



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Central Region

June 16, 2021

ON SCENE OBSERVATIONS

CEN21FA270

This document contains 24 embedded photos.

A. ACCIDENT

Location: Paragould, AR
Date: June 15, 2021
Aircraft: Air Tractor AT-502B, Registration N6088K, Serial #502B-0281
NTSB IIC: Samantha Link

B. EXAMINATION PARTICIPANTS:

Samantha Link
Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Johnny Victory
Aviation Safety Inspector
Federal Aviation Administration
Little Rock, Arkansas

Dakota Lowe
Aviation Safety Investigator
Air Tractor, Inc
Olney, Texas

C. SUMMARY

An on scene examination of the airframe and engine was conducted on June 16, 2021. No anomalies were noted during the examination.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site Overview

The airplane came to rest on the edge of a field along a heading of 220 degrees; the field was moderately hard and mostly dry. The airplane impacted the ground about a 45-degree angle and a post-crash fire ensued. The wreckage was mostly whole and contained to the immediate area. The ground around and underneath the wreckage was very wet and muddy consistent with firefighting efforts.

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1.1 Accident Site Photos



Figure 1: Front of Airplane



Figure 2: Forward Left side of Airplane



Figure 3: Aft Side of Airplane



Figure 4: Right Side of Airplane

2.0 Airframe Examination

- The nose of the airplane was embedded into the dirt about a 45-degree angle and only one propeller blade was visible.
- The hopper, forward fuselage, cockpit, inboard right and left wings, and the aft fuselage exhibited extensive thermal damage.
- The cabin area was completely destroyed by fire exposing the underlying airframe structure.
 - The instruments and instrument panel were not present.
 - A portion of the engine control quadrant was located.
 - The power cable and condition lever cable connectors were located. The hardware was still present and secured, but the cables were consumed by fire.
 - The frame of the pilot's seat was present and intact. The fabric was consumed by fire.
 - The seat belt and buckles were consumed by fire, but the connectors were present and positioned in a "T" configuration.
 - Which is consistent with the seatbelt being clasped.
- Both the left- and right-wing spars remained connected at the splice in the center of the fuselage.
- The spar came to rest in an about 45-degree angle relative to the ground.
 - The inboard portion of the left wing exhibited thermal damage and was mostly consumed by fire.
 - A large portion of the left flap was consumed by fire.
 - The fuel filler cap remained, and it was secured in its port.
 - The left main landing gear was fracture separated from its attachment point and it came to rest underneath the trailing edge of the wing.
 - The gear leg and wheel exhibited thermal damage.
- The leading edge of the outboard left-wing exhibited aft crush damage.
 - The skin on the wingtip exhibited a large upward bulge.
 - The aileron remained attached to most of its attachment points.
 - The lower wing skin exhibited extensive aft rippling.
- The aft fuselage exhibited extensive thermal damage up to the empennage.
 - The lower fuselage immediately below the forward portion of the vertical stabilizer was bent about 45-degree angle.
 - The left side horizontal impacted the side of the aft fuselage.
- The empennage was mostly intact.
 - The horizontal and vertical stabilizers were present and mostly intact.
 - The rudder and elevators remained attached and secured at their attachment points and moved freely when manipulated by hand.
 - The tip weights remained secured in place within the flight control surfaces.
 - A small puncture was noted on the lower left side of the rudder consistent with impact from the elevator.
 - The forward lower portion of the vertical stabilizer was pressed into the aft fuselage. It dented the fuselage at about a 45-degree angle.
 - The tailwheel remained attached.
- The inboard portion of the right wing exhibited thermal damage and was partially consumed by fire.
 - The flap was present, exhibited thermal damage, and remained mostly attached to the wing.
 - The filler cap remained secured in its port.

- The right main landing gear was fracture separated from its attachment point and it came to rest underneath the trailing edge of the wing.
 - The gear leg and wheel exhibited thermal damage.
- The outboard portion of the right wing remained whole.
 - The aileron was attached to its attachment points.
 - The leading edge was crushed aft.
 - 45-degree wrinkles in the upper wing skin.
 - The underside wing skin exhibited some wrinkling and thermal damage.
- The flight control system was extensively damaged.
 - The rudder controls were manipulated by hand from the rudder pedal assemblies to the rudder control horns.
 - The rudder cables were continuous to the forward cable attach plate.
 - The aluminum pedal adjustment channel was not located.
 - The pedal adjust hardware was found installed in the cable attach plate.
 - The pedal adjustment t-pin was visible in the left rudder pedal. The t-pin for the right pedal was not located.
 - The rudder-aileron interconnect cables were not located in the wreckage.
 - The hardware for the interconnect cables was not installed in the cable attach plate.
 - The elevator controls were continuous from the control stick to the forward idler. Then from the aft idler to the elevator control horns.
 - The area between the forward idler and the aft idler was not present consistent with thermal damage.
 - The crossbar, which connects the aft idler to the upper airframe, was fracture separated on the airframe side.
 - The aileron controls sustained thermal damage; however, it was able to be traced.
 - The left aileron control was continuous to the inboard rod end bearing.
 - The rod end bearing was found fragmented.
 - The inboard pushrod was found fractured from the fuselage mounted bellcrank consistent with thermal damage.
 - The outboard portion of the pushrod remained attached to the wing mounted bellcrank.
 - The aileron control was continuous from the wing mounted bellcrank to the aileron control horn.
 - The right aileron control was continuous to the aluminum wing mounted pushrod.
 - The pushrod remained secured to the inboard bellcrank, and the outboard portion of the pushrod was attached to the wing mounted bellcrank.
 - The aileron control was continuous from the wing mounted bellcrank to the aileron control horn.
 - The aileron drooping system was intact.
- The fuel system was consumed by fire.
 - The fuel control valve was located, and its internal components were destroyed.
 - The fuel control handle was present, but was fracture separated from the valve itself.

- Flap actuator was found and exhibited extensive thermal damage.
 - It was in the full extended position, but the motor was fracture separated.
- The spreader system:
 - The hopper was consumed by fire. Fiberglass residue was present ontop of the engine.
 - The wastegate was fracture separated from the system.
 - The spreader dispersing triangle was flattened in between the main landing gear, lower fuselage, and the ground.

2.1 Airframe Photos



Figure 5: Right Wing

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Figure 6: Underside of Right Wing



Figure 7: Left Wing



Figure 8: Underside of Left outboard wing.

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Figure 9: Bend in Empennage



Figure 10: Puncture on Lower Left side of Rudder



Figure 11: Crossbar for Elevator Control aft Idler.



Figure 12: Fuel Control Valve



Figure 13: Spreader

3.0 Engine Examination

- The engine was embedded into the ground and only one propeller blade was exposed.
- The engine was removed from an about 18-inch muddy hole and two of the blades remained attached at the hub.
 - The engine was heavily covered in fiberglass residue, dirt, and mud.
- The airplane's spinner was mostly fracture separated and fragments were found in the hole. A portion of the spinner was pushed aft past the propeller blades and pressed against the hub itself.
 - The propeller governor piston cylinder was mostly fracture separated from the hub.
- The airplane was equipped with three metal Hartzell propellers:
 - One blade was fracture separated from the engine near the blade root and found in the hole underneath the engine.
 - The fracture surface was consistent with overload.
 - The blade was bent slightly aft about midspan and curled aft on the outboard end. The blade tip was fracture separated.
 - The second blade was bent forward slightly outboard of the blade root. And the blade tip trailing edge was curled aft. The blade exhibited thermal damage throughout.
 - The third blade was bent forward near the blade root. The rest of the blade was flattened and exhibited some bending at the blade tip.

- Deformation and buckling was noted on the top and side of the reduction gearbox housing.
- The exhaust case sustained compressive damage, including angled consecutive folds consistent with impact damage.
- The exhaust tube on the right side of the engine was flattened and fracture separated from its port.
 - Many power turbine blade, vane ring, and shroud fragments were found loose within the port.
 - Several were removed and some were cleaned.
- The gas generator case sustained deformation and buckling.
- The engine housing was fracture separated exposing the axial compressor.
 - The first stage compressor rotor airfoils are bent in the opposite direction of rotation.
 - Environmental debris was noted inside of the compressor.

3.1 Engine Photos



Figure 14: Engine Embedded into the Ground

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Figure 15: Engine Hole



Figure 16: The Propeller Assembly and Front of Engine



Figure 17: Fractured Propeller Blade



Figure 18: Fractured Propeller Blade Fracture Surface



Figure 19: Power Turbine Blade Fragments removed from Exhaust.

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Figure 20: Fragments of Power Turbine Blades, Vane Ring, and Shroud.



Figure 21: Engine Exhaust Case



Figure 22: Deformation and Buckling on top of the Reduction Gear Housing.



Figure 23: Housing Fracture at the Axial Compressor.



Figure 24: The First Stage Compressor

END.

Submitted by: Samantha Link