



NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety

WRECKAGE EXAMINATION SUMMARY

May 25, 2021

A. ACCIDENT ERA21FA224

Location: Myrtle Beach, South Carolina
Date: May 21, 2021
Time: 1814 Eastern Daylight Time (EDT)
Operator: Private
Aircraft: Piper PA-31P
Registration: N575BC

B. PARTICIPANTS or GROUP NAME:

IIC: Heidi Kemner
National Transportation Safety Board
Ashburn, VA

Participant: James Jackson
Federal Aviation Administration
Columbia, South Carolina

Participant: Troy Helgeson
Lycoming Engines
Williamsport, Pennsylvania

Participant: Damian Galbraith
Piper Aircraft
Vero Beach, Florida

C. SUMMARY

On May 21, 2021, at 1814 eastern daylight time, a Piper PA-31P, N575BC, was destroyed when it was involved in an accident near Myrtle Beach, South Carolina. The airline transport pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.



Figure 1 - Radar Track - Overhead View

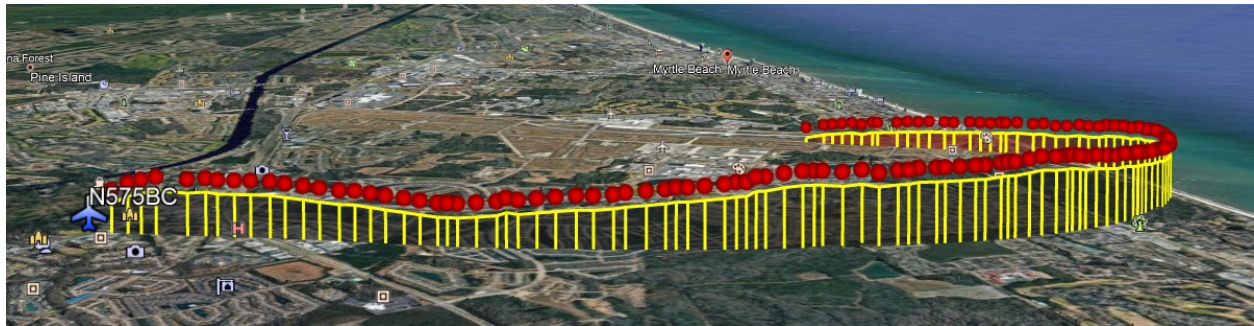


Figure 2 - Radar Track - Side View

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

The airplane impacted terrain about 2.4 miles from MYR at an elevation of 20 ft mean sea level. The airplane came to rest in a field and a post impact fire ensued. The debris field was on a 347° heading. The debris field was about 400 ft long and about 150 ft wide. An odor of 100LL aviation fuel was noted at the accident site.



Figure 3 - Main Accident Site

2.0 Airframe Examination

2.1 Fuselage

The fuselage impacted the ground in a near 90° nose down attitude. The radar dome remained attached to nose section of the airplane that was in an approximately 2 ft crater. A majority of the fuselage frame was consumed by post impact fire.

2.2 Empennage

The empennage was separated from the fuselage and located about 50 ft from the main wreckage. The cabin door remained attached to the empennage through the door cable. The door was in the locked position and all pins were extended. The elevator and rudder cables were impact separated in tensile overload.



Figure 4 - View of empennage

The right horizontal stabilizer remained attached to the empennage at the forward section. The elevator remained attached to the right horizontal stabilizer. The elevator torque tube was impact separated from the left elevator. The trim tab remained attached to the right elevator. The right horizontal stabilizer was bent in the negative direction about mid span. The right trim tab control rod was separated at the rod end. The right elevator balance weight was impact separated and located in the debris field. The down spring on the elevator remained attached and was under tension.

The left horizontal stabilizer remained attached to the empennage. The left horizontal stabilizer spar was impact separated but remained attached to the stabilizer at the outboard section. The left elevator remained attached to the left stabilizer. One bolt on the left elevator where the elevator attaches to the control tube was missing. Another bolt was pulled and the 2 remaining bolts stayed in place. It was impact fractured about 2 ft from the inboard section. The left elevator balance weight remained attached to the left elevator. The left trim tab connecting rod remained attached to the flight controls.

Further examination of the elevator trim tabs revealed that they were installed upside down and reversed. The tab that should be located on the top of the trim tab was located on the bottom. Note the control horn on the bottom of the trim tab on the accident airplane.

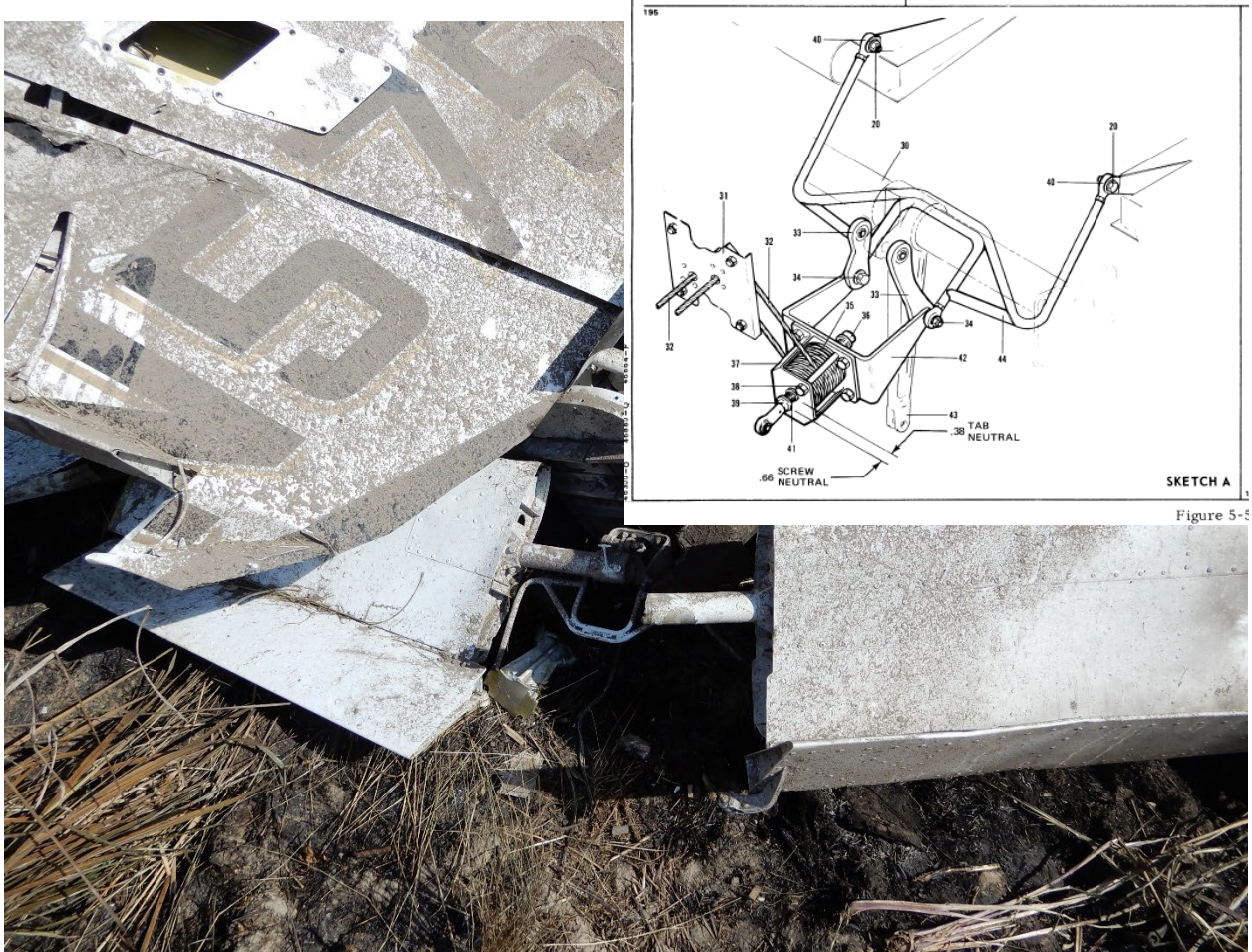


Figure 5 - View Elevator Trim Tabs. Note elevator trim tab attach points are on the bottom of the elevator trim tab as compared to the PA-31P maintenance manual where the trim tab attach points are on the top of the elevator trim tab.

The rudder control cable continuity was confirmed to the tensile overload breaks at the fuselage. The rudder remained attached to the vertical stabilizer at all attach points. The top section of the vertical stabilizer and the rudder were impact crushed in the negative direction. The rudder trim tab remained attached to the rudder and was deflected to the right. The rudder balance weight was impact separated and located in the debris field.

2.3 Wings

The left wing remained attached to the fuselage and a majority was consumed by fire. The remaining skin and structure exhibited accordion-like impact damage. The left aileron was impact separated and located approximately 10 ft from the empennage. The left flap was in the UP position. The aft portion of the flap was consumed by fire. The left inboard fuel cap remained in place and was seated. The surrounding skin was consumed by fire. Both aileron cables remained attached to the bell crank and the rod was fractured at the rod bearing. The left aileron balance weight remained attached to the aileron.



Figure 6 - View of Left Wing

The right wing remained attached to the fuselage and was mostly consumed by fire. The flap was in the UP position and mostly consumed by fire. The wing skin that remained exhibited accordion-like impact damage. The aileron remained attached to the right wing. The aileron trim remained attached to the inboard side of the aileron and was separated from the outboard section. The right aileron cable turnbuckle separated at the bellcrank. The aileron trim barrel was measured and corresponded to a “neutral to slight left aileron roll” trim setting.



Figure 7 - View of Right Wing. Note: Wing imprint in dirt.

2.4 Landing Gear

The main landing gear and nose gear were in the extended position. The nose landing gear was impact separated and located along the debris path.

2.5 Cockpit

The cockpit was impact crushed. The right yoke remained attached to the control column. The left yoke was impact separated and the pieces were located in the cockpit.

The pilot was located in the left seat and the lap belt was buckled. The shoulder harness inertial reel spring was stretched out of its casing.

The throttle quadrant was impact crushed.

2.6 Flight Controls

Flight control continuity was confirmed from all flight control surfaces to the cockpit through multiple overload breaks.

2.7 Fuel/Fuel System

The airplane was fueled prior to departure with 167.5 gallons of 100LL aviation fuel. 5 of the 6 fuel caps were located in the debris field. All located fuel caps were in the seated and locked position. The fuel shutoff valve to the right engine was in the shutoff position. The right engine fuel selector handle was on the inboard tank. The left engine fuel selector valve was in the OFF position. The fuel line going to the engine was not attached to the fuel selector valve fitting.

Both fuel selector levers were selecting the INBOARD tanks. The crossfeed selector was in the mid position between ON and OFF.

The emergency fuel shutoff handles were in the up position.

2.8 Other Systems

The ELT remained secured in the empennage of the airplane. It was located in the “armed” position and was turned off by an FAA inspector.



Figure 8 - View of ELT

3.0 Left Engine Examination

The left engine was located in a 6 ft crater. The crankcase was damaged in multiple places. The gearbox was impact separated. All valve covers remained intact and attached to the cylinders. The valve covers were removed and no anomalies were noted. Crankshaft and camshaft continuity was confirmed by using a lighted boroscope to examine the internal components of the engine. In addition, the cylinders were examined using a lighted boroscope and no anomalies were noted. All connecting rods remained connected to the crankshaft. The air manifold remained attached to the engine and was impact damaged. Multiple intake tubes were crushed. The left engine gascolator was impact separated and crushed. The oil suction screen was removed and contained debris similar to the terrain at the accident site. The left engine turbocharger was impact separated, would bind when it rotated, and scoring was noted on the casing. The alternator was impact separated and fragmented. The fuel inlet screen on the fuel servo was not located. The fuel servo was impact

separated and fragmented. Both magnetos were impact separated and fragmented. The vacuum pump was impact separated and fragmented. The fuel pump was impact separated and fragmented. The turbocharger waste gate and turbocharger controllers were impact separated and fragmented. The intercooler was impact separated.



Figure 9 - Left Engine

4.0 Right Engine Examination

The right engine was located in a 5 ft crater. The crankcase was damaged in multiple places. The gearbox was impact separated. All valve covers remained intact and attached to the cylinders. The valve covers were removed and no anomalies were noted. Crankshaft and camshaft continuity was confirmed by using a lighted boroscope to examine the internal components of the engine. In addition, the cylinders were examined using a lighted boroscope and no anomalies were noted. All connecting rods remained connected to the crankshaft. The air manifold remained attached to the engine and was impact damaged. Multiple intake tubes were crushed. The right engine gascolator was impact separated and crushed. The oil suction screen was removed and was not occluded. The right engine turbocharger was impact separated and would bind when it rotated. The alternator was impact separated and fragmented. The fuel servo was impact separated and fragmented. Both magnetos were impact separated and fragmented. The vacuum pump was impact separated and

fragmented. The fuel pump was impact separated and fragmented. The turbocharger controllers were impact separated and fragmented. The intercooler was impact separated.



Figure 10 - Right Engine

5.0 Left Propeller Examination

The left propeller was impact separated from the engine. Two of the 3 blades were separated from the hub. All blades exhibited polishing. One blade was bent forward, one exhibited tip curling, and the last blade was bent aft. The blade that was bent aft remained attached to the propeller hub.



Figure 11 - Left Propeller

6.0 Right Propeller Examination

The right propeller was impact separated from the right engine. Two of the 3 blades were impact separated from the hub. All blades exhibited polishing. One blade was bent forward, one blade was bent aft, and one blade remained straight. The straight blade remained attached to the propeller hub.



Figure 12 - Right Propeller