



National Transportation Safety Board Aviation Accident Factual Report

Location:	Prescott Valley, AZ	Accident Number:	LAX00FA213
Date & Time:	06/01/2000, 1005 MST	Registration:	N414PS
Aircraft:	Cessna 414A	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

HISTORY OF FLIGHT

On June 1, 2000, about 1015 mountain standard time, a Cessna 414A, N414PS, was substantially damaged when it impacted light poles in a housing development during an off-airport landing near Prescott Valley, Arizona. The pilot and his two dogs were not injured. The airplane was registered to Prop Jocks, Inc., of Los Angeles, California, and was being operated as a personal flight by the pilot under 14 CFR Part 91. The cross-country flight originated at Van Nuys Airport (VNY), Van Nuys, California Van Nuys, California, at 0821, with an intended destination of Las Vegas Municipal Airport (LVS), Las Vegas, New Mexico. Visual meteorological conditions prevailed at the time of the accident, and an instrument flight rules flight plan was filed and activated for the flight.

The pilot was flying to Las Vegas to check on his ranch home, which was surrounded by wildfires. He reported that he was in cruise flight at 13,000 feet mean sea level (msl) when he heard a loud sound. His ears "popped" and his dogs began barking. Concerned that he had lost pressurization, he looked for a suitable landing site. He reported being confused and had a hard time seeing his instruments. After seeing what he believed was an airport below, he circled the field to the left and initiated an approach from the west. On short final, he noticed a truck parked on the left side of what he believed was a runway near the approach end, and lengthened his approach to clear the vehicle by 4 or 5 feet.

Just prior to touchdown, the airplane's right wing struck a light pole, and lost about a 4-foot outboard section. The airplane then touched down, bounced, and touched down again. It crossed an intersection, and struck a stop sign and another light pole. The airplane then veered right, off the paved portion of the roadway, and struck an electrical utility box with outboard section of the extended left flap. The airplane came to rest, facing south, about 200 yards from the first impact point.

The pilot shut down the airplane, and he and his dogs exited without assistance.

Four witnesses, who were working in the housing development, originally reported to local law

enforcement personnel that they were at lunch during the accident and had not observed it. Later that day, one of the witnesses stated to another law enforcement officer that he had a "confession to make," and told the officer that he had witnessed the accident and had spoken with the pilot, but the pilot then walked to the road and obtained a ride from a passerby.

On June 6, 2000, local law enforcement personnel received a report that the witnesses had seen and spoken with the pilot in more detail, so officers spoke with them again. All four witnesses recanted their first statement, then submitted written accounts. In their accounts, all four witnesses reported that the airplane was maneuvering overhead, then lined up with the road near their worksite. The airplane crossed over a truck that was parked on the road, by about 5 feet, touched down on the road and bounced back into the air approximately 5-7 feet, and impacted a light pole with its right wing, separating the outboard wing section. The airplane then touched down again and impacted a second light pole with the right wing, removing another section of wing. The airplane rotated to the right approximately 180 degrees, and came to rest in a field.

According to one of the witnesses, he drove over to the airplane to check on the pilot. The witness drove around the airplane looking for fuel leaks, and when he found none, he parked next to the airplane's cabin door, which was open. Two dogs were wandering around outside the airplane, and the pilot was pacing back and forth through the airplane. When the witness asked the pilot if he was all right, the pilot answered that he was, but he seemed to be unaware that his airplane had impacted poles during the landing.

The pilot subsequently asked the witness if the wildfires had reached his ranch. The witness stated that he didn't know where the pilot's ranch was, and the pilot pointed to a nearby hill and said, "right over there, in the canyon." The witness was not aware of any ranch in that area. The pilot then asked the witness if he could put some beer that his brother left in the airplane, in the witness' truck. The witness agreed, and believed that the pilot retrieved the beer out of the wing compartment, which he remembered being warm. The witness then told the pilot to get him and his coworkers if he needed help with anything, and left.

The witness then returned to his coworkers, who then elected to return to the airplane with him. One of the other witnesses asked the pilot if he was all right, to which he replied, "yeah, I can't believe this happened." One of the witnesses then asked the pilot if something went wrong with the airplane, to which, the pilot replied, "everything went haywire up there." Another witness asked what happened, and the pilot said, "I don't know, I land here almost every other day." They all reported that the pilot seemed impaired, and unaware as to his whereabouts. Two of the witnesses indicated that they smelled alcohol in the airplane, but not on the pilot.

According to the witnesses, the pilot appeared to be looking for something in the airplane. One of the witnesses offered to help. The pilot stated that he was looking for a bottle of wine, which the witness found beneath one of the aft seats. Both the pilot and the witness then exited the airplane with the bottle of wine, which was 1/3 full. Another witness put the wine bottle in his toolbox. The pilot then asked the witnesses to make up a story about what they had seen. They

agreed to tell people that they were away at lunch when the accident occurred, and that they saw the pilot and his two dogs walk to the road and hitch a ride.

Three of the four witnesses returned to work and one stayed with the pilot. The pilot asked the remaining witness if he was in New Mexico, and was told that he wasn't. The remaining witness then offered to drive the pilot into town.

The witness drove the pilot to the witness's house at 1130, where the pilot called the Federal Aviation Administration (FAA) and cancelled his flight plan, then called his wife and his flight instructor. At 1330, the witness took the pilot to the accident site, but upon seeing the police and media, the pilot requested that the witness take him to a hotel.

About 1500, the pilot was contacted by police via cell phone. According to the police statement, the pilot told authorities that he "experienced a pressurization problem."

About 1615, the witness dropped the pilot off at a hotel.

The witness indicated that the pilot appeared impaired at the accident site, but at no time did he smell alcohol on the pilot. He added that he purchased a pack of cigarettes for the pilot before taking him to the hotel.

At 2015, the pilot met with law enforcement personnel, and told them that he thought he had a pressurization problem, and descended to land. He found what he thought was an airport and landed. He noticed people on the "runway" and attempted to land on the remaining runway. He told the officers that he did not remain at the accident site earlier in the day because he did not want to "make a spectacle out of the event."

AIR TRAFFIC CONTROL INFORMATION

A review of radar data revealed that the airplane was on a relatively straight and level flight track, at 12,900 feet, until 43 nautical miles east of the Needles VOR. At 0904, the airplane initiated a spiraling descent to the left. The radar data then depicted a very erratic flight path for about 1 hour, during which, the airplane's altitude varied between 6,000 and 9,000 feet. At 1012, the airplane, which had been flying south-southeast, began a descending right turn toward the accident site.

PERSONNEL INFORMATION

The private pilot was rated in single engine, multi-engine, and instrument airplanes. He was issued a second-class medical certificate on August 28, 1998, with a limitation to "have available glasses for near vision." The pilot reported a total of 979.8 flight hours, of which, 810 hours were flown in the same make and model as the accident airplane.

AIRPLANE INFORMATION

The airplane was manufactured in 1978, and had accumulated a total of 4,757.6 hours at the time of the accident. A review of the maintenance records revealed that the airplane underwent its last annual inspection on September 3, 1999, at an airplane total time of 4,631.2 hours. The twin-engine airplane was powered by two turbocharged, liquid-cooled Continental TSIOL-550-D engines and two McCauley 3-bladed propellers. The airplane was modified with numerous supplemental type certificate systems, none of which altered the heating or pressurization systems.

The pilot indicated in his written statement that he had noticed a "discrepancy in our differential/cabin altitude" a few weeks prior to the accident flight, and that his mechanics had replaced some ducts as a result of that discrepancy.

A review of the airplane's maintenance records revealed that on April 1, 2000, mechanics "installed new pressurization ducts from left and right wings to engine."

The pilot added that another pilot flew the airplane (apparently after the last discrepancy) and experienced "an incredibly loud noise that went on forever and sounded like the airplane was coming apart." The pilot did not mention if any repairs or inspections were conducted after that event, and no additional maintenance entries were noted concerning the pressurization or heating system after the April 1st entry.

The airplane incorporated a cabin air system and a cabin pressurization system. The cabin air system provided cabin heating, ventilation, and defrosting. The cabin air system consisted of an air inlet in the nose, a cabin fan, a gasoline combustion-type heater, pressurization air temperature controls, and controllable heat outlets in the cabin. Air supplied by the pressurization system could be heated, and ducted to the pilot and passenger compartments.

The airplane's combustion heater utilized the same aviation gasoline as the engines, but ported through a heater solenoid valve. If the pilot selected heated air, an ignition coil, located in the heater body, would activate, and fuel would then be supplied to an injector through the solenoid valve. The fuel would be ignited by the coil and burned, and the heater exhaust would be routed overboard.

The heater combustion chamber was completely separate from the ventilation system to prevent exhaust gases from contaminating the cabin air. Vented air would be routed through a heater shroud, which surrounded the heater body. The air between the shroud and heater body would be warmed, and sent into the cabin. The heater's fuel solenoid valve would cycle on and off, to supply fuel for the heater as needed according to the temperature selected via the thermostat control, adjusted by the cabin heat knob located in the cockpit.

The pressurization system consisted of two engine turbochargers, their respective flow limiters, heat exchangers that shared ducting through the cabin, a pressure regulator valve (also known as the outflow valve) and cabin pressure dump valve (also known as the safety valve). The pressurization controls consisted of right and left pressurization air controls, a ram dump control, a cabin pressurization switch, a cabin rate-of-climb indicator, and a combination cabin

altimeter and differential pressure indicator.

During normal pressurized flight, air enters the system through a ram air scoop on the side of the engine nacelle. In the case where a blockage occurs in the ram air supply, air for the system is supplied through the induction system's alternate air door, which takes its air supply from within the nacelle. The air is filtered through the induction system main air filter and compressed by the engine turbochargers. The clean compressed air is then directed through a controller, a venturi-type flow limiter, and to a ram air-cooled heat exchanger to reduce the temperature of the pressurized air entering the cabin. The pressurized air is then routed into the cabin air system through a flapper type check valve and distributed throughout the cabin via the overhead fresh air and heater outlets at a controlled temperature. The pressurization system could have provided cabin pressurization above 8,000 feet, with the cabin altitude maintained at 8,000 feet at all airplane altitudes between 8,000 and 23,120 feet.

During unpressurized operations, pressurized air would have been dumped overboard by means of two solenoid activated pressurization air dump valves located in the wing roots adjacent to the heat exchangers. The pressure regulator valve, which would automatically controlled the cabin air outflow, was located in the aft cabin pressure bulkhead. The cabin pressure dump valve was also located in the aft cabin pressure bulkhead, and acted as a safety valve to prevent a maximum differential pressure of 5.3 psi to prevent the airplane from being pressurized on the ground, and to allow the pilot to "dump" the cabin pressure if needed in flight.

The airplane's wing baggage compartment was aft of the engine nacelle, and was inaccessible in flight.

WRECKAGE AND IMPACT INFORMATION

The airplane was intact and undamaged, with the exception of the right wing outboard of the wing flap. Examination of the airplane revealed that a clamp, which connected a rubber hose between the plenum chamber and the upper plenum (aft of the nose baggage heater), had separated. The rubber hose remained in place between the plenum chamber and the plenum, but there was evidence of blow-by around the hose.

The airplane cabin had a strong odor of tobacco products.

TESTS AND RESEARCH

On June 5, 2002, the wreckage was examined at a salvage facility. The door seal and outflow valve exhibited dark brown, tar-like deposits. The dump valves were closed, the cabin altitude controller was set at a cabin altitude of 7,500 feet, and an airplane altitude was set at 22,000 feet. The cabin rate-of-climb indicator was missing from the cabin rate control, and the outflow valve exhaust housing was contaminated with a dark colored residue; however, it did appear to seat properly, and the safety valve appeared new and clean, and properly seated.

On June 6, 2002, the cabin altitude controller, outflow valve, and safety valve were examined and functionally tested. All of the components were tested with only nominal variations when compared to new units. According to the testing facility, none of the variations would have resulted in an operational complaint.

The cabin altitude controller's inlet filter was approximately 75-percent blocked. The contamination appeared to be by-products of cigarette and/or cigar smoke; however, the contamination was not tested.

The airplane's turbochargers were examined and were both found to rotate freely, no internal or external leakage was noted, and no damage was noted.

The heater was examined at a test facility under FAA supervision. According to the inspector, the heater was activated and operated with an erratic fuel pressure, resulting from inconsistent burning in the combustion chamber. The unit took 4-5 minutes to shut down due to an improperly functioning fuel solenoid valve. The unit was also missing sealant in various areas; however, no carbon monoxide was detected in the heater discharge air.

No anomalies were noted with the cabin air or pressurization systems that would have prevented their operation with the exception of the fractured clamp near the heater. Representatives from the airplane manufacturer and pressurization component manufacturer opined that the absence of the clamp could have prevented the pressurization system from maintaining the desired cabin pressure.

The stainless steel clamp was sent to the Safety Board Materials Laboratory for further examination. An energy dispersive x-ray spectroscopy examination of the fractured clamp revealed chlorine and zinc along with other elements. Further examination of the clamp's fracture surface under a scanning electron microscope revealed radial marks that emanated from corrosion cavities at the inside diameter of the clamp. The fracture face contained multifaceted features typical of intergranular features.

The Safety Board investigator-in-charge swiped debris from the following items in the pressurization system with cotton swabs:

- right engine controller to venturi duct
- right wing pressurization inlet tube at the flapper valve
- right engine fresh air inlet
- left controller to venturi duct
- left wing pressurization inlet tube at the flapper valve

- left engine fresh air inlet
- heater to plenum connection
- cabin air recirculation tube at front of heater

The swabs were sent to the Materials Laboratory for examination. Visual examination with the aid of a bench binocular microscope revealed that the debris was oily and black in color. The spectra from each sample contained the following elements: carbon, oxygen, aluminum, silicon, chlorine, potassium, calcium, titanium, and iron. In addition, two samples (from the left and right controller to venturi connections) contained small peaks of the elements lead and bromine, which are elements consistent with the residue of aviation fuel exhaust. In normal operations, these connections would not be exposed to engine exhaust.

PATHOLOGICAL INFORMATION

Toxicological tests for carbon monoxide, cyanide, ethanol, and drugs were not performed on the pilot. Local law enforcement personnel asked the pilot if he had consumed any alcohol, prescription drugs, and/or illicit drugs prior to, or during the flight. The pilot reported that he had not.

The pilot reported that he smoked approximately 3 packs of cigarettes a day and also smoked cigars. According to an American Lung Association fact sheet relating to carbon monoxide poisoning, dated September 2000, smoke can contain extremely high levels of carbon monoxide as well as 200 other poisons. The Environmental Protection Agency also listed cigarette smoke as a source of carbon monoxide. Carbon monoxide poisoning has been associated with the following side effects:

Somatic/physical symptoms - fatigue, dizziness, vertigo

Cognitive/memory impairments - attention and concentration problems, multi-tasking problems, verbal and/or visual deficits, word finding problems, word order problems, short-term memory problems, loss of intellectual capacity, slowed cognitive processing.

Sensory & motor disorders - slower fine motor speed/coordination, decreased gross motor strength, and speaking disorders.

Pilot Information

Certificate:	Private	Age:	47, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
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 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	08/28/1998
Occupational Pilot:		Last Flight Review or Equivalent:	11/16/1998
Flight Time:	980 hours (Total, all aircraft), 810 hours (Total, this make and model), 825 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N414PS
Model/Series:	414A 414A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	414A0056
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	09/03/1999, Annual	Certified Max Gross Wt.:	7087 lbs
Time Since Last Inspection:	126.4 Hours	Engines:	2 Reciprocating
Airframe Total Time:	4757.6 Hours at time of accident	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	TSIOL-550-A
Registered Owner:	Prop Jocks, Inc.	Rated Power:	350 hp
Operator:	Patrick W. Swayze	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PRC, 5045 ft msl	Distance from Accident Site:	10 Nautical Miles
Observation Time:	1053 MST	Direction from Accident Site:	310°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots / 20 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	28° C / -1° C
Precipitation and Obscuration:			
Departure Point:	Van Nuys, CA (VNY)	Type of Flight Plan Filed:	IFR
Destination:	Las Vegas, NM (LVS)	Type of Clearance:	IFR
Departure Time:	0721 PST	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	34.600000, -112.250000

Administrative Information

Investigator In Charge (IIC):	Robert R Crispin
Additional Participating Persons:	Dean Hennies; Federal Aviation Administration; Scottsdale, AZ Michael Cummins; Honeywell; Phoenix, AZ Gary L Lynn; RAM Aircraft Modifications; Waco, TX John Stewart; Cessna Aircraft Company; Wichita, KS Tom Moody; Cessna Aircraft Company; Wichita, KS John T Kent; Teledyne Continental Motors; Mobile, AL
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .