



AIRFRAME AND ENGINE EXAMINATION

NTSB ACCIDENT NUMBER: ERA20LA305

AIRCRAFT REGISTRATION: N7323K

OPERATOR: Individual

ACCIDENT LOCATION: Luray, VA

Investigative Team:

NTSB IIC: Adam Gerhardt (Senior Aviation Accident Investigator)

Piper Aircraft: Damian Galbraith (Air Safety Investigator)

Lycoming: Ryan Enders (Supervisor of Air Safety)

BRIEF NARRATIVE

On August 31, 2020, about 1900 eastern daylight time, a Piper PA-20-135 airplane, N7323K, was destroyed when it impacted trees and terrain near Luray, Virginia. The private pilot was fatally injured. The airplane was operated by the pilot as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

DETAILS OF EXAMINATION

The NTSB and party members examined the airframe and engine on October 20, 2020 at AMF Aviation LLC., in Springfield, Tennessee. The wreckage was placed in several recovery bags for transport to the recovery facility. This report details the factual findings from the investigative activities. Photographs from the examination are located in the NTSB Public Docket in the Photo Array attachment.

Note: The NTSB investigator-in-charge was not permitted to travel to the accident site due to NTSB COVID-19 protocols in effect at the time of the accident. A Federal Aviation Administration Inspector traveled to the accident site and provided photographs to the NTSB.

AIRFRAME EXAMINATION

Flight Control Continuity

According to the recovery crew personnel, several flight control cables were cut to facilitate the recovery of the airplane.

Fuselage

The fuselage was fragmented and destroyed. The engine cowling was impact damaged and separated from three attaching points. The seats were fragmented and deformed with their supporting structure destroyed. The forward cabin door was impact damaged and separated from the fuselage. The aft cabin door remained attached to the fuselage and exhibited impact damage. The flight control cables were cut at various areas to facilitate recovery. The T-bar flight control was fragmented. The pilot and copilot control wheel shafts remained attached to the fragmented T-bar. The copilot's control wheel remained attached, but the pilots was separated from its shaft and was not located within the recovered wreckage. The rudder pedal assembly was fractured and separated from the fuselage. The left and right main landing gear were impact damaged and separated from the fuselage. The tailwheel remained attached to its mounts.

The gascolator was separated from its supporting structure. The gascolator bowl was clear of debris and its screen was not observed upon inspection. A second lone gascolator bowl was observed but no additional gascolator base was observed.

The instrument panel exhibited impact damage and was mostly fragmented. The mixture control was fractured, and its position was undetermined. The throttle control was in the "forward" position but was impact separated from the carburetor. The magneto switch was in the "both" on position, and the engine primer was stowed. The tachometer was static at 200 RPM with a recorded hours of 2085.8. The airspeed indicator was fractured and its needle was separated with no witness or slap marks noted. The oil pressure and oil temperature gauge was impact damaged and separated from its attaching points; the oil pressure was static at 28 psi. The fuel

selector was not located within the recovered wreckage. Loose within the wreckage a Stratux ADS-B Dual Band Receiver and SiriusXM receiver was found impact damaged.

NOTE: There were no electric or mechanical fuel pumps, and no vacuum system or related instruments were identified. No Attitude indicator was installed.

Left Wing

The left wing was partially separated from the fuselage and was largely fragmented. A large semi-circle impression was observed to its leading edge about 3' from the wing root. The lift struts were separated to facilitate recovery. The flap exhibited impact damage and was partially separated from the wing; its control cables were cut by recovery. The aileron was impact damaged and separated from the wing; the control cables remained attached to the aileron but were cut by recovery. The fuel tank was destroyed.

Right Wing

The right was separated from the fuselage and separated into 2 sections. The wing was largely fragmented. The lift struts were crushed and were separated by recovery. The aileron was impact damaged and partially separated from the wing; its control cables remained attached and were separated at various lengths to facilitate recovery efforts. The flap exhibited impact damage and was partially separated from the wing; its control rod was fractured, and its control cable was cut by recovery. The fuel tank was destroyed.

Empennage

The vertical stabilizer exhibited impact damage and was separated by recovery. The rudder remained attached to its mounts and was cut by recovery. The rudder control cables remained attached to the rudder and were separated at various lengths to facilitate recovery. The right horizontal stabilizer was separated by recovery; the right elevator remained attached to its mounts. Impact damage was noted to the right elevator. The left elevator and horizontal stabilizer remained attached to their respective attaching points and exhibited impact damage with aft deformation. The elevator control cables remained attached to the elevator bellcrank but were cut by recovery. The elevator trim jackscrew exposed about 8 threads of jackscrew from the lower section which is indicative of a slight "nose down" trim setting.

Engine

The engine exhibited impact damage but remained attached to the fuselage. The engine's oil sump was fractured and the engine data plate was not observed within the recovered wreckage. The exhaust system was crushed and partially separated from the engine. The carburetor heat cable remained attached to the induction air box; however, impact damage precluded verification of its position prior to impact.

The magnetos remained attached to their respective mounts. No mechanical fuel pump or engine driven vacuum pump was installed.

ENGINE EXAMINATION

The powerplant was a four-cylinder, air cooled, direct drive, horizontally opposed, carbureted, naturally aspirated, internal combustion engine. The rating of an O-290-D series engine is 130HP at 2800 RPM.

The engine was in a recovery bag with the firewall partially attached and the propeller impact separated. The engine was hoisted from the back by the engine lifting hook and the firewall/mounts were removed.

All 4 cylinders, the oil sump, and the accessory housing were removed. Continuity of the crankshaft, camshaft, and connecting rods was confirmed by visual examination. No other damage was noted to the cylinders, valves, valve rockers, pushrods, pistons, or pistons pins.

The engine dipstick remained installed. All four exhaust pipes and the muffler showed crush damage from impact. The exhaust flanges were separated from the cylinder heads from the impact on cylinders 2 and 4.

The intake tubes on cylinder 1 and 3 remained attached to the engine with impact damage. The intake pipes on cylinders 2 and 4 were impact separated from cylinders 2 and 4. The tach showed 2085 hours at the time of the impact. The engine data plate was not recovered.

The 2-bladed metal fixed pitched propeller was separated from the engine and exhibited impact damage. One blade was bent forward while the other was bent aft; both blades exhibited S-type bending with trailing and leading edge damage noted. The propeller spinner was destroyed.

The aircraft was equipped with a Marvel Schebler Carburetor that was impact damaged and impact separated from the engine. The inlet fuel screen was removed and was found to be clean. The heat muffler exhibited impact damage, but no pre-impact anomalies were observed. The induction air filter was impact damaged but remained attached to the impact separated carburetor.

The carburetor body was separated. The floats were plastic and were not binding. There was no visible damage to the floats or the main jet of the carburetor. The main jet was free of obstructions. No fuel was found within the bowl of the carburetor.

Both magnetos remained secured to the accessory housing. Both magnetos were removed and both magnetos produced a spark at all four leads when rotated by hand.

The Unison spark plugs remained in the respective cylinder heads and were removed. The bottom spark plug for cylinder number 2 exhibited impact damage on the harness end. Except for the bottom number 2 spark plug, the spark plugs were attached to the respective spark plug lead. The spark plug electrodes remained mechanically undamaged, and according to the Champion Spark Aviation Check-A-Plug chart AV-27, the spark plug electrodes displayed coloration consistent with normal operation.

The harness' received impact damage but remained attached to the corresponding magnetos. The harness was not tested.

The starter was not recovered/present for this inspection. The starter ring gear was fragmented from impact. The alternator was impact damaged and separated from the engine.

This engine was equipped with an oil pressure screen. The pressure screen and the oil suction screen were both removed and both were found to be clean. The engine has a single Pacific oil cooler. The oil cooler was impact damaged and separated from the engine. The engines oil sump was impact damaged with a large portion fragmented and missing from it.

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