Aviation Investigation Final Report

Location:	ST. ELMO, Alabama	**Accident Number:**	MIA00LA044
Date & Time:	December 8, 1999, 17:00 Local	**Registration:**	N5864L
Aircraft:	American AA-5	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During preflight, slight amount of water noted in right wing and sump tanks. No water noted in left wing or sump tanks. Engine start/run-up, uneventful. After takeoff about 300 feet agl near the departure end of the runway, the engine began to 'sputter.' Attempts to restore engine power were unsuccessful. While maneuvering for a forced landing, the airplane pitched nose down and impacted a cotton field. Water was found in the carburetor bowl. An incorrect fuel drain valve by part number and design was installed in the right wing fuel tank; no determination made when the valve was installed. Testing on a same make and model airplane using an exemplar of the fuel drain valve found installed in the right fuel tank revealed .99 pound of fuel remained in the tank and could not be drained. All fuel could be drained with the airplane manufacturer specified drain valve installed. The airplane sat for a couple of months before the accident date with the right tank not topped; the left tank was full. The airplane was out of annual inspection. Additionally, the pilot's medical certificate was expired, and he could not produce the date of his last biennial flight review.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to maintain airspeed resulting in the in-flight loss of control while maneuvering for a forced landing in a field after the loss of engine power. Contributing factors were the loss of engine power due to water-contaminated fuel.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) FUEL SYSTEM,DRAIN - INCORRECT
2. MAINTENANCE,INSTALLATION - IMPROPER - UNKNOWN
3. (F) FLUID,FUEL - CONTAMINATION,WATER
4. (F) AIRCRAFT PREFLIGHT - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
5. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - GROUND

Factual Information

On December 8, 1999, about 1700 central standard time, an American AA-5, N5864L, listed in the FAA registry as "registration pending", experienced an in-flight loss of control following a loss of engine power shortly after takeoff from St. Elmo Airport, St. Elmo, Alabama. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 CFR Part 91 personal flight. The private-rated pilot sustained serious injuries and a passenger was not injured. The flight originated about 1 minute earlier.

The pilot stated that "...The individual that was with me that day was my IA [mechanic with inspection authorization] and I was on a test flight to see how the 'mags' were performing...." The airplane had sat for a couple of months before the accident flight date with the left fuel tank full and the right fuel tank not topped. During his aircraft preflight, he checked both wing and sump tank drains of each wing for water 4 or 5 times each and only discovered a small amount of water on the first check of the right wing fuel tank and right wing sump tank. He did not detect water in the left wing tank or sump tanks. He completed the preflight and after starting the engine, taxied to a hangar to put air in the tires. After doing so, he taxied to runway 06, performed an engine run-up checking the magnetos and carburetor heat; noting that each magneto drop was in tolerance. He positioned the airplane on the runway, applied power to takeoff, and while climbing near the departure end of the runway about 300 feet above ground level, the engine began to "sputter." He switched the fuel selector valve two times and pumped the throttle to restore engine power with no response. He maneuvered the airplane to the left, touched down in a cotton field, and the airplane nosed over after touchdown. The pilot broke his back in three places and later reported when asked that he noted that the left wing fuel tank drain valve was different than the "rest." He also stated that he has owned the airplane since 1991 or 1992, and since then to his knowledge, no fuel drain valves have been replaced.

The passenger who is a student pilot stated that the airplane became airborne about 1/3 down the runway and the pilot initiated a climb but he noticed that the pilot was "fiddling" with the primer. The pilot then banked to the left changing the aircraft heading 90 degrees then rolled wings level. He then noticed that the nose of the airplane pitched down approximately 45 degrees; the airplane impacted the ground in that attitude and nosed over.

An FAA inspector examined the airplane at the accident site. The nose wheel assembly was separated and damage to the left wing was noted. Examination of the magnetos revealed no discrepancies. Examination of the engine by an FAA certificated airframe and powerplant mechanic revealed crankshaft, camshaft, and valve train continuity. Thumb compression was noted from each cylinder. Fuel samples were taken from each wing fuel tank and from the carburetor bowl. No water was detected in each wing fuel tank but water was detected in the carburetor bowl. Examination of the airplane revealed that the left and right sump tank fuel drain valves were determined to be part number (CAV-110); the airplane parts catalog lists the

part number as (F391-187). The right fuel tank fuel drain valve was determined to be part number (CAV-170), and the left fuel tank fuel drain valve was determined to be part number (F391-53S). The airplane parts catalog lists the wing tank fuel drain valve as part number (F391-53S).

Examination of an exemplar of the wing tank fuel drain valve specified by the airplane manufacturer part number (F391-53S), and of an exemplar of the wing tank fuel drain valve which was installed in the right fuel tank of the accident airplane part number (CAV-170), revealed that the fuel drain port of the installed fuel drain valve is located approximately 1/4 inch higher along the length of the valve than the drain port of the fuel drain valve specified by the manufacturer.

Testing of an exemplar of the fuel drain valve found installed in the right fuel tank of the accident airplane and of an exemplar of the fuel drain valve listed in the parts catalog was performed on the same make and model airplane as the accident airplane. The tests which were witnessed by an FAA inspector revealed that with the airplane parts catalog specified wing tank fuel drain valve installed, all fuel by weight that was placed in the tank could be drained through the drain valve. With an exemplar of the wing tank fuel drain valve that was installed in the accident airplane installed in the test airplane, .99 pound of fuel remained in the wing fuel tank which could not be drained through the drain valve. Testing of an exemplar of the sump tank fuel drain valve found installed in the left and right sump tanks of the accident airplane versus an exemplar of the sump tank drain valve specified by the airplane manufacturer was also accomplished. Both valves were able to drain through them approximately all fuel by weight added to the sump tank.

Review of the airplane maintenance records by the facility that purchased the salvage of the airplane revealed no entry which indicates that the right wing fuel drain valve was replaced. Further review of the maintenance records revealed that the last recorded annual inspection occurred on October 23, 1998. Title 14 CFR Part 91.409 indicates in part, "...no person may operate an aircraft unless, within the preceding 12 calendar months, it has had-(1) An annual inspection in accordance with Part 43 of this chapter and has been approved for return to service...."

The pilot could not determine the date of his last biennial flight review. Additionally, FAA personnel stated that the pilot's medical certificate was expired at the time of the accident.

Pilot Information

Certificate:	Private	**Age:**	56,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:**	No
Medical Certification:	Class 3 Expired	**Last FAA Medical Exam:**	March 21, 1996
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	American	**Registration:**	N5864L
Model/Series:	AA-5 AA-5	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	AA5-0064
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 23, 1998 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2894 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated	**Engine Model/Series:**	O-320-E2G
Registered Owner:	REGISTRATION PENDING	**Rated Power:**	150 Horsepower
Operator:	JAMES R. SULLENS	**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:**	Dusk
Observation Facility, Elevation:	BFM ,26 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	57°
Lowest Cloud Condition:	Scattered / 6500 ft AGL	**Visibility**	8 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	80°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	14°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(2R5)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	16:59 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	ST. ELMO 2R5	**Runway Surface Type:**	
Airport Elevation:	133 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 None	**Latitude, Longitude:**	30.50966,-88.26918(est)

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	MIKE MITCHELL; BIRMINGHAM , AL DAVID H MILLER; HOUSTON , TX
Original Publish Date:	March 2, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47891