Aviation Investigation Final Report

Location:	OLYMPIA, Washington	**Accident Number:**	SEA94FA124
Date & Time:	May 21, 1994, 09:25 Local	**Registration:**	N1669Z
Aircraft:	RYAN NAVION L-17B	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

WHILE CLIMBING DURING A DOWNWIND DEPARTURE, THE PILOT OF THE NAVION DECLARED AN EMERGENCY AND INITIATED A DESCENDING TURN BACK TOWARD THE AIRFIELD. AFTER THE TURN WAS INITIATED, WITNESSES NOTED AN INTENSE FIRE IN THE CABIN OF THE AIRCRAFT. SUBSEQUENTLY, THE AIRPLANE CRASHED IN A STEEP, LEFT WING LOW, NOSE DOWN ATTITUDE AND WAS DEMOLISHED BY IMPACT AND FIRE. THERE WAS EVIDENCE THAT THE FIRE AND SMOKE WERE SO INTENSE THAT THE PILOT WAS UNABLE TO MAINTAIN CONTROL OF THE AIRCRAFT. THE SPECIFIC SOURCE OF FIRE WAS NOT DETERMINED.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: AN INFLIGHT FIRE FOR AN UNDETERMINED REASON.

Findings

Occurrence #1: FIRE
Phase of Operation: CLIMB

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. FUSELAGE,CREW COMPARTMENT - FIRE

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - EMERGENCY

Findings
3. AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On May 21, 1994, about 0925 Pacific daylight time (PDT), a Ryan L-17B (Navion A), N1669Z, impacted the terrain about one-quarter mile northeast of Aero Plaza Airport, Olympia, Washington. The airline transport rated pilot and his passenger received fatal injuries, and the aircraft was destroyed. The personal pleasure flight, which had just departed Aero Plaza Airport for Yakima Air Terminal, Yakima, Washington, was in visual meteorological conditions at the time of the accident. No flight plan had been filed, and there was no report of an ELT activation.

According to witnesses, N1669Z was the third in a group of five aircraft that were departing Aero Plaza to attend a fly-in at Yakima. The first two aircraft took off to the west, and then executed left downwind climbing departures to the east. The pilot of 69Z followed this same basic profile, and observers reported that everything appeared "normal" until 69Z passed the east end of the airfield. Within about 30 seconds after passing the east end of the airfield, at an altitude estimated to be between 1,000 to 1,200 feet AGL, the pilot of 69Z transmitted "Navion Emergency" over the Olympia Tower frequency. Then, either simultaneously or immediately thereafter, the aircraft was observed turning left (north) and beginning a shallow descent. The tower controller at Olympia responded to this transmission by asking if the tower could be of help, and a pilot who had departed Aero Plaza after the Navion called him on the tower frequency, but there was no answer to either of these calls. According to a number of witnesses, within a few seconds after turning north, engine power was reduced, and the aircraft's landing gear were lowered and then retracted. About the same time as the gear was lowered, a white/light brown smoke began trailing behind the aircraft. The aircraft then began a descending left turn back toward the airfield (east), and the smoke quickly turned grey, and then black. One witness, who was near the point where the smoke first began coming from the aircraft, reported that there was a single loud "pop" just prior to the initiation of the smoke. Within about five seconds after the smoke first started, the aircraft had rolled into a bank steep enough that those near the flight path could see clearly into the cockpit. They reported that the cockpit was "engulfed in flames", and that they were unable to see the occupants because of the intensity of the fire. These "close-in" witnesses reported that flames were coming out of the top front and aft bottom of the canopy, and that smoke was coming from the lower left front area of the cabin. None of the witnesses saw any flames in or near the engine compartment, and none of the "close-in" witnesses saw smoke that they were sure was clearly coming from forward of the firewall. Some of the witness that were further away felt that the smoke might have been coming from the engine compartment as well as the cabin area. No witness reported any external flames except those flames that could be seen trailing from the canopy.

As the smoke darkened, the angle of bank continued to increase, and the descending pitch angle began to steepen. Approximately 10 to 15 seconds after the smoke first appeared, the aircraft impacted the terrain in approximately 90 degrees of left bank, and with a nose-down pitch angle estimated by witnesses to be 50 to 70 degrees. Immediately after impacting a ditch on the east side of Rainier Rd. S.E., the aircraft hit the right side of a compact car, slid across the road to the west curb, and exploded in flames.

WRECKAGE AND IMPACT INFORMATION

The initial point of terrain contact was on the level grassy boundary of a golf course just east of Rainier Road Southeast. At this location, a six inch square chunk of grass had been torn loose, and a portion of the red (left wing tip) navigation light lens was found laying in the dirt where the grass had been. About one foot to the left of this scar was the counterweight from the left aileron. Twenty-three feet west of the initial contact point, about 10 feet to the east of the road, was an impact crater three foot deep and three to five feet wide. The grass between the initial contact point and this crater was torn and ripped along its surface, and the grass immediately around the crater was burned. A number of pieces of shattered plexiglass were laying in and around the crater. Most of the dirt from the crater had been thrown into the road in a fan-shaped pattern, and the main wreckage had come to rest against the western curb. The crash track from the initial contact point to the center of the main wreckage ran on a magnetic heading of 260 degrees. Except for the aircraft battery, part of a wheel rim, part of the engine cowling, the cabin canopy, and portions of the left wing tip, the aircraft burned where it came to rest against the curb.

After documentation, the wreckage was removed from the accident site and transferred to a closed hangar for further teardown and inspection. During this inspection, all identifiable fuel and hydraulic lines, hoses and fittings were checked for signs of looseness, failure or separation, and none were found. In addition, all valves, actuators, pumps, coolers, selectors, reservoirs, filters, probes, separators, tanks, sumps, or drains associated with either the fuel or hydraulic systems were examined, and no signs of pre-impact failure or malfunction were found. In addition, the pressure carburetor and its associated fittings were inspected, and no anomalies were found.

The propeller was still attached to its hub, and one blade was bent back 90 degrees about half way along its span. This blade showed chordwise scarring along the outboard portion of both its leading and trailing edge, and it was missing chunks out of the leading edge near its tip. The other blade was bent back about 20 degrees along its outboard one-half, and the surface of the outboard half had deformed from melting in the fire.

The exhaust system was examined for signs of pre-impact malfunction or failure that would have released hot gases into the engine compartment, but no discrepancies were found. All exhaust studs were either found in place, or the holes they had been screwed into were found with their threads ripped out. Mechanical continuity of the engine's rotating and reciprocating parts was unable to be established due to impact damage and heat distortion. The crankcase

and cylinders were checked for signs of pre-impact cracks, holes, or failures, and none were found. Neither were any problems found with the rockers or rocker pin journals. Because of recent maintenance on the number four cylinder, it was removed for inspection, but no discrepancies were found with the piston, rings, piston pin, connecting rod, or valves.

No cans or cylinders that could have contained flammable liquids or pressurized gas were found in or around the wreckage, and interviews with those present when the aircraft was loaded revealed no knowledge of any flammable substance being carried on board.

TESTS AND RESEARCH

Because the canopy was thrown clear of the main wreckage on impact, it was exposed only to the inflight fire. Therefore portions of the canopy interior were enclosed in a metal can and sent to Artech Corporation for analysis of the headspace gasses within the can. These gasses were analyzed using a gas chromatograph equipped with a flame ionization detector in order to determine the fuel source of the inflight fire. The chromatogram from these gasses was compared to chromatograms of 80/87 aviation fuel, and MIL-H-5606 hydraulic fluid, but it was not characteristic of either of these substances. Although combustible gasses were found in the headspace gasses, the chromatogram was characteristic of pyrolysis of plastics. It was the opinion of Artech that these gasses were produced by the burning of plastics in the fire, and were not the fuel source of the fire.

ADDITIONAL DATA AND INFORMATION

Autopsies were performed on both occupants by the Thurston County Coroner, and the cause of death was attributed to extensive blunt impact injuries to the head and trunk.

A forensic toxicology analysis was performed on the pilot by the FAA Toxicology and Research Laboratory, and no carboxyhemoglobin, cyanide, ethanol, or screened drugs were found.

A forensic toxicology analysis was also performed on the passenger, who held a student pilot certificate, and no carboxyhemoglobin, cyanide, or screened drugs were found. The analysis did show 45.000 mg/dl of ethanol in the blood, but the report stated that this was, "...most likely from postmortem ethanol production."

The aircraft was released to James V. Stiger, an insurance adjuster, on September 9, 1994, in Olympia, Washington.

Pilot Information

Certificate:	Airline transport	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 7, 1994
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	4700 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	RYAN	**Registration:**	N1669Z
Model/Series:	NAVION L-17B NAVION L-1	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1669
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 30, 1994 Annual	**Certified Max Gross Wt.:**	2750 lbs
Time Since Last Inspection:	5 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2600 Hrs	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed, not activated	**Engine Model/Series:**	E-185-9
Registered Owner:	SMITH, CHRIS A.	**Rated Power:**	205 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	OLM ,206 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	09:51 Local	**Direction from Accident Site:**	225°
Lowest Cloud Condition:	Scattered / 1900 ft AGL	**Visibility**	25 miles
Lowest Ceiling:	Overcast / 3500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	14°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	None
Destination:	YAKIMA , WA (YKM)	**Type of Clearance:**	None
Departure Time:	09:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	AERO PLAZA AIRPORT WA44	**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	In-flight
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal	**Latitude, Longitude:**	46.979499,-122.739433(est)

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	JIM ERWIN; RENTON, WA
Original Publish Date:	April 7, 1995
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=41806