Accident Rpt# CEN17CA120	**03/02/2017 1450 CST**	**Regis# N1755S**	**Fairmont, OK**	**Apt: N/a**
Acft Mk/Mdl AERO COMMANDER S2R-UNDESIGNAT		**Acft SN 1455R**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl PRATT AND WHITNEY R1340-53H1-G		**Acft TT 8123**	**Fatal 0 Ser Inj 1**	**Flt Conducted Under: FAR 137**
Opr Name: CARSON FLYING SERVICE INC		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: SPR

Events

1. Maneuvering-low-alt flying - Low altitude operation/event

Narrative

The pilot stated he was conducting spray operations to a pasture with power lines on its north border. As the pilot approached the pasture from the north on his fourth pass, he intended to descend after flying past the second of two cables. The pilot initiated a descent, but the airplane struck the second cable. The airplane subsequently impacted the ground and a post impact fire ensued. Following the accident, the pilot stated that he misidentified the first cable as the second cable.

Accident Rpt# WPR16LA105 05/10/2016 1215 PDT	**Regis# N2052L**	**Groveland, CA**	**Apt: Pine Mountain Lake E45**	
Acft Mk/Mdl BEECH B24R	**Acft SN MC-437**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO360 SER	**Acft TT 1461**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: ROBERT BLOOME	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Takeoff - Unknown or undetermined
4. Takeoff - Miscellaneous/other

Narrative

HISTORY OF FLIGHT

On May 10, 2016, about 1215 Pacific daylight time, a Beech B24R Sierra, N2052L, was substantially damaged when it impacted terrain during an attempted departure from Pine Mountain Lake Airport (E45), Groveland, California. The pilot and the passenger/owner received minor injuries. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed.

The passenger, who was a student pilot, recently purchased the airplane in an estate sale. Both the pilot and owner lived in Mississippi, and had traveled to E45 to retrieve the airplane, and fly it back to Mississippi. The airplane was domiciled at E45, and had not been maintained, operated, or flown in over 10 years. Subsequent to his purchase, the new owner contracted with a mechanic at E45 to conduct maintenance on the airplane, in preparation for the flight to Mississippi.

The day prior to the accident, both fuel tanks were filled, and the pilot and owner took the airplane for its first flight after its dormant period. The airplane departed on runway 27, and flew one circuit in the airport traffic pattern, as planned. That flight was uneventful. The next day, the pilot and owner planned to again fly the airplane, this time departing the area for some systems evaluations, before returning to E45. This takeoff attempt, which terminated in the accident, was conducted on runway 9. The pilot reported that the first part of the takeoff roll and liftoff "appeared normal but during or at gear retraction the aircraft started losing power." He stated that with about 1,000 feet of runway remaining, the engine "was not producing enough power to climb or accelerate," and that it was apparent the airplane was not going to clear the trees beyond the runway end. The pilot focused on attempting to climb, while simultaneously avoiding a stall.

The airplane struck trees and a utility pole, and then thick underbrush and the ground. The airplane came to rest about 1,800 feet beyond the end of the runway, at a point slightly north (left) of the extended runway centerline. The fracture-separated outboard right wing was located adjacent to the utility pole, and the engine had separated from the fuselage. The fuselage was slightly crumpled and otherwise deformed, but the cabin retained its normal occupiable volume. There was no fire.

PERSONNEL INFORMATION

Pilot

The pilot reported that for both flights, he was seated in the left front seat, and was the sole manipulator of the controls. He held an airline transport pilot certificate, and reported about 22,800 total hours of flight experience, including about 4,310 hours in single engine airplanes. Prior to his flight in the airplane the day before the accident, the pilot had no experience in the accident airplane make and model. His most recent flight review was completed in May 2015, and his most recent Federal Aviation Administration (FAA) third-class medical certificate was issued in January 2015.

Owner

The owner was seated in the right front seat for both flights. He reported that he held a student pilot certificate, but had no experience in the accident airplane make and model, and was only an observer on the two fights.

Mechanic

The individual who conducted the maintenance on the airplane for the new owner, and who most recently made entries in, and signed, the airplane maintenance records, resided and had a hangar at E45. He also owned and operated a repair facility, Buchner Aircraft Specialties, at Fresno Chandler Executive Airport (FCH) in Fresno, California. According to FAA records, the individual had previously held a mechanic certificate, with Airframe, Powerplant, and Inspection Authorization (IA) ratings. However, during the period when the mechanic performed the maintenance on the accident airplane and returned it to service, his IA rating was not valid, due to its expiration more than a year prior.

FAA regulations require that IA ratings be renewed biennially, or they become invalid. One renewal method allows the applicant to take approved classes within a specified period near the end of their biennial period. If an applicant fails to renew in that manner within the designated timeframe, they must take specified FAA tests to re-validate their IA rating.

In March 2015, for undetermined reasons, the mechanic did not renew his IA rating within the designated period. He then attempted to re-validate his IA rating by taking the required FAA tests, but he did not successfully pass them; thus his IA rating remained expired/invalid.

AIRCRAFT INFORMATION

FAA information indicated that the airplane was manufactured in 1976, and was equipped with retractable landing gear, and a Lycoming IO-360-A1B6 series engine. The engine drove a constant-speed, two-blade propeller. The airplane's most recent FAA registration expired in 2011.

Excluding the maintenance conducted just prior to the accident, the most recent annual inspection had been completed in December 2005.

METEOROLOGICAL INFORMATION

E45 was not equipped with any official weather sensing or recording equipment. Resident and eyewitness reports indicated that about the time of the accident, the temperature was about 75 degrees F (23 C), and there was a light wind from the west. An individual who was a flight instructor and FAA-designated pilot examiner estimated that the tailwind component along runway 9 was about 5 knots.

Calculations using the available information indicated that the temperature was about 14 degrees C above the standard atmosphere value ("ISA"), and that the resulting density altitude was 4,686 feet.

AIRPORT INFORMATION

E45 was situated at an elevation of 2,933 feet above mean sea level, and was equipped with a single paved runway designated 9/27, which measured 3,624 ft by 50 ft. The western-most 1,000 ft segment of the runway was relatively level, but then the runway sloped uphill beyond that (towards the east). The slope of that uphill portion was not constant; a maximum up slope of 1.8 per cent was present for the segment between 2,500 and 3,000 ft from the threshold of runway 9. The overall average gradient was 1.1 per cent.

There was a 100 ft gravel overrun at the east end of the runway. Beyond that, the terrain descended about 30 feet, but that region was populated with numerous trees as high as about 100 feet.

WRECKAGE AND IMPACT INFORMATION

FAA inspectors examined the wreckage the day after the accident, before it was recovered. The airplane struck several trees and came to rest upright, in dense undergrowth. The cabin and fuselage remained relatively intact, which afforded protection for the occupants during impact. Both wings sustained significant impact damage, but remained attached to the fuselage. The left wing remained securely attached. The right wing was partially fracture-separated at the wing root, and its outboard end was fracture-separated; it was found at the base of the power pole that was struck about 20 feet agl. The ailerons and flaps remained attached to their respective wings. The right fuel tank was breached, but the left tank was full of fuel. The vertical stabilizer remained securely attached to the aft fuselage, and the rudder remained securely attached to the vertical stabilizer. The stabilator remained securely attached to the aft fuselage, and the pitch trim tab remained securely attached to the stabilator.

The engine was fracture-separated from the airframe, and came to rest inverted, about 10 feet ahead of the airplane. Both blades of the propeller remained

securely installed in the propeller hub, and the hub remained attached to the engine.

All components of the airframe were accounted for, and were located in the debris path, or on or near the airplane. A detailed examination of the recovered wreckage was conducted a few weeks after the accident. There was no evidence of any in-flight or post-accident fire. No evidence consistent with any pre-impact malfunctions or failures of any airframe components that would have precluded continued normal operation was observed.

The fuselage had been cut for recovery, but flight control continuity was established for all flight controls. The cockpit stabilator trim tab indicator was observed to be set within the normal takeoff range. The stabilator trim actuator extension measurement was consistent with a stabilator trim tab position of 10§ training edge down. However, because the fuselage had been cut and otherwise disturbed for the recovery, these values could not be considered to represent the takeoff pitch trim setting.

Witness marks on both sides of the fuselage, and on the inboard ends of both flaps, indicated that the flaps were in the retracted position at the time of impact. This was corroborated by flap jackscrew extension and cockpit position indicator information. The cockpit flap control was a momentary paddle-type switch, and the flap position indicator was a circular display with a face diameter of about 1 inch. Both were situated on the right side instrument sub-panel, just to the right of the center-mounted engine control quadrant.

Damage patterns were consistent with the landing gear being near- or fully-retracted at the time of impact; the three landing gear were essentially undamaged. The landing gear control handle was in the UP position.

The airspeed indicator was properly marked; the colored speed arcs were in accordance with the Pilot's Operating Handbook (POH) values.

All three engine control (throttle, mixture, and propeller) push-pull cables had been fracture-separated from their respective engine components, at locations forward of the firewall; all three exhibited continuity from the cockpit control to the fracture locations forward of the firewall.

The fuel boost pump switch was set to the OFF, and the fuel selector valve was set to the right tank. Detailed examination of the airframe fuel system, including operation of the fuel boost pump and internal inspections of all components, did not reveal any indications of any pre-impact anomalies or deficiencies that would have precluded normal operation.

The engine bore no evidence of any pre-impact damage or failures. The engine-driven fuel pump was fracture-separated from the engine. The pump diaphragm was intact, and the engine actuator lever functioned with engine rotation. The fuel flow divider (distribution valve) and the fuel servo internal components were generally clean and intact. All lines and fittings were found to be secure. The spark plugs were new. Manual rotation of the engine resulted in thumb compression at all cylinders, in the proper sequence.

Both magnetos remained securely attached to the engine, but the left magneto bore impact damage. Magneto to engine timing was found to be 20 degrees for the right magneto, and 27 degrees for the left magneto. The Lycoming-specified timing is 20 degrees.

Both magnetos tested satisfactorily to rpm levels above the specified maximum rpm value of 2,700 for that engine/airframe combination. One harness lead exhibited an electrical short; any short would have manifested itself as engine roughness during the pilot's magneto check, but he did not report any such roughness. The cause/source of the short was not determined.

Aside from Airworthiness Directive (AD) 2015-19-07 (see below), the airplane, engine, magnetos, and fuel servo appeared to be in compliance with all applicable ADs.

The condition of the airframe and engine were not consistent with an airplane that had been subjected to a thorough annual inspection, and the requisite maintenance for a return to service. Items that were found to be non-conforming to the complete performance of an Annual or 100 Hour inspection and return to service included:

- Age hardened, deteriorated fuel injector line support clamp cushions, not in compliance with AD 2015-19-07 per Lycoming Service Bulletin 342G
- Uncleaned fuel injector nozzles (evidenced by sooty, partially-obstructed air bleed screens)
- Re-used, un-annealed M-674 spark plug gaskets

- Spark plug 2T found installed finger-tight
- Severely deteriorated internal muffler baffling
- All (except propeller governor) non-metallic flexible fuel and oil pressure hoses were over 40 years old
- Fuel cap external and internal seals age-deteriorated and cracked
- Fuel strainer gaskets age-deteriorated and cracked

ADDITIONAL INFORMATION

Mechanic and Maintenance Record Information

According to the pilot and the owner, a few weeks prior to the accident, the owner had contracted with a mechanic at E45 to conduct an annual inspection on the airplane, and to perform the maintenance necessary to render the airplane airworthy for its return to service. They also reported that subsequent to the maintenance, and prior to the accident flight, the mechanic made airframe and engine logbook entries that indicated that the airplane had been inspected in accordance with an annual inspection, was in airworthy condition, and that the mechanic's signature block denoted that he was an IA. Subsequent to the accident, the mechanic refused to provide the logbooks to the owner. The mechanic claimed that the owner owed him $6,000 for the maintenance that he had performed, and that he was retaining the logbooks for security until he was paid.

FAA and NTSB attempts to convince the mechanic to release the logbooks to the FAA or NTSB were unsuccessful; again the mechanic stated that he was holding the logbooks as security until he was paid by the owner. The mechanic eventually allowed an FAA inspector to examine and photograph the two most recent entries in each logbook. The FAA inspector, and his photographs, indicated that portions of the original airframe and engine logbook entries by the mechanic had been altered with "whiteout" and overwritten. The revised airframe and engine entry text indicated that the airplane had been inspected in accordance with a "ferry inspection," and the revised mechanic's signature block indicated that he was an "A&P."

"Ferry inspection" is not a term that is defined, referenced, or otherwise recognized by the FAA.

FAA and NTSB conversations with other aircraft owners at E45 revealed that subsequent to March 31, 2015, the mechanic had continued to represent himself as a valid IA holder, and that he had conducted and signed off numerous aircraft as an IA.

Airplane Performance

Takeoff performance distance data (ground roll, and total over 50 ft obstacle) for the airplane were presented in table form in the POH. The performance table values were predicated on the following fixed conditions:

- Gross weight: 2,750 lbs
- Engine/propeller rpm: 2,700
- Engine leaned "to field elevation"
- Flaps: 15§
- Landing gear retracted after lift-off
- Runway: paved, level, dry surface
- Takeoff speeds: lift off, 71mph; 50 ft height, 75 mph

The table provided for variations in the following parameters:

- Headwind (no tailwind accountability)
- Pressure altitude
- Ambient temperature

Because the POH performance data did not account for runway slope, tailwind, or 0§ flaps, the manufacturer provided calculated performance estimates that accounted for variations in those parameters for two example cases. The first case used the prescribed takeoff flap setting of 15§, and the second used the actual takeoff setting of 0§. Both cases use the calculated pressure altitude, a 1.1% runway upslope, a 5 knot tailwind, and all other fixed parameter values specified above.

The 15§ flap case resulted in an estimated ground roll distance of about 1,900 ft, and an estimated distance to 50 ft agl of about 3,250 ft. The 0§ flap case resulted in an estimated ground roll distance of about 2,300 ft, and an estimated distance to 50 ft agl of about 3,700 ft. It should be noted that these results do not represent certificated performance, and should not be construed as such.

The pilot estimated that the airplane actually weighed about 2,460 lbs for the takeoff. Although the POH performance table included a "NOTE" that provided a means to account for weights below 2,750 lbs, there was insufficient data to substantiate application of that correction factor to these two performance cases.

Other factors that can adversely affect takeoff performance, but whose specific values and effects could not be determined for this accident, included:
- Pilot techniques (engine leaning, airspeed, attitude) for the takeoff
- Airspeed indication system accuracy
- Engine, propeller, and airframe deterioration due to age, use, and care
- Engine rpm (tachometer, governor)
- Propeller blade pitch
- Ambient conditions (wind, temperature)

Airport Surveillance Video

There was a fixed-view surveillance camera mounted on a building on the north side of the runway at E45. The image and audio data from the camera was recorded, and the accident takeoff was captured. The data recording of the takeoff was provided to the investigation for review.

The camera view was oriented perpendicular to the runway, looking south. The camera was situated approximately 2,500 feet along the runway from the west (9) threshold. Its field of view encompassed the runway segment approximately 155 feet to either side, for a total field of view of about 310 feet of the runway. The airplane traversed the image from right to left. The airplane was already fully in the frame at the beginning of the image file. When it first appeared, it was airborne, with its landing gear extended, and the landing gear appeared to be about 2 feet above the runway. When it exited the frame, the gear altitude appears to have increased to about 6 feet. When the airplane was in mid-frame, perpendicular to the camera, the airplane attitude was measured to be approximately 11§ nose up. The flaps appeared to be retracted, but the image resolution was insufficient to positively ascertain the flap position.

Analysis by NTSB Recorders Laboratory personnel indicated that the airplane operated at an average ground speed of about 68 kts during the nearly 2 second period that the airplane was visible in the image. During the first 40% of that time, the estimated average speed was about 66 kts, and during the last 60% it was about 70 kts.

A frequency analysis of the audio recording of the engine/propeller was conducted by NTSB Recorders Laboratory personnel. The analysis indicated that the engine speed was 2,640 rpm.

Accident Rpt# CEN17LA113 **02/09/2017 1430 CST** **Regis# N2875F** **Archer City, TX** **Apt: N/a**

Acft Mk/Mdl BELL-TRANSWORLD HELICOPTERS 47D1 **Acft SN TWH-8** **Acft Dmg: SUBSTANTIAL** **Rpt Status: Factual** **Prob Caus: Pending**

Eng Mk/Mdl FRANKLIN 6V535A **Acft TT 2530** **Fatal 0** **Ser Inj 1** **Flt Conducted Under: FAR 091**

Opr Name: LUIG PERRY J **Opr dba:** **Aircraft Fire: NONE**

AW Cert: STN

Events

1. Enroute-cruise - Fuel starvation

Narrative

On February 9, 2017, about 1430 central standard time, a Bell - Transworld Helicopter 47D1, N2875F, sustained substantial damage during a forced landing to a field near Archer City, Texas. The pilot received serious injuries. The helicopter was owned and operated by the pilot under the provisions of the 14 Code of Federal Regulations Part 91 as a personal flight. Day visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The flight departed from the pilot's ranch near Holliday, Texas, about 1420.

The pilot reported that he departed his ranch and was flying about 100 ft above ground level and at 50 knots airspeed to inspect a cattle herd near Archer, TX. He reported that he intended to check his carburetor heat to ON, but he unintendedly pulled the mixture control to the fuel cutoff position, and the engine had an immediate total loss of power.

The pilot stated that he immediately entered an autorotation, but because he was so low and slow, there was not enough time and altitude to flare the helicopter. He stated that the airspeed decreased immediately and the main rotor blade stalled, causing the helicopter to just "drop." He stated that it only took seconds for the helicopter to impact the terrain. The pilot reported no preaccident mechanical malfunctions or failures with the helicopter that would have precluded normal operation.

Accident Rpt# WPR15FA161 05/14/2015 1032	**Regis# N5042P**	**Juntura, OR**	**Apt: N/a**
Acft Mk/Mdl BELLANCA 7GCBC-NO SERIES	**Acft SN 1121-79**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl TEXTRON LYCOMING O-320-A2B		**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: BENTZ MICHAEL	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: STN

Events

1. Maneuvering - Low altitude operation/event

Narrative

HISTORY OF FLIGHT

On May 14, 2015, at 1032 mountain daylight time, a Bellanca 7GCBC, N5042P, impacted wires while maneuvering near Juntura, Oregon. The private pilot was fatally injured, and the airplane sustained substantial damage. Visual meteorological conditions prevailed for the aerial observation flight to drive cattle, which was operated under the provisions of 14 Code of Federal Regulations (CFR) Part 91. No flight plan had been filed for the flight that departed a private airport in Juntura.

A witness reported that after getting up that morning, she had gone to make sure the property gate was closed, as she knew there was a cattle drive that morning. Upon returning to the house, she was cleaning the kitchen, when she heard the accident airplane flying overhead. She estimated that the airplane flew over three to four times. On the last pass, the accident pass, she had moved to the sliding glass door in the kitchen, and watched as the airplane flew straight and level into the wires. The airplane nosed over, impacted the ground, and came to rest inverted about 200 yards from her house. She described the engine sound before the accident as "normal."

According to responding law enforcement personnel, downed power lines were entwined in the wreckage. The responding sergeant reported a strong fuel smell inside the cockpit. He also reported that the pilot had initially survived the accident.

Both witnesses and local law enforcement stated that the pilot was a local area farmer/resident, that would routinely use his airplane for cattle drives, and was familiar with the area.

MEDICAL INFORMATION

The autopsy was performed by the Office of the State of Oregon Medical Examiner. The cause of death was listed as multiple blunt force injuries. The Federal Aviation Administration (FAA) Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The results were negative for carbon monoxide, cyanide, volatiles, and tested drugs.

AIRCRAFT INFORMATION

The high-wing, single-engine airplane was manufactured in 1979. It was powered by a Textron Lycoming (Avco Lycoming) O-320-A2B, 150-horsepower reciprocating engine. The airplane's records were not located; therefore, the airplane's maintenance history could not be determined.

PILOT INFORMATION

The 51-year old pilot held a private pilot certificate with a rating for airplane single-engine land. His most recent FAA third-class medical certificate was issued on January 21, 2013, with the limitation that the holder shall possess glasses for near/intermediate vision. The pilot reported 120 total hours of flight experience on his medical certificate application, with 30 hours in the previous 6 months. The pilot's medical certificate expired for all classes in January 2015.

METEOROLOGICAL INFORMATION

The 0953 automated weather observation at Burns Municipal Airport (BNO) Weather for BNO about 39 miles southwest of the accident site, reported wind from 257 degrees at 7 knots, visibility 10 statute miles, a broken cloud ceiling at 9,000 ft, temperature 12øC, dew point 02 øC, altimeter setting of 29.82 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in Juntura Valley; in a relatively flat area covered with scrub brush and rocks. The first identified point of contact was a set of power lines located about 700 ft southwest of the main wreckage. The airplane stuck the top three power lines; the power poles were about 100 ft tall. The first identified ground impact was about 10 ft from the main wreckage.

The entire airplane came to rest inverted at the accident site. Portions of the two lower power lines were wrapped around the airplane. Both wings and empennage remained attached to the fuselage. The left wing had impacted a small tree that ruptured the fuel tank. The right wing fuel tank had not been compromised, and contained about 3 « gallons of fuel.

Flight control continuity was established from the tail section to the cockpit and from both wings to the cockpit.

The engine remained attached to the engine mounts and firewall. The propeller assembly separated from the propeller flange. The fuel line from the gascolator to the carburetor had separated at the gascolator fitting; however, when the carburetor was elevated, fuel flowed out of the separated line. The carburetor sustained impact damage; the butterfly valve remained attached to the throttle cable, but had separated from the top portion of the carburetor. The top four spark plugs were removed, and, according to the Champion Aviation Check-A-Plug chart AV-27, the spark plug signatures were consistent with normal operation. Manual rotation of the crankshaft flange produced thumb compression at each of the cylinders in firing order, which established mechanical and valve train continuity. Due to damaged P-lead wires, the magnetos were removed and manually rotated via their respective drive shafts; both magnetos produced spark at each post. A detailed report is in the docket for this accident.

Accident Rpt# CEN16FA216	**06/13/2016 957 EDT**	**Regis# N102DK**	**Rockville, IN**	**Apt: Butler Fld IN46**
Acft Mk/Mdl CESSNA 150F		**Acft SN 15063277**	**Acft Dmg: DESTROYED**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR 0-200A		**Acft TT 6184**	**Fatal 2 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: KURT M WAUGH		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

Events

1. Initial climb - Collision during takeoff/land

Narrative

HISTORY OF FLIGHT

On June 13, 2016, at 0957 eastern daylight time, a Cessna 150F airplane, N102DK, impacted trees and terrain after departure from Butler Field Airport (IN46), Rockville, Indiana. The pilot and passenger were fatally injured, and the airplane was destroyed. The airplane was registered to and operated by a private individual as a 14 Code of Federal Regulations Part 91 personal flight. Day visual meteorological conditions existed about the time of the accident near the accident site, and no flight plan filed. The flight was destined for Eagle Creek Airpark, Indianapolis, Indiana.

According to a witness who was mowing grass at IN46, the airplane lifted off from the grass runway near midfield. The witness noticed that the airplane initially climbed with a high pitch attitude, but he did not observe the subsequent climbout or accident. The airplane struck the top of 50-ft-tall trees located about 1,100 ft past the departure end of the runway and came to rest about 125 ft beyond the initial tree strike. A postcrash fire ensued.

PERSONNEL INFORMATION

The pilot, age 44, held a private pilot certificate with an airplane single-engine land rating. On March 15, 2016, the pilot was issued a third-class medical certificate with no limitations. At the time of the medical examination, the pilot reported having 60 hours of total flight time with 25 hours in the last 6 months. The pilot's logbooks were not available for the investigation.

AIRCRAFT INFORMATION

The accident airplane, a Cessna 150F, was manufactured in 1966. It was powered by a Continental Motors O-200A engine, serial number 63037-6-A. On April 24, 2002, the Federal Aviation Administration (FAA) approved the use of auto gas for the airplane and engine in accordance with supplemental type certificates SE634GL and SA633. At the time of the airplane's last annual inspection on December 26, 2015, the airframe had accumulated 6,184 total hours, and the engine had accumulated 961 hours since its last overhaul.

METEOROLOGICAL INFORMATION

At 1015, the weather observation station at Edgar County Airport, Paris, Illinois, located about 21 miles west of the accident site, reported wind from 110ø at 3 knots, visibility 10 miles, clear skies, temperature 24ø C, dew point 13ø C, and altimeter setting of 30.06 inches of mercury.

AIRPORT INFORMATION

IN46 was a privately owned, uncontrolled airport, located in a rural area 2 miles south of Rockville, Indiana. The airport elevation was 687 ft mean sea level, and the grass runway, oriented in a 09/27 configuration, was 2,081 ft long and 65 ft wide. The runway was dry and in good condition at the time of the accident. When using runway 27, a 20-to-1 slope was required to clear trees 500 ft beyond the departure end.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located about 1,100 ft beyond the departure end of runway 27 slightly right of the projected runway centerline. Damage was observed to the tops of trees about 125 ft preceding the wreckage location, and broken branches were found below these trees. Broken tree branches were consistent with the airplane descending through the trees at an angle of about 70ø. No damage was noted to terrain outside of the immediate footprint of the airplane, which came to rest upright and aligned with the runway heading.

The cabin area of the fuselage was destroyed by fire, but the tail section was mostly intact and undamaged by fire. Damage to both wing leading edges was consistent with tree and branch impact. One of the propeller's blade tips was bent forward at a 90ø angle, and the other blade was bent aft and embedded in the ground.

Examination of the airplane revealed normal flight control continuity, and no anomalies of the flight control surfaces were noted. The flaps actuator indicated that the flaps were in the "up" position and that the elevator trim was near the "neutral" position. All cockpit engine controls were fire damaged, and the throttle was observed in the "full open" position.

The engine was removed for further examination, and the carburetor was disassembled, and no anomalies were noted except for thermal damage. The throttle and mixture control arms moved freely by hand, and the accelerator pump actuated normally.

The top spark plugs were removed, and the electrodes exhibited normal signatures. The cylinder combustion chambers were examined with a lighted borescope, and no anomalies were noted. The propeller was rotated by hand, and engine continuity was confirmed with thumb compression obtained on all four cylinders. The magnetos and ignition harness were thermally damaged, and the magnetos did not produce spark.

Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

The Terre Haute Regional Hospital Department of Pathology conducted an autopsy on the pilot. The autopsy report noted the cause of death was "blunt force injuries." The FAA's Civil Aerospace Medical Institute performed toxicology tests on the pilot's specimens, and the results were negative for tested drugs.

TESTS AND RESEARCH

Weight and Balance Calculations

Based on the pilot's medical certificate weight, the passenger's driver's license weight, and a full fuel load of 26 gallons, the airplane's takeoff weight would have been 45 lbs above its maximum gross weight. Although a witness observed the pilot add fuel to the airplane with plastic jugs from his car trunk, the investigation was unable to determine the actual amount of fuel onboard the airplane during the takeoff.

Based on the Pilot's Operating Handbook performance chart, at maximum gross weight and 24ø C with no wind, 1,500 ft of runway would have been needed to clear a 50-ft-high obstacle. The chart did not contain a correction for a grass runway.

Applicable Guidance

The FAA Airplane Flying Handbook (FAA-H-8083-3B, Chapter 5) describes ground effect as follows:

Ground effect is a condition of improved performance encountered when the airplane is operating very close to the ground. Ground effect can be detected and measured up to an altitude equal to one wingspan above the surface. When the wing is under the influence of ground effect, there is a reduction in upwash, downwash, and wingtip vortices. As a result of the reduced wingtip vortices, induced drag is reduced.

Due to the reduced drag in ground effect, the airplane may seem to be able to take off below the recommended airspeed. However, as the airplane rises out of ground effect with an insufficient airspeed, initial climb performance may prove to be marginal because of the increased drag. Under conditions of high-density altitude, high temperature, and/or maximum gross weight, the airplane may be able to become airborne at an insufficient airspeed, but unable to climb out of ground effect. Consequently, the airplane may not be able to clear obstructions.

The FAA Airplane Flying Handbook contains the following information about a soft-field takeoff:

After becoming airborne, the nose should be lowered very gently with the wheels clear of the surface to allow the airplane to accelerate to Vy, or Vx if obstacles

must be cleared. Extreme care must be exercised immediately after the airplane becomes airborne and while it accelerates, to avoid settling back onto the surface. An attempt to climb prematurely or too steeply may cause the airplane to settle back to the surface as a result of losing the benefit of ground effect. An attempt to climb out of ground effect before sufficient climb airspeed is attained may result in the airplane being unable to climb further as the ground effect area is transited, even with full power. Therefore, it is essential that the airplane remain in ground effect until at least Vx is reached.

Accident Rpt# CEN17LA153	**04/12/2017 1115 CDT**	**Regis# N95551**	**La Porte, TX**	**Apt: La Porte Municipal Airport T41**
Acft Mk/Mdl CESSNA 152		**Acft SN 15285919**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-235-N2C		**Acft TT 9168**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: HARVEY & RIHN AVIATION		**Opr dba:**		**Aircraft Fire: NONE**

Events

1. Approach-VFR pattern final - Fuel contamination

Narrative

On April 12, 2017, about 1115 central daylight time, a Cessna 152 airplane, N95551, was substantially damaged when it nosed over following a forced landing at the La Porte Municipal Airport (T41), La Porte, Texas. The commercial pilot was not injured. The post-maintenance test flight was conducted under the provisions of 14 Code of Federal Regulations Part 91 without a flight plan. Visual meteorological conditions prevailed. The local flight departed about 1150.

According to the written statement submitted by the pilot, during a low approach to the runway, "there was a noticeable lag in the response of the engine " and the engine lost power. The pilot attempted to restore power but was unsuccessful. There was no remaining runway so the pilot turned the airplane to avoid a ditch. During the landing the airplane encountered soft ground and the nose wheel dug into the ground. The airplane nosed over resulting in substantial damage to the empennage and firewall.

The airframe and engine examination revealed water contamination in the engine's fuel lines, fuel bowl, and carburetor. No water contamination was noted in either of the fuel tanks. An examination of the engine and fuel system revealed no mechanical anomalies that would have precluded normal operations.

The pilot wrote that the preflight inspection did not show any evidence of water when samples from the main fuel tanks were taken. During the preflight run-up the engine ran without hesitation or sputtering.

Accident Rpt# CEN17CA116	**03/03/2017 1830 CST**	**Regis# N3028G**	**Conway, AR**	**Apt: Cantrell Field Airport KCXW**
Acft Mk/Mdl CESSNA 162		**Acft SN 16200095**	**Acft Dmg: UNK**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL O-200-D			**Fatal 0 Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: TOADSUCK SPORT AVIATION, LLC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Events

1. Standing-engine(s) operating - AC/prop/rotor contact w person

Narrative

On March 3, 2017, about 1830 central standard time, a Cessna 162, N3028G, became stuck in the mud after landing at Cantrell Field Airport (KCXW), Conway, Arkansas. The pilot exited the airplane in an attempt to dislodge it and was struck by the rotating propeller, sustaining serious injuries. The passenger was not injured. The airplane was not damaged. The airplane was registered to and operated by Toadsuck Sport Aviation, LLC, under the provisions of 14 Code of Federal Regulations (CFR) Part 91 as a personal flight. Visual meteorological conditions (VMC) prevailed and no flight plan had been filed for the local flight that originated from KCXW about 1730.

The pilot said he developed "unnecessary anxiety" and hurried his landing due to approaching traffic. He failed to brake aggressively. As a result, he was unable to turn in time and rolled off the taxiway due to excessive speed. The airplane bogged down in the wet grass from a previous rain.

The pilot closed the throttle to idle, exited the airplane, and tried to push the airplane with the left strut. "Without thinking," the pilot walked towards the nose wheel to inspect the airplane and walked into the rotating propeller. The pilot of the landing traffic saw the commotion and rendered aid. The passenger called 9-1-1, and paramedics and a helicopter arrived shortly thereafter. The pilot was airlifted to a nearby hospital.

The pilot indicated he suffered abdominal and leg injuries.

Accident Rpt# GAA17CA204	**03/25/2017 1806 PDT**	**Regis# N9953A**	**Death Valley, CA**	**Apt: N/a**
Acft Mk/Mdl CESSNA 170-A		**Acft SN 19313**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR O-300A		**Acft TT 4841**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: ZACHARY RUSSELL HEINEMAN		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Events

2. Landing - Loss of control on ground

Narrative

The pilot of the tailwheel-equipped airplane reported that during landing on a backcountry dirt airstrip in a crosswind, the airplane touched down and bounced. He added that he attempted to maintain directional control, but a "[wind] gust weathervaned the aircraft nose left" and the right main landing gear wheel dug into the ground during the second touchdown. Subsequently, the airplane ground looped to the left and the right wing impacted the ground.

The airplane sustained substantial damage to the right wing.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

Accident Rpt# ERA17FA143A 04/01/2017 842 EDT	**Regis# N8082A**	**Edgewater, FL**	**Apt: N/a**
Acft Mk/Mdl CESSNA 170B-UNDESIGNAT	**Acft SN 20934**	**Acft Dmg: DESTROYED**	**Rpt Status: Prelim Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR 0-300-A	**Acft TT 4597**	**Fatal 2 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: SOMERTON GARY L	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: STN

Events

1. Maneuvering - Midair collision

Narrative

On April 1, 2017, about 0842 eastern daylight time, a Cessna 170B, N8082D, and a Grumman American AA-5B, N425AE, were destroyed during an in-flight collision near New Smyrna Beach, Florida. The airline transport pilot flying the Cessna and the airline transport pilot flying the Grumman were both fatally injured. The airplanes were part of a formation flight that departed from Spruce Creek Airport (7FL6), Daytona Beach, Florida, about 0839, and was destined for Arthur Dunn Airport (X21), Titusville, Florida. No flight plan was filed. Visual meteorological conditions prevailed, and the personal formation flight was conducted under 14 Code of Federal Regulations Part 91.

Both accident airplanes were participating in a formation flight with three other airplanes. All five pilots participating in the formation flight were members of a pilot group based at 7FL6. On the morning of the accident, members of the group were flying to X21 to attend a monthly breakfast event.

The five-airplane formation flight involved in the accident included a Great Lakes biplane, the accident Cessna, the accident Grumman, a Grumman AA-1C (Lynx), and an American Champion 8KCAB (Super Decathlon), all of which took off from 7FL6 in elements. The flight leader was flying the biplane and the accident Grumman took off in formation first, followed by the Cessna and the Lynx taking off in formation next, followed by the Decathlon.

After takeoff from 7FL6, the flight initially formed into a five airplane "Vic" or "V" formation, with the flight leader in the biplane at the apex, and the rest of the flight in echelon with the Grumman in the No. 2 position, and the Decathlon in the No. 5 position, to the left of the flight leader, and the Cessna in the No. 3 position, and the Lynx in the No. 4 position, to the right of the flight leader.

The formation flight then turned south towards X21. Due to the position of the sun, the flight leader decided to change to a left echelon formation where the airplanes would be arranged diagonally, to his left, with each airplane being stacked slightly low, behind, and to the left of the airplane ahead. This arrangement allowed the pilots to avoid the sun glare. This would require the Cessna (No. 3) and the Lynx (No. 4) to transition across from right to left behind the leader. The Grumman would remain in the No. 2 position to the left and aft of the leader, the Cessna in the No. 3 position to the left and aft of the Grumman, the Lynx in the No. 4 position to the left and aft of the Cessna, and the Decathlon in the No.5 position to the left and aft of the Lynx.

According to the flight leader, moments after he commanded the Cessna and the Lynx to the left, in the corner of his peripheral vision at approximately his 7 o'clock position, he saw a "flash" or something white, like the bottom of an airplane.

According to the pilot of the Lynx, when the flight leader commanded the Cessna, and himself to the left, he heard the flight leader transmit "cleared to cross," and he observed the Cessna start to move to the left "slow and normal." He stayed with the Cessna, and when it was almost on the left echelon bearing line, he saw the it move into position behind the Grumman. He then suddenly saw "parts" coming back towards him on his right side, along with what appeared to be "vapor." He then saw the Grumman abruptly pitch up, and go past him above and to his right. The Grumman then looked like it was entering a loop as the airplane's nose was already past vertical and he could see the top of the airplane. He then observed something on the right side of the Cessna move upward before its tail began to "slew to the left," and disappeared from view.

The biplane and the Lynx then broke formation, with the biplane immediately pulling up and turning hard left, and the Lynx entering a left 60ø banked turn. The flight leader in the biplane could see parts of the airplanes falling to the ground, and he could see the Cessna descending like a falling leaf with what appeared to be the right wing folded over. The flight leader then began to circle the accident site, and reported the accident over the radio to an air traffic controller at New Smyrna Beach Municipal Airport, (EVB), New Smyrna Beach, Florida. He then continued to circle the accident site until emergency responders arrived.

According to witnesses who were driving on Interstate Highway 95 (I-95), they saw the formation flight traveling southbound. They observed that the formation flight was about 1/4 mile west of I-95 when the collision occurred, and they observed the "wing" on one of the airplanes come off, the airplane tumble, and then rapidly descend tail low, until they lost sight of it behind a tree line. They also saw the other airplane descend rapidly, almost straight down, until losing sight of

it. The witnesses also watched as parts from both airplanes descend to the ground with one piece landing in the median between the northbound and southbound lanes. Moments after the collision occurred, another formation flight flew north along the east side of I-95.

Examination of the accident site revealed that a 1/4-mile-long debris field, with most the debris being contained in a 1,036 ft long by 290 ft wide section. The Grumman and Cessna came to rest approximately 220 ft apart.

Examination of the wreckage of the Cessna revealed that the monocoque structure of the aft fuselage was completely separated from the rest of the airplanes structure, just forward of the empennage. The empennage was attached to the rest of the airplane by the control cables for the elevator, rudder, and pitch trim, which were twisted around each other multiple times. Further examination of the aft fuselage and empennage also revealed the presence of paint transfers, which matched the trim color of the Grumman. These were present on the leading edge of the vertical stabilizer which had been crushed back, the right horizontal stabilizer, and the right side of the aft fuselage.

The Cessna's right wing flap came to rest approximately 397 ft northeast of the main wreckage of the Cessna. The inboard section of the right aileron was missing, the right aileron control cable had been severed, and the area of the wing just forward of the right wing flap mounting location, displayed evidence of propeller strikes, and was missing large sections of its structure.

Examination of the wreckage of the Grumman revealed that no major portions of the airplane were missing. The leading edges of the propeller blades were damaged and displayed semicircular gouges

According to Federal Aviation Administration (FAA) and maintenance records, the Cessna was manufactured in 1952. Its most recent annual inspection was completed on October 1, 2016. At the time of the inspection, the airplane had accrued 4596.8 total hours of operation.

According to FAA and maintenance records, the Grumman was manufactured in 1977. Its most recent annual inspection was completed on September 1, 2016. At the time of the inspection, the airplane had accrued 1673.4 total hours of operation.

According to FAA records, the pilot of the Cessna held an airline transport pilot certificate with ratings for airplane multi-engine land, and commercial privileges for airplane single-engine land. He also held a flight instructor certificate with ratings for airplane single engine, airplane-multi engine, and instrument airplane; a flight engineer certificate with a rating for flight engineer turbojet powered; and a mechanic certificate with ratings for airframe and powerplant. He also held type ratings for the B-737, B-757, B-767, B-777, BE-1900, and BE-300. His most recent FAA first-class medical certificate was issued on February 10, 2017. He had accrued about 14,620 total hours of flight experience.

According to FAA records, the pilot of the Grumman held an airline transport pilot certificate with ratings for airplane multi-engine land, and commercial privileges for airplane single-engine land, and airplane single-engine sea. She also held a flight instructor certificate with ratings for airplane single engine, airplane-multi engine, and instrument airplane; a flight engineer certificate with a rating for flight engineer turbojet powered; and a ground instructor certificate with ratings for advanced and instrument. She also held type ratings for the A-330, B-747, B-757, B-767, BE-1900, and CE-510S. Her most recent FAA first-class medical certificate was issued on October 19, 2016. She had accrued about 11,368 total hours of flight experience.

The wreckage of both airplanes was retained by the NTSB for further examination.

Accident Rpt# ERA15FA203	**05/03/2015 1134 EDT**	**Regis# N3969L**	**Penn Yan, NY**	**Apt: Penn Yan PEO**
Acft Mk/Mdl CESSNA 172-G		**Acft SN 17254138**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR O-300		**Acft TT 4625**	**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: SEELY STEVEN P		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

On the morning of the accident, the student pilot departed from his home airport and flew to two other airports before returning to his home airport. None of these cross-country flights were conducted under the supervision of a flight instructor nor was there any documentation available to show that the student was endorsed to conduct these flights. Upon reaching his home airport, the student pilot entered the traffic pattern to land on the 5,500-ft-long runway with a prevailing right quartering tailwind. A pilot-rated witness reported that he saw the airplane approach the runway "high and fast," that it was about 100 to 150 ft above the ground as it crossed over the runway threshold, and that it then appeared to "float" down the runway. He then lost sight of the airplane. Another witness noted that, after touching down near the midpoint of the runway, the airplane lifted off and reached about 50 ft above the ground, at which point, the engine power increased. The airplane then began climbing steeply and then banked left, making an arcing flightpath that continued to ground contact. Based on available evidence, the investigation was unable to determine whether the pilot was attempting to conduct a go-around following the previous landing approach, or was conducting a touch-and-go landing when the accident occurred.

Postaccident examination of the airframe and engine revealed no evidence of any mechanical malfunctions or failures that would have precluded normal operation. Although fuel drained from the airplane after the accident contained water, witness statements and wreckage signatures were consistent with the engine operating normally to ground impact. The flaps were found extended 40ø; however, airplane manufacturer guidance stated that during a go-around climb, the "flap setting should be reduced to 20ø immediately after full power is applied" and that "flap settings of 30ø to 40ø are not recommended at any time for takeoff." It is likely that the inappropriate flap setting for the initial climb contributed to the student pilot's failure to maintain airplane control.

Although the student pilot's autopsy identified the presence of coronary artery disease that could have caused acute symptoms such as chest pain, shortness of breath, palpitations, or fainting, there was no evidence of any such event occurring.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's failure to maintain airplane control during the initial climb. Contributing to the accident was the student's inappropriate configuration of the airplane's wing flaps for the initial climb.

Events

1. Initial climb - Loss of control in flight
2. Uncontrolled descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student/instructed pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-(general)-Not attained/maintained - C
3. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - F
4. Aircraft-Aircraft systems-Flight control system-TE flap actuator-Incorrect use/operation - F

Narrative

HISTORY OF FLIGHT

On May 3, 2015, at 1134 eastern daylight time, a Cessna 172G, N3969L, impacted terrain and an airport perimeter fence during initial climb at Penn Yan Airport (PEO), Penn Yan, New York. The airplane was being operated as a 14 Code of Federal Regulations Part 91 personal flight. The student pilot was fatally injured, and the airplane sustained substantial damage. Visual meteorological conditions prevailed at PEO about the time of the accident, and no flight plan was filed. The flight originated from Finger Lakes Regional Airport (0G7), Seneca Falls, New York, about 1115.

On the morning of the accident, the pilot contacted flight service and requested a weather briefing for a flight from PEO to Oswego County Airport (FZY), Fulton, New York, departing about 0730 and returning about 1100. The briefer advised the pilot of the current conditions at PEO and FZY, the forecast sky conditions for the area, and the NOTAMs applicable for the proposed flight.

Review of airport security video footage showed that the accident airplane began taxiing at PEO about 0800. Data downloaded from a handheld GPS receiver

recovered from the accident site showed that the device began recording on the morning of the accident at 0818. The airplane's first recorded position was about 22 nautical miles (nm) northeast of PEO, roughly along a course line between PEO and FZY. Over the next 17 minutes, three additional positions were recorded, the last of which was at 0835 and showed the airplane about 3 nm south of FZY. The next position was recorded at 0944 and showed the airplane about 2 nm southwest of FZY. Over the next 17 minutes, three additional positions were recorded; the last recorded position showed the airplane about 5 nm northeast of 0G7.

The airplane arrived at 0G7 on the morning of the accident, and the student pilot spoke with his mechanic. According to the mechanic, he and the pilot discussed an ongoing issue with the airplane involving water contamination of its fuel. The pilot and mechanic then drained about 1 quart of fuel through the fuel strainer before it was clear of water. At the pilot's request, the mechanic inspected the airplane's right main landing gear, relubricated the wheel bearings, and reinstalled the wheel and tire. The mechanic noted no discrepancies with the landing gear, wheel, or brakes during his inspection. The mechanic stated that the pilot departed 0G7 about 1100 and planned to return to PEO. After departure, three GPS positions were recorded starting at 1117; the first recorded position showed the airplane about 1.5 nm southwest of 0G7, and the final position, which was recorded at 1129, showed the airplane about 2 nm southeast of PEO.

Airport security video footage from PEO showed a high-wing airplane on approach to runway 19 at 1131. During a second approach to the runway at 1134, the airplane crossed the runway threshold at a significantly higher altitude than during the first approach. Review of the videos could not determine whether the airplane touched down during either of the approaches, based on the viewing angle of the camera.

A pilot-rated witness observed the accident airplane in the traffic pattern for runway 19 before the accident. Regarding the second approach, he stated that, as the airplane turned left from the base leg of the traffic pattern, it was in a "very aggressive slip." About the same time, he observed the windsock and estimated the wind to be from about 320ø and "greater than 10 knots." He stated that, while on final approach, the airplane appeared to be "high and fast." He estimated it was about 100 to 150 ft above the ground as it crossed over the runway threshold, and it then appeared to "float" down the runway. He then lost sight of the airplane behind terrain and obstructions. He realized that the airplane had crashed when he saw first responders arriving at the airport several minutes later. He noted that, during the landing approach, the flaps appeared to be fully extended, the propeller was rotating, and the engine sounded as if it was at idle speed.

Another witness was located on a golf course adjacent to the airport near the midpoint of runway 19. When he first saw the airplane, it was almost abeam his position adjacent to the runway, and it looked like it was taking off. He added that the engine sounded "normal," and the climb appeared normal from the time the airplane lifted off until it reached about 50 ft. At that point, the airplane began climbing at a faster rate than it had been previously and then banked left. The airplane also appeared to be higher and climbing faster than other airplanes he had previously observed about the same location. He added that the airplane then descended while continuing the left banking arc, as if the left wing was "tied to the ground with a string."

PERSONNEL INFORMATION

The pilot held a student pilot certificate and Federal Aviation Administration (FAA) third-class medical certificate, which was issued on January 20, 2014. The medical certificate was issued with the limitation, "Must wear corrective lenses." The pilot's flight logs were not recovered.

According to the pilot's flight instructor, the pilot had completed some initial flight instruction in an airplane that belonged to a local flying club. The pilot began flight training with the flight instructor about 1 year before the accident, and all of their flights were in the accident airplane. The flight instructor endorsed the pilot for solo flight around October 2014. After completing additional dual instructional and solo flights, the pilot took a hiatus from flying during the winter, and they began their training again in March 2015. At that time, the flight instructor provided the pilot with an additional 90-day solo endorsement. The flight instructor had not yet provided the pilot with an endorsement to fly to airports other than PEO and was not previously aware that the pilot had flown his airplane solo to FZY and 0G7 on the morning of the accident. The flight instructor estimated that the pilot had accumulated 40 total hours of flight experience.

The flight instructor reported that the pilot generally performed well landing the airplane but that landings were his weakest area. During their training, they practiced performing go-arounds from a full-flap configuration, and the pilot excelled at it. The flight instructor also thought it was important to fly with the pilot in strong crosswinds, and as such, the additional challenge of these conditions delayed his initial solo. By the time the pilot did solo, the flight instructor had confidence in his ability to handle crosswinds, and, recently, his landings had greatly improved. Their last flight together was on April 29, and it was a cross-country flight to Zelienople, Pennsylvania. The flight instructor stated that, during all of his flights in the accident airplane, he did not note any mechanical discrepancies.

AIRCRAFT INFORMATION

According to FAA registration records, the pilot purchased the accident airplane in May 2014. A review of maintenance logbooks revealed that new main and nose landing gear tires were installed on May 15, 2014, at an airframe total time of 4,558 flight hours. The airplane's most recent annual inspection was completed on August 17, 2014, at an airframe total time of 4,575 flight hours and 784 hours since the engine's most recent overhaul. An airframe maintenance log entry made the day of the accident noted that the right main landing gear wheel bearing and brake pads were installed, and that the wheel bearing was regreased and then reinstalled. At the time of the accident, the airframe had accumulated 4,625 total flight hours.

METEOROLOGICAL INFORMATION

The 1135 weather observation at PEO included wind from 310ø at 8 knots, 10 statute miles visibility, clear skies, temperature 73ø F, dew point 37ø F, and an altimeter setting of 30.08 inches of mercury.

AIRPORT INFORMATION

Runway 19 at PEO was 5,499 ft long and 100 ft wide. The approach end of the runway had an elevation of 916 ft, and the departure end of the runway had an elevation of 987 ft, or a 1.4% gradient. A two-light precision approach path indicator was available at both runway ends.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest upright with the right wing resting on the airport perimeter fence, about 300 ft left of the runway centerline and about 2,800 ft from the runway 19 approach threshold. All of the major components of the airplane were accounted for at the accident site. Areas of disturbed soil and intermittent ground scars extended from the initial impact point oriented on a magnetic heading of 145ø. A piece of left wing navigation light was located in the wreckage path about 20 ft from the initial impact point. About 15 ft further down the path, a ground scar was found oriented 90ø to the path, about the length of the propeller diameter and the width of a propeller blade. About 2 ft further down the path was an impact crater that was 3 ft wide and 8 ft long and contained paint chips and windscreen fragments, followed by the main wreckage, which came to rest oriented on a magnetic heading of about 340ø.

The propeller remained attached to the crankshaft flange, and both blades displayed s-bending, chordwise scratching, and leading-edge gouging. The engine remained partially attached to the firewall by its mounts. The nose landing gear was fractured and separated from the airplane at the firewall attachment point, consistent with impact. The nose section from the firewall forward had separated from the fuselage on both sides, and the windscreen was fractured and separated from the fuselage. The outboard portion of the left wing was deformed upward and displayed aft crush damage, consistent with ground contact. The right wing displayed a concave depression and was deformed aft beginning outboard of the wing strut.

First responders reported that, upon their arrival, they observed fuel leaking from the left wing near the vent tube and that they subsequently drained about 7 gallons of fuel from the left wing and about 10 gallons of fuel from the right wing. Fuel samples from both tanks displayed a color and odor consistent with automotive gasoline. A trace amount of water was detected in the sample from the left wing and in fuel recovered from the carburetor float bowl.

Flight control continuity was established from each control surface to the cockpit area. The elevator trim tab actuator position was consistent with 5ø to 10ø of tab deflection in the nose-up direction. The flap actuator extension was measured and found in a position consistent with a 40ø flap extension. The front seat tracks and seat roller brackets for both seats were checked for wear and found to be within prescribed limits. The left seat positioning rod was found bent forward about 1 inch from the engagement end.

The engine crankshaft was rotated by hand at the propeller flange, and continuity was confirmed from the valve and powertrains to the rear accessory gears. The oil screen and paper oil filter element were unobstructed and free of metallic contamination. The spark plugs were removed, and the No. 6 cylinder plugs displayed black-colored, carbon-type fouling. Thumb compression was confirmed on all cylinders. The fuel strainer screen and carburetor inlet screen were free of debris. The carburetor floats were intact, and both displayed concave, inward, uniform deformation. The magnetos were removed and actuated by hand, and spark was observed at each of their respective terminal leads.

MEDICAL AND PATHOLOGICAL INFORMATION

The Geneva General Hospital Laboratory, Geneva, New York, performed an autopsy of the pilot. The reported cause of death was "crash related injuries." The

autopsy report also identified significant coronary artery disease with a heart weight of 510 grams. The right ventricle was 0.5 centimeter (cm) thick, and the left ventricle was 1.5 cm thick. In addition, all three main coronary arteries were narrowed at least 50% and up to 75% by atherosclerosis, but there were no areas of scarring from previous heart attacks. The liver and stomach were also mildly inflamed.

The FAA's Civil Aerospace Medical Institute performed toxicological testing on specimens from the pilot. The results were negative for ethanol, carbon monoxide, and drugs.

ADDITIONAL INFORMATION

According to the 1966 Cessna Model 172 and Skyhawk Owner's Manual, "Slips are prohibited in full flap approaches because of a downward pitch encountered under certain conditions of airspeed and sideslip angle." Additionally, the manual stated that "In a balked landing (go-around) climb, the wing flap setting should be reduced to 20ø immediately after full power is applied," and that "Flap settings of 30ø to 40ø are not recommended at any time for takeoff."

Accident Rpt# GAA17CA140 02/16/2017 955 EST	**Regis# N381MG**	**Burlington, NC**	**Apt: Burlington-alamance Rgnl BUY**
Acft Mk/Mdl CESSNA 172-M	**Acft SN 17265873**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-E2D	**Acft TT 3955**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: MISSIONARY AIR GROUP INC.	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: STN

Events

3. Approach-VFR go-around - Loss of control in flight

Narrative

The pilot reported that during landing in a gusting crosswind, following the main wheels touching down, and as the nose wheel was about to touch down, the airplane "abruptly lifted into the air." He immediately added full power to go-around, but the airplane drifted to the left off the runway surface and impacted an embankment.

The left wing sustained substantial damage.

The pilot reported that there were no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

The automated weather observing station at the accident airport, about the time of the accident, recorded wind 270ø at 16 knots, gusting to 31 knots. A peak wind of 260ø at 31 knots was recorded about 5 minutes before the accident. The airplane landed on runway 24.

Accident Rpt# CEN17CA140 02/23/2017 0 CST	**Regis# N51827**	**Cahokia, IL**	**Apt: St Louis Downtown Airport CPS**	
Acft Mk/Mdl CESSNA 172R	**Acft SN 17281108**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-360-L2A		**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: IDEAL AVIATION	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Unknown - Unknown or undetermined

Narrative

The airplane was parked on the operator's ramp when Federal Aviation Administration Inspector(s), on a routine ramp inspection, found that the airplane had substantial damage to the firewall and structure aft of the firewall. Airplane maintenance records showed an entry stating that the damage was due to a suspected hard landing. The operator stated that the damage must have occurred between the airplane's 100-hour inspection and oil change performed September 27 and October 24, 2016, respectively. The operator's mechanic stated the damage was found when the engine cowl was removed for the oil change. A review of airplane flight logs showed approximately 20 different people had flown the airplane over 48 flights between the time of the 100-hour inspection and the oil change. On October 8, 2016, a student pilot was performing touch and go's when the airplane bounced 2 or 3 times during the flight's final landing. The student pilot stated that when she turned off the runway onto the taxiway, she noticed the airplane was not steering properly and reported to air traffic control tower that she had some mechanical difficulty that required maintenance assistance. The student pilot's flight instructor and a company lineman responded and noticed that the airplane had a flat nose wheel tire. The lineman inflated the tire, and the student pilot and flight instructor taxied the airplane to the operator's maintenance facility. The flight instructor informed the operator's mechanic of the bounced landing and flat tire. The mechanic stated he replaced the nose tire, performed a brief exterior walk-around visual inspection of the aircraft, noting it appeared airworthy and returned it to service. A hard landing inspection was not performed. Other than the bounced landing reported on October 8, 2016, there were no other operator concerns of the 48 separate flights conducted between inspections.

Accident Rpt# WPR14LA207 05/24/2014 1211 PDT	**Regis# N97038**	**Arvin, CA**	**Apt: N/a**	
Acft Mk/Mdl CESSNA 182-Q	**Acft SN 18266947**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl TELEDYNE CONTINENTAL O-470U(4)	**Acft TT 2862**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: SEIBOLD GUNTER W	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Enroute-cruise - Loss of engine power (total)

Narrative

On May 24, 2014, at 1211 Pacific daylight time, a Cessna 182Q, N97038, experienced a total loss of engine power and force landed in a field one mile south of Arvin, California. During the off airport landing the airplane nosed over, substantially damaging the tail and left lift strut. The airplane was registered to, and operated by, the commercial pilot under the provisions of 14 Code of Federal Regulations, Part 91, as a personal flight. Both the pilot and his single passenger received minor injuries. Visual meteorological conditions prevailed during the flight, and a visual flight plan was not filed. The flight originated at Corona Municipal Airport, Corona, California.

The pilot stated that an hour into the flight, while over the Tehachapi Mountains, he noticed that the engine oil pressure had dropped, but the oil temperature and cylinder temperatures were normal. He declared an emergency to Bakersfield Approach and was initially given vectors to Bakersfield Municipal Airport. About 2-3 minutes later he started hearing rattling noises coming from the engine and then the cockpit filled with black smoke. He identified an open field on his left and maneuvered to make that field but didn't realize it had crop furrows. The airplane hit the first berm hard, bounced 3-4 times hitting berms along the way, then the nose wheel hit a berm and flipped the airplane over onto its back. On scene photos showed that the belly of the airplane was coated with engine oil aft of the engine fire wall.

An examination of the airplane and engine by the NTSB Investigator-in-Charge (IIC) and a technical representative from Continental Motors Incorporated was performed on September 30, 2014. The engine time indicated on the tachometer was 2,861.6 (hours). Investigators found the air-oil separator return line disconnected from the oil return port located on the rocker cover of the engine's number 1 cylinder. Oil staining was evident on the lower engine cowling below the number 1 cylinder. It was noted that the engine oil filter was located behind the air-oil separator return line. The left engine case half, upper section above the No 4 cylinder, exhibited a 6 x 4 inch hole just aft of the oil filler neck. The cylinders were removed and the case was separated into its halves. The crankshaft main bearings exhibited normal wear with no heat discoloration. The number 3 crankshaft throw bearing was shiny & polished showing very little heat discoloration. The number 4 crankshaft throw was dark black with a few gouges and exhibited extreme heat distress. The number 5 crankshaft throw was black and exhibited extreme heat distress. The number 6 connecting rod attached to the crankshaft throw was discolored dark gray, consistent with heat distress. The internal section of the engine case in line with the number 3 & 4 crankshaft throws exhibited internal repeated impact marks, metal removal, and damage to the oil galleries on both sides of the engine case.

Examination of the engine logbook revealed that the most recent annual inspection was performed on April 10, 2013, 2,828.2 hours total time, and 309.5 hours since major overhaul (SMOH). The last entry in the logbook was dated April 18, 2014, where the pilot/owner had performed an oil change, 2,857.3 hours total time

Accident Rpt# CEN15FA400 09/05/2015 1408	**Regis# N1099Q**	**Silverton, CO**	**Apt: N/a**
Acft Mk/Mdl CESSNA 310H	**Acft SN 310H0099**	**Acft Dmg: DESTROYED**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL MOTORS IO-470-D	**Acft TT 5367**	**Fatal 4 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: PILOT	**Opr dba:**		**Aircraft Fire: NONE**

Summary

The airplane owner, who was a noninstrument-rated private pilot and did not hold a multiengine airplane rating, was conducting a visual flight rules (VFR), personal cross-county flight in the multiengine airplane. Before the accident flight, the pilot flew the airplane to an intermediate airport to refuel. A review of air traffic control (ATC) radio transmissions between the pilot and an air traffic controller between 0911 and 0938 showed that, during the approach for landing, the pilot misidentified in every transmission the make and model airplane he was flying, referring to his airplane as a Piper Comanche instead of a Cessna 310. Further, he did not provide correct responses to the controller's instructions (for example, he reported he was set up for the left base leg instead of right base leg as instructed), and he provided inaccurate information about the airplane's position, including its distance and direction from the airport.

A witness stated that, after the airplane landed and while it was taxiing, it almost hit another airplane and golf carts, and it was taxied close enough to the fuel pumps that it "knocked" a ladder with one of its propellers. The witness said that the pilot was not "observant about his surroundings." While at the intermediate airport, the pilot requested an abbreviated weather briefing for a VFR flight from that airport to the destination airport. However, the pilot incorrectly identified the destination airport as "L51," which was depicted on the VFR sectional chart for the Amarillo area but referred to the maximum runway length available at the destination airport not the airport itself. L51 was an airport identifier assigned to an airport in another state and located north of the accident location and in a direction consistent with the airplane's direction of travel at the time of the acident.

During the departure for the accident flight, the pilot taxied to and attempted to take off from an active runway without any radio communications with or clearance from ATC, which resulted in a runway incursion of an air carrier flight on final approach for landing to the runway. The air carrier initiated a missed approach and landed without further incident. The controller reported that the runway incursion was due to the accident pilot's loss of "situational awareness." Radar data showed that, after the airplane departed, it turned northward and away from a course to the intended destination airport. The northward turn and track was consistent with a course to an airport in another state. According to meteorological information, as the flight progressed northward, it likely encountered instrument meteorological conditions (IMC) while flying into rain showers. The wreckage was found in rising mountainous terrain, and the accident wreckage distribution was consistent with a low-angle, high-speed impact. Given that postaccident examination of the airplane revealed no mechanical anomalies that would have precluded normal operation, it is likely that the noninstrument-rated pilot did not see the rising mountainous terrain given the IMC and flew directly into it.

The pilot had told person(s) that he flew F-4 Phantoms, but a military identification card showed that the pilot was a retired Marine lance corporal. Although the pilot's logbook showed that he had accumulated 150 hours of multiengine airplane flight time, there was no record of the actual flights showing the accumulation of 150 multiengine airplane hours or any record that he had flown military aircraft. The logbook did not show that the pilot had received any flight training in the accident airplane. The logbooks also showed that he had flown numerous flights in the airplane with passengers without proper certification and that he had not had a recent flight review as required by Federal Aviation Regulations (FARs). The pilot's logbook showed that he had once made low-altitude (10 ft above the ground) passes over a parade in the same airplane. The airplane had not received an annual inspection for continued airworthiness as required by FARs. The pilot's noncompliance with FARs and the logbook entries indicate that he had a history of poor decision-making and piloting errors, which was reflected in his behavior and actions while landing at the intermediate airport and during the taxi and takeoff phases of the accident flight.

Although the pilot had a number of medical problems that potentially could have interfered with his ability to safely operate the airplane, including spinal cord injuries, diabetes, and psychiatric issues, and was taking medications to treat them, these conditions and medications likely would not have interfered with his navigational skills and his ability to communicate on the radio or affected his decision-making. Although the available medical information was limited by the degree of damage to the body, there was no evidence of a medical condition or effects of a medication that contributed to this accident. Although ethanol was detected in the pilot's tissues, it likely resulted from postmortem production.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The noninstrument-rated pilot's improper judgment and his failure to maintain situational awareness, which resulted in the flight's encounter with instrument meteorological conditions and controlled flight into terrain during cruise flight.

Events

1. Enroute - VFR encounter with IMC
2. Enroute - Controlled flight into terr/obj (CFIT)

Findings - Cause/Factor

1. Personnel issues-Experience/knowledge-Experience/qualifications-Recent instrument experience-Pilot - C
2. Personnel issues-Experience/knowledge-Experience/qualifications-Qualification/certification-Pilot - C
3. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
4. Personnel issues-Psychological-Attention/monitoring-Task monitoring/vigilance-Pilot - C
5. Personnel issues-Psychological-Attention/monitoring-Monitoring environment-Pilot - C
6. Personnel issues-Psychological-Perception/orientation/illusion-Situational awareness-Pilot - C
7. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-(general)-Effect on operation - C

Narrative

HISTORY OF FLIGHT

On September 5, 2015, about 1408 mountain daylight time a Cessna 310H, N1099Q, impacted mountainous terrain near Silverton, Colorado. The private pilot, a pilot-rated passenger, and two passengers were fatally injured. The airplane was destroyed by impact forces. The airplane was registered to and operated by the pilot as a 14 Code of Federal Regulations Part 91 a personal flight. Instrument meteorological conditions (IMC) prevailed at the time of the accident, and no flight plan had been filed. The pilot was not using air traffic control (ATC) services. The flight departed from Flagstaff Pulliam Airport (FLG), Flagstaff, Arizona, about 1150 and was destined for Tradewind Airport (TDW), Amarillo, Texas.

A fuel receipt from the Big Bear City Airport (L35), Big Bear, California, showed that 20.04 gallons of fuel was purchased for the airplane on September 4, 2015.

The pilot's daughter stated that the airplane was kept at L35 during the summer and afterward at Barstow-Daggett Airport (DAG), Daggett, California. She said that her father departed from L35 on September 5, 2015, about 0615 PDT, and arrived at DAG about 0630 PDT to pick up the passengers. He was then going to fly to Amarillo, Texas, following Interstate 40, where they were going to have dinner and then return the same day. She said that her father did not call her after he refueled and departed Flagstaff and that she called for help on September 6 because she had not heard from him. She said that there was another pilot aboard and that they had a GPS. She said that her father did not know anyone in Colorado or Montana.

A part-time Unicom operator at L35 said that the pilot talked about conducting the flight about 1 week before the accident. The pilot asked "a lot of different pilots to go along as copilot" and asked him to go on the flight. The Unicom operator did not know what time the pilot departed on September 5, but "it was pretty early in the morning" when the pilot left to pick up passengers. The Unicom operator stated that the pilot purchased the airplane "not too long ago," that the airplane radios were "very old," and that the "instruments were not all that good."

The pilot's initial contact with an air traffic control (ATC) facility on the day of the accident occurred during a visual approach to FLG. A rerecording of provided radio transmissions between the pilot and an FLG air traffic controller between 1011 and 1038 follows:

N1099Q: "Flagstaff traffic this is Piper Comanche N1099Z I'm sorry quebec we're approximately thirty miles miles west of the field anybody know what how the weather is down there you socked in there cause we are flying over the top here."

FLG tower: "Comanche 1099Q flagstaff tower we are open. The uh the ATIS is also broadcasting we're 900 broken, 1,600 broken, 2,400 overcast, visibility 10."

N1099Q: "Oh thank you I just turned the ATIS then. I appreciate it thank you Flagstaff."

N1099Q: "Flagstaff tower 1099Q about to land we are we are approximately 10 miles west of the airport."

FLG tower: "Comanche uh 99Q flagstaff tower the uh we're IFR at the airport 900 broken 1600 broken visibility 10."

1099Q: "We are now approximately 8,000 feet we have visibility looks like greater than 10 miles."

FLG tower: "Comanche 99Q I concur with the visibility uh are you requesting something special."

FLG tower: "Comanche 99Q the field is now VFR the uh ceiling is well I have a scattered layer of 1,200 ceiling 1,600 report a right base for runway 21."

N1099Q: "Report right base for runway 21 will do quebec."

FLG tower: "Comanche 99Q uh verify you have information charlie."

N1099Q: "Copy that we have we got a little bit of a . here."

FLG tower: "Comanche 99Q roger the wind is 220 at 8 temperature 16 density altitude is 8,400 dew point 13 and the altimeter 30.26."

N1099Q: "30.36 thank you."

FLG tower: "altimeter 30.26 26."

N1099Q: "Flagstaff tower this is quebec were gonna report left base runway 21 I just want to confirm that quebec."

FLG tower: "Comanche 99Q are you set up for a right base or a left base you're coming from the west you said."

N1099Q: "Oh its showing left base on my uh GPS left traffic on runway 21."

FLG tower: "Comanche 99Q uh we can make whichever way you want I just need to know which direction you're coming from."

N1099: "Well we're comin we're we're coming from 270 right now."

FLG tower: "From 270 you should be west of the.airport where was the destination you left from."

N1099Q: "Well we can report let's see the winds are from uh what."

FLG tower: "Comanche 99Q the wind is 240 at 6 just report base."

N1099Q: "Well. we're.right now."

FLG tower: "Comanche 99Q that came in broken and unreliable."

N1099Q: "The winds are 210."

FLG tower: "Wind 210 at 8."

FLG tower: "Comanche 99Q how far from the airport are you."

N1099Q: "We're downwind 21 left we're settin up for uh base for 21 left."

FLG tower: "Okay we only have runway 21 okay I see you now you are on a left downwind runway 21 cleared to land wind 210 at 8."

FLG tower: "Comanche 99Q runway 21 cleared to land."

N1099Q: ".the end of the runway now.on the downwind we'll make base to final."

FLG tower: "Comanche 99Q runway 21 cleared to land."

N1099Q: "Cleared to land runway 21."

FLG tower: "N99Q are you going to uh wiseman aviation the FBO."

N1099Q: "Yes we want to gas up can we exit."

FLG tower: "N99Q continue on the runway turn right alpha seven self-serve fuel will be towards the base of the rotating beacon if you want the uh FBO it's a green building near the uh rotating beacon."

N1099Q: "Okay I see the rotating beacon I guess we can make a right taxi here."

FLG tower: "N99Q you make right turn alpha seven that will get you more direct."

N1099Q: "Gotcha alpha seven."

N1099Q: "Flagstaff.down and clear of runway taxi to fuel pump."

N1099Q: "Yep."

N1099Q: "Quebec gettin ready to touchdown here runway 21 here flagstaff."

A fixed-base operator (FBO) employee at FLG stated that, during the airplane's taxi to the fuel pumps, the airplane almost hit an "Eclipse jet," and he thought it was going to hit golf carts that were near the FBO building. When the airplane arrived, it taxied close enough to the self-serve fuel pumps that it "knocked" a ladder with one of its propellers. He said that the pilot was not "observant about his surroundings." The airplane had white "house letters" painted on its side similar to those on fighter or Air Force aircraft. The house letters had "pilot" followed by a name, which he could not remember seeing, and "copilot" followed by "God." The airplane "looked clean.". The employee stated that the pilot told him that he hoped there were no more clouds, there was no more weather, and that he wanted 75 gallons of fuel for the airplane. The pilot pointed east and added that it should be 2 more hours to their destination. The employee thought the destination was Amarillo but was certain that it was in Texas.

The FBO employee said he showed the pilot how to use the fuel pump. The pilot gave the fuel order and payed for the fuel with cash. A passenger helped fuel the airplane at the self-serve fuel pump; he added about 15 gallons of fuel to the left and right wing fuel tanks (auxiliary fuel tanks) and put the fuel caps back on. The wing tip fuel tanks (main fuel tanks) were topped off.

The FBO employee stated that another passenger said that he bought a "brand new GPS" and could not get "ADAS[Automated Weather Observing System Data Acquisition System]" to work and thought he also said, "oh well we'll figure it out later."

At 1054, the pilot called Lockheed Martin Flight Services (LMFS) while at FLG and requested an abbreviated weather briefing for a visual flight rules flight from FLG to Amarillo, Texas. The pilot told the weather briefer that the Amarillo, Texas, airport identifier was "L51"; this was not the correct identifier for Tradewind Airport. The correct identifier was TDW; the L51 airport identifier was assigned to Heller Farm Airport, Winifred, Montana. Despite providing the weather briefer with the wrong airport identifier, the briefer did provide information for the flight to Amarillo. The pilot received the latest weather information in the briefing, which included Airmen's Meteorological Information for mountain obscuration, convective outlooks (the briefer mentioned that there was no convective activity yet but told the pilot to stay updated via Flight Watch), the terminal aerodrome forecast for Rick Husband Amarillo International Airport, Amarillo, Texas, the Meteorological Terminal Aviation Routine Weather Report for Tucumcari Municipal Airport, Tucumcari, New Mexico, and the winds aloft at 9,000 and 12,000 ft between the departure and destination airports. No record was found indicating that the accident pilot received or retrieved any other weather information before or during the flight.

The FBO employee at FLG stated that, after the airplane was fueled, it taxied past the FLG ATC tower without making any radio communications with ATC. The airplane taxied onto a runway while an "air shuttle" was landing, and the air shuttle (SkyWest 2992) had to abort its landing. The pilot then turned the radio

on and taxied off the runway and onto a taxiway near the air carrier ramp. A FLG airport rescue and firefighting (ARFF) employee drove to the airplane to talk to the pilot. The ARFF personnel told the left front pilot seat occupant that he had to move the airplane because it was blocking an air carrier ramp entrance. The employee said that FLG ATC had a "lengthy conversation" with the pilot after he had taxied the airplane off the runway and was told to call the FLG ATC tower. The employee said that he overheard on the FLG ATC frequency the air shuttle pilot asking about the airplane, and FLG ATC responded by saying it was "a case of situational awareness."

According to an Air Traffic Mandatory Occurrence Report, SkyWest 2992, CRJ2/L, was on the instrument landing system (ILS) runway 21 approach and was cleared to land on runway 21. The accident airplane was observed northbound on taxiway A without authorization from the FLG tower. N1099Q turned right onto the connecting taxiway A2 continuing toward runway 21. At that time, the tower controller issued go-around instructions to SkyWest 2992 on about 1 1/2 mile final and coordinated missed approach instructions with Phoenix Approach. The accident airplane continued onto runway 21 and initiated the takeoff roll and then established communication with the tower. The tower controller instructed the accident pilot to cancel takeoff and exit the runway. SkyWest 2992 was vectored back to the ILS approach course and landed without further incident.

The FLG ATC tower controller stated that, during his telephone conversation with the accident pilot following the runway incursion, the pilot "kind of missed the point," "came up with excuses" for the runway incursion, and did not know there was another airplane "out there" during the runway incursion. The controller stated that, when he told the pilot that there was an airliner on final, and it was at that point that the pilot "realized the gravity of the situation." The pilot then said that he had been flying for 50 years and nothing like this happened before. The controller said it "seemed" that the pilot "really didn't register" what had happened. The controller added that he did not remember having to repeat questions that he asked the pilot. The pilot did not seem upset nor did the pilot ask questions in response to the questions asked by the controller. The controller said that, during the second takeoff attempt, the accident airplane settled onto the runway after it had lifted off and then climbed out with a left turn.

The ARFF employee stated that the accident airplane taxied from the FBO to taxiway A2, held at A2, and then taxied onto an active runway with a commercial regional airplane on short final without any radio contact to ATC. The employee said that the accident pilot transmitted that he did not have the airplane's radio turned on or "something to that effect" and stated that they were going to take off. The employee said that the radio transmissions from the accident pilot were "screwy" and "lacked organization and context, and was not current."The employee said that it seemed like the pilot had spent a lot of time around uncontrolled airports. The employee said that during the airplane's second takeoff attempt, the airplane remained low over runway 21 for a long time and that, about 1,000 ft from the departure end of the runway, the airplane pulled up, "not steep," and entered a left turn to the east and headed northeast.

The flight was not receiving ATC services and was not assigned a transponder squawk code. The airplane used a squawk code of 1200 based upon ATC recordings and the arrival/departure times to and from FLG. The radar track of an airplane with a squawk code correlating to those times was plotted to provide an overview of the flight and is shown in figure 1.

Figure 1. A radar plot of an airplane flight track consistent with the accident airplane. The plot shows a turn toward the north.

PERSONNEL INFORMATION

Pilot/Airplane Owner Information

The pilot, age 71, held a private pilot certificate with a single-engine land airplane rating. The pilot's most recent FAA third-class airman medical certificate was issued December 17, 2013, with the limitation that he must wear corrective lenses for near and distant vision. At that time, the pilot reported a total flight time of 1,000 hours, 200 hours of which were in last 6 months. There was no military record received showing that the pilot had any flight experience in military airplanes.

The pilot's daughter stated that her father flew F-4 Phantoms. An L35 employee reported that he believed that the pilot said he flew F-4 Phantoms in the military and transitioned to helicopters and was injured in Vietnam. A Department of Defense (DOD)/Uniformed Services identification card that belonged to the pilot was recovered from the accident site. The card showed that he served in the US Marine Corps at grade "E3," which according to DOD's Enlisted Rank

Insignias was a grade of Lance Corporal.

The L35 employee said the pilot told him the he was a doctor and "had an MD." He stated that he researched the things told to him by the pilot, and none of it was true. He said the pilot had "some speech issues" and that he had a "high pitched garbled voice." He said that pilot could not "keep a fluent conversation" without having an "issue with talking." He said that the pilot's aircraft radio transmissions were "very short," which "concerned" him and L35 staff. He said "there were a lot of circumstances that concerned people about his [the pilot's] flying."

A review of the pilot's FAA airman record revealed that, on July 18, 2009, the pilot failed the practical portion of the examination in his first attempt for a private pilot certificate with a single-engine land airplane rating. Upon reexamination for the certificate/rating, he was to be reexamined on the following: IX. Basic Instrument Maneuvers, V. Performance Maneuver, and VII. Navigation. At the time of the examination, the pilot reported a total time of 301 hours and a total instruction time received of 52 hours. On September 21, 2009, the pilot successfully passed his second attempt and was issued a private pilot certificate with a single-engine land rating. At the time of reexamination, the pilot reported a total time of 305 hours and a total instruction time received of 55 hours. No record was found indicating that the pilot had been issued a multiengine airplane rating or that he had flown military aircraft..

The pilot's logbook, which was recovered from the accident site by first responders, had flight entries beginning July 7, 2007, and ending August 15, 2015. The logbook showed that the pilot's total flight time in single and multiengine airplanes was 801.9 hours, 255.6 hours of which were in single-engine airplanes and 217.7 hours of which were in multiengine airplanes. The first logbook page entry of a multiengine airplane flight time was dated January 6, 2013, in a Piper PA-23-250, N54155 and it showed a total multiengine flight time of 10.5 hours. The page also showed that the pilot's a total multiengine flight time for previous flights was 150 hours; however, there were no logbook entries documenting flights in multiengine airplanes before the page indicating that he had 150 hours of multiengine flight time. The pilot's logbook showed a total flight time in night conditions of 17.0 hours, of 0.2 hour of which was in the accident airplane. The most recent flight entry in night conditions was dated December 2, 2014, in the accident airplane for 0.1 hour.

The accident airplane's Application for Registration to the pilot was dated June 27, 2014. The Aircraft Bill of Sale shows the airplane title was transferred to the pilot on July 2, 2014, from Aerobanc of America, Inc. The first flight entry in the pilot's logbook for the airplane was dated July 3, 2014. No record was found indicating that the pilot had received training in the airplane after its purchase/registration. The pilot's logbook contained a total of 72 flight entries for the airplane with a total flight time of 35.4 hours. During this period, the logbook's remarks sections had entries that showed the pilot had flown with passengers. There was one logbook entry dated March 7, 2015, for a flight in the airplane that had the following remark: "I let [name of pilot-rated passenger] fly part way back."

A logbook entry showed that the pilot's most recent flight review, as required by Part 61.56, was dated July 17, 2013, with a departure and destination of Apple Valley Airport, Apple Valley, California. The flight was in a Piper PA-28-180 with a flight time of 1.0 hour, a ground instruction time of 1.0 hour, and the remarks, "FAR 61.56 FLT. REVIEW VFR PROCEDURES." The flight review was conducted by the same flight instructor that had provided the pilot-rated passenger's flight review. Title 14 CFR Section 61.56(c) stated that a flight review must have been accomplished within the 24 calendar months preceding the month in which a pilot acts as pilot-in-command in an aircraft for which that pilot is rated. The pilot was overdue for his flight review by about 2 months.

A logbook entry dated July 4, 2012, showed a flight from DAG to DAG in a Piper PA-28-180 that was 1.0 hours in duration. The remarks section for the flight had the following entry: "Flew over parade 10 feet off ground made six passes." A logbook entry dated July 4, 2013, showed a flight from DAG to DAG in a Piper PA-28-180 that was 2.0 hour long. The remarks section for the flight had the following entry: "Landed on Rt. 66 4 July Parade. With Mayor." A logbook entry dated November 2, 2013, showed a flight from DAG to "Rt.66," in a Piper PA-28-180 that was 0.2 hour long. The remarks section for the flight had the following entry: "Flew to the barn landed on RT. 66 for auto show." According to 14 CFR 91.119, "Minimum safe altitudes," a pilot should not operate an aircraft at an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

A logbook entry dated June 14, 2014, showed a flight in a Piper PA-28-180 that was 2.0-hour long and included five landings from "DAG" to "Big Bear" with the remarks: "Young Eagles." Regarding this entry, the L35 employee reported that nothing at the time made him question the pilot's flying ability. He said the pilot wanted to fly in the Young Eagles program and that they have a large Young Eagles program at L35. He said that they had asked the pilot to produce the required paperwork for the Young Eagles program, but the pilot never produced the paperwork, so the program representative decided about 8 to 10 months before the accident to not allow the pilot to fly in the Young Eagles program.

A logbook entry dated August 15, 2015, showed a 0.3-hour-long flight in the accident airplane "L35" to "L35." The remarks section for the flight stated: "Big Bear

airshow. made it. speed passes over runway." Regarding this entry, the L35 employee stated that there was "some issue" with the pilot during the Big Bear Airport air show. When the airport opened for departures, the pilot departed with passengers. Upon the pilot's return to the airport, he turned the airplane onto the final leg of the airport traffic pattern and did not have the airplane radio on. The shows's air boss cleared another airplane to depart from the active runway while the accident pilot was flying his airplane on short final. He stated that, instead of the pilot offsetting the airplane to the side of the runway during the go-around, the pilot performed a "low-level left turn over the crowd" with the landing gear and flaps extended.

The pilot had no previous FAA record of accident(s), incidents(s), or enforcement(s) actions.A search of publically available information of airman certificate information from on the FAA's website, FAA.govGOV, using only the pilot/airplane owner's first and last name, revealed that the pilot/airplane owner only held a private pilot certificate with a single-engine land rating.

Pilot-Rated Passenger Information

The pilot-rated passenger, age 67, held a private pilot certificate with a single-engine land airplane rating. His most recent FAA third-class airman medical certificate was issued May 28, 2015, with the limitation that he must wear corrective lenses. At that time, he reported 1,000 hours of flight experience.

On March 25, 2003, the pilot-rated passenger successfully passed, on his first attempt, an examination for a private pilot certificate with a single-engine land airplane rating. At the time of examination the pilot-rated passenger reported a total time of 168 hours, and a total instruction time received of 90 hours.

The pilot-rated passenger's logbook, which was recovered from the accident site by first responders, had flight entries beginning February 26, 2009, and ending August 31, 2015. The logbook showed that his total flight time in all aircraft was 785.5 hours, all of which was in single-engine airplanes.

A logbook entry showed that the pilot-rated passenger's most recent flight review as required by Part 61.56 was dated June 11, 2015. The flight review was conducted by the same flight instructor who had provided the pilot's flight review.

The pilot-rated passenger's logbook showed a total flight time in night conditions of 17.0 hours. The most recent flight entry in night conditions was dated January 5, 2011.

The pilot-rated passenger had no previous FAA record of accident(s), incident(s), or enforcement action(s).

AIRCRAFT INFORMATION

The accident airplane was a 1963 twin-engine Cessna 310H, serial number 310H-0099, airplane. It was powered by a Continental IO-470-VOCD, serial number 455693, engine and a Continental IO-470-D, serial number 79334, engine. The airplane was equipped with two 51-gallon capacity main fuel tanks and two 15.5-gallon capacity auxiliary fuel tanks.

According to FAA airworthiness records, the most recent airworthiness certificate for the airplane was a Special Airworthiness Certificate dated April 11, 2006. The Special Airworthiness Certificate was a Special Flight Permit for the purpose of "Out of Annual Inspection - Maintenance." The airplane did not have a current airworthiness certificate at the time of the accident. A standard airworthiness certificate remains valid as long as the aircraft meets its approved type design, is in a condition for safe operation and maintenance, and preventative maintenance and alterations are performed in accordance with Parts 21, 43, and 91.

The pilot's daughter provided copies of the aircraft logbooks . These copies showed that the airplane's last annual inspection was dated May 1, 2014, at a Hobbs time of 1,541.3 hours and a total time in service of 5,367.3 hours.

Logbook entries annotated the left engine as serial number 455693 and the right engine as serial number 79334 and noted that the most recent annual inspections of the left and right engines were dated May 1, 2014. At the time of the inspections, the left engine had a time since major overhaul of 1,241.6 hours; the Hobbs time was not annotated. The right engine had a time since major overhaul of 858.4 hours and a Hobbs time of 1,541.3 hours.

Title 14 CFR 43.7 states that every airplane is required to undergo an annual inspection: "no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an annual inspection and has been approved for return to service by a person authorized by Part 43.7."

METEOROLOGICAL INFORMATION

Astronomical Data

The astronomical data obtained from the United States Naval Observatory for the accident site on the day of the accident indicated that civil twilight began 0618, sunrise was 0645, sun transit was 1310, sunset was 1935, and civil twilight ended 2001.

Weather Information

Telluride Regional Airport (TEX), located 12 miles north-northwest of the accident site at an elevation of 9,070 ft mean sea level (msl) was the closest official weather station to the accident site. TEX had an Automated Weather Observing System, and its reports were not supplemented.

At 1415, TEX reported wind from 190 degrees at 5 knots, 10 miles visibility, present weather thunderstorms in the vicinity, sky condition scattered clouds at 4,700 ft above ground level (agl), broken ceiling at 6,000 ft agl, broken skies at 7,000 ft agl, temperature of 17ø C, dew point temperature of 7ø C, and an altimeter setting of 30.34 inches of mercury. Remarks: automated station with a precipitation discriminator, lightning distant northwest, temperature 17.4ø C, dew point temperature 6.6ø C.

Closer to the accident site, observations from the nonofficial surface stations within 12 miles of the accident site reported gusting wind between 8 and 39 mph. The strongest wind was at the nonofficial surface stations closest to the accident site altitude and near the tops of the mountains between 10,000 and 12,000 ft. In addition, these stations reported rain showers in the vicinity and had relative humidity values greater than 80 percent around the accident time. These stations were above 10,000 ft, and the high relative humidity values were consistent with cloud cover at or above 10,000 ft and mountain obscuration due to clouds, precipitation, and mist. Figure 2 shows the three-dimensional Grand Junction, Colorado, weather surveillance radar-88 Doppler base reflectivity from the scan initiated at 1406 and the ATC Flight Track.

Figure 2. Three-dimensional Grand Junction, Colorado, weather surveillance radar-88 Doppler base reflectivity from the scan initiated at 1406 and the ATC Flight Track. Blue and green colored areas depict reflectivity of greater than 10 decibels (dBZ) and greater than 20 dBZ, respectively.

AIRPORT INFORMATION

TDW was located about 482.7 nautical miles on a true course of 087ø from FLG. The VFR sectional chart for the Amarillo area, shown in figure 3, depicted an airport identifier of TDW, not L51 as stated by the pilot, next to the airport name. L51 is shown once, but it referred to the maximum runway length available at TDW, which was 5,100 ft.

Figure 3. The VFR sectional chart depicting the airport identifier for Tradewind as TDW with L 51 as the maximum runway length for the airport.

As noted previously, L51 was the designator for Heller Farm Airport, Winifred, Montana, which was located about 586 nautical miles on a heading 354ø from the accident site.

WRECKAGE AND IMPACT INFORMATION

The accident site was located at latitude 37.76ø north, longitude 107.84ø west at an elevation of 11,500 ft. The wreckage path was estimated to be about 1,050 ft long along an estimated northerly direction in up-sloping mountainous terrain. See figures 4 and 5 for photographs of the wreckage.

Figure 4. Aerial view taken the day after the accident by first responders showing a white-colored object, which was a portion of the aircraft fuselage, resting on the face of up-sloping terrain. The photo also shows the cloud height at the time first responders arrived on-scene. The view of the western ridgeline averaged about 12,000 ft msl.

Figure 5. A photograph of the main wreckage, which was destroyed by impact forces with no evidence of soot or fire. The airplane wings, horizontal and vertical stabilizers, engines, and propellers were located at accident site.

Wreckage Examination

The largest piece of recovered wreckage was the tail section, which had the horizontal and vertical stabilizers attached. There was no evidence of soot or fire on the pieces of wreckage. Both engines were separated from the airframe. The propellers from both engines were separated from their hubs and displayed chordwise gouging/scratching and S-shaped bending/twisting. Accident impact damage to the airframe, accessories, and both engines precluded functional operational testing of these components/systems.

The instrument panel was destroyed by impact forces, and none of the instruments were attached. The electrical, lighting, and ignition switches were destroyed.

The altimeter face was separated from its case, and the altimeter altitude indicator needles were not intact. The altimeter setting window of the face was intact and indicated a setting of 30.40 inches of mercury.

The attitude indicator unit was separated from the instrument panel and crushed. The attitude indicator display was internally separated and loose within the unit and did not yield an attitude. The gyro within the attitude indicator was removed, and it showed circumferential scoring on the gyro and the gyro's housing.

The horizontal situation indicator heading select bug and compass both displayed about a 360ø heading.

An oxygen bottle, consistent with a pilot oxygen system, was recovered, and its airworthiness/servicing was unknown due to the impact damage. A handheld GPS was not found/recovered from the accident site. The Hobbs meter and tachometers were destroyed.

The airplane's two fuel selector valve assemblies were separated from the airframe. One valve had its fuel selector control separated due to impact forces and was positioned to "off." The second valve was positioned to "main."

Examination of the flight control system revealed that the flight control cables were attached to the control horns/bell cranks. Separated sections of the flight control cables exhibited broom straw features.

Examination of both engines revealed no preimpact anomalies that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

The NTSB's Chief Medical Officer reviewed the pilot's and pilot-rated passenger's FAA medical case reviews, toxicology results, autopsy reports, the investigator's reports, and the audio tapes of the ATC conversations in Flagstaff. The pilot/airplane owner's personal medical records were obtained and reviewed.

Pilot/Airplane Owner

The pilot's last aviation medical examination was dated December 17, 2013. According to the records, he was 70 inches tall, weighed 165 pounds, and had reported no chronic medical conditions and no medications to the FAA. He had reported a number of previous surgical procedures and a disability related to a military gunshot wound but the aviation medical examiner noted "no residual."

Rocky Mountain Forensic Services, PLLC, performed an autopsy of the pilot. The autopsy report noted the cause of death was "multiple injuries" and the manner of death was "accident." Examination of the body for natural disease was limited by the severity of the pilot's injuries; no organs were available for evaluation.

The FAA's Bioaeronautical Research Laboratory performed toxicology testing on the only available specimen, which was muscle, from the pilot. The testing identified ethanol at 0.015 gm/dl as well as citalopram and its metabolite N-desmethylcitalopram. Federal Aviation Regulations, Section 91.17 (a), prohibits any person from acting or attempting to act as a crewmember of a civil aircraft while having 0.040 gm/dl or more ethanol in the blood. Detected ethanol may be to the result of ingestion or microbial activity in the body after death.

Citalopram is an antidepressant that carries a warning: "May impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery)." However, it has not been shown to degrade performance in psychological testing experiments using healthy volunteers.

According to records obtained from the pilot's Veteran's Administration Hospital, in January 2013, he was documented as having multiple chronic medical conditions including spinal stenosis, hypothyroidism, depressive disorder, posttraumatic stress disorder, panic disorder, gastroesophageal reflux disease, esophageal stricture, chronic neck pain, paraplegia, peptic ulcer disease, type 2 diabetes, and emphysema. In a single note from an outside physician, the pilot's paraplegia was documented as relating to a motor vehicle accident in 1996.

The Veterans Administration records show that, in January 2015, the pilot was hospitalized for being unable to swallow. Eventually, he had a gastrostomy tube placed for feeding. He was admitted for a rotator cuff repair in March, 2015, and remained in the hospital for rehabilitation until May 2015. During that time, the feeding tube was removed. His active medications as of July 2015 included albuterol, formoterol, citalopram, hydromorphone (4mg tab every 4 active hours), aspart insulin (short acting), glargine insulin (long acting), levothyroxine, lidocaine patch, prazosin, and zolpidem.

Albuterol and formoterol are beta-agonists available as inhaled medication for the short-term treatment of wheezing and the longer term prevention of wheezing, respectively. Hydromorphone is an opioid analgesic Schedule II controlled substance available by prescription that is commonly marketed with the name Dilaudid and carries a warning about central nervous system depression so severe it may cause respiratory failure.

The pilot was on two forms of injected insulin: aspart, which is short acting, and glargine, which is long acting. Their common names are Novolog and Lantus, respectively. Levothyroxine is a replacement thyroid hormone typically used to treat hypothyroidism; it is commonly marketed with the name Synthroid. Lidocaine is a local anesthetic available in patch format to treat localized pain. Prazosin is a blood pressure medication commonly marketed with the name Minipress. Zolpidem is a short-acting sleep aid commonly marketed with the name Ambien and carries a warning about sedation and changes in judgment or behavior.

Finally, in a visit from September 1, 2015, the pilot was described as having a T12 spinal cord injury, "in a wheelchair but able to transfer."

Pilot-Rated Passenger

The pilot-rated passsenger's last aviation medical exam was dated May 28, 2015. At that time, he was 67 inches tall and weighed 255 pounds. He had previously reported high blood pressure to the FAA and reported using atenolol and naproxen as medications.

Rocky Mountain Forensic Services, PLLC, performed an autopsy Rocky Mountain Forensic Services, PLLC. The autopsy reported the cause of death was "multiple injuries" and the manner of death was "accident." Examination of the body for natural disease was limited by the severity of the pilot's injuries; no organs were available for evaluation.

The FAA's Bioaeronautical Research Laboratory performed toxicology testing on the only available specimen from the pilot-rated passenger, which was muscle. The testing identified ethanol at 0.043 gm/dl, as well as atenolol, diphenhydramine, and D-methamphetamine.

Atenolol is a medication used to treat high blood pressure and prevent recurrent heart attacks. It is commonly marketed with the name Tenorman. Diphenhydramine is a sedating antihistamine used to treat allergy symptoms and as a sleep aid. It is available over the counter under the trade names Benadryl and Unisom. Diphenhydramine carries the following Federal Drug Administration warning: "may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery). Compared to other antihistamines, diphenhydramine causes marked sedation; it is also classed as a CNS depressant and this is the rationale for its use as a sleep aid. Altered mood and impaired cognitive and psychomotor performance may also be observed. In fact, in a driving simulator study, a single dose of diphenhydramine impaired driving ability more than a blood alcohol concentration of 0.100%."

Methamphetamine is a Schedule II controlled substance and is available in low doses by prescription to treat attention deficit hyperactivity disorder, attention deficit disorder, obesity, and narcolepsy. It is also commonly available as a street drug. Even in prescription form, methamphetamine can cause a host of physiological and psychoactive effects.

Accident Rpt# GAA17CA197 03/18/2017 1716	**Regis# N747AB**	**Colorado Spring, CO**	**Apt: City Of Colorado Springs Muni COS**
Acft Mk/Mdl CESSNA R182	**Acft SN R18201302**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-540-J3C5D	**Acft TT 3931**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: CHARLES FOLDES	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: STN

Events

1. Approach-VFR pattern final - Miscellaneous/other

Narrative

The pilot of the retractable landing gear airplane reported that during the approach of a simulated 180ø power off landing, he became fixated on his touchdown point and did not complete the landing checklist. He added that he did not look outside to check that the main landing gear was down or to "confirm a green [landing gear position indicator] light". The airplane landed with the gear retracted.

The airplane sustained substantial damage to the fuselage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airframe or engine that would have precluded normal operation.

In a follow up email correspondence, the pilot reported that he was using an active noise reducing headset during the accident flight. He added that although the gear warning horn was audible, it did not translate in his brain as a landing gear retracted warning.

Accident Rpt# ERA17LA141 03/29/2017 1325 EDT	**Regis# N2383C**	**Mooresville, NC**	**Apt: Atwell 1NC2**	
Acft Mk/Mdl CESSNA R182-NO SERIES	**Acft SN R18200171**	**Acft Dmg: UNK**	**Rpt Status: Prelim**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-540	**Acft TT 1822**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: SCOTT ATWELL INSURANCE SERVICES INC	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Takeoff - Loss of engine power (partial)

Narrative

On March 29, 2017, about 1325 eastern daylight time, a privately owned and operated Cessna R182, N2383C, was substantially damaged when it impacted a fence while attempting to depart from Atwell Airport (1NC2), Mooresville, North Carolina. The private pilot and passenger were not injured. The flight was destined for Riley Creek Airport (12TN), Kingston, Tennessee. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight, which was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to the pilot, the airplane was last flown in November 2016. On the morning of the accident, he moved the airplane out of the hangar, washed it, and performed a preflight inspection following the published manufacturer's checklist. He indicated that he was particularly careful checking for bird nests or other hazards, because the airplane had not been flown in four months. He found the airplane to be in good condition with no issues. He then went to a business meeting and returned to the airplane that afternoon, inspected it again, and found no discrepancies. He and his passenger boarded the airplane with a few personal items, and no baggage. After removing and stowing the gust lock, he started the engine without difficulty. He let it warm up for several minutes, then proceeded to back taxi on the turf runway to the beginning of runway 36 for a takeoff to the north.

Prior to takeoff, the pilot performed an engine run-up which he described as "everything seemed normal, the engine sounded fine." During the takeoff roll, as the airplane reached a point on the runway where it would normally lift off (about 1,200 feet down the runway), he pulled back on the yoke, and the airplane "didn't want to fly." He recalled that the airspeed at that time was "close to 60 knots." He did not recall any engine instrument indications and noted that the engine sounded "normal." Once he realized that the airplane was not going to takeoff and a collision appeared imminent, he advised his passenger to prepare for impact. As the airplane approached a fence just beyond the departure end of the runway, he pulled back on the yoke and the airplane lifted off, flew over the fence, then descended and struck another fence before coming to rest in the driveway of his residence.

The turf runway at 1NC2 was 1,700 feet-long by 60 feet-wide, and was located at an elevation of 830 feet above sea level. The pilot reported that the turf had recently been mowed and the grass was "very short."

Examination of the airplane by a Federal Aviation Administrator (FAA) inspector revealed that the right wing was crushed and bent aft, outboard of the wing strut. The right aileron and flap were damaged. The left wing was crushed aft near its root. The outboard section of the right horizontal stabilizer sustained impact damage consistent with striking a fence post, the right elevator balance horn was fractured and nearly separated from the elevator. The firewall and forward fuselage were buckled.

According FAA records, the pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA third-class medical certificate was issued October 28, 2015. A review of the pilot's logbook revealed that he had accrued 986 total hours of flight experience, of which 90 hours were in the accident airplane, as of January 16, 2017.

Review of the airplane's maintenance records revealed that the most recent annual inspection was completed on September 10, 2016, about 19 flight hours prior to the accident. The engine had accrued 1,822 hours since new.

At 1320, the reported weather at Statesville Municipal Airport (SVH), Statesville, North Carolina, about 10 nautical miles northwest of the accident site included wind from 080ø at 5 knots, the temperature was 22ø C, and the dew point was 11ø C.

An electronic engine monitor instrument and the engine were retained for examination.

Accident Rpt# WPR16CA121 05/25/2016 1037 PDT	**Regis# N9583S**	**Brookings, OR**	**Apt: Brookings Airport BOK**	
Acft Mk/Mdl CHAMPION 7ECA-NO SERIES	**Acft SN 7ECA-372**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL O-200-A	**Acft TT 1557**	**Fatal 0 Ser Inj 1**	**Flt Conducted Under: FAR 091**	
Opr Name: STONEBROOK ROBERT	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Landing - Landing area overshoot

Narrative

A witness reported that he observed the airplane lift off and fly low over the length of the runway several times before it entered the traffic pattern to land. The airplane approached the runway normally, however, it touched down about halfway down the runway at a high rate of speed. Towards the end of the runway, the airplane turned sharply and exited the runway surface. The airplane traversed down an embankment and abruptly came to rest at the bottom, substantially damaging the firewall and right wing. The pilot did not report any anomalies with the airframe or engine.

Accident Rpt# CEN17LA034	**10/31/2016 1530 CDT**	**Regis# N454RK**	**Baton Rouge, LA**	**Apt: Baton Rouge Metropolitan KBTR**
Acft Mk/Mdl CIRRUS DESIGN CORP SR22-NO SERIES		**Acft SN 2084**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Prelim** **Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR IO-550-N		**Acft TT 2262**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: JOHNNIE BURROWS LLC		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

Events

1. Standing-engine(s) start-up - Fire/smoke (non-impact)

Narrative

On October 31, 2016, about 1530 central daylight time, a Cirrus SR22 airplane, N454RK, experienced an engine fire while at the Baton Rouge Metropolitan Airport, Ryan Field, (KBTR), Baton Rouge, Louisiana. The airline transport rated pilot was not injured, and the airplane was substantially damaged during the accident. The airplane was registered to and operated by Johnnie Burrow, LLC, Longview, Texas, under the provisions of 14 Code of Federal Regulations Part 91 cross country flight. Day visual meteorological conditions prevailed at the time of the accident.

The pilot reported that she had flown into the airport about 2.5 hours earlier, and then parked at the airport. Before departing for a return cross-country flight, the pilot conducted a normal preflight and engine start. About a minute after engine start, she heard a loud "pop", followed by the smell of smoke, an erratic engine sound, and the oil light illuminating. She shut down the engine and evacuated the airplane. Ground and fire department personnel responded and extinguished the engine fire.

Examination of the engine compartment was conducted by an inspector from the Federal Aviation Administration (FAA) and a technical representative from Continental Motors, Inc.

The examination revealed small hole in the fuel drain line near an adel clamp. The fuel drain line assembly appeared consistent with the airframe manufacturer's assembly instructions.

Accident Rpt# ERA17FA143B	**04/01/2017 842 EDT**	**Regis# N425AE**	**Edgewater, FL**	**Apt: N/a**	
Acft Mk/Mdl GRUMMAN AMERICAN AVN. CORP. AA-5B		**Acft SN AA5B0487**	**Acft Dmg: DESTROYED**	**Rpt Status: Prelim**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-360-A4K		**Acft TT 1673**	**Fatal 2**	**Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: ANNE M. EDMONSON		**Opr dba:**			**Aircraft Fire: NONE**
					AW Cert: STN

Events

1. Maneuvering - Midair collision

Narrative

On April 1, 2017, about 0842 eastern daylight time, a Cessna 170B, N8082D, and a Grumman American AA-5B, N425AE, were destroyed during an in-flight collision near New Smyrna Beach, Florida. The airline transport pilot flying the Cessna and the airline transport pilot flying the Grumman were both fatally injured. The airplanes were part of a formation flight that departed from Spruce Creek Airport (7FL6), Daytona Beach, Florida, about 0839, and was destined for Arthur Dunn Airport (X21), Titusville, Florida. No flight plan was filed. Visual meteorological conditions prevailed, and the personal formation flight was conducted under 14 Code of Federal Regulations Part 91.

Both accident airplanes were participating in a formation flight with three other airplanes. All five pilots participating in the formation flight were members of a pilot group based at 7FL6. On the morning of the accident, members of the group were flying to X21 to attend a monthly breakfast event.

The five-airplane formation flight involved in the accident included a Great Lakes biplane, the accident Cessna, the accident Grumman, a Grumman AA-1C (Lynx), and an American Champion 8KCAB (Super Decathlon), all of which took off from 7FL6 in elements. The flight leader was flying the biplane and the accident Grumman took off in formation first, followed by the Cessna and the Lynx taking off in formation next, followed by the Decathlon.

After takeoff from 7FL6, the flight initially formed into a five airplane "Vic" or "V" formation, with the flight leader in the biplane at the apex, and the rest of the flight in echelon with the Grumman in the No. 2 position, and the Decathlon in the No. 5 position, to the left of the flight leader, and the Cessna in the No. 3 position, and the Lynx in the No. 4 position, to the right of the flight leader.

The formation flight then turned south towards X21. Due to the position of the sun, the flight leader decided to change to a left echelon formation where the airplanes would be arranged diagonally, to his left, with each airplane being stacked slightly low, behind, and to the left of the airplane ahead. This arrangement allowed the pilots to avoid the sun glare. This would require the Cessna (No. 3) and the Lynx (No. 4) to transition across from right to left behind the leader. The Grumman would remain in the No. 2 position to the left and aft of the leader, the Cessna in the No. 3 position to the left and aft of the Grumman, the Lynx in the No. 4 position to the left and aft of the Cessna, and the Decathlon in the No.5 position to the left and aft of the Lynx.

According to the flight leader, moments after he commanded the Cessna and the Lynx to the left, in the corner of his peripheral vision at approximately his 7 o'clock position, he saw a "flash" or something white, like the bottom of an airplane.

According to the pilot of the Lynx, when the flight leader commanded the Cessna, and himself to the left, he heard the flight leader transmit "cleared to cross," and he observed the Cessna start to move to the left "slow and normal." He stayed with the Cessna, and when it was almost on the left echelon bearing line, he saw the it move into position behind the Grumman. He then suddenly saw "parts" coming back towards him on his right side, along with what appeared to be "vapor." He then saw the Grumman abruptly pitch up, and go past him above and to his right. The Grumman then looked like it was entering a loop as the airplane's nose was already past vertical and he could see the top of the airplane. He then observed something on the right side of the Cessna move upward before its tail began to "slew to the left," and disappeared from view.

The biplane and the Lynx then broke formation, with the biplane immediately pulling up and turning hard left, and the Lynx entering a left 60ø banked turn. The flight leader in the biplane could see parts of the airplanes falling to the ground, and he could see the Cessna descending like a falling leaf with what appeared to be the right wing folded over. The flight leader then began to circle the accident site, and reported the accident over the radio to an air traffic controller at New Smyrna Beach Municipal Airport, (EVB), New Smyrna Beach, Florida. He then continued to circle the accident site until emergency responders arrived.

According to witnesses who were driving on Interstate Highway 95 (I-95), they saw the formation flight traveling southbound. They observed that the formation flight was about 1/4 mile west of I-95 when the collision occurred, and they observed the "wing" on one of the airplanes come off, the airplane tumble, and then rapidly descend tail low, until they lost sight of it behind a tree line. They also saw the other airplane descend rapidly, almost straight down, until losing sight of

it. The witnesses also watched as parts from both airplanes descend to the ground with one piece landing in the median between the northbound and southbound lanes. Moments after the collision occurred, another formation flight flew north along the east side of I-95.

Examination of the accident site revealed that a 1/4-mile-long debris field, with most the debris being contained in a 1,036 ft long by 290 ft wide section. The Grumman and Cessna came to rest approximately 220 ft apart.

Examination of the wreckage of the Cessna revealed that the monocoque structure of the aft fuselage was completely separated from the rest of the airplanes structure, just forward of the empennage. The empennage was attached to the rest of the airplane by the control cables for the elevator, rudder, and pitch trim, which were twisted around each other multiple times. Further examination of the aft fuselage and empennage also revealed the presence of paint transfers, which matched the trim color of the Grumman. These were present on the leading edge of the vertical stabilizer which had been crushed back, the right horizontal stabilizer, and the right side of the aft fuselage.

The Cessna's right wing flap came to rest approximately 397 ft northeast of the main wreckage of the Cessna. The inboard section of the right aileron was missing, the right aileron control cable had been severed, and the area of the wing just forward of the right wing flap mounting location, displayed evidence of propeller strikes, and was missing large sections of its structure.

Examination of the wreckage of the Grumman revealed that no major portions of the airplane were missing. The leading edges of the propeller blades were damaged and displayed semicircular gouges

According to Federal Aviation Administration (FAA) and maintenance records, the Cessna was manufactured in 1952. Its most recent annual inspection was completed on October 1, 2016. At the time of the inspection, the airplane had accrued 4596.8 total hours of operation.

According to FAA and maintenance records, the Grumman was manufactured in 1977. Its most recent annual inspection was completed on September 1, 2016. At the time of the inspection, the airplane had accrued 1673.4 total hours of operation.

According to FAA records, the pilot of the Cessna held an airline transport pilot certificate with ratings for airplane multi-engine land, and commercial privileges for airplane single-engine land. He also held a flight instructor certificate with ratings for airplane single engine, airplane-multi engine, and instrument airplane; a flight engineer certificate with a rating for flight engineer turbojet powered; and a mechanic certificate with ratings for airframe and powerplant. He also held type ratings for the B-737, B-757, B-767, B-777, BE-1900, and BE-300. His most recent FAA first-class medical certificate was issued on February 10, 2017. He had accrued about 14,620 total hours of flight experience.

According to FAA records, the pilot of the Grumman held an airline transport pilot certificate with ratings for airplane multi-engine land, and commercial privileges for airplane single-engine land, and airplane single-engine sea. She also held a flight instructor certificate with ratings for airplane single engine, airplane-multi engine, and instrument airplane; a flight engineer certificate with a rating for flight engineer turbojet powered; and a ground instructor certificate with ratings for advanced and instrument. She also held type ratings for the A-330, B-747, B-757, B-767, BE-1900, and CE-510S. Her most recent FAA first-class medical certificate was issued on October 19, 2016. She had accrued about 11,368 total hours of flight experience.

The wreckage of both airplanes was retained by the NTSB for further examination.

Accident Rpt# CEN16LA256 07/07/2016 1155	**Regis# N26908**	**Cheyenne, WY**	**Apt: N/a**	
Acft Mk/Mdl GULFSTREAM AMERICAN CORP AA 5	**Acft SN AA5A0805**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-320 E2G	**Acft TT 2710**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: TOMORROWS AERONAUTICAL MUSEUM	**Opr dba:**		**Aircraft Fire: NONE**	

Events

1. Initial climb - Windshear or thunderstorm

Narrative

On July 7, 2016, about 1155 mountain daylight time, a Gulfstream American CORP AA-5A airplane, N26908, was substantially damaged during a forced landing after departing Cheyenne Regional Airport/Jerry Olson Field (KCYS), Cheyenne, Wyoming. The flight instructor and student pilot were not injured. The instructional flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and a visual flight rules flight plan had been filed for the flight. The flight was originating at the time of the accident and was en route to Eppley Airfield (KOMA), Omaha, Nebraska.

The flight instructor stated that the takeoff was normal; however, at the departure end of the runway, between 300 and 400 feet above the ground, "the wind started blowing from all directions" and he had difficulty maintaining control of the airplane. The flight instructor had difficulty maintaining altitude and elected to land the airplane on the road next to a school. During the landing roll, the flight instructor maneuvered the airplane to avoid hitting construction workers directly ahead of him. The right wing hit a construction sign and was substantially damaged. The pilot stated that there were no mechanical anomalies with the airplane or engine at the time of the accident.

A weather study was conducted by a meteorologist with the National Transportation Safety Board. The National Weather Service charts depicted a low pressure system over southeast Wyoming and a mid-level trough just west of the accident site. Winds at the 700-hPa level were westerly around 10 knots, whereas winds at the 500-hPa level increased to 60 knots. There were no AIRMETs, SIGMETs, or center weather advisories valid for the accident site at the time of the accident. One PIREP in the area reported moderate "chop" between 6,500 feet and 8,500 feet mean sea level. The terminal aerodrome forecast valid at the time of the accident forecast winds from 300ø at 12 knots gusting to 20 knots.

Cheyenne Regional Airport had the closest official weather station to the accident site, 2 miles south-southeast of the accident location. The observation taken at 1153 reported wind 090ø at 9 knots, and clear skies. The observation taken at 1208, after the accident, reported wind from 090ø at 7 knots. The closest non-official surface observation site (5 miles west of the accident site) reported wind from 274ø with gusts to 19 knots at 1215. Weather service radar depicted a dry-line boundary at the accident site, at the time of the accident. Wind speed and direction changed with altitude associated with this dry-line boundary and would have had a corresponding increase in low-level turbulence and low-level wind shear.

A search of official weather briefing sources revealed that the flight instructor contacted Lockheed Martin Flight Service at 0853 on the morning of the accident and received an abbreviated briefing for the flight from Rock Springs, Wyoming, to Cheyenne, Wyoming. There was no record of the flight instructor receiving or retrieving any additional weather information before the accident flight.

Analysis

Accident Rpt# CEN16LA303	**07/29/2016 900 CDT**	**Regis# N269JB**	**Morris, MN**	**Apt: N/a**
Acft Mk/Mdl HUGHES 269A-1		**Acft SN 105-0395**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING HIO-360A1A			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: EVAN ANDERSON		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Events

1. Maneuvering - Controlled flight into terr/obj (CFIT)

Narrative

On July 29, 2016, about 900 central daylight time, a Hughes 269A helicopter, N269JB, was substantially damaged when it impacted crops and the ground near Morris, Minnesota. The pilot was not injured. The aerial application flight was conducted under the provisions of 14 Code of Federal Regulations Part 137. Visual meteorological conditions prevailed and no flight plan had been filed for the flight. The local flight departed about 0800.

According to the pilot, he was applying fungicide to a soybean field and was on his 4th load. He was flying to the east at 45 knots when he looked down at his navigation system, as he was maneuvering the helicopter for a spray pass, to ensure that he was on course. The helicopter felt as if it was being pulled towards the ground and slowed down. When the pilot corrected the tail of the helicopter entangled in the crop. The helicopter rotated 180ø, descended to the ground, and came to rest on its right side resulting in substantial damage to the main rotor and the fuselage.

The pilot stated that he used the DynaNav navigation system to control for drift and ensure the proper overlap of the product he was applying. He stated that he had flown with the system several times but was not overly familiar with it.

Accident Rpt# CEN17LA068	**01/04/2017 1545 CST**	**Regis# N1159G**	**Nacogdoches, TX**	**Apt: A L Mangham Jr Rgnl OCH**
Acft Mk/Mdl MOONEY AIRCRAFT CORP. M20-K		**Acft SN 25-0662**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR TSIO-360 GB		**Acft TT 2362**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: IRBY DONALD KEITH		**Opr dba:**		**Aircraft Fire: NONE**

Events

1. Approach-VFR pattern downwind - Loss of engine power (total)

Narrative

On January 4, 2017, about 1545 central standard time, a Mooney M20K airplane, N1159G, conducted a forced landing near Nacogdoches, Texas. The private rated pilot sustained minor injuries and the airplane was substantially damaged. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight departed the Kerrville Municipal Airport and was about to land at the A L Mangham Jr Regional Airport (OCH), Nacogdoches, Texas.

The airplane had recently undergone an annual inspection and the flight was the second flight since the inspection. The pilot reported that the preflight and flight was uneventful until he entered the pattern to land at OCH. The pilot prepared the airplane to land using the manufacturer's checklist, which included changing to the fullest fuel tank, which was the left fuel tank, setting flaps to 5ø and lowering the landing gear. While on an extended downwind leg, the pilot noticed that his altitude dropped to 700 to 800 ft above ground level, so he added engine power to climb back to pattern altitude. The airplane's engine stopped producing power without any vibrations or sputtering. The pilot turned the airplane towards the runway and estimated the distance to be more than 1.5 miles from the end of the runway. He set up best glide but perceived that the airplane was descending too quickly to make the runway. The pilot performed a forced landing to a field but landed short in a wooded area.

The airplane was moved to a secure location and several engine runs were conducted. Testing included scenarios with the fuel lines not purged of air. Engine runs with the left fuel line not purged of air, the engine would stop producing power if the pilot did not intervene and either activate the boost pump or switch back to the right tank. Testing found that when purged of air, the engine operated normally. Examination of the airframe found no anomalies. Examination of the fuel selector found no anomalies and each switch position was easily discerned.

The mechanic, who has worked on Mooney airplanes for 48 years, provided a statement concerning the work performed on the airplane prior to the accident. During N1159G's annual inspection, a discrepancy found were numerous fuel stains throughout the belly panels. The source of the leak was determined to be the o-rings on fittings in the fuel selector valve. The mechanic was familiar with the fuel selector valve and suspected that the o-rings were deteriorated. To perform the required replacement, both fuel tanks were drained and the fuel selector valve was removed from the airplane. The fuel selector was not disassembled and the four unions were removed. The O-rings were replaced and the fittings were torqued. The selector valve was reinstalled and the fuel tanks were refilled with the fuel that had been previously removed and filtered. The fuel selector was moved from the off position to the left position and the fuel supply to the valve was purged of air thru the gascolator drain valve. The selector was then moved to the right position and the right fuel line to the selector was purged of air thru the gascolator drain valve. Inspection showed no leaks and after several days was re-examined and found not leaking. The annual inspection and repairs were completed. The mechanic, who is also a pilot, performed a post maintenance flight that included selecting both the left and right tanks during the preflight, taxi, and flight portions. He did not detect any leaks during the post flight inspection.

The pilot has owned N1159G for almost 25 years and has at least 941 hours in the airplane without a similar incident occurring.

Accident Rpt# CEN16LA234 06/24/2016 1015	**Regis# N91137**	**Alamogordo, NM**	**Apt: N/a**
Acft Mk/Mdl NORTH AMERICAN NAVION-A	**Acft SN NAV-4-31**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL MOTORS IO-520-B	**Acft TT 3600**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: MARION LEE HOLMES	**Opr dba:**		**Aircraft Fire: NONE**

Events

2. Landing - Loss of engine power (total)
4. Landing - Hard landing

Narrative

On June 24, 2016, about 1015 mountain daylight time, a North American Aviation Navion airplane, N91137, made a forced landing near Alamogordo, New Mexico. The pilot and one passenger were not injured and the airplane sustained substantial damage. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan had been filed. The cross-country flight departed Sierra Blanca Regional Airport (SRR), Ruidoso, New Mexico, at 0938.

The pilot stated that he and his passenger were flying in a planned proficiency competition with several other airplanes. The objective of the competition was to predict a time en route and total fuel consumption for a predetermined four-leg route, then fly the route as close as possible to the predicted time and fuel consumption (Figure 1).

The airplane was in cruise flight and level at 7,500 ft mean sea level (msl) when the pilot noticed the engine was "running rough." At 0958, the Nos. 1 and 5 cylinders were significantly cooler than the other 4 cylinders; No. 1 cylinder head temperature (CHT) was 350ø and the exhaust gas temperature (EGT) was 990ø while No. 5 CHT was 305ø and EGT was 1320ø. In contrast, the No. 6 CHT was 398ø. At 1010, the airplane reached 8,000 ft msl over mountainous terrain when they noticed an "acrid metallic smell" in the cabin. The pilot made a distress call on the radio, then a right turn towards an airport. About 13 nautical miles (nm) southeast of Alamogordo-White Sands Regional Airport (ALM), the engine was "running very rough" and the pilot heard a "metallic clanking" sound. He reduced the engine power and descended. About 5 to 6 nm from ALM, the engine continued to operate with reduced power and the airplane continued to descend. The pilot setup for an emergency landing on a residential road, but with no engine power available the airplane landed in a field about 100 yards short of the road. The airplane continued into a drainage culvert and then came to rest on the road. The airplane sustained substantial damage to the engine mounts, firewall, wing spar, fuselage, and empennage (Figure 2).

The responding Federal Aviation Administration (FAA) inspector conducted a postaccident examination at the accident site with the pilot. They removed the engine cowling to examine the Continental Motors IO-520-B engine. The No. 5 cylinder appeared damaged and the engine crankcase was cracked in the same area (Figure 3).

A postaccident examination, conducted by the NTSB and Continental Motors, revealed that the No. 5 cylinder rocker box cover had been previously removed by the FAA inspector and was found in the engine compartment with an inner exhaust valve spring, an outer exhaust valve spring, a damaged valve guide, portions of a roto coil assembly, damaged valve spring keys, and six machine screws and lock washers. The rocker box cover contained a hole directly over the exhaust valve assembly. The engine crankcase was cracked at the base of the No. 5 cylinder, which measured about 2 inches. The No. 5 top spark plug exhibited mechanical damage. The rest of the engine's spark plugs displayed 'normal' to 'worn out normal' patterns when compared to a Champion Aviation Check-A-Plug chart. The oil filter safety wire was found attached to the fuel pump hose fitting. The oil filter was opened and contained metal debris. The oil sump was removed and contained a large amount of metal debris and damaged pieces of engine components, to include the No. 5 piston, piston rings, exhaust guide, and exhaust valve head. The No. 5 cylinder was removed and damage was observed to the cylinder head, cylinder wall, intake push rod and piston connecting rod. The rod was twisted and its pin displayed deformation on both ends. The rod bearing exhibited normal wear patterns. The No. 5 cylinder and associated components were retained and sent to Continental Motors for further examination.

The No. 5 cylinder was disassembled (Figure 4) and examined at the Continental Motors Analytical Department under the auspices of the NTSB. The examination revealed that the exhaust valve guide was fragmented; some of the valve guide fragments were not recovered for examination. The valve guide was marked with "FAA-PMA" on one of the fragments, which indicated that it was not a Continental Motors part. FAA Parts Manufacturer Approval (PMA) are

third-party manufactured replacement or modification parts sold for installation on a type-certificate product. The valve guide bore (Figure 5) was worn beyond the specified size and showed signs of the value guide moving in the guide bore. The exhaust valve head hardness was checked and met the appropriate specification. Only one valve key spring was found with the parts and it was worn.

A review of the airplane maintenance logbooks revealed that on January 20, 2006, at an engine total time (TT) of 358.3 hours, the No. 5 cylinder was replaced with an overhauled Engine Components International Division (ECi) cylinder. A 100-hour engine inspection was complete on March 23, 2016 at an engine TT of 1,089.9 hours. At the time of the accident the engine had accumulated 1,099 hours TT.

Accident Rpt# CEN16FA087 01/14/2016 1610 CST	**Regis# N4751Z**	**Garden City, TX**	**Apt: Midland Airpark MDD**	
Acft Mk/Mdl PIPER PA 22-108-108	**Acft SN 22-8307**	**Acft Dmg: DESTROYED**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-235-C1B	**Acft TT 3518**	**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: DALLAS LEE SMITH JR.	**Opr dba:**		**Aircraft Fire: NONE**	

Summary

The pilot had recently purchased the airplane and planned to fly it to a friend's private airport to show him the airplane. The private airport was located about 27 nautical miles east of the departure airport. A witness observed the pilot start the airplane's engine, but he did not observe the airplane take off. The airplane did not arrive at the destination, an alert notice was issued, and the wreckage was found the following day about 8 nautical miles southwest of the intended destination and about 6 nautical miles south of the direct route of flight. Although radar coverage was available and showed other airplanes in the accident area using a transponder code of 1200, no radar data were found for the accident flight. There were no known witnesses to the accident. The accident site was located in an area of mostly flat terrain with mesquite trees and shrubs immediately adjacent to a caliche pit that was surrounded by large dirt piles on three sides and measured about 35 ft from the bottom of the pit to the top of the dirt piles. The airplane struck the top of the dirt pile on the east side of the pit, and the debris extended 100 yards to the east, indicating that the airplane was heading east at impact. The damage to the airplane was consistent with impact at a high forward velocity in a relatively level attitude. The signatures observed on the propeller were consistent with the engine operating at a high power setting at the time of impact. There was no evidence of preimpact anomalies that would have precluded normal operation.

A review of weather information found no evidence of convective activity, a significant surface wind condition, or a low-level wind shear hazard in the accident area. The reported weather conditions at stations near the accident site included clear skies, visibility of 10 miles, and wind from the west at less than 20 knots.

Although the caliche pit was a whitish color that contrasted with the brownish color of the surrounding flat terrain, the dirt pile that the airplane struck was similar in color to the surrounding terrain. Due to this color similarity, it is possible that, while flying at low altitude, the pilot did not recognize that the dirt pile was higher than the surrounding flat terrain.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain clearance with terrain during a low altitude flight.

Events

1. Enroute - Low altitude operation/event
2. Maneuvering - Loss of control in flight

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Altitude-Not attained/maintained - C
2. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot
3. Environmental issues-Physical environment-Terrain-Sloped/uneven terrain-Awareness of condition
4. Environmental issues-Physical environment-Terrain-Sloped/uneven terrain-Contributed to outcome
5. Environmental issues-Physical environment-Terrain-Sloped/uneven terrain-Decision related to condition

Narrative

HISTORY OF FLIGHT

On January 14, 2016, about 1610 central standard time, a Piper PA-22-108 airplane, N4751Z, impacted terrain near Garden City, Texas. The airline transport rated pilot was fatally injured, and the airplane was destroyed. The pilot was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91 as a personal flight. Visual meteorological conditions prevailed, and no flight plan was filed. The airplane departed from the Midland Airpark (MDD), Midland, Texas, about 1545 and was en route to the Edwards Lucian Wells Ranch Airport (TX31), a private airport near Big Spring, Texas.

An employee of the pilot stated that the pilot planned to fly from MDD to TX31 to show the airplane to a friend, who was the owner of TX31. The employee reported that the pilot left the shop about 1400 and went to the airport. A witness at the airport, who spoke with the pilot before the airplane departed, confirmed that the pilot intended to fly the airplane to TX31. The witness saw the pilot start the engine about 1530, but he did not see the airplane take off. TX31 was located about 27 nautical miles east of MDD.

Family members reported the pilot missing the following day, and an alert notice was issued. The airplane was found by law enforcement via cell phone ping and a Civil Air Patrol pilot. The accident site was located about 8 nautical miles southwest of the intended destination, TX31, and about 6 nautical miles south of the direct route of flight. There were no known witnesses to the accident.

Radar coverage was available and detected other airplanes in the accident area using a transponder code of 1200. No radar data were found for the accident flight.

PERSONNEL INFORMATION

The pilot, age 73, held an airline transport pilot certificate with ratings for airplane multi-engine land, airplane single engine land, and rotorcraft-helicopter. The pilot also held a type rating for Learjet airplanes. Additionally, he held a flight instructor certificate with a single engine airplane rating, which had expired on December 31, 1987. On June 1, 2015, he was issued a third class medical certificate with the following limitation: must have available glasses for near vision. On the medical certificate application, the pilot reported his flight experience included 5,342 total hours and 0 hours in the preceding six months.

A review of the pilot's logbook revealed 5,345.8 total hours of which 3.2 hours were in the accident airplane. The pilot logged 5 flights in 2011 totaling 6.2 hours. There were no logbook entries from 2012 to 2014. The pilot logged 5 flights in 2015 totaling 4.4 hours. On October 25, 2015, the pilot completed a flight review with a flight instructor in a Cessna 206 airplane. On December 13, 2015, the pilot flew the accident airplane with a flight instructor, and the remarks section noted that the pilot completed stalls, steep turns, and landings.

AIRCRAFT INFORMATION

The Piper PA-22-108 Colt, serial number 22-8307, was a two-place, high-wing, tricycle landing gear airplane, manufactured in 1961. The airplane was constructed of metal tube and fabric and was equipped with one 18-gallon fuel tank located near the inboard portion of the left wing. The airplane was powered by a Lycoming O-235-C1B engine, serial number L-7020-15, rated at 108 horsepower at 2,600 rpm, which drove a two blade, fixed pitch, metal Sensenich propeller.

The airplane was sold to the pilot on November 30, 2015. On January 5, 2016, the FAA suspended the airplane's registration because the paperwork had not been submitted properly.

A review of the airplane's maintenance logbooks revealed that, on January 23, 2015, at a tachometer time of 3,501.92 hours, an airframe annual inspection and an engine 100-hour inspection were completed. The tachometer time at the accident site was 3,517.59 hours.

METEOROLOGICAL INFORMATION

At 1615, the automated weather observation station, located at the Big Spring McMahon-Wrinkle Airport (BPG), Big Spring, Texas, about 16 miles northeast of the accident site, recorded wind from 230ø at 15 knots, visibility 10 miles, clear sky, temperature 63ø F, dew point 23ø F, and altimeter setting 29.74 inches of mercury. The reported weather conditions at other stations near the accident site included clear skies, visibility of 10 miles, and wind from the west at less than 20 knots.

There was no evidence of the pilot receiving a weather briefing. A review of weather information found no applicable pilot reports and no evidence of convective activity, a significant surface wind condition, or a low-level wind shear hazard in the accident area. There was an active airmen's meteorological information (AIRMET) for moderate turbulence below 10,000 ft.

WRECKAGE AND IMPACT INFORMATION

The main wreckage came to rest in an area of mostly flat terrain with mesquite trees and shrubs immediately adjacent to a caliche pit, which was surrounded on three sides by large dirt piles. The dirt piles were a brownish color, similar to the color of the flat terrain surrounding the pit, and the pit was a contrasting whitish color. The caliche pit measured about 35 ft from the bottom to the top of the dirt piles. The initial impact point was on the west side of a large dirt pile that defined the eastern boundary of the caliche pit. The debris field and main wreckage were located on top of and to the east of the dirt pile. The debris field extended 100 yards to the east on a heading of 065ø magnetic. The engine was found about 30 yards from the initial impact point, and the main wreckage was

10 yards beyond that. The farthest extent of the debris path was defined by a piece of broken windscreen.

The initial impact area on the side of the dirt pile was defined by several areas of disturbed dirt and airplane debris. The first impact marks were toward the bottom of the dirt pile and were spaced similar to the airplane's landing gear. A horizontal line of debris and white paint chips, about 26 ft in length, was noted near the top of the dirt pile. On the left side of the line were pieces of broken red lens, and on the far right side were pieces of green lens. The propeller was found detached from the engine and partially embedded near the top of the dirt pile. The propeller blades exhibited chordwise scratches, leading edge gouges and polishing, and S-shape bending. The propeller spinner was crushed inward. The propeller mounting bolt holes were elongated.

The engine was found inverted in the middle of the debris path and sustained impact damage. The carburetor, starter, generator, and one magneto had separated during impact and were found near the engine. The other magneto remained attached to the engine and was impact damaged. When rotated by hand, neither magneto was able to produce a spark due to internal damage. The carburetor air box, all intake piping, and all fluid carrying lines were impact damaged. The pushrods and rocker arms appeared in place and secure. The engine oil appeared clean. The crankshaft could not be rotated due to impact damage and rearward bending of the propeller flange. To the extent that the engine could be examined, there was no evidence of preimpact anomalies.

The main wreckage was found upright and consisted of the left and right wings, fuselage and empennage. The fuselage was impact damaged and had been cut open to facilitate the pilot's extraction. The pilot seat was impact damaged and partially separated from the fuselage. The left wing was partially separated from the fuselage and exhibited impact damage. The left aileron remained attached and sustained impact damage. The right wing was partially separated from the fuselage. The empennage remained attached to the rear fuselage, and the vertical stabilizer and rudder were in place, but the lower rudder hinge point was impact separated. The horizontal stabilizer and elevator remained attached and were impact damaged. The rudder cables remained attached to the rudder bar and were continuous to the rudder bellcrank. The elevator control cables were attached to the elevator control horn and to the elevator bellcrank; both cables had been cut to facilitate the pilot's extraction. The elevator bellcrank rod was impact separated. The pitch trim jackscrew was found in a neutral setting. The left and right aileron control cables remained attached and were continuous from the control wheel chain to their respective bellcranks. The airplane was not equipped with flaps. The right landing gear remained attached, the nose gear was separated and found in the debris path about 15 yards beyond the initial impact, and the left main gear was separated and found beyond the main wreckage. There was no evidence of preimpact anomalies with the airframe that would have precluded normal operation.

The fuel selector was found in the "ON" position. The investigation was unable to determine the amount of fuel onboard before departure or the last time the airplane had been fueled. The emergency locator transmitter (ELT) was found separated from the airplane, and the switch was in the "ON" position; the ELT transmission was detected by the US Air Force. The cockpit instruments were impact damaged; the tachometer showed 3,517.59 hours, and the altimeter's Kollsman window was set to 29.92. The communication radio was set to 122.8 Megahertz (MHz), a popular common traffic advisory frequency. The navigation radio was set to 114.8 MHz, which was the same frequency as the Midland Very High Frequency Omni Directional Radio Range navigation aid.

A damaged cell phone was found in cockpit area, and its battery had separated from the phone. Law enforcement used the ping of this cell phone to locate the wreckage. An unfolded San Antonio Visual Flight Rules Sectional Aeronautical Chart was found next to the wreckage. The chart showed the area encompassing the direct route of flight and the accident location.

MEDICAL AND PATHOLOGICAL INFORMATION

South Plains Forensic Pathology, P.A., Lubbock, Texas, completed an autopsy of the pilot, and the cause of death was attributed to visceral injuries due to blunt impact trauma. The Bioaeronautical Research Laboratory at the FAA's Civil Aerospace Medical Institute conducted toxicological testing, which revealed the presence of amlodipine and was negative for other substances.
Amlodipine (generic and brand name Norvasc) was a prescription medication used to treat high blood pressure. The pilot had previously reported this medication to the FAA.

ADDITIONAL INFORMATION

Title 14 CFR Part 91.119 Minimum Safe Altitudes
Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes: (c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

Accident Rpt# CEN16FA001	**10/02/2015 1030 CST**	**Regis# N3552K**	**Huntsville, TX**	**Apt: Huntsville UTS**
Acft Mk/Mdl PIPER PA 28-140		**Acft SN 28-23623**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-E2A		**Acft TT 3942**	**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: JENSEN ROBERT E		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

A mechanic who worked for the fixed-based operator (FBO) at the airport reported that, on the day of the accident, the private pilot taxied the airplane to the maintenance hangar where he inflated the nose tire. The pilot told the mechanic he was flying the airplane to a nearby airport because someone there was interested in purchasing the airplane. No known witnesses saw the airplane take off. The air traffic control tower at the nearby airport did not have a record of the airplane landing there. The pilot was reported missing, and the wreckage was located later that evening on property adjacent to the departure airport.

The airplane came to rest inverted in a small clearing in a wooded area. The fuel selector was found in the "off" position. The left-wing fuel tank contained 2 cups of fuel, and the right-wing fuel tank contained about 4 gallons of fuel. A small amount of fuel was dripping from the right fuel cap before the airplane was righted. No evidence of fuel drainage from the left fuel tank was found. The airplane was not equipped with an ELT which likely contributed to the delay in locating the airplane. An examination of the airplane and engine did not reveal any anomalies that would have prevented normal operation. Damage to the starter housing from impact with the ring gear was consistent with slow rotation/no power at the time of impact. Based on the evidence, it is likely the engine lost power due to fuel starvation, which resulted from the pilot shutting off the fuel supply to the engine.

Although the autopsy and medical records showed that the pilot had arteriosclerotic cardiovascular disease, diabetes, and kidney stones, there was no evidence to suggest the pilot suffered an acute cardiac event or other medical incapacitation during the accident flight. A low therapeutic level of diphenhydramine, a sedating common over-the-counter antihistamine used to treat the common cold and hay fever, was detected in the pilot's heart and urine; however, it could not be determined whether the pilot was impaired by the effects of the drug at the time of the accident.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's mismanagement off the fuel supply to the engine, which resulted in fuel starvation.

Events

1. Enroute - Fuel starvation
2. Emergency descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C
2. Personnel issues-Action/decision-Action-Incorrect action selection-Pilot - C

Narrative

HISTORY OF FLIGHT

On October 2, 2015, about 1030 central daylight time, a Piper PA-28-140 airplane, N3552K, collided with terrain near Huntsville Municipal Airport (UTS), Huntsville, Texas. The private pilot was fatally injured, and the airplane was substantially damaged. The airplane was registered to a private individual and was being operated by the pilot as a 14 Code of Federal Regulations Part 91 personal flight. Visual flight rules conditions existed near the accident site at the time of the accident, and a flight plan had not been filed. The airplane departed UTS just before the accident and was destined for Lone Star Municipal Airport (CXO), Conroe, Texas.

A mechanic who worked for the fixed-base operator (FBO) reported that, on the day before the accident, the pilot was at UTS and that he replaced the airplane's battery. He added that, on the day of the accident, the pilot taxied the airplane to the maintenance hangar where he inflated the nose tire. The pilot told him that he was flying the airplane to Conroe because someone there was interested in purchasing the airplane. The mechanic stated that he told the pilot that the airplane had not been flown in a while, and the pilot stated that he might fly it around the area before heading to Conroe. The mechanic stated he did not see the pilot taxi the airplane nor take off, and no known witnesses saw the airplane take off.

CXO air traffic control tower personnel reported that the airplane did not land at the airport on the day of the accident.

The airplane owner, who was the pilot's brother-in-law, confirmed that the pilot replaced the airplane's battery on the day before the accident. He stated that the

pilot was going to check the radios on the day of the accident, but that he was not supposed to fly the airplane.

About 1900, the pilot's family notified the Walker County Sheriff's Office that the pilot was missing. A search was initiated, and the wreckage was located about 2130 on a law enforcement shooting range that bordered the east side of UTS.

PERSONNEL INFORMATION

The pilot's last Federal Aviation Administration (FAA) third-class medical certificate was issued on July 13, 2006. The medical certificate contained the limitation, "Not valid for any class after 07/31/2007. Must have available glasses for near vision."

On the application for his last FAA medical certificate, the pilot reported having 1,550 hours of flight time, 26 hours of which were flown in the preceding 6 months. The pilot's current flight time could not be determined because no personal flight records were located during this investigation.

AIRCRAFT INFORMATION

The airplane was a low-wing, four-seat, fixed-tricycle-landing gear airplane, serial number 28-23623, manufactured in 1967. The engine, serial number L19195-27A, was installed in the airplane on June 11, 2003, in accordance with Supplemental Type Certificate SE367CH, which increased the horsepower to 160.

The last annual inspection was completed on February 15, 2014, at a tachometer time of 48.2 hours. The tachometer time at the time of the accident was 49.5 hours. The aircraft total time at the time of the accident was calculated to be 3,942 hours.

An employee of the FBO at UTS reported that the airplane was last fueled at UTS on February 14, 2014. The amount of fuel added to the airplane is unknown. The airplane was kept in a hangar until May 5, 2015, when it was relocated to a ramp tie-down space.

The airplane owner stated that it had been about 1 year since the airplane was last flown. He reported that he and the pilot were planning on getting a ferry permit on October 5, 2015, so they could fly the airplane to Conroe for an annual inspection and to park the airplane outside the FBO to sell it. FBO personnel reported that the owner had rented a tie down space on their ramp, but as far as they knew, the airplane had not been parked there.

METEOROLOGICAL INFORMATION

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in a narrow clearing in a wooded area about 1/4 mile east of the approach end of runway 18 at UTC. The wreckage was inverted and on a heading of 10ø. Tree branches were embedded in the bottom of the fuselage.

The aircraft battery power was found in the "on" position, and the wingtip lights were illuminated. The cockpit switches for the fuel boost pump, strobes, and instrument lights were in the "on" position. The magneto switch was in the "both" position. The carburetor heat knob was broken off, and the control cable appeared to be in the "off" (cold) position. The mixture control was full rich, and the throttle was at idle. The fuel selector was in the "off" position.

Examination of the airframe revealed that both sides of the aft fuselage were crushed inward and that the left-side crushing was more extensive. The top of the cockpit area was crushed downward to the top of the seats, but the remainder of the cockpit area was not compromised. All four seats were intact. The seats were equipped with seat belts, but shoulder harnesses were not installed. The airplane was not equipped with an electronic locator transmitter.

Both wings sustained impact damage, but they remained attached to the fuselage. The ailerons and flaps remained attached to their respective wings. Both the left and right fuel tanks were intact, and their fuel caps were secured. The right wing fuel tank contained about 4 gallons of fuel, and the left wing fuel tank contained about 16 ounces of fuel. A slow drip of fuel was observed coming from the right fuel tank filler cap before the airplane was righted. There was no evidence of fuel leakage from the left fuel tank. The fuel was clean and consistent with 100LL aviation fuel.

The horizontal stabilator, rudder, and vertical stabilizer sustained minor damage, and all remained attached to the empennage. The top of both the rudder and

vertical stabilizer were crushed. The pitch trim drum displayed nine threads upper extension of the inner shaft, which was consistent with a trim setting of about 50% or 6ø of the available 12ø nose-up trim.

Flight control continuity was established from each flight control surface to their respective cockpit controls. Both the left and right flaps were in place, and the flaps were extended about 40ø. All three landing gears remained attached.

The gascolator bowl was removed, and it was about three-quarters full of clean fuel that was consistent with 100LL aviation fuel. The gascolator screen and fuel boost pump filter were free of debris. The carburetor was removed and disassembled. Metal floats and a one-piece venturi were installed. No fuel was present in the carburetor bowl. The carburetor fuel inlet screen was examined, and it was free of debris.

The engine was rotated by hand using the propeller. Thumb compression, suction, and valve train continuity were confirmed to all cylinders. Accessory gear rotation was verified, and both magnetos sparked all leads when the engine was manually rotated. All spark plugs, Champion (REM40E) were removed and were light grey. All of the spark plugs were mid- to late-service life per the manufacturer's chart. Damage to the starter housing from impact with the ring gear was consistent with slow rotation/no power at the time of impact.

The propeller remained attached to the propeller flange. One propeller blade was straight. The other blade had a slight bend near its tip. No anomalies were identified with the airframe, flight controls, engine, engine components, or the propeller that would have prevented their normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

The Montgomery County Forensic Services Department conducted an autopsy on the pilot. The manner of death was attributed to "multiple blunt force injuries." The autopsy report stated the pilot had arteriosclerotic cardiovascular disease, diabetes, and kidney stones. The autopsy, FAA medical records, and the pilot's medical records from his personal physician were reviewed, and no evidence was found to suggest that the pilot suffered an acute cardiac event at the time of the accident.

Toxicology testing performed by the FAA's Bioaeronautical Research Sciences Laboratory identified 0.088 ug/ml of diphenhydramine in heart blood, and tamsulosin and yohimbine in cavity blood. All three drugs were also identified in urine. In addition, 366 mg/dl of glucose was confirmed in urine (normal is 0). Clinical lab tests performed on the pilot's vitreous found 8 mg/dl of glucose and his blood revealed a hemoglobin A1C of 9 %.

Diphenhydramine is a sedating common over-the-counter antihistamine used to treat the common cold and hay fever and as a sleep aid. Diphenhydramine carries the following FDA warning: may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g. driving, operating heavy machinery). The therapeutic range for diphenhydramine is 0.0250 to 0.1120 ug/ml. Tamsulosin is an alpha blocker used in the symptomatic treatment of benign prostatic hyperplasia. Yohimbine is an alkaloid with stimulant and aphrodisiac effects found naturally in Pausinystalia Yohimbe. Neither causes significant sedation or other psychoactive effects.

Accident Rpt# GAA16CA352	**06/29/2016 1300 EDT**	**Regis# N601FT**	**Merritt Island, FL**	**Apt: Merritt Island COI**
Acft Mk/Mdl PIPER PA 28-161		**Acft SN 2841195**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-D3G			**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: AMERICAN AIR ACADEMY INC		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

an airsafety.com e-product
Prepared From Official Records of the NTSB By:
Air Data Research
9865 Tower View, Helotes, Texas 78023
210-695-2204 - info@airsafety.com - www.airsafety.com

Accident Rpt# GAA16LA352	**06/29/2016 1300 EDT**	**Regis# N601FT**	**Merritt Island, FL**	**Apt: Merritt Island COI**
Acft Mk/Mdl PIPER PA 28-161		**Acft SN 2841195**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-D3G		**Acft TT 15651**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: AIRBORNE SYSTEMS INC.		**Opr dba: SPACE COAST AVIATION**		**Aircraft Fire: GRD**
				AW Cert: STN

Events

1. Landing-landing roll - Loss of engine power (total)

Narrative

On July 29, 2016, about 1300 Eastern daylight time (EDT), a Piper PA-28-161 airplane, N601FT, experienced a total loss of engine power during the landing roll at Merritt Island airport (COI) in Merritt Island, Florida. During the engine restart a fire ensued, and the firewall sustained substantial damage. The flight instructor and student pilot did not sustain injuries. The airplane was registered to American Air Academy Inc. and was operated by the flight instructor as a visual flight rules (VFR), local, instructional flight under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the flight, no flight plan was filed. The flight originated from COI, Merritt Island, Florida about 1150 EDT.

The flight instructor reported that he and his student were practicing takeoff and landings in preparation for the student pilot's first solo. On their seventh landing the engine experienced a total loss of power during the landing roll. The flight instructor further reported that he attempted to restart the engine, but during that process he smelled and observed smoke coming from the engine cowling. He switched off the electrical equipment, secured the fire extinguisher, and attempted to extinguish the engine fire.

According to the operator, the carburetor was overhauled about 400 hours prior to accident. A representative of the company that overhauled the carburetor reported that they did not have any records of the overhauled carburetor.

The wreckage was sold by the insurance company to a private buyer, and the insurance company did not provide contact information for the buyer. The carburetor was not examined.

In the emergency section of the pilots operating handbook under engine fire during start, the procedure is:

1. Starter.....Crank Engine

2. Mixture.....Idle Cut-Off

3. Throttle.....Open

4. Electric Fuel Pump...Off

5. Fuel Selector.....Off

Accident Rpt# CEN17LA154	**04/07/2017 1835 EDT**	**Regis# N2389A**	**Greensburg, IN**	**Apt: Greensburg Municipal Airport I34**
Acft Mk/Mdl PIPER PA-22-135		**Acft SN 22-754**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Prelim Prob Caus: Pending**
			Fatal 0 Ser Inj 0	**Flt Conducted Under: FAR 091**
Opr Name: PILOT		**Opr dba:**		**Aircraft Fire: NONE**

Events

1. Approach - Loss of control in flight

Narrative

On April 7, 2017, at 1835 eastern daylight time, a Piper PA-22-135, N2389A, impacted terrain near the Greensburg Municipal Airport (I34), Greensburg, Indiana. The pilot received minor injuries and two passengers were uninjured. The aircraft sustained substantial damage. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 and was not operating on a flight plan. Visual meteorological conditions prevailed for the personal flight that departed from Upper Cumberland Regional Airport, Sparta, Tennessee, at 1535, and was destined to I34.

The airplane was on approach to runway 36 at I34 when it experienced an uncontrolled left roll. The pilot attempted a forced landing but impacted terrain.

Accident Rpt# WPR16FA103	**05/08/2016 1640 PDT**	**Regis# N5046W**	**Pomona, CA**	**Apt: Brackett Field POC**
Acft Mk/Mdl PIPER PA28		**Acft SN 28-48**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320		**Acft TT 4110**	**Fatal 0 Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: DONALD J BACH		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The private pilot estimated that he departed on the 10-minute, 16-mile, local flight with one fuel tank about one-half full and the other tank about one-quarter full; he did not recall which tank he had the fuel selector positioned to during takeoff. During descent for landing, the pilot observed the engine rpm decrease to between 500 and 600 rpm, at which time he declared an emergency. The pilot switched fuel tanks but did not remember which tank he selected or whether the engine lost total power. The pilot made a forced landing on the roof of an industrial office building.

During examination of the airplane after it was recovered from the roof of the building, about 7.5 gallons of fuel was drained from the left wing, and about 1 quart of fuel was drained from the right wing; no visible contamination was observed. Additionally, the fuel selector was selected to the right tank position. Other than the absence of fuel in the right tank, examination of the airframe and engine revealed no anomalies that would have precluded normal engine operation. Further, the lack of rotational damage to the propeller was consistent with a loss of engine power before impact. While atmospheric conditions at the time of the accident were conducive to carburetor ice, the physical evidence supports the position that total loss of engine power was due to fuel starvation.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's mismanagement of the available fuel, which resulted in a total loss of engine power due to fuel starvation.

Events

1. Enroute - Fuel related
2. Enroute - Fuel starvation
3. Emergency descent - Off-field or emergency landing
4. Landing-flare/touchdown - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C
2. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C

Narrative

On May 8, 2016, about 1640 Pacific daylight time, a Piper PA-28, N5046W, sustained substantial damage during a forced landing on top of an office/industrial building complex in Pomona, California. The private pilot, who was the registered owner and sole occupant of the airplane, sustained serious injuries. Visual meteorological conditions prevailed for the 16 nautical mile (nm) local flight, which was being operated in accordance with 14 Code of Federal Regulations Part 91, and a flight plan was not filed. The flight departed from the Fullerton Municipal Airport (FUL), Fullerton, California, about 1630, and the intended destination was Brackett Field (POC), La Verne, California.

In a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) about 6 weeks after the accident, the pilot reported that before departing on the 10-minute flight, he estimated that one fuel tank was about one-half full and the other fuel tank was about one-quarter full; he did not recall which tank contained what amount of fuel or which tank the fuel selector was positioned to use. The pilot stated that the pre-takeoff run up was "ok", and that the carburetor heat worked well. The pilot further stated that, after departing FUL, he climbed to 2,200 ft. mean sea level (msl), was cleared for a left downwind to runway 26L at POC, and contacted the POC tower over Diamond Bar, a small town just west of POC. He then descended to 2,000 ft. msl, and during the descent he observed the engine rpm decrease to between 500 and 600 rpm, at which time he radioed "MAYDAY, MAYDAY." The pilot stated that he then switched fuel tanks but was not sure which one he selected. He further stated that he was not sure if the engine had completely lost power or not. The pilot said that he was looking for a field to land in but could not find one. The pilot added that the only thing he saw was a rooftop, which he aimed for, and he subsequently "belly flopped" the airplane onto the roof of the building. The pilot concluded by saying that he did not remember when he had last refueled the airplane.

The building the airplane landed on was located about 2 nm southwest of the destination airport. An initial survey of the accident site was performed on the evening of May 8, 2016, by NTSB and Federal Aviation Administration (FAA) investigators. The wreckage was located on the top of a building, which measured about 200 ft. in length, and about 100 ft. in width; the roof was about 30 ft. above ground level. The airplane came to rest nose down with the building's roof collapsed around the engine cowling to the top of the propeller spinner. The left main landing gear collapsed aft, and the left wheel separated and was found on

the roof. The nose wheel separated and was found inside the building. Some blue staining was observed on the roof.

On the day after the accident, the wreckage was examined in more detail after it was lowered from the roof of the building. During the examination, investigators drained about 7.5 gallons of fluid from the left wing tank's fuel drain; it was a light blue fluid, which looked and smelled like aviation gasoline. There was no visible contamination. Additionally, investigators drained about 1 quart of fluid from the right wing tank's fuel drain; it was a light blue fluid, which looked and smelled like aviation gasoline. There was no visible contamination. Investigators also drained a few ounces of fluid from the carburetor; it was amber in color, and smelled like aviation gasoline. The gascolator was displaced from its position; the screen appeared clean. The fuel selector was observed positioned to the right fuel tank.

The propeller remained attached to the crankshaft flange, and the spinner remained attached to the propeller. One propeller blade was bent aft, and the other propeller blade did not appear to be bent. Neither blade displayed leading edge gouging or S-bending.

On June 14, 2016, a detailed examination of the engine and airframe, performed under the supervision of the NTSB IIC, revealed no evidence of preimpact mechanical anomalies that would have precluded normal operation of the engine. For details of the examination, refer to the Summary of Airplane Examination report, which is available in the public docket for this accident.

PERSONNEL INFORMATION

The pilot, age 61, possessed an FAA private pilot certificate with an airplane single-engine land rating. The pilot reported to the NTSB that he had a total flight time of 900 hours of which 300 hours were in the same make and model as the accident airplane. He also reported that he had accumulated a total of 5 hours flight time in the last 90 days and 2 hours in the last 30 days, all in the same make and model as the accident airplane.

The pilot completed his most recent flight review on February 27, 2016. He was issued a third-class FAA airman medical certificate on December 4, 2015, with the limitation that he must wear corrective lenses.

AIRCRAFT INFORMATION

The airplane was a Piper PA-28, serial number 28-48. It was a single-engine, low-wing airplane with a fixed tricycle landing gear.

Examination of the airplane's airframe logbook indicated that the airplane's last two annual inspections revealed several discrepancies, and the airplane was not signed off as airworthy. The annual inspection performed on October 4, 2014, at a tachometer time of 1,249.97 hours and 4,098.97 hours total time, revealed the following discrepancies: needs an engine data plate (missing); needs Right side exhaust shroud for carb heat replace; needs compass correction card entries legible/replaced. The most recent annual inspection, which was performed on November 1, 2015, at a tachometer time of 1,261.0 hours and 4,110.27 hours, revealed the following discrepancies: needs an engine data plate (missing); needs Right side exhaust shroud for carb heat replaced; needs engine front crankshaft seal replaced; left wing fuel sump drain weeping.

METEOROLOGICAL INFORMATION

At 1547, the weather reporting facility at POC reported: wind from 260ø at 8 knots, 10 miles visibility, overcast ceiling at 3,100 ft. above ground level, temperature 17ø C, dew point 10ø C, and an altimeter setting of 29.98 inches of mercury. According to the carburetor icing probability chart, conditions were conducive to moderate icing at cruise power, and serious icing at descent power. The carburetor icing probability chart included in Federal Aviation Administration Special Airworthiness Information Bulletin No. CE-09-35, Carburetor Icing Prevention, indicated that the airplane was operating in an area that was associated with moderate icing at cruise power, and serious icing at descent power.

Accident Rpt# ERA15FA128	**02/11/2015 1415 EST**	**Regis# N5985U**	**Greensboro, NC**	**Apt: Air Harbor Airport W88**
Acft Mk/Mdl PIPER PA28-140		**Acft SN 28-26822**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-E2A		**Acft TT 3799**	**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: RONALD O. MURPHY		**Opr dba: MURPHY AVIATION / GUILFORD LAKES AVIATION LLC**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

On the day of the accident, the private pilot rented the airplane from a fixed base operator. A witness saw the pilot start the airplane and taxi to the end of the runway, where the pilot performed an engine run-up. Two witnesses reported that the takeoff sounded normal; however, they did not hear the airplane continue around the airport traffic pattern. One of the witnesses then drove to the end of runway where he found the wreckage. Examination of the accident site and airplane revealed that the airplane had descended and impacted trees after departure. There was no evidence of engine power at the time of impact. Examination of the engine revealed no evidence of any preimpact mechanical malfunctions; however, only trace amounts of fuel were found in both the carburetor float bowl and the engine-driven fuel pump. Examination of the fuel system revealed that the fuel strainer and electric fuel pump were both devoid of fuel.

The fuel selector was likely original to the airplane, and had not been modified in accordance with mandatory service bulletins issued by the manufacturer to reduce the possibility of pilot mismanagement of the fuel system through inadvertent selection to the "OFF" position. Examination of the fuel selector control revealed that the valve handle was in the right tank position at the time of the accident; however, testing of the valve with air indicated that the valve was closed. Subsequent attempts to manipulate the selector valve revealed that it was stiff to rotate, and positive engagement of the detents could not be consistently obtained. Further attempts to flow air through the valve produced intermittent results, which indicated that the plug cock inside the fuel valve was not functioning properly and could reduce or block the fuel flow, resulting in a partial or complete loss of engine power. Disassembly of the fuel selector valve revealed rotational scoring in the valve body and on the plug cock, which displayed discoloration and heavily-worn detents. Spectroscopy of the debris particles found in the valve body and embedded in the plug cock indicated that the debris was the result of excessive wear of the valve components.

Both the owner, who was also the operator and maintenance personnel stated that they checked the fuel selector valve during an annual inspection that was completed about 11 hours prior to the accident. Review of maintenance and operator records revealed several discrepancies, including when the most recent annual inspection had occurred, whether the items required by the inspection were accomplished, and if the annual inspection engine run was performed by an individual unqualified to do so. The condition of the fuel selector valve cast doubt as to whether much of the maintenance had been properly performed, since inspection in accordance with Federal Aviation Administration and manufacturer guidelines would have revealed that the fuel selector valve was not airworthy.

Although an autopsy and toxicology testing of the pilot revealed evidence of coronary artery disease and unreported use of antidepressant medication, it is unlikely that these factors impaired the pilot's ability to safely operate the airplane. Given the condition of the airplane's fuel selector valve, it is likely that the engine experienced a total loss of power shortly after takeoff due to fuel starvation, which resulted in the airplane's descent into terrain, leaving the pilot with few options.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A total loss of engine power after takeoff due to fuel starvation as a result of excessive wear of the fuel selector valve. Also causal was the owner/operator and maintenance personnel's inadequate maintenance, and inadequate postmaintenance inspection.

Events

1. Prior to flight - Aircraft maintenance event
2. Prior to flight - Aircraft inspection event
3. Initial climb - Fuel starvation
4. Initial climb - Loss of engine power (total)
5. Emergency descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Fuel system-Fuel selector/shutoff valve-Inadequate inspection - C
2. Aircraft-Aircraft systems-Fuel system-Fuel selector/shutoff valve-Fatigue/wear/corrosion - C
3. Personnel issues-Task performance-Maintenance-Scheduled/routine maintenance-Maintenance personnel - C
4. Personnel issues-Task performance-Maintenance-Scheduled/routine maintenance-Owner/builder - C
5. Personnel issues-Task performance-Inspection-Post maintenance inspection-Maintenance personnel - C

6. Personnel issues-Task performance-Inspection-Post maintenance inspection-Owner/builder - C
7. Organizational issues-Support/oversight/monitoring-Oversight-Oversight of maintenance-Operator

Narrative

HISTORY OF FLIGHT

On February 11, 2015, about 1415 eastern daylight time, a privately owned and operated Piper PA-28-140, N5985U, was substantially damaged when it collided with trees and terrain after takeoff from Air Harbor Airport (W88), Greensboro, North Carolina. The private pilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local personal flight, which was conducted under the provisions of 14 Code of Federal Regulations (CFR) Part 91.

On the day of the accident, the pilot had rented the airplane from the owner/operator. A witness observed the pilot start the airplane and taxi to an area near the end of runway 27 where he performed an engine run-up. Two witnesses reported that the takeoff sounded normal; however, they did not hear the airplane continue around the airport traffic pattern. As a result, one of the witnesses drove to the end of runway 27 where he found the wreckage. He approached the airplane and saw that fuel was flowing out of the wing area. He then called 911.

PILOT INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot held a private pilot certificate with a rating for airplane single-engine land. His most recent FAA third-class medical certificate was issued on January 20, 2014. According to the pilot's records, he had accrued about 359 total hours of flight experience, 63 of which were in the accident airplane make and model.

AIRCRAFT INFORMATION

The accident airplane was a single-engine, unpressurized, low-wing monoplane manufactured in 1970. It was manufactured using conventional metal construction. It was equipped with tricycle landing gear and wing flaps and was powered by a 4-cylinder, 150 horsepower, Lycoming O-320-E2A, air-cooled engine, which drove a metal, two-bladed, fixed-pitch Sensenich propeller.

According to the individual listed on the airplane's registration at the time of the accident, he sold the airplane on August 21, 2013 to the owner/operator. Review of FAA records revealed that, at the time of the accident (approximately 1 1/2 years later), the owner/operator still had not registered the airplane.

When asked about the reason for the sale of the airplane, the previous owner advised that "it had been sitting for several years without flying." A review of the airplane's maintenance records indicated that the last annual inspection performed before the sale, occurred on January 3, 2008, at 3,690.9 total hours of operation. The first annual inspection performed after the sale occurred on January 1, 2014, at 3,709.4 total hours of operation.

The airplane's most recent annual inspection was completed on January 6, 2015. At the time of the inspection, the airplane had accrued 3,787.86 total hours of operation, and the engine had accrued 1,466.86 hours since major overhaul. In addition, the airplane had been operated about 11 hours since the inspection. Review of the rental sheet for the airplane indicated that the engine run for the annual inspection did not occur until January 21, 2015, and was 6 minutes (0.1 hour) in duration. Further review of maintenance records indicated that, at the time of the accident, the transponder inspection was out of date, and FAA Airworthiness Directive (AD) 2010-15-10, which required inspection of the control wheel shafts, had not been accomplished.

METEOROLOGICAL INFORMATION

The 1354 recorded weather at Piedmont Triad International Airport (GSO), Greensboro, North Carolina, located 8 nautical miles southwest of the accident site, included: calm winds, 10 statute miles visibility, few clouds at 15,000 ft above ground level, temperature 9øC, dew point -1øC, and an altimeter setting of 29.96 inches of mercury.

AIRPORT INFORMATION

Air Harbor Airport was owned by Guilford Lake Aviation, LLC, and was located 6 miles north of Greensboro, North Carolina at an elevation of 822 ft mean sea level (msl). It was classified by the FAA as a privately owned, non-towered, public use airport. The airport was equipped with one runway oriented in a 9/27

configuration, which measured 2,460 ft long by 65 ft wide.

The pilot rented the airplane from Murphy Aviation, the service provider at the airport that provided fuel, maintenance, parking, tie downs, and airplane rentals.

The owner/operator of the airplane was the airport manager and also owned Murphy Aviation. He was listed by the State of North Carolina as the registered agent for Guilford Lakes Aviation LLC, and in the past had also done business at the airport as Air Harbor Airport, Inc.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed that, after takeoff from runway 27, the airplane turned left, descended, and then struck approximately 65 foot high trees, about 400 feet from the end of the runway. The airplane first made contact with the trees about 45 ft above ground level, then dropped to the forest floor, coming to rest on its left side wedged between two trees on a magnetic heading of 192ø at an elevation of approximately 769 feet msl.

The fuselage exhibited multiple areas of crush and compression damage, and the aft fuselage had been bent about 45ø to the left during the impact sequence. The cabin was mostly intact. Examination of the restraint system revealed that the airplane had been equipped with lap belts but was not equipped with shoulder harnesses.

The left wing exhibited crush and compression damage on the leading edges and compression damage at the inboard trailing edge. It remained intact, with the exception of an approximate 4-ft long outboard section that had been separated from the left wing during the impact with trees.

The right wing was almost completely separated from the fuselage at the wing root, and it exhibited impact damage in several places, including a large depressed area at approximately mid-span, where the wing skin had been crushed aft to the wing spar.

The rudder and stabilator remained attached to their mounting points and moved freely. Internal examination of the rudder revealed the presence of wasp nests.

The stall warning vane was in place and operated normally when checked with a volt/ohm meter.

Examination of the instrument panel and flight controls revealed that the throttle was in the full power position, the mixture control was full rich, and the carburetor heat was off. The fuel primer was in and locked. The auxiliary electric fuel pump was "ON." The airspeed indicator needle indicated about 66 knots. The tachometer indicated about 1,100 rpm. The flap handle was in the flaps-retracted position and flight control continuity was established from the ailerons, stabilator, and rudder to the cockpit controls.

Examination of the propeller revealed that the propeller spinner exhibited crush damage on the tip. One side of the spinner and the propeller remained partially attached to the crankshaft flange. The flange was bent and three propeller bolts were broken. One propeller blade was bent aft about 10ø about mid-span. The other propeller blade was bent aft about 30ø about mid-span. Its tip was bent forward about 10ø. There was no evidence of leading edge gouging or chordwise scratching on either blade.

The engine remained attached to the firewall at its mount. The engine was removed from the firewall, suspended from a lift, and partially disassembled to facilitate examination. The drivetrain was rotated and continuity from the crankshaft to the rear gears and valve train was confirmed. Compression and suction were observed on all four cylinders. The interiors of the cylinders were examined using a lighted borescope and no anomalies were noted. Both magnetos produced spark when rotated. The spark plugs appeared normal with the exception of the No. 2 cylinder's bottom spark plug, which was impact-damaged. Oil was present in the engine, and both the oil suction screen and oil filter were clean absent of debris.

The carburetor remained attached to the engine. It was removed and partially disassembled, and about 2 teaspoons of fuel were observed in the float bowl. The carburetor fuel inlet screen was absent of debris and the carburetor internal components were undamaged. The engine-driven fuel pump remained attached to the engine and was impact-damaged. The pump was removed and partially disassembled. A small amount of fuel drained from the pump when it was tilted. No damage to the rubber pump diaphragms or check valves was noted.

The fuel strainer and electric fuel pump were removed and disassembled; both were devoid of fuel. The strainer and pump fuel screens contained no debris.

The fuel selector valve handle was found in the right tank position. The fuel selector valve was then removed from the airplane. With the handle in the right tank position, air was applied to the selector valve but would not pass through the valve. Subsequent attempts to manipulate the selector valve revealed that it was stiff to rotate, and positive engagements of the detents could not consistently be obtained. Further attempts to flow air through the valve produced intermittent results. Disassembly of the fuel selector valve revealed rotational scoring in the valve body and on the plug cock, which also displayed discoloration and worn detents.

MEDICAL AND PATHOLOGICAL INFORMATION

On his most recent FAA medical certification application, the 74-year-old pilot reported that he had glaucoma treated with timolol, prostatic hypertrophy treated with alfuzosin, and was using the cholesterol-lowering medication atorvastatin.

Autopsy

An autopsy was performed on the pilot by the North Carolina Department of Health and Human Services Office of the Chief Medical Examiner. The cause of death was multiple crushing blunt force injuries.

The autopsy revealed evidence of atherosclerotic cardiovascular disease. The pilot's heart weighed 450 grams (average heart weight for a 172-lb man is 345 grams, with a range from 261-455 grams) with concentric left ventricular myocardial hypertrophy. The coronary arteries exhibited up to 70%, 50%, and 60% luminal stenosis of the left anterior descending, circumflex, and right coronary arteries, respectively. The myocardium showed no evidence of scarring.

Toxicological Testing

Toxicological testing was conducted at the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. Toxicology identified alfuzosin and timolol; both had been reported during the pilot's FAA medical examinations. Additionally, citalopram and its metabolite, N-Desmethylcitalopram, were detected; this medication was not reported to the FAA. FAA toxicological testing does not distinguish between citalopram and the isomer escitalopram.

Both citalopram and escitalopram are prescription antidepressants marketed with the names Celexa and Lexapro, respectively. The medications carry the warning; "May impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery)."

According to the FAA's Guide for Aviation Medical Examiners, pilots treated for depression with citalopram or escitalopram may be considered for a special issuance medical certificate if the pilot has been clinically stable, as well as on a stable dose of medication without any aeromedically significant side effects and/or an increase in symptoms.

According to his family, the pilot was in good health, but had a history of anxiety that was well-managed with escitalopram without noted side effects.

TESTS AND RESEARCH

Fuel System Description and Review

The airplane was equipped with two 25-gallon fuel tanks, which were secured to the leading edge structure of each wing by screws and nut plates. Each tank had an individual fuel drain at the bottom inboard corner, which was used to check for water or sediment. From the outlet of each tank, fuel lines were routed through the wings to the fuel selector valve located on the left side panel forward of the pilot's seat. From the fuel selector valve, a line led to the fuel strainer bowl, which was mounted on the front of the engine firewall. The fuel line then routed from the strainer bowl to the electric fuel pump, engine driven fuel pump, and carburetor.

Examination of the fuel selector control revealed that it was likely original to the airplane. It had four selectable positions: LEFT TANK, RIGHT TANK, OFF, and OFF, indicating that it had not been modified per Piper Service Bulletin No. 840, issued in 1986, or per Piper Service Bulletin No. 840A, which superseded the previous bulletin and was issued in 2013. The modification would have reconfigured the fuel selector so it had a spring-loaded metal stop and only three selectable positions: L TANK, R TANK, and FUEL OFF. Piper Aircraft considered that compliance with these service bulletins was mandatory, which was

clearly stated on the service bulletin, to reduce the possibility of pilot mismanagement of the fuel system through inadvertent selection of the "OFF" position, which could result in power interruption or engine stoppage.

The electric fuel pump was provided in case the engine-driven fuel pump failed; the electric fuel pump was required to be on for takeoff, landing, and when switching tanks. Examination of the pump indicated that it was functional, and the electric fuel pump switch was found in the "ON" position following the accident.

The fuel strainer, which was equipped with a quick drain, was located on the lower left front of the engine firewall and was accessible outside of the nose section. A witness, who saw the airplane taxiing before the accident, observed what he believed was possibly fuel "atomizing" in front of the left wing of the airplane. He advised that it appeared to be coming from the front of the wing root area near the firewall (near where the fuel strainer was located) and dispersing aft over the wing. Examination of the fuel strainer had revealed though, that the quick drain was closed. During further examination of the fuel system for a source of the fuel the witness observed, it was discovered that, fuel staining was seen inside the wings, and the rubber fuel tank vent tube couplers were found age-hardened, split, and leaking.

Fuel Valve Inspection Guidance

According to the Piper Cherokee Service Manual, the operation of the fuel selector valve was required to be confirmed during inspections. The manual advised that, when the fuel selector handle was not in a positive selector detent position, more than one fuel port would be open at the same time. The manual stated, "It should be ascertained that the fuel selector is positioned in a detent, which can be easily felt when moving the handle through its various positions."

According to FAA Advisory Circular (AC) 43.13-1B, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair, when inspecting fuel crossfeed, firewall shutoff, and tank selector valves, these valves must be inspected for leakage and proper operation. In the case of selector valves, this means the operation of each handle or control needs to be checked to see that it indicates the actual position of the selector valve to the placard location. Movement of the selector handle should be smooth and free of binding, and stops and detents should exhibit positive action and smooth operational feel, as worn or missing detents and stops could cause unreliable positioning of the fuel selector valve. Inaccurate positioning of fuel selector valves could also be caused by worn mechanical linkages between the selector handle and the valve unit. Universal joints, pins, gears, splines, cams, levers, etc., should be checked for wear and excessive clearance, which prevent the valve from positioning accurately or from obtaining fully "off" and "on" positions. An improper fuel valve position setting could seriously reduce engine power by restricting the available fuel flow.

High Resolution Photography of Valve Body and Plug Cock

Comparison of the fuel selector valve to an exemplar valve removed from another airplane with about 2,206 total hours of operation revealed that the exemplar valve rotated smoothly, and the detents could be felt positively when the valve was selected to each position.

High resolution photography of the fuel selector valve revealed the presence of staining, corrosion, and debris, and the plug cock had debris embedded in its surface. None of the noted anomalies observed in the accident airplane's fuel selector valve were observed with the same severity in the exemplar valve.

Materials Identification and Spectroscopy

Positive material identification was used to determine the materials composition of the valve body, valve stem, and position washer.

Spectroscopy of the debris particles found in the valve body and embedded in the plug cock, revealed that the debris particles contained elements like the ones that made up the composition of the valve body, valve shaft, and position washer.

ADDITIONAL INFORMATION

Information Provided by the Chief Mechanic

The owner/operator's chief mechanic stated that he had assisted the owner in putting the airplane back into service after the owner purchased it. They had replaced all the hoses in the engine compartment, but did not do any work aft of the firewall with the exception of replacing the battery.

The chief mechanic also stated that he performed the airplane's last two annual inspections. He advised that entries for the last annual inspection were incorrect, and the annual was actually completed on January 21, 2015. He used Piper guidelines as well as 14 CFR Part 43 during the inspections of the airplane. The fuel selector was "stiff" to turn, but he thought it was not any tighter than any other older Piper he had worked on, and it seemed to work fine.

According to the chief mechanic, the owner/operator and the mechanic's helper also assisted with the annual inspection. He and the mechanic's helper had worked separate from the owner/operator and had not performed any work on the fuel selector. He and the mechanic's helper would always "check behind each other." He stated that had performed AD 2010-15-10 regarding inspection of the control wheel shafts, but had not entered it into the maintenance records. He stated that he was not in the airplane when the mechanic's helper performed the engine run-up following completion of the annual inspection, so he did not know if he had "exercised the fuel valve in the airplane."

The chief mechanic stated that he did not feel that anything was unairworthy with the airplane, and he was not aware that the owner had not registered the airplane after purchasing it.

Information Provided by the Mechanic's Helper

The mechanic's helper stated that his work was supervised by the owner/operator or the chief mechanic. He had performed most of the annual inspection as well as the engine run, which he performed alone. He was unaware that the engine run was part of the annual inspection and that a certificated mechanic with an inspection authorization was required to perform the engine run. He remembered that he had function-tested the fuel selector as part of the annual inspection and that he cycled it on and off and made sure it had "feel." He also pressurized it with the electric fuel pump and did not notice any fuel leaks. He was unaware that he was required to list his name in the maintenance records when performing work as a mechanic's helper.

He had started working for the owner/operator 8 years before the accident and had performed some of the work on the airplane to bring it back into service. He remembered that they had changed all the hoses forward of the firewall after the purchase, but they had not performed any work on the fuel selector, fuel lines, or vent lines, other than making sure that the vent lines were clear. He was aware that there were numerous discrepancies in the maintenance records for the airplane, including an undocumented oil change. He also knew that the airplane had been purchased by the owner in 2013, but was still registered to the previous owner.

Information Provided by the Owner/Operator

The owner/operator stated that, during the annual inspection, he never felt any "galling, binding, or anything else" when he checked the fuel selector valve. The mechanic's helper then checked it, then he checked the fuel strainer and they ran the electric pump. He never noticed any fuel staining.

He stated that, "there were no complaints or squawks prior to the accident." He also stated that after he purchased the airplane, and, before returning it to service, they "replaced all rubber lines firewall forward."

Accident Rpt# WPR15FA135 03/26/2015 1220	**Regis# CGAUS**	**Townsend, MT**	**Apt: N/a**
Acft Mk/Mdl PIPER PA32R - 301-301	**Acft SN 3246191**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-540-K1G5	**Acft TT 1479**	**Fatal 1 Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: DAVID CHARRON	**Opr dba:**		**Aircraft Fire: UNK**
			AW Cert: STN

Summary

The instrument-rated private pilot received an official weather briefing before beginning the visual flight rules (VFR) cross-county flight over mountainous terrain. The briefing included information about turbulence, icing, and mountain obscuration along the proposed route of flight, and the briefer stated that VFR flight was not recommended in areas of higher terrain with mountain obscuration. However, the pilot elected to depart on the flight. The passenger reported that during the flight, the weather started closing in, and they were soon in the clouds. The pilot was receiving VFR flight following service, and reported to the controller that he was turning around; soon after communication was lost.

Review of radar data revealed that, over the last 4 minutes of the flight, the airplane made multiple turns while ascending to 10,125 ft msl over mountainous terrain with peaks reaching 9,400 ft in height; it then headed southbound and descended to an altitude of 9,300 ft msl before dropping off radar. The accident site was located in heavily wooded and snow-covered terrain at an elevation of 8,350 ft. Damage to the airplane and to the trees at the accident site was consistent with controlled flight into terrain with the engine operating at a high power setting.

Examination of the pilot's logbook indicated that an instrument check ride was accomplished in December 2008, about 6 years 3 months before the accident and that the pilot had not logged any flight experience between December 2008 and October 2014, about 6 months before the accident. According to the logbook, the pilot was not current to act as pilot-in-command under instrument flight rules and likely was not proficient in instrument flight.

A weather model simulation revealed that the airplane likely encountered rapid horizontal wind speed changes along with downdrafts during the last 4 minutes of the flight. These downdrafts, which were likely encountered while the airplane was in clouds, would have increased the pilot's difficulty of maintaining level flight. If the pilot had been instrument current, he would likely have been better prepared to cope with the weather conditions encountered, including the mountain obscuration and the downdrafts.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's decision to depart on and to continue a visual flight rules flight over mountainous terrain into instrument meteorological conditions, which resulted in controlled flight into terrain. Contributing to the accident was the pilot's lack of recent instrument flight experience, which exacerbated his difficulty in maintaining control of the airplane while encountering downdrafts and mountain obscuration conditions.

Events

1. Enroute-change of cruise level - VFR encounter with IMC
2. Enroute-change of cruise level - Course deviation
3. Enroute-change of cruise level - Controlled flight into terr/obj (CFIT)

Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
2. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low visibility-Decision related to condition - C
3. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low visibility-Effect on operation - C
4. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Altitude-Not attained/maintained - C
5. Personnel issues-Experience/knowledge-Experience/qualifications-Recent instrument experience-Pilot - F
6. Personnel issues-Experience/knowledge-Experience/qualifications-Qualification/certification-Pilot - F
7. Personnel issues-Psychological-Perception/orientation/illusion-Situational awareness-Pilot
8. Environmental issues-Conditions/weather/phenomena-Wind-Downdraft-Effect on operation

Narrative

HISTORY OF FLIGHT

On March 26, 2015, about 1220 mountain daylight time, a Piper PA-32R-301, Canadian registration C-GAUS, collided with mountainous terrain about 16 miles northeast of Townsend, Montana. The private pilot was fatally injured, the passenger was seriously injured, and the airplane sustained substantial damage. The airplane was registered to the pilot, and he was operating it under the provisions of 14 Code of Federal Regulations (CFR) Part 91 as a cross-country flight.

Visual meteorological conditions prevailed for the flight, and a flight plan was not filed. The flight departed about 1200 from Great Falls International Airport (GTF), Great Falls, Montana, and the intended destination was Scottsdale Airport (SDL), Scottsdale, Arizona.

According to a fueler at the Springbank Airport (CYBW), near Calgary, Canada, the airplane departed from CYBW on the morning of the accident. The fueler said that the pilot told him that he had decided to delay his departure from CYBW due to unfavorable weather conditions. According to the passenger, who was the pilot's wife, they flew from CYBW to GTF, cleared customs, refueled, and shortly thereafter departed GTF for SDL.

According to Federal Aviation Administration (FAA) air traffic control personnel, after departing from GTF, the pilot received visual flight rules (VFR) flight following services from the non-radar approach control facility at the Helena Regional Airport (HLN), Helena, Montana. The controller solicited and received several position reports from the pilot as the airplane progressed southbound on the east side of HLN's Class D airspace. About 1220, the pilot reported that he was reversing his course due to clouds in the area. The pilot stated that the flight was "going back north," and the controller thought that the flight was returning to GTF. Shortly thereafter, the controller lost communications with the pilot. According to the controller, losing communications with aircraft in that area was not uncommon and did not trigger a search and rescue response. The controller stated that he verbally advised GTF tower that the airplane was returning.

Review of radar data revealed a primary target, consistent with the accident airplane, traveling on a southbound heading at an altitude of 8,450 ft mean sea level (msl), before climbing over the next 10 minutes to about 9,500 ft msl. Two minutes later, the target initiated multiple turns while climbing to 10,125 ft msl over mountainous terrain with peaks reaching 9,400 ft in height. The last 2 minutes of the radar track depicted the target heading southbound, paralleling the northern ridgeline of Mount Baldy, while descending to an altitude of 9,300 ft msl before disappearing from radar.

The passenger stated that, during the flight, the weather started closing in and they were soon in the clouds. She recalled that the pilot turned the airplane right to try to exit the clouds, and she heard the pilot communicate on the radio that they were turning around. She heard a computer voice inside the cabin state "terrain," followed by a partial "terr.," and then the airplane impacted the wooded, snow-covered terrain. The passenger used her cell phone to contact local authorities and report that the airplane had crashed and that the pilot was unconscious. The passenger also reported to the local authorities that she had injuries to her ribs.

A local search and rescue airplane found the wreckage after detecting the airplane's emergency locator transmitter. Coordinates were given to a search and rescue team that reached the accident site at 1810. The team reported encountering severe winter weather conditions.

PERSONNEL INFORMATION

The pilot, age 56, held a Canadian private pilot's license with airplane single-engine land and instrument ratings. A Canadian third-class airman medical certificate was issued on June 19, 2014, with the limitation that glasses must be worn. The pilot reported on his most recent medical certificate application that he had accumulated 628.8 total flight hours.

An examination of the pilot's logbook indicated that an instrument flight rules (IFR) check ride was accomplished on December 12, 2008, when the pilot had a total of 600 hours of flight time and 24 hours of actual instrument flight time. The logbook also indicated that almost 6 years had passed between the IFR check ride and the next entry on October 24, 2014. Between October 24, 2014, and the last entry on February 22, 2015, 12 flights equating to almost 32 flight hours were entered. According to the logbook, the pilot had a total of 632 hours of flight time. He had logged 31 flight hours in the accident airplane make and model, which included 3.8 hours in the last 90 days. He had logged a total of 27 hours of actual instrument flight time, none of which were in the last 90 days. Based on a review of the pilot's logbook, the pilot did not meet the recent instrument experience requirements of the Canadian Aviation Regulations (CARs) Part IV Standard 421.48, Period of Validity, to act as pilot-in-command in instrument meteorological conditions.

AIRCRAFT INFORMATION

The six-seat, low-wing, retractable-gear airplane, serial number 3246191, was manufactured in 2001. A review of the airplane's logbooks revealed that the last 100-hour inspection was completed on September 1, 2014, at a total time of 1,479 hours. The last logbook entry, dated February 22, 2015, indicated the airplane had a total time of 1,520 hours. The engine was a Lycoming IO-540-K1G5, serial number L-28049-48A, rated at 300 horsepower. At the most recent 100-hour inspection, the total time on the engine was 1,479 hours. The airplane was equipped with a Hartzell model HC-I3YR-1RF, serial number HK710B, three-bladed, adjustable-pitch propeller.

The airplane was equipped with a panel mounted mini-iPad with terrain avoidance software. This software would have provided an audible voice alert of "terrain" when in close proximity to terrain.

METEOROLOGICAL INFORMATION

At 1153, the automated surface weather observation station at HLN (elevation 3,877 ft, 32 miles northwest of the accident site) reported wind from 280ø at 18 knots, visibility 10 statute miles, overcast at 4,800 ft, temperature 12ø Celsius, dew point 2ø Celsius, and an altimeter setting of 30.25 inches of mercury. The remarks section of the report indicated that, at 1129, the peak wind was from 280ø at 29 knots.

The pilot received official weather briefings for the flight from GTF to SDL from Lockheed Martin Flight Service (LMFS) both by phone and electronically. The pilot called LMFS at 1126 while the airplane was on the ground at GTF. During the phone briefing, the pilot and the briefer discussed the overall weather synopsis for the proposed route of flight. The briefing included the presence of clouds along the route of flight in southwestern Montana through the Jackson Hole area and AIRMETs for turbulence, icing, and for mountain obscuration. VFR flight was not recommended in areas of higher terrain with mountain obscuration. The pilot and briefer also discussed problem weather spots including a gusting west wind and ceilings 4,500 to 6,000 ft agl in the Great Falls area and low scattered cloud coverage from Great Falls south to Bozeman, Montana. In addition, the pilot received an official weather briefing text package that was generated via a desktop computer application at 1129. The official weather briefing text package contained winds aloft information, current AIRMETs, Storm Prediction Center convective outlooks, area forecasts, weather observations, and terminal aerodrome forecast information from departure through destination. None of the information received specifically mentioned the possibility of mountain wave activity over the mountainous terrain. The AIRMETs forecast mountain obscuration due to clouds, precipitation, mist, and fog. There is no record of the pilot receiving or retrieving any additional weather information before beginning the flight.

A weather research and forecasting model simulation was run to simulate the weather conditions surrounding the accident site at the accident time. The simulation indicated that horizontal wind speed increased about 15 knots as the flight gained altitude along the flight track between 1216 and 1218. The horizontal wind speed then decreased about 7 to 10 knots between 1218 and 1220. The simulation indicated that the flight likely encountered downdrafts with a velocity between 500 and 900 ft per minute in the accident site area.

WRECKAGE AND IMPACT INFORMATION

The accident site was in heavily wooded and snow covered terrain at an elevation of 8,350 ft msl. The majority of the airplane came to rest at the end of a debris field about 300 ft in length. The debris field maintained a level elevation on a 20ø east-northeast facing slope on a heading of about 350ø magnetic. Both wings had separated from the fuselage with additional wreckage strewn throughout the debris path. The forward fuselage partially separated forward of the wing attachments revealing the forward cabin seats. The fuselage came to rest on its left side.

The first identified point of contact (FIPC) was an evergreen tree about 25 ft in height, which was missing the top 2 ft of its trunk. Over the next 150 ft, numerous trees were topped along the debris field. The right wing tip fairing and a small piece of broken green navigation light lens were found on the right side of the debris field about 40 ft from the FIPC. Next were portions of the right outboard wing that displayed accordion type crushing from the leading edge to the trailing edge. Both the left and right inboard sections of the wings were found next in the debris field. Near the midsection of the debris field was a long portion of disturbed snow about 10 ft wide, 20 ft long, and 3 ft deep. Several large trees were down along the debris path. A fresh diagonal cut, consistent with a propeller blade strike, was found on a smaller topped tree at a height of about 6 ft above the ground. The propeller assembly had separated from the engine and was found near the tree that displayed evidence of a blade strike. The propeller assembly had impact damage to two of the three blades, and the spinner was crushed. Throughout the remaining length of the debris field, several larger trees were topped about 4 ft from their bases. All major structural components of the airplane were located within the wreckage debris path.

Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. For further information, see the Wreckage Examination Summary in the public docket for this accident.

MEDICAL AND PATHOLOGICAL INFORMATION

Forensic Medicine and Pathology, PLLC, in Billings, Montana, conducted an autopsy on the pilot. The medical examiner determined that the cause of death was "massive blunt traumatic injuries to head, chest and left arm, when injured in plane crash into mountain."

The FAA's Civil Aeromedical Institute (CAMI) performed toxicology tests on the pilot. According to CAMI's report, carbon monoxide, cyanide, volatiles, and drugs were not detected. Valsartan, a medication to treat high blood pressure and heart failure, was detected.

Accident Rpt# ERA16LA236 06/30/2016 1230 EDT	**Regis# N44311**	**Winnsboro, SC**	**Apt: Fairfield County FDW**	
Acft Mk/Mdl PIPER PA34-200	**Acft SN 34-7450206**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO360 SER	**Acft TT 7685**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: S&S AIRCRAFT INC	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Events

1. Landing-flare/touchdown - Loss of control in flight

Narrative

On June 30, 2016, about 1230 eastern daylight time, a Piper PA-34-200, N44311, sustained substantial damage during an aborted landing at the Fairfield County Airport (FDW), Winnsboro, South Carolina. The flight instructor and the commercial pilot were not injured. The airplane was registered to and operated by a private company. No flight plan was filed for the flight that originated at FDW about 1020. Visual meteorological conditions prevailed for the instructional flight conducted under the provisions of 14 Code of Federal Regulations Part 91.

The flight instructor stated that the accident flight was the first time he had flown with the commercial pilot and the purpose of the flight was to get him recurrent. The flight instructor said they had flown for about 2 hours before they returned to FDW and executed the RNAV approach to runway 22. When the airplane reached the decision altitude for the approach, they transitioned to a visual approach and prepared to land. The landing gear was already down and the flaps were extended to 25 degrees.

The commercial pilot was at the controls and flared the airplane over the runway numbers, but was too high. He advised the commercial pilot to lower the nose and add power, which he did. The commercial pilot again flared too high and the flight instructor was concerned that the airplane was going to stall and started to reach for the controls when the commercial pilot initiated a go-around. The flight instructor said the commercial pilot simultaneously pushed both throttles forward and the airplane suddenly rolled to the right while at a height about 2- to 4 ft above the ground. The flight instructor, who never took the controls at any time, said it felt like the left engine was producing more power than the right engine. The airplane's right wing and main landing gear struck the ground. The airplane then veered off the right side of the runway, and spun about 180-degrees before coming to a stop upright.

Postaccident examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed the right wing and fuselage were substantially damaged. The landing gear, both engines, and their respective propellers were also damaged. Both engines and the airplane's fuel system were examined and no pre-impact mechanical deficiencies were noted that would have precluded normal operation at the time of the accident. Examination of the horizontal stabilator trim revealed it was positioned toward the full nose-up position.

The flight instructor held a flight instructor certificate for airplane single and multiengine land, and instrument airplane. He also held an airline transport pilot rating for single-engine airplane. His last FAA second-class medical certificate was issued on March 7, 2016. He reported a total of 6,482 hours of flight experience. Of those hours, 780 were in multiengine airplanes, of which, 500 hours were in the same make and model as the accident airplane.

The commercial pilot held a commercial pilot certificate for airplane single and multiengine land, and instrument airplane. His last FAA second-class medical certificate was issued on June 21, 2016. He reported a total of 2,400 hours of flight experience. Of those hours, 1,900 hours were in multiengine airplanes, of which, 0 hours were in the same make and model as the accident airplane.

The weather conditions reported at FDW, about the time of the accident included wind from 100 degrees at 5 knots, visibility 10 statute miles, and overcast clouds at 1,800 ft.

Accident Rpt# CEN17FA152	**04/12/2017 1310 EDT**	**Regis# N2377B**	**Hartsville, IN**	**Apt: Williams Flying Field Airport 24IN**
Acft Mk/Mdl TEMCO GC 1B		**Acft SN 3677**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Prelim** **Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL IO-360-C		**Acft TT 2600**	**Fatal 1** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: SAGAERT REN C		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Events

1. Takeoff - Loss of control in flight

Narrative

On April 12, 2017, about 1310 eastern daylight time, a Temco GC-1B single-engine airplane, N2377B, impacted trees and terrain shortly after takeoff from the Williams Flying Field Airport (24IN), Hartsville, Indiana. The commercial pilot sustained fatal injuries, and the airplane sustained substantial damage. The airplane was registered to and operated by the pilot as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and a flight plan was not filed. The flight was originating at the time of the accident and was destined for the Shelbyville Municipal Airport, Shelbyville, Indiana.

The accident pilot and his friend flew in the friend's airplane to 24IN in order to pick up the accident airplane. Maintenance had recently been completed on the accident airplane as a result of a ground loop event in June 2016. After arriving at 24IN, the accident pilot and a mechanic inspected the repairs and reviewed the airplane records. Prior to the flight, the accident pilot completed a brief engine run-up and then positioned the airplane to depart on runway 2; turf surface, 3,200 ft long, and 150 ft wide.

The accident pilot's friend and the mechanic observed the airplane depart 24IN. The takeoff roll appear normal and shortly after rotation, about 35 ft above ground level, the airplane entered a gradual left roll. The left roll continued until the airplane impacted trees in a near inverted attitude adjacent to the runway.

Examination of the accident site revealed the airplane impacted several trees and came to rest inverted in a tree-covered ravine. The main wreckage, which consisted of the fuselage, left and right wings, empennage, and engine, came to rest at the base of a large tree. The left wing displayed several semi-circular impacts, consistent with tree strikes. The two-bladed propeller hub was fractured and both blades were separated from the hub. One propeller blade came to rest adjacent to the forward fuselage, and one propeller blade was located about 150 ft west of the main wreckage. The airplane was recovered for further examination.

At 1245, the automated weather observing system at the Columbus Municipal Airport (BAK), Columbus, Indiana, located about 10 miles west of the accident site, recorded the following weather conditions: wind calm, sky clear, temperature 15 degrees Celsius, dew point 2 degrees Celsius, and an altimeter setting of 30.40 inches of mercury.

Accident Rpt# CEN17LA038	**11/12/2016 1300 CST**	**Regis# N2035J**	**Coleman, TX**	**Apt: N/a**
Acft Mk/Mdl WEATHERLY AVIATION CO INC 620B		**Acft SN 1592**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl PRATT AND WHITNEY R-985		**Acft TT 2786**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: BURKETT AVIATION		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: SPR

Events

1. Maneuvering - Loss of engine power (total)

Narrative

On November 12, 2016, about 1300 central standard time, a Weatherly Aviation Company 620B airplane, N2035J, was substantially damaged during a forced landing near Coleman, Texas. The pilot was not injured. The airplane was registered to and operated by Burkett Aviation under the provisions of 14 Code of Federal Regulations Part 137 as an aerial spraying practice flight. Day visual meteorological conditions prevailed for the flight, with no flight plan filed. The local flight departed a private strip about 1200.

Flying his initial flight in the model of the accident airplane, the pilot stated that a total loss of engine power occurred during climb following a practice spray pass. The pilot executed a forced landing into an adjacent wheat field. Due to trees and a fence in the path of his rollout, he aggressively applied brake pressure, which resulted in a nose over and damage to the vertical stabilizer.

The owner had informed the pilot prior to takeoff that he needed to switch from left to right tank after flying for about 40 minutes. His advice was based on the engine's typical fuel burn of about 33 gallons per hour and fuel tank capacity of 35 gallons of each wing. The owner estimated the airplane was airborne for about one hour.

Examination of the airplane by a Federal Aviation Administration inspector and local mechanic revealed fuel leaking from a breached left tank, with the right tank intact and empty. The fuel selector was in the right tank position. After flipping the airplane upright, the propeller was rotated, with normal engine continuity. Fuel was added to the right tank and the engine was started. The engine ran for about 10 seconds and then stopped. Additional engine starts attempts were not successful, due to unavailability of a powered electrical source.

The right fuel tank low level warning light was tested and initially found to inoperable. After adjusting the sensor in the right fuel tank, the warning light operated normally. The owner stated the low fuel warning system had been intermittent during previous flights.