



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

November 29, 2016

AIRFRAME AND ENGINE EXAMINATION

WPR17FA025

This document contains 15 embedded photos.



A. ACCIDENT

Location: Upland, California
Date: November 22, 2016
Aircraft: Piper PA28-181, N6912C, Serial #: 28-8590051
NTSB IIC: Patrick H. Jones

HISTORY OF FLIGHT

On November 22, 2016, at 0420 Pacific standard time(PST), a Piper PA, N6912C, impacted mountainous terrain near Upland, California. The airplane was registered to Brian Potkin and operated by Stephen Lassetter under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The private pilot was fatally injured. The airplane sustained substantial damage during the accident sequence. The cross-country personal flight departed Cable Airport (CCB), Upland, California, at 0416 with a planned destination of Riverside, California. Night visual meteorological conditions prevailed and no flight plan had been filed.

The accident pilot contacted Ontario International Airport (ONT) tower air traffic control (ATC) at 0419 PST, and requested flight following after departing CCB. ATC assigned the pilot a discrete transponder code, and radar identified the airplane. The pilot made a radio transmission that was unreadable at the same time as radar contact was lost. At the same time pilots in the area heard an Emergency Locator Transmitter (ELT) signal. An Alert Notice (ALNOT) was issued at 0457 PST. The wreckage was located at 0630 PST by local law enforcement.

The wreckage was located on the south face of rising mountainous terrain 3.5 NM north of the departure airport. The wreckage was located at an elevation of 2,915 feet Mean Sea Level (MSL).

The NTSB investigator traveled in support of this investigation, and the airplane was recovered for further examination.

B. EXAMINATION PARTICIPANTS:

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C. SUMMARY

Examination of the recovered airframe and engine was conducted on November 29, 2016, at the facilities of Air Transport Inc., Phoenix, AZ. No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engine.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

Left Wing

The left wing remained partially attached to the fuselage. The wing was partially separated at about mid span. The wing leading edge skins were crushed upwards along its span. The main landing gear separated from the upper strut. Both the flap and aileron surfaces remained attached to the wing. Both the primary and balance control cables remained attached to the bellcrank.

Right Wing

The right wing remained attached to the fuselage. The wing sustained extensive ground impact damage mostly to the bottom wing skins. The main landing gear separated from the upper strut. Both the primary and balance control cables remained attached to the bellcrank.

Empennage

The rear empennage and tail section sustained minor impact damage and was mostly intact. The rudder and vertical stabilizer surface were mostly undamaged. The horizontal stabilizer with trim tab sustained minor impact damage and were mostly intact. The control cables remained attached to the rudder and stabilizer surfaces at their attach points. The trim drum exhibited three threads that correlates to a slight nose down trim. Ref: 5 threads = neutral, 16 threads = full nose up, Zero threads = full nose down.

Fuselage

The forward cockpit and instrument panel sustained extensive impact damage and were destroyed. The front seats remained attached to structure. The left rear seat separated from structure and the right rear remained attached to structure. All lap and shoulder harnesses remained attached to structure. The left front seat belt latch sustained impact damage. All other belts were intact. The shoulder harnesses remained attached to the cabin roof section. None of the shoulder harnesses were attached to the lap belts.

The forward control cables for the rudder and horizontal stabilizer remained attached to their attach points. The left and right aileron primary cables remained attached to the chain assembly. The chain assembly was broken and separated in tension.

The electric fuel pump sustained impact damage and was destroyed. The electric fuel pump

filter elements were clean and free of contamination. The fuel gascolator assembly separated from the firewall. The fuel bowl and filter were separated and were not located.

Cockpit documentation:

Flight instruments and avionics were mostly destroyed.

Magneto switch: Separated from the panel, key broken, switch in the “Both” position.

Electrical switches: Battery and Alternator; On. The fuel pump, landing light, Anti-collision light and pitot heat were all, Off.

Mixture and throttle levers were bent and the quadrant was destroyed.

EGT, 75°

Carburetor heat lever, On

Blower fan, Off

Heat and defroster levers were, Off

Circuit breakers separated from the panel and were destroyed.

Fuel gauges; Left, Zero; Right, Zero

Fuel pressure gauge: destroyed.

Tachometer, destroyed, needle broken; 3044.9 recorded hours.

Hobbs; meter out of case, 3409.9 recorded hours.

Oil pressure gauge, top of the green arc @ 100 PSI.

Fuel selector valve and handle; Right tank.

Flap handle, destroyed by impact.

Trim indicator, destroyed by impact.

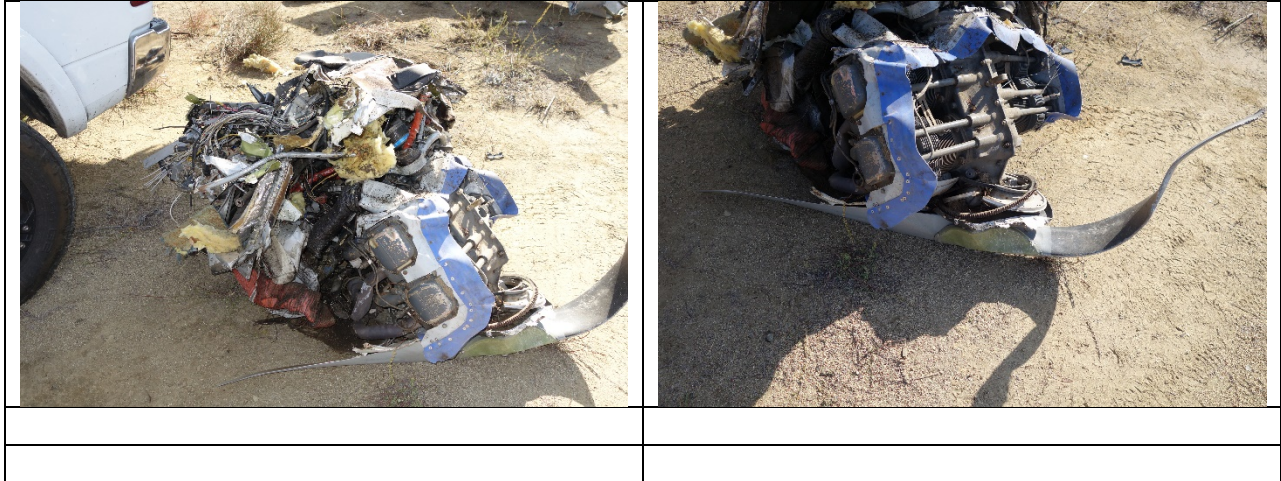
Primer; In and locked.

Engine

Oil filter, clean. Suction screen, clean.

1.1 Airframe Exam Photos





2.0 Engine Examination

The engine remained attached to the airframe by the engine mount. The engine had sustained significant impact energy damage at the left lower area, which displaced the starter and portions of the exhaust system. Visual examination of the engine revealed no evidence of pre-impact catastrophic mechanical malfunction or fire.

Rotation of the crankshaft was precluded due to impact damage to the crankshaft flange at the nose of the engine. The propeller flange was cut off to facilitate the examination. The top spark plugs were removed, examined and photographed. The vacuum pump was removed, and the crankshaft was rotated by hand through the drive pad utilizing a drive tool. The crankshaft was free and easy to rotate in both directions. "Thumb" compression was observed in proper order on all four cylinders. The complete valve train was observed to operate in proper order, and appeared to be free of any pre-mishap mechanical malfunction. Normal "lift action" was observed at each rocker assembly. Clean, uncontaminated oil was observed at all four rockerbox areas. Mechanical continuity was established throughout the rotating group, valve train and accessory section during hand rotation of the crankshaft. The bottom spark plugs were not removed. The combustion chamber of each cylinder was examined through the spark plug holes utilizing a lighted borescope. The combustion chambers remained mechanically undamaged, and there was no evidence of foreign object ingestion or detonation. The valves were intact and undamaged. There was no evidence of valve to piston face contact observed. The gas path and combustion signatures observed at the spark plugs, combustion chambers and exhaust system components displayed coloration consistent with normal operation. There was no oil residue observed in the exhaust system gas path. There was significant ductile bending of the exhaust system components. The exhaust system was found free of obstructions.

The left magneto was found securely clamped at the mounting pad. The flange had been fractured due to the absorption of impact energy. The impulse coupling was heard clicking during rotation of the crankshaft. Magneto to engine timing could not be ascertained, due to the destruction of the flywheel.

The right magneto was found securely clamped at the mounting pad. Magneto to engine timing could not be ascertained, due to the destruction of the flywheel.

The magnetos were removed for examination. Each magneto produced spark at the end of the respective spark plug lead, during hand rotation of the drive. The drives of each magneto remained intact and undamaged.

There was no evidence of pre-impact mechanical malfunctions observed during the examination of the engine.

2.1 Engine Exam Photos



The two-bladed fixed pitch propeller remained attached at the crankshaft flange. The spinner was attached to the propeller. The propeller blades remained attached to the propeller hub.

The propeller blades were marked “1” & “2” for narrative purposes.

The propeller blade marked as “1” displayed leading edge gouging, torsional twisting, chordwise striations across the cambered surface and trailing edge “S” bending. An approximate 2 inch section of blade tip had been torn away. The signatures were consistent with the absorption of rotational forces applied at the crankshaft at the time of impact.

The propeller blade marked as “2” remained intact and sustained minor damage.



FUEL SYSTEM

All engine compartment fuel lines were found to be in place and secure at their respective fitting of each fuel system component.

The carburetor was displaced from the engine due to the forces of impact. The portion that remained attached at the mounting pad was secure. The fracture surface signatures were consistent with overload. The throttle/mixture controls were found securely attached at their respective control arms of the carburetor.

The carburetor was opened for examination. The fuel bowl remained free of visible contaminants. The float assembly remained secure at the mounting and free of damage. The float pontoons exhibited no evidence of rubbing against the wall of the bowl. All internal locking tabs and safety devices of the carburetor were in place and properly secured. The fuel inlet screen was found properly installed and free of contamination. No external fuel staining was observed. Fluid consistent with the appearance and odor of aviation fuel was observed within the carburetor bowl and accelerator pump well.

The carburetor and induction system were examined and observed to be free of obstruction. The foam filter element exhibited crush damage. The filter element remained intact and exhibited no evidence of pre-impact obstruction to airflow.

The fuel pump was displaced from the engine. The portion of mounting flange remained secure at the mounting pad. The fracture surfaces exhibited signatures consistent with overload. The fuel pump was opened for examination. The fuel pump remained free of internal mechanical malfunction and obstruction to flow. The diaphragm was torn during the displacement of the pump from the mounting flange.



SPARK PLUGS

The spark plugs were secure at each position with their respective spark plug lead attached. The spark plugs (as noted) were removed, examined and photographed. The spark plug electrodes remained mechanically undamaged, and according to the Champion Spark Plugs Check-A-Plug chart AV-27, the spark plug electrodes displayed coloration consistent with normal operation.



The rear-mounted vacuum pump was secure at the mounting pad. The pump was removed, examined and photographed. The drive was intact and free to rotate by hand.

The oil filter and suction screen were secure at their respective mountings. The oil filter and suction screen were removed and examined. The full flow oil filter was cut open to expose the filter media. There was no evidence of pre-mishap metal contamination observed at the filter or suction screen.

Submitted by: Patrick Jones