Aviation Investigation Final Report

Location:	BOONE, North Carolina	**Accident Number:**	MIA00LA207
Date & Time:	July 7, 2000, 11:00 Local	**Registration:**	N7VZ
Aircraft:	Cessna P210N	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During takeoff rotation, engine power decreased and the pilot heard an unusual noise from the engine area. The pilot was unable to stop on the remaining runway and proceeded away from the airport and made a 180 degree turn to return to the airport. The engine did not produce enough power to return to the runway and the aircraft was landed in the grass adjacent to the runway. During rollout the nose landing gear collapsed and the aircraft impacted a mound of dirt where it came to rest. Post crash examination of the aircraft by an FAA inspector showed the engine inter-cooler system, which had been installed in accordance with an STC, was loose at the worn single attach point and the rubber duct from the inter-cooler to the engine was split about 50% around, causing turbocharged air to be exhausted overboard. The aircraft had received an annual inspection about 1 flight hour before the accident. Documents for the inter-cooler system did not give any directions for inspecting the system.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the inter-cooler duct connecting the inter-cooler to the engine due to inadequate attachment of the inter-cooler to the aircraft which resulted in loss of turbocharger air overboard and loss of engine power and damage to the aircraft during a forced landing. Contributing to the accident was inadequate inspection requirements for the inter-cooler system and inadequate inspection of the inter-cooler system by the mechanic during the last inspection.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) COOLING SYSTEM,RADIATOR - LOOSE
2. (C) ACFT/EQUIP,INADEQUATE DESIGN - MANUFACTURER
3. (C) MAINTENANCE,INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
4. (C) CONDITION(S)/STEP(S) NOT LISTED - MANUFACTURER
5. (C) INDUCTION AIR DUCTING - TEAR/TORN

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: NOSE GEAR COLLAPSED
Phase of Operation: LANDING - ROLL

Occurrence #4: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING - ROLL

Findings
6. TERRAIN CONDITION - DIRT BANK/RISING EMBANKMENT

Factual Information

On July 7, 2000, about 1100 eastern daylight time, a Cessna P210N, N7VZ, registered to Donatech Corporation, crashed while attempting to land, following loss of engine power during takeoff from Boone Airport, Boone, North Carolina, while on a Title 14 CFR Part 91 personal flight. Visual meteorological conditions prevailed at the time and no flight plan was filed. The aircraft received substantial damage and the private-rated pilot received serious injuries. The two passengers received minor injuries. The flight was originating at the time of the accident.

The pilot stated that upon takeoff rotation, power significantly decreased and there was a noise from the engine at the same time. On climb-out, the engine power and noise oscillated and power reduced. The aircraft failed to climb. At this point he had insufficient runway left to land. He began to maneuver the aircraft for a 180-degree turn back to the runway. As the turn progressed he found he had not enough power to complete the turn in order to land on the runway. The aircraft landed adjacent to the runway onto the grassed area. The aircraft began to skid, the nose wheel collapsed and then continued to slide until it contacted a large mound of dirt upon which the aircraft came to rest.

Postcrash examination of the aircraft by an FAA inspector and a representative of Teledyne Continental Motors showed that the aircraft and engine had been modified by the installation of a Riley International Corporation, Engine Inter-cooler System, in accordance with FAA Supplemental Type Certificates SA 2528 NM and SE 2529 NM. The single attach point for the inter-cooler had a worn bolt hole and the inter-cooler could be moved. The rubber duct which connects the outlet of the inter-cooler to the engine was split about 50% around, allowing turbocharged air to be exhausted overboard.

The aircraft had received an annual inspection on June 13, 2000, about 1 flight hour before the accident. The Riley International Corporation, Airplane Flight Manual Supplement and Pilot Operating Handbook Appendix, did not give any instructions for inspection of the inter-cooler system.

Pilot Information

Certificate:	Private	**Age:**	52,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:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 28, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	785 hours (Total, all aircraft), 111 hours (Total, this make and model), 716 hours (Pilot In Command, all aircraft), 23 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7VZ
Model/Series:	P210N P210N	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	P21000005
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 13, 2000 Annual	**Certified Max Gross Wt.:**	4000 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2300 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-520-P
Registered Owner:	ROBERT H. GLAZIER	**Rated Power:**	310 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:	TNB ,3100 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	11:13 Local	**Direction from Accident Site:**	30°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	22°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(5A3)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	10:58 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	BOONE 5A3	**Runway Surface Type:**	Asphalt
Airport Elevation:	3120 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	31	**IFR Approach:**	
Runway Length/Width:	2600 ft / 40 ft	**VFR Approach/Landing:**	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 2 Minor	**Latitude, Longitude:**	36.199348,-81.660835(est)

Administrative Information

Investigator In Charge (IIC):	Kennedy, Jeffrey
Additional Participating Persons:	BETTY REED; CHARLOTTE , NC GEORGE HOLLINGSWORTH; MOBILE , AL
Original Publish Date:	March 2, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49629