



National Transportation Safety Board Aviation Accident Final Report

Location:	Harrison, AR	Accident Number:	FTW04FA006
Date & Time:	10/08/2003, 1825 CDT	Registration:	N680WS
Aircraft:	Twin Commander Acft. Corp. 680FL	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The twin-engine airplane was on the base leg to final turn, about 1-1 1/2 miles from the approach end of the runway when the left engine lost power. Instantly after, the right engine lost power and the pilot feathered both engines. The airplane then impacted a 70-foot high tree and collided with the ground about 1,000 feet short of the runway. The 700-hour pilot reported that he activated the electric fuel boost pumps and switched the fuel selectors from the auxiliary fuel tank positions to the main fuel tank positions, about 17 miles from the airport. He recalled that the fuel gauges indicated approximately 70 gallons of fuel in the main tank and about 10-15 gallons of fuel in the auxiliary tanks. The original installed fuel system was configured with a center tank and two outboard tanks. The center tank was composed of five, interconnected rubber cells, having a total capacity of 150 to 159 US gallons. Each outboard fuel tank was composed of two fuel cells with a combined capacity of 33.5 gallons. The total of the two outboard fuel tanks (four cells) was 67 gallons, providing a total usable capacity of 233 gallons. Each engine had its own fuel shutoff switch. Rotating a switch to the RIGHT OUTBOARD or LEFT OUTBOARD position allows fuel from the outboard tanks to flow to the respective engine and shuts off fuel from the center tank. Rotating a fuel shutoff switch to the CENTER position allows fuel to flow from the center tank to the respective engine, and shuts off flow from the respective outboard tank. Rotating the switch to the OFF position shuts off all fuel flow to the respective engine. There was no cross-feed configuration of the switches. Documentation was found in the historical records that indicated extended range fuel system modifications, however, the information was incomplete. After review of all available records and examination of the wreckage, it was determined that the fuel system configuration/capacity of the airplane at the time of the accident was: 156 gallons for the center tank system; 67 gallons for the outboard wing tanks; and a set of auxiliary tanks capable of holding 21 gallons (records of installation unknown). The total usable fuel capacity was estimated at 244 gallons. Cockpit fuel selector positions were: LEFT Fuel Shut Off Valve Selector-LEFT HAND OUTBOARD; LEFT Fuel Boost Pump-OFF; LEFT Engine Primer-OFF; LEFT Ignition Switch-RIGHT; RIGHT Fuel Shut Off Valve Selector-RIGHT HAND OUTBOARD; RIGHT Fuel Boost Pump-ON; RIGHT Engine Primer-OFF; RIGHT Ignition Switch-BOTH. Airframe fuel shutoff valves were found in the following positions (Each valve

position corresponded to the cockpit selectors): Right Wing Auxiliary-OPEN; Right Wing Main-CLOSED; Left Wing Auxiliary-OPEN; Left Wing Main-CLOSED. A total of 37.5 gallons of usable fuel was drained from the uncompromised tanks (unknown amount had leaked at the accident site). Excerpts from the "Normal Procedures" section of the flight manual regarding fuel selector positions for take off and landing: "CAUTION; Burn center tank fuel first, when 100 gallons is shown on center tank gauge, switch to outboard tanks. Do not allow engine to be starved of fuel when outboard tanks run dry. Select center tanks at first indication of fuel pressure loss. Fuel boost pumps must be on when switching tanks." The "BEFORE LANDING CHECK" procedures in the aircraft flight manual state that the Fuel Selector Valves must be in the "CENTER TANK" position before the approach. The manufacturer stated that the simultaneous loss of power of both engines was likely a result of the outboard fuel tanks unporting. No mechanical anomalies were found during examination of the engines or airframe, and usable fuel was available in the center tank at the time of the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of power to both engines due to fuel starvation as a result of the pilot's failure to complete the landing checklist while on final approach. A factor contributing to the accident was the lack of suitable terrain for the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings

1. ALL ENGINES
 2. (C) FLUID,FUEL - STARVATION
 3. (C) PROCEDURES/DIRECTIVES - NOT PERFORMED - PILOT IN COMMAND
-

Occurrence #2: FORCED LANDING

Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

4. OBJECT - TREE(S)
-

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - GROUND
6. (F) TERRAIN CONDITION - NONE SUITABLE
7. TERRAIN CONDITION - HIGH VEGETATION

Factual Information

HISTORY OF FLIGHT

On October 8, 2003, approximately 1825 central daylight time, a Twin Commander 680FL, twin-engine airplane, N680WS, registered to War Eagle Aviation LLC., of Wilmington, Delaware, and operated by Community First Bank of Harrison, Arkansas, was destroyed when it impacted terrain following a loss of power to both engines while on final approach to land on runway 18 at Boon County Airport (HRO), near Harrison, Arkansas. The private pilot and a pilot rated passenger sustained serious injuries. Visual meteorological conditions prevailed and a flight plan was not filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight originated from the Springdale Municipal Airport (ASG), Springdale, Arkansas at 1745.

During an interview conducted by the NTSB investigator-in charge (IIC), the pilot stated that he had flown the airplane from HRO to St. Louis, Missouri, and then flew to ASG to pick up the pilot-rated passenger for the final leg of the flight back to HRO. The pilot and pilot rated passenger stated that during the departure sequence from ASG, both fuel selectors were in the main tank positions. The pilot leveled off at 5,500 feet MSL, turned the electric fuel boost pumps to the "on" position, switched the fuel selectors to auxiliary fuel tank positions, then turned the electric fuel boost pumps to the "off" position. Approximately 10 to 15 minutes later, about 17 miles from the airport, the pilot activated the electric fuel boost pumps and switched the fuel selectors from the auxiliary fuel tank positions to the main fuel tank positions. The pilot recalled that the fuel gauges indicated approximately 70 gallons of fuel in the main tank and about 10-15 gallons of fuel in the auxiliary tanks. The flight continued to the destination airport for approximately 5-7 minutes, entered the pattern, lowered the landing gear, and selected "approach" flaps. Upon completion of the base leg to final turn, approximately 1-1.5 miles from the approach end of runway 18, the airplane yawed to the left and the left engine "quit." The pilot rated passenger stated, "I think it's the left engine," and then the right engine "quit." Both left and right propellers were feathered. The airplane then impacted a 70-foot high tree about 45 feet from ground level, impacted the ground 50 yards from the tree, and came to rest in a ditch approximately 1,000 feet short of Runway 18.

Four witnesses who heard and observed the airplane just prior to and during the accident reported the following information to the NTSB IIC:

#1: The manager of a fixed base operator (FBO) on the airport stated that he heard a normal radio transmission from N680WS on UNICOM frequency to enter the pattern for runway 18. Next, he heard the downwind radio call and he didn't think that it was the pilot's voice on the radio. Shortly after that he heard another radio call from N680WS, which was, "final for 18." He stated that he recognized that this last transmission was the pilot's voice.

#2: A lineman for the FBO first "heard" engines and observed the airplane as it came over the airport from the west. He stated that the airplane looked normal, and then the airplane made a left turn onto downwind, and continued. Next he observed N680WS turn left onto base then final. Once established on final he noticed that both engines had stopped, and then the left wing drooped and the airplane went below the horizon.

#3: A person, who was burning leaves 1.5 miles northeast of the approach end of runway 18, stated that he heard the airplane fly over and then heard a "backfire sound coming from it." He

"didn't think anything about it because [he heard] planes all the time, and sometimes they cut their power to practice landings." He added that about a minute or two later, he and his girlfriend heard two "crashing" sounds.

#4: A person, who was driving a vehicle on Hwy 65 just north of the approach end of runway 18, stated that he saw the airplane on final approach to runway 18. He observed that the right engine was not turning and the propeller was feathered. He drove under the airplane as it crossed over U.S. 65, he stated that he thought "he's not going to make it, he looked too low", the airplane then went behind the tree line and was obscured. When a break in the tree line appeared he saw the airplane hit the ground well short of the runway on the tapered safety area, the airplane bounced up with the left wing down approximately 15-20 degrees.

PERSONNAL INFORMATION

The pilot's private pilot certificate was issued on June 23, 1975. His seaplane rating was issued on June 7, 2002. His instrument rating was issued on February 3, 2003 and multi-engine rating was issued on April 2, 2003. According to entries in the pilot's logbook and entries in the flight logbook for N680WS, the pilot's total flight time as of his last logbook entry on May 22, 2003, was 624.7 hours. Entries in an additional flight log, showed that the pilot had flown the accident airplane approximately 86 hours since May 22, 2003. Several airmen, who had either flown with or had given the pilot instruction, reported that he was a safe and "meticulous" pilot.

AIRCRAFT INFORMATION

The 1964 model 680FL Commander was manufactured on May 1, 1964, and its current registration was dated November 15, 2001. The airplane had a "Standard" Airworthiness Certificate Type, and was approved for normal operations. According to entries in the aircraft's maintenance logs, the last annual inspection was completed on May 27, 2003, at 9,362.3 hours of operation. The airplane was equipped with 2 IGSO-540-B1A engines with Hartzell HCB3Z30-2B propellers. According to entries in the engine logs, the left engine, s/n L-593-50, had accumulated 375.3 hours since its last major overhaul completed on November 21, 2001. The right engine, s/n L-2135-50, had accumulated 450.1 hours since its last overhaul completed on March 7, 1993. According to the records, both engines were last inspected on May 27, 2003.

Fueling records revealed that the airplane was fueled with 133.7 gallons of 100LL aviation grade fuel at Harrison Jet Center, Harrison Arkansas, prior to the departure. During an interview with the fueling technician from Harrison Jet Center, he stated that he fueled the left auxiliary first, then the pilot took the ladder and checked the oil in both engines, then returned the ladder to the technician, who then fueled the main fuel tank, and the right auxiliary fuel tank. The technician then rechecked the main fuel tank to see if there had been any change in the level of the fuel during the fueling sequence, there was none. The technician stated that the fuel tanks were "filled to the tabs."

According to aircraft historical records, the airplane was originally delivered new with a fuel system capacity of 223 usable gallons. The system consisted of the following components:

Center tank and sumps with low point drain.

Left inboard fuel cell

Left inboard aft cell

Left electromechanical shut off valve

Right electromechanical shut off valve

Left outboard tank system has a capacity of 33.5 gallons

Left outboard forward fuel cell

Left outboard aft fuel cell with low point drain.

Left electromechanical shut-off valve

Right outboard tank system has a capacity of 33.5 gallons

Right outboard forward fuel cell

Right outboard aft fuel cell with low point drain.

Right electromechanical shut off valve

According to the airplane maintenance manual, the original installed fuel system was configured with three tanks; the center tank and two outboard tanks. The center tank is composed of five, interconnected, synthetic rubber cells, having a total capacity of 150 to 159 US gallons. Each outboard fuel tank is composed of two fuel cells with a combined capacity of 33.5 gallons. The total of the two outboard fuel tanks (four cells) is 67 gallons, providing a total usable capacity of 233 gallons when all three tanks are filled. Fuel from the tanks flows through fuel supply lines to the fuel shutoff valves, fuel strainers, and to the fuel injector which delivers the fuel, under pressure, to the supercharger impeller. The fuel shutoff switches, located on the overhead cockpit switch panels, control the flow of fuel to the engines. Each engine has its own fuel shutoff switch. Rotating a switch to the RIGHT OUTBOARD or LEFT OUTBOARD position allows fuel from the outboard tanks to flow to the respective engine and shuts off fuel from the center tank. Rotating a fuel shutoff switch to the CENTER position allows fuel to flow from the center tank to the respective engine, and shuts off flow from the respective outboard tank. Rotating the switch to the OFF position shuts off all fuel flow to the respective engine. There is no cross-feed configuration of the switches.

A review of the airplane's available historical records revealed that several fuel system modifications had been installed. The earliest reference to an increased fuel capacity installation appeared on a copy of a Canadian Weight and Balance Statement, dated December 20, 1981, which showed a fuel capacity of 274 US gallons. The next reference to increased fuel capacity modification was in an airframe log dated, May 19, 1995, at an hour meter reading of 19.2 hours. The entry read: "Deactivated RH extended Range Aux fuel bladders and moved fuel filler to factory outboard nacelle bladder tanks. CLH was already deactivated previously by persons unknown. Placarded outboard fillers for 33.5 gallons." No additional documentation could be found regarding the details of these fuel system modifications.

On May 7, 2002, at hour meter reading 225.5 all fuel cells, except left inboard aft, which was installed on September 10, 1997, were replaced with new PMA approved Eagle fuel cells. The additional auxiliary tanks increased the total fuel capacity by 21 gallons, thus increasing the total usable fuel capacity from 223 gallons to 244 gallons. An entry in the airframe logbook dated May 7, 2002, stated: "Replaced all fuel cells except LT. INBD. AFT which was replaced 9/10/97. All replacement fuel cells were new manufacture received from Eagle Fuel Cells, Eagle River, Wisc. Cells were installed using all new gaskets, clamps and lacing. Aircraft was fueled to maximum capacity with no leaks noted. Aircraft was flown for 1 hour and proper fuel

feed and venting was evident."

During the examination of the wreckage, 4 additional auxiliary fuel cells per side were found installed with interconnects to the original system. It was noted that the low point drain for the left and right auxiliary tanks had been disabled and had been placarded.

Partial Invoice Summary of fuel cell replacement parts:

Work order No41902004 refers to P/N AT60-501 (5630060-501) LH INBD FWD cell.

Work order No41902005 refers to P/N AT60-502 (5630060-502) RH INBD FWD cell.

Work order No31402005 refers to P/N AT62-507 (5630060-501) LH INBD FWD cell.

Work order No32202008 refers to P/N AT61-502 (5630061-502) RH INBD AFT cell.

Work order No72401018 refers to P/N AT63-501 (5630063-501) LH OUTBD FWD cell.

Work order No81701018 refers to P/N AT63-502 (5630063-502) RH OUTBD FWD cell.

WAREHOUSE refers to P/N AT64-501(5630064-501) LH fuel cell.

WAREHOUSE refers to P/N AT64-502(5630064-502) RH fuel cell.

Work order No42402001 refers to the following part numbers:

P/N 64AT-507 (5630064-507) LH OUTBD AFT cell.

P/N 64AT-508 (5630064-508) RH OUTBD AFT cell.

P/N AT-304-1 (5630304-1) LH FWD INBD AUX cell.

P/N AT-304-2 (5630304-1) RH FWD INBD AUX cell.

P/N AT-301-1 (5630301-1) LH AFT INBD AUX cell.

P/N AT-301-2 (5630301-2) RH AFT INBD AUX cell.

P/N AT-296-1 (5630296-1) LH FWD OUTBD AUX cell.

P/N AT-296-2 (4530296-2) RH FWD OUTBD AUX cell.

P/N AT-302-2 (5630302-2) RH AFT OUTBD AUX cell.

According to the manufacturer, the proper PMA part numbers for the LH OUTBD FWD and RH OUTBD FWD cells should have been (5630063-503) and (5630063-504) respectively. The proper PMA part numbers for the LH OUTBD AFT and RH OUTBD AFT cells should have been (5630064-503) and (5630064-504) respectively.

Fuel Shut Off Valve Information:

Right Wing Auxiliary

Part number: AV 16B-1159; serial number D8033-0137

Right Wing Main

Part number: AV 16B-1159; serial number D3495-0048

Left Wing Auxiliary

Part number: AV 16B-1159 ; serial number D8033-0191

Left Wing Main

Part number: AV 16B-1159; serial number K3210-0066

After review of all available records and examination of the wreckage, it was determined that the fuel system configuration/capacity of the airplane at the time of the accident was: 156 gallons for the center tank system; 67 gallons for the outboard wing tanks; and a set of auxiliary tanks capable of holding 21 gallons. The total usable fuel capacity was estimated at 244 gallons. A search of available records did not reveal an FAA 337 field approval for the fuel system modification. Additionally, the aircraft flight manual (AFM) did not include information pertaining to the operation of the fuel system with the installed modification.

WRECKAGE AND IMPACT INFORMATION

The accident site was located within the airport perimeter on a grassy safety area in front of the approach end of runway 18. Evidence at the site showed that the airplane's left wing impacted a 70-foot high tree located about 1,200 feet north of the end of the runway, and about 150 feet left of the extended runway centerline. Remnants of the left wing were found south of the tree, about 50 feet left of the extended centerline, and 1,000 feet north of the end of the runway. The tree had impact signatures approximately 40 feet up from the base. The first evidence of the airplane's impact with the ground was a ground scar about 1,000 feet north of the runway and 125 feet left of the extended runway centerline. The ground scar was about 8-foot wide and 15-feet long, and corresponded to the width of the fuselage. The main wreckage was found laying on its right side in a 12-foot deep ditch, about 250 feet left of the extended centerline and about 750 feet north of the end of the runway. The nose of the airplane came to rest on a heading of 22 degrees magnetic. Both propellers were found in the full-feathered position, and the main and nose landing gears were extended.

The 70-foot high tree was found shattered and showed impact marks about 45 feet up from its base. A seven-foot outboard section of the left wing was found forward and to the right of the tree. The fuselage was found resting on its right side, separated and twisted at midpoint. The entire right wing was bent upward, aft, and 45 degrees clockwise from the fuselage. The main cabin and cockpit were found mostly intact with minimal bending and crushing.

Cockpit Documentation

Left Panel Instrument lights OFF

(Associated) Dimmer STOPPED on full CCW Position (Rheostat switch, full counterclockwise stop)

Right side Dimmer STOPPED on full CCW Position

Trim Wheels (Elevator and Rudder) Free spinning, or not attached to anything (were visually inspected and found to be in neutral position).

Engine Oil and Hydraulic Shut Off Switches OPEN POSITION (Guarded type)

Circuit breakers were not tripped.

Battery ON (3 positions ON, OFF, EXT. PWR.)

Left Generator ON

Right Generator ON
Cabin Lights OFF
Navigation Position Lights OFF
Beacon ON
Left Landing Gear Light OFF
Right Landing Gear Light OFF
Cabin Door Lock OFF
Windshield Alcohol OFF
Cabin Heat OFF
Cabin Blower OFF
Pitot and Fuel Vent Heat (left side) OFF, (right side) OFF.
Radios Switch 1 ON (These 2 switches power two avionics' busses)
Radios Switch 2 ON
Audio Amplifier ON
Inverter Switch 1 (3 position; 1, OFF, 2)
Propeller Deicer OFF
Strobe Light ON
De-Ice Single Cycle OFF (3 position; Cyc., OFF, AUTO)
Com 1 ON 123.00
Nav 1 ON 112.50
Auto Pilot Button OFF
LEFT Fuel Shut Off Valve Selector LEFT HAND OUTBOARD (3 positions; LHO, Center, OFF)
LEFT Fuel Boost Pump OFF
LEFT Engine Primer OFF (Guarded spring loaded switch)
LEFT Ignition Switch RIGHT (OFF, R, L, BOTH, START)
RIGHT Fuel Shut Off Valve Selector RIGHT HAND OUTBOARD (3 positions; RHO, Center, OFF)
RIGHT Fuel Boost Pump ON
RIGHT Engine Primer OFF (Guarded spring loaded switch)
RIGHT Ignition Switch BOTH (OFF, R, L, BOTH, START)

The left wing was found sheared off at a point just outboard of the standard equipment outboard fuel cells. The installation of additional fuel cells was observed at the shear. The outboard fuel cells were compromised and only residual fuel was present. The center fuel system low-point drain was found sheared off at the fuel sump. Fuel was visually observed

when the center section fuel filler cap was loosened. Total fuel drained from the aircraft during recovery was approximately 31.5 gallons. It was noted that the accident site had an odor of fuel, and the fuel that was drained was only the fuel that had not leaked from the compromised tanks prior to recovery.

The fuel shutoff valves were found in the following positions:

(Each valve position corresponded to the cockpit selectors)

Right Wing Auxiliary: OPEN POSITION

Right Wing Main: CLOSED POSITION

Left Wing Auxiliary: OPEN POSITION

Left Wing Main: CLOSED POSITION

TESTS AND RESEARCH

On October 13 and 14, 2003, the wreckage was examined and fuel system tests were conducted at Dawson Aircraft Inc., Clinton, Arkansas.

The fuel boost pumps were tested by supplying 24 volt DC power. Both pumps were found functional. Electrical power was supplied to each individual fuel shutoff valve while the movement of the valve position indicator was observed. All four valves were found to be opening and closing properly.

A test was devised to measure the amount of fluid that the uncompromised right wing could hold, and also determined at what angle that the outboard tanks would "unport" when tilted.

When the wing was lifted and leveled (to approximately level flight attitude, leftover fuel from the main tank began to pour from the center tank sump. The fuel was recovered and the quantity measured approximately six gallons (added to the 31.5 gallons recovered at the accident site, a total of 37.5 gallons of fuel was found in the uncompromised fuel cells of the wreckage). The outboard right wing sump was checked for residual fuel but none was found. Next, the forward outboard/auxiliary fuel cell was filled until reaching 25 gallons. The fuel level at the filler port was measured to be a half-inch high. The same fuel level was also measured at the opened port of the outboard aft fuel cell, at the 6 o'clock position, while looking from the rear. The level was found to be five and three eighths inches high.

The wing was stabilized by using an agricultural tractor equipped with a hydraulic fork that lifted the left side of the wing, under engine section. In addition, a truck equipped with a hydraulic structure was used to lift the right engine by its hooks. The lateral 0 degrees level of the wing was established by manually attaching a propeller protractor to the flat bottom section of the center fuel tank.

The fuel metering float unit was installed in the wing, and the outboard/auxiliary tank was filled to the filling port flap. Simultaneously, as the fuel tank became filled, water began to pour down from the fuel center tank sump. It was determined that this occurrence was only possible by a leak in the main tank shutoff valve (closed position), which allowed water to backflow through the auxiliary tank shutoff valve (open position), to the center tank sump.

It was determined that the total capacity of each wing tank system, including the four fuel cells

referred as the auxiliary fuel tank, was 50 gallons. In addition, it was also determined that the main fuel valve leak could have allowed fuel to flow from the main tank back into the right side auxiliary tank due to the lower position of the right wing as compared to the main fuel tank at the accident site.

Based on all of the findings, the aircraft had enough usable fuel on board at the time of the dual engine power loss. The manufacturer's representative stated that the loss of fuel supply to the engines while on approach was likely a result of the wing tank's becoming unported.

ADDITIONAL INFORMATION

Excerpts from the " Normal Procedures" section of the flight manual regarding fuel selector positions for take off and landing:

"CAUTION"

"Burn center tank fuel first, when 100 gallons is shown on center tank gauge, switch to outboard tanks. Do not allow engine to be starved of fuel when outboard tanks run dry. Select center tanks at first indication of fuel pressure loss. Fuel boost pumps must be on when switching tanks"

BEFORE LANDING CHECK

1. Safety Belts - FASTENED
2. Boost Pumps - ON
3. Fuel Selector Valves - CENTER TANK
4. Mixture - FULL RICH (Full Forward)
5. Check landing gear warning horn before extending landing gear
6. Landing Gear - DOWN

Pilot Information

Certificate:	Private	Age:	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With Waivers/Limitations	Last FAA Medical Exam:	02/01/2002
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	725 hours (Total, all aircraft), 86 hours (Total, this make and model), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Twin Commander Acft. Corp.	Registration:	N680WS
Model/Series:	680FL	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	1413-63
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	05/01/2003, Annual	Certified Max Gross Wt.:	8500 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	9362 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IGSO-540-B1A
Registered Owner:	War Eagle Aviation LLC	Rated Power:	365 hp
Operator:	War Eagle Aviation LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	HRO, 1365 ft msl	Distance from Accident Site:	
Observation Time:	2253 CDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	6 Miles
Lowest Ceiling:	Broken / 5500 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	80°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	27° C / 17° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Springdale, AR (ASG)	Type of Flight Plan Filed:	None
Destination:	Harrison, AR (HRO)	Type of Clearance:	Unknown
Departure Time:	1805 CDT	Type of Airspace:	

Airport Information

Airport:	Boone County Airport (HRO)	Runway Surface Type:	
Airport Elevation:	1365 ft	Runway Surface Condition:	
Runway Used:	NA	IFR Approach:	Unknown
Runway Length/Width:		VFR Approach/Landing:	Forced Landing; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious	Latitude, Longitude:	36.251111, -93.150278

Administrative Information

Investigator In Charge (IIC):	Alexander Lemishko	Report Date:	09/13/2005
Additional Participating Persons:	David Hall; FAA; Little Rock, AR John Butler; Lycoming; Williamsport, PA Geoffrey Pence; Twin Commander; Seattle, WA		
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 pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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](#).