National Transportation Safety Board
Aviation Accident Final Report

Location:	Concord, CA	**Accident Number:**	LAX01LA019
Date & Time:	10/19/2000, 1538 PDT	**Registration:**	N398DE
Aircraft:	Beech 300	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The twin turboprop airplane overran the runway, impacted two fences, and an occupied automobile after the airline transport pilot attempted to abort a takeoff. The pilot performed a rolling takeoff and was paying close attention to balancing the engine power and keeping runway centerline alignment. As the airplane accelerated, the pilot set the power above 80 percent and began an instrument scan. He then noted the airspeed indicator was reading zero with the needle resting on the peg. After a moment's hesitation, the pilot attempted to abort the takeoff by reducing the power levers to flight idle, and subsequently over the gate to ground fine. He reported to the FAA that he did not place the power controls into the reverse position. Air traffic controllers reported they observed the airplane with its nose wheel off of the ground approximately 3/4 of the way down the 4,602-foot long runway. The aircraft's left and right pitot/static systems were examined and tested after the accident, and no anomalies were noted. The pilot obtained verbal training on rejected/aborted takeoffs for the accident airplane. He obtained his type rating and 14 CFR 135 check-out in the accident airplane approximately 1 month prior to the accident. The pilot had accumulated a total of 10,867.5 hours of flight time, of which 34.7 hours were accumulated in the accident aircraft make and model. The pilot reported his total pilot-in-command flight time in the accident aircraft make and model as 20 hours, all of which were accumulated within the preceding 30 days of the accident. Examination of the airplane, the flight instruments and the pitot/static system found no explanation for the pilot reported lack of airspeed reading. The brakes were found to be fully functional. Review of the performance charts for the airplane disclosed that for the weight and ambient conditions of the takeoff, the airplane required 4,100 feet for an accelerate-stop distance; the runway was 4,602 feet long.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's delayed decision to abort the takeoff and his failure to utilize the propeller's reverse pitch function.

Findings

Occurrence #1: OVERRUN
Phase of Operation: TAKEOFF - ABORTED

Findings
1. (C) ABORTED TAKEOFF - DELAYED - PILOT IN COMMAND
2. (C) REVERSERS - NOT USED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - ABORTED

Findings
3. OBJECT - FENCE
4. OBJECT - VEHICLE

Factual Information

HISTORY OF FLIGHT

On October 19, 2000, at 1538 Pacific daylight time, a Beech 300 twin-engine airplane, N398DE, overran the runway and struck an automobile during an aborted takeoff at the Buchanan Field, Concord, California. The airplane sustained substantial damage; however, the airline transport pilot sustained minor injuries. The driver, who was the sole occupant of the automobile, received serious injuries. The airplane was registered to King Air Charter, Danville, California, and was operated by AeroSmith Aviation, Inc., Concord, as a positioning flight under 14 CFR Part 91 when the accident occurred. The flight was originating at the time of the accident and was destined for San Jose, California. Visual meteorological conditions prevailed, and a flight plan was not filed.

According to the pilot's written statement, he performed a rolling takeoff on runway 32R and was paying close attention to balancing the engine power and keeping runway centerline alignment. As the airplane accelerated, the pilot set the engine power above 80 percent and began an instrument scan. He then noted the airspeed indicator was reading zero with the needle resting on the peg. The pilot looked back at the power (torque) gauges, and then back to the airspeed indicator. He then attempted to abort the takeoff by reducing the power levers to idle, then to reverse, and by applying the brakes.

The airplane skidded off the end of the runway, through a chain link perimeter fence, and struck an automobile that was traveling on the perimeter road. The airplane continued across the road, coming to rest on second chain link fence that bordered California State Highway 4.

After coming to a stop, the pilot moved the fuel control levers to fuel cutoff, closed the engine firewall fuel shutoff valves, and moved the gang bar down to shutoff all electrical power. He then deplaned through the aft main cabin door.

Federal Aviaiton Administration (FAA) inspectors, who responded to the accident site, interviewed the Concord Air Traffic Control Tower controllers. The air traffic controllers observed the airplane with its nose wheel off of the ground between the intersections of runways 32R and 19R and taxiway E, which is approximately 3/4 of the way down the 4,602-foot-long runway.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate with an airplane multiengine land rating and type ratings in BE-300 and BA-3100 aircraft. He also held a commercial pilot certificate with an airplane single engine land rating. The pilot was issued a first-class medical certificate with no limitations on September 27, 2000.

The pilot underwent "Beechcraft Super King Air 300 Differences Ground & Flight Training" on August 23-26, 1999. Review of the pilot's training records revealed he obtained discussion training on rejected/aborted takeoffs. The pilot obtained the BE-300 type rating on September 17, 2000. According to the Airmen Competency/Proficiency Check Form for FAR 135 operations, dated September 18, 2000, the pilot received a satisfactory grade for Rejected Takeoffs.

The pilot's FAR 135 flight training with AeroSmith Aviation included the following aircraft:

BE-F90	April 27, 1999
BE-200B	May 14, 1999
BE-200	November 30, 1999
BE-F90	May 30, 2000
BE-300	September 18, 2000

FAA inspectors reported the pilot had only received discussion training for high speed takeoff aborts in both the 200 and 300 aircraft. The high speed aborts were never practiced or demonstrated during the pilot's training and checkouts.

According to the Pilot/Operator Aircraft Accident Report, the pilot had accumulated a total of 10,867.5 hours of flight time, of which 34.7 hours were accumulated in the accident aircraft make and model. The pilot listed his total pilot-in-command flight time in a 300 as 20 hours, all of which were accumulated within the preceding 30 days of the accident.

AIRCRAFT INFORMATION

The Beechcraft Super King Air 300 power levers have three possible ranges: 1. the flight range, from full power to idle (flight idle) position; 2. ground fine (ground idle); and 3. reverse. The power levers can move uninhibited from maximum power to idle. The levers must then be lifted over a detent to place the power levers to the ground fine position. The levers must be lifted again over another detent to place the power levers to the reverse position. The power lever columns have two LIFT placards located adjacent to the detent positions. For the model 200, the power levers have only the flight range and reverse, which is achieved by lifting the lever once at the idle stop over a gate.

There were two airspeed indicators installed in the aircraft; one on the pilot instrument panel, and one on the co-pilot instrument panel. The aircraft was also equipped with two entirely independent pitot/static systems. The aircraft's last altimeter and static system inspection was performed on November 17, 1998.

The pilot fueled the aircraft prior to departure, providing 2,400 pounds of fuel at the time of takeoff. The approximate takeoff weight at the time of departure was 11,192 pounds.

METEOROLOGICAL INFORMATION

The weather conditions at the time of the accident were winds from 310 degrees at 7 knots; temperature 26 degrees Celsius; dew point 8 degrees Celsius; and altimeter setting of 29.98 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

Tire skid marks, which led to the aircraft's final resting place, were noted in the runway surface approximately 203 feet prior to the runway end. The tire marks, from start to end, measured 699 feet in length and were noted on the runway, grass, road, and curbs.

The airplane's nose landing gear had separated from the aircraft at its lower strut was found laying near the automobile. The left landing gear collapsed; however, it remained attached to the aircraft. The right main landing gear remained upright and attached to the airplane. Some of the landing gear tires displayed flat spots, some of which had chord showing through. The brake linings were inspected and found to be within operational limits. No leaks were noted in

any of the brake lines.

The gust lock pin assembly was found loose in the cockpit. The gust lock pin hole in the control column did exhibit some scoring on its forward edge; however, it was not elongated.

The right pitot tube was found stuck in the chain link fence and was removed by airport personnel and was given to FAA inspectors. The left pitot tube was removed by FAA inspectors, and both pitot tubes were sent to the National Transportation Safety Board Materials Laboratory for further examination.

The propellers were examined by a manufacturer's representative. Prior to disassembly, both propellers were visually at a reverse pitch position; however, the representative indicated "this position is explainable by impact damage and is not necessarily a pre-impact position." One blade from each propeller had been turned about 90 degrees toward low/reverse pitch, and one blade from each propeller was bent aft. According to the representative, the spinners did not display impact damage that could be correlated to a propeller blade angle.

The left and right propeller blades (labeled L 1-4 and R 1-4) were examined. Blade L1 was bent aft 90 degrees and displayed scoring on the blade face and tip damage. Blade L2 was bent aft 20 degrees and displayed scoring on the leading edge and camber side. Blade L3 displayed impact marks on the camber side and the tip was twisted and torn off. Blade L4 was bent aft 45 degrees. All four of the left propeller blades were twisted toward low pitch.

Blade R1 was bent aft 90 degrees and displayed leading and trailing edge damage. Blade R2 was undamaged. Blade R3 was bent aft slightly and displayed leading edge, trailing edge, and tip damage. Blade R4 was bent aft 45 degrees and displayed leading and trailing edge damage. Three of the four right propeller blades were twisted toward low pitch.

One blade on the left and right propellers was found in an "extreme" reverse pitch position, and one blade on the right propeller was found approximately 20 degrees toward high pitch. The propeller pitch change links were examined, and it was noted that one of the pitch change links on the left propeller displayed a gouge that correlated with the hub and guide collar, indicating it had been "driven harshly toward reverse pitch." There were two pitch change links on the right propeller that displayed gouging, similar to the one left pitch change link, and compression bending also indicating they had been "driven harshly toward reverse pitch."

There was no clear propeller component damage and impact indications noted to estimate the preimpact blade angle.

The cockpit engine controls were photographed at the accident site. It was noted that the power levers were found in the flight idle position, the propeller controls were found in the feather position, and the condition levers were found in the fuel cutoff position. A post-accident examination of the engine and propeller controls in the engine compartment revealed that the left and right interconnect rods, reversing cables, and cambox assemblies were found in the idle power setting. Impact marks on the inner surface of the top right cowling correlated with the cambox assembly's interconnect rod and the reversing cable positions. With the dents and interconnect rod and reversing cable matched, the power lever equated to an idle power setting.

TESTS AND RESEARCH

On October 25, 2000, Sterling Avionics inspected the pitot/static system, with the exception of the pitot tubes. It was noted that the static system leak rates were within acceptable limits and both the left and right airspeed indicating systems indicated properly at several speeds up to 120 knots.

The pitot tubes were examined by the Safety Board Materials Laboratory in Washington, D.C., on August 2, 2001. According to the laboratory factual report, the pitot tubes were x-rayed, and no obstructions were noted internally. Air pressure was supplied to both left and right pitot tubes and no obstructions to air flow were noted through either tube.

The pitot tubes were sectioned aft of the heater element and forward of the corner of the "L" bend in the pitot tube. Particles found in the pitot tube after the cut were collected and examined. Orange and yellow shavings were observed, consistent with cut metal of the heater wire and the pitot tube material. Other granular particles were observed and were examined using energy dispersive x-ray spectroscopy (EDS). The EDS spectra for the particles had high peaks of aluminum oxide, consistent with the aluminum oxide abrasive wheel used to cut the pitot tubes. All the granular particles were relatively fine with no particle or clump of particles large enough to obstruct the internal air passage. No evidence of any insects or other obstruction was observed.

ADDITIONAL INFORMATION

During a November 1, 2000, FAA interview with the pilot, he stated when he elected to abort the takeoff he retarded the power levers to the first gate and lifted the levers and positioned them into the ground fine area. He added he stopped there and did not lift the power levers over the second gate into the reverse area.

The Beechcraft Super King Air 300 Performance Charts reveal that with a takeoff weight of 11,192 pounds, and the weather present at the time of the accident, the accelerate-stop distance (with flaps up and the takeoff power set before brake release), would have been approximately 4,100 feet. The prescribed procedures for accelerate-stop situation were listed in the performance section as follows:

1. Autofeather Switch - ARM

2. Power - SET TORQUE TO VALUE OBTAINED FROM "MINIMUM TAKE-OFF POWER" GRAPH

3. Brakes - RELEASE

4. Power Levers - TORQUE SHOULD INCREASE APPROXIMATELY 3% FROM ZERO TO 100 KNOTS. ADJUST, IF REQUIRED, TO PRECLUDE EXCEEDING TORQUE OR ITT LIMITS. AFTER DECISION IS MADE TO STOP, RETARD POWER LEVERS TO IDLE. IN A NATURAL, CONTINUING MOTION, LIFT AND RETARD TO THE MINIMUM GROUND FINE POSITION AT THE INSTANT V1 IS REACHED

5. Brakes - APPLY MAXIMUM BRAKING POSSIBLE WITHOUT SLIDING TIRES.

The Maximum Reverse Thrust Landing procedures are listed as:

1. Flaps - DOWN

2. Yaw Damp - OFF

3. Condition Levers - HIGH IDLE

4. Propeller Levers - FULL FORWARD

After Touchdown,

5. Power Levers - LIFT THROUGH GROUND FINE AND LIFT TO REVERSE

6. Brakes - AS REQUIRED

7. Condition Levers - LOW IDLE.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	44, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	09/27/2000
Occupational Pilot:		**Last Flight Review or Equivalent:**	09/17/2000
Flight Time:	10868 hours (Total, all aircraft), 35 hours (Total, this make and model), 5905 hours (Pilot In Command, all aircraft), 212 hours (Last 90 days, all aircraft), 46 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N398DE
Model/Series:	300 BE-300	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	FA-109
Landing Gear Type:	Retractable - Tricycle	**Seats:**	9
Date/Type of Last Inspection:	09/22/2000, Continuous Airworthiness	**Certified Max Gross Wt.:**	14000 lbs
Time Since Last Inspection:	47.3 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	3801.2 Hours at time of accident	**Engine Manufacturer:**	Pratt & Whitney
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-60A
Registered Owner:	King Air Charter	**Rated Power:**	1050 hp
Operator:	AeroSmith Aviation, Inc.	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:	AeroSmith Aviation, Inc.	**Operator Designator Code:**	XOSA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	CCR, 26 ft msl	**Distance from Accident Site:**	
Observation Time:	1538 PDT	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	26°C / 8°C
Precipitation and Obscuration:			
Departure Point:	Concord, CA (CCR)	**Type of Flight Plan Filed:**	None
Destination:	San Jose, A (SJC)	**Type of Clearance:**	VFR
Departure Time:	1538 PDT	**Type of Airspace:**	Class D

Airport Information

Airport:	Buchanan Field (CCR)	**Runway Surface Type:**	Asphalt; Concrete
Airport Elevation:	26 ft	**Runway Surface Condition:**	Dry
Runway Used:	32R	**IFR Approach:**	None
Runway Length/Width:	4601 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	1 Serious	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	37.989722, -122.056944

Administrative Information

Investigator In Charge (IIC):	Robert R Crispin	**Report Date:**	11/25/2003
Additional Participating Persons:	Dennis Pollard; Federal Aviation Administration; Oakland, CA Robert L Ramey; Raytheon Aircraft Company; Wichita, KS Tom McCreary; Hartzell Propeller Inc.; Piqua, OH		
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.ntsb.gov/pubdms/.		