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-C9005
CESSNA 150L

OPERATOR: MACTAN AVIATION TECHNOLOGY CENTER INC.

TYPE OF OPERATION: FLIGHT TRAINING

DATE OF OCCURRENCE MARCH 7, 2022

PLACE OF OCCURRENCE: PUROK MARBA, BARANGAY MARTIN MARUNDAN, MATI DAVAO ORIENTAL, PHILIPPINES

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(Cessna 150L, RP-C9005 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 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.

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FINAL REPORT

TITLE: Accident involving a Cessna 150L type of aircraft, with registry number RP-C9005 owned and operated by Mactan Aviation Technology Inc following a departure stall after taking off at Imelda R. Marcos Airport, Mati Davao Oriental. Philippines, on March 07, 2022/0740H.

Notification of Occurrence to National Authority

The Notification of accident to AAIIB CAAP was relayed by the Operator of the aircraft at 1000H (LOCAL) on March 07, 2022.

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 **15 June 2022.**

Synopsis:

On March 07, 2022 at about 0740H, a Cessna 150L type of aircraft, with registry number RP-C9005 operated by Mactan Aviation Technology Inc. sustained substantial damage following a departure stall after taking off at Imelda R. Marcos Airport, Mati Davao Oriental. The Flight Instructor and Student Pilot (SP) sustained minor injuries as a result of the accident. The cause of the occurrence was attributed to the decision of the Flight Instructor to fly the aircraft with known discrepancy resulting to aerodynamic stall.

LIST OF ACRONYMS AND ABBREVIATIONS

AAIIB	:	Aircraft Accident Investigation and Inquiry Board
AMO	:	Approved Maintenance Organization
ATOC	:	Aviation Training Organization Certificate
BRGY	:	Barangay
CAAP	:	Civil Aviation Authority of the Philippines
CB	:	Circuit Breaker
CPL	:	Commercial Pilot License
FI	:	Flight Instructor
IAS	:	Indicated Airspeed
OFSAM	:	Office of the Flight Surgeon and Aviation Medicine
POH	:	Pilot Operating Handbook
RPMQ	:	Imelda R. Marcos Airport
SP	:	Student Pilot
VMC	:	Visual Meteorological Condition

1. FACTUAL INFORMATION

Aircraft Registration No.	:	RP-C9005
Aircraft Type/Model	:	Cessna 150L
Operator	:	Mactan Aviation Technology Center Inc.
Address of Operator	:	Gen. Aviation Area, Davao International Airport, Sasa, Davao City
Place of Occurrence	:	Purok Marba, Brgy. Martin Marundan, Mati Davao Oriental, Philippines
Date/Time of Occurrence	:	07 March 2022/ 0740H/2340 UTC
Type of Operation	:	Training Flight
Phase of Flight	:	Take-Off
Type of Occurrence	:	Reciprocating engine - non-mechanical failure

1.1 History of Flight

On March 07, 2022 at about 0740H, a Cessna 150L type of aircraft, with registry number RP-C9005 bound for Davao City sustained substantial damage following a departure stall after taking off at Imelda R. Marcos Airport (RPMQ) Mati Davao Oriental. The aircraft is being operated by Mactan Aviation Technology Inc. for a training flight. The Flight Instructor (FI) and Student Pilot (SP) sustained minor injuries as a result of the accident. Visual meteorological conditions prevailed and no post-crash fire was reported at the time of the occurrence.

During the second approach after the first touch and go, the Flight Instructor (FI) demonstrated to the Student Pilot (SP), the proper traffic pattern and how to land the aircraft at full flaps configuration. The landing was uneventful, however on landing roll, the FI retracted the flaps for another take off but it did not respond. The FI aborted the take off and proceeded to the ramp to check the flaps. The FI informed the aircraft mechanic through messenger about the flaps' discrepancy being experienced. Without waiting for any response from the mechanic, the FI decided to fly the aircraft back to Davao City.

The FI taxied the aircraft towards the end of the runway to make use of the full length of the runway for take-off. One of the witnesses took a video while the aircraft was passing at the tower. Although the video does not cover the portion where the aircraft collided with trees, the aircraft appeared to be in nose level attitude and in full flaps configuration. The SP stated that before they impacted the trees, she noticed that the indicated airspeed (IAS) was decreasing. The aircraft settled about 320 meters from the end of runway 32 with last heading of 270 degrees and coordinates of 6.95703N,126.267699E (Figure 1 & 2). Both occupants' egress from the aircraft on their own. They were brought to the nearest hospital by the local police due to minor injuries sustained.

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Figure 1: RP-C 9005 final position

1.2 Injuries to Person (s)

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

1.3 Damage to Aircraft

The aircraft sustained substantial damage.

1.4 Personnel Information

1.4.1 Flight Instructor (FI)

Gender	:	Male
Date of Birth	:	November 22, 1995
Nationality	:	Filipino
License	:	Commercial Pilot License (CPL)# 136503-FI
Valid up to	:	August 31, 2023
Medical Certificate Valid until	:	Class 1 valid up to January 13, 2023
Total Flying Time	:	500+00 Hours (As per current logbook)
Total Flying Time On type	:	250+00 Hours (As per current logbook)

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1.4.2 Flight Instructor (FI)

Gender	:	Female
Date of Birth	:	March 19, 2000
Nationality	:	Filipino
License	:	SPL# 153346
Valid up to	:	August 26, 2023
Type rating	:	Airplane: Single Engine Land- C-150
Medical Certificate Valid until	:	Class 1 valid up to January 13, 2023
Total Flying Time	:	9+00 Hours (As per current logbook)
Total Flying Time On type	:	9+00 (As per current logbook)

1.5 Aircraft Information

1.5.1 Aircraft Data

Registration Mark	:	RP-C9005
Manufacturer	:	Cessna Inc.
Type/Model	:	C150L
Operator	:	Mactan Aviation Technology Center Inc.
Serial Number	:	15075650
Date of Manufactured	:	1974
Aircraft Total Time	:	5,678+51 Hours
Certificate of Airworthiness valid up to	:	January 01, 2023
Certificate of Registration valid up to	:	August 10, 2023
Category	:	Utility
Number of Crew	:	2

1.5.2 Engine Data

Manufacturer	:	Continental
Type/Model	:	0-200-A
Serial No.	:	69187-8-A
Engine Time Since New	:	6, 474+39 Hours

1.5.3 Propeller Data

Manufacturer	:	Mc Cauley
Serial Number	:	G1901
Model	:	1A102/OCM6948
Propeller Time Since New	:	5,334+30 Hours

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1.6 Meteorological Information

Visual Meteorological Conditions (VMC) prevailed at the time of the accident

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

Normal communications were carried out between the pilots and other aircraft operating in the area.

1.9 Aerodrome Information

1.9.1 General Information

Aerodrome Name	:	Imelda R. Marcos Airport (RPMQ)
Aerodrome Operator Address	:	Mati Davao Oriental, Philippines
Coordinates	:	06º 57'20.75"N ; 126º 12' 5017.35"E
Azimuth	:	14/32
Runway Length	:	1,500 meters
Runway Width	:	36 meters
Runway Surface	:	Concrete
Wind cone	:	Operational

1.10 Flight Recorders

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

1.11 Wreckage and Impact Information

The aircraft settled on an open area in an inverted position near Lambayong Airstrip, Sultan, Kudarat with last heading of 60 degrees and with coordinates of 6º 51.847 N, 124º 38.521 E. The aircraft sustained damage on the propeller, engine, portion of both wings, horizontal stabilizer, vertical fin, and elevator.

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Figure 2: Rear View of RP-C 9005 final position

1.12 Medical and Pathological Information

Both Pilots possesses valid medical certificates and had undergone the medical examination at CAAP-OFSAM. There was no medical impediment that could hinder their fitness to fly. Their medical history also confirmed that they met the CAAP and ICAO Annex 1 Medical Standards for exercising the privileges of the license held.

1.13 Fire

There was no post-crash fire observed during the site investigation.

1.14 Search and Survival Aspects

Search was not conducted since the aircraft crashed 320 meters away from the airport. The Pilots went out of the aircraft upon the arrival of the responders. They were brought to the nearest hospital due to minor injuries sustained.

1.15 Test and Research

During on-site investigation, flaps cables were inspected for continuity to eliminate the possibility flaps runaway. Additionally, on March 10, 2022, the flaps electric motor was removed from the aircraft and several tests were performed to determine any malfunction or failure. The inspection and tests revealed no evidence of broken cable and flaps electric motor malfunction.

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1.16 Organizational and Management information

1.16.1 Operator

The aircraft, RP-C9005 is being operated by Mactan Aviation Technology Center Inc. with an address of MATCI Hangar, Gen. Aviation Group Area, Old Airport Rd, Sasa, Davao City. Mactan Aviation Technology Center Inc. is a holder of Aviation Training Organization Certificate (ATOC) number 2008-18 valid to operate up until February 13, 2027. It is authorized to conduct as Pilot School that offers the following courses such as Private Pilot License Course for Airplane Single Engine Land (SEL), Commercial Pilot License Course for Airplane (SEL), Flight Instructor Course for Airplane (SEL), Ground Instructor Course for Airplane (SEL), Refresher Course for Airplane (SEL), Instrument Rating Course for Airplane and Agricultural Pilot Training Course.

1.16.2 Maintenance

The maintenance function of RP-C9005 is being undertaken by, Mactan Aviation Technology Center Inc. Approved Maintenance Organization (AMO) with a current Certificate number 91-10 with facility located at MATCI Hangar, Gen. Aviation Area, Old Airport, Sasa, Davao City valid to operate until July 31, 2025.

A review of the aircraft's maintenance records reveals that it was maintained in accordance with applicable regulations and Cessna 150L maintenance procedures. The aircraft flight logbook shows no related defects in the past seven (7) days of entries and showed no evidence that the aircraft was not airworthy. The aircraft was serviceable on the day of the accident.

2.0 ANALYSIS

2.1 General

On March 07, 2022 at about 0740H, a Cessna 150L type of aircraft, with registry number RP-C9005 bound for Davao City sustained substantial damaged after taking off at Imelda R. Marcos Airport (RPMQ) Mati Davao Oriental. The aircraft was on a training flight when the accident happened.

In the course of investigation, the Student Pilot (SP) revealed that it was her second (2nd) lesson of touch and go at Mati Airport prior for first solo flight. Before the accident happened, she was observing the Flight Instructor (FI), throughout the traffic pattern and during the second approach for landing. Upon landing while transitioning for another takeoff, she informed the FI that the flaps were not retracting. The FI aborted the takeoff and taxi the aircraft back to the ramp. The FI checked the flaps by retracting them but the SP could not recall if the flaps did retract. The FI then told the SP that such flaps setting is for short field takeoff and proceeded to the active runway for takeoff. While lining up, the FI, said to her that the full length of the runway will be used. During takeoff roll, she was monitoring the airspeed however, upon lift off she noticed that the airspeed started to decrease. A video acquired by AAIIB investigators from one of the witnesses suggest that the aircraft was in full flaps configuration and in nose level attitude when it passed the tower (Figure 3). Inspection of the RH flaps by AAIIB

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investigators in the crash site appeared to be in full flaps configuration before the impact (Figure 4).

Figure 3: RP-C9005 in nose level attitude and full flaps configuration

Figure 4: RH flaps in full flaps configuration after impact to a tree

According to the Cessna 150 Pilot Operating handbook (POH), flaps setting for normal and short field takeoffs are performed with flaps up. The use of flaps will shorten the ground run and in case with obstacles ahead. Flap deflections greater than 10° are not approved for takeoff. It is also stipulated in the POH for short field takeoff that if an obstruction dictates the use of a steep climb angle, accelerate to and climb out at an obstacle clearance with flaps retracted.

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Interview with the FI by the AAIIB investigators, revealed some deficiencies. These deficiencies represent a culture that contributed to the safety issue of training flight operations conducted by the operator. If not addressed would stem to poor organizational management and constitutes a breakdown of accepted operational standard. Training Organization is not considered safety conscious if such practices are condoned.

The FI said that during the second approach after the first touch and go, the proper traffic pattern and how to land the aircraft at full flaps configuration was demonstrated to the SP. The FI also added that the landing was uneventful however, while on landing roll, the flaps was retracted for another take off but it did not respond. He then aborted the take off and proceeded to the ramp to check the flaps. The FI then communicated to the assigned aircraft mechanic to inform the assigned aircraft mechanic through "messenger" about the flaps malfunction currently being experienced. The FI even sent the video showing that the flaps were not reacting while he was actuating the flaps lever. Without reply from the aircraft mechanic, the FI decided to fly the aircraft back to Davao City.

With such action of the FI had a degraded situation awareness particularly on the issue on proper handling of aircraft with discrepancy. It is important for the FI to recognize and maintain a heightened awareness of situations particularly on aircraft discrepancy. It is necessary for the FI to wait for the aircraft mechanic to check the aircraft. Operating an aircraft with known discrepancy or malfunctions subjects the aircraft from further damage and endangers the lives of the occupants during flight. Although as licensed pilot, he may perform elementary works. An elementary work is a form of maintenance that is not subject to a maintenance release. Hence, it need not be performed by a holder of an AMT license, or by persons working under an AMO certificate. Individuals including pilots are permitted to perform these tasks however, malfunction issue on flaps is not included in such elementary works.

Interview with the concerned mechanic further also disclosed that he is not aware of the message sent by the FI through "messenger" because he was busy at that time. He came to read the message regarding the aircraft malfunction sent by the FI only after the accident.

Accordingly, their internal procedures dictates that after receiving the information it will be forwarded to the Chief Maintenance for evaluation and referral to the maintenance manual. They will determine if minor trouble shooting to be conducted by the FI is applicable. It not, that is the time that they will send rescue personnel to the site to trouble shoot the aircraft.

The Head of Training (HOT) was interviewed on how and to whom aircraft discrepancy is being relayed while there is an ongoing training flight. The HOT explained that the issue/discrepancy should first be reported to him before coordinating to the maintenance department. However, review of the training manual revealed that there is no established flow of communication by the training organization to address such concerns and issues.

On the day of the accident, an aircraft mechanic from another Flying School based in Imelda R. Marcos Airport was among the first responders. He was asked by the Bureau of Fire Personnel who responded to the accident to turn off the master switch including all the electric circuit breakers (CBs) of the aircraft to prevent fire from developing since the fuel was leaking. The aircraft mechanic disclosed that after locating the CBs, noticed that the CB for the flaps has already popped out (tripped) before he pulled out the remaining CBs.

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CBs protect wire and cable from damage owing to an over-current condition. They successfully protect the circuit when the temperature and time duration characteristics of the over-current condition are outside the CB's design limits. When the heat exceeds a preset amount, the bimetallic element bends causing the spring-loaded contact to trip and open the circuit. The tripping of the CB for flaps indicates that there is an electrical fault. The non-retraction of the flaps was caused by an open circuit (no electrical supply) because of the tripping of the CB. The FI should have waited for the reply of the aircraft mechanic or even called up the HOT to ask for assistance. The decision of the FI to fly the aircraft back to Davao City with the aircraft having discrepancy (flaps deployed) was unsafe. The lack of established procedures in reporting of aircraft discrepancy including the flow of communication resulted to confusion on the side of the FI.

3. CONCLUSIONS

3.1 Findings

3.1.1 Both Pilots has a valid license and medical certificate issued by Office of Flight Surgeon and Aviation Medicine (OFSAM), CAAP.
3.1.2 Visual meteorological condition prevailed at the time of the accident.
3.1.3 The aircraft was released for flight without any discrepancies noted on its logbook.
3.1.4 The aircraft has a valid Registration and Airworthiness Certificates.
3.1.5 The aircraft was on touch and go lesson before the accident happened.
3.1.6 While on landing roll, the flaps were retracted for another take off but it did not respond.
3.1.7 The aircraft took-off in full flaps.
3.1.8 The aircraft was substantially damaged.
3.1.9 No post-crash fire ensued upon impact.

3.2 Probable Cause

3.2.1 Primary Cause

a. The decision of the Flight Instructor to fly the aircraft with known discrepancy (flaps retraction fault) resulting to aerodynamic stall.

3.2.2 Contributory Cause

a. Lack of established company procedure in reporting aircraft discrepancy happened in the outlying station.

4.0 SAFETY RECOMMENDATIONS

4.1 CAAP-FSIS should ensure that the Operator:

a. Establish company procedure in reporting aircraft discrepancy happened in the outlying station.

b. Include in their regular safety meeting the importance of adhering to the Operating Limitations and Performance of all aircraft being operated by the company.

-END-

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