



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Eastern Region

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AIRFRAME AND ENGINE EXAMINATION

ERA21FA165

1.0 EXAMINATION PARTICIPANTS:

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2.0 SUMMARY

Examination of the airframe and engine was conducted on scene and at the facilities of Atlanta Air Recovery on 04/1/2021. No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engine.

3.0 DETAILS OF THE INVESTIGATION

Airframe Examination

An examination of the airplane revealed that the entire cockpit and cabin area was crushed by impact damage. All flight instruments and control positions were unreliable due to impact damage. Flight control continuity was established from the flight controls in the cockpit to the control surfaces. Although maintenance logbooks were not available for review, examination of the airframe did not reveal any anomalies that would have precluded normal operation.

Engine Examination

Examination of the engine revealed it remained partially attached to the airframe on the tubular mount. The engine was displaced aft into the firewall. The crankshaft was fractured at the crankcase nose and the propeller and crankshaft flange separated from the engine. The engine was removed from the airframe for examination. The crankshaft was rotated using a tool inserted in the vacuum pump drive and continuity of the crankshaft to the rear gears and to the valve train was confirmed. Compression and suction were observed from all four cylinders. The interiors of the cylinders were observed using a lighted borescope and no anomalies noted.

The carburetor was fractured across the throttle bore and partially separated from the engine. The induction airbox was partially crushed and the induction air filter partially covered with soil. The carburetor heat cable remained attached to the air box carburetor heat control arm and the arm was positioned in a carburetor heat off position. The throttle control cable remained attached to the carburetor throttle control arm and the arm was positioned in a full throttle position. The mixture control cable remained attached to the carburetor mixture control arm and the arm was positioned in a full rich position. The carburetor was partially disassembled. No damage was noted to the blue composite float assembly or the other carburetor internal components. About 1 teaspoon of liquid with an odor consistent with aviation gasoline was observed in the carburetor float bowl. The carburetor fuel inlet screen was free of debris.

Examination of the ignition system revealed that Tempest UREM40E and Champion REM38E and REM40E sparkplugs were installed in the engine. The spark plug electrodes exhibited gray coloration and normal wear. The No.2 and No.4 bottom spark plug electrodes were oil soaked. The No.2 bottom spark plug was impact damaged.

The propeller and the crankshaft flange were separated from the engine. The propeller spinner was crushed. One propeller blade was curved aft and exhibited twisting toward the blade face. The blade also exhibited leading edge gouges. The propeller blade tip was broken and separated. The other blade was also curved aft and exhibited twisting toward the blade face. The blade also exhibited leading edge gouges. The propeller governor remained attached to the engine. The governor control arm was separated from the governor. The governor oil screen was free of debris.