

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24FA238

AIRFRAME AND ENGINE EXAM

August 20-21, 2024

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A. ACCIDENT

Location: Helena, Montana
Date: July 10, 2024
Time: 1210 mountain day light time
Airplane: Air Tractor Inc. AT-802A, N10122

B. AIRFRAME AND ENGINE EXAM

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Party Member	Martin Holte Wipaire, Inc South Saint Paul, Minnesota

C. SUMMARY

Airframe and engine exam was conducted on August 20 and 21, 2024, at the facilities of Inter-State Aviation, Pullman, Washington. Postaccident examination of the airframe found no mechanical anomalies that would have precluded normal operation. The group decided to further examine the Wipaire floats, Hartzell propeller assembly, and various avionics.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination



Figure 1. Side View of Fuselage



Figure 2. Side View of Tail

Flight control continuity was established. The outboard portion of the left aileron and its counterweight were not recovered with the wreckage, and the assembly is believed to be at the bottom of the lake.

Left wing aileron steel pushrod was observed separated, consistent with over stress due to impact forces.

The extension of the flap actuator measured approximately 3 and 5/8 inches, which corresponds to flaps fully extended.

The fuel control unit manual override lever was found in the up and locked position, with the safety pin installed.

The emergency dump was observed in the up and stowed position and was latched. When manually moved, it functioned normally with no binding.

The instrument panel was displaced forward and the hydraulic PUMP 1 and hydraulic PUMP 2 circuit breakers were observed tripped and displaced forward.



Figure 3. View of Instrument Panel (Photo courtesy of Air Tractor)

The warning/caution lights were removed from the instrument panel. Initial examination revealed no filament stretch. The bulbs are being sent back to the NTSB materials laboratory for further examination.

The left rudder pedal had separated from the fuselage attach location. The right rudder pedal remained secure at the fuselage attach location.

The pedal adjustment pin at the rudder adjustment channel for both rudder pedals was set to the most aft position and both pins were installed in the pedals through the rudder pedal attachment channels. There were no witness marks on either rudder pedal.



Figure 4. Rudder Pedal Assembly



Figure 5. Left View Rudder Pedal adjustment channel



Figure 6. Left View Rudder Pedal adjustment channel

The control stick remained secure to the torque tube and the torque tube remained attached to the frame. Impact damage was observed on the torque tube forward of the control stick socket.



Figure 7. Control Stick Torque Tube (Photo Courtesy of Air Tractor)

The control stick grip has a Wipaire installed trigger assembly that remained attached to the control stick. The trigger assembly has red button to activate the "scoop down" function and the black button to activate the "fire gate" for the hopper. The trigger assembly was displaced aft into the control stick grip.

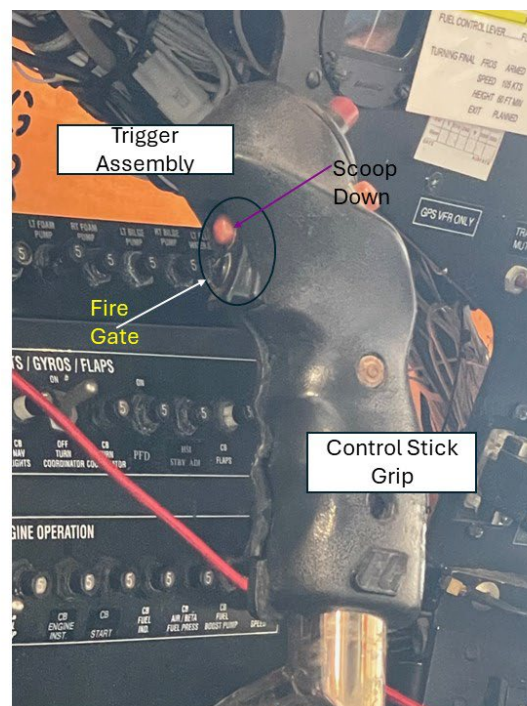


Figure 8. Control Stick Grip Trigger Assembly (Photo Courtesy of Wipaire)

It's likely that the displacement and damage to the instrument panel, and the control stick grip were because of the impact sequence.

Restraint System

A 5-point harness restraint system was installed on the accident airplane and equipped with an AmSafe seatbelt airbag. The AmSafe airbags were deployed. The harness attach connections were unlatched and the webbing was not cut.

2.0 Other Systems

FLOATS

Float Manufacturer: Wipaire, Inc

Float Model: 10,000

Right Float Serial Number: 10124

Left Float Serial Number: 10123

The right float remained relatively intact with the nose portion crushed inboard. The underside/bottom of the float was minimally damaged. The scoop was observed to be deployed about 1/8 inch below the main keel.

Nose landing gear hydraulic actuator assembly was pushed aft one full float compartment past its normal mounting location. The water rudder was observed separated from the aft float bulkhead. The landing gear was observed in the retracted position. The side skins of the float had several punctures, consistent with impact damage.

The left float remained relatively intact with the nose portion crushed inboard and upward. The underside/bottom of the float was minimally damaged. The scoop was observed deployed about 1/4 inch below the main keel. The water rudder remained attached at the aft float bulkhead. The landing gear was observed in the retracted position. The side skins of float had several punctures, consistent with impact damage.

The housing that contains the red scoop down trigger switch on the cabin mounted control grip, was displaced aft, into the yolk grip.

The floats hydraulic pumps' reservoir and hydraulic lines were empty of hydraulic fluid. The working theory is that the hydraulic pump continued to operate (pump) after the floats separated during the impact sequence and while the airplane was submerged in the water, which allowed for the hydraulic fluid to leak out.



Figure 9. Side View of Right Float Scoop



Figure 10. Overhead view of the Right Scoop (Photo Courtesy of Wipaire)



Figure 11. Side View of Left Scoop



Figure 12. Overhead View of Left Scoop
(Photo Courtesy of Wipaire)

Components removed and shipped to the NTSB Recorders Laboratory in Washington, DC to download the units.

Garmin
Aera 796
s/n 2CY013481

Garmin GTN 635
p/n 011-0225500

Garmin G1275 (HSI)
p/n 011-04489-10

Garmin G1275 (ADI)
p/n 011-4489-10

Sentry ADS-B
Model FFSEN3

3.0 Engine Examination

Engine Manufacturer: Pratt & Whitney
Engine Model Number: PT6A-67F
Engine Serial Number: PCE-RZ0118

Recovery personnel reported that the engine remained attached to the airframe via the hoses and cables. For recovery purposes, the engine was separated from the airframe.



Figure 13. Side View of Engine



Figure 14. Side View of Engine

4.0 Propeller Examination

Propeller Manufacturer: Hartzell Propeller Inc

Propeller Model: HC-85MA-3DM11267NS

Propeller Serial Number: HBA 1200

The 5-bladed propeller assembly as well the second stage planetary gears of the reduction gearbox separated from the main engine.

Three of the five blades remained attached to the propeller assembly at the hub; however, the blades were loose in the respective hub attachments. All three blades exhibited S-bending, chordwise scratching, and leading and trailing edge nicks and gouges on both the cambered and face sides of the blades.

The fourth blade had separated at the hub and was relatively straight with some curling and leading and trailing edge nicks and gouges at the tip area.

The fifth propeller blade was not recovered with the wreckage and is likely to be at the bottom of the lake.



Figure 15. Front View of Propeller



Figure 16. Rear View of Propeller



Figure 17. Propeller Blade

Submitted by:

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