



National Transportation Safety Board Aviation Accident Final Report

Location:	Uniondale, IN	Accident Number:	CHI03FA291
Date & Time:	09/01/2003, 2002 EST	Registration:	N8018J
Aircraft:	Beech B36TC	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	3 Fatal, 1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane impacted a utility pole and the terrain following a loss of engine power while being vectored for an ILS approach. The pilot diverted to an airport that had an ILS approach during the flight because of deteriorated weather. The pilot stated that during the approach the airplane did not seem to be descending so he disconnected the autopilot and subsequently executed a missed approach. The pilot reported that upon reaching 2,600 feet msl during the missed approach, he leaned the engine using turbo inlet temperature. The pilot reported the engine began to sputter so he pushed the mixture to rich, adjusted the throttle, and switched the boost pump to LOW, but the engine continued to sputter. He switched the boost pump to HI and the sputtering stopped momentarily before starting again. The pilot informed ATC that he was having a fuel problem and he needed to land "ASAP." The approach controller issued a vector to turn N8018J onto the approach. The pilot stated he switched the fuel selector to the left tank position and he attempted to restart the engine to no avail. The pilot reported that during the emergency descent all of the airplane lights went out except for the GPS and EFIS which had independent lighting systems. The airplane impacted the utility pole and slid across a county road before coming to rest. A post impact fire and explosion ensued. Usable fuel capacity for the airplane is 102 gallons. The fuel tanks were last topped off on August 1, 2003, and there was an addition total of 151.7 gallons added since that time. This resulted in the airplane having had 253.7 gallons of usable fuel on board since August 1, 2003. The airplane was flown 12.1 hours with 8 takeoffs since it was topped off. The pilot stated the fuel burn ranged from 12 to 30 gallons per hour with an average of 18 to 19 gallons per hour. According to Beechcraft, an additional 4 gallons of fuel would be used for each taxi, takeoff, and climb sequence. A fuel burn of 18 gallons per hour, would have resulted in the airplane using 249.8 gallons (217.8 gallons plus 32 gallons) of fuel during the 12.1 hours of flight time. A fuel burn of 19 gallons per hour would have resulted in 261.9 gallons (229.9 gallons plus 32 gallons) being used. Inspection of the engine revealed only residual fuel was present in the fuel manifold and in the fuel metering unit. There was no fuel present in any of the fuel lines or in the fuel pump. Regulation 49 CFR Part 91.167 states no person may operate a civil aircraft in IFR conditions unless it carries enough fuel to complete the flight to the first airport of intended landing, fly from that airport to the alternate airport, and fly thereafter for 45 minutes

at normal cruise.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inaccurate preflight planning which resulted in an inadequate fuel supply and subsequent fuel exhaustion. Factors associated with the accident were the low ceiling, dark night conditions, and the utility pole which the airplane contacted during the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: MISSED APPROACH (IFR)

Findings

1. (C) PREFLIGHT PLANNING/PREPARATION - INACCURATE - PILOT IN COMMAND
2. (C) FLUID,FUEL - EXHAUSTION
3. (C) FUEL SUPPLY - INADEQUATE - PILOT IN COMMAND

Occurrence #2: FORCED LANDING

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

4. (F) WEATHER CONDITION - LOW CEILING
5. (F) LIGHT CONDITION - DARK NIGHT
6. ELECTRICAL SYSTEM - INADVERTENT DEACTIVATION - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

7. (F) OBJECT - POLE

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

8. TERRAIN CONDITION - ROADWAY/HIGHWAY

Occurrence #5: FIRE/EXPLOSION

Phase of Operation: OTHER

Findings

9. OXYGEN SYSTEM - EXPLODED

Factual Information

HISTORY OF FLIGHT

On September 1, 2003, at 2002 eastern standard time, a Beech B36TC, N8018J, collided with a utility pole and the terrain during a forced landing in Uniondale, Indiana, following a reported loss of engine power. The private instrument rated pilot received serious injuries, one passenger received minor injuries, and three passengers were fatally injured. The airplane was destroyed by a post impact fire and explosion. The 14 CFR Part 91 personal flight was operating in instrument meteorological conditions and an instrument flight rules (IFR) flight plan was filed. The flight originated from the Boyne City Municipal Airport (N98), Boyne City, Michigan, at 1812, with an intended destination of Smith Airport (SMD), Ft. Wayne, Indiana.

The pilot reported he received a flight service station weather briefing at 1738 prior to departing N98. Due to the weather conditions, he filed an IFR flight plan using South Bend Regional Airport (SBN), South Bend, Indiana, as an alternate. The pilot stated he departed N98 with 60 gallons of fuel on board and he calculated that he would use about 35 gallons for the flight.

At 1812, the pilot contacted air traffic control stating that he had departed N98. While en route, the pilot contacted Ft. Wayne International (FWA) air traffic control approach control and stated that he wanted to fly the global positioning system (GPS) approach into SMD. The pilot then stated to the controller that based on weather conditions reported by another airplane, he wanted to fly the instrument landing system (ILS) approach to runway 05 at FWA. The pilot was issued vectors for the ILS runway 05 approach. The pilot stated he used the autopilot, but turned it off while intercepting the localizer during the approach.

The pilot stated he selected the heading mode on the autopilot after he intercepted the localizer. He stated that during the approach the airplane did not seem to be descending so he disconnected the autopilot and hand flew the approach. The pilot stated the airplane only descended to 1,400 feet above mean sea level (msl) because he had been "messing around" with the autopilot, so he executed the missed approach. (Radar data showed the pilot was at 1,200 feet msl and 1.5 miles from FTW when he initiated the missed approach. Decision height for the approach is listed as 1,015 feet msl.) The pilot informed the controller that he wanted to fly the approach again. He was instructed to contact FWA approach control at which time he was issued vectors for the approach. The pilot reported that upon reaching 2,600 feet msl during the missed approach, he leaned the engine using turbo inlet temperature.

The pilot stated the engine began to sputter during the missed approach. He pushed the mixture to rich, adjusted the throttle, and switched the boost pump to LOW, but the engine continued to sputter. He then switched the boost pump to HI and the sputtering stopped momentarily before starting again. The pilot informed the controller that he was having a fuel problem and he needed to land "ASAP." The approach controller issued a vector to turn N8018J onto the approach. The pilot then declared an emergency. The pilot stated he switched the fuel selector to the left tank position and he attempted to restart the engine to no avail. When questioned by the controller, the pilot reported that he was not able to maintain altitude and he did not have any power.

The pilot reported that during the emergency descent all of the airplane lights went out except for the Garmin Global Positioning System (GPS) and the EFIS/heading indicator which have

independent lighting systems. He stated he turned on a flashlight that he kept tucked in his shirt and used it to illuminate the artificial horizon. He also handed another flashlight to his son, who was in the right front seat, and told him to shine it on the vertical speed indicator. The pilot stated that once the engine lost power, he did not have time to secure the airplane or any of the switches.

The pilot stated that during the descent, at an altitude of 300 feet agl, he was able to see lights along the road and he was hoping to land in a farm field alongside the road. He then heard a loud noise from the left side of the airplane and the airplane banked to the left. The pilot stated a fire started instantaneously on the left rear side of the airplane. The airplane then contacted the road and the next thing he recalled was looking for the door handle to exit the airplane. He stated he and his son were able to exit the airplane through the door. He returned to the airplane in an attempt to help his wife and two children who were in the back, but the flames were too intense. The pilot reported that shortly thereafter, the oxygen bottle on board the airplane exploded.

The pilot's son who was in the front right seat told an Indiana State Police Trooper they could not land at Smith Field because of the low ceiling so they decided to go to Ft. Wayne Internatoinal. He also stated that they ran out of fuel and he recalled hitting a tree and the airplane catching fire.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with single engine land and instrument airplane ratings. The private pilot certificate was issued on June 26, 1997, and the instrument rating was added on March 15, 1998. According to the pilot's logbook, his last biennial flight review was dated March 9, 2003. The pilot received a high performance aircraft checkout on the same date.

The last entry in the pilot's logbook is dated August 22, 2003. The logbook showed he had a total flight time of 836.3 hours, of which 666.6 hours were as pilot-in-command. The pilot's total flight time in B36TC airplanes was 58.6 hours. The logbook showed the pilot had a total of 106.9 hours of actual instrument flight time in addition to 47.7 hours of simulated instrument flight time.

The pilot held a third class medical certificate which was issued on July 23, 2002. The medical certificate did not contain any limitations.

AIRCRAFT INFORMATION

N8018J, was a 1990-model Beech B36TC, serial number EA-510. The single engine, low-wing, airplane was purchased by the pilot on March 14, 2003. According to the airframe logbook, the last annual inspection on the airplane was dated December 17, 2002, at an airframe total time of 1,477.5 hours. The last entry in the logbook was dated March 6, 2003. On this date the tachometer time on the airplane was recorded as being 1,489 hours. According to the pilot's logbook and his recollection, he flew N8018J for 59.6 hours since March 6, 2003, making the total airframe time at the time of the accident 1548.6 hours.

N8018J was powered by a Teledyne Continental TSIO-520-UB4F, turbocharged engine. According to the engine logbook, the last annual inspection on the engine was conducted on December 17, 2002, at an engine total time of 941.5 hours.

The pilot reported, with the exception of water leaking in around a window seal, he did not

have any problems with the airplane during the flight until the engine lost power while on the approach.

The airplane's fuel system consisted of two interconnected bladder-type fuel cells located in each wing. The outboard fuel cell in each wing fed fuel to the inboard cell on each wing. The fuel pick-up line was in the aft portion of the inboard fuel cell in each wing. Each outboard fuel cell held 14 gallons of fuel and each inboard cell held 40 gallons of fuel. The total fuel capacity was 108 gallons of which 102 gallons were usable. Fuel quantity is measured using float sensors in each wing.

METEOROLOGICAL INFORMATION

At 1954, the FWA weather was recorded as: Wind 080 degrees at 11 knots; visibility 2 1/2 statute miles with light rain and mist; sky condition overcast 300 feet; temperature 17 degrees C; dew point 17 degrees C; altimeter 30.06 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest on a heading of 18 degrees alongside County Road (CR) 100W between CR 800N and CR 900N. The location was at 40:52'04" N and 085:41'32" W at an elevation of 815 feet msl. The wreckage site was 8.3 miles south-southwest of FWA.

The initial impact was with a utility pole about 12 feet from the top of the pole. The pole was broken into 3 sections with each section being about 12 feet in length. There were two lines on the pole. The lower line was broken and the top line was sagging. The pole was located on top of a 5 foot high embankment along the west side CR 100W. One of the left wing fuel bladder covers was located in the grass near the utility pole. The airplane then contacted CR 100W and slid across the road coming to rest approximately 10 feet off the east side of CR 100W up against a tree and a utility pole support wire. An impact mark was visible on the tree approximately 4 feet above the ground. Approximately half of the tree foliage was scorched.

There were several gouge and scrape marks visible on CR 100W. The initial pavement marks consisted of tire marks located on the right side of the wreckage path. These marks were followed by an oil slick on the pavement. Just past the oil slick were three cut marks in the pavement that were equally spaced and perpendicular to the direction of travel. These marks were followed by three more gouge marks which were on the left side of the wreckage path and in the direction of travel.

The data tag from the number 6 engine cylinder (front left side) was found on the ground near where the airplane departed the pavement on the east side of the road.

The airplane came to rest inverted on the east side of CR 100W. The top of the airplane from the top of the instrument panel to the tail, along with the right side of the airplane was consumed by fire. The left side of the airplane was consumed to a level below the window line. The bottom of the fuselage, although fire damaged, remained intact.

Both wings were found on the ground on the right side of the cabin. The right wing was inverted and in front of the left wing which was in an upright position. The inboard section of the right wing was consumed by fire with approximately 10 feet of the outboard section remaining. The entire remaining piece of wing was covered by soot, with the heaviest amounts being on the inboard portion. A mid-span area of this wing section, between the leading edge and the aileron, was consumed by fire. An approximate five-foot section of the aileron remained attached to the wing. The trailing edge of the wing tip was bent upward. The fuel

filler cap was in place. The right wing flap actuator was located. This actuator indicated the flaps were in the retracted position.

The left wing was found upright on the ground along the right side of the cabin. This wing was found behind the right wing. The top portion of the wing was burnt away from the wing root out to the fuel filler cap. Melted portions of the bottom wing skin remained from the inboard aileron attach point up to the fuel filler cap. The fuel filler cap was in place. The fire/heat damage on the left wing was more severe than that on the right wing. The left leading edge of the wing root that remained attached to the fuselage was flattened rearward.

The turnbuckle connections on the aileron cables on both wings were melted away. All sections of the cable were located and the sections between the turnbuckles were intact. The fuel quantity indicator floats were both burned and melted. The float for the left wing remained attached to the wing and the right wing float was separated.

The empennage was melted and the tail of the airplane came to rest in an inverted position next to the main wreckage. The leading edge and top skin of the right side horizontal stabilizer and elevator were melted. The top inboard section of the left horizontal stabilizer was scorched. The left horizontal stabilizer and elevator outboard of the trim tab were bent up in an approximate 45-degree angle. Grass was imbedded in portions of the left stabilizer and rudder. The bottom half of the leading edge of the vertical stabilizer was burned and melted. The top of the vertical stabilizer was bent to the right. The rudder and elevator cables were intact to the cockpit. The rudder trim cables were still attached to the electric trim motor.

The nose gear was in the extended position. The right main landing gear separated from the airplane and was found on the ground below the main spar carry through. The tire was burned. The left main gear remained attached to the airplane and was found in the extended position. The gear handle in the cockpit was in the up position.

One of the propeller blades had 5 inches of tip bent rearward. The second blade had 12 inches of the blade tip bent back and twisted. The tip of the third blade was buried in the ground. Six inches of blade tip on this blade were bent rearward and twisted.

The battery was tested and it indicated a charge of 25.05 volts. The post crash fire did not spread forward of the firewall. All of the spark plugs were clean with the exception of the plugs from cylinders 2, 4, and 6 which were oil soaked. The oil filter was opened and it was free of debris. The fuel pressure sensor line to the wastegate was removed and no fuel was present in the line. The wastegate was in the open position. Spark was noted on all of the spark plug leads when the engine was rotated by hand. Piston and valve movement continuity was established when the engine was rotated by hand. Compression was present on all cylinders with the exception of the number 6 cylinder which sustained impact damage.

The fuel pump was removed and the drive coupling was intact. The pump was rotated by hand and no binding was noted. There was no fuel present in the pump. The return line for the fuel pump-metering unit was removed and no fuel was present in the line. A few drops of fuel did come out of the metering unit coupling. The inlet line to the fuel manifold was disconnected and no fuel was present in the line. The manifold was opened and residual fuel was present. The fuel line to the manifold both before and after the fuel flow transmitter did not contain any fuel. The fuel screen was clean.

The fuel selector was positioned on the left fuel tank. The selector was opened and this position was verified. No fuel was present in the selector.

The aircraft battery switch was burned and in the off position. The avionics master switch and the alternator were in the on positions. The fuel boost pump was off and the left magneto was selected. Mixture was set to full rich. The elevator trim was measured at the tab and the trim was set approximately 5 degrees tab down which equates to a slight nose up trim position.

TESTS AND RESEARCH

The pilot reported the airplane was last "topped off" on August 1, 2003. Since it was "topped off" an additional total of 151.7 gallons of fuel were added at various times. This brought the total usable fuel in the airplane since August 1, 2003, to 253.7 gallons.

Date	Time Flown (hours)	No. of Takeoffs	Fuel Added (gallons)
August 1, 2003	--	-	75.5 (Topped Off)
August 1, 2003	3.4	2	None
August 14, 2003	1.6	1	29.5
August 17, 2003	1.6	1	25
August 22, 2003	2.0	2	37
August 29, 2003	1.6 (aprx)	1	60.2
September 1, 2003	1.9	1	None

The pilot reported the airplane was equipped with a fuel flow meter along with a digital fuel quantity indicator. He stated that in cruise flight with the mixture leaned, the airplane typically used between 18 and 19 gallons per hour. At lower altitudes at full power settings the maximum fuel burn was 30 gallons per hour. During a descent with the power reduced, the fuel consumption rate was typically 12 gallons per hour.

The airplane was flown 12.1 hours since the tanks were last topped off on August 1, 2003. Using an average fuel burn of 18 gallons per hour, the airplane would have used 217.8 gallons of fuel during the 12.1 hours. The 217.8 gallons does not take into account the additional amount of fuel required for engine start, taxi, takeoff, climb, and descent. According to Beechcraft, a conservative average for this additional amount of fuel, would be between 4 and 8 gallons for each taxi, takeoff, climb, and descent sequence. According to this information, with 8 takeoffs the airplane would have used an additional 32 to 64 gallons of fuel. This would have brought the total fuel used to between 249.8 and 281.8 gallons. If a fuel burn of 19 gallons per hour is used, the total amount of fuel used since August 1, 2003, would have been between 261.9 and 293.9 gallons.

Regulation 49 CFR Part 91.167 states no person may operate a civil aircraft in IFR conditions unless it carries enough fuel to complete the flight to the first airport of intended landing, fly from that airport to the alternate airport, and fly thereafter for 45 minutes at normal cruise.

ADDITIONAL INFORMATION

The parties to the investigation included the FAA, Beechcraft, and Teledyne Continental Motors.

The aircraft wreckage was released to a representative of Mercury Air Centers on September 3, 2003. The pilot's logbooks were returned to the pilot's attorney on September 15, 2003.

Pilot Information

Certificate:	Private	Age:	38, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	07/23/2002
Occupational Pilot:		Last Flight Review or Equivalent:	03/09/2003
Flight Time:	836 hours (Total, all aircraft), 59 hours (Total, this make and model), 667 hours (Pilot In Command, all aircraft), 48 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N8018J
Model/Series:	B36TC	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	EA-510
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	12/17/2002, Annual	Certified Max Gross Wt.:	3850 lbs
Time Since Last Inspection:	1477.5 Hours	Engines:	1 Reciprocating
Airframe Total Time:	1548.6 Hours at time of accident	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	TSIO-520-UB4F
Registered Owner:	Microjet LLC	Rated Power:	300 hp
Operator:	Stephen J. Hatch	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	FWA, 815 ft msl	Distance from Accident Site:	11 Nautical Miles
Observation Time:	1954 EST	Direction from Accident Site:	15°
Lowest Cloud Condition:		Visibility	2.5 Miles
Lowest Ceiling:	Overcast / 300 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	80°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	17° C / 17° C
Precipitation and Obscuration:			
Departure Point:	Boyne City, MI (N98)	Type of Flight Plan Filed:	
Destination:	Ft. Wayne, IN (SMD)	Type of Clearance:	IFR
Departure Time:	1812 EST	Type of Airspace:	Class C

Airport Information

Airport:	FORT WAYNE INTERNATIONAL (FWA)	Runway Surface Type:	Asphalt; Concrete
Airport Elevation:	815 ft	Runway Surface Condition:	Wet
Runway Used:	05	IFR Approach:	ILS
Runway Length/Width:	12000 ft / 150 ft	VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	3 Fatal, 1 Minor	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	On-Ground
Total Injuries:	3 Fatal, 1 Serious, 1 Minor	Latitude, Longitude:	40.867222, -85.688611

Administrative Information

Investigator In Charge (IIC):	Pamela S Sullivan	Report Date:	01/24/2005
Additional Participating Persons:	Mike Kenna; FAA; South Bend, IN Dave Kepple; FAA; South Bend, IN Brian D Cassidy; Beechcraft; Wichita, KS John Kent; Teledyne Continental; Seagoville, TX		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).