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

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.

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)		

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°
Lowest Cloud Condition:	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

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)

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