



National Transportation Safety Board Aviation Accident Final Report

Location:	MYERSTOWN, PA	Accident Number:	NYC97LA024
Date & Time:	12/02/1996, 1521 EST	Registration:	N394PM
Aircraft:	Piper PA-46-350P	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Serious

Flight Conducted Under: Part 91: General Aviation - Personal

Analysis

During the climb after takeoff, between 3,500 and 4,000 feet, the pilot noticed the engine oil pressure decreasing and the oil temperature increasing. The pilot advised the controller that he was experiencing a problem, and he was provided radar vectors to the nearest airport. During vectors, the engine failed, and oil covered the windshield and pilot's side window. Unable to see the airport, the pilot completed a forced landing to an open field, where the airplane impacted the ground. The engine had accumulated about 440 hrs of flight time, since it was last overhauled (by the manufacturer). Investigation revealed that remanufactured connecting rods had been installed. Examination of the engine revealed four of the six connecting rod bearings had melted at the crankshaft, and fatigue cracks were found on the number four connecting rod and end cap. When the connecting rod end cap retaining nuts were removed, rings of moderate wear and fretting were found in the nut recesses where the nuts contacted the rods.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: fatigue failure of the connecting rod to crankshaft attachments, due to inadequate overhaul of the engine by the manufacturer, which resulted in a loss of engine power and a forced landing. Factors relating to the accident included the discharge of oil from the ruptured engine, which subsequently obstructed the pilot's view through the windshield and side window, preventing him from having an unobstructed view of the emergency landing area.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CLIMB

Findings

1. (C) ENGINE ASSEMBLY,CONNECTING ROD BOLT - LOOSE
 2. (C) MAINTENANCE,REBUILD/REMANUFACTURE - INADEQUATE - MANUFACTURER
 3. (C) ENGINE ASSEMBLY,CONNECTING ROD - FATIGUE
 4. (C) ENGINE ASSEMBLY,CONNECTING ROD CAP - FATIGUE
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Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

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

Findings

5. (F) FLUID,OIL - DISCHARGED
6. (F) WINDOW,FLIGHT COMPARTMENT WINDOW/WINDSHIELD - OBSTRUCTED
7. (F) VISUAL/AURAL DETECTION - PILOT IN COMMAND

Factual Information

On December 2, 1996, at 1521 eastern standard time, a Piper PA-46-350P, N394PM, was substantially damaged during a forced landing near the Decks Airport, Myerstown, Pennsylvania. The certificated private pilot received serious injuries. Visual meteorological conditions prevailed for the personal flight that originated at Harrisburg, Pennsylvania, about 1508. A visual flight rules flight plan had been filed for the flight conducted under 14 CFR Part 91.

In the NTSB Form 6120.1/2, the pilot/owner stated that he flew an uneventful proficiency flight from Somerset, New Jersey, to Harrisburg. After landing, without shutting the engine down, he received taxi and flight following instructions for a return flight to Somerset. During the climb after takeoff, between 3,500 and 4,000 feet, the pilot noticed the engine oil pressure decreasing, and the oil temperature increasing. The pilot advised the controller that he was experiencing a problem, and after a discussion with the controller, he was provided a heading to the Decks Airport.

The pilot further stated:

"...He vectored me toward the Decks Airport and about the time I made the turn to the proper heading, the engine stopped running and oil was thrown on the left windscreen. I was having trouble seeing. The only thing I was able to see in front of me was a row of houses. I looked out the right side window and saw a field and I decided I would try to put the plane down on the field..."

Several witnesses observed the airplane near the Decks Airport. Three of the witnesses stated that they observed the airplane heading east, about 2 miles south of the airport, at 3,000 feet. They observed white smoke trailing the airplane. The airplane made an abrupt turn to the north, and when the airplane was about mid-field, black smoke was observed trailing the airplane.

The witnesses further stated:

"...At that time he made a hard left turn toward the southwest, the engine had locked-up and the gear was down. It appeared that he was trying to make the field but could not. He stalled the airplane approximately 40 feet above the ground at which time the right wing dropped. Then he impacted the ground..."

On January 8, 1997, the engine was disassembled at Executive Air, Hagerstown, Maryland. Present during the examination was the NTSB investigator-in-charge, and parties to the investigation. The engine examination revealed that the numbers one, two, and five connecting rod ends and bearings had melted from the crankshaft. The number six connecting rod crankshaft bearing was melted to the crankshaft. The number three connecting rod rotated freely on the crankshaft; however, when disassembled, the bearing was worn and grooved. The number four connecting rod crankshaft bearing was broken in several pieces and partially melted to the crankshaft. The numbers three and four connecting rods and bearings were removed for further examination.

Several pieces of metal were found in the valve covers of the numbers two, four, and six cylinders. The suction oil screen was packed with metal particles similar to the connecting rod ends. Large quantities of metal particles were also found in the oil filter, lines and sump. One

turbo charger rotated freely. The other turbo charger contained caked mud. When the mud was removed, the turbo charger rotated freely.

NTSB Materials Laboratory

The connecting rod components were sent to the NTSB Materials Laboratory Division for examination. The Metallurgist's Factual Report addressed the number four connecting rod. The report stated:

"...fractures were located at the machined recess for the rod bolt nuts. Optical examinations revealed features indicative of fatigue progression along two fronts for each fracture...fatigue fronts initiated at multiple origins on the machined sides of the nut recess...fatigue fronts initiated at the corners between the recess and the exterior surface of the rod...The rod cap was transversely fractured approximately equidistant from the split line faces...Optical examination of the fracture showed characteristics of multiple independent fatigue cracks emanating from the bearing surface..."

The Metallurgist's report also stated:

"...the rod bolt nuts were cut and removed...Visual examination found moderate fretting and some galling on the contact faces...With the nuts removed, rings of moderate wear and fretting were noted in the nut recesses where the nuts contacted the rods..."

Engine History

The Lycoming engine installed in N394PM had been overhauled by Textron-Lycoming, on September 25, 1995. The Lycoming certificate in the engine log book stated, "...All parts have been inspected and have been determined airworthy to return to service..." The engine was installed with zero total time. At the time of installation a new oil cooler, oil cooler hoses, and oil filter were also installed. The engine examination revealed that the connecting rods were stamped with "-85." According to the Lycoming investigator, the -85 represented remanufactured parts. The engine had accumulated about 440 hours since installation. The engine log book revealed that the engine oil had been changed on the average about every 18 hours for the first 100 hours of operation, and every 27 hours for the next 350 hours.

Fuselage

The airplane fuselage was also examined on January 8, 1997. An oil coating obstructed vision out the front windshield and pilot's side window. The examination also revealed that the pilot's shoulder harness reel and attachment bracket had separated from the fuselage.

This accident, and another fatal PA-46 accident, were review with the New Piper Aircraft, Inc. As a result of the information, the New Piper Aircraft, Inc., issued a PA-46 service bulletin for a shoulder harness mounting bracket replacement kit.

Pilot Information

Certificate:	Private	Age:	70, Male
Airplane Rating(s):	Multi-engine Land; 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--w/ waivers/lim.	Last FAA Medical Exam:	10/12/1996
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	1924 hours (Total, all aircraft), 300 hours (Total, this make and model), 1707 hours (Pilot In Command, all aircraft), 64 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N394PM
Model/Series:	PA-46-350P PA-46-350P	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	4622153
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	03/16/1996, Annual	Certified Max Gross Wt.:	4300 lbs
Time Since Last Inspection:	233 Hours	Engines:	1 Reciprocating
Airframe Total Time:	1433 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540-AE2A
Registered Owner:	MARK J. ANTON	Rated Power:	350 hp
Operator:	MARK J. ANTON	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	RDG, 344 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	1455 EST	Direction from Accident Site:	90°
Lowest Cloud Condition:	Scattered / 8000 ft agl	Visibility	20 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	7°C / 3°C
Precipitation and Obscuration:			
Departure Point:	HARRISBURG INTL, PA (MDT)	Type of Flight Plan Filed:	VFR
Destination:	SOMERSET, NJ (N52)	Type of Clearance:	VFR
Departure Time:	1508 EST	Type of Airspace:	Class C

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	ROBERT L PEARCE	Report Date:	04/15/1998
Additional Participating Persons:	JOSEPH GREEN; HARRISBURG, PA JAMES BROWN; WILLIAMSPORT, PA DANIEL MCANALLY; VERO BEACH, FL		
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](#).