Aviation Investigation Final Report

Location:	Hollister, California	**Accident Number:**	LAX03LA213
Date & Time:	June 26, 2003, 19:24 Local	**Registration:**	N104JM
Aircraft:	MCANALLY Glasair JM-1	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had just departed the airport when the engine started to surge. Upon reducing power and leaning the mixture, the engine smoothed out and the pilot was able to turn the airplane back towards the airport. At 800 feet and parallel to runway 31, the engine quit. During the descent, the airplane clipped a tree and struck a piece of concrete before coming to rest inverted in a field. The pilot stated that the electric fuel boost pump, which was required for flight, was not turned on. A post accident inspection failed to reveal any discrepancies with the engine or the aircraft's fuel system. The pilot did not report any mechanical malfunction with the airplane. To prevent similar accident in the future, he recommended turning the electric fuel pump to the "ON" position, prior to departure. The pilot reported the ambient temperature to be 38 degrees Celsius. Item number 5 on the pretakeoff portion of the checklist notes to turn on the electric boost pump.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to follow the checklist and apply the electric fuel pump prior to takeoff, which resulted in vapor lock.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. WEATHER CONDITION - TEMPERATURE,HIGH
2. (C) CHECKLIST - NOT FOLLOWED - PILOT IN COMMAND
3. (C) FUEL BOOST PUMP SELECTOR POSITION - NOT SET - PILOT IN COMMAND
4. (C) FUEL SYSTEM - VAPOR LOCK

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

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

Findings
5. OBJECT - OTHER

Factual Information

On June 26, 2003, at 1924 Pacific daylight time, an experimental McAnally Glasair JM-1, N104JM, lost engine power during takeoff, collided with obstacles during a forced landing attempt, and came to rest inverted near Hollister Municipal Airport (307), Hollister, California. The owner was operating the airplane under the provisions of 14 CFR Part 91. The two occupants, both certificated pilots, sustained serious injuries; the airplane sustained substantial damage. The personal local flight departed Hollister Municipal Airport about 1920. Day visual meteorological conditions prevailed, and no flight plan had been filed. The primary wreckage was at 36 degrees 53.36 minutes north latitude and 121 degrees 24.36 minutes west longitude.

In a written statement, the owner/pilot reported that the airplane had just departed runway 24 when the engine started to surge. He then reduced power and leaned the mixture in an attempt to smooth it out. Following a turn back towards the airport, the airplane was parallel to runway 31 at 800 feet when the engine quit. Instead of trying to land on a busy road, the pilot chose instead to head for a stubble field. During the descent, the airplane clipped a tree, and then struck a piece of concrete before coming to rest inverted. The electric fuel boost pump, which according to the pilot was required for flight, was not turned on. The pilot did not report any mechanical malfunction with the airplane. To prevent similar accidents in the future, he recommended turning the electric fuel pump to the "ON" position, prior to departure. The pilot reported that the ambient temperature was 38 degrees Celsius.

The National Transportation Safety Board investigator-in-charge (IIC) and a representative from Textron Lycoming, a party to the investigation, examined the engine. They manually rotated the engine, and obtained thumb compression on all four cylinders in firing order. They observed normal lift action on each rocker assembly; the rocker housing contained oil. They removed the top spark plugs. The electrodes were circular and their coloration was consistent with normal operation according to the Champion Spark Plug Check-A-Plug chart AV-27. A borescope inspection revealed no mechanical deformation on the valves, cylinder walls, internal cylinder heads, or pistons.

The engine driven fuel pump's rubber diaphragm was unbroken and the diaphragm pump shaft gasket was in place. The plunger in the fuel distribution valve moved freely and investigators observed no contamination. The fuel selector valve was in the auxiliary position with the other positions labeled as off and main. Fuel lines went from each main and auxiliary tank to the fuel selector valve. A line then went from the fuel selector valve to the electric boost pump, to the gascolator, to the engine driven fuel pump, and finally to the fuel servo. The investigators were unable to test the experimental electric ignition system installed on the engine. They noted no other discrepancies with the engine.

The IIC contacted a representative from the New Glasair, LLC, regarding vapor lock situations in the Glasair airplane. The representative advised the IIC that the company recommends to the builder to provide cooling air to the fuel system components. Also, the builder should recognize the increased potential for vapor lock during higher ambient temperatures. On the newer model of airplanes, the company provides a circular cooling shroud for the mechanical fuel pump. The installation of a cooling shroud on older airplanes is optional.

The accident airplane had cooling shrouds installed for the engine driven fuel pump and the firewall mounted electric boost pump.

Item number 5 on the pretakeoff portion of the checklist notes to turn on the electric boost pump.

Pilot Information

Certificate:	Commercial	**Age:**	79,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Expired	**Last FAA Medical Exam:**	June 25, 1999
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 23, 1997
Flight Time:	4651 hours (Total, all aircraft), 5 hours (Total, this make and model), 4651 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft)		

Co-pilot Information

Certificate:	Private	**Age:**	70,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	April 4, 2003
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 28, 2001
Flight Time:	1060 hours (Total, all aircraft), 1 hours (Total, this make and model), 1060 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MCANALLY	**Registration:**	N104JM
Model/Series:	Glasair JM-1	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	001SH778
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 16, 2003 Annual	**Certified Max Gross Wt.:**	2000 lbs
Time Since Last Inspection:	8.5 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	285 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-360
Registered Owner:	William J Brin	**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:	KSNS,76 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	18:53 Local	**Direction from Accident Site:**	200°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.89 inches Hg	**Temperature/Dew Point:**	25°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hollister, CA (K307)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	19:20 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	2 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	36.893333,-121.410278

Administrative Information

Investigator In Charge (IIC):	Rich, Jefferey
Additional Participating Persons:	Matthew Hill; Federal Aviation Administration; San Jose, CA Mark Platt; Lycoming; Williamsport, PA
Original Publish Date:	October 28, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57334