

Aviation Investigation Final Report

| Location: | Lamesa, Texas | Accident Number: | FTW02LA120 |
|-------------------------|-----------------------------|------------------|-------------|
| Date & Time: | April 15, 2002, 12:02 Local | Registration: | N91905 |
| Aircraft: | Air Tractor AT-502 | Aircraft Damage: | Substantial |
| Defining Event: | | Injuries: | 1 Minor |
| Flight Conducted Under: | Part 137: Agricultural | | |

Analysis

The 22,894-hour pilot reported that after a "normal" takeoff he reduced the throttle to cruise power and the "engine started losing power." During a forced landing, the aircraft nosed over and came to rest in an inverted position. Examination of the engine by a Pratt & Whitney representative revealed that the P3 air filter, low pressure fuel pump filter, and the fuel line between the fuel control unit (FCU) and the oil/fuel heat exchanger contained dirt and water contamination. The 14 fuel nozzles were removed and flow checked. One nozzle met the manufacturer's specifications, one nozzle was completely obstructed, and the remaining 12 nozzles displayed "varying degrees of streaking."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power due to contamination of the fuel system. A contributing factor was the lack of suitable terrain for the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings 1. (C) FUEL SYSTEM - CONTAMINATION Occurrence #2: FORCED LANDING Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER Phase of Operation: EMERGENCY LANDING

Findings 2. TERRAIN CONDITION - NONE SUITABLE

Occurrence #4: NOSE OVER Phase of Operation: EMERGENCY LANDING

Factual Information

On April 15, 2002, at 1202 central daylight time, an Air Tractor AT-502 agricultural airplane, N91905, was substantially damaged during a forced landing following a loss of engine power near Lamesa, Texas. The airplane was registered to a private individual who was doing business as Hogg Flying Service of Lamesa, Texas. The commercial pilot, sole occupant of the airplane, sustained minor injuries. Visual meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 137 aerial application flight. The local flight originated from the Lamesa Municipal Airport, Lamesa, Texas, at 1155.

According to the 22,894-hour pilot, the airplane departed from runway 16 with a load of granular fertilizer. The pilot reported that after a "normal" takeoff he reduced the throttle to cruise power and the "engine started losing power." A forced landing was executed to a soft field 1.5 miles from the departure runway, during which the airplane nosed over and came to rest inverted.

The FAA inspector, who examined the airplane at the accident site, reported that both wings sustained structural damage and the engine was displaced from the engine firewall. According to a representative from Pratt & Whitney (P&W) who examined the airplane, two propeller blades were curled, one propeller blade was bent aft, and the propeller spinner remained attached. The high pressure fuel filter bowl was removed and "large amounts of very fine sand/dirt [were found] between the pleats" of the fuel filter. The engine was removed from the aircraft and transported to P&W in Addison, Texas, for examination.

The engine was examined at P&W under supervision of the NTSB Investigator-In-Charge. The P3 air filter was removed and dirt contamination was present in the wire screen; however, there was no water present. The low pressure fuel pump was removed and its filter was contaminated with water and dirt. The fuel line between the fuel control unit (FCU) and the oil/fuel heat exchanger contained water contamination. The 14 fuel nozzles were removed and flow checked. One nozzle met the manufacturer's specifications, one nozzle was completely obstructed, and the remaining 12 nozzles displayed "varying degrees of streaking." The high pressure fuel pump and FCU were removed as one assembly and sent to the P&W facility in Canada for further examination. The low pressure fuel pump was removed and sent to S&T Accessories, Inc., in New Braunfels, Texas, for further testing. The turbine section was boroscoped and the blades for the second stage turbine were intact. Furthermore, the blade tips and their respective shrouds did not display rub marks or scoring.

Pilot Information

| | | • | 40.14 |
|---------------------------|---|-----------------------------------|----------------|
| Certificate: | Commercial | Age: | 49,Male |
| Airplane Rating(s): | Single-engine land; Multi-engine land | Seat Occupied: | Front |
| Other Aircraft Rating(s): | None | Restraint Used: | |
| Instrument Rating(s): | Airplane | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 2 Valid Medicalw/ waivers/lim | Last FAA Medical Exam: | August 1, 2001 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | May 18, 2000 |
| Flight Time: | 22894 hours (Total, all aircraft), 6894 hours (Total, this make and model), 22894 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 100 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

| Aircraft Make: | Air Tractor | Registration: | N91905 |
|-----------------------------------|----------------------------------|-----------------------------------|-----------------|
| Model/Series: | AT-502 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | |
| Airworthiness Certificate: | Restricted (Special) | Serial Number: | 502-0226 |
| Landing Gear Type: | Tailwheel | Seats: | 1 |
| Date/Type of Last Inspection: | January 8, 2002 Annual | Certified Max Gross Wt.: | |
| Time Since Last Inspection: | | Engines: | 1 Turbo prop |
| Airframe Total Time: | 3623.6 Hrs as of last inspection | Engine Manufacturer: | Pratt & Whitney |
| ELT: | Not installed | Engine Model/Series: | PT6A-15AG |
| Registered Owner: | Glenn Hogg | Rated Power: | 680 Horsepower |
| Operator: | | Operating Certificate(s) Held: | |
| Operator Does Business As: | Hogg Flying Service | Operator Designator Code: | TYRG |

Meteorological Information and Flight Plan

| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Day |
|---|----------------------------------|---|-------------------|
| Observation Facility, Elevation: | MAF,2871 ft msl | Distance from Accident Site: | 65 Nautical Miles |
| Observation Time: | 11:53 Local | Direction from Accident Site: | 190° |
| Lowest Cloud Condition: | Clear | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 15 knots / 22 knots | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 220° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 29.82 inches Hg | Temperature/Dew Point: | 27°C / 7°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Lamesa, TX (2F5) | Type of Flight Plan Filed: | None |
| Destination: | | Type of Clearance: | Unknown |
| Departure Time: | 11:55 Local | Type of Airspace: | Class E |

Airport Information

| Airport: | Lamesa Municipal 2F5 | Runway Surface Type: | Asphalt |
|----------------------|----------------------|---------------------------|----------------|
| Airport Elevation: | 2998 ft msl | Runway Surface Condition: | Dry |
| Runway Used: | 16 | IFR Approach: | None |
| Runway Length/Width: | 4999 ft / 75 ft | VFR Approach/Landing: | Forced landing |

Wreckage and Impact Information

| Crew Injuries: | 1 Minor | Aircraft Damage: | Substantial |
|------------------------|---------|-------------------------|----------------------------|
| Passenger Injuries: | | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Minor | Latitude, Longitude: | 32.729106,-101.949577(est) |

Administrative Information

| Investigator In Charge (IIC): | Ragogna, Jason |
|--------------------------------------|---|
| Additional Participating Persons: | William W Carmody; Federal Aviation Administration; Lubbock, TX Fletcher E Sharp; Pratt & Whitney; Addison, TX |
| Original Publish Date: | June 30, 2004 |
| Last Revision Date: | |
| Investigation Class: | <u>Class</u> |
| Note: | |
| Investigation Docket: | https://data.ntsb.gov/Docket?ProjectID=54522 |
| | |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available <u>here</u>.