



# National Transportation Safety Board Aviation Accident Final Report

<b>Location:</b>	Puyallup, WA	<b>Accident Number:</b>	SEA02FA036
<b>Date &amp; Time:</b>	02/02/2002, 1033 PST	<b>Registration:</b>	N520SE
<b>Aircraft:</b>	Aero Commander 520	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Serious, 1 Minor
<b>Flight Conducted Under:</b>	Part 91: General Aviation -		

## Analysis

The pilot reported that the engines had full power before rotation, and that the takeoff roll was normal until rotation. Right after the aircraft lifted off, the left wing dropped and he felt a swerve to the left, and the aircraft's nose pitched up. The pilot pushed on the control yoke and attempted to counteract the roll motion with opposite aileron. The aircraft continued to the left and collided with trees approximately 1,250 feet from the departure end of the runway and about 100 yards east of the runway edge. Post accident inspection of the flight controls found control continuity from all flight control surfaces to the cockpit controls. The left engine was inspected and partially torn down. During the engine inspection, there was no evidence found to indicate a mechanical failure or malfunction.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain aircraft control during takeoff. Trees were a factor.

## Findings

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

### Findings

1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND  
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Occurrence #2: IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: DESCENT - UNCONTROLLED

### Findings

2. (F) OBJECT - TREE(S)

## Factual Information

### HISTORY OF FLIGHT

On February 2, 2002, approximately 1033 Pacific standard time, an Aero Commander 520 airplane, N520SE, registered to and being flown by a private pilot, was substantially damaged during a collision with trees adjacent to runway 16 at Pierce County Airport-Thun Field, Puyallup, Washington. The pilot received minor injuries, and the pilot-rated passenger sustained a serious injury. Visual meteorological conditions, with winds from 120 degrees true at 6 knots, were reported at McChord Air Force Base, Tacoma, Washington, at 0955, and no flight plan was filed for the 14 CFR Part 91 local flight.

During a telephone interview with the NTSB investigator-in-charge (IIC), the pilot reported that he had full power before rotation, and that the takeoff roll was normal until rotation. The pilot reported that right after rotation, the aircraft's left wing dropped and he felt a swerve to the left, and the aircraft's nose pitched up. The pilot stated that he reacted by pushing on the control yoke and attempting to counteract the motion with opposite aileron. He stated that he then saw he was not going to make it above the trees, so he tried to hit the trees as flat as possible, "like a belly flop." The pilot stated that he did not change the power setting on the engines, that he did not have time to feather either engine, and that he did not have a chance to look at the engine instruments during the accident sequence, since he was concentrating on flying the airplane. The pilot reported that he set the takeoff trim before takeoff to 15 degrees, and that he took off with 1/4 flaps. The pilot also reported that the aircraft had 140 gallons of fuel aboard at takeoff (he stated that full fuel is 150 gallons, with 145 gallons usable.)

The passenger reported in a telephone interview with the NTSB IIC that the flight proceeded normally through the engine run up before takeoff. He stated that just prior to rotation, he looked at the engine tachometers and that they were matched (NOTE: the aircraft is equipped with a dual-needle engine tachometer, with two needles on a concentric axis that indicate on a single dial face.) The passenger stated that rotation was normal, but that the aircraft then swerved hard to the left during the initial climb (within 1 second of the main wheels leaving the ground.) The passenger stated that the aircraft stayed nose-high during the turn. The passenger reported that he did not notice any change in engine pitch until the aircraft started hitting the trees, and that it got quiet about that time. The passenger stated he did not know whether or not the left engine was running when the aircraft started the left turn, but that he was certain the right engine was running at high power until impact (or just before impact.) The passenger stated that he did not notice any other abnormal indications (such as loud noises, flashes, or bangs) preceding the abrupt left turn after rotation. The passenger reported that he stayed off the flight controls during the entire event, and did not know what control inputs the pilot made in response to the situation.

A witness standing about mid-field and watching the aircraft takeoff, reported that after takeoff, the left wing dipped, and the aircraft began to yaw to the left. The nose pitched up and engine power seemed to reduce. The aircraft "fell into woods" traveling about 90 degrees to runway heading.

### PERSONNEL INFORMATION

At the time of the accident the pilot held a private pilot certificate for single and multi-engine land aircraft. The pilot also held certificates for Flight Engineer in turbojet powered aircraft

and airframe and powerplant. The pilot reported a total flight time of 5,000 hours in all aircraft with 2,500 hours as pilot-in-command. Approximately 1,500 hours were in multi-engine aircraft with 110 hours of pilot-in-command time in the accident aircraft.

The pilot held a Class II medical certificate dated August 27, 1992, with a limitation to wear corrective lenses.

#### AIRCRAFT INFORMATION

The accident aircraft, an Aero Commander 520, serial number 520-25, was manufactured in 1952. Two Lycoming GO-435-C2B engines were installed on the aircraft at the time. A review of maintenance records indicated that the last annual inspection/100 hours inspection was accomplished on September 29, 2001, at a total airframe time of 3,476.9 hours.

The left engine, serial number L-2200-11-BA, indicated a total time since overhaul of 264.3 hours. The right engine, serial number L-2830-11A, indicated a total time since overhaul of 1,121.9 hours.

Approximately 3 hours had been accumulated on the aircraft since the last inspection.

#### METEOROLOGICAL INFORMATION

The nearest weather reporting facility to the accident site was McChord Air Force Base, Tacoma, Washington, located eight miles southwest of the accident site, reported the weather at 0955 as a broken ceiling at 5,000 feet. Visibility was seven miles. The altimeter was 30.16" Hg. The winds were from 120 degrees at six knots. Temperature was three degree Celsius.

#### WRECKAGE AND IMPACT INFORMATION

The accident site was located in the trees about 1,250 feet south of the north end of runway 16, a 3,650-by-60 foot runway, and about 100 yards east of the runway edge. A generally easterly path of broken trees was noted toward the crash site, and the aircraft had come to rest upright on a generally easterly heading. Both propellers were at low pitch and both exhibited some degree of tip curl, with the right propeller exhibiting somewhat more severe blade damage than the left propeller. The aircraft's gear and flaps appeared to be extended.

The wreckage was removed from the trees and taken to the ramp area at the airport for further examination. Both wings remained attached to the wing roots. Both engines remained attached to the wings and encased in their respective nacelles. Both propeller assemblies remained attached to their respective crankshafts. Extensive leading edge impact damage was noted to both wings. The empennage/aft fuselage was twisted to the right. The vertical stabilizer remained attached. The rudder remained attached at the hinges. The horizontal stabilizers remained attached. The elevators remained attached at their respective hinges. During the airframe examination, flight control continuity was established from all flight control surfaces to the cockpit controls.

The left engine was examined and partially torn down. During the examination, the crankshaft rotated easily. Gear and valve train continuity was established. Compression was developed in all cylinders. Both magnetos produced a spark from all towers. The airframe low-point drains and pressure carburetor inlet screens were clean and free of contaminants. Fuel was found at the inlet to the fuel pump and at the inlet to the pressure carburetor. Fuel was removed from various points along the fuel system and was found clean and clear. All spark plugs were removed and most of the electrodes were found to be dark grayish, or covered with slight dark

soot.

The three blades of the left side propeller displayed slight tip curls with minimal leading edge damage. One blade contacted the side of the fuselage during the accident sequence.

#### TESTS AND RESEARCH

The Bendix PS-5BD pressure carburetor, serial number 855493, was removed from the left engine for bench testing and inspection. On May 29, 2002, the unit was taken to Precision Airmotive, Everett, Washington. Initial inspection of the unit determined that it was flowable on the test bench. The unit was installed on the bench and during the test it was noted that the unit flowed slightly lean of specifications at low power test points, and within specification at the mid and high power test points to include the full power test point.

The left engine fuel pump was removed for inspection and bench flow testing. On June 4, 2002, the unit was installed on a bench test at Galvin Flying Service, Seattle, Washington. At 5 PSI, the pressure relief valve was tested and found to cut off at approximately 12 PSI (specification is 13.1 PSI minimum at 2,500 rpm/175 gph). The check was reaccomplished in accordance with Pesco Service Instructions. During this check at 2,500 rpm and 15 PSI, fuel flow was 208 gph. The test specification is 212 gph minimum. The test operator reported that the bench was slightly low on fluid and some air cavitation of the fluid was evident. The pump was in specification for the 1,500 rpm test with 116 gph minimum. After a second flow test, the pressure relief valve was readjusted to as-found setting of 12 PSI and the test was concluded.

#### ADDITIONAL DATA/INFORMATION

The wreckage to include the Bendix pressure carburetor were released to the owner on October 10, 2002.

#### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	62, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Expired	<b>Last FAA Medical Exam:</b>	08/27/1992
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	05/21/2000
<b>Flight Time:</b>	5000 hours (Total, all aircraft), 2500 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Aero Commander	<b>Registration:</b>	N520SE
<b>Model/Series:</b>	520	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	520-25
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	09/29/2001, Annual	<b>Certified Max Gross Wt.:</b>	5500 lbs
<b>Time Since Last Inspection:</b>	3 Hours	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	3477 Hours as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	GO-435-C2B
<b>Registered Owner:</b>	Robert M. Kosola	<b>Rated Power:</b>	260 hp
<b>Operator:</b>	Robert M. Kosola	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	TCM, 323 ft msl	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	0955 PST	<b>Direction from Accident Site:</b>	245°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	7 Miles
<b>Lowest Ceiling:</b>	Broken / 5000 ft agl	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	120°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.16 inches Hg	<b>Temperature/Dew Point:</b>	3°C / 0°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Puyallup, WA (150)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>		<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	1033 PST	<b>Type of Airspace:</b>	Class E

## Airport Information

<b>Airport:</b>	Pierce Co-Thun Field (150)	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	538 ft	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	16	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	3650 ft / 60 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious, 1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Serious, 1 Minor	<b>Latitude, Longitude:</b>	47.106667, -122.289722

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gregg Nesemeier	<b>Report Date:</b>	07/23/2003
<b>Additional Participating Persons:</b>	James M Erwin; FAA-FSDO; Renton, WA David Owen; Precision Engines Corp.; Everett, WA Jeffrey R Poschwatta; Textron Lycoming; Kent, WA Geoffrey A Pence; Twin Commander Aircraft Corporation; Arlington, WA		
<b>Publish Date:</b>			
<b>Investigation Docket:</b>	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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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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](#).