

PRELIMINARY SERIOUS INCIDENT REPORT

Accident and Incident Investigations Division

Serious Incident
- Preliminary Report -
AIID Ref No: CA18/3/2/1408



Figure 1: Beechcraft 1900D ZS-PKB aircraft. (Source: www.moneyweb.co.za)

Description:

On Friday morning, 10 March 2023, two (2) pilots and nineteen (19) passengers on-board a Beechcraft 1900D aircraft with registration ZS-PKB were taxiing from taxiway India at O.R. Tambo International Airport (FAOR) in Gauteng province when the incident occurred. The aircraft was on a scheduled commercial flight to Margate Airport (FAMG) in KwaZulu-Natal province. An instrument flight rules (IFR) plan was filed for this flight. Visual meteorological conditions (VMC) prevailed at the time of the flight.

The aircraft was pushed back from parking bay Charlie 19 (C19) to taxiway India, thereafter, the towbar was disconnected from the aircraft and reconnected to the tug which was parked in front of the aircraft. The aircraft taxied into the stationary tug and, as a result, the aircraft's right leading-edge tip was substantially damaged. The aircraft was taxied back to parking bay C19. The occupants on-board the aircraft were not injured during this serious incident. The passengers were sent back to the terminals and the aircraft was grounded.

Occurrence Details

Reference Number : CA18/3/2/1408
Occurrence Category : Category 1
Type of Operation : Commercial (Part 135)
Name of Operator : Cemair
Aircraft Registration : ZS-PKB
Aircraft Make and Model : Beechcraft 1900D
Nationality : South African
Place : During taxi on taxiway India at FAOR
Date and Time : 10 March 2023 at 0855Z
Injuries : None
Damage : Substantial

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.

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.

Investigation Process

The Accident and Incident Investigations Division (AIID) of the South African Civil Aviation Authority (SACAA) was notified of the occurrence involving a Beechcraft 1900D aircraft which occurred on Charlie 19 (C19) taxiway India on 10 March 2022 at 0855Z at O.R. Tambo International Airport (FAOR) in Gauteng province. The occurrence was classified as a serious incident according to the CAR 2011 Part 12 and ICAO Annex 13 definitions.

The AIID has appointed an investigator-in-charge to conduct a full investigation. The investigator dispatched to FAOR. Notifications were sent to the State of Registry, Operator, Design and Manufacturer in accordance with the CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. The states appointed an accredited representative and advisor. The AIID will lead the investigation and issue the final report of this serious incident in accordance with CAR 2011 Part 12 and ICAO Annex 13.

The information contained in this preliminary report is derived from the information gathered during the on-going investigation into the occurrence. Later, an interim statement or the final report may contain altered information in case new evidence is uncovered during the on-going investigation that requires changes to the information depicted in this report.

The AIID reports are made available to the public at:

<http://www.caa.co.za/Pages/Accidents%20and%20Incidents/Aircraft-accident-reports.aspx>

Notes:

1. *Whenever the following words are mentioned in this report, they shall mean the following:*
Serious Incident — this investigated serious incident
Aircraft — the Beechcraft 1900D involved in this serious incident
Investigation — the investigation into the circumstances of this serious incident
Pilot — the pilot involved in this serious incident
Report — this serious incident report

2. *Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows, or lines.*

Disclaimer

This report is produced without prejudice to the rights of the AIID, which are reserved.

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Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AIID	Accident and Incident Investigations Division
AMM	Aircraft Maintenance Manual
AMO	Aircraft Maintenance Organisation
ATC	Air Traffic Control
ATPL	Airline Transport Pilot Licence
CAR	Civil Aviation Regulation
C of A	Certificate of Airworthiness
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
CRM	Crew Resource Management
FAMG	Margate Aerodrome
FAOR	O.R. Tambo International Airport
FDR	Flight Data Recorder
FO	First Officer
ft	Feet
GPS	Global Positioning System
I.A.W.	In Accordance With
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
kt	Knots
METAR	Meteorological Aeronautical Report
MHz	Megahertz
PF	Pilot Flying
PM	Pilot Monitoring
PN	Part Number
QNH	Query Nautical Height
RWY	Runway
S	South
SACAR	South African Civil Aviation Regulations
SAWS	South African Weather Service
S/N	Serial Number
UTC	Co-ordinated Universal Time
Z	Zulu (Term for Universal Co-ordinated Time - Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1. History of Flight

- 1.1.1. On Friday morning, 10 March 2023, a Beechcraft 1900D aircraft with registration ZS-PKB was taxiing from taxiway India at O.R. Tambo International Airport (FAOR) in Gauteng province when the incident occurred. The aircraft was on a commercial scheduled flight to Margate Airport (FAMG) in KwaZulu-Natal province. Two (2) pilots and nineteen (19) passengers were on-board. An instrument flight rules (IFR) was filed for this flight. Visual meteorological conditions (VMC) prevailed at the time of the flight which was conducted under the provisions of Part 135 of the Civil Aviation Regulations (CAR) 2011 as amended.
- 1.1.2. In a recorded statement, the pilot flying (PF) stated that they were parked at C19 at FAOR at 0855Z when they received pushback and start clearance from Air Traffic Control (ATC) ground on frequency 121.9-Megahertz (MHz). The PF stated that during pushback, the engine number 2 was started, followed by engine number 1; and once on taxiway India, the ramp agent signalled to the crew to engage parking brakes before the tug driver disconnected the tow bar. The crew carried out the after-start checklist whilst the tug drove away. The PF stated that he then received taxi clearance from ATC. Thereafter, he checked and confirmed that the left side of the aircraft had no obstructions whilst the pilot monitoring (PM) confirmed the right side. The PF then released the brakes to begin taxi, but shortly thereafter, the right-wing tip and the underside of the right wing hit the tug. The aircraft was taxied back to parking bay C19 and the engines were shut down.
- 1.1.3. The PF further stated that the aircraft was scheduled to depart at 0820Z, but there was a problem with the bowser during refuelling, which led to the aircraft being delayed for 35 minutes. The PF also mentioned that he was new to the company and that it was his second time being pushed back in his career — the first time being earlier on the day of the incident. He mentioned that he was not aware of the procedures involved in pushbacks, and was not familiar with the FAOR layout.”
- 1.1.4. A video footage from FAOR that was shared with the investigator shows *“the aircraft parked at C19 at approximately 0855Z. The tug is then seen pushing the aircraft back (in a walking pace) to taxiway India whilst the ramp agent walks along side on the left of the tug. Upon reaching the taxiway, the crew then positions the aircraft to face south. Thereafter, the ramp agent disconnects the towbar from the tug, and the tug driver drives to the right side of the aircraft and parks the tug facing the C19 parking bay in front of the right wing of the aircraft and inside the demarcation marked C19. The tug driver then jumps out of the tug and assists the ramp agent to disconnect the tow bar from the aircraft. The tug driver then reconnects the tow bar to the tug. Thereafter, the ramp agent walks away facing the C19 parking bay. When he is a few metres away, he turns around to face the aircraft, raises his left hand, and continues to walk towards the C19 parking bay. The tug driver then jumps into the tug and closes the door. At that moment, the aircraft starts to move and it impacts the stationary tug with the right wing before it comes to a stop facing slightly south-west.*
- 1.1.5. The aircraft was taxied back to parking bay C19. The occupants were not injured during this serious incident. The passengers were sent back to the terminals and the aircraft was grounded.
- 1.1.6. The aircraft sustained damage to the right-wing tip and the underside of the right wing.

1.1.7. The serious incident occurred during daytime at Global Positioning System (GPS) co-ordinates determined to be 26° 08.16' South (S) 028°13.47'East (E), at an elevation of 5557.743 feet (ft) above ground level (AGL).



Figure 1: The star indicates the position of the aircraft at C19. (Source: Google Earth)

1.2. **Injuries to Persons**

Injuries	Pilot	Crew	Pass.	Total On-board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	2	-	19	21	-
Total	2	-	19	21	-

Note: Other means people on the ground.

1.3. **Damage to Aircraft**

1.3.1. The aircraft was substantially damaged.



Figure 2: The damaged wing tip.



Figure 3: Damage on the underside of the right-wing tip.

1.4. Other Damage

- 1.4.1. The upper right back side of the tug was abraded, and the rubber lining on the window was partly detached.

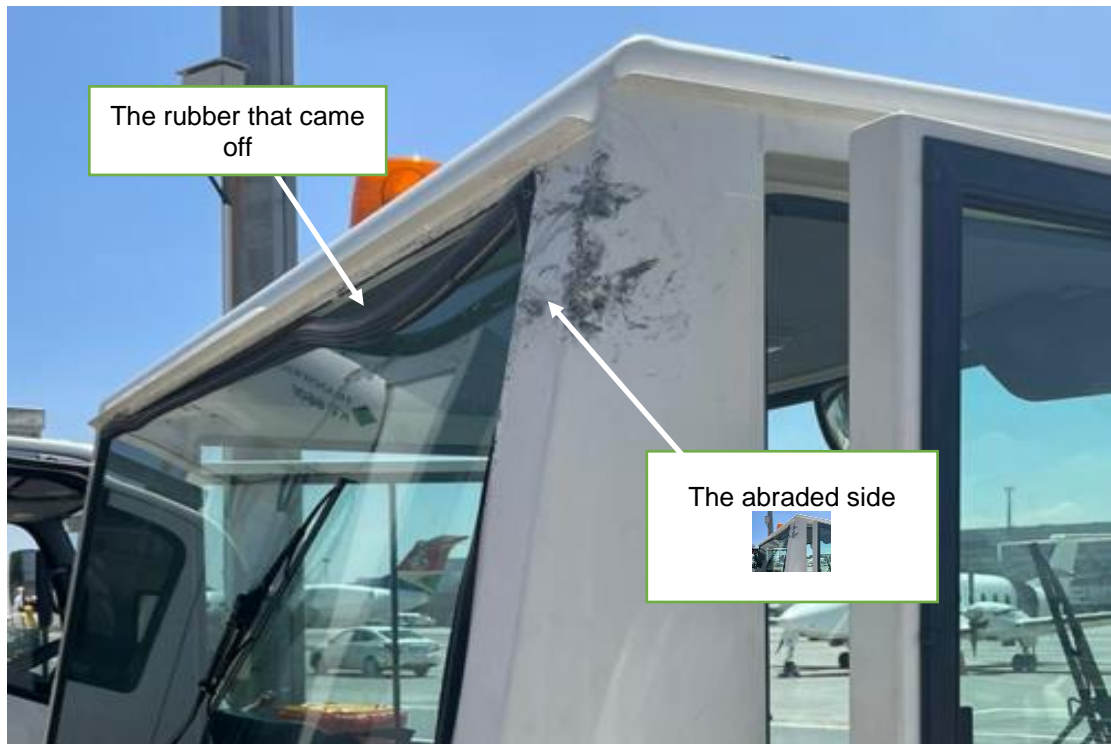


Figure 4: The abraded side of the tug.

1.5. Personnel Information

Pilot-in-command (PIC) who was the pilot flying (PF)

Nationality	South African	Gender	Male	Age	27
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument, Grade II Flight Instructor,				
Medical Expiry Date	30 November 2023				
Restrictions	None				
Previous Incidents	None				

Note: Previous incidents refer to past incidents the pilot was involved in, when relevant to this incident.

Flying Experience:

Total Hours	1680.1
Total Past 24 Hours	0
Total Past 7 Days	18.2
Total Past 90 Days	43.0
Total on Type Past 90 Days	43.0
Total on Type	43.0

- 1.5.1. The PF was initially issued an Airline Transport Pilot Licence (ATPL) on 8 September 2022 with an expiry date of 30 September 2023. The PF was issued a Class 1 medical certificate on 23 November 2022 with an expiry date of 30 November 2023.

- 1.5.2. According to available information, the PF joined the company on 6 February 2023. He conducted a simulator training exercise for B1900 Command upgrade from 18 to 20 February 2023 with a total of approximately 16 flying hours. From 2 to 6 March 2023, the PF conducted his line flying on B1900 under supervision with a total of 22.19 flying hours.
- 1.5.3. The PF took his first command on B1900 on 10 March 2023. The incident flight was his second flight of the day.
- 1.5.4. The PF completed his Crew Resource Management (CRM) on 7 February 2023 with an expiry date of 29 February 2024.

First Officer (FO) who was the pilot monitoring (PM)

Nationality	South African	Gender	Male	Age	36
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument and Instructor Grade II				
Medical Expiry Date	30 June 2023				
Restrictions	None				
Previous Incidents	None				

Note: Previous incidents refer to past incidents the pilot was involved in, when relevant to this incident.

Flying Experience:

Total Hours	1954.5
Total Past 24 Hours	0
Total Past 7 Days	0
Total Past 90 Days	200
Total on Type Past 90 Days	200
Total on Type	310

- 1.5.5. The PM was initially issued an Airline Transport Pilot Licence (ATPL) on 28 September 2022. His last licence revalidation was on 29 July 2022 with an expiry date of 31 August 2023. His last proficiency check was on 5 December 2021.
- 1.5.6. The PM was issued a Class 1 aviation medical certificate on 10 September 2021 with an expiry date of 30 September 2022 with no medical waivers.
- 1.5.7. The PM completed his CRM on 28 January 2023 with an expiry date of 31 January 2024.

Tug Driver

- 1.5.8. The tug driver was issued an Airside Vehicle Operator Permit on 23 November 2022 with an expiry date of 22 November 2024.
- 1.5.9. The tug driver completed an Airside Induction Training on 22 November 2022 with an expiry date of 21 November 2024.

1.5.10. The tug driver was issued a Certificate of Radiotelephony and Airside Competency on 27 February 2023 with an expiry date of 27 February 2025.

The Ramp Agent

1.5.11. The ramp agent was issued an Airside Vehicle Operator Permit on 23 August 2022 with an expiry date of 23 August 2024.

1.5.12. The ramp agent completed an Airside Induction Training on 23 August 2022 with an expiry date of 22 August 2024.

1.6. **Aircraft Information** (Source: Beechcraft 1900 Owner’s Manual)

1.6.1. *The Beechcraft 1900 is a 19-passenger, pressurised twin-engine turboprop fixed-wing aircraft manufactured by the Beechcraft Division of the Raytheon Company (now Textron Aviation). It was designed and primarily used as a regional airliner. It is also used as a freight aircraft and corporate transport by the United States military and other governments. The aircraft is powered by two PT6A-67D, free turbine and reverse flow turboprop engines. The super freighter has a maximum take-off weight of 17 120 lbs and a wingspan (wingtip to wingtip) of 17.6 metres (m) or 57.7ft.*

Airframe:

Manufacturer/Model	Beechcraft/1900D	
Serial Number	UE-003	
Year of Manufacture	1991	
Total Airframe Hours (At Time of Serious incident)	37755.46	
Last Inspection (Date & Hours)	19 February 2023	37711.41
Hours Since Last Phase Inspection	44.05	
CRS Issue Date	19 February	
C of A (Issue Date & Expiry Date)	15 December 2004	29 August 2023
C of R (Issue Date) (Present Owner)	26 April 2013	
Type of Fuel Used	Jet A1	
Operating Category	Commercial (Part 135))	
Previous Incidents	None	

Note: Previous incidents refer to past incidents the pilot was involved in, when relevant to this incident.

1.6.2. According to available information, the aircraft was first registered to the present owner on 26 April 2013. The aircraft’s Certificate of Release to Service (CRS) was issued on 19 February 2023 with an expiry date of 19 February 2025 or at 37 911.41 airframe hours, whichever occurs first.

1.6.3. Based on the aircraft maintenance records, the last phase inspection (fourth) was carried out on 19 February 2023 at 37 711.41 airframe hours. The aircraft had accumulated an additional 44.05 airframe hours since the last inspection.

Engine: 1

Manufacturer/Model	Pratt & Whitney/Pt6-67D
Serial Number	PCE-PS0672
Part Number	3044800
Hours Since New	2202,8
Hours Since Overhaul	Not Reached

Engine: 2

Manufacturer/Model	Pratt & Whitney/Pt6-67D
Serial Number	PS114120
Part Number	3044800
Hours Since New	2203.55
Hours Since Overhaul	Not Reached

Propeller 1:

Manufacturer/Model	Hartzell
Serial Number	HJ-2282
Part Number	HC-E4A-31
Hours Since New	1767.69
Hours Since Overhaul	Not Reached

Propeller 2:

Manufacturer/Model	Hartzell
Serial Number	HJ-2457
Part Number	HC-E4A-31
Hours Since New	443.34
Hours Since Overhaul	Not Reached

1.7. Meteorological Information

1.7.1. The weather information in the table below was sourced from the Meteorological Aerodrome Report (METAR) that was issued for FAOR by the South African Weather Service (SAWS) on 10 March 2023 at 0900Z.

METAR FAOR 100900Z VRB05KT CAVOK 23/15 Q1022 NOSIG=

Wind Direction	VRB	Wind Speed	05kt	Visibility	9999m
Temperature	23°C	Cloud Cover	Nil	Cloud Base	Nil
Dew Point	15°C	QNH	1022hPa		

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA) for the aircraft type. There were no records indicating that the navigational equipment was unserviceable prior to the incident.

1.9. Communication

1.9.1. The aircraft was equipped with a standard communication system as approved by the Regulator. There were no recorded defects with the communication system prior to the incident. The crew was in communication with the FAOR ATC ground on frequency 121.9 Megahertz (MHz).

1.10. Aerodrome Information

Aerodrome Location	Kempton Park, Gauteng Province	
Aerodrome Status	Licensed	
Aerodrome GPS coordinates	26°08'.00" South, 028°14'.05" East	
Aerodrome Elevation	5 558ft	
Runway Headings	03L/21R	03R/21L
Dimensions of Runways	4 421m x 60m	3 405m x 60m
Runway Used	India taxiway	
Surface of Runway Used	Asphalt	
Approach Facilities	Runway lights, PAPI, DVOR / DME (JSV), ILS LOC and ILS GP for both runways	
Radio Frequency	121.9 MHz, 124.5 MHz, 128.30 MHz, 118.600 MHz	

1.10.1. Taxiway India has a yellow centreline which runs through to the safe zone, approximately 24 metres. The distance from the centreline to where the tug was parked (in front of the aircraft) was approximately 6.5 metres (inside the box marked C19).



Figure 5: C19 layout at FAOR.

1.11. Flight Recorders

1.11.1. The aircraft was fitted with a flight data recorder (FDR) and a cockpit voice recorder (CVR) as required by Part 135.05.10 of the CAR 2011 as amended. The FDR and the CVR circuit breakers (CBs) were removed on 10 March 2023 to preserve the information. Both the FDR and the CVR were sent to an approved aircraft maintenance organisation (AMO) for downloading. The findings of both recordings will be discussed in the final report.

FDR information:

- Manufacturer — Fairchild Aviation Recorders
- Type — Fairchild Model F1000
- Part Number — S703-1000-00
- Serial Number — 00255
- Date of manufacture — June 1991

CVR information:

- Manufacturer— Fairchild Aviation Recorders
- Type — Fairchild Model A100A
- Part Number — 93-A100-83
- Serial Number — 59130
- Date of manufacture — July 1991

1.12. Wreckage and Impact Information

1.12.1. During the second turnaround, the aircraft was parked at C19, and both engines were started whilst it was being pushed back to taxiway India. The aircraft faced a heading of 198°. After the tow bar was disconnected and the tug was still parked in front of the right wing, the aircraft was taxied (started to move) at a ground speed of 7 knots (kts) and collided with the right back corner of the stationary tug with its right-wing tip. It came to a full stop facing a heading of 225°. The aircraft's right wing and the tug were substantially damaged.

1.12.2. Following the serious incident, the operator grounded the aircraft for inspection and repairs.



Figure 6: The aircraft after the serious incident.

1.13. **Medical and Pathological Information**

1.13.1 None.

1.14. **Fire**

1.14.1. There was no evidence of a pre- or post-impact fire.

1.15. **Survival Aspects**

1.15.1 The serious incident was considered survivable as no damage was caused to the cockpit and the cabin structure.

1.16. **Tests and Research**

1.16.1. To be discussed in the final report.

1.17. **Organisational and Management Information**

1.17.1. The flight was conducted in accordance with the provisions of Part 135 (Commercial) of the CAR 2011 as amended.

1.17.2. The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued by the Regulator on 15 December 2004. The latest C of A had an expiry date of 29 August 2023.

1.17.3. The AMO that certified the last maintenance inspection (fourth phase inspection) prior to the serious incident flight had an AMO certificate that was issued by the Regulator (SACAA) on 2 March 2023 with an expiry date of 31 March 2024.

1.17.4. The operator was in possession of an approved Class 1 Air Service Licence for domestic schedule, which was issued on 6 October 2022 by the Department of Transport. The licence authorised the carrier to operate under the following categories: Type S1 – transport of passengers between two or more specified points, and Type S2 – transport of cargo or mail between two or more specified points.

1.17.5. The operator had an Air Operating Certificate (AOC) which was issued on 23 November 2022 by the SACAA with an expiry date of 30 November 2023. The aircraft was duly authorised to operate under the AOC.

1.18. **Additional Information**

1.18.1. To be discussed in the final report.

1.19. **Useful or Effective Investigation Techniques**

1.19.1. None.

2. **FINDINGS**

2.1. **General**

From the available evidence, the following preliminary findings were made with respect to this incident. These shall not be read as apportioning blame or liability to any organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusions heading:

- **Findings** — are statements of all significant conditions, events, or circumstances in this incident. The findings are significant steps in this incident sequence, but they are not always causal or indicate deficiencies.

2.2. **Findings**

2.2.1. The PF had an ATPL that was issued on 8 September 2022 with an expiry date of 30 September 2023. The aircraft type was endorsed on his licence. The PF had a Class 1 aviation medical certificate that was issued on 23 November 2022 with an expiry date of 30 November 2023 with no medical waivers.

2.2.2. The PF had completed the CRM course.

2.2.3. The PM had an ATPL that was issued on 29 July 2022 with an expiry date of 31 August 2023. The aircraft type was endorsed on his licence. The PM had a Class 1 aviation medical certificate that was issued on 29 June 2022 with an expiry date of 30 June 2023 with no medical waivers.

2.2.4. The PM had completed the CRM course.

- 2.2.5. The tug driver had completed the airside courses.
- 2.2.6. The ramp agent had completed the airside courses.
- 2.2.7. The flight was conducted in accordance with (I.A.W.)the provisions of Part 135 of the CAR 2011 as amended.
- 2.2.8. The aircraft was first registered to the current owner on 26 April 2013. The aircraft was issued the C of A on 15 December 2004. The latest C of A had an expiry date of 29 August 2023. The aircraft was re-issued a CRS on 19 February 2023 with an expiry date of 19 February 2025 or at 37 911.41 airframe hours, whichever occurs first.
- 2.2.9. The operator had an approved Class 1 Air Service Licence for domestic schedule that was issued on 12 August 2015 by the Department of Transport. The licence authorised the carrier to operate under the following categories: Type S1 – transport of passengers between two or more specified points, and Type S2 – transport of cargo or mail between two or more specified points. Aircraft used under Type S1 and Type S2 are required to meet Category A1 provisions, *“aircraft, excluding a helicopter, with a maximum certificated mass exceeding 20 000 kilograms”*.
- 2.2.10. The operator had an AOC that was issued by the Regulator on 23 November 2022 with an expiry date of 30 November 2023.
- 2.2.11. The AMO that certified the last phase inspection (4th) prior to the accident flight had an approved AMO certificate that was issued by the Regulator on 2 March 2023 with an expiry date of 31 March 2024.
- 2.2.12. The last phase inspection (A-Check) was carried out on 19 February 2023 at 37 711.41 airframe hours. The aircraft had accumulated an additional 44.05 airframe hours in operation since the last inspection.
- 2.2.13. The aircraft was pushed back from parking bay C19 to taxiway India, thereafter, the towbar was disconnected from the aircraft and reconnected to the tug. The aircraft taxied into a stationary tug that was in front it. The aircraft’s right leading-edge tip was substantially damaged. Following the serious incident, the aircraft was grounded for inspection and repairs.
- 2.2.14. Fine weather conditions prevailed at the time of the serious incident. The weather had no bearing to this serious incident.

3. ON-GOING INVESTIGATION

- 3.1. The AIID investigation is on-going, and the investigator will look into other aspects of this occurrence which may or may not have safety implications.

4. Appendices

- 4.1. Appendix A – FAOR Aerodrome Chart

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

Appendix A: FAOR Aerodrome Chart

