

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

SUMMARY OF ACCIDENT SITE AND AIRCRAFT EXAMINATIONS

-- CEN16LA244 --

A. ACCIDENT

Location: Stirum, North Dakota
Date: June 29, 2017
Time: 0740 central daylight time
Aircraft: Air Tractor AT-602 (s/n 602-1183), N4196Y

B. PARTICIPANTS

Brent Allen
Aviation Safety Inspector
Federal Aviation Administration
Fargo, North Dakota

Joanna Spiekermeier
Aviation Safety Inspector
Federal Aviation Administration
Fargo, North Dakota

Kyle Schroeder
Project Engineer
Air Tractor, Inc.
Olney, Texas

C. ACCIDENT SUMMARY

On June 29, 2017, about 0740 central daylight time, an Air Tractor AT602 airplane, N4196Y, was destroyed during an in-flight collision with terrain near Stirum, North Dakota. The pilot was fatally injured. The airplane was registered to and operated by Wilbur-Ellis Company as a 14 *Code of Federal Regulations* Part 137 aerial application flight. Instrument meteorological conditions prevailed in the vicinity of the accident site. The flight was not operated on a flight plan. The local flight originated from the Lisbon Municipal Airport (6L3), Lisbon, North Dakota, about 0700.

Summary of Accident Site and Aircraft Examinations

D. DETAILS OF EXAMINATIONS

The examination was conducted at the accident site on June 30, 2016. The FAA inspectors were assisted by a representative of the airframe manufacturer. The NTSB investigator did not travel to the accident site.

E. DESCRIPTION OF ACCIDENT SITE

The airplane impacted a soybean field about 14 miles west-southwest of 6L3. The elevation of the accident site was about 1,350 ft. No obstacles such as large trees, power lines, or transmission towers were located in the immediate vicinity of the accident site. The debris field was approximately 280 ft long by 170 ft wide, and oriented on a 056-degree magnetic bearing.

A ground impact crater about 10 feet wide by 20 feet long and 2 feet deep was located approximately 150 feet southwest of the main wreckage. A small circular ground depression and impact scar were located immediately adjacent to the impact crater, oriented in the direction of the debris path. The location and size of the depression and scar appeared consistent with being formed by the right main landing gear. A second shallow impact mark, about 30 feet long, was located adjacent to the impact crater. The right aileron counterweight was separated and embedded into the ground near the end of the impact mark. Ground marks consistent in appearance with propeller slashes were located near the impact point.

F. SUMMARY OF AIRCRAFT EXAMINATION¹

The main wreckage came to rest upright about 150 feet from the impact crater. The fuselage was oriented in a southwesterly direction. The fuselage nose section was fragmented. The engine cowlings and firewall were separated and located in the debris path. The cockpit and aft fuselage were deformed. The cockpit overturn structure was reportedly cut by first responders to facilitate recovery of the pilot. At the time of the examination, the cockpit doors were separated from the fuselage; they were located at the accident site. The pilot seat remained attached to the airframe; however, the seat rails were fractured immediately above the upper seat attachment points. A 5-point harness with inflatable shoulder-harness restraints was installed; the shoulder-harness airbags had deployed.

Both wings had separated from the fuselage. The outboard portion of the left wing appeared intact; the left aileron remained attached to the wing. The inboard portion of the left wing leading edge separated and fragmented. The wing spar was partially separated from the inboard wing; it remained attached as part of the intact outboard wing section. The right wing was fragmented and completely separated from the spar. Fragments of the right-wing structure were located in the debris path. The right aileron was separated and located in the debris path. The wing spar was continuous; although, separated and deformed. The center splice connection appeared intact.

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

Summary of Accident Site and Aircraft Examinations

F. SUMMARY OF AIRCRAFT EXAMINATION *(concluded)*

The vertical stabilizer and rudder remained attached to the fuselage and the stabilizer, respectively. The left horizontal stabilizer was partially separated from the fuselage and deformed. The right horizontal stabilizer was dislocated from its normal position. The elevators remained attached to the stabilizers. The trim tabs remained attached to the elevators. A portion of the right elevator tip was separated; it was located in the debris path.

The left main landing gear spring remained attached to a segment of the fuselage structure common to the firewall. The wheel and brake assemblies separated from the spring; they were located about 400 feet north of the initial impact. The right main landing gear spring remained attached to a portion of the fuselage structure; it was located immediately adjacent to the fuselage. The tailwheel remained attached to the fuselage. It appeared to be intact and undamaged.

Aileron control continuity was confirmed from the cockpit control stick to the lower fuselage bellcranks. The left aileron pushrod was separated at the wing root consistent with separation of the wing. The right aileron pushrod was fragmented consistent with the damage to the wing. All fracture surfaces appeared consistent with overstress failures. Elevator control continuity was confirmed from the cockpit control stick to the aft control idler. The pushrod from the aft idler to the elevator horns was in place; however, it was deformed, and the forward rod end was fractured consistent with an overstress failure. The rudder control cables remained attached to each cockpit rudder pedal and to the rudder horns. However, the left cable was separated at a point in the aft fuselage. The elevator and rudder trim remained continuous from the corresponding cockpit controls to the trim tabs.

The flap actuator had separated consistent with an overstress failure. The actuator extension was about one-inch. According to the airframe manufacturer, this corresponded to an approximate 7-degree flap deflection. The flap system, including the flap-aileron droop control linkage, was fragmented. All separations appeared to be consistent with overstress failures.

The engine and propeller had separated from the airframe and were located within the debris path. Two propeller blades had separated from the propeller hub. The separated blades were located at the impact crater. The propeller hub remained attached to the reduction gearbox; however, the gearbox had separated from the engine at the A-flange. The engine itself appeared intact; although, the individual accessory components had separated from the engine.

The recording hour (Hobbs) meter indicated 4,278.4 hours. The altimeter was set to 29.46 inHg.