



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

April 11, 2018

SUMMARY OF AIRPLANE EXAMINATION

(WPR17FA105)

A. ACCIDENT

Location:	Sierraville, California
Date:	April 17, 2017
Aircraft:	Socata TB-20 Trinidad
NTSB Investigator-in-Charge	Thomas Little

B. EXAMINATION PARTICIPANTS

Thomas Little
Senior Air Safety Investigator
National Transportation Safety Board
Federal Way, Washington

Charles Geyer
Federal Aviation Administration
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Reno, Nevada

Troy Helgeson
Senior Air Safety Investigator
Lycoming Engines
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Field Representative
Daher
Pompono Beach, Florida

C. SUMMARY

On April 17, 2017, about 1600 Pacific daylight time, a Socata TB-20 Trinidad airplane, N28070, was destroyed following impact with remote mountainous terrain while about 16 nautical miles (nm) north of Truckee, California. The private pilot, the co-owner of the airplane, and one passenger were fatally injured. The personal 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. Instrument flight rules conditions prevailed at the time of the accident. The flight departed the Truckee-Tahoe Airport (TRK), Truckee, California about 20 minutes prior to the time of the accident, with the destination reported to be Petaluma Airport (O69), Petaluma, California.

When the airplane failed to arrive at O69, family members contacted local authorities. Search and rescue operations began on April 18, and suspended April 23. The airplane was subsequently located in remote mountainous terrain on May 17 and recovered from the accident site on May 18 to a secured salvage facility.

TRK airport operations personnel reported that about the time the airplane departed, lowering cloud bases were observed west of the airport, which would have been the direction of flight en route to O69. However, the pilot elected to depart to the north in an area where higher cloud bases existed.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site Examination

Examination of the accident site by a National Transportation Safety Board (NTSB) air safety investigator revealed that the airplane came to rest on the rising face of a mountain approximately 17 nautical miles north of Truckee-Tahoe Airport, Truckee, California. The initial impact point (IIP) was identified by a broken tree branch, right wing fragments, and a green position light. Several broken tree branches were located about 15 feet beyond the IIP around the base of an approximate 70-foot tall tree, which displayed a large impact scar. Fragments of airframe skin were embedded in the tree, which comprised the beginning of the main wreckage. Approximately 5-inch long striations were observed along the left side of large impact scar in 45-degree downward angle.

The wreckage debris path was oriented on a northerly heading. All major components of the airplane were accounted for at the accident site. The right wing spar along with portions of the right wing were found at the base of the scarred tree. The spar was broken outboard beyond the fuel tank sight gage and the wing flap was separated about midspan. Several additional pieces of wing skin were found beneath the right wing. Both the right and left ailerons were separated from their respective wings; the right aileron was co-located with the empennage and the left aileron was co-located with the left wing. The left wing was intact with the exception of its wingtip, which had separated from the airfoil and the left wing leading edge displayed aft crush damage. The left wing flap was intact and remained attached to the left wing. The wing spar was broken inboard and the left main landing gear was in the retracted position. The vertical stabilizer and rudder were found at the base of the scarred tree and the horizontal stabilizer was found a few feet beyond the vertical stabilizer.

The horizontal stabilizer was intact and attached to the tailcone and part of the aft fuselage. A small concaved depression was found about midspan on the leading edge of the right horizontal stabilizer. Both the rudder and lower vertical stabilizer had formed a concaved shape around the large impact scar; however, it was removed from the tree by first responders before the NTSB and FAA arrived. The upper vertical stabilizer separated from the spar but was co-located with the rest of the airfoil at the base of the scarred tree. The cabin, forward fuselage and engine compartment were beneath several feet of snow.

2.0 Follow-up examination notes

Follow-up examinations of the airframe, engine and propeller, which was overseen by representatives from the NTSB and the Federal Aviation Administration, was conducted at the facilities of Plain Parts, Pleasant Grove, California, on June 29, 2017. The results of the examinations revealed no mechanical anomalies that would have precluded normal operation.

2.0.1 Airframe examination notes

The following airframe examination notes were provided to the NTSB IIC by a Daher field representative, as a result of his postaccident examination of the airplane subsequent to its recovery to the salvage facility. The examination revealed the following:

The fuselage was observed fractured at numerous locations with no specific sections remaining attached together.

The nose LDG assembly, as well as engine mount were separated as a result of the impact sequence. Nevertheless, from frame 0 to frame 9 and including wings, all major components were recovered and accounted for.

Both wing spars were observed fractured at their mating points. All coupling components remain attached to the left spar. All securing hardware is present. Left wing flap remained attached to its respective wing, while the aileron was separated as a result of the impact sequence. Both flaps were confirmed in the UP position.

The left main landing gear assembly was observed to have remained attached to its respective wing and in the retracted position.

Right wing skin was observed peeled off from its respective spar. A portion of the right flap was observed to have remained attached to the wing. Aircraft is equipped with OEM full TKS system. The wings attachment points to fuselage were confirmed.

Despite postimpact damage, aileron continuity was established and confirmed to both wings.

Both pilot and copilot's seat belt locking mechanisms had separated from fuselage due to the impact sequence. The copilot's seat remained attached to the airframe by front brackets.

Both fuel caps were observed to have remained attached to their respective wings by a lanyard.

The left-hand and right-hand forward wing attaching hardware is present. Additionally, the left-hand and right-hand wing/fuselage attaching hardware was present.

The airplane's canopy was observed separated from fuselage. Both doors were accounted for and remained attached to center canopy frame.

All 4 door latching mechanisms remain in "locked "position. On canopy side, all locking hooks were observed fractured and separated from both doors due to the impact sequence forces.

Section from Frame 4 to Frame 7 is present but totally crushed.

While all rudder components were accounted for, rudder continuity could not be confirmed due the.

The vertical stabilizer was accounted for but was crushed due to the postimpact sequence.

All seat belts and safety belts were accounted for.

Both left and right control yokes were accounted for and remained attached to the T tree.

The side circuit breaker panel was too badly damaged for conclusive analysis.

The fuel selector was separated from its location in the cockpit but identified as being selected to the right tank position.

Luggage compartment door was separated from main structure but in the LOCKED position.

The elevator was observed separated from fuselage but remained as one component including the de-ice leading edge, both trim tabs, tail cone, tail light, counter weight. Both elevator trim tabs were observed to have remained attached to their respective connecting rods.

The ELT was recovered but was severely damaged during the impact sequence.

The engine instrument panel was accounted for, however individual instrument reading could not be interpreted due to postimpact damage.

The engine was located buried in deep snow at the base of the impacted tree. The propeller had remained attached to the engine.

The airplane was equipped with a 3-bladed propeller. All 3 blades were impact damaged and remained attached to their respective hubs. Two of the blades remained relative straight, while one blade was bent aft almost 90° due to impact damage incurred during the accident sequence.

2.0.2 Engine examination notes

The following engine examination notes were provided to the NTSB IIC by Lycoming Engines Senior Air Safety Investigator field representative, as a result of his postaccident examination subsequent to its recovery to the salvage facility. The investigator's examination revealed the following:

The aircraft was examined on 6/29/2017 at the facilities Plain Parts (Pleasant Grove, Ca.) The engine was hanging from a hoist. The engine had separated from the firewall during the accident.

The propeller and propeller flange were broken off from the crankshaft. One blade was bent aft about 90° and the other two blades were bent aft about 30°, all blades had leading edge gouging. The right-side exhaust was crushed aft, and the left side exhaust and intake was found separated from the engine. The #1-cylinder forward fins were crashed aft. Various pushrods were bent from impact damage.

The valve covers, accessories and top sparkplugs were removed for the examination. The sparkplugs appeared worn-out normal as compared to the Champion Aviation Check a Plug Chart AV-27. The cylinders were borescope inspected and no anomalies were noted. The crankshaft was rotated via the vacuum pump drive, and thumb compression was obtained at all cylinders. Engine drive train continuity was established throughout. The oil pickup screen was found free of debris. The dual magneto was found intact with hole punctured in the lower back side of the case. The magneto was rotated by hand and spark was observed from all leads. The fuel servo was found broken free from the sump. The brass plug was found tight and secure. The fuel inlet screen, fuel injectors, and fuel flow divider were all found free of debris. The throttle control rod was broken just aft of the rod end. And the mixture control arm was broken free from the servo. The engine driven fuel pump was found broken apart. The Vacuum pump was disassembled, and the rotor was found cracked with the veins intact. The drive splines were also found intact.

No evidence was found of a catastrophic in-flight engine failure.