Cessna®

MORE PEOPLE BUY AND FLY CESSNA AIRPLANES THAN ANY OTHER MAKE

WORLD'S LARGEST PRODUCER OF GENERAL AVIATION AIRCRAFT SINCE 1956

JERRY FREED

[redacted]

STATIONAIR SERIES, SKYWAGON 206 SERIES AND SUPER SKYLANE SERIES

1969 thru 1971

SERVICE MANUAL

[redacted]

SCOPE AND PREPARATION.

If the aircraft is NOT equipped with an external oil filter, the engine oil should be changed and the oil screen cleaned EVERY 25 HOURS.

The 50-hour inspection includes a visual check of the engine, propeller, and aircraft exterior for any apparent damage or defects; an oil change and filter element change on aircraft equipped with an external oil filter; and accomplishment of lubrication and servicing requirements. Remove propeller spinner and engine cowling, and replace after the inspection has been completed.

The 100-hour (or annual) inspection includes everything in the 50-hour inspection. Also loosen or remove all fuselage, wing, empennage, and upholstery inspection doors, plates, and fairings as necessary to perform a thorough, searching inspection of the aircraft. Replace after the inspection has been completed.

NOTE

Numbers appearing in the "AS SPECIFIED" column refer to the data listed at the end of the inspection chart.

	EACH 50 HOURS	EACH 100 HOURS	AS SPECIFIED
PROPELLER.			
1. Spinner and spinner bulkhead	●		
2. Blades	●		
3. Hub	●		
4. Bolts and nuts	●		
5. Governor and control	●		
ENGINE COMPARTMENT.			
Check for evidence of oil and fuel leaks, then clean entire engine and compartment, if needed, prior to inspection.			
1. Engine oil, screen, filler cap, dipstick, drain plug and external filter element	●		1
2. Oil cooler	●		
3. Induction air filter (Also see paragraph 2-18)	●		
4. Induction airbox, air valves, doors, and controls	●		
5. Cold and hot air hoses	●		
6. Engine baffles	●		

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
7. Cylinders, rocker box covers, and push rod housings			●
8. Crankcase, oil sump, accessory section, and front crankshaft seal			●
9. ~~All lines and hoses~~ FUEL LINES			●
10. Intake and exhaust systems (Also see paragraphs 12-24 and 12A-28)		7	●
11. Ignition harness			●
12. Spark plugs and compression check		●	
13. Crankcase and vacuum system breather lines			●
14. Electrical wiring			●
15. Vacuum pump, oil separator, and relief valve			●
16. Vacuum relief valve screen		●	
17. Engine controls and linkage			●
18. Engine shock mounts, engine mount structure, and ground straps			●
19. Cabin heater valves, doors, and controls			●
20. Starter, solenoid, electrical connections			●
21. Starter brushes, brush leads, and commutator		2	
22. Alternator, drive belt, pulley, and electrical connections			●
23. Alternator brushes, brush leads, and slip ring		2	
24. Voltage regulator mounting and electrical leads			●
25. Magnetos (externally) and electrical connections			●
26. Magneto timing		3	
27. Magneto breaker compartment (Also see paragraph 12-68)		3	
28. Fuel injection fuel-air control unit, fuel pump, fuel manifold valve, fuel lines, and nozzles			●
29. Fuel-air control unit screen			●
30. Firewall			●
31. Engine cowling			●
32. Cowl flaps and control			●

33
34
35.
7
36.
37.
38.

AIRFR.
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.

[redacted]

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS	
33. Turbocharger			●	4
34. Turbocharger pressurized vent lines to fuel pump, discharge nozzles, and fuel flow gage			●	
35. Turbocharger mounting brackets			●	
36. Waste gate, actuator and linkage, controller, and overboost relief valve			●	4
37. All oil lines to turbocharger, waste gate, controller, and overboost relief valve			●	
~~38. Exhaust system (Also see paragraph 12A-28)~~			●	
AIRFRAME.				
1. Aircraft exterior			●	
2. Aircraft structure (Also see figure 4-1)		●		
3. Windows, windshield, and doors			●	
4. Seats, stops, seat rails, upholstery, structure, and seat mounting			●	
5. Safety belts and attaching brackets			●	
6. Control column bearings, sprockets, pulleys, cables, chains, and turnbuckles		●		
7. Control lock, control wheel, and control column mechanism		●		
8. Instruments and markings		●		
9. Central air filter (Also see paragraph 2-19)		●		5
10. Magnetic compass compensation				4
11. Instrument wiring and plumbing		●		
12. Instrument panel, shock mounts, ground straps, cover, and decals and labeling		●		
13. Defrosting, heating, and ventilating systems, and controls		●		
14. Cabin upholstery, trim, sunvisors, and ash trays		●		
15. Area beneath floor, lines, hoses, wires, and control cables		●		
16. Electrical horns, lights, switches, circuit breakers, and clock fuse			●	
17. Exterior lights			●	

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
18. Pitot and static systems			●
19. Stall warning sensing unit, and pitot and stall warning heaters			●
20. Radios and radio controls			●
21. Radio antennas			●
22. Battery, battery box, and battery cables			●
23. Battery electrolyte level (Also see paragraph 2-20)			●
24. Oxygen system			●

CONTROL SYSTEMS.

In addition to the items listed below, always check for correct direction of movement, correct travel, and correct cable tension.

1. Cables, terminals, pulleys, pulley brackets, cable guards, turnbuckles, and fairleads			●
2. Chains, terminals, sprockets, and chain guards			●
3. Trim control wheels, indicators, actuator, and bungee			●
4. Travel stops			●
5. All decals and labeling			●
6. Flap control switch, flap rollers and tracks, flap position transmitter and linkage, flap position indicator, flap electric motor and transmission, and synchronizing system			●
7. Elevator downspring system			●
8. Rudder pedal assemblies and linkage			●
9. Skin and structure of control surfaces and trim tabs			●
10. Balance weight attachment			●

6

FUEL SY

1. F
2. F
3. E
4. F
5. D
6. F
7. F
8. F
9. E
10. V
11. T

LANDING C

1. Br cyl
2. Ma
3. No
4. No tir
5. Pa

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
FUEL SYSTEM.			
1. Fuel strainer, drain valve, and control			●
2. Fuel strainer screen and bowl		●	
3. Electric fuel pump, throttle switch, and electric connections			●
4. Fuel tanks, fuel reservoir tanks, fuel lines, drains, filler caps, and placards		●	
5. Drain fuel and check tank interior, attachment, and outlet screens		●	
6. Fuel vents and vent valves		●	
7. Fuel selector valve and placards		●	
8. Fuel quantity gages and transmitter units		●	
9. Engine primer		●	
10. Vapor return line and check valve		●	
11. Turbocharger vent system		●	
LANDING GEAR.			
1. Brake fluid, lines and hoses, linings, disc, brake assemblies, and master cylinders		●	
2. Main gear wheels, wheel bearings, step and spring strut and tires		●	
3. Nose gear strut servicing, and shimmy dampener servicing (Refer to paragraph 2-23)		●	
4. Nose gear wheel, wheel bearings, strut, steering system, shimmy dampener, tire and torque links		●	
5. Parking brake system		●	

NOTE

A high-time inspection is merely a 100-hour inspection with the addition of an engine overhaul. Teledyne Continental Motors, recommends overhaul at 1500 hours for the IO-520 Series engine and overhaul at 1400 hours for the TSIO-520 Series engine. At time of engine overhaul the turbocharger, turbocharger controllers, waste gate valves, and waste gate actuators should be overhauled. Propeller overhaul shall coincide with engine overhaul, but intervals between propeller overhauls SHALL NOT exceed 1200 hours. Propeller governor overhaul should coincide with engine overhaul along with all other engine accessories.

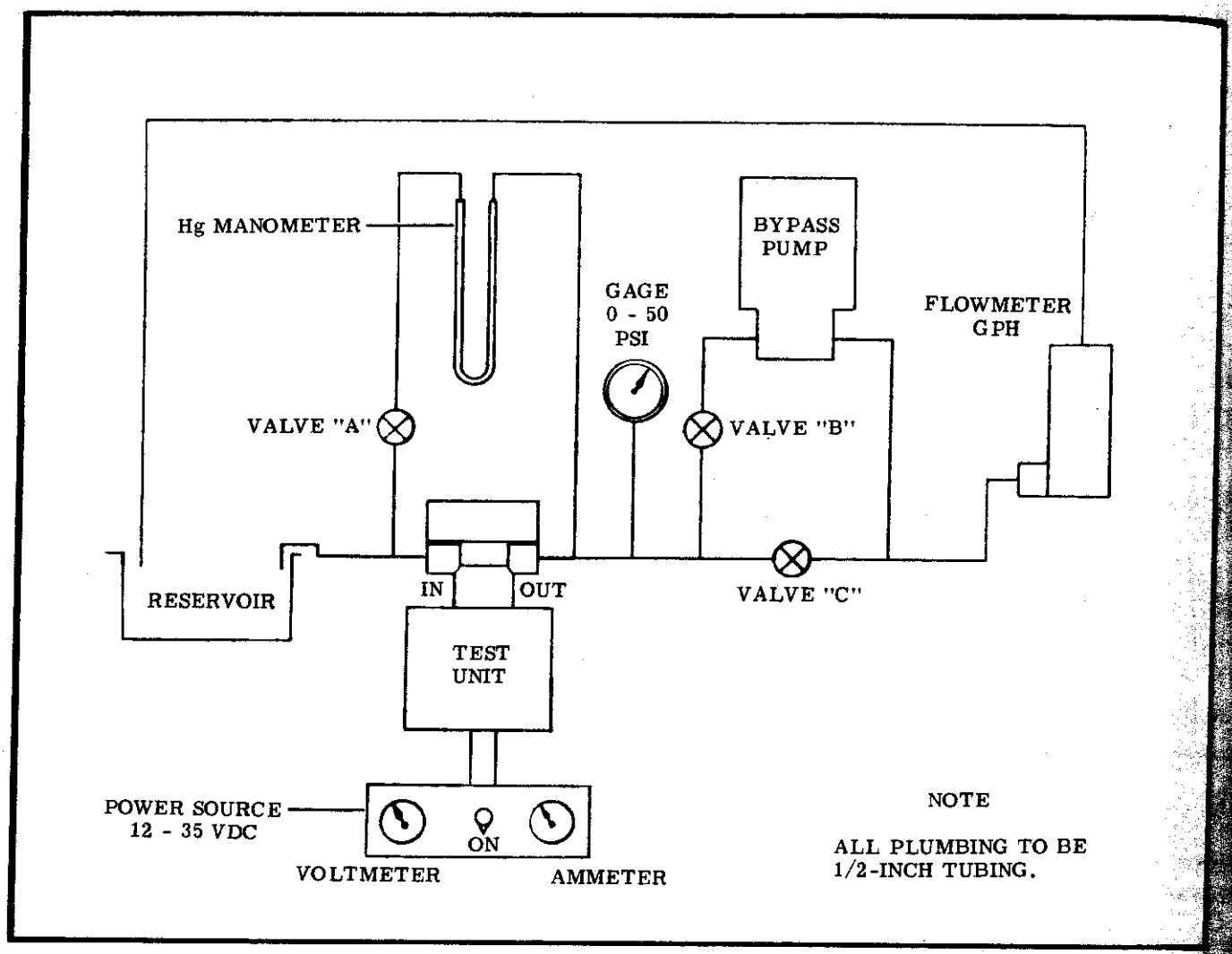

Figure 13-8. Test Stand Schematic

c. Insulation Resistance Test.

1. Apply 50 volts dc across both leads and pump case. Insulation resistance shall be 50 megohms minimum.

13-40. ELECTRIC FUEL PUMP CIRCUITS. The electric fuel pump circuit is operated by a split rocker-type switch. The low side of the switch is connected through the "START" position of the ignition switch so that the fuel pump will operate only while the ignition switch is in the "START" position and the low side of the fuel pump switch is turned on. When the ignition key is released, the pump will stop. The high side of the fuel pump switch will operate the pump regardless of ignition switch position. A throttle shaft operated microswitch adds a resistance to the high circuit to slow down the pump when the throttle is retarded to prevent an excessively rich mixture as throttle is retarded while the electric pump is operating in the high position. Refer to Section 12 for rigging of the microswitch.

13-41. FUEL STRAINER. The fuel strainer is located in the nose wheel well and is readily accessible with the nose gear doors open. The fuel strainer drain control located adjacent to the oil dipstick. Access to the strainer drain control is made through the oil dipstick cowling door.

13-42. FUEL STRAINER DISASSEMBLY. (See figure 13-9.) To disassemble and assemble the strainer, proceed as follows:

a. Turn off fuel selector valve.

b. Disconnect strainer drain tube and remove safety wire, nut, and washer at bottom of filter bowl and remove bowl.

c. Carefully unscrew standpipe and remove.

d. Remove filter screen and gasket. Wash filter screen and bowl in solvent (Federal Specification P-S-661, or equivalent) and dry with compressed air.

e. Using a new gasket between filter screen and top assembly, install screen and standpipe. Tighten standpipe only finger tight.

f. Using all new O-rings, install bowl. Note that step-washer at bottom of bowl is installed so that step seats against O-ring. Connect strainer drain tube.

appear as bubbles and can be readily detected.

5. It is recommended that any components found defective be replaced with new parts before the next flight.

6. If no defects are found, remove plugs and dry components with compressed air.

e. Install the exhaust system and engine cowling.

12-29. INSTALLATION OF ENGINE EXHAUST SYSTEM. When installing exhaust stacks, be sure there is one copper-asbestos gasket between each riser and its mounting pad on the cylinder. Torque riser attaching nuts to 100-110 lb-in. The tailpipes are secured at the lower end with a clamp, which is attached to shock mounts on the firewall brackets. Make certain that the clamp is tight around tailpipe and the shock mounts are in serviceable condition.

12-30. ENGINE FUEL INJECTION SYSTEM.

NOTE

Throughout the aircraft fuel system, from the tanks to the engine-driven fuel pump, use RAS-4 (Snap-On Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound, Antiseize, Graphite-Petrolatum) or equivalent, as a thread lubricant, or to seal a leaking connection. Apply sparingly to male fittings only, omitting the first two threads on the fitting. Always ensure that a compound, the residue from a presiously used compound or any other foreign material cannot enter the system. Throughout the fuel injection system, from the engine-driven fuel pump through the discharge nozzles, use only a fuel soluble lubricant, such as engine lubricating oil, on fitting threads. Do not use any other form of thread compound on the fuel injection system fittings.

12-31. The fuel injection system is a simple, low pressure system of injecting fuel into the intake valve port in the cylinder head. It is a multi-nozzle, continuous-flow type which controls fuel flow to match engine airflow. Any change in throttle position, engine speed, or a combination of both, causes changes in fuel flow in the correct relation to engine airflow. A manual mixture control and a fuel flow indicator are provided for leaning at any combination of altitude and power setting. The fuel flow meter is calibrated in gallons per hour and indicates approximately the gallons of fuel consumed each hour. The continuous flow system uses a typical rotary vane fuel pump. There are no running parts in this system except for the engine-driven fuel pump.

12-32. FUEL-AIR CONTROL UNIT. This unit occupies the position ordinarily used for a carburetor, at the intake manifold inlet. The function of this unit is to control engine air intake and to set the metered fuel pressure for proper fuel-air ratio. There are three control elements in this unit, one for air and two for fuel. One of the fuel control elements is for fuel mixture and the other is for fuel metering. Fuel enters the control unit through a strainer and passes to the metering valve. The position of the metering valve controls this fuel passed to the manifold valve and nozzles. A linkage connecting the metering valve to the air throttle proportions airflow to fuel flow. The position of the mixture valve determines the amount of fuel returned to the fuel pump. The fuel control portion of the fuel-air control unit is enclosed in a shroud and is blast-air cooled to help prevent vapor lock.

12-33. REMOVAL OF FUEL-AIR CONTROL UNIT.

a. Remove the air intake box and air filters and disconnect mixture and throttle control rod ends at fuel-air control unit.

NOTE

Cap all disconnected hose, lines, and fittings.

b. The three fuel lines which attach to the fuel control unit are routed inside flexible tubing to help cool the fuel. Loosen the tubing clamps at the fuel control unit and slide the tubing back to gain access to the fuel line fittings.

c. Disconnect the fuel lines at the fuel control unit.

d. Loosen the hose clamps which secure the fuel-air control unit to the right and left intake manifolds.

e. Remove the fuel-air control unit.

f. Cover the open ends of the intake manifold piping to prevent the entry of foreign matter.

12-34. CLEANING AND INSPECTION OF FUEL-AIR CONTROL UNIT.

a. Check control connections, levers, and linkages for security, safetying, and for lost motion due to wear.

b. Remove the fuel screen assembly and clean in fresh cleaning solvent. Reinstall and safety.

c. Check the air control body for cracks and the fuel-air control unit for overall condition.

12-35. INSTALLATION OF FUEL-AIR CONTROL UNIT.

a. Place the fuel-air control unit in position on the engine.

b. Before tightening the hose clamps which secure the fuel-air control unit to the intake manifold, temporarily bolt the fuel-air control unit to the fuel-air control unit support to obtain the correct position.

c. Connect the fuel lines at the fuel-air unit.

d. Install the air tubes on the fuel control shroud and secure with clamps.

e. Install the induction airbox and clean filter.

f. Rig the engine controls and throttle operated microswitch.

12-36. FUEL-AIR CONTROL UNIT ADJUSTMENTS. The idle speed adjustment is a conventional spring-loaded screw located in the air throttle lever. The idle mixture adjustment is the locknut at the metering valve end of the linkage. Tightening the nut to shorten the linkage provides a richer mixture. A leaner mixture is obtained by backing off the nut to lengthen the linkage. Adjust mixture control to obtain a slight and momentary gain of 25 rpm maximum.

OPERATOR'S MANUAL FOR IO-520 SERIES AIRCRAFT ENGINES

NOTICE

IN ORDER TO PROPERLY USE THIS ENGINE, THE USER MUST COMPLY WITH ALL INSTRUCTIONS CONTAINED HEREIN. FAILURE TO SO COMPLY WILL BE DEEMED MISUSE, RELIEVING THE ENGINE MANUFACTURER OF ANY RESPONSIBILITY.

THIS MANUAL CONTAINS NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, THE PURPOSE OF THE DATA PRESENTED IS INSTRUCTION, INFORMATION, & SAFETY.

FORM NO. X3004I

FAA APPROVED
SEPTEMBER 1980

7.	Adjustments & Repairs:	Perform service as required on any items found defective.
8.	Engine Condition:	Run up and check as necessary for any items serviced in Step 6. Check engine for oil and fuel leaks before returning to service.

100 HOUR INSPECTION.

Perform all items listed under 50 Hour inspection, and add the following:

1.	Oil:	Drain while engine is warm. Refill sump.
2.	Valves/Cylinders:	Check compression (Refer to Service Bulletin M73-19).
3.	Cylinders, Fins, Baffles:	Inspect.
4.	Control Connections:	Inspect and lubricate.
5.	Fuel and Oil Hoses and Lines	Inspect for deterioration, leaks, chafing.
6.	Fuel Nozzles:	Inspect nozzles and vent manifold for leaks or damage.
7.	Exhaust:	Check all joints for condition and leaks.
8.	Alternate Air Door:	Check operation.
9.	Spark Plugs:	Inspect, clean, regap (if necessary) reinstall. Rotate plugs from upper to lower positions and vice versa to lengthen plug life.
10.	Oil Filter:	Replace.

11.	Magnetos:	Check. Adjust points and timing if necessary.

NOTE . . . Minor changes in magneto timing can be expected during normal engine service. The time and effort required to check and adjust the magnetos to specifications is slight and the operator will be rewarded with longer contact point and spark plug life, smoother engine operation and less corrective maintenance between routine inspections.

12.	Oil Pressure Relief Valve:	Inspect and clean.
13.	Oil Temperature Control Unit:	Inspect and clean.
14.	Fuel Metering Unit Inlet Screen:	Inspect and clean.
15.	Throttle Shaft and Linkage.	Inspect for wear and lubricate.
16.	High & Low Fuel Pump Outlet Pressure:	Check. Adjust if necessary. (Refer to latest TCM Service Bulletin for Procedure)
17.	Adjustments & Repairs:	Perform service as required on any items found defective.
18.	Engine Condition:	Perform complete run up. Check engine for fuel or oil leaks before returning to service.

NOTE . . . Refer to IO-520 Overhaul Manual or applicable Service Bulletins for proper procedures and limits.