

SECTION 14
UTILITY SYSTEMS

TABLE OF CONTENTS	Page		
UTILITY SYSTEMS	14-1	Operation	14-3
Heating System	14-1	Trouble Shooting	14-3
Description	14-1	Removal, Repair and Installation	14-3
Operation	14-1	Ventilating System	14-3
Trouble Shooting	14-1	Description	14-3
Removal, Repair and Installation	14-1	Operation	14-3
Defroster System	14-3	Trouble Shooting	14-3
Description	14-3	Removal, Repair and Installation	14-3

14-1. UTILITY SYSTEMS.

14-2. HEATING SYSTEM.

14-3. DESCRIPTION. The heating system is comprised of the heat exchange section of the exhaust muffler, a shut-off valve, mounted on the right forward side of the firewall, a push-pull control on the instrument panel, outlets and flexible ducting connecting the system.

14-4. OPERATION. Ram air is ducted through an engine baffle inlet and heat exchange section of the exhaust muffler, to the shut-off valve at the firewall. The heated air flows from the shut-off valve into a duct across the aft side of the firewall, where it is distributed into the cabin. The shut-off valve, operated by a push-pull control marked "CABIN HT", located on the instrument panel, regulates the volume of heated air entering the system. Pulling the control full out, supplies maximum flow, and pushing the control in, gradually decreases flow, shutting off flow completely when the control is pushed full in.

14-5. TROUBLE SHOOTING. Most of the operational troubles in the heating, defrosting and ventilating systems are caused by sticking or binding air valves and their controls, damaged air ducting or defects in the exhaust muffler. In most cases, valves or controls

can be freed by proper lubrication. Damaged or broken parts must be repaired or replaced. When checking controls, ensure valves respond freely to control movement, that they move in the correct direction, and that they move through their full range of travel and seal properly. Check that hoses are properly secured, and replace hoses that are burned, frayed or crushed. If fumes are detected in the cabin, a thorough inspection of the exhaust system should be accomplished. Refer to applicable paragraph in Section 11 for this inspection. Since any holes or cracks may permit exhaust fumes to enter the cabin, replacement of defective parts is imperative because fumes constitute an extreme danger. Seal any gaps in shut-off valves at the firewall with Pro-Seal #700 (Coast Pro-Seal Co., Los Angeles, California) compound, or equivalent compound.

14-6. REMOVAL, REPAIR AND INSTALLATION. Figure 14-1 illustrates the heating, defrosting and ventilating systems, and may be used as a guide during removal, repair and installation of system components. Burned, frayed or crushed hose must be replaced with new hose, cut to length and installed in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. Defective air valves must be repaired or replaced. Check for proper operation of valves and their controls after repair or replacement.

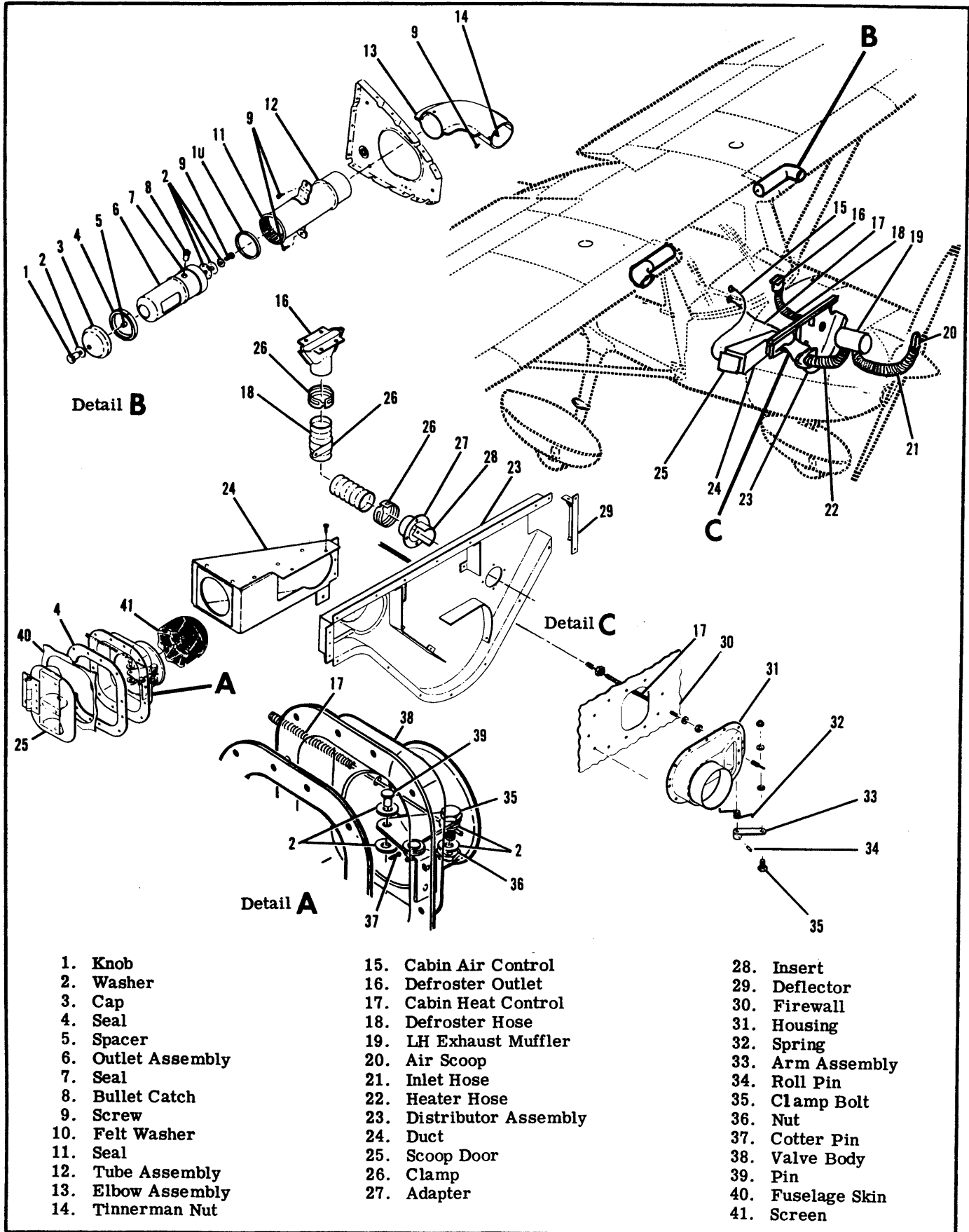


Figure 14-1. Heating, Defrosting, and Ventilating Systems

14-7. DEFROSTER SYSTEM.

14-8. DESCRIPTION. The defrosting system is comprised of the duct across the aft side of the firewall, a defroster outlet, mounted on the left side of the cowl deck, immediately aft of the windshield, and flexible ducting connecting the system.

14-9. OPERATION. Air from the duct across the aft side of the firewall flows through a flexible duct to the defroster outlet. The temperature and volume of this air is controlled by the settings of the heater system control.

14-10. TROUBLE SHOOTING. Since the defrosting system depends on proper operation of the heating system, refer to paragraph 14-5 for trouble shooting the heating and defrosting systems.

14-11. REMOVAL, REPAIR AND INSTALLATION. Figure 14-1 may be used as a guide for removal, repair and installation of defrosting system components. Cut hoses to length and install in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. A defective defroster outlet must be repaired or replaced.

14-12. VENTILATING SYSTEM.

14-13. DESCRIPTION. The ventilating system is comprised of an airscoop mounted in the inboard leading edge of each wing, an adjustable ventilator mounted on each side of the cabin near the upper corners of the windshield, a fresh air scoop door mounted on the right side of the fuselage, a control knob on the instrument panel, and flexible ducting connecting the system.

14-14. OPERATION. Air received from scoops

mounted in the inboard leading edges of the wings is ducted to the adjustable ventilators mounted on each side of the cabin near the upper corners of the windshield. Forward cabin ventilation is provided by a fresh air scoop door, mounted on the right side of the fuselage, just forward of the copilot seat. The scoop door is operated by a control in the instrument panel marked "CABIN AIR." Fresh air from the scoop door is routed to the duct across the aft side of the firewall, where it is distributed into the cabin. As long as the "CABIN HT" control is pushed in, no heated air can enter the firewall duct; therefore, when the "CABIN AIR" control is pulled out, only fresh air from the scoop will flow through the duct into the cabin. As the "CABIN HT" control is gradually pulled out, more and more heated air will blend with the fresh air from the scoop and be distributed into the cabin. Either one, or both of the controls may be set at any position from full open to full closed.

14-15. TROUBLE SHOOTING. Most of the operational troubles in the ventilating system are caused by sticking or binding of the inlet scoop door or its control. Check filter element in the inlet scoop door. The element may be removed and cleaned or replaced. Since air passing through the filter is emitted into the cabin, do not use a cleaning solution which would contaminate cabin air. The filter may be removed to increase air flow. However, the removal will cause a slight increase in noise level.

14-16. REMOVAL, REPAIR AND INSTALLATION. Figure 14-1 may be used as a guide for removal, repair and installation of ventilating system components. A defective ventilator or scoop door must be repaired or replaced. Check for proper operation of ventilating controls after installation or repair.

SHOP NOTES:

11-64. REMOVAL AND INSTALLATION.

- a. Remove cowling as required for access.

CAUTION

When disconnecting or connecting the starter cable, do not permit starter terminal bolt to rotate. Rotation of the terminal bolt could break the conductor between terminal and field coils causing the starter motor to be inoperative.

- b. Disconnect starter power cable at starter. Insulate terminal on power cable to prevent accidental shorting.
- c. Remove nuts attaching starter adapter to crankcase cover studs.
- d. Cut safety wire and remove two bolts threaded through crankcase into starter.
- e. Tap starter gently to loosen gasket and remove starter and adapter with a straight rearward movement.
- f. Clean any gasket which may be stuck to starter, starter adapter, or crankcase cover.
- g. When installing starter, work a non-hardening gasket paste into both sides of a new gasket, and position starter and adapter assembly against crankcase pad.
- h. Install washers and nuts on studs and install bolts through crankcase.

CAUTION

Tighten bolts and nuts evenly to prevent warping adapter cover.

- i. Install lock wire on bolt heads.
- j. Connect starter power cable to starter.

11-65. PRIMARY MAINTENANCE. The starting circuit should be inspected at regular intervals, the frequency of which should be determined by the amount of service and conditions under which the equipment is operated. Inspect the battery and wiring. Check battery for fully charged condition, proper electrolyte level with approved water and terminals for cleanliness. Inspect wiring to be that all connections are clean and tight and that the wiring insulation is sound. Check that the brushes slide freely in their holders and make full contact on the commutator. When brushes are worn to one-half of their original length, install new brushes (compare brushes with new brushes). Check the commutator for uneven wear, excessive glazing or evidence of excessive arcing. If the commutator is only slightly dirty, glazed, or discolored, it may be cleaned with a strip of No. 00 or No. 000 sandpaper. If the commutator is rough or worn, it should be turned in a lathe and the mica undercut. Inspect the armature shaft for rough bearing surfaces. New brushes should be properly seated when installing by wrapping a strip of No. 00 sandpaper around the commutator (with sanding side out) 1-1/4 to 1-1/2 times maximum. Drop brushes on sandpaper covered commutator and turn armature slowly in the direction of normal rotation. Clean sanding dust from motor after sanding operations.

11-66. EXHAUST SYSTEM.

11-67. DESCRIPTION. The exhaust system consists of a muffler for each bank of cylinders with an exhaust pipe from each cylinder to the muffler on that side of the engine. The muffler assemblies are enclosed in shrouds which captures ram air to be heated by the exhaust gases in the muffler. This heated air is used to heat the aircraft cabin and to furnish heated air for carburetor heat at the engine intake system. A tail pipe from each muffler routes exhaust gases overboard through the lower cowling.

11-68. REMOVAL.

- a. Remove engine cowling as required for access.
- b. Disconnect flexible ducts from shrouds on muffler assemblies.
- c. Disconnect braces from muffler and tail pipe assemblies.
- d. Remove nuts and washers securing the exhaust stack assemblies to the cylinders.
- e. Remove exhaust stack assembly.

11-69. INSPECTION. Inspection of the exhaust system shall be thorough because the cabin heating system uses air heated by the heat exchangers of the exhaust system. Since exhaust systems of this type are subject to burning, cracking, and general deterioration from alternate thermal stresses and vibration, inspection is very important and should be accomplished every 100-hours of operation. In addition, an inspection of the exhaust system shall be performed anytime exhaust fumes are detected in the cabin area.

- a. Remove engine cowling, and loosen or remove shrouds so that ALL surfaces of the exhaust system can be visually inspected. Especially check areas adjacent to welds. Look for exhaust gas deposits in surrounding areas, indicating that exhaust gas is escaping through a crack or hole.
- b. For a more thorough inspection, or if fumes have been detected in the cabin, the following inspection is recommended:
 1. Remove exhaust pipe and mufflers.
 2. Use rubber expansion plugs to seal openings.
 - e. Using a manometer or gage, apply approximately 1-1/2 psi (3 inches of mercury) air pressure while the muffler and each exhaust pipe is submerged in water. All leaks will appear as bubbles and can be readily detected.
 4. It is recommended that any exhaust pipe or muffler found defective be replaced with a new part before the next flight.
- c. Install exhaust system.

11-70. INSTALLATION. Reverse procedure outlined in paragraph 11-68 to install exhaust system. Be sure there is one new copper-asbestos gasket between each exhaust pipe and its mounting pad on the cylinder. Make sure clamps attaching mufflers to exhaust pipes are tight and all air ducts are installed.

11-71. EXTREME WEATHER MAINTENANCE.

11-72. COLD WEATHER. Cold weather starting is made easier with the installation of the engine primer system and ground service receptacle. The primer

I INSPECTION REQUIREMENTS.

As required by Federal Aviation Regulations, all civil aircraft of U.S. registry must undergo a COMPLETE INSPECTION (ANNUAL) each twelve calendar months. In addition to the required ANNUAL inspection, aircraft operated commercially (for hire) must also have a COMPLETE AIRCRAFT INSPECTION every 100 hours of operation.

In lieu of the above requirements, an aircraft may be inspected in accordance with a progressive inspection schedule, which allows the work load to be divided into smaller operations that can be accomplished in shorter time periods.

Therefore, the Cessna Aircraft Company recommends PROGRESSIVE CARE for aircraft that are being flown 200 hours or more per year, and the 100 HOUR inspection for all other aircraft.

II INSPECTION CHARTS.

The following charts show the recommended intervals at which items are to be inspected.

As shown in the charts, there are items to be checked each 50 hours, each 100 hours, each 200 hours, and also Special Inspection items which require servicing or inspection at intervals other than 50, 100 or 200 hours.

- a. When conducting an inspection at 50 hours, all items marked under EACH 50 HOURS would be inspected, serviced or otherwise accomplished as necessary to insure continuous airworthiness.
- b. At each 100 hours, the 50 hour items would be accomplished in addition to the items marked under EACH 100 HOURS as necessary to insure continuous airworthiness.
- c. An inspection conducted at 200 hour intervals would likewise include the 50 hour items and 100 hour items in addition to those at EACH 200 HOURS.
- d. The numbers appearing in the SPECIAL INSPECTION ITEMS column refer to data listed at the end of the inspection charts. These items should be checked at each inspection interval to insure that applicable servicing and inspection requirements are accomplished at the specified intervals.
- e. A COMPLETE AIRCRAFT INSPECTION includes all 50, 100 and 200 hour items plus those Special Inspection Items which are due at the time of the inspection.

III INSPECTION PROGRAM SELECTION.

AS A GUIDE FOR SELECTING THE INSPECTION PROGRAM THAT BEST SUITS THE OPERATION OF THE AIRCRAFT, THE FOLLOWING IS PROVIDED.

1. IF THE AIRCRAFT IS FLOWN LESS THAN 200 HOURS ANNUALLY.

a. IF FLOWN FOR HIRE

An aircraft operating in this category must have a COMPLETE AIRCRAFT INSPECTION each 100 hours and each 12 calendar months of operation. A COMPLETE AIRCRAFT INSPECTION consists of all 50, 100, 200 and Special Inspection Items shown in the inspection charts as defined in paragraph II above.

b. IF NOT FLOWN FOR HIRE

An aircraft operating in this category must have a COMPLETE AIRCRAFT INSPECTION each 12 calendar months (ANNUAL). A COMPLETE AIRCRAFT INSPECTION consists of all 50, 100, 200 and Special Inspection Items shown in the inspection charts as defined in paragraph II above. In addition, it is recommended that between annual inspections, all items be inspected at the intervals specified in the inspection charts.

2. IF THE AIRCRAFT IS FLOWN MORE THAN 200 HOURS ANNUALLY.

Whether flown for hire or not, it is recommended that aircraft operating in this category be placed on the CESSNA PROGRESSIVE CARE PROGRAM. However, if not placed on Progressive Care, the inspection requirements for aircraft in this category are the same as those defined under paragraph III 1. (a) and (b).

Cessna Progressive Care may be utilized as a total concept program which insures that the inspection intervals in the inspection charts are not exceeded. Manuals and forms which are required for conducting Progressive Care inspections are available from Cessna Parts Distribution (CPD 2).

IV INSPECTION GUIDE LINES.

- (a) **MOVABLE PARTS** for: lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing and tension.

CAUTION

Braided steel covered fluid lines will cause rapid wear of any object they are allowed to chafe against. Check that minimum one-half (1/2) inch clearance be maintained between steel covered lines and any component. If this is not feasible, ensure lines are securely clamped or tied to the component.

- (b) **FLUID LINES AND HOSES** for: leaks, cracks, dents, kinks, chafing, proper radius, security, corrosion, deterioration, obstruction and foreign matter.
- (c) **METAL PARTS** for: security of attachment, cracks, metal distortion, broken spotwelds, corrosion, condition of paint and any other apparent damage.
- (d) **WIRING** for: security, chafing, burning, defective insulation, loose or broken terminals, heat deterioration and corroded terminals.
- (e) **BOLTS IN CRITICAL AREAS** for: correct torque in accordance with torque values given in the chart in Section 1, when installed or when visual inspection indicates the need for a torque check.

NOTE

Torque values listed in Section 1 are derived from oil-free cadmium-plated threads, and are recommended for all installation procedures contained in this book except where other values are stipulated. They are not used for checking tightness of installed parts during service.

- (f) **FILTERS, SCREENS & FLUIDS** for: cleanliness, contamination and/or replacement at specified intervals.
- (g) **AIRCRAFT FILE.**

Miscellaneous data, information and licenses are a part of the aircraft file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the United States Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of exported aircraft should check with their own aviation officials to determine their individual requirements.

To be displayed in the aircraft at all times:

1. Aircraft Airworthiness Certificate (FAA Form 8100-2).
2. Aircraft Registration Certificate (FAA Form 8050-3).
3. Aircraft Radio Station License, if transmitter is installed (FCC Form 556).

To be carried in the aircraft at all times:

1. Weight and Balance, and associated papers (Latest copy of the Repair and Alteration Form, FAA Form 337, if applicable).
2. Aircraft Equipment List.

To be made available upon request:

1. Aircraft Log Book and Engine Log Book.

(h) ENGINE RUN-UP.

Before beginning the step-by-step inspection, start, run up and shut down the engine in accordance with instructions in the Owner's Manual. During the run-up, observe the following, making note of any discrepancies or abnormalities:

1. Engine temperatures and pressures.
2. Static RPM. (Also refer to Section 11 of this Manual.)
3. Magneto drop. (Also refer to Section 11 of this Manual.)
4. Engine response to changes in power.
5. Any unusual engine noises.
6. Fuel selector and/or shut-off valve; operate engine(s) on each tank (or cell) position and OFF position long enough to ensure shut-off and/or selector valve functions properly.
7. Idling speed and mixture; proper idle cut-off.
8. Alternator and ammeter.
9. Suction gage.
10. Fuel flow indicator.

After the inspection has been completed, an engine run-up should again be performed to determine that any discrepancies or abnormalities have been corrected.

SHOP NOTES:

IMPORTANT

READ ALL INSPECTION REQUIREMENTS PARAGRAPHS PRIOR TO USING THESE CHARTS.

SPECIAL INSPECTION ITEM

EACH 200 HOURS

EACH 100 HOURS

EACH 50 HOURS

PROPELLER

- 1. Spinner
- 2. Spinner bulkhead
- 3. Blades
- 4. Bolts and/or nuts
- 5. Hub

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
- 2. Oil cooler
- 3. Induction air filter
- 4. Induction airbox, air valves, doors and controls
- 5. Cold and hot air hoses
- 6. Engine baffles
- 7. Cylinders, rocker box covers and push rod housings
- 8. Crankcase, oil sump, accessory section and front crankshaft seal
- 9. Hoses, metal lines and fittings
- 10. Intake and exhaust systems
- 11. Ignition harness
- 12. Spark plugs
- 13. Compression check
- 14. Crankcase and vacuum system breather lines
- 15. Electrical wiring
- 16. Vacuum pump and oil separator
- 17. Vacuum relief valve filter (cabin area)
- 18. Engine controls and linkage
- 19. Engine shock mounts, mount structure and ground straps
- 20. Cabin heat valves, doors and controls
- 21. Starter, solenoid and electrical connections

SPECIAL INSPECTION ITEM
EACH 200 HOURS
EACH 100 HOURS
EACH 50 HOURS

22. Starter brushes, brush leads and commutator	•		
23. Alternator and electrical connections	•		
24. Alternator brushes, brush leads, commutator or slip rings			7
25. Voltage regulator mounting and electrical leads	•		
26. Magnetos (externally) and electrical connections	•		
27. Magnetos (internally)			15
28. Magnetos timing			8
29. Carburetor and drain plug	•		
30. Firewall		•	
31. Engine cowling	•		
FUEL SYSTEM			
1. Fuel strainer, drain valve and control	•		
2. Fuel strainer screen and bowl		•	
3. Fuel tank vents, caps and placards	•		
4. Fuel tanks, sump drains and fuel line drains		•	
5. Drain fuel and check tank interior, attachment and outlet screens			5
6. Fuel vent valves		•	
7. Vent line drain		•	
8. Fuel shut-off valve and placards	•		
9. Fuel valve drain plug		•	
10. Engine primer		•	
11. Perform a fuel quantity indicating system operational test. Refer to Section 15 for detailed accomplishment instructions.			18
LANDING GEAR			
1. Main gear wheels and fairings	•		17
2. Nose gear wheel, torque links, steering tubes, boots and fairing	•		17
3. Wheel bearings			9
4. Nose gear strut and shimmy dampener (service as required)	•		
5. Tires	•		
6. Brake fluid, lines and hoses, linings, discs, brake assemblies and master cylinders		•	
7. Parking brake system		•	
8. Main gear springs		•	

SPECIAL INSPECTION ITEM
EACH 200 HOURS
EACH 100 HOURS
EACH 50 HOURS

- 9. Nose steering arm lubrication
- 10. Torque link lubrication
- 11. parking brake and toe brakes - operational check.....

AIRFRAME

- 1. Aircraft exterior
- 2. Aircraft structure
- 3. Windows, windshield, doors and seals
- 4. Seat belt and shoulder harness
- 5. Seat stops, seat rails, upholstery, structure and mounting.....
- 6. Control "Y" bearings, sprockets, pulleys, cables, chains and turnbuckles
- 7. Control lock, control wheel and control "Y" mechanism
- 8. Instruments and markings
- 9. Gyros central air filter.....
- 10. Magnetic compass compensation
- 11. Instrument wiring and plumbing
- 12. Instrument panel, shock mounts, ground straps, cover, decals and labeling
- 13. Defrosting, heating and ventilating systems and controls
- 14. Cabin upholstery, trim, sun visors and ashtrays
- 15. Area beneath floor, lines, hose, wires and control cables
- 16. Lights, switches, circuit breakers, fuses, and spare fuses
- 17. Exterior lights.....
- 18. Pitot and static systems
- 19. Stall warning unit and pitot heater
- 20. Radios, radio controls, avionics and flight instruments.....
- 21. Antennas and cables
- 22. Battery, battery box and battery cables.....
- 23. Battery electrolyte
- 24. Emergency locator transmitter
- 25. Inspect all fluid carrying lines and hoses in the cabin and wing areas for leaks, damage, abrasion, and corrosion.

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SPECIAL INSPECTION ITEM

EACH 200 HOURS

EACH 100 HOURS

EACH 50 HOURS

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. Decals and labeling			●
6. Flap control switch, flap rollers and tracks, flap indicator	●		
7. Flap motor, transmission, limit switches, structure, linkage, bellcranks, etc.			●
8. Elevator and trim tab hinges, tips and control rods	●		
9. Elevator trim tab system free-play inspection		●	
10. Elevator trim tab actuator lubrication and tab free-play inspection			13
11. Rudder pedal assemblies and linkage			●
12. Skins (external) of control surfaces and tabs	●		
13. Internal structure of control surfaces			●
14. Balance weight attachment			●
15. Flap actuator jack screw threads			14

SPECIAL INSPECTION ITEMS

1. First 25 hours: Use mineral oil conforming with MIL-C-6529 Type II for the first 25 hours of operation or until oil consumption has stabilized, or six months, whichever occurs first. If oil consumption has not stabilized in this time, drain and replenish the oil and replace the oil filter. After oil consumption has stabilized, change to an ashless dispersant oil, refer to Teledyne Continental Service Information Letter SIL99-2, or latest revision for a current listing of lubricants authorized by TCM. Change oil each 25 hours if engine is NOT equipped with external oil filter; if equipped with an external oil filter, change oil filter element and oil at each 50 hours of operation or every six months, whichever occurs first. Refer to the latest edition of the TCM engine operator/maintenance manual for the latest oil change intervals and inspection procedures.
2. Clean filter per paragraph 2-22. Replace as required.
3. Replace engine compartment hoses per the following schedule:
 - A. Cessna-Installed Flexible Fluid Carrying Rubber Hoses; replace every 5 years or at engine overhaul, whichever occurs first.
 - B. Cessna Installed Flexible Fluid Carrying Teflon Hoses, replace every 10 years or at engine overhaul, whichever occurs first.
 - C. TCM Installed Engine Compartment Flexible Fluid Carrying Hoses, refer to Teledyne Continental Service Bulletin SB97-6 or latest revision for hose replacement intervals.
4. General inspection every 50 hours. Refer to Section 11 for 100 hour inspection.
5. Each 1000 hours, or at engine overhaul, whichever occurs first.
6. Each 50 hours for general condition and freedom of movement. These controls are not repairable, replace throttle and mixture controls at each engine overhaul.
7. Each 500 hours.
8. Internal Timing:

For airplanes equipped with Slick 4100 series magnetos:

These magnetos cannot be overhauled in the field. The coil, capacitor, and breaker assembly are non-replaceable. These magnetos shall be removed from service upon reaching 800 hours total time in service.

For airplanes equipped with Slick 4300 Series magnetos or TCM/Bendix magnetos:

Refer to the applicable service manual and service bulletins for internal timing procedures and service intervals.

Magneto-To-Engine Timing: First 50 hours, first 100 hours and each 200 hours thereafter.
9. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
10. Replace each 500 hours.
11. Check electrolyte level and clean battery compartment each 50 hours or 30 days, whichever occurs first.
12. Refer to Section 16 of this manual.

13. Replacement or overhaul of the actuator is required each 1000 hours and/or 3 years, whichever comes first. Refer to figure 2-5 for grease specifications.

NOTE: Refer to Section 9 of this service manual and Cessna Single Engine Service Letter SE73-25, or latest revision, for free-play limits, inspection, replacement and/or repair information.

14. Refer to paragraph 2-44 for detailed instructions for various serial ranges.
15. Each 500 hours. Inspect contact points. Inspect carbon brush, high tension lead, and distributor block. Inspect impulse coupling and pawls. Replace as required. Inspect and lubricate bearings and contact point cam.
16. Vertical stabilizer attachment each 100 hours or annual inspection. However it is recommended that nutplates used to attach the vertical stabilizer be inspected after each 100 hours of operation. Refer to paragraph 4-14A for detailed instructions.
17. Each 100 hours or annual inspection, check socket head cap screws for proper torque. When replacing wheel bearings, check webs around flange mounting screw holes. During tire or tube change, or when the wheel is otherwise disassembled, use dye penetrant to inspect the hubs. Refer to paragraph 2-38.
18. Fuel quantity indicating system operational test is required every 12 months. Refer to Section 15 for detailed accomplishment instructions.
19. Inspect each 50 hours for general condition and security. Replacement is required every 10 years.
20. When the accuracy of the compass is in question, when components are added or removed which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or after a lightning strike. Refer to Advisory Circular AC43.13-1B, Chapter 12, Section 3 Ground Operational Checks for Avionics Equipment for a detailed listing of conditions requiring the performance of a compass swing and compass swing procedures.

2-45. COMPONENT TIME LIMITS

1. General

- A. Most components listed throughout Section 2 should be inspected as detailed elsewhere in this section and repaired, overhauled or replaced as required. Some components, however, have a time or life limit, and must be overhauled or replaced on or before the specified time limit.

NOTE: The terms overhaul and replacement as used within this section are defined as follows:

Overhaul - Item may be overhauled as defined in FAR 43.2 or it can be replaced.

Replacement - Item must be replaced with a new item or a serviceable item that is within its service life and time limits or has been rebuilt as defined in FAR 43.2.

- B. This section provides a list of items which must be overhauled or replaced at specific time limits. Table 1 lists those items which Cessna has mandated must be overhauled or replaced at specific time limits. Table 2 lists component time limits which have been established by a supplier to Cessna for the supplier's product.
- C. In addition to these time limits, the components listed herein are also inspected at regular time intervals set forth in the Inspection Charts, and may require overhaul/replacement before the time limit is reached based on service usage and inspection results.

2. Cessna-Established Replacement Time Limits

A. The following component time limits have been established by Cessna Aircraft Company.

Table 1: Cessna-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
Restraint Assembly Pilot, Copilot, and Passenger Seats	10 years	NO
Trim Tab Actuator	1,000 hours or 3 years, whichever occurs first	YES
Vacuum System Filter	500 hours	NO
Vacuum System Hoses	10 years	NO
Pitot and Static System Hoses	10 years	NO
Vacuum Relief/Regulator Valve Filter (If Installed)	500 hours	NO
Engine Compartment Flexible Fluid Carrying Teflon Hoses (Cessna-Installed) Except Drain Hoses (Drain hoses are replaced on condition)	10 years or engine overhaul, whichever occurs first (Note 1)	NO
Engine Compartment Flexible Fluid Carrying Rubber Hoses (Cessna-Installed) Except Drain Hoses (Drain hoses are replaced on condition)	5 years or engine overhaul, whichever occurs first (Note 1)	NO
Engine Air Filter	500 hours or 36 months, whichever occurs first (Note 9)	NO
Engine Mixture, and Throttle, Controls	At engine TBO	NO
Engine Driven Dry Vacuum Pump Drive Coupling (Not lubricated with engine oil)	6 years or at vacuum pump replacement, whichever occurs first	NO
Engine Driven Dry Vacuum Pump (Not lubricated with engine oil)	500 hours (Note 10)	NO
Standby Dry Vacuum Pump	500 hours or 10 years, whichever occurs first (Note 10)	NO

COMPONENT	REPLACEMENT TIME	OVERHAUL
Switch (Landing Light)	4 years (Note 11)	NO
Landing and Taxi Light Switch	4 years (Note 11)	NO
Switch (Beacon Light)	4 years (Note 12)	NO

3. Supplier-Established Replacement Time Limits

A. The following component time limits have been established by specific suppliers and are reproduced as follows:

Table 2: Supplier-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
ELT Battery	(Note 3)	NO
Vacuum Manifold	(Note 4)	NO
Magnetos	(Note 5)	YES
Engine	(Note 6)	YES
Engine Flexible Hoses (TCM Installed)	(Note 2)	NO
Auxiliary Electric Fuel Pump	(Note 7)	YES
Propeller	(Note 8)	YES

NOTES:

Note 1: This life limit is not intended to allow flexible fluid-carrying Teflon or rubber hoses in a deteriorated or damaged condition to remain in service. Replace engine compartment flexible Teflon (AE3663819BXXX series hose) fluid-carrying hoses (Cessna installed only) every ten years or at engine overhaul, whichever occurs first. Replace engine compartment flexible rubber fluid-carrying hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first (this does not include drain hoses). Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose from Cessna.

Note 2: Refer to Teledyne Continental Service Bulletin SB97-6, or latest revision.

Note 3: Refer to FAR 91.207 for battery replacement time limits.

Note 4: Refer to Airborne Air & Fuel Product Reference Memo No. 39, or latest revision, for replacement time limits.

Note 5: For airplanes equipped with Slick magnetos, refer to Slick Service Bulletin SB2-80C, or latest revision, for time limits.

For airplanes equipped with TCM/Bendix magnetos, refer to Teledyne Continental Motors Service Bulletin No. 643, or latest revision, for time limits.

Note 6: Refer to Teledyne Continental Service Information Letter SIL98-9, or latest revision, for time limits.

- Note 7: Refer to Cessna Service Bulletin SEB94-7 Revision 1/Dukes Inc. Service Bulletin No. 0003, or latest revision.
- Note 8: Refer to the applicable McCauley Service Bulletins and Overhaul Manual for replacement and overhaul information.
- Note 9: The air filter may be cleaned, refer to Section 2 of this service manual for servicing instructions. For airplanes equipped with an air filter manufactured by Donaldson, refer to Donaldson Aircraft Filters Service Instructions P46-9075 for detailed servicing instructions.
The address for Donaldson Aircraft Filters is:

Customer Service
115 E. Steels Corners RD
Stow, OH. 44224

Do not overservice the air filter, overservicing increases the risk of damage to the air filter from excessive handling. A damaged/worn air filter may expose the engine to unfiltered air and result in damage/excessive wear to the engine.

- Note 10: Replace engine driven dry vacuum pump not equipped with a wear indicator every 500 hours of operation, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

Replace standby vacuum pump not equipped with a wear indicator every 500 hours of operation or 10 years, whichever occurs first, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

For a vacuum pump equipped with a wear indicator, replace pump according to the vacuum pump manufacturer's recommended inspection and replacement intervals.

- Note 11: During the next annual inspection and every four years thereafter, replace the Switch (Landing Light) with part number C906-5 or the Landing and Taxi Light Switch with part number TTGC-TA201TW-B, as applicable.
- Note 12: During the next annual inspection and every four years thereafter, replace the Switch (Beacon Light) with part number TA201TW-B.