



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	SKAGWAY, AK	<b>Accident Number:</b>	ANC93LA077
<b>Date &amp; Time:</b>	06/02/1993, 1455 AKD	<b>Registration:</b>	N8127K
<b>Aircraft:</b>	PIPER PA-32-300	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	3 Minor, 2 None
<b>Flight Conducted Under:</b>	Part 135: Air Taxi & Commuter - Non-scheduled		

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## Analysis

ABOUT 15 MIN AFTER DEPARTING SKAGWAY, WHILE MANEUVERING OVER A GLACIER, THE PILOT NOTED DECREASING ENGINE OIL PRESSURE. SHORTLY THEREAFTER THE ENGINE BEGAN TO EMIT METALLIC SOUNDS, AND THEN THE ENGINE QUIT. AN EMERGENCY LANDING WAS MADE ON THE GLACIER. ON-SCENE EXAMINATION OF THE ENGINE REVEALED THAT THE #2 CYLINDER CONNECTING ROD HAD FAILED. SUBSEQUENT METALLURGICAL EXAMINATION BY THE SAFETY BOARD REVEALED THAT THE FRACTURE OF THE ROD THROUGH THE STRAP AREA ADJACENT TO THE HEAD OF THE ROD BOLT DISPLAYED FEATURES TYPICAL OF A FATIGUE FRACTURE.

## 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 AS A RESULT OF A FATIGUE FAILURE OF THE #2 CONNECTING ROD. A FACTOR WHICH CONTRIBUTED TO THE ACCIDENT WAS THE LACK OF SUITABLE TERRAIN FOR THE EMERGENCY LANDING.

## Findings

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

### Findings

1. (C) ENGINE ASSEMBLY,CONNECTING ROD - FATIGUE
2. ENGINE ASSEMBLY,CONNECTING ROD - FAILURE,TOTAL

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Occurrence #2: FORCED LANDING  
Phase of Operation: LANDING - FLARE/TOUCHDOWN

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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: LANDING - FLARE/TOUCHDOWN

### Findings

3. (F) TERRAIN CONDITION - NONE SUITABLE

## Factual Information

On June 2, 1993, at 1455 Alaska daylight time, a fixed gear wheel equipped Piper PA 32 300 airplane, N8127K, owned and operated by Skagway Air Service, Inc., experienced a loss of engine power while maneuvering near Davidson Glacier, approximately 23 miles south of Skagway, Alaska. The commercial certificated pilot in command and one of the four revenue passengers on board the airplane were not injured. The remaining three passengers received minor injuries and the airplane sustained substantial damage during the emergency landing on the glacier. The airplane was being operated as a 14 CFR Part 135 on demand air taxi sightseeing flight by Skagway Air Service, Inc. when the accident occurred. The flight originated in Skagway at approximately 1435. Visual meteorological conditions prevailed at the time and a VFR flight plan was on file with the Juneau Flight Service Station.

The pilot told the Safety Board investigator in charge that prior to departing Skagway, he observed nothing out of the ordinary during his preflight of the airplane and operational check of the engine shortly before departure. The oil sump had 9 plus quarts of oil and the oil filler cap was properly secured. About 15 minutes after departing Skagway, as he was maneuvering over the glacier at an altitude of approximately 3500 to 4000 feet msl (1000 ft. agl), he glanced at the engine gauges and observed a decreasing oil pressure indication. Approximately four seconds later, the engine began to vibrate and emit metallic sounds then quit. An emergency landing was performed on the glacier.

An on scene examination of the engine by a Federal Aviation Safety Inspector disclosed a failure of the number two cylinder connecting rod.

The engine, a Textron Lycoming IO540-KIG5, S/N L-11897-48A, was shipped to the Textron Lycoming Reciprocating Engine Division in Williamsport, Pennsylvania for disassembly and inspection under the scrutiny of FAA personnel from the Flight Standards District Office (FSDO) in Harrisburg, Pennsylvania. The piston end portion of the number two cylinder connecting rod remained with the piston and was shipped with the engine assembly. A portion of the number two cylinder rod end, rod cap and bolts were shipped to the NTSB's Materials Laboratory Division in Washington, D.C. for examination.

The engine inspection revealed that the top of the engine crankcase was broken above the number two cylinder, exposing a broken number two connecting rod. The camshaft was broken directly above the number two connecting rod. The disassembly inspection revealed that the remaining connecting rods exhibited moderate to severe levels of galling. Likewise, the connecting rod caps also exhibited galling. The piston portion of the number two cylinder connecting rod exhibited a failure due to overload. (Note. See attached engine disassembly inspection report)

The examination of the end portion of the rod, the rod cap and bolts revealed, impart, that the fractures of the rod cap exhibited bending overstress features. The bolt fracture was indicative of a tensile overstress separation. The fracture of the rod through the strap area adjacent to the head of the bolt displayed features typical of a fatigue fracture. None of the components exhibited any indications of high temperature exposure. High magnification inspections of the rod fracture revealed bench marking indicating fatigue progression away from a single point of initiation on the bearing surface of the rod. (Note. See attached Metallurgist's Factual Report)

A search of the FAA's Integrated Safety Information Subsystem (ISIS) for Service Difficulty

Information (SDR's) files on the PA-32-300 with a IO540-K1G5 engine did not produce "rod failure" as a previously reported problem.

Company maintenance records indicate that the engine was overhauled by Textron Lycoming in June 1990 and was installed on N8127K on July 30, 1990. The most recent combined annual/100 hour inspection was performed on the engine on January 10, 1993. At the time of the accident, the engine had accrued a total time of 1,229.7 hours since the factory overhaul and 41.5 hours since the January inspection. There was no record or indication that the engine had been disassembled since overhaul by the factory.

### Pilot Information

<b>Certificate:</b>	Flight Instructor; Commercial	<b>Age:</b>	25, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	07/01/1992
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1210 hours (Total, all aircraft), 50 hours (Total, this make and model), 1105 hours (Pilot In Command, all aircraft), 75 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N8127K
Model/Series:	PA-32-300 PA-32-300	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	7940268
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	01/10/1993, Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	41 Hours	Engines:	1 Reciprocating
Airframe Total Time:	3266 Hours	Engine Manufacturer:	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540-K1G5
Registered Owner:	SKAGWAY AIR SERVICE, INC.	Rated Power:	300 hp
Operator:	SKAGWAY AIR SERVICE, INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	FYOA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	JNU, 19 ft msl	Distance from Accident Site:	50 Nautical Miles
Observation Time:	1344 ADT	Direction from Accident Site:	330°
Lowest Cloud Condition:	Scattered / 2000 ft agl	Visibility	15 Miles
Lowest Ceiling:	Broken / 5000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	16° C / 11° C
Precipitation and Obscuration:			
Departure Point:		Type of Flight Plan Filed:	VFR
Destination:		Type of Clearance:	None
Departure Time:	1430 ADT	Type of Airspace:	Class G

## Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 Minor, 1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Minor, 2 None	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** TIMOTHY A BORSON **Report Date:** 08/18/1994

**Additional Participating Persons:** PATTY MATTISON; JUNEAU, AK

**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](mailto: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](#).