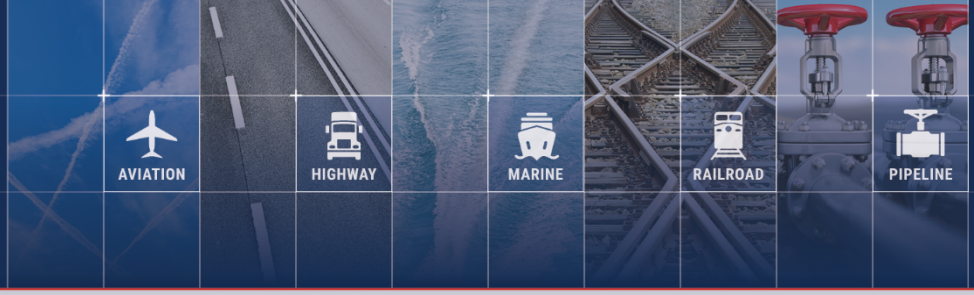

Aviation Investigation Final Report

Location:	Tyler, Texas	**Accident Number:**	CEN17FA266
Date & Time:	July 13, 2017, 08:10 Local	**Registration:**	N47GW
Aircraft:	Piper PA31T	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The airline transport rated pilot and passenger departed on a cross-country business flight in a twin-engine, turbo-propeller-equipped airplane in day, visual meteorological conditions. Shortly after takeoff, the airplane banked left, descended, and impacted terrain about 1/2 mile from the end of the runway. There was not a post-crash fire and fuel was present on site. A postaccident airframe examination did not reveal any anomalies that would have precluded normal operation.

Examination of the left engine found signatures consistent with the engine producing power at impact. Examination of the right engine revealed rotational scoring on the compressor turbine disc/blades, and rotational scoring on the upstream side of the power vane and baffle, which indicated that the compressor section was rotating at impact; however, the lack of rotational scoring on the power turbine disc assembly, indicated the engine was not producing power at impact. Testing of the right engine's fuel control unit, fuel pump, propeller governor, and over-speed governor did not reveal any abnormities that would have accounted for the loss of power. The reason for the loss of right engine power could not be determined based on the available information.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power and the subsequent pilot's loss of control for reasons that could not be determined because post-accident engine examination revealed no anomalies.

Findings

Aircraft	(general) - Not specified
Personnel issues	Aircraft control - Pilot
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 13, 2017, about 0810 central daylight time, a Piper, PA-31T airplane, N47GW, impacted terrain shortly after takeoff from Tyler Pounds Regional Airport (TYR), Tyler, Texas. The pilot and passenger were fatally injured, and the airplane was destroyed. The airplane was registered to and operated by T-210 Holdings, LLC, under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a business flight. Visual meteorological conditions prevailed, and the airplane was on an instrument flight rules flight plan. The cross-country flight was originating at the time of the accident, and was en route to Midland Airpark (MDD), Midland, Texas.

The tower controller stated that, after the airplane was cleared for takeoff from runway 17, it appeared to have a shallower-than-normal climb. The controller then saw the airplane bank left, before descending and impacting terrain off airport property.

Pilot Information

Certificate:	Airline transport	**Age:**	62
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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	January 17, 2017
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	17590 hours (Total, all aircraft)		

Passenger Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

The pilot held an airline transport pilot certificate with ratings for airplane single- and multi-engine land and instrument airplane. He held type ratings for Boeing 737 and Falcon 10 airplanes. He also held a mechanic certificate with airframe and powerplant ratings. His Federal Aviation Administration (FAA) first-class medical certificate was issued on January 17, 2017, with the limitation that he, must wear corrective lenses. At the time of the medical exam, the pilot reported 17,590 total flight hours and 120 hours in the previous six months.

The operator reported that the pilot routinely flew to MDD, that he also flew a business jet, and that this was first solo flight since receiving a checkout in the accident airplane.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N47GW
Model/Series:	PA31T	**Aircraft Category:**	Airplane
Year of Manufacture:	1981	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	31T-8104030
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	March 17, 2017 Continuous airworthiness	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Turbo prop
Airframe Total Time:	5685.7 Hrs as of last inspection	**Engine Manufacturer:**	P&W CANADA
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A-60A
Registered Owner:	T-210 HOLDINGS LLC	**Rated Power:**	1127 Horsepower
Operator:	T-210 HOLDINGS LLC	**Operating Certificate(s) Held:**	None

The accident airplane was a Piper Cheyenne, PA-31T, which is a low-wing, twin-engine airplane, with retractable, conventional landing gear, powered by two Pratt & Whitney PT-6A turboprop engines and

Hartzell full-feathering propellers.

The airplane was on a progressive maintenance inspection program. A review of the airplane's maintenance records revealed an "event one" inspection was completed on March 17, 2017. The left engine's power section was disassembled due to metal in the oil and was repaired under a work order , on March 2, 2017, at 5,698.9 hours total time. The right engine's power section was also found to have metal in the oil and was repaired on March 2, 2017, at 5,609.5 hours total time and 2,888.0 hours since overhaul.

The airplane was filled with 245 gallons of Jet-A fuel, before departure.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KTYR	**Distance from Accident Site:**	
Observation Time:	07:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	26°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tyler, TX (KTYR)	**Type of Flight Plan Filed:**	IFR
Destination:	Midland Airpark, TX (KMDD)	**Type of Clearance:**	IFR
Departure Time:		**Type of Airspace:**	Class D

At 0753, the automated weather observation station (AWOS) located at TYR, recorded: wind from 120° at 4 knots, 10 miles visibility, a clear sky, temperature 79° F, dew point 74° F, and an altimeter setting of 29.97 inches of mercury.

Airport Information

Airport:	Tyler-Pounds Regional KTYR	**Runway Surface Type:**	Asphalt
Airport Elevation:	544 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	4849 ft / 150 ft	**VFR Approach/Landing:**	None

TYR) is a publicly owned, open to the public, tower-controlled airport, located 3 miles west of Tyler, Texas. TYR has three asphalt runways: Runway 17/35, is 4,849 ft by 150 ft. The

airport is at an elevation of 544.1 ft.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	32.344165,-95.40583

The on-site examination of the wreckage and ground scars revealed the airplane impacted the bank of a small pond about 1/2 mile from the end of runway 17. There was not a post-crash fire and fuel was present at the site. The airplane came to rest on its right side, on the edge of the pond; the front of the cabin displayed heavy impact damage. Both wings separated from the fuselage; the right wing was in the pond and just beyond the main wreckage, and the left wing was located under the main wreckage. The right engine separated from the nacelle and was located beside the right side of the wreckage; the four-bladed propeller remained attached to the engine. The left engine came to rest in front of the wreckage and its propeller was separated at the propeller shaft.

The wreckage was recovered to a secure facility, for further examination. by the NTSB Investigator-in-Charge and technical representatives from the engine and airframe manufacturers.

The left wing displayed substantial impact damage. The outboard 1/3 of the wing was impact-separated from the inboard portion. The aileron and outboard half of the flap were also impact-separated. The aileron control cable was secure to the bell crank and continuous to the wing root area. The balance cable was secure to the bell crank and continuous to the center fuselage area where it displayed an overload separation. The flap actuator showed about 1/2 thread, consistent with a retracted position.

The left main landing gear was retracted. The left fuel valve was found in the open position. The cross-feed valve was found in the off position.

The right wing was largely intact with both the aileron and flap in place. The aileron control cable was secure to the bellcrank and continuous to the wing root area where it had been cut for transport. The balance cable was secure to the bellcrank and continuous to the left side of the middle attach fitting, where it was overload separated.

The right main landing gear was retracted in the wheel well but not secured by the up-lock. The flap actuator displayed about 1/2 thread, consistent with a retracted position. The aileron trim drum inner shaft aft extension was about 1/2 thread, consistent with a tab position of full up about 15°.

The right fuel valve was found in the open position.

The horizontal stabilizer and elevator displayed substantial impact damage and were separated for transport. The elevator control cables were secure to the elevator bellcrank and continuous to the elevator sector in the cockpit. The elevator trim drum displayed 3 threads aft extension of the inner shaft consistent with a setting of about 3° degrees trailing edge down, (nose up), pitch trim.

The rudder was secure and free to move through full travel. The rudder cables had been cut for recovery transport forward of the rudder sector but were continuous to the forward cockpit. The rudder trim drum inner shaft forward extension had about 9.5 threads showing, consistent with a neutral setting.

The fuselage had substantial impact damage to the nose and cockpit areas. The engine control levers were found in the forward positions. The rudder trim was set at the neutral position. The landing gear lever was in the retracted position. The flap lever was in the full up (retracted) position. Both handles were broken from the pilot's control wheel.

The fuel controls were both in the "ON" position and the cross feed was in the "OFF" position and corresponded to the positions at the fuel valves.

No airframe anomalies were noted that would have precluded normal operation.

Left Engine

The left engine's four-bladed propeller shaft had fractured, separating the propeller from the engine. The blades exhibited twisting, polishing, and bend signatures.

The exhaust duct displayed compressional bending and was torn from impact with terrain. The left exhaust stack was impact separated from the exhaust duct. The gas generator case displayed compressional bending.

The engine was separated at the "C" flange to expose the hot section components. The downstream face of the compressor turbine disc and blades exhibited rotational scoring from contact with the power turbine vane. The upstream side of the compressor turbine blades displayed rotational scoring from contact with the compressor turbine vane. The power turbine vane and baffle exhibited rubs on the upstream side from contact with the compressor turbine disc. The downstream side of the vane and the baffle exhibited rotational scoring from contact with the power turbine disc. The power turbine disc and blades exhibited rotational scoring on the upstream and downstream sides from contact with the adjacent static components.

Several first stage compressor blades exhibited impact damage.

Right Engine

The right engine's four-bladed propeller remained attached to the propeller shaft. The blades exhibited varying degrees of bends.

The exhaust duct displayed compressional bending due to impact with the terrain. The left exhaust stack was bent and distorted. The gas generator case displayed compressional bending. The inlet case struts

were all fractured.

The engine was separated at the "C" flange to expose the hot section components. The downstream face of the compressor turbine disc and blades exhibited rotational scoring from contact with its respective adjacent static components. The upstream face of the compressor turbine disc and blades were unremarkable. The power turbine vane and baffle exhibited rubbing on the upstream side from contact with compressor turbine disc. The downstream side vane and baffle exhibited static impact marks from contact with the power turbine disc and blades. The power turbine disc and blades exhibited impact marks on the upstream and downstream side from contact with the adjacent static components. Several blades were fractured and displaced forward in the disc fixings.

The accessory gearbox was manually rotated by hand, and mechanical continuity was established through the gears.

The wire bundles on the engines were in poor condition, with bare metal showing in some sections.

Several components were removed from the right engine and shipped to P&W Canada for testing under the observation and guidance of the Transportation Safety Board of Canada. The fuel control unit, the fuel pump, propeller governor, and over-speed governor were tested and disassembled.

Testing of the fuel pump indicated that the pump performance was satisfactory. Observations recorded during testing of the overspeed governor indicated that the speed pick-up voltage was below the test point minimum limit;. however, the tests on the components did not identify any abnormalities that would have explained a loss of engine power.

Medical and Pathological Information

The office of The Forensic Medical of Texas, P.A., Tyler, Texas, conducted an autopsy on the pilot. The cause of death was determined to be "blunt impact injures."

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, conducted toxicological testing on the pilot. The specimens were not tested for cyanide and carbon monoxide. The test was positive for fexofenadine and azacyclonol.

Fexofenadine is a non-sedating antihistamine and is used to treat the symptoms of seasonal allergies, such as hay fever, and is available as a prescription and over-the-counter medication. It is not considered impairing. Azacyclonol is a metabolite of fexofenadine.

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig
Additional Participating Persons:	Butch Nimmo; FAA FSDO; Dallas, TX Adam Henderson; FAA FSDO; Dallas, TX Mike McClure; Piper Aircraft; Vero Beach, FL Jeff Davis; Pratt & Whitney; Quebec
Original Publish Date:	July 8, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=95560