Aviation Investigation Final Report

Location:	Baker, California	**Accident Number:**	LAX00LA222
Date & Time:	June 8, 2000, 10:25 Local	**Registration:**	N31M
Aircraft:	Mooney M20D	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot collided with a sand dune after making a forced landing on a service road. It was during cruise flight when the pilot had first observed the fluctuation (a drop) on the fuel pressure indicator. He reported the same fluctuation after switching from the left tank to the right another hour into the flight. Activating the electric fuel pump had remedied the situation and it was left on for another hour. The fuel tanks were then switched again and the fuel pump was turned off. About 25 minutes had passed when the pressure dropped to zero and the engine lost power. The pilot tried various engine out procedures and to maneuver the airplane in an effort to get the engine to run, but his attempts to restart were unsuccessful. He had been receiving radar flight following service and declared an emergency before landing the airplane on a service road next to some railroad tracks. The left wing was torn and the right main gear had collapsed. The sheriff deputy who responded to the scene did not observe any fuel in the left tank and very minimal fuel in the right wing fuel tank. The deputy also reported the fuel gauges were indicating fuel on board when he turned the master switch on. A post crash inspection of the fuel selector body and screen revealed contamination in the system. The owner photographed the components, which displayed debris in the selector body below the fuel screen area. Both fuel tanks were resealed with a similar colored compound in December 1997. The last annual inspection was performed on the airplane in December 1999. The maintenance technician did not recollect any unusual contamination at the time.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fuel flow became restricted by remnants of fuel tank sealant that had accumulated in the fuel selector screen. Contributing to the pilot's inability to restart the engine in flight was the empty fuel tank in the left wing and the fuel gauge indication. The constrained landing area

was also a factor.

Findings

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

Findings
1. (C) FLUID,FUEL - CONTAMINATION,OTHER THAN WATER
2. (C) FUEL SYSTEM - RESTRICTED
3. (F) FUEL SUPPLY - NOT UNDERSTOOD - PILOT IN COMMAND

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

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

Findings
4. (F) TERRAIN CONDITION - DIRT BANK/RISING EMBANKMENT
5. EMERGENCY PROCEDURE - NOT SUCCESSFUL - PILOT IN COMMAND
6. LANDING GEAR,MAIN GEAR - COLLAPSED
7. WING - BENT

Factual Information

On June 8, 2000, at 1025 hours Pacific daylight time, a Mooney M20D, N31M, made a forced landing in a railroad yard and collided with a sand dune southwest of Baker, California. The airplane sustained substantial damage; however, the certificated private pilot received no injury. The pilot was operating the airplane as a personal cross-country flight under the provisions of 14 CFR Part 91. The flight departed from Walker Field in Grand Junction, Colorado, en route to the Big Bear Airport, California, earlier that day. Day visual meteorological conditions prevailed at the time, and a flight plan had not been filed.

The pilot reported that he had noticed a fuel pressure fluctuation, which began while he was just north of the Grand Canyon. He switched fuel tanks from right to left after his observation and the pressure returned to normal (about 4 pounds per square inch). Another fluctuation was noticed upon switching back to the right tank 1 hour later. The pilot activated the electric fuel pump and it remedied the situation. He left the electric fuel pump running as the leg continued for another hour. The tanks were switched again, at which time the electric pump was turned off. The fuel pressure started to fluctuate and dropped to zero after a 25-minute period had passed. It was at this point that the engine completely stopped running. The pilot attempted to bring the engine back on-line by maneuvering the airplane and using various engine out procedures. Cycling the fuel selector, electric pump switch, adjusting the mixture, and carburetor heat did not have any effect.

The airplane received radar flight following service from Los Angeles Center. Radar contact was lost at 1023. According to the pilot, he declared an emergency and made a forced landing on a rail service road about 20 miles southwest of Baker. During the landing sequence, the airplane received a 3-foot tear to the left wing's leading edge, and the right main landing gear had collapsed. A San Bernardino County sheriff's deputy responded to the scene and found very minimal fuel in the right fuel tank of the airplane. The deputy also reported that when the electrical master switch had been placed in the on position, the quantity gauges did indicate fuel on board. The next day, retrieval personnel recovered less that 1 quart of fuel from the fuel tanks.

On June 14, 2000, a Safety Board investigator successfully ran the engine at Aircraft Recovery Services, Compton, California. At the time of the test and examination, the investigator noted that the engine fuel pressure was 4.5 pounds per square inch (psi) with the electric fuel boost pump in the on position. The pressure was 3.5 psi with engine boost pump in the off position. The engine idled and accelerated smoothly.

The owner conducted a post crash inspection of the airplane and discovered contamination in the fuel selector assembly. He took photos of the fuel selector body and strainer. The particles in the body were orange in color, and they had accumulated under the fuel selector

screen. The owner told the Safety Board investigator that he had resealed the tanks with a compound similar in color to the debris found in the fuel screen area.

Review of the aircraft maintenance records indicated that both fuel bays were repaired in December 1997. An annual inspection was performed in December 1999. The mechanic who performed the annual inspection and repairs did not recall finding any unusual contamination at the time. A tachometer time of 3,523 hours had been recorded in the aircraft log for this inspection.

The Mooney service manual recommends that fuel screens should be checked for contamination every 50-flight hours, and about 43 hours had accrued since the last inspection.

Pilot Information

Certificate:	Private	**Age:**	22,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
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 Without waivers/limitations	**Last FAA Medical Exam:**	October 15, 1999
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 21, 1999
Flight Time:	147 hours (Total, all aircraft), 87 hours (Total, this make and model), 106 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N31M
Model/Series:	M20D M20D	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	188
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 18, 1999 Annual	**Certified Max Gross Wt.:**	2640 lbs
Time Since Last Inspection:	43 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3523 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360
Registered Owner:	JOHN M. PASCHAL JR	**Rated Power:**	180 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:	KDAG,1927 ft msl	**Distance from Accident Site:**	35 Nautical Miles
Observation Time:	16:54 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	12000 ft AGL	**Visibility**	35 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	16 knots / 22 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	260°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.82 inches Hg	**Temperature/Dew Point:**	25°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GRAND JUNCTION, CO (GJT)	**Type of Flight Plan Filed:**	None
Destination:	BIG BEAR, CA (L35)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Barstow Dagget DAG	**Runway Surface Type:**	
Airport Elevation:	1927 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**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:**	35.043609,-116.193336

Administrative Information

Investigator In Charge (IIC):	Crispin, Robert
Additional Participating Persons:	JESUS GONZALES; FAA FSDO; RIVERSIDE, CA
Original Publish Date:	December 6, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49408