Aviation Investigation Final Report

Location:	Afton, Wyoming	**Accident Number:**	DEN03LA089
Date & Time:	May 26, 2003, 11:00 Local	**Registration:**	N2106L
Aircraft:	Beech A36	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had three passengers and 50 gallons of fuel on board when he made the first scenic flight. The density altitude was reported to be 7,200 feet msl. On the second flight, he had another three passengers and 38 gallons of fuel. Density altitude had increased to 8,500 feet msl. The mixture was leaned. The pilot said "the plane did not develop the same amount of power as on the previous takeoff" and the takeoff roll was longer. "The plane rotated approximately 200 yards before the departure end of the runway, and did not accelerate beyond 70 knots." He lowered the nose to gain airspeed. Airspeed slowly increased and the airplane "was ascending at about the same rate as the terrain. Approximately eight seconds after take off, I felt a slight surge in power and lifted the nose." He then heard a "pop" and "felt a slight shudder." He concluded he had "grazed over the top of some object with the stinger at the rear of the plane." Concerned about possible damage to the airplane, the pilot radioed the airport manager and asked that he inspect the airplane when he made a low pass over the airport. He lowered the landing gear and flew over the runway. The airport manager advised him that "everything looked fine." The pilot then proceeded with the flight. As the passengers disembarked, they noticed the rear foot step had been knocked off. Further investigation revealed a gash under the right wing, 2 feet outboard from the fuselage, that extended from just aft of the leading edge to the flap. Based on a maximum gross weight of 3,600 pounds and a density altitude of 8,500 feet, it was computed that the airplane would require 2,100 feet for the takeoff roll and would climb approximately 600 feet per minute. According to the engine manufacturer, a full power setting is to be used for pre-takeoff leaning on all normally-aspirated reciprocating engines. This information is contained in the various engine handbooks. If the engine were to be leaned at a lower power setting, the mixture would become richer as power was increased beyond the setting used for leaning, and would result in lower rpm and reduced horsepower.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to achieve an adequate climb rate, resulting in an inflight collision with the sign. Contributing factors were the pilot's improper mixture leaning procedure, the high density altitude, his failure to abort the takeoff in a timely manner, and the highway sign near the end of the runway.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) MIXTURE - IMPROPER USE OF - PILOT IN COMMAND
2. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
3. (F) ABORTED TAKEOFF - NOT PERFORMED - PILOT IN COMMAND
4. (C) CLIMB - INADEQUATE - PILOT IN COMMAND
5. (F) OBJECT - SIGN

Factual Information

On May 26, 2003, approximately 1100 mountain daylight time, a Beech A36, N2106L, was substantially damaged when it struck a sign during takeoff at Afton Municipal Airport, Afton, Wyoming. The private pilot and three passengers were not injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the personal flight being conducted under Title 14 CFR Part 91. The local flight was originating at the time of the accident.

According to the pilot, he had 50 gallons of fuel on board and the density altitude was reported to be 7,200 feet msl when he took off with three passengers for a local scenic flight. When he returned about 45 minutes later, three other passengers asked to go on a similar flight. No fuel was added, and the pilot estimated he had approximately 38 gallons of fuel remaining. Engine start, taxi and run-up were uneventful. Density altitude was reported to be 8,500 feet msl, and the mixture was leaned. The pilot said "the plane did not develop the same amount of power as on the previous takeoff" and the takeoff roll was longer. "The plane rotated approximately 200 yards before the departure end of the runway," he wrote, "and did not accelerate beyond 70 knots." He lowered the nose to gain airspeed. Airspeed slowly increased and the airplane "was ascending at about the same rate as the terrain. Approximately eight seconds after take off, I felt a slight surge in power and lifted the nose." He then heard a "pop" and "felt a slight shudder." He concluded he had "grazed over the top of some object with the stinger at the rear of the plane." Concerned about possible damage to the airplane, the pilot radioed the airport manager and asked him to inspect the airplane when he made a low pass over the airport. He lowered the landing gear and flew over the runway. The airport manager advised him that "everything looked fine." The pilot then proceeded with his scenic flight which lasted about 25 minutes. After an uneventful landing and as the passengers disembarked, they noticed the rear foot step had been knocked off. Further investigation showed a gash under the right wing, 2 feet outboard from the fuselage, that extended from just aft of the leading edge to the flap. The pilot said he had struck a "highway sign."

The performance charts in the Beech A36 Pilot Operating Handbook/FAA Approved Airplane Flight Manual were consulted. Based on a maximum gross weight of 3,600 pounds and a density altitude of 8,500 feet, it was computed that the airplane would require 2,100 feet for the takeoff roll, and would climb approximately 600 feet per minute.

According to Teledyne Continental Motors, a full power setting is to be used for pre-takeoff leaning on all their normally-aspirated reciprocating engines. This information is contained in the various engine handbooks. If the engine were to be leaned at a lower power setting, the mixture would become richer as power was increased beyond the setting used for leaning, and would result in lower rpm and reduced horsepower.

Pilot Information

Certificate:	Private	**Age:**	57,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	June 14, 2001
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	April 14, 2002
Flight Time:	396 hours (Total, all aircraft), 250 hours (Total, this make and model), 240 hours (Pilot In Command, all aircraft), 52 hours (Last 90 days, all aircraft), 28 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N2106L
Model/Series:	A36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E878
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	April 16, 2003 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	41 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3715 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-BB56B
Registered Owner:	On file	**Rated Power:**	285 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	JAC	**Distance from Accident Site:**	
Observation Time:	11:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	20°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Afton, WY (KAFO)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	AftonMunicipal AFO	**Runway Surface Type:**	Concrete
Airport Elevation:	6210 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	34	**IFR Approach:**	None
Runway Length/Width:	5220 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	42.711112,-110.941947

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	James E Smith; FAA Flight Standards Field Office ; Casper, WY
Original Publish Date:	November 25, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57068