Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-R3027
AG CAT G-164A

OPERATOR: MINDANAO RAINBOW AGRICULTURAL DEVELOPMENT SERVICES INC.

TYPE OF OPERATION: AGRICULTURAL SPRAYING

DATE OF OCCURRENCE: SEPTEMBER 24, 2019

PLACE OF OCCURRENCE: AGROTECH INTEGRATED FARMS, BRGY. UNION, MONKAYO, DAVAO DE ORO

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(AG CAT G-164A, RP-R3027 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: Serious incident involving an Agcat G-164A type of aircraft with Registry Number RP-R3027 operated by Mindanao Rainbow Agricultural Development Services, Inc (MRADS) that made a runway excursion after an aborted take-off at Agrotech Integrated Farm Airstrip, Monkayo Davao De Oro on September 24, 2019 at about 0610H.

Notification of Occurrence to National Authority

The Notification of serious incident to AAIIB CAAP was relayed by the Operator of the aircraft at 0730H (LOCAL) on September 24, 2019.

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 **02 April 2025.**

Synopsis:

On September 24, 2019, at about 0610H, an Agcat G-164A type of agricultural aircraft with registry number RP-R3027 owned and operated by MRADS sustained minor damage following a runway excursion after an aborted take-off at Agrotech Integrated Farm Airstrip, Monkayo, Davao De Oro. The aircraft is owned and operated by Mindanao Rainbow Agricultural Development Services, Inc. (MRADS). The pilot, who was the sole occupant, did not sustain any injuries. Visual Meteorological Conditions (VMC) prevailed at the time of the incident. The cause of the incident was attributed to the failure of the Pilot to control the aircraft during the aborted take-off.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AAC	:	Agricultural Aircraft Certificate
AAOC	:	Agricultural Aircraft Operator Certificate
AGL	:	Above Ground Level
CAAP	:	Civil Aviation Authority of the Philippines
CPL	:	Commercial Pilot License
HSPSM	:	Hamilton Standard Propellers Service Manual
MC	:	Memorandum Circular
MRADSI	:	Mindanao Rainbow Agricultural Development Services, Inc.
OFSAM	:	Office of the Flight Surgeon and Aviation Medicine
PCAR	:	Philippine Civil Aviation Regulations
RWY	:	Runway
TSN	:	Time since New
TSO	:	Time since Overhaul
VFR	:	Visual Flight Rules
VHF	:	Very High Frequency
VMC	:	Visual Meteorological Condition

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP-R3027
Aircraft Type/Model	:	Allied Ag Cat Production Inc. G-164A
Operator	:	Mindanao Rainbow Agricultural Development Services Inc.
Address of Operator	:	Mactan Aviation Hangar, Gen Aviation Area, Old Airport, Sasa, Davao City
Place of Occurrence	:	Agrotech Integrated Farms, Brgy. Union, Monkayo, Davao De Oro
Date/Time of Occurrence	:	September 24, 2019/ 0610H
Type of Operation	:	Agricultural (Aerial) Spraying
Phase of Flight	:	Take-off
Type of Occurrence	:	Runway excursion during take off

1.1 History of Flight

On September 24, 2019, at about 0610H, an Agcat G-164A type of aircraft with registry number RP-R3027 sustained minor damage following a runway excursion after an aborted take-off at Agrotech Integrated Farm Airstrip. The aircraft is owned and operated by Mindanao Rainbow Agricultural Development Services, Inc. (MRADS), a holder of the Agricultural Aircraft Certificate (AAC) authorized to perform aerial agricultural operations. The pilot, who was the sole occupant, did not sustain any injuries. Visual Meteorological Conditions (VMC) prevailed at the time of the serious incident.

An interview with the pilot revealed that while on take-off roll, passing 70 knots at runway 25, he experienced a loss of power, which prompted him to abort the take-off. The event happened while he was passing marker number 3, which is half of the runway length. The pilot applied full brakes and dumped his chemical loads to lessen the impact. However, the aircraft veered to the left side of the runway, colliding with marker 0, and

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continued to roll for about 200 meters before exiting the end of runway 25. The aircraft came to a complete stop at the left end of the runway, with a last heading of 189 degrees and coordinates of 7 47 18.20 N, 126 4 49.20 E.

Figure 1 - Final position of RP-R3027 at the end of RWY 25.

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
Missing	0	0	0	0
None	1	0	0	1

1.3 Damage to Aircraft

The aircraft sustained damage to the wing tip, lower left-wing leading edge, tail wheel spring, and broken propeller counterweight bracket.

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Figure 2 - Damages sustain by RP-R3027.

1.4 Other Damages

There was no reported other damage caused by this incident.

1.5 Personnel Information

1.5.1 Pilot (P)

Gender	:	Male
Date of Birth	:	November 16, 1984
Nationality	:	Filipino
Civil Status	:	Married
License Type	:	109511-CPL
License Validity	:	March 31, 2021
Type Rating	:	Airplane: Single Engine Land C-150; C172 Agcat G-164A (3-10-2017)
Medical Certificate Validity	:	February 16, 2020
Total Flying Time	:	1,414+35 Hours as of 23 Sep 2019
Total Flying Time on type	:	1,149+50 Hours as of 23 Sep 2019

1.6 Aircraft Information

1.6.1 Aircraft Data

Registration Number	:	RP-R3027
Manufacturer	:	Allied Agcat Production Inc.

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Country of Manufacturer	:	USA
Type/Model	:	Agcat/G-164A
Serial Number	:	461
Owner/Operator	:	Mindanao Rainbow Agricultural Development Services Inc.
Address of Owner/Operator	:	Solidwood Hangar, Bangoy International Airport, Sasa, Davao City
Gross Weight	:	1,681.82 Kilograms (Kgs)
Total Time in Service	:	5,838+05 hours as of September 23, 2019
Last 100 hours Inspection Performed	:	June 17, 2019

1.6.2 Engine Data

Manufacturer	:	Pratt & Whitney
Type	:	Radial Piston Engine
Model	:	R985-AN-14B
Engine Serial Number	:	19732
Time Since New	:	6,557+05 hours
Time Since Overhaul	:	1,062+05 hours as of Sep 23, 2019
Last 100 hours Inspection Performed	:	June 17, 2019

1.6.3 Propeller Data

Manufacturer	:	Hamilton Standard
Type/Model	:	2D30/421
Propeller Serial Number	:	L5514
Propeller Time Since New	:	5,324+05 hours
Time Before Overhaul	:	1,200 hours
Propeller Time	:	822+05 hours as of September 23, 2019
Last 100 hours Inspection Performed	:	June 17, 2019

1.7 Meteorological Information

Visual Meteorological Condition (VMC) prevailed.

1.8 Aids to Navigation

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

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1.9 Communications

The aircraft was equipped with operational Very High Frequency (VHF) transceiver used for communicating with aerodrome personnel and other aircrafts in the area.

1.10 Flight Recorders

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

1.11 Wreckage and Impact Information

The aircraft veered to the left side of the runway, colliding with marker 0, and continued to roll for about 200 meters before exiting at the end of runway 25. The aircraft came to a complete stop at the left end of the runway, with a last heading of 189 degrees and coordinates of 7 47 18.20 N, 126 4 49.20 E.

Figure 3 - RP-R3027 final position after colliding runway marker “0”.

1.12 Fire

No post fire was reported after the incident.

1.13 Search Survival Aspect

The pilot egresses the aircraft with no injuries after the incident.

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1.14 Medical and Pathological Information

Following the incident, the pilot underwent a drug test on September 26, 2019 at the Department of Health, BMCDC Health Care Inc., Davao Del Sur, with negative results. Post-medical examinations conducted at CAAP-OFSAM on October 10, 2019 revealed no significant findings.

1.15 Organizational and Management Information

The Mindanao Rainbow Agricultural Development Services Inc. (MRADSI) is a holder of an Agricultural Aircraft Operator Certificate (AAOC) number 11-20110004 valid to operate up to December 10, 2019 authorized to perform Aerial Work on (commercial) agricultural aircraft operations, as defined, in accordance with the Operations Manual and PCAR Part 11. Based on the attached Operations Specifications, RP-R3027 is included in the list of authorized aircraft for aerial work operations.

2. ANALYSIS

2.1 General

The RP-R3027 aircraft was scheduled to perform aerial spraying activities at Agrotech Farms, Barangay Union, Monkayo, Davao de Oro, on September 24, 2019. During the second load at around 0610H, when the aircraft was taking off at runway 25 with full engine power and an airspeed of about 70 knots, the pilot abruptly experienced a power loss. At this point, the pilot decided to abort the take-off, but failed to control the aircraft, resulting in a runway excursion

Figure 4 - RP-R3027 Final position after the incident.

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2.2 Pilot Qualification

The pilot is qualified to fly the Agcat G-164A aircraft based on the number of hours flown. However, during this particular incident, the pilot failed to control the aircraft after aborting the take-off, resulting in a runway excursion after hitting marker “0” of RWY 25.

2.3 Propeller Records

Records show that the Aeromania Propeller/NDT Service Center, Bacoor, Cavite, overhauled the propeller assembly with SN-L5514 from September 5, 2017 to October 18, 2017. The overhaul process involved disassembling the propellers, followed by an NDT inspection, and then reassembling and balancing them, preparing them for aircraft installation. No further replacement of parts were noted.

2.4 Maintenance Coverage on Inspection of Propellers

The Operator's pre-flight and post-flight inspection checklist, which primarily focuses on visual inspection, does not specify the activities related to propeller inspection, especially for counterweight brackets and accessories. It also revealed that, based on the Agcat Maintenance Manual, the inspections being performed by the Operator for 50 hours, 100 hours, and the annual inspection showed that propeller inspection covers only the following:

1. Check propeller hub nut for proper tightness applying a torque of 750 for pounds.
2. Inspect the exposed portion of piston for corrosion, galling, or nicks.
3. Visually inspect for ample lubrication of the counterweight bearing.
4. Inspect propeller governor hold down nuts for tightness, and oil line connections for leaks.

The inspection did not specifically mentioned the counterweight bracket inspection. Only counterweight-bearing lubrication was mentioned. The presence of galling, nicks, or cracks cannot be determined because no specific activity necessitates these inspections.

2.5 Counterweight Bracket Failure

After the incident, the pilot examined the aircraft for damages. The broken counterweight bracket, which helps balance the propeller and adjust blade pitch to maintain a constant RPM under varying conditions and ensure efficient flight performance, was clearly visible in the damaged aircraft. The diagrams below show how a controllable counterweight two-position pitch mechanism operates.

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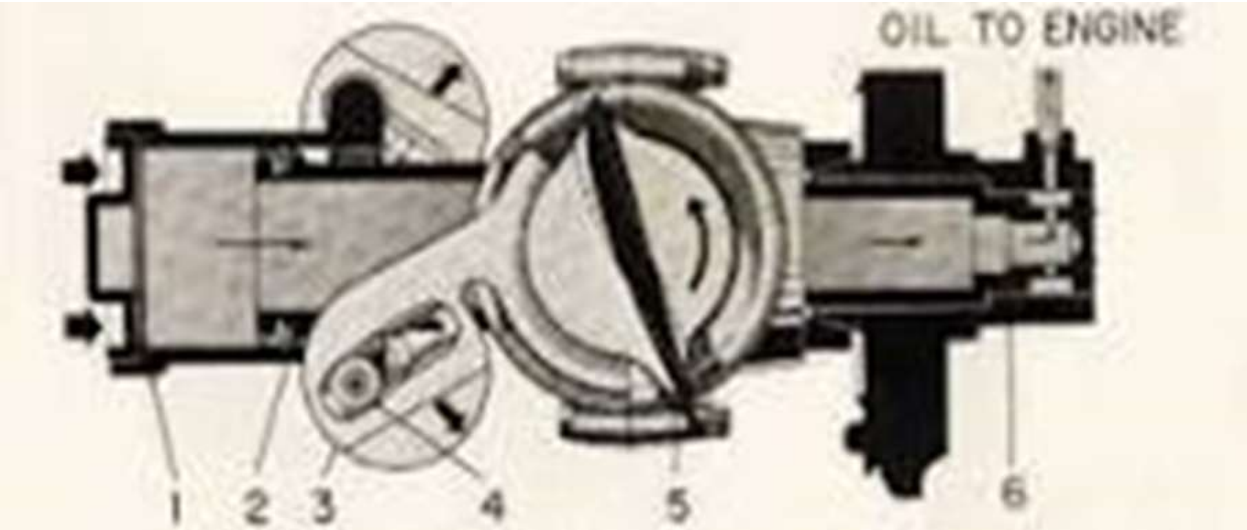

Diagram of Controllable Two Position Pitch Mechanism

(1) Propeller cylinder, (2) propeller piston, (3) propeller counterweight and bracket, (4) propeller counterweight shaft and bearing, (5) propeller blade, (6) engine propeller shaft.

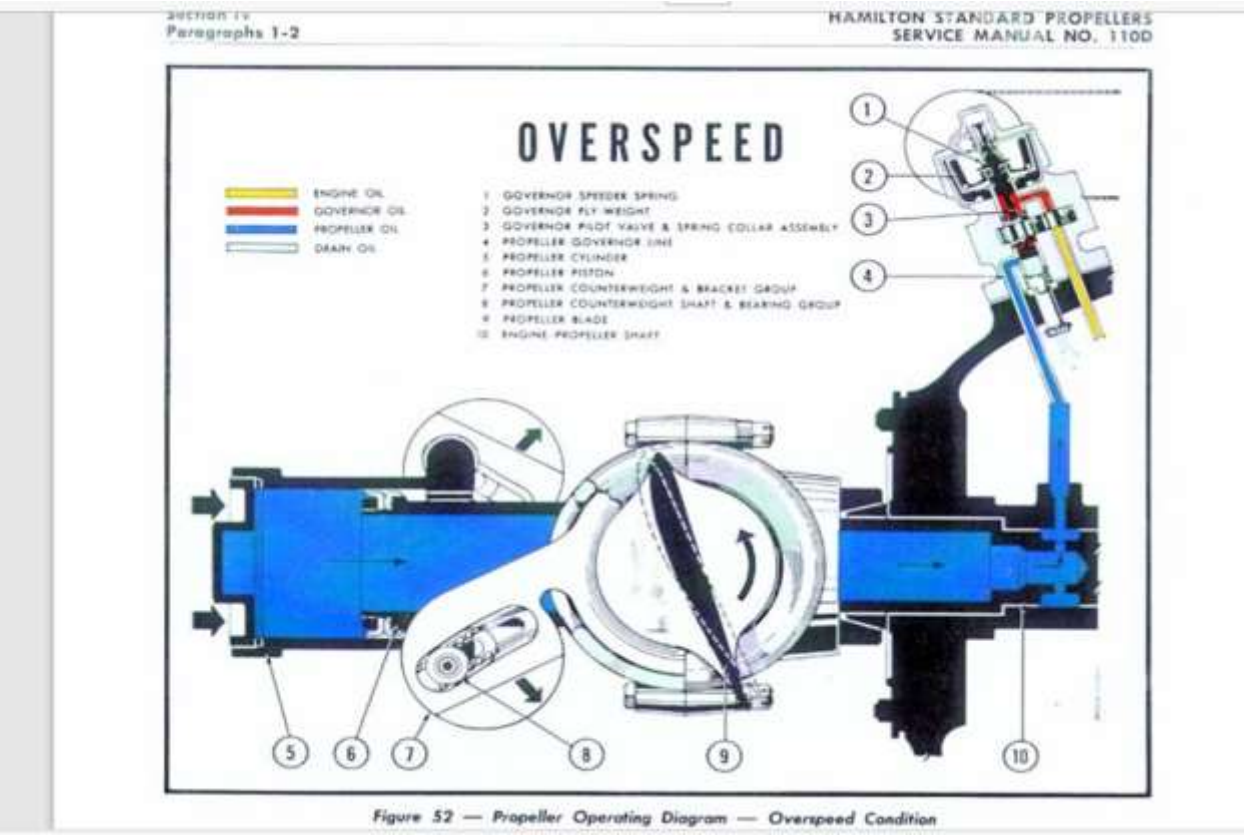

Figure 52 — Propeller Operating Diagram — Overspeed Condition

Figure 5 - Operation of a two pitched propeller.

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Fatigue appears to be the cause of the propeller counterweight bracket's failure. Despite the unique circumstances, a thorough inspection of the propeller counterweight bracket and its accessories is necessary. The 50-hour, 100-hour, and annual inspections provide limited information about the necessary inspections for propeller counterweight brackets and accessories.

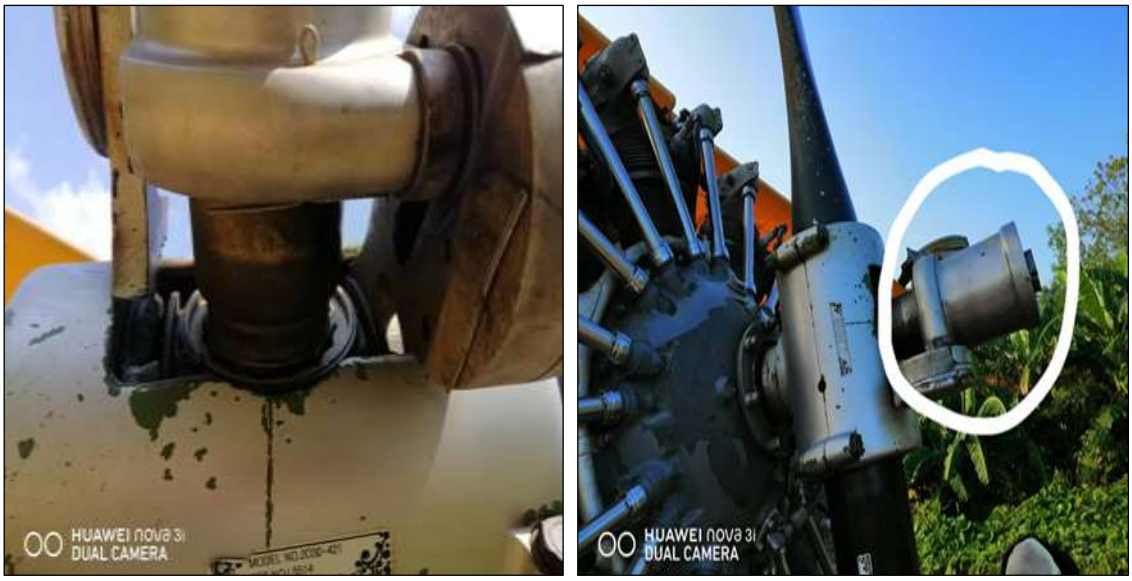

Figure 6 - Showing the broken counterweight bracket.

2.6 Propeller Counterweight Bracket and Accessories Maintenance

A review of the Hamilton Standard Propellers No. 110D Handbook for Counterweight Propellers Service Manual, Section V-Service Inspection, Maintenance, and Section VI-Disassembly, Inspection, Repair, and Assembly for propeller counterweights shall be conducted in accordance with this Handbook.

Understanding the propeller as a whole, the counterweight type propeller is composed of two (2) major assemblies, the hub assembly and the blade assembly. The hub assembly comprises the hub group, the counterweight group, and a cylinder group (Figure 7).

Based on Section V of the handbook, the propeller counterweight bracket shall be inspected during the 200-to-240-hour inspection, wherein the counterweight bearing shall be checked for ample lubrication, the counterweight bearing retainer should be thoroughly cleaned, and the balls should be examined for pit marks and cracks. The counterweight bearing races should be closely examined for wear, galling, or brineling, and visually inspected for fatigue cracks, all of which are found in the cylinder assembly. Moreover, Section VI para 5 (6) (7) (8) (9) of the handbook describes the detailed inspections to be undertaken during the installation and maintenance of counterweight brackets and accessories.

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The procedures defined in the handbook concerning counterweight bracket and accessory inspection should be observed and incorporated in the operator's procedures and maintenance manual to be accomplished during the particular periodic inspections.

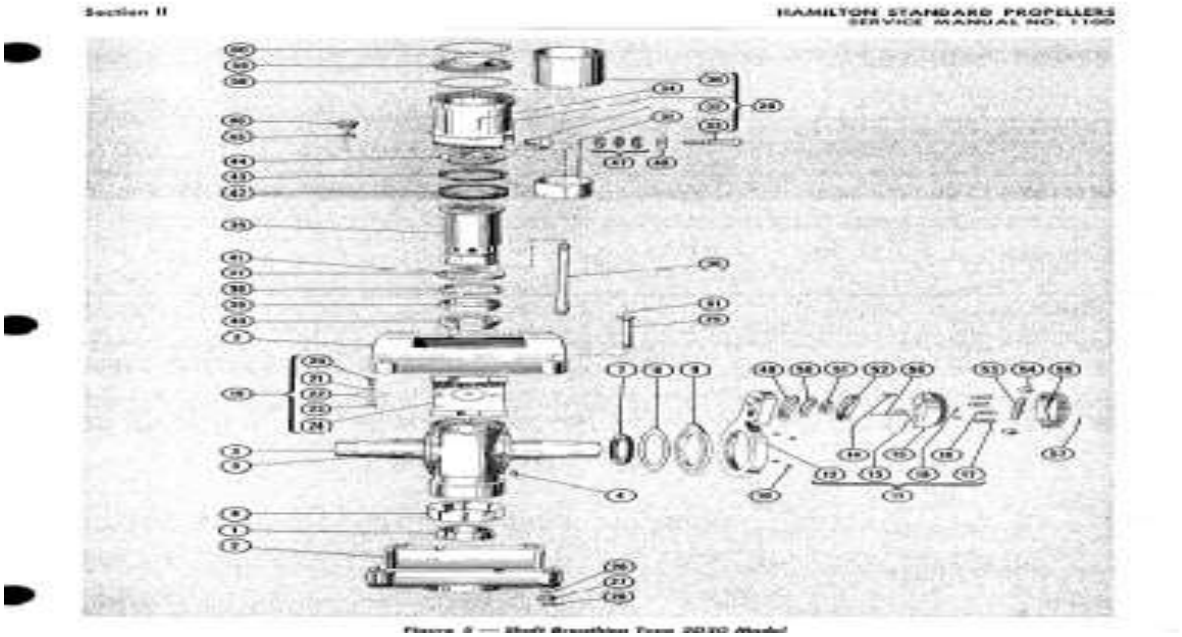

Figure 7 - The Propeller Hub Assembly Diagram.

Note: No. 11 - Counterweight Bracket Assembly.
No. 12 - Counterweight Bracket.
No. 29 - Cylinder Assembly.
No. 43 - Counterweight Bearing Inner Race.

Figure 8 - A Propeller Counterweight Bracket.

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3. CONCLUSION

3.1 Findings

3.1.1 The pilot has a valid and current commercial pilot license and medical certificate.
3.1.2 The aircraft's Certificate of Registration is valid until June 15, 2027.
3.1.3 The aircraft's Certificate of Airworthiness is valid until August 22, 2020.
3.1.4 The aircraft maintenance records and logbook recorded no discrepancy for the last seven (7) days of flight.
3.1.5 The last 100-hour periodic inspection was conducted on June 17, 2019.
3.1.6 The periodic inspection conducted on RP-R3027 focused only on the ample lubrication of the counterweight bearing.
3.1.7 The aircraft has accumulated a total of 5,838+05 hours as of September 23, 2019.
3.1.8 The propeller time since overhaul (TSO) is 822+05 hours, and the total time since new (TSN) is 5,324+05 hours as of September 23, 2019.
3.1.9 The procedures for conducting inspections of counterweight brackets and accessories are not defined in the Operator's Procedures and Maintenance Manual.

3.2 Probable Cause

a. The pilot's failure to control the aircraft during the aborted take-off resulted in a runway excursion.

3.3 Contributory Cause Factor

a. The failure of the propeller counterweight bracket.

4. SAFETY RECOMMENDATIONS

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

4.1 To ensure that the operator, Mindanao Rainbow Agricultural Development Services Inc., includes in their pre-flight and post-flight inspection checklists the inspection of the propeller counterweight bracket and accessories for wear, tear, and fatigue.

4.2 To ensure that the operator, Mindanao Rainbow Agricultural Development Services Inc., adheres to the propeller inspections in the Hamilton Standard Propellers Handbook, particularly on counterweight brackets and accessories.

------END-----

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