Aviation Investigation Final Report

Location:	Westbrook, Connecticut	**Accident Number:**	ERA11FA334
Date & Time:	June 10, 2011, 14:32 Local	**Registration:**	N8233P
Aircraft:	Piper PA-24-250	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During approach to the destination airport, the airplane experienced a loss of engine oil pressure followed by a total loss of engine power. The airplane subsequently impacted wooded terrain about 3 miles from the runway. Examination of the engine revealed that the No. 3 cylinder had separated from the engine case, and its hold-down nuts were not recovered. The hold-down nuts for the adjacent No. 5 cylinder were loose and not adequately torqued to the extent that, had the engine continued to operate, the No. 5 cylinder would have separated. No other mechanical failures were noted with the engine. The Nos. 3 and 5 cylinders, which were newer than the other cylinders and were manufactured by a different company than the original engine manufacturer, were installed about 13 years prior to the accident. There was no record of any recent work performed on those cylinders, and the most recent annual inspection was completed 10 months prior to the accident. Based on the available evidence, the No. 3 cylinder separation was likely due to inadequate torquing of the cylinder hold-down nuts.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of engine power during approach due to inadequate torque on the No. 3 cylinder hold-down nuts.

Findings

Aircraft	Recip eng cyl section - Failure
Personnel issues	Replacement - Maintenance personnel

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On June 10, 2011, about 1432 eastern daylight time, a Piper PA-24-250, N8233P, owned and operated by a private individual, was substantially damaged when it collided with wooded terrain during a forced landing, following a total loss of engine power near Westbrook, Connecticut. The certificated airline transport pilot was fatally injured and the private pilot passenger was seriously injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the planned flight to Chester Airport (SNC), Chester, Connecticut. The flight departed Brookhaven Airport (HWV), Shirley, New York, about 1411.

According to the pilot-rated passenger, he knew the pilot for 3 years and they flew together frequently. On the date of the accident, the pilot planned to visit an avionics shop at SNC. During the flight, the pilot-in-command was sitting in the left seat and manipulating the controls, with the pilot-rated passenger in the right seat. The pilot-rated passenger added that he did not have a complex aircraft endorsement, and therefore would rarely manipulate the controls, except at cruise altitudes. After crossing the Long Island Sound, the pilot stated "we have engine trouble, we are going down." The pilot-rated passenger suffered a head injury in the impact and did not remember any other details.

Review of recorded radio communications from Bradley Approach revealed that 1427, the pilot broadcast on emergency frequency 121.5 megahertz that he was 6.4 miles south of SNC, experienced a total loss of engine power with no oil pressure, and was attempting to glide to SNC. Seconds later, the pilot radioed that he was 5.6 miles from SNC, at 1,600 feet, and was not going to make it to SNC.

A witness, who lived in the vicinity of the accident site, stated that he heard the engine "sputtering" as if it had six cylinders and only five were working. The airplane then disappeared into trees.

PERSONNEL INFORMATION

The pilot, age 74, held an airline transport pilot certificate, with a rating for airplane multiengine land; and a commercial pilot certificate, with a rating for airplane single-engine land. In addition

to numerous type ratings in large transport category airplanes, he also held a flight engineer certificate, flight navigator certificate, and flight instructor certificate. The pilot's most recent Federal Aviation Administration (FAA) first-class medical certificate was issued on January 3, 2011. At that time, he reported a total flight experience of 37,260 hours. According to the pilot's logbook, he had flown 5.85 hours and 1.75 hours during the 90-day and 30-day period preceding the accident, respectively. All of the recent hours were in the accident airplane, except for 1.05 hours in a Mooney M20J.

AIRCRAFT INFORMATION

The four-seat, low-wing, retractable-gear airplane, serial number 24-3486, was manufactured in 1963. It was powered by a Lycoming O-540, 250-horsepower engine and equipped with a two-bladed, constant-speed Hartzell propeller. Review of the airframe and engine logbooks revealed that the most recent annual inspection was completed on June 10, 2010. At that time, the airplane had accumulated 4,194 total hours of operation. The engine had accumulated 1,086 total hours of operation since its last major overhaul. The airplane was operated 41 hours from the time of the last annual inspection, until the accident.

According to the pilot's son, who owned the airplane since 1991 and based it at HWV, its most recent engine overhaul was completed in the mid-1970's. Additionally, in 1998, the No. 3 cylinder and No. 5 cylinder were replaced due to low compression and corrosion, respectively. The son was not aware of any additional maintenance work performed on those cylinders, which would have required the loosening of the cylinder nuts' torque. Review of the engine logbook and receipts also did not reveal any additional pertinent maintenance work performed on those cylinders since 1998.

METEOROLOGICAL INFORMATION

The recorded 1435 weather at SNC was: wind from 350 degrees at 5 knots; visibility 9 miles; few clouds at 4,400 feet, broken ceiling at 5,000 feet, broken ceiling at 6,000 feet; temperature 28 degrees Celsius; dew point 17 degrees Celsius; altimeter 29.97 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in a wooded area, about 3 miles south of SNC. A debris path was observed, which originated with the right elevator outboard tip, and extended about a 220-degree magnetic heading for approximately 150 feet to the main wreckage. The right wingtip was observed about 70 feet up in a tree, about 75 feet along the debris path. The main wreckage was oriented about a 155-degree magnetic heading and all major components of the airplane were accounted for at the scene. The airplane came to rest inverted, with the empennage separated and resting about 8 feet northwest of the main wreckage. Oil was observed on the underside of the fuselage and empennage.

The separated empennage remained intact and was canted left. The vertical stabilator,

horizontal stabilator, and rudder remained attached to the empennage. Both wings remained attached to the airframe. The left aileron was approximately neutral and the right aileron had separated. The landing gear and flaps were retracted. The outboard leading edge of the left wing exhibited an indentation consistent with a treestrike. The inboard leading edge of the right wing also exhibited an indentation consistent with a treestrike. Both wings contained fuel, which appeared bright, clear, and consistent with 100-low-lead aviation gasoline. The cockpit area was crushed. The throttle lever was found near the full-forward position and the mixture was in the rich position. The carburetor heat was off and the magneto switch was positioned to "Both." The seats were equipped with seatbelts, but not shoulder harnesses. The front seatbelts were cut by rescue personnel.

Aileron control continuity was confirmed from the cockpit controls to the left and right aileron bellcranks. Rudder and stabilator control continuity were confirmed from the cockpit controls to the rudder bar and "T" bar, respectively. The cables had separated at the point where the empennage separated, consistent with overstress. The stabilator trim jackscrew measured full nose-up trim; however, one of the trim cables had been pulled from the stabilator trim drum, consistent with impact forces.

The engine remained attached to the airframe and the propeller remained attached to the engine. The propeller assembly did not exhibit rotational damage. The No. 3 cylinder was observed partially separated from the engine and an approximate 4-inch hole was observed in the top of the engine crankcase.

A subsequent teardown examination of the engine was performed at the manufacturer's facility, under the supervision of an NTSB investigator. During the examination, it was noted that cylinder Nos. 1, 2, 4, and 6 were older Lycoming cylinders and cylinder Nos. 3 and 5 were newer and manufactured by Superior Air Parts. The No. 3 cylinder had separated from the engine case and its hold-down nuts were not recovered. While removing the cylinders from the engine, it was noted that the No. 5 cylinder hold-down nuts were not torqued and "finger loose." No fretting was observed and the hold-down studs were unremarkable.
Additionally, the No. 3 connecting rod was fractured at the end, with its associated piston pin missing and not recovered. The remnants of the No. 3 piston were located inside the No. 3 cylinder. No other mechanical failures were noted during the examination.
MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on June 11, 2011, by the State of Connecticut Office of the Chief Medical Examiner, Farmington, Connecticut.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma.

Review of the toxicology report revealed:

"Metoprolol detected in Urine

Metoprolol detected in Blood"

ADDITIONAL INFORMATION

The airplane was equipped with a handheld global positioning system (GPS) receiver, which was forwarded to the NTSB Vehicle Recorders Laboratory, Washington, DC, for data download. The data was successfully downloaded and GPS plots were generated for the accident flight.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor	**Age:**	74,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	January 3, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 4, 2011
Flight Time:	37260 hours (Total, all aircraft), 6 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8233P
Model/Series:	PA-24-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-3486
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 10, 2010 Annual	**Certified Max Gross Wt.:**	2900 lbs
Time Since Last Inspection:	41 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4194 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	O-540
Registered Owner:	BENDZLOWICZ PETER P III	**Rated Power:**	250 Horsepower
Operator:	BENDZLOWICZ PETER P III	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SNC,416 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	14:35 Local	**Direction from Accident Site:**	10°
Lowest Cloud Condition:	Few / 4400 ft AGL	**Visibility**	9 miles
Lowest Ceiling:	Broken / 5000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	28°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Shirley, NY (HVN)	**Type of Flight Plan Filed:**	None
Destination:	Chester, CT (SNC)	**Type of Clearance:**	None
Departure Time:	14:11 Local	**Type of Airspace:**	

Airport Information

Airport:	Chester Airport SNC	**Runway Surface Type:**	
Airport Elevation:	416 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	41.338611,-72.508056

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Kurt Schemmerling; FAA/FSDO; Windsor Locks, CT Mike McClure; Piper Aircraft; Duncanville, TX John Butler; Lycoming Engines; Arlington, TX
Original Publish Date:	January 17, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=80729