AIRFRAME AND ENGINE EXAMINATION

NTSB ACCIDENT NUMBER: ERA21FA189

AIRCRAFT REGISTRATION: N4303G
OPERATOR: Individual
ACCIDENT LOCATION: Brownsville, TN

Investigative Team:
NTSB IIC: Adam Gerhardt
FAA Coordinator: Daniel Butler, Memphis FSDO

Part Member(s):
Damian Galbraith, Piper Aircraft

BRIEF NARRATIVE

On April 20, 2021, at 2052 central daylight time, a Piper PA-28RT-201T airplane, N4303G, was destroyed when it impacted terrain near Brownsville, Tennessee. The student pilot and passenger were fatally injured. The airplane was operated by the student as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

MAINTENANCE RECORDS

The investigation did not discover the airplane's maintenance records.

DETAILS OF THE INVESTIGATION

The National Transportation Safety Board did not travel to the scene of the accident. A Federal Aviation Administration (FAA) inspector documented the accident site and supervised the recovery of the wreckage. The wreckage was recovered to AMF Aviation in Springfield, TN. The NTSB investigator-in-charge, FAA, and Piper Aircraft examined the wreckage at AMF on April 23, 2021.

WRECKAGE AND IMPACT INFORMATION

The main wreckage was located partially submerged in a creek and along a creek bed. All major components of the airframe and engine were located within about a 100 ft debris path oriented on an easterly heading. The engine was located multiple feet below the surface of mud and water. An excavator was required to dig down several feet into thick mud to recover the engine. The propeller separated from the engine but was located within a few feet of the main wreckage. The wreckage was highly fragmented. There was no evidence of a post-crash fire. A faint smell of fuel was reported from one of the first responders, while the airplane was being lifted from the creek.

AIRFRAME EXAMINATION

Right Wing

The right wing was heavily fragmented. The right flap outboard 58 inches was located and had separated from the wing. The inboard 26 inches were not located. The full span of the right aileron was located and had fragmented and separated. The right aileron balance weight was not located. The aileron bell crank was pulled from its support structure. The aileron cables remained attached and were cut by the recovery crew. There were no repeated contacts on the aileron travel stops. The full tank was fragmented. The fuel cap receded into its receptacle. The pickup screen was free of obstruction. The main gear separated. The right landing gear actuator was not located. All fragmented surfaces on the right wing were consistent with impact damage overload.

Left Wing

The left wing was heavily fragmented. The left flap separated and was impact damaged. The left aileron remained attached and fragmented into two sections. The left aileron balance weight was not located. The left bell crank impact damage and cables remained attached and separated at the fuselage area. The cable ends displayed tension overload. The left aileron travel stops were not located. The pitot mast was not observed. The lift detector was impact

damaged and separated. The left fuel tank was fragmented, and the cap receded into the receptacle. The pickup screen was clear. The left main landing gear was impact damaged. The actuator was consistent with an UP selection. The nose gear displayed impact damage and separated. The nose gear actuator was not located.

Empennage

The vertical stabilizer separated from its mounts. Semi-circular impressions were observed on the leading edge. The rudder had separated. Rudder control cables were pulled from the rudder sector. The rudder travel limit stops showed no repeated contact. The balance weight remained attached. The stabilator remained attached to its hinges; it was heavily fragmented. The stabilator balance weight separated from its assembly and was not located. The stabilator push pull tube was pulled from both ends of its attachment and was crushed. The stabilator travel limit stops showed no repeated contact.

The stabilator trim tab was attached to its hinges and was deformed aft. The stabilator trim was exposed 6 threads from its forward leading edge, which corresponded to a partial nose up setting. The stabilator control cables were attached to its sector and separated at various length. The cable exhibited signs of tension overload. The ELT was located in the debris. It was an Artex ELT-1000. It was set to Armed/ Off.

Fuselage and Cockpit

The baggage door was impact damaged and had separated. The cabin door was crushed into two pieces. The fuselage was significantly fragmented. The flap torque tube was impact damaged and separated into two sections. The flap position could not be determined. The flap control lever separated and was impact damaged. The flap control cable remained attached.

All four seats were separated, and their frames were fragmented. The No. 3 and 4 seatbelts were unlatched. One lap belt assembly had separated from its attach point and was latched. The other lap belt was not located. One shoulder harness was observed in the wreckage. The fuel selector valve had separated from its attach point. When air was blown through the valves, air was felt from the right tank valve.

The instrument panel was destroyed. No non-volatile memory devices were recovered in the wreckage. The T-bar was fragmented. One control wheel was located, and it had fragmented. The air induction box was crushed. The standby attitude indicator was found in the debris field. When the instrument was disassembled, the gyro remained intact and its housing exhibited rotational scoring. No other instruments were readable.

ENGINE EXAMINATION

Continental Motors TSIO-360-FB (1)
Horsepower: 200
RPM: 2575
Serial Number: 310851

The engine displayed significant impact damage. The crankcase exhibited a crack above the No. 1 cylinder. The crack extended to an area of significant impact damage. The rear section of the engine was heavily fragmented; the internal gears to the engine were exposed at the aft section of the engine. The drive gears remained intact. The turbocharger remained attached to

the engine. Signs of rotational scoring and bending with several fan blades were observed.

All cylinders remained attached to the crankcase. All top spark plugs remained installed to their respective cylinder. Each top plug was removed with exception to the No. 5 cylinder. The cylinder was impact damaged into the plug and it could not be removed. All other plugs when removed had significant amounts of mud encased to them. When the mud was removed, each displayed normal combustion signatures.

The engine could not be rotated due to the heavy impact damage. The Nos. 1, 2, 3, 4, and 6 cylinder valves remained intact and were unremarkable when observed after the rocker covers were removed. The No. 5 cylinder sustained significant impact damage. The forward valve was impact damaged and was loose in the cylinder and its spring had separated. Each cylinder contained a significant amount of mud and water inside the jug.

The fuel manifold remained attached to the engine. It was caked in mud. The safety wire was observed to be attached at each screw. The wire and screws were removed; liquid and the smell of fuel was present in the manifold. The screen was intact and free of obstruction, with exception of a glob of wet mud that was consistent with the mud found on the outer portion of the casing.

The vacuum pump separated from the engine. The case of the pump remained intact. When disassembled the stator had fractured. All vanes remained intact. The gascolator bowl separated from its attach point and was impact damaged. Its bowl was clean. The electric boost was not located.

The propeller departed from the engine and was found co-located with the engine. The flange exhibited a 45-degree fracture consistent with overload. Partial s-bending, leading edge gouges, and chord wise scratches were observed on the propeller.

APPENDIX A: PHOTOGRAPHS

Photo 1: View of the fragmented wreckage at the accident site (Photo Courtesy of FAA)

Photo 2: View of right wing fragments

Photo 3: View of left wing fragments

Photo 4: View of empennage fragments

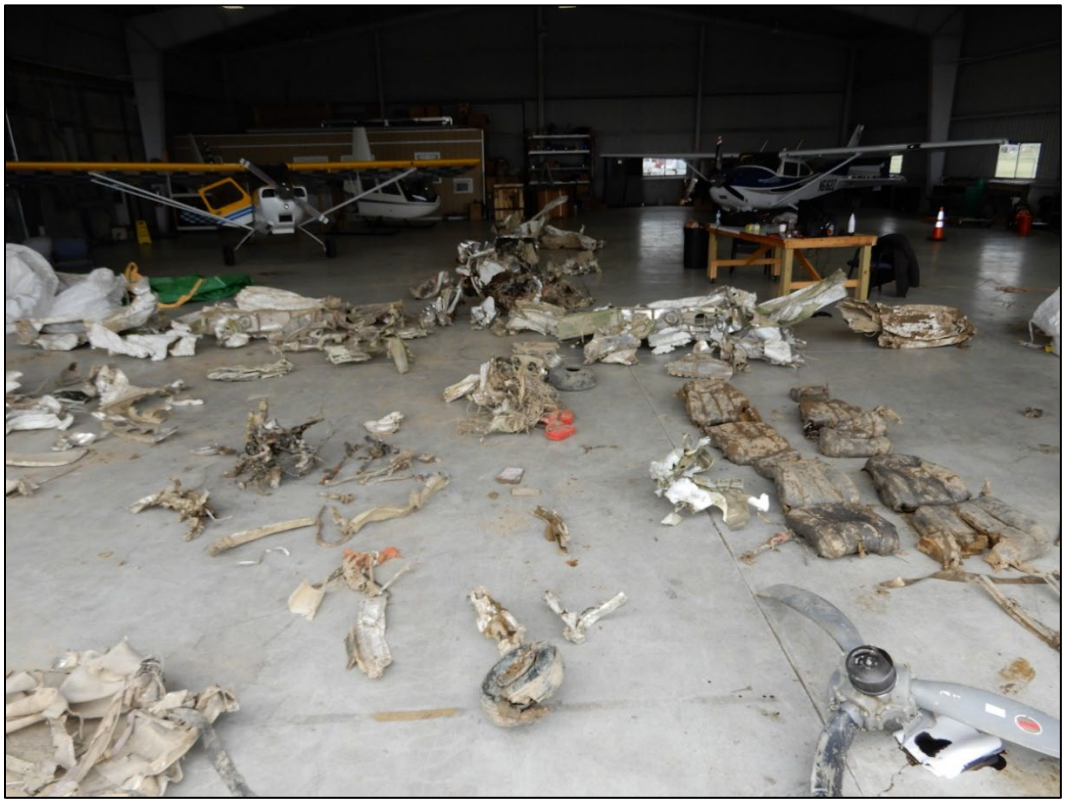

Photo 5: Overview of the fragmented wreckage during examination of wreckage

Photo 6: View of the propeller

Photo 7: View of the engine after thick mud had been removed

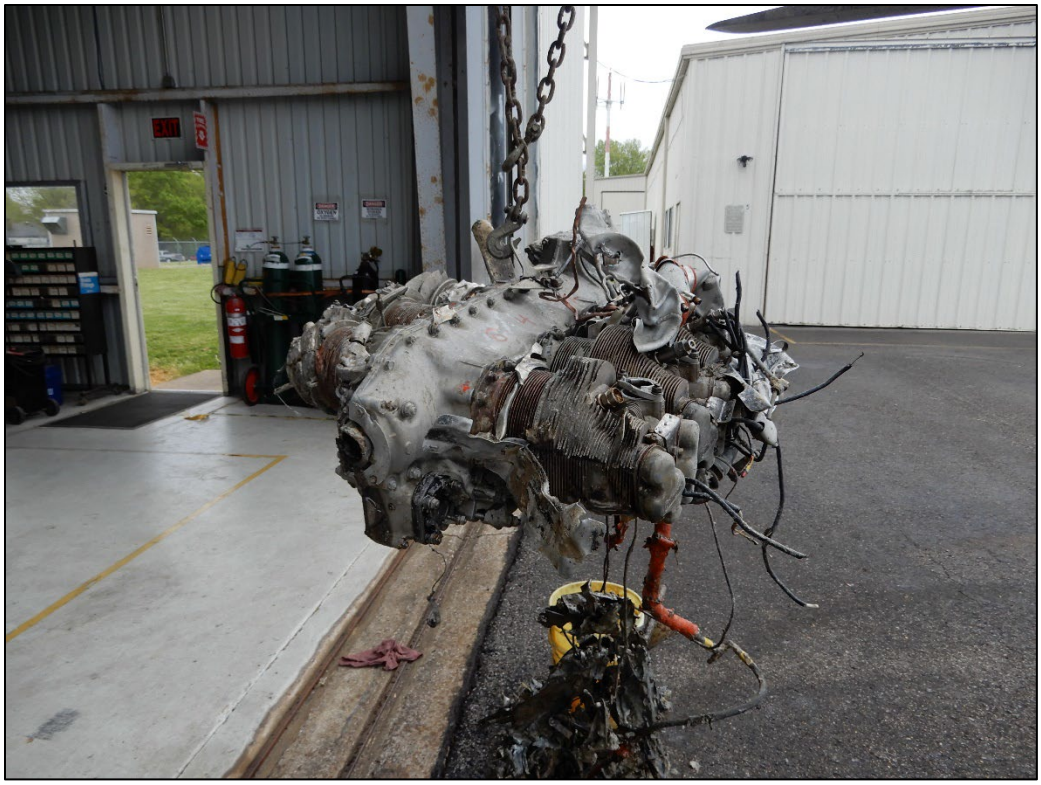

Photo 8: Additional view of the engine

Photo 9: View of the underside of the engine

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