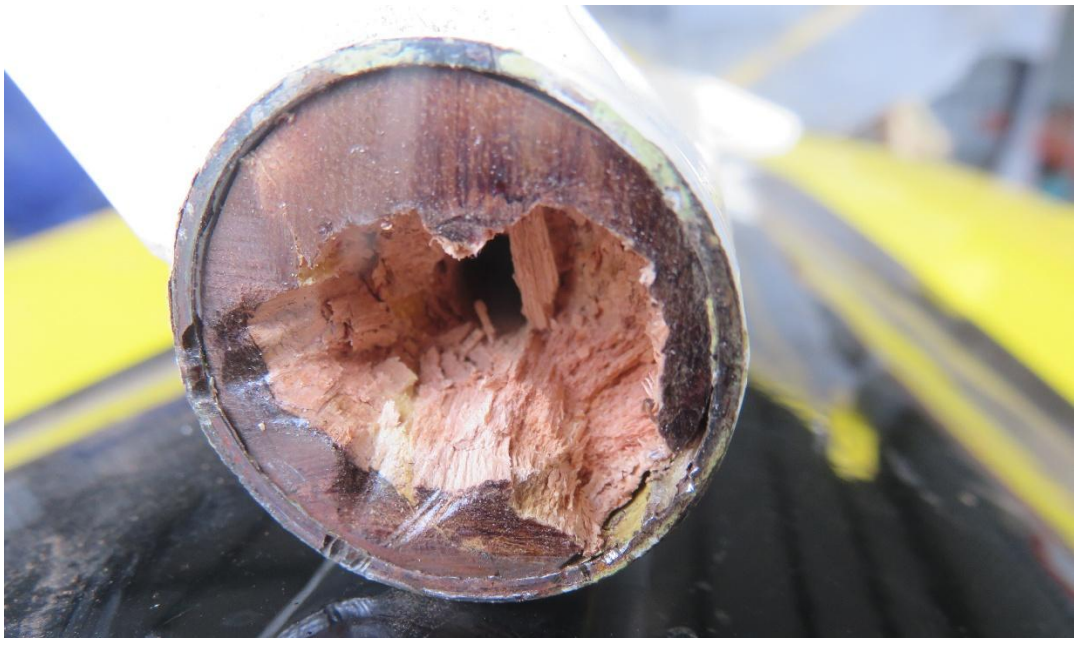

Figure 8: A piece of the structure was penetrated to confirm the bushes were made from wood.

Figure 9: The two bolts (M6 x 20) that were used on either side of the mixer.

The bolts (M6 x 20) were used on either side of the mixer as indicated in Diagram 2 (item 5). The bolt that became dislodged was found lying on the fabric on the belly of the aircraft. These bolts were of substandard length as the construction manual required M6 x 35 bolts to be fitted with a self-locking nut at each end.

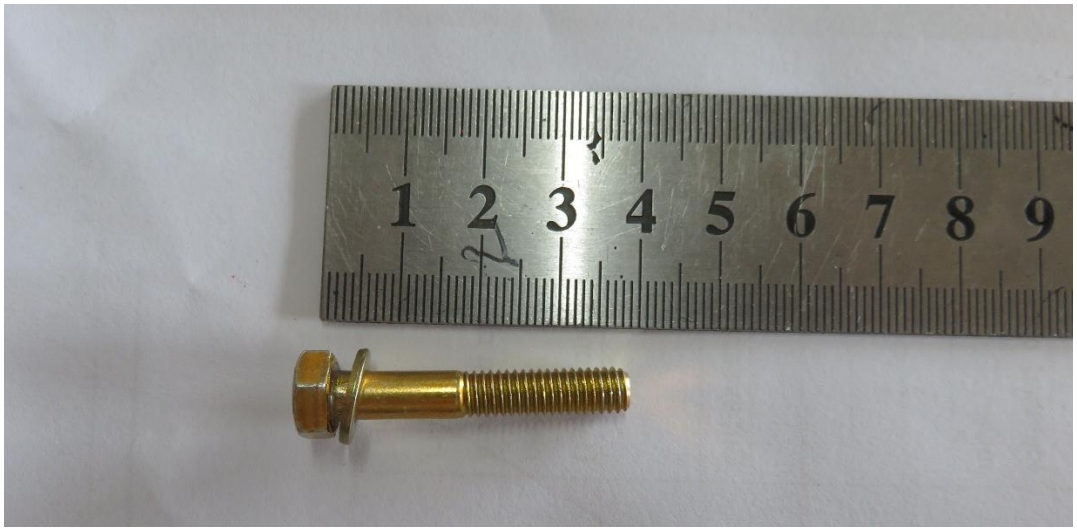

Figure 10: An example of the bolt (M6 x 35) that should have been used.

Figure 11: The nylon 'bearing' (Diagram 2, item 4) with the self-locking nut secured as part of it.

Findings

1. Personnel

1.1 The pilot had a National Pilot Licence (NPL) that was initially issued by the Regulator (SACAA) on 18 March 2022. The latest reissued NPL had an expiry date of 9 March 2025. The pilot had flown a total of 311.7 hours of which 286.6 hours were on the aircraft type.

1.2 The pilot had a Class 4 aviation medical certificate that was issued on 1 December 2023 with an expiry date of 31 December 2025 and with the stipulation to wear lenses for defective near vision.

1.3 The pilot elected to perform a forced landing on a maize field which was approximately 1.4 nautical miles (nm) from the Howick Aerodrome (FAHC) after encountering aileron control and wing flap input failure. The pilot was being cautious as he thought the aircraft might enter a low-altitude stall/spin should he continue with the right turn onto base leg and final approach.

2. Aircraft

2.1 The aircraft was purchased by a person in Kimberley in 2013 as a home-built kit from the aircraft manufacturer. This person did not complete the building process and, thus, requested

assistance from another person who resided in Bloemfontein to complete the project on his behalf. The aircraft was then sold to another person who removed the Rotax 528 engine that was installed and replaced it with a Rotax 912 ULS engine; this owner also converted the aircraft from a fixed tricycle landing gear (fitted with a nose wheel) to a tail dragger. This owner then requested the assistance of another person who resided in Durban to complete the project, but he never did. At this stage, the aircraft had not yet been flown. The current owner, who was also the pilot in this accident flight, bought the aircraft and collected it on 27 February 2021 from the person in Durban, and he completed the project. The aircraft was first flown on 8 May 2022 from Howick Aerodrome, and thereafter, several flights were conducted to complete the proving flight phase. The aircraft was issued with its first Authority-to-fly (ATF) Certificate on 10 October 2022 by the Regulator (SACAA).

2.2 The last maintenance inspection of the aircraft was certified on 13 August 2024 at 289.7 airframe hours. The aircraft had accrued 61.8 hours since the said inspection (351.5 total airframe hours).

2.3 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 23 June 2021.

2.4 The aircraft had a valid Authority-to-fly (ATF) Certificate that was initially issued by the Regulator (SACAA) on 10 October 2022. The latest ATF Certificate had an expiry date of 9 October 2025.

2.5 The aircraft had a Certificate of Release to Service that was issued on 13 August 2024 with an expiry date of 12 August 2025 or at 389.7 airframe hours, whichever comes first.

2.6 The building project of the aircraft started in 2013 and was completed in 2022. The aircraft changed ownership and builders five times before its first flight in 2022.

2.7 The owner/pilot at the time of the accident flight was unaware that the aileron/flap mixer assembly was fitted with wooden bushes as it was found during the post-accident investigation. This was a fundamental deviation from the fuselage assembly manual on the mixer assembly.

2.8 It could not be determined who had installed the wooden bushes as some of the people who have worked on the aircraft had passed away prior to this accident.

3. Meteorological Information

3.1 Based on the weather information provided by the pilot, fine weather conditions prevailed, and the wind was light and variable at the time of the flight. The weather had no bearing on this accident.

Probable Cause

The pilot performed a forced landing in a maize field after loss of aileron and wing flap control whilst on the right downwind for landing. The flight control failure was a result of the mechanical failure, a bolt that became dislodged during flight on the left side of the aileron/flap mixer assembly which rendered the pilot without aileron and wing flap control.

Contributing Factors

1. Due to a deviation in the built instructions, the “initial” builder made use of wooden bushes on either side of the mixer assembly to ensure the control rods that are attached to the unit are secured by a bolt on each side. This bolt, which was also of substandard length, disengaged during flight due to the movement associated with it when flight controls were manoeuvred. The bush was supposed to rotate within the sleeve, instead, the bolt rotated inside the wooden bush that remained stationary in the sleeve until it was worn out and could no longer secure the bolt and, thus, fell out in-flight.

2. The person(s) who assembled this part of the aircraft disregarded the Fuselage Assembly Manual instructions and the continuous airworthiness status of the aircraft, which jeopardised the safety of the aircraft and its occupants.

   NOTE: According to the aircraft manufacturer, the design (displayed in Diagram 2 and in Figure 11) had not changed since the first aircraft was manufactured. At the time of this accident, more than 700 of the aircraft types had been built.

3. On this type of aircraft, the area behind the seats where the mixer assembly is located is covered with fabric and, therefore, an area that a pilot would not inspect during his or her pre-flight inspection.

Safety Action(s)

None.

Safety Recommendation

The accident highlights the risks associated with multiple modifications and uncertain regulatory compliance in home-built aircraft. A structured regulatory approach, combined with enhanced inspection procedures and pilot awareness, could mitigate similar risks in the future.

It is recommended that the Director for Civil Aviation issue an urgent safety notice/directive to inform all owners and prospective owners of this aircraft type to not deviate from the Fuselage Assembly Manual when building the aircraft in their private capacity (from a kit) as it might result in loss of aileron and flap control in-flight.

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 apportion blame or liability.

Disclaimer

This report is issued by:

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