Aviation Investigation Final Report

Location:	Lafayette, Indiana	**Accident Number:**	CHI08CA035
Date & Time:	November 1, 2007, 17:14 Local	**Registration:**	N5912Q
Aircraft:	Mooney M20E	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The airplane was in cruise flight at 6,500 feet when the engine began to run roughly. The pilot verified both magnetos were functioning properly, switched fuel tanks, and manipulated the throttle without any improvement in engine operation. He informed air traffic control of the loss of engine power and was subsequently cleared to land at an airport about 8 nm north of his position. The engine continued to run roughly as he maneuvered for the airport. The airplane impacted rising terrain that preceded the runway threshold. The airplane came to rest within 100 feet of the threshold. The airplane received substantial damage to the right wing and engine firewall. The nose and right main landing gear collapsed during the landing. The left main landing gear remained fully extended. Examination of the engine revealed that the number 3 cylinder had separated from the engine case. Further examination showed that the number 3 connecting rod had separated from the crankshaft. The connecting rod cap, two rod bolts, and two nuts were found separated inside the engine case. One of the rod bolts was bent and fractured approximately mid-span. One-half of this bolt remained with the rod cap. The bolt's fracture surface exhibited a cup/cone shape, consistent with an overload failure. The threaded region of this bolt was undamaged. One of the nuts had undamaged threads. The first three threads adjacent to the flat side of the remaining nut were damaged. The remaining rod bolt was intact, but the three threads from the end were damaged consistent with the damage noted on the second nut. The last engine overhaul was completed on November 19, 1972. The engine had accumulated 820 hours since that overhaul.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The improper installation of the connecting rod bolts during major overhaul, which resulted in the separation of the connecting rod from the crankshaft in flight. Contributing to the accident was the rising terrain encountered during touchdown and the subsequent landing gear collapse.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: CRUISE - NORMAL

Findings
1. (C) ENGINE ASSEMBLY,CONNECTING ROD CAP - SEPARATION
2. (C) ENGINE ASSEMBLY,CONNECTING ROD BOLT - LOOSE PART/BOLT/NUT/CLAMP/ETC
3. (C) MAINTENANCE,OVERHAUL,MAJOR - INADEQUATE - OTHER MAINTENANCE PERSONNEL

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

Occurrence #3: HARD LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
4. (F) TERRAIN CONDITION - RISING
5. (F) LANDING GEAR - COLLAPSED

Factual Information

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Pilot Information

Certificate:	Private	**Age:**	58,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	June 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 1, 2006
Flight Time:	855 hours (Total, all aircraft), 46 hours (Total, this make and model), 11 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N5912Q
Model/Series:	M20E	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	821
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 1, 2007 Annual	**Certified Max Gross Wt.:**	2575 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1794.4 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-A1A
Registered Owner:	G & W Aviation, LLC	**Rated Power:**	200 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:	LAF,606 ft msl	**Distance from Accident Site:**	
Observation Time:	16:54 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.25 inches Hg	**Temperature/Dew Point:**	12°C / -6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	La Porte, IN (PPO)	**Type of Flight Plan Filed:**	None
Destination:	Springfield, TN (M91)	**Type of Clearance:**	VFR
Departure Time:	16:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Purdue University Airport LAF	**Runway Surface Type:**	Asphalt
Airport Elevation:	606 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	5	**IFR Approach:**	None
Runway Length/Width:	4225 ft / 1288 ft	**VFR Approach/Landing:**	Forced landing

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:**	40.412223,-86.936943

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Randy A Shafer; Federal Aviation Administration, Indianapolis FSDO; Indianapolis, IN
Original Publish Date:	January 31, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=67274