



National Transportation Safety Board Aviation Accident Final Report

Location:	SKWENTNA, AK	Accident Number:	ANC96LA140
Date & Time:	09/01/1996, 1505 AKD	Registration:	N4366Y
Aircraft:	Piper PA-28-161	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor, 2 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled - Sightseeing		

Analysis

The pilot & 2 passengers departed on a local area sightseeing flight. While in cruise flight at about 4,000 ft, the engine developed a vibration, then lost power. Oil spray was deposited on the windshield. The pilot performed an emergency landing on a sand bar. After landing, he noticed that the entire propeller, propeller flange, & the outboard end of the engine crankshaft were missing from the engine. Examination of the engine revealed evidence of fatigue cracking, emanating from a corrosion pit on the inner diameter surface of the crankshaft bore. Numerous other corrosion pits were found adjacent to the fracture origin. The engine manufacturer reported the engine was built & shipped from the factory on 4/13/81. The engine was the subject of a mandatory service bulletin (S/B), dated 1018/94, that addressed the inspection of the inside bore of the crankshaft for the presence of corrosion. The S/B required that an initial inspection be conducted within the next 200 hrs of operation or 1 year from the date of the S/B. The operator's company manual stated the Director of Maintenance shall ensure that current manufacturer's mandatory S/B's were complied with. No record of compliance with the S/B was noted in the engine maintenance records.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: corrosion and subsequent fatigue failure of the crankshaft, which resulted in engine failure and a forced landing. Factors related to the accident were: the lack of suitable terrain for a forced landing, and the operator's non-compliance with a service bulletin.

Findings

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

Findings

1. (C) ENGINE ASSEMBLY,CRANKSHAFT - CORRODED
2. (C) MAINTENANCE,SERVICE BULLETIN/LETTER - NOT COMPLIED WITH - COMPANY MAINTENANCE PERSONNEL
3. (C) ENGINE ASSEMBLY,CRANKSHAFT - FATIGUE
4. PROPELLER SYSTEM/ACCESSORIES - SEPARATION

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) TERRAIN CONDITION - NONE SUITABLE

Factual Information

On September 1, 1996, about 1505 Alaska daylight time, a wheel equipped Piper PA-28-161, N4366Y, crashed during a forced landing about 7 miles east of Skwentna, Alaska. The airplane was being operated as a visual flight rules (VFR) local area sightseeing flight under Title 14 CFR Part 135 when the accident occurred. The airplane, registered to and operated by Vernair Inc., Anchorage, Alaska, sustained substantial damage. The certificated commercial pilot and one passenger were not injured. One passenger received minor injuries. Visual meteorological conditions prevailed. A VFR flight plan was filed and VFR company flight following procedures were in effect. The flight originated at Merrill Field, Anchorage, at 1440.

The operator/pilot reported that he was in cruise flight about 4,000 feet mean sea level when the engine developed a vibration. He switched fuel tanks and applied carburetor heat. The engine condition did not improve and began to run rough. The engine then quit and oil spray was deposited on the windshield. The pilot maneuvered the airplane toward a sand bar adjacent to the Yentna River. During the touchdown on the sand bar, the main gear encountered soft mud. The airplane received damage to the main gear and fuselage. After the emergency landing, the pilot noticed that the entire propeller, propeller flange and the outboard end of the engine crankshaft were missing from the engine. The missing propeller and crankshaft segment were not recovered.

On September 11, 1996, an engine examination was conducted at Sea Air Inc., Anchorage, Alaska. The examination revealed the crankshaft was broken about even with the front edge of the engine case. The crankshaft displayed a diagonal fracture and crack oriented in an aft direction on a 45 degree angle from just forward of the oil slinger flange.

The engine crankshaft was submitted to the National Transportation Safety Board (NTSB) Materials Laboratory for examination. The examination revealed crack arrest positions indicative of fatigue cracking emanating from the inner diameter surface of the crankshaft bore. The crack progressed between the forward edge of the oil slinger in a forward direction through 1/3 of the radius of the crankshaft, forward of the oil slinger. Examination of the crack origin revealed a 0.01 by 0.01 inch corrosion pit. A second fatigue crack origin was noted at the intersection of the first crack and the forward edge of the oil slinger. This crack progressed in an aft direction along a 45 degree angle around and through the number 1 main bearing journal.

Numerous other corrosion pits were found adjacent to the fracture origin. The inside diameter surface of the crankshaft bore was covered by heavy accumulations of sludge deposits.

Examination of the maintenance records revealed the engine was overhauled on October 8, 1992. The operator reported the engine accrued a total time in service of 8,775.0 hours, 1,879.9 since the last overhaul. The operator noted a previous major engine overhaul as "rebuilt" in June, 1988. The crankshaft had been ground 0.006 inches undersize.

The engine manufacturer reported the engine was built and shipped from the factory on April 13, 1981. They did not have any record the engine was ever returned to the factory for an overhaul or remanufacture.

The engine is the subject of a Lycoming Engine Mandatory Service Bulletin number 505A, dated October 18, 1994. The service bulletin addresses the inspection of the inside diameter of 4 cylinder engines for the presence of corrosion. The bulletin requires an initial inspection of

the crankshaft..."For new, remanufactured and overhauled engines shipped from Lycoming prior to and including 1984, the initial inspection must be conducted within the next 200 hours of operation or 1 year from date of this Service Bulletin, whichever comes first. For new, remanufactured and overhauled engine shipped from Lycoming after 1984, the initial inspection must be conducted at the next overhaul or engine disassembly or within 10 years of the original ship date, whichever comes first."

The operator's company operations manual, chapter XIII, states in part:..."13-1 Aircraft Inspection and Maintenance:...b. It shall be the responsibility of the Director of Maintenance to ensure that adequate equipment, A.D. notes and current manufacturers service bulletins that are mandatory are complied with."

A review of the engine maintenance records did not reveal any notation that the operator complied with the service bulletin.

Pilot Information

Certificate:	Commercial	Age:	63, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	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 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	04/26/1996
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	3100 hours (Total, all aircraft), 1586 hours (Total, this make and model), 3069 hours (Pilot In Command, all aircraft), 70 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:	N4366Y
Model/Series:	PA-28-161 PA-28-161	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	28-8416053
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	04/12/1996, Annual	Certified Max Gross Wt.:	2440 lbs
Time Since Last Inspection:	63 Hours	Engines:	1 Reciprocating
Airframe Total Time:	8453 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	O-320-D3G
Registered Owner:	VERNAIR	Rated Power:	160 hp
Operator:	VERNAIR	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	INXA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0000	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	100 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	7° C
Precipitation and Obscuration:			
Departure Point:	ANCHORAGE, AK (MRI)	Type of Flight Plan Filed:	VFR
Destination:		Type of Clearance:	VFR
Departure Time:	1440 ADT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 Minor, 1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 2 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC): SCOTT R ERICKSON **Report Date:** 03/31/1998

Additional Participating Persons: WILBER KEITH; ANCHORAGE, AK
JEFFREY POSCHWATTA; KENT, WA

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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