



National Transportation Safety Board Aviation Accident Final Report

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| Location: | Hammonton, NJ | Accident Number: | NYC07LA001 |
| Date & Time: | 10/03/2006, 1230 EDT | Registration: | N5097P |
| Aircraft: | Piper PA-24-250 | Aircraft Damage: | Substantial |
| Defining Event: | | Injuries: | 1 None |
| Flight Conducted Under: | Part 91: General Aviation - Personal | | |

Analysis

The airplane was on a base leg to the airport when the engine lost power, and the pilot performed a forced landing to a swampy area short of the runway. A subsequent examination of the engine revealed that within the accessory section, the idler gear assembly, which normally transferred power from the crankshaft to the left magneto and the camshaft, had been displaced. The mounting shaft had also been displaced, and the shaft hole was elongated. The upper portions of both shaft mounting plate retaining screws were missing. The lower screw appeared to be sheared, while the remnant of the upper screw exhibited mechanical damage. The crankcase surface area around the upper screw hole exhibited fretting, and the idler gear had missing and damaged gear teeth. Remnants of the shaft mounting plate retaining screws and screw lockplate were found in the bottom of the crankcase. The engine operating time was below the recommended time between overhaul (TBO). However, the manufacturer also recommended an overhaul if the TBO was not reached within the previous 12 years, and the accident engine had not been overhauled in over 30 years. The failure sequence could not be determined, and although an excessive amount of time had passed since the previous overhaul, the lack of an overhaul could not be correlated to the displacement of the idler gear assembly.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Displacement of the idler gear assembly, which resulted in a loss of camshaft timing, and a subsequent engine failure. Contributing to the accident was the swampy terrain condition.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: APPROACH - VFR PATTERN - BASE LEG/BASE TO FINAL

Findings

1. (C) ACCESSORY DRIVE ASSY,DRIVE GEAR - SHIFTED
2. ENGINE ASSEMBLY,CAMSHAFT - TIMING IMPROPER

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

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

Findings

3. (F) TERRAIN CONDITION - SWAMPY

Factual Information

On October 3, 2006, about 1230 eastern daylight time, a Piper PA-24-250, N5097P, was substantially damaged when it impacted terrain while approaching Hammonton Municipal Airport (N81), Hammonton, New Jersey. The certificated private pilot was not injured. Visual meteorological conditions prevailed. No flight plan was filed for the flight, from Cross Keys Airport (17N), Cross Keys, New Jersey, to Hammonton. The personal flight was conducted under 14 Code of Federal Regulations Part 91.

According to the pilot, the airplane was on a base leg to the airport when he turned on the auxiliary fuel pump, and the engine lost power. The pilot then performed a forced landing to a swampy area short of runway 21.

A subsequent examination of the Lycoming O-540-A engine revealed that within the accessory section, the idler gear assembly, which normally transferred power from the crankshaft to the left magneto and the camshaft, had been displaced. The mounting shaft had also been displaced, the shaft hole was elongated, and the upper portions of both shaft mounting plate retaining screws were missing. The lower screw appeared to be sheared, while the remains of the upper screw exhibited mechanical damage. The crankcase surface around the upper screw hole exhibited fretting, and the idler gear had missing and damaged gear teeth. Remnants of the retaining screws and screw lockplate were found in the bottom of the crankcase. The failure sequence could not be determined.

The pilot reported 1,393 hours of engine operation since overhaul. The engine logbook revealed that the engine was last overhauled on February 1, 1975.

Lycoming Service Instruction 1009AS, "Recommended Time Between Overhaul Periods," recommended 2,000 hours of operation between overhaul. In addition, "All engines that do not accumulate the hourly period of time between overhauls specified in this publication are recommended to be overhauled in the twelfth year." However, there was no evidence that the calendar time since the previous overhaul contributed to the displacement of the idler gear assembly.

Pilot Information

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|----------------------------------|--|--|----------------------------|
| Certificate: | Private | Age: | 73, 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): | Instrument Airplane | Toxicology Performed: | No |
| Medical Certification: | Class 3 With Waivers/Limitations | Last FAA Medical Exam: | 08/01/2006 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | 10/01/2005 |
| Flight Time: | 1050 hours (Total, all aircraft), 230 hours (Total, this make and model), 3 hours (Last 90 days, all aircraft) | | |

Aircraft and Owner/Operator Information

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|--------------------------------------|--|---------------------------------------|-----------------|
| Aircraft Make: | Piper | Registration: | N5097P |
| Model/Series: | PA-24-250 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | 24-107 |
| Landing Gear Type: | Retractable - Tricycle | Seats: | 4 |
| Date/Type of Last Inspection: | 12/01/2005, Annual | Certified Max Gross Wt.: | 2900 lbs |
| Time Since Last Inspection: | 38 Hours | Engines: | 1 Reciprocating |
| Airframe Total Time: | 3671 Hours as of last inspection | Engine Manufacturer: | Lycoming |
| ELT: | Installed, activated, did not aid in locating accident | Engine Model/Series: | O-540A1A |
| Registered Owner: | Frank L. Greiner | Rated Power: | 250 hp |
| Operator: | Frank L. Greiner | Operating Certificate(s) Held: | None |

Meteorological Information and Flight Plan

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|----------------------------------|----------------------------------|--------------------------------------|-------------------|
| Conditions at Accident Site: | Visual Conditions | Condition of Light: | Day |
| Observation Facility, Elevation: | ACY, 75 ft msl | Distance from Accident Site: | 15 Nautical Miles |
| Observation Time: | 1254 EDT | Direction from Accident Site: | 120° |
| Lowest Cloud Condition: | Clear | Visibility | 10 Miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 9 knots / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 210° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 30.2 inches Hg | Temperature/Dew Point: | 27° C / 12° C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Cross Keys, NJ (17N) | Type of Flight Plan Filed: | None |
| Destination: | Hammonton, NJ (N81) | Type of Clearance: | None |
| Departure Time: | EDT | Type of Airspace: | |

Airport Information

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|----------------------|----------------------|---------------------------|----------------------------|
| Airport: | Hammonton Muni (N81) | Runway Surface Type: | Asphalt |
| Airport Elevation: | 70 ft | Runway Surface Condition: | Dry |
| Runway Used: | 23 | IFR Approach: | None |
| Runway Length/Width: | 3600 ft / 75 ft | VFR Approach/Landing: | Full Stop; Traffic Pattern |

Wreckage and Impact Information

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|---------------------|--------|----------------------|-----------------------|
| Crew Injuries: | 1 None | Aircraft Damage: | Substantial |
| Passenger Injuries: | N/A | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 None | Latitude, Longitude: | 39.671667, -74.755000 |

Administrative Information

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|-----------------------------------|--|--------------|------------|
| Investigator In Charge (IIC): | Paul R Cox | Report Date: | 04/30/2008 |
| Additional Participating Persons: | Robert Drapala; FAA/FSDO; Philadelphia, PA Michael Childers; Lycoming Engines; Williamsport, PA | | |
| 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 pubinquiry@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](#).