NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

May, 2015

AIRFRAME EXAMINATION

WPR15FA158

This document contains 16 embedded photos.

A. ACCIDENT

Location:	Spokane, Washington
Date:	May 7, 2015
Aircraft:	Piper PA-46-350P, Registration Number: N962DA, Serial #: 4636031
NTSB IIC:	Eliott Simpson

B. EXAMINATION PARTICIPANTS:

Eliott Simpson
Aviation Accident Investigator
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C. SUMMARY

Examination of the recovered airframe was conducted on May 10, 2015 at the facilities of Discount Aircraft Salvage, Deer Park, Washington.

The fuselage sustained crush damage and fragmentation from the firewall through to the right-side emergency exit door. The engine remained attached to the firewall, and the propeller hub with all four blades remained attached to the engine gearbox (Photo 1). All blades were bent about 90 degrees aft, 8 to 12 inches from their roots (Photo 2). Both wings had separated from the airframe, and at the time of examination, the right wing outboard of the main landing gear had not been recovered from the accident site (Spokane River). The horizontal stabilizer had separated from the tailcone.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

Fuselage

The forward fuselage skins and cowling on the right side had been forced aft and out, exposing the contents of the cockpit and forward cabin, along with the header tank, baggage bay, and wiring side of the instrument panel (Photo 3).

The instrument panel was fragmented, resulting in varying degrees of damage to all of the flight instruments and avionics. The Hobbs hour meter indicated 1170.6 hours. The engine throttle and propeller levers were in the full forward position, and the condition lever was in the ON position (Photo 4). The right-side control yoke had separated from the control column, the fracture area exhibited conical separation with granular surface features (Photo 5). The left-side yoke remained attached to its control column.

The flap actuator assembly was examined under the left aft seat. Thirty six threads were visible at the actuator shaft, corresponding to 6 inches of exposure (Photo 6). According to Piper documentation, full flaps correspond with 5.1 inch shaft exposure and 30 threads.

The rudder trim wheel indicator was in the full left position (Photo 7).

The elevator trim actuators drum was positioned such that eight actuator threads were visible on the forward side and six on the rear, which according to Piper documentation was consistent with neutral trim (Photo 8).

The aileron interconnect system was intact in the forward lower fuselage. The left aileron and rudder cables were attached, and the system appeared to be centered. The interconnect springs appeared intact.

Left Wing

The left wing center and aft spar had separated at the root, with the forward spar remaining attached to its mounting bolt and frame bracket, which had separated from the airframe. All failure surfaces propagated in an aft direction, and exhibited granular surface features and 45 degrees sheer lips (Photo 9).

The wing remained largely intact, and had sustained leading edge crush damage to the outboard 6 ft including the tip (Photo 10). The landing gear remained attached and was in the extended position.

The flap was in the retracted position, and remained attached at the outboard and center flap tracks. The inboard flap track had pulled away from the aft spar and was bent aft. The inboard flap actuator rod eyebolt remained attached to the upper flap surface but its threaded portion had separated with bending observed at the failure surface. The flap center bellcrank was intact and

attached to aft spar; the interconnect rod was attached, and the inboard bellcrank was intact and attached to spar. The push-pull tube eyebolt was intact but had separated inboard at the thread with damage and granular surface features.

The aileron remained attached at the inboard hinge, and partially attached at the outboard hinge where the tip had become bent upwards. The aileron control cable remained attached to upper portion of the control sector wheel, and had looped back through the lower balance cable rib pass-through hole. The hole had been torn open, and both the aft section of the rib and the forward surface of the hole exhibited serrations consistent with cable contact (Photo 11). The rest of the cable passed through the wing rib at the flap outboard hinge, and then was separated approximate to the wing root. The balance cable was not attached to the lower sector wheel. All cable pulleys rotated freely, and sustained varying degrees of damage to their rims.

The aileron balance cable remained attached to the center section of the airframe, with the cable swage balls intact at both ends. The right side of the cable exhibited bunching, where four of its strands had separated (Photo 12). The remaining control cables within the airframe were continuous through to both control yoke assemblies. The left yoke sector wheel had separated in an area where it had become impinged against panel components.

Right Wing

The inboard section of the right wing was recovered, extending 3 ft outboard of the landing gear, which was in the extended position. Leading edge crush damage was present, and the upper skins had separated at the aft spar (Photo 13). The spars had separated from the airframe in a similar manner to the left wing. The flap had become detached and separated in two. The aileron was not present.

Vertical Stabilizer

The vertical stabilizer and rudder remained attached to the tailcone, and were largely intact (Photo 14). The rudder balance weight had torn free from the structure and was located adjacent to the main cabin at the accident site.

Horizontal Stabilizer

The horizontal stabilizer had separated from the tailcone. The left side remained largely intact with the elevator attached aft spar (Photo 15). The right side exhibited upwards bending damage twisting the leading edge up to 60 degrees relative to the direction of travel (Photo 16). The elevator remained attached at the center hinge and had bent aft. The trim tab was still attached.

1.1 Airframe Examination Photos

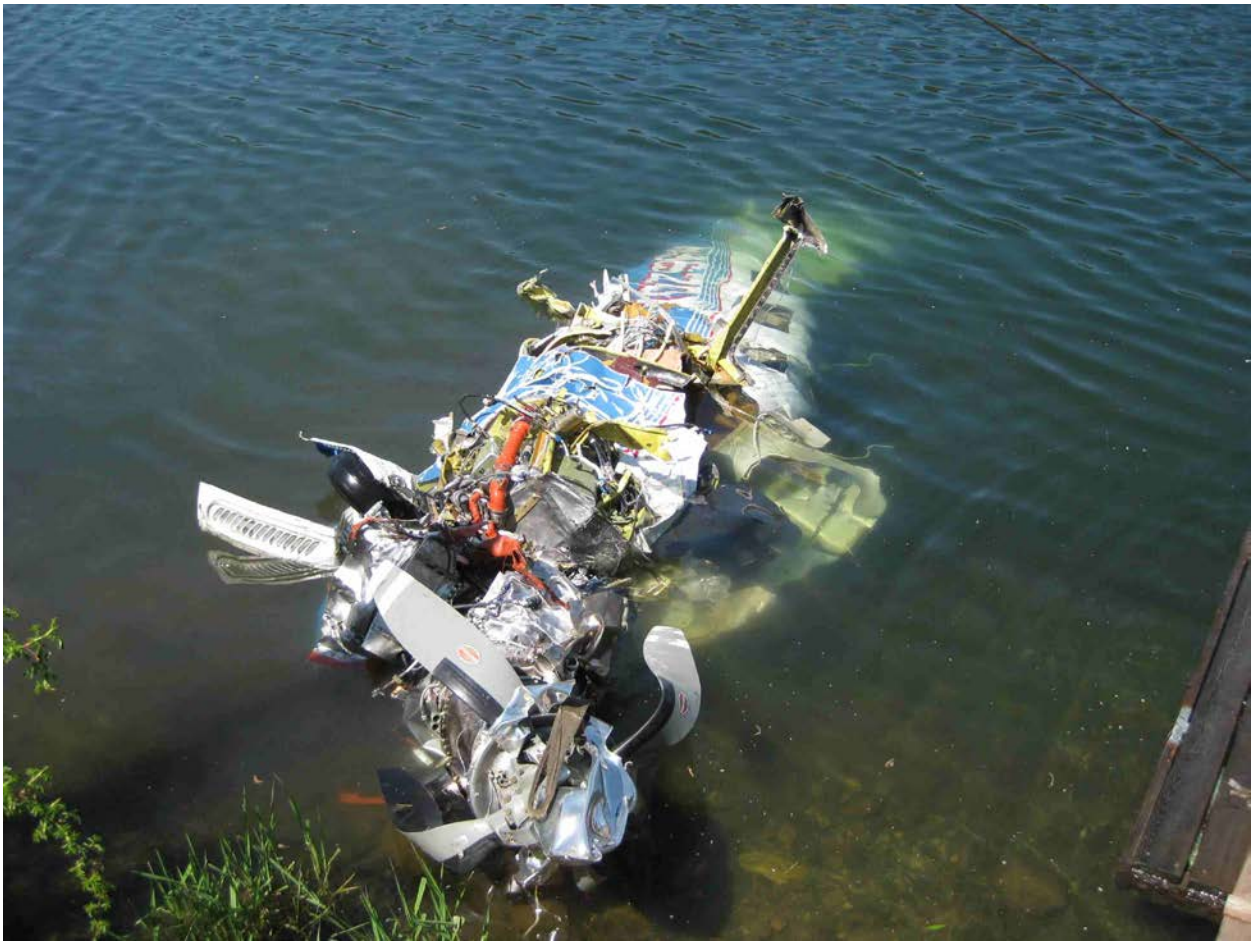

Photo 1 - Airframe in Water

Photo 2 - Engine and Propeller

Photo 3 - Firewall and Header Tank

Photo 4 - Throttle Quadrant

Photo 5 - Right Control Yoke

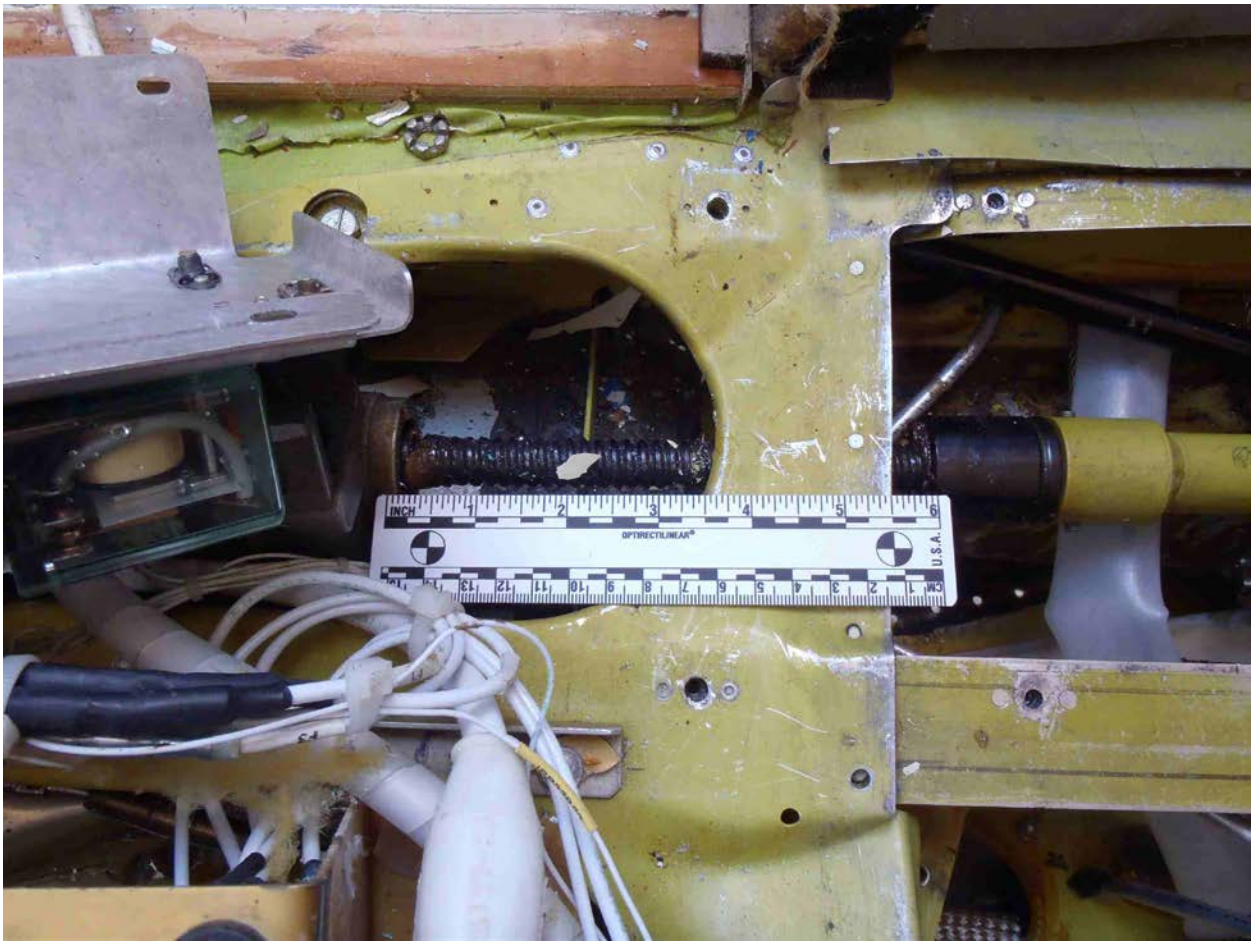

Photo 6 - Flap Actuator

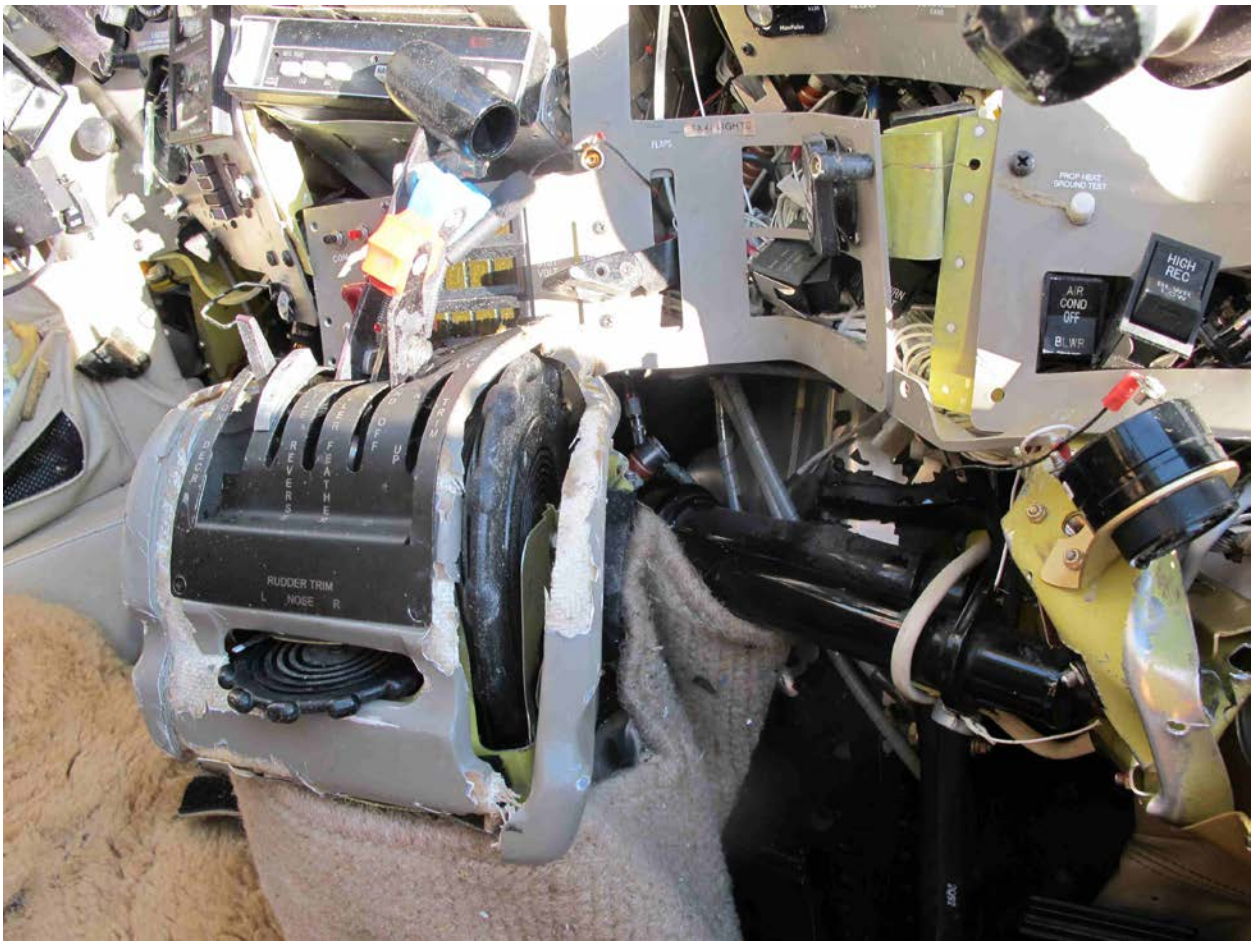

Photo 7 - Rudder Trim Position

Photo 8 - Elevator Trim Actuator

Photo 9 - Left Wing Spar Cap Fracture Surface

Photo 10 - Left Wing

Photo 11 - Left Wing Aileron Cable

Photo 12 - Aileron Balance Cable, Right Side

Photo 13 - Inboard Left Wing and Landing Gear

Photo 14 - Rear Cabin and Vertical Stabilizer

Photo 15 - Horizontal Stabilizer and Elevator, Left Side

Photo 16 - Horizontal Stabilizer and Elevator, Right Side

Submitted by: Eliott Simpson