



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	ALVIN, TX	<b>Accident Number:</b>	FTW99FA018
<b>Date &amp; Time:</b>	11/02/1998, 1630 CST	<b>Registration:</b>	N21EE
<b>Aircraft:</b>	Morrissey RUTAN LONG EZE	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	1 Fatal, 1 Serious
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The airplane impacted a rice harvesting combine during a forced landing following a loss of engine power. The pilot stated that during cruise flight the 'engine rpm dropped rapidly' and turning on the fuel boost pump, switching the fuel selector from left to right then back to left, and checking the magneto switch did not restore engine power. The pilot did not recall checking the carburetor heat or the mixture control. During the final approach to a dirt road, which ran between two rice fields, the pilot realized that he was not going to clear the rice combine parked adjacent to the dirt road and leveled the wings just prior to impact. Examination of the engine revealed that there was a broken fuel line fitting on the output side of the engine driven fuel pump. The fitting was replaced and the engine was test-run for 20 minutes at various power and mixture settings. No anomalies were noted during the test-run. An NTSB metallurgist found that the fracture surface of the fuel line fitting 'contained ductile dimple features, typical of overstress separations.'

## Probable Cause and Findings

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

## Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL  
Phase of Operation: CRUISE - NORMAL

### Findings

1. (F) REASON FOR OCCURRENCE UNDETERMINED  
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Occurrence #2: FORCED LANDING  
Phase of Operation: DESCENT - EMERGENCY  
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Occurrence #3: IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: EMERGENCY DESCENT/LANDING

### Findings

2. OBJECT - VEHICLE

## Factual Information

### HISTORY OF FLIGHT

On November 2, 1998, approximately 1630 central standard time, a Morris Rutan Long EZE homebuilt experimental airplane, N21EE, co-owned by five private individuals and operated by one of the co-owners, was substantially damaged during a forced landing following a complete loss of engine power near Alvin, Texas. The private pilot received serious injuries and his passenger sustained fatal injuries. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations (CFR) Part 91 personal flight. The local flight departed at approximately 1600 from the Clover Airport near Houston, Texas.

During interviews conducted by the NTSB investigator-in-charge (IIC) and another NTSB investigator, the pilot stated that on the day of the accident, he had completed a preflight inspection of the airplane which included checking the fuel tanks for water. Prior to the accident flight, he took a friend flying for about 40 minutes. Neither he nor the friend reported any discrepancies during that flight. Another friend, who added fuel to the aircraft, stated that the left tank was 3/4 full and that the right tank was full prior to the accident flight.

The pilot further reported that during cruise flight at about 2,500 feet msl, the engine rpm decreased "like pull[ing, the] throttle quick." He asked the passenger if he had pulled the throttle to idle, and the passenger answered in the negative. He then engaged the electric fuel boost pump, and the fuel pressure increased to 8 p.s.i. He then rotated the fuel selector handle from the left tank to the right tank. He did not notice a change in rpm and switched the fuel selector back to the left tank. He also stated that he checked the magnetos. The pilot stated that he did not remember checking the carburetor heat or mixture control. He then pumped the engine fuel primer which produced a 300 to 400 RPM increase. The primer was not returned to the locked position prior to the impact.

The pilot also reported that he turned the airplane toward the Clover Airport; however, realizing the airplane would not be able to reach the airport, he elected to make a forced landing to a dirt road that ran between two rice fields and parallel to a water canal. During final approach, he realized that the airplane would not clear an International Farm Combine (utilized for harvesting rice) that was parked adjacent to the dirt road. He leveled the wings just prior to impacting the farm equipment.

Local authorities reported that during the rescue operations, "the pilot stated that the engine quit." Witnesses located approximately one mile from the accident site reported hearing a "sudden shut off of engine noise" as they observed the airplane.

When the airplane did not return to the non-towered Clover Airport, pilots at the airport initiated a search. At 0900 the following morning, the airplane was located by a man driving to work. Local authorities responding to the site reported that the seat belts were not secured on the occupants.

### PERSONNEL INFORMATION

The pilot, who was occupying the front seat, held a private pilot certificate and was issued a third class medical certificate on May 27, 1997. According to the pilot's logbooks, he had accumulated 224 total flight hours, of which 38 hours were in the same make and model as the accident aircraft. The pilot, who was one of the builders of the airplane, completed a biennial

flight review on July 9, 1997, in a Stinson 108-1 airplane.

The 76-year-old passenger, who was occupying the rear seat, was the certified repairman for the experimental aircraft. The passenger was issued a commercial pilot certificate in January 1985. However, his application for a medical certificate was denied on June 6, 1996.

#### AIRCRAFT INFORMATION

The canard wing, pusher engine, all composite airplane, serial number 1270, was issued an airworthiness certificate on December 18, 1991. The aircraft's maintenance records indicated that in February 1995, the airplane experienced an engine fire. During the engine fire, the cowling, lower fuselage, and the electrical wiring next to the engine compartment were damaged. The fire damage was repaired between 1995 and 1998. According to the maintenance records, the certified repairman for the Long EZE endorsed a condition inspection on June 16, 1998. On October 28, 1998, the pilot made the first solo test flight (Hobbs time of 79.8 hours) since the occurrence of the engine fire. The flight lasted approximately 40 minutes and no discrepancies were noted.

The airplane was powered by a Lycoming O-235-C engine, serial number 1089-15. An Ellison Fluid Systems, Inc., EFS-3 (serial number 1083) pressure carburetor was installed on the engine.

#### WRECKAGE INFORMATION

The fuselage, with the engine intact, came to rest (29 degrees 25 minutes North; 095 degrees 17 minutes West) inverted against the upslope of the water canal dyke which ran parallel with the dirt road that the pilot had selected for the forced landing. The initial impact point was the rice combine parked adjacent to the dirt road. The wreckage distribution path extended on a measured magnetic heading of 064 degrees for a distance of 86 feet. Numerous pieces of fiberglass from the forward canard and left wing were found on the combine. The right main landing gear and gear struts were also found on the combine. Physical evidence indicated that the left main tire struck a hinged inspection door of the combine. Both wings were separated from the fuselage. The left wing was found 27 feet from the combine, and the outboard portion of the right wing was found 43 feet from the combine. The nose gear, front canard, emergency locator transmitter, and the inboard portion of the right wing were found along the edge of the drainage ditch, which ran along the south side of the dyke. See the wreckage diagram for additional information.

Flight control continuity was compromised where the wings separated from the fuselage. The cables at the wing roots were pulled by hand and proper movement of the flight controls was observed. The speed brake (located on the bottom of the fuselage) was found in the deployed position; however, the speed brake contained impact scrapes that matched scrapes found on the bottom of the fuselage, indicating that it was stowed at the time of impact.

During an examination of the cockpit, the throttle and mixture controls were found in the full forward position, and the carburetor heat was in the off position. The fuel selector was found selected to the left tank and the primer pump was found in the unlocked position. The magneto switch was in the both position and the fuel pump switch was found in the off position.

The integrity of the composite fuel tanks was compromised, and physical evidence of fuel in the drainage ditch water was noted. It was estimated by the NTSB investigator that the total

amount of fuel on board at the time of the accident was 39.5 gallons.

Initial examination of the engine revealed that the engine was still attached to the engine mounts. The wooden propeller was attached to the crankshaft, and there was no leading edge damage or scraping on either blade. During the examination, it was noted that the fuel line fitting at the output side of the engine driven fuel pump was separated. The fuel fitting was photographed and removed for further examination at the NTSB Materials Laboratory in Washington, D.C.

The airplane was moved to the owner's hangar for further examination and an engine test run. When the propeller was hand rotated, valve movement was observed on all cylinders and continuity was confirmed to the accessory case at the rear of the engine. Fuel was found in the engine driven fuel pump line. When the engine gascolator filter was removed and examined, no evidence of water or debris was found. The automotive gasoline tank and filter that the owners used to fuel the airplane were examined, and no evidence of water or debris was found in the tank. The gasoline tank was then connected to the engine fuel line where it attaches to the fuel selector. The airplane fuselage was secured to a trailer prior to the engine run. The separated fuel fitting was replaced with a serviceable fitting. The engine was primed using the airplane's electric fuel boost pump. The engine was started using an outside power source to operate the starter. The engine was operated for a total of 20 minutes through its power range utilizing the front and aft seat throttle controls. No discrepancies were noted during the engine run.

The magneto test could not be performed during the engine test run because the ignition switch lines had been cut during the rescue operation. However, no discrepancies were noted during the engine test run. For more information on the engine test run see the enclosed manufacturer's engine report.

The integrity of the fuel lines and the fuel vent lines was tested by applying compressed air through the fuel lines. Fuel tank screens were clear and no blockage was detected in the fuel system. Examination and disassembly of the engine driven fuel pump did not reveal any anomalies.

The Ellison Fluid Systems carburetor was removed after the test run for subsequent examination at the manufacturer's facility.

#### METEOROLOGICAL INFORMATION

At 1650, the weather observation for Ellington Field (located 15 miles northeast of the accident site) was wind from 290 degrees at 8 knots, visibility 10 statute miles, sky clear, temperature 72 degrees Fahrenheit, dewpoint 52 degrees Fahrenheit, altimeter setting 29.82 inches of Mercury.

At 1653, the weather observation for Galveston Airport (located 25 miles southeast of the accident site) was wind from 270 degrees at 8 knots, visibility 10 statute miles, sky clear, temperature 73 degrees Fahrenheit, dewpoint 54 degrees Fahrenheit, altimeter setting 29.82 inches of Mercury.

#### MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the passenger by Forensic Pathology Services in Texas City, Texas. Aviation toxicological testing was performed by the FAA Civil Aeromedical Institute (CAMI), Oklahoma City, Oklahoma. Toxicology tests for drugs and alcohol were negative,

except for Salicylate (aspirin) found in the urine.

## SURVIVAL ASPECTS

Search and rescue operations were initiated after the pilots at the airport reported the overdue airplane. Units of the Civil Air Patrol flew over the area in search of an emergency locator transmitter (ELT) signal. The airplane's ELT was destroyed upon impact. Its pre-impact location was in the nose section of the airplane. Examination of the manufacturing blue prints revealed that the recommended location of the ELT was in the wing root area.

## TESTS AND RESEARCH

The carburetor (Ellison Fluid Systems model EFS-3, serial number 10830) was examined at the manufacturer's facility under the supervision of an NTSB investigator. A tear-down inspection was performed to check for internal anomalies, and an operational test was conducted to confirm that the carburetor supplied adequate fuel to the engine. No anomalies were found which would have caused intermittent operation of the carburetor. See the enclosed manufacturer's examination report for more information.

The ignition switch was disassembled and examined by an NTSB investigator and an FAA inspector. The ignition switch was found in a clean condition and did not show any signs of corrosion or carbon tracking. A continuity test was conducted on the ignition switch on June 10, 1999. No anomalies were noted that would have prevented the operation of the ignition switch.

The NTSB metallurgist reported that examination of the engine fuel line fitting under a scanning electron microscope, revealed that the fracture surface "contained ductile dimple features, typical of overstress separations." See the enclosed metallurgy report for more information.

## ADDITIONAL INFORMATION

The aircraft was released to one of the airplane's co-owners on November 4, 1998. The maintenance and pilot records were released to the FAA inspector on November 5, 1998.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	71, Male
<b>Airplane Rating(s):</b>	Single-engine Land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	05/27/1997
<b>Occupational Pilot:</b>	<b>Last Flight Review or Equivalent:</b>		
<b>Flight Time:</b>	224 hours (Total, all aircraft), 38 hours (Total, this make and model), 178 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Morrisey	<b>Registration:</b>	N21EE
<b>Model/Series:</b>	RUTAN LONG EZE RUTAN LONG	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	1270
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	06/16/1998, Annual	<b>Certified Max Gross Wt.:</b>	1325 lbs
<b>Time Since Last Inspection:</b>	2 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	81 Hours	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-235-C
<b>Registered Owner:</b>	OWEN G. MORRIS	<b>Rated Power:</b>	115 hp
<b>Operator:</b>	OWEN G. MORRIS	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	EFD, 34 ft msl	<b>Distance from Accident Site:</b>	15 Nautical Miles
<b>Observation Time:</b>	1650 CST	<b>Direction from Accident Site:</b>	35°
<b>Lowest Cloud Condition:</b>	Clear / 0 ft agl	<b>Visibility</b>	10 Miles
<b>Lowest Ceiling:</b>	None / 0 ft agl	<b>Visibility (RVR):</b>	0 ft
<b>Wind Speed/Gusts:</b>	8 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	290°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29 inches Hg	<b>Temperature/Dew Point:</b>	22° C / 11° C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	HOUSTON, TX (T02)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>		<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	1600 CST	<b>Type of Airspace:</b>	Class G

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal, 1 Serious	<b>Latitude, Longitude:</b>	

## Administrative Information

**Investigator In Charge (IIC):** JOYCE ROACH **Report Date:** 03/31/2000

**Additional Participating Persons:** TOM LATSON; HOUSTON, TX

**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](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).