Aviation Investigation Final Report

Location:	White Cloud, Michigan	**Accident Number:**	CHI05LA190
Date & Time:	July 15, 2005, 13:54 Local	**Registration:**	N355RZ
Aircraft:	Mooney M20M	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane sustained substantial damage on impact with terrain during a forced landing following an in-flight loss of engine power. The pilot's accident report stated, "Climbing through 9,000 feet I noticed that my climb performance had been reduced substantially. I then noticed that I had a serious problem. The [oil] temp was then red-lined, the oil pressure low, and power drastically reduced. At that point I disconnected the autopilot and lowered the nose to avoid a stall and attempt to cool the engine. I contacted [Minneapolis] center and reported the problem. The controller asked if I was declaring an emergency, and I said yes, and requested vectors to the closest airport. At this point I could see oil coming down the left window. ... I had a scattered layer around 3-4,000 feet that I descended through. I got visual on the airport. At that point airspeed and altitude [were] minimal and the power reduced to almost nothing. ... I aimed the aircraft towards mid field and figured if I put the aircraft down without stalling or hitting trees I would walk away. ... I put the aircraft down on the uneven terrain at the south end of [the runway]." An examination of the wreckage revealed a disconnected oil line. The disconnected oil line went to the cylinder valve guides for cooling. The other end of the line was connected at the outlet of the oil cooler from where the oil is supplied to the valve guides. A representative of the fixed base operator stated that three cylinders were removed and replaced. During the engine's operational check, no oil leaks were noted. The technician that performed the work also inspected the work. The representative stated that oil would begin to flow from the disconnected line once the engine warmed up and the vernatherm opened. The representative stated that human factors were also involved, as there was pressure to get the work done as the owner requested. The representative stated that secondary inspectors will be used whenever possible and that the entire maintenance staff will be trained on human factors.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power during cruise flight due to the mechanic's improper maintenance, the disconnected oil line, the oil leak from the disconnected line, and the unsuitable terrain the pilot encountered during the forced landing. Factors were the outside pressures on the maintenance personnel and the uneven terrain.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: CRUISE

Findings
1. (C) LUBRICATING SYSTEM,OIL LINE - DISCONNECTED
2. (C) MAINTENANCE - IMPROPER - OTHER MAINTENANCE PERSONNEL
3. (F) PRESSURE INDUCED BY OTHERS - OTHER MAINTENANCE PERSONNEL
4. (C) FLUID,OIL - LEAK

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

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
5. (F) TERRAIN CONDITION - ROUGH/UNEVEN
6. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - ENCOUNTERED - PILOT IN COMMAND

Factual Information

On July 15, 2005, about 1354 eastern daylight time, a Mooney M20M, N355RZ, piloted by a commercial pilot, sustained substantial damage on impact with terrain during a forced landing at the White Cloud Airport, near White Cloud, Michigan. The flight encountered an in-flight loss of engine power. The personal flight was operating under 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the accident. An instrument flight rules (IFR) flight plan was on file and was activated. The pilot reported no injuries. The flight originated from the Gerald R. Ford International Airport, near Grand Rapids, Michigan about 1317, and was destined for the Brainerd Lakes Regional Airport, near Brainerd, Minnesota.

The pilot's accident report stated:

> This is to explain the facts of the engine failure of Mooney N355RZ. The Mooney Bravo was left at Grand Rapids (KGRR) airport for engine repair for a rough running engine. The airplane was inspected and left for repair to have three cylinders sent in to be repaired.
>
> On Friday July 15th, 2005, I drove to (KGRR) to pick the aircraft up and return it to Bismarck, ND. The mechanics where still working on the engine so I waited until mid-afternoon until the repairs [were] finished. In the meantime I filed IFR and checked weather with Lansing [Flight Service Station]. I planned my route of flight direct Beaver Island, and then direct Brainerd, MN. I planned this route to avoid flying over the widest part of Lake Michigan.
>
> I taxied out to runway 8R at (KGRR) did my run-up and was cleared for take off. I filed for 14,000 feet [above mean sea level]. Tower had me runway heading to 4000 feet and then to contact departure. Departure had cleared me direct and up to 14,000 feet. At that point I had the climb power set and the auto-pilot flying [global positioning system] GPS direct to Beaver Island with all engine instruments reading normal. Climbing through 9,000 feet I noticed that my climb performance had been reduced substantially.
>
> I then noticed that I had a serious problem. The [oil] temp was then red-lined, the oil pressure low, and power drastically reduced. At that point I disconnected the autopilot and lowered the nose to avoid a stall and attempt to cool the engine. I contacted [Minneapolis] center and reported the problem. The controller asked if I was declaring an

emergency, and I said yes, and requested vectors to the closest airport. At this point I could see oil coming down the left window.

He turned me heading west and gave me the identifiers for White Cloud airport. I put the identifiers in the GPS and was trimming the aircraft to conserve altitude. Then the aircraft began to shake extremely rough, making me wonder what was going to happen next. I still had some power but was wondering how long until the engine would totally fail.

I had a scattered layer around 3-4,000 feet that I descended through. I got visual on the airport. At that point airspeed and altitude where minimal and the power reduced to almost nothing. The power then seized to nothing, I adjusted the manifold and got no response. The terrain around the airport was heavily congested with trees, houses, and power lines. I aimed the aircraft towards mid field and figured if I put the aircraft down without stalling or hitting trees I would walk away. At that point I was low, out of altitude, out of power and [decided] to take the side of the runway at [White Cloud].

I put the aircraft down on the uneven terrain at the south end of runway 18-36 at White Cloud. The aircraft came to a stop promptly. I then opened the door and exited the aircraft. Local authorities then arrived. I could then see the stream of oil going down the side of the fuselage.

A Federal Aviation Administration Inspector along with an airplane mechanic examined the wreckage. The mechanic found a disconnected oil line. The disconnected oil line went to the cylinder valve guides for cooling. The other end of the line was connected at the outlet of the oil cooler from where the oil is supplied to the valve guides.

A representative of the fixed base operator at KGRR stated that three cylinders were removed and replaced. During the engine's operational check, no oil leaks were noted. The technician that performed the work also inspected the work. The representative stated that oil would begin to flow from the disconnected line once the engine warmed up and the vernatherm opened. The representative stated that human factors were also involved, as there was pressure to get the work done as the owner requested. The representative stated that secondary inspectors will be used whenever possible and that the entire maintenance staff will be trained on human factors.

Pilot Information

Certificate:	Commercial	**Age:**	26,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	March 1, 2005
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 1, 2004
Flight Time:	1870 hours (Total, all aircraft), 210 hours (Total, this make and model), 1494 hours (Pilot In Command, all aircraft), 42 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N355RZ
Model/Series:	M20M	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	27-0235
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 1, 2005 Annual	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	60 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	745 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TIO-540-AF1B
Registered Owner:	REMC LEASING LLC	**Rated Power:**	270 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:	RQB,990 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	13:56 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots / 0 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	30°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GRAND RAPIDS, MI (GRR)	**Type of Flight Plan Filed:**	IFR
Destination:	BRAINERD, MN (BRD)	**Type of Clearance:**	IFR
Departure Time:	17:33 Local	**Type of Airspace:**	

Airport Information

Airport:	WHITE CLOUD 42C	**Runway Surface Type:**	Asphalt
Airport Elevation:	914 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	2917 ft / 60 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:**	43.559722,-85.774169

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Henry Aung; Federal Aviation Administration; Grand Rapids, MI
Original Publish Date:	April 25, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=62002