



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Perry, KS	<b>Accident Number:</b>	CEN10FA364
<b>Date &amp; Time:</b>	07/01/2010, 0750 CDT	<b>Registration:</b>	N3071T
<b>Aircraft:</b>	BEECH F33A	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The pilot reported a loss of engine power to an air traffic controller and was then provided vectors to an airport located 10 miles south of the airplane's position. The radar track illustrated the airplane reversed course back to the east and then to the south towards the airport. According to a witness in the area, the airplane was extremely low and started to turn or rotate when the nose dropped and he lost sight of the airplane; the airplane impacted an open field in a nose low attitude. Recorded engine data revealed that the fuel flow dropped to zero and cylinder head temperature and rpm decreased. An examination of the airframe and its related systems revealed no anomalies. An examination of the engine revealed that the engine driven fuel pump was seized and could not be rotated by hand. Further examination revealed that foreign particles in the bearing resulted in the seizure of the fuel pump. The source of the foreign particles was not determined. The emergency procedures checklist for a loss of engine power included the activation of the auxiliary fuel pump. The switch was in the off position at the accident site. An examination of the auxiliary fuel pump revealed no anomalies.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the engine driven fuel pump causing a loss of engine power and the pilot's failure to maintain aircraft control resulting in an inadvertent stall. Contributing to the accident was the pilot's failure to follow the emergency procedures checklist and utilize the electric fuel boost pump which would have restored engine power.

## Findings

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<b>Aircraft</b>	Fuel pumps - Failure (Cause)
<b>Personnel issues</b>	Aircraft control - Pilot (Cause) Use of checklist - Pilot (Factor)

## Factual Information

### HISTORY OF FLIGHT

On July 1, 2010, approximately 0750 central daylight time, a Beech F33A single engine airplane, N3071T, was substantially damaged when it impacted terrain five miles east northeast of Perry, Kansas. Visual meteorological conditions prevailed at the time of the accident. The personal flight was being conducted under the provisions of 14 Code of Federal Regulations Part 91 on an instrument flight rules flight plan. The commercial pilot and his passenger were fatally injured. The cross country flight departed Charles B. Wheeler Downtown Airport (KMKC), Kansas City, Missouri, and was en route to St. Johns Industrial Air Park (KSJN), St. Johns, Arizona.

According to records provided by the Federal Aviation Administration (FAA), N3071T was in radio communications with Kansas City Air Route Traffic Control Center (ZKC). At 0740:55 N3071T contacted ZKC and reported an altitude of 7,000 feet, climbing to an altitude of 8,000 feet. At 0742:40 the pilot reported that he “lost an engine” and requested immediate vectors for the nearest airport. The controller provided a heading of 080 thinking that the pilot wanted to return KMKC.

At 0743:34 the controller verified that the pilot wanted to return to KMKC and the pilot stated yes unless there was a closer airport. The controller stated that Lawrence was 10 miles to the south of the pilot’s position, offered weather information for the airport, and cleared the pilot to descend to 4,000 feet. The pilot told the controller that he was not going to make Lawrence and the controller responded with obstacles in the area and a heading for Lawrence. The controller continued to provide landmarks and headings to the pilot to aid him in finding the Lawrence airport.

At 0747:42 the controller asked the pilot if he could see any “place to put down.” The pilot responded that there were several roads and that he wanted to keep it away from the trees. At 0748:06 the pilot reported he had a road directly in front of him. No further transmission were received or recorded from the pilot.

Long range radar data, provided by the FAA, depicted the accident flight from the time of departure from KMKC to the time of the accident. The airplane initially climbed to 7,400 feet mean sea level (msl), and then began to descend after reporting the loss of engine power. Shortly after the report of engine failure, the flight track illustrated a course reversal of 180 degrees in a right hand turn. The track then continued around to an approximate heading of south towards the Lawrence airport, and continued in this direction until the track ended. Radar contact was lost at 0749 at 1,300 feet.

A witness in the area observed the airplane flying from the north towards the south at a “really low” altitude. The witness indicated that the nose of the airplane rose up and then came down. He commented that he momentarily saw the belly of the airplane and then the airplane disappeared from view behind the trees.

### PERSONNEL INFORMATION

The pilot, age 56, held a commercial pilot certificate with an airplane single engine land, multiengine land, and instrument ratings. In addition he held a private pilot certificate with helicopter rating. He was issued a third class airman medical certificate on April 7, 2009. The

certificate contained the limitation “must wear corrective lenses.”

The pilot’s most recent insurance application, dated October 16, 2009, reflected a total time of 3,000 hours; 1,500 hours of which were logged in the make and model of the accident airplane. He reported his biennial flight review was successfully completed on April 7, 2009. The pilot’s logbook was not available for review.

#### AIRCRAFT INFORMATION

The accident airplane, a Beech F33A (serial number CE-1158), was manufactured in 1987. It was registered with the FAA on a standard airworthiness certificate for utility operations. A Teledyne Continental Motors IO-520-BB engine rated at 285 horsepower at 2,700 rpm powered the airplane. The engine was equipped with a three-blade, McCauley propeller.

The airplane was registered to Syracuse Aviation Services, LLC., operated by the pilot, and was maintained under an annual inspection program. A review of the maintenance records indicated that an annual inspection had been completed on October 9, 2009, at an airframe and tachometer time of 2,233.63 hours.

The Tornado Alley Turbo Inc., Rammer Intercooler System was installed on March 30, 2007, at an airframe total time of 1,920.99 hours.

#### METEOROLOGICAL INFORMATION

The closest official weather observation station was Lawrence Municipal Airport (KLWC), Lawrence, Kansas, located 6.75 nautical miles (nm) southeast of the accident site. The elevation of the weather observation station was 833 feet msl. The routine aviation weather report (METAR) for KLWC, issued at 0752, reported, winds 110 degrees at 6 knots, visibility 9 miles, sky condition clear, temperature 20 degrees Celsius (C), dew point 16 degrees C, altimeter 30.26 inches.

#### FLIGHT RECORDERS

The accident airplane was equipped with a JPI engine data monitoring (EDM) 800 unit (serial number 24855). The EDM was sent to the National Transportation Safety Board (NTSB) Vehicle Recorders Laboratory in Washington, D.C., for download. Approximately 33 minutes of data from the accident flight was recovered. Parameters recorded included exhaust gas temperature, cylinder head temperature, manifold pressure, engine rpm, oil temperature, and fuel flow.

#### WRECKAGE AND IMPACT INFORMATION

The airplane impacted the ground, to the north of a line of trees, in an open field characterized by short vegetation and rolling terrain.

The accident site initiated with a long narrow ground scar, oriented east/west, with the propeller in the center of the ground scar. The point of the ground scar furthest to the east contained green lens fragments, white paint chips, and the housing of a navigation light. This scar extended from its point of initiation west for 23 feet to the crater containing the propeller assembly. The crater was four feet in diameter. The spinner was oriented down with the blades bowed up slightly. The second portion of the ground scar extended to the west in a slight V shape for 20 feet. Red lens fragments were located at the west most point of the ground scar. White paint chips were contained through the entire length of the scar.

The propeller was a three-bladed McCauley propeller. The blades were arbitrarily labeled "A," "B," and "C" for identification purposes. Blade A was bowed aft slightly, exhibited 45 degree chordwise scratching and leading edge polishing. Blade B was bowed aft slightly, and exhibited a slight S bend. The leading edge was polished and the face of the blade was unremarkable. Blade C was bowed aft and then forward slightly. The face of the blade exhibited slight 45 degree scratches and leading edge polishing. The propeller spinner exhibited circular crushing.

An area 90 feet in diameter surrounding the propeller and ground scar was discolored consistent with fuel blight. A debris field extended from the ground scar to the west towards the main wreckage. Debris located in this field included various engine components, torn metal, engine cowling, fragmented Plexiglas, and both wing tip tanks.

The main wreckage included the left and right wing, the empennage, fuselage, and the engine assembly.

The fuselage included the cabin area, four seats, and the instrument panel. The forward windscreen was fragmented and the frame and structure surrounding the forward fuselage and front two seats was bent, broken, and fragmented. The instrument panel was broken and partially fragmented. The landing gear actuator was in the retracted position. The auxiliary fuel pump switch was in the off position. The fuel selector valve contained trace amounts of fuel and was free of contamination and water. The fuel screen was clear of contaminants.

The right wing included the right aileron, right flap assembly, and right main landing gear. The entire leading edge exhibited aft accordion crushing. The wing was bent up, and partially fragmented. The fuel tank was compromised and was empty. The aileron control cables were continuous from the control surface inboard to the flight control yoke. The landing gear was in the retracted position.

The left wing included the left aileron, left flap assembly, and left main landing gear. The entire leading edge exhibited aft accordion crushing. The fuel tank was compromised and was empty. The aileron control cables were continuous from the control surface inboard to the flight control yoke. The landing gear was in the retracted position.

The empennage, to include the horizontal stabilizer, vertical stabilizer, elevator, and rudder, remained attached to the fuselage. The skin was buckled along an aft rivet line and the empennage was bent slightly to the right. The elevator, rudder, and vertical stabilizer were without damage and unremarkable. The elevator and rudder control cables were continuous from the control surfaces forward to the flight control yokes.

The right outboard leading edge tip of the horizontal stabilizer exhibited a slight bend and had dirt embedded within the edge. The belly of the airplane illustrated aft oil streaking from the wings aft to the navigation light on the bottom of the tail cone.

#### MEDICAL AND PATHOLOGICAL INFORMATION

The autopsy was performed by the Shawnee County Coroner's Office on July 2, 2010, as authorized by the Jefferson County Coroner's office. The autopsy concluded that the cause of death was due to multiple traumatic injuries.

The FAA's Civil Aerospace Medical Institute, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference #201000143001). Results were negative for all tests conducted.

## TESTS AND RESEARCH

### Engine

The engine and its accessories were transported to a facility in Mobile, Alabama, for examination by investigators from the NTSB, Hawker Beechcraft, Teledyne Continental Motors, and Tornado Alley.

The engine driven fuel pump was removed from the engine revealing the drive coupling had broken. The basic fuel pump could not be rotated by hand. The fuel pump had a data tag bearing the name of "FliteCraft Turbo - Pagosa Springs, CO - P/N 632818-11 - S/N Ho78636RB."

Further examination of the engine revealed normal operating signatures and no anomalies that would have precluded the engine from producing design horsepower at the time of the accident.

### Fuel Pumps

The engine driven fuel pump and drive coupling were shipped to the NTSB Materials Laboratory in Washington, D.C., for further examination.

Examination of the fracture surfaces on the drive coupling pieces revealed flat fractures perpendicular to the coupling's longitudinal axis. The fracture surfaces exhibited circumferential swirl-like features on the fracture face consistent with predominately shear stresses associated with a torsional overload fracture of a ductile metal.

The fuel pump was carefully disassembled to determine why the rotor would not freely rotate. At the point when the rotor shaft and bearing were removed from the bearing housing it was noted that the rotor shaft was no longer frozen in place as it had been up to that point. Care was taken not to allow the components to move relative to each other while performing the final sectioning operation on the bearing to reveal the interior surface of the bearing and outer diameter of the rotor shaft. During the disassembly, but prior to performing the first sectioning operation, it was noted that the bearing and the drilled hole in the bore where the bearing was installed were in the correct alignment such that fuel could pass through and lubricate the bearing. No evidence of relative motion between the bearing and bore was observed. Additionally, the vanes of the impeller were examined and found to have small chips missing from the outboard edges. No other deteriorated components or foreign debris were found within the fuel pump assembly during the examination.

After sectioning, the interior surfaces of the bearing were examined and small particles were observed adhering to the surfaces. One half of the bearing exhibited more particles than the other half. The particles had a silver/gray appearance and were reflective. Energy dispersive spectroscopy revealed that the particles were not all the same but typically contained iron, aluminum, silicon, chrome, nickel, and molybdenum.

The rotor shaft did not have any evidence of significant surface defects although light scoring and polishing wear were evident on the shaft's outer diameter.

The source of the particles was not determined.

An examination of the electric fuel boost pump revealed no anomalies. When power was added, it functioned as designed.

## ADDITIONAL INFORMATION

### JPI Engine Data Monitoring Unit

The accident airplane was equipped with an engine data monitoring unit. The information downloaded from this unit depicted that fuel flow dropped to zero 26 minutes into the flight. Engine rpm and exhaust gas temperature decreased at the same time. The accident flight continued for approximately 6 additional minutes before the unit stopped recording.

### Aircraft Performance

According to the Emergency Procedures section of the Beech Aircraft Flight Manual, the glide distance of the accident airplane would have been 1.7 nautical miles or 2 statute miles per 1,000 feet of altitude above terrain. This distance is based upon the maximum glide configuration which consists of the landing gear and flaps being retracted, the cowl flaps closed, the propeller set at low rpm, and the airspeed set at 105 knots. According to Hawker Beechcraft, the airplane should have been able to glide 10.88 miles in a no-wind scenario.

The Emergency Procedures section of the Beech Aircraft Flight Manual also directed the pilot to select the fuel boost pump to the on position following a loss of engine power.

### History of Flight

Enroute-climb to cruise	Loss of engine power (total) (Defining event)
Emergency descent	Loss of control in flight

### Pilot Information

Certificate:	Commercial; Private	Age:	56, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last Medical Exam:	04/07/2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	04/07/2009
Flight Time:	3000 hours (Total, all aircraft), 1500 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	BEECH	<b>Registration:</b>	N3071T
<b>Model/Series:</b>	F33A	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Utility	<b>Serial Number:</b>	CE-1158
<b>Landing Gear Type:</b>	Retractable -	<b>Seats:</b>	5
<b>Date/Type of Last Inspection:</b>	10/09/2009, Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2233.6 Hours	<b>Engine Manufacturer:</b>	CONT MOTOR
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	IO 520 BB
<b>Registered Owner:</b>	SYRACUSE AVIATION SERVICES LLC	<b>Rated Power:</b>	285 hp
<b>Operator:</b>	On file	<b>Air Carrier Operating Certificate:</b>	None

## Meteorological Information and Flight Plan

<b>Observation Facility, Elevation:</b>	KLWC, 833 ft msl	<b>Observation Time:</b>	0752 CDT
<b>Distance from Accident Site:</b>	5 Nautical Miles	<b>Condition of Light:</b>	Day
<b>Direction from Accident Site:</b>	180°	<b>Conditions at Accident Site:</b>	Visual Conditions
<b>Lowest Cloud Condition:</b>	Clear	<b>Temperature/Dew Point:</b>	20° C / 16° C
<b>Lowest Ceiling:</b>	None	<b>Visibility</b>	9 Miles
<b>Wind Speed/Gusts, Direction:</b>	6 knots, 110°	<b>Visibility (RVR):</b>	
<b>Altimeter Setting:</b>	30.26 inches Hg	<b>Visibility (RVV):</b>	
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Kansas City, MO (KMKC)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	St Johns, AZ (KSJN)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>		<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal		

## Administrative Information

**Investigator In Charge (IIC):** Jennifer Rodi **Adopted Date:** 06/13/2011

**Additional Participating Persons:** Bobby Warren; FAA FSDO; Wichita, KS  
Brian Weber; Hawker Beechcraft Corp; Wichita, KS  
John Kent; Teledyne Continental Motors; Mobile, AL  
David Landreth; Tornado Alley Turbo Inc; Ada, OK  
Bruce A Lampert; NATCA; Denver, CO

**Publish Date:** 06/13/2011

**Investigation Docket:** <http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=76499>

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