Aviation Investigation Final Report

Location:	Moscow, Kansas	**Accident Number:**	CHI02FA112
Date & Time:	April 23, 2002, 13:43 Local	**Registration:**	N101LT
Aircraft:	Piper 601P	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was destroyed during an attempted forced landing following an in-flight fire in cruise flight. The pilot was reported to be flying the airplane to an airport in order to have maintenance work performed on the right engine due to a boost problem. It was reported that the pilot had another mechanic at another airport look at the airplane. A work order for a transient airplane was found that indicated work performed on the right engine turbocharger system about 1 month before the accident. The work order shows that the wastegate oil filter was found clogged and collapsed and that it was cleaned, straightened and reinstalled. The pilot operated the airplane with a right engine boost problem. The boost problem with the right engine is evidenced by the previous work order, the excessive amount of runway used during takeoff, the reported smoke from the right engine after takeoff, and the airplane not climbing as expected after takeoff. Due to the reduced power from the right engine, the pilot was required to apply left brake in order to maintain directional control during takeoff, as evidenced by the blued left brake disk with metal transfer into the relief holes and slots. As a result of the pilot using left brake during takeoff, a fire erupted in the left wheel well, which spread to the aft fuselage. This is evidenced by the sooting, fire, and heat damage to the wheel well, the carpet above the wheel well, and aft fuselage. The fuselage immediately behind the baggage compartment had extensive fire damage. The damage in this area included blistered paint on the upper surface, and a two foot square section of the left fuselage skin that was burned away. The area that was burned away was in the vicinity of the hydraulic fluid reservoir. The aluminum hydraulic fluid reservoir was not found, only the steel filler neck, mounting screws, and cap were found. No evidence of fire was found within the right main landing gear wheel well or in the engine compartments. A witness reported seeing the airplane flying south and trailing smoke then banking to the left making a complete circle before descending and ultimately impacting the ground.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's intentional operation of the airplane with a known engine boost problem resulting in the improper use of brakes to maintain directional control during takeoff, the brake system fire, and the loss of control for undetermined reasons during the emergency landing. A factor was the loss of engine power due to a restricted wastegate filter.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - ROLL/RUN

Findings
1. (F) LUBRICATING SYSTEM,OIL FILTER/SCREEN - FLOW RESTRICTED
2. (C) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - INTENTIONAL - PILOT IN COMMAND
3. (C) BRAKES(NORMAL) - IMPROPER USE OF - PILOT IN COMMAND

Occurrence #2: FIRE
Phase of Operation: CRUISE

Findings
4. (C) LANDING GEAR,NORMAL BRAKE SYSTEM - FIRE

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
5. (C) AIRCRAFT CONTROL - NOT MAINTAINED
6. (C) REASON FOR OCCURRENCE UNDETERMINED

Factual Information

HISTORY OF FLIGHT

On April 23, 2002, at 1343 central daylight time (CDT), a Piper Aerostar 601P, N101LT, piloted by an airline transport pilot, was destroyed when it impacted terrain while attempting a forced landing following an in-flight fire during cruise flight. The airplane came to rest in a harvested cornfield near Moscow, Kansas. The 14 CFR Part 91 personal flight was operating in visual meteorological conditions and was not on a flight plan. The pilot, who was the sole occupant, was fatally injured. The flight originated from the Lamar Municipal Airport, Lamar, Colorado, about 1200 mountain daylight time, and was en route to the Liberal Municipal Airport (LBL), Liberal Kansas.

A witness near the accident site reported seeing the airplane flying south and trailing smoke. The witness said that the airplane banked to the left and made a complete circle before descending. He said that the airplane descended "like a spray plane but was not leveling out," and he then saw a large puff of smoke and reported the accident to authorities.

A witness at the departure airport reported that the airplane was fueled with 34 gallons of fuel prior to departure. She said that while the airplane was taking off, a flight instructor standing in the airport lobby commented that the airplane was using too much runway and did not gain altitude, as it should have. The witness said that she then looked and saw black smoke coming from the right engine.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate with an airplane multiengine land rating. The pilot also had commercial privileges for single engine land airplanes. The pilot was type rated for DC-9, DC-10, and Lear Jet operations. According to training records, the pilot received his most recent flight review on December 14, 2001. The record indicates that the review was performed in the accident airplane.

The pilot's most recent second-class medical certificate was issued on June 19, 2001, with the limitation "Must wear corrective lenses."

According to Federal Aviation Administration (FAA) records, the pilot had accumulated 17,725 hours of flight experience as of the date of his most recent medical examination.

AIRCRAFT INFORMATION

The accident airplane was a Piper Aerostar 601P twin-engine airplane with retractable landing

gear. The pressurized airplane was of aluminum construction and could seat six occupants.

A set of partially burned aircraft maintenance logs were found among the wreckage. The maintenance logs were reviewed during the on-scene investigation. Due to the damage to the logs, a complete maintenance history could not be determined. However, the records showed that the airplane had been modified in accordance with a supplemental type certificate and two Lycoming IO-540-S1A5-MM engines were installed on March 22, 1986. The records also showed that the left engine had been overhauled on April 20, 1993, and the right engine was overhauled on December 27, 1993. The most recent annual inspection was performed by the fixed base operator (FBO) at LBL on January 12, 2002.

METEOROLOGICAL INFORMATION

The weather reporting station located at the Hugoton Municipal Airport, about 10 nautical miles southwest of the accident site recorded the following weather observations:

Observation time: 1325 CDT
Wind direction: 220 degrees magnetic
Wind speed: 6 knots
Visibility: 10 statute miles
Sky condition: Clear
Temperature: 25 degrees Celsius
Dew point: 10 degrees Celsius
Altimeter setting: 29.91 inches of mercury

Observation time: 1340 CDT
Wind direction: 280 degrees magnetic
Wind speed: 5 knots
Visibility: 10 statute miles
Sky condition: Clear
Temperature: 25 degrees Celsius
Dew point: 8 degrees Celsius
Altimeter setting: 29.90 inches of mercury

Observation time: 1355 CDT
Wind direction: 240 degrees magnetic
Wind speed: 8 knots gusting to 15 knots
Visibility: 10 statute miles
Sky condition: Clear
Temperature: 26 degrees Celsius
Dew point: 6 degrees Celsius
Altimeter setting: 29.89 inches of mercury

WRECKAGE AND IMPACT INFORMATION

The airplane impacted into a level harvested cornfield about 3 nautical miles south-southwest of Moscow, Kansas. The accident location was determined using a global positioning system receiver as 37-degrees 17.242-minutes north latitude and 101-degrees 14.321-minutes west longitude. The line of wreckage was distributed across approximately 700 feet and oriented in a 110-degree magnetic direction.

The fuselage forward of the aft pressure bulkhead remained primarily intact with crush damage to the nose section. The aft fuselage was destroyed, as were the wings and empennage. Portions of all of the major structural components of the airplane were located at the accident site.

The farthest component from the initial impact point was the fuselage mounted fuel tank. This fuel tank was partially burned and had evidence of fire damage. There was also evidence of ground fire leading from the initial impact to the final position of the fuel tank. This fuel tank was installed in the aft fuselage immediately behind the aft pressure bulkhead.

The horizontal stabilizer remained attached to the last few feet of fuselage structure. The elevators were still attached to the horizontal stabilizer. The vertical stabilizer was separated from the fuselage structure and was found a few feet from the horizontal stabilizer. The rudder remained attached to the vertical stabilizer. All of the tail surfaces exhibited evidence of soot streaking in the longitudinal direction. The soot trails emanated from gaps and holes in the aft fuselage structure that were used for such items as pushrod routing, lightening holes, drain holes, etc.

Portions of aft fuselage skins were found which had blistered paint and heat damage. The skin pieces with the most extensive damage were those above and immediately behind the baggage compartment.

The steel filler neck assembly, including the cap, attaching screws, and nut plates, for the aluminum hydraulic fluid reservoir was found along the wreckage path. The hydraulic fluid reservoir was not found. The filler neck assembly had evidence of heat and fire damage. The hydraulic fluid reservoir mounts immediately behind the aft baggage compartment bulkhead.

The left engine was found lying upside down adjacent to the left engine nacelle of the wing. The engine was attached to the engine mount and the engine mount was broken loose from the firewall. Visual examination of the engine revealed no signs of a catastrophic engine failure. The engine was examined in further detail after the wreckage was moved to a hangar at a nearby airport. During that examination, the upper set of spark plugs was removed. The spark plugs exhibited signatures consistent with normal engine operation. A lighted borescope was used to examine the cylinder combustion chambers and no pre-impact defects were found. No evidence of an engine compartment fire was observed.

The left propeller was broken loose from the engine and was found along the wreckage path.

The right engine was found lying upright near the main wreckage with the propeller still attached. The engine was attached to the engine mount and the engine mount was broken loose from the firewall. Visual examination of the engine revealed no signs of a catastrophic engine failure. The engine was examined in further detail after the wreckage was moved to a hangar at a nearby airport. During that examination, the upper set of spark plugs was removed. The spark plug deposits were black and sooty in appearance. A lighted borescope was used to examine the cylinder combustion chambers and no pre-impact defects were found. No evidence of an engine compartment fire was observed.

A piece of carpet found at the site had evidence of heat damage to the underside. The area that was heat damaged rests on a shelf above the left main landing gear wheel well.

The left main landing gear wheel well contained evidence of heat and fire damage. The interior surfaces of the wheel well were covered with black soot. The right main landing gear wheel well contained no evidence of fire or heat damage. The interior surfaces retained the green zinc-chromate paint.

The wreckage was moved to a hangar at a nearby airport for further examination. A partial layout of the fuselage components revealed an area aft of the left main wheel well that was burned and melted. A portion of the left side of the fuselage, aft of the left main landing gear well, approximately 2 feet square was not recovered. The edges of the surrounding area were melted and showed evidence of fire damage. This area of the fuselage is in the vicinity of the hydraulic fluid reservoir.

Examination of the left main landing gear revealed bluing of the brake disk with metal transfer into the disk relief slots and holes. No other evidence of a pre-impact mechanical defect, with respect to the left brake system, was found. Examination of the right main landing gear brake system and disk revealed no defects.

MEDICAL AND PATHOLOGICAL INFORMATION

Cimarron Pathology, P.A., Liberal, Kansas performed an autopsy on the pilot, on April 24, 2002.

A Final Forensic Toxicology Fatal Accident Report, prepared by the Federal Aviation Administration (FAA), Toxicology and Accident Research Laboratory, listed negative results for all tests performed.

TESTS AND RESEARCH

A FBO at LBL said that the pilot had telephoned and made arrangements to bring the airplane to LBL for maintenance work. The FBO said that they had maintained the airplane since the pilot's company had owned the airplane. The FBO stated that the owner had called him and told him that he had experienced a boost problem with the right engine. The FBO stated that

the pilot had a mechanic in Montrose, Colorado look at the airplane. The FBO stated that the pilot said that the other mechanic was unable to duplicate the problem and that he was going to bring the airplane to LBL for the FBO to look at.

The maintenance facilities at the Montrose Regional Airport, Montrose, Colorado were contacted. One of the maintenance facilities indicated that they performed work on the right engine of a transient airplane on March 13, 2002. The work order states, "uncowl right engine, pull the turbo inlet ducts off both turbos and check the turbos. Checked ok. Removed wastegate filter, found clogged and collapsed on one side, cleaned, straightened and reinstalled, suggest new screen be installed." The work order does not list any identifying information as to the type of aircraft, registration, or whom the work was performed for.

The National Transportation Safety Board's Materials Laboratory examined a portion of a separated hose and fitting for the left main landing gear inner door actuator. The examination revealed that the hose had received fire and heat damage. The wire braiding within the hose had been mechanically deformed at 90-degrees to the axis of the hose.

ADDITIONAL INFORMATION

The FAA, the New Piper Aircraft, and Textron Lycoming were parties to the investigation.

The aircraft wreckage was released to a representative of the insurance company.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	June 19, 2001
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	December 14, 2001
Flight Time:	17725 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N101LT
Model/Series:	601P	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	61P-0760-8063377
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	January 12, 2002 Annual	**Certified Max Gross Wt.:**	6000 lbs
Time Since Last Inspection:	17.2 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	2442 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-S1A5-M
Registered Owner:	Columbine Farm LLC	**Rated Power:**	340 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HQG,3133 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	13:40 Local	**Direction from Accident Site:**	220°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.89 inches Hg	**Temperature/Dew Point:**	25°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LAMAR, CO (LAA)	**Type of Flight Plan Filed:**	None
Destination:	LIBERAL, KS (LBL)	**Type of Clearance:**	None
Departure Time:	12:00 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	Both in-flight and on-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal	**Latitude, Longitude:**	37.287223,-101.238334

Administrative Information

Investigator In Charge (IIC):	BRANNEN, JOHN
Additional Participating Persons:	Jim Badhorse; FAA-Wichita-FSDO; Wichita, KS Mark Platt; Textron Lycoming; Van Nuys, CA Charles Little; The New Piper Aircraft; Chino Hills, CA
Original Publish Date:	November 25, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=54609