Aviation Investigation Final Report

Location:	Stebbins, Alaska	**Accident Number:**	ANC01LA057
Date & Time:	May 15, 2001, 15:34 Local	**Registration:**	N756DJ
Aircraft:	Cessna 206	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Scheduled		

Analysis

The solo certificated commercial pilot was departing for another airport about 5 miles away. During the takeoff roll, as the airplane's airspeed approached 60 knots, the pilot applied aft control yoke pressure to rotate the nose of the airplane. When the desired pitch angle for takeoff was attained, she released the back pressure, but the yoke failed to move forward. The airplane then pitched-up uncontrollably, and she disengaged the electric trim, as she was concerned about a runaway trim condition. She regained control of the airplane, noted that she had very limited aileron and elevator range of motion available, and elected to continue straight ahead to her next scheduled stop. She added that she tried to transmit a "mayday" to other airplane's in the area, but the radio transmit button, located on the pilot's control yoke, was now inoperative. During the short flight, she was able to adjust the altitude and airspeed by adjusting engine power. During approach to the accident airport, while using a combination of engine power, rudder, and the remaining amount of aileron control, she was able to maneuver the airplane for landing on runway 05. As the airplane passed over the approach end of the runway, she attempted to flare just before touchdown. The nose of the airplane failed to rise, and the nose wheel struck the gravel-covered runway. The nose landing gear collapsed, and the airplane bounced off the right side of the runway. A postaccident examination of the control yoke mechanism, behind the instrument panel, revealed that a wiring harness had become entangled in a series of roller bearings associated with the control yoke mechanism. A subsequent inspection revealed that the accident airplane's control column did not have a required STA-Strap, part number S-2209-2, installed. The proper installation of the required STA-Strap would provide proper clearance between the wiring harness, and the control yoke roller bearings. The roller bearing assembly was disassembled, and the entangled wiring harness was removed. The correct length for the factory installed wiring harness is 49 inches. The wiring harness that was removed from the roller bearing assembly measured at 34 inches. A review of the airplane's maintenance history disclosed no maintenance activity concerning the control yoke assembly. A review of the FAA's aircraft registry database disclosed that the operator owned the airplane for about 11 years. The

airplane had been added to the operator's Approved Aircraft Inspection Program (AAIP), on February 11, 2001. In order for an airplane to be initially placed on the AAIP, it must be inspected in accordance with AAIP Events1, 2, 3, and 4. According to the operator's AAIP inspection schedule, an inspection of the control wheels, columns, pulleys, and cables, for condition is required during the Event 4 inspection.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A jammed control yoke during landing, an entangled wiring harness, and inadequate maintenance by company personnel. A factor associated with the accident was the pilot's inability to flare the airplane during landing, due to the mechanical malfunction.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) FLT CONTROL SYST,YOKE/CONTROL STICK - JAMMED
2. (C) ELECTRICAL SYSTEM,ELECTRIC WIRING - ENTANGLED
3. (C) MAINTENANCE - INADEQUATE - COMPANY MAINTENANCE PERSONNEL

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: EMERGENCY LANDING

Findings
4. (F) FLARE - NOT POSSIBLE - PILOT IN COMMAND

Factual Information

On May 15, 2001, about 1534 Alaska daylight time, a wheel-equipped Cessna 206 airplane, N756DJ, sustained substantial damage during an emergency landing at Stebbins Airport, Stebbins, Alaska. The airplane was being operated as a visual flight rules (VFR) scheduled domestic commuter flight under Title 14, CFR Part 135, when the accident occurred. The airplane was registered to, and operated by, Warbelow's Air Ventures, Inc., Fairbanks, Alaska, as Flight 911-2. The solo certificated commercial pilot was not injured. Visual meteorological conditions prevailed, and a VFR flight plan was filed. The flight originated at the St. Michael Airport, St. Michael, Alaska, about 1450, and was en route to Stebbins. The intended routing of Flight 911-2 was from Unalakleet, Alaska, to St. Michael, to Stebbins, and then return to Unalakleet.

During a telephone conversation with the National Transportation Safety Board investigator-in-charge on May 17, the pilot reported that the first leg of her flight between Unalakleet and St. Michael was uneventful. She said that after deplaning the one passenger in St. Michael, she had about 256 pounds of US mail/cargo remaining in the airplane that was destined for Stebbins. She added that as she entered runway 02, she conducted a pretakeoff control continuity check, and noted no deficiencies. During the takeoff roll, as the airplane's airspeed approached 60 knots, she applied aft control yoke pressure to rotate the nose of the airplane. When the desired pitch angle for takeoff was attained, she released the back pressure, but the yoke failed to move forward. She said, in part: " ... the nose of the airplane then pitched-up uncontrollably. I tried to push the yoke forward, but it just wouldn't move, so I disengaged the electric trim for fear that I had a runaway trim." She said that when she tried to move the control yoke left or right, she had a very limited range of motion available in both directions. The pilot said that after she regained control of the airplane, she elected to continue straight ahead to her next scheduled stop, located about 5 miles from her departure airport. She added that she tried to transmit a "mayday" to other airplane's in the area, but the radio transmit button, located on the pilots control yoke, was now inoperative. She said by using the limited amount of aileron control she had remaining, in conjunction with the rudder, she was able to make a very shallow left turn to the west, and headed to Stebbins, her previously intended destination. She said that during the 5 mile flight to Stebbins, she was able to adjust the altitude and airspeed by adjusting engine power. As she approached the Stebbins Airport, she noted that the wind was favoring a northerly approach for landing on runway 05. Using a combination of engine power, rudder, and the remaining amount of aileron control, she was able to maneuver the airplane for landing on runway 05, at Stebbins. As the airplane passed over the approach end of the runway, the pilot attempted to flare just before touchdown. The nose of the airplane failed to rise, and the nose wheel struck the gravel-covered runway. The nose landing gear collapsed, and the airplane bounced off the right side of the runway. The airplane sustained substantial damage to the wings and fuselage.

A Federal Aviation Administration (FAA) airworthiness inspector, Fairbanks Flight Standards District Office, traveled to the accident scene on May 15, and examined the airplane wreckage before recovery efforts were started. The FAA inspector reported that his initial examination of the control yoke confirmed the pilot's report of not being able to move the control yoke. A closer examination of the control yoke mechanism, behind the instrument panel, revealed that a wiring harness had become entangled in a series of roller bearings associated with the control yoke mechanism.

The airplane was recovered by the operator and transported to the operator's maintenance facility in Fairbanks.

On May 25, 2001, in the presence of an FAA airworthiness inspector from the Fairbanks Flight Standards District Office, the control yoke assembly was removed from the accident airplane, along with the entangled wiring harness. The control yoke assembly was shipped to the FAA's Wichita Aircraft Certification Office, Wichita, Kansas, for further examination and inspection. The FAA inspector added that after reviewing the accident airplane's maintenance records, he was unable to find any maintenance log entry concerning the control yoke assembly. A review of the FAA's aircraft registry database disclosed that the operator owned the airplane for about 11 years.

The FAA airworthiness inspector reported that the accident airplane was maintained under the operator's Approved Aircraft Inspection Program (AAIP). This program requires inspections be performed approximately every 100 hours. He said that the accident airplane was initially placed on the AAIP on February 11, 2001, and added that in order for an airplane to be initially placed on the approved aircraft inspection program, it must be inspected in accordance with AAIP Events 1, 2, 3, and 4. According to the operator's AAIP inspection schedule, an inspection of the control wheels, columns, pulleys, and cables for condition, is required during the Event 4 inspection. The most recent inspection (event 2), was accomplished on May 9, 2001, 7.3 hours before the accident.

On June 4, 2001, in the presence of a senior airframe/structures engineer from the FAA's Aircraft Certification Office in Wichita, and an Air Safety Investigator from Cessna Aircraft Company, a detailed inspection and teardown of the accident airplane's control yoke assembly was conducted. An initial inspection revealed that the accident airplane's control column did not have a required STA-Strap, part number S-2209-2, installed. The installation of the required STA-Strap would provide proper clearance between the wiring harness, and the control yoke roller bearings. The roller bearing assembly was disassembled, and the entangled wiring harness was removed. The correct length for the factory installed wiring harness is 49 inches. The wiring harness that was removed from the roller bearing assembly measured at 34 inches.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	25,Female
Airplane Rating(s):	Single-engine land; 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; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	March 19, 2001
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 29, 2001
Flight Time:	1000 hours (Total, all aircraft), 100 hours (Total, this make and model), 925 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 100 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N756DJ
Model/Series:	206	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	20604005
Landing Gear Type:	Tricycle	**Seats:**	6
Date/Type of Last Inspection:	May 9, 2001 AAIP	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	7.3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	8393.9 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-F27B
Registered Owner:	Warbelow's Air Ventures, Inc.	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	WVBA

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:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 15 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	4°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	St. Michael, AK (5S8)	**Type of Flight Plan Filed:**	VFR
Destination:	Stebbins, AK (WBB)	**Type of Clearance:**	None
Departure Time:	15:00 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	STEBBINS WBB	**Runway Surface Type:**	Gravel
Airport Elevation:		**Runway Surface Condition:**	Dry
Runway Used:	05	**IFR Approach:**	None
Runway Length/Width:	3000 ft / 60 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	63.5,-162.266662

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Kenneth C Thomas; Federal Aviation Administration; Fairbanks , AK
Original Publish Date:	May 21, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=52420