Aviation Investigation Final Report

Location:	PLACERVILLE, California	**Accident Number:**	LAX97FA253
Date & Time:	July 18, 1997, 10:42 Local	**Registration:**	N405LA
Aircraft:	Mooney M20J	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The airplane collided with trees and a residence after a loss of engine power while on final approach to runway 23. The airplane was destroyed by impact forces and postimpact fire, to include all engine accessories, the cockpit, and fuel system. A witness heard the pilot announce that he was on a 2 mile final to runway 23 and no additional transmissions were heard. Other witnesses saw the airplane make a descending, low, sweeping turn to the southwest just above the tree line, in a left wing down attitude just prior to the collision with the trees and residence 1 mile west of the airport. The engine was disassembled and examined with no anomalies noted which would have precluded the engine from producing power. The landing gear was in the down position, and the fuel selector was in the off position. Fuel load and usage was reconstructed based upon the distance between the origin and destination airports. The trip required 15 gallons of fuel. The airplane's last known fueling was on July 17th at the departure airport, when each wing tank was filled with 10 gallons. It is not known how much fuel was present in each tank prior to this fueling. Flight hours subsequent to the July 17th fueling could not be determined. Diphenhydramine, an antihistamine, was detected in the pilot's blood at 0.186 ug/ml, and in the liver at 1.594 ug/ml

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power for undetermined reasons.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. IMPAIRMENT(DRUGS) - PILOT IN COMMAND

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

Findings
3. TERRAIN CONDITION - NONE SUITABLE

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
4. OBJECT - TREE(S)
5. OBJECT - RESIDENCE

Factual Information

HISTORY OF FLIGHT:

On July 18, 1997, at 1042 hours Pacific daylight time, a Mooney M20J, N405LA, collided with trees and a residence while on final approach to runway 23 at the Placerville, California airport. The airplane was destroyed by impact forces and postimpact fire. The private pilot and one passenger received fatal injuries. The fire destroyed the rear deck of the unoccupied residence. The airplane was operated as a business flight under the provisions of 14 CFR Part 91 by the pilot/owner when the accident occurred. The flight originated in Van Nuys, California, at 0810, and was destined for Placerville. Visual meteorological conditions prevailed at the time and no flight plan was filed.

A witness working at the Placerville airport office heard the last known radio transmission from the pilot. The witness heard the pilot on the airport's Unicom frequency announce that he was on a "straight-in, 5 mile final for runway 23." Several minutes later, he heard the same pilot announce that he was on a "2 mile final to runway 23 at Placerville." No additional transmissions were heard. The witness stated that there was no change in the sound of the pilot's voice to indicate an emergency. He did not hear a distress call or a "microphone being keyed."

In written statements made to the Safety Board, witnesses saw the airplane make a descending, "low, sweeping turn southwest" just above the tree line, in a "left wing down" configuration. They then heard a loud bang and observed smoke. Witness accounts varied in their remembrance of engine noise; some recalled hearing the engine prior to impact while others did not.

Recorded radar data was obtained from the Federal Aviation Administration (FAA) Oakland Air Route Traffic Control Center (ARTCC) in the form of a National Track Analysis Program (NTAP). The raw data was then transferred into a computer program. This data indicated the first radar return from a 1200 secondary beacon from the airplane occurred at 10:18:43, 38 degrees 44 minutes 27 seconds north latitude, 120 degrees 22 minutes 55 seconds west longitude, at an altitude of 9,700 feet msl. The data indicated that the airplane descended approximately 500 feet per minute along northeast magnetic headings for 8 minutes. At 10:26:32, it then turned southwest, continuing its 500 feet per minute descent. The data indicated a final radar return at 10:36:20, of 38 degrees 43 minutes 56 seconds north latitude, 120 degrees 44 minutes 02 seconds west longitude, at an altitude of 2,800 feet msl. The data indicated that the last airspeed was 139 knots, 1,000-feet-per-minute descent, on a 237-degree magnetic heading.

PERSONNEL INFORMATION:

The pilot held a private pilot certificate with an airplane single engine land rating. He also held a third-class medical certificate, dated January 18, 1996, which had no restrictions. A personal logbook was recovered at the accident scene. The last entry in this logbook indicated the pilot had 1,531 hours as of January 20, 1996, with 72 hours in the accident airplane.

The pilot's flight bag, recovered from the accident scene, contained many local sectional charts, instructional charts, and pamphlets, including Pilot Proficiency Award Programs and Accident Prevention Programs, as well as a spiral-bound, instructional notebook. The notebook contained hand-written information pertaining to each airport the pilot frequented on a regular basis, such as communication and navigation frequencies, elevations, traffic pattern altitudes, and distances between these airports.

AIRCRAFT INFORMATION:

The airplane had been modified by the installation of a 300-horsepower Teledyne Continental IO-550-A engine and a 3-blade Hartzell full feathering propeller in accordance with the Rocket Engineering Master Drawing List dated February 25, 1994, and Supplemental Type Certificate (STC) number SA00081SE. The airplane last received an annual inspection on October 2, 1996. The time since the last inspection is unknown, as is the airframe's total time.

The airplane's last known fueling was on July 17, 1997, at Van Nuys Airport in Van Nuys. According to the daily fuel log provided by the fixed base operator and a written statement from the line service technician, each wing tank was filled with 10 gallons of 100LL fuel for a total of 20 gallons. It is not known how much fuel was present in each tank prior to this fueling. Flight hours subsequent to the July 17 fueling could not be determined.

In addition to the fuel gauges and fuel enunciators standard on the cockpit instrument panel for the Mooney M20J, the panel was also equipped with a Shadin fuel flow instrument.

Using the published Rocket Engineering performance data in the airplane's Pilot Operating Handbook, the Safety Board conducted a fuel usage calculation based upon the distance between Van Nuys and Placerville Airports. It was estimated that approximately 15 gallons of fuel were necessary for travel between these airports. Given the airplane's fuel system configuration, the fuel capacity was 32 gallons usable fuel per each wing tank.

METEOROLOGICAL INFORMATION:

Daylight, visual meteorological conditions prevailed at the accident site. At 0955, McClellan Air Force Base located 31 nautical miles from the accident site, was reporting clear skies, 15 miles visibility, 75 degrees Fahrenheit, a dew point of 55 degrees Fahrenheit, an altimeter setting of 29.92 inHg, a wind direction of 130 degrees, and a wind speed of 5 knots. There was no record of a weather briefing by the pilot.

AIRPORT INFORMATION:

Placerville airport is located 3 nautical miles east of the city of Placerville, at an elevation of 2,583 feet msl. The airport incorporates one runway identified 05-23, with VASI light systems available at each approach end. The asphalt runway is 4,200 feet in length and 75 feet in width.

WRECKAGE AND IMPACT INFORMATION:

The wreckage was located in a hilly area within the Sierra Nevada Mountains, approximately 40 statute miles southwest of Lake Tahoe, California. Placerville airport is situated on a plateau surrounded by lower elevations. The area consists mainly of gentle, rolling hills with approximately 10 degrees of slope.

The wreckage was located at the rear of a residence approximately 1 mile west of the Placerville airport on a 249-degree magnetic bearing. The area surrounding the residence was densely populated by trees. Several trees, located west of the main wreckage, were broken. Airplane wreckage and broken tree limbs were found near the bases of these disturbed trees.

The 3-blade Hartzell propeller was found in the debris path, separated from the crankshaft. All three blades remained attached to the hub. Two blades exhibited symmetrical damage with the tips bent opposite the direction of rotation. Approximately 2/3 of the third blade outboard was melted, and no chordwise striations were observed. The spinner was crushed and exhibited no torsional deformation. The crankshaft propeller flange exhibited a 45-degree shear lip, approximately halfway around it's circumference. No discoloration or "smearing" was observed.

The empennage was intact and separated from the main wreckage. The elevator and rudder were attached to their respective hinge points. The left, leading edge of the horizontal stabilizer exhibited minor dents. The right, leading edge exhibited extensive deformation, with an even, chordwise crushing along the entire span.

Debris from the left, outboard wing section, including the red lens of the wingtip navigation light, was scattered amongst broken tree limbs, west of the main wreckage. A portion of the aileron remained attached to the wing. The leading edge of the left wing was crushed accordion style back to the main spar. The right wing navigation light assembly was amongst the burnt remains of the main aircraft wreckage. Both air brakes were found in the retracted position.

The engine fuel injection throttle body/metering unit remained attached to the firewall and was located amongst the burnt remains of the main wreckage. The throttle was found in the fully open position and the mixture control was found in the 2/3 rich position. All 12 Champion spark plugs were located and removed. All of the electrodes exhibited normal erosion and gapping in comparison to the Champion Check-a-Plug chart. Three of the spark plugs were

oily while the remaining 9 appeared gray in color.

Except for the vertical and horizontal stabilizers, rudder and elevator, the main wreckage was consumed by fire, along with the rear portion of the residence. The El Dorado County Sheriff's Department estimated the overall debris track to be approximately 50 feet in length.

MEDICAL AND PATHOLOGICAL INFORMATION:

A postmortem examination of the pilot was conducted by the El Dorado County Coroner's Office with specimens retained for toxicological examination. The toxicological test was negative for alcohol. Diphenhydramine was detected in the blood at 0.186 ug/ml and in the liver at 1.594 ug/ml. Diphenhydramine is an antihistamine, often known by the trade name Benadryl, commonly used in over-the-counter cold/allergy preparations. Carbon monoxide analysis was not performed due to a lack of suitable specimen.

TESTS AND RESEARCH:

The engine was recovered to a facility located in Pleasant Grove, California, where it was disassembled and examined with the assistance of a technical representative from Teledyne Continental Motors. The engine was charred over it's entire exterior by a postimpact fire, and many accessories were detached from the engine. Continuity of the drive train could not be established. Both exhaust manifolds were intact and no obstructions were noted. The right side intake elbows were melted away, as were both rear induction tubes. The steel bores of all six cylinders were smooth and free of scoring. All six pistons were free of scoring, and the piston rings were intact and free moving in their grooves. The crankshaft was broken in the area of the oil seal. The fracture surface exhibited a single bending lip, and no 45-degree faces were observed. All of the main journals were smooth and free of scoring. Magneto timing to the engine could not be determined due to thermal damage to the magnetos. No mechanical failures were noted during the disassembly.

The Safety Board provided photographs of the main landing gear and fuel selector valve to the Mooney Aircraft Corporation. Upon review, an engineer with Mooney determined that the landing gear was in the down position, and the fuel selector was in the off position. The engineer also noted that the aircraft was equipped with a model M20K selector valve instead of a model M20J valve. The M20J model is a single, 3-position valve with 3 ports, while the M20K model is a double stack with 6 ports. Mooney explained that the second stack is for the purpose of vapor return, and that both fuel selector valves are identical in their operating positions.

During a phone conversation with a representative from Rocket Engineering, the Safety Board was informed that the M20K model fuel selector valve is installed with the Rocket Conversion. The representative also explained that the fuel system is configured to allow fuel to return to the selected fuel tank.

ADDITIONAL INFORMATION:

Upon reviewing the pilot's logbook, it was noted that the pilot made frequent flights from Placerville airport to Van Nuys airport. These trips usually occurred once a month from July 1992 to May 1994, sometimes occurring as often as three times a month. The frequent flights between these two airports resumed in February 1995, and continued until the last known logbook entry of December 15, 1995.

The wreckage was released to representatives of the registered owner after the engine examination on July 21, 1997. The wreckage was last seen at the facilities of Plain Parts in Pleasant Grove on July 21, 1997.

Pilot Information

Certificate:	Private	**Age:**	47,Male
Airplane Rating(s):	Single-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:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 18, 1996
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1531 hours (Total, all aircraft), 73 hours (Total, this make and model), 1354 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N405LA
Model/Series:	M20J M20J	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-3018
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 2, 1996 Annual	**Certified Max Gross Wt.:**	3000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-A
Registered Owner:	LOGAN, TIMOTHY J.	**Rated Power:**	300 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:	MCC ,75 ft msl	**Distance from Accident Site:**	31 Nautical Miles
Observation Time:	09:55 Local	**Direction from Accident Site:**	249°
Lowest Cloud Condition:	Clear	**Visibility**	15 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	24°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	VAN NUYS , CA (VNY)	**Type of Flight Plan Filed:**	None
Destination:	(PVF)	**Type of Clearance:**	None
Departure Time:	08:10 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	PLACERVILLE PVF	**Runway Surface Type:**	Asphalt
Airport Elevation:	2583 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	23	**IFR Approach:**	None
Runway Length/Width:	4200 ft / 75 ft	**VFR Approach/Landing:**	Full stop;Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	38.729408,-120.799636(est)

Administrative Information

Investigator In Charge (IIC):	Wilcox, Thomas
Additional Participating Persons:	PETER WILHELMSON; SACRAMENTO , CA MICHAEL GRIMES; MOBILE , AL
Original Publish Date:	November 4, 1999
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29624