Aviation Investigation Final Report

Location:	Clearwater, Idaho	**Accident Number:**	SEA04LA189
Date & Time:	September 13, 2004, 12:45 Local	**Registration:**	N4661F
Aircraft:	Cessna P206A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While en route, the aircraft's engine began to run rough, vibrate, and make a lot of unusual noises. Soon thereafter the oil pressure dropped to 0 psi, and the engine seized. The pilot then attempted an emergency power-off landing in an open field, but the nose gear collapsed, and the nose gear strut dug into the dirt resulting in the aircraft nosing over onto its back. A teardown inspection of the engine revealed that the number three piston pin had failed, and as a result a significant portion of the internal components of the engine had been destroyed. An examination of the Superior Air Parts piston pin revealed that it had failed along a fatigue crack that propagated across the longitudinal axis of the pin. The portion of the pin that contained the origin of the crack was not recovered, and therefore a determination of the initiating factor could not be made.

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Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to fatigue crack propagation of the number three piston pin while in cruise flight, leading to a power off forced landing in an open field. Factors include soft uphill terrain.

Findings

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

Findings
1. (C) ENGINE ASSEMBLY - FATIGUE

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

Occurrence #3: GEAR COLLAPSED
Phase of Operation: EMERGENCY LANDING

Findings
2. LANDING GEAR,NOSE GEAR - OVERLOAD
3. (F) TERRAIN CONDITION - UPHILL

Occurrence #4: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
4. (F) TERRAIN CONDITION - SOFT

Occurrence #5: NOSE OVER
Phase of Operation: EMERGENCY LANDING

Factual Information

On September 13, 2004, approximately 1245 mountain daylight time, a Cessna P206A, N4661F, nosed over during a forced landing in an open field near Clearwater, Idaho. The airline transport pilot and his three passengers were not injured, but the aircraft, which is owned and operated by the pilot, sustained substantial damage. The 14 CFR Part 91 personal pleasure flight, which departed Weiser, Idaho, about 75 minutes prior to the accident, was being operated in visual meteorological conditions. No flight plan had been filed for the flight to Moose Creek, Idaho. The ELT, which was activated by the accident sequence, was picked up by a Forest Service aircraft, whose crew notified the local Sheriff's Department.

According to the pilot, while en route, the aircraft's engine began to run rough, vibrate, and make a lot of unusual noises. He therefore checked the oil pressure, which was indicating zero psi, so he reduced the power and turned toward lower terrain. About 30 seconds after the onset of the symptoms, the engine seized, and the pilot decided to make an emergency power-off landing in an open field. Due to the fact that the pilot was landing without power on a "fairly steep upslope," the nose gear contacted the surface with sufficient force to result in its collapse, and as the aircraft began to slide across the soft terrain, the nose gear strut dug into the dirt, and the aircraft nosed over onto its back.

A preliminary inspection of the engine revealed that the case was cracked in an area above the number three piston, and the small end of the number three connecting rod was protruding slightly from the top of the case. A further teardown inspection of the engine revealed that the number three piston was no longer connected to its associated connecting rod, but that both the piston pin boss in the piston and the piston pin boss in the small end of the connection rod were intact. A significant portion of the internal components of the engine had been destroyed, and eleven separate pieces of the piston pin were able to be recovered from areas inside the case and in the oil sump. Although the damage to the pin had obliterated any manufacturer's identification markings, all the other piston pins in the engine had the Superior Air Parts "S" stamped into their aluminum caps.

The recovered piston pin pieces were submitted to the NTSB's Materials Laboratory Division, where close examination revealed that four pieces of the pin contained areas of crack propagation along the longitudinal axis of the pin in a plane normal to the surface, with arrest marks consistent with fatigue. Further inspection of the pin revealed that the fatigue regions were all part of a single fatigue crack that initiated from the inner diameter surface of the pin. None of the recovered pieces contained the origin of the crack, but examination of the inner diameter surface of the recovered pieces did not reveal any clear signs of corrosion or other preexisting surface damage.
One small additional fatigue crack was observed in one of the fragments, but the location of that fragment within the pin could not be determined. The macroscopic superficial hardness

measurement of the outer diameter surface of the failed pin (HRC 44) was within the required hardness range of HRC 42-45.

Due to the lack of an origin area, a clear determination of the initiating cause could not be made.

Pilot Information

Certificate:	Airline transport; Flight engineer; Flight instructor	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	July 18, 2003
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	September 24, 2003
Flight Time:	26751 hours (Total, all aircraft), 275 hours (Total, this make and model), 19890 hours (Pilot In Command, all aircraft), 42 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4661F
Model/Series:	P206A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	P206-0261
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 2, 2004 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	49 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4248 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-520-A
Registered Owner:	William J. Vaughn	**Rated Power:**	285 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Weiser, ID (S87)	**Type of Flight Plan Filed:**	Unknown
Destination:	Moose Creek, ID (1U1)	**Type of Clearance:**	None
Departure Time:	11:30 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	46.023887,-115.889442

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	John Phillips; Spokane FSDO; Spokane, WA
Original Publish Date:	July 7, 2005
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=60146