LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10523					
Classification	Accident	**Date**	24 October 2024	**Time**	1400Z	
Type of Operation	Private (Part 91)					
Location						
Place of Departure	Secunda Aerodrome (FASC), Mpumalanga Province	Place of Intended Landing	Secunda Aerodrome (FASC), Mpumalanga Province			
Place of Occurrence	Left of Runway 29 at Secunda Aerodrome (FASC)					
GPS Co-ordinates	Latitude	26°31'27.11" S	Longitude	029°09'59.72" E	Elevation	5 248 feet
Aircraft Information						
Registration	ZS-III					
Make; Model; S/N	Cessna Aircraft Company; 310Q (Serial Number: 310Q-0255)					
Damage to Aircraft	Substantial	Total Aircraft Hours	2 912.2			
Pilot-in-command						
Licence Type	Commercial Pilot Licence (CPL)	Gender	Male	Age	45	
Licence Valid	Yes	Total Hours	1 449.0	Total Hours on Type	45.0	
Total Hours Past 30 Days	34.4	Total Hours on Type Past 90 Days	8.8			
People On-board	1 + 3	**Injuries**	0	**Fatalities**	0	**Other (on ground)** 0

What Happened

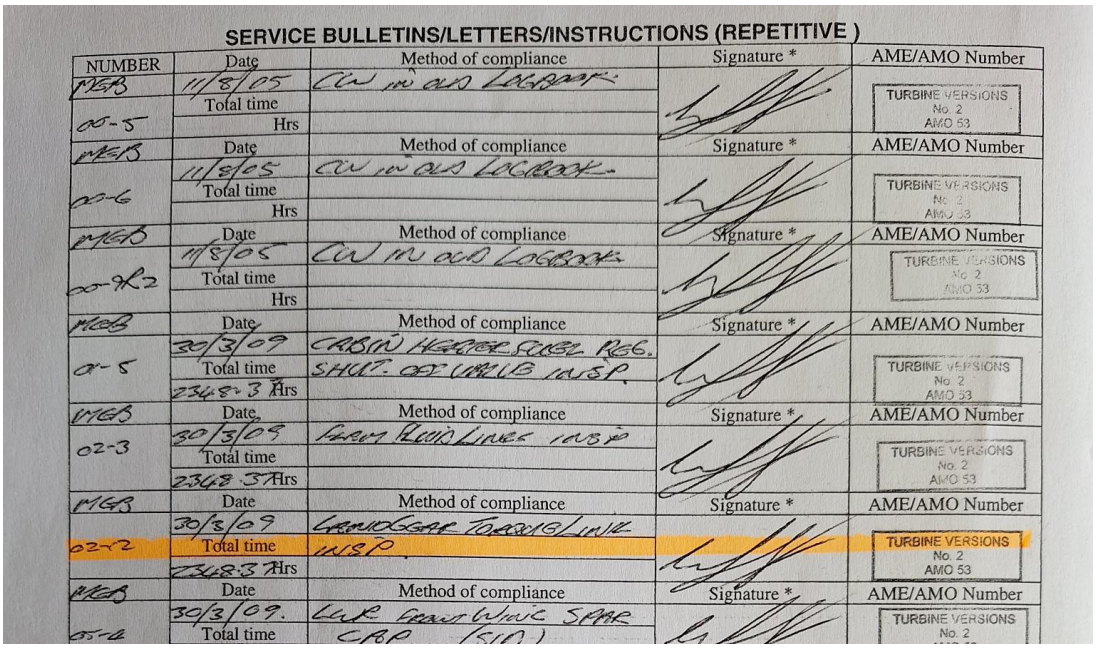
On Thursday afternoon, 24 October 2024, a pilot and three passengers on-board a Cessna 310 with registration ZS-III took off on a private flight from Secunda Aerodrome (FASC) with the intention to land back at the same aerodrome. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that they were airborne for approximately 30 minutes. Upon their return to FASC, they opted to perform a touch-and-go landing on Runway 29. He stated that after the touch-and-go landing, he could not retract the landing gear but confirmed the three green gear position lights. *(The three green lights are a cockpit indication to the pilot that the landing gear is down and locked, see Figure 7.)* The pilot then decided to perform a full-stop landing. After touch down, he felt the aircraft jerk heavily to the left, followed by noise associated with something breaking. The pilot then shut down both engines; he was able to maintain runway heading with the right rudder and the right brake. However, as the aircraft slowed down, it veered to the left and came to a halt. The left main gear collapsed and, as a result, the left wing rested on the grass next to the runway. After examination, it was noted that the left main landing gear torque link centre hinge had separated, and the landing gear assembly had rotated 180°. The nose and right main landing gears had remained extended.

The aircraft sustained substantial damage; however, no person was injured during the accident sequence.

Further inspection of the left main landing gear torque link (Part No. 5041114) by the aircraft maintenance organisation (AMO) personnel at Secunda who had assisted in the recovery of the aircraft as it was obstructing the runway, revealed that the centre hinge point attachment bolt, spacer, washers, nut and split pin were still secured to the upper torque link (see Figure 3). The lower torque link had dislodged at the attachment point (as it pulled through) which caused the wheel assembly to rotate 180°.

On 4 November 2002, the Cessna manufacturer had issued the Service Bulletin (SB) MEB02-12 which required the inspection of the main landing gear torque link assembly. The SB prescribed that the washers with the correct thickness be installed in the correct position at the centre hinge point attachment. Non-compliance with this SB could cause the retaining bolt and bushing to pull through the torque link assembly. This condition could result in the torque link failing to properly align the main landing gear wheel. The SB prescribed that if the outside diameter of the installed washers was 0.5625 inches, they were to be replaced with S1450-5H12-063 washers. The outside diameter of the specific replacement washer is 0.750 inches. This SB was complied with, and the job was signed off on 30 March 2009 and was recorded on page 77 of the aircraft airframe logbook.



SERVICE BULLETINS/LETTERS/INSTRUCTIONS (REPETITIVE)

NUMBER	Date / Total time / Hrs	Method of compliance	Signature *	AME/AMO Number
MEB 05-5	11/8/05	CW in our Logbook.		TURBINE VERSIONS No. 2 AMO 53
MEB 05-6	11/8/05	CW in our Logbook.		TURBINE VERSIONS No. 2 AMO 53
MEB 05-R2	11/8/05	CW in our Logbook.		TURBINE VERSIONS No. 2 AMO 53
MEB 02-5	30/3/09 2348.3 Hrs	CABIN HEATER SUPPL. RG6. SHUT. OFF VALVE INSP.		TURBINE VERSIONS No. 2 AMO 53
MEB 02-3	30/3/09 2348.3 Hrs	FUEL FLOW LINES INSP		TURBINE VERSIONS No. 2 AMO 53
MEB 02-2	30/3/09 2348.3 Hrs	LANDING GEAR TORQUE LINK INSP.		TURBINE VERSIONS No. 2 AMO 53
MEB 05-6	30/3/09.	LWR. GEAR WING SPAR		TURBINE VERSIONS No. 2

Figure 1: The Service Bulletin MEB 02-12 entry on page 77 of the logbook.

The accident occurred on 24 October 2024 and was reported to the Accident and Incident Investigations Division (AIID) on 7 November 2024, two weeks after the accident. Part 12.02.1 of the CAR 2011 as amended states: *"(1) The PIC of an aircraft involved in an accident within the Republic, or if he or she is killed or incapacitated, a flight crew member, or if there are no surviving flight crew members or if they are incapacitated, the operator or owner, as the case may be, shall, as soon as*

possible but at least within 24 hours since the time of the accident, notify— (a) the Director; (b) an ATSU; or (c) the nearest police station, of such accident. (Editorial Note: Wording as per original Government Gazette.) (2) If an ATSU or police station is notified of an accident in terms of subregulation (1), such ATSU or police station shall, immediately on receipt of the notification, notify— (a) the Director; and (b) where such accident occurs on an aerodrome, the aerodrome manager."

The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 26°31'27.11" South 029°09'59.72" East, at an elevation of 5 248 feet (ft).

Figure 2: The aircraft as it came to rest on the side of the runway. (Source: Pilot)

Figure 3: The left wing rested on the grass post-accident. (Source: Pilot)

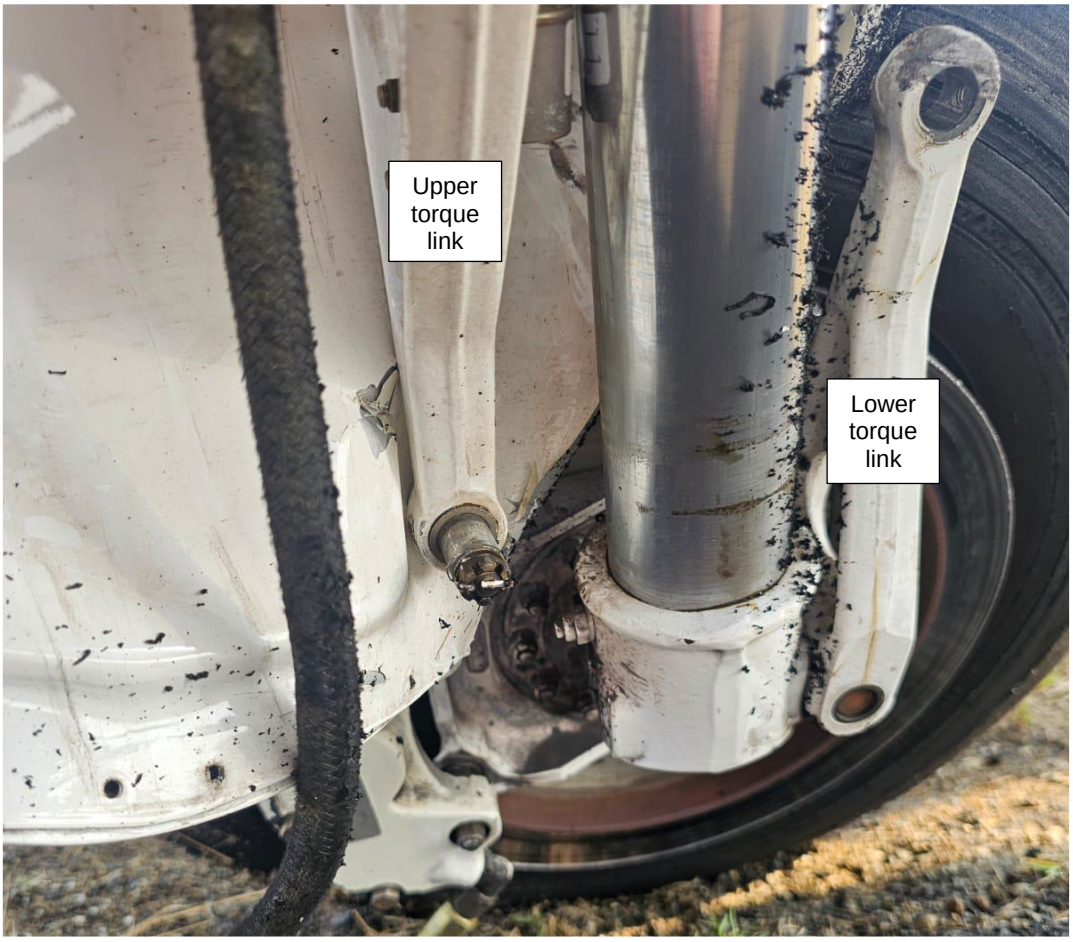


Figure 4: The upper and lower torque links dislodged from each other. (Source: AMO)

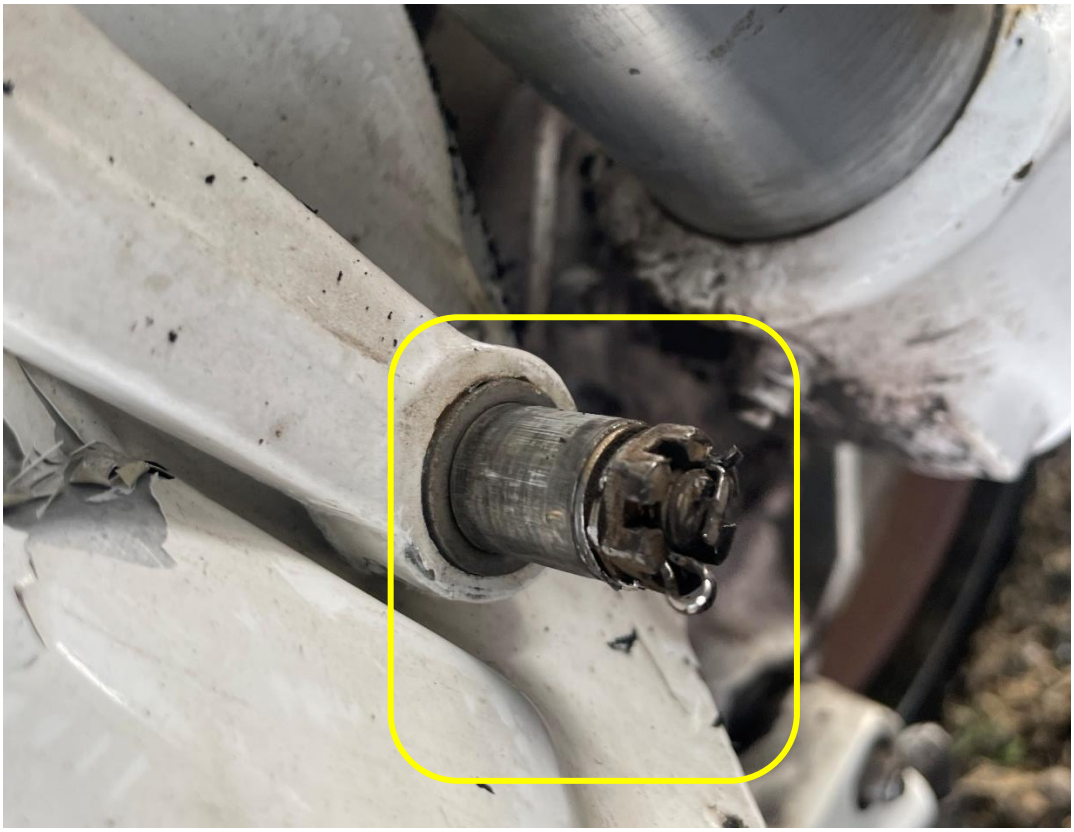


Figure 5: The torque links connecting bolt with the two washers and nut still secured. (Source: AMO)

This picture was obtained from the AMO at Secunda Aerodrome. From the picture, it could be seen that the bolt, the spacer, the two washers, the nut, and the split pin are still in place.

Figure 6: The broken lug on the bell crank assembly. (Source: AMO)

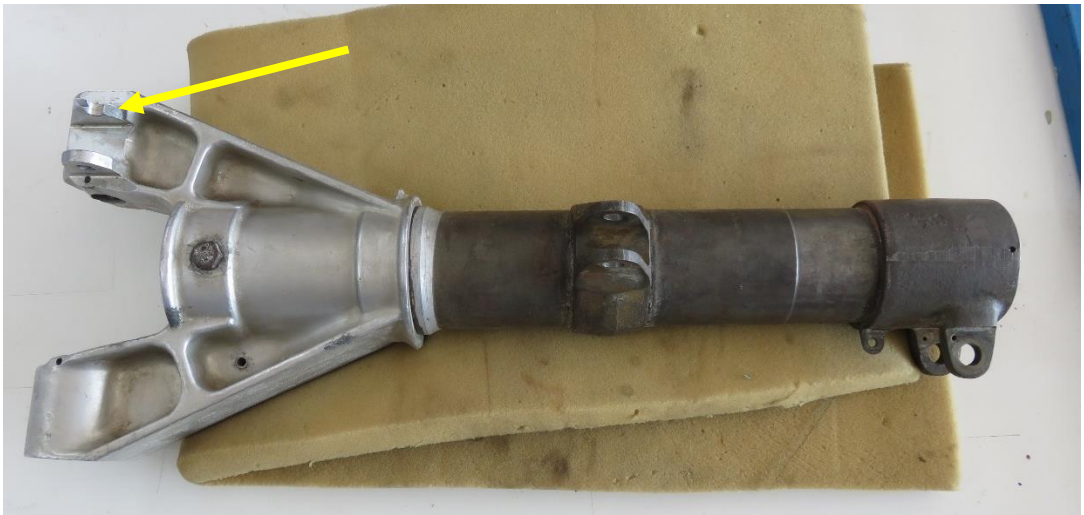


Figure 7: The yellow arrow indicates the left main gear trunnion with the broken lug.

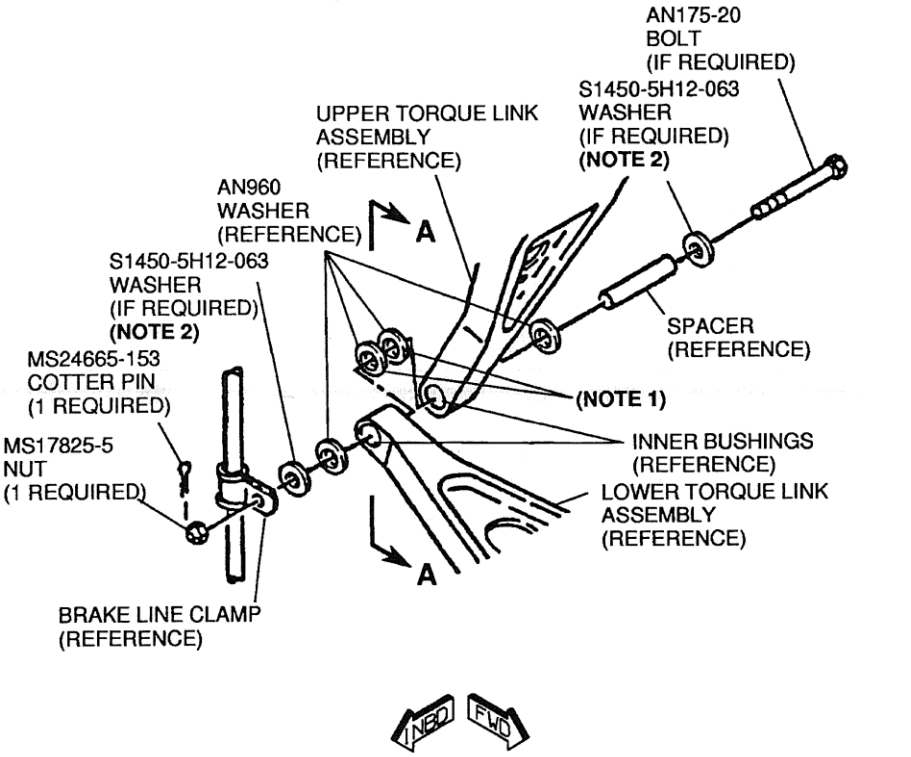
Figure 8: Some structural damage to the left wing. (Source: AMO)

Figure 9: The left main wheel assembly rotated 180°. (Source: AMO)

The Aircraft Landing Gear System (Source: Pilot's Operating Handbook, Section 7, Systems)

"The landing gear system is electrically operated and fully retractable which incorporates a steerable nosewheel. To help prevent accidental retraction, an automatic safety switch on the LEFT shock strut prevents retraction if the weight of the airplane is sufficient to compress the strut. The landing gear is operated by a switch, which is identified by a wheel-shape knob. The switch position is: UP, OFF and DOWN. To operate the gears, pull out on the switch knob and move to desired position. The landing gear position lights are provided, one above and three below the landing gear switch. The upper light is amber and will always illuminates when the landing gear is fully retracted. The three lower lights are green and will illuminate when each gear is fully extended and locked. When the gear up light and gear down lights are not illuminated, the landing gear is in an intermediate position. The lights are push-to-test type with rotatable dimming shutters.

Landing gear warning horn is controlled by the throttles and will sound an intermittent note if either throttle is retracted below approximately 12 inches Hg. Manifold pressure with the gear up. The warning horn is also connected to the UP position of the landing gear switch and will sound if the switch is placed in the UP position while the airplane is on the ground. The landing gear system is equipped with an emergency retraction extension system. A hand crank (pump lever) for manually lowering the landing gear is located just below the right front edge of the pilot's seat."



NOTE 1: RECORD NUMBER OF WASHERS AT EACH LOCATION BEFORE DISASSEMBLY AND REINSTALL SAME NUMBER OF WASHERS UPON REASSEMBLY.

NOTE 2: REPLACE ANY WASHERS AT THESE LOCATIONS THAT HAVE AN OUTSIDE DIAMETER OF LESS THAN 0.75 INCH WITH S1450-5H12-063 WASHERS.

Diagram 1: Schematic of the main landing gear torque link assembly.

Figure 10: The landing gear lever and indication lights in the cockpit.

Findings

1. <u>Personnel Information</u>

1.1 The pilot had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 21 May 2015. The latest CPL had an expiry date of 31 May 2025. The pilot had flown a total of 1 449.0 hours, with 45.0 hours flown on the aircraft type.

1.2 The pilot was issued a Class 1 aviation medical certificate on 25 September 2024 with an expiry date of 30 September 2025.

1.3 The pilot did not report this accident to the AIID within the 24-hour window period as prescribed in Part 12.02.1 of the Civil Aviation Regulations (CAR) 2011. This was a contravention of the Regulation. As a result, evidence was lost due to the lapsed time to gather information that would have been essential to this investigation.

2. <u>Aircraft Information</u>

2.1 The last maintenance inspection of the aircraft was certified on 15 April 2024 at 2 874.8 airframe hours. The aircraft had accrued 34.4 hours since the said inspection.

2.2 The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued on 9 November 2022. The latest C of A had an expiry date of 2 May 2025.

2.3 The aircraft's Certificate of Registration (C of R) was issued to the present owner on 6 December 2022.

2.4 The aircraft was issued a Certificate of Release to Service (CRS) on 15 April 2024 with an expiry date of 14 April 2025 or at 2 974.8 airframe hours, whichever occurs first.

2.5 The outer lower surface of the left wing sustained sheet metal damage; also, the inner area of the wheel well required structural repairs.

2.6 The Cessna 300 and 400 series aircraft have the same main landing gear design; hence, the Federal Aviation Administration (FAA) had issued Special Airworthiness Information Bulletin (SAIB) CE-14-19 on 30 May 2014 with special emphasis to inspect the main landing gear torque link assembly to ensure that the correct thickness washers are installed in the correct position.

2.7 The aircraft was involved in a similar accident on 2 April 2023 at Rand Aerodrome (FAGM) when the left main landing gear assembly collapsed; the AIID reference No. CA18/2/3/10278 was issued for this accident. The aircraft had flown 34.4 hours since it was repaired.

3. Meteorological Information

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

4. Secunda Aerodrome (FASC)

4.1 FASC is an unmanned licensed aerodrome. It has a single asphalt surface runway that is orientated 11/29. The runway is 1 100m long and 18m wide.

5. Reporting an Accident

5.1 The accident occurred on 24 October 2024 and was reported to the AIID on 7 November 2024, two weeks after it had occurred. This was in contravention of Part 12.02.1 of the CAR 2011 as amended.

5.2 Due to the late reporting of this accident, critical evidence was lost which hampered this investigation.

Probable Cause

The left main landing gear collapsed when the upper and lower torque links disconnected from each other due to excessive wear on the two retaining washers; the lower strut including the wheel assembly rotated 180°. This resulted in substantial drag on the trunnion support which failed due to overload, as well as the gear collapse.

Contributing Factors

The possibility that the nut, spacer, washers, bolt and split pin were not replaced during the repair of the aircraft after the left main gear collapse on 2 April 2023.

Safety Action(s)

None.

Safety Recommendation and Safety Message

1. It is recommended that the Director of Civil Aviation issue an Advisory Notice which calls for the re-inspection of all Cessna 300 and 400 series aircraft in accordance with the Cessna Service Bulletin MEB02-12 that was issued on 4 November 2002. This should be a re-occurring inspection to prevent similar failures.

2. Pilots flying the Cessna 300 and 400 series aircraft should be cognitive of this possible failure and should conduct a proper pre-flight inspection on these bolts and associated hardware to prevent similar failures.

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

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa