

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA314

EXAMINATION SUMMARY

July 22, 2023

TABLE OF CONTENTS

A. ACCIDENT	3
B. EXAMINATION SUMMARY	3
C. SUMMARY	3
D. DETAILS OF THE EXAMINATION.....	5
1.0 ACCIDENT SITE	5
2.0 AIRFRAME EXAMINATION.....	ERROR! BOOKMARK NOT DEFINED.
2.1 Fuselage.....	6
2.2 Empennage	7
2.3 Wings.....	7
2.4 Landing Gear.....	10
2.5 Cockpit.....	10
2.6 Survivability.....	11
2.7 Fuel/Fuel System.....	11
2.8 Other Systems	11
3.0 ENGINE EXAMINATION	11
4.0 PROPELLER EXAMINATION	13
5.0 PILOT INFORMATION	14
6.0 AIRCRAFT INFORMATION	14
7.0 METEOROLOGICAL INFORMATION	14

A. ACCIDENT

Location: Kearney, Missouri
Date: July 20, 2023
Time: 0934 CDT
Airplane: N200RA - Piper PA-31P, S/N 31P-7400198

B. EXAMINATION SUMMARY

IIC	Andrew Finne NTSB Aurora, Colorado
Party Member	Jon Hirsch Piper Aircraft, Inc Vero Beach, Florida
Party Member	Troy Helgeson Lycoming Engines Williamsport, Pennsylvania
UAS Specialist	Aaron Sauer NTSB Aurora, Colorado
FAA IIC	David Wood Federal Aviation Administration Kansas City, Missouri

C. SUMMARY

On July 20, 2023, about 0934 central daylight time, a Piper PA-31P Pressurized Navajo, was destroyed when it was involved in an accident near Kearney, Missouri. The pilot sustained fatal injuries. The flight was being operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Multiple witnesses reported that the airplane was chained to a tree in an agricultural field adjacent to the Midwest National Air Center Airport (GPH), Mosby, Missouri, property from 2021 until December 2022 due to the previous owner being evicted from the airport. Prior to the eviction, the airplane's last recorded annual inspection was August 15, 2015, with a TACH time of 1182.2. A propeller inspection record on May 19, 2019, still reported a TACH time of 1182.

A Special Airworthiness Certificate for a one-time maintenance ferry flight between GPH to Clyde Cessna Field (9K8) was issued by a Kansas City Federal Aviation Administration Flight Standards District Office inspector on June 29, 2023, and then reissued on July 11, 2023 with an expiration date of July 23, 2023. The airplane was inspected and a logbook entry was recorded with a TACH time of 1192.2 by a mechanic on June 28, 2023, for the one-time ferry flight. Part of the logbook entry stated that the mechanic removed the emergency locator beacon (ELT) for repair during his inspection. However, postaccident examination showed that the ELT was in the airframe cradle with an undisturbed animal nest in the antenna wiring. The animal nest had to be removed by investigators to disconnect the antenna from the ELT.

Multiple airport workers witnessed the right inboard fuel tank leaking while being fueled prior to the accident flight. The leaking was to such an extreme one of the workers took a video of the leaking fuel and provided it for further review. Two workers reported that the airplane had had multiple issues with leaking fuel during the past few months that the mechanic was never able to resolve. In the video provided, the owner can be heard commenting they will leak out "one or two" due to the known leak.

The takeoff was witnessed by numerous people who commented that the airplane had an extended ground roll and a very slow climb rate after rotation. Several videos were provided that show the takeoff sequence from line up to the airplane disappearing behind a tree line.

The video shows the airplane veering to the right multiple times during the takeoff roll. During the first attempted rotation, the airplane is seen settling back to the runway and continuing towards the departure end. Very near to the departure end the airplane jerks off the runway, yaws to the right, and starts a very slow climb roughly in parallel with surrounding rising terrain. The airplane is then seen with the gear retracting and the climb rate briefly accelerating to clear a tree line. The airplane is then seen making a left turn and disappearing behind the same group of trees.

On site investigation was conducted by the NTSB, Federal Aviation Administration, Lycoming Engines, and Piper Aircraft. The airplane was not insured and recovered by the current owner. The airplane was released to the owner for recovery purposes and retained for further examination.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site



Figure 1: Accident site

- Location is +39.363823° / -094.322714°
- Location is 1.58 NM about 335° MH from the departure end of Runway 36 at GPH
- Airplane came to rest on about a 254° MH.
- Altitude is about 807 ft MSL.
- Airplane is in a flat soybean agricultural field.
- Accident site is surrounded, in the local area, by similar fields with pockets of dense trees in between the fields.
- Post impact vegetation fire was observed in and around the airplane debris field.

The fuselage, left wing, and inboard section of the right wing came to rest in the field. A post-crash fire thermally damaged the fuselage from the nose to the aft pressure bulkhead. The fire also damaged the left wing up, including the left engine and nacelle, to the midspan of the wing. The right wing had fire damage and post-crash fire damage to the right engine and right nacelle inboard to the wing root.

The debris path measured about 735 ft in length on a heading of 254°. The first impact point was two static lines on a power transmission line about 65 ft above the surrounding terrain. According to local authorities and power company personnel, the static wires were pulled and separated from the power poles and

found in a field in the direction of the airplane's path. The static wires had blue paint transfer consistent with airplane contact. A tree had a large v shaped cut on the side canopy about 60 ft above ground level and 150 ft from the transmission static wires. The right aileron counterweight was found at the base of the tree. Numerous paint and airplane skin fragments were found in-between the transmission lines and the tree. Broken fresh tree branches and tree leaves were found below the v shaped tree cut.

The ground debris path was a ground scar through agricultural plants consistent with the airplane nose structure. One pitot tube was found embedded in the ground about 25 ft from the initial ground scar. The ground scar widened to the airplane span about 150 ft past the first agricultural plant contact. A second separate ground scar through agricultural plants started about 100 ft past the first impact point and contained the outboard section of the left elevator. Numerous small vegetation burn spots located along the debris path. The outboard 4 ft of the right wing was found separated and laying upside down in the field about 210 ft from the first impact. The left propeller and gear reduction prop shaft were found separated and located on the right side of the debris path about 30 ft from the airplane. Numerous fuselage and wing fragments were found along the entire length of the path.

1.1 Fuselage



Figure 2: Accident airplane

The fuselage came to rest upright, and the left wing attached. The right wing was separated from the fuselage and laying on the ground next to the fuselage in it's normal orientation. Thermal damage occurred along the length of the fuselage to the aft pressure bulkhead. The interior, sides, and ceiling of the fuselage were consumed

by the post-crash fire. The upper nose skin surface had a large diagonal impact with witness marks and crush damage consistent with impact with a wire. The airplane records were located in the forward baggage compartment. The records were wet and damp, consistent with the fire suppression efforts.

1.2 Empennage

The empennage was intact with no fire damage from the aft pressure bulkhead rearward. The left horizontal stabilizer and elevator had upward deformation of the structure with crush damage. The elevator outboard of the outboard hinge was separated and was located in the debris path. The right elevator had wrinkling of the lower skin near the outboard hinge. The vertical stabilizer was intact with no accident damage noted. The rudder above the upper hinge was displaced to the left about 45° degrees with no impact damage noted. The fuselage contained numerous pre-accident vegetation debris, bird and insect nests, tree sap, and bird droppings were located on and in the empennage. Flight control continuity was established from the elevator and rudder control surfaces to the cockpit controls. The rudder trim tab was found in the NEUTRAL position with an insect nest surrounding the entire jackscrew protruding forward of the drum. The elevator trim was found in the full NOSE UP position.

1.3 Wings

Right Wing



Figure 3: Right wing

- Found separated from the fuselage at the wing root with fire damage outboard to the right engine nacelle. Outboard of the nacelle the wing had fire damage, crush damage, and fragmentation of the structure. The outboard 4 ft of wing structure was found separated in the debris field.



Figure 4: Separated outboard section of right wing

- The separated 4 ft section of wing had no fire damage and was found missing the right aileron. The fracture surfaces were consistent with overload failure. A large bird nest was found inside the leading edge. The upper surface had witness marks and crush damage consistent with impact of the static wire. The wire damage started at the separation point and wrapped around the leading edge of the wing. The leading edge had crush damage within the witness mark areas.

Right Aileron

- Found attached to the inboard wing structure and separated from the outboard 4 ft of wing structure. The aileron had crush damage consistent with contact with a static wire.
- Flight control continuity was established from the control surface to the fuselage. Fuselage to yoke continuity was not established due to impact damage of the fuselage and wing root.

Right Flap

- Found attached and in the RETRACTED position with no trailing edge damage. Fire damage was observed along the entire length with crush damage mid span outboard.

Left Wing



Figure 5: Outboard left wing

- Found attached to the fuselage at the wing root with fire damage to the aux tank fuel filler cap outboard of the left nacelle. Outboard of the filler cap, the wing had upward deformation with crush damage along the leading edge. The wing tip navigation light had crush damage consistent with ground impact.

Left Aileron

- Found attached to the wing with crush damage.
- Flight control continuity was established from the control surface to the fuselage. Fuselage to yoke continuity was not established due to impact damage to the fuselage and wing root.

Left Flap

- Found attached and in the RETRACTED position with no trailing edge damage. Fire damage was observed along the entire length with crush damage.

The aileron trim was found in a partial RIGHT WING LOW position.

1.4 Landing Gear

The left and right main landing gear were found in the RETRACTED position. The nose main landing gear position was not observed due to fuselage fire damage. The cockpit landing gear handle was in the UP position.

1.5 Cockpit



Figure 6: Cockpit

Fire damage prevented verification of the majority of the flight instruments. The manifold gauge was found intact with the right engine needle at 29 inHg and the left engine needle at 45 inHg. The vertical speed indicator needle was found at the descent limit. The throttle, prop, and mixture were found in FULL FORWARD position with fire damage. Both the right and left fuel selectors were found with the inboard tanks selected. The pilot lap belt was found unlatched with fire damage. The upper control column chain assembly was intact, and the two columns moved in unison when manually manipulated.

1.6 Survivability

According to local authorities, the pilot was found rear of the cockpit seats towards the cabin door. An autopsy and toxicology were requested.

1.7 Fuel/Fuel System

Due to thermal damage, the fuel system was compromised and unable to be examined in detail.

1.8 Other Systems

The Emergency Locator Transmitter (ELT) was found in the OFF position and the battery expired in June 2016. The ELT was secured under the vertical stabilizer fairing undisturbed with a bird nest in the antenna wiring.

2.0 Engine Examination

Right Engine



Figure 7: Right engine and propeller

Found attached to the nacelle with fire damage to the engine and accessories. The engine magnetos were unable to be tested due to being melted and partially consumed by the post-crash fire. The upper six spark plugs were removed and examined with heavy carbon fouling present. All six cylinders were borescoped with no issues noted. The crankshaft was unable to be rotated by hand due to the airplane resting on the ground. The intake system was intact, and the exhaust tailpipe

disconnected at band clamp missing. A band clamp was found in the debris path. The turbocharger rotated freely but was stiff when moved by hand. The fuel screen was clear with no fuel present in the fuel system. The oil filter was unable to be examined due to fire damage with oil present on the ground surrounding the engine. The cowling had a large diagonal impact with witness marks and crush damage consistent with impact with the static wire. The wire damage was in line with the nose and wing wire damage.

Left Engine



Figure 8: Left engine

Found attached to the nacelle with major fire damage to the engine and accessories. The right engine magneto was unable to be tested due to being melted and partially consumed by the post-crash fire. The left magneto was discolored due to fire but intact. However, it was unable to be tested due to the heat damage. The upper six spark plugs were removed and examined with heavy carbon fouling present. All six cylinders were borescoped with no issues noted. The crankshaft was unable to be rotated by hand due to the airplane resting on the ground. The intake system was intact, and the exhaust tailpipe contain a large crack from ground impact. The turbocharger rotated freely but was stiff when moved by hand. The fuel screen was clear with no fuel present in the fuel system due to fire exposure. The oil filter was unable to be examined due to fire damage with oil present in the sump. The gearbox was found destroyed with the propeller separated from the engine. Various forward gearbox and crankshaft fragments were found within the debris path.

3.0 Propeller Examination

Right Propeller



Figure 9: Right propeller

The propeller blades were identified from right to left as A, B, and C for documentation purposes. All three blades were found attached to the hubs. The propeller blades were found loose within the hub. Blade A had a leading-edge gouge consistent with impact with a wire. Blade B had filing of the leading edge and blade face witness marks consistent with wire impact. Blade A and C had no rotational bending and were bent lengthwise aft of the hub. Blade B had rotational bending.

Left Propeller



Figure 10: Left propeller

The propeller blades were identified from right to left as A, B, and C for documentation purposes. All three blades were found attached to the hubs. The propeller blades were found loose within the hub. The entire propeller was found separated from the engine gearcase with the gear reduction prop shaft still attached to the hub. All three blades had bending. Blade B had blue paint transfer on the back side of the blade consistent with impact with the airplane structure. Additionally, Blade B had a loop witness mark on the blade face consistent with impact with a wire. Blade C had about 4 inches of the tip missing. The tip was unable to be located due to the agricultural nature of the site.

4.0 Pilot Information

Alan D. Moler, Pilot Certificate, held numerous pilot certificates and ratings up to Airline Transport Pilot. Pilot had Basic Med dated April 28, 2023, with an expired FAA Second Class medical dated April 1, 2021 with an expiration date of October 31, 2021. The last medical application listed a total flight time of 23,550 hours.

5.0 Aircraft Information

Piper PA-31P, N200RA, S/N 31P740098. An Airplane Multi-Engine Land with a date of manufacture of January 1, 1974.

6.0 Meteorological Information

Visual meteorological conditions were reported with wind from 330° at 4 knots and temperature 27°C.

Submitted by:

Andrew Finne
Air Safety Investigator