Aviation Investigation Final Report

Location:	Whittier, Alaska	**Accident Number:**	ANC07FA102
Date & Time:	September 22, 2007, 14:20 Local	**Registration:**	N46209
Aircraft:	Cessna 180	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The float-equipped airplane was departing from a remote lake as a pilot-witness watched its westerly takeoff run from the shoreline. The witness said that during the takeoff run, the nose appeared abnormally high as it lifted off, then "the wings began to wobble" as it disappeared behind an area of hilly, tree-covered terrain at the west end of the lake. The airplane subsequently collided with trees, which severed the right wing. It became inverted before colliding with an area of tundra-covered rock. The airplane's wreckage was about 800 feet from the west shoreline. During the NTSB's on scene investigation, the pilot's seat was found in the full aft position. There was no evidence of mechanical problems with the airplane's engine or flight controls during postaccident inspections. An FAA airworthiness directive (AD), 87-20-03 R2, defines the maximum acceptable wear limits on the seat locking mechanism and seat tracks. The AD states, in part: "...If the wear dimension across any hole exceeds 0.36 inches but does not exceed 0.42 inches, continue to measure each hole every 100 hours for excessive wear. ...If the wear dimension across any hole exceeds 0.42 inches, prior to further flight, replace the seat track." The NTSB IIC measured each of the 17 seat rail holes using a McFarlane seat rail wear gauge, revealing that 4 of the 17 holes were in excess of 0.42 inches. The 4 excessively worn holes were the 8th through 11th holes [from front to back]. Using an exemplar Cessna 180 and a pilot that was the same height as the accident pilot, it was discovered that the 9th seat track rail hole was selected after the seat was adjusted to comfortably operate the flight controls. Cessna issued service bulletin SEB07-5, which provides for the installation of a secondary seat stop kit for the pilot seat, free of charge. Compliance is mandatory within the next 200 hours of operation or 12 months, whichever occurs first. The bulletin was issued about 4 months before the accident, and the airplane had flown about 22.4 hours since its issuance. The accident airplane was not equipped with the secondary seat stop kit. Given the lack of mechanical deficiencies with the airplane's engine or flight controls, and the discovery of the worn seat rail holes, it is likely that the pilot's seat moved aft during the takeoff run, making it difficult for him to properly operate the airplane's controls.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot's seat to engage, or remain engaged, and the pilot's inadvertent stall/mush during takeoff-initial climb. Contributing to the accident was the failure of maintenance personnel to comply with an FAA AD regarding the pilot's seat rails.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) FUSELAGE,SEAT - NOT ENGAGED
2. (C) STALL/MUSH - INADVERTENT - PILOT IN COMMAND
3. (F) MAINTENANCE,COMPLIANCE WITH AD - NOT COMPLIED WITH - OTHER MAINTENANCE PERSONNEL

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
4. OBJECT - TREE(S)
5. TERRAIN CONDITION - ROCK(S)/BOULDER(S)
6. TERRAIN CONDITION - TUNDRA

Factual Information

HISTORY OF FLIGHT

On September 22, 2007, about 1420 Alaska daylight time, a float-equipped Cessna 180 airplane, N46209, sustained substantial damage during takeoff from a remote lake when it impacted a tree and hilly terrain, about 15 miles southeast of Whittier, Alaska. The airplane was operated as a visual flight rules (VFR) personal flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91, when the accident occurred. The private pilot received fatal injuries, and the sole passenger sustained serious injuries. Visual meteorological conditions prevailed, and a VFR flight plan was filed. The flight originated at the Lake Hood Seaplane Base, Anchorage, Alaska, about 1015, with an anticipated return of 1700.

During a conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on September 23, a friend of the accident pilot who met the pilot and passenger at the lake in his own airplane, reported that he watched the accident airplane's takeoff from the shoreline of the remote lake. The friend reported that the accident airplane departed before him, and he saw its westerly takeoff run while sitting in his airplane, parked on the eastern shore of Lake Shrode.

The friend said that as the airplane lifted off near the western shoreline, the airplane's nose appeared abnormally high. He said that as the airplane began to climb, "the wings began to wobble" then the airplane disappeared behind an area of hilly, tree-covered terrain at the west end of the lake. The friend said he thought the accident airplane had crashed, and he immediately departed in his airplane to search for it. Unable to locate the airplane, he assumed that it had successfully departed, and he continued to the next planned rendezvous point, Johnstone Bay. When the accident airplane failed to arrive at Johnstone Bay, the pilot of the second airplane contacted the Kenai Flight Service Station (FSS) specialist on duty, and reported the that the first airplane was presumed to have crashed.

Two witnesses hiking near the north shore of Lake Shrode, in an area of tree-covered terrain, reported hearing the accident airplane's takeoff run, but trees blocked their view of the airplane. Both recalled hearing the accident airplane's engine at a high power setting, followed by the sound of impact, and then silence. The witnesses said they had to hike for about 45 minutes before finding the airplane's wreckage. After reaching the accident site they summoned help from members of Coast Guard auxiliary group that was conducting a training exercise in Cochrane Bay.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with airplane single-engine land and single-engine sea ratings. His most recent third-class medical certificate was issued on May 22, 2007, and contained the limitation that he wear corrective lenses.

No personal flight records were located for the pilot, and the aeronautical experience listed on page 3 of this report was obtained from FAA records on file in the Airman and Medical Records Center located in Oklahoma City, Oklahoma. On the pilot's application for medical certificate, dated May 22, 2007, he indicated that his total aeronautical experience was 976.0 flight hours, of which 1.4 flight hours were accrued in the previous 6 months.

AIRCRAFT INFORMATION

The airplane had a total time in service of 2,880.2 flight hours at the time of the accident. Examination of the maintenance records revealed that the last annual inspection of the airframe and engine was on December 8, 2006, about 22.4 flight hours before the accident.

The airplane was equipped with a Teledyne Continental Motors (TCM) O-520-F/TS engine, rated at 270 horsepower, which was installed in accordance with Texas Skyways supplemental type certificate (STC) SE 09017SC. The maintenance records note that a factory new engine was installed at the time of the modification, on March 29, 2000, about 461.0 flight hours before the accident. The standard engine in a Cessna 180 is a TCM O-470, rated at 230 horsepower.

METEOROLOGICAL INFORMATION

The closest official weather observation station is Whittier, Alaska, about 15 miles northwest of the accident site. At 1455, an Aviation Routine Weather Report (METAR) was reporting in part: Wind, calm; visibility, 20 statute miles; clouds and sky condition, 7,000 feet broken; temperature, 54 degrees F; dew point, 46 degrees F; altimeter, 29.88 inHg.

COMMUNICATIONS

There were no reports of communications with the accident airplane.

WRECKAGE AND IMPACT INFORMATION

On September 23, 2007, the NTSB IIC, and an FAA operations inspector from the Anchorage Flight Standards District Office (FSDO), examined the airplane wreckage at the accident site.

All of the airplane's major components were found at the accident site. The accident site was in an area of hilly, tree and tundra-covered terrain, at an elevation of about 100 feet msl.

The first piece of airplane wreckage discovered along the debris path was the crushed right wing assembly, which was at the base of a 75-foot tall tree. The right aileron and right flap

remained attached to the wing.

The main wreckage site was about 800 feet beyond the shoreline of the accident lake, along the anticipated departure route. The wreckage debris path was oriented on a west-northwesterly path, and was about 150 feet long.

The airplane's fuselage was inverted, and adjacent to a crater, measuring about 5 feet in diameter, which is believed to be the initial impact point with the ground.

An examination of the impact crater revealed that the terrain consisted of tundra-covered, solid rock. Interior and exterior fragments of the forward portion of the airplane's cockpit area, including its Plexiglas windshield, were found within the impact crater. An area of tundra disruption, which matched the airplane's left wing, was discovered adjacent to the crater. Propeller strike marks were discovered atop the exposed rock face.

The propeller crankshaft flange was separated from the engine. The propeller bolts attaching the propeller to the crankshaft flange were stripped, but all were retained in the propeller flange. The propeller hub and blade assembly was discovered between the impact crater and the main wreckage site. All three blades were loose in the hub, but remained attached to the hub and propeller blade assembly. All three propeller blades displayed multiple leading edge gouges, and torsional "S" bending. One propeller blade was fractured about 12 inches from the tip. The fractured propeller tip was found next to the impact crater.

The nose of the inverted airplane was oriented on a 175 degree magnetic heading.

The airplane's forward cabin structure, engine cowling, and windshield "V" brace, were crushed and buckled inward. The primary crush zones extended from the firewall area back to about the forward doorpost, and encompassed the pilot and front seat passenger area.

The pilot's seat was discovered in the full aft position. The aft seat rail roller assembly was found against a rail-mounted SAF-T-Stop Seat Stop. The SAF-T-Stop Seat Stop is an auxiliary seat stop mechanism that stops rearward motion should the seat lock fail. According to the two hikers that first arrived on scene after the accident, neither recalled moving the pilot's seat during the rescue.

The airplane's left wing remained attached to the fuselage. The wings upper surface had extensive spanwise leading edge aft crushing. The left aileron and left flap remained attached to the wing.

The left wing lift strut remained attached to the lower and upper attach points. The right wing lift strut remained attached to its lower attaching point, but the upper portion of the lift strut was severed at the wing to lift strut attachment point.

The float assemblies remained attached to their respective fuselage attach points, and they

were not damaged.

The vertical stabilizer and rudder were crushed downward and aft, and curled to the right side of the empennage. The horizontal stabilizers and elevator had minor damage. The fuselage, aft of the cabin area, had wrinkling of the underside of the tail. The aft fuselage was displaced slightly downward.

Flight control system cable continuity was established from the control surfaces to the point of impact related damage.

There were no preaccident mechanical problems discovered with the airplane's engine or flight controls during the NTSB IIC's on-scene wreckage examination.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was conducted under the authority of the Alaska State Medical Examiner, 4500 South Boniface Parkway, Anchorage, Alaska, on September 25, 2007. The cause of death for the pilot was attributed to blunt force, traumatic injuries.

The FAA's Civil Aeromedical Institute (CAMI) did a toxicological examination on October 22, 2007, and was negative for alcohol or drugs.

TESTS AND RESEARCH

The wreckage was recovered from the accident site and transported to Alaska Claims Services, Inc., in Wasilla, Alaska.

October 25, 2007, a wreckage examination and layout was done under the direction of the NTSB IIC. Also present were air safety investigators from TCM, Cessna Aircraft, and the FAA. There were no preaccident mechanical problems discovered with the airplane's engine or flight controls.

Seat Track Rails

The two front seats are individually mounted on set of tracks, and each seat is individually adjustable, forward and aft. A seat adjustment handle is located on the left side of each seat. When the seat adjustment handle is raised, it disengages a spring-loaded locking pin from 1 of 17 holes situated on the top of the left side seat track rail. Once the locking pin is disengaged the seat is free to roll forward or backward on a set of 4 rollers.

On September 24, 1990, the FAA issued a revised Airworthiness Directive (AD) 87-20-03 R2, which defines the airworthiness requirements and minimum acceptable wear limits on the seat locking mechanism and seat track components. The AD states, in part: "...If the wear dimension across any hole exceeds 0.36 inches but does not exceed 0.42 inches, continue to

measure each hole every 100 hours for excessive wear. ...If the wear dimension across any hole exceeds 0.42 inches, prior to further flight, replace the seat track."

During the October 25 wreckage examination, the NTSB IIC, and an air safety investigator from Cessna Aircraft, measured each of the 17 seat rail holes using a McFarlane seat rail wear gauge. The inspection revealed that 4 of the 17 holes were in excess of 0.42 inches. The 4 excessively worn holes were the 8th through 11th holes [from front to back] situated about midway along the track.

According to the pilot's most recent third-class medical certificate, he was 70 inches tall. Using an exemplar Cessna 180 and a pilot that was the same height as the accident pilot, it was discovered that the 9th seat track rail hole was selected after the seat was adjusted to comfortably operate the flight controls.

Cessna Service Bulletin SEB07-5

On May 14, 2007, Cessna Aircraft Company issued service bulletin SEB07-5, which provides for the installation of a secondary seat stop kit for the pilot seat. The service bulletin states, in part: "The secondary seat stop is designed to assist in providing an additional margin of safety by limiting the aft travel of the seat in the event the primary latch pin is not properly engaged in the seat rail/track. In certain instances, seat slippage could result in some pilots not being able to reach all the controls and/or subsequently losing control of the airplane. Compliance is mandatory: Shall be accomplished within the next 200 hours of operation or 12 months, whichever occurs first." The secondary seat stop kit is available to Cessna airplane owners, free of charge, until May 14, 2009, after which owners are required to purchase the kit.

The bulletin was issued about 4 months before the accident, and the airplane had flown about 22.4 hours.

The accident airplane was not equipped with the Cessna provided secondary seat stop kit.

ADDITIONAL INFORMATION

During subsequent telephone conversations with the NTSB IIC, the passenger said that to date, she has been unable to recall any information concerning the accident or the circumstances surrounding the accident.

WRECKAGE RELEASE

The Safety Board released the wreckage to the owner's representative on September 24, 2007. The Safety Board did not retain any parts or components.

Pilot Information

Certificate:	Private	**Age:**	61,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 1, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	976 hours (Total, all aircraft), 100 hours (Total, this make and model), 2 hours (Last 90 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N46209
Model/Series:	180	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18052406
Landing Gear Type:	Float	**Seats:**	4
Date/Type of Last Inspection:	December 8, 2006 Annual	**Certified Max Gross Wt.:**	2820 lbs
Time Since Last Inspection:	22.4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2857.5 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-520-F48B
Registered Owner:	Earl D. Korynta	**Rated Power:**	270 Horsepower
Operator:	Howard C. Holtan	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PAWR,30 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	14:55 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:		**Visibility**	20 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	12°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Anchorage, AK (LHD)	**Type of Flight Plan Filed:**	VFR
Destination:	Anchorage, AK (LHD)	**Type of Clearance:**	None
Departure Time:	10:00 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	60.635833,-148.335006

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Michael J Yorke; Federal Aviation Administration; Anchorage, AK Peter Basile ; Cessna Aircraft Company ; Wichita, KS Rodney Martinez ; Teledyne Continental Motors; Mobile, AL Corey W Howlett; Federal Aviation Administration; Anchorage, AK
Original Publish Date:	November 25, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66744