

**Preliminary Report on the Accident involving a Boeing 737-400 Freighter aircraft with nationality and registration marks 5N-JRT operated by Allied Air Limited, which occurred at Nnamdi Azikiwe International Airport (DNAA) Abuja, Nigeria on 11 December 2024.**

<b>Operator:</b>	Allied Air Limited
<b>Aircraft type and model:</b>	Boeing 737-400F
<b>Manufacturer:</b>	The Boeing Company, USA
<b>Year of manufacture:</b>	1993
<b>Nationality and registration marks:</b>	5N-JRT
<b>Serial number:</b>	26081
<b>Location:</b>	Runway 22 Nnamdi Azikiwe International Airport (DNAA) Abuja
<b>Date and Time:</b>	11 December 2024 at 10:04 h (All times in this report are local time, equivalent to (UTC+1) unless otherwise stated)



## INTRODUCTION

The Nigerian Safety Investigation Bureau (NSIB) was notified of the occurrence by the Nigeria Airspace Management Agency (NAMA) on 11 December 2024. Investigators were dispatched to the site the same day. They commenced post-occurrence assessments under the provisions of Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2023 and Annex 13 to the Convention on International Civil Aviation.

This Preliminary Report details the initial facts, discussions, and findings surrounding the incident. It includes information gathered from witness statements, flight recorders, ATC transcripts, and a preliminary inspection of the site and aircraft.

This report presents the current status of the notification's processing. Its content may still change and does not necessarily bind the conclusions published in the investigation's final report.

**The investigation is ongoing.**



## 1.0 FACTUAL INFORMATION

### 1.1 History of the flight

On 11 December 2024, a Boeing 737-400F aircraft with nationality and registration marks 5N-JRT, operated by Allied Air Limited was on a positioning flight to pick up cargo for the Central Bank of Nigeria (CBN). The aircraft had arrived from Douala earlier in the morning. The aircraft was scheduled for six sectors: Lagos-Abuja, Abuja-Sokoto, Sokoto-Abuja, Abuja-Yola, Yola-Abuja and Abuja-Lagos, with the same flight crew.

At 09:11:44 h, 5N-JRT departed Murtala Muhammed International Airport (DNMM) Lagos for Nnamdi Azikiwe International Airport (DNAA) Abuja on the first sector as flight AJK 206 on an Instrument Flight Rule (IFR) flight plan. Six persons were onboard, including two flight crew, two engineers, and two CBN personnel, with five hours and 30 minutes of fuel endurance. The First Officer was the Pilot Flying (PF), while the Captain was the Pilot Monitoring (PM).

At 09:29:48 h, AJK 206 attained its top of climb and continued cruise at Flight Level 350. Descent commenced at 09:44:07 h.

At 09:52:12.1 h, Abuja Radar cleared AJK 206 to fly, heading 070° "FOR SEQUENCING", and instructed the aircraft to descend to 5,000 feet. During this time, the flight crew commented on the preceding traffic, maintaining a speed of 210 knots. Observing this, they remarked that flying at 250 knots could allow them to overtake the preceding traffic.

At 09:56:37.0 h, Abuja Radar issued a new clearance for AJK 206 to fly heading 090° "FOR POSITIONING" and instructed a descent to 3,600 ft with an altimeter setting of QNH 1014 hPa. The Captain then called for the Approach Checklist.

At 09:58:18.3 h, with the aircraft positioned 17 nm north of the airfield, Abuja Radar cleared AJK 206 for a right turn to heading 180° to establish a right base for Runway 22.



At 10:00:49.1 h, the Captain instructed the First Officer (FO) to standby for localizer capture before deploying the flaps.

At 10:01:32.3 h, Abuja Radar advised AJK 206 that it was 10 nm to touchdown on Runway 22 and instructed the aircraft to contact Abuja Tower on frequency 118.6 MHz. at 10:01:44.3 h, the FO subsequently called for Flaps One and at about 8 nm.

At 10:01:54.6 h, the flight crew established contact with Abuja Tower. Abuja Tower instructed AJK 206 to continue the approach, advising that a preceding aircraft was on short finals while another aircraft was lining up for departure. AJK 206 was instructed to reduce speed and report when 4 nm to touchdown.

The Flight Crew discussed the approach speed, noting that the aircraft was configured for Flap 15. The Flight Crew then decided to request priority to land behind the preceding traffic, ahead of traffic cleared to line up and wait.

At 10:03:23.0 h, the FO called out, "THREE NAUTICAL MILES," AJK 206 requested clearance to land after the landing traffic. Abuja Tower instructed AJK 206 to continue the approach and cleared it to land.

At 10:03:59.6 h, the FO reported that Flaps 30 could not be deployed, a situation acknowledged by the Captain. During the post-occurrence interview, the Flight Crew reported that Vref 15+5 knots was determined to be 145+5 kt and elected to continue with Flaps 15 until landing as the aircraft's weight was within limits.

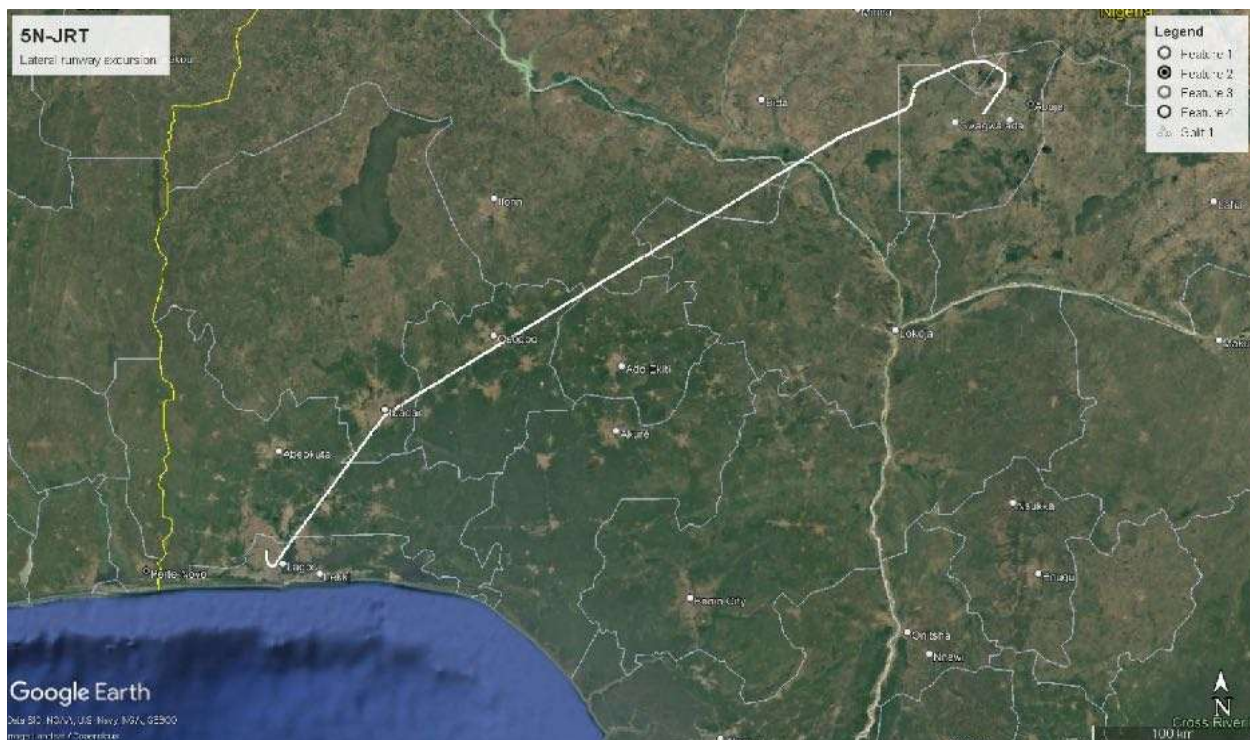
At 10:04:05.7 h, AJK 206 confirmed its position as 0.6 nautical miles to touchdown. Abuja Tower then issued the clearance: "LAND AFTER... CLEARED TO LAND RUNWAY TWO TWO." AJK 206 sought confirmation of this clearance, and Abuja Tower reiterated, "AFTER... CLEARED TO LAND RUNWAY TWO TWO."

The Flight Data Recorder indicated that AJK 206 touched down at 10:04:24 h with a speed of 157 Kt CAS. The Cockpit Voice Recorder captured the Captain saying, "PUSH IT DOWN," followed by a thump. The fire warning aural annunciation sounded, followed by



the landing gear horn. The Flight Crew's post-occurrence statement indicated that the touchdown was smooth and speed brakes and reversers were deployed automatically. Shortly after, a bang was heard from the aircraft's right side, and then the aircraft collapsed to its right while the Flight Crew attempted to maintain directional control. The aircraft proceeded the landing roll as its Number 1 engine nacelle dragged on the runway for 1172 m before it veered off to the right of the runway centerline. The aircraft came to a final stop in the grass verge and made a 170° turn to the right. The flight crew then shut down the engines and secured the aircraft. All the occupants exited the aircraft through the forward main door without injuries.

The accident occurred at 10:04 h, during daytime hours, under Visual Meteorological Conditions (VMC).



**Figure 1:** Flight track for AJK 206



## 1.2 Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
<b>Fatal</b>	Nil	Nil	Nil	Nil
<b>Serious</b>	Nil	Nil	Nil	Nil
<b>Minor</b>	Nil	Nil	Nil	Nil
<b>None</b>	4	2	6	Nil
<b>TOTAL</b>	4	2	6	Nil

## 1.3 Damage to aircraft

The aircraft was substantially damaged.

## 1.4 Other damage

Nil

## 1.5 Personnel information

### 1.5.1 Captain

Nationality:	Nigerian
Age:	37 years
License type:	Airline Transport Pilot License (Aeroplane)
License validity:	Valid till 24 April 2028
Aircraft ratings:	Boeing 737-300/500, B737-800 NG
Medical certificate:	Valid till 23 December 2024
Instrument rating:	Valid till 28 May, 2025
Proficiency check:	Valid till 23 December, 2024



Total flying time:	5496:30 h
Total on type:	5242:30 h
Total on type (PIC):	381:25 h
Last 90 days:	202 h
Last 28 days:	74:25 h
Last 24 hours:	4:05 h

### 1.5.2 Co-Pilot

Nationality:	Nigerian
Age:	33 years
License type:	Airline Transport Pilot License (Aeroplane)
License validity:	Valid till 22 August 2028
Aircraft ratings:	Boeing 737-300/500, Boeing 737-NG, McDonnell Douglas-80
Medical certificate:	Valid till 27 October 2025
Instrument rating:	Valid till 22 July 2025
Proficiency check:	Valid till 22 January 2025
Total flying time:	1389:09 h
Total on type:	359:05 h
Total on type (PIC):	nil
Last 90 days:	232:03 h
Last 28 days:	88:08 h
Last 24 hours:	4:05 h

### 1.5.3 Engineer

Nationality:	Indonesia
Age:	44 years
Licence type:	Aircraft Maintenance Engineer's Licence
Licence validity:	Valid till 3 December 2025
Aircraft type ratings:	Boeing 737-300/400/500/600/700/800/900, Airbus A320



## 1.6 Aircraft information

### 1.6.1 General information

Type:	Boeing 737-400F
Manufacturer:	The Boeing Company, USA
Year of manufacture:	1993
Serial number:	26081
Certificate of Airworthiness:	Valid till 27 April 2025
Certificate of insurance:	Valid till 31 January 2025
Certificate of registration:	Issued 16 April 2014
Total airframe time:	62855:11 h
Total Landing Cycles:	37647

### 1.6.2 Engines

Engine	Number 1	Number 2
Manufacturer	CFM International, USA	CFM International, USA
Type/Model	CFM56-3C1	CFM56-3C1
Serial number	727249	858358
Time Since New	62080:24	62255:59
Cycles Since New	44405	51595

Fuel Used: Jet A1

### 1.6.3 Excerpt from Allied Air B737-400 Flight Operations Manual Part B (issue 1, Rev 0, 1<sup>st</sup> March 2021, Page 3-8)

#### **3.17 Non-Normal Flap**

*If a non-normal flap problem has been encountered, the crew should avoid moving the flaps until after the QRH has been actioned to reduce the risk of subsequent damage or failure. Crews should also avoid raising the flaps after landing when taxiing to the apron to allow the engineers to inspect the problem.*





#### **1.6.4 Excerpt from Boeing 737 CL Flight Crew Training Manual (August 30 2024, FCT 737 CL (TM) Page 8.11)**

##### ***Approach and landing***

*When a non-normal situation occurs, a rushed approach can often complicate the situation. Unless circumstances require an immediate landing, complete all corrective actions before beginning the final approach.*

*In some non-normal situations, the possibility of a higher airspeed on approach, a longer landing distance, a different flare profile, or a different landing technique should be considered.*

*Plan an extended straight in approach with time allocated for the completion of any lengthy NNC steps such as the use of alternate flap or landing gear extension systems. Arm autobrakes and speedbrakes unless precluded by the NNC.*

*Note:*

*The use of autobrakes is recommended because maximum autobraking may be more effective than maximum manual braking due to timely application upon touchdown and symmetrical braking. However, the advisory information in the PI chapter of the QRH includes Non-Normal Configuration Landing Distance data specific to the use of maximum manual braking. When used properly, maximum manual braking provides the shortest stopping distance.*



### **1.6.5 Excerpt from Boeing 737 CL Flight Crew Training Manual (August 30 2024, FCT 737 CL (TM) Page 5.7)**

#### ***Flap Setting for Landing***

*For normal landings, use flaps 15, 30, or flaps 40. Flaps 15 is normally limited to airports where approach climb performance is a factor. Flaps 30 provides better noise abatement and reduced flap wear/loads. When performance criteria are met, use flaps 40 to minimise landing speed, and landing distanced.*

*Note:*

*Runway length and condition must be taken into account when selecting a landing flap position.*

### **1.6.6 Excerpt Boeing 737-300/400/500 Aircraft Maintenance Manual (32-11-00, September 25/2015, Page 1-3)**

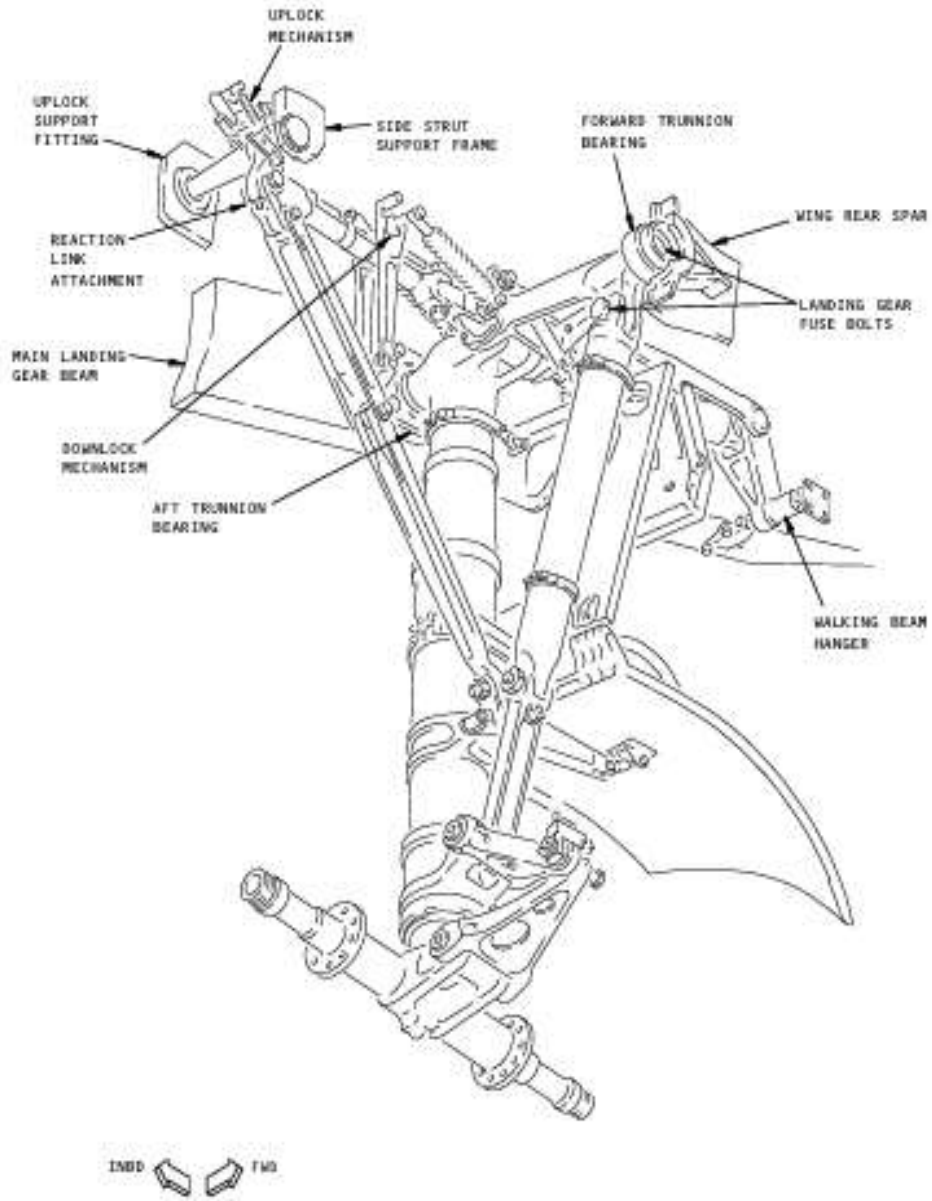
#### ***Main Gear-Description and Operation***

##### ***1. General***

**A.** *Each main gear consists of a trunnion link, a shock strut, a drag strut, torsion links, a damper, a side strut, and a reaction link. In addition, the right main gear carries ground-speed brake operating rods and cable.*

**B.** *The shock strut assembly is attached to the trunnion link by a pin joint, and the two are mounted between the rear wing spar and a trunnion support beam. The shock strut is charged with oil and compressed nitrogen to provide a shock-absorbing medium. The main gear axles and the shock strut inner cylinder are machined from a one-piece forging. Replaceable sleeves are assembled over the axles to provide a mounting for wheel bearings and to protect the axles from damage. The reaction link is connected to the shock strut and the upper end of the side strut.*





82386 200041216508\_V1

Main Gear Attachment  
Figure 2/32-11-00-990-802



### 1.6.7 Excerpt from Boeing 737 Quick Reference Handbook (QRH)

9.14

**BOEING**  
737 Flight Crew Operations Manual

LE FLAPS  
TRANSIT

LEADING EDGE FLAPS  
TRANSIT

**Condition:** One or more of these occur:

- The leading edge devices are not in the commanded position
- A leading edge device asymmetry is detected.

**Note:** Do not use FMC performance predictions with any flaps or slats extended.

1 Choose one:

- ◆ **Trailing** edge flaps are **extended** and the trailing edge flap position indication **disagrees** with the flap handle position:
  - ▶▶ **Go to the Trailing Edge Flap Disagree checklist on page 9.30**
  - ■ ■ ■
- ◆ **Trailing** edge flaps are **extended** and the trailing edge flap position indication **agrees** with the flap handle position:
  - ▶▶ **Go to step 7**
- ◆ **Trailing** edge flaps are **up**:
  - Limit airspeed to 230 knots maximum.
  - ▶▶ **Go to step 2**

▼ Continued on next page ▼

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

9.14
D6-27370-4Q8-LLD
June 15, 2023



▼ LEADING EDGE FLAPS TRANSIT continued ▼

2 Choose one:

◆ Roll is **encountered**:

▶▶ **Go to step 7**

◆ Roll is **not** encountered:

**Note:** Roll can be difficult to identify with the autopilot engaged.

▶▶ **Go to step 3**

Maximum flap extension altitude 20,000 feet.

3 ⚠ Flaps . . . . . Extend to flaps 1, then retract to flaps up

4 Choose one:

◆ LE FLAPS TRANSIT light **extinguishes** after the flaps are up:

Continue normal operation.



◆ LE FLAPS TRANSIT light **stays illuminated** after the flaps are up:

▶▶ **Go to step 5**

5 Check LE DEVICES annunciator panel.

▼ Continued on next page ▼



9.16



737 Flight Crew Operations Manual

▼ LEADING EDGE FLAPS TRANSIT continued ▼

6 Choose one:

◆ Light(s) for **only one** leading edge device is illuminated:

Limit airspeed to 300 knots (280 knots for turbulent air penetration) or 0.65 Mach, whichever is lower.

▶▶ **Go to step 7**

◆ Light(s) for **more than one** leading edge device is illuminated:

Limit airspeed to 230 knots maximum.

▶▶ **Go to step 7**

7 Plan a flaps 15 landing.

8 Set VREF 15 + 5 knots.

9 Limit bank angle to 15° when airspeed is less than the flaps up maneuvering speed.

10 Check the Non-Normal Configuration Landing Distance table in the Advisory Information section of the Performance Inflight chapter.

11 **Checklist Complete Except Deferred Items**

**Deferred Items**

**Descent Checklist**

Pressurization . . . . . CAB ALT \_\_\_\_, LAND ALT \_\_\_\_

Recall . . . . . Checked

Autobrake . . . . . \_\_\_\_

▼ Continued on next page ▼

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

9.16

D6-27370-4Q8-LLD

June 15, 2023



▼ LEADING EDGE FLAPS TRANSIT continued ▼

Landing data . . . . . **VREF 15 + 5 knots** \_\_\_\_\_,  
**Minimums** \_\_\_\_\_

Approach briefing . . . . . Completed

**Approach Checklist**

Altimeters . . . . . \_\_\_\_\_

**Additional Deferred Item**

GROUND PROXIMITY FLAP  
INHIBIT switch . . . . . FLAP INHIBIT

**Note:** The amber LE FLAPS TRANSIT light is illuminated. Operation within the lower yellow airspeed band for landing is normal for this condition.

**Note:** V/S and VNAV PTH modes can revert to LVL CHG mode.

**Landing Checklist**

ENGINE START switches . . . . . CONT

Speedbrake . . . . . ARMED

Landing gear . . . . . Down

Flaps . . . . . **15, Amber light**







9.18



737 Flight Crew Operations Manual

**MACH TRIM FAIL**

**MACH TRIM FAIL**

Condition: The mach trim system is failed.

- 1 Limit airspeed to 0.74 Mach.



**SPEED BRAKE DO NOT ARM**

**SPEED BRAKE DO NOT ARM**

Condition: An automatic speedbrake fault occurs.

**Note:** Speedbrakes may be used in flight.

- 1 Do **not** arm the speedbrake for landing. Manually deploy the speedbrakes immediately upon landing.
- 2 **Checklist Complete Except Deferred Items**

**Deferred Items**

**Descent Checklist**

Pressurization . . . . . CAB ALT \_\_\_\_, LAND ALT \_\_\_\_  
 Recall . . . . . Checked  
 Autobrake . . . . . \_\_\_\_  
 Landing data . . . . . VREF \_\_\_\_, Minimums \_\_\_\_  
 Approach briefing . . . . . Completed

**Approach Checklist**

Altimeters . . . . . \_\_\_\_

▼ Continued on next page ▼

9.18



▼ SPEED BRAKE DO NOT ARM continued ▼

**Landing Checklist**

ENGINE START switches . . . . . CONT

Speedbrake . . . . . **DOWN detent**

Landing gear . . . . . Down

Flaps . . . . . \_\_\_\_, Green light



**SPEED TRIM FAIL**

**SPEED TRIM FAIL**

Condition: Speed Trim function is inoperative.

**Note:** The Speed Trim System will not provide stabilizer trim inputs when deviating from a trimmed airspeed.

- 1 Continue normal operation.





9.26



737 Flight Crew Operations Manual

### Trailing Edge Flap Asymmetry

Condition: One or more of these occur:

- An uncommanded roll occurs when the flaps change position
- The left and right flap indications disagree.

Objective: To configure the airplane for landing.

- 1 Set the flap lever to the nearest detent that is equal to or less than the smallest indicated flap position.

**Caution!** Do not attempt to move the trailing edge flaps with the **ALTERNATE FLAPS** switch because there is no asymmetry protection.

**Note:** Do not use FMC performance predictions with any flaps or slats extended.

▼ Continued on next page ▼

9.26

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

D6-27370-4Q8-LLD

September 15, 2022



▼ Trailing Edge Flap Asymmetry continued ▼

2 Choose one:

◆ Flap lever is set to **30**:

Set VREF 30.

**Note:** VREF + wind additive must not exceed the flap placard speed for flaps 40.

▶▶ Go to step 3

◆ Flap lever is set to **15 or 25**:

Set VREF 15.

**Note:** VREF + wind additive must not exceed the flap placard speed for the next larger flap setting.

▶▶ Go to step 3

◆ Flap lever is set to **1 or greater and less than 15**:

Consider burning off fuel to reduce touchdown speed.

Set VREF 40 + 30 knots.

▶▶ Go to step 3

◆ Flap lever is set to **UP**:

▶▶ Go to the Trailing Edge Flaps Up Landing checklist on page 9.36



▼ Continued on next page ▼



9.28



737 Flight Crew Operations Manual

▼ Trailing Edge Flap Asymmetry continued ▼

- 3 Check the Non-Normal Configuration Landing Distance table in the Advisory Information section of the Performance Inflight chapter.

4 **Checklist Complete Except Deferred Items**

**Deferred Items**

**Descent Checklist**

- Pressurization . . . . . CAB ALT \_\_\_\_, LAND ALT \_\_\_\_
- Recall . . . . . Checked
- Autobrake . . . . . \_\_\_\_
- Landing data . . . . . **VREF \_\_\_\_ as directed by checklist, Minimums \_\_\_\_**
- Approach briefing . . . . . Completed

**Approach Checklist**

- Altimeters . . . . . \_\_\_\_

▼ Continued on next page ▼

9.28

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

**D6-27370-4Q8-LLD**

**September 15, 2022**



▼ Trailing Edge Flap Asymmetry continued ▼

**Additional Deferred Item**

Choose one:

◆ Flap lever is set to **30**:

▶▶ **Go to Landing Checklist below**

◆ Flap lever is set to **less than 30**:

GROUND PROXIMITY FLAP  
INHIBIT switch . . . . . FLAP INHIBIT

▶▶ **Go to Landing Checklist below**

**Landing Checklist**

ENGINE START switches . . . . . CONT  
Speedbrake . . . . . ARMED  
Landing gear . . . . . Down  
Flaps. . . . . \_\_\_\_\_, **Green light**





9.30



737 Flight Crew Operations Manual

### Trailing Edge Flap Disagree

Condition: The trailing edge flaps are not in the commanded position.

Objective: To configure the airplane for landing.

1 Choose one:

◆ Trailing edge flap asymmetry **exists**:

▶▶ **Go to the Trailing Edge Flap Asymmetry checklist on page 9.26**



◆ Trailing edge flap asymmetry does **not** exist:

▶▶ **Go to step 2**

2 Choose one:

◆ Indicated flap position is **30 or greater and less than 40**:

Land using existing flaps.

▶▶ **Go to step 3**

◆ Indicated flap position is **15 or greater and less than 30**:

Land using existing flaps.

▶▶ **Go to step 5**

◆ Indicated flap position is **less than 15**:

▶▶ **Go to step 4**

▼ Continued on next page ▼

9.30

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

D6-27370-4Q8-LLD

September 15, 2022



737 Flight Crew Operations Manual

▼ Trailing Edge Flap Disagree continued ▼

3 Set VREF 30.

**Note:** VREF 30 + wind additive must not exceed the flap placard speed for flaps 40.

▶▶ **Go to step 6**

4 Plan to extend flaps to 15 using alternate flap extension.

**Note:** Alternate flap extension time to flaps 15 is approximately 2 minutes.

The drag penalty with the leading edge devices extended can make it impossible to reach an alternate field.

5 Set VREF 15.

**Note:** VREF 15 + wind additive must not exceed the flap placard speed for the next larger flap setting.

6 Check the Non-Normal Configuration Landing Distance table in the Advisory Information section of the Performance Inflight chapter.

7 **Checklist Complete Except Deferred Items**

**Deferred Items**

**Descent Checklist**

Pressurization . . . . . CAB ALT \_\_\_\_, LAND ALT \_\_\_\_

Recall . . . . . Checked

Autobrake . . . . . \_\_\_\_

Landing data . . . . . **VREF \_\_\_\_ as directed by checklist, Minimums \_\_\_\_**

▼ Continued on next page ▼





9.32



737 Flight Crew Operations Manual

▼ Trailing Edge Flap Disagree continued ▼

Approach briefing . . . . . Completed

**Approach Checklist**

Altimeters . . . . . \_\_\_\_\_

**Additional Deferred Item**

Choose one:

- ◆ Indicated flap position is **30 or greater**:
  - ▶▶ **Go to Landing Checklist below**
- ◆ Indicated flap position is **15 or greater and less than 30**:
  - GROUND PROXIMITY FLAP  
INHIBIT switch . . . . . FLAP INHIBIT
  - ▶▶ **Go to Landing Checklist below**
- ◆ Indicated flap position is **less than 15**:
  - GROUND PROXIMITY FLAP  
INHIBIT switch . . . . . FLAP INHIBIT
  - ▶▶ **Go to Alternate Flap Extension below**

**Alternate Flap Extension**

During flap extension, set the flap lever to the desired flap position.

▼ Continued on next page ▼

9.32

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

D6-27370-4Q8-LLD

September 15, 2022



737 Flight Crew Operations Manual

▼ Trailing Edge Flap Disagree continued ▼

230K maximum during alternate flap extension.

! ALTERNATE FLAPS master switch . . . . . ARM

**Note:** The landing gear configuration warning can sound if the flaps are between 10 and 15 and the landing gear are retracted.

**Note:** The amber LE FLAPS TRANSIT light stays illuminated until the flaps approach the flaps 10 position.

**Note:** Operation within the lower yellow airspeed band can be needed until the LE FLAPS TRANSIT light extinguishes.

If flap asymmetry occurs, release the switch immediately. There is no asymmetry protection.

! ALTERNATE FLAPS position switch . . . . . Hold DOWN to extend flaps to 15 on schedule

As flaps are extending, slow to respective maneuvering speed.

▼ Continued on next page ▼



9.34



737 Flight Crew Operations Manual

▼ Trailing Edge Flap Disagree continued ▼

Choose one:

- ◆ Trailing edge flaps asymmetry occurs:
  - ▶▶ **Go to the Trailing Edge Flap Asymmetry checklist on page 9.26**
  - ■ ■ ■
- ◆ Trailing edge flaps extend to **15**:
  - ▶▶ **Go to Landing Checklist below**
- ◆ Indicated flap position is **less than 1** after attempting alternate flap extension:
  - ▶▶ **Go to the Trailing Edge Flaps Up Landing checklist on page 9.36**
  - ■ ■ ■
- ◆ Indicated flap position is **1 or greater and less than 15** after attempting alternate flap extension:
  - Land using existing flaps.
  - Consider burning off fuel to reduce touchdown speed.
  - Set VREF 40 + 30 knots.
  - Check the Non-Normal Configuration Landing Distance table in the Advisory Information section of the Performance Inflight chapter.
  - ▶▶ **Go to Landing Checklist below**

▼ Continued on next page ▼

Boeing Proprietary. Copyright © Boeing. ECCN: 9E991. See title page for details.

9.34

D6-27370-4Q8-LLD

September 15, 2022



▼Trailing Edge Flap Disagree continued▼

**Landing Checklist**

- ENGINE START switches . . . . . CONT
- Speedbrake . . . . . ARMED
- Landing gear . . . . . Down
- Flaps. . . . . \_\_\_\_\_, **Green or amber light**

**Note:** The light may be green or amber depending on the failure.





## 1.7 Meteorological information

<b>DNAA</b>	<b>0800Z</b>	<b>0900Z</b>	<b>1000Z</b>
Wind	VRB/02 kt	130°/04 kt	080°/12 kt
Visibility	10 km	10 km	10 km
Weather	Nil	Nil	Nil
Cloud	NOSIG	NOSIG	NOSIG
Temperature/Dew point	29°C/15	33°C/14	35°C/10
QNH	1014	1014	1013

## 1.8 Aids to navigation

The status of the navigational aids at Nnamdi Azikiwe International Airport on the day of the occurrence was as follows:

"ABC" VOR/DME	116.3 MHz	- 'Serviceable'
"IAB" ILS/DME	109.3 MHz	- 'Serviceable'
"IAC" ILS/DME	111.9 MHz	- 'Serviceable'
Aerodrome Beacon		- 'Serviceable'
ALDIS Lamp		- 'Serviceable'
Airfield Lightening Panel System		- 'Unserviceable'
Panasonic Transceiver		- 'Serviceable'
Ground Control Surface Movement Monitor		- 'Serviceable'
Nav Heading Remote System Monitor		- 'Serviceable'
Binocular		- 'Serviceable'
ICOM Transceiver		- 'Serviceable'

## 1.9 Communication

Effective communication was maintained between the flight crew and DNAA Air Traffic Controllers on the day of the incident.

The status of the communication equipment at Nnamdi Azikiwe International Airport on the day of the occurrence was as follows:

VHF 118.6 MHZ Tower Main Frequency	- 'Serviceable'
------------------------------------	-----------------



VHF 118.7 MHZ Tower Secondary Frequency	- 'Serviceable '
VHF 127.9 MHZ App/Radar Main Frequency	- 'Serviceable '
VHF 119.8 MHZ App/Radar Secondary Frequency	- 'Serviceable '
VHF 121.9 MHZ Ground Control Frequency	- 'Serviceable'
VHF 121.7 MHZ Domestic Frequency	- 'Serviceable'
VHF 127.05 MHZ ATIS Frequency	- 'Serviceable'
VHF 121.5 MHZ Emergency Frequency	- 'Serviceable '
Frequentis Smart strip Backup Main	- 'Serviceable'
Frequentis Smart strip Backup	- 'Unserviceable'
Techno Mobile Phone	- 'Unserviceable'

### 1.10 Aerodrome information

Nnamdi Azikiwe International Airport, Abuja (DNAA) has aerodrome reference points 09°000'25"N, 07°15'47"E and an elevation of 1123 ft (342 m). The aerodrome has a single runway with orientation 04/22. The runway has an asphalt/concrete surface length of 3610 m and a width of 60 m with a blast pad of 65 m at both ends.

### 1.11 Flight recorders

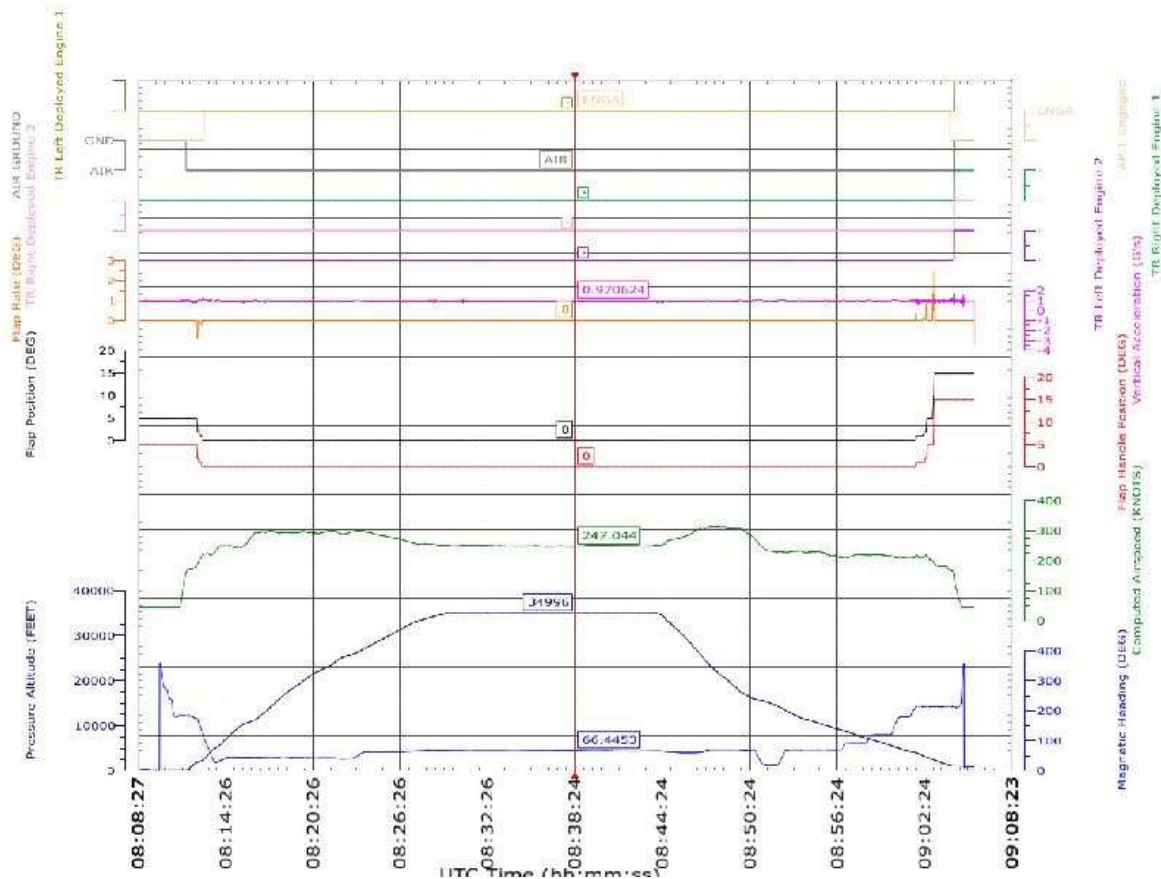
The aircraft is fitted with Solid State Flight Data Recorder (FDR) and Solid State Cockpit Voice Recorder (CVR) with the following particulars:

Recorders	Flight Data Recorder	Cockpit Voice Recorder
Manufacturer	L3 Communications, USA	Universal Avionics, USA
Model	FA2100	SSCVR
Part Number	2100-4043-00	1603-02-12
Serial Number	000521556	2446



The FDR and CVR were retrieved and downloaded at the Flight Safety Laboratory of the Nigerian Safety Investigation Bureau (NSIB) in Abuja, Nigeria.

**1.11.1 Flight Data Recorder (FDR)**



**Figure 2:** Relevant flight parameters for AJK 206

The table below summarizes relevant flight parameters for the aircraft during the approach.

Parameter	3100 ft (PA)	2600 ft (PA)	2150 ft (PA)	Touchdown
Computed Air Speed (kts)	217.73	206.968	182.5	157.31
Flap Position	1.8°	4.92°	14.94°	14.94°
Flap handle position	1.33°	5°	15°	15°
Localiser Deviation	-0.02	-0.11	-0.08	0.06
Glideslope Deviation	-0.113	-0.087	-0.02	-



Rate of Descent	Not available	Not available	Not available	Not available
Spoilers	Not Available	Not available	Not available	Not available
Thrust Reversers	-	-	-	-
DME Distance	6.41	4.62	3.05	-
Pitch	1.5	1.91	1.32	2.43
Roll	-0.007	-1.75	-1.60	1.24
Magnetic Heading	213.75	213.12	213.39	212.69

**Table 1:** Flight parameters for the aircraft during the approach.

Thrust reversers and spoilers were deployed after the touchdown.

The table below summarizes the FDR records of the aircraft Landing Flap configuration from 01 November 2024 to the day of occurrence. A total of 101 landings were performed out of which 85 landings were performed with Landing Flap 15 configuration.

S/N	Flap 15 landings	Flap 25 landings	Flap 30 landing
1		1	
2	4	2	
3	4		
4	1		
5	2		
6	4		
7	3		
8	3		
9	3		
10	1		
11	1		
12	2		





13	3		
14	3		
15	3		
16	2		
17	2		
18	2		
19	1		
20	3		
21	7		
22	3		
23	8		
24	3	3	
25	6		
26	1		
27	1	3	
28		2	
29	1	1	
30	4	4	
31	4		
Total landings	Total flap 15		
101	85		
	The percentage of flap15 is 85.85%		

**Table 2:** FDR Records of the aircraft Landing Flap configuration from 01 November 2024 to the day of occurrence



### 1.11.2 Cockpit Voice Recorder (CVR)

Based on the information collected from Cockpit Voice Recorder (CVR), the Investigation identified the sequence of events preceding the occurrence. The time reference utilized is local time.

**TRANSCRIPT**

	ATC	ALPHA JULIET KILO TWO ZERO SIX POSITION ONE SEVEN MILES NORTH OF THE FIELD TURN LEFT HEAD TO THE RIGHT CORRECTION TURN RIGHT HEADING ONE EIGHT ZERO CLEARED ILS APPROACH RUNWAY TWO TWO	Radio
	P1	RIGHT HEADING ONE EIGHT ZERO CLEARED ILS RUNWAY TWO TWO ALPHA JULIET KILO TWO ZERO SIX	Radio
	P1	DON'T ** STANDBY	Internal
	P1	LETS CAPTURE BEFORE WE TAKE FLAPS.. LETS CAPTURE THE LOCALIZER	Internal
	ATC	ALPHA JULIET KILO TWO ZERO SIX TEN MILES TOUCH DOWN RUNWAY TWO TWO CONTACT TOWER ONE ONE EIGHT DECIMAL SIX	Radio
	P1	TOWER ONE ONE EIGHT SIX ALPHA JULIET KILO TWO ZERO SIX	Radio
	P2	FLAPS ONE	Internal
	P1	FLAPS ONE	Internal
	P1	ABUJA TOWER ALPHA JULIET KILO TWO ZERO SIX GOOD MORNING ** EIGHT MILES ILS RUNWAY TWO TWO	Radio
	ATC	ALPHA JULIET KILO TWO ZERO SIX CONTINUE APPROACH NUMBER ONE TRAFFIC ECHO ONE NINE ZERO SHORT TO LAND ADDITIONAL TRAFFIC C R J 9 LINING UP FOR DEPARTURE REDUCE TO MINIMUM REPORT FOUR MILES	Radio
	P1	OKAY CONTINUE APPROACH	Radio
	P1	GEAR DOWN	Internal
	P2	** AGAIN	Internal
	P1	ONE WAN LAND ONE WAN TAKEOFF.. AND WE GET HIGHER SPEED FLAPS FIFTEEN LANDING ** I NO KNOW O.. ARE YOU GOU TO TELL..	Internal
	P2	TELL AM MAKE WE **	Internal
	P2	WE ARE HIGH SPEED MAKE WE **	Internal
	P1	YEAH I WILL I WILL TELL AM	Internal
	P2	WE ARE THREE MILES OUT	Internal
	P1	ABUJA BAMBI TWO ZERO SIX WE MIGHT NOT BE ABLE TO ACCOMMODATE THE DEPARTURE TRAFFIC MAY WE LAND IMMEDIATELY AFTER THE LANDING TRAFFIC	Radio
	ATC	ALPHA JULIET KILO TWO ZERO SIX CONTINUE APPROACH CLEARED FOR LANDING	Radio
	P1	COPIED CONTINUE APPROACH	Radio
	P2	FLAPS THIRTY NO WORK	Internal
	P1	E NO GO	Internal



**TRANSCRIPT**

	P1	POINT SIX MILES FINAL ALPHA JULIET KILO TWO ZERO SIX	Radio
	ATC	LAND AFTER	Radio
		[SOUND OF AUTOPILOT DISENGAGING]	Internal
	P1	CONFIRM CLEARED TO LAND	Radio
	ATC	AFTER.. CLEARED TO LAND RUNWAY TWO TWO	Radio
	P1	CLEARED TO LAND	Radio
	P1	PUSH IT DOWN	Internal
		[SOUND OF IMPACT] WHATS THAT WHATS THAT	Internal
		[SOUND OF FIRE WARNING ]	Internal
		[SOUND OF LANDING GEAR HORN]	Internal
	P2	LETS SHUT DOWN THE ENGINE SHUT DOWN THE ENGINE	Internal
	P2	CAPTAIN SHUT DOWN ENGINE	Internal
	P2	WE SHOULD HAVE JUST GONE ROUND	Internal
	Comment	[End of Recording]	None

**1.12 Wreckage and impact information**

The aircraft landed right of the centreline of Runway 22, 501 m from the threshold, travelled 120m, and was corrected back to the centreline. Marks on the runway surface indicated that during this process, the aircraft performed an S-pattern/ground loop that extended over 140 m.

The aircraft continued the Landing Roll for 917 m from the Threshold of Runway 22, where the Right Main Landing Gear Assembly detached from its attachment points. The detached landing gear assembly was found on the grass verge right of Runway 22 at about 38 m from the runway centreline.

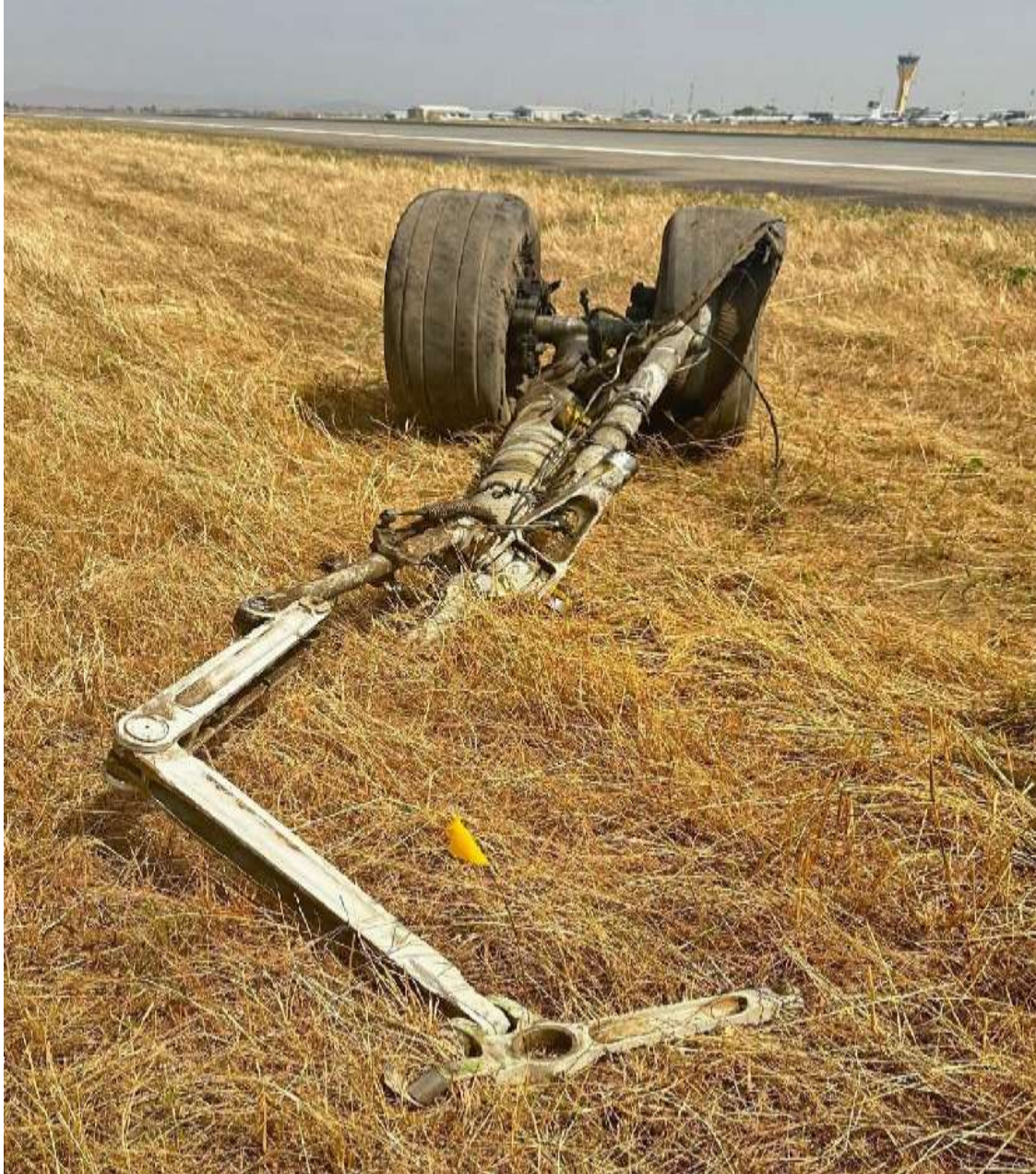
The aircraft continued its Landing Roll, with the underside of Engine number 2 Nacelle dragging on the runway for 1172 m before it veered off to the right of the runway, traversed the grass verge, and came to a stop about 54 m from the Runway Edge and 74 m from the Runway Centerline at a Heading of 170°.



**Figure 3:** Area view of DNAA showing the distance the aircraft moved.

The following damage was observed:

1. The Right Main Landing Gear sheared off from its attachment point
2. The No.3 and No.4 Main wheel tyres burst
3. Dents/damage was observed on the No.2 Engine Nacelle.
4. Portions of the lower section of the Right Wing was damaged.



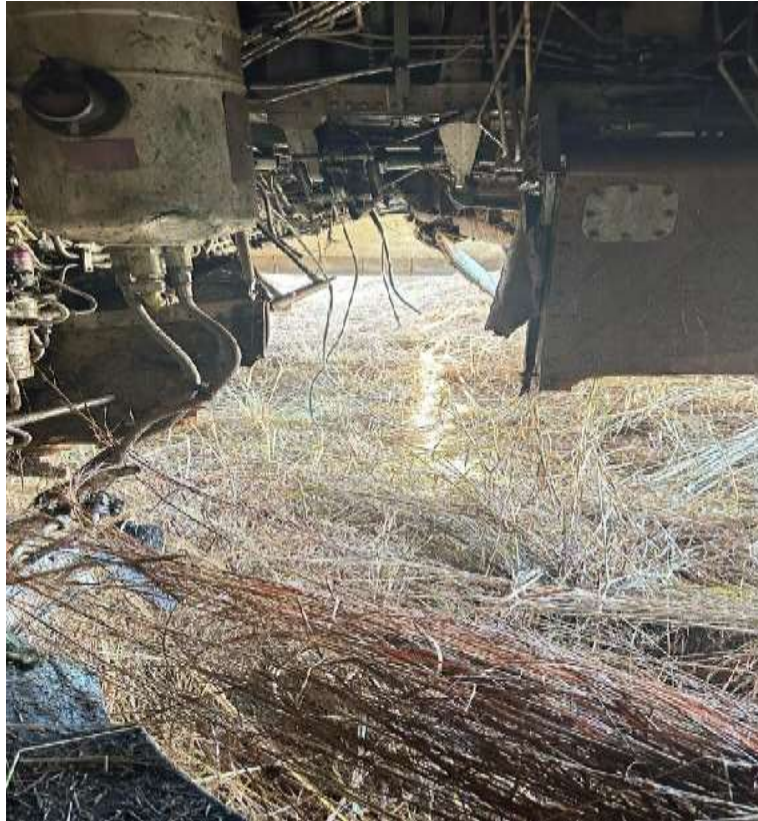
**Figure 4:** Detached Right Main Landing Gear found on the grass verge to the right of Runway 22



**Figure 5:** Point of attachment of the Right Main Landing Gear



**Figure 6:** The Joint on the aircraft where the Right Main Landing Gear sheared off



**Figure 7:** Landing Gear Wheel Well showing the position of the sheared-off Main Landing Gear



**Figure 8:** Damaged Right Main Wheel Tyres



**Figure 9:** Damaged No.4 Main Wheel Assembly



**Figure 10:** Damaged No.3 Main Wheel Assembly





**Figure 11:** Dents/damage on the No.2 Engine Cowl



**Figure 12:** Damage to the lower section of the right-wing



**Figure 13:** Scratch marks on runway surface



**Figure 14:** Multiple scratch marks on the runway surface



### **1.13 Medical and pathological information**

The post-occurrence medical examination was conducted on the flight crew at 063 NAF Hospital Abuja on 11 December 2024 at 12:15 h. The urine samples tested negative for all the drugs tested.

### **1.14 Fire**

There was no fire.

### **1.15 Survival aspect**

The accident was survivable because the structural integrity of the cabin and cockpit was not compromised. There was no fire after the occurrence, and the seat and seat belt harnesses were intact. The occupants evacuated through the aircraft's forward main entry door.

### **1.16 Test and Research**

Not applicable



## **1.17 Organisation and management information**

### **1.17.1 Allied Air Limited**

Allied Air Limited was established in 1998 and issued an Air Operator Certificate (AOC) with the number AAL/AOC/07-13/003, valid until 30 July 2026.

Allied Air is a [cargo airline](#) based in [Lagos, Nigeria](#). It operates scheduled and charter services in Nigeria and throughout [Africa](#). Its main base is [Murtala Mohammed International Airport, Lagos](#).

Key scheduled destinations include [Accra](#), [Freetown](#), [Monrovia](#), [Entebbe](#), and [Malabo](#). It also has regular services to [Liege](#).

The Allied Air fleet consists of two Boeing 737-400F and one Boeing 737-800F.

### **1.17.2 Nigeria Civil Aviation Authority**

*Per Section 8 (3) of the Civil Aviation Act 2022, The Nigeria Civil Aviation Authority (NCAA) is Nigeria's sole civil aviation regulatory body, notwithstanding anything contained in any other law.*

*It became autonomous with the passing into law of the Civil Aviation Act 2022 by the National Assembly and its assent by the President of the Federal Republic of Nigeria. The Act not only empowers the Authority to regulate Aviation Safety without political interference but also to carry out oversight functions of Airports, Airspace, Meteorological Services, etc., as well as economic regulations of the industry.*

*The NCAA uses well-coordinated procedures and rules to ensure safety and economic regulatory standards in the aviation industry, including Inspection, Operation, Certification, Licensing, Monitoring, Sanctions, and Enforcement.*



*Currently, the country has about 31 airports. There are about 39 AOC holders (for scheduled and non-scheduled flight operations), and about 28 foreign airlines operate in Nigeria.*

*Going by the Licence Crew Data for Total Current (With Valid License) as of April 2024: License Pilots, 2,049; Certification of validation for Pilots, 63; Aircraft Maintenance Engineer's Licence, 2,061; Aircraft Maintenance Engineer's Licence with validation, 102; Aircraft Dispatchers' Licence, 840; Air Traffic Controllers (ATC), 420; Cabin Crew Licence, 3,770; Air Traffic Safety Electronic Personnel Licence, 443; and Aeronautical Station Operators' Licence, 161.*



## 2.0 FINDINGS

1. The flight crew held valid, current Licence and were qualified to conduct the flight.
2. The aircraft had a valid Certificate of Airworthiness.
3. The aircraft came in from Doula, Cameroon, on the day of the occurrence.
4. There were no snags logged in the aircraft technical logbook.
5. The flight was a cargo revenue flight.
6. The aircraft was scheduled for six sectors: Lagos-Abuja, Abuja-Sokoto, Sokoto-Abuja, Abuja-Yola, Yola-Abuja, and Abuja-Lagos. The same flight crew would operate the flights.
7. The accident occurred in the first sector, and there was no cargo on the flight.
8. The flight crew stated that during the Final Approach, flap 30 was selected, but the flaps did not move to the commanded position; they stopped at flap 15.
9. The flight crew reported hearing a bang from the aircraft's right side as the wheels touched down on the runway surface. The aircraft collapsed to the right when the crew attempted to maintain directional control.
10. The Right Main Landing Gear Assembly detached from the aircraft, and as the landing roll continued, the Engine number 2 nacelle dragged on the runway surface until the aircraft veered off to the right of runway 22 centerline and came to a stop on the grass verge.
11. After landing, debris was observed falling from the rear side of the aircraft's undercarriage.
12. The Abuja Tower immediately alerted Aerodrome Rescue and Fire Fighting Services (ARFFS) of the occurrence.
13. The No.3 and No.4 Main Wheel Tyres bust.
14. The post-occurrence inspection did not reveal evidence of a Hard Landing.
15. The FDR data indicated that from 01 November 2024 to the day of occurrence, the aircraft had performed a total of 101 landings out of which 85 were flap 15 landings.



## **3.0 Immediate Safety Recommendation**

### **3.1 Safety Recommendation 2025-001**

Nigeria Civil Aviation Authority should inspect all Allied Air aircraft for potential mechanical and structural vulnerabilities, including Flap and Landing Gear Systems.

#### **Further Investigation**

1. Detailed inspection and examination of the Right Main Landing Gear Assembly
2. Test and inspect the flap drive system components, including the transmission assemblies (transmission gearboxes, universal joints, ball nuts, flap tracks, jackscrew actuators, etc.)
3. Further inspection and testing of the aircraft Main Wheel Tyres