

# **Aviation Investigation Final Report**

Location:	QUEMADO, New Mex	kico	Accident Number:	DEN00FA007
Date & Time:	October 18, 1999, 10	:10 Local	Registration:	N13WM
Aircraft:	Gardner	VARIEZE	Aircraft Damage:	Substantial
Defining Event:			Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General avia	tion - Personal		

# Analysis

While visiting a repair facility in California to have minor repair work performed on the aircraft, the pilot was visited at his request by a man who sold him the engine's carburetor foam air filter. The man inspected the filter and it appeared 'aged' and 'crumbly.' The pilot declined to have the filter replaced, and the pilot then reinstalled it. After an overnight stop in Arizona while en route back to his home town in Texas, the pilot contacted Albuquerque ARTCC and reported a rough running engine. He requested vectors to the closest airport, but was never identified on radar. The last transmission from the pilot was received at 1008, and the aircraft was located by a local rancher several hours later. The airplane was landed on a dry dirt field parallel to a forrest road and directly perpendicular to another gravel road. The touchdown speed was estimated to be excess of 100 knots, and the aircraft's owners manual recommends 55 knots on a rough field. Following the accident, the engine was test run. Black smoke exited from the exhaust and the engine ran rough. An internal examination of the carburetor revealed that the foam air filter had been torn and pulled through the throat of the injector, causing a restriction in airflow.

# **Probable Cause and Findings**

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's selection of an unsuitable landing area on which to make a precautionary landing, and his excessive airspeed during landing touchdown. Factors were the ingestion of the foam air filter into the throat of the injector, and the pilot's failure to replace the worn air filter.

### **Findings**

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF Phase of Operation: CRUISE

Findings 1. (F) INDUCTION AIR CONTROL, AIR FILTER/SCREEN - INGESTED 2. (F) MAINTENANCE, REPLACEMENT - NOT PERFORMED - PILOT IN COMMAND

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

Occurrence #3: NOSE OVER Phase of Operation: LANDING - ROLL

Findings

3. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - SELECTED - PILOT IN COMMAND

4. (C) AIRSPEED - EXCESSIVE - PILOT IN COMMAND

5. TERRAIN CONDITION - LOOSE GRAVEL/SANDY

## **Factual Information**

#### HISTORY OF FLIGHT

On October 18, 1999, approximately 1010 mountain daylight time, a Gardner VariEze experimental homebuilt aircraft, N13WM, was substantially damaged when it nosed over during a precautionary landing following a partial loss of engine power while in cruise flight 20 miles southwest of Quemado, New Mexico. The private pilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal cross-country flight being conducted under Title 14 CFR Part 91. The flight originated from St. Johns Industrial Airpark, St. Johns, Arizona, at 0850 mountain standard time, with an intended destination of Albuquerque, New Mexico.

According to the owner of Light Speed Engineering (LSE), the manufacturer of the airplane's ignition system and propeller, the pilot had flown to his repair facility in Santa Paula, California, on either October 10 or 11. He stated that he grounded N13WM due to the aircraft having a blown tire and not being equipped with brake pads. According to a work invoice dated October 16, 1999, the repairman performed a wheelpant repair, winglet modification, removal and replacement of brakes and tires, a cowling modification for baffling stop, an ignition and carburetor adjustment, and alternator bracket repair, a propeller refinish and balance, and a throttle adjustment. According to the owner, the pilot did not report any mechanical discrepancies with the engine when he arrived at his facility.

According to the owner of the Hal Hunt exhaust system and the engine's fiberglass air box assembly, both installed on N13WM, he also sold the pilot the carburetor's air filter sometime in 1997. According to him, he received a call from the pilot while the aircraft was being serviced at LSE in Santa Paula. He visited the pilot at LSE's repair facility and inspected the air filter located in the engine's Ellison Throttle Body Injector carburetor. According to him, the foam air filter was "aged" and "crumbly." He stated that he asked the pilot if wanted to have the foam air filter replaced, to which he declined. According to him, the pilot himself then reinstalled the air filter back onto the metal air filter screen of the carburetor. This was verified by the owner of LSE, who was present during their conversation.

According to the owner of LSE, the pilot departed Santa Paula on the evening of October 16, en route to Laughlin, Nevada. According to an airport manager employed at St. Johns Industrial Air Park Airport, the pilot landed at St. Johns on the evening of October 17. The pilot told him that he had been on a business trip in California, and was returning to his home town of McKinney, Texas. He advised him that the aircraft's engine was experiencing an oil leak, and that he was intending to fly to Albuquerque to have the engine inspected before returning home. According to a fuel receipt provided by St. Johns airport dated October 17, 1999 at 6:38 pm, N13WM was serviced with 13 gallons of 100LL and 2 quarts of oil.

According to Federal Aviation Administration (FAA) records, at 1001 on the day of the accident, the pilot contacted the Albuquerque Air Route Traffic Control Center (ARTCC). He advised them that he was level at 13,500 feet mean sea level (msl) and that his aircraft was experiencing a rough running engine. The pilot was asked his exact location, but he failed to acknowledge. Shortly thereafter, he requested vectors to the closest airport. He was provided a discreet transponder code of 2142, but was never identified on radar. The last transmission ARTCC received from the pilot was at 1008, and all further attempts to contact the pilot were unsuccessful. The pilot had a distinct accent and his pronunciation of words was difficult to understand. A search of surrounding airports was initiated but unsuccessful. An ALNOT (alert notice) was issued at 1312, and the aircraft was located by a local rancher at 1400.

### PERSONNEL INFORMATION

The pilot, age 63, was born on June 21, 1936. He held Private Pilot Certificate No. 558158675, dated November 26, 1986, with an airplane single engine land and instrument rating. He possessed a third class airman medical certificate, dated October 30, 1998, with the restriction, "Must wear corrective lenses."

Two of the pilot's logbooks were made available for review. The first logbook had entries which began on August 30, 1989, and ended on September 26, 1998. Midway through the logbook, the entries ended on February 1, 1990, and began again on September 14, 1998. The logbook entries were slightly out of date order. The third to last entry was dated October 5, 1998, and was the most recent recorded entry in the logbook. The second logbook had entries that began on May 3, 1991, and the second to last entry was dated October 31, 1992. The last entry was dated November 20, 1997, and appeared to be the pilot's most recent FAR 61.56 flight review. No flight time totals were provided in either logbook; however, the pilot indicated on his most recent medical exam dated October 30, 1998, that he had flown a total of 2,973 hours, and 62 hours within the past 90 days.

### AIRCRAFT INFORMATION

N13WM was a 2-seat, composite, experimental homebuilt aircraft that was manufactured by Wesley C. Gardner in 1980. The pilot purchased the aircraft from the original owner/builder in 1994. It was designed with a leading edge forward canard and an engine mounted aft of the empennage. The aircraft was originally equipped with a Continental O-200 series engine, rated at 100 horsepower. However, a Lycoming O-320-B1A engine, rated at 160 horsepower, was installed in the aircraft at the time of the accident. It was equipped with a Light Speed Engineering fixed-pitch propeller, designed with a combination of wood and composite material. The nose landing gear of the airplane was retractable, and the left and right main landing gear were fixed.

According to the aircraft's maintenance records, the last FAR Part 43 Appendix D condition inspection on the engine was accomplished on July 4, 1999, at a recorded tachometer time of

0, and a total time in service of 1691.3 hours. The logbook entry stated, "Installation on N13WM. New fuel lines, oil lines, Ellison Throttle Body, Hal Hunt Breather, Hal Hunt Pipes. Installed 2 new LSE Plasma Systems. B&C Alt. Dyno."

### METEOROLOGICAL INFORMATION

According to a deputy with the Catron County Sheriff's Department, the weather conditions at the time were light winds and unlimited visibility.

### WRECKAGE AND IMPACT INFORMATION

The aircraft landed on a sandy, dry dirt field on a heading of 180 degrees parallel to Forrest Road 23 and directly perpendicular to another gravel road (see attached maps of accident area). Initial ground scars were found where the two roads intersected. There were 3 initial ground scars at the initial touchdown point measuring the distance and widths of the nose and main landing gear. At approximately 480 feet from the initial point of impact, a ground scar measuring the width of the nose wheel was found toward the right of the impact marks, and 2 drag marks measuring in width to that of the left and right main landing gear were observed toward the left as the aircraft began a left skid. Intermittent ground scars similar in width to the landing gear were recurrently observed along the entire wreckage path.

The ground scars ceased at approximately 545 feet from the point of initial impact, and the aircraft came to rest 640 feet from the initial touchdown point in an inverted position resting on a heading of 360 degrees. The ground scar to the right of the wreckage path led to the point where the nose gear came to rest. The plexiglass canopy of the aircraft was shattered on impact.

### MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy on the pilot was performed by the University of New Mexico's Office of the Medical Investigator on October 19, 1999. A toxicological protocol (#9900273001) was performed by the FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. No carbon monoxide or cyanide were detected in the blood, and no ethanol or drugs were detected in the urine.

### TESTS AND RESEARCH

On November 16, 1999, the engine was examined and test run at the facilities of Air Transport Salvage in Phoenix, Arizona. The engine sustained minimal impact damage and remained in the airframe mounts and attached to the fuselage. Fuel was added to the fuel tanks. The engine was successfully started and run at various power settings. It was observed that black smoke was being emitted from the exhaust and the engine ran rough throughout the engine run. A continuity check of the dual electronic ignition system was performed and no discrepancies were found. It was also verified that sufficient battery voltage was present. Following the engine run, an internal examination of the engine was performed. During the examination of the carburetor, it was revealed that the induction air filter appeared to be aged and slightly disintegrated, and a section of the filter had been torn and pulled over the top and inside the metal air filter screen. It had then been pulled up through the throat of the injector, causing a restriction in the airflow. Once the filter was removed, an approximate 4-inch section of the filter was found missing.

According to the VariEze Owner's Manual under the landing section, "Make your approach and traffic pattern very cautiously... Best pattern speed is 80 to 90 knots (90 - 105 mph) slowing to 70 knots (80 mph) on final approach (75 - 80 knots in turbulence or gusty winds)... Make a complete flare and touchdown at 55 to 60 knots (63 to 69 mph). Maintain a slightly nose high attitude as you roll out and use aft stick to ease the loads on your nose wheel during heavy braking... If you need to land on a rough field, hold the aircraft off to 55 knots." Based on the evidence provided by ground scars present at the accident site, the landing speed of the aircraft was estimated to be in excess of 100 knots.

#### ADDITIONAL INFORMATION

In addition to the Federal Aviation Administration, parties to the investigation were Textron Lycoming engines, Light Speed Engineering and Ellison Fluid Systems, Inc.

The wreckage was released to a representative of the owner's insurance company on November 16, 1999.

Certificate:	Private	Age:	63,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medicalw/ waivers/lim	Last FAA Medical Exam:	October 30, 1998
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2973 hours (Total, all aircraft)		

#### **Pilot Information**

# Aircraft and Owner/Operator Information

Aircraft Make:	Gardner	Registration:	N13WM
Model/Series:	VARIEZE VARIEZE	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	218
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	July 4, 1999 Annual	Certified Max Gross Wt.:	1350 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-320-B1A
Registered Owner:	JOHN B. CANNON	Rated Power:	160 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:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	0°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:	No Obscuration; No Precipitat	tion	
Departure Point:	ST. JOHNS (SJN)	Type of Flight Plan Filed:	None
Destination:	ALBUQUERQUE (ABQ)	Type of Clearance:	None
Departure Time:	08:50 Local	Type of Airspace:	Class G

# **Airport Information**

Airport:		Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:	0	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Precautionary landing

# Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	34.310779,-108.790763(est)

### **Administrative Information**

Investigator In Charge (IIC):	Scott, B. beach
Additional Participating Persons:	JOHN C SANDERS; ALBUQUERQUE , NM
Original Publish Date:	November 2, 2000
Last Revision Date:	
Investigation Class:	<u>Class</u>
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47600

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available <u>here</u>.