

A. DETAILS OF THE INVESTIGATION

Examination – 24Feb2021, examination was done by certified mechanic with NTSB IIC Zoom oversight

The engine remained attached to the airframe by only one engine mount. All engine accessories remained attached to the engine via their respective mounts. All cylinders remained attached to the crankcase.

Throttle, mixture and carburetor heat controls were damaged and continuity to the engine was not established. Propeller control continuity was established from the control to the engine. The fuel Primer plunger moved freely.

The top spark plugs and cylinder rocker box covers were removed. Note, the #6 top spark plug was only installed finger tight. The top spark plugs (Champion part number RHB32E) were intact and exhibited normal operational signatures. The electrode gaps were consistent with service specifications.

The crankshaft was rotated by hand using the propeller. Rotational continuity was established throughout the engine and valve train. Equal movement was observed on all of the intake and exhaust valve rocker arms. Thumb compression and suction was obtained on four of the six cylinders. Cylinder number 3 and 5 had very minimal thumb compression. A differential pressure gauge was connected to the number 3 and 5 cylinders which exhibited around 25% to 75% compression loss. The valve rocker arms were tapped with a rubber mallet and compression recovered to approximately 25% loss in the number 3 cylinder and 15% loss in the number 5 cylinder.

The magnetos were removed and rotated by hand. Spark was observed on all posts.

The intake system remained intact at the cylinder heads; however the air filter and filter housing were severely damaged. The exhaust system was damaged and pulled away from the cylinder heads.

The engine cylinders were examined internally using a borescope. The piston tops and cylinder sidewalls appeared normal. No evidence of foreign object ingestion was observed.

The gravity feed fuel system was connected to a fuel strainer upstream of the Marvel Schebler carburetor. The fuel strainer drain pull handle used for draining the strainer was inoperable. An examination of the fuel strainer found the drain valve cable to be dirty without evidence of frequent actuation (cable showed no signs of sliding in and out of the cable housing). The fuel strainer drain valve cable was disconnected and the drain valve was opened manually without restriction. The fuel strainer housing (bowl) was removed and the internal screen was free of debris. Fuel remaining in the strainer bowl was clear and bright.

The carburetor remained attached to the engine. Throttle arm movement was restricted due to throttle cable damage.

The fuel selector valve was rotated to the four detent positions (Off, Left, Right, Both) without restriction.

Examination of the airframe revealed that both the left and right wings were removed during the recovery operation. The wing flight control cables were cut at the wing root (typical for wing removal during recovery). Both left and right wing fuel tank caps remained secure and there was no evidence of fuel remaining in the wings. The fuel lines were disconnected and the vent tubes were intact and not obstructed.

Continuity of the flight control system could not be established for the elevators and rudder due to severe damage to the empennage and stabilizers. The aileron control rigging was disconnected when the wings were removed during the recovery operation.