



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Ada, MI	<b>Accident Number:</b>	CHI08LA129
<b>Date &amp; Time:</b>	05/09/2008, 2037 EDT	<b>Registration:</b>	N893FE
<b>Aircraft:</b>	CESSNA 208B	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 135: Air Taxi & Commuter - Non-scheduled		

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## Analysis

The airplane was on a visual approach to an airport when the engine stopped producing power. The pilot subsequently landed the airplane in a field, but struck trees at the edge of the field during the forced landing. Examination of the engine, engine fuel controls, and Power Analyzer and Recorder (PAR), provided evidence that the engine shut down during the flight. Further examination of engine and fuel system components from the accident airplane failed to reveal a definitive reason for the uncommanded engine shut-down.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power for undetermined reasons.

## Findings

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<b>Aircraft</b>	Power plant - Failure (Cause)
<b>Environmental issues</b>	Tree(s) - Not specified
<b>Not determined</b>	Not determined - Unknown/Not determined (Cause)

## Factual Information

### HISTORY OF FLIGHT

On May 9, 2008, at 2037 eastern daylight time, a Cessna 208B, N893FE, operated by CSA Air, Inc., and piloted by a commercial pilot, sustained substantial damage during a forced landing following a loss of engine power near Ada, Michigan. The airplane was on a visual approach to runway 26L at the Gerald R. Ford International Airport (GRR), Grand Rapids, Michigan. The Title 14 Code of Federal Regulations Part 135 cargo flight was operating in visual meteorological conditions and was on an instrument flight rules (IFR) flight plan. The pilot was not injured. The flight originated from the Cherry Capital Airport, Traverse City, Michigan about 2000.

### PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with airplane single-engine land, airplane multiengine land, and instrument airplane ratings. His most recent flight review was conducted on February 20, 2008, in the same make and model airplane as the accident airplane. His most recent second class medical certificate was issued on February 12, 2008. According to a report submitted by the pilot, he had accumulated 5,600 hours of total flight experience, including 3,450 hours in the same make and model as the accident airplane.

### AIRCRAFT INFORMATION

The airplane was a 1990 Cessna model 208B airplane, serial number 208B0223, and was a fixed landing gear, strut braced high wing airplane. It was powered by a single Pratt & Whitney PT6-114A turboprop engine rated at 675 horsepower. The airplane was maintained under an approved airworthiness inspection program (AAIP), and had accumulated 8,625 hours time in service as of the last inspection on March 18, 2008. The airplane's engine had accumulated 8,836 total hours, 675 hours since overhaul, and 60 hours since the March 18, 2008 inspection.

### METEOROLOGICAL INFORMATION

The recorded weather conditions at the GRR at 1953 were: winds 320 degrees at 9 knots; visibility 10 statute miles; few clouds at 6,000 feet above ground level; overcast clouds at 12,000 feet above ground level, temperature 15 degrees Celsius; dew point 3 degrees Celsius; altimeter setting 29.83 inches of mercury.

### COMMUNICATIONS

The airplane was on an instrument flight rules flight plan and was in contact with the GRR air traffic control tower using the identifier "iron air 7343". The airplane had been cleared for a visual approach to runway 26L at GRR. The GRR controller issued a traffic advisory and cleared the accident airplane to descend to 2,500 feet above sea level. The pilot later informed the controller that engine power was lost. When queried, the pilot informed the controller that there was one person and 800 pounds of fuel on board the airplane. No further transmissions were received.

### WRECKAGE AND IMPACT INFORMATION

The airplane touched down in a field of tall grass and impacted trees at the edge of the field. The left wing was separated from the fuselage at the wing root. The right wing was separated

about mid-span. The nose landing gear had collapsed and the propeller blades were all bent rearward with little evidence of rotation. Some grass and dirt debris was visible in the cowling intakes. Examination of the airplane established that engine control continuity from the cockpit to the engine existed. Engine compressor and power turbine blades appeared intact. The compressor and propeller shafts rotated freely. Fuel was found within the fuel lines from the tanks to the engine fuel controls. Fuel samples were tested for water accumulation and tested negative. The fuel lines and vent lines were tested for obstructions and none were found. The engine and fuel boost pumps were retained for further examination at the respective manufacturer's facilities.

Examination of the fuel boost pump consisted of testing for compliance with the factory acceptance test procedure. The pump from the accident airplane passed the acceptance test within the specified parameters.

Examinations of the engine and fuel controls were conducted at the Pratt & Whitney facilities in Longueuil, Quebec, Canada. The compressor and power turbine shafts rotated freely. The engine fuel and pneumatic lines were tight. During initial examination, a crack was observed on the engine scavenge pump housing. Due to the presence of the crack, an engine run was not performed. It could not be determined if the crack existed prior to impact. The engine core was subsequently disassembled. The turbine blades and disc were intact and unburned grass was found within the gas generator case and combustor confirming the non-running state of the engine at the time of ingestion.

The fuel control unit (FCU) and fuel pump were tested as a unit on a test stand at the manufacturer's facility. Low speed testing of the units revealed pressure and fuel flow fluctuations that could not be reliably duplicated. The testing of the units revealed other test parameters that were outside of manufacturing tolerances; however, those test point discrepancies were noted to be due to permissible field adjustments and would not have resulted in a loss of engine power. The minimum pressurizing valve which regulates fuel pressure is not fully open at low speed and it was noted that a sticky FCU minimum pressurizing valve can slam closed during a deceleration, and could result in a flameout. The minimum pressurizing valve was disassembled and axial scoring of the plunger and housing were noted. Examination of the scoring on the valve and plunger revealed the presence of embedded silicon particles. Further examination of the scoring revealed that the depth of the scoring (0.00006 inches) relative to the valve radial clearance (0.0015" to 0.0025") was too small to make a positive determination that the valve stuck due to imbedded contamination.

Testing of additional fuel system components revealed no anomalies that would have resulted in a loss of engine power.

#### TESTS AND RESEARCH

The airplane was equipped with a Power Analyzer and Recorder (PAR). Data downloaded from the PAR confirmed an engine shutdown near the time that the pilot reported the loss of power to air traffic control. No data was obtained from the PAR that indicated the reason for the power loss.

## History of Flight

Approach	Loss of engine power (total) (Defining event)
Landing	Collision with terr/obj (non-CFIT)

## Pilot Information

Certificate:	Commercial	Age:	39, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last Medical Exam:	02/12/2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	02/20/2008
Flight Time:	5600 hours (Total, all aircraft), 3450 hours (Total, this make and model), 5120 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	Registration:	N893FE
Model/Series:	208B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	208B0223
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	03/18/2008, AAIP	Certified Max Gross Wt.:	8750 lbs
Time Since Last Inspection:		Engines:	1 Turbo Prop
Airframe Total Time:	8625 Hours	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	PT6-114A
Registered Owner:	Federal Express Corporation	Rated Power:	675 hp
Operator:	CSA AIR INC	Air Carrier Operating Certificate:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	SBAA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Dusk
Observation Facility, Elevation:	GRR	Observation Time:	1953 EST
Distance from Accident Site:		Direction from Accident Site:	
Lowest Cloud Condition:	Few / 6000 ft agl	Temperature/Dew Point:	15 °C / 3 °C
Lowest Ceiling:	Overcast / 12000 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	9 knots, 320°	Visibility (RVR):	
Altimeter Setting:	29.83 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	TRAVERSE CITY, MI (TVC)	Type of Flight Plan Filed:	IFR
Destination:	GRAND RAPIDS, MI (GRR)	Type of Clearance:	IFR
Departure Time:	2000 EDT	Type of Airspace:	

## Wreckage and Impact Information

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

## Administrative Information

Investigator In Charge (IIC):	John M Brannen	Adopted Date:	03/23/2010
Additional Participating Persons:	John Golda; FAA-Grand Rapids FSDO; Grand Rapids, MI Thomas Teplik; Cessna Aircraft; Wichita, KS Wayne Gelfand; Federal Express; Memphis, TN Yvon Boileau; Pratt and Whitney Canada; Quebec, Canada, Rob Norton; CSA Air, Inc.; Kingsford, MI		
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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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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