

NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SUMMARY OF AIRCRAFT EXAMINATION

-- CEN19FA003 --

A. ACCIDENT

Location: Placedo, Texas
Date: October 12, 2018
Time: 1840 central daylight time
Aircraft: Air Tractor AT-502B (s/n 502B-0286), N6135P

B. PARTICIPANTS

Timothy Sorensen
Senior Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Kyle Schroeder
Project Engineer
Air Tractor Inc.
Olney, Texas

C. ACCIDENT SUMMARY

On October 12, 2018, at 1831 central daylight time, an Air Tractor AT-502B airplane, N6135P, impacted an antenna tower near Placedo, Texas. The pilot was fatally injured. The airplane was destroyed by impact forces and a postimpact fire. The airplane was registered to and operated by Coastal Flying Service Inc., Ganado, Texas, as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight. Visual meteorological conditions prevailed at the time of the accident. The flight was not operated on a flight plan. The local flight originated from the operator's private airstrip near Ganado, Texas, about 1730.

D. AIRCRAFT DESCRIPTION

Airframe

The Air Tractor AT-502B is a single-place, single-engine airplane, with a conventional (tailwheel) landing gear arrangement. The airplane was designed for agricultural operations. It is certificated as a restricted category airplane, with a maximum gross takeoff weight of 8,000 lbs. The airplane has a conventional flight control arrangement. The control surfaces are directly manipulated by the cockpit controls through push-pull tubes and cables.

Summary of Aircraft Examination

D. AIRCRAFT DESCRIPTION *(continued)*

Engine Assembly

The Pratt & Whitney Canada PT6A-34 turboprop engine is capable of producing 750 shaft horsepower (shp) at 2,200 rpm. The engine is a reverse flow, free turbine design, consisting of a four-stage axial compressor, a single-stage centrifugal compressor, an annular combustion chamber, a single-stage gas generator turbine, and a two-stage power turbine.

Propeller Assembly

The Hartzell HC-B4TN-3C/T10702NS propeller assembly is a four-blade, hydraulically actuated, constant speed design, with feathering and reverse pitch capability. The propeller blades are constructed of aluminum alloy. The hub is constructed of alloy steel.

E. DETAILS OF AIRCRAFT EXAMINATION

The on-scene examination was conducted on October 13, 2018. The airplane was relocated from the accident site by Allan's Wrecker Service, Victoria, Texas. A post-accident airplane examination was conducted on October 15, 2018.

All examinations were completed by or under the direct supervision of the NTSB investigator-in-charge. Air Tractor provided technical support as a party to the investigation.

F. DESCRIPTION OF ACCIDENT SITE

The accident site was located about 1-1/2 miles northeast of Placedo, on and adjacent to Farm-to-Market Road 616, a paved two-lane roadway. A ditch with tall grass ran along both sides of the road. A set of railroad tracks paralleled the north side of the road on the opposite side of the ditch; the tracks were offset about 100 ft from the road. The site was located about 700 feet west-southwest of the radio antenna tower. The accident site was located at approximate coordinates 28.7058° north latitude, 96.8045 west longitude.

The main wreckage consisted of the fuselage, wings, and empennage. The upper section of the antenna tower structure was intertwined with the right wing and located with the main wreckage. The fuselage nose section, including the firewall, and engine had separated and were located in the roadway ditch about 25 ft east of the main wreckage. The propeller had separated from the engine and came to rest in the ditch on the opposite side of the road about 125 ft west of the main wreckage. The outboard right wing and wing tip were separated and came to rest about 275 ft west of the antenna; this was about 425 ft east-northeast of the main wreckage. The right main wheel was located in an agricultural field about 330 feet southwest of the antenna; this was about 430 ft east of the main wreckage. Minor debris was located along the railroad tracks.

G. SUMMARY OF AIRCRAFT EXAMINATION¹

Airframe – Air Tractor AT-502B (s/n 502B-0286)

The fuselage nose section including the engine assembly was separated. The mid-fuselage section between the firewall and the cockpit, including the chemical hopper, was fragmented. The forward portion of the cockpit floor structure was separated and

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

Summary of Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

displaced upward approximately 12 inches into the cockpit. The remainder of the cockpit structure appeared intact. The lower fuselage area below the cockpit floor was damaged.

The cockpit and aft fuselage had sustained extensive thermal damage with the majority of non-steel components melted or consumed. The side and upper fuselage skin panels were consumed. The cockpit doors remained attached. The windshield frame was separated, and the windshield was fragmented.

The pilot seat frame remained secured to the airframe structure and appeared intact; however, the seat cushions and non-metallic components had been consumed by the fire. The four-point pilot restraints were found with the buckles properly fastened; the restraints exhibited thermal damage.² The cockpit instrument panel was separated and damaged. The positions of the flight and powerplant controls were considered unreliable due to the condition of the wreckage. The boom pressure gauge, hopper quantity gauge, altimeter, compass, and ITT gauge remained in the panel, but all other instruments were separated. The circuit breaker/switch panel was separated. The switch and breaker positions were considered to be unreliable due to the damage to the panel.

The wings had separated from the fuselage and were located adjacent to the fuselage at the accident site. The wing center splice was intact. The left wing was deformed over the entire span. The left wing root exhibited thermal damage consistent with the post-impact fire. The left aileron and wing flap remained attached to the wing. The right wing was separated at the root and fragmented. The main spar caps were separated from the spar webs consistent with overstress failures. Paint transfer that appeared to match the antenna tower was observed in multiple locations of the inboard wing structure. The right aileron and flap were separated and fragmented. The left and right wing fuel caps were properly installed and appeared intact. Both fuel tanks were compromised.

The vertical stabilizer remained attached to the aft fuselage. The rudder remained attached to the vertical stabilizer at the center and lower hinges; the upper hinge was separated. The upper half of the rudder was bent to the right.

The left horizontal stabilizer was separated at the root. The stabilizer spar and elevator torque tube separations appeared consistent with overstress. The v-strut remained attached to the stabilizer and the aft fuselage. The stabilizer was deformed and exhibited sooting near the root. The left elevator remained attached to the stabilizer. The outboard portion of the elevator (horn balance) was deflected downward approximately 90°. The elevator trim tab remained attached to the control surface.

The right horizontal stabilizer had separated from the fuselage and was located in the debris path. The inboard portion of the stabilizer spar was separated from the assembly and remained attached to the aft fuselage. The stabilizer was deformed. The right elevator had separated and was damaged. The elevator torque tube separated at the inboard end; the separation was consistent with overstress. The v-strut remained attached to the stabilizer; however, it was separated from the aft fuselage consistent with overstress.

² Inflatable restraints (airbags) were not installed.

Summary of Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

The left main landing gear and the tail wheel assembly remained attached to the airframe at the attach points. The right main landing gear was separated from the airframe. The right main wheel assembly was separated from the landing gear spring.³

The cockpit control stick remained attached to the mating torque tube assembly. The torque tube remained attached to the forward (pivot) housing assembly; however, it was dislocated from the aft pivot consistent with damage to the supporting airframe structure. The control stick and torque tube were damaged consistent with impact forces and the post-impact fire. The aileron control system was dislocated and damaged consistent with the airframe damage; however, the control linkage was continuous from the cockpit torque tube to the left and right wing roots. Separations of the left and right main aileron push rod assemblies appeared consistent with overstress failures. The left aileron control linkage was continuous from the wing root to the control surface. The right aileron control linkage was fragmented consistent with the overall wing impact damage. The right aileron bellcrank appeared intact, with the outboard portion of the main push tube and the bellcrank-to-aileron push rod assembly remaining attached.

The elevator forward push rod assembly was separated from the control stick at the lower pivot bolt; the bolt appeared to have failed in shear consistent with impact forces. The aft end of the push rod assembly remained attached to the forward idler assembly. The push rod and forward idler were damaged consistent with impact forces and the postimpact fire. The forward portion of the main elevator push rod assembly remained attached to the idler. The rod assembly was separated immediately aft of the idler consistent with impact forces. The aft portion of the main push rod remained attached to the aft fuselage idler assembly, and the elevator push rod weld assembly remained attached to the idler and the elevator torque tube control horn. However, the control horn had separated from the remaining portion of the torque tube assembly consistent with impact damage to the horizontal stabilizer assemblies.

The rudder pedals remained attached to the pedal mount assemblies; however, the supporting airframe structure was deformed consistent with impact forces. The rudder control cables remained attached to the left and right rudder pedal assemblies. The cables were continuous to the empennage and remained secured to the rudder horn assembly at the control surface.

The flap actuator was separated from the flap torque tube consistent with the deformation of the attachment arms. The actuator extension was about 0.8 inches; however, the actuator jackscrew turned freely by hand.⁴ The flap torque tube had separated near the airplane centerline and from the fuselage hinge point consistent with impact damage. The flap control linkage was continuous from the attachment arm to the left flap. The right flap linkage was fragmented consistent with the impact damage to the right wing. The flap torque tube attachment arms exhibited small cracks that appeared to be

³ The right landing gear spring was not present at the time of the examination. However, the right main wheel assembly was recovered from the accident site with the wreckage

⁴ According to a representative of the airframe manufacturer, the flap actuator extension corresponded to a 5° wing flap deflection. However, due to the separation of the actuator from the actuator arms and the handling during recovery of the wreckage, the extension of the actuator at the time of the wreckage exam may be unreliable.

Summary of Aircraft Examination

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(concluded)*

consistent with a known cracking issue in this area.⁵ The flap arms had not separated from the flap torque tube.

Engine – Pratt & Whitney Canada PT6A-34 (s/n PC-E 57022)

Propeller – Hartzell HC-B4TN-3C/T10702NS (s/n CDA5669)

The engine remained attached to the engine mount and the engine mount remained attached to the firewall. The engine reduction gearbox and propeller assembly were separated from the engine at the “A” Flange. The exposed planetary gears appeared intact. The remainder of the engine remained with the airframe. The left exhaust dust was deformed but remained attached; the right exhaust duct was separated consistent with impact. The engine exhaust case exhibited outward denting consistent with separation of turbine blades during operation.

The cockpit power lever quadrant assembly was damaged. No reliable pre-impact position of the controls could be determined. The condition and power lever control cables were separated near the control levers; the remaining portion of the cables was continuous to the engine. The propeller control cable was separated near the engine “A” flange; the remaining portion of the cable was continuous to the propeller governor.

The propeller assembly remained attached to the engine reduction gearbox, as noted. The spinner remained secured to the hub; it was damaged consistent with impact. The hub appeared to be intact. Two adjacent propeller blades remained attached to the hub; the remaining two had separated near the root. One separated blade was recovered with the wreckage; however, the outboard one-third of the blade span was separated from the inboard portion of the blade and not recovered. The fourth blade was not recovered. Two of the three recovered blades exhibited orange paint transfer.

⁵ Air Tractor Service Letter #347 and FAA Special Airworthiness Information Bulletin (SAIB) CE-16-27 were issued to alert owners and mechanics regarding this issue.