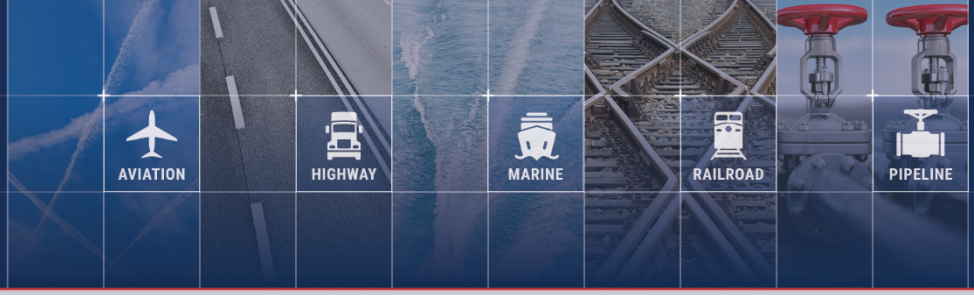

Aviation Investigation Final Report

Location:	ASHLAND, Oregon	**Accident Number:**	SEA96LA206
Date & Time:	August 30, 1996, 14:30 Local	**Registration:**	N4992Z
Aircraft:	Piper PA-22-108	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot, who was also an A&P mechanic, and a passenger took off on a cross-country flight. During the initial climbout, the pilot smelled something burning and decided to return for landing. White smoke entered the cockpit, followed by black smoke and a small flame under the instrument panel. While on short final approach, the engine lost power, and the pilot could not see outside the airplane due to the smoke in the cabin. The airplane touched down and the occupants escaped without injury. The airplane continued to burn and was destroyed. Examination of the wreckage revealed that a worn exhaust system clamp had come loose. The exhaust pipe became disconnected and imparted hot gasses onto the voltage regulator. The electrical wiring on the regulator subsequently burned and became shorted. An electrical fire and cabin fire followed. The pilot/mechanic had purchased the airplane three months before the accident after an annual inspection. The maintenance log books were not recovered. Verification of the last inspections, as well as compliance with an FAA airworthiness directive regarding exhaust system inspection every 50 hours, could not be confirmed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: inadequate inspection of the airplane by maintenance personnel,and a worn exhaust clamp, which resulted in a disconnected exhaust pipe, exhaust leak, burning and shorting of electrical wiring associated with the voltage regulator, and a cabin fire.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) MAINTENANCE,INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
2. (C) EXHAUST SYSTEM,CLAMP - WORN
3. (C) EXHAUST SYSTEM,MANIFOLD/PIPE - DISCONNECTED
4. (C) EXHAUST SYSTEM,MANIFOLD/PIPE - LEAK
5. ELECTRICAL SYSTEM,VOLTAGE REGULATOR - BURNED
6. FUSELAGE,INSTRUMENT/ELECTRICAL PANEL - SHORTED

Occurrence #2: FIRE
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings
7. ELECTRICAL SYSTEM,ELECTRIC WIRING - FIRE
8. FUSELAGE,CABIN - FIRE

Occurrence #3: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Occurrence #4: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Factual Information

On August 30, 1996, about 1430 Pacific daylight time, N4992Z, a Piper PA-22, operated by the owner/pilot, had an in-flight fire and was destroyed after an emergency landing at Ashland, Oregon. The in-flight fire was first detected during the initial climbout from Ashland. The private pilot and his passenger were not injured. Visual meteorological conditions prevailed and no flight plan had been filed. The personal flight was conducted under 14 CFR 91 and was destined for Creswell, Oregon.

According to the pilot in a telephone interview on the day of the accident, the airplane underwent a "good" preflight and engine run-up prior to departure from runway 30 at the Ashland Municipal Airport. The pilot stated that no anomalies were detected prior to the takeoff, and that the ammeter was showing about "a 1/2 needle-width of charge." During the initial climbout, the pilot smelled something burning. Shortly thereafter, at an altitude of about 250 feet above the ground, the pilot saw white smoke coming from underneath the left portion of the instrument panel. The pilot stated that he checked the circuit breakers, and none had popped. He shut off the airplane's electrical equipment and commenced an immediate turn back to the departure airport.

The pilot further stated in a written statement (attached) that he entered the traffic pattern for landing on runway 30. He turned the electrical master switch back on to announce his intentions of the radio, and then turned the switch off. The smoke turned black and began to get thicker; he then observed a small flame coming from underneath the instrument panel. The engine quit just short of the runway. While on final approach and during the flare over the runway, the pilot could not see outside of the airplane. He felt the airplane touch down. He attempted to activate the brake, and it was ineffective. The airplane veered off the left side of the runway and into grass. As it slowed, the pilot got his passenger to exit the airplane, followed by himself. The airplane came to a stop and burned. It was completely consumed in the fire, except for the engine and a portion of the right wing.

According to the Oregon State Fire Marshall fire investigation report (attached):

... the exhaust pipe connecting to the muffler was not connected. It had come apart a distance of approximately 1-1/2". Back towards the engine where the exhaust pipe entered the manifold portion of the exhaust system I noted a new crack approximately half way around the pipe. My determination that the crack was new was due to the [shiny] appearance of the metal in the crack area. The spread of the crack was in direct relation to the distance the pipe was pulled out of the muffler. My opinion finds that the heat from the exhaust pipe disconnection was in close proximity to the voltage regulator on the firewall above the connection point. It was apparent ... that the heat melted the insulation on the wiring short circuiting the wiring in all directions leading to

and from the voltage regulator. The resulting short circuit began to smoke....increased oxygen [due to opening of the cabin doors after landing] intensified the ignition and brought it into full flame.

According to an FAA aviation safety inspector (statement attached) from Portland, Oregon:

... the left exhaust pipe was cracked at the rear riser and separated from the muffler. The exhaust pipe muffler clamp was loose and worn. The clamp has a knob welded to the interior side. This knob extends through the exhaust pipe and muffler inlet to prevent the separation of the two. The clamp bolts to the pipe. The knob on the clamp appeared to be badly worn and the insertion holes in the pipe and muffler were elongated.

The FAA inspector further stated that FAA Airworthiness Directive 68-05-01(attached) and Piper Service Letter 324C (attached) address the maintenance and inspection of the PA-22 exhaust system. They require an inspection of the exhaust system at 50 hour intervals. The inspector stated that the pilot claimed the aircraft maintenance log books were destroyed in the accident; therefore, verification of compliance with the Airworthiness Directive was impossible, as well as any maintenance activity or inspections prior to the accident.

The pilot, age 39, was issued an FAA Private Pilot certificate on February 12, 1996. He also issued an FAA Airframe and Powerplant Mechanic certificate on July 5, 1994. The pilot stated that he had purchased the accident airplane after it underwent an annual inspection in April of 1996. He stated that no unresolved discrepancies were noted prior to the accident and since the inspection.

Pilot Information

Certificate:	Private	**Age:**	39,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 3, 1994
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	89 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4992Z
Model/Series:	PA-22-108 PA-22-108	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	22-8600
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	Annual	**Certified Max Gross Wt.:**	1600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2800 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-235-C1
Registered Owner:	HOUCK, STANLEY E.	**Rated Power:**	108 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:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ASHLAND , OR (S03)	**Type of Flight Plan Filed:**	None
Destination:	CRESWELL , OR (77S)	**Type of Clearance:**	None
Departure Time:	14:28 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	ASHLAND MUNICIPAL S03	**Runway Surface Type:**	Asphalt
Airport Elevation:	1885 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	30	**IFR Approach:**	None
Runway Length/Width:	3603 ft / 75 ft	**VFR Approach/Landing:**	Forced landing;Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 None	**Aircraft Fire:**	In-flight
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	42.149162,-122.529273(est)

Administrative Information

Investigator In Charge (IIC):	Guzzetti, Jeffrey
Additional Participating Persons:	JERRY BAAS; HILLSBORO , OR
Original Publish Date:	May 23, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42458