PRELIMINARY SERIOUS INCIDENT REPORT

Accident and Incident Investigations Division

Serious Incident
- Preliminary Report -
AIID Ref No: CA18/3/2/1447

Figure 1: The ZS-FGE aircraft. (Source: www.jetphotos.com)

Description:

On Sunday morning, 21 April 2024 at approximately 0948Z, a Boeing 737-800 aircraft with registration ZS-FGE was on a scheduled commercial flight from O.R. Tambo International Aerodrome (FAOR) in Gauteng province to Cape Town International Aerodrome (FACT) in the Western Cape province when the left outer (No.1) mainwheel separated from its axle during rotation. The crew opted to fly to the holding pattern to burn fuel. After being airborne for 2 hours and 17 minutes, the crew was cleared to land on Runway 21R at FAOR. The landing was uneventful; however, approximately 30 metres (m) before the aircraft was brought to a stop on the runway, the left inner (No. 2) mainwheel tyre burst. No person was injured during the serious incident.

Occurrence Details

Reference Number	**:** CA18/3/2/1447
Occurrence Category	**:** Serious Incident (Category 1)
Type of Operation	**:** Air Transport Operations - Passengers (Part 121)
Name of Operator	**:** FlySafair
Aircraft Registration	**:** ZS-FGE
Aircraft Make and Model	**:** Boeing 737-800
Nationality	**:** South African
Place	**:** O.R. Tambo International Aerodrome, Gauteng Province
Date and Time	**:** 21 April 2024 at 1205Z
Injuries	**:** None
Damage	**:** Minor

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 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 Boeing 737-800 which occurred at O.R. Tambo International Aerodrome, Gauteng province, on 21 April 2024 at 1205Z. The occurrence was classified as a serious incident according to the CAR 2011 Part 12 and the International Civil Aviation Organisation (ICAO) STD Annex 13 definitions.

The AIID has appointed an investigating team to conduct a full investigation. The investigators dispatched to the serious incident site. Notifications were sent to the State of Design and Manufacturer in accordance with the CAR 2011 Part 12 and ICAO Annex 13 Chapter 4. The State of Design and Manufacturer had appointed an accredited representative and advisor. The AIID will lead the investigation and issue the final report on this serious incident in accordance with the CAR 2011 Part 12 and the 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 or final report may contain altered information in case new evidence is found 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:*
   Incident — this investigated serious incident
   Aircraft — the Boeing 737-800 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 various 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

Table of Contents

Abbreviation	Description
°	Degrees
°C	Degrees Celsius
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
AOC	Air Operating Certificate
ARFF	Aerodrome Rescue and Firefighting
ATC	Air Traffic Control
ATPL	Airline Transport Pilot's Licence
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CAR	Civil Aviation Regulations
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FACT	Cape Town International Aerodrome (ICAO designation)
FAOR	O.R. Tambo International Aerodrome (ICAO designation)
FDR	Flight Data Recorder
FO	First Officer
ft	Feet
GPS	Global Positioning System
hPa	Hectopascal (equivalent unit to mb)
kg	kilogram(s)
kt	knot(s)
m	metre(s)
METAR	Meteorological Aerodrome Report
MTOW	Maximum Take-off Weight
NTSB	National Transportation Safety Board
PF	Pilot Flying
PIC	Pilot-in-command
psi	Pounds per Square Inch
QAR	Quick Access Recorder
QNH	Barometric Pressure Adjusted to Sea Level
QRH	Quick Reference Handbook
SACAA	South African Civil Aviation Authority
SAWS	South African Weather Service
TBO	Time Between Overhaul
UTC	Co-ordinated Universal Time (GMT)
WoW	Weight on or off Wheels
Z	Zulu (Term for Co-ordinated Universal Time – Zero Hours Greenwich)

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On Sunday morning, 21 April 2024, a Boeing 737-800 with registration ZS-FGE was on a scheduled domestic flight FA212 from O.R. Tambo International Aerodrome (FAOR) in Gauteng province to Cape Town International Aerodrome (FACT) in the Western Cape province. Six crew members and 178 passengers were on-board the aircraft. The flight was conducted under the provisions of Part 121 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.1.2 The flight deck crew (pilot-in-command and first officer) as well as the four cabin crew members signed in for duty at 0830Z after being called from standby. The crew requested fuel uplift of 12 000 kilograms (kg), which was adequate for the flight from FAOR to FACT, and back to FAOR. The take-off weight was 69 736 kg with flap 1 selected for take-off. The take-off decision speed (V1) was calculated at 156 knots (kt), the take-off safety speed (V2) was 156 knots, and the rotation speed (Vr) was 159 knots. The pilot-in-command (PIC) was the pilot flying (PF).

1.1.3 According to the preliminary radar and voice communication data, air traffic control (ATC) cleared the aircraft for take-off from Runway 21R, the aircraft was airborne at 09:48:51Z with the rotation speed at 161 kt. As the aircraft took off, a cabin crew member who was seated at the back of the aircraft observed, through a porthole window, the wheel that had separated from the aircraft. After the seatbelt signs were switched off, the cabin crew member alerted the flight deck crew. The cabin crew member and the senior cabin crew member were summoned to the flight deck where the PIC informed them that one of the left main wheels had dislodged during take-off. The crew was informed by air traffic control (ATC) that the wheel had come off after the crew from flight FA396 had alerted ATC. The PIC informed the senior cabin crew member that they would go into the hold to burn off fuel before they could return to FAOR to land. The PIC also informed the passengers about the occurrence, and that the cabin crew will prepare the cabin for an emergency landing. The passengers were kept updated throughout the flight about the measures being taken. The cabin crew remained seated for most of the flight whilst in the holding pattern. Later, the ATC informed the flight crew that pieces of the brake assembly were found next to the runway. As a result, the crew declared a PAN PAN PAN. There was no Non-Normal Quick Reference Handbook Checklist for the nature of this emergency. Therefore, the crew consulted the Flight Crew Training Manual (FCTM) for guidance under the *"Tire Failure During or After Take-off"* and *"Landing on a Flat Tire"* as well as *"Partial or all Gear Up Landing",* which they concurred were the most appropriate actions considering the similarities between the situation they were in, and the guidance prescribed in the FCTM.

1.1.4 After being in the hold for approximately 90 minutes, the crew enquired from ATC if they could perform a low fly pass at their maintenance facility at FAOR with the landing gear extended to enable the technicians to assess the left main landing gear and advise accordingly. The request was granted, and the aircraft was cleared to 6 500ft, which was approximately 1 000ft above ground level (AGL). Figure 2 shows the missing left outer mainwheel.

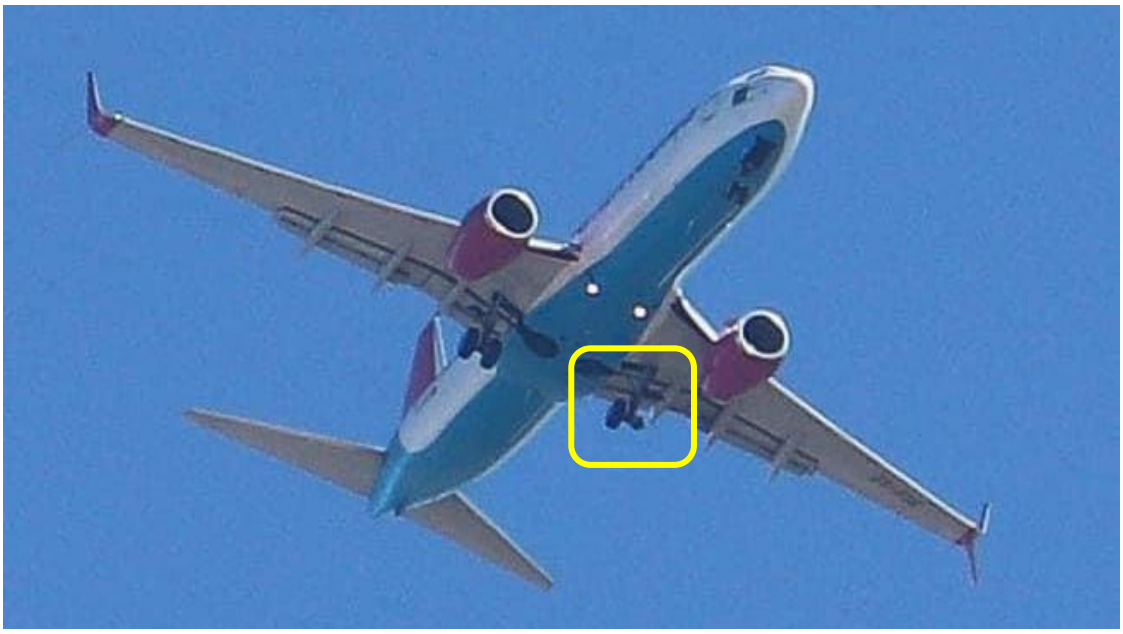


Figure 2: The aircraft with the missing left outer mainwheel.

After the low-level fly pass, the aircraft climbed to 10 000ft and went into the hold to the west of Swartkops Air Force Base (FASK) for approximately 35 minutes. The flight crew decided that they would perform a normal landing after confirming that the left inner mainwheel was still attached to the aircraft. The flight crew had also planned to land with a weight of 62 000kg and with the wing flaps at 40° at a landing speed of 133kt. Radar control vectored the aircraft for landing Runway 21R. At a height of approximately 500ft above ground level (AGL), the PIC commanded for *"brace"* position, which the cabin crew communicated to the passengers. The cabin crew had rehearsed the brace position with the passengers whilst the aircraft was still in the holding pattern.

1.1.5 The aircraft was then cleared to land on Runway 21R; it touched down (weight on wheels) at 12:05:58Z at a speed of 135kt with a g-loading of 1.062g. Available video footage showed that the aircraft landed normally, but approximately 30m before the aircraft came to a stop on the runway, the left inner mainwheel tyre burst. Data obtained from the Quick Access Recorder (QAR) indicated that the pilot flying (PF) had applied brakes during the latter part of the landing roll with the initial brake pressures captured at 671 pounds per square inch (psi) on the left side, and 729 psi on the right side. The maximum brake pressure recorded during this period was 1 835 psi on the left side and

820 psi on the right side. The pilot continued to apply brakes until the aircraft came to a stop on the runway in a left-wing low attitude.

1.1.6 After the aircraft had stopped, the PIC instructed all crew and passengers to remain seated. Upon the arrival of the Aerodrome Rescue and Firefighting (ARFF) personnel, the crew was requested to shut down the engines as smoke was observed from the left main gear. The PIC broadcasted to all occupants in the aircraft to continue to be seated to ensure positive control of the cabin. No person was injured during the landing sequence. After the ARFF personnel had declared the aircraft safe, the PIC informed the passengers that they would be deplaning the aircraft normally on the runway via the front left exit door, and that they would be transported by bus to the terminal building. The crew members were released from further duties, and they were debriefed by the operator representatives. The mainwheel tyre that separated from the axle was recovered within the aerodrome parameters.

1.1.7 The serious incident occurred during the day shortly after rotation from FAOR at Global Positioning System (GPS) co-ordinates determined to be 26°07'44.23" South 028°14'23.05" East.

Figure 3: The yellow pin marks the position where the aircraft stopped on the runway. (Source: Google Earth)

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-Board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	2	4	178	184	-
Total	**2**	**4**	**178**	**184**	**-**

Note: Other means people on the ground.

1.3 Damage to Aircraft

1.3.1 The left main landing gear on the left outer brake unit was damaged. Minor damage was observed on the left inboard flap and the inboard ground spoiler which was caused by debris from the burst tyre.

1.4 Other Damage

1.4.1 Minor damage was observed on the runway surface.

Figure 4: Damage to the runway surface where the aircraft had stopped.

1.5 Personnel Information

1.5.1 Pilot-in-command (PIC)

Nationality	South African	Gender	Male	Age	32
Licence Type	Airline Transport Pilot Licence (ATPL)				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument, Flight Instructor Grade 2				
Medical Expiry Date	30 September 2024 (Class 1)				
Restrictions	SSL - Special Restriction(s) as Specified OML – Valid only as or with Qualified Co-Pilot				
Previous Incidents	None				

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

Flying experience:

Total Hours	4 667.42
Total Past 90 Days	115.03
Total on Type Past 90 Days	115.03
Total on Type	3 504.36

1.5.2 First Officer (FO)

Nationality	South African	Gender	Male	Age	46
Licence Type	Airline Transport Pilot Licence				
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument				
Medical Expiry Date	31 July 2024 (Class 1)				
Restrictions	None				
Previous Incidents	None				

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

Flying experience:

Total Hours	7 353.5
Total Past 90 Days	193.0
Total on Type Past 90 Days	193.0
Total on Type	771.2

1.6 Aircraft Information

1.6.1 Boeing 737-800

Source: www.skybrary.aero

The Boeing 737-800 is a member of the Boeing 737 family of aircraft. The 737-800 is a stretched version of the 737-700 and replaced the 737-400. It is a narrow-body, fixed-wing aircraft with a tricycle undercarriage and is fitted with two turbofan engines which are mounted under the wings. The 737-800 seats 162 passengers in a two-class layout or 189 in a one-class layout.

Airframe:

Manufacturer/Model	Boeing 737-800	
Serial Number	34269	
Year of Manufacture	2007	
Total Airframe Hours (at time of incident)	51 520.2	
Last Inspection (Hours & Date)	51 504.0	18 April 2024
Hours Since Last Inspection (A10 Check)	16.2	
CRS Issue Date	18 April 2024	
C of A (Issue Date & Expiry Date)	26 November 2020	30 November 2024
C of R (Issue Date) (Present Owner)	22 October 2020	
MTOW	71 894kg (158 500 lbs)	
Type of Fuel Used	Jet A1	
Operating Category	Standard Transport Category (Aeroplane)	
Previous Incidents	None	

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

Engine No. 1

Manufacturer/Model	CFM International CFM56-7B27
Serial Number	895953
Hours Since New	49 477.0

Engine No. 2

Manufacturer/Model	CFM International CFM56-7B27
Serial Number	894950
Hours Since New	47 480.2

1.6.2 Aircraft History

The aircraft was manufactured in Renton in the United States of America (USA) and its first flight was on 5 October 2007 with a test registration issued N1786B. The table below is a breakdown of the aircraft's history. It had mostly been operated in South America (12 years).

Airline/Owner	**Registration**	**Date in service**
GOL Airlines – Brazil	PR-GTU	22 October 2007
Webjet Linhas Aereas – Brazil	PR-GTU	30 December 2011
GOL Airlines – Brazil	PR-GTU	14 November 2012
Wells Fargo Bank Northwest – USA	N269WC	19 December 2019
FlySafair – South Africa	ZS-FGE	19 October 2020

1.6.3 Mainwheel Assembly and Tyre Information

The table below contains a summary of the mainwheel that separated from the axle after take-off. The last overhaul was conducted in accordance with the Honeywell Component Maintenance Manual (CMM) 32-40-14 REV 13. According to the list of fitted parts entered on the Authorised Release Certificate (CA 21-19), neither the inner nor the outer bearings were replaced during this overhaul.

Mainwheel Assembly	
Wheel Hub Manufacturer	Honeywell
Part Number	2612311-1
Outer Hub Serial Number	B8561
Inner Hub Serial Number	BH0527
Last Overhaul Date	13 September 2023
Total Hours Since Overhaul	1 243.1
Total Cycles Since Overhaul	963
Date Fitted to ZS-FGE	6 April 2024
Cycles Since Fitted to ZS-FGE	67
The number of aircraft the mainwheel was fitted to, since its last overhaul	6

Tire Information	
Tyre Manufacturer	Goodyear
Part Number	441K82T1
Serial Number	91365521
Rethreaded Status	3 times
Last Rethreaded Date	December 2023
Speed Limitation	225 mph (195kt)

1.7 Meteorological Information

1.7.1 The weather information below was obtained from the Meteorological Aerodrome Report (METAR) that was issued by the South African Weather Service (SAWS) recorded at FAOR on 21 April 2024 at 1200Z.

FAOR 211200Z 19005KT 080V250 CAVOK 27/04 Q1024 NOSIG=

Wind Direction	190°	Wind Speed	5kt	Visibility	> 10km
Temperature	27°C	Cloud Cover	Nil	Cloud Base	Nil
Dew Point	4°C	QNH	1024hPa		

1.8 Aids to Navigation

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

1.9.2 The crew was in constant communication with ATC after declaring a PAN PAN PAN emergency.

1.10 Aerodrome Information

1.10.1 The aircraft took off from FAOR on Runway 21R and returned to the same aerodrome after the aircraft was in the hold to burn fuel before the crew landed back on Runway 21R.

Aerodrome Designation	O.R. Tambo International Aerodrome (FAOR)	
Aerodrome Status	Licensed	
Aerodrome GPS co-ordinates	26°08’01.30” South 028°14’32.38” East	
Aerodrome Elevation	5 558ft	
Runway Headings	03L/21R	03R/21L
Dimensions of Runways	4 436 x 60m	3 410 x 60m

Heading of Runway Used	21R
Surface of Runway Used	Asphalt
Approach Facilities	DVOR/DME, ILS LOC, ILS GP, Runway lights, PAPI's
Radio Frequency	ATIS: 126.20, 115.20 Apron: 122.65 Tower East: 118.60 Tower West: 118.10 Approach South: 124.50 Approach East: 124.50 Approach West: 123.70 SMC: 121.90

1.10.2 The aerodrome layout chart for FAOR is attached as Appendix A.

1.11 Flight Recorders

1.11.1 The aircraft was equipped with a flight data recorder (FDR) and a cockpit voice recorder (CVR). Both units were retrieved from the aircraft after the serious incident.

1.11.2 The FDR was a Honeywell Solid State recorder with serial number 13375.

1.11.3 The CVR was a Honeywell Solid State recorder with serial number 120-09968. The aircraft was airborne for more than 2 hours, which resulted in the voice recording pertaining to the serious incident flight being overwritten.

1.12 Wreckage and Impact Information

1.12.1 The crew performed a normal landing on Runway 21R after the left outer mainwheel separated from the axle. The left inner mainwheel tyre burst approximately 30m before the crew brought the aircraft to a stop on the runway centreline. The runway surface sustained minor damage (marks) because of the collapsed and missing outer mainwheel and the burst inner tyre.

Figure 5: First markings on the runway surface caused by the brake assembly and the inner wheel rim when they contacted the runway.

Figure 6: The ground spoiler protection fairing that was damaged by the tyre debris.

Figure 7: Damage on the inboard ground spoiler caused by the tyre debris.

Figure 8: The left inner mainwheel tyre that burst during the landing roll.

Figure 9: The left mainwheel brake assembly with the wheel nut still secured to the axle.

Figure 10: The left outer mainwheel assembly as it was found within the aerodrome parameter.

1.13 Medical and Pathological Information

1.13.1 Not applicable.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 No person was injured during the serious incident.

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 operator was issued a Class I Air Service Licence number S941D by the Air Service Licensing Council on 26 March 2014 for Category A1 aircraft. The operator was also issued a Class II Air Service Licence number N942D on 17 August 2011 for Category A1 aircraft as well as Class III Air Service Licence number G943D on 17 August 2011 for Category A1 aircraft.

1.17.2 The operator had a valid Air Operating Certificate (SACAA.AOC.0113-PART 121) that was issued by the Regulator on 14 April 2023 with an expiry date of 30 April 2024.

1.17.3 The aircraft maintenance organisation (AMO) that performed the last maintenance on the aircraft before the incident flight had a valid AMO Approval certificate that was issued by the Regulator on 22 September 2023 with an expiry date of 31 October 2024.

1.18 Additional Information

1.18.1 Landing gear, wheels and brakes

Source: Boeing

Main wheels

The main wheels, which are designed to allow easy replacement, are fitted to fixed stub axles and are held in place by a single wheel nut and washer. The wheel nut is secured by locking bolts.

The wheels are of a split hub design with the hubs containing the inboard and outboard tapered roller bearings (see Figure 12). The outer bearing component is known as the cup and the inner bearing component as the cone. The cup-bearing raceway is an interference fit within the hub, and the cone is a sliding fit on the stub axle. The rollers run on tracks in the cone and cup. The track on the cone is defined by a rib around its edges; there are no ribs on the cup. The inboard and outboard bearing assemblies are fitted with external grease seals which are held in place by spring steel retaining rings located in grooves in the wheel hub.

The bearings are provided as part of the wheel assembly. When fitted to the axle, a nut and washer are used to apply pressure to the bearings, which is known as the preload. The preload ensures the bearing cups and cones are correctly seated, and the rollers correctly aligned. This is achieved by applying a torque to the nut using a suitable torque wrench. Once the bearing assembly has been preloaded, the nut is loosened slightly, whilst maintaining a tight contact between the cup, cone and rollers, then retightened to this service torque, which is usually about 20-25% of the preload torque. Both these procedures are done whilst slowly rotating the wheel clockwise to ensure that the large roller ends are seated against the cone rib.

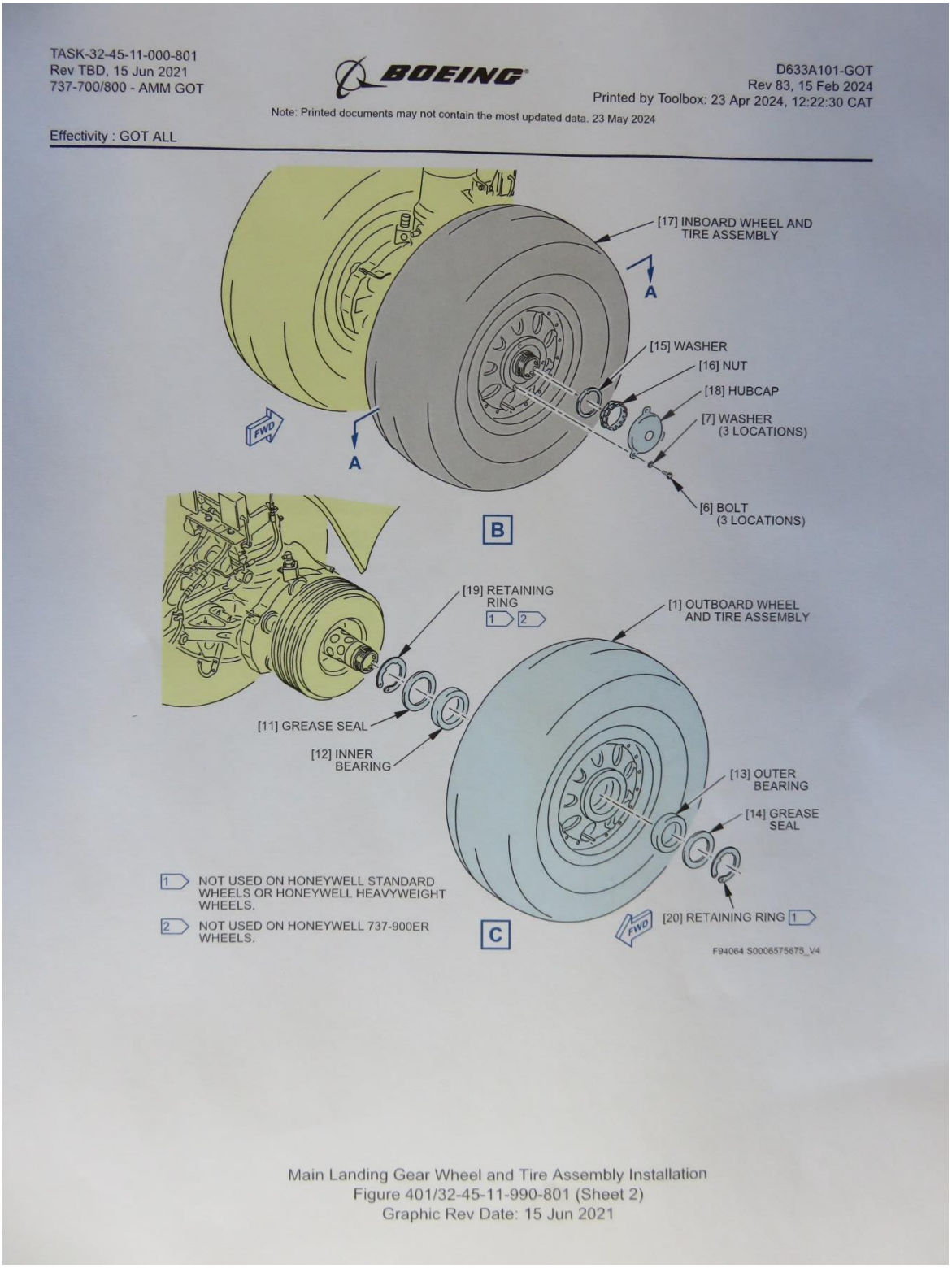


Figure 11: Landing gear mainwheel general arrangement. (Source: Boeing)

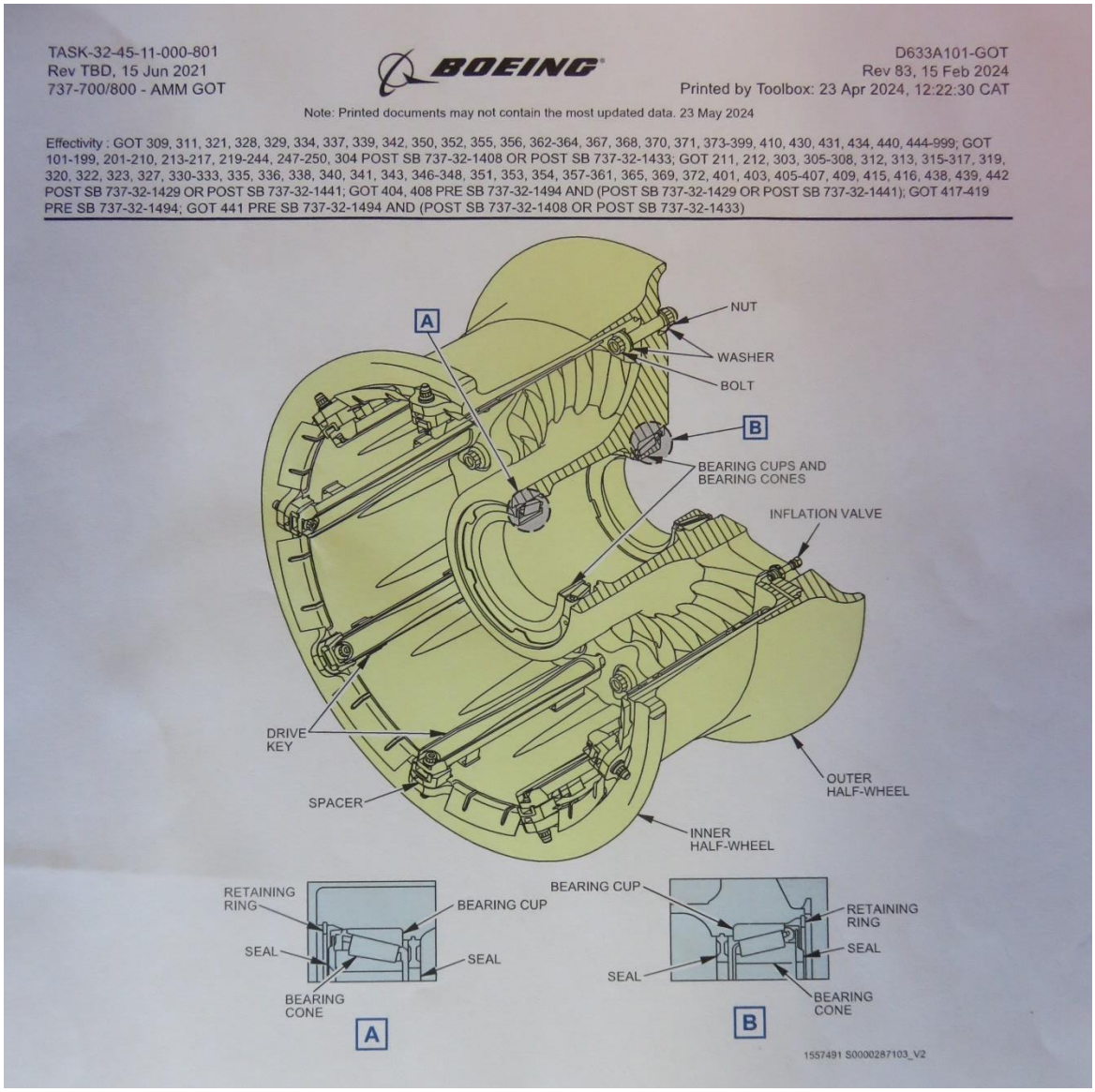


Figure 12: The inner [A] and outer [B] bearing arrangement. (Source: Boeing)

1.19 Useful or Effective Investigation Techniques

1.19.1 To be discussed in the final report.

2. FINDINGS

2.1 General

From the available evidence, the following preliminary findings were made with respect to this serious 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 serious incident. The findings are significant steps in this serious incident sequence, but they are not always causal or indicate deficiencies.

2.2 Findings

The pilots

2.2.1 The crew was properly licensed and had valid medical certificates.

2.2.2 The crew declared a PAN PAN PAN after ATC personnel informed them that the mainwheel had separated from the aircraft during rotation. The crew requested to enter the hold to burn fuel before they could return to the departure aerodrome.

The aircraft

2.2.3 The last maintenance inspection that was conducted on the aircraft prior to the serious incident flight was certified on 18 April 2024 at 51 504.0 airframe hours. The aircraft accrued 16.2 airframe hours since the said inspection.

2.2.4 The aircraft was issued a Certificate of Airworthiness (C of A) on 26 November 2020.

2.2.5 The aircraft was issued a Certificate of Registration on 22 October 2020.

2.2.6 The mainwheel that separated from the axle was installed on the aircraft on 6 April 2024; it had since completed 67 cycles. It was last overhauled on 13 September 2023 and had since completed 963 cycles.

Environment

2.2.7 Fine weather conditions prevailed at the time of the flight; the weather had no bearing to this serious incident.

Air Traffic Control

2.2.8 Following the emergency declaration by the crew, the aircraft was permitted by ATC to enter the hold to burn fuel. The crew was also granted permission to conduct a low-level fly pass above their maintenance facility at FAOR for technicians to assess the left mainwheel assembly.

2.2.9 ATC informed ARFF about the emergency and requested that they take position in preparation for the arrival of the aircraft.

Aerodrome

2.2.10 The FAOR is a licensed aerodrome with two parallel runways. The aircraft used Runway 21R for take-off, which is 4 421m long and 60m wide. On their return to the aerodrome, the aircraft landed on the same runway.

2.2.11 The ARFF personnel took up their positions next to Runway 21R. After the aircraft came to a stop and the engines were shut down, they performed an external inspection and observed that the left main landing gear was damaged. The ARFF personnel dosed the brake assemblies and the left inner mainwheel which had burst during the landing roll.

3. On-going Investigation

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

4. Safety Recommendations

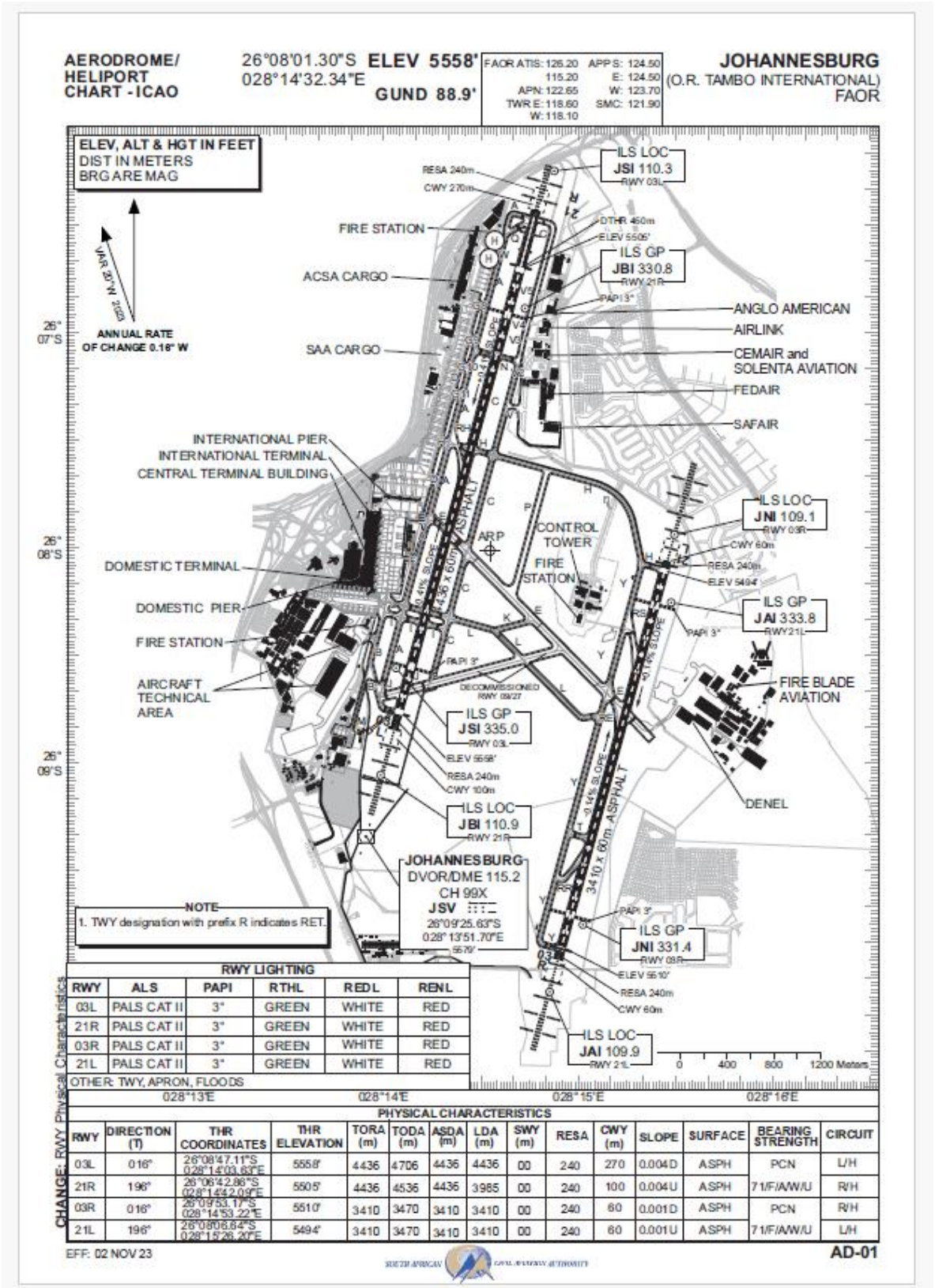
4.1 None.

5. Appendices

5.1 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


AERODROME/ HELIPORT CHART - ICAO
26°08'01.30"S 028°14'32.34"E
ELEV 5558'
GUND 88.9'
FAOR ATIS: 126.20 115.20 APN: 122.65 TWR E: 118.60 W: 118.10
APP S: 124.50 E: 124.50 W: 123.70 SMC: 121.90
JOHANNESBURG (O.R. TAMBO INTERNATIONAL) FAOR
ELEV, ALT & HGT IN FEET
DIST IN METERS
BRG ARE MAG
VAR 25°W 2023
ANNUAL RATE OF CHANGE 0.16° W
ILS LOC JSI 110.3 RWY 03L
RESA 240m
CWY 270m
FIRE STATION
ACSA CARGO
SAA CARGO
DTHR 450m
ELEV 5505'
ILS GP JBI 330.8 RWY 21R
PAPI 3°
ANGLO AMERICAN
AIRLINK
CEMAIR and SOLENTA AVIATION
FEDAIR
SAFAIR
INTERNATIONAL PIER
INTERNATIONAL TERMINAL
CENTRAL TERMINAL BUILDING
DOMESTIC TERMINAL
DOMESTIC PIER
FIRE STATION
AIRCRAFT TECHNICAL AREA
ARP
CONTROL TOWER
FIRE STATION
ILS LOC JNI 109.1 RWY 03R
CWY 60m
RESA 240m
ELEV 5494'
ILS GP JAI 333.8 RWY 21L
PAPI 3°
FIRE BLADE AVIATION
DENEL
DECOMMISSIONED RWY 09/27
ILS GP JSI 335.0 RWY 03L
ELEV 5558'
RESA 240m
CWY 100m
ILS LOC JBI 110.9 RWY 21R
JOHANNESBURG DVOR/DME 115.2 CH 99X JSV
26°09'25.63"S 028°13'51.70"E
5570'
ILS GP JNI 331.4 RWY 03R
ELEV 5510'
RESA 240m
CWY 60m
ILS LOC JAI 109.9 RWY 21L
3410 x 60m ASPHALT
0.14% SLOPE
0.41% SLOPE
0.4% SLOPE
4436 x 60m ASPHALT
NOTE
1. TWY designation with prefix R indicates RET.
0 400 800 1200 Metres
026°07'S
026°08'S
026°09'S
028°13'E
028°14'E
028°15'E
028°16'E
RWY LIGHTING
RWY | ALS | PAPI | RTHL | REDL | RENL
03L | PALS CAT II | 3° | GREEN | WHITE | RED
21R | PALS CAT II | 3° | GREEN | WHITE | RED
03R | PALS CAT II | 3° | GREEN | WHITE | RED
21L | PALS CAT II | 3° | GREEN | WHITE | RED
OTHER: TWY, APRON, FLOODS
PHYSICAL CHARACTERISTICS
RWY | DIRECTION (T) | THR COORDINATES | THR ELEVATION | TORA (m) | TODA (m) | ASDA (m) | LDA (m) | SWY (m) | RESA | CWY (m) | SLOPE | SURFACE | BEARING STRENGTH | CIRCUIT
03L | 016° | 26°08'47.11"S 028°14'03.63"E | 5558' | 4436 | 4706 | 4436 | 4436 | 00 | 240 | 270 | 0.004D | ASPH | PCN | L/H
21R | 196° | 26°06'42.86"S 028°14'42.09"E | 5505' | 4436 | 4536 | 4436 | 3985 | 00 | 240 | 100 | 0.004U | ASPH | 71/F/A/W/U | R/H
03R | 016° | 26°09'53.17"S 028°14'53.22"E | 5510' | 3410 | 3470 | 3410 | 3410 | 00 | 240 | 60 | 0.001D | ASPH | PCN | R/H
21L | 196° | 26°08'06.84"S 028°15'26.20"E | 5494' | 3410 | 3470 | 3410 | 3410 | 00 | 240 | 60 | 0.001U | ASPH | 71/F/A/W/U | L/H
CHANGE: RWY Physical Characteristics
EFF: 02 NOV 23
AD-01