Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-C1030
CESSNA152

OPERATOR: WCC AVIATION COMPANY

TYPE OF OPERATION: FLIGHT TRAINING

DATE OF OCCURRENCE: FEBRUARY 12, 2020

PLACE OF OCCURRENCE: BARANGAY PILAR, STA. CRUZ, ILOCOS SUR, PHILIPPINES

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(RP-C1030, Cessna 152 Final Report)

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.

FINAL REPORT

TITLE: Incident involving a Textron Aviation Inc., Cessna 152 type of aircraft with Registry Number RP-C1030 operated by WCC Aviation Company that had forced landing due to engine mechanical failure at Barangay Pilar, Sta. Cruz, Ilocos Sur, Philippines, on February 12, 2020 at about 0900H/0100 UTC.

Notification of Occurrence to National Authority

The notification of accident to AAIIB CAAP was relayed by the Operator of the aircraft at 1225H (LOCAL) on February 12, 2020.

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 at the CAAP website on **06 January 2025.**

Synopsis:

On February 12, 2020 at about 0900H (local), a Textron Aviation Inc., Cessna 152 type of aircraft with registration no. RP-C1030, sustained substantial damage following a forced landing at Barangay Pilar, Sta. Cruz, Ilocos Sur, Philippines. The aircraft is operated by WCC Aviation Company. The two (2) occupants did not sustain any injury. Visual Meteorological Conditions (VMC) prevailed at the time of the occurrence. The probable cause of the event was attributed to the failure of the cylinder #3 connecting rod big end cap bolt which led to a sudden stoppage of the engine resulting to engine power loss.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AMO	:	Aviation Maintenance Organization
AGL	:	Above Ground Level
ATO	:	Approved Training Organization
CAAP	:	Civil Aviation Authority of the Philippines
COA	:	Commission On Audit
FI	:	Flight Instructor
FSIS	:	Flight Standards Inspectorate Service
OFSAM	:	Office of the Flight Surgeon and Aviation Medicine
CPL	:	Commercial Pilot License
ICAO	:	International Civil Aviation Organization
NLG	:	Nose Landing Gear
PCAR	:	Philippine Civil Aviation Regulation
POH	:	Pilot Operating Handbook
PPL	:	Private Pilot License
RPM	:	Revolution Per Minute
RPUQ	:	Vigan Community Airport
SP	:	Student Pilot
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Conditions

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP-C1030
Aircraft Type/Model	:	Textron Aviation Inc., Cessna 152
Operator	:	WCC Aviation Company
Address of Operator	:	960 Aurora Blvd., Cubao, Quezon City, Philippines
Place of Occurrence	:	Barangay Pilar, Sta. Cruz, Ilocos Sur, Philippines
Date/Time of Occurrence	:	February 12, 2020 at about 0900H/0100 UTC.
Type of Operation	:	Flight Training
Phase of Flight	:	Cruise
Type of Occurrence	:	Reciprocating engine – mechanical failure

1.1 History of Flight

On or about 0900H, February 12, 2020, a Cessna C-152 type of aircraft with Registry Number RP-C1030 sustained damage to its propeller and nose landing gear after experiencing a total loss of power over Barangay Pilar, Sta. Cruz, Ilocos Sur. The aircraft was operated by WCC Aviation Corporation under PCAR Part 3. There were no injuries to any of the two (2) occupants on board. Visual meteorological conditions (VMC) prevailed at the time of the occurrence, and a local flight plan had been filed. The flight originated at Vigan Community Airport (RPUQ) for routine flight training in the area.

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Figure 1. RP-C1030 at its final resting point.

1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others	TOTAL
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0
None	2	0	0	2

1.3 Damage to Aircraft

The aircraft sustained substantial damage.

1.4 Other Damages

There were no reported other damages by the local responders.

1.5 Personnel Information

1.5.1 Flight Instructor (FI)

Gender	:	Male
Date of Birth	:	May 10, 1991
Nationality	:	Philippine
License	:	104387-CPL

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Valid up to	:	November 30, 2024
Type rating	:	Single Engine Land: C152, C172
Medical Certificate	:	Expiry: March 18, 2022
Time on Aircraft	:	200+00 Hours as per Pilot logbook
Grand Total time	:	1,600+00 Hours as per Pilot logbook

1.5.2 Student Pilot (SP)

Gender	:	Male
Date of Birth	:	October 15, 1998
Nationality	:	Philippine
License	:	014488-PPL
Valid up to	:	August 31, 2021
Type rating	:	Single Engine Land: C152, C172
Medical Certificate	:	Expiry: February 2, 2021
Time on Aircraft	:	52+00 Hours as per Pilot logbook
Grand Total time	:	100+00 Hours as per Pilot logbook

1.6 Aircraft Information

The Cessna 152 was an American two-seat, fixed-tricycle-gear, general aviation airplane, used primarily for flight training and personal use. It was based on the earlier Cessna 150 incorporating a number of minor design changes and a slightly more powerful engine with a longer time between overhaul.

1.6.1 Aircraft Data

Registration Mark	:	RP-C1030
Manufacturer	:	Textron Aviation Inc.
Country of Manufacturer	:	USA
Type/Model	:	Single-Engine/ Cessna 152
Operator	:	WCC Aviation Company Services Inc.
Serial No./Type Certificate	:	15281352/ 3A19
Date of Manufacture	:	1978
Certificate of Airworthiness Valid up to	:	February 13, 2020
Certificate of Registration Valid up to	:	September 27, 2021
Category	:	Normal
Number of Crew	:	1
Passenger Seats	:	1
Time Since New	:	11,069+52 Hours

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1.6.2 Engine Data

The Lycoming O-235 was a family of four-cylinder, air-cooled, horizontally opposed piston aircraft engines that produce 100 to 135 hp (75 to 101 kW), derived from the earlier O-233 engine. The engine has variants of C1, C1A, C1B, C1C, C2A, C2B, C2C, E1, E2A, E2B, F1, F1B, F2A, F2B, G1, G1B, G2A, H2C, J2A, J2B, K2A, K2B, K2C, L2A, L2C, M1, M2C, M3C, N2A, N2C, P1, P2A, P2C and P3C.

Manufacturer	:	Lycoming Motors
Type	:	Piston (Carburetor)
Model	:	O-235-L2C
Serial No.	:	L-20228-15
Time Since New	:	8,984+46 Hours
Time Since Overhaul	:	1,695+40 Hours as of last CoA

1.6.3 Propeller Data

Sensenich Fixed Pitch/ 72CKS6-0-54 was an Aluminum Propeller was designed for use on the Lycoming O-235 engine. It has become a favorite of Cessna 152 owners. This blade was designed for in aircraft with a speed range of 80 – 130 MPH. Furthermore, this propeller model was more efficient than of the 1A103TCM type.

Manufacturer	:	Sensenich
Type	:	Constant Speed (Aluminum Alloy)
Model	:	72CKS6-0-54
Propeller SN#	:	K11507
Date last Installed	:	July 24, 2019
Propeller total time	:	409+43 Hours

1.7 Meteorological Information

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

1.8 Aids to Navigation

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

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1.9 Communications

The aircraft was equipped with a standard radio transceiver. Communications were carried out between the pilot and air traffic controller within the area.

1.10 Aerodrome Information

Vigan Community Airport (RPUQ) is operated by the Civil Aviation Authority of the Philippines (CAAP), and is listed in the CAAP approved aerodrome facility data as well as in the Philippine Aeronautical Information Publication.

1.10.1 General Information

Aerodrome Name	:	Vigan Community Airport – RPUQ
ARP coordinates and site at AD	:	173314N 1202105E
Aerodrome Operator address, telephone, telefax, telex,	:	Civil Aviation Authority of the Philippines Vigan Airport, Vigan 2700 Ilocos Sur
Types of traffic permitted (IFR/VFR)	:	VFR
AD category for fire fighting	:	CAT IV. One (1) fire truck - SIDES VMA28
Apron surface and strength		Surface: ASPH. Strength: Nil.
Taxiway width, surface and strength	:	Width: 15M. Surface: CONC. Strength: Nil.
Aerodrome Obstacles		Nil
ATS Communication Facilities	:	Vigan Radio
Frequency/Operation	:	120.10MHZ, Primary A/G Freq 5062.50KHZ, Laoag Network 3608KHZ, Secondary 0000 – 0800 Operation
Airspace classification	:	Class G
Runway Direction	:	02/20
Runway Length	:	1165 Meters
Runway Width	:	30 Meters
Surface	:	PCN 7.5 F/B/Z/U/ASPH, Eff 0.16% uphill to the North

1.11 Flight Recorders

The aircraft was not equipped with any flight recorders and existing CAAP regulation does not require it.

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1.12 Wreckage and Impact Information

The FI took control of the aircraft and discovered a forced landing area on the shoreline of Sta. Cruz, Ilocos Sur. During the landing roll, about one hundred (100) meters from the touchdown point, the aircraft nose landing gear (NLG) hit a drift wood and subsequently fractured the NLG arm assembly and steering bolt. The aircraft continued to roll for another thirty (30) meters, scrapping the beach with its propeller. The lower engine mounted to the firewall bolts were bent due to the NLG impact. The aircraft came to a complete stop, with the final resting point located at coordinates 17°4'31.86"N, 120°26'17.00"E and heading approximately north. The occupants then immediately performed engine shutdown procedures and alighted the aircraft with no injuries. No fire ensued. The barangay duty personnel and some fishermen on site immediately arrived to assist in securing the aircraft.

1.13 Medical and Pathological Information

The pilots underwent the post-accident medical examination at CAAP-OFSAM and no medical impediments were found that hindered their fitness to fly. The pilots' medical results also confirmed that they met the CAAP and ICAO Annex 1 Medical Standards for exercising the privileges of the license held.

1.14 Fire

There was no evidence of post impact fire.

1.15 Search and Survival Aspects

The accident was survivable due to the limited damage to the aircraft engine. Since the incident occurred on a coastline with local fishermen and duty personnel in the area, no search operation was deployed.

1.16 Test and Research

A teardown inspection was conducted on the aircraft engine on March 9, 2020, at the WCC Aircraft Maintenance Organization facility in Binalonan, Pangasinan.

1.17 Organization and management information

1.17.1 Operator

The Cessna C-152, registered RP-C1030 was operated and maintained by WCC Aviation Company with official address at 960 Aurora Boulevard, Cubao, Quezon City. The

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company is under the regulatory Authority of CAAP to operate as an Approved Training Organization (ATO) with Certificate number ATO-2008-05 valid up to June 22, 2021. It operates Six (6) Cessna C-152, two (2) Cessna C-172, four (4) Tecnam P2002 JF, and two (2) Tecnam P2006T. WCC Company is also engaged in other aviation related activities that are as follows:

a. WCC Pilot Academy (Flight School).

b. WCC Aeronautical and Technological College.

c. WCC Flight Attendant School.

d. WCC Aviation Company Repair Station.

e. Sky Pasada, Air Operations.

f. Binalonan Airfield Operation.

1.17.2 Maintenance

The maintenance function of RP-C1030 is being 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. ANALYSIS

2.1 General

The flight was a cross-country dual-flight training, departing from Vigan Community Airport (RPUQ) and proceeding to Binalonan Airfield, Pangasinan (RPT-12). The flight took approximately one (1) hour and thirty (30) minutes. The aircraft took off RWY 20 at Vigan airport for straight-out departure, and during the initial climb to two thousand five hundred (2,500) feet AGL, it was stable. The aircraft and engine instruments also displayed normal readings. RP-C1030 continued to climb to four thousand (4,000) feet AGL, then proceeded to lean the fuel by using the fuel lever. As the flight was abeam left of Santa Cruz, the crew experienced unusual engine vibration and observed the engine tachometer reading dropping to almost zero (0). After noticing the vibration and engine RPM drop, the FI took control of the aircraft and increased engine power. Suddenly, a total loss of engine power occurred. The FI tried to restart the engine by applying carb heat, but it still did not run. The FI tried as many as four (4) times to do the restart procedures as per POH, but to no avail. The FI declared to his SP that they would execute a forced landing. The SP helped his FI look for a suitable force landing field, and both decided to land on the beach in a less populated area. The FI begins his approach by

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targeting his landing point, then circling twice to dissipate altitude and set the flaps as necessary. The aircraft landed on the sand, just like a soft field landing with no power. During the landing roll, about one hundred (100) meters from the touchdown point, the aircraft nose landing gear (NLG) hit a drift wood, resulting in a fracture of the NLG arm assembly and steering bolt. The aircraft continued to roll for another thirty (30) meters, scraping the beach with its propeller. The lower engine mounted to the firewall bolts were bent. The aircraft came to a complete stop, with the final resting point located at coordinates 17°4'31.86"N, 120°26'17.00"E and heading approximately north. Barangay duty personnel and fishermen who witnessed the incident immediately rushed to the site to assist and secure the aircraft.

2.2 Engine Teardown.

A teardown inspection was conducted on the aircraft engine on March 9, 2020, at the WCC Aircraft Maintenance Organization facility in Binalonan, Pangasinan.

The engine teardown highlights the damage to cylinder #4's piston (Figure 2). The cylinder #3 was also damaged and its connecting rod big end cap bolt was broken (Figure 3). Additionally, the crankshaft was broken too (Figure 4). The connecting rod of cylinder #3 impacted the crankcase resulting to a hole above the oil sump. The misalignment between the cylinder and its rod resulted to the connecting rod becoming stuck in place (Figure 5). Assorted debris of engine materials were collected on the oil sump (Figure 6). The hole was measured roughly about seven point seventy-eight (7.78) centimeters (Figure 7). Hence result of the engine teardown on which the crankshaft was broken substantiated that the engine could not perform normal operation.

Figure 2. Cylinder #4.

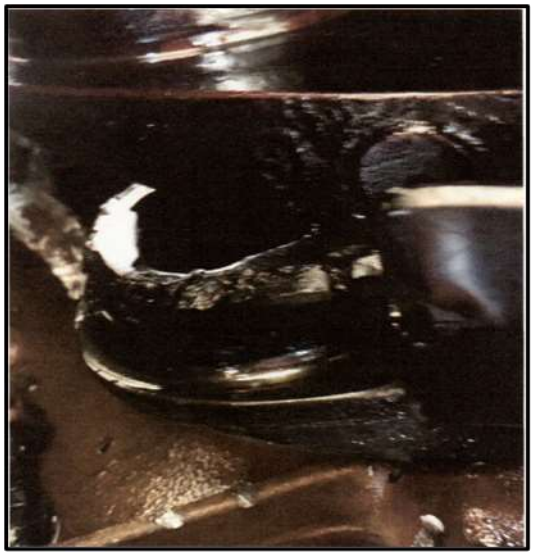

Figure 3. Cylinder #3.

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Figure 4. Broken crankshaft.

Figure 5. Broken connecting rod Cylinder #3.

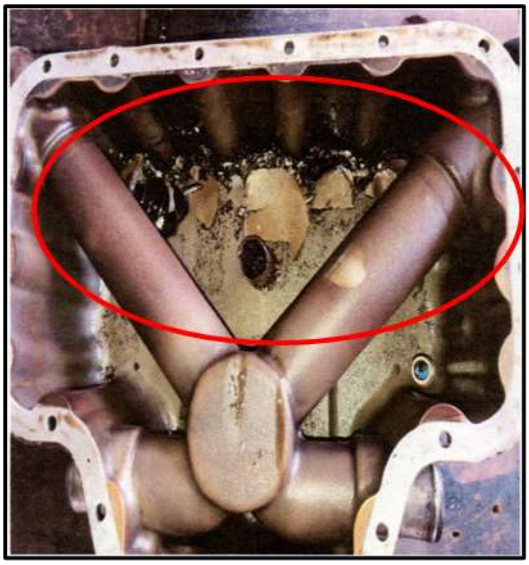

Figure 6. Assorted Metals collected.

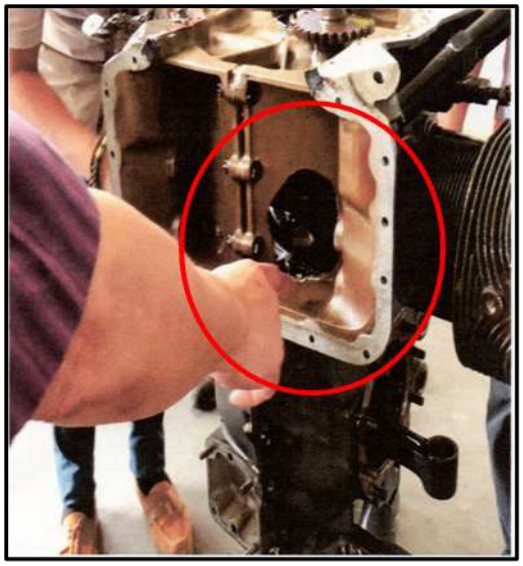

Figure 7. The hole in the crankcase

2.3 Connecting Rods

Connecting rod failure is responsible for a significant number of catastrophic engine failures. When a rod fails in flight, it often punches a hole in the crankcase ("thrown rod") and causes loss of engine oil and subsequent oil starvation. Rod failure have also been known to cause camshaft breakage. The result is invariably rapid and often leads to a total loss of engine power. However, connecting rods usually have a long useful life and are not normally replaced at overhaul. (Rod bearings, like all bearings, are always replaced at overhaul.) Many rod failures are infant-mortality failures caused by improper tightening of the rod cap bolts during engine assembly. It can also be caused by the

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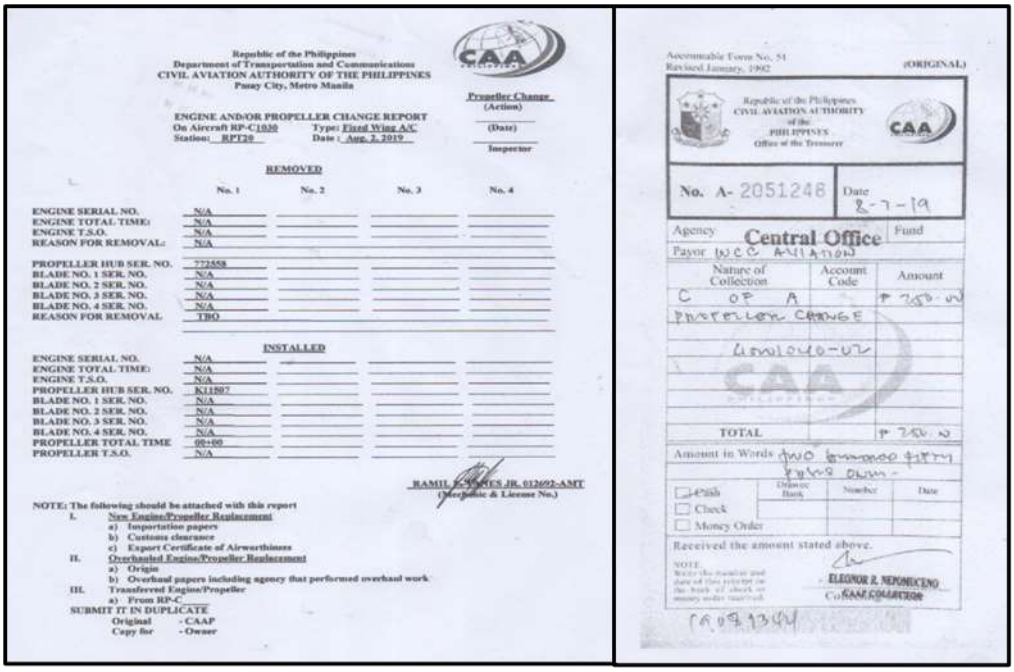
failure of the rod bearings, often due to oil starvation and unusual vibrations. Such rod failures are usually random failures unrelated to time since overhaul.

2.4 New Model Propeller

Records reveals that on July 18, 2019, the company submitted a propeller change report to CAAP (Figure 8). The installation of a new model propeller from its default configuration, the obsolete McCauley 1A103TCM to the new model Sensenich 72CKS56-0-54 with a routine flight test respectively. The new propeller which modified the aircraft's performance into having less noise was installed on July 24, 2019 (Figure 9). Since it was the first time that the engine used a new model propeller, an initial period of operation or what they call "brake-in" was necessary for observation purposes. However, the company pilots were not aware of these changes and continued to operate the aircraft in the standard power settings. Therefore, as engine time progressed having no reminder of such, it led to the deterioration of its engine materials which by time caused them to fail.



Republic of the Philippines
Department of Transportation and Communications
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
Pasay City, Metro Manila

Propeller Change
(Action)
(Date)
Inspector

ENGINE AND/OR PROPELLER CHANGE REPORT
On Aircraft RP-C1030 Type: Fixed Wing A/C
Station: RPT20 Date : Aug. 2, 2019

REMOVED

	No. 1	No. 2	No. 3	No. 4
ENGINE SERIAL NO.	N/A			
ENGINE TOTAL TIME:	N/A			
ENGINE T.S.O.	N/A			
REASON FOR REMOVAL:	N/A			
PROPELLER HUB SER. NO.	772558			
BLADE NO. 1 SER. NO.	N/A			
BLADE NO. 2 SER. NO.	N/A			
BLADE NO. 3 SER. NO.	N/A			
BLADE NO. 4 SER. NO.	N/A			
REASON FOR REMOVAL	TBO			

INSTALLED

ENGINE SERIAL NO.	N/A			
ENGINE TOTAL TIME:	N/A			
ENGINE T.S.O.	N/A			
PROPELLER HUB SER. NO.	K11507			
BLADE NO. 1 SER. NO.	N/A			
BLADE NO. 2 SER. NO.	N/A			
BLADE NO. 3 SER. NO.	N/A			
BLADE NO. 4 SER. NO.	N/A			
PROPELLER TOTAL TIME	00+00			
PROPELLER T.S.O.	N/A			

RAMIL [illegible] JR. 012692-AMT
(Aeronautic & License No.)

NOTE: The following should be attached with this report
I. New Engine/Propeller Replacement
a) Importation papers
b) Customs clearance
c) Export Certificate of Airworthiness
II. Overhauled Engine/Propeller Replacement
a) Origin
b) Overhaul papers including agency that performed overhaul work
III. Transferred Engine/Propeller
a) From RP-C
SUBMIT IT IN DUPLICATE
Original - CAAP
Copy for - Owner

Accountable Form No. 51
Revised January, 1992
(ORIGINAL)

Republic of the Philippines
CIVIL AVIATION AUTHORITY
of the
PHILIPPINES
Office of the Treasurer

No. A- 2051248 Date 8-7-19

Agency Central Office Fund
Payor WCC AVIATION

Nature of Collection	Account Code	Amount
C OP A		P 750.00
PROPELLER CHANGE		
[illegible]		
TOTAL		P 750.00

Amount in Words TWO [illegible] PESOS ONLY

Cash / Check / Money Order — Drawee Bank — Number — Date

Received the amount stated above.

ELEONOR P. NEPOMUCENO
CAAP COMMISSION

Figure 8. Propeller change report.

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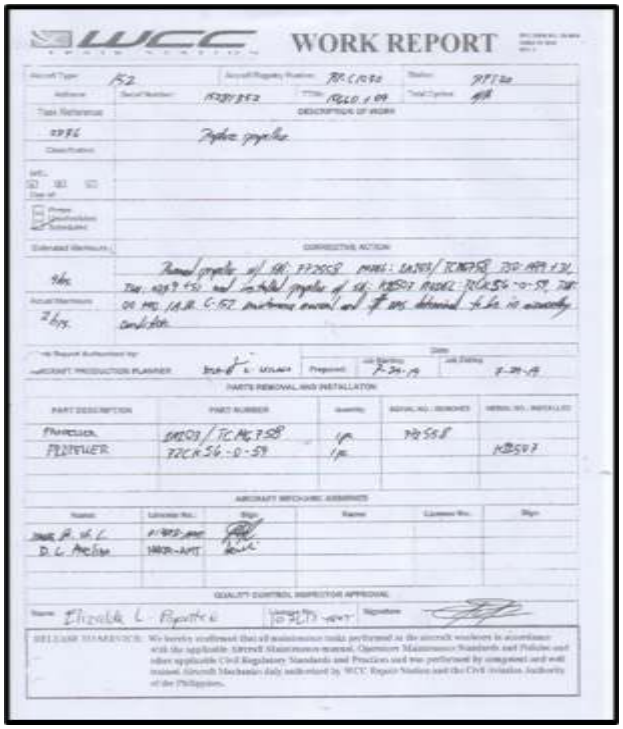
WCC WORK REPORT

Figure 9. AMO work report on new propeller.

3. CONCLUSIONS

3.1 Findings

a. The crew was trained and qualified on the Textron Aviation Inc., Cessna C152 aircraft and WCC training procedures.

b. The pilots possess valid airmen license and medical certificate issued by the CAAP.

c. The pilots alighted the aircraft safely.

d. Visual meteorological condition prevailed at the time of the occurrence.

e. The aircraft was properly released for flight without any discrepancies noted on the day of the occurrence.

f. The aircraft has a current Certificates of Airworthiness and Registration.

g. The installation of a new model propeller.

h. The aircraft 100hours inspection was performed by WCC Aviation Company Repair Station on January 24, 2020.

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3.2 Cause Factor

3.2.1 Primary Cause Factor

a. The failure of the cylinder #3 connecting rod big end cap bolt resulted to a sudden stoppage of the engine. (Material Factor).

3.2.2 Contributory Cause Factors:

a. The lack of policy and procedures for Cessna 152 pilots when breaking in a new propeller model, such as the Sensenich 72CKS56-0-54.

b. Lack of an operating placard placed in the cockpit to provide essential safety information and warnings to the pilot regarding the operation and limitations of the aircraft.

4. SAFETY RECOMMENDATION

4.1 As a result of the safety investigation conducted, the AAIIB proposes the following safety recommendations to the **CAAP-FSIS**:

a. To ensure that the operator, WCC Aviation Company, include in the company policy and procedures manual the procedures for Cessna 152 pilots when breaking in a new propeller model, such as the Sensenich 72CKS56-0-54.

b. To ensure that the operator, WCC Aviation Company, install an operating placard in the cockpit to provide essential safety information and warnings to the pilot regarding the operation and limitations of the aircraft.

-----END-----

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