



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

AIRFRAME EXAMINATION

WPR20LA177

This document contains 8 embedded photos.

A. ACCIDENT

Location: Maricopa, AZ
Date: June 9, 2020
Aircraft: Zenith 601HDS, N6402X, SN:6-3904
NTSB IIC: Elliott Simpson

B. EXAMINATION PARTICIPANTS:

Elliott Simpson
Senior Aviation Accident Investigator
National Transportation Safety Board
Western Pacific Regional Office
Los Angeles, CA

Christopher L. Kennedy
Aviation Safety Inspector / Principal
Maintenance Inspector
Federal Aviation Administration
Scottsdale FSDO

C. SUMMARY

Examination of the airplane was conducted at the facilities of Air Transport in Phoenix, Arizona, on July 20, 2020. No evidence of preimpact mechanical malfunction or failure was noted during the examination.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

The entire cabin had fragmented and was consumed by fire through to the aft fuselage bulkhead. All remaining structure was coated in a fine layer of black soot (photo 1).

The leading edges of both wings sustained crush damage through to the main spar, focused on the lower side of each wing, at an angle about 45° relative to the chord. Similar 45° aft bending was present on the spar (photo 2).

Both wings remained attached to each other through the spar carry through, which had been cut during recovery. Both ailerons remained attached to their respective wings.

Aileron control cable continuity was confirmed from each aileron control horn through to the control stick in the cabin.

The tail cone sustained crush damage through to the leading edge of the horizontal stabilizer.

The horizontal stabilizer was largely undamaged and remained attached to the airframe on its right side by its forward and aft spar (photo 3). The left attach points had broken away, and exhibited fresh and bright separation features, and were not coated in soot.

The left elevator had partially detached from the horizontal stabilizer about midspan and had bent upwards by about 30°.

Elevator control cable continuity and direction was confirmed from the elevator control horns through to the cabin control stick. The upper cable remained attached to the stick, the lower cable fitting had melted away.

The moving rudder assembly remained attached to the tail cone by its hinges.

Rudder control cable continuity and direction was confirmed from the rudder to the right foot pedal assembly; the left foot pedal was not located.

Both main landing gear wheels had detached from the gear leg.

There was no evidence of bird strike, or trailing soot or oil deposits to any of the airframe components.

2.0 Engine Examination

A data tag for the engine was not located, however, maintenance records indicated it was a PZL-Franklin, type: PZL-F4A235B31, serial number: 2611300034.

The engine sustained impact damage liberating the carburetor, inlet manifold, engine driven fuel pump, alternator, gascolator, starter and both magnetos (photo 4).

The forward cylinders 3 and 4 sustained impact damage and were partially detached from the crankcase. The rocker covers of those cylinders had been breached, and the rocker assemblies were liberated.

The propeller hub and all composite blades remained attached to the crankshaft. The spinner exhibited compression and scoring damage, opposite the direction of rotation. The blades had been consumed by fire, but their internal torsional rods were intact and sustained bending damage opposite the direction of rotation (photo 4).

The air inlet screen was crushed, and no blockage was noted. The carburetor had fragmented, revealing a single crushed float. The engine driven fuel pump drive coupling was intact, and the pump could be rotated freely by hand (photo 5).

Both magnetos sustained impact and heat damage, and all spark wires were consumed by fire. The top spark plugs were removed, and exhibited light grey to dark brown discoloration, and wear signatures consistent with normal operation (photo 6). There was no evidence of

catastrophic internal engine failure. The inner surface of the exhaust pipe outlet was coated in light tan deposits (photo 7).

One magneto produced a spark at each terminal when rotated by hand. The other could not be rotated, however disassembly revealed thermal damage to the gear and plug distributor assembly and points. There was no indication of arcing damage.

The throttle, mixture, and carburetor heat controls were found in the full forward position (photo 8).

3.0 Examination Photos



Photo 1 – Main cabin and tails section



Photo 2 - Wings



Photo 3 – Tail section



Photo 4 – Engine and propeller

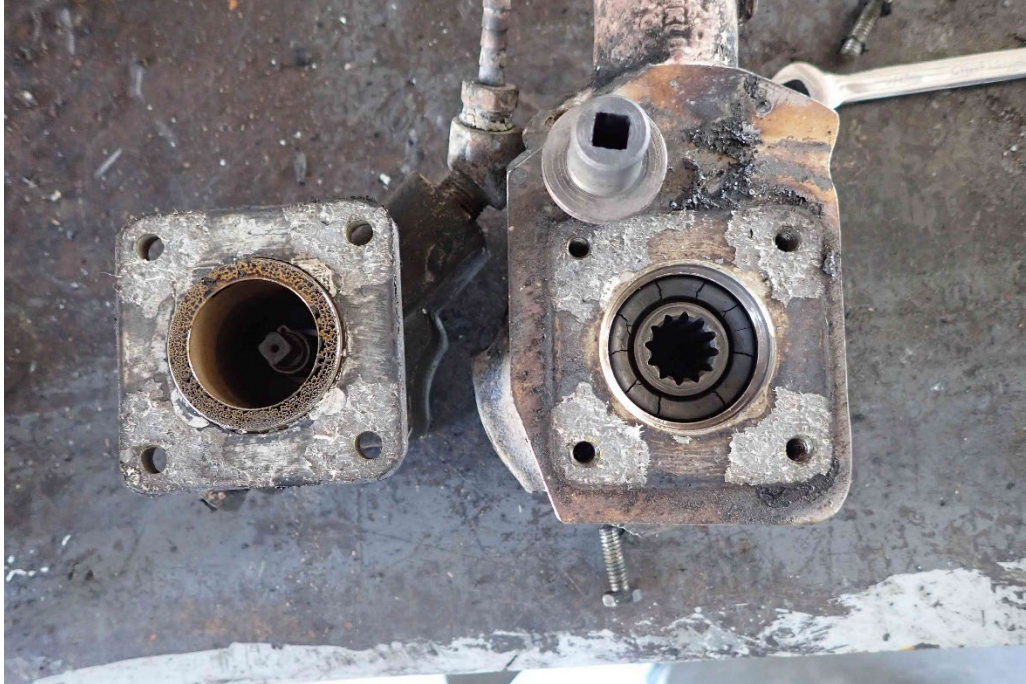


Photo 5 – Engine driven fuel pump



Photo 6 – Top spark plugs



Photo 7 – Exhaust pipe outlet



Photo 8 – Throttle and mixture controls

Submitted by: Elliott Simpson