



ENGINE EXAM: WPR21LA104 (N8107S)

DATE: 14APR2021

LOCATION: SouthWest Aircraft Recovery & Transport -Phone: (951)757-0452

AFFILIATION/ATTENDEES:

Corona Engines: Ben O'con

SouthWest Aircraft Recovery & Transport: Jack Vanderman

A/C MK/MDL	Cessna 150F
Accident Location	Flabob Airport (KRIR)
Accident Date	04FEB2021

ENGINE Make	Lycoming
Model	O-360-A4A
Serial No.	15061707
Engine Time	At time of Accident TACH: 7,093.58 Last Inspection ☒ Ann ☐ 100-hr Date: 28MAY2020 TSMOH: 1174.34 ESTIMATED T/T: 2183.1

AIFRAME EXAM

Position of fuel selector valve/firewall shutoff OFF

Are fuel caps in place? L ☒ YES ☐ NO R ☒ YES ☐ NO

Vented Caps? L ☒ YES ☐ NO R ☒ YES ☐ N Vents Clear ☒ YES ☐ NO

Are tanks ruptured? L ☒ NO ☐ YES _____ R ☒ NO ☐ YES _____

Any fuel in the tanks? ☐ NO ☒ YES (Aux Tank Only)

Color: Blue

Quantity: 4 Gallons

Smell Like ☒ Avgas ☐ Auto

☒ CLEAN ☐ CONTAMINATED WITH ☐ WATER ☐ DIRT ☐ DEBRIS _____

At the accident site, FAA Inspectors observed a total fuel quantity in the right tank of about 5-cups and the left tank was empty. During recovery, the recovery team confirmed that there were a few cups of fuel in the right tank and the left tank was empty. Both the FAA and Recovery team confirmed that the AUX Tank contained about ¼ tank of AVGAS. The AUX tank has a capacity of 15.5-Gallons of which, 14.6 Gallons are usable. The pilot reported that 42-gallons of 100LL aviation fuel were on board the airplane at last takeoff.

FUEL DRAINS

LWing ☒ CLEAN ☐ CONTAMINATED WITH ☐ WATER ☐ DIRT ☐ DEBRIS _____

Color: Light Blue Quantity: Empty Smell Like: ☒ Avgas ☐ Auto

RWing ☒ CLEAN ☐ CONTAMINATED WITH ☐ WATER ☐ DIRT ☐ DEBRIS _____

Color: Light Blue Quantity: <1-gallon Smell Like: ☒ Avgas ☐ Auto

AUX ☒ CLEAN ☐ CONTAMINATED WITH ☐ WATER ☐ DIRT ☐ DEBRIS _____

Color: Blue Quantity: ~4 Gallons

Smell Like ☒ Avgas ☐ Auto

FUEL STAINER/GASCOLATOR

Color: Light Blue Quantity: <1-gallon Smell Like: ☒ Avgas ☐ Auto

AUX ☒ CLEAN ☐ CONTAMINATED WITH ☐ WATER ☐ DIRT ☐ DEBRIS _____

FUEL QUANTITY GAUGES

Photographs taken by FAA inspectors that arrived at the accident site reveal that the left and right fuel quantity gauges indicate that the fuel tanks were empty. The fuel quantity indicator located on top of the auxiliary fuel tank revealed that the tank was about ¼ full and contained about 4-gallons of fuel.

FUEL CAPS

The vented fuel caps were installed and intact. The fuel quantity transmitters as well as the float and float arm inside the left and right tanks were intact. The fuel screen located on the inboard left tank and the right tank were intact, operational, and clear of debris.

FUEL PLACARDS

The left and right wing tank fuel filler port placards identified a fuel quantity capacity of 19-gallons per wing tank. The auxiliary fuel tank filler port placard identified a fuel quantity capacity of 14.6 usable gallons. Per the Supplemental Type Certificate specific to the auxiliary fuel tank, the total capacity of the auxiliary tank was 15.5 gallons.

FUEL TANKS

The left and right fuel tanks, as well as the auxiliary tank were integral. To confirm tank integrity, the left and right wing tanks were individually and manually pressurized by blowing air into the inboard fuel line. When pressure had stopped being introduced to the tank, the air pressure released through the same inboard fuel line orifice. Ambient air was removed from each fuel tank by extracting the air inside through the inboard fuel line. Once released, ambient air returned into each tank through the fuel inlet. The left and right wing tank fuel vents were examined using the above mentioned methods of introducing air to and extracting air from each tank to ensure tank integrity. Left and right wing tanks remained intact and exhibited no indication of breach. The auxiliary fuel tank remained intact and exhibited no indication of breach.

FUEL SELECTOR

The fuel selector located in the middle of the cabin and aft of the pilot and passenger seats, had two positions "OFF" and "ON". There was no placard on or around the fuel selector indicating the position. The fuel selector position was found in the OFF position at the accident site. The gascolator sustained impact damage and was bypassed to facilitate the engine run. When examined, the gascolator and strainer were clean and free of debris.

CARBURETOR HEAT SELECTOR

☐ NI ☒ SELECTED ☒ ON ☐ OFF ☒ PARTIAL

CARBURETOR AIR BOX

☒ Clear ☐ Blocked

THROTTLE

☐ Stuck ☐ Moves Freely S2S ☒ Binds as a result of impact damage

POSITION ☐ OPEN ☐ FULL ☐ $\frac{3}{4}$ ☐ $\frac{1}{2}$ ☐ $\frac{1}{4}$ ☐ $< \frac{1}{4}$ ☒ CLOSED

The throttle linkage sustained impact damage but was manually adjusted to ensure a full range of operational movement.

MIXTURE ☐ Stuck ☒ Moves Freely S2S ☐ Binds ☐ FR _____ ☐ SEPARATED _____
POSITION ☐ OPEN ☐ FULL ☐ $\frac{3}{4}$ ☐ $\frac{1}{2}$ ☐ $\frac{1}{4}$ ☐ $< \frac{1}{4}$ ☒ CLOSED/OFF

FAA photographs revealed that the mixture control was found in the lean position at the accident site. During the examination, the mixture control traveled through a full range of motion and was found operational.

Is engine run-able? ☒ YES ☐ NO

If YES did it run successfully? ☒ YES ☐ No

☒ Operated smoothly through entire range of RPM

The engine was increased to 1,450 RPM with no anomalies

☒ Shutdown OK and the RPM did not rise during shutdown

ENGINE EXAM

The engine was not disassembled and ran without issue or mechanical anomaly. Prior to running the engine, top spark plugs were removed, and each cylinder was borescoped and revealed no mechanical anomalies. The compressions were checked on each cylinder which recorded the following values per cylinder:

No. 1) 76 No. 2) 78 No. 3) 80 No. 4) 78

The timing was confirmed to be 25° at top-dead-center.

Magnetos (4370)

The right magneto was 26° at top-dead-center.

The left magneto was 25° at top-dead-center.

The gascolator sustained impact damage and was bypassed to run the engine. The gascolator was examined and the filter screen exhibited no signs of breach, blockage, or mechanical anomaly.

The firewall-mounted electrical fuel pump manufactured by Facet (Gold Flo) was examined and found operational by applying external battery power and activating the internal components as indicated by sound and function during the engine run.

The Marvel-Schebler Carburetor (Model: MA-4-5) (Part No. 10-3878) operated without impediment or mechanical anomaly. The carburetor was removed from the engine after running the engine and examined. Throttle & mixture linkage was intact, fuel lines, floats, metering pin & jet, and the idle adjustment needle assembly were intact.

The fuel system was equipped with a Supplemental Type Certificate Auxiliary Fuel tank, which included a pressure regulator, and auxiliary fuel pump. Also, a panel mounted toggle switch located in the cabin had a placard indicating three positions, "START" "ON" and "OFF". An additional placard located above the auxiliary pump position switch indicated that the fuel transfer system is to be operated in straight and level flight only, once the left and right tank fuel quantity gauges read 2/3 full. To verify engine operation while utilizing the auxiliary fuel transfer system, the auxiliary fuel line was connected directly to the carburetor fuel inlet, again bypassing the impact damaged gascolator. The auxiliary fuel transfer system operated normally and sustained fuel transfer to the engine. The airplane was manually rolled to the right while the engine was operating to simulate a right bank. Once the right bank attitude reached 21° the engine quit. The auxiliary tank fuel pick up is located just left of center, on the bottom forward section of the tank.