



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

# **PRELIMINARY**

**KNKT 22.10.15.04**

**Aircraft Accident Investigation Report**

**PT Reven Global Airtranspor  
Cessna Caravan 208 B; PK-RVA**

**Ilaga, Papua**

**Republic of Indonesia**

**25 October 2022**

**2022**

This Preliminary Report is published by the Komite Nasional Keselamatan Transportasi (KNKT), Transportation Building, 3rd Floor, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, Indonesia.

The report is based upon the investigation carried out by the KNKT in accordance with Annex 13 to the Convention on International Civil Aviation, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

The preliminary report consists of factual information collected until the preliminary report published. This report will not include analysis and conclusion.

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Jakarta, 27 December 2022

**KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI  
CHAIRMAN**



**SOERJANTO TJAHHJONO**

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## ABBREVIATIONS AND DEFINITIONS

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AME	:	Aircraft Maintenance Engineer
AMM	:	Aircraft Maintenance Manual
AOC	:	Air Operator Certificate
CASR	:	Civil Aviation Safety Regulation
CPL	:	Commercial Pilot License
DGCA	:	Directorate General of Civil Aviation
GPS	:	Global Positioning System
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> (is the Indonesia Independent Investigation Authority also known as National Transportation Safety Committee/NTSC)
LT	:	Local Time
OM	:	Operation Manual
PIC	:	Pilot in Command
PF	:	Pilot Flying
PM	:	Pilot Monitoring
SIC	:	Second in Command
SD	:	Secure Digital
TIBA	:	Traffic Information Broadcast by Aircraft
VFR	:	Visual Flight Rules

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## SYNOPSIS

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On 25 October 2022 a Cessna C208B aircraft, registration PK-RVA was being operated by PT. Reven Global Airtransport (RGA) for an unscheduled cargo flight.

During flight preparation in Timika, the engineer informed the pilot to perform brake burned in after replacement right brake lining backplate without detail instruction or guidance on how to perform. The pilot applied light braking several times while taxiing then continued the flight Timika – Ilaga – Timika.

After landed in Timika, the pilot reported to the engineer that right brake pedal was spongy compare to the left side. The engineer suggested this condition commonly occurs after replacement of brake lining and the brake pedal pressure will be equal after several burned-in or brake usage. No maintenance action taken by the engineer.

The aircraft departed from Timika at 2348 UTC (0848 LT) and cruised at altitude of 13,000 feet. On board on this flight were 2 pilots and cargo consisted of six motorcycles and some groceries. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM).

During the descent passing about 8,700 feet, the pilot contacted the airport personnel to report the position. The airport personnel informed the pilot that the weather at Ilaga was clear.

About 0913 LT, the aircraft landed within the touchdown zone of Runway 25. The pilot applied brake and the pilot felt the aircraft tend to veered to the left. The pilot recovered by released pedal brake and apply right rudder to turn the aircraft to the apron.

The aircraft continued to roll to the end of the runway and impact to the runway barrier and stopped about 75 meters from the end of Runway 25. The pilot shut down the engine then evacuated the aircraft. No person was injured in this occurrence.

At the time of issuing this investigation report, the KNKT had been informed of safety actions resulting from this occurrence taken by the helicopter operator. However there still safety issues remain to be considered, therefore, the KNKT issued safety recommendations to the aircraft operator.

The investigation is continuing, should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

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# 1 FACTUAL INFORMATION

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## 1.1 History of the Flight

On 25 October 2022 a Cessna C208B aircraft, registration PK-RVA was being operated by PT. Reven Global Airtranspor (RGA) for an unscheduled cargo flight. The flight plan of the day for the aircraft and the pilots were from Timika<sup>1</sup>-Ilaga<sup>2</sup>-Timika-Ilaga-Timika-Ilaga-Timika-Sinak<sup>3</sup>-Timika. The flights were conducted in accordance with Visual Flight Rules.

The occurrence flight was the third flight of the day for the pilots which was from Timika to Ilaga. The aircraft departed from Timika at 2348 UTC<sup>4</sup> (0848 LT) and cruised at altitude of 13,000 feet. On board on this flight were 2 pilots and cargo consisted of six motorcycles and some groceries. The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM).

During the descent passing about 8,700 feet, the pilot contacted the airport personnel to report the position. The airport personnel informed the pilot that the weather at Ilaga was clear. Afterward, the pilot performed approach briefing and the approach checklist.

At the final approach, the pilot noticed that the airspeed indicated 83 knots and the tailwind indicated about 3 knots. There was no traffic on the ground and the runway was clear.

About 0913 LT, the aircraft landed within the touchdown zone of Runway 25. The pilot applied brake and the pilot felt the aircraft tend to veered to the left. The pilot recovered by released pedal brake and apply right rudder to turn the aircraft to the apron.

The aircraft continued to roll to the end of the runway and impact to the runway barrier and stopped about 75 meters from the end of Runway 25. The pilot shut down the engine then evacuated the aircraft. No person was injured in this occurrence.

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<sup>1</sup> Timika in this report is referred to Mozes Kilangin Airport, Timika (WAYY), Papua.

<sup>2</sup> Ilaga in this report is referred to Aminggaru Ilaga Airport, (WAYL), Papua.

<sup>3</sup> Sinak in this report is referred to Sinak Airport, (WABS), Papua.

<sup>4</sup> The 24-hours clock in Local Time (LT) is used in this report to describe the local time as specific events occurred. Local time is Universal Time Coordinated (UTC) +9 hours

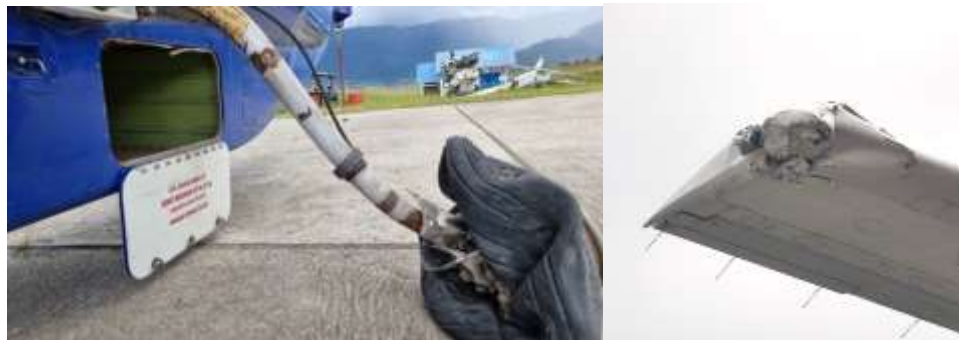


## 1.2 Damage to Aircraft

The aircraft was substantially damaged. The propeller blades number 2 and 3 were bent. The left landing gear strut bent and the tire deflated. The right wingtip was dent. The nose wheel strut broken and the nose wheel detached.



**Figure 1.1 Damage to the Aircraft propeller and nose wheel strut detached**



**Figure 1.2 Damage to the left gear and right wingtip**

## 1.3 Other Damage

There was no other damage to property and or the environment.

## 1.4 Personnel Information

### 1.4.1 Pilot in Command

Gender	: Male
Age	: 22 years
Nationality	: Indonesia
Date of joining company	: 1 October 2019
License	: CPL
Date of issue	: 25 March 2019
Aircraft type rating	: Cessna Grand Caravan C208B

Instrument rating validity : 12 February 2019  
Medical certificate : First Class  
    Last of medical : 1 July 2022  
    Validity : 1 January 2023  
    Medical limitation : Holder shall wear corrective lenses  
Last line check : 2 September 2022  
Last proficiency check : 23 October 2021

**Flying experience**

Total hours : 1,506 hours  
Total on type : 1,493 hours  
Last 90 days : 192 hours 38 minutes  
Last 60 days : 133 hours 10 minutes  
Last 30 days : 34 hours 50 minutes  
Last 24 hours : 6 hours and 35 minutes  
This flight : 35 minutes

**1.4.2 Second in Command**

Gender : Male  
Age : 26 years  
Nationality : Indonesia  
Date of joining company : 1 December 2021  
License : CPL  
    Date of issue : 25 March 2019  
    Aircraft type rating : Cessna Grand Caravan C208B  
Instrument rating validity : 11 November 2017  
Medical certificate : First Class  
    Last of medical : 19 May 2022  
    Validity : 7 December 2022  
    Medical limitation : None  
Last line check : 25 March 2022  
Last proficiency check : 28 March 2022

**Flying experience**

Total hours : 1,112 hours

Total on type	: 1,112 hours
Last 90 days	: 119 hours 11 minutes
Last 60 days	: 62 hours 32 minutes
Last 30 days	: 23 jam 55 minutes
Last 24 hours	: 6 hours 35 minutes
This flight	: 35 minutes

### 1.4.3 Engineer

The engineer was 30 years, Indonesian nationality. The engineer had about 10 years experience as aircraft maintenance personnel (aircraft mechanic). On November 2021, the engineer certified as basic aircraft maintenance for airframe and powerplant (A1 and A4). Since 29 March 2022, the engineer held Aircraft Maintenance Engineer (AME) Licence and received company authorization since 1 August 2022. The engineer has a type rating Cessna 208 series and PT6 engine.

## 1.5 Aircraft Information

### 1.5.1 General

Registration Mark	: PK-RVA
Manufacturer	: Textron Aviation Inc.
Country of Manufacturer	: United States of America
Type/Model	: Cessna Caravan 208B
Serial Number	: 208B2255
Year of Manufacture	: 2010

### Certificate of Airworthiness

Date of issue	: 29 September 2022
Validity	: 28 September 2023
Category	: Normal
Limitation	: None

### Certificate of Registration

Number	: 4272
Date of issue	: 29 September 2020
Validity	: 28 September 2023
Time Since New	: 11,846,1 hours
Cycles Since New	: 21,057 cycles
Last Major Check	: 11,798,9 hours

Last Minor Check : 11,798,9 hours

### 1.5.2 Engines

Manufacturer : Pratt & Whitney Canada  
Type/Model : PT6A-114  
Serial Number engine : PCE-PC2368  
Time Since New : 2,674 hours 5 minutes  
Cycle Since New : 4,722 cycles

### 1.5.3 Propellers

Manufacturer : McCauley Textron  
Type/Model : P7036368-0154  
Serial Number propeller : 101002  
Time Since New : 12,221 hours 7 minutes

### 1.5.4 Recent Maintenance History

On 24 October 2022, during post-flight inspection, the engineer found that the right wheel brake lining backplate was out of limit and hydraulic fluid leak found on the brake cylinder. The brake lining and O-ring piston were replaced.

After removal and installation process completed, the engineer performed bleeding on the right main wheel brake. To perform the bleeding, the engineer used a hand pump as hydraulic pressure source and was connected to the to the right brake wheel cylinder bleeder valve. The engineer open the bleeder valve and pumped the hydraulic fluid to the brake system until the fluid level on the reservoir indicator passed the MAX fill line.

Afterward the hand pump disconnected from cylinder bleeder valve with the bleeder valve remained in open position and hydraulic fluid drained until the fluid in the reservoir dropped to below the MAX fill line then the bleeder valve closed. The engineer pushed the brake pedal several times and inspect the right brake system to ensure no hydraulic leakage. There was no leakage found then the aircraft returned to service.

On 25 October 2022 during flight preparation in Timika, the engineer informed the pilot to perform brake burned in<sup>5</sup> without detail instruction or guidance on how to perform. The pilot applied light breaking several times while taxing then continued the flight Timika – Ilaga – Timika. After landed in Timika, the pilot reported to the engineer that right brake pedal was spongy compare to the left side. The engineer suggested this condition commonly occurs after replacement of brake lining and the

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<sup>5</sup> Brake burn-in is a method to helps transfer an even layer of brake pad material onto the brake rotor which assists in smoother brake operation and improved braking power by multiple application of brake.

brake pedal pressure will be equal after several burned-in or brake usage. No maintenance action taken by the engineer.

### **1.5.5 Brake Replacement Procedure**

The aircraft manufacturer provided the procedure of brake replacement in the Aircraft Maintenance Manual chapter 32-40-00 which is described as follows:

#### ***Brake Assembly Removal/Installation***

*A. Remove the Brake Assembly (Refer to Figure 202).*

- (1) Without applying brakes, pull parking brake handle to the ON position (fully out).*
- (2) Disconnect brake line at brake cylinder and allow fluid to drain from brake line.*
- (3) Remove backplate bolt's and backplate's.*
- (4) Slide brake cylinder assembly off torque plate.*

*B. Install the Brake Assembly (Refer to Figure 202).*

- (1) Install pressure plate over anchor bolts.*

*CAUTION: Do not use a liquid lubricant on the anchor bolts or torque plate bushings. Liquid lubricant can attract dirt and moisture that can cause the accelerated wear or corrosion of the components.*

- (2) Lubricate the anchor bolts and torque plate bushings with the following:*

- (a) For non-amphibious environments, use Silicone Spray, Dri-Slide® Multi-Purpose Lubricant or LPS Force 842® Dry Moly Lubricant (equivalent substitutes are permitted).*
- (b) For amphibious environments, use Lubriplate X-357 Extreme Pressure Moly Lubricant (equivalent substitutes are permitted).*

- (3) Purge any air from the brake assembly before installation on the torque plate.*

- (4) Slide brake cylinder assembly onto torque plate.*

- (5) With shim positioned against backplate's, install backplate bolts and torque from 85 to 90 inch-pounds (9.6 to 10.2 N.m).*

*NOTE: Backplate bolts incorporate a special self- locking feature and are typically good for approximately four to six reuses. If backplate bolt can be fully engaged into the backplate by hand with no resistance, the self-locking feature of backplate bolt has been destroyed and the backplate bolt should be rejected. Replacement bolts can be ordered from Cessna Parts Distribution.*

- (6) Connect brake line at wheel cylinder fitting.*

- (7) Push parking brake handle to the off position (fully in).*

- (8) Bleed brake system. Refer to Brake System Bleeding.*

- (9) Do the Operational Check of the Brakes. Refer to Chapter 32-40-00, Wheels and Brakes - Inspection/Check, Brakes Operational Check.*

### **1.5.6 Brake Bleeding Procedure**

The Cessna 208B Maintenance Manual, Chapter 32-40-00 (Revision 37), described the procedure for brake system bleeding as follows:

*NOTE: Anytime a brake line is disconnected or a spongy feel to the brake pedal is detected, there is a likelihood that air has entered the system. To make sure the proper braking action is gotten, all the trapped air must be removed from the system by the following procedures.*

*NOTE: Only use hydraulic fluid with MIL-H-5606 specifications.*

- (1) *Ensure the parking brake handle is off (fully in).*
- (2) *If installed, remove the wheel fairings.*
- (3) *Connect a hydraulic pressure source, such as a hand pump or Hydro Fill unit, to the right brake wheel cylinder bleeder valve.*
- (4) *Open the bleeder valve and begin pumping the hydraulic fluid into the system while observing fluid level in the brake system reservoir, located on lower left corner of the firewall in engine compartment.*
- (5) *When the reservoir is full, close the wheel-brake bleeder valve and remove pressure source.*
- (6) *Using a test syringe or equivalent, remove 90% of fluid from the reservoir.*
  - (a) *Make sure that the remaining fluid covers the outlet fitting in the base of the reservoir.*
- (7) *Connect a hydraulic pressure source to the left wheel-brake bleeder valve.*
- (8) *Open the left wheel-brake bleeder valve and pump hydraulic fluid into the system while you observe the fluid level in the brake system reservoir.*
- (9) *When the reservoir is full, close the left wheel-brake bleeder valve and remove the pressure source.*
- (10) *Make sure that the reservoir is filled to within 0.50 inch (12.70 mm) of the MAX fill line shown on the reservoir.*
- (11) *Torque each of the wheel-brake bleeder valves to 35-45 In-Lbs (3.96-5.08 N-m).*
- (12) *If installed, install the brake fairings.*

### **1.5.7 Brake Burn-In Procedure**

The relevant procedure for new brake burn-in provided in the AMM chapter 32-40-00 were as follows:

*For Airplanes 20800136 and On, 208B0103 and On, and All Spares.*

*NOTE: The brake pads are of a metallic composition and require the following break-in procedure.*

*(1) Perform two consecutive full stop braking applications from 30 to 35 knots.*

*CAUTION: Do not allow brake discs to cool substantially between stops. Use caution in performing this procedure, as higher speeds with successive stops could cause the brakes to overheat, resulting in warped discs and/or pressure plates.*

## **1.6 Weight and Balance**

According to the weight and balance sheet, the takeoff weight was 8,706 lbs of the maximum of 9,062 lbs. The landing weight was estimated at 8,507 lbs of the maximum of 9,000 lbs. The aircraft was operated within the weight and balance envelope.

## **1.7 Meteorological Information**

There was no meteorological station available at Ilaga, the pilot relied on visual observation by airport personnel or other pilot. The pilot noticed that weather along the route and the area around Ilaga Airport was clear.

The Bureau of Meteorology, Climatology, and Geophysics of Indonesia (*Badan Meteorologi Klimatologi dan Geofisika*) provide weather satellite image of the Papua area, which showed that at 2020 UTC (0520 LT) there was no indication of any cloud development surrounding the flight route, including the accident site.

## **1.8 Aids to Navigation**

The aircraft was fitted with a GPS (Global Positioning System) Garmin G1000, which has the capability to provide navigation data. The Garmin G1000 also records flight logs, which are stored on a Secure Digital (SD) card. The flight log has been downloaded successfully contained of several flight including occurrence flight.

The Reven Global Airtransport developed standard VFR routes in the Operation Manual Part C (OM-C), which included routes and detailed guidance on Ilaga that were used internally. The route guidance for Timika - Ilaga are shown in the figure below.



PT. Reven Global Airtranspor

# OPERATION MANUAL PART C

## CHAPTER 3 ROUTES GUIDANCE AND AIRPORTS / AIRSTRIPS INFORMATION

### 3.6.1.17 TIMIKA - ILAGA

#### ILAGA

S 03 58.61 || E 137 37.33

ILA || WAYL

November 2021

#### ROUTE GUIDANCE

SUN | N/A

WIND | 1000 AM

Airspace	G
Class	C3
Radius	122.25
Elevation	7500
Surface	Paved
Length	600 m
Width	33 m
TDZ Slope	2 %
AVG Slope	4 %
Key point	7700
Take-off	07
Landing	25
RFFS Level	0



Surface	Paved
Obstructions	Nil
Weather Pattern	Early morning fog common usually clearing by 08:00 am. Normally open until mid-afternoon, then closes with rain and cloud. Moderate turbulence and strong up or downdrafts develop.
Hazard	High altitude airstrip with tricky winds can make operations difficult. Illusions caused by airstrip sitting on a plateau.
Operating Minims	VFR only. Instrument approach procedures not available. Class G airspace VFR minimum apply. VFR runway takeoff and landing operating minimums apply.
Remarks	Nil.

#### DETAIL GUIDANCE

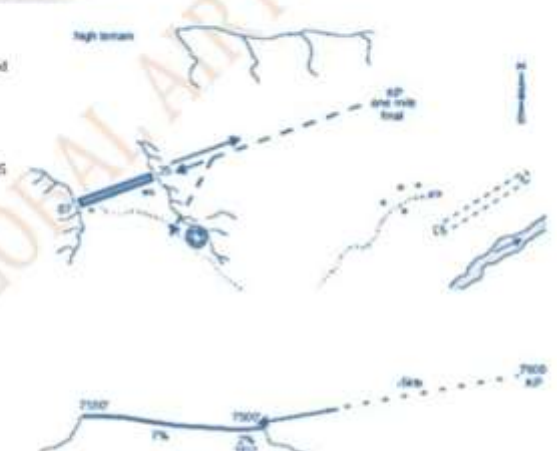
Altitude  
VMC 13000 ft.

Departure - **TIM**  
After takeoff follow ATC clearance continue climb to 13000 ft. proceed to ILA via **TEMBAGA**

**TIM - TEMBAGA - ILACUT - ILAPZ - ILA25 - WAYL**

Descent  
Visual only  
Descent leaving 13000 ft. proceed to OH ILA to join LH Pattern RW 25 ILA for landing.

Departure - **ILA**  
After takeoff continue climb to 12000 ft to TIM via **JILPZ**.  
**WAYL - JILPZ - ABJILA - TIM**



#### ABORTS

Landing  
200m final, left turn out around hill. Swerve to the right at upper end.

Takeoff  
50-100m into takeoff roll. Swerve into right ditch. **DO NOT** go off end.

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Figure 1.3 Routes guidance for Timika-Ilaga flight.



## **1.9 Communications**

The air traffic services in Ilaga for takeoff and landing was handled by Indonesian military personnel since AirNav Indonesia temporarily closed the air traffic services due to the security issues. All aircraft advise using Traffic Information Broadcast by Aircraft (TIBA).

## **1.10 Aerodrome Information**

Airport Name	:	Ilaga Airport
Airport Identification	:	WAYL/ ILA
Airport Operator	:	Directorate General of Civil Aviation (DGCA)
Coordinate	:	03° 58' 37.65" S; 137° 37' 12.59" E
Elevation	:	7,975 ft msl
Runway Direction	:	25/07
Runway Length	:	600 meters
Runway Width	:	18 meters
Surface	:	Asphalt

## **1.11 Flight Recorders**

The aircraft was not fitted with flight data recorder or cockpit voice recorder. Neither recorder was required by current Indonesian aviation regulations.

## **1.12 Wreckage and Impact Information**

The tyre mark of the aircraft during touch down and landing roll on the runway was not clearly visible. The last position of the aircraft is shown in the figure below.



**Figure 1.4 Aerial view of the PK-RVA at the accident site**

### **1.13 Medical and Pathological Information**

No medical or pathological examination were conducted as result of this occurrence, nor were they required.

### **1.14 Fire**

There was no evidence of in-flight or post-impact fire.

### **1.15 Survival Aspects**

After the aircraft stopped, the pilots evacuated by themselves from the aircraft.

### **1.16 Tests and Research**

Test and research information were not available at the time of the issuance of this preliminary report. Should any test or research information be obtained during this investigation that is relevance to this investigation will be included in the final report.

### **1.17 Organizational and Management Information**

#### **1.17.1 Aircraft Operator**

The aircraft was operated by PT Reven Global Airtranspor and had a valid Air Operator Certificate (AOC) number of 135-066. Under Civil Aviation Safety Regulation (CASR) Part 135, the operator was authorized by the Directorate General of Civil Aviation (DGCA) to conduct non-scheduled air transportation carrying passengers and cargo within Indonesia.

### **1.18 Additional Information**

The investigation is continuing and KNKT plans to complete the investigation within 12 months since the day of the occurrence. Should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

### **1.19 Useful or Effective Investigation Techniques**

The investigation was conducted in accordance with the KNKT approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

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## 2 FINDINGS

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The findings are statements of all significant conditions, events, or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal or indicate deficiencies. Some findings point out the conditions that pre-existed the accident sequence, but they are usually essential to the understanding of the occurrence, usually in chronological order.

In this occurrence, the KNKT identified several findings as follows:

1. Both pilots held valid licenses and medical certificates.
2. The aircraft had a valid Certificate of Airworthiness (C of A) and a valid Certificate of Registration (C of R) and was operated within the weight and balance envelope.
3. The engineer held a valid Aircraft Maintenance Engineer (AME) license with a type rating of Cessna 208 and PT6 engine.
4. On 24 October 2022, the right brake lining and O-ring piston were replaced. After removal and installation process completed, the engineer performed bleeding on the right main wheel brake.
5. The bleeding procedure conducted was different with the guidance provided on the aircraft maintenance manual.
6. On 25 October 2022 during flight preparation in Timika, the engineer informed the pilot to perform brake burned in without detail instruction or guidance on how to perform. The pilot applied light breaking several times while taxing.
7. After landed in Timika, the pilot reported to the engineer that right brake pedal was spongy compare to the left side. The engineer suggested this condition commonly occurs after replacement of brake lining and the brake pedal pressure will be equal after several burned-in or brake usage. No maintenance action taken by the engineer.
8. The aircraft landed within the touchdown zone of Runway 25. The pilot applied brake and felt the aircraft tend to veered to the left. The pilot recovered by released pedal brake and applied right rudder with intention to turn the aircraft to the apron.
9. The aircraft continued rolling to the end of the runway and impact to the runway barrier and stopped about 75 meters from the end of Runway 25.

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### **3 SAFETY ACTION**

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At the time of issuing this preliminary report, KNKT had been informed of any safety action taken by the Reven Global Airtransport were as follows:

1. On 27 October 2022 issued safety notice number 001/SQD/SN/X/2022 to recommend the Engineer to check all the landing gear area.
2. Perform recurrent type rating training on the Cessna Grand Caravan 208B for the engineer that released the PK-RGA aircraft.

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## **4 SAFETY RECOMMENDATIONS**

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The Komite Nasional Keselamatan Transportasi acknowledged the safety actions taken by Reven Global Airtranspor and considered that the safety actions were relevant to improve safety, however there still safety issues remain to be considered. Therefore, the KNKT issued safety recommendations to address safety issues identified in this report.

The safety recommendation in this investigation report is made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident.

### **4.1 Reven Global Airtranspor**

- **04.O-2022-15.1**

After replacement the brake lining and O-ring piston the engineer performed bleeding on the right main wheel brake, hereafter the pilot performed brake burn in as requested by the engineer. The bleeding and brake burn in procedure that were performed were different with the guidance provide on the aircraft maintenance manual. The use of incorrect procedure may allow deviation and unable ensure the replacement process has been performed correctly.

Therefore KNKT recommends to ensure the maintenance activities are conducted according to the correct procedure in the aircraft maintenance manual.

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