Aviation Investigation Final Report

Location:	Detroit, Michigan	**Accident Number:**	CHI05FA024
Date & Time:	November 8, 2004, 14:07 Local	**Registration:**	N63887
Aircraft:	Piper PA-23-250	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The multi-engine airplane collided with power lines, a house, a tree, and a fence following a loss of engine power during initial takeoff climb. A second house sustained fire and impact damage from flying debris. The pilot reported all engine indications were normal until after takeoff. The pilot reported he estimated being about 50 feet above ground level when he noticed a "split" in the manifold pressure and rpm indicating a loss of power on the left engine. He stated he turned to the south (left) to avoid obstacles and attempted to land in a field. A pilot-rated passenger reported that after takeoff, the pilot "seemed to be having problems gaining and maintaining altitude." She reported that she thought the pilot was returning to the airport when they began to lose altitude and that she heard the stall warning horn come on twice during the flight. She stated she was busy making call-outs and looking at the airspeed, and therefore did not know which engine had lost power or if the propeller had been feathered. Both engines had sustained heat and impact damage. Post accident inspection of the engines failed to reveal any failure/malfunction which would have resulted in the loss of engine power. Detailed inspection of the left engine propeller revealed the propeller had not been feathered prior to impact. The airplane information manual states that once the "... faulty engine is identified and its power loss verified, its propeller should be feathered."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to feather the propeller and to maintain control of the airplane following the loss of engine power which resulted from undetermined reasons. Factors associated with the accident were the power lines and the house that the airplane contacted.

Findings

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

Findings
1. 1 ENGINE
2. (C) REASON FOR OCCURRENCE UNDETERMINED
3. (C) PROPELLER FEATHERING - NOT PERFORMED - PILOT IN COMMAND
4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
5. (F) OBJECT - WIRE,TRANSMISSION
6. (F) OBJECT - RESIDENCE
7. OBJECT - TREE(S)
8. OBJECT - FENCE

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - EMERGENCY

Findings
9. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On November 8, 2004, at 1407 eastern standard time, a Piper PA-23-250, N63887, collided with power lines, a house, a tree, and a fence following a loss of engine power during an initial takeoff climb from the Detroit City Airport (DET), Detroit, Michigan. The pilot and a pilot-rated passenger were both seriously injured. There were no injuries to others on the ground. The airplane was destroyed by impact and post impact fire. The 14 Code of Federal Regulations Part 91 personal local flight was operating in visual meteorological conditions without a flight plan. The flight originated from DET at 1405.

The takeoff was made on runway 25 (4,025 feet by 100 feet, dry asphalt) at DET. The DET air traffic control tower cleared the airplane for a right turn to the north after takeoff. The pilot reported he powered up both engines prior to releasing the brakes for takeoff. He reported that all engine indications were normal and that he rotated for takeoff between 70 and 75 knots. The pilot reported he estimated being about 50 feet above ground level when he noticed a "split" in the manifold pressure and rpm indicating a loss of power on the left engine. He stated he turned to the south (left) to avoid obstacles and attempted to land in a field.

The pilot-rated passenger reported that after takeoff, the pilot "seemed to be having problems gaining and maintaining altitude." She reported that she thought the pilot was returning to the airport when they began to lose altitude. During a telephone interview the passenger stated she heard the stall warning horn come on twice during the flight. She stated she was busy making call-outs and looking at the airspeed, and therefore did not know which engine was lost power or if the propeller had been feathered. She stated that she did not observe the airplane preflight.

PERSONNEL INFORMATION

The pilot-in-command held a private pilot certificate with single-engine land, multi-engine land, and instrument airplane ratings. Federal Aviation Administration (FAA) records indicate the pilot held a second-class medical certificate issued April 20, 2004, with the restriction that he must wear corrective lenses. The pilot also held an airframe and powerplant (A&P) mechanic certificate.

According to the National Transportation Safety Board (NTSB) Pilot/Operator Aircraft Accident Report that was submitted by the pilot, his last biennial flight review was on January 10, 2004, in a Piper PA-28-140. The pilot reported having a total of 1,203.5 hours of flight time, of which 296.1 hours were in a PA-23-250. He reported having flown 1 hour of flight time in a PA-23-240 in the last 90 days.

The pilot-rated passenger held a commercial pilot certificate with single-engine land, multi-engine land, and instrument airplane ratings. In addition, she held a certified flight instructor certificate with single-engine land, and instrument ratings. The passenger held a first-class medical certificate dated September 21, 2004, with no restrictions. The passenger reported having a total of 771 hours of flight time of which 3 hours were in a PA-23-250. She reported having 0 hours of flight time in the last 90 days.

AIRCRAFT INFORMATION

N63887 was a PA-23-250, 1978 Piper Aztec, serial number 27-7854032. The maximum gross weight of the airplane was 5,200 pounds. The airplane was configured to hold six occupants. The twin engine airplane was powered by 2 Lycoming IA-540-C-4B5 engines. Each engine was rated at 250 horsepower.

The pilot reported the airframe, engine, and propeller logbooks were in the airplane at the time of the accident. None of the logbooks were located during the post accident inspection of the wreckage. The pilot reported that the total time on the airplane was approximately 8,000 hours. The pilot, who was also an A&P mechanic, stated he performed his own maintenance on the airplane. He stated he performed the last annual inspection in December 2003. The pilot stated the only work he had done on the left engine was to replace the starter.

The pilot reported the airplane was parked on the ramp at DET and had not been flown for approximately one month prior to the accident. The pilot stated the airplane was fueled shortly before it sat for the month.

METEOROLOGICAL INFORMATION

The weather reported at DET at 1415 was: wind 310 degrees at 11 knots gusting to 20 knots, 10 miles visibility, scattered clouds at 6,000 feet, temperature 7 degrees Celsius, dew point 2 degrees Celsius, and altimeter 30.34 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted wires, the roof of a house, and a tree prior to contacting the ground. The airplane then continued through a chain link fence and came to rest in the yard of a second residence. The second residence sustained fire damage and impact damage from aircraft debris. The residences that were damaged were located at 9027 and 9040 Holcomb Street, Detroit, Michigan. The accident site was located approximately one-half mile south of the departure end of runway 25.

The wreckage was inspected in a hangar at DET on November 17, 2004. The entire fuselage/cockpit area was destroyed by fire as was much of the wing structure. All cockpit instrumentation with the exception of the altimeter was destroyed by fire and impact.

The horizontal stabilator was intact and remained attached to the empennage. The leading edge of the outboard portion of the right stabilator was bent down. The outboard 18 inches of the right stabilator trim was crushed downward. The aft edge on the outboard section of the left stabilator was crushed and buckled upward. The inboard leading edge of the left stabilator was crushed downward. The stabilator trim was measured and the measurement corresponded to neutral trim. The rudder was intact and attached to the vertical stabilizer. The rudder trim jackscrew was measured and the measurement corresponded to 25 degrees of nose right trim. The empennage just aft of the aft seats was separated from the remainder of the fuselage. The forward portion of the empennage was buckled and bent to the left.

Flight control continuity was established from the cockpit to the flight control surfaces. All separated cables in the flight control system exhibited broom straw characteristics.

The throttle quadrant was burned away leaving the throttle, propeller, and mixture control quadrant rods. The throttle control rod for the left engine was extended 3/8 of an inch and the throttle control rod for the right engine was extended 3/4 of an inch. The left propeller control rod was extended 1/2-inch and the right propeller control rod was extended 5/8-inch. The left engine mixture control rod was in the full in position and the right engine mixture control rod was extended 1 1/4- inch.

The landing gear and the flaps were in the retracted position.

The left engine fuel valve was positioned to the left outboard fuel tank. The right engine fuel valve was positioned to the right inboard fuel tank.

Left Engine

The left engine, serial number L-9847-48, sustained impact and fire damage. The engine remained partially attached to the engine mounts. The engine and surrounding wing structure were separate from the remaining wing structure. The oil pan and bottom of the dipstick were melted. The spark plugs were removed and found clean with normal wear. The cylinder head covers were removed and all valves were intact. The cylinder walls and piston heads were inspected using a lighted boroscope. The piston heads were light gray in color and areas of rust were viewed on the cylinder walls. The engine was free to turn by hand and thumb compression was achieved on all cylinders. Continuity was established to all of the valves and to the accessory gears. Both magnetos sustained fire and heat damage which prevented them from being tested. The engine driven fuel pump was partially consumed by fire. The fuel lines to the flow divider were intact and attached to the divider. The fuel flow divider was opened and the outside diameter of the diaphragm had sustained heat damage. The fuel servo was found separated from its mounts. The fuel inlet screen was removed and rust was visible on both the spring and screen.

Right Engine

The right engine, serial number L-18481-48A, sustained impact and fire damage. The engine remained attached to the engine mounts and firewall. The upper wing skin was burned away outboard of the engine and the lower skin extended approximately 3 1/2-feet outboard of the engine. The top spark plugs were removed and appeared clean. The bottom plugs were not removed due to impact damage on the engine. The oil dipstick was removed and it showed the engine contained 6 quarts of oil. The oil appeared to be clean. The cylinder head covers were removed and all valves were intact. The cylinder walls and piston heads were inspected using a lighted boroscope. The piston heads were light gray in color and areas of rust were viewed on the cylinder walls. The engine was free to turn by hand and thumb compression was achieved on all cylinders. Continuity was established to all of the valves and to the accessory gears. Both magnetos sustained fire and heat damage which prevented them from being tested. The engine driven fuel pump was mostly consumed by fire. The fuel lines to the flow divider were intact and attached to the divider. The fuel flow divider was opened and the outside diameter of the diaphragm had sustained heat damage. The fuel servo was removed from the engine. The fuel inlet screen was removed. The screen was clean and dry.

Propellers

The airplane was equipped with 2 Hartzell HC-E2YR-2RBSF 2-bladed propellers. The propellers were hydraulically operated, constant speed models with feathering capability. Oil pressure was used to move the blade to the low pitch direction. A spring and an air charge were used to move the blades to a high pitch/feather position in absence of oil pressure. The propeller contained a start lock mechanism.

The left propeller was attached to the engine and the spinner was melted. A detailed inspection of this propeller was conducted. One of the propeller blades was straight with little impact damage. The other blade had leading edge gouges and the blade tip was bent forward. The pitch control arm was positioned against the high RPM (low blade angle/pitch) stop. The pitch change mechanism was seized. The cylinder had a dent on its side and it was separated from the hub. The piston was also dented in a position which corresponded to the dent in the cylinder. The position of the damage corresponded to a high RPM position. The low pitch stop had a small impact mark on it. The feather stop was not damaged. The start lock housing was fractured. One preload plate was undamaged. The other plate had a mark corresponding to the position of the fork. This elongated mark corresponded with a low blade angle.

The right propeller sustained head damage and remained attached to the engine. One propeller blade was bent back and twisted. The other blade was straight with several leading edge gouges and chordwise scratches.

ADDITIONAL INFORMATION

The PA-23-250 Information Manual states, "... if the airspeed is between 64 KIAS and 83 KIAS

and the pilot has decided to continue takeoff, the first step before attempting climb is to reach and maintain a minimum airspeed of 83 KIAS. Since one engine will be inoperative and the other will be at maximum power, the airplane will want to turn in the direction of the inoperative engine. Rudder pedal force on the side of the operating engine will be necessary to maintain directional control. Once committed to takeoff, maintain maximum power and retract the landing gear. Once the faulty engine is identified and it power loss verified, its propeller should be feathered."

Parties to the investigation were the FAA, Hartzell Propellers, and Textron Lycoming.

Pilot Information

Certificate:	Private	**Age:**	61,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:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	April 1, 2004
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 1, 2004
Flight Time:	1204 hours (Total, all aircraft), 296 hours (Total, this make and model), 1104 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Information

Certificate:	Commercial; Flight instructor	**Age:**	34,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	September 1, 2004
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	March 1, 2004
Flight Time:	771 hours (Total, all aircraft), 3 hours (Total, this make and model), 588 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N63887
Model/Series:	PA-23-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	27-7854032
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	IO-540-C4B5
Registered Owner:	Bonnies Deli, Inc	**Rated Power:**	250 Horsepower
Operator:	Willie L. Shaw	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DET,626 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	14:19 Local	**Direction from Accident Site:**	70°
Lowest Cloud Condition:	Scattered / 6000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.34 inches Hg	**Temperature/Dew Point:**	7°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Detroit, MI (DET)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	VFR
Departure Time:	14:05 Local	**Type of Airspace:**	

Airport Information

Airport:	Detroit City DET	**Runway Surface Type:**	Asphalt
Airport Elevation:	626 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	25	**IFR Approach:**	None
Runway Length/Width:	4025 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Serious	**Latitude, Longitude:**	42.405555,-83.005836

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	Melvin Beasley; Belleville, MI FAA FSDO; Belleville, MI Greg Erikson; Lycoming Engines; Williamsport, PA Tom McCreary; Hartzell Propellers; Piqua, OH George Hollingsworth; Piper; Wichita, KS
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Investigation Class:	Class
Note:	
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