

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA173

N2038Y WRECKAGE AND EXAMINATION SUMMARY

May 1, 2023

A. ACCIDENT

Location: Big Bear, California
Date: May 1, 2023
Time: 1359 PDT
2059 UTC
Airplane: N2038Y -1978 Beech A36 Bonanza

B. N2038Y WRECKAGE AND EXAMINATION SUMMARY

IIC	Michael Hicks National Transportation Safety Board Seattle, Washington
Subject Matter Expert	Andrew Hall Textron Aviation Wichita, Kansas
L35 Airport Manager	Ryan Goss Big Bear City Airport Big Bear City, California

C. SUMMARY

On May 01, 2023, about 1359 Pacific daylight time, a Beech A36 Bonanza, N2038Y, was substantially damaged when it was involved in an accident near Big Bear City, California. The pilot and two passengers sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight.

Postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site

The airplane impacted the south side of a fenced in city owned facility yard and narrowly missed power line wires located just outside the western fence. The initial point of impact was identified by ground scars located at latitude: 34.2266689° longitude: -116.839562° and the ground elevation was 6,731 ft. The airplane impacted the ground in a nose down, right bank on a heading of 310° magnetic (see figure 1). The right wing struck the ground forming the initial point of impact, as confirmed by ground

scars that contained fragments of the green position light lens. The right wing created a ground scar that was about 45' long, and a subsequent ground scar was created by the nose of the airplane. The ground scars revealed a pivot point from the nose of the aircraft, followed by a cartwheel over to the left wing before the airplane came to rest in a near upright position.

The spinner created a pivot point for the airplane to cartwheel and the propeller hub was liberated from the engine crank case. The left wing subsequently struck the ground, and the airplane came to rest upright with the nose of the airplane oriented on a heading of 329° magnetic (see figure 2).



Figure 1: View of airplane from initial point of impact



Figure 2: View of airplane from nose to tail

2.0 Airframe Examination

2.1 Fuselage

The aircraft was equipped with a throw over pilot's control yoke, which was observed separated from the control column. Review of the first responder's photographs indicated the control yoke was in the left position. All the primary flight control cables were observed attached to their input devices in the cockpit area and were observed attached to their respective control surfaces. When the cables were moved in the cockpit area, movement near the control surfaces was detected. The elevator trim cables were also observed connected in the cockpit and were continuous to the trim tab actuators. The right flap was observed in the retracted position. Further investigation revealed the actuator was in the full extended position and damage was observed to the flap where the actuator attached.

During the rescue and recovery efforts for the occupants, the cabin overhead was separated from the forward fuselage at the windshield area and peeled back over the aft fuselage. The forward seats were observed removed from the aircraft.

2.2 Empennage

The empennage remained attached to the aft fuselage and minimal damage was sustained to the right side horizontal stabilator, elevator and trim tab. The left side horizontal stabilator, elevator and trim tab sustained impact damage which created an upward bow from the top of each surface control surface, that emanated from the outboard section to the fuselage (see figure 3). The aft left fuselage sustained impact damage identified by concave signatures resulting from horizontal stabilator and elevator ground impact (see figure 3). The vertical stabilizer sustained impact damage at its fuselage mating surface, and the rudder attachment points (see figure 4). The rudder revealed crushing signatures emanating from the top aft section which bent to the airfoil to the right, as indicated by the concave signatures at the top and midspan vertical stabilizer attachment points, when viewed from the right side (see figure 4).



Figure 3: View of empennage damage



Figure 4: View of damage to horizontal stabilizer and rudder

2.3 Wings and Landing Gear

Both wings sustained impact damage and were fracture separated from the remainder of the wing at the aileron bellcrank. The right aileron separated from the outboard wing section. The left aileron remained attached to the left outboard wing. The left wing tank was breached, but the right wing tank was not breached and contained about 25 gallons of fuel.

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The left flap was observed in the full extended position. The right flap was observed in the retracted position, however, further investigation revealed that the flap actuator was in the full extended position and damage was observed to the flap where the actuator attached.

The left main and nose landing gear were observed extended and the right main was observed collapsed. The control rod for the right main gear was observed with impact related damage near the main actuator. The actuator was observed in the landing gear extended position. The landing gear switch in the cockpit was observed in the gear extended position.

2.4 Cockpit

The ignition key was observed in the Both position. The alternator, avionics, beacon, strobe, and pitot heat switches were observed with impact damage. The master battery switch was observed with impact damage, however, was in the "ON" position. The right side attitude indicator showed an attitude of 10° nose low. The turn coordinator was observed with the ball pegged left. The heading indicator was observed at 290° and the heading bug indicated 355°. The vertical speed indicator showed a 2,000-fpm climb. The avionics sustained impact damage and frequency settings were undetermined. The Kollsman window altimeter setting was 29.92 inHg and the altimeter setting according to the L35 Automated Weather Observation System at the time of the accident was 29.84 inHg.

2.5 Survivability

First responders indicated that the lap belt position for both the pilot and co-pilot seat was used and were in the latched position. The shoulder harnesses were not observed attached to the lap belt portion of the seat belt. Both crew shoulder harnesses were observed worn. The third occupant was observed by rescue personnel in the No. 4 seat and was not utilizing the seat belt.

According to first responders the ELT was activated, and they switched it to the off position. The ELT was removed from the aircraft, the switch was in the off position and when moved to either the on or arm position, the red light adjacent to the switch illuminated. When the reset button was pushed, the ELT reset, and the light extinguished in the armed position.

2.6 Fuel/Fuel System

The right wing fuel tank was observed breached and first responders indicated there was evidence of fuel near the initial impact location, which the fire department sprayed foam over to eliminate the fire hazard. The left wing fuel tank was not breached and approximately 25 gallons of clean light blue fuel was extracted through the fuel drain on the bottom of the fuel selector valve. The fuel selector handle was observed in

the right position and the fuel valve was in the right position. Both locking fuel caps were opened during the investigation and the seals were in fair condition with no indications of fuel leakage. A fuel sample was taken at the fuel strainer, and no contaminants were observed in the sample. The boost pump switch was observed with impact damage.

3.0 Engine Examination

The airplane registration for the accident airplane indicated that it was equipped with a Continental IO-520 engine. However, the engine data plate was not attached to the engine case and did not appear that its absence was the result of impact damage. The letters PB were stamped into the engine case where the data plate should have been, along with several alpha numeric characters that were illegible. The engine logbook was not located in the wreckage.

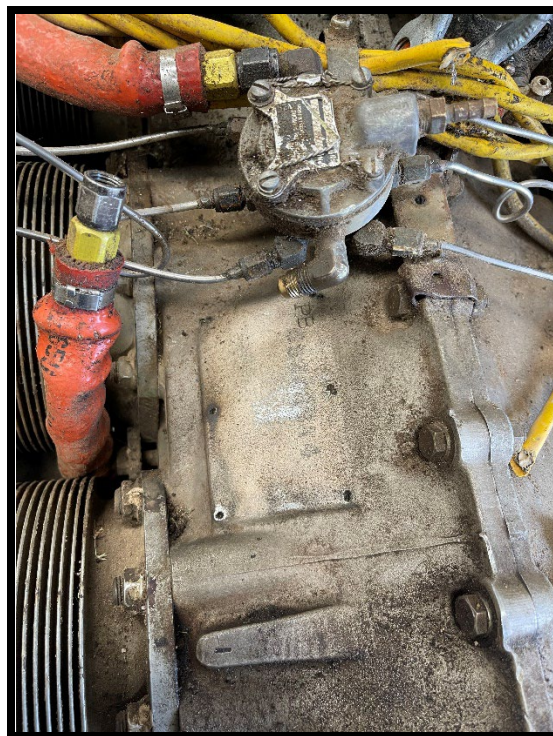


Figure 5: View of missing engine data plate

An initial overview of the accident engine indicated that the No. 5 cylinder sustained impact damage to the cooling fins, the spark plug, ignition wire, and the rocker cover had separated into multiple pieces. The intake rails on the bottom of the engine were crushed and impact damage was observed on the No. 1, 3, 5 and 6 cylinders. The exhaust pipes on both sides of the engine sustained impact damage and the baffles remained attached yet impact damaged. The alternator was liberated from the engine due to impact damage. The right magneto was liberated from the accessory case yet remained attached to the ignition harness. The left magneto attachment points were fractured, but the magneto remained attached to the accessory case, and the

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distributor housing remained attached to the magneto. The fuel manifold sustained impact damage as did the fuel injector lines. The propeller governor did not sustain impact damage. The engine oil sump remained intact, but the fuel servo was liberated. The starter was liberated from the crankcase.

The left and right magnetos were removed and separated from the ignition harness, rotated by hand, and both produced a shower of sparks. The engine was rotated using a socket wrench and an M16 drive was inserted into the left magneto housing drive. The top spark plugs were removed, presented normal operational signatures and appeared to be new. The No. 5 spark top plug was impact damaged and separated in half (see figure 6). The bottom spark plugs were removed from each of the cylinders and thumb compression was obtained, albeit the No. 5 (impact damaged) cylinder compression was low. The bottom spark plugs presented normal operational signatures and appeared to be relatively new (see figure 7).

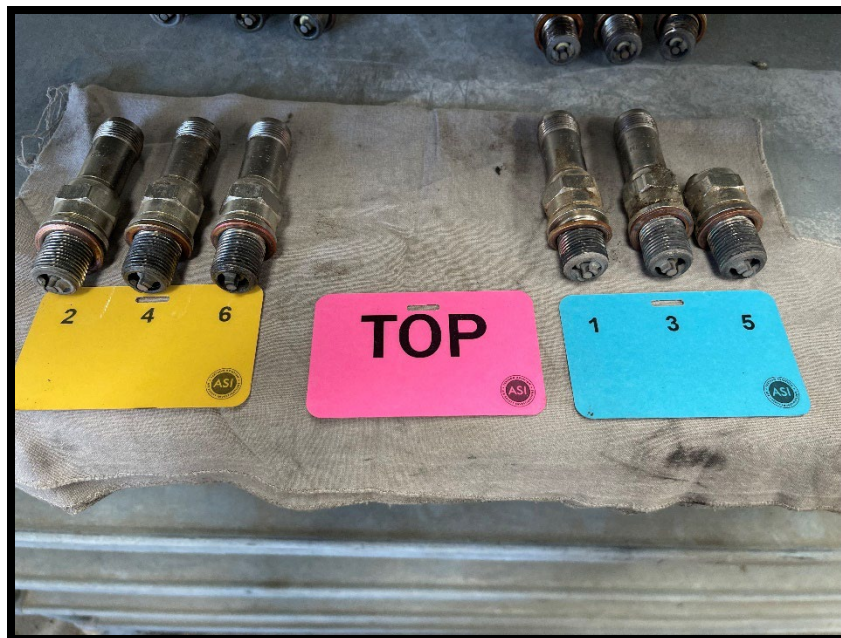


Figure 6: View of top spark plugs



Figure 7: View of bottom spark plugs

The fuel pump did not sustain impact damage, was removed and the drive coupling remained attached with normal operational signatures. The fuel servo sustained impact damage to the housing attachment mounts. The throttle cable remained attached and was cut to facilitate further examination. The throttle linkage remained intact and operated without impedance. The mixture cable sustained impact damage and was separated near the fire wall. The mixture linkage remained attached and operated without impedance. The filter screen was removed, remained intact, and trace amounts of debris were observed. The fuel manifold safety wire was removed, the manifold was opened, and the rubber seal was intact. The spring was present underneath the diaphragm, and the metallic shut off valve (pintle valve/plunger) remained attached and intact, as did the gold-colored filter screen with no indication of debris. The fuel lines and 90° elbows remained attached with no identifiable deformation. The injectors were removed from their respective cylinders and the No. 4 and 6 contained debris inside the injectors. The No. 5 injector was separated and found in two pieces due to impact damage sustained to the cylinder.

The oil filter remained attached to the oil filter adapter that was secure and attached to the accessory case. The date on the oil filter indicated March 03, 2021, with a tachometer time of 3,666.62 hours (see figure 8). The oil filter indicated that the aircraft registration number was N2038Y, the engine field was annotated with XC 20W50, which is the type of engine oil (see figure 8). The safety wire was removed, the filter was cut open and did not contain debris or visible contaminants. The oil appeared clean throughout the engine.

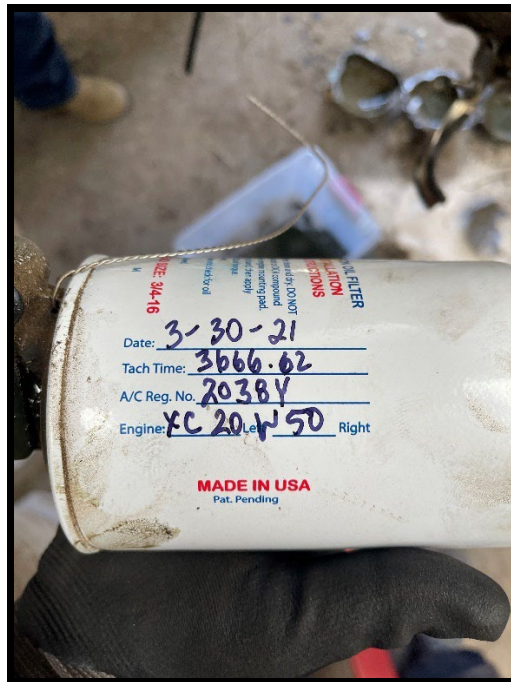


Figure 5: View of oil filter inscriptions

4.0 Propeller (see figure 9)

Model: 2A36C/23PCE6
 Serial Number: 67126F
 TCO: 880 PC3



Figure 6: View of propeller hub inscription

The propeller was observed separated from the engine about 1.5" aft of the propeller attachment flange (see figure 10). The spinner was observed deformed around the propeller hub with little rotational damage. The propeller blade marked "A" was observed in the No. 2 blade position of the hub, sustain rotational scoring along the length of the blade with leading-edge damage. The "A" blade was observed deformed towards the flat side, about mid-span. The propeller blade marked "B" was observed in the No. 1 blade position of the hub and was observed with rotational scoring and very little leading-edge damage. The blade was observed in a nearly straight condition.



Figure 7: View of propeller hub and blades

Submitted by:

Michael Hicks
Air Safety Investigator
Investigator-in-charge

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