



# Aviation Investigation Final Report

<b>Location:</b>	Montezuma, Indiana	<b>Accident Number:</b>	CEN10LA450
<b>Date &amp; Time:</b>	July 29, 2010, 13:20 Local	<b>Registration:</b>	N2085J
<b>Aircraft:</b>	Cessna T188C	<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 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

<b>Aircraft</b>	Recip eng cyl section - Failure
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## Factual Information

### History of Flight

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

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	65, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Single
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane; Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane single-engine	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	April 29, 2010
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	June 30, 2010
<b>Flight Time:</b>	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

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

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KPRG,654 ft msl	<b>Distance from Accident Site:</b>	16 Nautical Miles
<b>Observation Time:</b>	13:25 Local	<b>Direction from Accident Site:</b>	261°
<b>Lowest Cloud Condition:</b>	Scattered / 3100 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.1 inches Hg	<b>Temperature/Dew Point:</b>	28°C / 21°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Clinton, IN (117)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Clinton, IN (117)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	13:15 Local	<b>Type of Airspace:</b>	Class G

## Wreckage and Impact Information

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

## Administrative Information

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

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).