Aviation Investigation Final Report

Location:	Southbury, Connecticut	**Accident Number:**	NYC05LA074
Date & Time:	April 20, 2005, 16:03 Local	**Registration:**	N3810X
Aircraft:	Beech A36TC	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation		

Analysis

During taxi, runup, and takeoff, the pilot did not notice any anomalies with the engine, and the flight progressed without incident until about 90 miles short of the intended destination when the engine started to run rough for a few seconds before it stopped producing power. The windscreen became covered with oil, and the pilot executed an off airport forced landing, substantially damaging the airplane. External examination of the engine revealed three holes in the top of the engine case, and a crankshaft counter weight pin resting on top of the engine. Internal examination of the engine revealed heavy mechanical damage on the No. 5 counter weight, and the engine case in the vicinity of the No. 3 and No. 4 cylinders. Examination of the No. 5 counter weight assembly revealed that one of the two aft snap rings, plates, and pins were missing. The pin was located on top of the engine during the external examination, but neither the snap ring nor plate could be located. The fact that the engine was operated for approximately 16 hours since overhaul, along with the witness mark on the surface of the counter weight, suggested that the snap ring, plate, and pin were installed; however, it could not be determined if the snap ring was properly seated. A review of engine overhaul records revealed that on February 5, 2005, the counterweights, along with the pins, plates, and snap rings were installed on the crankshaft.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the counter weight aft snap ring to hold the associated plate and pin in place, which resulted in a total loss of engine power.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE

Findings
1. (C) ENG ASSEMBLY,CRANKSHAFT COUNTERWEIGHTS/VIB DAMPER - SEPARATION

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

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

Findings
2. OBJECT - TREE(S)

Factual Information

On April 20, 2005, at 1603 eastern daylight time, a Beech A36TC, N3810X, was substantially damaged during a forced landing to an open field after experiencing a total loss of engine power near Southbury, Connecticut. The certificated private pilot received minor injuries. Visual meteorological conditions prevailed for the business flight that departed Cuyahoga County Airport (CGF), Cleveland, Ohio, destined for the Theodore Francis Green State Airport (PVD), Providence, Rhode Island. An instrument flight rules flight plan was filed and activated for the flight conducted under 14 CFR Part 91.

According to the pilot, he arrived at the airport, preflighted the airplane, and then boarded. During taxi, runup, and takeoff, he noticed no anomalies with the engine, and the flight progressed without incident until about 90 miles southwest of Providence. While in cruise flight at 9,000 feet msl, the pilot felt the engine start to "shake and then shudder." About 5 seconds later, the engine lost power, and the windscreen became covered with oil. The pilot advised air traffic control (ATC) of his situation, and declared an emergency.

The air traffic controller advised the pilot that the Waterbury-Oxford Airport (OXC), Oxford, Connecticut, was the closest airport, and recommended a heading of 150 degrees. The pilot thought he saw an airport at 130 degrees, which he turned the airplane towards. The controller radioed the pilot that he was no longer headed towards the closest airport, and once again, recommended a heading of 150 degrees. The pilot acknowledged the transmission, and turned the airplane back towards the Waterbury-Oxford Airport.

After passing 5,000 feet msl, the pilot felt he might not reach the airport, so he started looking for an alternate forced landing location. After descending through 2,500 feet, the pilot was confident he would not make the airport. He identified an open field, and maneuvered to land, but impacted trees and wires just short of his intended forced landing area. The airplane came to rest about 4.5 miles west of the Waterbury-Oxford Airport, and the pilot egressed unassisted.

The pilot added that the engine had been overhauled approximately 16 hours before the accident, so he closely monitored engine instruments during the flight, and did not notice any anomalies with the engine oil pressure, engine oil temperature, or cylinder head temperature.

The engine was removed from the airframe, and sent to a maintenance facility in Mattituck, New York, for further examination. On May 19, 2005, the engine was examined under the supervision of the Safety Board.

External examination of the engine revealed three holes in the top of the engine case, and a crankshaft counter weight pin resting above the No. 2 cylinder deck area.

Internal examination of the engine revealed heavy mechanical damage on the No. 5 counter weight, and the case in the vicinity of the No. 3 and No. 4 cylinders, along with the associated pistons. The No. 3 and No. 4 connecting rod links had separated, and the associated fracture surfaces were consistent with overload.

Examination of the No. 5 counter weight assembly revealed that one of the two aft snap rings, plates, and pins were missing. The pin was located on top of the engine during the external examination, but neither the snap ring nor plate could be located in or around the engine.

An impression on the surface of the No. 5 counter weight was identified. The impression started on the surface of the counter weight and angled into the hole where the No. 5 aft snap ring, plate, and pin should have been located. The impression had an average depth of approximately 1/8 inch, was about 1 inch long, and had approximately the same diameter as the pin that was found on top of the engine.

A review of engine overhaul records revealed that on February 5, 2005, the counterweights, along with the pins, plates, and snap rings, were installed on the crankshaft.

The engine and wreckage were released to a representative of the owner on May 20, 2005.

Pilot Information

Certificate:	Private	**Age:**	51,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 None	**Last FAA Medical Exam:**	June 1, 2003
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 1, 2004
Flight Time:	1783 hours (Total, all aircraft), 1560 hours (Total, this make and model), 1783 hours (Pilot In Command, all aircraft), 22 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N3810X
Model/Series:	A36TC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	EA186
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 1, 2005 Annual	**Certified Max Gross Wt.:**	3650 lbs
Time Since Last Inspection:	16 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3445 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	TSIO-520-K1B
Registered Owner:	Jestair, LLC	**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:	OXC,726 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	16:15 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Few / 4500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / 17 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	27°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CLEVELAND, OH (CGF)	**Type of Flight Plan Filed:**	IFR
Destination:	PROVIDENCE, RI (PVD)	**Type of Clearance:**	IFR
Departure Time:	13:30 Local	**Type of Airspace:**	

Airport Information

Airport:	WATERBURY-OXFORD OXC	**Runway Surface Type:**	
Airport Elevation:	726 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	Unknown
Runway Length/Width:		**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	41.483333,-73.228614

Administrative Information

Investigator In Charge (IIC):	Muzio, David
Additional Participating Persons:	Steve Levine; FAA/FSDO; Windsor Locks, CT
Original Publish Date:	February 26, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=61343