



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

AIRFRAME AND ENGINE EXAMINATION

WPR19FA163

This document contains 10 embedded photos.

A. ACCIDENT

Location: Antioch, CA.
Date: June 9, 2019
Aircraft: Piper Aircraft PA 28-151
NTSB IIC: Fabian Salazar

B. EXAMINATION PARTICIPANTS:

Name: Fabian Salazar
IIC
National Transportation Safety Board
Federal Way, WA 98003

Name: Michael Arraiz
Principle Maintenance Inspector
Federal Aviation Administration
Oakland, CA.

Name: Harlow Voorhees
FAA Safety Team, FAA
Oakland, CA.

Name: Mark Platt
Air Safety Investigator
Lycoming Engines
Phoenix, AZ.

Name: Kathryn Whitaker
Air Safety Investigator
Piper Aircraft
Phoenix, AZ.

C. SUMMARY

Examination of the airframe and engine occurred on July 2, 2019 at Plane Parts facility, Pleasant Grove, California. After examination of the available airframe and the engine, no evidence of preimpact mechanical malfunction was noted.

D. DETAILS OF THE INVESTIGATION

Airframe Examination

On June 9, 2019, the airplane came to rest in the Broad Slough portion of the San Joaquin River near Antioch, CA. Portions of the airplane were recovered on June 13, 2019, and transported to a secure facility in Pleasant Grove, CA. The fuselage was fragmented, and some of the airframe and several components were not recovered. The recovered components consisted of the empennage and a portion of the tail cone, the left wing assembly, the left-wing fuel tank, some of the cabin structure including interior door panels, some of the seatbelts and lap belts, the rear seat, and the left and right main landing gear. Items missing included but were not limited to the cockpit area of the airplane, the front seats. The cabin area of the fuselage, most of the instrument panel, most of the right wing including the aileron and flap assembly, and the propeller. Some personal items, belonging to the pilot were recovered, including a backpack,

identification card, a headset, and a notebook. Fragments of the orange plastic maintenance book protector were recovered, but the maintenance book was not.

FUSELLAGE

WINGS

The left wing separated from the fuselage. The spar displayed fractures consistent with overload. The left wing remained mostly intact and retained the aileron, flap and main landing gear. The leading-edge fractured and partially separated from the wing. The portions of the leading edge that remained attached sustained crush damage inwards towards the spar. The tip and outer portion of the wing were crush damaged upwards. The aileron remained attached to the wing at the in-board hinge. The flap remained attached to the wing at the inner and center hinge. The outer hinge was impact separated from the wing. The flap was found in the retracted/up position. The flap was damaged from the outer end to the center hinge. The left-wing fuel cell separated from the wing and received damage deforming the shape. The fuel cap was found secured with the seal soft and pliable. No fuel was found in the fuel cell.

A small portion of the right wing was recovered. This section was a portion of the center of the wing and consisted mainly of the upper wing skin nearest the root, and a portion of the spar. The aileron, flap assembly, the leading edge, portions of the spar, and the right-wing fuel tank were not recovered. The wingtip and navigation light were not recovered. The right main landing gear remained attached to the wing portion by the brake line.

Empennage. All the major components of the empennage were recovered. The vertical stabilizer was impact damaged and remained attached to a portion of the aft fuselage. The rudder remained attached to the vertical stabilizer at the top hinge and displayed damage throughout. The lower hinge was impact separated. The right side of the stabilator was damaged from the bottom upwards and rearwards. The leading edge was twisted backwards facing 180 degrees. The left side of the stabilator was crushed aft at the leading edge. A tear in the skin was observed on the underside running from the trailing edge to the leading edge. The stabilator counterweight was observed protruding out of the bottom of the assembly.

The left rear portion of the fuselage skin was recovered. This section included the skin running from the empennage to the first window and from the bottom of the airplane to just under the windows. No significant portion of the right side of the fuselage was recovered. No significant portion of the engine nacelle was recovered. No portion of the overhead fuselage was recovered.

Landing gear. The main landing gear was recovered. The left main landing gear remained attached to the underside of the left wing. The brake assembly appeared normal. The tire and wheel assembly appeared normal. The oleo strut appeared pressurized and over-extended. The right main landing gear separated from the underside of the right wing. The brake assembly appeared normal. The oleo strut appeared pressurized and over-extended. The wheel and tire assembly appeared normal. The nose gear assembly was not recovered.

Flight Controls. The flight controls were recovered. Flight control continuity was established for the ailerons, stabilator, rudder, and trim. The cables of the aileron were removed from the wreckage and laid out. There were two broom straw breaks on the left aileron cable. The chain linking the yokes was impact separated. The right aileron cable had a broom straw break near the right control yoke and a second which resembled a recover cut. Rudder cable continuity was established. The rudder cables remained connected to the ruder horn and traced through the empennage and cabin remnants to the rudder pedals. Stabilator control cable continuity was established from the stabilator to recovery cuts near an attachment clevis. The stabilator trim was set at neutral as verified by five threads exposed or .75" on the trim extension screw. Throttle control continuity was not established due to the carburetor being absent.

INSTRUMENTATION. A small portion of the instrument panel was recovered.

Airspeed indicator: 0 Knots

Clock: 16:30:27

Turn Coordinator: Tumbled

Engine tachometer: Found detached from the instrument panel, damaged and outside of the protective housing. The dial missing.

Engine tach meter: 9396.7

Circuit Breaker panel. All circuit breakers were missing from the panel.

Carb Heat: OFF

Engine Prime: IN

Throttle: Bent and crushed into the instrument panel.

Mixture: Bent and crushed into the instrument panel

Ignition Key: Bent and found in the "L" magneto position.

AvMstr: Down

ENGINE

Serial number: L-13541-39A, Model number: O-320-D3G.

The engine was recovered after being submerged in the San Joaquin River for four days. Attached to the engine were multiple wires and portions of the engine mounts. The engine appeared intact with all cylinders and heads attached.

A visual inspection revealed the number one-cylinder intake pushrod and push rod tube were absent as was the carburetor. The number one exhaust push rod tube was found damaged and unsealed from the crank case.

Thumb compression was confirmed in all four cylinders. The crankshaft and cam shaft rotated freely. Valve continuity and proper cam lobe shape was established, by monitoring the correct and free movement of all eight rocker arms and, or tappets.

The top spark plugs were removed from the engine. Spark plug number one was broken in two pieces. The portion furthest away from the electrode was not recovered. The half containing the electrode remained with the engine and appeared to have oxidation and contamination present. Deposits around the electrode appeared light gray and was present throughout the inner portion of the spark plug. Spark plugs two, three, and four were intact and remained attached to the engine. When examined they all demonstrated oxidation and corrosion. The electrodes appeared intact with corrosion throughout the inner portion of the spark plug. The lower spark plugs were not removed. The number two, and number three lower spark plugs were intact. The number four and number three lower spark plug was broken in two with the half furthest away from the electrode not recovered.

Magnetos. Both magnetos remained attached to the rear of the engine. The magnetos were removed from the engine. The right [when viewed from the rear of the engine], serial number 12080261/G-12608, magneto would not spark when tested with a drill. The left magneto, serial number 95040170/G-12629, sparked on all four posts when tested with a drill.

The vacuum pump was examined and appeared to have a white powdery substance consistent with corrosion present. The pump rotated freely.

Alternator. The alternator was not recovered.

The engine driven fuel pump remained attached to the engine. The fuel pump contained a substance consistent with water along with a white powdery substance consistent with corrosion. The diaphragm was present and without tears.

Carburetor. The carburetor was not recovered. Two pieces of the carburetor to manifold attachment flange were found attached to the intake manifold.

Intake manifold. The number four intake tube remained attached to the intake manifold. The number one intake tube remained attached to the cylinder head but was impact removed from the intake manifold. The number two and three intake tubes were not recovered. The muffler assembly was not recovered. The number one, two, three, and four exhaust pipes remained attached to the cylinder heads and were crush damaged. The intake manifold revealed a hole just underneath the number one intake port.

Propeller flange. The propeller flange was attached to the engine crank. The flange was damaged and bent towards the engine. Three of the six bolt remained attached to the propeller flange.

The engine starter remained attached to the engine block.

The oil filter remained attached to the rear of the engine. The oil filter was marked with green permanent marker with the following information:

Date: 5/23/19

Tach Time: 0390.3

Aircraft reg: 7943C

The word engine was circled.

The oil filter was cut open and the insides components were examined. The oil inside the filter was a dark brownish color with a substance appearing to be water present. There was no metal present in the folds of the filter. The oil screen was clear of obstructions.

Propeller. The propeller was not recovered. The propeller was a model 74DM6-0-60 with a serial number of A41962.

INSPECTIONS AND OVERHAULS

Airframe. The airframe underwent an annual inspection on February 8, 2019. At 13834.2 total time in service.

Engine. The engine underwent an annual inspection on February 8, 2019, at 10289.7 total time, and 343.5 tachometer hours. The engine underwent a major overhaul on January 15, 2008.

Propeller. The propeller was last inspected in accordance with annual inspection criteria and was determined to be in airworthy condition as of February 8, 2019, at 13834.0 total time in service and 5335.6 time since partial overhaul, tach time of 343.5 hours.

PHOTO GALLERY



Photo 1. N7943C. Recovered Portions of the Airplane.



Photo 2. N7943C. Recovered Portions of the Airplane.

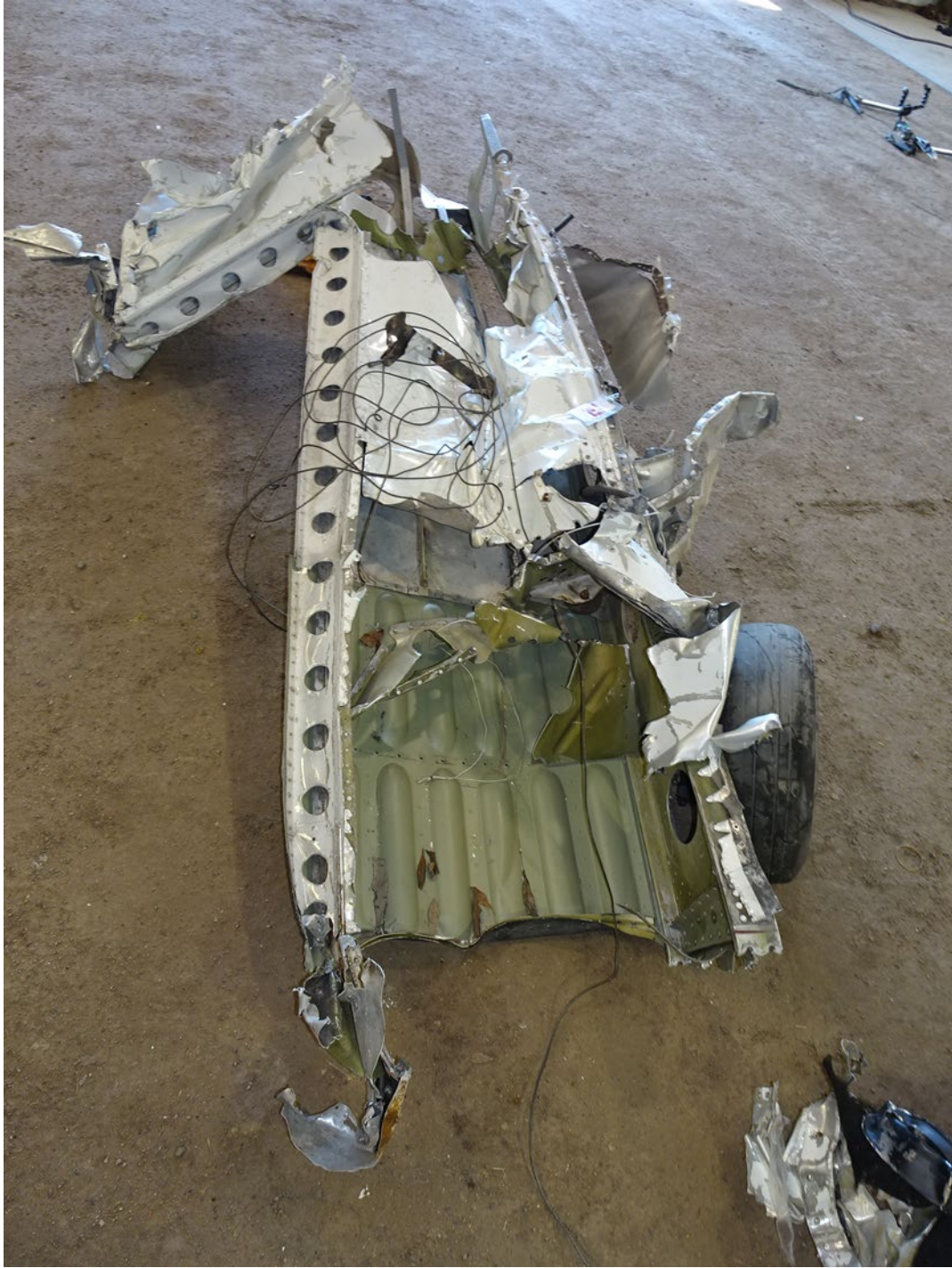


Photo 3. Right Wing



Photo 4. Left Wing



Photo 5. Empennage, Right Side



Photo 6. Empennage, Left Side



Photo 7. Instrument Panel

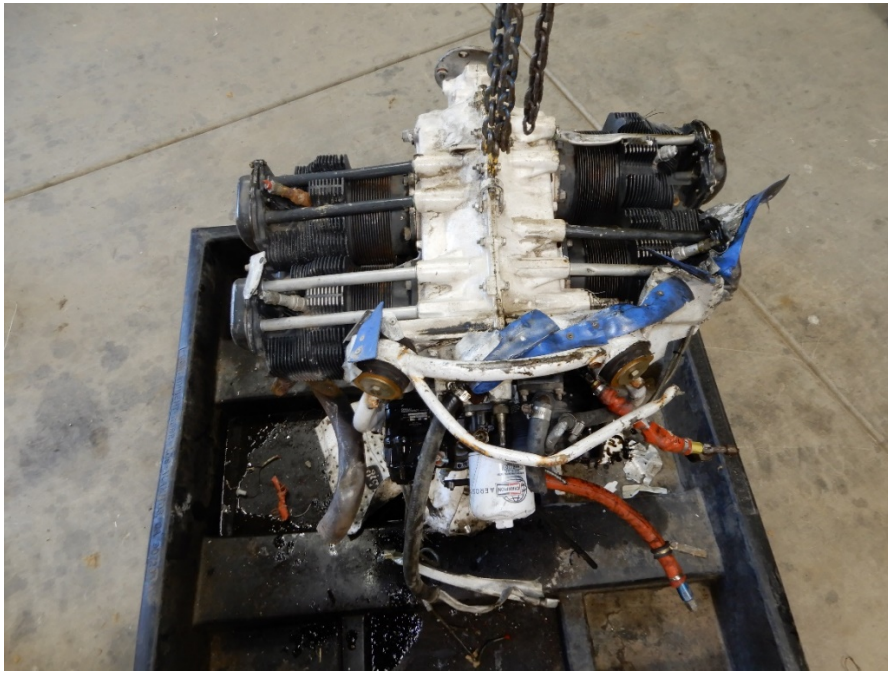


Photo 8. Engine



Photo 9. Trim Setting



Photo 10. Aileron Control Cables