# Aviation Investigation Final Report

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| **Location:** | Saranac Lake, New York | **Accident Number:** | ERA15FA297 |
| **Date & Time:** | August 7, 2015, 17:50 Local | **Registration:** | N819TB |
| **Aircraft:** | Piper PA46 | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | Loss of control in flight | **Injuries:** | 4 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The private pilot, who was experienced flying the accident airplane, was conducting a personal flight with three passengers on board the single-engine turboprop airplane. Earlier that day, the pilot flew uneventfully from his home airport to an airport about 1 hour away. During takeoff for the return flight, the airplane impacted wooded terrain about 0.5 mile northwest of the departure end of the runway. There were no witnesses to the accident, but the pilot's radio communications with flight service and on the common traffic advisory frequency were routine, and no distress calls were received. A postcrash fire consumed a majority of the wreckage, but no preimpact mechanical malfunctions were observed in the remaining wreckage.

Examination of the propeller revealed that the propeller reversing lever guide pin had been installed backward. Without the guide pin installed correctly, the reversing lever and carbon block could dislodge from the beta ring and result in the propeller blades traveling to an uncommanded feathered position. However, examination of the propeller components indicated that the carbon block was in place and that the propeller was in the normal operating range at the time of impact. Additionally, the airplane had been operated for about 9 months and 100 flight hours since the most recent annual inspection had been completed, which was the last time the propeller was removed from and reinstalled on the engine. Therefore, the improper installation of the propeller reversing lever guide pin likely did not cause the accident.

Review of the pilot's autopsy report revealed that he had severe coronary artery disease with 70 to 80 percent stenosis of the right coronary artery, 80 percent stenosis of the left anterior descending artery, and mitral annular calcification. The severe coronary artery disease combined with the mitral annular calcification placed the pilot at high risk for an acute cardiac event such as angina, a heart attack, or an arrhythmia. Such an event would have caused sudden symptoms such as chest pain, shortness of breath, palpitations, or fainting/loss of consciousness and would not have left any specific evidence to be found during the autopsy. It is likely that the pilot was acutely impaired or incapacitated at the time of the accident due to an acute cardiac event, which resulted in his loss of airplane control.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's loss of airplane control during takeoff, which resulted from his impairment or incapacitation due to an acute cardiac event.

### Findings

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| **Personnel issues** | Cardiovascular - Pilot |
| **Aircraft** | Lateral/bank control - Not attained/maintained |
| **Personnel issues** | Aircraft control - Pilot |

# Factual Information

## History of Flight

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| **Initial climb** | Loss of control in flight (Defining event) |
| **Uncontrolled descent** | Collision with terr/obj (non-CFIT) |

HISTORY OF FLIGHT

On August 7, 2015, about 1750 eastern daylight time, a Piper PA-46-500TP, N819TB, registered to Majestic Air LLC and operated by a private individual, was destroyed during collision with terrain, shortly after takeoff from Adirondack Regional Airport (SLK), Saranac Lake, New York. The private pilot and three passengers were fatally injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the planned flight to Greater Rochester International Airport (ROC), Rochester, New York.

The airplane was based at ROC and flew uneventfully to SLK earlier during the day of the accident. Prior to the accident flight, the airplane was fueled with 44 gallons of Jet A aviation gasoline. The pilot then radioed flight service at 1734 and received his IFR clearance at 1744, which he read-back correctly. During the return flight, a witness, who was an airport employee, heard the pilot announce on the common traffic advisory frequency that the airplane was departing on runway 5. No further communications were received from the accident airplane and there were no eye witnesses to the accident. The accident airplane was subsequently located about 1830 in a wooded area approximately .5 mile northwest of the departure end of runway 5, by pilots in another airplane who observed smoke from a postcrash fire.

PERSONNEL INFORMATION

The pilot, age 67, held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent Federal Aviation Administration (FAA) second-class medical certificate was issued on March 16, 2015. At that time he reported a total flight experience of 4,620 hours; of which, 60 hours were flown during the previous 6 months. Review of the pilot's logbook revealed that he had accumulated approximately 229.8 hours in the accident airplane, dating back to September 7, 2013, which was 9 days after he purchased the airplane. He had flown 21.6 hours during the 90-day period preceding the accident; of which, 3.9 hours were flown during the 30-day period preceding the accident. All of those hours were flown in the accident airplane and did not include the approximate 1-hour flight to SLK earlier during the day of the accident.

AIRCRAFT INFORMATION

The six-seat, low-wing, retractable tricycle gear airplane, serial number 4697117, was manufactured in 2001. It was powered by a Pratt and Whitney of Canada PT6A-42A, 500-horsepower engine, equipped with a four-blade, controllable-pitch, Hartzell propeller. Review of maintenance records revealed that the airplane's most recent annual inspection was completed on November 6, 2014. At that time, the

airframe and engine had accumulated 1,294.5 hours of operation. The annual inspection included a detailed inspection of the engine as a result of an engine over-temperature event during a previous startup. That inspection would have required removal and reinstallation of the propeller. The airplane was subsequently flown about 100 hours, from the time of the annual inspection, until the accident.

On July 7, 2015, about 6 hours prior to the accident, a 100-hour power recovery and turbine wash was performed on the engine. During that time, a pitch trim servo was replaced as the autopilot only trimmed in one direction and the pilot side trim switch button was replaced as it was broken. A friend of the pilot reported that he subsequently flew with the pilot in the accident airplane on July 29, 2015. The flight included approaches and holds, both with and without the autopilot, and everything on the airplane performed well with no anomalies noted.

## METEOROLOGICAL INFORMATION

The recorded weather at SLK, at 1751, was: wind from 360 degrees at 6 knots; broken ceiling at 6,000 feet; visibility 10 miles; temperature 20 degrees C; dew point 11 degrees C, altimeter 29.99 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

The airplane came to rest upright against several trees, oriented about a magnetic heading of 020 degrees. The beginning of a debris path was observed with several freshly cut tree branches. Red lens fragments from the left wing navigation light were embedded in one of the tree branches, consistent with a left-wing-low, nose-down impact. The debris path extended on a course about 195 degrees for 60 feet to the main wreckage, which had been partially consumed by the postcrash fire. The cockpit was consumed by fire and no readable flight instruments were recovered. The right wing remained partially attached to the airframe and exhibited more fire damage near the wingtip. The right flap and aileron remained partially attached to the right wing. The left wing remained partially attached to the airframe and was bent aft, twisted, and partially consumed by fire. A section of flap and aileron remained attached and the left wing. The horizontal and vertical stabilizer remained intact, with the elevator and rudder attached, and exhibiting fire damage.

Flight control continuity was confirmed from the respective left and right aileron sectors to the mid cabin area, with the balance cable intact. Elevator and rudder control continuity were confirmed from their respective sectors at the control panel in the cockpit to their sectors in the empennage. Measurement of the flap actuator corresponded to a flaps-retracted setting and the landing gear actuator corresponded to a landing gear retracted position. Measurement of the rudder trim linkage corresponded to an approximate neutral setting. Measurement of the elevator jackscrew corresponded to an approximate 13.5 degree tab down (50 percent nose-up) setting. A representative from the airframe manufacturer stated that the elevator setting was near the upper (nose-up) limit of the takeoff range, but within the takeoff range.

The propeller had separated from the engine and was located in a crater about 20 feet along the debris path. One propeller blade was loose in the hub consistent with impact, while the other three remained attached. The propeller blades exhibited aft bending, chordwise scratching on the camber side, leading edge nicks, and twisting from the leading edge downward. The engine remained attached to the airframe and was separated for examination. Disassembly and examination of the engine revealed rotational

scoring on both sides of the compressor turbine disc and blades consistent with contact by its adjacent static components. Rotational scoring was also observed on both sides of the power turbine vane and baffle, as well as the first stage power turbine disc and blades on the upstream face. The accessory gearbox and inlet were consumed by postcrash fire.

A subsequent teardown examination of the propeller was performed at a recovery facility, by a representative of the propeller manufacturer, under the supervision of an NTSB investigator. The examination revealed that the propeller reversing lever guide pin had been installed backwards. Without the guide pin installed correctly, the reversing lever (beta arm) and carbon block could dislodge from the beta ring, resulting in the propeller blades traveling to an uncommanded feather position. However, examination of the propeller components indicated the carbon block was in place and the propeller was not in a feather position at time of impact. Specifically, a fork bumper witness mark on preload plate No. 3 and the pitch change rod extension length corresponded to a blade angle range of approximately 27 to 29 degrees, which was in the normal operating range. Additionally, if the beta arm dislodged and moved to a feather position, spring pressure from the propeller governor would have kept it in that position (for more information, see Manufacturer Report of Propeller Teardown Examination in the NTSB Public Docket). Review of maintenance records did not reveal any other occasion subsequent to the annual inspection, in which the propeller would have been removed from and reinstalled in the engine.

## MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Adirondack Medical Center, Saranac Lake, New York. The cause of death was determined to be "multiple blunt force injuries due to aircraft accident." In addition to his injuries, significant heart disease was identified, including 70 to 80 percent stenosis of the right coronary artery and 80 percent stenosis of the left anterior descending artery without evidence of a previous heart attack. The autopsy report also noted an area of calcification of the mitral annular ring, known as mitral annular calcification.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. The results were negative for alcohol and drugs.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 67,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | Unknown |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 2 Without waivers/limitations | **Last FAA Medical Exam:** | March 16, 2015 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 4620 hours (Total, all aircraft), 230 hours (Total, this make and model), 22 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Piper | **Registration:** | N819TB |
| **Model/Series:** | PA46 500TP | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 2001 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 4697117 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | | **Certified Max Gross Wt.:** | 4850 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Turbo prop |
| **Airframe Total Time:** | | **Engine Manufacturer:** | P&W CANADA |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | PT6-42A |
| **Registered Owner:** | MAJESTIC AIR LLC | **Rated Power:** | 500 Horsepower |
| **Operator:** | Raymond Shortino | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | SLK,1663 ft msl | **Distance from Accident Site:** | 1 Nautical Miles |
| **Observation Time:** | 17:51 Local | **Direction from Accident Site:** | 185° |
| **Lowest Cloud Condition:** | | **Visibility** | 10 miles |
| **Lowest Ceiling:** | Broken / 6000 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 6 knots / None | **Turbulence Type Forecast/Actual:** | / None |
| **Wind Direction:** | 360° | **Turbulence Severity Forecast/Actual:** | / N/A |
| **Altimeter Setting:** | 29.98 inches Hg | **Temperature/Dew Point:** | 20°C / 11°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Saranac Lake, NY (SLK ) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | Rochester, NY (ROC ) | **Type of Clearance:** | None |
| **Departure Time:** | 17:50 Local | **Type of Airspace:** | |

## Airport Information

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| **Airport:** | Adirondack Regional Airport SLK | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 1633 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 05 | **IFR Approach:** | None |
| **Runway Length/Width:** | 6573 ft / 150 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 3 Fatal | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 4 Fatal | **Latitude, Longitude:** | 44.403331,-74.203613 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Gretz, Robert |
| **Additional Participating Persons:** | Mark Denny; FAA/FSDO; Albany, NY<br>Mike McClure; Piper Aircraft ; Vero Beach, FL<br>Les Doud; Hartzell Propeller; Pique, OH |
| **Original Publish Date:** | May 16, 2016 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=91729 |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.