# Aviation Investigation Final Report

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| **Location:** | Houston, Texas | **Accident Number:** | DFW05FA241 |
| **Date & Time:** | September 17, 2005, 21:24 Local | **Registration:** | N69146 |
| **Aircraft:** | Piper PA-46-310P | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 2 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The 641-hour private pilot and passenger were departing on a 155-nautical mile night cross-country flight. Shortly after the airplane took off, the tower controller heard a weak transmission that she could not completely understand, but did hear the words "engine" and "power." The controller asked the pilot to "say again", but there was no response. She again asked, "say again" and the pilot transmitted, " I'm going down." There were no further communications from the pilot. While approximately 400 feet above ground level, the airplane's engine stopped producing power. While in a left turn, the left wingtip impacted the ground and the airplane cartwheeled. The debris field encompassed an area approximately 125 feet long and approximately 50 feet wide. Witness reports of the airplane's flight path along with the wreckage distribution path were consistent with the pilot's attempt to return to the airport. A post-impact fire consumed the fuselage and caused extensive thermal damage to the engine and wings. An examination of the wreckage revealed the landing gear and wing spoilers were in the retracted position. The position of the flaps could not be determined. No mechanical deficiencies were noted with the airframe that could have prevented normal operations. Examination of the engine revealed no preimpact anomalies. The reason for loss of engine power could not be determined.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper in-flight decision to maneuver back to the departure airport following a loss of engine power on initial climb. Contributing factors were the loss of engine power for undetermined reasons, and the dark night conditions.

## Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) REASON FOR OCCURRENCE UNDETERMINED
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Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings
2. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
3. (C) LOW ALTITUDE FLIGHT/MANEUVER - ATTEMPTED - PILOT IN COMMAND
4. (F) LIGHT CONDITION - NIGHT
5. TERRAIN CONDITION - GROUND

## Factual Information

HISTORY OF FLIGHT

On September 17, 2005, about 2124 central daylight time, a Piper PA-46-310P single-engine airplane, N69146, was destroyed when it collided with terrain following a loss of engine power shortly after takeoff from Ellington Field Airport (EFD), near Houston, Texas. The private pilot and his passenger sustained fatal injuries. The airplane was registered to a private corporation and operated by the pilot. Night visual meteorological conditions prevailed and no flight plan was filed for the 14 Code of Federal Regulations Part 91 personal flight. The 155-nautical mile cross-country flight was originating at the time of the accident and was destined for the Rusty Allen Airport (5R3), near Lago Vista, Texas.

A witness, located near the south end of runway 17R, first observed the airplane while it was on its takeoff roll. The witness reported that as the airplane flew past him, left to right, at an altitude of about 200 feet, he detected no notable problems. The airplane continued to climb and shortly after, while at an altitude of approximately 300 to 400 feet, the engine started "sputtering." The engine "sputtered" for about two seconds and then there were no more audible engine sounds. Due to the prevailing darkness, the witness could only observe the airplane's navigation lights as the airplane entered a left turn followed by a sharp descent to the ground. On impact, the airplane erupted in flames.

A second witness was directly south of the airport when he first observed the airplane flying in a southerly direction. The witness stated the airplane appeared to be climbing "normally" and the engine sounded "even." Shortly after the airplane crossed over Highway 3, "the engine cut-out completely." The airplane continued straight for five to ten seconds and then began a left turn. While turning, the airplane maintained a consistent altitude for several seconds before it started to descend towards the ground in an "increasingly sharp arc." The airplane impacted the ground in an approximate 75-degree nose down attitude and burst into flames about 190 to 200 yards from where the witness was standing.

On the day of the accident, the pilot and the passenger landed at Ellington Field about 1700 and visited with family before departing for Lago Vista. A review of the fueling records established that the airplane was fueled at 1717, with the addition of 65 gallons of 100 low lead (LL) aviation fuel.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His last Federal Aviation Administration (FAA) third-class medical was issued on September 06, 2002, with the limitation of "MUST WEAR CORRECTIVE LENSES."

An examination of the pilot's logbook indicated an estimated total flight time of 641 hours; of which 330 hours were in this make and model of airplane. He logged 71 hours in the last 90 days and 15 in the last 30 days. His last noted flight review was completed October 23, 2003.

## AIRCRAFT INFORMATION

The 1985-model Piper PA-46-310P, serial number 46-8508076, was a low wing, semi-monocoque airplane, with a retractable landing gear, and was configured for six occupants. The airplane was powered by a direct drive, horizontally opposed, fuel injected, turbo-charged, six-cylinder engine. The engine, installed under STC #SA00380AT, was a Teledyne Continental TSIO-550-C, serial number 802590, rated at 300 horsepower at 2,850 rpm, and was driving a two-bladed constant speed Hartzell propeller.

According to the airframe logbook, the airplane's most recent annual inspection was completed on June 9, 2005, at an airframe total time of 3,835.9 hours. At the time of the accident, the airframe had accumulated approximately 3,916.1 hours and 80.2 hours since the last inspection.

The engine logbook revealed that the engine had been inspected in accordance with an annual inspection on June 9, 2005. At the time of the accident the engine had accumulated approximately 996 hours since major overhaul and about 179 hours since a propeller strike inspection.

## METEOROLOGICAL INFORMATION

At 2150, the weather observation facility at Ellington Field reported, wind from 170 degrees at 4 knots, visibility 10 statute miles, few clouds at 25,000 feet, temperature 80 degrees Fahrenheit, dew point 79 degrees Fahrenheit, and a barometric pressure of 29.98 inches of Mercury.

## COMMUNICATIONS

An air traffic controller reported that the pilot was cleared to takeoff of Runway 17R and instructed to fly south for three miles before turning west in order to stay clear of William P Hobby Airport's airspace. Shortly after the airplane took off, the controller heard a weak transmission that she could not completely understand, but did hear the words "engine" and "power." The controller asked the pilot to "say again", but there was no response. She again asked, "N69146 say again" and the pilot transmitted, " I'm going down." There were no further communications from the pilot.

## AERODROME INFORMATION

Ellington Field was a controlled airport operating under class D airspace. The field elevation

was 32 feet mean sea level (msl). Runway 17R was a 9,001-foot-long by 150- foot-wide concrete runway.

WRECKAGE AND IMPACT INFORMATION

On site documentation of the wreckage was conducted by investigators from the National Transportation Safety Board, Federal Aviation Administration, The New Piper Aircraft Company, and Teledyne Continental Motors.

The wreckage was located in a flat grassy field approximately 250 feet south of the airport's perimeter fence. The Global Positioning System (GPS) coordinates recorded at the accident site were 29 degrees 35.195 minutes North latitude and 095 degrees 09.654 minutes West longitude, at a field elevation of approximately 25 feet mean sea level (msl). The debris field encompassed an area approximately 125 feet long and approximately 50 feet wide, on a magnetic heading of 352 degrees. All major components of the airplane were accounted for at the accident site.

The initial point of impact was a ground scar containing red glass consistent with the left wing navigation light lens.

The propeller assembly separated from the engine crankshaft and was found buried 23 feet from the initial impact point, at a depth of approximately two feet and six inches in the ground. The propeller was recovered from the ground with the assistance of a backhoe. One blade was loose in the hub and found near the low pitch angle. The blade was bent towards the non-cambered side at an approximate angle of 30 degrees. There were no leading edge gouges or chordwise scratches. The other blade was found near the low pitch angle and was bent about 45 degrees aft towards the non-cambered side. The leading edge did not exhibit gouges or chordwise scratches. The spinner was mapped aft over the propeller hub and did not exhibit rotational crushing.

The engine, nose landing gear, and fuselage section, from the instrument panel area forward, were located approximately nine feet beyond the propeller.

The main wreckage consisting of, the cabin section, remaining fuselage, right wing, outboard section of the left wing, and empennage, was located about 45 feet beyond the engine. The fuselage and cabin area came to rest upright on a heading of 205 degrees. A post-impact fire consumed the cabin area and fuselage aft to the vertical stabilizer.

The fuel tank selector system consisted of a valve assembly located in the right wing root area and a selector lever mounted on the instrument panel. The valve and selector lever were interconnected via a cable. The fuel valve positions, which could be selected, were, "OFF, LEFT, or RIGHT." The fuel tank selector lever was found between the "OFF" and "LEFT" tank positions. The fuel selector valve was found in the "OFF" position.

The vertical and horizontal stabilizers remained attached in their respective positions and displayed impact damage. The rudder and elevator were attached via all hinge points. Control cable continuity was established from the forward fuselage separation, aft to the rudder and elevator. The elevator trim was found in the approximate 17-degree, of the available 19-degree, nose down setting.

The right wing remained partially attached to the fuselage, sustained extensive thermal damage, and came to rest with the leading edge pointing skyward. The right aileron was separated and found beneath the outboard end of the right wing. The right aileron control cable was separated near the right wing root and at the forward fuselage separation. The ailerons single balance cable was separated approximately 1-foot inboard of the left aileron drive sector assembly and again near the right wing root. The right flap was partially separated and located beneath the trailing edge of the wing. The right flap position could not be determined. The right fuel cap was in place and secure. All fuel from the right fuel tank was consumed in the post impact fire. The right main landing gear was found partially extended. The right spoiler was found in the stowed position.

The left wing was found separated from the fuselage and in two main parts. About 7 feet 6 inches of the inboard section was located 45 feet beyond the main wreckage. The remaining outboard section of left wing was located near the main wreckage. Both sections sustained substantial thermal as well as impact damage. The left aileron remained attached to the outboard wing section. The left aileron control cable was separated from the aileron drive sector at the attach point fastener and again near the left wing root. The remaining section of the left aileron control cable was located with the separated front fuselage section. The left flap was separated from the wing and found in two pieces. The left flap position could not be determined. The left fuel cap was in place and secure. All fuel from the left fuel tank was consumed in the post impact fire. The left main landing gear was found in the retracted position. The left spoiler was found in the stowed position.

The engine, which sustained impact and thermal damage, was slung from a hoist. The engine was manually rotated via an adapter inserted in the vacuum pump drive. The engine rotated freely and valve train continuity was established for each cylinder except the #5 cylinder exhaust valve due to a push rod that sustained impact damage. Continuity was established to the gears in the accessory case. Compression was developed in each cylinder.

All spark plugs were removed and displayed "Normal" signatures when compared to the Champion Aviation Check-A-Plug (AV-27) chart. The top and bottom spark plugs from the #1 cylinder and the top spark plug from the #6 cylinder contained an oily substance consistent with engine oil.

The oil sump was removed and the oil sump screen was clean and open. The propeller governor screen was found unobstructed with small amounts of debris present. The oil filter exhibited thermal damage. When cut open, the oil filter element was found charred. The engine driven fuel pump exhibited thermal damage and could not be turned by hand. The fuel

pump drive coupling was found undamaged. The fuel manifold valve plunger moved freely, the rubber diaphragm was unbroken, and no contamination was noted in the screen. The fuel injector nozzles were found unobstructed.

The left magneto exhibited thermal damage and could not be tested. All teeth were present on the distributor and rotor gear. The right magneto was rotated via a magneto-testing bench and produced spark through all leads of a slave harness.

The fuel filter bowl was removed and the filter element was found unrestricted.

The engine and engine accessories were then recovered to Teledyne Continental Motors located in Mobile, Alabama. On December 6, 2005, the engine was further examined under the supervision of the Safety Board.

The external surfaces of the crankcase exhibited thermal discoloration. Internal engine continuity was confirmed by separating the crankcase. No evidence of fretting was noted on the crankcase halves. The main bearing support diameters exhibited no signs of bearing movement or rotation. All cylinder bays were undamaged. The oil galleys and passages in the left and right crankcase halves were clear and unobstructed.

The crankshaft exhibited thermal discoloration toward the aft end of the assembly. The connecting rod journals, main journals and thrust surfaces were undamaged and showed no signs of lubrication distress. The counterweights were attached, undamaged, and had free and unrestricted movement on their respective attachment points. The propeller flange end of the crankshaft was fractured and separated upon impact.

The camshaft exhibited thermal discoloration at the aft (driven) end of the assembly. The lobes exhibited normal operating and wear signatures.

The accessory gears had continuity and exhibited thermal discoloration. The gear teeth were undamaged and exhibited normal operating signatures.

All cylinder combustion chambers exhibited normal amounts of combustion deposits and the cylinder bores were not scored or damage. All cylinder skirts were undamaged and exhibited hone marks in each cylinder bore. The intake and exhaust valve heads exhibited normal deposits and operating signatures. Each rocker box area had an oil residue consistent with lubrication to the cylinder overhead components. The cylinder overhead components (valves, rocker arms, guides, springs, and retainers) were undamaged.

All piston heads exhibited normal combustion deposits and the piston skirts were free of scoring and damage. All piston rings were free to move in their respective grooves and exhibited normal wear and operating signatures. The piston pin and plug assemblies were undamaged.

Both turbochargers exhibited impact damage and thermal discoloration. The turbines were rotated freely by hand with no rubbing or dragging noted when an axial load was applied. The wastegate and actuator assembly exhibited extensive impact and thermal damage. The wastegate was found approximately 80 percent open. The wastegate clevis pin was removed and the wastegate valve could be moved freely by hand. The actuator shaft was found bent approximately forty-five degrees, which was consistent with impact damage.

Both vacuum pumps exhibited thermal damage and both drive gears were broken and could not be turned. All vacuum pump vanes were complete and in their respective positions.

Examination of the engine revealed no preimpact anomalies that could have contributed to the loss engine power.

An inspector from the FAA quarantined the fuel truck after the accident and extracted a quart sample. The liquid was blue in color and consistent with 100 low lead (LL) aviation fuel. No contaminants were observed.

MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Medical Examiner of Harris County, located in Houston, Texas, performed an autopsy on the pilot on September 18, 2005.

The FAA, Toxicology Accident Research Laboratory, located in Oklahoma City, Oklahoma, conducted toxicological testing on the pilot.

ADDITIONAL INFORMATION

A passenger, who had been on board the accident airplane on a previous flight, provided a written statement to the Investigator-In-Charge (IIC). According to the passenger, on September 5, 2005, after a cross-country flight of about 4 hours and 45 minutes, the pilot landed for additional fuel before continuing on to their final destination. After the addition of 15 gallons of fuel to each fuel tank, the pilot performed a pre-flight inspection, including a check of the fuel, and an engine run up before departing. During the initial takeoff climb, while at an altitude of approximately 600-800 feet and in a slight right turn, the engine experienced a partial loss of power.

After the pilot reported the engine trouble to the airport tower controller, the controller responded that the airplane was emitting smoke and asked the pilot if he was declaring an emergency. The passenger reported, "I saw the pilot press some switches that I believed changed the fuel tanks and turned on an aux power fuel pump, we never lost all power, and what ever he did seemed to help as the engine began to regain some power; the pilot had already begun a left hand turn and when we finished, we were lined up with the airport runway; the pilot told the controller that we had power to land and he gave us clearance; we did not declare and emergency; there was no wind fact and we landed in the opposite direction from

takeoff and taxied to the parking area with no incident thereafter."

The passenger reported that after landing "the fuel was checked again and it was determined that some contamination had occurred in one of the wing tanks; pilot then consulted the fuel truck driver and manager, who said the truck had been checked for water that morning." The pilot then taxied the airplane to the maintenance parking area and "did a complete check and full run up." The pilot departed by himself and flew the airplane for about 15 minutes and landed. "At which time we determined that the plane was operating to standards and that bad fuel had caused the problem." The pilot and passengers then boarded the airplane and completed the last leg of their journey without incident.

The wreckage was released on February 16, 2006, to a representative of the owner's insurance company.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 42,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:** | Yes |
| **Medical Certification:** | Class 3 | **Last FAA Medical Exam:** | September 1, 2003 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | October 1, 2003 |
| **Flight Time:** | 641 hours (Total, all aircraft), 330 hours (Total, this make and model), 596 hours (Pilot In Command, all aircraft), 71 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Piper | **Registration:** | N69146 |
| **Model/Series:** | PA-46-310P | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 46-8508076 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | June 1, 2005 Annual | **Certified Max Gross Wt.:** | 4118 lbs |
| **Time Since Last Inspection:** | 80 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 3916 Hrs at time of accident | **Engine Manufacturer:** | Teledyne Continental |
| **ELT:** | Installed, activated, did not aid in locating accident | **Engine Model/Series:** | TSIO-550-C |
| **Registered Owner:** | On file | **Rated Power:** | 300 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Night |
| **Observation Facility, Elevation:** | EFD,32 ft msl | **Distance from Accident Site:** | 1 Nautical Miles |
| **Observation Time:** | 21:50 Local | **Direction from Accident Site:** | 360° |
| **Lowest Cloud Condition:** | Few / 25000 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 4 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 170° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.97 inches Hg | **Temperature/Dew Point:** | 27°C / 26°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | HOUSTON, TX (EFD ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | LAGO VISTA, TX (5R3 ) | **Type of Clearance:** | None |
| **Departure Time:** | 21:22 Local | **Type of Airspace:** | |

## Airport Information

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| **Airport:** | ELLINGTON FIELD EFD | **Runway Surface Type:** | Concrete |
| **Airport Elevation:** | 32 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 17R | **IFR Approach:** | None |
| **Runway Length/Width:** | 9001 ft / 150 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 1 Fatal | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 Fatal | **Latitude, Longitude:** | 29.586666,-95.160835 |

## Administrative Information

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| **Investigator In Charge (IIC):** | LeBaron, Timothy |
| **Additional Participating Persons:** | John Koppenhaver; Federal Aviation Administration; Houston, TX<br>Michael C McClure; The New Piper Aircraft Company; Vero Beach, FL<br>Andrew Swick; Teledyne Continental Motors, Inc.; Mobile, AL |
| **Original Publish Date:** | May 30, 2006 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=62479 |