

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24FA371

WRECKAGE EXAMINATION SUMMARY

04/29/2026

A. ACCIDENT

Location: Vergennes, VT
Date: September 8, 2024
Time: 12:25 EDT
16:25 UTC
Airplane: Piper PA28R-180

B. WRECKAGE EXAMINATION SUMMARY

IIC	Kurt Gibson NTSB Washington, DC
Investigator	Todd Gunther NTSB Washington, DC
Party Coordinator	Matthew Hall FAA Portland, ME
Party Coordinator	Kris Wetherell Piper Aircraft Vero Beach, FL
Party Coordinator	Russel Gait Lycoming Engines Williamsport, PA

C. DETAILS OF THE EXAMINATION

1.0 Accident Site

The airplane impacted terrain approximately 362 ft east of and near the departure end of runway 20 of the Basin Harbor Airport (B06), Vergennes, VT. The airplane impacted terrain in a steep, left wing low, nose low attitude. The airplane's left wing separated during the impact sequence and was located next to the primary wreckage. All the major airplane components were located at the accident site and there was no sign of fire. There were several cut branches with 45° cuts found at the accident site that were consistent with propeller strikes.



Figure 1: Airplane wreckage at accident site

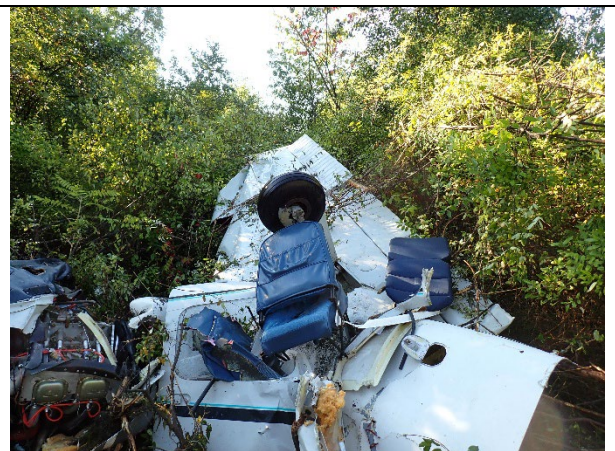


Figure 2: Airplane wreckage at accident site



Figure 3: Branches with 45° cuts



Figure 4: Branch with 45° cut



Figure 5: Branch with 45° cut



Figure 6: Branch with 45° cut

2.0 Airframe Examination

2.1 Fuselage

The fuselage sustained substantial damage with the majority of the damage occurring to the forward cabin area. A portion of the cabin had been cut open by first responders prior to the investigator's arrival.

The instrument panel was impact damaged. A JPI 700 engine monitor was installed in the panel. The JPI engine monitor was removed and retained by the IIC and was sent to the NTSB Recorders Laboratory for data download. The tachometer instrument displayed impact damage signatures and the engine RPM needle was captured by a portion of the instrument face. The engine RPM needle was pointed to approximately 2300 RPM. The tachometer time was 2157.9. The hobbs meter displayed minor impact damage and the hobbs time was 27.7. Both the attitude indicator and the turn coordinator were indicating a steep left bank.

The magneto switch was found in the "BOTH" position. The throttle, propeller, and mixture controls were found in the full forward positions. The alternate air control was found in the "OPEN" position in the cockpit; the valve position at the air box was also found in the "OPEN" position.

There were no shoulder harnesses installed in the airplane. First responders reported that all of the occupants had been using their lap belts and remained securely belted in at the accident site.



Figure 7: Fuselage overview at accident site



Figure 8: Fuselage overview after recovery



Figure 9: Tachometer

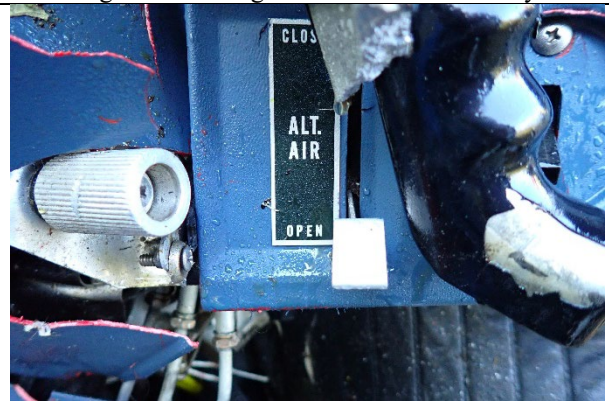


Figure 10: Alternate air control



Figure 11: Induction air box assembly



Figure 12: Alternate air door

2.2 Empennage

The empennage remained attached to the rest of the fuselage and displayed minor impact damage.



Figure 13: Vertical stabilizer and rudder



Figure 14: Stabilator after removal

2.3 Wings

The left wing had impact separated from the rest of the airplane and was found adjacent to the primary wreckage site. A portion of the left wingtip was found in the initial impact point. The leading edge of the left wing displayed aft crushing in multiple locations. The right wing remained attached to the fuselage and displayed minor leading edge damage. The stall warning switch remained attached to its installation point and displayed impact damage signatures. The switch was tested for electrical continuity and the stall warning switched functioned normally while manually activating the switch.



Figure 15: Right wing overview at the accident site



Figure 16: Right wing overview after recovery



Figure 17: Left wing overview at the accident site



Figure 18: Left wing overview after recovery

2.4 Landing Gear

Both the left and right main landing gear were found in the down and locked position. The nose gear was found in the retracted position; however, the nose gear displayed impact damage signatures. The landing gear switch was in the down position.

2.5 Fuel/Fuel System

1.5 gallons of blue fuel was found in the right wing tank. This fuel was tested with water detecting paste. No water was found during this test. No fuel was found in the left wing tank, however, blue staining was observed near the left wing filler port. The fuel line from the left tank to the fuselage separated in the impact sequence. The fuel selector was found in the left tank selected position. Fuel was found in the fuel selector valve. Low pressure air was used to flow check the fuel lines and the fuel selector valve. All lines were found clear without restriction from the fuel selector valve to both wing tanks. The fuel selector valve was functionally checked for continuity. The valve operated normally in the "LEFT", "RIGHT" and "OFF" positions and produced a tactile detent for each position when the valve handle was operated. The fuel strainer bowl was displaced from its mounting location due to impact damage. The bowl contained some impact related debris. The fuel strainer screen was intact and was found clean. The electric fuel pump remained attached to the firewall and contained some blue fuel. The electric fuel pump was removed from the firewall and was tested using a 12-volt power source. The pump successfully ran smoothly during dry testing.



Figure 19: Fuel sample from right fuel tank (testing with water finding paste)



Figure 20: Recovered amount of fuel from the right fuel tank



Figure 21: Left wing fuel tank with blue staining



Figure 22: Left fuel cap and filler port

2.6 Flight Control System

Both control yoke control shafts were broken. The left pilot control yoke was broken off and was not present. Both horns of the right side pilot yoke were broken. The flap selector was found in the retracted position. This position was verified at the flap torque tube on both sides of the airplane. The flap selector operated the right wing flap appropriately through the full flap selection range. The left flap remained attached to the wing at all hinges. The flap was retracted. The left aileron control rod from the bellcrank to the aileron was broken at the bellcrank end. The bellcrank was torn from the mounting location and was found inside the left wing aft of the fuel tank. Full left aileron cable continuity was verified from the aileron bellcrank to the control column, which included two cable separations. About 44 inches of primary and balance cable remained attached to the bellcrank. The separated cable ends displayed fraying and unraveling consistent with overload separation. The wing leveler bridle cable remained attached from the servo to the aileron balance cable in the mid-cabin. The right flap and aileron remained attached to the wing at all hinges. The right aileron bellcrank remained attached to the mounting location inside the

wing. Both aileron cables remained attached to the bellcrank, and the aileron could be manipulated correctly when pulling on the aileron cables by hand from inside the fuselage. Full aileron cable continuity from the right direct aileron cable to the control column drive chain was verified.

The stabilator remained attached at the hinges. The stabilator trim remained attached to the stabilator at all hinges. The rudder remained attached to the vertical stabilizer at all hinges. Stabilator and rudder control cable continuity was confirmed from the empennage to the control column and rudder bar in the forward cabin. Stabilator trim control cable continuity was confirmed, and the trim remained controllable from the control wheel in the forward cabin. The stabilator trim was found with 0.45 inches of rod extended on the top side of the drum. This position equates to a partial nose down trim setting.

3.0 Engine Examination

The engine remained attached to the airframe through some of the tubular engine mounts, wires, hoses, and cables. The engine was removed from the airframe for examination.

The crankcase remained intact, and there were no signs of a catastrophic engine failure. The crankshaft was rotated by hand a full 720°, and continuity was established between the crankshaft, camshaft, connecting rods, and associated components. During crankshaft rotation, all four cylinders displayed thumb compression and suction. All the rocker arms and valves operated normally during crankshaft rotation, with the No. 2 and No. 4 rocker arms having reduced movement, which was consistent with the impact damage observed to the push rods. The cylinders were inspected utilizing a lighted borescope; all of the piston faces exhibited normal operating and combustion signatures. The cylinder walls exhibited varying degrees of surface corrosion and scoring. All of the intake valve heads displayed normal operating and seating signatures. The #1 exhaust valve head displayed a slight greenish tint that was uniform around the outer diameter of the exhaust valve; however, the valve head was intact and was not deformed and displayed normal seating signatures. The rest of the exhaust valves displayed normal operating, combustion, and seating signatures. All of the overhead components (valve stems, springs, and rocker arms) displayed normal operating and lubrication signatures.

Both magnetos remained attached to their respective installation points and exhibited minor impact damage. Due to the impact damage to the starter gear and support, magneto timing could not be verified. Both magnetos were removed, and their drive shafts rotated normally. The left magneto impulse coupling remained intact and operated normally during rotation. During impulse coupling operation, the magneto was capable of producing a spark on all four towers. The right magneto drive was rotated using a drill, and the magneto was capable of producing a spark on all four towers. The left magneto ignition lead harness displayed significant impact

damage, and all four leads were either partially or completely severed; there were no signs of chafing or shorting of the ignition leads. The right magneto ignition leads displayed less impact damage; however, several of the leads were partially severed. The right ignition leads were capable of conducting a spark from the magneto to the ignition lead end or to the first section of impact damage. The spark plugs were removed and visually examined; the plugs were a mixture of Champion and Tempest spark plugs. All the spark plugs displayed normal wear and were dark grey in color when compared to Champion Aviation Service Manual AV6R and the Tempest Aviation Spark Plugs Installation and Maintenance Manual 1710A.

The fuel pump remained attached to its installation point and was undamaged and both the inlet and outlet fuel lines remained secured. The fuel pump was disassembled and displayed normal operating signatures. The fuel pump drive plunger was in place and operated normally during crankshaft rotation. The fuel injector servo remained attached to its installation point and displayed minor impact damage. The throttle and mixture control rod ends remained attached to their respective controls in the cockpit and the fuel injector servo. Both arms were capable of movement from stop to stop. The throttle control stop pin was noted to be missing the plastic portion of the throttle stop. The fuel inlet and outlet fuel lines remained secured, and there were no signs of fuel leaks. The fuel inlet screen was removed and was clear of any obstructions. The fuel flow divider remained attached to its installation point and was undamaged. The inlet fuel line and the fuel pressure indication line remained secured, and there were no signs of fuel leaks. The flow divider was removed and disassembled; the internal components displayed normal operating signatures, and there were no signs of obstructions. All four fuel nozzles remained installed in their cylinders and exhibited varying degrees of impact damage, with the No. 2 fuel nozzle showing the most damage. The fuel lines going to the nozzles were all secured to the nozzles and to the flow divider, and there were no signs of fuel leaks. All fuel nozzles were removed and found unobstructed.

The oil suction screen was removed and found to contain particulates with the consistency of carbon; however, the screen was not obstructed. The oil pressure filter remained attached to the oil filter adapter and exhibited impact damage signatures. The oil filter was removed, and the filter housing was cut open. The filter pleats were visually inspected, and no anomalies were observed.

The propeller governor remained attached to its mounting point and exhibited impact damage signatures. The propeller control rod end remained attached to the propeller control arm; however, the propeller control arm had broken free from the rest of the governor which was consistent with impact damage. The governor was removed, and the gasket screen was observed to be unobstructed. The governor drive was rotated by hand and the governor pump operated normally.

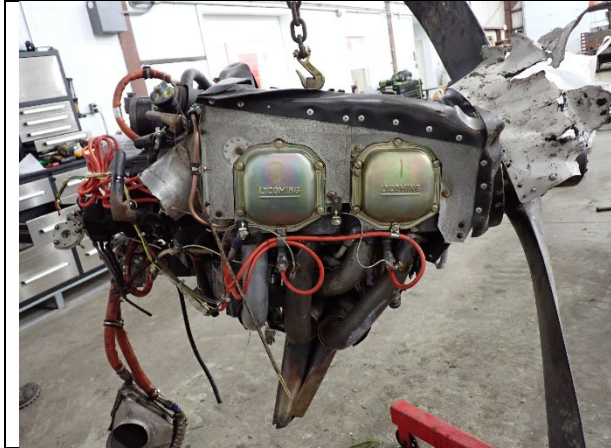


Figure 23: Engine overview



Figure 24: Engine overview

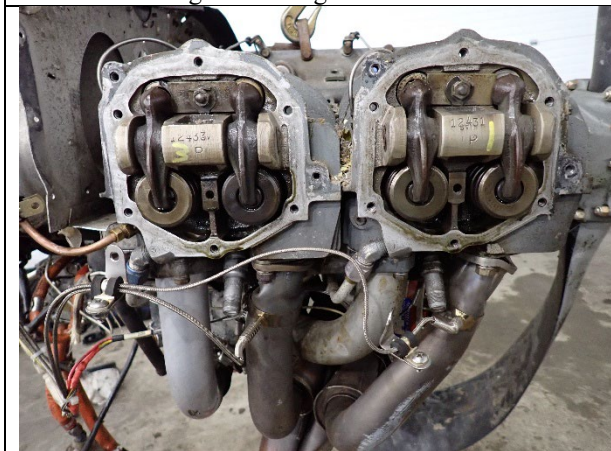


Figure 25: No. 1 and No. 3 cylinder overhead components



Figure 26: No. 2 and No. 4 cylinder overhead components



Figure 27: Oil suction screen



Figure 28: Oil filter pleats



Figure 29: Right magneto

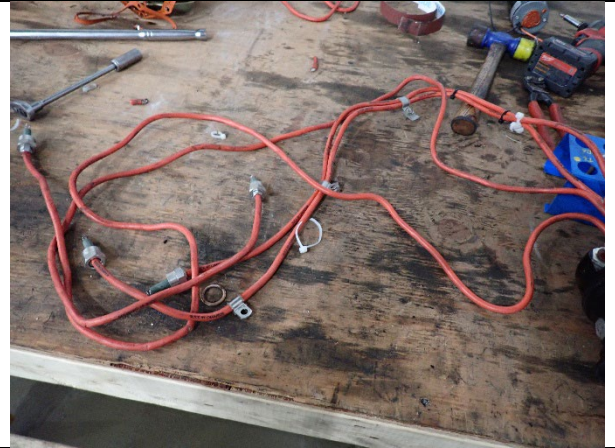


Figure 30: Right magneto ignition harness

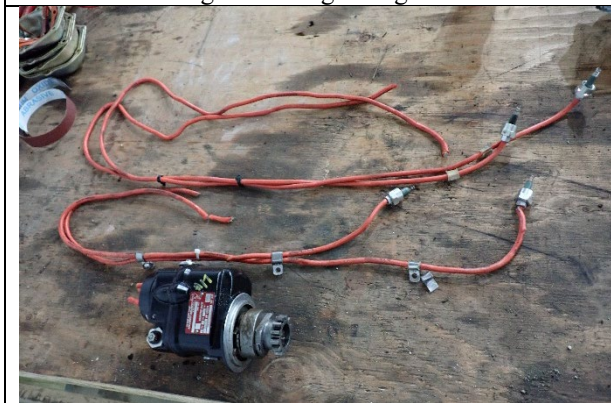


Figure 31: Left magneto and ignition harness



Figure 32: Spark plugs



Figure 33: Fuel pump after disassembly



Figure 34: Fuel injection servo after removal



Figure 35: Fuel injector servo inlet screen



Figure 36: Fuel injection servo throttle stop pin
(missing plastic)

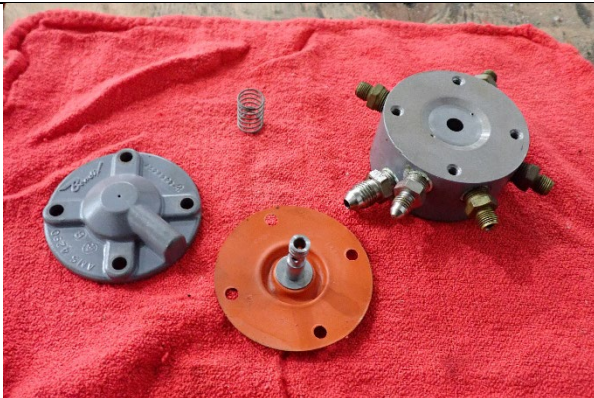


Figure 37: Fuel flow divider after disassembly



Figure 38: Fuel nozzles

4.0 Propeller Examination

The two blade, constant speed propeller remained attached to the crankshaft, and both blades were secure in the propeller hub. The propeller blade marked "A" displayed minor impact damage signatures; the blade had minor aft bending deformation, minor leading edge polishing, and there was a gouge in the leading edge. The propeller blade marked "B" displayed aft bending and twisting deformation, leading edge polishing, and minor gouges near the blade tip.



Figure 39: Propeller blade marked "A"



Figure 40: Propeller blade marked "A"



Figure 41: Propeller blade marked "B"



Figure 42: Propeller blade marked "B"

5.0 Aircraft Information

According to the airplane's logbooks, the last annual inspection was performed on 04/18/2024 at a tachometer time of 2134.0. The next entry in the airframe logbook was the installation of a JPI EDM 700 engine monitor and the installation of a Hobbs meter switch.

A review of the engine logbook revealed that at the last annual inspection, the engine had a total time of 2134.0 hours, and the engine had never been overhauled since it was manufactured and had been installed on the airplane on 09/16/1967. According to Lycoming Service Instruction 1009BE, an IO-360-B1E should be overhauled every 2,000 hours or every 12 years, whichever occurs first. The tachometer reading at the time of the accident was 2157.9, indicating the engine was 157.9 hours and almost 45 years past the recommended overhaul interval.

Submitted by:

Kurt Gibson
Senior Aviation Accident Investigator