



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

March 8, 2012

# **AIRFRAME AND ENGINE EXAMINATION NOTES**

**WPR12FA123**

This document contains 8 embedded photos.

## **A. ACCIDENT**

Location: Brockton, MT  
Date: March 5, 2012  
Aircraft: Bellanca 7GCBC, Registration Number: N5542K, Serial #: 1030-78  
NTSB IIC: Jeffery Rich/Samantha Link

## **B. EXAMINATION PARTICIPANTS:**

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## **C. SUMMARY**

Examination of the recovered airframe and engine was conducted on March 8, 2012 at the facilities of Arlin's Aircraft in Belgrade, Montana. No evidence of preimpact mechanical malfunction or failure was noted during the examination of the recovered airframe and engine.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Airframe Examination**

Examination of the cabin area revealed that the throttle was in the full forward/full throttle position. The fuel primer was found unlocked in the open position. The fuel primer plunger was exercised and a blue liquid consistent with aviation fuel was found within the primer plunger. The carburetor heat was part way in between hot and cold. The fuel selector valve was removed and examined. Air was blown through the fuel selector valve and it was determined to be in the closed position. The shoulder harnesses were attached to their mounting brackets; however, examination revealed that they did not appear to be used during the accident flight. The pilot shoulder harness was wrapped and secured around structural airframe tubing. Both sets of lap belts were attached to their respective mounting attachment point and were cut by rescue personnel.

Control Continuity was established on-scene from all flight control surfaces to their respective controls. All cabin controls were jammed due to deformation of the airframe.

Examination of the airplane's wings revealed that there was no stall warning system installed. The left wing root fabric was cut and the fuel tank was examined. The bottom of the fuel tank was bulged outward. The top of the fuel tank was bulged on the forward leading edge section of the tank and dented in on the aft trailing edge. No damage was noted to the adjacent wing ribs.

The gascolator was found still secured to the firewall; it was removed, the screen was clear of debris and no fuel was found within the gascolator bowl.

## 2.0 Engine Examination

During the engine examination all spark plugs were removed; normal wear signatures according to the Champion Check-a-plug chart were noted. The top number 1 and 3 spark plugs were oily; all other spark plugs contained consistent wear patterns. The valve rocker arm covers were removed and contained no thermal discoloration. All cylinders were borescoped; carbon deposits consistent with normal operations were noted.



Figure 1: Ride side of Engine



Figure 2: Left side of Engine



Figure 3: Spark Plugs (the forward plugs are the bottom spark plugs; the aft plugs are the top spark plugs)

The propeller was separated at the propeller flange and the propeller flange was bent.



**Figure 4: Bent Propeller Flange**

The crankshaft was rotated manually by the propeller flange. The accessory gears rotated freely; the valves moved accordingly, and thumb compression was obtained from all cylinders.

The magnetos were intact. The left magneto was separated, and the right magneto remained secured to its engine attachment point. Both magnetos were removed from the engine and manually rotated by hand. The impulse couplings fired appropriately and spark was obtained from all ignition lead ends.



**Figure 5: Right Magneto**



**Figure 6: Left Magneto**

The carburetor was removed from the engine. The screen was removed and observed to be clear of debris. The carburetor was disassembled, no fuel was found within the carburetor bowl; crushing deformation was noted on one of the carburetor floats.

The oil pressure and oil pick up screens were removed and found to be clear of debris. The oil sump was secured and contained about 4 quarts of oil.



Figure 7: Oil Pressure Screen



Figure 8: Oil Pick-Up Screen

Submitted by: Samantha Link