Aviation Investigation Final Report

Location:	Montezuma, Indiana	**Accident Number:**	CEN10LA450
Date & Time:	July 29, 2010, 13:20 Local	**Registration:**	N2085J
Aircraft:	Cessna T188C	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot reported that, while en route to spray a field, the engine lost power and the windshield became obscured with oil. The pilot immediately turned into the wind and made a forced landing into a nearby cornfield. A postaccident examination revealed that the No. 2 connecting rod had separated from the engine crankshaft. Metallurgical examinations found polishing and wear patterns indicative of relative motion between the connecting rod components and an associated rod bolt head/nut. The nut threads were sheared as result of overload failure, consistent with impulse loading. The observed anomalies were consistent with an insufficient fastener preload on installation of the connecting rod bolt. The engine had accumulated 1,193 hours since its last major overhaul. It is likely that the rod bolt head/nut became loose during operation, which led to a failure of the assembly due to impulse loading.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The total loss of engine power due to an insufficient fastener preload that led to the failure of the No. 2 connecting rod assembly.

Findings

Aircraft	Recip eng cyl section - Failure

Factual Information

History of Flight

Enroute	Powerplant sys/comp malf/fail
Enroute	Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing
Landing	Landing gear collapse

On July 29, 2010, at 1320 eastern daylight time, a Cessna model T188C airplane, N2085J, was substantially damaged during a forced landing following a total loss of engine power near Montezuma, Indiana. The pilot was not injured. The airplane was registered to and operated by Swing Wings, Inc., under the provisions of 14 Code of Federal Regulations Part 137 without a flight plan. Day visual meteorological conditions prevailed for the aerial-application flight that originated from Clinton Airport, Clinton, Indiana, at 1315.

The pilot reported that while en route to the field to be sprayed there was total loss of engine power and the windshield became obscured with oil. The pilot immediately turned into the wind and made a forced landing into a nearby corn field. The airframe was substantially damaged after touchdown when the left main landing gear collapsed and the left wing impacted terrain.

A postaccident examination conducted by a Federal Aviation Administration inspector established that the No. 2 connecting rod had separated from the engine crankshaft. A portion of the No. 2 connecting rod was found protruding through a hole in the engine crankcase. The engine was partially disassembled and the connecting rod components were sent to the National Transportation Safety Board's (NTSB) Materials Laboratory Division for metallurgical examination.

The NTSB lab examination established that there were polishing and wear patterns on the washer faces of one rod bolt and a corresponding nut. Further examinations found similar wear and polishing on the No. 2 connecting rod and a rod cap. The observed polishing and wear patterns were indicative of relative motion between the connecting rod components and associated rod bolt head/nut. The nut threads were sheared, consistent with impulse loading. A review of available maintenance information revealed that the engine, a Continental model TSIO-520-T, had accumulated 1,193 hours since its last major overhaul.

At 1325, the automated surface observing system at the Edgar County Airport, located about 16 miles west of the accident site, reported the following weather conditions: variable wind direction at 6 knots; visibility 10 miles; scattered clouds between 3,000 and 4,400 feet above ground level (agl); temperature 28 degrees Celsius; dew point 21 degrees Celsius; altimeter setting 30.10 inches of mercury.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	April 29, 2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	June 30, 2010
Flight Time:	10530 hours (Total, all aircraft), 229 hours (Total, this make and model), 10000 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 185 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N2085J
Model/Series:	T188C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility; Restricted (Special)	**Serial Number:**	T18803375T
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	May 25, 2010 Annual	**Certified Max Gross Wt.:**	4400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5862 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Not installed	**Engine Model/Series:**	TSIO-520-T
Registered Owner:	Swing Wings, Inc.	**Rated Power:**	310 Horsepower
Operator:	Swing Wings, Inc.	**Operating Certificate(s) Held:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KPRG,654 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	13:25 Local	**Direction from Accident Site:**	261°
Lowest Cloud Condition:	Scattered / 3100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	28°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Clinton, IN (1I7)	**Type of Flight Plan Filed:**	None
Destination:	Clinton, IN (1I7)	**Type of Clearance:**	None
Departure Time:	13:15 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	39.760555,-87.359725(est)

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Geoffrey T Prendergast; Federal Aviation Administration, Indianapolis FSDO; Plainfield, IN
Original Publish Date:	May 21, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=76812