

CEN19FA221

Airframe and Engine Examination Report

1. Onsite Examination

The National Transportation Safety Board (NTSB) investigator-in-charge (IIC), a Federal Aviation Administration (FAA) aviation safety inspector (ASI), and two air safety investigators (ASIs) from Textron Aviation responded to the accident site in Katy, Texas on 07/14/2019.

The airplane struck an approximately 60-foot-tall pine tree in a neighborhood and then impacted a parking lot in a nose-down, right-wing-low attitude before it slid into a small building (cinder block construction) that housed a chemical storage room and restrooms. Upon impact, an explosion occurred. The empennage, left wing, and part of the outboard right wing came to rest in the building. The fuselage, engine, and inboard right wing continued along the north side of the building and impacted a gazebo. The wreckage came to rest partially outside of the small building, on the deck of the pool, and inside of the pool. The portions that were submerged in the pool included part of the fuselage, the engine, and the inboard right wing.

The party members canvassed the surrounding neighborhood for airplane parts and additional damage. A home next to the community center, where the pine tree was struck, pine tree branches were found in the front yard of the home. No other damage was discovered.

Various parts of the wreckage sustained postimpact fire damage. The airplane was destroyed. Various property damaged occurred at the impact site. No ground injuries occurred.

Airframe (total time = 6,229.3 at the time of the accident)

The airframe data plate was not observed.

All structural components of the airframe were accounted for.

Most of the fuselage, both wings, and the empennage sustained multiple fractures from ground impact, along with fire damage from an explosion and postimpact fire.

The inboard section of the right wing, along with the flap was found in the pool. It was removed by community center maintenance personnel on 07/13/2019.

The elevator trim actuator was found in the near neutral position. The flap actuator was found in the fully retracted position.

All the flight control cables for the airframe were found separated with overstress signatures. Flight control continuity was established for the airframe.

Both fuel tanks were compromised from the impact, explosion, and postimpact fire. No fuel samples were recovered.

The cockpit was equipped with a Garmin G1000 system, with two large glass displays (PFD and MFD). The instrument panel was fractured into various pieces and was destroyed. The indications for the standby instruments were undetermined. The indications for the circuit breaker panel were undetermined.

The fuel tank selector handle was found between the both and right positions. The valve was verified to be in the both positions. The fuel strainer bowl (with a clean appearance) and screen were separated due to impact forces at the accident site. The right fuel cap was in place and was secured. The left fuel filler port was thermally damaged; the left fuel cap was not found.

Engine control cable continuity was destroyed from the impact forces.

Both seats in the front had a 3-point restraint system with airbags installed. The two airbags for the front seats did not activate. Both seats in the back had a 3-point system installed. Both seats in the front were intact and installed correctly. Seat 1, the pilot seat, remained securely pinned in the third hole aft.

The landing gear was a fixed configuration. The front nosewheel was found separated on the pool deck. One main wheel was recovered from the infant pool. The other main wheel was not observed.

The emergency locator transmitter was found but was incinerated from the postimpact fire. The make and model were not determined from the damage.

The ship battery and back-up avionics battery were found separated and laying on the pool deck.

Various personal flight paperwork/books were recovered that belonged to the pilot. No commercial or personal cargo was observed in the wreckage.

No mechanical malfunctions or failures were observed with the airframe.

Engine (engine times are unknown)

The engine was initially submerged in the pool, and then was then removed by community center maintenance personnel on 07/13/2019.

The engine data plate was observed on the engine sump case.

All components of the engine and engine accessories were accounted for based upon a visual inspection.

The engine was found attached to the engine mount system, which was attached to the impact separated forward portion of the airframe. No evidence of fire damage was observed on the engine crankcase or top engine cowling. The engine oil sump case was fractured and separated from the main case.

A fuel flow divider injection line (for the #1 cylinder) was found separated at a solder joint at the divider end fitting. All other injection lines were found intact.

Both magnetos were found attached. All spark plug leads were found connected. The alternator housing frame was found fractured with an adjustment bolt with the safety wire intact.

An examination of the engine and engine accessories was not performed at the accident site.
No mechanical malfunctions or failures were observed with the engine and engine components.

Propeller (propeller times are unknown)

All components of the propeller assembly were accounted for.

The two-blade metal propeller was found separated from the crankshaft. Both blades were found separated into various pieces from the ground impact. Two propeller impact marks were observed on the asphalt just prior to the small building that was impacted. Signs of powered rotation and forward bending were observed with the propeller.

Half of the propeller spinner was found attached to the propeller hub.

No mechanical malfunctions or failures were observed with the propeller assembly.

2. Postaccident Examination.

The wreckage was recovered to Air Salvage of Dallas in Lancaster, Texas. The NTSB IIC, a FAA ASI, and two ASIs from Textron Aviation and Lycoming Engines traveled to Lancaster, Texas on 12/03/2019 and 12/04/2019.

Airframe (total time = 6,229.3 at the time of the accident)

The airplane was a Cessna 172S. The serial number was 172S10915.

The initial airframe examination was conducted at the accident site in Katy, Texas.

The airframe wreckage was laid out to resemble the airplane.

Electronic wires, the two batteries onboard the airplane, the cockpit, and cabin areas were examined for the presence of preimpact smoke and or fire, and nothing was found.

The fuel control system was examined for continuity and no issues of concern were noted.

The two Garmin navigation cards were examined. One card was verified to be a navigation card and the other card was corrupted and was unable to verify its contents.

The two servos for the autopilot system were disassembled and examined. The servo for the trim system was rotated by hand. The servo for pitch axis was seized, could not be rotated, and the internal components sustained fire damage.

No mechanical malfunctions or failures were observed with the airframe.

Engine (engine times are unknown)

The engine was a Lycoming IO-360-L2A. The serial number was L-32101-51E.

The engine was initially submerged in the pool, and then was removed by community center maintenance personnel on 07/13/2019. The engine was preserved with a combination of WD-40 and transmission oil since it was submerged in a pool.

All components of the engine and engine accessories were accounted for.

The engine was found attached to the engine mount system, which was attached to the impact separated forward portion of the airframe. The engine was removed from the engine mount system to facilitate an examination.

No evidence of fire damage was observed on the engine crankcase or top engine cowling. The engine oil sump case was fractured and separated from the main case. The engine oil level was not able to be obtained.

Each cylinder was borescoped. Corrosion was observed inside each cylinder and on each piston.

Engine rotation was attempted by hand through the vacuum pump accessory drive and was not unsuccessful. Thumb compression was not performed, and rocker arm movement was not observed.

The left magneto did not produce spark at all leads. The left magneto was disassembled and found to contain corrosion and water. The right magneto did produce spark at all leads.

A fuel flow divider injection line (for the #1 cylinder) was found separated at a solder joint at the divider end fitting. The number #2 cylinder injection line was also fractured at the solder joint. All other injection lines were found intact. The fuel injector system (fuel servo, fuel manifold valve, fuel flow divider, throttle body, and fuel control unit) were disassembled and no issues of concern were found, except for one rubber diaphragm missing from the fuel servo.

No signs of a fuel leak or fuel stains were observed on the engine or engine components.

All spark plug leads were found connected. The top and bottom spark plugs were removed and examined. The top and bottom spark plugs were compared to the Champion Aerospace Aviation Check-A-Plug Chart (AV-27) and were found to have normal wear signatures along with corrosion, sediment, and deposits on them from impact damage and from submersion in the pool.

The oil filter was cut open to examine the internal oil filter element. No issues of concern were found in the internal oil filter element.

The engine-driven fuel pump was damaged and separated into two pieces. The lower portion was not disassembled due to the damage it sustained. All the drive components remained attached to the engine.

The alternator housing frame was found fractured with an adjustment bolt with the safety wire intact.

The vacuum pump was disassembled, and corrosion was found. The rotor and vanes were all intact.

No concerns were noted with the exhaust system and the exhaust gas path coloration.

No mechanical malfunctions or failures were observed with the engine and engine components.

Propeller (propeller times are unknown)

The propeller model was a McCauley TC P-857 PC3. The propeller serial number was AGF23030.

All components of the propeller assembly were accounted for. The propeller was a fixed-pitch model.

The two-blade metal propeller was found separated from the crankshaft. Both blades were found separated into various pieces from the ground impact. Signs of powered rotation and forward bending were observed with the propeller. Half of the propeller spinner was found attached to the propeller hub.

No mechanical malfunctions or failures were observed with the propeller assembly.