

Engine Examination notes

25 February 2021, Southwick, Massachusetts

Cessna CE-421B N421DP

LH Engine: GTSIO-520

RH Engine: GTSIO-520

INSTRUMENTS

Fuel Computer- The fuel computer is a Shadin Fuel/Airdata Computer, part number 912802, serial number 538. The instrument was removed from the forward instrument panel, copilot's side, above the copilot's left knee. The gage showed slight signs of impact damage to the case. The gage will be sent to the NTSB.

Left Engine Examination

General- There was no visible damage too, cracks, or oil leakage from the engine case. There were no signs of or evidence of fire in the engine compartment or on the engine nacelle.

Visual inspection of pistons through upper plug holes revealed normal wear and operating signatures. The assembly was turned by hand via propeller, with rocker arm and valve movement observed at all cylinders, along with compression at each cylinder.

Fuel System- The fuel pump was mounted and showed no signs of damage. The device was subsequently removed, and no internal debris was noted. The fuel pump drive was spun and the pump was capable of pumping the fuel retained inside. The shear shaft was undamaged and spun freely. The Fuel Manifold Valve remained attached to its installation point and showed signs of damage. There was one broken fuel line. The valve was disassembled and visually inspected. The screen was clear of any contamination and the plunger and diaphragm appeared to operate normally.

Ignition System- The ignition harness showed no signs of damage or wear. The top spark plugs were removed and inspected. All displayed normal electrode operating and wear signatures. The magnetos remained mounted to their installation points and displayed no impact damage. Both magnetos were removed and rotated via cordless drill to confirm spark at each cylinder top lead. The test indicated magnetos were operational and produced spark for each cylinder.

Lubrication- The oil filter was intact with no signs of damage, and found full of oil when removed. Oil filter was cut open, internal paper revealed some minor non-ferrous particulate, but was not abnormal.

Induction/Exhaust- Intake system was intact with minor impact damage signatures, and no signs of obstructions in intercooler when removed.

Propeller- Propeller hub remained attached, with blades showing impact damage. One blade was bent aft. Two blades showed evidence of mid span waves. We were unable to determine if the damage was consistent with the rotation of the engine. There was no extreme leading edge gouging to any blade. Chord wise rotational scoring seemed minimal. There was no torn or fractured blades observed.

Wing Fuel Strainer- The fuel strainer bowl on the underside of the wing was removed. The strainer showed normal to moderate sediment in the bottom of the bowl. All of the strainer screens were clear, clean, and unobstructed.

Right Engine Examination

General- There was no visible damage too, cracks, or oil leakage from the engine case. There was evidence of fire in the aft nacelle, immediately forward of the turbocharger. There was discoloration of the external cowling, supporting the evidence of fire within the aft nacelle. The aft internal engine bay was heavily coated in dry chemical fire agent making observations difficult.

Visual inspection of pistons through upper plug holes revealed normal wear and operating signatures. The assembly was turned via propeller, with rocker arm and valve movement observed at all cylinders, along with compression at each cylinder.

Fuel System-The fuel pump was mounted and showed no signs of damage. The device was subsequently removed and no internal debris was noted. The fuel pump drive was spun and the pump was capable of pumping the fuel retained inside. The shear shaft was undamaged and spun freely. The Fuel Manifold Valve remained attached to its installation point and was undamaged. The valve was disassembled and visually inspected. The screen was clear of any contamination and the plunger and diaphragm appeared to operate normally.

Ignition System- The ignition harness showed no signs of damage or wear. The top spark plugs were removed and inspected. All displayed normal electrode operating and wear signatures. The magnetos remained attached to their installation points and displayed no impact damage. Both magnetos were removed and rotated via cordless drill to confirm spark at each cylinder top lead. The test indicated magnetos were operational and produced spark for each cylinder.

Lubrication- Oil filter was intact and showed signs of discoloration due to fire. There no signs of damage, and found full of oil when removed. Oil filter was cut open, internal paper revealed no particulate.

Induction/Exhaust-Intake system was intact with minor impact damage signatures, and no signs of obstructions in intercooler when removed. The exhaust system was intact with no signs of leaks.

Propeller- Propeller remained attached, with blades showing impact damage. One blade was bent forward mid-blade. One blade was bent aft between mid-blade and tip. The third blade showed a mid-span wave. We were unable to determine if bends / twists / waves were consistent with the rotation of the engine. There was no extreme leading edge gouging on any blade. Chord wise rotational scoring seemed minimal. There were no torn or fractured blades observed.

Wing Fuel Strainer-The fuel strainer bowl on the underside of the wing was removed. The strainer showed normal to moderate sediment in the bottom of the bowl. All of the strainer screens were clear, clean, and unobstructed.