

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ANC24LA025

ENGINE EXAMINATION

April 30, 2024

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A. ACCIDENT

Location: Talkeetna, AK
Date: April 21, 2024
Time: 1445 Local

Airplane: Cessna 120 N77032

B. ENGINE EXAMINATION

IIC	Mark Ward NTSB Anchorage, AK
Investigator	Stacia Joyce NTSB Anchorage, Ak
Investigator	Mitch Rasmussen NTSB Anchorage, AK
FAA IIC	Curtis Martin FAA Anchorage, AK

C. SUMMARY

The pilot reported that, he had performed his standard pre-flight checks. Sumped fuel from both wing tanks and the gascolator. He verified that each wing fuel tank had 6 gallons of fuel. He started the engine and allowed the engine to warm up for 10 minutes and the engine operated normally. He obtained weather and taxied to runway 19 at the Talkeetna airport (TKA) and was number 3 for departure. Before takeoff he performed an engine run up check to include checking both magnetos and carburetor heat with no abnormalities noted. He verified the fuel selector was in the right fuel tank position and departed runway 19 at about 14:44 Alaska daylight time (AKDT). The takeoff roll and lift off were normal and he climbed at the airplane's airspeed for best angle of climb (VX). When the airplane reached about 300 ft above the ground (agl) the pilot observed the engine rpm dropping down to 1500 and then back to 2400 rpm about 5 or 6 times. He turned the airplane back towards the airport and verified the fuel selector was in the right fuel tank position. During the turn the engine loss total power and the pilot made a forced landing into snow covered terrain short of the runway. The airplane traveled about 40 feet in the snow before the

landing gear dug into the snow and the airplane nosed over. The airplane sustained substantial damage to the wing lift struts.

D. DETAILS OF THE EXAMINATION

The engine is a Continental Aircraft engine, Model C85, S/N 4915-12 (Figure 3)



Figure 1 Left and right side of the engine.

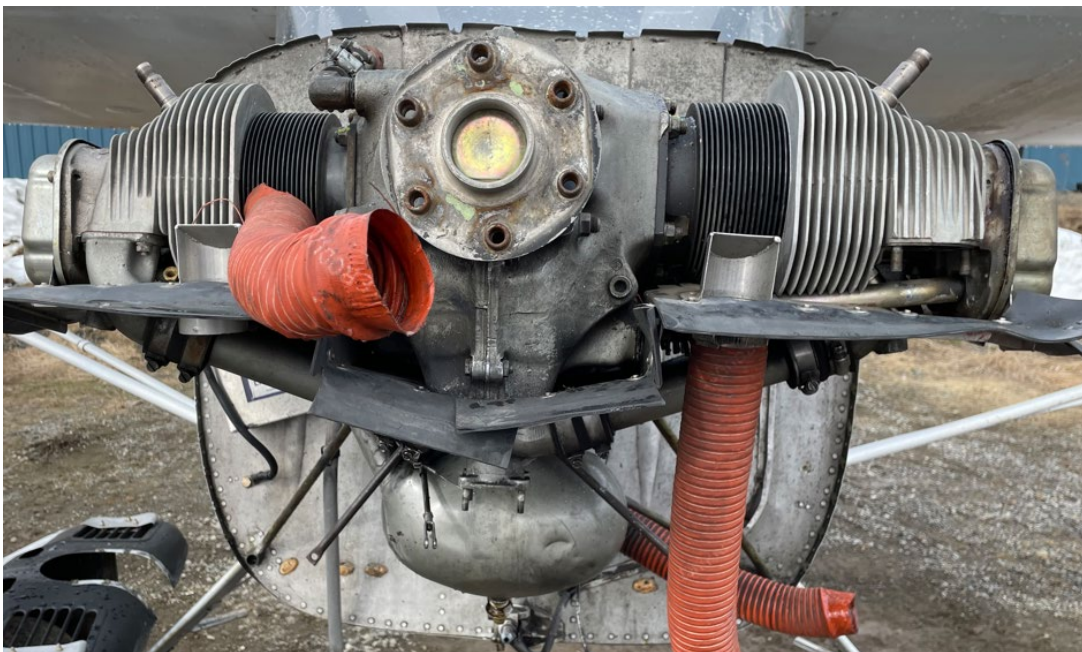


Figure 2 Front view of the engine.

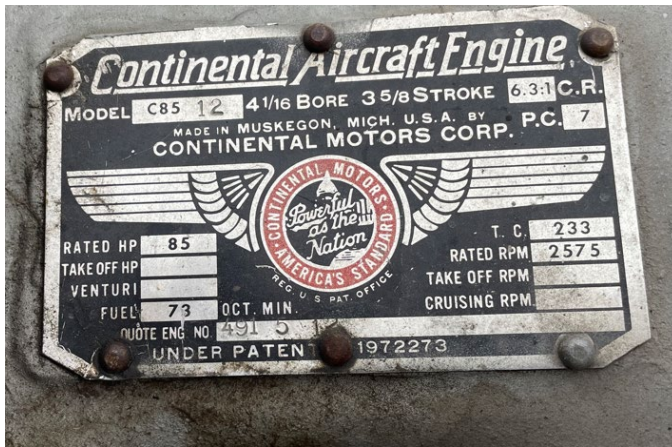


Figure 3 View of data tag on top of the engine.



Figure 4 View of airplane's tach time.

1.1 Fuel/Fuel System

The owner verified that the airplane had 6 gallons of fuel in each wing before takeoff. During the engine examination the left wing fuel tank indicated just under a half tank and the right wing fuel tank was just over a half of tank (Figure 5).



Figure 5 View of the left and right fuel level indicator from inside the cockpit.

Fuel was collected from each wing tank's fuel sump drain valve. No water was observed in the fuel drained from the left fuel tank. A small amount of water was observed in the fuel drained from the right fuel tank (Figure 6). Before the engine examination the owner retold the events leading up to the accident. He stated he had found a small amount of water when sumping the right side wing fuel tank and that it was typical for this airplane to collect a small amount after sitting outside.



Figure 6 view of fuel collected from the left and right fuel tank.

The gascolator was drained of fuel. A small amount of water was observed with a few particles of dirt (Figure 7). The gascolator screen was free of obstructions (Figure 8).

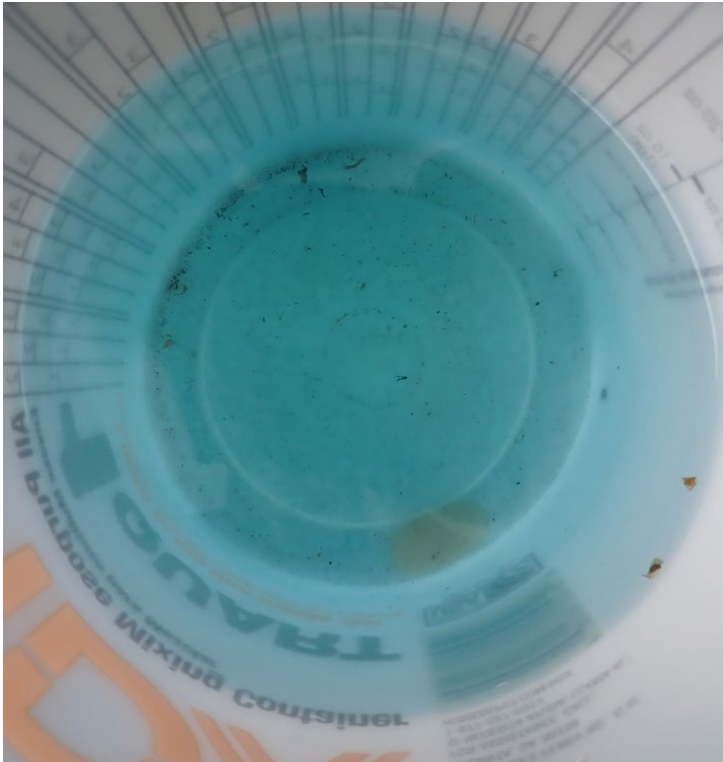


Figure 7 View of fuel collected from the gascolator.



Figure 8 View of the gascolator mount and screen.

The gascolator was full of fuel. The fuel selector was moved to the left tank and fuel flowed from the fuel tank to the gascolator. Fuel was observed in the fuel line to the carburetor. The carburetor bowl was full of fuel. During the throttle control cable

continuity check, the movement of fluid could be heard from the accelerator pump when pushing the throttle control knob forward.

A very small amount of water was observed in the carburetor bowl (Figure 10). The last chance inline fuel filter screen was clean, and no obstructions were observed (Figure 11). The carburetor float was in good condition, no damage to the float was observed (Figure 12).



Figure 9 View looking down into the carburetor bowl.



Figure 10 Fuel collected from the carburetor bowl.

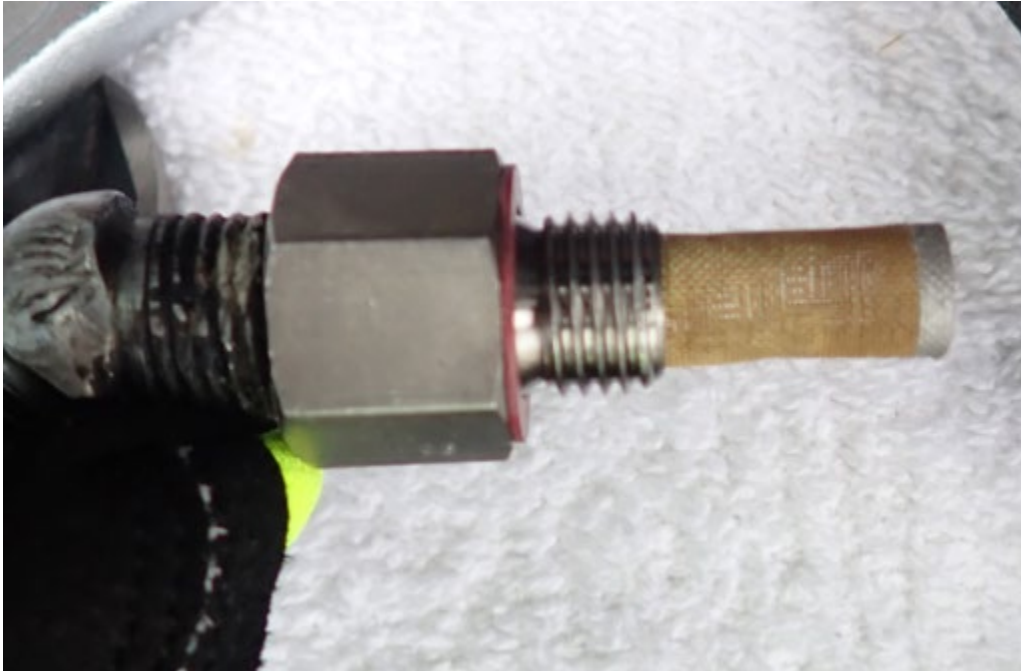


Figure 11 View of the last chance fuel screen into the carburetor.

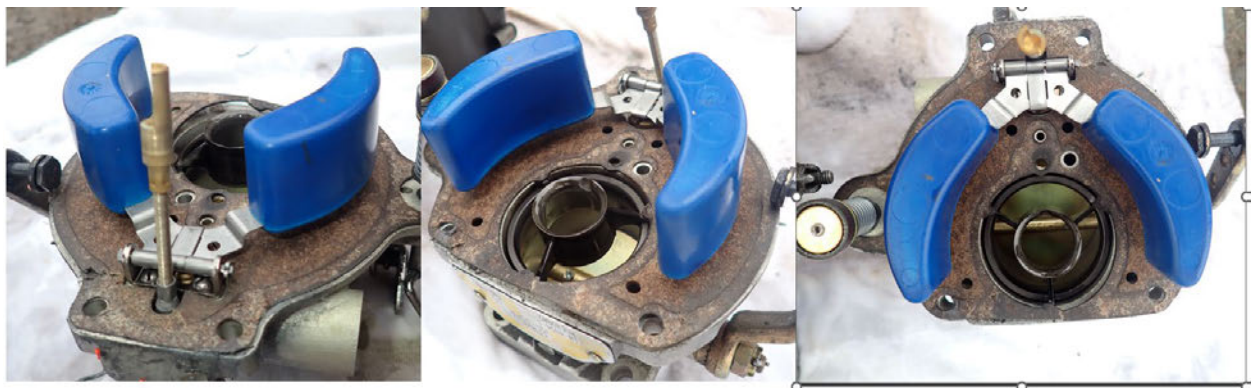


Figure 12 View of the carburetor float assembly.

2.0 Engine Examination

Engine throttle, mixture and carburetor control cables were securely attached and moved freely.

Engine oil level was good (Figure 13), the total time of the airplane is 1695.01. The last oil filter change was performed at 1649.21 aircraft hours (Figure 13).

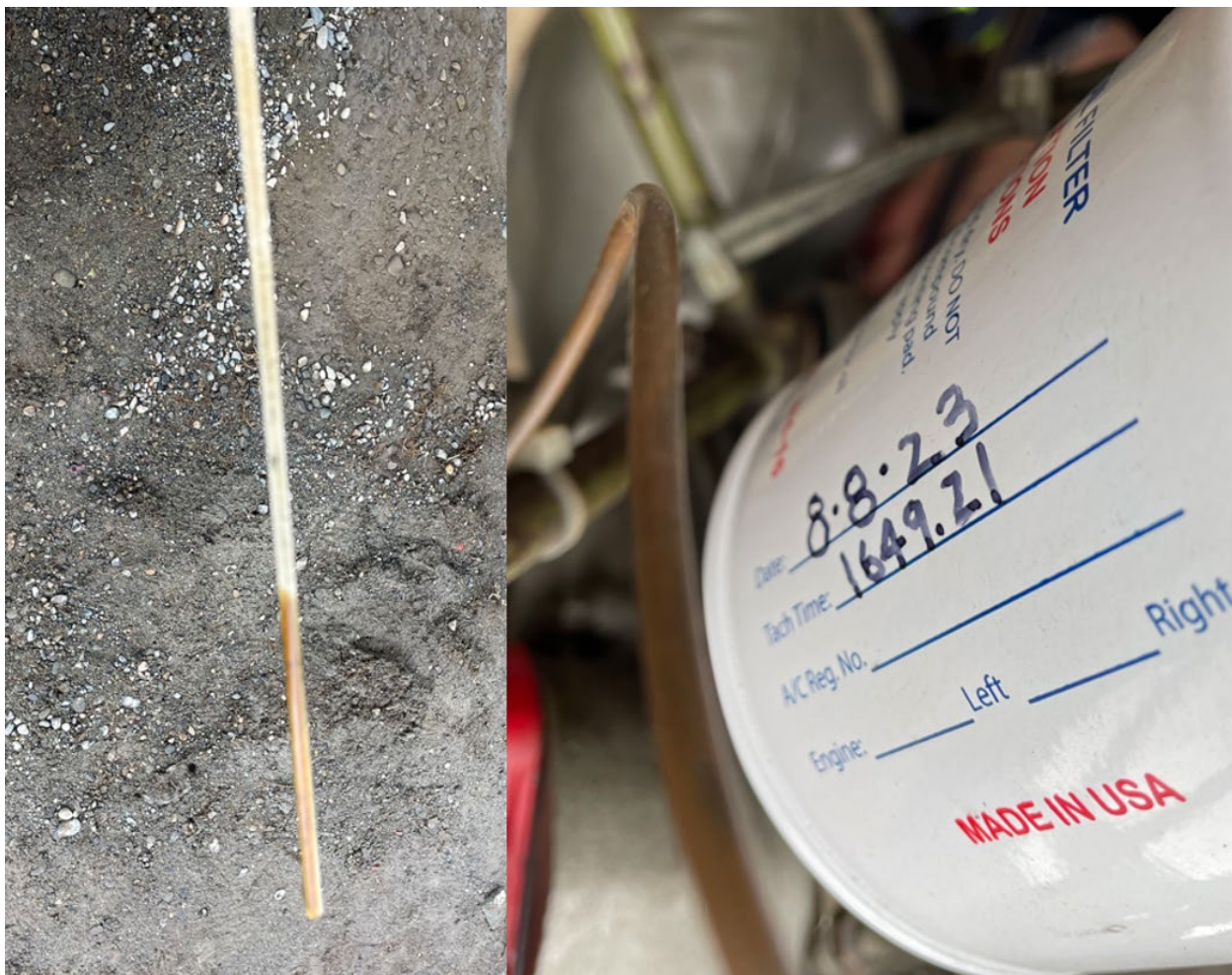


Figure 13 View of the engine dip stick and remote oil filter.

All high-tension sparkplug wires were securely fastened from the magnetos to the sparkplugs. The high-tension sparkplug wires had numerous spots along the shielding of excessive wear (Figure 14). Wire resistance was the same on all high-tension wires except for the wires going to the top number two and four sparkplugs, those wires had a higher resistance. The wires were tested in a cable tester. All high-tension sparkplug wires tested good except for the wires to the bottom number two and four cylinders. The number two tested good only after moving the wires around. When testing the number four wire you could hear a wire shorting out in or near the magneto.



Figure 14 View of damage to the high-tension sparkplug lead wires.

The engine main crankshaft was rotated at the propeller flange. All valves moved smoothly and equally. Clicks could be heard during rotation from the impulse coupler in the magnetos, which confirmed drivetrain continuity from the front to the rear of the engine. Thumb compression was observed in all cylinders.

Magneto information

- Left side – Bendix S4LN-21 10-51360-37 S/N 113464
- Right side - Bendix S4LN-21 10-51360-37 S/N 437135

Both magnetos were securely fastened, and timing was about 30° before TDC. The P-lead connection into the back of the left side magneto was loose and had backed out about four full turns, the right magneto connection had backed out about a half a turn. The p-lead grounds were disconnected from both magnetos and the main crank shaft was rotated and only one sparkplug lead on the top left side would intermittently produce a weak spark. The magnetos were removed and benched tested. When directly spinning the magnetos, all leads produced strong spark except for wire leads to the top sparkplug in cylinder four(T4) and to the bottom leads in cylinder two(B2) and four(B4). The spark produced to T4, B2 and B4 was very weak and difficult to see.

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Right

ACCESSORY SPECIALIST
2425 MERRILL FIELD DR.
CRS #EX4R170M

OWNER shelf stock W.O. 7455
 PART NAME Magneto DATE 7-16-91
 MODEL SHLN-21 SERIAL 385053
 REMARKS overhauled & A.P. 7809-07 9w by replacement
 SIGNATURE [REDACTED]
S.B. 5990 C/w by replacement

Figure 15 Right magneto yellow tag. Provided by owner.

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LEFT

ACCESSORY SPECIALIST:
2425 MERRILL FIELD DR.
CRS #EX4R170M

OWNER Will Mayo - AK. Eng W.O. 8041
 PART NAME mag DATE 6-26-92
 MODEL SHLN-21 SERIAL 437135
 REMARKS O/H & Repair S.B. 5990 C/w by replacement
 SIGNATURE [REDACTED]

Figure 16 Left magneto yellow tag. Provided by owner.

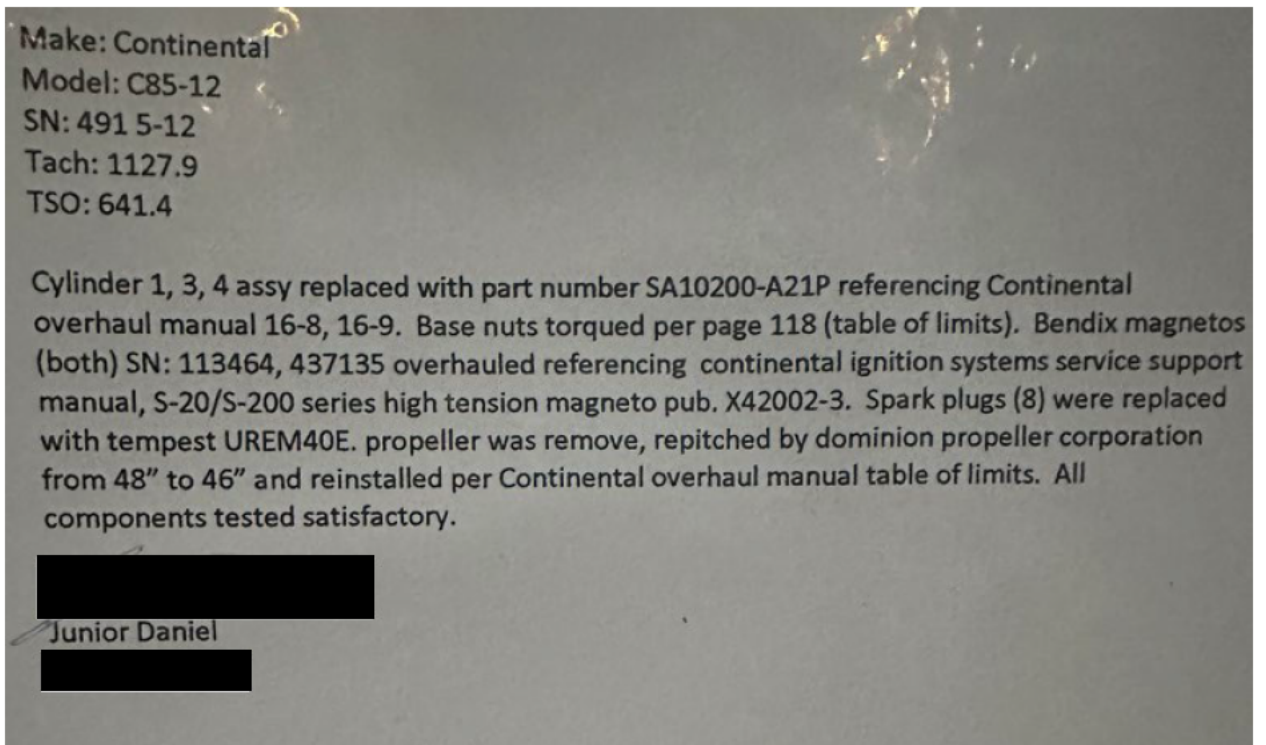


Figure 17 Logbook entry for magnetos installation. Provided by owner.

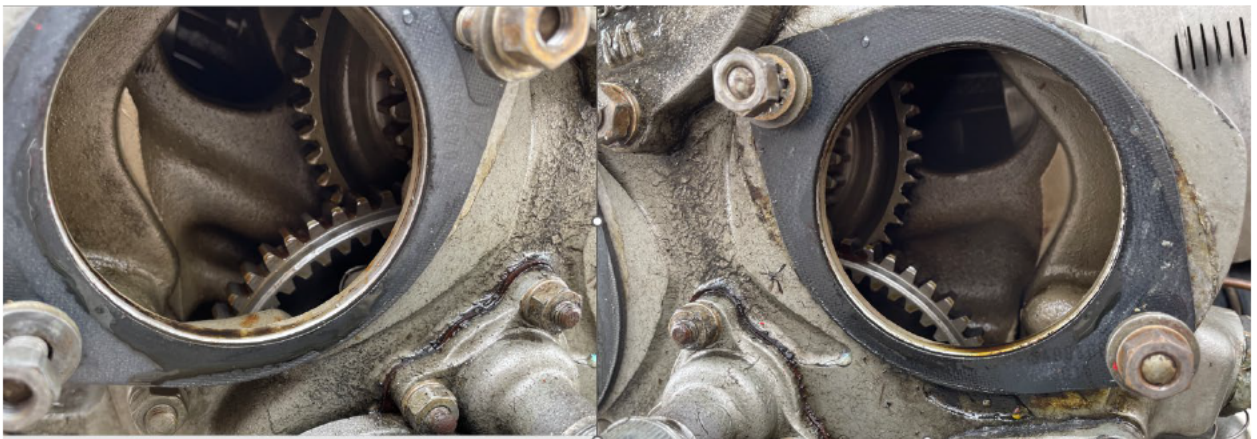


Figure 18 View into the accessory case after the removal of the magnetos.



Figure 19 view of wire damage to the P-lead connection into the back of the left magneto.

All sparkplugs except the bottom sparkplug to the number 4 cylinder were securely installed. The number four sparkplug was about halfway backed out of the cylinder. The sparkplugs were removed. Using the Champion aviation check-a-plug guide. The sparkplugs were in worn out - normal condition (Figure 20). Electrodes showed normal erosion, ground electrodes about half original thickness. The bottom sparkplugs to cylinders one and four had excessive gaps between the ground electrode and the center electrode and top sparkplugs to cylinders one, three and four had excessive gaps between the ground electrode and the center electrode.



Figure 20 View of sparkplugs removed from the engine.

Air inlet screen to the carburetor heat box was removed and no obstruction in the screen or air intake to the carburetor were observed. The exhaust collectors were removed, and no obstructions were observed in the exhaust collectors or mufflers (figure 21).



Figure 21 Left and right exhaust collectors and mufflers.

3.0 Propeller Examination

The propeller was removed to prevent damage during recovery. The mechanic and owner provided the below pictures of the propeller before removal. The propeller was not available during the engine examination. The owner's mechanic during the engine examination stated that the propeller was undamaged with no signs of rotational damage and believes the engine had quit before the airplane nosed over in the snow (Figure 22-24).



Figure 22 View of propeller at the accident site, photo provided by owner's mechanic.



Figure 23 View of propeller at the accident site, photo provided by owner's mechanic.



Figure 24 View of propeller at the accident site, photo provided by owner's mechanic.

4.0 Meteorological Information

Talkeetna weather facility reported at 14:53 local time temperature of 53.6F with a dew point of 19.4F. Talkeetna METAR PATK 212253Z 28003KT 10SM CLR 12/M07 A2983 RMK AO2 SLP105 T01171067. The environment conditions were outside the carburetor icing probability chart for carburetor icing (Figure 25).

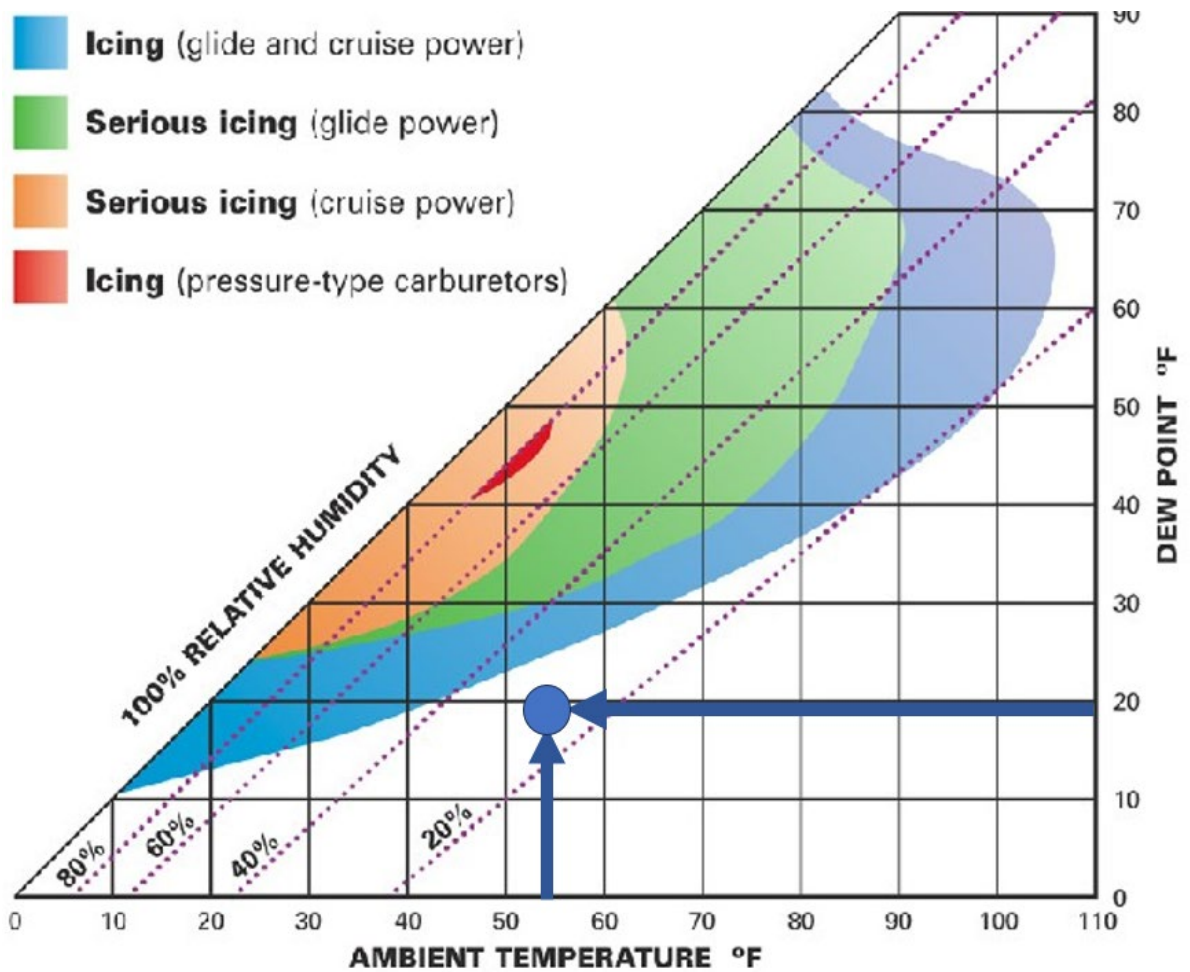


Figure 25 Carburetor icing probability chart

Submitted by:

M. Ward
AAI