

Examination – 23Feb2021, Air Transport, Phoenix, AZ
Examination was done by a certified mechanic with Zoom oversight by NTSB IIC.

The engine remained attached to the airframe although the engine mounting structure is damaged. All engine accessories remained attached to the engine via their respective mounts. All cylinders remained attached to the crankcase.

Throttle and choke continuity was established from the controls to the engine.

The top spark plugs and cylinder rocker box covers were removed. The top spark plugs (NGK part number DCPR8E) were intact and exhibited normal operational signatures. The electrode gaps were within Rotax Service Instruction specification. The crankshaft was rotated by hand using the propeller. Rotational continuity was established throughout the engine and valve train. Thumb compression and suction was obtained on all four cylinders. Equal movement was observed on all of the intake and exhaust valve rocker arms.

The magneto generator was rotated by cranking the engine using the engine starter. Spark was observed on all four posts of the top spark plugs.

The intake system remained intact. The exhaust system was partially intact with the front cylinder exhaust pipes pulled away from the muffler assembly.

The engine cylinders were examined internally using a borescope. The piston tops and cylinder sidewalls appeared normal.

The engine driven fuel pump was intact. The fuel pump was disassembled and the diaphragm appeared normal. The engine was rotated by hand and the fuel pump diaphragm operated normally. The fuel pump vent / overflow hose nipple was missing the drain hose which is supposed to be routed to a safe neutral air pressure area. Positive or negative pressure at this hose fitting may affect proper operation. The area around the fuel pump had evidence of a previous leak with accumulated dirt.

The carburetors remained attached to the engine. The throttle arm moved freely from stop to stop. Both carburetors were removed and the float bowls opened. The floats appeared normal and the float needle moved freely. The float pins were intact and there was no evidence of leakage through the float bowl. The carburetor air box drip trays were installed; however, the left tray drain hose was found to be melted (possibly plugged) due to its proximity to the exhaust pipe. Also, the left air box drain hose was disconnected.

The air filter and air filter housing were free of debris.

The radiator cooling system was intact with no evidence of leakage.

The inline fuel filter (PN KF28000033) was inspected and found to be installed in the correct direction of flow as indicated by the inscribed direction arrow. The fuel filter was unscrewed and opened to reveal the internal mesh metal filter which was free of debris. The fuel valve is purely On/Off. The operation of the fuel valve does not allow the ignition key to be inserted unless the fuel valve is in the “ON” position. This engine does not have a mixture valve or require leaning.

The gascolator is located at the lowest point in the fuel system at the lower left firewall. The gascolator drain valve was opened and no liquid drained. The gascolator housing was removed and the very fine filter, as described in the Flight Design Aircraft Operating Instructions (AOI), was missing.

Examination of the airframe revealed that both the left and right wings were removed during the recovery operation. Both left and right wing fuel tank caps remained secure. The right wing contained an unmeasured amount of fuel and the left wing appeared to be empty. Low air pressure applied to the right wing fuel line fitting resulted in fuel expelled through the vent tubes. Low air pressure applied to the left wing resulted in no fuel or air being expelled through the vent tube.

No fuel samples were obtained from the right wing.

Examination of the fuselage lower belly skin aft of the engine compartment found an accumulation of dirt which is typical evidence of a previous leak. There is a fuel drain tube (ref. carburetor drip trays) which exits the engine compartment in this area. A sample of the accumulated dirt was bagged and tagged for future analysis.

Continuity of the flight control system was intact for the elevators and rudder which was partially intact. The aileron control rigging was disconnected when the wings were removed during the recovery operation; however, control rods at the wing root were still connected through the wing to the ailerons and the control rods in the cabin were connected from the flight control stick to the fuselage wing attach point.

The flight instruments were not installed due to removal during the recovery and storage operation.