Aviation Investigation Final Report

Location:	Amarillo, Texas	**Accident Number:**	DFW06LA188
Date & Time:	July 19, 2006, 08:30 Local	**Registration:**	N732TZ
Aircraft:	Cessna P210N	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation		

Analysis

Shortly after departure, the pilot of a single-engine airplane reported that he had experienced a loss of engine power and needed to proceed to the nearest airport. An air traffic controller provided a heading to the closest airport and provided landmarks to help assist the pilot locate the runway. The 1,440-hour private pilot was not able to find the airport and elected to land in a short field with a prevailing tailwind. During the landing roll, the airplane collided with several obstacles before the airplane caught on fire. Examination of the engine revealed that the crankcase was breached above the number 2 cylinder. The components of the crankshaft and the number 1, number 2, and number 3 connecting rod assemblies exhibited signatures of thermal distress consistent with a lack of lubrication. The engine driven oil pump was disassembled and examined. The examination revealed that the two bushings that support the oil driven-gear were not installed, and the driven gear had fractured at the spline-drive. Further examination found that the oil pump driven-gear support shaft in the oil pump housing exhibited full gear length wear, indicating that it had been operating without bushings. In addition, the interior wall of the oil pump that housed the driven-gear exhibited heavy scoring and displaced material, indicating binding of the gear. The oil filter element was removed and the pleats were individually examined. The pleats contained a minimal amount of metallic debris. A review of the aircraft maintenance logs revealed that the engine was last overhauled on July 20,1998; however, pertinent details of the repair were not included in the logs and were only referenced in work orders. The maintenance records revealed that the engine was sent back to the overhauling facility on March 11, 2000, approximately 459.4 hours after the overhaul, due to a reported propeller strike. The Safety Board contacted the overhauling facility and requested a copy of the work orders for both repairs; however, a company official reported that they only retain records for two years as required by Federal Aviation Regulation 145.219 (c). Further review of the engine logbook revealed there were no entries that indicated that the oil pump had ever been removed or replaced after the overhaul was completed. As a result, it could not be determined when/who had last disassembled/re-assembled the pump. The engine had accrued approximately 1,059.7 hours since it was overhauled at the time of the

accident. At the time of the accident the winds were reported from 210 degrees at 12 knots.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power as result of the failure by maintenance personnel to install oil pump support bushings, which resulted in the fracture of the driven-gear and subsequent loss of oil pressure. Contributing factors were the lack of suitable terrain for the forced landing and the prevailing tailwind.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: CRUISE

Findings
1. (C) LUBRICATING SYSTEM,OIL PRESSURE PUMP - FAILURE,TOTAL
2. (C) MAINTENANCE,INSTALLATION - IMPROPER - UNKNOWN
3. (C) FLUID,OIL - STARVATION

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings
4. OBJECT - FENCE
5. OBJECT - VEHICLE
6. OBJECT - BUILDING(NONRESIDENTIAL)
7. (F) TERRAIN CONDITION - NONE SUITABLE
8. (F) WEATHER CONDITION - TAILWIND

Factual Information

HISTORY OF FLIGHT

On July 19, 2006, approximately 0830 central daylight time, a single-engine Cessna P210N airplane, N732TZ, was destroyed by post-impact fire upon collision with a barbed wire fence, a tractor, and a water well during a forced landing to a field near the Buffalo Airport (1E7), Amarillo, Texas. The commercial pilot was fatally injured and the passenger sustained serious injuries. The airplane was registered to and operated by Talon Air Services, Incorporated, of Amarillo, Texas. No flight plan was filed for the cross-country flight that departed the Rick Husband International Airport (AMR), near Amarillo, Texas, at 0811, and was destined for the Lubbock Preston Smith International Airport (LBB), near Lubbock, Texas. Visual meteorological conditions prevailed for the business flight conducted under 14 Code of Federal Regulations Part 91.

A review of air traffic control communications revealed that the pilot departed Amarillo at 0811. About 7 minutes later the pilot reported, "We've got a problem here we're going to have to come back and land." An air traffic controller asked the pilot if he was going to return to AMR, and the pilot asked for the location of the closest airport and requested a heading. The controller provided a heading toward the Buffalo Airport, which was seven miles away. The controller asked the pilot what the nature of the emergency was, and the pilot responded, "We've got a cylinder out." Over the next four minutes, the controller and another pilot listening on the same radio frequency attempted to direct the pilot to the Buffalo Airport, but the pilot was unable to locate the runway and reported that he was going to have to land in a field. Shortly after, the pilot reported, "Our engine's out now." This was the last radio communication with the pilot.

A witness, who was a 9-year-old girl, was standing in her driveway when she first heard the airplane flying over her parent's property from south to north. She told her father, who was a private pilot and regularly flew with his daughter, that the sound of the engine was a lot louder than normal. She said that the airplane landed in the neighbor's field and the engine noise "got quiet." She then heard the sound of the engine pick back up, and thought that the airplane was attempting to take off. According to her father, he looked outside and saw a dust cloud about 600 feet from his home and called 911. Moments later he observed that the airplane was engulfed in flames and he responded to the scene of the accident. Due to the intense fire, and fear of a large propane tank exploding, the father was not able to render aid to the airplane's occupants; however, he could see that his neighbors were already assisting the occupants on the other side of the wreckage.

The witness's father reported that he examined the field where the airplane landed. He reported that there were three distinct landing gear wheel marks from the point where the

airplane touched down to where it collided with a barbed wire fence, about 330 feet. He reported that he did not see any signs of propeller strikes or wing tip strikes on the ground. He added that at the time of the mishap, the wind was from the south at about 10 knots, and he concluded that the pilot landed with a tailwind. During the ground roll, the airplane also collided with a water well, a parked tractor, and came to rest next to a large propane tank. As a result of the extreme heat associated with the post-impact fire, the tank's safety relief valve popped (as designed), which released propane vapors into the air. These vapors caught on fire and added to the intensity of the fire.

The witness's father added that he is an active pilot and is very familiar with the local airports. He stated that the airplane landed in a field located between Blue Sky Airport and the Buffalo Airport, and stated that both of these airports were difficult to locate from the air, especially if a pilot was not familiar with the area. The witness said that the field that the pilot landed in was probably the most visible area to land an airplane in the case of an emergency.

A second witness was in the back of her home when she heard a "loud roar." She looked out a window and saw an airplane flying toward the Buffalo Airport, which was located approximately one-half mile from her home. She reported that the landing gear was extended and the witness was unable to recall if the engine was operating. She could not tell how high the airplane was above the ground, but added that the airplane flew "above the telephone lines and over some pine trees, as it descended rapidly into a field." The witness stated that she did not see the airplane collision with objects on the ground, but she did hear the sound of what she described as "metal hitting metal." At that same time, she observed an explosion through the trees and black smoke rising from her neighbor's yard.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate for airplane single-engine and multi-engine land, and instrument airplane. His last Federal Aviation Administration (FAA) second class medical was issued on January 4, 2005. At that time he reported a total of 1,440 flight hours. According to information provided by the pilot's business partner, the pilot had accrued a total of approximately 943 hours in the accident airplane between 1995 and 2006.

METEOROLOGICAL INFORMATION

Weather at the Rick Husband International Airport, Amarillo, Texas, about 10 miles north of the accident site, at 0839, reported wind from 210 degrees at 12 knots, visibility 10 miles, few clouds at 9,000 feet, temperature 79 degrees Fahrenheit, dew point 55 degrees Fahrenheit, and a barometric pressure setting of 30.17 inches of Mercury.

AIRCRAFT INFORMATION

A review of the airplane's maintenance logs revealed that the TSIO-520-P engine was last overhauled (major) by Victor Aviation on July 20,1998; however, pertinent details of the repair

were not included in the log entry and were only referenced in work orders. The records revealed that the engine was sent back to Victor Aviation on March 11, 2000, approximately 459.4 hours after the major overhaul, as a result of a propeller strike. The Safety Board contacted Victor Aviation and requested a copy of the work orders for both repairs; however, a company official reported that they only retain records for two years as required by Federal Aviation Regulation 145.219 (c). Further review of the engine logbook revealed there were no entries that indicated that the oil pump had ever been removed or replaced after the overhaul was completed.

At the time of the accident, the engine had accrued approximately 1,059.7 hours since it was overhauled.

WRECKAGE AND IMPACT INFORMATION

An FAA inspector performed an on-scene examination of the airplane on the day of the accident. According to the inspector, the airplane came to rest on a northerly heading and the fuselage, empennage, left wing, and section of the right wing were consumed by fire.

The engine was examined at the manufacturer's teardown facility in Mobile, Alabama, on September 11, 2006, under the supervision of the Safety Board. Examination of the engine revealed that the crankcase was breached above the number 2 cylinder. The components of the crankshaft and the number 1, number 2, and number 3 connecting rod assemblies exhibited signatures of thermal distress consistent with a lack of lubrication.

The engine driven oil pump was disassembled and examined. The examination revealed that the two bushings that support the oil driven-gear were not installed, and the driven gear had fractured at the spline-drive. Further examination found that the oil pump driven-gear support shaft in the oil pump housing exhibited full gear length wear, indicating that it had been operating without bushings. In addition, the interior wall of the oil pump that housed the driven-gear exhibited heavy scoring and displaced material, indicating binding of the gear.

The oil filter element was removed and the pleats were individually examined. The pleats contained a minimal amount of metallic debris.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot died of his injuries several days after the accident had occurred. An autopsy and toxicological report were not requested or performed.

ADDITIONAL INFORMATION

The airplane wreckage was released to a representative of the owner's insurance company on November 15, 2006.

Pilot Information

Certificate:	Private	**Age:**	54,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	January 1, 2005
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1440 hours (Total, all aircraft), 934 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N732TZ
Model/Series:	P210N	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	P21000594
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 1, 2006 Annual	**Certified Max Gross Wt.:**	4000 lbs
Time Since Last Inspection:	6 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3619 Hrs at time of accident	**Engine Manufacturer:**	Teledyne Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-P
Registered Owner:	Talon Air Services	**Rated Power:**	310 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	AMR,3607 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	08:49 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Few / 9000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.17 inches Hg	**Temperature/Dew Point:**	26°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Amarillo, TX (AMR)	**Type of Flight Plan Filed:**	None
Destination:	Lubbock, TX (LBB)	**Type of Clearance:**	VFR
Departure Time:	08:11 Local	**Type of Airspace:**	

Airport Information

Airport:	None	**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	35.058887,-101.874168

Administrative Information

Investigator In Charge (IIC):	Yeager, Leah
Additional Participating Persons:	Mark McDougall; FAA FSDO; Lubbock, TX John Kent; Teledyne Continental Motors; Mobile, AL Emile Lohman; Cessna Aircraft Company; Wichita, KS
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