



National Transportation Safety Board Aviation Accident Final Report

Location:	Dallas, TX	Accident Number:	FTW04FA052
Date & Time:	01/01/2004, 1004 CST	Registration:	N4104B
Aircraft:	Bellanca 17-30A	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

After takeoff and climb out in solid instrument meteorological conditions, the single-engine airplane experienced failures of flight/navigation instruments. The 1,050-hour pilot was attempting to maneuver the airplane using partial panel techniques. Radar data showed that the pilot appeared to be experiencing spatial disorientation. ATC controllers were alerted due to the fact that the airplane was making "left" turns instead of right turns as advised. After being observed by several witnesses flying just below the lowest cloud layer (approximately 125 feet agl) the airplane impacted several homes in a residential neighborhood. Both homes and the airplane were destroyed by post-impact fire. One person who was located 1/2 miles from the accident site, witnessed the airplane flying overhead in a straight and level attitude approximately 125 feet above ground level (agl), slightly below a layer of clouds. Another person who was a private pilot and located about 1/2 miles from the accident site, stated that he heard an airplane engine that sounded "normal." After about 15 seconds, it sounded as if the airplane was maneuvering, because of the pitch change in the engine. According to this witness, the engine sounded like it was "making good power." The airplane was rapidly getting closer and sounded very low and fast. The witness stated, "at no time did I see the aircraft due to the weather conditions." The nearest automated surface observing station reported wind from 130 degrees at 6 knots, visibility 7/8 in mist, overcast at 100 feet. The temperature and dew point were reported as 17 degrees Celsius, and an altimeter setting of 30.20 inches of Mercury. Flight control continuity could not be verified due to impact damage. A fire extinguisher from the airplane was found with the handle lock pin missing and bottle fully discharged. The instrument panel was completely destroyed by post-impact fire. The vacuum pump was separated and the drive coupling was bent approximately 30-degrees. The unit was disassembled and the rotor vanes were observed to be in place and not damaged. The core element was cracked. The intake and exhaust pipes were separated; the exhaust pipes were separated aft of the mufflers. Examination revealed that the left side ball flange clamp had four washers on the bolt. The clamp was tight on the ball flange, and the tailpipe would not move on the ball flange. The exhaust pipes were separated on both sides of the left ball flange. Due to the extensive post-impact fire damage, it could not be concluded as to the cause of the pilot's reported loss of instruments during the flight. However, it was noted that the wire bundle that connects the instrument panel through the firewall were in close proximity to the muffler's

exhaust flange, on the engine side of the firewall.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of flight/navigation instruments while in instrument meteorological conditions (in-cloud flight and low ceilings) resulting in spatial disorientation. A contributing factors was the prevailing instrument meteorological conditions (low ceiling and in-cloud flight)

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) WEATHER CONDITION - CLOUDS
2. (F) WEATHER CONDITION - LOW CEILING

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

3. (C) FLIGHT/NAV INSTRUMENTS - INOPERATIVE
4. (C) FLIGHT/NAVIGATION INSTRUMENT(S) - UNAVAILABLE - PILOT IN COMMAND

Occurrence #3: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

5. (C) AIRCRAFT CONTROL - NOT MAINTAINED
6. (F) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #4: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: MANEUVERING

Findings

7. OBJECT - RESIDENCE

Factual Information

HISTORY OF FLIGHT

On January 1, 2004, at 1004 central standard time, a Bellanca 17-30A single-engine airplane, N4104B, registered to and operated by the pilot, was destroyed when it impacted residential structures shortly after takeoff from Addison Airport (ADS), near Dallas, Texas. The instrument rated private pilot and his passenger sustained fatal injuries. Instrument meteorological conditions (IMC) prevailed and an instrument flight rules (IFR) flight plan was filed for the personal flight conducted under the provisions of Title 14 Code of Federal Regulations Part 9. The planned 277-nautical miles cross-country flight was destined for Amarillo International Airport (AMA) near Amarillo, Texas.

According to air traffic control (ATC) data provided by the Federal Aviation Administration (FAA), the pilot was issued a clearance to AMA at 0945 via the Kingdom Five standard departure; however, the pilot was unclear about the instructions. The controller then re-explained the instructions, and the pilot read back the clearance correctly. At 0948, the pilot advised the tower that he had the Kingdom Four departure, not the Kingdom Five departure. The controller then re-read the clearance to the pilot again, and the pilot seemed confused about the radials. The controller re-read the radial information again, and the pilot stated, "I got it and am ready for takeoff." At 0952, the controller contacted regional departure and advised them to watch N4104B, since the pilot had trouble with his departure clearance. At 0956, the tower advised the pilot to contact regional departure, and the pilot acknowledged. The airplane departed ADS from runway 15 at 0957.

After the aircraft departed ADS, the departure controller informed the pilot that he had lost the transponder beacon, and requested that the pilot recycle his transponder. At 0958, the departure controller advised the pilot that he had the transponder beacon again. At 1001:01, the pilot was instructed to turn right to a heading of 270 degrees. The pilot acknowledged and reported "....gyro has out gone out so I'm on partial panels." The departure controller advised the pilot that it looked like he was making a left turn, and instructed him to turn right. The pilot acknowledged. The controller advised ATC at Dallas Love Field (DAL) that he thought the pilot was disorientated because "he's doing left turns instead of right turns like he's suppose to be so watch out for him." At 1001:59, the pilot advised ATC that he was "gonna go ahead and ease it around to the right till I get to two forty degrees." At 1002:07, the pilot stated, "I'm getting ah starting to get oriented to the partial panel here." There were no further communications with N4104B, and radar contact was lost.

The airplane impacted a private residence on a northeasterly heading, slid across a residential street, and impacted two vehicles in the garage of a second private residence. The airplane and both residences were destroyed by post-impact fire. There were no reported ground injuries.

Details of the approximate last minute radar data follow. All times are given in central standard time (CST). Altitudes are given in feet above mean sea level (msl).

Time	Altitude	Heading	Ground Speed
1001:05	2,800	140 deg	111 knots
1001:09	2,800	117 deg	120 knots
1001:14	2,800	108 deg	120 knots

1001:19	3,000 110 deg	115 knots
1001:23	3,100 105 deg	111 knots
1001:28	3,100 088 deg	111 knots
1001:33	unknown 067 deg	118 knots
1001:37	2,800 042 deg	136 knots
1001:42	unknown 035 deg	144 knots
1001:47	2,800 025 deg	155 knots
1001:51	3,000 023 deg	157 knots
1001:56	3,100 027 deg	157 knots
1002:00	3,200 030 deg	155 knots
1002:05	3,200 043 deg	153 knots
1002:09	3,200 058 deg	153 knots
1002:14	3,000 072 deg	149 knots

The last discernable radar return was approximately 32 degrees, 53 minutes north latitude, and 096 degrees, 46 minutes west latitude, and at an unknown altitude, on a heading of 091 degrees and 148 knots.

Eight witnesses in the vicinity of the accident site who either heard or observed the airplane prior to impact, were interviewed by or provided written statements to the NTSB investigator-in-charge. The witnesses (by number) are depicted on a diagram showing their respective locations relative to the accident site. The diagram is attached to this report.

Witness #1, a frequent "plane watcher" and private pilot, provided a written statement to the NTSB investigator-in-charge (IIC). The witness stated that his house, located 2.11 miles west of the accident site, is almost under the Runway 33 approach path into ADS and the downwind leg to DAL, so airplanes flying above his house was normal. Just before 1000, he heard an aircraft with a high performance engine fly over or near his home at an altitude that "seemed" to be lower than normal; since the sound was louder than normal. Several seconds later, he heard the airplane fly over or near the house again. He went out into the backyard to see if he could see the airplane, but couldn't because of the low ceiling and limited visibility. He thought the airplane might be circling and remembered wondering why he would be doing that at a low altitude and in that weather. As the noise seemed to lessen, he heard another plane's engine and thought the first plane could possibly be maneuvering for sequencing into ADS. Several seconds later, while still in the backyard, he heard the first plane a third time, as loudly as the first and second times. The engine seemed to be running at high RPM's, but smoothly. It sounded like the airplane was again maneuvering, or circling. The witness stated that he remembered thinking the pilot must be lost. The sound seemed to fade slightly, and then it came back as loud as ever. The witness remembered thinking that the plane sounded like it was pulling out of a loop or similar high-speed maneuver. The sound, clearly coming from the east, got louder and louder, then abruptly stopped with a faint "pop, pop" sound. The witness stated again that the airplane "clearly" came over or near his house three separate times, and the engine "seemed" to be running smoothly each time.

Witness#2, located approximately .5 miles west of the accident site was interviewed by the IIC and reported observing the airplane flying overhead in an straight and level attitude approximately 125 feet above ground level (agl), slightly below the layer of clouds.

Witness#3, who resided approximately .2 miles west of the accident site, stated that she had stepped outside and was standing on the back patio, when she "heard the loud noise of a small plane going full throttle - racing, full speed overhead." She looked up but could not see anything, even though from the noise, the airplane sounded low. She heard two "popping noises - like a car backfiring." Then not hearing anything else, she stepped back inside her house. After a few minutes, she returned outside, in front of her house. When she looked to the east, she saw flames coming from the end of the block, on the north side of the street. She stated that she never heard what she would recognize as an explosion, a "boom" sound, nor was she aware of any shaking of her house. Walking back inside her house, she observed a sizeable piece of glass in the middle of her neighbor's front yard.

Witness #'s 4 and 5, who resided approximately .2 miles west of the accident site, reported hearing the sound of an engine pass overhead, at a low altitude, followed by a "loud boom." The impact was "hard enough to rattle windows." The witnesses reported hearing the noise, but it was too "cloudy" to see anything.

Witness #6, was located approximately 80 yards north of the accident site. At the time of the accident, he was jogging towards the location of the accident, and reported hearing the airplane's engine "humming." He saw the airplane strike the first house eastbound. The witness stated that he saw the fire "stretch" from the house on Currin (the impact point), 20-25 yards north of Currin, across St. Judes. He saw parts of the airplane cross St. Judes into the 7100 block of Currin, the north side. The witness observed the fire engulf the house west of St. Judes, on the north side of Currin, and observed smoke engulf the house located on the eastside of St. Judes, the north side of Currin.

Witness #7 was interviewed and provided a statement to the IIC. At the time of the accident, she was inside her house, located across the street from the accident site, and heard a "cranking" noise. She observed smoke coming from the tail section of the airplane prior to impact. Due to the cloudy weather conditions, she could only see the tail section; however, stated that she heard a "bang."

Witness #8, a private pilot, resided approximately .58 of a mile northeast of the accident site, and was outside of his house at the time of the accident. He stated that he heard an airplane engine that sounded "normal." After about 15 seconds, it sounded as if the airplane was maneuvering, because of the pitch change in the engine. According to the witness, "it [the engine] still sounded like it was making good power." The airplane was rapidly getting closer and sounded very low and fast. Right before he heard the impact, the "engine was still at a very high power level and the airspeed sounded to be very high." This was followed by two impacts in rapid succession and he felt the percussion. The witness stated, "at no time did I see the aircraft due to the weather conditions. At no time did the engine sound seem to be faulty or cutting in or out."

PERSONNEL INFORMATION

The pilot held a private pilot certificate with airplane single-engine land and instrument airplane ratings. The pilot was issued his most recent third-class medical certificate on May 30, 2001, with limitations stated "must wear corrective lenses." At the time of his last medical

application, the pilot reported to have accumulated a total of 1,050 hours. The pilot's personal flight logbooks were not recovered.

AIRCRAFT INFORMATION

The 1975 model Bellanca 17-30A, serial number 75-30776, was a single-engine, low-wing retractable landing gear monoplane with an all wood wing construction and a fabric covered steel-tube fuselage, configured for a maximum of four occupants. The airplane was powered by a Continental IO-520-K series engine (serial number 557201), rated at 300 horsepower, driving a three bladed Hartzell constant speed propeller (model HC-C3YF-1RF). The airplane was registered to the current owner on January 30, 1989.

The airframe and engine logbooks were damaged by post-impact fire. Review of the airframe logbooks revealed that an annual inspection of the airplane was completed on September 10, 2003, at a total airframe time of 2,104.5 hours. The exact total time of the airframe at the time of the accident could not be retrieved due to impact damage to the Hobbs meter and tachometer. The last airframe logbook entry on October 23, 2003, stated that new brushes in the landing gear motor were installed. The airframe total time as of this entry was 2,120 hours.

According to the engine logbook, the engine was overhauled on October 23, 1990, and had accumulated a total time of 562.5 hours since the major overhaul. An annual inspection of the engine was completed on September 10, 2003 at a total engine time of 2,104.5 hours.

METEOROLOGICAL INFORMATION

At 0028, the pilot contacted the Fort Worth Flight Service Station (AFSS), Fort Worth, Texas, and requested and received a standard weather briefing for a flight from ADS to AMA. The pilot filed an IFR flight plan for a 0730 departure the following morning from ADS direct to AMA, at an altitude of 4,000 feet msl.

At 0914, the pilot contacted Fort Worth AFSS and received a standard weather briefing for an IFR flight from ADS to AMA. The briefer informed the pilot that an AIRMET for icing conditions in the Wichita Falls area was in affect, and that a weather advisory was in affect for low IFR conditions in the vicinity of Waco, Texas. There were no notices to airmen (NOTAMs) issued. At this time, weather reported at ADS was wind from 130 degrees at 3 knots, visibility 7/8 in mist, with overcast skies at 200 feet. The temperature and dew point were reported as 15 degrees Celsius.

The automated surface observing station ADS at 0957 reported wind from 130 degrees at 6 knots, visibility 7/8 in mist, overcast at 100 feet. The temperature and dew point were reported as 17 degrees Celsius, and an altimeter setting of 30.20 inches of Mercury. The IIC calculated the pressure altitude at 386 feet and the density altitude at 775 feet.

COMMUNICATIONS

The following are excerpts of radio transmissions between the pilot and Dallas-Fort Worth Terminal Radar Approach Control (TRACON), Dallas South (DS) position for the time period from January 1, 2004, 0947 to 1011. The times have been converted from coordinated universal time to central standard time.

Agencies Making Transmissions:	Abbreviations:
Addison ATCT, Local Control	ADS

DFW TRACON, Dallas South DS
Bellanca N4104B N4104B
Dallas ATCT, Local Control DAL
Mooney N52Q N52Q

0952:18 ADS

I'm getting ready to roll a prop here this guy never did read his clearance back right and he finally just told me I've got it so ah I don't know what you're going to get out of him

0957:02 N4104B

departure this is bellanca four one zero four bravo thru seventeen hundred for two thousand

0957:09 DS

bellanca four one zero four bravo departure I've lost the transponder recycle your transponder climb and maintain four thousand report reaching four thousand

0957:16 N4104B

climb and maintain four

0957:51 DS

bellanca four one bravo still no transponder say altitude leaving

0957:56 N4104B

zero four bravo ah no transponder ah let me squawk and see if anything happens

0958:03 DS

what altitude are you leaving sir

0958:05 N4104B

ah leaving ah two thousand four

0958:27 DS

bellanca zero four bravo turn right heading two two zero

0958:31 N4104B

roger right heading two two zero

0958:58 DS

bellanca zero four bravo I have the transponder again give me your best rate of climb through three thousand please

0959:02 N4104B

climbing ah thru three thousand

0959:58 DS

bellanca zero four bravo turn right heading two four zero

1000:01 N4104B
right heading two four zero

1001:01 DS
bellanca zero four bravo turn right heading two seven zero

1001:04 N4104B
right heading two seven zero ah my gyro has out gone out so I'm on partial panels

1001:15 DS
alright looks like your making a left turn, turn right bellanca zero four bravo

1001:19 N4104B
roger right to two four zero

1001:31 DS
love north south everything over here

1001:33 DAL
yes sir love in tower

1001:34 DS
that bellanca zero four bravo out to the north

1001:36 DAL
yes sir

1001:40 DS
I think he's disorientated he's doing left turns instead of right turns like he's suppose to be so
watch out for him

1001:40 DAL
ok alright

1001:41 DS
alright

1001:45 DS
bellanca zero four bravo what is your altitude

1001:47 N4104B
altitude is ah three thousand going to ah four

1001:59 N4104B
roger I'm gonna go ahead and ease it around to the right till I get to two forty degrees

1002:07 N4104B
and I'm starting to get oriented to the partial panel here

1002:35 DS

addison north I had to turn that mooney away from that bellanca he's descending to two going to turn him westbound over the top of you is that alright

1002:40 ADS

that's approved

1002:41 DS

thank you

1002:45 DS

bellanca zero four bravo turn right heading two seven zero can you do that ok

1002:58 DS

bellanca four one zero four bravo departure

1003:14 DS

bellanca four one zero four bravo departure

1003:26 DS

bellanca four one zero four bravo departure

1003:37 DS

bellanca four one zero four bravo departure

1004:04 DS

bellanca four one zero four bravo departure

1004:4 DS

bellanca zero four bravo approach

1004:44 DS

mooney five two quebec turn left heading two two zero and i need you to do me a favor

1004:48 N52Q

two zero tell me five two quebec

1004:50 DS

alright can you change to one two four point three one twenty four three on that frequency and call me on that one

1004:57 N52Q

one twenty four three five two quebec

1005:06 N52Q

approach five two quebec is with you twenty four three

1005:08 DS

five two quebec can you transmit to a bellanca zero four bravo and see if you can pick him up

1005:13 N52Q

bellanca zero four bravo do you have a copy on five two quebec

1005:25 N52Q

bellanca two four bravo do you a copy five two quebec

1005:48 N52Q

negative copy approach

1006:08 DS

bellanca zero four bravo approach

1006:21 DS

addison north that zero four bravo I've lost him out there can't talk to him just stop automatics

1006:26 ADS

wilco

1006:27 DS

thank you

1010:17 DS

well this is everything right now we've ah let's see here weather is up to date ah they are ah IFR everywhere running approaches ah status information area is up to date as far as I know equipment is working normally I've cancelled automatics for everybody except for DFW jets no props off DFW no props nothing off love and stopped them at Addison on their autos cause

1010:40 DS

ok

1010:40 DS

i've lost this guy nobody seems to know for sure

1010:44 DS

ok yea

1010:44 DS

where he is

1010:46 DS

ok

1010:47 DS

love tower called and said somebody there is a building on fire or something so this guy has probably crashed as far as we know but I've stopped everything right now until we know for sure where he is at eagle three fifty seven is on the radial climbing to seven ah level at seven six eight six up to the north is on the ILS cleared for the ILS approach twenty three hundred till

established his missed approach is runway heading to three i believe it was and he's already been called into to McKinney still on your frequency commander on short final at Addison and the Mooney on a three mile final to the left at love loves rvr has been up and down holding about five thousand right now I think for the left

1011:19 DS

all right

1011:20 DS

and so got one two you're talking to here and you know about him

1011:24 DS

ok

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a private residence on a magnetic heading of 070 degrees, in a wings level and approximately 30-degrees nose down attitude. After the initial impact, the airplane slid across a residential street and impacted two vehicles in the garage of a second private residence, before coming to rest. The global positioning system (GPS) location of the accident site was 32 degrees 53 minutes 94 seconds north latitude, and 096 degrees 47 minutes and 03 seconds west longitude. Most of the airplane was destroyed from post-impact fire.

Fragments of Plexiglas from a side window were found in the front yard of a neighboring residence, located approximately .2 miles from the accident site.

Flight control continuity could not be verified due to impact damage. The landing gear, flaps, elevator trim, and fuel selector valve positions could not be determined. The frame from of the empennage section of the airplane was located in the garage of the second residence. A fire extinguisher from the airplane was found with the handle lock pin missing and bottle fully discharged.

The engine exhibited post-impact damage and fire damage. The fuel pump remained attached to the accessory housing assembly. All other engine accessories were not attached to the engine. The fuel manifold valve remained attached by the number five cylinder fuel injector line. The unit was opened and the diaphragm and spring were not damaged. The fuel screen was observed to be absent of debris, and no fuel was observed in the interior. Both magnetos exhibited fire and impact damage, and would not rotate. The magnetos were disassembled and no internal damage was observed. The vacuum pump was separated and the drive coupling was bent approximately 30-degrees. The unit was disassembled and the rotor vanes were observed to be in place and not damaged. The core element was cracked. The top number six spark plug was removed and moderate wear and light deposits in the electrode area were observed. The intake and exhaust pipes were separated; the exhaust pipes were separated aft of the mufflers. Examination revealed that the left side ball flange clamp had four washers on the bolt. The clamp was tight on the ball flange, and the tailpipe would not move on the ball flange. The exhaust pipes were separated on both sides of the left ball flange.

The propeller was separated, along with the crankshaft propeller attachment flange. The spinner was not located. One blade was folded 180-degrees toward the non-cambered side, and the tip was missing. The second blade exhibited "S-type" bending, and exhibited heat discoloration. The third blade was "wrinkled," with the outboard half separated and heat

discoloration.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Southwestern Institute of Forensic Sciences, Dallas, Texas, on January 2, 2004. The pilot's cause of death was "a result of blunt force injuries."

Toxicology tests were performed by the FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. Imipramine and Desipramine were detected in the pilot's liver and kidney. According to the FAA's Regional Flight Surgeon, Imipramine is an antidepressant medication. Desipramine most likely represents a metabolite of Imipramine in the sample obtained. Use of these medications would have precluded medical certification of this pilot had they been reported. Review of past applications show this airman failed to report these medications to the FAA.

TESTS AND RESEARCH

On November 12, 1976, the FAA issued an amendment to airworthiness directive (AD) 76-23-03, applicable to certain Bellanca models including 17-30A, by changing the inspection intervals for the affected airplanes to intervals not to exceed 100 hours time-in-service or the next annual inspection, whichever occurs first. This amendment also added a specific reference to inspect the tailpipe support, because its failure may have been a causal factor in some of the exhaust system failures. If the tailpipe assemblies are not free to move at the ball joints, the bending stress created by the tailpipe and resonator can break the welded muffler outlet. According to the FAA, "In 1985, the left exhaust muffler of a Bellanca model 17-30A airplane failed at the outlet, permitting the exhaust gasses to burn the magneto wiring resulting in power loss and a subsequent accident." AD 76-23-03 had been complied with in August 1982; however, no subsequent comparable inspections of the exhaust system had been accomplished because the airplane had only accumulated 50 flight hours since the previous inspection. Additional reports document similar problems with the exhaust systems of these models of Bellanca airplanes. "Long periods of nonuse may allow corrosion to develop causing the ball joint between the tailpipe and muffler to seize, resulting in undue stress on the exhaust system." Subsequently, the FAA revised the AD, and on November 7, 1986, AD 76-23-03-R1 - Recurring Inspection of the Exhaust System, became effective.

According to the aircraft logbook for N4104B, the AD was complied with at the time of the last annual inspection on September 10, 2003. A work order revealed that on August 8, 2003, Aerospace Welding Minneapolis, Inc., of Burnsville, Minnesota welded the right tailpipe (part number 191925-1, serial number AWI66439) and replaced the left tailpipe.

Detailed examination of the exhaust system was accomplished under the supervision of the FAA at the National Service Center for Bellanca, near Plainview, Texas, on February 19, 2004. It was confirmed that all of the components from the exhaust system and the riser from the EGT probe location were present. The right tailpipe had been sent to a repair station one month prior to the completion of the last annual inspection. According to AD-76-23-03-R1, section A, "Visually inspect the muffler and tailpipe assemblies for cracks paying particular attention to the ball joint welds and the outlets of the muffler and resonator. Replace defective assemblies with serviceable assemblies of the same part numbers." Examination of this component revealed that it was welded on the outside, on both ends making it easy to inspect for leaks in subsequent annual and 100 hour inspections. However, the other side with the

factory welds was welded on the inside prior to assembly of the muffler. That means that if a leak exists from a separation at the weld joint, it can only be detected with a mirror and flashlight looking inside the muffler. A mechanic would have to disassemble the muffler from the tailpipe, as well as from the collector connection at the top of the muffler in order to inspect both welds. This procedure is not specified in the AD-76-23-03-R1. Maintenance personnel at the National Service Center were able to demonstrate to the FAA how they inspect the assemblies with dye-penetrant to locate leaks.

According to AD-76-23-03-R1, section B, "Inspect the exhaust system for freedom of movement at the ball joints by removing the tailpipe support bolts. When the bolts are removed: (1) The left tailpipe assembly must drop from its supported position unassisted, (2) The right tailpipe assembly must move from its supported position when a two pound force is applied one inch below the resonator can 90 degrees to the axis of the resonator, i.e., the assembly must move when a two pound pull is applied one inch below the resonator can forward and down, (3) If a greater force than the above are required: (a) Disassemble the ball joint and inspect for surface abnormalities such as galling or wear marks. (b) Rework the ball joints as required to correct noted discrepancies. (c) Reassemble the ball joint. Do not over tighten the clamp as this may distort ball surfaces."

Examination of the ball clamp assembly on the accident airplane revealed that the left side ball flange clamp had four washers on the bolt. The clamp was tight on the ball flange, and the tailpipe would not move on the ball flange.

Due to the extensive post-impact fire damage, it could not be concluded as to the cause of the pilot's reported loss of instruments during the flight. However, it was noted that the wire bundle that connects the instrument panel through the firewall were in close proximity to the muffler's exhaust flange, on the engine side of the firewall.

ADDITIONAL INFORMATION

The aircraft was released to the owner's representative.

Pilot Information

Certificate:	Private	Age:	59, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last Medical Exam:	05/30/2001
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	1050 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Bellanca	Registration:	N4104B
Model/Series:	17-30A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	75-30776
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	09/10/2003, Annual	Certified Max Gross Wt.:	3325 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	2104.5 Hours	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	IO-520-K
Registered Owner:	David D. Knowles	Rated Power:	300 hp
Operator:	David D. Knowles	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	ADS, 644 ft msl	Observation Time:	0957 CST
Distance from Accident Site:	4 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	250°	Conditions at Accident Site:	Instrument Conditions
Lowest Cloud Condition:	Partial Obscuration	Temperature/Dew Point:	17° C / 17° C
Lowest Ceiling:	Overcast / 100 ft agl	Visibility	0.88 Miles
Wind Speed/Gusts, Direction:	6 knots, 130°	Visibility (RVR):	
Altimeter Setting:	30.2 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:			
Departure Point:	Addison, TX (ADS)	Type of Flight Plan Filed:	IFR
Destination:	Amarillo, TX (AMA)	Type of Clearance:	IFR
Departure Time:	0957 CST	Type of Airspace:	Class D

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal		

Administrative Information

Investigator In Charge (IIC): Alexander Lemishko **Adopted Date:** 07/07/2005

Additional Participating Persons: Gene M Bland; Flight Standards District Office; Dallas, TX
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