



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

May 30, 2018

AIRFRAME AND ENGINE EXAMINATION SUMMARY

WPR18FA150

This document contains 0 embedded photos.

A. ACCIDENT

Location: Petaluma, California
Date: May 27, 2018
Aircraft: RV-6A, N4269Y
NTSB Investigator-in-Charge: Thomas Little

B. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

Examination of the recovered airframe revealed that the aft part of the fuselage was cut and removed to facilitate transport of the wreckage.

The left and right fuel tanks were breeched. Both of the fuel tank vent lines were impact damaged near the inboard portion of the fuel tanks. A hose was attached to the vent lines and compressed air was applied. Both the left and right vent lines were found to be free of debris and restrictions. A hose was attached to the fuel outlet port of the fuel selector valve. Compressed air was applied and the fuel selector valve was found to be functional throughout the left, right, and off positions. In addition, all of the associated fuel lines were found to be free of debris and restrictions.

Flight control continuity was established from the left and right seat controls throughout the airframe to all primary flight control surfaces.

The airframe electric fuel pump was intact. The outlet line of the fuel pump was separated at the "B" nut fitting and the "B" nut fitting was found slightly loose. The power and ground wires were attached to a 12v battery and the inlet line was submerged within water. The pump expelled water throughout the outlet port of the fuel pump.

The engine driven fuel pump was disassembled and inspected. The internal diaphragm was intact and undamaged. The fuel inlet and outlet ports were unrestricted.

The engine compartment fuel lines "B" nuts were found secure at their respective fittings of the fuel system.

The airframe fuel filter (gascolator) was intact. Residual fuel was found within the gascolator bowl. The screen was free of debris and restrictions.

Air was applied throughout all fuel lines to from the fuel selector valve forward to the carburetor and no debris or restrictions was noted.

Instrument Panel/Cockpit Documentation:

Throttle: Separated
Propeller: Full In

Mixture: Separated
Carburetor Heat: In
Magnetos: Left / Key bent over 90 degrees
Master Switch: Missing
Turn Coordinator: electric / damaged
Radio: Damaged
Airspeed: About 68 knots
RPM: Digital / damaged
Manifold Pressure: Digital / damaged
Fuel: Digital / damaged
Oil: digital / damaged

Circuit Breakers:
ALT: In
Field: In
LED Dimmer: In
T&B: In
MAN Fuel Pressure: Out
EGT/CHT Fuel Qty: Out
Acc Dimmer: In
RPM Oil Temp: Out
Flaps: In
Intercom Bolt: Out
Trim: Out
Unlabeled: Out
Comm 1: Damaged
Comm 2: In
TPX ENC: Damaged
Auto Pilot: Damaged

Switches:
Radio: Damaged
Fuel Boost: Off / damaged
Lights: On / Damaged
Strobe Lights: On / damaged
Blank: Damaged

2.0 Engine Examination

Examination of the recovered engine revealed that the engine remained attached to the engine mount and forward portion of the airframe.

All of the engine accessories remained attached to the engine with the exception of the alternator and propeller governor. The carburetor was partially attached. The left magneto was found loose and it rotated freely by hand. The left magneto gasket was mostly extruded. The top

securing nut rotated about ½ turn until it was tight, and the bottom nut rotated about ¾ of a turn until it was tight. When both nuts were tightened, the magneto did not rotate by hand. No evidence of any impact damage was observed to the left magneto. The right magneto remained secure to its mount and was found displaced to its counter-clockwise rotational limit with no visible damage noted other than displaced paint on its mounting flange. Both the right magneto mounting nuts were secure and tight. Damage to the propeller and starter ring gear prohibited verifying engine to magneto timing. The oil suction screen was found free of debris.

The upper spark plugs were removed along with both magnetos, engine driven fuel pump, and propeller. All four cylinders were examined internally using a lighted borescope and were found to be unremarkable.

The crankshaft was rotated using a hand tool attached to the accessory drive pad. Rotational continuity was established throughout the engine and valve train. Thumb compression was obtained on all 4 cylinders. Equal movement of all of the intake and exhaust rocker arms was observed, and the fuel pump plunger shaft moved accordingly.

Both the left and right magneto drive shafts rotated freely by hand. When the left magneto drive shaft was rotated, impulse coupling engagement was noted, and spark was produced on all 4 ignition terminals. When the right magneto drive shaft was rotated, spark was produced on all 4 ignition terminals. The ignition harness was impact damaged.

All four top spark plugs exhibited normal operational signatures and gray deposits within the electrode area.

The carburetor was mostly intact. Damage was noted to the top and bottom flanges. A portion of the mixture arm was separated from the linkage. The remainder of the arm exhibited movement beyond its stop. The fuel inlet finger screen was free of debris. When the throttle lever was actuated by hand, no fuel expelled from the accelerator pump orifice. The carburetor was disassembled and inspected. The blue composite floats were intact. The needle valve and seat were intact. No fuel was observed within the float bowl or the accelerator pump well. The accelerator plunger was intact and undamaged. The float bowl exhibited impact damage near one bolt hole, which would allow fuel to escape from the bowl, but not the accelerator pump well. The mixture metering sleeve was free of debris and restrictions. The throttle plate was intact and undamaged. No restrictions were noted from the fuel inlet port throughout the carburetor.

The air intake airbox was impact damaged and the filter element was impact damaged.

The exhaust stacks were found free of debris.

The propeller governor remained attached to its mount, however, the mount was mostly separated from the engine. The drive shaft rotated freely by hand. The control arm shaft exhibited impact damage and was displaced. The rod end remained attached.

3.0 Propeller

The propeller remained partially attached to the engine crankshaft. Both propeller blades remained attached to the hub and did not rotate freely. One blade was bent aft slightly about 5 degrees and exhibited 45-degree striations on the forward side of the blade. The trailing edge corner of the blade tip was separated at a 45-degree angle. The opposing blade was bent aft about 10 to 15 degrees and exhibited chordwise striations on the forward side of the blade near the blade root. A large gouge was observed on the trailing edge of the propeller blade about 8 inches inboard of the blade tip.

4.0 Summary

The left magneto was found loose and free to rotate by hand, which result in erratic engine to magneto timing for that magneto. No additional evidence of any preexisting mechanical malfunction was noted during the examination of the engine or airframe that would have precluded normal operation.

Submitted by: Joshua Cawthra