National Transportation Safety Board
Aviation Accident Final Report

Location:	NEW SMYRNA BCH, FL	**Accident Number:**	MIA97FA152
Date & Time:	05/02/1997, 1313 EDT	**Registration:**	N5057F
Aircraft:	Bellanca 8KCAB	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

While circling flying southbound, the engine was heard to run for about 4-5 seconds then quit for about 2-4 seconds with the cycle repeated. An approximate 600-acre sod farm was located 1.29 nautical miles west of the location of the airplane at that time. The airplane was observed to continue flying southbound while circling then the airplane was observed flying low over trees and circled 2 times over a field sparsely occupied by trees. The airplane then rolled inverted and impacted the ground slightly inverted. Examination of the flight controls revealed no evidence of preimpact failure or malfunction. Examination of the engine revealed that the mixture control cable was separated from the control arm at the servo fuel injector. A non-aviation washer was used in the mixture control cable installation and was found failed. The cable attach hardware was in place. No engine mechanical failure or malfunction was noted. Bench testing of the impact damaged servo fuel injector revealed the fuel flow to momentarily remain high when the throttle was reduced. Disassembly of the servo revealed that the fuel diaphragm stem was bent. The fuel servo was last overhauled in 1991, and the fuel diaphragm was reportedly replaced at that time but the part number of the installed unit at the time of the accident was not the same as the diaphragm after replacement.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: an in flight loss of control for undetermined reasons.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT

Factual Information

HISTORY OF FLIGHT

On May 2, 1997, about 1313 eastern daylight time, a Bellanca 8KCAB, N5057F, registered to a private owner, crashed into an open field near New Smyrna Beach, Florida. Visual meteorological conditions prevailed and no flight plan was filed for the 14 CFR Part 91 personal flight. The airplane was substantially damaged and the airline transport pilot, the sole occupant, was fatally injured. The flight originated about 1238 from Spruce Creek Airport, Daytona Beach, Florida.

A friend of the pilot observed him in the front seat of the airplane and stated that the engine was started after two or three attempts then while the pilot was taxiing to the runway, the pilot waved to him. The weather conditions at the time were reported to be "CAVU", a term used to describe unlimited ceiling and visibility; everything appeared normal.

A pilot-rated witness who was at his residence which was located 1.33 nautical miles due north of the crash site reported first hearing the engine which would run for 4-5 seconds then quit for 2-4 seconds then the cycle started again. The airplane at that time was just south of his house about 400-500 feet above ground level. The engine power interruption continued for about 4 minutes during which time while the engine was operating, the pilot would attempt to climb while circling. The circling continued while flying southbound and he reported occassionally losing sight of the airplane only to observe it climbing above the tree line. He estimated that during the flight the airspeed was 70-90 knots and while circling the bank angle was no more than 20-30 degrees. The last time he observed the airplane he estimated it was at 200 feet above ground level flying westbound. He did not witness the accident and reported a scattered layer of clouds at 3,500 to 4,000 feet. He further stated that there is a sod farm located west of his house. The distance from his house to a point about 300 yards west of the western edge of the approximate 600 acre sod farm was determined to be 1.29 nautical miles.

Several other witnesses closer to the crash site reported seeing the airplane circling two times low over the trees. One of the witnesses observed the airplane attempt to pull up then observed the airplane "...instead went down 'head' propeller forward." The other witnesses reported seeing the airplane go inverted then descend vertically to impact with the ground.

PERSONNEL INFORMATION

Information pertaining to the pilot is contained on page 3 of the Factual Report-Aviation. Additionally, his pilot logbook was not located therefore his flight time experience could not be exactly determined. According to his last FAA medical application form dated October 19, 1995, he indicated that he had a total civilian pilot time to date of 22,500 hours with 50 hours flown in the previous 6 months. According to his son who is a certified flight instructor, he gave his father a Biennial Flight Review in January 1997, in the accident airplane.

According to personnel who worked with or for the pilot in a cleaning business he owned, on the day of the accident, the pilot did not follow his routine of having a daily cup of coffee with an employee and he also reportedly tore up "IOU" notes from employees who owed him money. Additionally, on the day after the accident, an employee found a birthday card envelope in the freezer which was located in the back of the store that was owned by the pilot. The envelope was inscribed with "Dad" and "Thanks for the wonderful memories God knows I Love you both so much.We had a Hellava' good ride didn't we! Don't take life too seriously, its

only a temporary place.I'll wait for you on the other side.Dad.-------. The envelope was reportedly given to the pilot as part of a birthday card a year earlier. The individual who found the note stated that the writing which followed the word "Dad" was written by the pilot to his son and daughter-in-law. The individual who turned the note over to the Sheriff's Department investigator reported that the pilot's son and wife asked him not to talk to anyone. Another employee was also asked by the pilot's son, wife, and daughter-in-law not to talk to any investigator about the crash.

The envelope was analysed by personnel from the Volusia County Sheriff Department personnel and compared to known handwritten documents by the pilot. The handwriting style was similar.

AIRCRAFT INFORMATION

Information pertaining to the airplane is contained on page 2 of the Factual Report-Aviation. Review of the provided maintenance records (airframe and engine logbook) revealed that they contained information from the first production test flight to an entry dated April 1, 1991, in which the entry indicated that the airplane was inspected in accordance with an annual inspection. Additional Aircraft Logbook information from April 29, 1991, to January 14, 1992, was reviewed which revealed that there was no record of another annual inspection. Additionally, on June 25, 1991, the maintenance records reflects that the servo fuel injector was removed for overhaul. According to paperwork from the facility that overhauled the servo fuel injector, in part, the fuel diaphragm was replaced.

According to the pilot's son, the airplane was last inspected in accordance with an annual inspection in May of 1996, by an unknown person. No determination could be made as to who last inspected the airplane. The pilot's son further stated that the last time he flew the airplane "was approximately 3 weeks maximum prior to the day of 2 May 97" and "I had no problems with the aircraft (airframe or engine) during this flight." That was the last time he had observed the aircraft and engine logs which were located inside the airplane. According to the owner of a fixed base operator at the departure airport, review of their records revealed that no work was done by his facility to the accident airplane between July 1, 1996, and May 4, 1997, when he was asked for maintenance information on that day by the NTSB Investigator-In-Charge.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed in the area at the time of the accident. Additional weather information is found on page 4 of the Factual Report-Aviation.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed that the airplane crashed into a field which sparsely contained trees and was located 5.85 nautical miles and 200 degrees from the departure airport. The airplane was observed to be nearly inverted with the wings slightly greater than perpendicular to the ground with the empennage inverted and displaced to the left. All components necessary to sustain flight were in the immediate vicinity of the crash site. The airplane was observed on a magnetic heading of about 190 degrees. Chordwise crushing was noted to both wings and ground scars from the wing tips, wing leading edges, and both main landing gears was noted. No fire was noted but browning of grass was noted north of both wings. Examination of the rudder flight controls revealed control cable continuity from the control surface to the rear seat rudder pedals. Continuity to the front seat rudder pedals

was also verified. Examination of the aileron and elevator flight control cables revealed continuity at each control surface to the rear seat control but the attach points at the rear control stick were failed. Examination of the fracture surfaces exhibited evidence of overload failure. Examination of the rudder revealed a hole in the fabric on the left lower side of the rudder nearly in-line with the position light. The hole corresponded with the trim tab attach hardware for the left elevator trim tab. The left elevator was observed to be displaced down near the tip and the outboard portion of the left elevator trim tab was observed to be displaced up. The emergency locator transmitter was located. See tests and research section of this report. The gascolator screen was examined and found to be clean.

Examination of the forward cockpit revealed that the mixture and throttle controls were full forward. The fuel selector was found in the "off" position and impact damage was noted to the handle. Examination of the servo fuel injector which was impact damaged revealed that the throttle control was in the full open position and the mixture control was in the "idle-cutoff" position. The throttle control cable rod end was connected to the throttle control arm but the rod end was failed at the threaded end due to impact damage. The mixture control cable was observed to be separated at the mixture control arm. The mixture cable attach hardware which consisted of a bolt, two washers, a nut, and a cotter key were observed to be in place. The attach hardware was removed for further examination. See tests and research section of this report. The engine was removed for further examination.

Examination of the engine revealed crankshaft, camshaft, and valve train continuity. The right magneto was tightly secured to the accessory case but impact damage precluded testing. The left magneto was partially separated from the accessory case which precluded determination of magneto to engine timing. The drive portion of the magneto was rotated by hand and spark at all towers was noted. Examination of the propeller revealed that both blades were bent aft with evidence of chordwise scratches noted on one of the blades. The engine was disassembled which revealed badly spalled faces of the hydraulic tappet bodies and associated wear of the camshaft lobes was noted. Additionally, foreign objects were found in the engine oil sump pan which included a broken snap ring, and the threaded portion of a small screw with attached nut. The engine-driven oil pump was removed from the accessory section and examination of the inside housing revealed it was scored and the oil pump gears were gouged. The air filter was observed to be in place and no blockage of the air induction system was noted. The engine-driven fuel pump received impact damage. The servo fuel injector inlet screen was determined to be clean and the servo was removed for bench testing which revealed minor discrepancies. (See the tests and research section).

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examination of the pilot was performed by Ronald L. Reeves, M.D., of the Volusia County Medical Examiners Office, Daytona Beach, Florida. The cause of death was listed as blunt force trauma and the manner of death was listed as suicide.

Toxicological analysis of specimens of the pilot was performed by the FAA Toxicology and Accident Research Laboratory and the Wuesthoff Memorial Hospital. The results of analysis by the FAA was negative for volatiles and tested drugs. Carbon monoxide and cyanide testing was not performed due to lack of a suitable specimen. The results of testing by Wuesthoff was negative for carbon monoxide, volatiles, salicylate, cannabinoids, cocaine metabolite, opiates, and benzodiazepines. Caffeine, nicotine, and nicotine metabolite were detected in the urine.

TESTS AND RESEARCH

Examination of the impact damaged servo fuel injector revealed that the throttle valve was adjusted .014 inch greater than specification at idle which resulted in a fuel flow of 6 pounds per hour greater than specified. Additionally, examination of the exterior portion of the servo revealed a seal which partially covered the brass hex plug. The seal was imprinted with the letter "M" and wire was observed beneath the crimped seal. Bench testing of the servo revealed the fuel flow at full throttle and midrange were within limits however during smooth throttle reduction, the fuel flow momentarily remained high. Disassembly of the servo revealed that the fuel diaphragm stem was bent. Comparison of the part number of the installed fuel diaphragm with the overhaul records revealed a discrepancy. In accordance with overhaul procedures effective on September 20, 1982, the installed fuel diaphragm by part number was required to be changed.

Review of the type certificate data sheet and FAA list of Supplemental Type Certificates for the accident airplane revealed no listing for the installed propeller by make and model. Review of the available maintenance records revealed no entry which indicated installation of the propeller.

Examination of the installed emergency locator transmitter revealed that the battery expired in May 1996. Testing of the unit revealed it was not operational due to a dead battery.

Examination of the separated mixture control cable revealed that the end contained two nearly 45-degree angle cuts which formed a peak about the middle. Examination of the securing hardware revealed that a non-aviation washer was used to secure the cable. The washer contained indentations similar in width to the cable and the washer was observed to be failed. Examination of the bolt revealed the cable hole was drilled at about a 45-degree angle from the predrilled cotter key hole. According to the airplane type certificate holder, the cable hole is required to be drilled in line with the predrilled cotter key hole.

ADDITIONAL DATA/INFORMATION

The wreckage minus the retained servo fuel injector and a section of the mixture control cable assembly was released to Investigator J.R. Johnson of the Volusia County Sheriff's Department on May 4, 1997. The retained components and materials were shipped via Federal Express in two boxes on December 2, 1997. Both boxes were delivered at 1354 local time on December 4, 1997, to the home address of the pilot's son and were signed for by a "S. May." The wreckage release form which was included in one of the boxes was not returned as requested.

Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	61, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	10/19/1995
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	22500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N5057F
Model/Series:	8KCAB 8KCAB	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	545-79
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	AEIO-320-E2B
Registered Owner:	LESTER H. & MARGARET A. MAY	**Rated Power:**	150 hp
Operator:	LESTER H. & MARGARET A. MAY	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	DAB, 35 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	1253 EDT	**Direction from Accident Site:**	2°
Lowest Cloud Condition:	Scattered / 3400 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	None / 0 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	Variable	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	27°C / 18°C
Precipitation and Obscuration:			
Departure Point:	DAYTONA BEACH, FL (44J)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	1238 EDT	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	TIMOTHY W MONVILLE	**Report Date:**	11/06/1998
Additional Participating Persons:	ALAN NEMCIK; ORLANDO, FL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		