



National Transportation Safety Board Aviation Accident Final Report

Location:	EDISON, WA	Accident Number:	SEA99LA046
Date & Time:	04/02/1999, 1425 PST	Registration:	N8464K
Aircraft:	Cessna 205	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Shortly after takeoff, and while cruising at 3,000 feet (mean sea level) over Samish Bay, the Cessna 205's Continental IO-470-S engine ceased developing power. With the propeller continuing to windmill, and only muddy fields available, the pilot initiated a forced landing to a north/south paved road at the south end of the bay. The pilot, observing power lines along the west side of the road, landed along the east side. During the landing roll the left wing impacted a sign. With the pilot being unable to maintain directional control of the aircraft following the sign impact, the aircraft departed the left side of the road into a deep ditch. Post-crash examination of the engine revealed that the crankshaft had separated at the number six cheek. Metallurgical examination of the crankshaft revealed that a large area in the central portion of number six cheek fracture surface displayed a smooth texture and contained multiple crack arrest features, characteristic of fatigue progression originating at the outboard flat surface of the crankcheek, approximately at the mid point between the horizontal centerlines for the main and rod journals. No further determination could be made regarding the initiating condition of the fatigue due to post-separation heat and mechanical damage to the fracture features.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of engine power due to fatigue of the number six crankcheek resulting in crankshaft separation, and the lack of suitable terrain. Contributing factors were the sign and the ditch.

Findings

Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: CRUISE

Findings

1. (C) ENGINE ASSEMBLY,CRANKSHAFT - FATIGUE
2. (C) ENGINE ASSEMBLY,CRANKSHAFT - SEPARATION

Occurrence #2: FORCED LANDING

Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING - ROLL

Findings

3. (F) OBJECT - SIGN
4. (C) TERRAIN CONDITION - NONE SUITABLE
5. (F) TERRAIN CONDITION - DITCH
6. OBJECT - WIRE,TRANSMISSION

Factual Information

HISTORY OF FLIGHT

On April 2, 1999, approximately 1425 Pacific standard time, a Cessna 210-5 (205), N8464K, registered to and being flown by a private pilot, was substantially damaged during a forced landing approximately two nautical miles southwest of Edison, Washington, following a complete loss of power in cruise. The pilot sustained minor injuries. Visual meteorological conditions existed and no flight plan had been filed. The flight, which was personal, was to have been operated under 14CFR91, and originated from the Bellingham International airport, Bellingham, Washington, at 1415.

The pilot reported to the investigator-in-charge that he departed Bellingham, climbed to 3,000 feet above mean sea level (MSL) and set cruise power. Approximately three to four minutes later, and while flying southbound over Samish Bay, the engine began to lose power. The pilot attempted to troubleshoot the problem adjusting throttle and mixture without success, and after approximately 30 to 60 seconds all power was lost. With the propeller continuing to windmill and only muddy fields available, the pilot initiated a forced landing to a north/south paved road at the south end of Samish Bay. The pilot, observing power lines along the west side of the road, landed along the east side. During the landing roll the left wing impacted a sign and the aircraft rolled off the left side of the road into a deep ditch.

Post-crash examination of the engine by an inspector from the Federal Aviation Administration's Flight Standards District Office revealed a discontinuity in the engine crankshaft. Specifically, when the propeller was rotated by hand no accessory gear train rotation was observed.

AIRCRAFT INFORMATION

Records indicated that the Continental IO-470-D engine had been manufactured 02/26/76 and was subsequently overhauled at an unknown time and date. The first entry in the engine log, dated 09/19/90, indicated that the engine had been removed from N86627 and that "Logbook [had been] lost, maintenance records show engine has 420 hrs approximately since factory overhaul. Engine disassembled to confirm time. Crankshaft magnafluxed OK. Replaced main & rod Brgs, seals & gaskets -."

The next logbook entry, dated January 1991, stated that the engine was "removed from 310G, 60 hrs operation since previous entry -."

The next logbook entry, dated 05/16/92, stated that "Engine time SMOH [since major overhaul] is 480 hrs. S/N CS105475R. Engine installed in Cessna 205 N8464K."

The next logbook entry, also dated 05/16/92, stated that "Annual Inspection. Verified that this engine has been converted from an IO-470D to an IO-470S for inst. in Cessna 205 N8464K S/N 205-0460. I certify that this engine has been inspected per Annual inspection and found to be airworthy."

There was no record within the engine log of any core maintenance (crankshaft or bearings) having been accomplished following the 05/16/92 inspection.

The last engine inspection was recorded on 06/10/98 at a total time in service (SMOH) of 1121.9 hours. The engine had been operated an additional 61 hours between this date and the

accident.

Documentation provided by the engine manufacturer showed no difference between the buildup of the IO-470-D version compared to the IO-470-S (refer to ATTACHMENT TCM-I).

TESTS AND RESEARCH

The engine was shipped to the facilities of Teledyne Continental where it was disassembled and examined on 04/28/99 under the oversight of an Air Safety Investigator from the Board's Northwest Regional Office. The examination revealed that the crankshaft had separated at the number six cheek. No other significant disparities were noted (refer to ATTACHMENT TCM-II).

The crankshaft and connecting rods were shipped to the Board's Office of Research and Engineering, Material Laboratory Division. Examination revealed that a large area in the central portion of number six cheek fracture surface displayed a smooth texture and contained multiple crack arrest features, characteristic of fatigue progression (refer to MATERIALS LABORATORY FACTUAL REPORT 99-133). Additionally, the report stated that "the curvature of the crack arrest positions indicated that the fatigue initiated at the outboard flat surface of the crankcheek, approximately at the mid point between the horizontal centerlines for the main and rod journals." Further examination with a scanning electron microscope revealed that "post-separation heat and mechanical damage destroyed all discernable fracture features in this piece."

ADDITIONAL INFORMATION

The engine was returned to Chuckanut Aviation Center, Burlington, Washington, in early May 1999. The crankshaft and connecting rods were returned to a representative of the insurance holder on July 2, 1999. Formal release of the engine (S/N CS105475R) was documented on NTSB Form 6120.15 (attached).

Pilot Information

Certificate:	Private	Age:	53, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
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:	03/31/1999
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	333 hours (Total, all aircraft), 197 hours (Total, this make and model), 281 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N8464K
Model/Series:	205 205	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	2050460
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	06/10/1998, Annual	Certified Max Gross Wt.:	3300 lbs
Time Since Last Inspection:	61 Hours	Engines:	1 Reciprocating
Airframe Total Time:	4398 Hours	Engine Manufacturer:	Continental
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-470-S
Registered Owner:	ZOSEL, PAUL, J.	Rated Power:	260 lbs
Operator:	ZOSEL, PAUL, J.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BLI, 166 ft msl	Distance from Accident Site:	15 Nautical Miles
Observation Time:	1453 PST	Direction from Accident Site:	330°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 7000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	9°C / 2°C
Precipitation and Obscuration:			
Departure Point:	BELLINGHAM, WA (BLI)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1415 PST	Type of Airspace:	Class G

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC): STEVEN A MCCREARY **Report Date:** 03/31/2000

Additional Participating Persons: WILLIAM REICHARDT; RENTON, WA
MICHAEL GRIMES; LANCASTER, CA
DEBORAH J ECKROTE; SEATTLE, 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/>.

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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](#).