

Record of Examination
CEN21LA208
Date of Examination: August 2, 2021
Performed By: Mitchell Gallo

The aircraft, a Beech Aircraft Corporation 23, serial number M102, N2378Z, was examined by the NTSB Investigator-In-Charge at Beegles Aircraft Service, Greeley, Colorado, on August 2, 2021.

The aircraft was not equipped with shoulder harnesses. Photo 1 shows the aircraft front and rear seats without shoulder harnesses.



Photo 1: Front and Rear Seats

The Hobbs meter indicated 232.1 hours, and the tachometer indicated 660.9 hours.

There was an unmarked cockpit push-pull control with a label of "INOP" shown in Photo 2.



Photo 2: Unmarked Cockpit Control

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The cockpit elevator trim control was labeled "AIL" and had no nose-up and nose-down range markings of as shown in Photo 3.



Photo 3: Elevator Trim Control

The elevator trim jack screw was extended approximately 2 ½ inch as shown in Photo 4, which equated to approximately a slightly elevator trim tab down from neutral.

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Photo 4: Elevator Jack Secure Extension

The cockpit fuel selector was positioned to the left limit of travel. The fuel selector position markings were covered by a metal piece installed on top of the unit shown in Photo 5. During rotation of the fuel selector by hand, there were no detents felt, and the selector moved freely through the left and right detents.

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Photo 5: Fuel Selector Control

The master switch was turned ON and the auxiliary fuel pump switch, "BOOST PUMP," was turned ON and a sound consistent with fuel pump operation was heard.

The propeller exhibited bending and twisting as shown in Photo 6. The propeller hub had the following markings:

R1
P.C.NO.1
MODEL M74DM
- 0 - 60

SERIAL K2439
PITCH 60

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Photo 6: Propeller

The engine data plate had the following markings:

Lycoming Aircraft Engine
Model: O-320-D2B
Serial number: L-5250-39

The engine crankcase number had the following marking: L5250-39.

Throttle and mixture control continuity from the cockpit controls to the carburetor was confirmed.

All fuel lines leading from the fuel tanks to the carburetor were intact, secure, and did not display evidence of fuel leakage.

The gascolator was removed and disassembled. The gascolator was full of a blue color liquid consistent with 100 low-lead aviation fuel. The bottom of the gascolator contained a black color non-metallic debris, and the gascolator screen had a contaminant that did not obstruct an estimated 80% of screen shown in Photo 7.

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Photo 7: Gascolator and Gascolator Screen

The carburetor was removed for further examination. The carburetor data plate is shown in Photo 8.



Photo 8: Carburetor Data Plate

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A differential compression test of all cylinders was performed with the engine at an ambient air temperature of about 80° F. With the top spark plugs removed, a source 80 psi air was applied. The following compressions were obtained:

Cylinder #1: 58 psi/80 psi

Cylinder #3: 68 psi/80 psi

Cylinder #2: 42 psi/80 psi

Cylinder #4: 70 psi/80 psi

The oil dipstick was removed during the compression test and air could be heard flowing into the crankcase consistent with the compressed air in the cylinders flowing past the piston rings during the test.

The oil dipstick indicated an oil level of about 8 qt. The engine oil screen did not contain an abnormal amount of metallic debris.

The left and right magneto data plates are shown in Photo 9.



Photo 9: Left (L) and Right (R) Magnetos

The ignition harness was attached and secured at both magnetos and at all spark plugs. Both magnetos were attached, secure, and were unable to be rotated/moved while mounted to the engine accessory case using hand pressure. Engine to left magneto timing was about 26° before top dead center (BTDC), and the engine to right magneto timing was about 25° BTDC. The engine data plate indicated the spark advance for the engine was 25°. Both magnetos were removed for bench testing and a check of internal timing. All plugs were of the massive electrode type and displayed “normal wear” consistent with the Champion Aviation Service Manual AV-6R. Comparative spark plug features of the top and bottom spark plugs with the Champion Check-A-Plug chart is shown in Photo 10.

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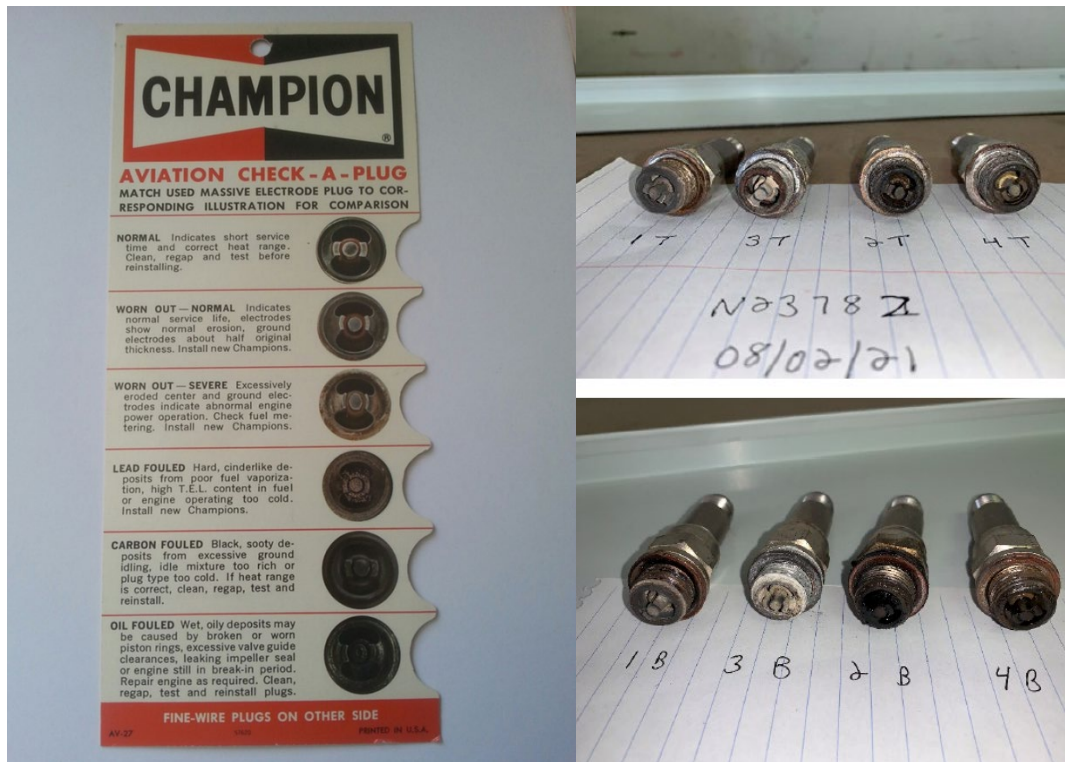


Photo 10: Top (T) and Bottom (B) Spark Plugs from 1 to 4

The ignition harness was tested using an ignition harness tester set at 12 V. Each cable of the harness tested without fault.

The engine was rotated though by rotating the propeller hub by hand. Valve and engine train continuity was confirmed to the engine accessory section. Borescope of all the cylinders revealed no abnormal cylinder wall or piston wear/features.

The air filter element for the induction system and the induction system was unobstructed.

The exhaust system was intact and secure. The exhaust heat exchanger was unobstructed as shown in Photo 11.

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Photo 11: Internal View of Heat Exchanger

The engine driven fuel pump was removed for further examination. The pump had the following marking: 154720899.

The left and right fuel transmitters were removed from their respective fuel tanks. Both fuel transmitter float arms were moved full travel by hand and no binding or sticking was present. The fuel transmitters are shown in Photo 12. The left transmitter had a white colored residue at its base. The left transmitter float was a made of solid non-metallic material, and the float arm was soldered together about mid length of the arm. The right transmitter float was metallic and did not contain liquid within the float. The resistive values of both transmitters were measured at the approximate bottom, middle, and upper float travel positions using a multimeter and those values are shown in Figure 1.

Transmitter	Bottom (ohms)	Middle (ohms)	Upper (ohms)
Left	1	17.5	34
Right	1	18	32

Figure 1: Fuel Transmitter Resistive Values

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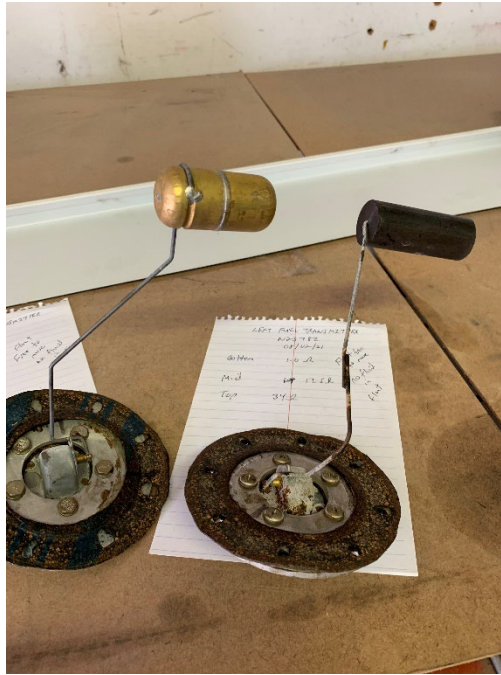


Photo 12: Fuel Transmitters