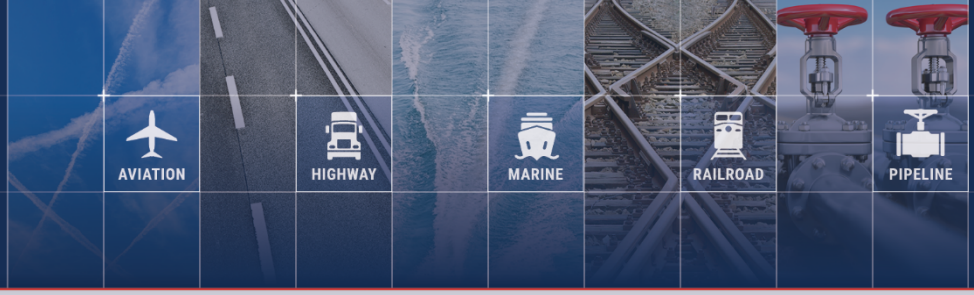

Aviation Investigation Final Report

Location:	Centennial, Colorado	**Accident Number:**	DEN07FA002
Date & Time:	October 3, 2006, 18:05 Local	**Registration:**	N7855R
Aircraft:	Beech 36	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that during the downwind leg for the runway, he performed his "GUMPS" check, which included verifying the fuel selector position and extending the landing gear. The pilot lowered the flaps during the base leg. During the base leg to final approach turn, the pilot advanced the mixture lever to full rich, the propeller lever to full forward, and secured his seatbelt. At the time the pilot advanced the mixture and propeller controls, "there wasn't any change in the engine noise and the engine RPMs were noted to have fallen to 1,500 RPMs." At some point during the final approach, the engine lost power. The pilot twice attempted to restart the engine, however, the restart was not successful. The pilot declared an emergency and executed a forced landing to the partially vacant parking lot. During the forced landing, the airplane impacted a light pole and three parked vehicles. Examination of the airframe and systems revealed no anomalies. The engine was functionally tested and did not reveal any anomalies that would have prevented normal operation and production of rated horsepower. The reason for the loss of engine power was not determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the loss of engine power for undetermined reasons. Contributing factors were the light pole and parked vehicles impacted during the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (C) POWERPLANT - FAILURE
2. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
3. (F) OBJECT - POLE
4. (F) OBJECT - VEHICLE

Factual Information

HISTORY OF FLIGHT

On October 3, 2006, approximately 1805 Mountain daylight time, a Beech 36 single-engine airplane, N7855R, sustained substantial damage when it impacted a light pole and three unoccupied parked vehicles in a parking lot following a loss of engine power during final approach to runway 17L at Centennial Airport (APA), Centennial, Colorado. The private pilot, who was the sole occupant, sustained minor injuries. The airplane was registered to Baryn Properties, Portland, Oregon, and was operated by the pilot. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The flight departed San Jose, California, at 1230 Pacific daylight time.

According to APA air traffic control tower controller statements, the pilot was initially cleared for the instrument landing system (ILS) runway 35R approach to APA. During the approach, the controllers instructed the pilot to cancel the ILS runway 35R approach, due to a shift in the wind conditions, and enter a right downwind for runway 17L. The controller cleared the pilot to land the airplane on runway 17L. Shortly thereafter, the pilot declared an emergency and stated he was not going to make it to the runway.

The pilot reported that during the downwind leg for runway 17L, he performed his "GUMPS" check, which included verifying the fuel selector position and extending the landing gear. The pilot lowered the flaps during the base leg. During the base leg to final approach turn, the pilot advanced the mixture lever to full rich, the propeller lever to full forward, and secured his seatbelt. At the time the pilot advanced the mixture and propeller controls, "there wasn't any change in the engine noise and the engine RPMs were noted to have fallen to 1,500 RPMs." At some point during the final approach, the engine lost power. The pilot twice attempted to restart the engine, however, the restarts were not successful. The pilot declared an emergency and executed a forced landing to the partially vacant parking lot.

During an interview with a Federal Aviation Administration (FAA) inspector, the pilot reported that he believed he had pushed the mixture, propeller, and throttle controls forward during his GUMP check and did not move the controls after the accident occurred. The inspector informed the pilot that the investigation team noted the fuel boost pump in the off position, and the pilot responded, "Well, then it was off for landing." The inspector asked him why he pushed the mixture full rich for landing and the pilot responded, "This engine was turbo normalized and that full rich was the proper position for the mixture for landing even at this altitude (5,000 feet)...pushing the mixture full rich on this engine doesn't make any difference because the engine thinks its at sea level." The pilot added that the engine did not surge like it normally did when he pushed in the mixture to full rich. When the airplane was lower on final

approach than the pilot wanted to be, he applied engine power to adjust his glide path. During the engine power application, the pilot realized the engine had failed.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with single-engine land and instrument airplane ratings. He held a third-class medical certificate, issued on April 21, 2006, with a limitation for corrective lenses. The pilot's most recent flight review was completed on May 30, 2006, in the accident airplane. According to the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2), the pilot reported he had accumulated a total of 3,699.8 hours of flight time, of which 3,398.8 hours were in the accident airplane make and model.

AIRCRAFT INFORMATION

The 1969-model Beech 36 airplane, serial number E-134, was a low-wing, retractable landing gear, semi-monocoque design airplane. The airplane was powered by a six-cylinder, direct drive, air cooled, horizontally-opposed, fuel injected Teledyne Continental Motors (TCM) IO-550-B engine (serial number 296921-R), rated at 300 horsepower, and equipped with a McCauley three-bladed constant speed propeller. The airplane was configured to carry a maximum of six occupants, and the maximum gross weight for the airplane was 4,000 pounds.

The airplane was issued a standard airworthiness certificate and was certificated for normal category operations. The airplane's current registration was issued to the owner on February 4, 1997. Review of the maintenance records revealed the most recent annual inspection was completed on September 6, 2006, at a total airframe time of 6,428.1 hours and a total engine time of 1,338.8 since factory rebuild. According to the tachometer at the accident site, the airplane had accumulated 14.4 hours since the annual inspection.

On November 19, 1999, a Tornado Alley Turbo "Whirlwind" Turbo normalizing System was installed in accordance with supplemental type certificate (STC) SA5223NM.

METEOROLOGICAL INFORMATION

At 1753, the APA automated surface observation system reported the wind from 160 degrees at 9 knots, visibility 10 statute miles, decreasing rain, broken clouds at 6,000 feet, overcast ceiling at 8,000 feet, temperature 12 degrees Celsius, dew point 8 degrees Celsius, and an altimeter setting of 30.27 inches of Mercury.

WRECKAGE AND IMPACT

The accident site was located in the parking lot of a business complex approximately 1/4 miles northwest of the threshold of runway 17L. A global positioning system (GPS) receiver recorded the location as 39 degrees 34:04 minutes north latitude and 104 degrees 50:52

minutes west longitude at an elevation . The main wreckage came to rest upright adjacent to two of the parked vehicles. The outboard 3 feet of the right wing was separated and came to rest near the light pole, which collapsed during the initial impact. The wreckage distribution path (light pole to main wreckage) was approximately 125 feet in length and oriented on a measure magnetic heading of approximately 180 degrees.

Examination of the main wreckage revealed the airplane impacted the parking lot in a nose low attitude. Flight control continuity was established to all flight control surfaces. Approximately 24 gallons of 100 low lead fuel was drained from the left and right wing fuel tanks (12 gallons each tank). The landing gear was found in the extended position, and the flaps were found in the full extended position. Examination of the cockpit revealed the throttle, mixture and propeller controls were full forward, the fuel selector was in the left tank position, and the fuel pump was in the off position. The manifold pressure gauge indicated 25 inches and the RPM gauge indicated 0.

TEST AND RESEARCH

On March 7, 2007, at the facilities of TCM, Mobile, Alabama, under the supervision of the NTSB investigator-in-charge, the engine was examined and functionally tested. Prior to the engine test run, the following items were completed: fuel control mixture shaft was straightened, scat duct was used to connect the throttle and control assembly to the aft cross-over, a fitting on the oil cooler was replaced, the number 6 cylinder rocker cover was replaced, and the starter adapter was replaced. The cylinders were borescoped and exhibited normal operating signatures.

The first attempt to start the engine resulted in a loss of power without the application of fuel boost pump pressure. Examination revealed that an abnormal amount of fuel was flowing from the fuel control fuel return fitting with the mixture control positioned at full rich. The fuel control hose was detached and the fittings were capped. The engine started on the second attempt without hesitation or stumbling observed in the RPM. The engine RPM was advanced in steps for warm-up in preparation for full power operation. The engine RPM was advanced and held for 5 minutes to each of the following RPM settings: 1,200, 1,600, 2,100, and 2,450 RPM. The engine throttle was advanced to full open position and held for 5 minutes where it sustained rated 2,600 RPM. The engine was advanced to full throttle from idle 6 times where it performed without any hesitation, stumbling or interruption in power. According to TCM, throughout the test phase, the engine operation was normal and did not reveal any abnormalities that would have prevented normal operation and production of rated horsepower.

A Tornado Alley Turbo representative conducted a flight in an aircraft with the same engine and turbo normalizer configuration as the accident airplane. During the flight, the pilot leveled the airplane at an altitude of 7,500 feet mean sea level. The pilot applied full throttle, full rich mixture, engine set at 2,700 RPM, and the boost pump in the off position. The pilot then reduced the throttle to idle and maintained the 7,500 feet altitude which allowed the engine

RPM and airspeed to decrease. Approximately 90 knots, the pilot applied full throttle and the engine recovered immediately to full power. The pilot repeated the process several times with the same result.

ADDITIONAL INFORMATION

According to the Tornado Alley Turbo Airplane Flight Manual (AFM) Supplement, Section 3. Emergency Procedures, Retarding Throttle To Idle, "Retarding the throttle to idle at or near full rich mixture setting may cause engine combustion to cease, depending on auxiliary fuel pump operation and altitude. At altitudes below 18,000 feet, merely advancing the throttle should cause resumption of normal engine operation..."

The AFM Supplement Section 4. Normal Procedures, Before Landing, indicates the following procedures:

1. Seat Belts & Shoulder Harnesses - FASTENED; Seat Backs - POSITION FOR LANDING
2. Fuel Selector Valve - SELECT FULLER MAIN TANK (feel for detent and visually check)
3. Fuel Boost Pump - OFF
4. Cowl Flaps - AS REQUIRED
5. Mixture - AS REQUIRED FOR ALTITUDE AND THROTTLE SETTING
6. Landing Gear - DOWN and CHECKED (Check AFM for correct Landing Gear extension speed)
7. Landing Lights - AS REQUIRED
8. Flaps - DOWN (observe maximum extension airspeeds)
9. Airspeed - ESTABLISH NORMAL APPROACH SPEED
10. Propeller - HIGH RPM

The airplane was released to the owner's representative.

Pilot Information

Certificate:	Private	**Age:**	76,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 1, 2006
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	May 1, 2006
Flight Time:	3700 hours (Total, all aircraft), 3399 hours (Total, this make and model), 3700 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N7855R
Model/Series:	36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E-134
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	September 1, 2006 Annual	**Certified Max Gross Wt.:**	4000 lbs
Time Since Last Inspection:	14 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	6428 Hrs as of last inspection	**Engine Manufacturer:**	Teledyne Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-B
Registered Owner:	Baryn Properties	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

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:	Overcast / 5000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	SAN JOSE, CA (SJC)	**Type of Flight Plan Filed:**	IFR
Destination:	Centennial, CO (APA)	**Type of Clearance:**	IFR
Departure Time:	12:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	39.567779,-104.847778

Administrative Information

Investigator In Charge (IIC):	Sauer, Aaron
Additional Participating Persons:	Steve Scully; Federal Aviation Administration; Denver, CO Terry Horton; Teledyne Continental Motors; Mobile, AL
Original Publish Date:	July 25, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=64633