Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

AIRCRAFT ACCIDENT INVESTIGATION AND INQUIRY BOARD

FINAL REPORT

RP-C1085
PA-38-112

OPERATOR: FLITELINE AVIATION SCHOOL, INC.

TYPE OF OPERATION: GENERAL AVIATION

DATE OF OCCURRENCE: FEBRUARY 19, 2025

PLACE OF OCCURRENCE: BARANGAY LALANGAN, PLARIDEL, BULACAN, PHILIPPINES

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(PA-38-112, RP-C1085 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: A serious incident involving a Piper PA-38-112 type of aircraft with Registry Number RP-C1085 operated by Fliteline Aviation School Inc., that experienced reciprocating engine material failure and made a forced landing at Barangay Lalangan, Plaridel, Bulacan, Philippines on February 19, 2025/0936H.

Notification of Occurrence to National Authority

The Notification of serious incident to AAIIB CAAP was relayed by the Operator of the aircraft at 1000H (LOCAL) on February 19, 2025.

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 June 2025.**

Synopsis:

On February 19, 2025, at about 0941H, a PA-38-112 type of aircraft with Registry Number RP-C1085 operated by Fliteline Aviation School Inc., had made a forced landing after a complete engine failure at Barangay Lalangan, Plaridel, Bulacan, Philippines. The two (2) pilots on board did not sustain any injuries, and the aircraft sustained damage as a result of the serious incident. A visual meteorological condition (VMC) prevailed at the time of the incident. The cause of the occurrence was attributed to the reciprocating engine material failure during flight.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AIP	:	Aeronautical Information Publication
AMO	:	Approved Maintenance Organization
ATOC	:	Approved Training Operator Certificate
CAAP	:	Civil Aviation Authority of the Philippines
CPL	:	Commercial Pilot License
FI	:	Flight Instructor
NLG	:	Nose Landing Gear
OFSAM	:	Office of the Flight Surgeon and Aviation Medicine
PCAR	:	Philippine Civil Aviation Regulation
SP	:	Student Pilot
SPL	:	Student Pilot License
TBO	:	Time Before Overhaul
TSN	:	Time Since New
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Condition

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP-C1085
Aircraft Type/Model	:	PA-38-112
Operator	:	Fliteline Aviation School, Inc.
Address of Operator	:	Plaridel Community Airport, Plaridel, Bulacan, Philippines
Place of Occurrence	:	Barangay Lalangan, Plaridel, Bulacan, Philippines
Date/Time of Occurrence	:	February 19, 2025/0948H
Type of Operation	:	Flight Training
Phase of Flight	:	Landing
Type of Occurrence	:	Reciprocating engine – mechanical failure

1.1 History of Flight

On 19 February 2025, at 0900H, a Piper 38-112 Tomahawk type of aircraft with Registry Number RP-C1085, operated by Fliteline Aviation School Inc., was scheduled for a 360-overhead maneuver and flapless landing lessons with two pilots on board. After completing the pre-flight inspection, the aircraft taxied to the holding point at Runway 35, where it performed the standard before-takeoff checklist while awaiting clearance. At 0930H, the tower cleared the aircraft for takeoff with the SP at the controls, climbing to 1,000 feet. However, during the base leg turn at 500 feet, the engine began running rough, producing sputtering sounds, a drop in instrument readings, and ultimately, a complete engine failure.

The FI took control and attempted to restart the engine but was unsuccessful. While managing the aircraft, the FI searched for a suitable landing site, declared a "Mayday," and executed forced landing procedures, cutting off fuel and switching off all master switches. The aircraft touched down in an open field, rolling approximately 10 meters coming to a stop on a grassy area causing the nose landing gear to collapsed due to uneven terrain at coordinates 14.87649912N, 120.84527802E, heading 117 degrees SE. The FI checked for fuel leaks before exiting the aircraft.

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Both occupants were uninjured but were transported to Marcelo Padilla Children and Medical Hospital in Plaridel for further evaluation. The aircraft sustained damage to the nose landing gear, engine cowlings, and engine supports.

Figure 1 - RP-C1085 final position at the incident site.

1.2 Injuries to Person (s)

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	0	0	0
Minor	0	0	0
Total	**0**	**0**	**0**

1.3 Damage to Aircraft

The aircraft sustained damaged on the Nose Landing Gear, engine cowlings, and engine supports.

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Figure 2 - Damaged Nose Landing Gear (NLG), engine cowlings and engine support.

1.4 Other Damages

No reported other damage on the incident site.

1.5 Personnel Information

1.5.1 Flight Instructor (FI)

Gender	:	Male
Date of Birth	:	14 February 1975
Nationality	:	Filipino
Civil Status	:	Married
License Type	:	103819- CPL/FI
Date Issued	:	10 May 2024/10 October 2024
Type Rating	:	Airplane: Single Engine Land-C-152, C-12, PA-38-112
Medical Certificate Validity	:	17 March 2025
Total Flying Time	:	9,568+04 Hours
Total Flying Time on type	:	640+24 Hours

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1.5.2 Student Pilot (SP)

Gender	:	Male
Date of Birth	:	19 September 1999
Nationality	:	Filipino
Civil Status	:	Single
License Type	:	164206-SPL
Date Issued	:	26 March 2024
Type Rating	:	Airplane: Single Engine: PA-38-112
Medical Certificate Validity	:	07 March 2026
Total Flying Time	:	64+48 Hours
Total Flying Time on type	:	64+48 Hours

1.6 Aircraft Information

1.6.1 Aircraft Data

Registration Mark	:	RP-C1085
Manufacturer	:	Piper Aircraft Corporation
Type/Model	:	PA-38-112
Operator	:	Fliteline Aviation School, Inc.
Serial No.	:	38-78A0274
Certificate of Airworthiness Valid up to	:	29 August 2025
Certificate of Registration Validity	:	28 December 2029
Time Since New (TSN)	:	3,694+17 Hours as of February 18, 2025

1.6.2 Engine Data

Manufacturer	:	LYCOMING
Type	:	Piston
Type/Model	:	O-235-L2C
Serial No.	:	L-15874-15
Time Since New	:	3,694+17 Hours as of February 18, 2025
Time Since Overhaul (TSO)	:	1, 699 +59 Hours
Time Before Overhaul (TBO	:	2, 400+00 Hours

1.6.3 Propeller

Manufacturer	:	SENSENICH
Type/Model	:	72CK-1-56
Serial No.	:	K694

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Time Since New	:	3,694+17 Hours as of February 18, 2025
Time Since Overhaul	:	1,699+59 Hours
Time Before Overhaul	:	2,000+00

1.7 Meteorological Information

A Visual Meteorological Condition (VMC) prevailed during the serious incident. At 0100Z/0900H, the weather information was wind condition @ 8knots, sky condition broken at 050 with visibility 6000M.

1.8 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 landmark references to the ground and visually avoid obstructions and other aircraft.

1.9 Communications

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

Plaridel Control Tower	122.4 MHZ PRI FREQ.
	5447.1 KHZ P/P PRI FREQ.
	3834 KHZ P/P SRY FREQ.

1.10 Aerodrome Information (AIP) as of 26 December 2024

1.10.1 General

Plaridel Community Airport (RPUX) is operated by the Civil Aviation Authority of the Philippines, and is listed in the CAAP approved aerodrome facility data as well the Philippine Aeronautical Information Publication (AIP) as of December 2024.

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Aerodrome	:	Plaridel Community Airport
ARP Coordinates and site at AD	:	145329.5445N 1205111.1410E
Elevation	:	6.20 AMSL
Aerodrome Operator	:	Civil Aviation Authority of the Philippines
Address, Telephone. Telefax	:	Plaridel Airport, Plaridel, Bulacan, Philippines 3004; (044) 795-063/ (02) 879-9122 to 9125
Type of Traffic permitted (IFR/VFR)	:	VFR
Runway Direction	:	17/35
Runway Length	:	900 M
Runway Width	:	30 M
Surface	:	PCN & F/C/Y/U/ASPH
Slope	:	0.16%Uphill towards THR27

1.11 Flight Recorders

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

1.12 Wreckage and Impact Information

The aircraft, upon touchdown on a grassy area, rolls for about 10 meters before coming to a complete stop. The soft and uneven terrain caused the nose landing gear to collapse, damaging the lower engine cowling and engine support.

1.13 Medical and Pathological Information

The two (2) pilots were brought to Marcelo-Padilla Children's and Medical Hospital Corporation for medical evaluation after the incident. Later, the hospital released them without any adverse findings. Additionally, both pilots reported to OFSAM on 27 February 2025 for a post-medical examination. The OFSAM reported that no further medical examination is required and that they are medically fit.

1.14 Fire

There was no post fire reported.

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1.15 Survival Aspects

The serious incident was survivable since no injuries were reported for both pilots. They egressed the aircraft normally after checking the aircraft for fuel leaks.

1.16 Test and Research

During the initial examination, an attempt was made to manually rotate the propeller, but it was found to be stuck.

The engine was removed from the aircraft and subjected to teardown inspection. The engine teardown inspection was conducted by the Fliteline Aviation School, Inc., on 27 February 2025 at their facility at Plaridel Airport.

The sampling of fuel that was gathered on both fuel tanks and the carburetor assembly was subjected to a test using a Kolor Kut Water Finding Paste for contamination.

1.17 Organizational and Management Information

1.17.1 Aircraft Training Organization (ATO)

Fliteline Aviation School, Inc., is located at Plaridel Airport, Plaridel, Bulacan, Philippines as its primary place of business and operations. The school offers pilots training with the following ratings: Primary and Commercial Flight Training Courses (PPL, CPL) Instrument Rating (IR) for fixed wing aircraft, Flight Instructor Course (FI) for Single Engine (SE) and Multi-engine (ME) aircraft. The institution is also duly approved and licensed by the Civil Aviation Authority of the Philippines (CAAP) with an Aviation Training Organization Certificate (ATOC) number # 2006-99. Currently it is operating Ten (10) Cessna 152, five (5) Cessna 172, one (1) PA 34-200 and Three (3) PA-38-112 Tomahawk. The RP-C1085 is included in the Authorized Aircraft for Training of the School.

1.17.2 Maintenance

The maintenance function of RP-C1085 is being undertaken by Fliteline Aviation School, Inc., with a current Approved Maintenance Organization (AMO) Certificate number 66-07 valid until July 31, 2026 located at Plaridel Community Airport, Lumang Bayan, Plaridel, Bulacan, Philippines. The maintenance facility is authorized to perform overhaul Lycoming O-235 series engines. The aircraft and engine have undergone its current 2z100 hours inspection last February 3, 2025.

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2. ANALYSIS

2.1 General

The Piper PA-38-112 Tomahawk aircraft, registered as RP-C1085, was conducting a 360-degree overhead approach and flapless landing training exercise when it experienced a complete engine failure during the base leg turn. The flight instructor (FI) executed a forced landing in an open field, resulting in no injuries to the pilots on board and minor damage to the aircraft.

According to interviews with both pilots, the propeller ceased rotation during the base leg turn. The FI made two unsuccessful attempts to restart the engine before committing to an off-airport landing. The controlled emergency landing was performed without further incident, mitigating potential risks to the aircraft and crew.

2.2 The Aircraft

The PA-38-112 Tomahawk aircraft is a single-engine low-wing cantilever monoplane with a T-tail and an enclosed cabin for two. It has a fixed tricycle landing gear and is powered by a Lycoming O-235-L2C and is rated at 112 horsepower. It is a four-cylinder piston engine with a twin-bladed tractor propeller, normally aspirated, direct drive, air cooled, horizontally opposed, carburetor equipped engine. Fuel is stored in two 16-gallon fuel tanks. The tanks are secured to the leading edge of each wing with rivets. For RP-C1085, the aircraft has no noted significant maintenance activity for the last seven (7) days of flight training.

Figure 3 - The PA-38-112 Tomahawk type of aircraft.

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2.3 Last 100 hours inspection

The aircraft and engine have already accumulated a total time of 3,674+17 hours' time since new (TSN). The last 100 hours inspection was conducted last February 3, 2025 with no significant finding noted during the inspection.

2.4 Engine Overhaul

The aircraft is powered by a Lycoming O-235 series engine, a four-cylinder piston type of engine. Based on records, the aircraft engine has accumulated a total time of 3,674 + 17 hours' time since new (TSN) and was last overhauled by Fliteline Aviation School, Inc., in accordance with the Lycoming Maintenance Handbook after accumulating the required 2,000 hours' time before overhaul (TBO) and was installed on the aircraft on April 18, 2022. Since then, the engine has accumulated a total time of 1,674 hours and shall be overhauled upon reaching the 2,000 hours' time required before overhaul.

2.5 Fuel Test

After the incident, an initial examination was conducted on the fuel hoses and carburetor confirming the presence of fuel flow on both components.

A sampling of fuel that was taken from the aircraft fuel tanks and carburetor assembly was placed on a clean/clear glass container and was tested for fuel contaminants using the Kolor Kut Water Finding Paste (Figure 4). The test results revealed negative fuel contamination.

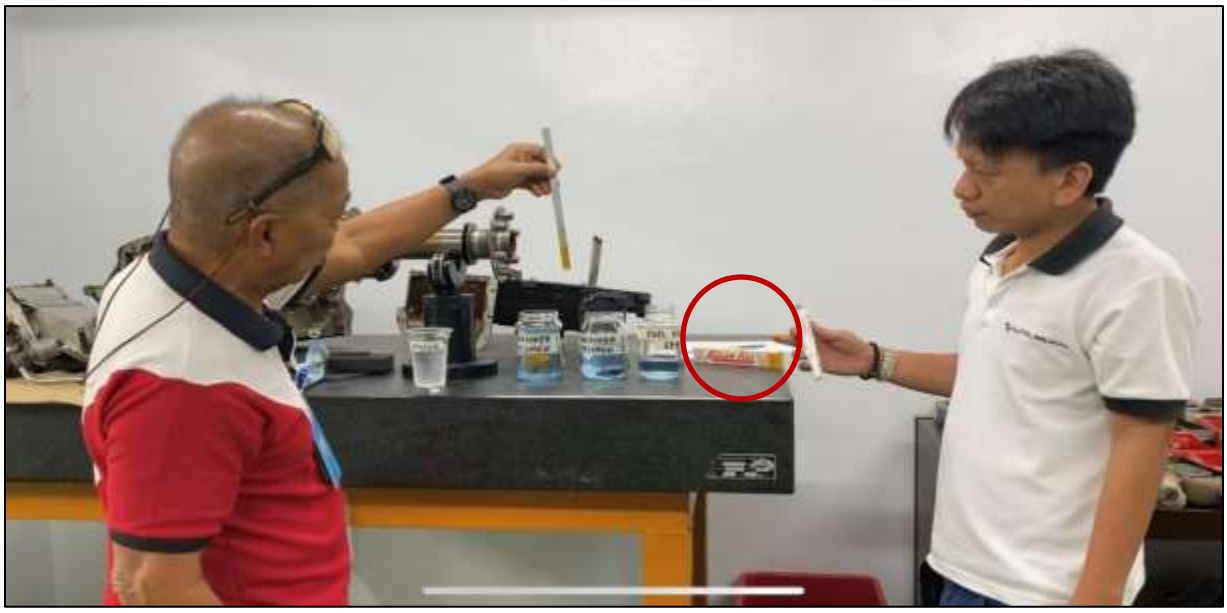

Figure 4 - Testing the fuel with **Kolor Kut Water Finding Paste.**

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2.6 Engine Teardown Inspection

After a complete engine failure that caused the serious incident, the engine was removed from the aircraft and was subjected to a teardown inspection to determine what caused the engine to fail during flight. The teardown inspection revealed the following findings.

a. The worn-out crankshaft bearing number 3 exceeds the normal clearance.
b. The crankcase bearing holder is scratched due to the shrinkage of the third bearing.

The finding that the number 3 bearing had worn out can likely be attributed to material failure since the three other bearings are still within the normal dimensions that likely made the engine come to a complete stop while in flight.

Figure 5 - Engine teardown inspection.

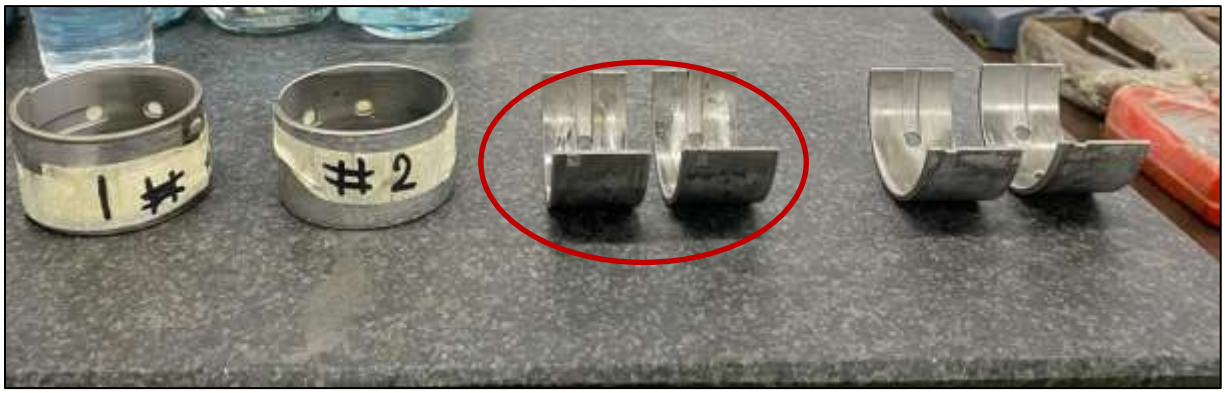

Figure 6 - Photo showing the four (4) bearings remove from the engine with #3 bearing showing differently.

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Figure 7 - The Crankcase bearing No.3 holder with scratches.

Figure 8 - Showing the #3 bearing still attached to crankshaft.

2.7 Engine Stoppage Causes

Aircraft engine stoppage can be viewed in so many instances:

a. Detonation will cause piston and ring damage, top ring groove wear, scoring, or piston scuffing and cylinder wall damage, sticking rings, loose head gaskets, and possible bearing damage leading to complete engine failure. Detonation can be caused by a lean fuel mixture or fuel octane that is too low.

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During the teardown inspection, the number 3 bearing showed damage, and when examined further, it revealed that its dimension was not within the normal parameters that likely caused the engine to fail.

Figure 9 - Dimensions of bearing #3 not within normal dimensions.

b. Engine seizure is caused by overheating or lack of lubrication. Without oil, the engine's moving parts will no longer move smoothly against each other, and the engine will overheat. The first symptom may be a loss of engine power. You may also notice a change in the engine's sound.

During the flight, the pilots reported intermittent sputtering sounds emanating from the engine before it ultimately ceased operation, indicating a probable mechanical malfunction. Although the worn bearing did not exhibit signs of overheating, initial indications suggest the presence of early-stage deterioration, which may have contributed to the engine failure.

3. CONCLUSIONS

3.1 Findings

3.1.1 The aircraft has a valid Certificates of Airworthiness and Registration issued by FSIS, CAAP.
3.1.2 The pilots have current licenses and medical certificates issued by CAAP.
3.1.3 The pilots did not sustain any injuries.
3.1.4 The aircraft sustained minor damage.
3.1.5 There were no significant remarks listed on the aircraft logbook for the last 7 days.
3.1.6 The engine was subjected to a teardown inspection.
3.1.7 The fuel was tested for contamination.
3.1.8 The aircraft made a forced landing after a complete engine failure during flight.
3.1.9 Visual Meteorological condition prevailed during the incident.

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3.2 Probable Cause

3.2.1 Primary Cause Factor

a. Complete failure of the engine during flight.

3.2.2 Contributory Factor

a. Worn-out number 3 bearing.

4. SAFETY RECOMMENDATION

4.1 The safety deficiencies detailed in this report have been fully addressed as a result of the safety measures implemented by Fliteline Aviation School Inc., Consequently, no further safety recommendations are being proposed.

5. SAFETY ACTIONS

5.1 As a result of the occurrence, Fliteline Aviation School Inc., initiated the following safety corrective actions to mitigate the possibility of the same event recurring in the future:

5.1.1 Include in the pilot's handbook to monitor and record any unusual observation about engine parameter during flight.

5.1.2 Incorporate in the maintenance procedures manual the thorough inspection of engine during scheduled maintenance to detect any hint of material failure within the internal parts of the engine in compliance with Lycoming Maintenance Manual.

5.1.3 Adherence to Lycoming Service Bulletin and Service Instruction service documents related to bearings.

5.1.4 Ensure a high degree of cleanliness of the bearing areas and application of approved assembly lubricant during overhaul.

------**END**------

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