

National Transportation Safety Board

Office of Aviation Safety

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ERA24FA300

WRECKAGE EXAMINATION SUMMARY

July 13, 2024

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A. ACCIDENT

Location: West Palm Beach, FL
Date: July 10, 2024
Time: 1410 EDT
1810 UTC
Airplane: Piper PA-28-161

B. WRECKAGE EXAMINATION SUMMARY

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NTSB

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Lycoming Engines

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C. SUMMARY

On July 10, 2024, about 1410 eastern daylight time, a Piper PA-28-161, N81250, was substantially damaged when it was involved in an accident near West Palm Beach, Florida. The flight instructor and private pilot were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 instructional flight.

According to preliminary information from air traffic control obtained from the Federal Aviation Administration, the airplane departed Sarasota Bradenton International Airport (SRQ), Sarasota, Florida at 1121. The airplane flew east over Satellite Beach, flew over the ocean and performed a couple maneuvers before flying to Melbourne Orlando International Airport (MLB), Melbourne, Florida for a touch and go landing at 1247. Then they flew south to North Palm Beach County General Aviation Airport (F45), West Palm Beach, Florida. The airplane performed one touch and go landing. During takeoff, the airplane reached an altitude of 75' above ground level (agl), made a right turn and the last data point indicated he was at 25' agl right over the edge of the pond.

Airport security video showed the airplane perform a touch and go landing, takeoff and at the end of the runway, make a right 180° turn and disappear behind the trees.

A witness stated he was standing in front of the hangar where he works, when he watched an airplane perform a touch and go landing. He watched the airplane as it departed runway 27L. As the airplane was departing, he noticed the airplane make a 180° turn to the right and disappear behind the trees. He heard the airplane splash into the water. He and another person drove down to the pond to render assistance.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

The airplane was located in a pond about 600 ft to the right side of the departure end of runway 27L. The airplane was submerged in about 15 ft of water. The right wing fractured off and floated to the north side of the pond. It was located in 10 ft of water.

2.0 Airframe Examination

Flight controls and control cable continuity

The right horn of the left pilot yoke was broken off. Both horns of the right pilot yoke were intact and attached. The left side control shaft remained partially attached to the control column. The right-side control shaft was broken from the control column.

Full aileron cable continuity was confirmed from the bellcranks in the wings to the control column. The aileron control cables remained attached to the aileron drive chain at the control column. The autopilot servo bridle cables remained attached to the aileron balance cable in the fuselage.

Rudder continuity was confirmed from the rudder horn to the rudder bar in the forward cabin. Both cables remained attached to the rudder horn at the empennage and the rudder bar in the forward cabin.

Both stabilator cables remained attached to the stabilator control rod in the aft fuselage and to the base of the control column. The stabilator balance weight remained attached to the control rod. The stabilator trim actuator was found with 0.6 inches of extension on the top side of the drum. This equates to a partial nose down trim position.

The stabilator trim worked appropriately when moved at the control wheel.

All flight control cable continuity was confirmed. No impact separations of any control cables were found.

Fuel system.

The last known fueling occurred in Sarasota, FL, on the day of the accident, where, 18 gallons of 100 LL were added. The fuel selector valve was found set to the right tank position and was in a tactile detent for that position. The valve was functionally tested in both the left and right tank selected positions. Low pressure air was successfully flowed in both positions from the wing roots through the selector valve and to the fuel strainer. Some water flowed out of the fuel strainer during this test. The fuel strainer fuel screen displayed some debris but was not blocked. The electric fuel pump was removed and powered with a 12-volt power source. During this testing the pump successfully pumped water. Blue fuel was found in the left main tank. Approximately 10 or more gallons were recovered. No fuel was found in the right (separated wing) tank. The right-wing fuel tank contained water with minor signs of fuel mixed in.

Instrument panel

The throttle and mixture controls were found about two-thirds of full forward. The fuel selector valve was selected to the right tank. The fuel boost pump switch was on. The magneto key switch was on both. The master switch was on. The primer was in and locked. The carburetor heat was about one third from the off position. The pitot heat switch was off. The left fuel gauge read empty. The right fuel gauge read full. The oil temperature was 210 degrees. The oil pressure gauge was off scale low. The hobbs meter read 8,395.3 hours. The flap selector was in the zero-degree position. This position was verified at the flap torque tube. The left flap functioned correctly when the flap selector handle was moved.

Left wing – The left wing remained attached to the fuselage. The aileron and flap remained attached to the left wing at all hinges. The left aileron bellcrank remained attached to the mounting location inside the wing. Both aileron cables remained attached to the bellcrank. The aileron push rod remained intact and attached to the aileron. The aileron actuated correctly when the cables were pulled by hand. Both aileron

cables were cut by salvage personnel at the wing root. Left wing contained approximately 12-14 gallons of blue fuel after removal from pond. Air was passed from the wing root to the left fuel tank via the fuel line. No obstructions were found in the fuel line or the fuel vent line. The fixed landing gear remained attached to the wing.

Right wing – The right wing separated from the airframe at impact and floated to a position on the opposite side of the pond (pond about 8+- acres). The flap and aileron remained attached to the right wing at all hinges. The aileron bellcrank remained attached to both cables. The bellcrank had pulled completely through wing, was deformed and remained attached to the fuselage by the cables. The aileron bellcrank push rod was broken. Water was contained in the right-wing fuel tank. Air was passed from wing root to the fuel tank via the fuel line. No obstructions were found in the fuel line or the fuel vent line. The fixed landing gear remained attached to the wing. The right-wing main spar fractures appeared a normal light gray color on the fuselage side of the fracture, but appeared darker on the wing side of the fractures. The NTSB, IIC retained both sides of the fracture to send to their material laboratory for examination and analysis.

Empennage

The rudder and stabilator remained attached to the aft fuselage at the hinges. The rudder displayed a buckle about 1 foot from the top. The stabilator displayed no notable impact damage. The ELT remained intact and mounted inside the aft fuselage. It was found with the switch in the ARM position. The stabilator was cut on both sides by recovery personnel.

3.0 Engine Examination

The engine remained attached to the aircraft fuselage through the tubular mount. The mount was impact damaged and the engine was tilted nose down about 20 degrees. The engine cowling was not present. The induction air box was crushed and the induction air filter was not observed. The exhaust system was impact damaged. The exhaust system was not obstructed.

The engine was partially disassembled to facilitate the examination. Water drained from the engine cylinders when the lower spark plugs were removed. Water and oil drained from the oil sump drain when it was opened.

The crankshaft was rotated by turning the propeller and continuity of the crankshaft to the rear gears and to the valve train confirmed. Compression and suction were observed from all four cylinders. The interiors of the cylinders were observed using a lighted borescope and no damage noted.

The propeller remained attached to the engine crankshaft flange. The propeller spinner was impact damaged. No damage was noted to one of the propeller blades. The other blade was bent aft about 5 degrees at about 6 inches from the blade tip.

The carburetor remained attached to the engine. The carburetor air box and carburetor heat valve were partially crushed. The throttle cable remained attached to the carburetor throttle control arm. The arm was observed against the full throttle stop. The cockpit throttle control lever was observed near the idle position. The mixture control cable remained attached to the carburetor mixture control arm. The arm was observed about 1/8 inch from the carburetor full rich stop. The cockpit mixture control lever was observed near the idle cut-off position. The carburetor heat control cable remained attached to the air box carburetor heat arm. The air box and carburetor heat valve were impact damaged. The cockpit carburetor heat control lever was observed about 3/4 of the way toward the carburetor heat hot position.

The carburetor was partially disassembled. The float bowl was about 1/3 full of blue liquid with an odor consistent with aviation gasoline. No damage to the composite float assembly or other internal carburetor parts was noted. The carburetor fuel inlet screen was unobstructed.

The fuel strainer bowl was impact separated from the strainer body. The fuel strainer screen surface exhibited a small amount of debris.

The engine driven fuel pump remained attached to the engine and no damage was noted. The pump was partially disassembled, and fuel and water observed in the pump cavity. No damage to the rubber diaphragms, check valves or other internal components was observed. Fuel drained from the hose between the engine driven fuel pump and the carburetor when it was disconnected.

Both magnetos remained attached to the engine. Power was applied to both electronic magnetos. One tower of the left magneto produced spark when the magneto drive was rotated by hand. The right magneto produced no spark when rotated by hand. Water drained from both magnetos when the distributor covers were removed. Both magnetos

were place in the sun for about an hour and then set aside to dry out overnight. Both magnetos were powered the following morning and rotated using an electric drill. Neither magneto produced spark from any electrode tower.

The spark plug electrodes exhibited dark gray coloration and worn normal condition. The electrodes of the #1, #2 and #3 spark plugs were oil soaked. Silt was observed in the electrode well of the #1 top spark plug.

Oil and water drained from the engine oil sump when the sump drain was opened. The oil suction screen and oil pressure screens were absent of debris.

The alternator remained attached to the engine. No damage was noted and it was not removed. The alternator belt remained in place.

4.0 **Additional Information**

According to a mechanic, on or about July 2, 2024, he performed an engine swap on this airplane. He removed a Lycoming, O-320-D3G, and installed a O-320-D2B. He converted the engine to a O-320-D2A by swapping out the Bendix magnetos with Slick magnetos. The owner of the airplane then supplied the mechanic with two Surefly, electronic ignition modules. This was installed under a supplemental type certificate (STC). The mechanic also had to install a back up battery system for the STC and this modification required a major repair and alteration form 337. The mechanic also installed a challenger oil screen and a new air filter. Both required an STC for installation.

The mechanic further stated that he went home sick on the last day of the engine swap and he did not complete any paper work for the engine swap, STC installations, or the form 337, nor did he complete the engine conversion on the engine data plate. He was home sick for 8 days when he heard that the airplane has an accident and knew that the paperwork was not completed.

Submitted by:

Daniel Boggs
Air Safety Investigator