



# Aviation Investigation Final Report

<b>Location:</b>	Laredo, Texas	<b>Accident Number:</b>	CEN18FA116
<b>Date &amp; Time:</b>	March 8, 2018, 10:38 Local	<b>Registration:</b>	N82605
<b>Aircraft:</b>	Piper PA 31P	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The commercial pilot and passenger, who held a student certificate, departed runway 18R for a local flight in a multi-engine airplane. The pilot held a flight instructor certificate for single-engine airplane. Just after takeoff, the tower controller reported to the pilot that smoke was coming from the left side of the airplane. The pilot acknowledged, stating that they were going to "fix it," and then entered a left downwind for runway 18R, adding that they didn't need any assistance. The controller subsequently cleared the airplane to land on runway 18L, which the pilot acknowledged. Two witnesses reported seeing the smoke come from the left engine. Still images taken from airport security video show the airplane before making the turn to land with white smoke trailing and the landing gear down. The airplane was then seen in a steep left turn to final approach exceeding 90° of bank, before it impacted terrain, just short of the runway in a near vertical attitude. A postcrash fire ensued.

The examination of the wreckage found that the left engine's propeller was not being driven by the engine at the time of impact. The left propeller was not in the feathered position and the landing gear was found extended. The damage to the right engine propeller blades was consistent with the engine operating at high power at impact. The examination of the airframe and engines revealed no evidence of preimpact anomalies; however, the examinations were limited by impact and fire damage which precluded examination of the hoses and lines associated with the engines. The white smoke observed from the left side of the airplane was likely the result of an oil leak which allowed oil to reach the hot exterior surfaces of the engine; however, this could not be verified due to damage to the engine. There was no evidence of oil starvation for either engine.

Both the extended landing gear and non-feathered left propeller would have increased the drag on the airplane. Because the pilot's operating procedures for an engine failure in a climb call for feathering the affected engine and raising the landing gear until certain of making the field, it is unlikely the pilot followed the applicable checklists in response to the situation. Further, the change from landing on runway 18R to 18L also reduced the radius of the turn and increased the required angle of bank. The increased left banked turn, the right engine operating at a high-power setting, and the airplane's

increased drag likely decreased the airplane airspeed below the airplane's minimum controllable airspeed (Vmc), which resulted in a loss of control.

## Probable Cause and Findings

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

An engine malfunction for undetermined reasons and the subsequent loss of control, due to the pilot's improper decision to maneuver the airplane below minimum controllable airspeed and his improper response to the loss of engine power.

### Findings

Aircraft	Recip eng oil sys - Malfunction
Not determined	(general) - Unknown/Not determined
Personnel issues	Aircraft control - Pilot
Personnel issues	Decision making/judgment - Pilot
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Incorrect action performance - Pilot
Personnel issues	(general) - ATC personnel

## Factual Information

### History of Flight

Enroute-climb to cruise	Fire/smoke (non-impact)
Enroute-climb to cruise	Loss of engine power (partial)
Landing	Loss of control in flight (Defining event)
Post-impact	Fire/smoke (post-impact)

\*\*\*This report was modified on October 21, 2019. Please see the docket for this accident to view the original report.\*\*\*

### HISTORY OF FLIGHT

On March 8, 2018, about 1038 central standard time, a Piper PA-31P twin-engine airplane, N82605, impacted terrain during an approach to the Laredo International Airport (LRD) Laredo, Texas. The pilot and student rated passenger were fatally injured, and the airplane was destroyed. The airplane was registered to and operated by a private individual, as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions existed near the accident site about the time of the accident, and no flight plan was filed for the local flight.

Shortly after departing runway 18R, the tower controller contacted the pilot and reported that smoke was coming from the left side of the airplane. The pilot reported, "... we're gonna fix that." The airplane turned back toward the airport and was cleared to land on runway 18L.

Witnesses reported seeing the airplane trailing smoke as it approached the airport. Two of the witnesses reported that the smoke came from the left engine. Several airport security cameras captured the accident airplane while airborne. A review of the video showed a trail of white smoke behind the airplane and showed that the landing gear was extended. While the airplane was on a left downwind leg for landing, the smoke trail was not visible. As the airplane turned left from base leg to final, its bank angle increased past 90 degrees. The airplane impacted terrain in a nose down, near-vertical attitude just short of runway 18L; a post-crash fire ensued.

### PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with ratings for airplane single-engine land, multi-engine land, and instrument airplane. He held a flight instructor certificate for airplane single-engine and instrument airplane. He also held a ground instructor (basic) certificate. The pilot's second-class Federal Aviation Administration medical certificate was issued on May 15, 2017, with the limitation, "must have available glasses for near vision." On the application for the medical certificate, the pilot reported 4,243 total hours of flight experience and 45 hours in the previous six months. The pilot's logbook was not available during the investigation for review.

The passenger held a student pilot certificate and a mechanic certificate with a powerplant rating. A third-class medical certificate was issued on August 1, 2014, with no limitations. At the time of the medical certificate examination, he reported 48.9 total hours and 48.9 hours in the last six months. The student's logbook was found at the accident site, but due to the accident, some of the entries were illegible, but it appeared that the student had 194 total hours in single-engine airplanes, with the last logbook entry dated February 2018. Additionally, he had been signed off for the private pilot check ride in November 2017; however, there was no record of him taking the pilot test.

## AIRCRAFT INFORMATION

The Piper PA-31P Navajo is low-wing, cabin-class, pressurized, twin-engine airplane with retractable landing gear. The accident airplane was powered by two 425-horsepower Lycoming TIGO-541 reciprocating six-cylinder engines, which each drove a three-bladed, full-feathering Hartzell propeller. Review of the airplane's maintenance records revealed that the airplane's annual inspection was conducted on January 3, 2018, at a total airframe time of 3,185 hours. At the time of the annual inspection, the Hobbs time on both the left and right engines were 2,089.2 hours, and 1,027.3 since factory remanufacture.

## METEOROLOGICAL INFORMATION

At 1056, the weather observation facility at LRD recorded wind from 140° at 14 knots gusting to 17 knots, 10 miles visibility, a clear sky, temperature 70°F, dew point 45°F, and an altimeter setting of 30.23 inches of mercury.

## COMMUNICATIONS

A review of communications data between air traffic controllers and N82065, (it was not determined whether the pilot or student rated passenger was operating the radios) revealed a pilot contacted LRD ground control and received a clearance to runway 18R. About 12 minutes later, a pilot contacted the tower controller and requested a southeast departure to the practice area.

Just after takeoff, the tower controller reported to N82065, "I have you, ah, smoking actually pretty bad, ah, looks, appears to be your left-hand side". A pilot responded "... we're gonna fix that".

The controller asked if they needed to come back around and land, and if they need any assistance.

A pilot reported that they were going to turn for the downwind 18R; and they were not requesting any assistance.

The tower controller cleared the airplane for 18L, and a pilot acknowledged 18L.

About one minute later, the tower controller notified crash rescue of the accident.

## AIRPORT INFORMATION

Laredo International Airport (LRD) is a publicly owned, tower-controlled airport located 3 miles northeast of Laredo, Texas at an elevation of 508 ft mean sea level. LRD has three concrete

runways; 18L/36R is 8,236 ft long by 150 ft wide, 18R/36L is 8,743 ft long by 150 ft wide, and 14/32 is 5,927 ft long by 150 ft wide.

## WRECKAGE AND IMPACT INFORMATION

The front of the airplane cabin/cockpit area was largely destroyed by the impact and fire. The major components of the airplane were located at the accident site. Separated pieces were scattered between the aft cabin and the impact crater, and several fragments of the airplane were scattered away from the impact point.

Both wings were separated from the fuselage and displayed heavy thermal and impact damage.

The airplane was examined at the site by the NTSB investigator-in-charge and technical representatives from the engine and airframe manufacturers. Flight control continuity was confirmed from the front cabin to the left and right aileron bellcranks. The rudder cables were traced from the cockpit to the rudder. The control column and rudder pedals were impact and fire damaged. All three of the airplane's landing gear were extended. The wing flap actuator was in the up position, which corresponded to the flaps retracted position. The cockpit instrument panel and avionics were destroyed by impact and fire damage. The airplane's emergency locator transmitter, located in the empennage, was found in the "off" position with the antenna coaxial cable disconnected; the replacement battery date was labeled as Sept 2019.

Both engines separated from the wing nacelles and were located near the fuselage. The engines were moved and examined in a nearby facility.

The left engine sustained extensive fire and impact damage. Due to impact damage, the engine would not rotate by hand. Engine components, such as the magnetos, fuel metering unit, ignition harness, and fuel pump all sustained fire and impact damage and could not be field tested. Fuel and oil lines were consumed by fire. The turbocharger separated from the engine during the impact damage and would not rotate.

The top sparkplugs were removed; the plugs exhibited normal combustion deposits and wear signatures. The engine was disassembled and, other than extensive fire and impact damage, no abnormalities were noted, and the source of the smoke was not found.

The right engine's components were fire/impact damaged and could not be field tested. The top set of sparkplugs were removed; the plugs exhibited normal combustion deposits and wear signatures.

Both left and right engine turbocharger's V-band clamps were found in place on the turbocharger exhaust system.

The left propeller separated from engine with a section of the propeller shaft. The left engine propeller blades were labeled A, B, and C for identification purposes. Blades A and C were in a high-pitch position, with blade C bent aft, and displayed leading-edge polishing. Blade B was loose in the hub and exhibited chordwise scratching and leading-edge polishing.

The right propeller also separated from the engine with a section of the propeller shaft. The blades for the right propeller were labeled A, B, and C for identification purposes. Blade A exhibited bending and

curling beginning about mid-span, with about 2 inches of the blade tip torn off. Blade B was bent forward and exhibited leading edge polishing and gouging. Blade C had fractured and separated outside of the propeller hub. The blade exhibited twisting, curling and leading-edge polishing.

Although the examination was limited by thermal and impact damage, no pre-impact abnormalities were noted during the airframe or engine examinations.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Webb County Medical Examiner, Laredo, Texas, conducted an autopsy on the occupants. The cause of death was determined to be, "multiple blunt force and crushing injuries."

The FAA Forensic Sciences Laboratory, Oklahoma City, Oklahoma, conducted toxicological testing. For the pilot, the specimens were not tested for cyanide and carbon monoxide. The tests were negative for ethanol and tested drugs. For the student pilot rated passenger, the specimens were not tested for cyanide. The tests were negative for carbon monoxide and ethanol. The test was positive for cetirizine in the blood and urine.

Cetirizine is an over the counter antihistamine and commonly marketed under the trade names: Zyrtec, Aller-Tec, or Alleroff. The medication is taken to relieve the symptoms of hay fever and allergy.

## ADDITIONAL INFORMATION

The FAA Airplane Flying Handbook (FAA-H-8083-3B), Chapter 12, Transition to Multiengine Airplanes, addresses in part, operational procedures and hazards associated with twin-engine airplanes and the loss of engine power:

### *General*

*The basic difference between operating a multiengine airplane and a single-engine airplane is the potential problem involving an engine failure. The penalties for loss of an engine are twofold: performance and control. The most obvious problem is the loss of 50 percent of power, which reduces climb performance 80 to 90 percent, sometimes even more. The other is the control problem caused by the remaining thrust, which is now asymmetrical. Attention to both these factors is crucial to safe OEI [one engine inoperative] flight. The performance and systems redundancy of a multiengine airplane is a safety advantage only to a trained and proficient pilot.*

### *Engine Failure After Lift-Off*

*A takeoff or go-around is the most critical time to suffer an engine failure. The airplane will be slow, close to the ground, and may even have landing gear and flaps extended. Altitude and time is minimal. Until feathered, the propeller of the failed engine is windmilling, producing a great deal of drag and yawing tendency. Airplane climb performance is marginal or even non-existent, and obstructions may lie ahead. An emergency contingency plan and safety brief should be clearly understood well before the takeoff roll commences. An engine failure before a predetermined airspeed or point results in an aborted takeoff. An engine failure after a certain airspeed and point, with the gear up, and climb*

*performance assured result in a continued takeoff. With loss of an engine, it is paramount to maintain airplane control and comply with the manufacturer's recommended emergency procedures.*

### *Control*

*The first consideration following engine failure during takeoff is to maintain control of the airplane. Maintaining directional control with prompt and often aggressive rudder application and STOPPING THE YAW is critical to the safety of flight. Ensure that airspeed stays above VMC [minimum control speed with the critical engine inoperative]. If the yaw cannot be controlled with full rudder applied, reducing thrust on the operative engine is the only alternative. Attempting to correct the roll with aileron without first applying rudder increases drag and adverse yaw and further degrades directional control. After rudder is applied to stop the yaw, a slight amount of aileron should be used to bank the airplane toward the operative engine. This is the most efficient way to control the aircraft, minimize drag, and gain the most performance.*

The PA-31P Pressurized Navajo, Pilot's Operating Handbook, Section III, C, Emergency Procedures, states in part:

### *FEATHERING PROCEDURE*

- a. Maintain Direction and Airspeed
- b. Mixtures – forward
- c. Props – forward
- d. Throttles – forward
- e. Gear – retract
- f. Flaps – retract
- g. Emergency Pumps – on
- h. Identify inoperative engine
- i. Throttle on inoperative engine - retard to verify
- j. Prop on inoperative engine - feather
- k. Mixture on inoperative engine - idle cut off
- l. Emergency pump on inoperative engine – off
- m. Magnetos on inoperative engine – off
- n. Prop Synchronizer - off, if installed
- o. Cowl Flaps - close on inoperative engine, as required on good engine
- p. Alternator on inoperative engine - off (use circuit breaker switch)
- q. *Electrical Load - reduce, to prevent battery depletion*
- r. *Trim - as required*
- s. *Fuel Management - fuel off on inoperative engine, consider crossfeed*
- t. *Land at first opportunity*

### *ENGINE FAILURE DURING CLIMB*

- a. Follow feathering procedure.
- b. *Hold single engine best rate-of-climb speed of 133 MPH*

c. Monitor cylinder head temperature - adjust cowl flap as required.

### *SINGLE ENGINE LANDING*

a. Complete feathering procedure

b. Before landing check list

(1) Do not extend landing gear until certain of making field. Maintain 133 MPH.

(2) Do not lower flaps until certain of making field. Maintain 116 MPH.

c. Trim for landing - (rudder)

d. Do not land pressurized above .3 psi.

### **Pilot Information**

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	56
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Unknown
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	May 15, 2017
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	4243 hours (Total, all aircraft)		

### **Pilot-rated passenger Information**

<b>Certificate:</b>	Student	<b>Age:</b>	19
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Unknown
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Unknown	<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	194 hours (Total, all aircraft)		



## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N82605
<b>Model/Series:</b>	PA 31P UNDESIGNAT	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1977	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Utility	<b>Serial Number:</b>	31P-7730010
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	
<b>Date/Type of Last Inspection:</b>	January 3, 2018 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	Reciprocating
<b>Airframe Total Time:</b>	3185 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C91 installed, not activated	<b>Engine Model/Series:</b>	TIGO-541
<b>Registered Owner:</b>		<b>Rated Power:</b>	425 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	On-demand air taxi (135)

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KLRD	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	10:56 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	14 knots / 17 knots	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	140°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.22 inches Hg	<b>Temperature/Dew Point:</b>	21°C / 7°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Laredo, TX (KLRD)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Laredo, TX (KLRD)	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	10:35 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Laredo International KLRD	<b>Runway Surface Type:</b>	Concrete
<b>Airport Elevation:</b>	508 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	18L	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	8236 ft / 150 ft	<b>VFR Approach/Landing:</b>	Precautionary landing;Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	Both in-flight and on-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	27.560832,-99.457496

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Christian Morales ; FAA FSDO; San Antonio, TX John Butler; Lycoming Aircraft Engines; Williamsport, PA Jon Hirsch; Piper Aircraft; Vero Beach, FL
<b>Original Publish Date:</b>	November 6, 2019
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=96840">https://data.nts.gov/Docket?ProjectID=96840</a>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).