



# **Aviation Investigation Final Report**

**Location:** Miami, Florida **Accident Number:** ERA23LA141

Date & Time: March 7, 2023, 17:22 Local Registration: N64535

Aircraft: Cessna 172M Aircraft Damage: Substantial

**Defining Event:** Loss of engine power (total) **Injuries:** 2 None

Flight Conducted Under: Part 91: General aviation - Instructional

### **Analysis**

The flight instructor was conducting an instructional flight when the engine began to make a "knocking" noise, followed by a total loss of oil pressure and subsequent loss of engine power. The instructor reported they were unable to return to the airport and made a forced landing to a marsh area. The nose wheel of the airplane dug into the soft/wet terrain and the airplane slowly flipped over, resulting in substantial damage to an engine mount.

Postaccident examination of the airplane revealed there were no major oil streaks on the lower engine cowling and fuselage; however, there was some dark oily residue noted on the right underbelly of the airplane that appeared to have been there for an extended period of time. The engine did not seize and crankshaft rotated freely when the propeller was manually rotated. Examination of the engine's oil system revealed no obvious mechanical failures; however, damage signatures were observed that were consistent with a lack of lubrication. The instructor said they departed for the flight with 6 quarts of oil; however, about one quart of dark oil was drained from the engine following the accident. Pieces of metal were found throughout the oil system consistent with high heat, friction, and metal-to-metal contact within the engine. A review of the engine maintenance records revealed the engine was 55 hours past its last 100-hr inspection.

Based on the instructor's report that the engine was "knocking," followed by a loss of oil pressure and a power loss, and evidence of high heat, friction, and metal-to-metal contact within the engine with no sign of leaks in the oil system, the engine was likely being operated with an inadequate oil level at the time of the power loss. Though the engine did not fully seize, the damage found throughout the engine most likely contributed to a loss of engine power.

### **Probable Cause and Findings**

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A total loss of engine power due to a lack of oil lubrication.

### **Findings**

Aircraft	(general) - Failure
Aircraft	Oil - Fluid level

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#### **Factual Information**

#### **History of Flight**

Maneuvering	Loss of engine power (total) (Defining event)
Landing	Nose over/nose down

On March 7, 2023, about 1722 eastern standard time, a Cessna 172, N64535, was substantially damaged when it was involved in an accident near Miami, Florida. The flight instructor and the private pilot were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The flight instructor said that, about 30 to 40 minutes into the flight, the engine began to make a "knocking" noise followed by a total loss of oil pressure. The engine then stopped producing power and the propeller "locked up." The instructor said they were unable to return to the airport and made a forced landing in the Everglades National Park. The nose wheel of the airplane dug into the soft/wet terrain and slowly flipped over, resulting in substantial damage to an engine mount.

The airplane was recovered from the Everglades about seven days after the accident and taken to a secure facility. Examination of the airplane revealed there were no major oil streaks on the lower engine cowling and fuselage; however, there was some dark oily residue noted on the right underbelly of the airplane that appeared to have been there for an extended amount of time.

The engine was not seized and the crankshaft rotated freely when the propeller was manually rotated. When the propeller was rotated, valvetrain continuity and thumb compression were observed on each cylinder. Examination of the engine's oil system revealed no obvious mechanical failures; however, damage was observed that was consistent high heat and friction due to a lack of lubrication.

The flight instructor said that there were six quarts of oil on the airplane before they departed; however, about one quart of dark-colored oil was drained from the oil sump after the accident. The oil suction screen was removed and several pieces of metallic debris were observed. The filter was also removed and was filled with dark-colored oil. The element was removed and small flecks of carbon were observed. The oil pump was removed and all gearing was intact. The oil sump was partially exposed when the accessory gear box was removed and several large pieces of metal debris were observed. The oil filter tube was found slightly loose but was being held in place by safety-wire. Some oil was observed on the engine case around and below where the tube connected to the engine case.

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Review of the engine maintenance records revealed the last 100-hour inspection was completed on December 20, 2022, at an engine total time of 1,124 hours. At the time of the accident the engine had accrued 1,279 hours, which was 55 hours past its next required 100-hr inspection.

**Flight instructor Information** 

Certificate:		Age:	66,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Unmanned (sUAS)	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	Toxicology Performed:	
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 2, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	7306 hours (Total, all aircraft), 4518 hours (Total, this make and model), 7248 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

#### **Student pilot Information**

Certificate:	Private	Age:	28,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 1 None	Last FAA Medical Exam:	December 14, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	216 hours (Total, all aircraft), 216 hours (Total, this make and model), 180 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

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### **Aircraft and Owner/Operator Information**

Aircraft Make:	Cessna	Registration:	N64535
Model/Series:	172M	Aircraft Category:	Airplane
Year of Manufacture:	1975	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	17265291
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	December 20, 2022 100 hour	Certified Max Gross Wt.:	2300 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	1124 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	O-320-E2D
Registered Owner:	PANAIR FLYING CLUB INC	Rated Power:	150 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KTMB,6 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	17:53 Local	Direction from Accident Site:	196°
<b>Lowest Cloud Condition:</b>	Few / 9000 ft AGL	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	100°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.98 inches Hg	Temperature/Dew Point:	27°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Miami, FL	Type of Flight Plan Filed:	None
Destination:	Miami, FL	Type of Clearance:	None
Departure Time:	16:15 Local	Type of Airspace:	Special

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### **Wreckage and Impact Information**

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	25.647564,-80.433225(est)

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#### **Administrative Information**

Investigator In Charge (IIC):	Read, Leah
Additional Participating Persons:	Juan Garcia; FAA/FSDO; Mirimar, FL
Original Publish Date:	May 2, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=106844

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 Code of Federal Regulations section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 United States Code section 1154(b)). A factual report that may be admissible under 49 United States Code section 1154(b) is available here.

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