

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA23FA247

WRECKAGE EXAMINATION SUMMARY

May 27-28, 2023

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A. ACCIDENT

Location: Lake Worth, Florida
Date: May 26, 2023
Time: 1118 EDT
1518 UTC
Airplane: Cessna 172P, N3KV

B. WRECKAGE EXAMINATION SUMMARY

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C. SUMMARY

On May 26, 2023, at 1118 eastern daylight time, a Cessna 172P, N3KV, was destroyed when it was involved in an accident at Palm Beach County Park Airport (LNA), Lake Worth, Florida. The flight instructor and student pilot were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations (CFR) Part 91 instructional flight.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

The airplane initially impacted about 200 ft from runway 16/34. The debris path was on a 006° heading and the airplane came to rest about 140 ft from the initial impact point at an elevation of 16 ft mean sea level.

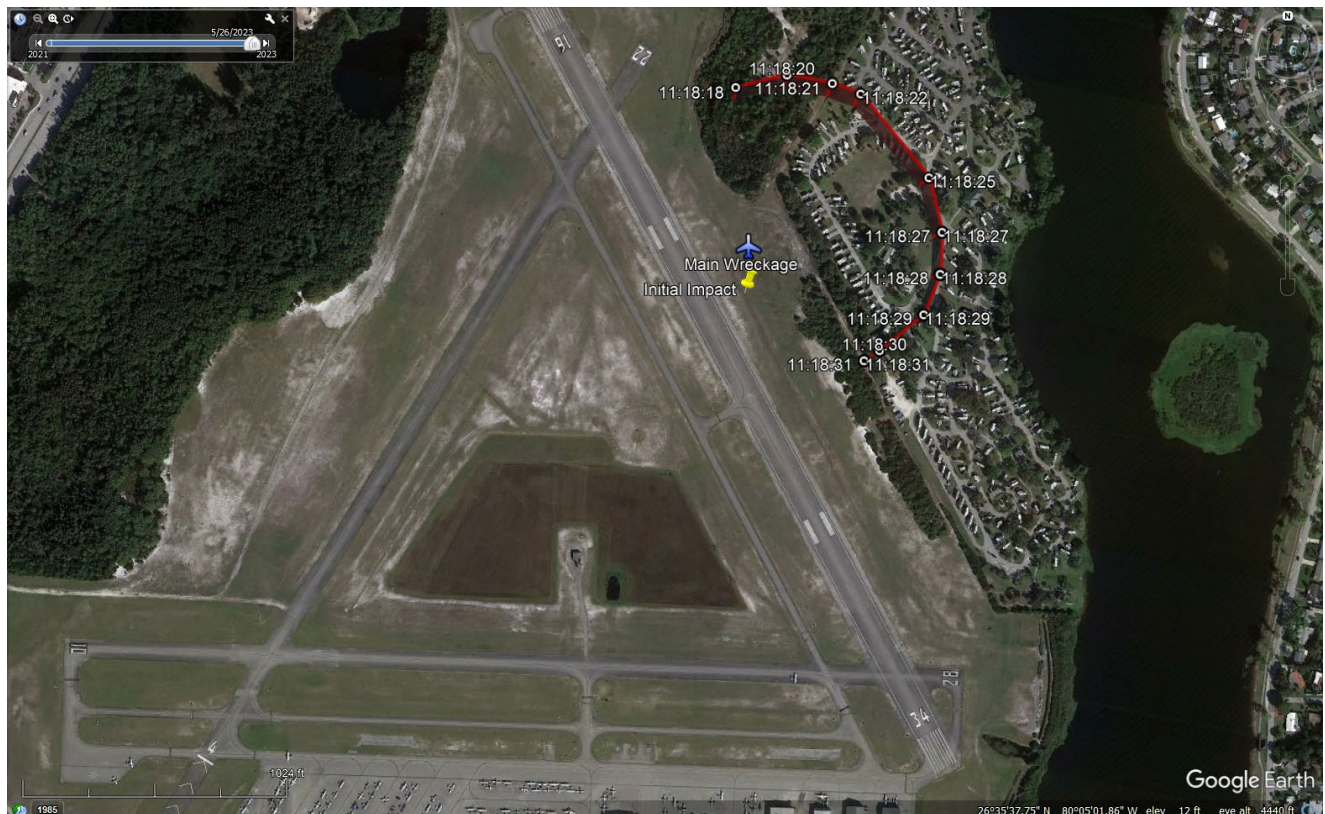


Figure 1: Flight Track Overview

2.0 Airframe Examination

2.1 Fuselage

The fuselage came to rest in the vicinity of the runway and the engine remained attached to the fuselage. The empennage remained partially attached to the fuselage. All major components of the airplane were located within the vicinity of the main wreckage.



Figure 2: View of wreckage debris path.

2.2 Empennage

The empennage was wrinkled. The right horizontal stabilizer remained attached to the empennage. The right elevator remained attached to the right horizontal stabilizer. The trim tab remained attached to the right elevator and was measured to be in a 8° tab down position. However, the empennage cables were twisted and pulled during the impact. The right elevator cap remained attached to the right elevator and exhibited impact damage. The right elevator counterweight remained attached. Elevator and rudder control continuity was confirmed from the flight control surface to the flight control yoke in the cockpit.



Figure 3. View of right horizontal stabilizer, right elevator, rudder, and vertical stabilizer.

The left horizontal stabilizer remained attached to the empennage. The left elevator remained attached to the left horizontal stabilizer. The left elevator cap remained attached to the left elevators and the outboard trailing edge of the left elevator was slight bent in the positive direction.



Figure 4. View of left horizontal stabilizer and left elevator along with the left side of the rudder and vertical stabilizer.

The vertical stabilizer remained attached to the empennage and was not damaged. The rudder remained attached to the vertical stabilizer and was not damaged.

2.3 Airplane Wings

The right wing was impact separated from the fuselage. The wing tip was impact separated from the right wing and located along the debris path. The right-wing tip light lens cap was located at the initial impact point. The outboard 5 ft section of the wing tip was bent in the position direction and crushed aft. A 6-inch section of the right aileron was impact separated from the wing. The remaining portion of right aileron and right flap remained attached to the right wing. The inboard 4 ft section of the right wing exhibited thermal damage. The right-wing fuel tank was breached. When the right wing was moved by recovery personnel, an undetermined amount of fuel drained from the wing. The right strut was impact separated from the right wing and located on the debris path. The flap jack screw was measured and corresponded to the flaps in the retracted position.



Figure 5. View of right wing.

The left wing was impact separated from the fuselage. The outboard 6 ft section of the left wing was impact crushed aft and the wing tip was impact separated. However, it was located along the debris field. The left aileron and the left flap remained attached to the wing. The flap was free to move along the flap tracks. The inboard 4 ft section of the wing exhibited thermal damage. The pitot tube remained attached to the left wing. The left fuel tank was breached. The left strut remained attached to the left wing.



Figure 6. View of left wing.

Aileron control continuity was not confirmed. A separation was noted in the aileron control systems in the vicinity of the left upper door post right direct aileron cable pulley. The pulley was removed, examined, and exhibited corrosion. Several other breaks were noted in the aileron control system consistent with tension overload failures. The pulley did not move freely. The right upper door post left direct aileron over pulley was removed and examined. The pulley did not rotate freely, and corrosion was noted.

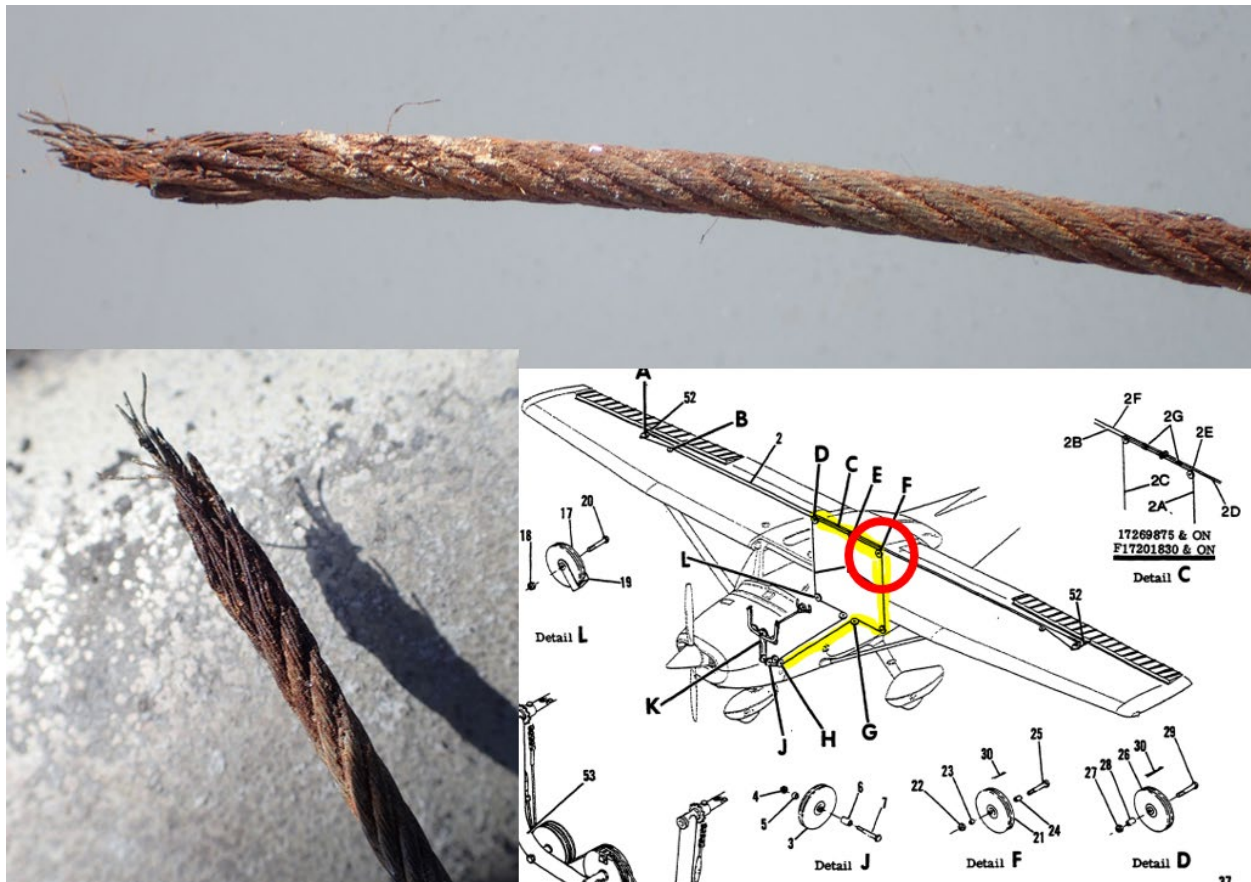


Figure 7. Close up view of the separated aileron cable sections. The red circle indicates the approximate location of the broken portion of cable. The highlight portion of aileron cable in the diagram indicates the section of cable sent to the NTSB Materials Laboratory.

2.4 Landing Gear

The left main landing gear remained attached to the fuselage. The right main landing gear was impact separated. The nose landing gear was partially separated from the fuselage.

2.5 Cockpit

The cockpit was impact crushed aft and multiple instruments were separated from the cockpit and damaged.

- Magneto Switch - BOTH
- Tachometer - 5025.5 hours
- Compass - Damaged
- GPS - Damaged
- Mixture control - Full rich
- Throttle control - Full forward
- Flaps Handle - 10°
- Pitot Heat - ON
- NAV light - ON
- Strobe light - ON
- Beacon light - OFF
- Carburetor Heat - Pushed in (OFF)
- Airspeed indicator - needle separated
- Turn Coordinator - Right wing down and ball deflected to the right.

The flight control lock was located stowed in the forward front pocket in the cabin.

2.6 Survivability

The left front seat remained attached to the fuselage and was bent to the right. The left front seatbelt was cut.

The right front seat was impact separated from the fuselage and the right seat rail remained attached to the seat. The left seat rail of the right seat remained partially attached to the fuselage floor. The right seatbelt was separated where the webbing connected to the male side of the buckle. The buckle remained latched. Both connecting points remained secure to the floor.

Both front seats were equipped with should harnesses. However, neither shoulder harness was connected to the seat belt.

2.7 Fuel/Fuel System

The fuel selector was removed from the airframe and was between the detents. It was moved into the detents and was not obstructed. The fuel selector handle was twisted and bent. The fuel strainer bowl contained a small amount of fuel, and the strainer screen was not obstructed. The fuel pickup screens were examined in the left and right wing, with no debris noted.

2.8 Other Systems

The emergency locator transmitter (ELT) was found secured in the airplane fuselage and it was in the armed position. The ELT battery expiration date was July 2025. An FAA inspector who responded to the accident site turned it to the OFF position.



Figure 8: ELT in the off position

Corrosion was noted throughout the airplane during the examination.

3.0 Engine Examination

The crankcase was examined and did not have any holes except in the oil sump. The cylinders were examined with a lighted borescope and no anomalies were noted. Crankshaft continuity was confirmed by rotating it through the vacuum pump drive shaft through 720° of rotation. Compression was confirmed on all cylinders by rotating the propeller. The rocker covers were removed from the cylinders and valve train continuity was confirmed.



Figure 9. Four side view of engine.

3.1 Magnetos

The left magneto was removed from the engine and sparked on all towers when turned by hand. The right magneto was impact separated from the engine and sparked on all towers when rotated by hand.

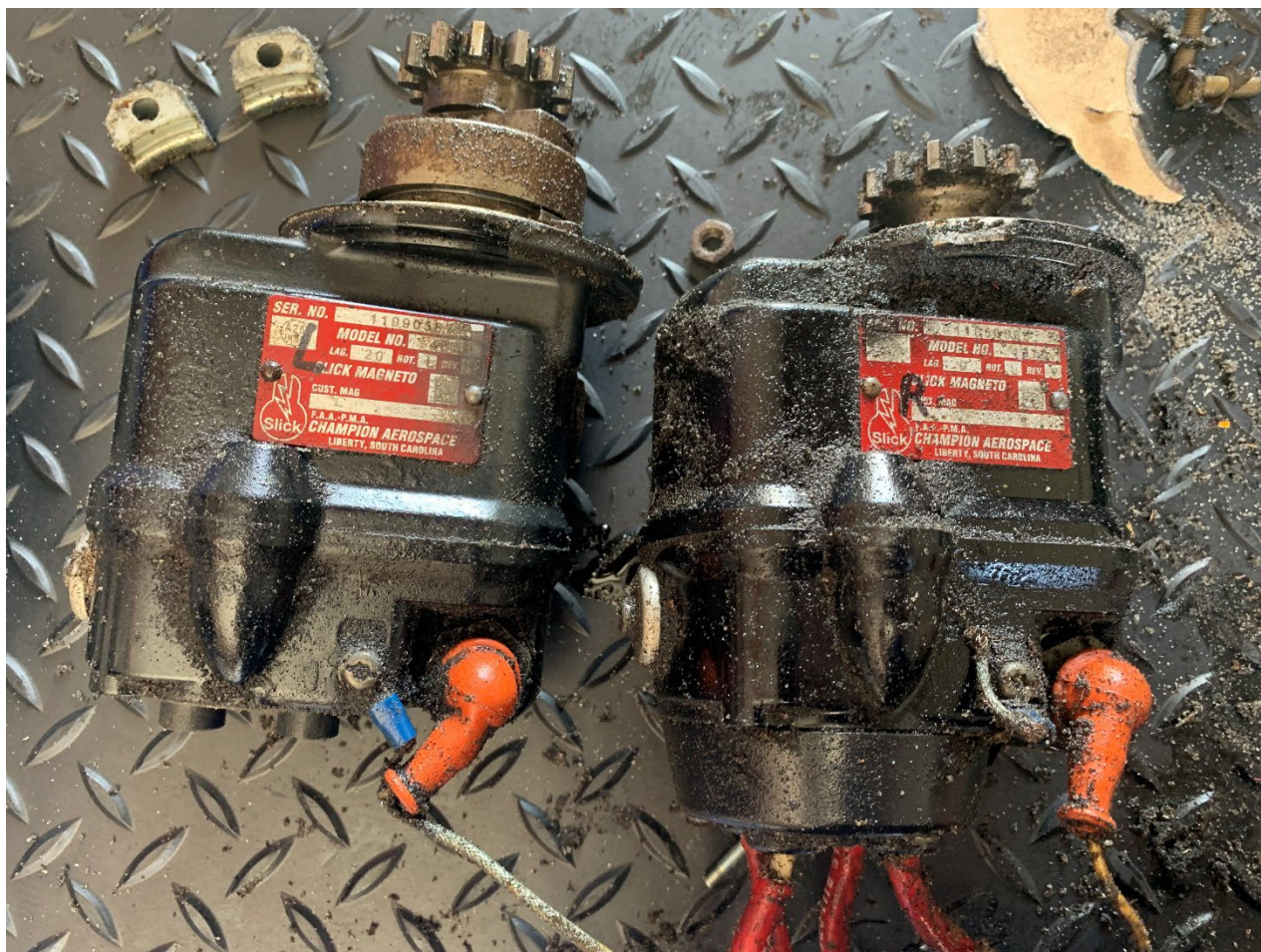


Figure 10. Left and right magnetos.

3.2 Ignition System

The airplane was equipped with a starter motor that remained attached to the engine. There were rotational scoring marks on the starter.



Figure 11. Engine starter. Note rotational scoring.

The spark plugs were removed and examined using the Champion Aerospace Aviation Check-A-Plug chart. The Nos. 1 and 3 top spark plugs were oily and the electrode was in normal condition. The Nos. 1 and 3 bottom spark plugs were damaged and could not be removed. However, they were examined using a lighted borescope and no anomalies were noted. The Nos. 2 and 4 top and bottoms spark plugs exhibited normal wear when compared to the Champion Aerospace Aviation Check-A-Plug chart.



Figure 12. Spark plugs removed from engine.

3.3 Fuel System

The carburetor was removed and disassembled. There was fuel in the carburetor bowl that drained out when the carburetor was removed from the engine. The floats were examined and were not damaged. The fuel inlet screen was examined, and no debris was noted. The float needle valve was examined and was without anomalies.



Figure 13. View of disassembled carburetor.

3.4 Lubrication System

The oil filter was impact separated from the engine. It was disassembled and no metallic material was noted in the filter.



Figure 14. View of oil filter element.

The oil pick up screen was removed from the oil sump and no debris was noted.



Figure 15. View of oil pickup screen.

4.0 Propeller Examination

The fixed pitch propeller remained attached to the crankshaft flange and the two blades remained attached to the hub. Blade A was bent forward about mid-span and exhibited chordwise scratching. Blade B was twisted and exhibited chordwise scratching.



Figure 16. Two-angle view of the propeller blade.

5.0 Recovery of Wreckage

The airplane was recovered to Florida Air Recovery in Ft. Pierce, Florida. Scott Harris is the insurance adjuster.

FAA inspector - Mike and Inspector Derek Mayberry have the flight log from the airplane, the student pilot's flight log, along with the new registration paperwork.

The aileron control cables that were removed from the airplane were left with Florida Air Recovery and a shipping label was sent to floridaairrecovery@gmail.com to ship the cables to the NTSB Materials Laboratory in Washington, DC.

Submitted by:

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