



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Round Rock, TX	<b>Accident Number:</b>	DFW06LA010
<b>Date &amp; Time:</b>	10/18/2005, 2315 CDT	<b>Registration:</b>	N978FE
<b>Aircraft:</b>	Cessna 208	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Minor
<b>Flight Conducted Under:</b>	Part 135: Air Taxi & Commuter - Non-scheduled		

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## Analysis

The airplane was fueled with 65-gallons of jet-A in preparation for the evening's flight. The 6,600-hour pilot stated that no abnormalities were noted during the engine start, and takeoff. However; shortly after departure, and after the pilot had leveled off at 7,000-feet, he reported to air traffic control that he had an engine failure and a total power loss. During the descent, the pilot attempted both an air and battery engine restart, but was not successful. The inspection on the engine was conducted on November 30, 2005. The accessory gearbox had a reddish-brown stain visible beneath the fuel pump/fuel control unit. The accessory gearbox was turned; rotation of the drive splines in the fuel pump (splines for the fuel control unit) was not observed. The fuel pump unit was then removed, the area between the fuel pump and accessory gearbox was stained with a reddish brown color. The fuel pump drive splines were worn. Additionally, the internal splines on the fuel pump drive coupling were worn. The wear on the spline drive and coupling prevented full engagement of the spline drives. Both pieces had evidence of fretting, with a reddish brown material present. The airplane had approximately 130 hours since a maintenance inspection (which included inspection of the fuel pump). The engine had accumulated approximately a total time of 9,852 hours, with 5,574 hours since overhaul.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of engine power due to the failure of the engine-driven fuel pump. A contributing factor was the inadequate inspection of the engine driven fuel pump.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: CRUISE

Findings

1. (C) FUEL SYSTEM,PUMP - FRETTE
2. (F) MAINTENANCE - INADEQUATE - OTHER MAINTENANCE PERSONNEL

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Occurrence #2: FORCED LANDING

Phase of Operation: DESCENT - EMERGENCY

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Occurrence #3: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

3. OBJECT - UTILITY POLE
4. TERRAIN CONDITION - GROUND

## Factual Information

On October 18, 2005, approximately 2315 central daylight time, a single-engine Cessna 208 turbo-prop airplane, N978FE, was substantially damaged during a forced landing after a reported loss of engine power near Round Rock, Texas. The airline transport pilot, sole occupant of the airplane, sustained minor injuries. The airplane was registered to Federal Express Corporation, of Memphis, Tennessee, and was being operated by Baron Aviation Services, of Vichy, Missouri. Night visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the 14 Code of Federal Regulations Part 135 air cargo flight. The cross-country flight originated from the Austin-Bergstrom International Airport (AUS), near Austin, Texas, at 2251, and was destined for the Fort Worth Alliance Airport (AFW), near Fort Worth, Texas.

The night cargo flight was a regularly scheduled run between AUS and AFW. Earlier in the day, the airplane was fueled with 65-gallons of Jet-A fuel in preparation of the evening's flight. According to the 6,600-hour airline transport pilot, he performed a normal pre-flight inspection prior to departure and no abnormalities were noted during the engine start and take-off. However, shortly after departure and after the pilot had leveled-off at 7,000-feet, he reported to air traffic control that he "had an engine failure and a total power loss." During the descent, the pilot attempted both an air and battery engine start; the attempts to restart the engine were not successful. The pilot elected to perform a night forced landing on a road; however, the right wing collided with a utility pole, turning the airplane, which then impacted the ground. The airplane came to rest on its nose, with the top of the airplane leaning against a residential home. There were no reported injuries to anyone in the building.

A Federal Aviation Administration (FAA) inspector responded to the accident site and reported the aircraft sustained structural damage to the wings and fuselage. He reported that there was no post-crash fire, and that fuel was found in the left and right wing tanks. The wreckage was recovered from the site and secured at a near-by fixed based operator (FBO) for further investigation.

The PT6A-114A engine was removed and shipped to the engine manufacturer's service center in Addison, Texas, for a detailed examination. The inspection on the engine was conducted on November 30, 2005, under the supervision of the NTSB investigator in charge (IIC).

On this engine design, the engine fuel pump is bolted to and driven from the accessory gearbox by a spline/spline coupling. The fuel control unit is attached to the fuel pump and driven by a spline arrangement from the fuel pump.

Pratt & Whitney's maintenance manual calls for a "in-situ" inspection of this pump every 600 hours by looking for a reddish brown (iron oxide) stain inside the fuel pump drain port. A review of the engine's maintenance logs revealed this inspection was completed approximately 130 hours prior to the accident. The engine had accumulated approximately a total time of 9,852 hours, with 5,574 hours since overhaul.

The engine had evidence of light external impact damage, the compressor, and power turbine sections were turned by hand; continuity was established through the accessory gearbox. The fuel control unit was removed; the drive spline coupling was intact and the fuel control unit spun freely. With the powerplant removed from the airframe for the inspection and the fuel control unit removed, a reddish-brown stain was visible on the accessory gearbox, originating

from the attachment point for the fuel pump/fuel control unit. The accessory gearbox was turned; rotation of the drive splines in the fuel pump (splines for the fuel control unit) was not observed. The fuel pump unit was then removed, the area between the fuel pump and accessory gearbox was stained a reddish brown color. The fuel pump drive splines were found to be worn. Additionally, the internal splines on the fuel pump drive coupling were also worn. The wear on the spline drive and coupling prevented full engagement of the spline drives. Both pieces had evidence of fretting, with a reddish brown material present.

At 2253, the automated weather observing system at AUS, reported wind from 190 degrees at 5 knots, 10 statute miles visibility, a clear sky, temperature 68 degrees Fahrenheit, dew point 61 degrees Fahrenheit, and an altimeter setting of 29.98 inches of Mercury.

### Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	60, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With Waivers/Limitations	<b>Last Medical Exam:</b>	03/01/2005
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	10/01/2005
<b>Flight Time:</b>	6600 hours (Total, all aircraft), 2000 hours (Total, this make and model), 6560 hours (Pilot In Command, all aircraft), 148 hours (Last 90 days, all aircraft), 47 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Cessna	Registration:	N978FE
Model/Series:	208	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	208B0105
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	09/01/2005, AAIP	Certified Max Gross Wt.:	8750 lbs
Time Since Last Inspection:	32 Hours	Engines:	1 Turbo Prop
Airframe Total Time:	10623 Hours	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	PT6A-114A
Registered Owner:	FedEx Corp.	Rated Power:	600 hp
Operator:	Baron Aviation Services	Air Carrier Operating Certificate:	Commuter Air Carrier (135)
Operator Does Business As:		Operator Designator Code:	DEMA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	AUS, 540 ft msl	Observation Time:	2253 CST
Distance from Accident Site:	20 Nautical Miles	Direction from Accident Site:	190°
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	20° C / 16° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	5 knots, 190°	Visibility (RVR):	
Altimeter Setting:	29.98 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	AUSTIN, TX (AUS)	Type of Flight Plan Filed:	IFR
Destination:	FORT WORTH, TX (AFW)	Type of Clearance:	IFR
Departure Time:	2251 CDT	Type of Airspace:	

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** Craig R Hatch **Adopted Date:** 05/30/2006

**Additional Participating Persons:** Jesse Sanchez; FSDO San Antonio, Texas  
Thomas Teplik; Cessna Aircraft Company  
Tom Berthe; Pratt & Whittney  
Ed Schmidt; Baron Aviation  
Wayne Gelfand; FedEx, Inc.

### **Publish Date:**

**Investigation Docket:** NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at [pubinquiry@ntsb.gov](mailto:pubinquiry@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.ntsbt.gov/pubdms/>.

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