National Transportation Safety Board
Aviation Accident Final Report

Location:	Rocksprings, Texas	**Accident Number:**	CEN09FA087
Date & Time:	December 14, 2008, 15:00 Local	**Registration:**	N43KM
Aircraft:	Beech C90	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot was cleared to 17,000 feet approximately 7 minutes after takeoff. After arriving at 17,000 feet, radar showed the airplane in a meandering flight path increasingly off course that continued through the end of the flight, even after several prompts from the controller. The pilot was cleared to flight level 240 (24,000 feet) after about 6 minutes at 17,000 feet, and about 2 minutes later, while passing through about 18,000 feet, he made his last radio transmission, acknowledging a corrected heading. About 6 minutes later, the airplane arrived at 24,000 feet and the pilot did not make any intelligible responses to controller inquiries for the remainder of the flight. At 1456, radar showed the airplane in a descent to 21,000 feet before beginning a rapid descent and continuing to impact. The airplane was substantially damaged by the impact forces and the pilot, who was the only occupant, was fatally injured. During the review of the air traffic control recordings, it was determined that none of the voice transmissions from N43KM sounded as if the pilot was speaking through an oxygen mask microphone. At the accident scene both bleed air switches were observed to be in the closed position and the airplane pressurization switch on the console was observed to be in the dump position. No other preimpact anomalies were observed that would have prevented the normal operation of the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to properly configure the pressurization controls, resulting in his impairment and subsequent incapacitation due to hypoxia.

Findings

Personnel issues	Lack of action - Pilot
Aircraft	Pressurization control system - Not used/operated
Aircraft	(general) - Not attained/maintained
Personnel issues	Hypoxia/anoxia - Pilot

Factual Information

HISTORY OF FLIGHT

On December 14, 2008, approximately 1500 hours central standard time, a Beech C90A King Air, N43KM, registered to and operated by Western Wings Corp., Roseburg, Oregon as a 14 CFR Part 91 flight, impacted terrain following a descent from cruise flight. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan had been filed. The airplane was substantially damaged by the impact forces. The commercial pilot, who was the only occupant, was fatally injured. The airplane had departed the Hondo Municipal Airport (HDO) Hondo, Texas at approximately 1425, en route to the Phoenix Goodyear Airport (GYR) Goodyear, Arizona.

The pilot was cleared to 17,000 feet approximately 7 minutes after takeoff. After arriving at 17,000 feet, the pilot began a meandering flight path increasingly off course that continued through the end of the flight, even after several prompts from the controller. He was cleared to flight level 240 (24,000 feet) after about 6 minutes at 17,000 feet, and about 2 minutes later, while passing through about 18,000 feet, he made his last radio transmission, acknowledging a corrected heading. About 6 minutes later, he arrived at 24,000 feet, and did not make any intelligible responses to controller inquiries at that time or for the remainder of the flight. At 1456 he descended to 21,000 feet before beginning a rapid descent. Several witnesses reported seeing the airplane just before it impacted terrain. The first call to 9-1-1 emergency was logged at 1500.

The accident flight was the first flight following an aircraft repaint at a Federal Aviation Administration (FAA) certificated repair station (CRS) at the HDO airport. Two mechanics at that CRS said the owner of N43KM and several other persons arrived in the owner's Falcon 10 "at 2:00 pm sharp". During the time before N43KM departed, the aircraft owner first took several photos of the newly painted airplane. They then observed that the owner spent several minutes in the cockpit with the pilot of N43KM. After a restroom stop the pilot then climbed back into N43KM, started the right engine first, left engine second, and then taxied out toward the north. While N43KM was stationary and facing north the owner got a cell phone call from the pilot in N43KM. The owner told the pilot "you have to switch the toggle switches for fuel transfer or you won't get any fuel". Several minutes after that cell phone call they heard the engines rev up and witnessed N43KM takeoff to the south on runway 17L. The aircraft made a normal takeoff and all three landing gears retracted.

Another witness was the owner of N43KM. His party, which included the accident pilot, arrived on a Falcon Jet flight from Oregon and landed at the HDO airport at 1345. After arrival the owner said he observed that the pilot of N43KM took 45 minutes to prepare and preflight the aircraft including about 10 minutes spent on an exterior preflight. The owner said he went into the cockpit with the pilot to verify his understanding of the Shadin fuel computer and he verified that the tanks were full of fuel and the pilot had plenty of fuel to make it to GDY. The pilot told the owner that he would most likely stop in EI Paso to refuel just for safety's sake. The owner then watched the pilot start the engines and taxi north to the end of runway 17. He heard the pilot perform the over-speed governor check, the auto-feather check, and the full

propeller feather check. Before taking the active runway, the pilot made a cell phone call to the owner to verify the position of the fuel switch positions on the fuel panel. The pilot confirmed that he had it correct and that he understood that nomenclature, but was just checking to make sure. The owner said he then observed the takeoff which appeared picture perfect.

A witness at the accident scene was a ranch employee who said he heard a loud bang and looked up and saw the airplane falling out of the sky in a slow spin with a lot of white smoke. The witness lost sight of the airplane prior to impact. The witness then went to the crash site where he saw another witness.

Another witness was an unnamed person that the owner of N43KM personally interviewed near the accident scene on the day after the accident. In a December 31, 2008 e-mail message the owner of N43KM wrote: “I then spoke to an eye witness who observed the aircraft coming down. The witness said the plane was in a spin all the way from altitude until impact. He thinks it took 2 to 3 minutes from when he first heard it until it crashed. He said it sounded like someone doing aerobatics. He believed, but was not sure the aircraft was spinning counterclockwise. This witness said he observed at least one of the engines depart the aircraft and saw smoke as the engine departed. This was shortly before he lost site of the airplane and heard the impact with the ground. He estimated the impact was 5 to 10 seconds after he saw the engine depart the aircraft. He said he continued to see pieces of aluminum raining down for quite some time after the impact”.

PERSONNEL INFORMATION

The pilot, age 67, held a commercial pilot certificate with airplane single-engine land, multi-engine land and instrument airplane ratings. The pilot was issued a second class medical certificate on April 29, 2008, with no restrictions.

The pilot's log book was not located during the investigation. Records provided by the aircraft owner show the pilot had an estimated 3,500 hours of pilot experience, of which 1,300 hours were in multi-engine airplanes with an estimated 250 hours of experience in the accident airplane.

The pilot completed the "BE-90/100/200, 61.157 Initial Course" at the Flight Safety training center at Long Beach, California on August 31, 2007. That training included 2.0 hours of ground training in King Air F-90 differences and included 10.0 hours of training in a King Air 200 Level C flight simulator. The pilot completed a biennial flight review (BFR) concurrent with the training course.

The pilot completed the "King Air 200 Recurrent Training course with 90 differences" at Jet Aeronautical LLC, El Cajon, California on October 15, 2008. That training included 8 hours of ground training in aircraft systems and flight procedures relating to the King Air 200/ F90 aircraft. It also included 6 hours of training in a King Air 200 advanced aviation training device (AATD). A BFR was not completed at that time.

AIRCRAFT INFORMATION

N43KM (s.n. LJ-1345), a model C90A King Air, was a low-wing, 7-place, multi engine land airplane manufactured by the Beech Aircraft Corporation in 1993. At the time of manufacture the airplane was originally equipped with two Pratt & Whitney Canada (PWC) turbo propeller PT6A-21 engines each rated at 550 horsepower, driving two McCauley 4-blade, constant speed, aluminum alloy propellers.

The airplane was equipped with a Bendix/King Enhanced Ground Proximity Warning System (EGPWS).

A review of the airplane logbooks and FAA Records revealed the following:

The airplane was being maintained in accordance with the manufacturer's inspection program. A CRS in Medford, Oregon installed two PWC PT6A-135A engines in accordance with Blackhawk Modification, STC SA10341SC and two Hartzell 4-blade propellers were installed in accordance with Raisbeck Engineering, STC SA3593NM. A new cabin door seal P/N 50-430043•1211 and seal assembly P/N 50-430061-21 were installed and a pressurization check was performed in accordance with Beechcraft Maintenance Manual Chapter 21-30-00. No discrepancies were reported. The airplane oxygen tank and oxygen regulator were removed for testing and overhaul, reinstalled, and the oxygen tank was serviced. The most recent inspection, a phase four inspection, was completed by the CRS on October 24, 2008, at 3711.5 total flight hours.

At the time of the accident the airplane had accumulated a total of 3,725.1 flight hours and was powered by two PWC turbo propeller PT6A-135A engines (s.n. PCE-PZ0797 and s.n. PCE-PZ0798) each rated at 550 horsepower, driving Hartzell 4-blade, constant speed, aluminum alloy propellers

On November 8, 2008, the airplane was flown to the HDO airport to be re-painted. The flight control surfaces were removed before painting the airframe, and were then balanced and re-installed on the airframe. The re-paint was completed at 3724.7 total flight hours. There were no reported open maintenance discrepancies with the airplane at the time of the accident.

METEOROLOGICAL INFORMATION

Surface analysis charts at 1200 and at 1500 depicted a low pressure system located over the Texas panhandle with cold fronts extending to the east over northeastern Oklahoma and to the west over southeastern Arizona. The accident site was located well to the southeast of the center of the advancing low pressure system. Observations surrounding the accident site indicated visual flight rules (VFR) conditions with mostly clear skies and visibilities of 9 to 10 miles prevailing at the time of the accident.

At 1451, the automated surface observing system (ASOS) at Kimble County Airport (JCT), Junction, Texas, located approximately 47 miles northeast of the accident site, reported the wind from 240 degrees at 8 knots, visibility 10 statute miles, clear of clouds, temperature 28 degrees Celsius, dew point 2 degrees Celsius, and an altimeter setting of 29.71 inches of Mercury.

COMMUNICATIONS

At 1429:56, N43KM contacted the FAA Houston Air Route Traffic Control Center (ARTCC) Stonewall Radar (STV-R) controller and said “houston center king air (unintelligible) three kilo mike (unintelligible) pick up our i f r up to goodyear arizona”.

At 1430:18, the controller instructed N43KM to squawk a transponder code of 4016 and N43KM responded.

At 1431:56, the controller said “november four three kilo mike radar contact ah six miles northwest of hondo and i show you passing six thousand”.

At 1432:03, N43KM responded by stating “six thousand five hundred yes sir”.

At 1432:06, the controller said “november three kilo mike roger you’re cleared to ah golf yankee romeo airport as filed climb and maintain one seven thousand---the ah uvalde altimeter two niner seven four”.

At 1432:15, N43KM responded by stating “two niner seven four cleared to one seven thousand to ah goodyear”.

At 1438:17, the STV-R controller said “november three kilo mike contact ah houston center one three two correction ah one two five point seven five”.

At 1438:26, N43KM responded by stating “one two five seven five for ah three kilo mike”.

At 1438:53, N43KM contacted the Houston ARTCC, Rocksprings Radar (RSG-R) controller and reported at 17,000 feet.

At 1440:30 the RSG-R controller cleared N43KM to climb to and maintain FL 240. N43KM acknowledged the clearance.

At 1442:08, the controller instructed N43KM to amend their altitude and maintain 17,000.

At 1442:13, N43KM acknowledged the clearance by stating, "one seven thousand four kilo mike".

At 1442:24, the controller said “november four three kilo mike i show you turned north to a turned to the north a little bit are you back direct el paso”.

At 1442:30, N43KM responded by stating “back direct el paso”.

At 1442:36, the controller said “november four three kilo mike ah just want to make that ah you’re not experiencing any problems or emergencies (unintelligible)”.

At 1442:41, N43KM responded by stating “yeah (unintelligible) okay”.

At 1442:51, the controller said “november four three kilo mike did you deviate around some weather or something---you were ah through one seven thousand and you descended and turned north”.

At 1442:58, N43KM responded by stating “yes sir we’re testing an autopilot and had a malfunction but it’s corrected”.

At 1443:02, the controller said “okay thank you sir”.

At 1444:51, the controller said “november four three kilo mike climb and maintain flight level two four zero”.

At 1444:55, N43KM responded by stating “two four zero for four kilo mike”.

At 1446:25, the controller said “november four three kilo mike are you proceeding direct el paso yeah you’re still ah right of course”.

At 1446:31, N43KM responded by stating “show direct el paso i’ll correct”.

At 1446:36, the controller said “what do you show the heading”.

At 1446:39, N43KM responded by stating “ah two nine zero”.

At 1446:42, the controller said “(unintelligible) four three kilo mike i’m showing a no wind heading of two eight five take into account the winds you probably need about a two eight zero heading---possibly even two seven five for now november four three kilo mike fly heading two eight zero when able direct el paso”.

At, 1446:53, N43KM responded by stating “heading two eight zero direct el paso when able”.

At 1455:36, the controller said “november four three kilo mike houston”.

At 1455:58, the controller said “november four three kilo mike houston”

At 1456:07, the controller said “november four three kilo mike houston”.

At 1456:16, the controller said “november four three kilo mike no reply received if you hear center ident”.

At 1456:52, the controller said “king air four three kilo mike houston center”.

At 1457:35, the controller said “november four three kilo mike houston center”.

At 1457:39, an unintelligible sound was heard that lasted approximately two seconds.

At 1457:43, the controller said “and ah if that was november four three kilo mike i didn’t get a voice i just ah got carrier only ident please if you hear center november four three kilo mike”.

The controller called N43KM six more times over the next 4 1/2 minutes but received no response.

During the Safety Board's review of the air traffic control (ATC) recordings the sound of an aural warning was not heard on any of the transmissions from N43KM. Further, none of the voice transmissions from N43KM sounded as if the pilot was speaking through an oxygen mask microphone.

RADAR INFORMATION

A direct course from the HDO airport to El Paso, Texas was measured at approximately 293 degrees at a distance of 398 nautical miles. A review of the radar data from the first radar contact at 1430 until 1440 shows the airplane's flight path was tracking a course of approximately 294 degrees. At 1440, after the airplane had leveled at 17,000 feet it began a meandering course of approximately 340 degrees until 1442. For the next three minutes it began to turn back to the left with a course of approximately 300 degrees. At 1445 the airplane then began to drift back to the right to a course of approximately 318 degrees. At 1446, the airplane turned to the left for an average course of 290 degrees until 1453. During the next five minutes the airplane meandered from 270 degrees to 340 degrees with an average course of approximately 322 degrees.

Radar data shows the airplane began to climb from 17,000 feet at 1445 and reached flight level 240 at 1453. The airplane began to descend from flight level 240 at 1456. The last radar contact at 1457:59 was 4,800 feet to the southwest from the main wreckage location.

WRECKAGE AND IMPACT INFORMATION

Investigators from the Safety Board, the FAA, and Hawker Beechcraft Corporation examined the wreckage at the accident scene on December 15 and 16, 2008.

The accident site was on relatively flat rocky and grassy terrain with adjacent areas that were sparsely covered with scrub trees. The main wreckage was located at 30 degrees, 10 minutes, 23 seconds north latitude, and 100 degrees, 35 minutes, 30 seconds west longitude, at an estimated elevation of 2,200 feet mean sea level (MSL). All recovered portions of the wreckage of the airplane were found in an area approximately 1,000 feet by 1,600 feet.

The wreckage examination revealed the following:

The fuselage was observed upright on a measured heading of 120 degrees. The rear fuselage was separated forward of the FS 364 bulkhead. The left cabin upper sidewall was separated from the left cabin lower sidewall forward of the air stair door, and the cabin was rolled over to the right. The right cabin sidewall was bulged out over the right wing root. The rear fuselage near the rear pressure bulkhead was buckled inward on the left side.

The nose section, at the instrument panel, was partially separated. The cockpit left and right sidewalls were shattered into multiple skin pieces; the fuel management panel and the left side

circuit breaker panel were separated.

The center wing sections remained attached to the fuselage. Wing panel remnants remained partially attached to the center wing section. Each wingtip assembly was separated. Each outboard wing panel separated in a positive (upward) direction.

The right wing panel leading edge assembly separated from the front spar, and the wing panel partially separated from the front spar. The left wing panel center assembly and leading edge assembly remained attached to the front spar; the piano wire hinge assemblies on the top spar cap were puckered. The center wing rear spar on the left side, was separated inboard of the rear spar wing attachment fittings. The inboard and outboard flaps remained attached to the center wing and the wing panel. The flaps were in a retracted position. The inboard section of each aileron remained attached to the wing panel remnants by the aileron pushrod.

Both engines, along with their engine truss, separated from their respective firewall in a downward direction. The propellers remained attached to their engines. Both engines including their nacelle structures were still attached to their truss assemblies. The right engine was found 324 feet on a bearing of 200 degrees from the main wreckage. The left engine was found 542 feet on a bearing of 182 degrees from the main wreckage.

The left horizontal stabilizer leading edge had damage at about two thirds of the span. The left elevator was separated from its stabilizer at each hinge. The right horizontal stabilizer rear spar separated outboard of its FS 380 bulkhead attachment, and the spar stub remained attached to the bulkhead.

The separated rear fuselage bulkheads and empennage components were recovered and laid out at the scene. The vertical stabilizer front spar, front spar extension, and rear spar were separated at the FS 364 bulkhead and the FS 380 bulkhead. The separated front spar and front spar extension spar stubs remained attached to the bulkheads.

The rudder hinges were separated from the vertical stabilizer aft spar. The lower rudder bearing and rudder stop fitting remained attached to the vertical stabilizer aft spar; the lower rudder bearing portion was separated. The lower rudder (area below the trim tab) was recovered. The right side of the vertical stabilizer had collision damage and black paint transfer. When the piece of recovered rudder was positioned next to the vertical stabilizer, the rudder separation aligned with the collision damage on the vertical stabilizer. The left horizontal stabilizer main spar remained attached to the FS 364 bulkhead. The spar was bent aft and twisted stab leading edge down at the outboard edge of the bulkhead. The aft spar was separated at the FS 380 bulkhead. The spar stub remained attached to the bulkhead. The left horizontal stabilizer leading edge had damage at about two thirds of the span. The damage was not correlated to damage resulting from ground impact.

The left elevator separated from its stabilizer at each hinge. The inboard bearing support was partially separated from the bulkhead. The right horizontal stabilizer front spar remained attached to the FS 364 bulkhead, which was separated just to the right of its centerline. The right horizontal stabilizer rear spar separated outboard of its FS 380 bulkhead attachment; the spar stub remained attached to the bulkhead.

The cockpit examination revealed the following: The throttle levers were forward. The propeller levers were aft (LOW RPM). The condition levers were in run (LOW IDLE). The landing gear lever was UP. The flap lever was UP. The aileron and rudder trims wheels were in a neutral position, and the pitch trim knob was indicating 6 units UP. The pilot seat belt was clasped along with the bayonet shoulder harness tags. The cabin pressurization control was separated from its mount and had fallen into the console. The pilot's oxygen mask was observed in the cockpit lying on the right front seat. The connecting plug on the end of the mask was broken off and the male portion of that plug was observed in the pilot's side receptacle. The position of the oxygen ON/OFF rod located in the cockpit overhead was observed in the fully forward or ON position. The lower right subpanel was partially separated from the instrument panel and debris from the cockpit had fallen onto the lower right subpanel switches. The LEFT BLEED AIR switch and the RIGHT BLEED AIR switch, located on the lower right subpanel, were found in the CLOSED position. The airplane pressurization switch on the pedestal was observed selected to the DUMP position. Several lamps on the annunciator panel were examined. For the ALTITIUDE WARN segment, both glass envelopes were intact and the filaments were broken. The circuit breaker labeled ANUN IND on the right side panel was observed in the CLOSED position.

A review of photographs from emergency first responders show that the left side bulkhead behind the pilot's seat was separated from its attach points and had fallen forward onto the pilot's seat, the console, and the co-pilot's seat. The pilot was seated in the left cockpit seat with his lap belt and both shoulder straps securely fastened. The pilot was not wearing an oxygen mask.

TESTS AND RESEARCH

On February 18 and 19, 2009 investigators from the Safety Board, the FAA, Hawker Beechcraft Corporation, Pratt & Whitney Canada, and Hartzell Propeller, Inc. examined the wreckage at the facilities of Air Salvage of Dallas, Lancaster, Texas. The wreckage was laid out and the various separation and fracture surfaces were examined. The upper two thirds of the rudder, the rudder trim tab and trim actuator, and the rudder counterweight, were not recovered.

The oxygen bottle was observed separated from its mount on the rear pressure bulkhead and loose in the rear fuselage compartment. All pressure lines connected to the oxygen bottle valve and regulator were separated. The oxygen ON/OFF control cable was separated from the valve. The oxygen valve on the oxygen bottle was found in the ON position.

In the cockpit area, the overhead PULL ON SYS READY oxygen knob was observed in the fully extended or ON position.

The crash damaged Enhanced Ground Proximity Warning System (EGPWS) part number 965-1198-003 (s.n. 1061) was observed in its installed position in the forward right avionics bay in the nose. The EGPWS was removed and sent to a Safety Board investigator for further testing.

The cabin altitude warning switch was removed from its installed position in the cockpit and sent to an FAA inspector for further testing.

Both the left and right hand engines were partially disassembled and examined. The compressor turbines, the compressor turbine shrouds, the power turbine guide vane rings, the power turbine shrouds, and the power turbines displayed rotational contact signatures.

Both the left hand and right hand propellers were partially disassembled and examined. The damage to both propellers was similar. Both propeller spinners were crushed on one side and did not have frontal impact damage. Both propellers had one blade that was severely damaged due to being beneath the engine during impact. The other three blades, from both propellers, had mild bending with indications of rotation at impact.

Spinner crushing over the cylinder and pitch change rod provided the location of the feather stop nuts. The pistons/pitch change rods from both propellers were not at or near the feather position when the spinners were crushed. The right spinner had a counterweight impact mark that occurred while at a low blade angle.

On March 16, 2009 an investigator from the Safety Board conducted an examination of the Honeywell EGPWS at the facilities of Honeywell Inc., Redmond, Washington. The EGPWS unit had been removed from the accident airplane and was received severely damaged. The memory flash chips were found intact and removed from the printed circuit board (PCB) and installed on a slave EGPWS unit. The slave unit was powered and stored data was successfully downloaded. The data extracted from the memory chips revealed that in flight leg 708, a takeoff event from Hondo Municipal Airport (HDO), Hondo, Texas, was recorded. The data further revealed that the EGPWS unit operated for approximately 30 minutes before power was lost to the unit. No faults, discrepancies, or warnings were noted within flight leg 708.

On March 18, 2009 investigators from the FAA, and Hawker Beechcraft Corporation, examined the cabin altitude warning switch at the facilities of Hawker Beechcraft Corporation facilities in Wichita, Kansas. The switch, BEECH P/N 101-384028-15 manufactured by Eaton Corp., Pressure Sensor Div. (p.n. 214C40-3-278 and s.n. R194) had been removed from the accident airplane. The HBC Acceptance Test Procedure E-2065 Rev 26 was performed on the switch. The switch functioned within limits with the exception that the ascent activation point was outside of Acceptance Test E-2065 Rev 26 published ascent activation tolerance. During the testing, on ascent, the switch closed at 10,970 feet; and closed at 10,800 feet when the tolerance was 10,000 feet +/- 500 feet.

PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on December 15, 2008 by the Bexar County Medical Examiner's Office, San Antonio, Texas. The autopsy findings reported the cause of death as "multiple blunt force injuries".

Forensic toxicology was performed on specimens from the pilot by the Federal Aviation Administration (FAA), Aeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated: tests for CARBON MONOXIDE were not performed; tests for CYANIDE were not performed; NO ETHANOL detected in Liver; NO ETHANOL detected in Muscle; NAPROXIN detected in Liver.

ADDITIONAL INFORMATION

FAA Aeronautical Information Manual (8-1-2 a. 2-3.) states: From 12,000 to 15,000 feet of altitude, judgment, memory, alertness, coordination and ability to make calculations are impaired, and headache, drowsiness, dizziness and either a sense of well-being (euphoria) or belligerence occur. The effects appear following increasingly shorter periods of exposure to increasing altitude. In fact, pilot performance can seriously deteriorate within 15 minutes at 15,000 feet. ... The ability to take corrective and protective action is lost in 5 to 12 minutes at 20,000 feet, followed soon thereafter by unconsciousness.

A review of portions of the FAA Approved Airplane Flight Manual shows the following:

ANNUNCIATOR SYSTEM

The annunciator system consists of an annunciator panel centrally located in the glareshield, a press-to-test switch, and a fault warning light. The illumination of a GREEN or YELLOW annunciator will not trigger the fault warning system, but a RED annunciator will actuate the fault warning flasher. The annunciators are of the word-readout type. Whenever a fault condition occurs, an electric signal is generated and the appropriate annunciator is illuminated.

WARNING ANNUNCIATORS

If a RED warning annunciator is illuminated, the fault requires immediate attention and reaction of the pilot and the MASTER WARNING flasher is activated. Any illuminated warning lens in the annunciator panel remains on until the fault is corrected. In such a case, the MASTER WARNING flasher will again be activated if an additional annunciator illuminates. When a fault is corrected, the affected annunciator is extinguished, but the MASTER WARNING flasher continues to flash until depressed.

CAUTION ANNUNCIATORS

If the fault requires the immediate attention, but not the immediate reaction of the pilot, the appropriate YELLOW caution annunciator will illuminate. Any illuminated caution lens in the annunciator panel remains on until the fault is corrected.

The ALTITUDE WARN annunciator is powered through a 5 AMP circuit breaker labeled ANUN IND on the cockpit right side panel. The ALTITUDE WARN annunciator will illuminate when the cabin altitude exceeds about 10,000 feet. The annunciator is YELLOW and its activation will not activate the FLASHING MASTER WARNING annunciator in front of the pilot. There is no aural warning associated with the activation of the ALTITUDE WARN annunciator.

ADVISORY ANNUNCIATORS

The annunciator panel also contains GREEN advisory annunciators. No flashers are associated

with these lights since they are advisory in nature, indicating functional situations which do not demand the immediate attention or reaction of the pilot. An advisory light can only be extinguished by changing the condition indicated.

PRESSURIZATION AND AIR-CONDITIONING SYSTEMS

The cabin pressure differential is 5.0 psi ... The air pressure for cabin pressurization, heating the cabin and cockpit, and for operating the instruments, autopilot, and surface deicer is obtained by bleeding air from the compressor stage (P3) of each engine. Engine bleed air is ducted from the engine to the flow control unit mounted on the firewall. A pressure supply line to operate the instruments, autopilot, and surface deicer tees off the bleed air line just aft of the first fire seal forward of the firewall. The bleed air from either engine will continue to provide adequate air for pressurization and heating and for the deicer system and instruments should the opposite engine fail. The bleed air and ambient air from the cowling intake are mixed together by the flow control units to produce a total air flow of 14 pounds per minute from both the right and left engine units. Bleed air comprises as much as ten pounds of the total air flow on cold days and as little as six pounds on hot days. The air from each flow control unit is routed aft through the firewall along the inboard side of each nacelle and inboard to the center section forward of the main spar. The heat in the air may either be retained for cabin heating or dissipated for cooling purposes as the air passes through the center section to the fuselage. If the air is to be cooled, it is routed through an air-to-air heat exchanger that absorbs heat by passing the hot air through a radiator kept cool by outside air from an opening in the leading edge of the center section. A bypass valve, located adjacent to the heat exchanger, allows the hot air to be routed around the heat exchanger and into the air ducts to heat the cabin during cold weather. At the juncture of the bleed air lines under the cabin floor on the right side of the fuselage, two flapper valves are installed to prevent the loss of pressure should either engine fail. The bleed air lines from the tee are routed forward along the right side of the fuselage to a heat plenum just aft of the electric heater under the floor of the nose compartment....

PRESSURIZATION CONTROL - DESCRIPTION AND OPERATION

Pressurization is regulated through a pressurization controller, dual altimeter, rate-of-climb indicator, and a guarded PRESSURE-DUMP switch. These components are mounted on the on the pedestal itself. Additional components of the system are: a cabin air filter for the pressurization controller, which is located on the left hand side of the first bulkhead forward of the instrument panel; a static line drain located on the side of the fuselage behind an access panel aft of the right- hand seat track; and the outflow and safety valves mounted on the aft pressure bulkhead. The CABIN ALT knob of the controller is used to select the desired cabin pressure altitude on the controller dial, while the controller RATE knob regulates the cabin rate of climb and descent. The dual altimeter, which is based on standard pressure, shows cabin pressure altitude and airplane altitude. A scale between the altimeter needles indicates the cabin to atmosphere pressure differential. This scale is redlined at: 5.0 psi on airplanes LJ-986, LJ-996 and LJ-1011 and after.

An outflow valve, mounted in the bulkhead at the rear of the cabin, automatically meters the outflow of cabin air during pressurized operation in response to vacuum control forces from the controller. The outflow valve also incorporates a negative-pressure-relief diaphragm with

cabin pressure on one side and atmospheric pressure on the other. If atmospheric pressure exceeds cabin pressure, the diaphragm opens the outflow valve to relieve cabin negative pressure. The outflow valve contains a preadjusted relief valve set to assure that the cabin pressure does not exceed the prescribed differential. A cabin air safety valve, mounted just to the left of the outflow valve, also contains a preset relief valve that relieves at approximately 0.3 psi higher than the setting on the outflow valve should the relief valve on the latter fail. The safety valve has a vacuum line with an electrical solenoid valve used to port vacuum to the valve control chamber for opening the valve. The solenoid valve is opened whenever the cabin PRESSURE-DUMP switch is placed in the DUMP position, or the landing gear safety switch is closed by compressing the landing gear shock strut.

OXYGEN SYSTEM

The oxygen cylinder and regulator, located behind the aft pressure bulkhead, provide oxygen for the crew and passengers. The cylinder valve has fittings for high pressure and low pressure lines for oxygen service and delivery. The high pressure lines include the cylinder recharge line, the pressure gage line and the overpressure relief dump. Two pressure gages are installed in the airplane, one in the copilot's lower instrument panel for in-flight use and one in the oxygen service panel for checking oxygen pressure during the filling procedure. The regulator on the cylinder is a constant-flow type that supplies low pressure oxygen through tubing to the crew and passenger oxygen outlets. In this airplane the pilot and the co-pilot are each provided with a quick-donning diluter demand mask. The mask hangs on a quick release hanger behind and outboard of each pilot's head. The microphone and oxygen tube are plugged in at all times. These masks can be donned immediately with one hand and oxygen is furnished only on inhalation after the PULL ON SYS READY control is pulled out. An indicator in the oxygen tube indicates green for proper pressure or red for low pressure. The NORMAL PROCEDURES Section of the Airplane Flight Manual directs the pilot to determine sufficient O2 is available for the flight and activate the O2 system and test his O2 mask before flight. The O2 system is to be left activated for the flight. The mask is equipped with a microphone. The microphone and oxygen tube are plugged in at all times.

History of Flight

Prior to flight	Miscellaneous/other
Prior to flight	Pressure/environ sys malf/fail
Enroute-cruise	Loss of control in flight (Defining event)
Emergency descent	Aircraft structural failure
Emergency descent	Part(s) separation from AC
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	66,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	April 28, 2008
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 31, 2007
Flight Time:	(Estimated) 3500 hours (Total, all aircraft), 250 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N43KM
Model/Series:	C90 B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	LJ-1345
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	October 24, 2008 Continuous airworthiness	**Certified Max Gross Wt.:**	10100 lbs
Time Since Last Inspection:	13 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	3725 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	C91A installed, not activated	**Engine Model/Series:**	PT6A-21
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KJCT,1749 ft msl	**Distance from Accident Site:**	47 Nautical Miles
Observation Time:	14:51 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:	Clear	**Visibility**	9 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	28°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hondo, TX (KHDO)	**Type of Flight Plan Filed:**	Unknown
Destination:	Goodyear, AZ (KGYR)	**Type of Clearance:**	IFR
Departure Time:	14:25 Local	**Type of Airspace:**	

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:**	30.170555,-100.588333(est)

Administrative Information

Investigator In Charge (IIC):	Latson, Thomas
Additional Participating Persons:	Victor H Lopez; FAA San Antonio FSDO; San Antonio, TX Carlos A Balderas; FAA San Antonio FSDO; San Antonio, TX Michael R Jordan; FAA San Antonio FSDO; San Antonio, TX Paul E Yoos; Hawker Beechcraft Corporation; Wichita, KS Thomas A Berthe; Pratt & Whitney Canada; Longueuil - Quebec Robert Salyers; Pratt & Whitney Canada; Longueuil - Quebec Tom McCreary; Hartzell Propeller Inc.; Piqua, OH Josh Cawthra; National Transportation Safety Board; Seattle, WA
Original Publish Date:	December 20, 2010
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=69562