



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

Date: February 15, 2018

SUMMARY OF AIRPLANE EXAMINATION

(WPR17FA065)

This document contains no embedded photos.

A. ACCIDENT

Location:	Panguitch, Utah
Date:	February 25, 2017
Aircraft:	Cessna 172H
NTSB Investigator-in-Charge	Thomas M. Little

B. EXAMINATION PARTICIPANTS

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C. SUMMARY

On February 25, 2017, about 2049 mountain standard time (mst), a Cessna 172H, N3712F, was substantially damaged following impact with terrain while maneuvering at a low altitude about 11 nautical miles (nm) north-northwest of Panguitch, Utah. The private pilot and two passengers were fatally injured. Instrument meteorological conditions prevailed at the time of the accident. The cross-country flight was being operated under the provisions of Title 14 *Code of Federal Regulations* Part 91, and a flight plan was not filed. The flight departed Page Municipal Airport (PGA), Page, Arizona, at about 1930, with the reported destination as South Valley Regional Airport (U42), Salt Lake City, Utah.

Examination of the accident site was conducted on February 28, 2017, under the supervision of the National Transportation Safety Board investigator-in-charge, assigned to the NTSB's Western Pacific Region, Federal Way, Washington, assisted by two Federal Aviation Administration Aviation Safety Inspectors, assigned to the Salt Lake City Flight Standards District Office, Salt Lake City, Utah. The airplane was recovered from the accident site on March 1, 2017, by Air Transport Recovery, and transported to their facility in Phoenix, Arizona for further examination. A follow-up examination of the airplane and engine was completed on March 8, 2017, under the supervision of the NTSB IIC, with representative from the Textron Aviation and Continental Motors, Inc. present. As a result of the examinations referred to above, no evidence of preimpact mechanical malfunction was noted during the examination of the airframe or engine, inclusive of the propeller.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site Examination

An examination of the accident site was conducted on February 28, 2017 by representatives of the NTSB and the FAA. The airplane's wreckage was located about 80 nm northwest of the departure airport, in a remote, snow-covered, mountainous region, characterized by sparse vegetation, and virtually no close inhabited dwellings; the closest town Panguitch, Utah, was located about 12 nm southeast of the accident site.

The main wreckage site was observed to have come to rest in a ravine, about 206 ft down a 20° slope, which was oriented on a southwest heading that originated from the first point of impact. Documentation of the wreckage site was problematic, due to the amount of snow that had recently blanketed the area, as well as active snow conditions while on site. The fuselage was observed in many sections, with both wings separated from the fuselage. The empennage was observed with all flight controls attached. All flight control cables were accounted for at the accident site. There was no postcrash fire. Airplane and engine components observed in the initial debris path consisted of the engine's carburetor, the left-hand door post, the right wing tip, the nose landing gear strut, and the intake air box. Additional components identified about half way down the debris field included the nose landing gear wheel/tire, engine cowling (partial), magneto assembly, and part of an aileron. The last third of the debris field included the left side cabin door, a main landing gear wheel/tire, the ELT, fuel tank, and engine. The propeller was located about 135 ft west of the main wreckage site.

2.0 Follow-up examination notes

A follow-up examination of the airframe, engine and propeller was performed at the facilities of Air Transport, Phoenix, Arizona, on March 8, 2017.

2.0.1 Airframe examination notes

The following compilation airframe examination notes was the result of information gathered onsite by the NTSB and FAA representatives who responded to the accident site, as well as additional notes compiled as a result of the follow-up examination of the wreckage by the NTSB IIC, and a Senior Aviation Safety Investigator from Textron Aviation. The examinations revealed the following:

The Cessna 172H was a high-wing, 4-place, single-engine airplane, N3712F, serial number 17255207, manufactured in 1966. It was issued a standard FAA airworthiness certificate on October 1, 1966.

The cabin and cockpit areas were both destroyed and due to high energy impact forces during the accident sequence.

The left wing sustained impact damage throughout its span, with the outboard 4 ft having separated during the impact sequence. The separated wing was located about 25 ft east of the main wreckage. The wing strut remained attached to the wing but separated from the fuselage; was observed bent due to impact forces. The left flap was bent and twisted and remained attached to the wing's trailing edge at all attached points. The flap was observed in the UP/retracted position.

The left aileron was observed bent, twisted and remained attached to the trailing edge of the wing at all attach points. The respective fuel tank was destroyed by impact forces.

The left elevator remained attached to the left horizontal stabilizer at all attach points. The inboard trailing edge was bent up slightly, with the outboard section slightly wrinkled. No other damage noted. The leading edge of the left horizontal stabilizer was deformed through its span.

The right wing was substantially damaged due to the impact forces during the accident sequence; it remained attached to the fuselage by a small amount of metal skin. The top half of the wing strut remained attached to the wing, while the bottom half was separated from the fuselage attach point. The flap remained attached to the trailing edge of the wing at all attach points, with the inboard section observed bent down about 90°. The right aileron, which was bent, twisted and mangled, was observed separated from the wing's trailing edge. The right fuel tank cap was intact and tight to movement. The tank was breached, with leading edge impact damage and aft crushing.

The right elevator remained attached to the trailing edge of the respective horizontal stabilizer at all attach points, with minor damage observed. The right elevator trim tab remained attached to the hinge points of the right elevator at all attach points. The tab was observed in the neutral position and slightly damaged at mid-span. The right horizontal stabilizer's outboard 2 ft was crushed aft, with the top and bottom surfaces wrinkled; it remained attached to the aft fuselage.

The vertical stabilizer was observed to have separated in an upward motion from the aft fuselage. The lower 18 inches of the stabilizer was impact damaged, with the remainder of the top portion wrinkled.

The rudder remained attached to the vertical stabilizer at all attach points and sustained only minor damage.

Both the left and right main landing gear remained attached to the fuselage at all attach points. Both gear sustained impact damage during the accident sequence.

The nose landing gear and tire had separated from the airframe at the initial impact point and was located about one-third of the way down the linear debris field.

Aileron cables were observed attached to the right and left aileron bellcranks. The aileron cables and chains were observed intact, however, the chains were off their respective sprockets. The elevator cables were observed attached at the elevator aft bellcrank, at the elevator, and at the forward elevator bellcrank. The push-pull rod from the bottom of the control column to the forward elevator bellcrank was observed separated at both ends. However, the attaching hardware was observed in place. The rudder cables were observed attached to the rudder bellcrank and were observed attached to the rudder torque tubes. The rudder torque tubes were observed separated from the floorboard area. All flight control cables were observed with numerous tension overload type separations.

The flap actuator was observed extended approximately 1 inch, which would place the flaps approximately 4° down.

The left wing fuel tank was observed separated from the wing and breached. The right wing fuel tank remained inside the wing. The right fuel cap was observed installed. The left fuel cap was not observed. Air was passed through the fuel selector valve and the valve was in the both position the valve was functionally tested and functioned properly. The fuel selector handle was observed separated from the valve and was trapped in the BOTH position. On site documentation revealed that the left fuel gage was off scale high, and the right gauge was at just above one-half tank full.

Also observed and noted:

The onsite investigation by the NTSB IIC revealed that the engine was separated from the aircraft during the accident sequence. Several engine components were also separated from the engine during the accident, and the engine had significant amounts of mud impacted into the engine. Both magnetos were not recovered from the accident site. The vacuum pump was separated from the engine during the accident sequence and was not recovered. The mounting flange of the pump remained with the engine and was of the style which indicates that the pump should have been of the dry type. The carburetor bowl was removed, and hydraulic damage was noted to the brass floats. An FAA onsite inspector revealed that the oil temperature gauge indicated near the top of the green arc. Additionally, the airspeed indicated reading was about 186 knots, about 12 knots in excess of the rpm redline of 174 knots. The rpm indicator reading was just short of the redline maximum of 2,700 rpm.

One propeller blade exhibited extreme leading edge damage at the tip, accompanied by blade twisting. The second blade exhibited both leading and trailing edge damage. After the removal of the propeller spinner, it was noted that there were several locations where someone had drilled into the propeller hub. It was determined that none of these holes revealed cracking that could be observed. The locations of the holes were such that someone might have been stop drilling cracks in the forward propeller spinner bulkhead plate.

2.0.2 Engine examination notes

An examination of the engine and propeller was performed on March 8, 2017, at the facilities of Air Transport, Phoenix, Arizona. The results of the examination, according to the Continental Motor, Inc. field representative who performed the examination, revealed the following:

The engine was a Continental O-300-D model, serial number 34931 D-6-D. At the time of the accident the engine had accumulated a total time of 7,011.76 hours, time since major overhaul of 1,577.14 hours, and 38.37 hours since its most recent oil sump gasket, oil, and oil filter change.

A review of the maintenance records for the engine revealed that the engine underwent a major overhaul on February 15, 1999, at a tachometer time of 5,795.5 hours and an engine total time of 5,434.62 hours. On June 28, 2003, at a recorded time of 6,467.02 hours (unknown if that time represents tachometer or total time), the carburetor was removed for repair and reinstalled. On June 1, 2006, at a recorded time of 6,560 hours, the engine was disassembled, inspected and reassembled. The entry for that work did not indicate that it was an overhaul. On August 7, 2009, at a recorded time of 6,809.0 hours, the #4 and #5 cylinders were removed and replaced. On July 1, 2010, at a recorded time of 6,899.6 hours, a Slick Magneto Kit was installed. On August 10, 2011, at a recorded time of 6,981.0 hours, the #5 cylinder was overhauled. The last annual inspection took place on April 14, 2016, at a recorded tachometer time of 7,239.75 hours and a recorded engine total time of 6,878.87 hours. The last maintenance entry was dated October 8, 2016, at a tachometer time of 7,334.27 hours. The entry indicated that a new oil sump gasket was installed after troubleshooting an oil leak. The tachometer indicated 7,372.64 hours at the accident investigation examination.

The engine sustained significant impact damage that separated the oil pan and fractured the crankshaft aft of the propeller flange, the #5 cylinder head, and portions of the accessory case. Camshaft and crankshaft continuity were visually confirmed through the bottom of the crankcase. Borescope examination of the cylinders did not reveal any pre-accident anomalies. The magnetos were separated from the accessory end and were not recovered. Examination of the top sparkplugs revealed a normal worn out condition with no signs of lead or carbon fouling. The carburetor was separated from the induction system and was fractured at the mount. The throttle valve was not observed, and the mixture control lever was separated. Disassembly of the carburetor revealed that the venturi and nozzle were fractured. Corrosion was observed within the carburetor bowl and the metal floats were intact with hydraulic deformation noted. The inlet fitting was fractured and filled with mud. Dried mud was observed inside the inlet fuel screen. No pre-accident anomalies were noted with any of the observed engine and engine-related components.

The engine was lying upside down on an examination table. The propeller was separated from the crankshaft aft of the propeller flange and the fracture surfaces appeared jagged and irregular with blue/black discoloration in some areas. The oil sump was separated from the engine and not observed. View of the engine through the bottom side of the crankcase halves

revealed that the camshaft and lifters were intact and in place with no signs of pre-accident anomalies. The crankshaft could be seen as well as the connecting rods, which were intact. The crankshaft and camshaft gears were visible as the accessory section was fractured. The oil pump gears were also visible, and no pre-accident anomalies were noted. The #5 cylinder head was fractured, and the rockers were not observed. The remaining rocker covers were removed, and no pre-accident anomalies were noted with any of the rockers or valves springs.

The engine was righted, and the top sparkplugs were removed (with the exception of the #6 top sparkplug, which was separated). All of the top sparkplugs displayed a normal worn out condition with no signs of lead or carbon fouling. With the top sparkplugs removed, a borescope inspection of the cylinders was performed with no pre-accident anomalies noted with the pistons, cylinder barrels, valves or valve seats (it should be noted that the #5 cylinder's valves were offset from their valve seats, but that was attributed to the impact damage sustained by the cylinder).

The magnetos were separated from the accessory case and were not observed. Remnants of the ignition harness were attached to the sparkplugs.

The carburetor was separated from the engine and was located within a bag of recovered debris. The carburetor's throttle valve and lever were separated and not observed. Dirt and mud were packed within the carburetor inlet. The venturi and nozzle were fractured with the venturi lodged in the mud within the carburetor inlet. The carburetor was disassembled, and the metal floats were intact but sustained hydraulic deformation on the sides. The accelerator pump was in place. The carburetor bowl contained corrosion and debris. Dried mud impacted the fractured inlet fitting. Removal of the inlet fuel screen revealed dirt in the screen.

The intake system was fractured and only portions were observed. The two exhaust mufflers were separated from the engine and airframe and both sustained deformation damage.

The oil filter was attached to a remote oil filter adapter. The following information was written on the side of the oil filter: Date 11/8/16, Tach Time 7,334.2, Aircraft Registration N3712F. The oil filter was cut open and no metallic contamination or obstructions were noted.

The two-bladed McCauley propeller, part number 1C172 EM7651, serial number E8889, was separated from the crankshaft just aft of the propeller flange. The blades were twisted toward low pitch and both displayed leading edge gouges and chord-wise scrapes.