



Air Tractor, Inc.
Accident Investigation

Airframe Report

NTSB Accident Number:

CEN19LA295

Date & Location of Accident:

8/29/19
Olney, TX

NTSB REQUESTED CONFIDENTIAL:

The information contained in this report is produced for the sole purpose of providing observations and information to the NTSB and/or FAA during an active accident investigation. No entity may release or share this information prior to its inclusion in the NTSB's public docket without the express written consent of Air Tractor, Inc.

PREPARED BY:

Dakota Lowe
Air Tractor, Inc.

FACTUAL INFORMATION

AIRCRAFT:

AT-502A manufactured in 2019
502A-3210
N8517Q

DATE & TIME:

08/29/19
~11:00 am local (CDT)

INJURIES:

Minor

LOCATION:

Olney Municipal Airport
N 33.345833° W 98.810277° (Approx.
Crash site)

PILOT:

Logan Lane (28)
[REDACTED]
Richmond, TX 77406

OPERATOR:

Lane Aviation
[REDACTED]
Rosenberg, TX 77471
[REDACTED]

NTSB INVESTIGATOR:

Andrew Todd Fox
NTSB – Central Region
[REDACTED]
Denver, CO 80239
[REDACTED]

INSURANCE:

G&R Aeronautic Engineering
[REDACTED]
Brazil
[REDACTED]

FAA INVESTIGATOR:

Corey Wehmeyer – Lubbock FSDO

SALVAGE:

Not Recorded

OTHER CONTACTS:

Harry Reichel
NTSB – Office of Aviation Safety
[REDACTED]
SW, Washington D.C. 20594
[REDACTED]
Robert Salyers – Pratt & Whitney
[REDACTED]
Jean-Marc Limoges – Pratt & Whitney
[REDACTED]

OTHER CONTACTS:

Les Doud – Hartzell
[REDACTED]
Jeremy Katt - Parker
[REDACTED]
Doug Beyer – Ontic
[REDACTED]
Dennis Nobile – Sun Air Parts
[REDACTED]
Jim Rosplock – Woodward
[REDACTED]



Example of AT-502 in Flight

The information contained in this report is the result of traveling to the accident scene on 8/29/2019 to document the initial condition of the wreckage and on 8/30/2019 under the supervision of FAA Investigator Corey Wehmeyer for the on-scene investigation. Also present during the on-scene investigation were Robert Salyers of Pratt and Whitney, and Mike Rhodes and Joe Hughes of Air Tractor.

This report also contains information that is the result of a series of examinations following the on-scene investigation including a review of the wreckage under supervision of FAA Investigator Corey Wehmeyer on 9/10/19, and various examinations of the wreckage and components under the supervision of NTSB Powerplant group chair Harald Reichel. The examinations that occurred under the supervision of NTSB Powerplant group chair Harald Reichel are summarized in the *List of Examinations* section at the end of this report.

This report is subject to revision as additional information becomes available. The intent of this report is to provide details relating to the investigation of the subject accident. This report is not to be shared with any person outside the scope of this official investigation.

GENERAL OBSERVATIONS OF WRECKAGE AND ACCIDENT SITE:

Arrival at the accident site was approximately 2:00 pm on 8/29/19. The aircraft wreckage was found in a pasture approximately 850 ft southeast of runway 31. The pasture contained a few scattered trees. A ditch oriented generally east to west, separated the southern 1/3 of the of the pasture from the north.

Debris and ground scarring at the scene indicated that the aircraft impacted the ground on an northeast heading, impacted a tree with the left wing, and crossed the ditch before coming to rest upright on the north side of the ditch, oriented on an western heading.



Overview of Wreckage (Looking Northeast)

The airplane was confirmed to be N8517Q, an Air Tractor AT-502A, serial number 502A-3210 which was manufactured in 2019. The Hobbs meter was found showing 1.0 hours at the time of the accident.

FUSELAGE:

The fuselage was found upright with the aft fuselage completely separated. The engine and engine mount remained attached to the fuselage and were found bent upward. The aircraft was equipped with airbags which were found deployed. Each of the restraints were found intact, unbuckled.



Fuselage Wreckage (Looking Northwest)

The preimpact position of the powerplant control levers could not be determined due to impact forces during the accident. The condition control lever could not be manipulated. The outer linkage sleeve on the engine side of the cable was found separated at the swivel forward of the support bracket. The cable was open to the outer spiral wrapping of the push pull cable. The

power control lever could not be manipulated. The power control cable was found with damage to the outer plastic coating approximately 3 inches aft of the cable support on the engine side of the cable. The propeller control lever was found to move freely, and the engine end of the cable found to move sympathetically with manipulation of the propeller control lever. The propeller pushrod forward of the propeller control cable was found with multiple bends.

LANDING GEAR:

The right main landing gear was found bent aft, attached to the fuselage attach points. The left main tire/wheel was found separated from the main gear spring which remained attached to the fuselage attach points.

The tail gear was found attached at the aft fuselage, with the gear spring bent forward.

WINGS:

The outboard portion of the left wing was separated from the wing and found near a tree that had marks consistent with impact. The left flap remained attached to the wing. The left aileron was found separated from the wing near the wreckage.



Left Wing Wreckage

The right wing was found intact with outboard portion of the wing crushed inboard. The right flap and aileron were found in place on the wing.

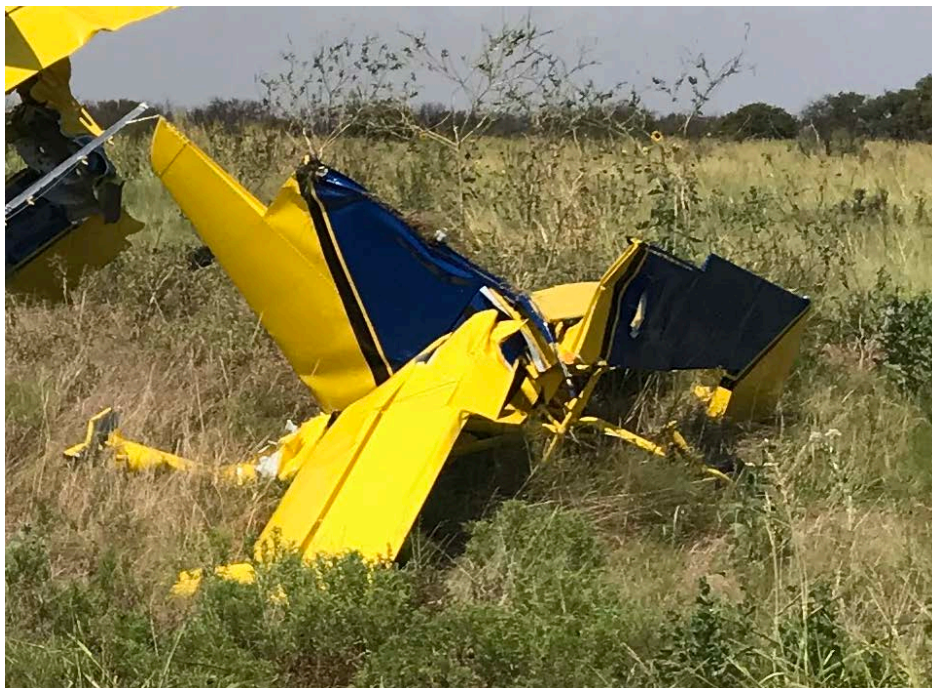


Right Wing Wreckage

Each of the wings were equipped to hold 443 liters (117 gallons) of fuel in the integral wing fuel tanks for a total of 886 liters (234 gallons).

EMPENNAGE:

The empennage was found attached to the aft fuselage with significant crush damage.



Empennage Wreckage

FLIGHT CONTROLS:

All flight control surfaces remained with the main wreckage other than the left aileron which was found near the fuselage wreckage. The flight controls were damaged, but flight control continuity was established to the extent possible by the condition of the wreckage. The pilot did not report any issues with the control system prior to the accident.

Elevator Controls

The elevator controls are manually operated by steel and aluminum pushrods connecting the control stick to the elevator control horns through two control idlers. The controls were found to be continuous from the control stick to the main aluminum pushrod. The main aluminum pushrod was found fractured consistent with bending overstress. The aft portion of the pushrod was found attached to the aft idler, which was found separated from the fuselage. The rod end of the aft steel pushrod was found separated from the pushrod, attached to the aft idler.

Rudder Controls

The rudder controls are manually operated by a pair of stainless-steel cables running directly

from the rudder pedal assemblies to the rudder control horn. Both rudder cables remained attached at the rudder control horn and at the rudder pedals. The left rudder cable was found with a horse tail separation consistent with tensile overstress. The right rudder cable was found to be continuous.

Aileron Controls

The aileron controls are manually operated by steel and aluminum pushrods connecting the control stick to the aileron control horns through a torquetube and multiple bellcranks and idlers. In addition, the AT-502 ailerons incorporate a drooping feature that lowers both ailerons in conjunction with extension of the flaps. The aileron drooping controls are documented below under "Flap System".

The primary aileron controls were shown to be continuous from the control stick to the right aileron by sympathetic movement of the control stick when the aileron was moved. The left aileron controls were continuous from the control stick to the wing mounted aluminum pushrod. The condition of the wing mounted aluminum pushrod could not be determined due to damage to the wing and fuselage. Both wing mounted aluminum pushrod rod ends were found in their proper location. The left wing mounted bellcrank was found properly installed. The left short wing mounted pushrod was found separated aft of the forward rod end. The aft section of the pushrod was found attached to the aileron.

Flap System

The flap actuator was found fully retracted. The flap control system was found to be continuous. The upper steel ear on the left side of the flap torque tube was found to have separated from the torque tube consistent with overstress.



Left End of Flap Torque Tube

The aileron drooping system was found continuous with multiple bends throughout the system.

POWERPLANT:

The powerplant remained attached to the fuselage. The reduction gearbox case was found cracked and the engine case was bent upward in multiple locations. The engine was confirmed to be a Pratt & Whitney PT6A-140AG engine, serial number PCE-VB0070.

The engine was equipped with four-bladed constant speed, fully reversable, propeller. The propeller was found separated from the engine at the propeller flange.



Propeller Wreckage

FUEL SYSTEM:

The fuselage fuel filter was removed, and the fuel was drained into a clean can. The fuel removed from the housing was found to completely fill the housing without the filter element installed. The filter element was found free of any substantial blockage. The fuel drained from the fuel filter housing was found to contain small dark grey particles. Samples of the fuel containing the particles were retained but, at the time of writing this report, were not analyzed.



Airframe Fuel Filter Housing (Without Filter Element)



Airframe Fuel Filter Element



Fuel from Airframe Fuel Filter (Containing Particles)

The finger strainers at the wing fuel tank outlets were removed and found without any substantial blockage.



Left Fuel Tank Finger Strainer



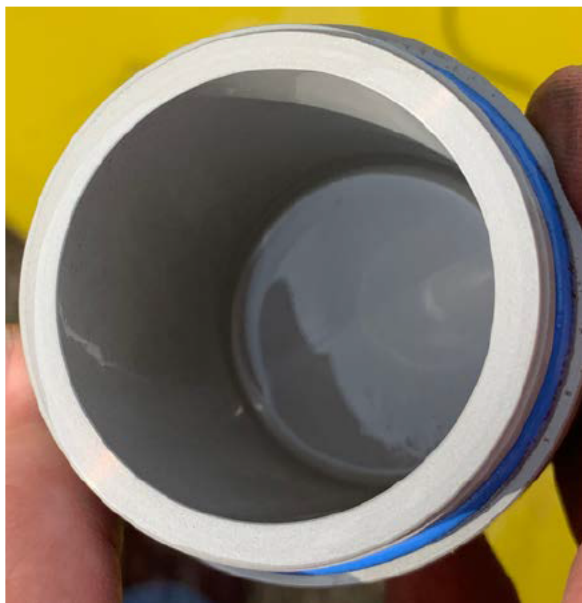
Right Fuel Tank Finger Strainer

The hose was removed from the header tank outlet and air was blown through the system. Air was found to flow from the hose inlet to the airframe fuel filter housing inlet.

The fuel valve handle was determined to be appropriately aligned with the fuel valve.

The fuel tank vent lines were found bent and fragmented. The lines were determined, to the extent possible, to be free from any blockage.

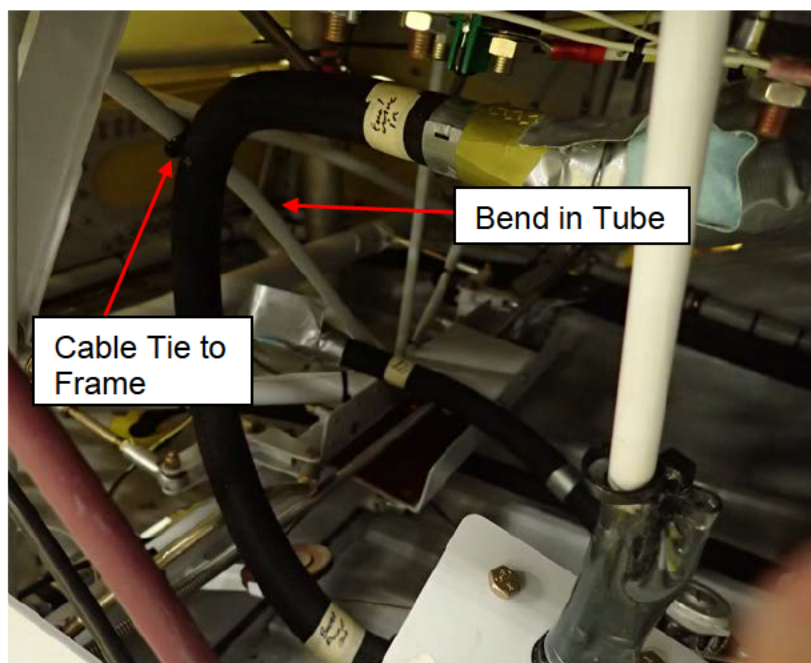
The FCU filter bowl was removed and found wetted, with less than a teaspoon of fuel remaining. The FCU filter was found without any noticeable blockage.



FCU Bowl

The airframe fuel filter outlet hose was removed from the fuel filter housing. When air pressure was applied to the inlet of the hose, fuel exited the outlet of the low-pressure fuel pump of which the hose had been removed.

The airframe fuel hoses were removed from the airplane and internally inspected using a borescope. A tear was found on the inside of the hose that connected the boost pump to the fuel selector valve. The tear was approximately 20 inches from the boost pump end of the hose which is the approximate location where the hose is attached to the frame with cable ties. The frame tube that the hose was attached to was found with an upward bend. The hose was sent to Parker Hannifin Corp. for further review.



Hose Secured to Fuselage Frame



**Tear in Boost Pump to Fuel Selector
Valve Hose**

The hose was examined by FAA Aviation Safety Inspector Darryl Shaw, Parker Air Safety Officer Jeremy Katt, and Parker Product Engineering Manager Shadrach Nanney at Parker Stratoflex in Fort Worth on February 5, 2020. Per the examination report provided by Parker Hannifin Corp., the tear in the hose was most likely caused by a sharp sudden bend that exceeded the bend radius of the hose. The tear, being primarily on one side of the hose, was reportedly consistent with a sharp sudden kink in that location.

The mechanical low-pressure fuel pump was removed from the accessory gearbox and sent to Ontic for further examination. The mechanical low-pressure fuel pump examination took place February 18, 2020. Testing of the pump did not reveal any pre-existing damage that would have prevented normal operation. The pump was disassembled after testing was completed. Some minor scoring was found on the outer rotor endplate. Detailed field notes of the examination were provided by NTSB Powerplant Group Chairman Harald Reichel.

The electric boost pump was removed from the airplane and sent to Sun Air Parts for further examination. The boost pump examination took place February 19, 2020. Testing of the boost pump did not reveal any pre-existing damage that would have prevented normal operation. The pump was disassembled after the testing was completed. No noticeable damage was found on the internal components of the pump. Detailed field notes of the examination were provided by NTSB Powerplant Group Chairman Harald Reichel.

The propeller governor, high pressure (FCU) fuel pump, FCU, and fuel heater were removed from the engine and sent to Pratt and Whitney Canada for further examination. The high pressure fuel pump, FCU, and fuel heater were tested to the extent possible by the condition of each component. The propeller governor was damaged so that it could not be tested. Testing of the components did not reveal any pre-existing conditions that would have prevented normal operation. After testing, each component was disassembled. No noticeable damage was found that would have prevented normal operation. Minor debris was found in the high pressure fuel pump and FCU inlet screens. Light scoring, that could be felt with a fingernail, was noted on the on the gear journal and bushing of the high pressure fuel pump. Detailed field notes of the examination were provided by NTSB Powerplant Group Chair Harald Reichel.

The propeller beta rods and bushings were removed and examined at Air Tractor Inc. on 4/22/2020. Examination of the phenolic bushings and beta rods revealed that the bushing internal diameters were larger than the beta rod outer diameters. The examination also revealed that 7 of the 8 bushing internal diameters were below Hartzell's specification. Detailed notes of the examination were provided by Les Doud of Hartzell Propeller.

DISTURBANCE OF WRECKAGE:

Our disturbance of the wreckage was limited to handling components to the extent necessary for identification and documenting their condition, including removing inspection covers/access panels. We did not make any modification to the aircraft wreckage that would intentionally result in loss of evidence.

With approval from IIC Todd Fox, the wreckage was moved from the accident scene to an Air Tractor, Inc. hanger.

List of Examinations:

Several components were given detailed examinations through the course of the investigation. A list of the components and the details of the examination is below.

- Engine
 - o Date :11/6/2019-11/8/2019
 - o Location: Air Tractor, Olney, TX
 - o Field Notes:Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Dakota Lowe (Air Tractor)
- Propeller
 - o Date: 11/8/2019
 - o Location: Air Tractor, Olney, TX
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Les Doud (Hartzel), Dakota Lowe (Air Tractor)
- Boost Pump to Fuel Valve Hose,
 - o Date: 02/05/2020
 - o Location: Parker Stratoflex, Ft. Worth, TX
 - o Field Notes: Parker Hannifin Corp.
 - o Attendees: Darryl Shaw (FAA), Jeremy Katt (Parker), Shadrach Nanney (Parker)
- Low Pressure Mechanical Fuel Pump
 - o Date: 2/18/2020
 - o Location: Ontic Engineering and Manufacturing, Chatsworth, CA
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Doug Beyer (Ontic), Dakota Lowe (Air Tractor)
- Electric Fuel Boost Pump
 - o Date: 2/19/2020
 - o Location: Sun Air Parts, Valencia, CA
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Dennis Nobile (Sun Air Parts), Dakota Lowe (Air Tractor)

- Propeller Governor
 - o Date: 03/04/2020 to 03/05/2020
 - o Location: Pratt And Whitney Canada, Saint-Hubert QC
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Jean-Marc Limoges (Pratt and Whitney Canada), Jim Rosplock (Woodward), Dakota Lowe (Air Tractor)
- High Pressure (FCU) Fuel Pump
 - o Date: 03/04/2020 to 03/05/2020
 - o Location: Pratt And Whitney Canada, Saint-Hubert QC
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Jean-Marc Limoges (Pratt and Whitney Canada), Jim Rosplock (Woodward), Dakota Lowe (Air Tractor)
- Fuel Control Unit (FCU)
 - o Date: 03/04/2020 to 03/05/2020
 - o Location: Pratt And Whitney Canada, Saint-Hubert QC
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Jean-Marc Limoges (Pratt and Whitney Canada), Jim Rosplock (Woodward), Dakota Lowe (Air Tractor)
- Fuel Heater
 - o Date: 03/04/2020 to 03/05/2020
 - o Location: Pratt And Whitney Canada, Saint-Hubert QC
 - o Field Notes: Harald Reichel (NTSB Powerplant Group Chair)
 - o Attendees: Harald Reichel (NTSB), Jean-Marc Limoges (Pratt and Whitney Canada), Jim Rosplock (Woodward), Dakota Lowe (Air Tractor)
- Propeller Beta Rods and Bushings
 - o Date: 4/22/2020
 - o Location: Air Tractor, Olney, TX
 - o Field Notes: Les Doud (Hartzell)
 - o Attendees: Corey Wehmeyer (FAA), Les Doud (Hartzell), Kyle Schroeder (Air Tractor), Dakota Lowe (Air Tractor)