Aviation Investigation Final Report

Location:	MOUNT PLEASANT, Texas	**Accident Number:**	FTW99LA206
Date & Time:	July 30, 1999, 16:00 Local	**Registration:**	N91FH
Aircraft:	Mooney M20J	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While in cruise flight at 10,500 feet msl, the pilot smelled a strong odor of fuel, and observed that the fuel pressure gauge needle had dropped almost to zero. The pilot switched fuel tanks and turned on the electric fuel pump. This did not increase the fuel pressure, and a strong odor of fuel persisted. The pilot initiated a forced landing to the nearest airport, but landed in an open field 1/4 mile short of the runway and subsequently, impacted a fence. Examination of the fuel system after the accident revealed that the fuel hose that ran between the fuel pump and the fuel injector servo was disengaged from the coupling at the fuel pump. Examination of the coupling revealed that a portion of the first thread was separated as a result of fatigue.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The separation of the fuel line fitting as a result of fatigue. A factors was the lack of suitable terrain for a forced landing.

Findings

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

Findings
1. (C) FUEL SYSTEM,LINE FITTING - FATIGUE
2. (C) FUEL SYSTEM,LINE FITTING - SEPARATION

3. FLUID,FUEL - STARVATION

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

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
4. (F) TERRAIN CONDITION - NONE SUITABLE
5. OBJECT - FENCE

Factual Information

On July 30, 1999, at 1600 central daylight time, a Mooney M20J single-engine airplane, N91FH, registered to and operated by the Nacogdoches Gospel Assembly Church of Nacogdoches, Texas, was substantially damaged during a forced landing following a partial loss of engine power near Mount Pleasant, Texas. The private pilot and his passenger were not injured. Visual meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 business cross-country flight. The flight departed Aurora, Missouri, at 1400, with a destination of David Wayne Hooks Memorial Airport, Spring, Texas.

During a telephone interview, the pilot reported to the NTSB investigator-in-charge that while in cruise flight at 10,500 feet msl, he smelled a "strong" odor of fuel and observed that the fuel pressure had dropped almost to zero. The pilot switched fuel tanks, and turned on the electric fuel pump. The needle on the fuel gauge did not increase, and the strong odor of fuel persisted. The pilot diverted toward the Mount Pleasant Municipal Airport with the engine operating at idle. While on final approach to runway 17, he applied throttle to adjust the aircraft's rate-of-descent; however, it had no effect on the engine rpm. A forced landing was executed to an open field approximately 1/4 mile short of the runway.

The pilot stated that the airplane touched down near the middle of the field, and during the landing roll, the airplane impacted a fence and came to a rest upright. The pilot added that after exiting the aircraft, he observed fuel leaking from the right fuel tank.

Examination of the airplane by an FAA inspector revealed that the right wing was displaced aft, and the airplane's fuel tanks were empty. The FAA inspector stated that the airplane's cabin had the odor of fuel.

Further examination revealed that the fuel hose that ran between the engine driven fuel pump and the fuel injector servo was separated from the coupling at the fuel pump. The B-nut and coupling that attached the fuel hose to the fuel pump remained secure. The fuel hose and the coupling were removed from the accident aircraft for further examination.

The fuel hose and the separated coupling were examined at the NTSB Materials Laboratory in Washington, D.C. Examination of the coupling revealed that a portion of the first thread was missing and a fractured surface, extending around two-thirds of the circumference of the thread, was visible. The coupling was ultrasonically cleaned and examined with a scanning electron microscope (SEM). The fractured surface contained radial marks and crack arrest positions emanating from the root of the thread, which are typical of fatigue cracking. There were multiple origins along the root of the thread that propagated towards the inside diameter of the tube and extended through the wall thickness of the thread.

The mating threads inside the fuel hose were examined with a borescope, and there were signs of wear on all threads. The fractured portion of the first thread from the coupling was not present between the threads in the fuel hose.

According to the NTSB Pilot/Operator Aircraft Accident Report (NTSB Form 6120. 1/2), the aircraft and engine had accumulated 1,000 hours total time. Review of the engine maintenance records revealed that on April 15, 1999, the Lycoming IO-360-A386D engine (s/n: L-25601-51A) underwent a 100-hour inspection at an engine time of 905.7 hours total time.

Pilot Information

Certificate:	Private	**Age:**	52,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 23, 1999
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	1078 hours (Total, all aircraft), 900 hours (Total, this make and model), 1078 hours (Pilot In Command, all aircraft), 38 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N91FH
Model/Series:	M20J M20J	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	243214
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 15, 1999 Annual	**Certified Max Gross Wt.:**	2740 lbs
Time Since Last Inspection:	33 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	IO-360-A3B6D
Registered Owner:	NACOGDOCHES GOSPEL ASSEMBLY	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PRX ,547 ft msl	**Distance from Accident Site:**	39 Nautical Miles
Observation Time:	15:35 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	36°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	AURORA , MO (2H2)	**Type of Flight Plan Filed:**	None
Destination:	HOUSTON , TX (DWH)	**Type of Clearance:**	
Departure Time:	14:00 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	MOUNT PLEASANT MUNICIPAL MSA	**Runway Surface Type:**	
Airport Elevation:	404 ft msl	**Runway Surface Condition:**	
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	3836 ft / 70 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	33.159778,-94.970916(est)

Administrative Information

Investigator In Charge (IIC):	Wigington, Douglas
Additional Participating Persons:	DARRELL HUGHES; DALLAS , TX
Original Publish Date:	April 6, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46932

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