SECTION 2

GROUND HANDLING, SERVICING, LUBRICATION, AND INSPECTION

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2-1. GROUND HANDLING.

2-2. TOWING. Moving the airplane by hand is accomplished by using the wing struts or landing gear struts as push points. A tow bar attached to the nose gear is used for steering and maneuvering the airplane. The tow bar is provided as standard equipment and is stowed in the baggage compartment.

CAUTION

When towing the airplane, never turn the nose wheel more than 39 degrees either side of center or the nose gear will be damaged. Do not push on control surfaces or empennage surfaces. Depress airplane nose when towing.

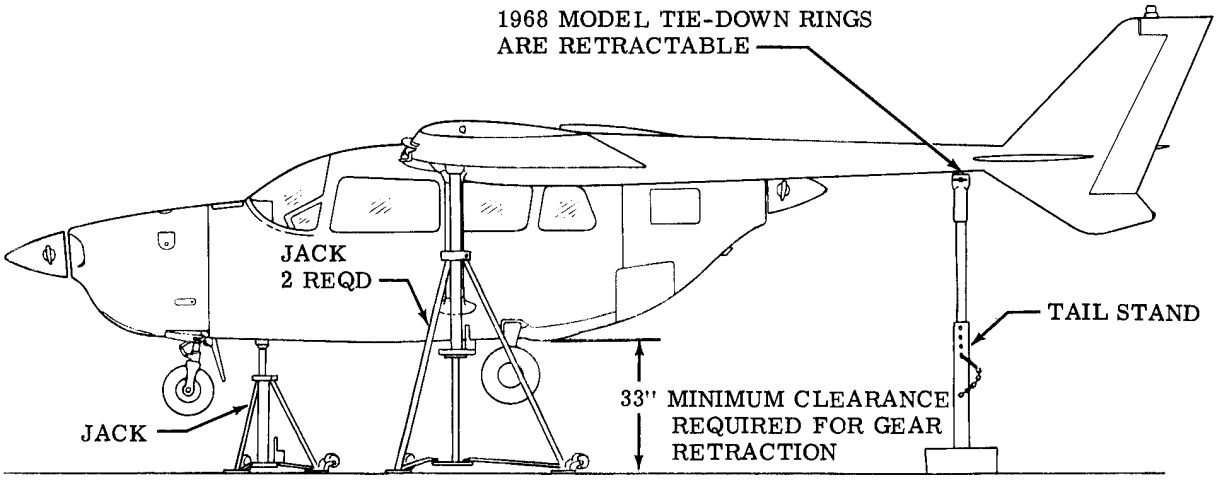
2-3. HOISTING. The airplane may be lifted by means of hoisting lugs which are provided as optional equipment. Provisions for attaching the optional hoisting rings to the front and rear carry-thru spars are provided as standard equipment. If the optional hoisting rings are used, a minimum cable length of 60 inches for each cable is required to prevent bending of the eyebolt-type hoisting rings. If desired, a spreader jig may be fabricated to apply vertical force to the eyebolts. When hoisting the airplane, use a hoist with a minimum capacity of three tons.

2-4. JACKING. Refer to figure 2-1 for jacking procedures. Wing jack points and mounting screws are stowed in the map compartment. The jack points are to be installed just outboard of the wing strut, in the bottom forward flange of the front wing spar. Remove existing screws to install the jack points and reinstall after jacking operation has been completed.

CAUTION

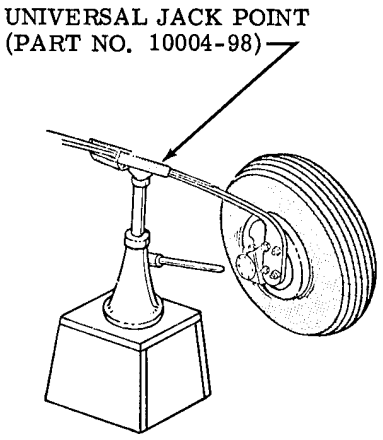
When using the universal jack point, flexibility of the gear strut will cause the main wheel to slide inboard as the wheel is raised, tilting the jack. The jack must then be lowered for a second jacking operation. Jacking both wheels simultaneously with universal jack points is not recommended. Do not use brake casting as a jacking point.

If the airplane is to be jacked with the rear engine removed, the tail must be weighted to provide balance while jacking. This weight is added by placing shot bags on the horizontal stabilizer rear spar.



NOTE

Wing jacks available from the Cessna Service Parts Center are REGENT Model 4939-30 for use with the SE-576 wing stands. Combination jacks are the REGENT Model 4939-70 for use without wing stands. The 4939-70 jack (70-inch) may be converted to the 4939-30 jack (30-inch) by removing the leg extensions and replacing lower braces with shorter ones. The base of the adjustable tail stand (SE-767) is to be filled with concrete for additional weight as a safety factor. The SE-576 wing stand will also accommodate the SANCOR Model 00226-150 jack. Other equivalent jacks, tail stands, and adapter stands may be used.



JACKING PROCEDURE:

1. Install wing jack points (Part No. 1400110-2, 2 reqd.) just outboard of wing struts.
2. Position wing jacks at wing jack points.
3. Locate one or two people at the aft end of the tail booms to balance the airplane manually as the wing jacks are raised. The airplane will become tail heavy as the wings are jacked.
4. Raise wing jacks evenly until desired height is reached.
5. Attach a weighted, adjustable tail stand to either boom tie-down ring.
6. Position nose jack at nose jack point and raise until airplane becomes steady.
7. Use the universal jack point to jack one wheel.
8. The nose may be raised either by jacking with the nose jack or by placing weight, such as shot bags, along the stabilizer rear spar.

Figure 2-1. Jacking

2-5. PARKING. Parking precautions depend principally on local conditions. As a general precaution, it is wise to set the parking brake or chock the wheels and install the control lock. In severe weather, and high wind conditions, tie down the airplane as outlined in paragraph 2-6 if a hangar is not available.

2-6. TIE-DOWN. When mooring the aircraft in the open, head into the wind if possible. Secure control surfaces with the internal control lock and set brakes.

CAUTION

Do not set parking brakes during cold weather when accumulated moisture may freeze the brakes or when the brakes are overheated.

After completing the preceding, proceed to moor the aircraft as follows:

a. Secure ropes, chains, or cables of 700 pounds or more tensile strength to the wing tie-down fittings located at the upper end of each wing strut. Secure opposite ends of ropes, chains, or cables to ground anchors.

b. Secure ropes, chains, or cables of 700 pounds or more tensile strength to the tie-down fitting on each tailboom and fasten opposite end of ropes, chains, or cables to a common ground anchor.

NOTE

In locations where heavy snow accumulations occur, additional precautions should be taken to support the tail section of the aircraft. Snow accumulations on the horizontal stabilizer can result in considerable weight on the tail, causing it to rotate downward, resulting in damage to the ventral fins. Proper nose gear tie-down and a simple tail support attached to one of the tailboom tie-down fittings will protect against such damage.

c. Secure the middle of a rope (do not use chain or cable) to the nose gear trunnion (see figure 2-2). Pull each end away at a 45 degree angle and secure to the ground anchors.

d. These aircraft are equipped with a spring-loaded steering bungee which affords protection against normal wind gusts. However, if extremely high wind gusts are anticipated, additional external locks may be installed.

e. Install pitot tube cover.

f. On turbocharged aircraft, close rear cowl flaps.

NOTE

In areas subject to severe wind-driven rainstorms the turbocharged aircraft should be hangared to reduce the possibility of water getting into the rear engine induction system. If hangar storage is not available, install a cover with prominent red streamer on the rear engine air inlet scoop.

2-7. FLYABLE STORAGE. Flyable storage is defined as a maximum of 30 days non-operational storage and/or the first 25 hours of intermittent engine operation.

NOTE

The aircraft is delivered from Cessna with a Corrosion Preventive Aircraft Engine Oil (Military Specification MIL-C-6529, Type II). This engine oil is a blend of aviation grade straight mineral oil and a corrosion preventive compound. This engine oil should be used for the first 50 hours of engine operation. Refer to paragraph 2-21 for oil changes during the first 50 hours of operation.

During the 30 day non-operational storage or the first 25 hours of intermittent engine operation, every seventh day the propellers shall be rotated through five revolutions, without running the engines. If the aircraft is stored outside, tie-down in accordance with paragraph 2-6. In addition, the pitot tube, static air vents, air vents, openings in the engine cowling, and other similar openings shall have protective covers installed to prevent entry of foreign material. After 30 days, the aircraft should be flown for 30 minutes or ground run-up until oil has reached operating temperature.

2-8. RETURNING AIRCRAFT TO SERVICE. After flyable storage, returning the aircraft to service is accomplished by performing a thorough pre-flight inspection. At the end of the first 25 hours of engine operation, drain engine oil, clean oil screens and change external oil filter element. Service engines with correct grade and quantity of engine oil. Refer to figure 2-5 and paragraph 2-21 for correct grade of engine oil.

2-9. TEMPORARY STORAGE. Temporary storage is defined as aircraft in a non-operational status for a maximum of 90 days. The aircraft is constructed of corrosion resistant alclad aluminum, which will last indefinitely under normal conditions if kept clean, however, these alloys are subject to oxidation. The first indication of corrosion on unpainted surfaces is in the form of white deposits or spots. On painted surfaces, the paint is discolored or blistered. Storage in a dry hangar is essential to good preservation, and should be procured, if possible. Varying conditions will alter the measures of preservation, but under normal conditions in a dry hangar, and for storage periods not to exceed 90 days, the following methods of treatment are suggested:

a. Fill fuel tanks with correct amount and grade of gasoline.

b. Clean and wax aircraft thoroughly.

c. Clean any oil or grease from tires and coat tires with a tire preservative. Cover tires to protect against grease and oil.

d. Either block up fuselage to relieve pressure on tires or rotate wheels every 30 days to change supporting points and prevent flat spotting the tires.

e. Lubricate all airframe items and seal or cover all openings which could allow moisture and/or dust to enter.

NOTE

The aircraft battery serial number is recorded in the aircraft equipment list. To assure accurate warranty records, the battery should be reinstalled in the same aircraft from which it was removed. If a battery is returned to service in a different aircraft, appropriate record changes must be made and notification sent to the Cessna Claims Department.

f. Remove battery and store in a cool dry place; service the battery periodically and charge as required.

NOTE

An engine treated in accordance with the following may be considered protected against normal atmospheric corrosion for a period not to exceed 90 days.

g. Disconnect spark plug leads and remove upper and lower spark plugs from each cylinder.

NOTE

The preservative oil must be Lubricating Oil-Contact and Volatile, Corrosion Inhibited, MIL-L-46002, Grade 1 or equivalent. The following oils are approved for spraying operations by Teledyne Continental Motors, Nucle Oil 105-Daubert Chemical Co., 4700 So. Central Ave., Chicago, Illinois; Petratect VA - Pennsylvania Refining Co., Butler, Pennsylvania; Ferro-Gard 1009G-Ranco Laboratories, Inc., 3617 Brownsville Rd., Pittsburgh, Pennsylvania.

h. Using a portable pressure sprayer, atomize spray the preservative oil through the upper spark plug hole of each cylinder with the piston in a down position. Rotate crankshaft as each pair of cylinders is sprayed.

i. After completing step "h," rotate crankshaft so that no piston is at a top position. If the aircraft is to be stored outside, stop two-bladed propeller so that blades are as near horizontal as possible to provide maximum clearance with passing aircraft.

j. Again, spray each cylinder without moving the crankshaft, to thoroughly cover all interior surfaces of the cylinder above the piston.

k. Install spark plugs and connect spark plug leads.

l. Apply preservative oil to the engine interior by spraying approximately two ounces of the preservative oil through the oil filler tube.

m. Seal all engine openings exposed to the atmosphere, using suitable plugs or non-hygroscopic tape. Attach a red streamer at each point that a plug or tape is installed.

n. If the aircraft is to be stored outside, perform the procedures outlined in paragraph 2-6. In addition, the pitot tube, static source vents, air vents, openings in the engine cowling and other similar openings should have protective covers installed to prevent entry of foreign material.

o. Attach a warning placard to the effect that the propeller shall not be moved while the engine is in storage.

2-10. INSPECTION DURING STORAGE.

a. Inspect airframe for corrosion at least once a month and remove dust collections as frequently as possible. Clean and wax as required.

b. Inspect the interior of at least one cylinder through the spark plug hole for corrosion at least once a month.

NOTE

Do not move crankshaft when inspecting interior of cylinder for corrosion.

c. If at the end of the 90 day period, the aircraft is to be continued in non-operational storage, again perform procedures outlined in paragraph 2-9.

2-11. RETURNING AIRCRAFT TO SERVICE. After temporary storage, use the following procedures to return the aircraft to service.

a. Remove aircraft from blocks and check tires for proper tire inflation. Check for proper nose gear strut inflation.

b. Check battery and install.

c. Check that oil sump has proper grade and quantity of engine oil.

d. Service induction air filter and remove warning placard.

e. Remove materials used to cover openings.

f. Remove, clean, and gap spark plugs.

g. While spark plugs are removed, rotate propellet several revolutions to clear excess rust preventive oil from cylinders.

h. Install spark plugs. Torque spark plugs to 330±30 lb-in and connect spark plug leads.

i. Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment, drain enough fuel to eliminate.

j. Perform a thorough pre-flight inspection, then start and warm-up engine.

2-12. INDEFINITE STORAGE. Indefinite storage is defined as aircraft in a non-operational status for an indefinite period of time. Engines treated in accordance with the following may be considered protected against normal atmospheric corrosion, provided the procedures outlined in paragraph 2-13 are performed at the intervals specified.

a. Operate engine until oil temperature reaches normal operating range. Drain engine oil sump and reinstall drain plug.

b. Fill oil sump to normal operating capacity with corrosion preventive mixture which has been thoroughly mixed and pre-heated to a minimum of 221°F at the time it is added to the engine.

NOTE

Corrosion preventive mixture consists of one part compound MIL-C-6529, Type I, mixed with three parts new lubricating oil of the grade recommended for service. Continental Motors Corporation recommends Cosmoline No. 1223, supplied by E.F. Houghton & Co., 305 W. LeHigh Avenue, Philadelphia, Pa. During all spraying operations, corrosion mixture is pre-heated to 221° to 250°F.

c. Immediately after filling the oil sump with corrosion preventative mixture, fly the aircraft for a period of time not exceed a maximum of 30 minutes.

d. With engine operating at 1200 to 1500 rpm and induction air filter removed, spray corrosion preventive mixture into induction airbox, at the rate of one-half gallon per minute, until heavy smoke comes from exhaust stack, then increase the spray until the engine is stopped.

CAUTION

Injecting corrosion-preventive mixture too fast can cause a hydrostatic lock.

e. Do not rotate propeller after completing step "d."

f. Remove all spark plugs and spray corrosion-preventive mixture, which has been pre-heated to 221° to 250°F, into all spark plug holes to thoroughly cover interior surfaces of cylinders.

g. Install lower spark plugs or install solid plugs, and install dehydrator plugs in upper spark plug holes. Be sure that dehydrator plugs are blue in color when installed.

h. Cover spark plug lead terminals with shipping plugs (AN4060-1) or other suitable covers.

i. With throttle in full open position, place a bag of desiccant in the carburetor intake and seal opening with moisture resistant paper and tape.

j. Place a bag of desiccant in the exhaust tail-

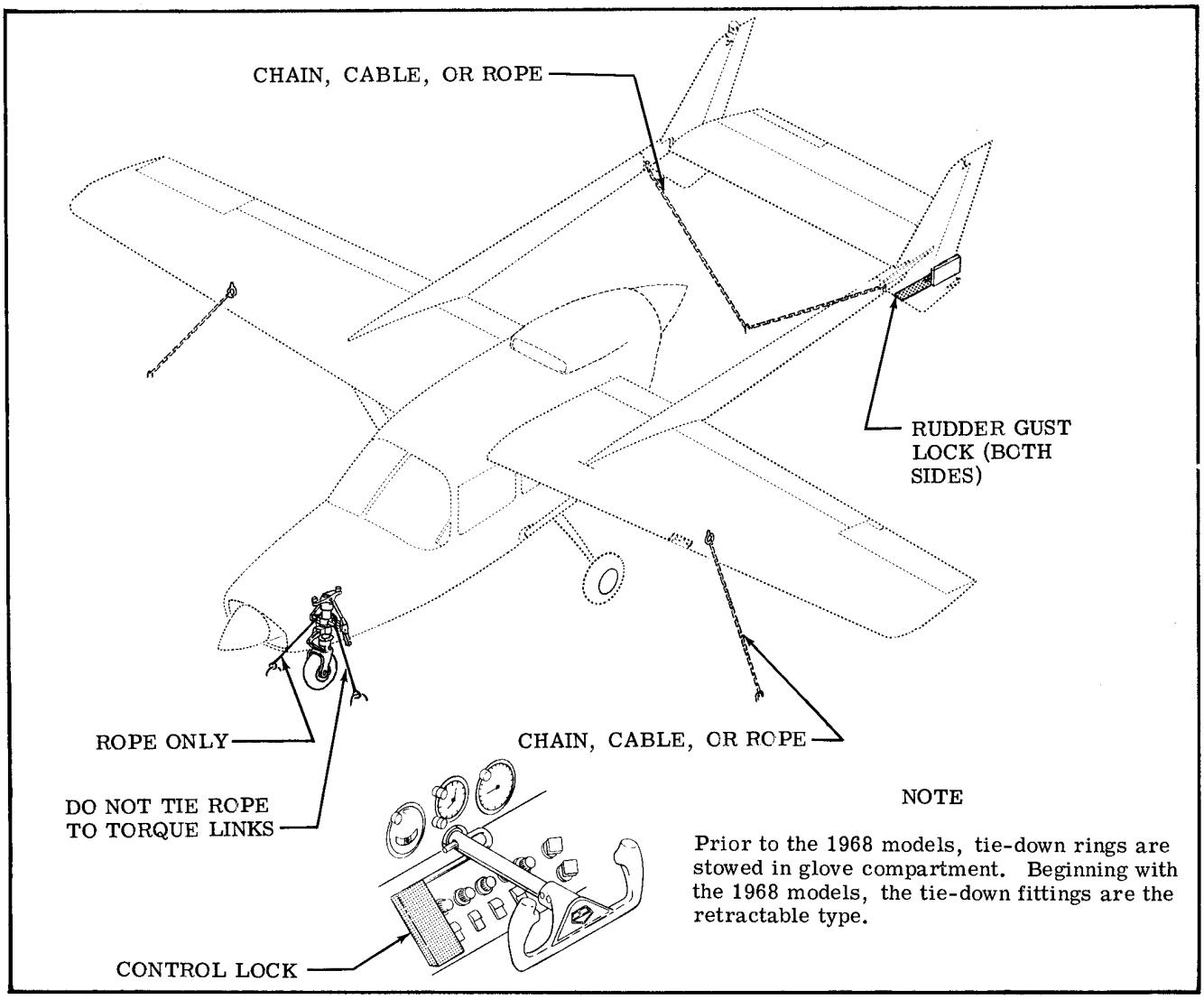


Figure 2-2. Tie-Down Diagram

pipe(s) and seal openings with moisture resistant tape.

k. Seal cold air inlet to the heater muff with moisture resistant tape.

l. Seal engine breather by inserting a protex plug in the breather hose and clamping in place.

m. Seal all other engine openings exposed to atmosphere using suitable plugs or non-hygroscope tape.

NOTE

Attach a red streamer to each place plugs or tape is installed. Either attach red streamers outside of the sealed area with tape or to the inside of the sealed area with safety wire to prevent wicking of moisture into the sealed area.

n. Drain corrosion-preventive mixture from engine sump and reinstall drain plug.

NOTE

The corrosion-preventive mixture is harmful to paint and should be wiped from painted surfaces immediately.

o. Attach a warning placard on the throttle control knob, to the effect that the engine contains no lubricating oil. Placard the propeller to the effect that it should not be moved while the engine is in storage.

p. Prepare airframe for storage as outlined in paragraph 2-9 thru step "f."

NOTE

As an alternate method of indefinite storage, the aircraft may be serviced in accordance with paragraph 2-9 providing the aircraft is run-up at maximum intervals of 60 days and then reserviced per paragraph 2-9.

2-13. INSPECTION DURING STORAGE. Aircraft in indefinite storage shall be inspected as follows:

a. Inspect cylinder protex plugs each 7 days.

b. Change protex plugs if their color indicates an unsafe condition.

c. If the dehydrator plugs have changed color in one half of the cylinders, all desiccant material in the engine shall be replaced with new material.

d. Every 6 months respray the cylinder interiors with corrosion-preventive mixture.

NOTE

Before spraying, inspect the interior of one cylinder for corrosion through the spark plug hole and remove at least one rocker box cover and inspect the valve mechanism.

2-14. RETURNING AIRCRAFT TO SERVICE. After indefinite storage, use the following procedure to return the aircraft to service.

a. Remove aircraft from blocks and check tires for correct inflation. Check for correct nose gear strut inflation.

b. Check battery and install.

c. Remove all materials used to seal and cover openings.

d. Remove warning placards posted at throttle and propeller.

e. Remove and clean engine oil screen, then reinstall and safety. On aircraft that are equipped with an external oil filter, install new filter element.

f. Remove oil sump drain plug and drain sump. Install and safety drain plug.

NOTE

The corrosion-preventive mixture will mix with the engine lubricating oil, so flushing the oil system is not necessary. Draining the oil sump will remove enough of the corrosion-preventive mixture.

g. Service and install the induction air filter.

h. Remove dehydrator plugs and spark plugs or plugs installed in spark plug holes and rotate propeller by hand several revolutions to clear corrosion-preventive mixture from cylinders.

i. Clean, gap, and install spark plugs. Torque plugs to the value listed in Section 10.

j. Check fuel strainer. Remove and clean filter screen. Check fuel tanks and fuel lines for moisture and sediment, and drain enough fuel to eliminate.

k. Perform a thorough pre-flight inspection, then start and warm-up engine.

l. Thoroughly clean aircraft and flight test aircraft.

2-15. LEVELING. Longitudinal leveling of the airplane is accomplished by backing out the two leveling screws, located on the left side of the airplane just below the pilot's side window, and placing a level across the screws. A level placed across the front seat rails at corresponding points is used to level the airplane laterally.

2-16. SERVICING.

2-17. Servicing requirements are shown in the Servicing Chart (figure 2-5). The following paragraphs supplement this figure by adding details.

2-18. FUEL TANKS should be filled to capacity immediately after flight to retard moisture condensation. The airplane may have an optional auxiliary fuel tank installed in each wing between the tail boom and fuselage. The recommended fuel grade to be used is listed in figure 2-5. Total fuel capacity of the standard and optional fuel tanks is given in the chart in Section 1.

2-19. FUEL DRAINS are located at various points in the fuel system to provide for drainage of water and sediment. See Section 11.

2-20. FUEL STRAINERS. Each 100 hours, clean the fuel strainers as outlined in Section 11. During the 1967 model year, the strainer drain control was removed from the instrument panel and relocated adjacent to the engine oil dipstick. Access to the strainer drain control is through the engine oil

dipstick access door. Remove drain plugs and open strainer drain at the intervals specified in figure 2-5 to drain water and sediment from the fuel system. Also, during daily inspection of the fuel strainer, if any water is found in the fuel strainer, there is a possibility that wing tank sumps and fuel lines contain water. Therefore, all fuel drain plugs should be removed and all water drained from the fuel system.

2-21. ENGINE OIL. Check engine lubricating oil with the dipstick five to ten minutes after the engine has been stopped. The aircraft should be in as near a level position as possible when checking the engine oil, so that a true reading is obtained. Engine oil should be drained while the engine is still hot, and the nose of the aircraft should be raised slightly for more positive draining of any sludge which may have collected in the engine oil sump. Engine oil should be changed every four months, even though less than the specified hours have accumulated. Reduce these intervals for prolonged operations in dusty areas, in cold climates where sludging conditions exist, or where short flights and long idle periods are encountered, which cause sludging conditions. Always change oil, clean oil screens and clean and/or change external filter element whenever oil on the dipstick appears dirty. Detergent or ashless dispersant oil, conforming to Continental Motors Specification No. MHS-24A, shall be used in these engines. Multi-viscosity oil may be used to extend the operating temperature range, improve cold engine starting and lubrication of the engine during the critical warm-up period, thus permitting flight through wider ranges of climate change without the necessity of changing oil. The multi-viscosity grades are recommended for aircraft engines subjected to wide variations in ambient air temperatures when cold starting of the engine must be accomplished at temperatures below 30°F.

NOTE

New or newly-overhauled engines should be operated on aviation grade straight mineral oil until the oil change. If a detergent or ashless dispersant oil is used in a new or newly-overhauled engine, high oil consumption might possibly be experienced. The anti-friction additives in detergent and dispersant oils will retard "break-in" of the piston, rings and cylinder walls. This condition can be avoided by the use of straight mineral oil Beginning with Serial 337-0612 and all T337, the aircraft are delivered from Cessna with straight mineral oil (MIL-L-6529, Type II, RUST BAN). If oil must be added during the first 25 hours, use only aviation grade straight mineral oil (non-detergent) conforming to Specification No. MIL-L-6082. After the first 25 hours of operation, drain engine oil sump and clean both the oil suction strainer and oil pressure screen. If an external oil filter is installed, change filter element at this time. Refill sump with straight mineral oil (non-detergent) and use until a total of 50 hours have accumulated or oil consumption has stabilized, then change to detergent oil.

When changing engine oil, remove and clean oil screens, or install a new filter element on aircraft equipped with an external oil filter. An oil quick-drain valve may be installed. This valve provides a quick and cleaner method of draining the engine oil. This valve is installed in the oil drain port of the oil sump. To drain the engine oil, proceed as follows:

a. Operate engine(s) until oil temperature is at normal operating temperature.

b. (Front Engine) Remove cowling and open landing gear doors.

c. In the nose landing gear door opening, remove oil drain plug from engine sump and allow oil to drain into a container. Reinstall and safety oil drain plug.

WARNING

Do not install quick-drain valve shown in figure 2-3 in the front engine. The valve will interfere with nose landing gear retraction.

d. (Rear Engine.) Remove cowling side panels.

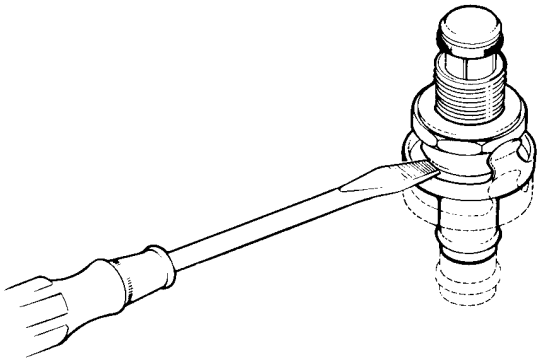
e. Attach a hose to the quick-drain valve in oil sump, or place a flexible funnel down through small spring-loaded door in bottom of cowling. Push up on quick-drain valve until it locks open, and allow oil to drain into a container.

f. After oil has drained, close quick-drain valve as shown in figure 2-3. Remove hose or funnel.

g. On turbocharged engines, remove oil drain plug. Reinstall and safety after draining oil.

h. Remove and clean oil screen or change external oil filter element of each engine.

i. Service each engine with correct amount and grade of engine oil.



Valve shown open. To close, twist screwdriver until valve unlocks and snaps down to closed position.

Figure 2-3. Quick-Drain Valve

2-22. ENGINE INDUCTION AIR FILTERS keep dust and dirt from entering the induction system. The value of maintaining the induction air filters in a good clean condition can never be overstressed. More engine wear is caused through the use of dirty and/or

damaged air filters than is generally believed. The frequency with which the filter should be removed and cleaned will be determined primarily by the airplane operating conditions. A good general rule, however, is to remove, clean, and inspect filters at least every 50 hours of engine operating time and more frequently if warranted by operating conditions. Some operators prefer to hold a spare set of induction air filters at their home base of operation so that a clean set of filters are always readily available. Under extremely dusty conditions, daily servicing of the filters is recommended.

NOTE

Prior to airplane serial number 337-0634 a permanent type filter element is used. This permanent type filter has a wire mesh screen around the inside and the outside of the filtering media. Beginning with airplane serial number 337-0634 and all service parts, an improved filter element is used. This improved filter has a perforated steel band around the inside and the outside of the filtering media. The filters used with the turbocharged engines are of a different shape, but are serviced in the same manner as the improved filter.

To service the induction air filters, proceed as follows:

a. Remove filter from airplane. For removal refer to Section 10 for the non-turbocharged engines or Section 10A for turbocharged engines.

b. Clean filter by blowing with compressed air (not over 100 psi) from direction opposite of normal air flow. Normal air flow for the cylindrical filter is from outside to inside. Arrows on filter case indicate direction of normal air flow on filters used with turbocharged engines.

NOTE

Use care to prevent damage to filter element when cleaning with compressed air. Never use air pressure greater than 100 psi to clean filter.

c. After cleaning as outlined in step "b," filter may be washed, if necessary, with a mild household detergent and warm water solution. A cold water solution may be used.

CAUTION

Do not use solvent or cleaning fluids to wash either type filter. Use only a mild household detergent and water solution when washing the filters.

NOTE

The improved filter assembly may be cleaned with compressed air a maximum of 30 times or it may be washed a maximum of 20 times. The filter should be replaced after 500 hours of engine operation or one year, whichever should occur first. However, the filter should be replaced anytime it is damaged.

The permanent filter may be cleaned and reused as long as it is not damaged. A damaged filter may have the wire mesh screen broken on the inside or the outside of the filter, or the filtering media may have sharp or broken edges. However, any filter that appears doubtful should be replaced.

d. After washing, rinse filter in clean water until rinse water runs clear from filter. Allow water to drain from filter and dry with compressed air (not over 100 psi).

NOTE

The filtering panels of the filter may become distorted when wet, but they will return to their original shape when dry.

e. Be sure induction air box and air inlet ducts to the engine are clean, inspect and replace filter if it is damaged.

f. Install filters as outlined in Section 10 for non-turbocharged engines or Section 10A for turbocharged engines.

2-23. VACUUM SYSTEM AIR FILTERS. On aircraft equipped with a vacuum system, inspect the central filter every 100 hours for damage and cleanliness. Change central air filter element every 500 hours of operating time and whenever suction gage reading drops below 4.6 inches of mercury. Also, do not operate the vacuum system with the filter removed, or a vacuum line disconnected as particles of dust or other foreign matter may enter the system and damage the vacuum operated instruments. Change gyro internal filters are overhauled. Beginning with the the vacuum system. These instruments are not equipped with internal filters. The new instruments are smaller with a beveled box type case. Also, these gyro instruments and related plumbing are used as service parts.

2-24. BATTERY. Servicing involves adding distilled water to maintain the electrolyte even with the horizontal baffle plate at the bottom of filler holes, checking the battery cable connections, and neutralizing and cleaning off any spilled electrolyte or corrosion. Use bicarbonate of soda (baking soda) and water to neutralize electrolyte or corrosion. Follow with a thorough flushing with water. Brighten cables and terminals with a wire brush, then coat with petroleum jelly before connecting. The battery box also should be checked and cleaned if any corrosion is noticed. Distilled water, not acid or "rejuvenators," should be used to maintain electrolyte level. Check the battery every 50 hours (or at least every 30 days), oftener in hot weather. See Section 15 for detailed battery replacement and testing.

2-25. TIRES should be maintained at the air pressure specified in the chart of Section 1. When checking tire pressure, examine tire for wear, cuts, bruises, and slippage.

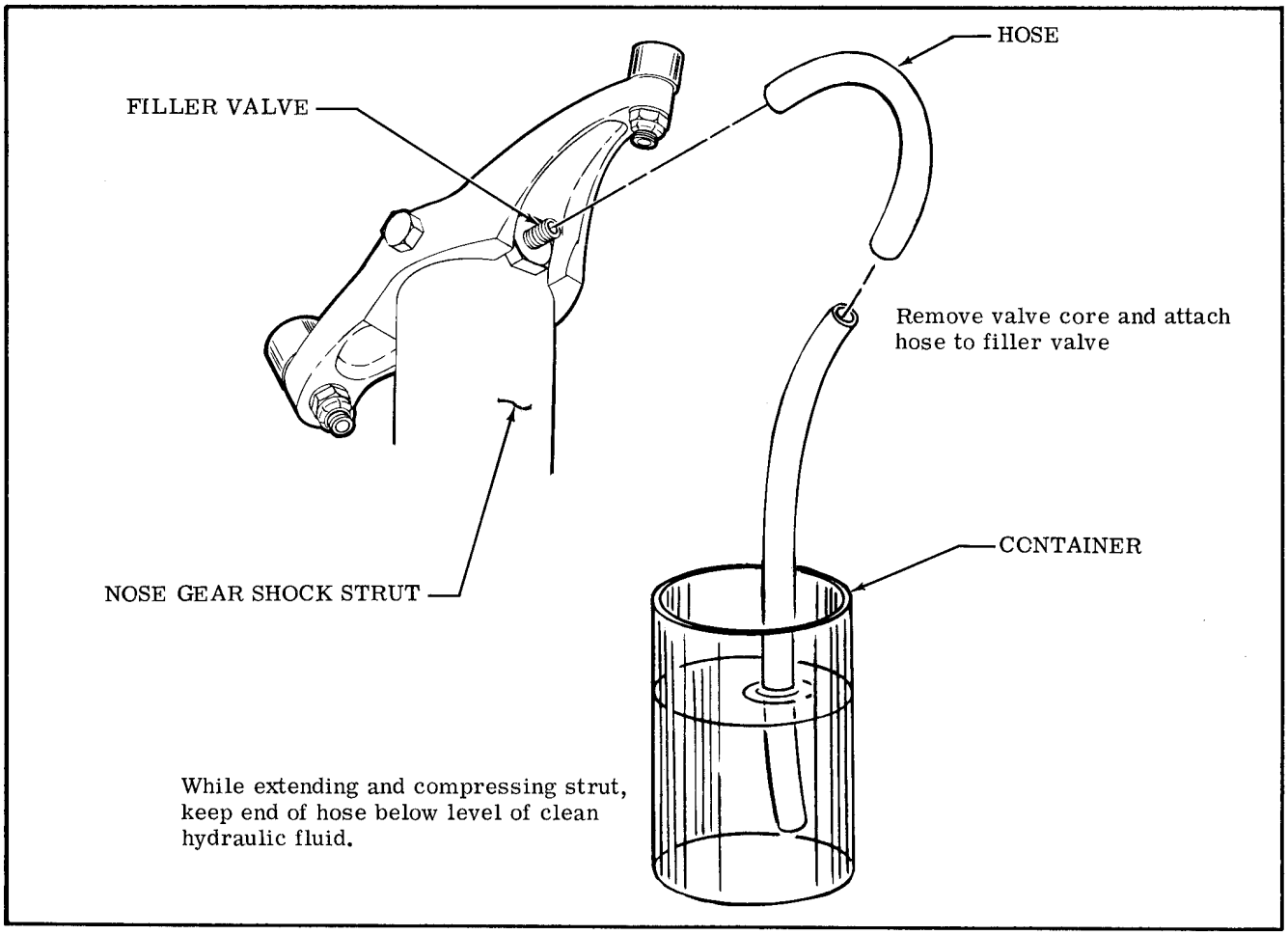


Figure 2-4. Filling Nose Gear Strut

SHOP NOTES:

NOTE

Recommended tire pressure should be maintained. Especially in cold weather, remember that any drop in temperature of the air inside a tire causes a corresponding drop in pressure.

2-26. NOSE GEAR STRUT. The nose gear strut requires periodic checking to ascertain that the strut is filled with hydraulic fluid and is inflated to the correct air pressure. When servicing the nose gear strut proceed as follows:

a. Remove valve cap and reduce air pressure to zero.

b. Remove valve core and attach hose and container as shown in figure 2-4.

c. Lift nose of airplane, extend and compress strut several times to expel any entrapped air, then lower nose of airplane until strut is telescoped to its shortest length. Remove hose and container.

d. Install valve core and inflate strut to pressure specified in Section 1.

NOTE

The nose landing gear shock strut will normally require only a minimum amount of service. Maintain the strut extension pressure as shown in Section 1. Lubricate landing gear as shown in figure 2-6. Check the landing gear daily for general cleanliness, security of mounting, and for hydraulic fluid leakage. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excess hydraulic fluid or kerosene.

2-27. NOSE GEAR SHIMMY DAMPENER. The shimmy dampener should be serviced at least every 100 hours. The dampener must be filled completely with fluid, free of entrapped air, to serve its purpose. To fill or add fluid to shimmy dampener while installed on airplane:

a. Remove filler plug from dampener.

b. Using a tow-bar, turn nose gear in the direction that places the dampener piston at the end opposite the filler plug.

c. Fill with clean hydraulic fluid.

d. Install and safety filler plug.

To fill shimmy dampener when it is removed from airplane, proceed as follows:

a. Remove filler plug from dampener.

b. Submerge dampener in clean hydraulic fluid and work dampener piston shaft in and out to remove any entrapped air and ascertain complete filling of cylinder.

c. Reinstall plug before removing dampener from hydraulic fluid.

NOTE

Keep shimmy dampener, especially the exposed portions of the dampener piston shaft clean to prevent collection of dust and grit which could cut the seals in the dampener barrel. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excess hydraulic fluid or kerosene

2-28. HYDRAULIC BRAKE SYSTEMS should be checked for the correct amount of fluid at least every 100 hours. Add hydraulic fluid at the brake master cylinders. Bleed the brake system of entrapped air whenever there is a spongy response to the brake pedals.

2-29. HYDRAULIC RESERVOIR. The reservoir fluid level should be checked and replenished as necessary every 25 hours. Filling is accomplished by using a pressure brake bleeder or Hydro Fill unit attached to filler fitting on forward side of the firewall. Hydraulic fluid should be pumped into the filler unit until fluid flows from the reservoir overboard vent line. The reservoir may also be filled as outlined in paragraph 5-127 using the Hydro Test Unit.

2-30. HYDRAULIC PUMP CHECK. The aircraft may be equipped with the rear engine optional hydraulic system. Since either hydraulic pump will operate the system, it is very difficult to determine if one pump has failed. At each 100-hour inspection a hydraulic pump check should be performed as follows:

a. With front engine running, place master switch to the OFF position.

b. Check that landing gear doors open.

c. Place master switch to ON position. Check that landing gear doors close.

d. Start rear engine and shut down front engine.

e. Place master switch in the OFF position and check that landing gear doors open.

f. Place master switch to ON position and check that landing gear doors close.

2-31. HYDRAULIC FILTER. The screen in the hydraulic filter should be removed and cleaned with solvent (Federal Specification P-S-661, or equivalent) at the first 25 hours and the first 50 hours of operation, thereafter at 100-hour inspections or whenever improper fluid circulation is suspected. Also, clean rear filter when optional dual hydraulic system is installed.

2-32. HYDRAULIC FLUID SAMPLING. At the first 50 and first 100 hours, thereafter at each 500 hours or one year, whichever should occur first, a sample of fluid should be taken and examined for sediment and discoloration. This may be done as follows:

a. Place master switch in OFF position.

b. With landing gear control handle in down-neutral, actuate hydraulic hand pump to supply pressure to open landing gear doors.

c. Remove door open line from a door actuator cylinder. Using the hydraulic hand pump, drain off a small sample of hydraulic fluid into a non-metallic container.

d. Reconnect door actuating cylinder line and inspect fluid coloration. If the fluid is clear and is not appreciably darker in color than new fluid, continue to use the present fluid in the system.

e. If the fluid coloration is doubtful, insert a strip of polished copper in the fluid. Keep the copper in the fluid for six hours at a temperature of 70°F or more. A slight darkening is permissible and there should be no pitting or etching visible up to 20X magnification.

2-33. OXYGEN SYSTEM.

WARNING

Do not rotate control lever to "ON" position with outlet (low pressure) port(s) open to atmosphere. Refer to Section 13.

2-34. OXYGEN FACE MASKS. (Refer to Section 13.)

2-35. CLEANING.

2-36. Keeping the aircraft clean is important. Besides maintaining the trim appearance of the airplane, cleaning reduces the possibility of corrosion and makes inspection and maintenance easier.

2-37. WINDSHIELD AND WINDOWS should be cleaned carefully with plenty of fresh water and a mild detergent, using the palm of the hand to feel and dislodge any caked dirt or mud. A sponge, soft cloth, or chamois may be used, but only as a means of carrying water to the plastic. Rinse thoroughly, then dry with a clean moist chamois. Do not rub the plastic with a dry cloth since this builds up an electrostatic charge which attracts dust. Oil and grease may be removed by rubbing lightly with a soft cloth moistened with Stoddard solvent.

CAUTION

Do not use gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, de-icer fluid, lacquer thinner or glass window cleaning spray. These solvents will soften and craze the plastic.

After washing, the plastic windshield and windows should be cleaned with an aircraft windshield cleaner. Apply the cleaner with soft cloths, and rub with moderate pressure. Allow the cleaner to dry, then wipe it off with soft flannel cloths. A thin, even coat of wax, polished out by hand with clean soft flannel cloths, will fill in minor scratches and help prevent further scratching. Do not use a canvas cover on the windshield or windows unless freezing rain or sleet is anticipated since the cover may scratch the plastic surface.

2-38. PLASTIC TRIM. The plastic trim instrument panel, and control knobs need only to be wiped off with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with Stoddard solvent. Volatile solvents, such as mentioned in paragraph 2-37, must never be used since they soften and craze the plastic.

2-39. ALUMINUM SURFACES require a minimum of care, but should never be neglected. The airplane may be washed with clean water to remove dirt, and with carbon tetrachloride or other non-alkaline grease solvents to remove oil and/or grease. Household type detergent soap powders are effective cleaners, but should be used cautiously since some of them are strongly alkaline. Many good aluminum cleaners, polishes, and waxes are available from commercial suppliers of aircraft products.

2-40. PAINTED SURFACES. The painted exterior surfaces of the aircraft, under normal conditions, require a minimun of polishing or buffing. Approximately 15 days are required for acrylic or lacquer paint to cure completely and approximately 90 days are required for vinyl paint to cure completely; in most cases, the curing period will have been completed prior to delivery of the airplane. In the event that polishing or buffing is required within the curing period, it is recommended that the work be done by an experienced painter. Generally, the painted surfaces can be kept bright by washing with water and mild soap, followed by a rinse with water and drying with cloths or a chamois. Harsh or abrasive soaps or detergents which cause corrosion or make scratches should never be used. Remove stubborn oil and grease with a cloth moistened with Stoddard solvent. After the curing period, the airplane may be waxed with a good automotive wax. A heavier coating of wax on the leading edges of the wings and tail and on the engine nose cap will reduce the abrasion encountered in these areas.

2-41. ENGINE COMPARTMENT. Cleaning is essential to minimize any danger of fire, and for proper inspection of components. The engine and engine compartment may be washed down with a suitable solvent, and then dried thoroughly. Refer to Section 10.

2-42. UPHOLSTERY AND INTERIOR cleaning prolong the life of upholstery fabrics and interior trim. To clean the interior, proceed as follows:

a. Empty all ash trays.

b. Brush or vacuum clean the carpeting and upholstery to remove dirt.

c. Wipe leather and plastic surfaces with a damp cloth.

d. Soiled upholstery fabrics and carpeting may be cleaned with a foam-type detergent, used in accordance with the manufacturer's instructions.

e. Oily spots and stains may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place in the fabric to be cleaned. Never saturate the fabric with a volatile solvent; it may damage the padding and backing materials.

f. Scrape sticky materials with a dull knife, then spot-clean the area.

2-43. PROPELLERS should be wiped off occasionally with an oily cloth to clean off grass and bug stains. In salt water areas this will assist in corrosion-proofing the propeller.

2-44. WHEELS should be washed periodically and examined for corrosion, chipped paint, and cracks or dents in the wheel castings. Sand smooth, prime, and repaint minor defects.

2-45. LUBRICATION.

2-46. LUBRICATION requirements are shown on the Lubrication Chart (figure 2-6). Before adding grease to grease fittings, wipe off all dirt. Lubricate until new grease appears around parts being lubricated, and wipe off excess grease. The following paragraphs supplement this figure by adding details.

2-47. NOSE GEAR TORQUE LINKS. Lubricate torque links every 50 hours. When operating in dusty conditions, more frequent lubrication is recommended.

2-48. UNIVERSAL JOINTS. It is important that all pivot points and sliding surfaces of the universal joints be lubricated. Lubricate with SAE 90 gear oil at installation and at each 100-hour inspection. Apply gear oil to each pivot point and sliding surface of the universal joint so that the oil will work between the moving surfaces.

2-49. DOWNLOCK PINS AND OVERCENTER BUTTONS. At each 100-hour inspection, clean with solvent and inspect for sharp edges the downlock pins, overcenter buttons, and main landing gear struts where they contact the pins and buttons. Smooth all sharp edges. Do not paint the "tracks" on the struts made by the pins and buttons. Lubricate downlock pins, overcenter buttons, and strut with general purpose grease. Also, clean and lubricate the cam surface of the downlock switch bracket.

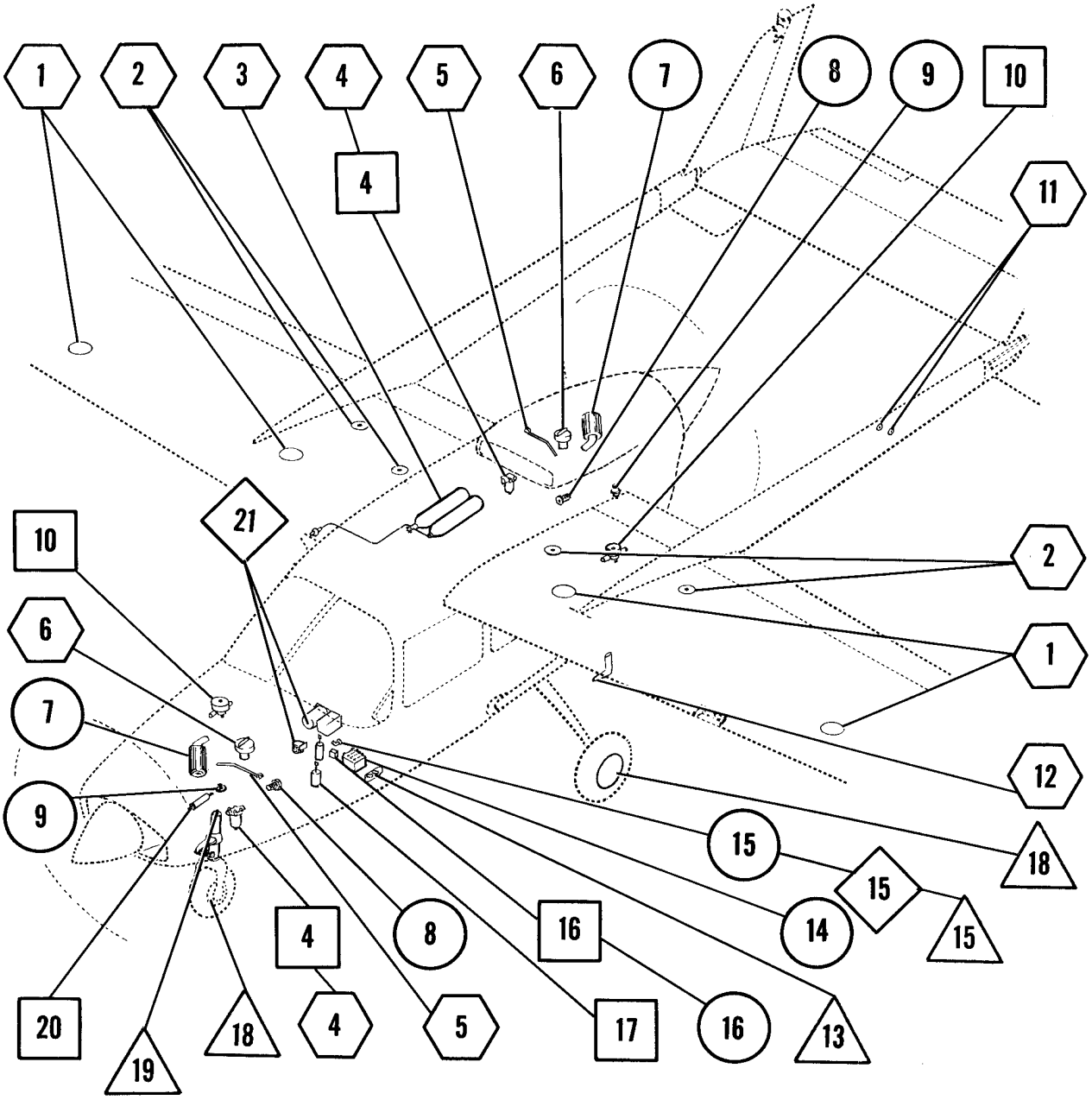
2-50. NOSE GEAR CAM FOLLOWERS. At the first 500-hour inspection, remove plugs in stud of cam followers and lubricate with general purpose grease. Lubricate cam followers at each 500-hour inspection, using automotive type rubber tipped grease gun when lubricating cam followers. There is no need to reinstall plugs in cam follower studs.

2-51. WHEEL BEARING LUBRICATION. It is recommended that nose and main wheel bearings be cleaned and repacked at the first 100-hour inspection and at each 500-hour inspection thereafter. If more than the usual number of take-off and landings are made, extensive taxiing is required, or the airplane is operated in dusty areas or under seacoast conditions, it is recommended that cleaning and lubrication of wheel bearings be accomplished at each 100-hour inspection.

2-52. FUEL SELECTOR VALVE LUBRICATION. It is now recommended that the fuel selector valve detents and valve shaft be lubricated at each 100-hour inspection. Apply lubrication to each detent of the valve and to the valve shaft where it protrudes from the valve cover boss.

2-53. AILERON ROD END BEARING. The actuating rod attach point is exposed to the weather through a small opening in the upper leading edge of the aileron. Therefore, periodic inspection and lubrication is required to prevent corrosion of the bearing in the rod end. At each 100-hour inspection, disconnect the control rods at the aileron and inspect each rod end ball for corrosion. If no corrosion is found, wipe the surface of the rod end balls with general purpose oil and rotate the ball freely to distribute the oil over its entire surface and connect the control rods. If corrosion is detected during inspection, replace the rod end.

2-54. WING FLAP ACTUATORS. On aircraft prior to 337-0240, clean screw jack threads of the wing flap actuator with solvent and brush, and lubricate screw jack threads as specified in figure 2-6. Beginning with Serial 337-0240, the wing flap actuator jack screw threads require no lubrication.



*RECOMMENDED FUEL:
AVIATION GRADE---100/130 MINIMUM GRADE

*100/130 low lead aviation fuel with a lead content limited to 2 cc per gallon is also approved.

HYDRAULIC FLUID
SPEC. NO. MIL-H-5606

OXYGEN:
SPEC. NO. MIL-O-27210

*RECOMMENDED ENGINE OIL:
AVIATION GRADE---SAE 30 OR SAE 10W30 BELOW 40°F.
SAE 50 ABOVE 40°F.

* MULTI-VISCOSITY OIL WITH A RANGE OF SAE 10W30 IS RECOMMENDED FOR IMPROVED STARTING AND TURBOCHARGER CONTROLLER OPERATION IN COLD WEATHER. DETERGENT OR DISPERSANT OIL, CONFORMING TO CONTINENTAL MOTORS SPECIFICATION MHS-24A, MUST BE USED.

Figure 2-5. Servicing Chart (Sheet 1 of 4)

DAILY

1 FUEL TANKS:
Fill after each flight. Keep full to retard condensation. Refer to paragraph 2-18 for details.

2 FUEL TANK SUMP DRAINS:
Drain water and sediment before first flight of day and after each refueling. Refer to paragraph 2-19 for details.

3 OXYGEN CYLINDER (OPTIONAL MODEL 337) (STANDARD MODEL T337):
Check for anticipated requirements before each flight. Refer to Section 13 for details.

4 FUEL STRAINERS:
Drain water and sediment before first flight of day.

5 OIL DIPSTICK:
Check on preflight. Add oil as necessary. Refer to paragraph 2-21 for details.

6 OIL FILLER CAP:
Whenever oil is added, check that oil filler cap is tight and oil filler door is secure.

11 12 PITOT AND STATIC PORTS:
Check for obstruction before first flight of the day.

50 HOURS

7 INDUCTION AIR FILTERS:
Service every 50 hours; oftener under dusty conditions. Refer to paragraph 2-22 for details.

14 BATTERY:
Check electrolyte level every 50 hours (or at least every 30 days), oftener in hot weather. Refer to paragraph 2-24 for details.

8 9 ENGINE OIL SYSTEM:
Change engine oil and external filter element every 50 hours. Without external filter, change oil and clean oil screen EVERY 25 HOURS. Reduce these intervals under severe operating conditions. Refer to paragraph 2-21 for details.

16 HYDRAULIC FILTER:
See under 100 hours.

15 HYDRAULIC FLUID CONTAMINATION CHECK:
See under 500 hours.

100 HOURS

10 VACUUM RELIEF VALVE FILTER:
Check air inlet filter for cleanliness. Remove, flush with solvent, and dry with compressed air. Replace air filter at each engine overhaul.

Figure 2-5. Servicing Chart (Sheet 2 of 4)

100 HOURS (Cont)

17 BRAKE MASTER CYLINDERS:
Check fluid level and refill as required with hydraulic fluid.

20 SHIMMY DAMPENER:
Check fluid level and refill as required with hydraulic fluid. Refer to paragraph 2-27 for details.

4 FUEL STRAINERS:
Remove bowl and filter screen and clean every 100 hours. Refer to paragraph 2-20 for details.

16 HYDRAULIC FILTER:
Remove and clean filter screen at first 25 and first 50 hours of operation; thereafter, at each 100-hour inspection. Refer to paragraph 2-31 for details.

500 HOURS

15 HYDRAULIC FLUID CONTAMINATION CHECK:
At the first 50 and first 100 hours, thereafter at each 500 hours or one year, whichever occurs first, make a hydraulic fluid sampling test as outlined in paragraph 2-32.

21 VACUUM SYSTEM AIR FILTERS:
Replace central air filter every 500 hours. Replace gyro instrument air filters at instrument overhaul. Refer to paragraph 2-23 for details.

AS REQUIRED

18 TIRES:
Maintain proper tire inflation as listed in chart in Section 1. Also refer to paragraph 2-25.

19 NOSE GEAR SHOCK STRUT:
Keep strut filled and inflated to correct pressure. Refer to paragraph 2-26 for details.

15 HYDRAULIC FLUID RESERVOIR AND FILLER:
Check fluid level at least every 25 hours through sight gage in reservoir and fill as required. Refer to paragraph 2-29 for details.

Figure 2-5. Servicing Chart (Sheet 3 of 4)

△ AS REQUIRED (Cont)

13 GROUND SERVICE RECEPTACLE (PRIOR TO 1967 MODELS) (OPT):
Connect to 24-volt, DC, negative-ground power unit for cold weather starting and lengthy ground maintainance of the electrical system. Master switch should be turned on before connecting a generator type external power source; it should be turned off before connecting a battery type external power source. Refer to Section 10.

CAUTION

Be certain that the polarity of any external power source or batteries is correct (positive to positive and negative to negative). A polarity reversal will result in immediate damage to semiconductors in the airplane's electronic equipment.

13 GROUND SERVICE RECEPTACLE (1967 MODELS AND ON) (OPT):
Connect to 24-volt, DC, negative-ground power unit for cold weather starting and lengthy ground maintenance of the airplane's electrical equipment with the exception of electronic equipment. Master switch should be turned on before connecting a generator type or battery type external power source. Refer to Section 10.

NOTE

The ground power receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground service plug is connected correctly to the airplane.

FUSES:
Replace as required with the following fuses:

PROTECTS	LOCATION	NUMBER
Clock	Upper left forward firewall.	S-1091-2
Front Cowl Flaps	At cowl flap motor.	AGC-2
Rear Cowl Flaps	At cowl flap motor.	AGC-3
Cigarette Lighter	Forward side of instrument panel just left of center.	SPE-6
Alternators (Auxiliary Field Circuit)	Upper left forward firewall.	S-1091-5

Figure 2-5. Servicing Chart (Sheet 4 of 4)

FREQUENCY (HOURS)

50 100 500

METHOD OF APPLICATION

HAND — GREASE GUN — OIL CAN — SYRINGE (FOR POWDERED GRAPHITE)

WHERE NO INTERVAL IS SPECIFIED, LUBRICATE AS REQUIRED AND WHEN ASSEMBLED OR INSTALLED.

NOTE

The military specifications listed below are not mandatory, but are intended as guides in choosing satisfactory materials. Products of most reputable manufacturers meet or exceed these specifications.

LUBRICANTS

PG —	MIL-G-6711	POWDERED GRAPHITE
GR —	MIL-G-81322A	GENERAL PURPOSE GREASE
GH —	MIL-G-23827	AIRCRAFT AND INSTRUMENT GREASE
GL —	MIL-G-21164	HIGH AND LOW TEMPERATURE GREASE
OG —	MIL-L-7870	GENERAL PURPOSE OIL
PL —	VV-P-236	PETROLATUM
GO —	MIL-L-2105B	MULTI PURPOSE GEAR OIL GRADE 90

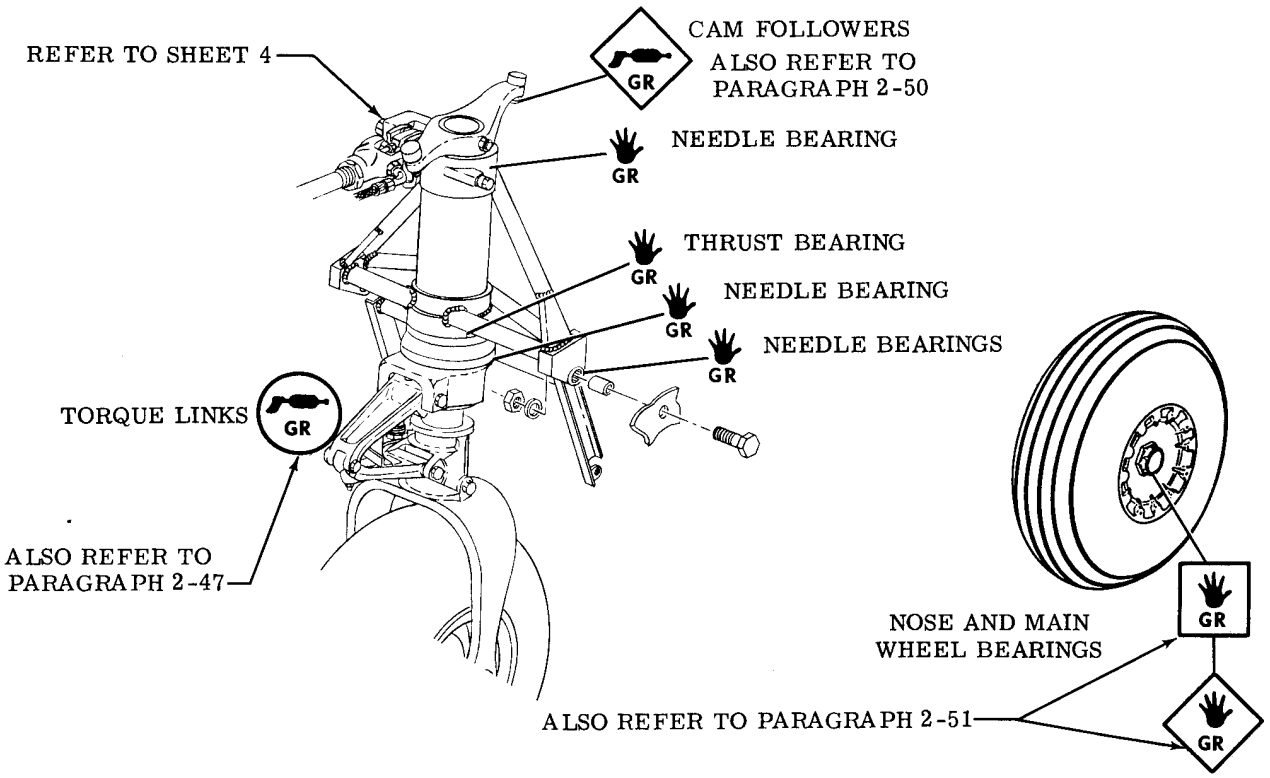
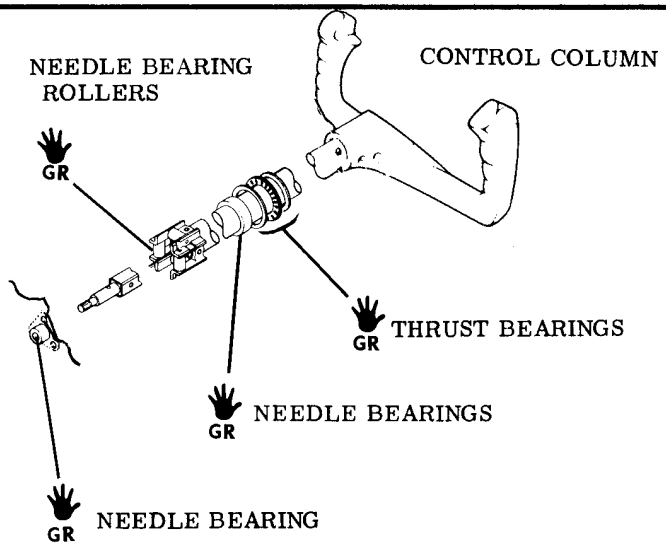
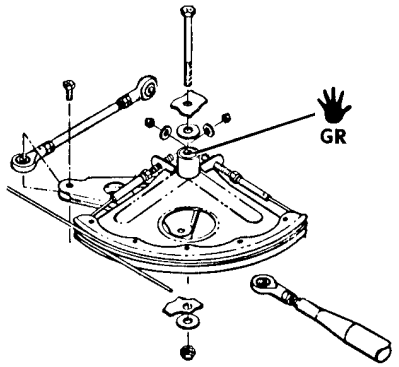
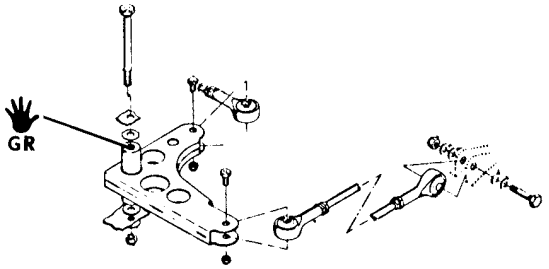


Figure 2-1. Lubrication (Sheet 1 of 5)



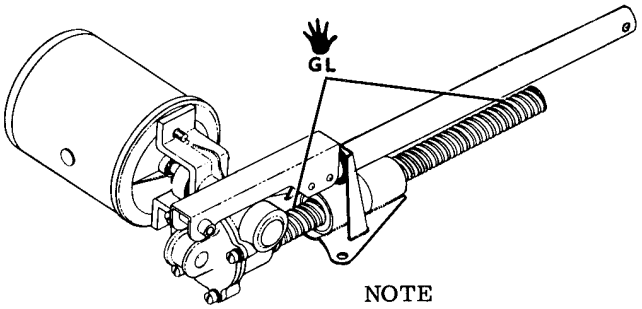


FLAP BELLCRANK NEEDLE BEARINGS



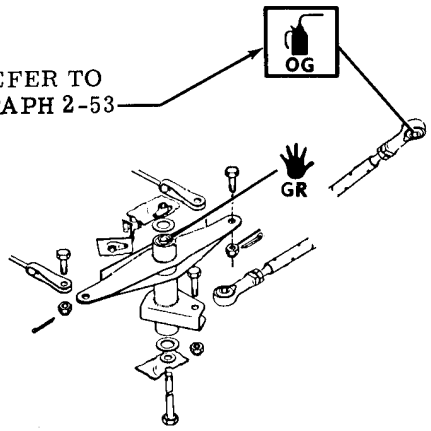
FLAP BELLCRANK NEEDLE BEARINGS

THRU SERIAL 337-0239

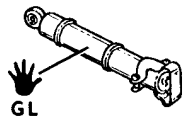


NOTE

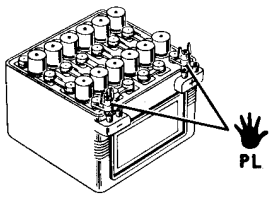
Beginning with serial 337-0240, no lubrication is required on the wing flap actuator screw jack threads. Also, refer to paragraph 2-54.



AILERON BELLCRANK NEEDLE BEARINGS



ELEVATOR TRIM TAB ACTUATOR



BATTERY TERMINALS

Figure 2-1. Lubrication (Sheet 2 of 5)

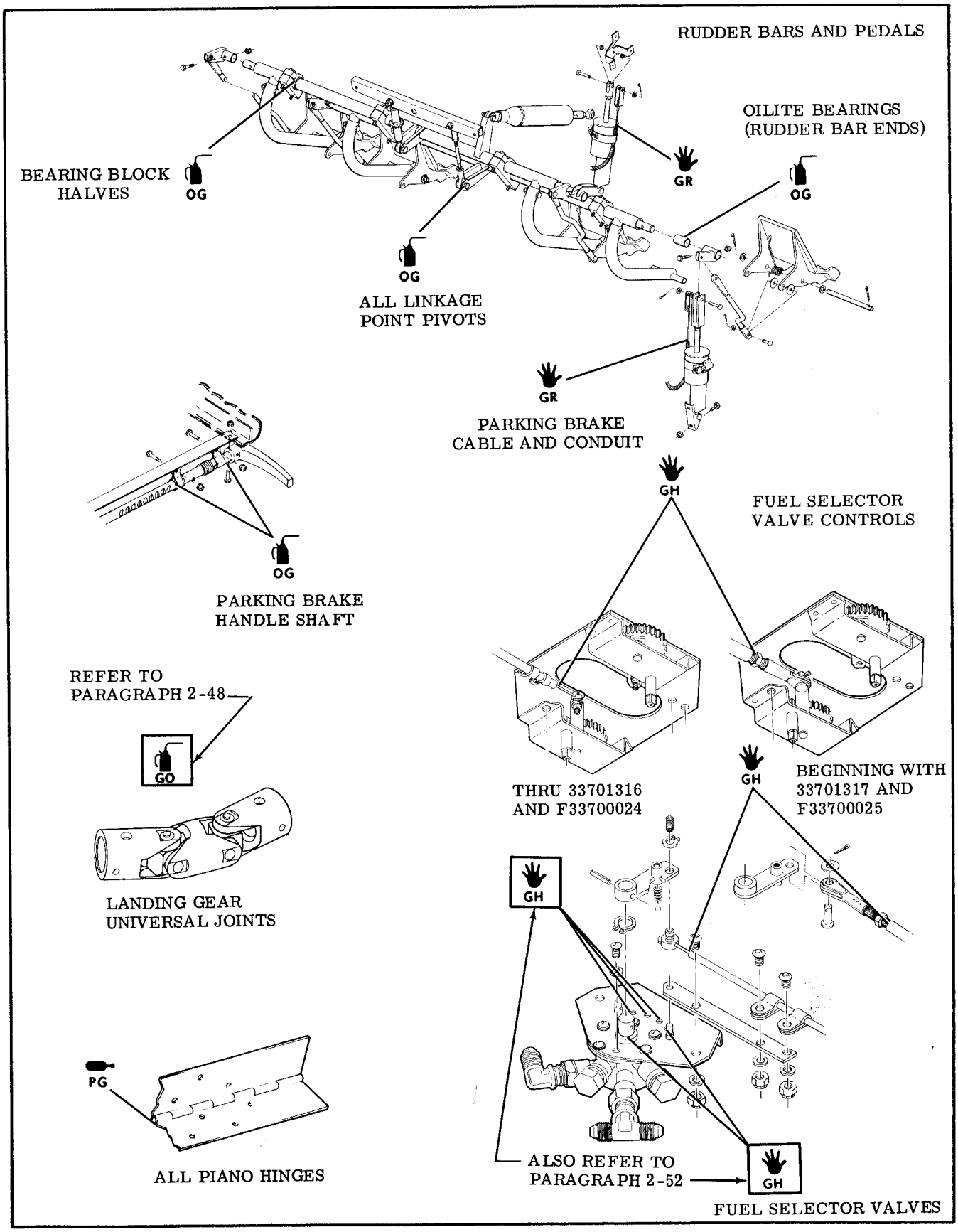


Figure 2-1. Lubrication (Sheet 3 of 5)

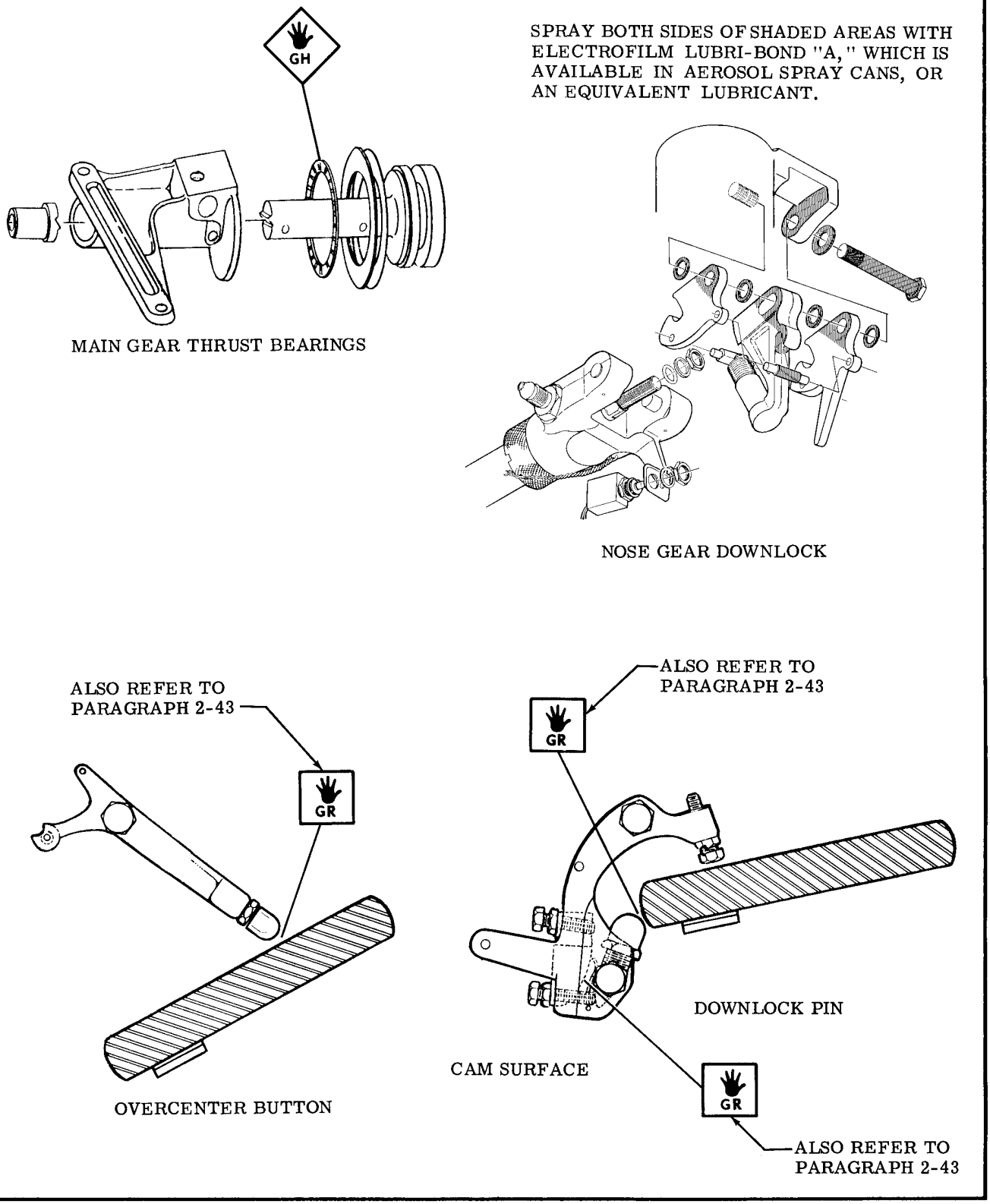
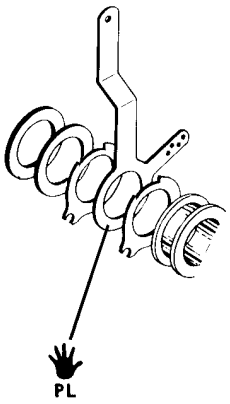
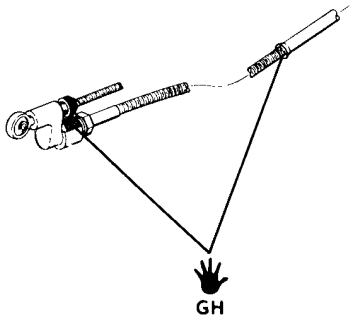


Figure 2-1. Lubrication (Sheet 4 of 5)

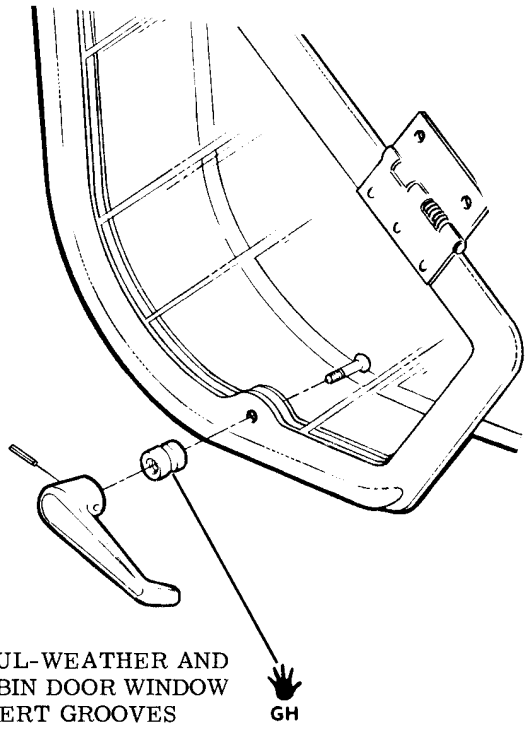
3



CONTROL QUADRANT LEVERS



PROPELLER SYNCHRONIZER CONTROL



FOUL-WEATHER AND CABIN DOOR WINDOW INSERT GROOVES

NOTE

Sealed bearings require no lubrication.

McCauley propellers are lubricated at overhaul and require no other lubrication.

Do not lubricate roller chains or cables except under seacoast conditions. Wipe with a clean, dry cloth.

Lubricate unsealed pulley bearings, rod ends, Olite bearings, pivot and hinge points, and any other friction point obviously needing lubrication, with general purpose oil every 1000 hours or oftener if required.

Paraffin wax rubbed on seat rails will ease sliding the seats fore and aft.

Lubricate door latching mechanism with MIL-G-81322A, applied sparingly, to friction points, every 1000 hours or oftener if binding occurs. No lubrication is recommended on the rotary clutch.

Lubricate quadrant controls with petrolatum on levers only within a one-inch radius from pivot hole.

Figure 2-1. Lubrication (Sheet 5 of 5)

INSPECTION

To avoid repetition throughout the inspection, general points to be checked are given below. In the inspection, only the items to be checked are listed; details as to how to check, or what to check for, are excluded. The inspection covers several different models. Some items apply only to specific models, and some items are optional equipment that may not be found on a particular airplane. Check FAA Airworthiness Directives and Cessna Service Letters for compliance at the time specified by them. Federal Aviation Regulations require that all civil aircraft have a periodic (annual) inspection as prescribed by the administrator, and performed by a person designated by the administrator. The Cessna Aircraft Company recommends a 100-hour periodic inspection for the aircraft.

CHECK AS APPLICABLE:

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 tensions.
FLUID LINES AND HOSES for: leaks, cracks, dents, kinks, chafing, proper radius, security, corrosion, deterioration, obstructions, and foreign matter.
METAL PARTS for: security of attachment, cracks, metal distortion, broken spotwelds, corrosion, condition of paint, and any other apparent damage.
WIRING for: security, chafing, burning, defective insulation, loose or broken terminals, heat deterioration, and corroded terminals.
BOLTS IN CRITICAL AREAS for: correct torque in accordance with the torque values given in the chart in Section 1, when installed or when visual inspection indicates the need for a torque check.
FILTERS, SCREENS, AND FLUIDS for: cleanliness, contamination and/or replacement at specified intervals.

AIRPLANE FILE.

Miscellaneous data, information, and licenses are a part of the airplane 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 installed (FCC Form 556).

To be carried in 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 Books.

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.
3. Magneto drop (See Owner's Manual).
4. Engine response to changes in power.
5. Any unusual engine noises.
6. Propeller response (See Owner's Manual).
7. Fuel tank selector valve; operate engine on each tank position and off position long enough to make sure the valve functions properly.
8. Idling speed and mixture; proper idle cut-off.
9. Alternator and ammeter.
10. Suction Gage.
11. Fuel flow indicator.
12. Optional hydraulic pump (see paragraph 2-30).

SCOPE AND PREPARATION.

If the engine is NOT equipped with an external oil filter, change engine oil and clean the oil screens EVERY 25 HOURS of engine operation.

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, boom, empennage, and upholstery inspection doors, plates, and fairings as necessary to perform a thorough, searching inspection of the airplane. On those aircraft with inspection plates on the tunnel cover, it is not necessary to remove the tunnel cover during inspection, remove only the inspection plates on the tunnel cover. 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. Mounting nuts	●		
5. Governor and control	●		
6. Unfeathering accumulator		●	1
7. Synchronizing system	●		
8. Anti-Ice electrical wiring		●	
9. Anti-Ice brushes, slip ring, and boots		●	
ENGINE COMPARTMENT.			
Check for evidence of oil, hydraulic fluid, 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
2. Oil cooler	●		

	EACH 50 HOURS	EACH 100 HOURS	AS SPECIFIED
3. Induction air filters (Also see paragraph 2-22)	●		
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 pan, accessory section, and front crankshaft seal	●		
9. Metal lines and fluid hoses	●		13
10. Intake and exhaust systems (Also refer to Section 10)	●		14
11. Ignition harness	●		
12. Spark plugs and compression check		●	
13. Crankcase breather lines	●		
14. Electrical wiring	●		
15. Vacuum pump, oil separator, and relief valve	●		
16. Vacuum relief valve filter		●	3
17. Engine controls and linkage	●		15
18. Engine shock mounts, engine mount structure, and ground straps	●		
19. (Exhaust type heaters) Cabin heater valves, doors, and controls	●		
20. Starter, solenoid, and electrical connections	●		
21. Starter brushes, brush leads, and commutator			4
22. Alternator, and electrical connections	●		
23. Alternator brushes, brush leads, and slip ring			5
24. Voltage regulator mounting and electrical leads	●		
25. Magnetos (externally) and electrical connections	●		
26. Magneto breaker compartment (Also refer to Section 10)			16
27. Magneto timing to engine		●	16
28. Fuel injection fuel-air control unit, fuel pump, fuel manifold valve, fuel lines, and nozzles	●		
29. Firewall		●	
30. Engine cowling	●		
31. Cowl flaps controls and motors	●		
32. Hydraulic pump (s)	●		

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
33. Turbocharger			●
34. Turbocharger pressurized vent lines to fuel pump, discharge nozzles, and fuel flow gage			●
35. Turbocharger mounting brackets			●
36. Waste gate, actuator and linkage, and controllers			●
37. All oil lines to turbocharger, waste gate, and controllers			●
38. (Internal combustion heater) Ventilating and combustion air inlets, exhaust outlet, fuel and drain lines, electrical connections, combustion air blower, and air tube connections		● 7	
FUEL SYSTEM.			
1. Fuel strainers, drain valves, and controls			●
2. Fuel strainer screens and bowls		●	
3. Electric fuel pumps and electric connections			●
4. Fuel tanks, fuel sump tanks, fuel lines, drains, filler caps, and placards		●	
5. Drain fuel and check tank interior, attachment, and outlet screens	6		
6. Fuel vents and vent valves		●	
7. Fuel selector valves and placards		●	
8. Fuel quantity gages and transmitter units		●	
9. Vapor return lines and check valves		●	
10. Engine primer		●	
11. Turbocharger vent system		●	
AIRFRAME.			
1. Aircraft exterior			●
2. Aircraft structure		●	
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		●	

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
8. Instruments and markings			●
9. Gyro filter replacement		8	
10. Vacuum system central air filter		8	
11. Magnetic compass compensation		6	
12. Instrument wiring and plumbing			●
13. Instrument panel, shockmounts, ground straps, cover, and decals and labeling			●
14. Defrosting, heating, and ventilating systems, and controls			●
15. Cabin upholstery, trim, sunvisors, and ash-trays			●
16. Area beneath floor, lines, hoses, wires, and control cables			●
17. Electrical horns, lights, switches, circuit breakers, fuses, and spare fuses			●
18. Exterior lights			●
19. Pitot and static systems			●
20. Stall warning sensing unit, and pitot and stall warning heaters			●
21. Electronic equipment and controls			●
22. Antennas			●
23. Battery, battery box, and battery cables			●
24. Battery electrolyte level (Also see paragraph 2-24)			●
25. Oxygen system (Also see Section 13)			●
26. Oxygen supply, masks, and hoses		9	
27. De-Ice system plumbing			●
28. De-Ice system components			●
29. De-Ice system boots			●

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			●

	AS SPECIFIED	EACH 100 HOURS	EACH 50 HOURS
5. All decals and labeling			●
6. Flap rollers and tracks, flap electrical indicating system, flap mechanical indicating system, flap controls, flap electric motor brake and transmission, and flap/elevator trim interconnect 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			●
LANDING GEAR.			
1. Brake fluid, lines and hoses, linings, discs, brake assemblies, and master cylinders			●
2. Main gear wheels, wheel bearings, spring struts, and tires			●
3. Nose gear strut and shimmy dampener servicing			●
4. Nose gear wheel, wheel bearings, strut, steering system, shimmy dampener, tire, and torque links			●
5. Parking brake system			●
LANDING GEAR RETRACTION SYSTEM.			
NOTE: When performing inspection of the landing gear retraction system, a hydraulic power source can be used. Refer to Section 5 for test stand operation procedures.			
1. Operate the landing gear through five fault-free cycles, noting cycling time. Refer to Section 5			●
2. Check landing gear doors for at least 1/2 inch clearance with any part of landing gear during operation, and for proper fit when closed			●
3. Check down position of main gear struts. Refer to Section 5			●
4. Check main gear downlock engagement. Refer to Section 5			●
5. Check overcenter adjustments of retracted main gear downlock. Refer to Section 5			●
6. Check operation of downlock cam. Refer to Section 5			●

		AS SPECIFIED	EACH 50 HOURS	EACH 100 HOURS	
7	Check main gear uplock hook operation. (Refer to Section 5.)			●	
8	Check that main gear snubbing action occurs. (Refer to Section 5.)			●	
9	Check adjustment and operation of main gear up and down indicator switches, nose gear up and down indicator switches, and nose gear safety switch. (Refer to Section 5.) Also check indicator lights for proper operation.			●	
10	Check nose gear downlock adjustments. (Refer to Section 5.)			●	
11	Check nose gear uplock operation. (Refer to Section 5.)			●	
12	Check adjustment of landing gear handle up-down switch. (Refer to Section 5.)			●	
13	Check operation of landing gear handle lockout solenoid. (Refer to Section 5.)			●	
14	Check all hydraulic system components for security, hydraulic leaks, and any apparent damage to components or mounting structure.			●	
15	Check universal joints for cracks and excessive wear.			●	
16	Check gear and door linkage for security, wear of pivot points and bearings, and for distortion or other damage			●	
17	Check main gear strut-to-saddle attachment			●	
18	Check torque of adapter-to-pivot shaft attaching bolts, and resafety				10
19	Check condition of all springs			●	
20	Clean hydraulic filter (Refer to Section 2.)			●	11
21	Clean small in-line filters at each end of restrictor check valve between main gear actuator and main gear downlock cylinders. Also, clean in-line filter in nose gear up line on forward side of front firewall				6
22	Hydraulic fluid contamination check (Refer to Section 2.)			●	12
23	Check security and operation of emergency hand pump			●	
24	Check roller clearances on steering cam (Refer to Section 5.)			●	

NOTE

A high-time inspection is merely a 100-hour inspection with the addition of an engine overhaul. Continental Motors Corporation, Inc. recommends overhaul at 1500 hours for the IO-360 Series engines, and overhaul at 1400 hours for the TSIO-360 Series engines. At time of engine overhaul, engine accessories, turbochargers, controllers, waste gate valves, and waste-gate actuators should be overhauled. Engine propellers and governors should be overhauled at 1200 hours of engine operating time. Refer to Section 12 for specific information.

1 First 25 hours; each 100-hour inspection thereafter.

2 First 25 hours, refill with straight grade mineral oil (non-detergent) and use until a total of 50 hours have accumulated or oil consumption has stabilized, then change to detergent oil. Thereafter, change oil each 25 hours if the engine is NOT equipped with an external filter.

3 At each instrument overhaul, replace filter.

4 Each 200 hours.

5 Each 500 hours.

6 Each 1000 hours, or to coincide with engine overhauls.

7 It is recommended that the internal combustion heater be removed from the aircraft for a complete inspection and necessary overhaul operations at the expiration of 500 hours of operation or after each heating season, whichever occurs first.

8 Replace central filter each 500 hours; gyro filters at instrument overhaul. See paragraph 2-23.

9 Anticipated requirements before each oxygen flight.

10 At first 100-hour inspection; at next 100-hour inspection after new shear washers installed.

11 At first 25 hours and first 50 hours of operations; at each 100-hour inspection thereafter.

12 First 50 and first 100 hours, thereafter at each 500 hours or one year, whichever comes first.

13 Replace fluid hoses at engine overhaul or after 5 years, whichever comes first.

14 General inspection every 50 hours. Refer to Sections 10 and 10A for 100 hour inspection.

15 Each 50 hours for general condition and freedom of movement. These controls are not repairable. Replace as required at each engine major overhaul.

16 Check timing each 200 hours; check breaker compartment each 500 hours, unless timing is off.