



WPR16FA126

Hayward, California

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1149 PDT

Piper PA-23-150; N1270P

NTSB Aircraft Examination Report

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HISTORY OF FLIGHT

On June 19, 2016, about 1149 Pacific daylight time, a Piper PA-23-150, N1270P, impacted a rail yard during an approach to land at Hayward Executive Airport (HWD), Hayward, California. The airline transport and sole passenger was fatally injured. Visual meteorological conditions prevailed and no flight plan was filed for the local flight, which was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. The personal flight departed HWD at 1035.

PERSONNEL INFORMATION

The pilot, age 60, held an airline transport pilot certificate with ratings for single and multi-engine land. He additionally held both flight and ground instructor certificates. The pilot's most recent second-class medical certificate was issued on January 13, 2016, which included one restriction; "must have glasses available for near vision." During the exam, the pilot reported that he had accumulated 2,161 flights hours; 21 hours of which were in the previous 6 months.

The pilot's logbook did not include any entries beyond June 5, 2016. A review of the recorded entries revealed that he had accumulated a total of 2194 flight hours and 59 hours in the previous 12 months. The pilot accrued approximately 14 total flight hours in the accident airplane make and model.

AIRCRAFT INFORMATION

According to Federal Aviation Administration (FAA) records, the airplane was manufactured in 1955 and registered to the pilot on September 2, 2015. The airplane was powered by a Lycoming O-360, a normally-aspirated, direct drive, air cooled, 150 hp engine. The family provided the original logbooks from May 1986 to July 2015. A review of the aircraft logbooks revealed that the airplane's most recent 100 hour inspection was completed on July 15, 2015 at

which time the left engine had accumulated 4,051 flight hours, and the right engine had accumulated 4,059 flight hours.

At the time of the inspection, the left engine had accrued 4,051 flight hours, 1,955 hours since major overhaul. According to an entry in the engine's logbook, the left engine carburetor was previously rebuilt on July 26, 2004 at 3,086 flight hours.

The right engine had accrued 4,059 flight hours and 1,957 since major overhaul at the time of the last 100 hour inspection. The right engine oil filter was last changed and the oil pump screen was cleaned during the last 100 hour inspection. The logbooks did not contain any record of a camshaft lobe inspection or camshaft replacement.

According to records furnished by a refueling station at HWD, that the pilot had purchased fuel from their self-service facility 11 times in the previous 10 months. The records showed that the pilot last purchased fuel for the accident airplane in September 2015 in the amount of 23.4 gallons. In addition, the records revealed that the pilot had purchased fuel multiple times without entering the aircraft tail number into the self-service fuel kiosk. The pilot's logbook showed that he flew the accident airplane on May 1, 2016, which correlates with a fuel purchase in the amount of about 21 gallons that took place the same day. The logbook did not show any other flights for this day.

COMMUNICATIONS

Preliminary radar data provided by the FAA captured the airplane's position, altitude, and airspeed in 5 second snapshots. According to the data, the airplane departed on a local flight at approximately 1035. During his return to HWD, the pilot initiated a descent from approximately 2,000 feet at a rate of descent of about 450 feet per minute (fpm). From the beginning of his approach to the time of impact, the airplane's rate of descent fluctuated between 450 fpm and 700 fpm. During the last minute of flight, the pilot's airspeed reached a minimum airspeed of 52 knots (60 mph), approximately 20 seconds before the last radar return and presumably the time of the accident. The manufacturer's published stall speed is 61 mph.

METEOROLOGICAL INFORMATION

The 1152 recorded weather observation at HWD included wind 280 degrees true at 11 knots, visibility 10 statute miles, clear skies, temperature 26 degrees C, dew point 07 degrees C, and an altimeter setting of 30.06 inches of mercury.

EYEWITNESS REPORTS

A total of three eyewitnesses were interviewed; two of which observed the airplane flying inbound to land and another that captured the airplane moments before it impacted the rail yard.

According to the preliminary radar data, the first witness (Witness 1) was located near the airplane's inbound leg, approximately 9 nautical miles from HWD. Witness 2 was located approximately 10 miles from HWD in proximity of the airplane's outbound leg. Witness 3 was

located one half mile from the accident site in a nearby graveyard. Please refer to *Figure 1* below for a graphical depiction of the witness locations.

Witness 1 reported that she heard the airplane and an abnormal sound from inside her home. She went outside and observed an airplane approaching her house from a group of hills located to the east. The airplane appeared to be losing altitude and the engine made a "sputtering sound," which she also described as "cutting out." The sound repeated when the airplane reached her property and again seconds later after it passed her home.

Witness 2 stated that he was working in his yard all morning and initially observed a red and white colored airplane on a southeastern heading at approximately 1,750 feet. He never observed any smoke, but heard a sound that resembled an engine "backfiring." The airplane subsequently made a left turn and proceeded eastbound and disappeared behind a group of hills. About 30 minutes later he observed an airplane northeast of his house flying towards the airport. The witness reported hearing more sounds that resembled an engine "popping" and "backfiring." He added that he did not observe any smoke, FOD, or fluids coming from the airplane, but clarified that the engine "backfiring" sounds were much louder during the airplane's inbound leg.

According to Witness 3, he observed an airplane flying abnormally low over a group of houses before noon on the day of the accident. The airplane suddenly entered a steep left bank angle, with the right wing approximately 70 degrees to the horizon. The airplane then disappeared behind a residential area. Approximately 10 seconds later he heard a sound that resembled a bat striking an aluminum shed; shortly thereafter plumes of smoke emerged from the airplane's direction. The witness stated that he observed the airplane in a wings level descent for a few seconds before it entered the steep turn. He added that he may have been downwind of the accident because he smelled fuel burning.

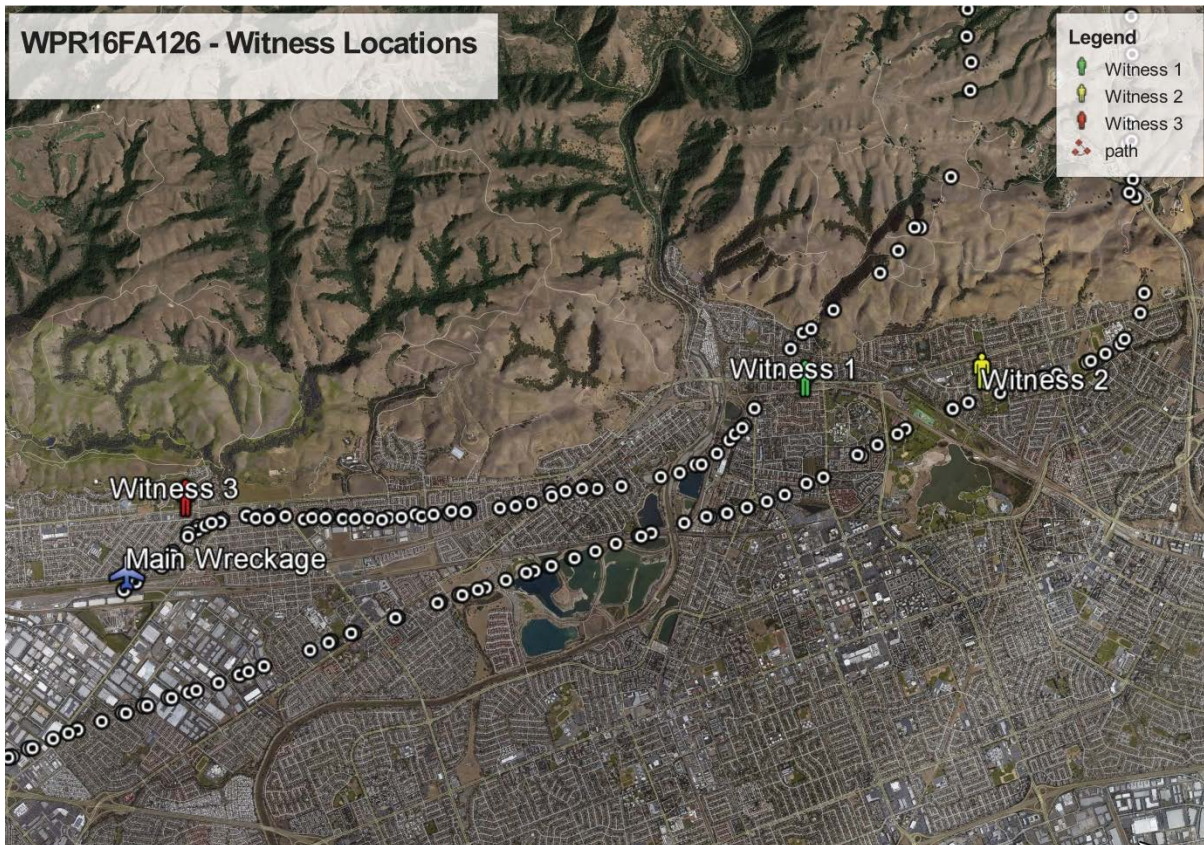


Figure 1 – Witness Locations

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest at the base of a fiberglass railcar wash building about 5 nautical miles from HWD. All four corners of the airplane were accounted for at the accident site, which was contained within an area about 35 feet by 25 feet. The main fuselage came to rest inverted on a heading of 095 degrees magnetic and was destroyed by fire. With the exception of some thermal damage, the empennage was in one piece that remained connected to the fuselage through the airplane's control cables. The right wing was destroyed by fire and its corresponding engine was inverted and covered in soot. The left wing was in a vertical position, at rest against the southeastern end of the railcar wash building. Both sets of propeller blades remained attached to their respective hubs; the left engine blades were in the feathered position and exhibited no damage signatures. Both right engine propeller blades displayed nicks, gouges, and tip curling.

COCKPIT/CABIN OBSERVATIONS

Several instruments were recovered from the accident that will be reviewed during the postaccident examination at the recovery facility in Sacramento, California.

AIRFRAME

The fuselage was destroyed by fire, which exposed most of the fuselage frame and control cables. The nose cone skin and several structural tubes from the forward fuselage were crushed aft. Continuity of the rudder control system was traced from the left seat occupant's left rudder pedal and rudder torque tube to the rudder. Although the instrument panel was destroyed, the yoke control tube, a portion of the throttle quadrant, and several round dial instruments were recovered.

The wings were co-located with the main wreckage; the left wing remained intact with the exception of the wingtip, which had separated. Most of the right wing was destroyed by fire; however, the right engine exhibited some heat damage and soot, but remained intact. The left main landing gear was in the retracted position. The left bladder fuel tank was breached and an odor of fuel was detected inside the wash building a few feet beyond the wing. The left flap and left aileron remained attached at their hinge points and rotated through their axes by hand, but the flap control mechanism had separated from its push pull tube and aileron continuity through the wing could not be established. Due to safety concerns, the left wing control cables were examined at a later date. The left engine cowling was removed to document the engine accessories, hoses and cables in situ. A small quantity of oil was observed on the bottom of the wing near the exhaust and on the carburetor case. The left main landing gear was in the retracted position and the tire was intact.

A portion of the inboard right wing was located near the fuselage and a section of the right wing flap remained connected by its inboard hinge. The flap's push pull tube rod end displayed thermal damage and was not attached to the wing. The right engine propeller was attached to the engine, which faced towards the right wingtip. A sooty black residue covered the propeller hub and the assembly's piston section displayed a puncture hole protruding outward. Both the throttle and mixture cables exhibited broomstrawing consistent with overload separation aft of the engine firewall. The throttle cable remained connected to the throttle arm, which was surrounded by molten metal and could not be operated by hand. The right engine mixture cable was not connected to the butterfly valve armature. The fuel bladder screen was free of contaminants.

The empennage and aft fuselage came to rest inverted, 90 degrees to the left of the center fuselage. The right side of the empennage displayed significant thermal damage. The right side to the aft fuselage was destroyed by postcrash fire, which exposed the rudder trim jackscrew, elevator control tube, and rudder cables. The elevator trim tab displayed 16 threads, consistent with a nose up position. The elevator trim drum was also partially separated from the spindle.

Postaccident Airframe Examination

Left Wing

Left aileron control continuity was confirmed from the left aileron bell crank to the wing root where cables were cut by recovery personnel. The rubber seal to the inboard left tank fuel cap was corroded and the cap did not form a seal inside the fuel tank ring when installed. The fuel cap rubber seal to the left outboard tank displayed some corrosion and also did not form a seal when installed in the fuel tank ring. The left fuel selector valve displayed $\frac{3}{4}$ inches of space between the lever and the valve. According to the manufacturer, this position is consistent with

an auxiliary tank setting. A trace amount of fuel was drained from the left engine gascolator into a plastic container that had been cleaned and dried. A sargel fuel purity test indicated that the fuel was contaminated with water. The fuel odor and appearance resembled 100LL Aviation Gasoline.

Right Wing

The right wing fuel boost pump was disassembled and the gasket and internal components displayed carbon coloring consistent with exposure to fire. The pump was void of fuel and the fuel screen was found free of debris.

The right wing bell crank was damaged by fire, but remained intact and attached to the primary aileron and balance cables. The right aileron cable was continuous from the bell crank to the chain, which was broken. Further examination of the chain revealed that the chain had fractured in tensile overload.

Fuselage

One arm from the control T bar assembly separated at the T section and the assembly was damaged by fire; however, the remaining three sprockets were intact. A portion of elevator control tube remained attached to the tube stem.

Continuity of the rudder assembly was traced from the rudder torque tube through a control cable located on the right side of the airplane to the rudder. A rudder control cable on the opposing side was traced from the rudder to the cockpit; however, the cable had separated from the torque tube arm. The arm was separated from the torque tube.

The flap actuator measured approximately 20 inches, which is consistent with partial deployment of the flaps. According to the airplane manufacturer, an actuator measurement of 18.35 inches corresponds with a full flap extended position and 25.50 inches corresponds with a full flap retracted position. While the flap actuator rod displayed significant fire damage on the fore and aft ends, the intermediate section was shiny in appearance with only some blue discoloration.

Elevator continuity was traced from the elevators to a fractured control tube near the forward section of the empennage.

Empennage

The rudder trim jackscrew displayed approximately 1 inch of exposed threads. According to the manufacturer, this measurement is consistent with a neutral trim position.

The elevator trim displayed approximately 17 threads, which correlates to a near full nose up trim position. However, the elevator trim cables were loosely fixed to the trim drum, which indicates that the trim jackscrew may have moved during the accident sequence.

ENGINE

Postaccident Engine Examination

Left Engine

The propeller was rotated by hand accompanied by a thumb compression, which confirmed continuity through the valvetrain and accessories. The intake and exhaust valves were normal, indicating that the camshaft lobes were not flattened.

A magneto timing light confirmed the magneto breaker points opened at 25 degrees BTDC. The left and right magnetos were timed within 1 degree of each other.

Disassembly of the left engine driven fuel pump revealed trace amounts of residual fuel, which exhibited an odor and appearance of 100LL aviation gasoline. A sargel fuel purity test confirmed that the fuel was contaminated with water. The pump valves and backing plate displayed significant amounts of a white powdery substance consistent with corrosion.

The carburetor remained attached to the engine accessory case, but was removed for examination. The carburetor fuel screen was free of debris and the carburetor floats were intact. Trace amounts of residual fuel were discovered in the carburetor fuel bowl and in the accelerator pump. A subsequent sargel fuel purity test confirmed the presence of water contamination in both cavities. A white powdery residue was observed on the accelerator pump plunger, which had a consistency that resembled corrosion.

The top spark plugs were gapped and displayed normal wear. The bottom spark plugs were oil fouled. The engine came to rest in a near vertical position with the forward end pointed down where it remained for 2 days. After recovery, the engine was hoisted to a near level position.

Right Engine

The right engine and accessories displayed significant fire damage. The propeller was rotated successfully by hand with some resistance and valvetrain continuity was confirmed. Further examination revealed that the aft cam lobe was concentric and the forward cam lobe was worn.

The top spark plugs that corresponded with cylinder nos. 1, 2 and 4 were thermally damaged, but displayed normal wear. Spark plug no. 3 was also damaged by fire and was covered in grime.

EMERGENCY LOCATOR TRANSMITTER (ELT)

The aircraft's ELT was destroyed by fire.