



Republic of the Philippines
DEPARTMENT OF TRANSPORTATION
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
MIA Road, Pasay City 1300

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-C 1975 **TECNAM P2002JF**

OPERATOR: WCC AVIATION COMPANY INC.

TYPE OF OPERATION: FLIGHT TRAINING

DATE OF OCCURRENCE: MARCH 18, 2023

***PLACE OF OCCURRENCE: VIGAN AIRPORT, BARANGAY MINDORO,
VIGAN, ILOCUS SUR, PHILIPPINES***

TABLE OF CONTENTS

(Tecnam P2022JF, RP-C1975 Final Report)

Description	Page
Title Page	i
Table of Contents	ii
Foreword	iii
Synopsis	iv
List of Acronyms and Abbreviation	v
1 Factual Information	1
1.1 History of Flight	1
1.2 Injuries to Person	2
1.3 Damage to Aircraft	2
1.4 Personnel Information	2
1.4.1 Flight Instructor	2
1.4.2 Pilot Trainee	3
1.5 Aircraft Information	3
1.5.1 Aircraft Data	3
1.5.2 Engine Data	3
1.5.3 Propeller Data	3
1.6 Meteorological Information	3
1.7 Aids to Navigation	4
1.8 Communications	4
1.9 Aerodrome Information	4
1.9.1 General Information	4
1.10 Flight Recorders	4
1.11 Wreckage and Impact Information	4
1.12 Medical & Pathological Information	4
1.13 Fire	4
1.14 Search and Survival Aspect	5
1.15 Test and Research	5
1.16 Organization and Management Information	5
1.16.1 Operator	5
1.17 Maintenance	5
2.0 Analysis	5
2.1 General	5
3.0 Conclusions	9
3.1 Findings	9
3.2. Probable Cause	9
4.0 Safety Recommendations	9
Signatories	10

FOREWORD

This report was produced by the Aircraft Accident Investigation and Inquiry Board (AAIIB), Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Philippines.

The report is based upon the investigation carried out by the AAIIB in accordance with Annex 13 to the Convention on International Civil Aviation, Republic Act 9497 Section 42, and Philippine Civil Aviation Regulation Part 13.

Readers are advised that the AAIIB investigates for the sole purpose of enhancing aviation safety. Consequently, AAIIB reports are confined to matters of safety significance and may be misleading if used for any other purpose. It should be noted that the information in AAIIB reports and recommendations is provided to promote aviation safety, and in no case is it intended to imply blame or liability.

Furthermore, no part of the AAIIB report or reports relating to any accident or investigation shall be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report or reports.



Republic of the Philippines
DEPARTMENT OF TRANSPORTATION
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
MIA Road, Pasay City 1300
www.caap.gov.ph

FINAL REPORT

TITLE: A serious incident involving a Tecnam P2002JF type of aircraft with Registry Number RP-C1975 owned and operated by WCC Aviation Company that experienced collapsed left main landing gear during landing at Vigan Airport, Barangay Mindoro, Vigan, Ilocus Sur, Philippines, on March 18, 2023/1150H

Notification of Occurrence to National Authority

The notification of serious incident to AAIIB CAAP was relayed by the Operator of the aircraft to the OIC AAIIB through the Operation Center CAAP at 1300H (LOCAL) on March 18, 2023.

Identification of the Investigation Authority

The Aircraft Accident Investigation and Inquiry Board (AAIIB), the mandated accident investigation organization within the Civil Aviation Authority of the Philippines (CAAP) as the state of Occurrence/Registry/ Operator conducted the investigation.

Organization of the Investigation

In accordance with provisions of Philippine Civil Aviation Regulation (PCAR) Part 13, an Investigator-In-Charge was appointed.

Authority Releasing the Report

The Final investigation report was released by Aircraft Accident Investigation and Inquiry Board (AAIIB) and published on the CAAP website on **15 June 2023.**

Synopsis:

On or about 1150H local time, March 18, 2023, a Tecnam P2002JF type of aircraft with Registry Number RP-C1975 operated by WCC Aviation Company sustained minor damage on its left Main Landing Gear (MLG) after landing at Vigan Airport, Vigan Ilocus Sur, Philippines. During landing roll after touched down approximately 550 meters from the threshold, the aircraft started to veer to the left. It came to a full stop with a heading of 160 degrees and grid coordinates of 17° 33' 16.9"N; 120° 21' 21" E. Both occupants evacuated the aircraft unhurt after performing engine shutdown. The Aircraft Accident Investigation and Inquiry Board determined that the cause factor of this serious incident was attributed to the MLG leaf spring being partially disconnected due to the failure of internal hex head bolt resulting to the collapse of the left main landing gear.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AMO	:	Approved Maintenance Organization
CPL	:	Commercial Pilot License
FI	:	Flight Instructor
MLG	:	Main Landing Gear
RWY	:	Runway
SP	:	Student Pilot
TSO	:	Time since Overhaul
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Condition



Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

1. FACTUAL INFORMATION

Aircraft Registration No. : RP- C1975

Aircraft Type/Model : Tecnam P2002JF

Operator : WCC Aviation Company Inc.

Address of Operator : 960 Aurora Blvd., Cubao, Quezon City,
Philippines

Place of Occurrence : Vigan Airport, Barangay Mindoro, Vigan, Ilocos
Sur, Philippines

Date/Time of Occurrence : March 18, 2023 at about 1150H/0350 UTC

Type of Operation : Flight Training

Phase of Flight : Landing

Type of Occurrence : Main gear - partial collapse

1.1 History of Flight

On or about 1150H local time, March 18, 2023, a Tecnam P2002JF type of aircraft with Registry Number RP-C1975 sustained minor damage on its left Main Landing Gear (MLG) after landing at Vigan Airport, Vigan Ilocos Sur, Philippines. The flight took off from Binalonan airfield on a navigational cross-country training flight bound for Vigan, Ilocos Sur, with a Flight Instructor (FI) and Student Pilot (SP) on-board. The aircraft is being operated by WCC Aviation Company under PCAR Part 3, Approved Training Organizations. Visual Meteorological Conditions (VMC) prevailed at the time of occurrence, and a local flight plan had been filed.

The flight was uneventful until touchdown at RWY 20 for a full stop landing. After touched down approximately 550 meters from the threshold of RWY 20 and during landing roll that the aircraft started to veer to the left. The Student Pilot (SP) said who is in the control applied right rudder to bring the aircraft back to the center of the runway. The FI also further said that while on landing roll, he noticed that the aircraft left wing was lower than the right wing. Immediately the FI took over the control from the SP as the aircraft continue to move towards the left of the runway for another 315 meters. It came to a full stop with a heading of 160 degrees and grid coordinates of 17° 33' 16.9" N; 120° 21' 21" E. The aerodrome duty personnel and others who observed the event proceeded to the site to assist and secure the aircraft. Both occupants evacuated the aircraft unhurt after performing engine shutdown.



Figure 1. Aircraft's final resting point

1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others	TOTAL
Missing/Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0
None	0	0	0	0

1.3 Damage to Aircraft

The aircraft sustained minor damage.

1.4 Personnel Information

1.4.1 Flight Instructor

Gender	: Male
Date of Birth	: April 01, 1997
Nationality	: Filipino
License	: 130452 CPL/FI
Valid up to	: February 28, 2024
Type rating	: Single Engine Land-P2002 JF
Medical Certificate Valid up to	: 07 March 2023
Time on Aircraft	: 150+00 Hours as per Pilot logbook
Grand Total time	: 350+00 Hours as per Pilot logbook

1.4.2 Pilot Trainee

Gender	: Female
Date of Birth	: March 09, 2002
Nationality	: Filipino
License	: 152159 SPL
Valid up to	: June 24, 2023
Type rating	: Single Engine Land- C-152, P2002 JF
Medical Certificate Valid up to	: June 24, 2023
Time on Aircraft	: 25 Hours as per Pilot logbook
Grand Total time	: 25 Hours as per Pilot logbook

1.5 Aircraft Information

1.5.1 Aircraft Data

Registration Mark	: RP-C1975
Manufacturer	: Costrozioni Aeronautiche Tecnam
Type/Model	: P2002JF
Serial Number	: 243
Date of Manufactured	: 2014
Airframe Total Time	: 4,473+57 Hours
Certificate of Airworthiness	: Valid until August 16, 2023
Certificate of Registration	: Valid until February 17, 2026
Number of Aircrew	: 2

1.5.2 Engine Data

Manufacturer	: BRP Rotax
Type/Model	: 912 S2-01
Engine Serial Number	: 9563798
Time Since New	: 477+44 Hours

1.5.3 Propeller Data

Manufacturer	: HOFFMANN
Type/Model	: HO17GHM-A-174-177C
Propeller SN#	: 8127
Propeller total time	: 1,879+04 Hours

1.6 Meteorological Information

Visual Meteorological Conditions (VMC) prevailed at the time of the incident.

1.7 Aids to Navigation

The flight was carried out under Visual Flight Rules (VFR). Using VFR, the pilot must be able to operate the aircraft with visual references to the ground and visually avoiding obstructions and other aircraft.

1.8 Communications

The aircraft is equipped with a radio transceiver tuned at 122.90 Mhz. Communications were carried out between the pilot and other aircraft within the area.

1.9 Aerodrome Information

1.9.1 General Information

Aerodrome Name	: RPUQ - Vigan Community Airport
Aerodrome Operator Address	: Civil Aviation Authority of the Philippines, Vigan Airport, Vigan Ilocos Sur, 2700
Coordinates	: 173314N 1202105E
Azimuth	: RWY 02/20
Runway Length	: 1165 meters Concrete Pavement
Runway Width	: 30 meters Concrete Pavement
Runway Surface	: Concrete

1.10 Flight Recorders

The aircraft is not equipped with any flight recorders and existing Philippine Civil Aviation Regulation does not require it.

1.11 Wreckage and Impact Information

The damage was limited to the left main landing gear.

1.12 Medical and Pathological Information

The crew were subjected to medical and drug test after the occurrence with no significant findings. They also had undergone the post-accident medical examination conducted by the Office of the Flight Surgeon and Aviation Medicine (OFSAM). There was no medical impediment on both pilots that could have had a bearing on this incident.

1.13 Fire

No evidence of post impact fire was noted during on-site investigation as a result of the incident.

1.14 Search and Survival Aspects

The pilots egress safely on their own after performing engine shutdown.

1.15 Test and Research

On March 19, 2023, a MLG teardown and inspection on RP-C1975 was performed by the Operator's AMO and witnessed by AAIIB investigator. The MLG inspection was conducted to determine any malfunction or failure that might cause the incident.

1.16 Organization and Management Information

1.16.1 Operator

The RP-C 1975 is being operated and maintained by WCC Aviation Company with official address at 960 Aurora Boulevard, Cubao, Quezon City. It operates Six (6) Cessna C152, two (2) Cessna C172, four (4) Tecnam P2002 JF, two (2) Tecnam P2006T. WCC Company is also engaged in other aviation related activities such as:

1. WCC Pilot Academy (Flight School)
2. WCC Aeronautical and Technological College
3. WCC Flight Attendant School
4. WCC Repair Station
5. Sky Pasada
6. Binalonan Airfield

1.7 Maintenance

The maintenance functions of RP-C1975 is undertaken by WCC Aviation Company Repair Station with official address at Binalonan Airfield, Barangay Linmansangan, Binalonan, Pangasinan 2436 with a current Approved Maintenance Organization (AMO) Certificate number 76-09.

2.0 ANALYSIS

2.1 General

In the course of the investigation, the Student Pilot (SP) in the control revealed that the aircraft touched down approximately 550 meters from the threshold of RWY 20. It was during landing roll that the aircraft started to veer towards the left. She then applied right rudder to bring the aircraft back to the center of the runway.

The FI further said that while on landing roll, he noticed that the aircraft left wing was lower than the right wing. Immediately he took over the control from the SP as the aircraft continue to move towards the left of the runway for another 315 meters. It came to a full stop with a heading of 160 degrees and grid coordinates of 17° 33' 16.9" N; 120° 21' 21" E.

A teardown inspection on RP-C1975 left main landing gear after the occurrence was conducted by CAAP-Investigator together with the Operator's AMO last March 19, 2023. This was done to determine the cause of the landing gear failure. During the inspection on the aircraft revealed that the MLG leaf spring was partially disconnected which had caused a structural damage to the left-wing area (Figure 2). A more detailed inspection also shows that the Internal Hex Head Bolt connecting the MLG to the leaf spring was broken and is consistent with a material failure (Figure 3 and 4). The material fatigue in the Internal Hex Head Bolt was observed to be present long before it developed into a crack and continued to progress in time.



Figure 2 – Left Main Landing Gear leaf spring partially disconnected



Figure 3 and 4 – Broken Left Main Landing Gear Internal Hex Head Bolt

Review of the Operator's schedule maintenance inspection on Tecnam P2002-JF shows that RP-C1975 has recently undergone the 50 Hours Inspection on March 11, 2023 with a total time of 4,445+39 hours since new (TSN). This Inspection is a maintenance task required in accordance with the Tecnam P2002JF Manufacturer Maintenance Manual. Part of the maintenance task includes the inspection of main landing gear attachments, bolts, and bushing for condition especially for cracks, corrosion, looseness and security of mounting points, or any condition that can cause stress concentrations and eventual failure (Figure 5). However, the Operator's Scheduled Maintenance Inspection Checklist only includes the checking of the correct torque of Main Landing gear attachment bolts and does not include the inspection of said aircraft component that may help discover fatigue cracks. Had the Operator included the Manufacturer Maintenance task in their Maintenance Checklist Inspection, the removal and replacement of the internal Hex Head Bolt during the early detection of the development of the fatigue crack could prevent jeopardize the MLG and /or the aircraft structural integrity.

ATA	Item	Maintenance task	FREQUENCY				
			A	B	C	D	E
31	Indicating system	Inspect all instruments markings for their readability and wear.		X			
32	Landing gear	Inspect nose and main gear attachments, bolts and bushings for condition and security. Check especially for cracks, corrosion and damaged surface protection. Inspect for looseness, condition and security of mounting points.		X			
32	Landing gear	Examine the structure to which MLG and NLG assembly is attached. Check especially for cracks, nicks, cuts, corrosion damage, or any other condition that can cause stress concentrations and eventual failure.		X			
32	Landing gear	Inspect gear fairings for cracks, deformation, proper rigging, and general condition.		X			
32	Landing gear	Inspect the NLG for movement, condition and relative steering system.		X			
32	Landing gear	Check shock for general condition and state of rubber disks.		X			
32	Landing gear	Inspect tires for cuts, worn spots, bulges on the side walls, foreign bodies in the treads, and tread condition. Check tire pressure.		X			
32	Landing gear	Examine the wheel axles. Look especially for corrosion and cracks.			X		
32	Landing gear	Disassemble the wheels and check for cracks, corrosion, dents, distortion, and faulty bearings. Clean, check and repack MLG wheel bearings with fresh grease and replace the NLG Ones if necessary.			X		

Figure 5 – Tecnam P2002-JF 50 Hours Inspection Maintenance Task

3.1 CONCLUSION

3.1 Findings

- a. Both pilots are qualified on the Tecnam P2002-JF type of aircraft.
- b. Both pilots have a valid license and medical certificate issued by the CAAP.
- c. Visual meteorological condition prevailed at the time of the incident.
- d. The aircraft was properly released for flight without any discrepancies noted on its logbook.
- e. The aircraft has current Certificates of Airworthiness and Registration.
- f. The aircraft has recently undergone the 50 Hours Inspection.

3.2 Probable Cause

3.2.1 Primary Cause Factor

- a. The MLG leaf spring was partially disconnected due to the failure of internal hex head bolt resulting to the collapse of the left main landing gear. (Material Failure)

3.2.2 Contributory Cause Factor

- a. The non-adherence to Tecnam P2002-JF Maintenance Manual.

4.0 SAFETY RECOMMENDATIONS

4.1 For CAAP-FSIS to ensure that Operator:

- a. Revise the Tecnam P2002-JF, 50-hour checklist to include the inspection of main landing gear attachments, bolts, and bushing. The inspection must be particularly for cracks, corrosion, looseness, security of mounting points or any condition that can cause stress concentrations and eventual failure.

-END-

